

NSSDC/WDC-A-R&S 77-03

REPORT ON ACTIVE AND PLANNED

SPACECRAFT AND EXPERIMENTS

Edited by

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National Space Science Data Center

September 1977

National Space Science Data Center (NSSDC)/ World Data Center A for Rockets and Satellites (WDC-A-R&S) National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt, Maryland 20771

PREFACE

This Report on Active and Planned Spacecraft and Experiments provides the professional community with information on current as well as planned spacecraft activity in a broad range of scientific disciplines. Spacecraft that were active sometime in the time period January 1, 1975, to June 30, 1977, are included, as well as those planned missions that have progressed beyond the experiment or investigation selection stage. The document provides brief descriptions for these spacecraft and experiments as well as approximate time periods when data are being accumulated. The performance information for active NASA and NASA-cooperative programs is based, to a large extent, on the project office status reports through June 30, 1977. The National Space Science Data Center (NSSDC) has attempted to update all performance information to that date.

We would like to acknowledge the cooperation of the acquisition scientists and others at NSSDC in obtaining information and offering suggestions for this report. The cooperation of the project offices and experimenters in supplying current documentation of their spacecraft and experiments is gratefully acknowledged. We are particularly pleased with the many constructive comments and corrections we have received from interested users of this report.

> James I. Vette Robert W. Vostreys

September 1977

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^{*} For a complete listing of the spacecraft and experiments described in these sections, please refer to the Index of Active and Planned Spacecraft and Experiments (Section 4).

1 INTRODUCTION

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1. INTRODUCTION

1.1 Purpose

This Report on Active and Planned Spacecraft and Experiments provides 'the professional community with information on current and planned spacecraft activity for a broad range of scientific disciplines. By providing brief descriptions of the spacecraft and experiments as well as the approximate time periods when data are being accumulated, it is hoped that this document will be useful to many people interested in the scientific, applied, and operational uses of such data. Furthermore, for those planning or coordinating future observational programs employing a number of different techniques such as rockets, balloons, aircraft, ships, and buoys, this document can provide some insight into the contributions that may be provided by orbiting instruments. One such program utilizing this report is the International Magnetospheric Study (IMS).

1.2 Contents

This document includes information concerning active and planned spacecraft and experiments known to the National Space Science Data Center (NSSDC). The information includes a wide range of disciplines: astronomy, earth sciences, meteorology, planetary sciences, aeronomy, particles and fields, solar physics, life sciences, and material sciences. These spacecraft projects represent the efforts and funding of individual countries as well as cooperative arrangements among different countries.

Descriptions of navigational and communications satellites are specifically not included in this report. Also not included are descriptions of spacecraft that contain only continuous radio beacons used for ionospheric studies. Many of these spacecraft are listed in the *SPACEWARN Bulletin**. No attempt has been made to include information regarding classified spacecraft or experiments.

*The SPACEWARN Bulletin is prepared by the World Data Center A for Rockets and Satellites, Code 601, Goddard Space Flight Center, Greenbelt, Maryland 20771, U.S.A. It is intended to serve as an international communications mechanism for the rapid distribution of information on satellites and space probes. It is published on behalf of the Committee on Space Research (COSPAR) by the International URSIGRAM and World Days Service (IUWDS), a permanent service of the International Scientific Radio Union in association with the International Astronomical Union and the International Union for Geodesy and Geophysics. The personnel at NSSDC have collected the information contained in this document from a variety of sources during the past several years; e.g., program offices, project offices, principal investigators and their staffs, publications, etc. The performance information of the spacecraft and experiments for active NASA and NASA-cooperative programs is based, to a large extent, on the project office status reports through June 30, 1977. NSSDC has attempted to update all performance information to that date. A few changes subsequent to this date may appear, depending on time availability.

1.3 Organization

This report includes four major sections with descriptive material introducing each section.

Section 2, "Descriptions of Active Spacecraft and Experiments," is a listing of descriptions of the spacecraft and experiments that were active sometime during the time period January 1, 1975, to June 30, 1977. The listing is arranged by spacecraft common name and the last name of the principal investigator or team leader.

Section 3, "Descriptions of Planned Spacecraft and Experiments," is a listing of descriptions of the spacecraft and experiments that were planned missions as of June 30, 1977, for which experiments or investigations have been selected and NSSDC has at least minimal documentation.

Sections 4 and 5 are two indexes to the information presented in Sections 2 and 3. Section 4, "Index of Active and Planned Spacecraft and Experiments," is an alphabetical listing by spacecraft name, including both common and alternate names, of all active and planned spacecraft and experiments. (This listing serves as an index to the location of spacecraft and experiment descriptions and includes launch dates and current status-of-operation data.) Section 5, "Investigator Name Index," is a listing, ordered by last name, of the investigators or team members associated with the experiments and their current affiliations.

These major sections were generated from NSSDC automated files. Other relevant spacecraft without brief descriptions are given in Appendix A. Special investigators for some new missions that could not conveniently be presented in Section 2 appear in Appendix B. Several words and phrases used in this document are defined in Appendix C. A more comprehensive list of the abbreviations and acronyms used in this document are included in Appendix D.

1.4 Availability of This Report

Upon request, NSSDC will provide copies of this report and future supplements to an individual or organization resident in the United States who can establish a need (in writing or by telephone) for this information. The same services are available to persons outside the United States through the World Data Center A for Rockets and Satellites (WDC-A-R&S). The official addresses for requests are printed on the inside front cover of this report.

Recipients are requested to inform potential users of the availability of this report. Because of continuing costs involved in publishing a document of this size on a periodic basis, NSSDC encourages individuals collocated in the same organization to share this document.

1.5 Request for Additions/Corrections

NSSDC continually strives to increase the usefulness of this report by improving the spacecraft and experiment descriptions and by including additional spacecraft and experiments as they become known to NSSDC. This report is complete and reasonably accurate concerning NASA and NASA-cooperative programs; however, descriptions of other spacecraft and experiments may be rather terse and incomplete because of a lack of information available to NSSDC. It should be noted that the information concerning the planned spacecraft and experiments is frequently general in nature and subject to change.

NSSDC would welcome comments as to errors or omissions in this report. Recommendations regarding the overall contents and organization of this report would also be appreciated. In particular, it is hoped that principal experimenters and project offices will cooperate in bringing such matters to NSSDC's attention.

*Note added in press: ESA is planning to launch the backup spacecraft, ESA-GEOS 2, carrying the same experiments. See the ESA-GEOS experiments. This is planned to be launched in the second quarter of 1978 into an equatorial, geostationary orbit.

DESCRIPTIONS OF ACTIVE SPACECRAFT AND EXPERIMENTS

2

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2. DESCRIPTIONS OF ACTIVE SPACECRAFT AND EXPERIMENTS

This section contains descriptions of spacecraft and experiments pertinent to this report that were active sometime during the period January 1, 1975, to June 30, 1977. A few changes subsequent to this date may appear, depending on time availability. The descriptions are sorted first by spacecraft common name. Within each spacecraft listing, experiments are ordered by the principal investigator's or team leader's last name. Explorer spacecraft prelaunch generic names are used as common names; e.g., IMP-H instead of Explorer 47. If the common name, as used by NSSDC, is not known, it can be found by referring to an alternate name found in the Index of Active and Planned Spacecraft and Experiments (Section 4).

Each spacecraft or experiment entry in this section is composed of two parts -- a heading and a brief description. The headings list characteristics of satellites and experiments. Definitions of many of the terms used in this section are included in Appendix C.

2.1 Contents of Spacecraft Entries

The heading for each spacecraft description in this section includes a set of initial or planned orbit parameters. These parameters consist of orbit type, epoch date, orbit period, apoapsis, periapsis, and inclination for the spacecraft. No orbit parameters are listed for lander and flyby missions. In addition, the heading contains the spacecraft weight, launch date, launch site, launch vehicle, spacecraft common and alternate names, NSSDC ID code, sponsoring country and agency, and spacecraft personnel -- project manager (PM), project scientist (PS), program manager (MG), program scientist (SC), technical director (TD), and program director (PD). The spacecraft brief description is immediately below each heading. This terminology is standard for NASA missions; the equivalent functions for the missions of other countries and/or agencies have been given the same position names.

2.2 Contents of Experiment Entries

Each experiment entry heading includes the experiment name, the NSSDC ID code, the investigative program, the investigation discipline, and the name and affiliation or location of the principal investigator (PI) or team leader (TL) for the experiment as well as other investigators (OI) or team members (TM) associated with the experiment. The experiment brief description is immediately below each heading.

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2.3 Active Spacecraft and Experiment Descriptions

A spacecraft is included in the active section of this report if it had a status of "normal" or "partial" and a data acquisition rate of "standard" or "substandard" for any length of time since January 1, 1975. Experiments that meet this same criteria are included.

SPACECRAFT CONKON NAME+ AD-A Alternate Names- explorer 19, 00714 NSSOE 10- 63-053A

LAUMCH DATE- 12/19/63 Laumch Site- Vandengerg Afb, United States Laumch Venicle- Scout VEIGHT- 7. KG

SPONSORING COUNTRY/AGENCY United States NASA-055

DRDIT PARAMETERS ORDIT TYNE- GEOCENTRIC ORDIT PERIOD - 110.6 MIN PERIAPSIS- 846. KM EPOCH DATE- 02/28/77 Inclination- 78.8 deg Apoapsis- 1673. KM APOAPSIS-PERSONNEL NASA HEADQUARTERS NG - J.R. HOLTZ

PN - C.W. COFFEE/JR.	NASA HEADQUARTERS NASA-LARC NASA HEADQUARTERS
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PS - R.F. FELLOWS (RETIRED) NASA HEADQUARTERS BRIEF DESCRIPTION EXPLORER 19 WAS INE SECOND IN A SERIES OF 3.66-M INFLATIBLE SPHERES PLACED INTO ORBIT TO DETERMINE ATMOSPHERIC DENSITIES. EXPLORER 19 WAS LAUNCHED WHILE EXPLORER 9, THE FIRST SATELLITE IN THE SERIES, WAS STILL ACTIVE, SO THAT DENSITIES IN TWO DIFFERENT PORTIONS OF THE ATMOSPHERE COLD BE SAMPLED SIMULTANEOUSLY. THE SATELLITE CONSISTED OF ALTERNATING LAYERS OF ALUMINUM FOIL AND PLASTIC FILM. UNIFORMLY DISTRIBUTED OVER THE ALUMINUM OUTER SURFACE WERE 5.1-CM DOTS OF WHITE PAINT FOR THERMAL CONTROL. A 136.620-MHZ TRACKING BEACON, WHICH WAS POWERED BY FOUR SOLAR CELLS AND WAS MOUNTED ON THE SPACECRAFT SKIN, USED THE LECTRICALLY SEPARATED ON THE SPACECRAFT SKIN, USED THE LECTRICALLY SEPARATED ON THE SPACECRAFT ON HUT ITS APOGEE WAS LOWER THAN PLANNED. THE BEACON DID NOT HAVE SUFFICIENT POWER TO BE RECEIVED BY GROUND TRACKING STATIONS, MAKING IT NECESSARY TO RELY SOLELY ON THE SAO BAKET-NUMN CAMERA NETWORK FOR TRACKING.

--- AD-A, JACCHIA------

INVESTIGATION NAME- NONSYSTEMATIC CHANGES OF AIR DENSITY

INVESTIGATIVE PROGRAM N550C 10- 63-053A-01 CODE ST

INVESTIGATION DISCIPLINE(S) AERONOMY

SAO

PERSONNEL PI - L.G. JACCHIA

GRIEF DESCRIPTION

GRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO DETERMINE NONSYSTEMATIC CHANGES OF UPPER ATMOSPHERIC DEMSITY BY CONDUCTING STUDIES OF THE DRAG ON A 3.6-M DIAMETER, LOW-DENSITY SPHERE CAUSED BY SHORT-TERM VARIATIONS IN SOLAR ACTIVITY. DEMSITY VALUES NEAR PERIGEE WERE DEDUCED FROM SEQUENTIAL OBSERVATIONS OF THE SPACECRAFT POSITION USING OPTICAL GAKER-HUNN CAMERA NETWORK) AND RADID/RADAR TRACKING TECHNIQUES. THE GENERAL TECHNIQUES USED TO DEDUCE DERSITY VALUES FROM SATELLITE DRAG DATA CAN BE FOUND IN SMITHSONIAN ASTROPHYSICAL OBSERVATORY SPECIAL REPORT ND. 100 BY JACCHIA AND SLOWEY.

----- AD-A, KEATING------

INVESTIGATION NAME- SYSTEMATIC CHANGES OF AIR DENSITY

INVESTIGATIVE PROGRAM NSSOC ID- 63-053A-02

CODE ST

INVESTIGATION DISCIPLINE(5) PLANETARY ATMOSPHERES

PERSONNEL		
P1 - G.M.	KEATING	NASA-LARC
	D'SULLIVAN, JR.	NASA-LARC
01 - C.W.	COFFEE, JR.	NASA-LARC

BRIEF DESCRIPTION

DRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT WAS TO DETERMINE ATMOSPHERIC DENSITY AS A FUNCTION OF ALTITUDE, LATITUDE, AND TIME BY MEASURING ATMOSPHERIC DRAG ON A LOW MASS-TO-AREA RATIO (0.7680 kg Per SQUARE METER) SPHERICAL SATELLITE. THE ORDIT WAS SUN SYNCHRONIZEG SO THAT NEAR-POLAR DENSITIES WOULD ALWAYS BE OBTAINED ALONG MOON AND MIDNIGHT MERIDIANS.

SPACECRAFT COMMON NAME- AD-C Alternate Names- PL-683J, Explorer 39 D3337

HSSDE 10- 68-066A

LAUNCH DATE- 08/08/68 Launch Site- Vandenberg Afd, united States Launch Vehicle- Scout WEIGHT- 9.4 KG

SPONSORING COUNTRY/AGENCY UNITED STATES NALA-055

ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 114.4 MIN PERIAPSIS- 684. KM	EPOCH DATE- 02/28/77 Inclination- 80.6 deg Apdapsis- 2174. KN
PERSONNEL MG - J.R. HOLTZ SC - E.R. SCHMERLING PM - C.W. COFFEE, JR. PS - R.F. FELLOWS(RETIRED)	NASA HEADQUARTERS NASA HEADQUARTERS NASA-LARC NASA HEADQUARTERS

BRIEF DESCRIPTION EXPLORER 30 WAS AN INFLATABLE SPHERE, 3.66 M IN DIAMETER. IT WAS ORBITED TO MAKE DENSITY ATMOSPHERE DETERMINATIONS. THE SPACECRAFT WAS SUCCESSFULLY LAUNCHED INTO A NEARLY POLAR. HIGHLY ELLIPTICAL ORBIT. IT WAS FOLDED AND CARRIED INTO ORBIT. TOGETHER WITH EJECTION AND INFLATION EQUIPMENT, AS PART OF THE PAYLOAD OF EXPLORER 40 (NISSOC ID 68-D66B). TWO DENSITY EXPERIMENTS WERE PERFORMED. ONE INVOLVED THE STUDY OF SYSTEMATIC DENSITY VARIATION, AND THE OTHER WAS CONCERNED WITH EMPERIMENTS USED FROM SEQUENTIAL OBSERVATIONS OF THE SPHERE BY USE OF AN ATACHED ISG.020-MHZ RADIO TRACKING BEACON AND BY OPTICAL TRACKING. THE RADIO BEACON CEASED TRANSMITTING IN JUNE 1971. SINCE THAT TIME IT HAS DEEN NECESSARY TO RELY SOLELY ON THE SAN DAKER-NUMM CAMERA NETWORK FOR TRACKING. EXPLORER 39 HAS AN EXPECTED ORDITAL LIFETIME OF 50 YEARS.

--- AD-C, JACCHIA------

INVESTIGATION NAME- NONSYSTEMATIC CHANGES OF AIR DENSITY

INVESTIGATIVE PROGRAM NSSBC 10- 68-066A-01

INVESTIGATION DISCIPLINE(5) AERONOMY

SAO

PERSONNEL PI - L.G. JACCHIA

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED IN DETERMINE NON-SYSTEMATIC UPPER ATMOSPHERIC DENSITY CHANGES. THE DATA ARE DERIVED FORE STUDIES OF THE DRAG ON A 3.6-METER DIAMETER LOW-DENSITY SPHERE CALSED BY SHORT-TERM DIFFERENCES IN SOLAR ACTIVITY. DENSITY VALUES MEAR PERIGEE WERE DEDUCED FROM SEQUENTIAL OBSERVATIONS OF THE SPACECRAFT POSITION USING OPTICAL (GAKEN-NUMN CAMERA HETWORK) AND RADIG AND/OR RADAR TRACKING TECHNIQUES. THE GENERAL TECHNIQUES USED TO DEDUCE DENSITY VALUES FROM SATELLITE DRAG DATA CAN BE FOUND IN SMITHSONIAR ASTROPHYSICAL OBSERVATOR" SPECIAL REPORT NO. 10D, BY JACCHIA AND SLOWEY. THIS EXPERIMENT HAS DETERNINED REASONABLE DENSITY VALUES, AND IS CAPABLE VIELDING LONG-TERM ATMOSPHERIC DENSITY VALUES, AS EXPLORER SP HAS AN EXPECTED ORBITAL LIFETIME OF 50 YEARS.

INVESTIGATION NAME- SYSTEMATIC CHANGES OF AIR DENSITY

INVESTIGATIVE PROGRAM #550C 10- 68-066A-02

CODE ST

INVESTIGATION DISCIPLINE(5) AERONOMY

PERSONNEL		
PI - G.M.	KEATING	NASA-LARC
01 - C.W.	COFFEE, JR.	NASA-LARC
01 - W.J.	O'SULLIVAN, JR.	HASA-LARC

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO DETERMINE SYSTEMATIC CHANNES OF AIR DENSITY AS A FUNCTION OF ALTITUDE, LATITUDE, AND TIME OF DAY, BY MEASURING THE DRAG ON A 3.6-METER DIAMETER LOW-DENSITY SPHERE WITH GROUND TRACKING.

SPACECRAFT COMMON NAME- AE-C Alternate NAMES" 5 6C, PL-721C Atmosphere Explorer-C, Explorer 51 6977

NESUC 10- 73-101A

LA NCH DATE- 12/16/73 Launch Site- Cape Canaveral, United States Launch Vehicle- Delta WEIGHT- 658. KG SPONSORING COUNTRY/AGENCY UNITED STATES NASA-055

INITIAL ORDIT PARAMETERS	 	1.1	11.1	
ONBIT TYPE- GEOCENTRIC		EPOCH	DATE-	12/16/73
DABIT PERIOD- 132.3 MIN			NATION	
PERIAPSIS= 149.0 Km		APOAP	515-	4294 0 KH
and the second				11 C 1 C 1

PERSONNEL

MG	- F.H.	GAETAND	NASA HEADQUARTERS
5.0	- E.R.	SCHMERLING	HASA HEADQUARTERS
Ê P.M.	- J.E.	RUPPERIAN, JR.	NASA-GSFC
PS	- Nide	SPENCEN	NASA-GSFC

BRIEF JESCRIPTION THE PURPOS

THE PURPOSE OF THE AC-C MISSION WAS TO INVESTIGATE THE THERMOSPHERE, WITH EMPHASIS ON THE ENERGY TRANSFER, AND PRICESSES THAT GOVERN ITS STATE. THE STUDY OF PHOTOCHENICAL PRICESSES ACCOMPANYING THE ABSORPTION OF SOLAR UV RADIATION IN THE EARTH'S ATMOSPHERE WAS ACCOMPLISHED. BY MAKING CLOSELY CORDINATED MEASUREMENTS OF REACTING CONSTITUENTS AND THE SOLAR IMPUT. THE AE SPACEDRAFT WAS A MULTI-SIGED POLYHFDRON WITH A DIAMETER OF. APPROXIMATELY 1.4 M AND WEIGHED ABOUT 675 KG OF AN ONBOARD PRIPUSION SYSTEME EMPLOYING A 3.5 LB THRUSTER. THE PURPOSE OF THESE CHANGES WAS TO ALTER THE PERIGEC HEIGHT TO 170 KM. AFTER THIS PERIOD, THE ORBIT WAS AITENDED TO ADOUT 170 KM. AFTER THIS PERIOD, THE ORBIT WAS CIRCULARIZED AND WAS ALTERED FRIDUCALLY TO ABOUT 300 KM WHEN IT WOULD DECAY TO 250 KM ALTITUDE, DURING THE FIRST YEAR, THE LATITUDE OF PERIGEE MOVED FROM ABOUT 10 DEG NUP TO GB DEG N AND THEN DOWN TO ABOUT 00 SEG S. DURING THE FIRST YEAR, THE LATITUDE OF PERIGE MOVED FROM ABOUT 10 DEGA WAS TO ALTER THE DOWN TO ABOUT 10 - REVOLUTION PER COMPLETED. THE SPACECRAFT COULD BE OPERATED IN ELIVER OF TWO NODES - SPINNING AT A NOMINAL & RPM OR DESPIN 10 - REVOLUTION PER ORBIT. THE SPIN AND THA DOWN TO ABOUT 10 - REVOLUTION PER ORBIT. THE SPIN AXIS WAS PERPENDICULAR TO 10 - REVOLUTION DEGA PER ORBIT. THE SPIN AXIS WAS PERPENDICULAR TO 10 - REVOLUTION PER ORBIT. THE SPIN AXIS WAS PERPENDICULAR TO 10 - REVOLUTION PER ORBIT. THE SPIN AXIS WAS PERPENDICULAR TO 10 - REVOLUTION PER ORBIT. THE SPIN AXIS WAS PERPENDICULAR TO 10 - REVOLUTION PER ORBIT. THE SPIN AND A SUTTA PARTICLES THE 11 - SPACECRAFT USED A PEN TELEMERY DATA SYSTEM THAT OPERATED 10 N REAL TIME OR A TAPE RECORDER MODE, MORE DETAILS CAN BE FOUND ON PP. 263-269 OF 'RADIO SCIENCE'S, 7, 4, APRIL 1973. THE PATLOAD IMCLUDED INSTRUMENTATION FOR THE MEASUREMENT OF SOLAR 10 STAL THE COMPOSITION OF POSITIVE IONS AND ELECTRONS; THE MEASUREMENT OF ATALGLOW EMISSIONS, PHOTOELECTRON ENERGY SPECTRA, AND PROTON AND ELECTRON FLUXES UP TO 25 KEV.

---- AE-CA BARTH------

12/16/73 68.1 DEG

INVESTIGATION NAME- ULTRAVIOLET NITRIC-OXIDE (UVNO) -- AE-C, BRINTON--INVESTIGATIVE PROGRAM

PΕ

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES Atmospheric Physics

PERSONNEL PI - C.A. BARTH

U OF COLORADO

NSSDC 10- 73-101A-13

PERSONNEL PI-C.A. BARTH U OF COLORADO DRIEF DESCRIPTION THIS ULTRAVIOLET NITAIC-OXIDE EXPERIMENT (UVNO) CONSISTED OF A TWO-CHAMNEL FIXED-GRATING EMERT SPECTROMETER WHICH MEASURED THE AIRGLOW IN THE (1, 0) GAMMA BAND IN A 12-A REGION CENTERED AT 2350 A. THE OBSERVED INTENSITY WAS PRODUCED BY RESONANCE FLUORESCENCE BY SUMLIGHT OF THE MITRIC-OXIDE MOLECULES IN THE INSTRUMENT'S FIELD OF VIEW. THE INTENSITY PROFILES OBTAINED YIELDED ALTITUDE PROFILES OF NIT.'IC-OXIDE DENSITY AS A FUNCTION OF TIME AND LOCATION, PRO'ILES WERE MALEOUES IN THE INSTRUMENT'S FIELD OF VIEW. THE INTENSITY PROFILES OBTAINED YIELDED ALTITUDES BOTH ABOVE AND RELOW. CHARACTER OF THE UNNIT SIDE OF THE EARTH. INF 'EMOTE SUMSING CHARACTER OF THE UNNO EXPERIMENT PERMITTED MEASUREMENTS OF MITRIC-OXIDE TO BE MADE AT ALTITUDES BOTH ABOVE AND RELOW. SAFELLIFE PERIGE, AS THE SPACECRAFT SPINJ, THE SMECTROMETER, WHICH LOOKED OUTMARD THROUGH THE RIM OF THE SATELLITE, REPEATEDLY HAD ITS FIELD OF VIEW CARRIED DOWN THROUGH THE ENTITED AIRGLOW. INTENSITY WERE OBTAINED BY RAYLEIGH SCATTERED SUMLIGHT. TO CORRECT FOR THIS CONTAMINATION, A SECOND CHAMNEL MEASURED ONLY SCATTERED LIGHT INTENSITY MAS DETERTINED BY TAKING THE CORRECTED SIGNAL AND ZONG THANDA' REGION CENTERED AT 2150 A. THE TWO CHANNELS WERE OPTICALLY AND ELECTRICALLY INDEPENDENT. NITRIC-OXIDE AIRGLOW INTENSITY MAS DETERTINED BY TAKING THE CORRECTED SIGNAL, NITRIC-OXIDE DENSITY RAFILES WERE OBTAINED BETMENA PERPONSIMATELY BO KM AND ASO KM. THE SENSOR'S SPHERICAL FUSED OULSTAT THELSOLEMINTED SOL THE HASUREPENTS. FROM THE CORRECTED SIGNAL, NITRIC-OXIDE ENSITY RAFILES WERE OBTAINED BETMENA PERPONSIMATELY BO KM AND ASO KM. THE SENSOR'S SPHERICAL FUSED OULSTON EACH CHANNEL WAS DETERTIONED BY TAKING AND WAS COLLIMATED THE SIGN STRUCK ONE HALF OF THE EBERT NITROR AND WAS COLLIMATED VIEW THERATED. TO THE OTHER HALF OF THE EBERT NITROR, AND MAS COLLIMATED THE LIGHT WAS PROUDED ON THO EXIT SLITS. THE SPECTROMETER FIELD TH VIEW HAS ODE GATING; HAD ADSERVATION OF A 1-KR EMERDAYS C

INVESTIGATION NAME- CYLINDRICAL ELECTROSTATIC PROBES (CEP)

NSSDC ID- 73-101A-D1 INVESTIGATIVE PROGRAM CODE 51

> INVESTIGATION DISCIPLINE(5) IDNOSFHERES PLANETARY ATMOSPHERES

> > NASA-GSFC NASA-GSFC

PI - L.H. DI - R.F. BRACE THEIS

BRIEF DESCRIPTION

PERSONNEL

DITATE THEIS NASA-USER BRIEF DESCRIPTION THE CEP CONSISTED OF TWO IDENTICAL INSTRUMENTS DESIGNED TO MEASURE ELECTRON THE STATES, ELECTRON AND ION CONCENTRATIONS, ION MASS, AND SPACECRAFT POTENTIAL. UNE PROBE WAS GRIENTED ALONG THE SPIN AXIS OF THE STACECRAFT (NORMALLY PERPENDICULAR TO THE ORBIT PLANE), AND THE OTHER RADIALLY SO THAT IT COULD OBSERVE IN THE DIRECTION OF THE VELOCITY VECTOR ONCE EACH 15-5 SPIN PERIOD. EACH INSTRUMENT WAS A RETARDING (I-V) CURVE FOR A KNOWN VOLTAGE PATTERN PLACED ON THE COLLECTOR. ELECTROMETERS WERE USED TO MEASURE THE CUMRENT-VOLTAGE (I-V) CURVE FOR A KNOWN VOLTAGE PATTERN PLACED ON THE COLLECTOR. ELECTROMETERS WERE USED TO MEASURE THE CUMRENT. THERE WERE TWO SYSTEMS OF OPERATION (ONE WITH TWO NODES AND ANOTHER WITH THREE MODES) USING COLLECTOR VOLTAGE LIMITS ON THE I-V PROFILE PROVIDED HIGH RESOLUTION. EACH SYSTEM WAS DESIGNED FOR USE WITH ONLY ONE OF THE RESOLUTION. EACH SYSTEM WAS DESIGNED FOR USE WITH ONLY ONE OF THE ROBES, BUT INEY COULD BE INTERSWITCHED TO PROVIDE HACKUP REDUNDANT. THE BEST MEASUREMENTS IN THE MOST FAVORABLE MODES PROVIDED ONS SECOND TIME RESOLUTION; ELECTRON TEMPERATURE BETWEEN SOL AND 106.000 DEG K (30 PERCENT ACCURATY); ION DENSITY BETWEEN TO DAND 10.000 DEG K (30 PERCENT ACCURATY); ION DENSITY BETWEEN TO DAND 10.000 DEG K (30 PERCENT ACCURATY); ION DENSITY BETWEEN TO DENSITY BETMEENS AND 1066 PER CUBIC CM, EACH PROBE HAD A CULLCIOD AND THE ESOLUTION; ELECTRON TEMPERATURE BETWEEN SOL AND 106.000 DEG K (30 PERCENT ACCURATY); ION DENSITY BETWEEN TO DENSITY BETMEENS AND 1066 PER CUBIC CM, EACH PROBE HAD A CULLCIOD AND IOF? PER CUBIC CM (10-20 PERCENT ACCURACY); ELECTRON DENSITY BETMEENS AND 1066 PER CUBIC CM, EACH PROBE MAD A CULLCIOD AND IOF PER CUBIC CM, AND ION MASS AT ION DENSITIES ADOVE 10-DOO PER CUBIC CM, EACH PROBE MAD A CULLECTON DENSITY BETMEEN SO AND 1066 DEN CULLECTOR WERE O.2 CM IN DIA. MORE OSTATED INFORMATION CAN BE FOUND IN 'RADIO THE GUARD RING. THE 7.5-CM LIONG GUARD RING WAS AT THE BUD OF A DIA. MORE OST

INVESTIGATION NAME- BENNETT ION-MASS SPECTROMETER (BINS)

NSSOC ID-	73-1018-13	INVESTIGATIVE PROGRAM Code St
		INVESTIGATION DISCIPLINE(S)

PLANETARY ATMOSPHERES ATMOSPHERIC PHYSICS

RSONNEL				
PI - H.C.	BRINTON.		1.1.1	٠.
01 - L.R.	SCOTT			
AT	NULOO			

1	PT - H.C.	BRINTON		1.1	NASA-GSEC
	01 - L.R.	SCOTT			NOAA-NESS
	01 - N.W.	PHARO			NASA-GSFC
	01 - H.A.	TAYLOR, JR.			NASA-GSEC
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BRIEF DESCRIPTION

01 - H.A. TAYLOR, JR. NASA-GSFC BRIEF DESCRIPTION THIS EXPERIMENT WAS LOWN TO MEASURE, THROUGHOUT THE AE ORDIT, THE INDIVIDUAL CONCENTRATIONS OF ALL THERMAL ION SPECIES IN THE INDIVIDUAL CONCENTRATIONS OF ALL THERMAL ION SPECIES IN THE INDIVIDUAL CONCENTRATIONS OF ALL THERMAL ION SPECIES IN THE MASS RANGE OF 1 TO 72 ATCMIC MASS UNITS (U) J AND IN THE ANDIENT DENSITY ANAGE FROM 5 IONS PER (C TO 5 MILLION IONS PER CC. ANY COMBINATION OF THE FOLLOWING THREE MASS RANGES, WHICH WERE EXPRESSED IN J. WERE SELECTED BY GROUND COMMAND -- RANGE A 4 TO 1. RANGE B - 18 TO 2. RANGE (C - 72 TO 8. EACH RANGE WAS NORMALLY SCANNED IN 1.6 S (APPROXIMATELY 12 KM ALONG ORBIT). BUT THE SCAN THE PER RANGE WAS INCREASED TO 5.1 S BY COMMAND. NORMALL OPERATION CONSISTED IN SEQUENCE ABCABC (72 TO 1 0 IN 4.8 S). LLABORATORY AND IN-FLIGHT DETERMINATION OF SPECTBORE 14 EFFICIENCY AND MASS DISCRIMINATION PERMITTED DIRECT CONVENSION OF MEASURED JON CURRENTS TO ANBIENT CONCENTRATIONS. THE EXPERIMENT'S FOUR PRIMARY MECHANICAL COMPONENTS WERE -- SUARD RING AND ION-AMALTER TUBE. COLLECTOR AND PREAMPLIFIER ASSEMBLY. VENT. AND MAIN ELECTRONICS HOUSING. THE GUARD RING WAS NORMALLY AT GROUND POTENTIAL, BUT IT COULD BE PLACED AT -6 V BY COMMAND IF DESIRABLE, E.G., IF THE SPACECRAFT ACQUIRED A POSITIVE CHARGE. A THREE-STAGE BENNET IDDE WITH 7 TO 5 TYCLE DRIFT SPACES WAS FLOWM AND WAS MODIFIED TO PERMIT CON COMCENTRATION MEASUREMENTS TO BE DUBTINED TO MONN TO 120-KM ALTITUDE. SPECIFICALLY, A VENT WAS PROVIDED AT THE REAR OF THE SPECTROMETERY AND THE USUAL FLAT-DISK ION-CURRENT COLLECTOR WAS REPLACED WITH A STACK OF MIRE-MESH GRIDS. THE FREQUENT OF THE 30 V PERK-TO-PEAK R. F. VOLTAGE VARIED WITH THE MASS RANGE CAMALYER TUBE A SERIES OF 116 MARCHES COULD BE AND AND COLLECTOR WAS REPLACED WITH A STACK OF MIRE-MESH GRIDS. THE FREQUENT OF THE 30 V PERK-TO-PEAK R. F. VOLTAGES. THESE CHANGES COULD BE GOMTROLLED INDEPENDENTLY BY GROUND COMMENT SENSITIVITY AND MASS-RESOLUTION IN A BENNETT SPECTROMETER COULD BE ANAMESE BAAZED. TH

IN THE ION SPECTRUM. OHE B-BIT WOPD INDICATED PEAK AMPLITUDE (CURRENT) AND THE OTHER B-BIT WORT IDENTIFIED SWEEP POSITION, I.E., SPECIES IDENTIFICATION, THE WRORS WERE READ OUT IN PAIRS AT THE MAIN FRAME TELEMETRY RATE OF IG SAMPLES PER S. INSTRUMENT CONFIGURATION SELECTED FIR A PARTICULAR PASS DEPENDED PRIMARILY ON THE DATA REQU, REMENTS OF THE SCIENCE PROBLEM WHOLE. INVESTIGATION AND ON THE SPACETARFT S'IN MODE. MORE COMPLETE DETAILS CAN BE FOUND IN THE PAPER 'THE BENNETT IDN-MASS SPECIFACHIER ON ATMOSPHERE EXPLORER -C AND -E,' H.C. DRIMTON ST ..., RADIO SCIENCE, B, 4, 323-332, 1973.

--- AE-C, CHAMPION-----

INVESTIGATION NAME- ATMOSPHERIC DENSITY ACCELEROMETER (MESA)

INVESTIGATIVE PROCRAM CODE ST NSSDC 10- 73-101A-02

INVESTIGATION DISCIPLINE(S) IONOSPHERES Planetary Atmospheres

PERSONNEL PI - K.S.W.CHAMPION DI - F.A. MARCOS

URIEF DESCRIPTION

USAF GEOPHYS LAB USAF GEOPHYS LAB

URIEF DESCRIPTION MESA OUTAINED DATA ON THE NEUTRAL DENSITY OF THE ATMOSPHERE IN THE ALTITUDE RANGE OF 12D KM TO 400 KM BY THE HEASUREHENTS OF SATELLITE DECELERATION DUE TO AERDBYNAMIC DRAG. THE INSTRUMENT CONSISTED OF THREE SINGLEAXIS ACCELEROMETERS. HOUNTED MUTUALLY AT RIGHT ANGLES, TWO IN THE SPACERAFT X-Y PLANE AXIS AND THE OTHER IN THE 2-AXIS. THE INSTRUMENT DETERMINED THE APPLIED ACCELERATION FROM THE ELECTROSTATIC FORCE REQUIRED TO RECENTER A PROOF MASS. THE OUTPUT OF THE DEVICE WAS A DIGITAL PULSE RATE PROPORTIONAL TO THE APPLIED ACCELERATION. THE MEASUREMENTS ALLOWED DETERMINANTION OF THE DENSITY OF THE NEUTRAL ATMOSPHERE, MONITORED THE THRUST OF THE DENSITY OF THE NEUTRAL ATMOSPHERE, MONITORED THE THRUST OF THE DENSITY OF THE NEUTRAL ATMOSPHERE, MONITORED THE SATELLITE AUXIDUM ALTITUDE, MEASURED SPACECRAFT NUTATIONS OF LESS THAN 0.01 DEGREES WERE MONITORED. THE INSTRUMENT HAD THREE SENSITIVITY RAN.1S -- 8.E-3 G IN OAPS MONITOR MODE; 4.E-4 G BETWEEN 120 KM (PLUS OR MINUS 7) PERCENT). AND 400 KM (PLUS OR MINUS 7) PARENTHESS REPERSENT ERRORS, IN ADDITION, THERE MAY DES IN PARENTHESS REPERSENT ERRORS, IN ADDITION, THERE MAY DES IN ATSITEMATIC ERROR OF UP TO PLUS OR MINUS S PERCENT). NUMBERS IN PARENTHESS REPERSENT ERRORS, IN ADDITION, THERE MAY DES TO ASSIMING THE INSTRUMENT (COULD SENSE TO 0.7 PERCENT DUE TO DRAG COFFICIENT UNCERTAINTY. THE HIGHEST ALTITUDE WAS DETERMINED ASSIMING THE INSTRUMENT COULD SENSE TO 0.7 PERCENT OF FULL SCALE. SCALE.

--- AE-C, DOERING------

INVESTIGATION NAME- PHOTOELECTRON SPECTROMETER (PES)

INVESTIGATIVE PROGRAM NSSDC 10- 73-101A-03 CODE ST

> INVESTIGATION DISCIPLINE(S) **10NOSPHERES** PLANETARY ATMOSPHERES

PERSONNEL		
PI - J.P.	DOERING	JOHNS HOPKINS U
01 - C.O.	FOSTROM	APPLIED PHYSICS LAB
01 - J.C.	ARMSTRONG	UNKNOWN

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DI-J.C. ARMSTRONG UNKNOWN BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO PROVIDE INFORMATION ON THE INTENSITY, ANGULAR DISTRIBUTION, ENERGY SPECTRUM, AND NET FLOWS ALONG FIELD LINES, OF ELFCTRONS IN THE THERMOSPHEREW WIT HENRES HETWIEN 2 AND SOD EV. THE INSTRUMENT CONSISTED OF TWO IDENTICAL, OPPOSITELY DIR'CTED, HEMISPHERICAL, ELECTROSTATIC AMALYPEDS. EACH SPECTROMETER HAD A RELATIVE ENERGY RESOLUTION 'MLC'S OR MINUS 2.5 PERCENT AND A GEOMETRIC FACTOR ON THE SWDE' OF 0.001 SG CM STEM, INDEPENDENT OF ELECTRON ENREGY. THREE SEPARATE ENERGY RANGES COULD BE SENSED -- O TO 25 EV. O TO 100 EV. OR O TO 500 EV. MEASUREMENTS FROM THESE INTERVALS COULD BE SEQUENCED IN 5 DIFFERENT WAYS. DATA COULD BE TAKEN FROM ELTHER SENSOR SEPARATELY, OR ALTERNATELY WITH THE RESOLUTION VARYING FROM 0.25 TO BS. THEME WERE TWO DEFLECTION VOLTAGE WAS CHANGED IN 64 STEPS, AND WAS DONE AT 4 OR 1A STEPS PER TELEMETRY FRAME. WITH 16 FRAMESSIS, THIS ALLOWED A CHOICE OF EITHER ONE 64-POINT SPECTRUM, OR FOUR 16-POINT SPECTRA IN ONE SECOND. THE LONGEST (B S) CYCLE OF DATA INVOLVED OBSERVATIONS USING INCREASING VOLTAGE STEPS FOR THE LOWEST, NIDDIE, LOWEST, HEN HIGHEST ENERGY RANGES (IN THAT ORDER) FOR 1 S EACH. M REPEAT FOR DECREASING VOLTAGE STEP FOR THE LOWEST, NIDDIE, LOWEST, HEN HIGHEST ENERGY RANGES (IN THAT ORDER) FOR 1 S EACH. M REPEAT FOR DECREASING VOLTAGE STEP FOR THE LOWEST FOUND IN "ANDI'S SCHMERCE' 8, 4, 387-392, APRIL 1973.

----- AFAC, MANSON-------

INVESTIGATION NAME- RETARDING PUTENTAL AMALYZER/DRIFT METER (RPA)

NSSDC ID- 73-101A-04

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) IONOSPHERES PLANETARY ATHOSPHERES

PERSONNEL			
P1 - W.B.	HANSON	U OF	TEXAS, DALLAS
01 - D.R.	ZUCCARO		TEXAS, DALLAS
01 = S.	ŞANATAN I	11 OF	TEXAS, DALLAS

DI - S. SANATANI U OF TEXAS, DALLAS DRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO DETERMINE OBSERVATIONS OF VECTOR ION DRIFT VELOCITIES, ION CONCENTRATION AND TEMPERATURE, AND SPACECRAFT POTENTIAL. AN IONOSPHERIC IRREGULARITY INDEX WAS ALSO OBTAINED FROM THE ION CONCENTRATION SENSOR. THE EXPERIMENT CONSISTED OF A RETARDING POTENTIAL ANALYTER WITH HOUR PLANAR SENSOR MEADS, THE SENSOR WEAD USED FOR ION DRIFT MEASURENTS WAS CO-LOCATED WITH ANOTHER HEAD, AND ALL WERE SPACED MEARLY EDUALLY, LOOKING OUTWARD FROM THE SATELLITE EQUATOR. SINCE THE SATELLITE SPIN AXIS WAS PERPENDILULAR TO THE ORBIT PLANE, THESE HEADS COULD OBSERVE ALONG THE SATELLITE EQUATOR. SINCE THE SATELLITE SPIN AXIS WAS PERPENDILULAR TO THE ORBIT PLANE, THESE HEADS COULD OBSERVE ALONG THE SACECRAFT VELOCITY VECTOR IN EITHER THE SPIN OR DESPUN MODE OF THE SPACECRAFT. THE PRIMART PURPOSE OF THIS EXPERIMENT WAS TO PROVIDE ACCURATE ION TEMPERATURES WITH OTHER MEASUREMENTS BEING OF SECONDARY IMPORTANCE. THREE OF THE SENSOR HEADS WERE SIMILAR. THEY HAD TWO GROUNDED ENTRANCE GRIDS, TWO RETARDING GRIDS, A SUPPRESSOR GRID, A SHIELD GRID, AND A COLLECTOR. A LINEAR SWEEP VOLTAGE (32 OR 22 TO O V, UP OR DOWN MAS NORMALLY APPLIED TO THE RETARDING GRIDS IN 0.75 S. INTERPRETATION OF THE RESULTING CURRENT-VOLTAGE PROFILES PROVIDED THE ION THEPERATURE, THE ION AND ELECTRON CONCENTRATION, SOME ION COMPOSITION INFORMATION, VEHICLE POTENTIAL AND PLASMA DRIFT VELOCITY PARALLEL TO THE VELOCITY VECTOR. TWO OF THE THREE SIMILAR SUESORS HAD AN ANDITIDNAL GRID BETWEEN THE ENTANCE AND DOSTRUE OF THERMAL ELECTRON MEASUREMENTS. THE OTHER SIGNIFICANT FORMATION, VEHICLE POTENTIAL AND PLASMA DRIFT VELOCITY PARALLEL TO THE VELOCITY VECTOR. TWO OF THE THREE SIMILAR TO UDRING ELECTRON PARAMETERS WERE MEASURED IN A MANNER SIGNIFICANT FORMATION. VEHICLE POTENTIAL AND PLASMA DEGULAR DOSTITUE COLLECTOR DIAS COULD BE APPLIED TO ASSURE ADEQUATE ACCESS OF THERMAL ELECTRON VOLTS, CURRENT CANCESSOR WAS HAT A SHALL POSITIVE COLLECTOR DIAS COULD NO AST HA APRIL 1973.

----- AE-C, HAYS------

INVESTIGATION NAME- VISIBLE AIRGLOW PHOTOMETER (VAE)

INVESTIGATIVE PROGRAM CODE ST HSSOC ID- 73-101A-14

> INVESTIGATION DISCIPLINE(5) PLANETARY ATMOSPHERES ATMOSPHERIC PHYSICS

> > U OF MICHIGAN York U

PERSONNEL PI - P.B.

HAYS 01 - G.G. SHEPHERD

SRIEF DESCRIPTION

OI - G.G. SHEPHERD YOUND SRIEF DESCRIPTION THIS EXPERIMENT CONTAINED A FILTER PHOTOMETER DESIGNED TO MONITOR VARIOUS AIRGLOW AND AURORAL FEATURES WHICH LIE IN THE SPECTRAL RANGE BETWEEN 3000 A AND 7500 A. THE PRIMARY INFORMATION OBTAINED FROM THIS EXPERIMENT WAS THE RATES OF EXCITATION OF THE ATOMIC AND MOLECULAR CONSTITUENTS OF THE HIERMOSPHERE. FOR THE AFC- MISSION. THE FOLLOWING SIX SPECIFIC INFORMAT ROLE IN THE PHOTOMETER FOR STUDY SINCE THEY PLAY AN INFORMAT ROLE IN THE PHOTOMENTICAL ENERGY BALANCE OF THE ATMOSPHERE -- 3371 AA 4278 A, 5200 A, 5577 A, 6300 A, AND 7319 A. THE EMISSIONS WERE NEASURED IN PAIRS -- 5577 AND 6300, 7319 A. THE EMISSIONS WERE NEASURED IN PAIRS -- 5577 AND 6300, 7319 A. THE EMISSIONS WERE NEASURED IN PAIRS -- 5577 AND 6300, 7319 A. THE EMISSIONS WERE NEASURED IN PAIRS -- 5577 AND 6300, 7319 A. THE EMISSIONS WERE NEASURED IN PAIRS -- 5577 AND 6300, 7319 A. THE EMISSIONS WERE NEASURED IN PAIRS -- 5577 AND 6300, 7319 A. THE EMISSIONS WERE NEASURED IN PAIRS -- 5577 AND 6300, 7319 A. THE EMISSIONS WERE NEASURED IN PAIRS -- 5577 AND 6300, 7319 A. THE EMISSIONS WERE NEASURED IN PAIRS -- 5577 AND 6300, 7319 A. THE EMISSIONS WERE NEASURED IN PAIRS -- 5577 AND 6300, 7319 A. THE DISCIPTIVE LENS AND FIELD STOP TO DEFINE THE FIELD OF VIEW, AND EACH CONTAINED A MULTISTAGE LIGHT BAFFLE. THE WIDE-ANGLE HIGH SENSITIVITY SYSTEM (DESIGNATED CHANNEL 2) HAD A FIELD OF VIEW OF J DEG HALF-ANGLE, AND WAS USED TO MEASURE THE HIGHTGLOW, DAYGLOW ABOVE THE SAFELLITE, AND OTHER WEAK EMISSION FEATURES. THE LESS SENSITIVE SYSTEM (DESIGNATED CHANNEL 2) HAD A FIELD OF VIEW OF A PPROXIMATELY 3/4 DEG HALF-ANGLE AND WAS USED FOR DAYGLOW AND MIGHTGLOW HORIZON MEASUREHERIS, AN WEAK MISSTORE AURORAL FEATURES WHICH SHOWED STRONG SPATIAL USED FOR DAYGLOW AND MIGHTGLOW HORIZON MEASUREHERITS, AN WELL THEY SHARED A FILTER WHEEL THAT CONTAINED SIX INTERFRENCE FULTERS AT THE WAS A LARR POSITION FOR NOISE MEASUREHENTS, AND THE OTHER WAS A LALBRATE POSITION FOR NOISE MEASUREHENTS, AND THE OTHER W

WITH NO APPARENT ENHANCEMENT IN BACKGROUND WITHIN 120 MS AFTER A DIRECT VIEW OF THE SUM. PHOTONS REACHING THE CATHODE WERE RECORDED USING A PULSE-COUNTING SYSTEM. THE INTEGRATION TIME WAS 33 MS FOR CHANNEL 1 AND 132 MS FOR CHANNEL 2. PRIMARY COMMAND AND TELEMETRY FORMATTING SYSTEMS WERE SMARED BY THE TWO CHANNELS. THE EXPERIMENT COULD BE COMMANDED INTO ANY ONE OF SEVERAL OPENATING MODES DEPENDING ON THE SCIENCE REQUIREMENTS AND SPACECRAFT ATTITUDE. FOR MORE EXPERIMENT DETAILS, SEE 'THE VISABLE-AIRGLOW EXPERIMENT ON ATMOSPHERE EXPLORER,' P. B. HAYS, ET AL, RADID SCIENCE, 8, 4, 369, 1973.

----- 48-6. HEATH-------INVESTIGATION NAME- EXTREME SOLAR UV MONITOR (ESUM) INVESTIGATIVE PROGRAM NSSDC 10- 73-101A-05

CODE 51

INVESTIGATION DISCIPLINE(S) Ionospheres Planetary Atmospheres

PERSONNEL

PI - D.F. DI - J.F. HEATH OSANTOWSKI NASA-GSFC NASA-GSFC

BRIEF DESCAIPTION ESUM MADE ABSOLUTE BROADBAND SPECTRO-RADIOMETRIC MEASUREMENTS OF THE SOLAR EUV FLIX FROM 20D A THROUGH LYMAN-ALPINA AT 1216 A AND MADE PRECISE MEASUREMENTS OF THE TENPORAL VARIABILITY - APPROXIMATILY ONE PERCENT PER SOLAR ROTATION. THE INSTRUMENT CONSISTED JF TWO IDENTICAL WINDOWLESS EUV PHOTODIODES WITH ALUMINUM OXIDE CATHODES AND A FILTER WHELL CONTAINING TWO SET'S OF UNDACKEJ METALLIC FILTERS (ALUMINUM TIN, INDIUM) AND AN OPEN POS'TION. A VISIBLE LIGHT DIODE MEASURED THE PINDLE TRANSNITTANCE OF THE FILTERS TO DETERMINE THE WHITE LIGHT BACKGROUND. THE TILT ANGLE OF THE INSTRUMENT RELATIVE TO THE +2 SPACECRAFT AXIS WAS OPTIMIZED FOR THE MAXIMUM VIEWING TINE OF THE SUN IN BOTH SPINNING AND DESPUN SPACECRAFT MUDES. THE INSTRUMENT FIELD OF VIEW WAS 60 DEG. THE MONINAL BANDWIDING FOR SO PERCENT OF SIGNAL) WERE 270 TO S50 A, 570 TO 586 A, 800 TO 935 A, AND 1216 A. BRIEF DESCRIPTION

--- AE-C, H1NTEREGGER------

INVESTIGATION NAME- SOLAR EUV SPECTROPHOTOMETER (EUVS)

NSSDC 10- 73-101A-06 INVESTIGATIVE PROGRAM CODE ST

> 1NVESTIGATION D15CIPLINE(S) Ionospheres Planetary Atmospheres SOLAR PHYSICS

PERSONNEL

P1 -	н.Е.	HINTEREGGER	USAF	GEOPHYS	LAB	
01 -	D.E.	BEDO	USAF	GEOPHYS	LAB	
0I -	L.8.	HALL	USAF	GEOPHYS	LAB	
01 -	C.W.	CHAGNON	USAF	SEDPHYS	LAB	
GI -	J.E.	MANSON	USAF	GEOPHYS	LAB	

BRIEF DESCRIPTION

DRIEF DESCRIPTION EUVS WAS USED TO OBSERVE THE VARIATIONS IN THE SOLAR EUV FLUX IN THE WAVFLENGTH RANGE FROM 140 TO 1850 A AND THE ATMOSPHERIC ATTENUATION AT VARIOUS FIXED WAVELENGTHS. THIS PROVIDED QUANTITATIVE ATMOSPHERIC STRUCTURE AND COMPOSITION OATA. THE INSTRUMENT CONSISTED OF 24 GRAZING-INCIDENCE GRATING HONOCHROMATORS, USING PARALLEL-SLIT SYSTEMS FOR ENTRANCE COLLIMATION AND PHOTOELECTRIC DETECTORS AT THE EXIT SLITS. TWELVE OF THESE HONOCHROMATORS HAD WAVELENGTH SCAN CAPABILITY. EACH WITH 12B SELECTABLE WAVELENGTH HOSITIONS, WHICH COULD ALSO AUTOMATICALLY STEP SCAN THROUGH THESE POSITIONS, WHICH COULD ALSO AUTOMATICALLY STEP SCAN THROUGH ADISK TO AID IN THE ATMOSPHERIC ABSONPTION ANALYSIS. THE SPECTRAL RESOLUTION VARIED FROM 2 TO 54 A DEPENDING UPON THE PARTICULAR INSTRUMENT. THE FIELD OF VIEW WARLER THAN THE FULL SOLAR DISK TO AID IN THE ATMOSPHERIC ABSONPTION ANALYSIS. THE SPECTRAL RESOLUTION VARIED FROM 2 TO 54 A DEPENDING UPON THE PARTICULAR INSTRUMENT. THE FIELD SO VIEW VARIED FROM 60 X 600 ARCT MIN OWN TO 3 X 6 ARC MIN. ALL 24 MONOCHROMATOR-ENTRANCE AXES WERE CO-ALIGNED PARALLEL. A SOLAR POINT SYSTEM COULD POINT TO 256 DIFFERENT POSITIONS, EXECUTE A 16-STEP ORE-DIMENSIONAL SCAN OR A FULL 256-STEP RASTER. THE TIME RESOLUTION VARIED FROM 0.5 S FOR OBSERVING 12 FIXED WAVELENGTHS UP TO 256 S FOR PROGRAMMING THE EUVS THROUGH ALL POSSIBLE MODES. MORE DETAILS CAN BE FOUND IN "RADIO SCIENCE." 8, 4, 340-360, APRIL 1973.

-- AE-C, HOFFMAN

INVESTIGATION NAME- MAGNETIC ION-MASS SPECTROMETER (MINS)

NSSDC 10- 73-101A-10

INVESTIGATION DISCIPLINE(S) Ionospheres Planetary Atmospheres Atmospheric Physics

INVESTIGATIVE PROGRAM

PERSONNEL PI - J.H. HOFFMAN

U OF TEXAS, DALLAS

BRIEF DESCRIPTION A MAGNETIC ION MASS SPECTROMETER WAS FLOWN TO MEASURE IN SITU THE CONCENTRATIONS OF THE ANDIENT ION SPECIES IN THE MASS RANGE FROM 1 TO 90 ATOMIC MASS UNITS (U). MOUNTED ON THE SATELLITE EQUATOR NORMAL TO THE SPIN AXIS, THE ENTRANCE APERTURE FACED FORWARD WHEN THE SPACECRAFT WAS IN THE DESPIN MODE. THE ELECTRIC AND MAGNETIC FIELDS WERE ARRANGED TO PRODUCE A MASS SPECTRUM ALONG THE FOCAL PLANE FOLLONG THE FOCAL PLANE IN APPROPRIATE PLACES TO SIMULTANEOUSLY COLLECT IONS IN THE MASS RATIOS 1 TO 4 TO 16 U. IONOSPHERIC IONS WERE ACCELERATED INTO THE ANALYZER SYSTEM BY A MEGATIVE VOLTAGE THAT VARIED FROM -1060 TO -225 V. THE THREE MASS RANGES MEASURED SIMULTANEOUSLY WERE 1 TO 4, 4 TO 16 U. IONOSPHERIC IONS WERE SIMULTANEOUSLY WARE 1 TO 4, 4 TO 16 J. AND 16 TO 64 U. FOLLOWING EACH SLIT WAS AN ELECTRON MULTIPLIER AND A LOGARITHMIC ELECTROMETER-AMPLIFIER DETECTOR. THE DETECTOR OUTPUT COULD BE FED TO A 'DEAK' CIRCUIT THAT DETEMINED THE AMPLITUDE OF EACH PEAK VAS THE SPECTRUM. ONLY THE AMPLITUDE OF EACH PEAK VAS TELEMETERED IN THE PRIMARY PEAKS MODE, AND IN THIS MODE THE TIME REQUIRED TO SIMULTANEOUSLY SWEEP ALL THREE MASS RANGES WAS 1 S. OTHER MODES OF OPERATION WERE POSSIDEL. IN THE ANALOG SHORT MODE. THE THREE MASS RANGES WERE SWEPT IN 3 S, ALTERNATING WITH 1-S 'PEAKS' HODE SCANS. AN &-S SWEEP WAS REQUIRED IN THE ANALOG LONG MODE, AGAIN ALTERNATING WITH 1-S PEAKS MODE SCANS. AN OPTION EXISTED IN THE LOCKED MODE TO CONTINUOUSLY MEASURE ANY SET OF MASS NUMBERS IN THE RATIO 1 TO 4 TO 16 TO 6 TO GIVE HIGH SPATIAL RESOLUTION. MORE EXPERTMENT DETAILS CAN BE FOUND AN 'THE MACHETIC ION-MASS SPECTROMETER ON ATMOSPHERE EXPLODERS.' J. H. HOFFMAN, ET AL, RADIO SCIENCE, 8, 4, 315-322, APRIL 1973. BRIEF DESCRIPTION

----- AF-C. HOFFMAN------

INVESTIGATION NAME- LOW-ENERGY ELECTRONS (LEE)

NSSDC 10-	73-101A-12	INVESTIGATIVE PROGRAM
		CODE ST

INVESTIGATION DISCIPLINE(S) Particles and fields

ERSONNEL		
PI - R.A.	HOFFMAN	NASA-GSFC
01 - D.S.	EVANS	NDAA-ERL
0I - J.L.	BURCH	NASA-MSFC

BRIEF DESCRIPTION THIS EXPERIMENT FURNISHED DIRECT MEASUREMENTS OF THE ENERGY INPUT INTO THE UPPER AIMOSPHERE DUE TO ELECTRONS AND PROTONS (IONS) IN THE ENERGY RANGE OF 0.2 TO 25 KEV. THE EXPERIMENT ACQUIRED DIFFERENTIAL MEASUREMENTS OF THE ENERGY INFLUX AND AMGOURD DIFFERENTIAL MEASUREMENTS OF THE ENERGY ELECTRONS CONTINUOUSLY. EACH DETECTOR MEASURING 5 KEV ELECTRONS CONTINUOUSLY. EACH DETECTOR MEASURING 5 KEV SELECTION. AND A SPIRALTRON ELECTRON NULTIPLIER FOR PARTICLE DETECTION. ANG A SPIRALTRON ELECTRON NULTIPLIER FOR PARTICLE DIFFERENT FIXED OR STEPPED VOLTAGES TO THE DEFLECTION PLATES; DISTRIBUTIONS IN ANGLE WERE MEASURED BY USING THE SPINNING MODE, ANGOULAR DISTRIBUTIONS OF BOTH PROTONS AND ELECTRONS WERE OBTAINED. IN THE DESPUN MODES, MEASUREMENTS WERE ODTIMINE AN 45 DEG TO THE SPACECRAFT EQUATOR, AND RADIALLY MAY FROM THE GATAT. DETECTOR LOOK ANGLES WERE CHOSEN TO GIVE OPTIMUM MAGNETIC PITCH-ANGLE COVERAGE WHEN THE SPACEGRAFT WAS MOVING EITHER POLEMARD OR EQUATORMARD. ALL DETECTORS WERE ODTAILES. ONLY ONE (MONITOR) HODE WAS AVAILABLE. IT CONSISTED OF CONTINUOUS MEASUREMENT OF 5-KEV ELECTRONS AT 45 DEG TO THE SPICECRAFT WAS MOVING EITHER POLEMARD OR ELEVERTY FRAME (62.5 MS). THE TWO STEPPED DETECTORS MOVED ONE ENERGY STEP ONCE EACH MAIN FRAME WITH THE SAME ACCUMULATION TIME REAGY STEP ONCE EACH MAIN THE SPIRENTARY EQUATOR (+Y) AXIS. COUNTS WERE ACCUMULATED OVER S5.7 MS AND READ OUT EACH MAIN TELEMETRY FRAME (62.5 MS). THE TWO STEPPED DETECTORS MOVED ONE ENERGY STEP ONCE EACH MAIN FRAME WITH THE SAME ACCUMULATION TIME REQUINTING ABOUT 1 S FOR A COMPLETE CYCLE OF STEPS. MORE COMPLETE DETAILS OF THIS EXPERIMENT MAY BE FOUND IN "RADIO SCIENCE' 8, 4, 393-400, APRIL 1973. BRIEF DESCRIPTION THIS EXPER

- AE-C, NIER-

INVESTIGATION NAME- OPEN-SOURCE NEUTRAL MASS SPECTROMETER (OSS)

NSSDC 10- 73-101A-07

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) Ionospheres Planetary Atmospheres Atmospheric Physics

PERSONNEL A.O.C.NIER F.J. HEYDEN PI -01 -01 MAHERSBERGER .ε. POTTER

U OF MINNESOTA Manila obs U of minnesota U of minnesota

BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT WAS TO CONTRIDUTE TO A STUDY OF THE CHEMICAL, OTMAMIC, AND ENERGETIC PROCESSES THAT CONTROL THE STRUCTURE OF THE THERMOSPHERE BY PROVIDING DIRECT. ATMOSPHERIC CONSTITUENTS THATTERMOSPHERE BY PROVIDING DIRECT. ATMOSPHERIC CONSTITUENTS THATING HASSES IN THE RANGE FROM 1 TO 48 ATOMIC MASS UNITS (U). A DOUBLE-FOCUSING MATTACH-HERZOG MAGNETIC BEFLECTION MASS SPECTRADHERE WITH AN IMPACT ION SOURCE WAS FLOWN. TWO ION COLLECTORS WERE INCLUDED TO MEASURE IONS DIFFERING IN MASS BY A FACTOR OF & 1.1.2. THE TWO MASS RANGES COVERED WERE 1 TO 8 U AND 7 TO 48 U. IN THE ION SOURCE THE ELECTRON ENERGIES WAS CONTEED BY THEANS OF ELECTRON INPACT. THE ELECTRON ENERGIES WAS CONTEED BY THEANS OF ELECTRON INPACT. THE ELECTRON ENERGIES WAS CONTEED BY THEANS OF ELECTRON INPACT. THE ELECTRON ENERGIES WARE CONTEED BY THAN ELECTRON MULTIPLIER CONTING INDIVIDUAL IONS. COUNTS WERE ACCUMULATED FOR 1/20 S BEFORE AUTOMATICALLY SWITCHING TO A DIFFERENT HAS NUMBER. WHILE COMPLETE MASS SPECTRA COULD BE SWEPT. IN THE COMMON HODE OF OPERATION. PEAK STEPPING WAS EPHLOYED WITH READINGS ON THE PRINCIPAL PEAKS IN THE MASS SPECTRUM BEING REPEATED APPROXIMATELY EVERY D.S S AND OTHER SPECIES LESS FREQUENTLY. DATA BELOW 380 KM WERE MERSEUED SING AN ELECTRONMETER. IN ADDITION TO THE PEAK STEPPING MODE, THERE WERE SEVERAL OTHER OUTAINS MODE, WHER MERSELECTED BY GROUND COMMAND. IN THE FLY-THROUGH MDDE, THE ION SOURCE VOLTAGES WERE ADJUSTED SO THAT HERE MAS NO ELECTRICIFIELD TO DRAWINGS OUT THE ELECTRON BEAM WHEN THEY WERE FORMED. ANDIENT PARTICLES STRIKING THE ION SOURCE GETAIN ENERGIES LESS THAN 0.1 EV. WHICH WAS NOT HIGH FUNCTION TO THE PEAK STEPPING MOZE THE INSTUMENT IN THE FLY-THROUGH MODE, THE ION SOURCE CHING BENERGY OF SEVERAL OF AFTER IONIZATION AND ESCAPE INTO THE ACCELERATING REGION OF THE ANALYZER. THE ELECTRON ACELERATING POTENTIAL HOLDING THE ANDIFER OPERATION AND WAS 25 EV IN THE FLY-THROUGH MODE. IN ANOTHER OPERATING MODE, THEIR INCOMING ENERGY OF SEVERAL EV A

----- AE-C. RICE------

INVESTIGATION NAME- COLD CATHODE ION GAUGE

NSSDC 10- 73-101A-15 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) Ionospheres Planetary Atmospheres

PERSONNEL PI - C.J. RICE

AEROSPACE CORP

BRIEF DESCRIPTION THE COLD CATHODE ION GAUGE FLOWN ON AE-C WAS PRIHARILY AN ENGINEERING EXPERIMENT TO PROVIDE DATA ON SPACECRAFT OPERALION. HOWEVER, DATA FROM THIS EXPERIENT WAS CORRELATED WITH ACCELEROMETER AND CAPACITANCE MANOMETER DATA TO EVALUATE SATELLITE DRAG PERFORMANCE. THE ION GAUGE, ALSO REFERED TO AS PRESSURE SENSOR A (PSA), MEASURED ATMOSPHERIC PRESSURE IN THE REGION BETWEEN 120 AND 370 KM ABOVE THE EARTH'S SURFACE FOR VALUES OF ATMOSPHERIC PRESSURE DETWEEN 1.3E-3 TO 1.3E-7 MD. THE ESTIMATED ACCURACY OF THE PSA WAS PLUS OR MINUS 20 PERCENT. THE CVILINORICALLY SHAPED SENSOR PACKAGE CONSISTED OF A VEDGE-SHAPED ORIFICE, A CATHODE NEAR GROUND POTENTIAL, AN ANODE OPERATING AT ABOUT 1300 VOC, AND A PERMANENT MAGNETIC FIELD OF ADOUT 1600 GAUSS. THE GAUGE CONTAINED NO PRIMARY SOURCE OF IONIZING ELECTRONS. THE DISCHARGE WAS INITIATED BY FIELD EMISSION AND WAS SELF-SUSTAINING AT A PRESSURE ABOVE 1.3E-7 MD. THE ION CURRENT WAS COLLECTED AT THE CATHODE. THE SENSOR WAS MOUNTED ON THE SPACECRAFT, WITH THE ORIFICE PERPROJICULAR TO THE SPACECRAFT SPIN-AXIS UNICH WAS NORMAL TO THE ORDITAL PANE. THE INSTRUMENT COULD BE OPERATED IN ING MODES, SPINNING MODE. THE PSA ALTERNATELY SAMPLED THE RAM AND WAKE PRESSURE. WHEN THE SPACECRAFT WAS IN THE DESFUN MODE, THE PSA FACED 30 DEG FROM THE DIRCTION OF MOTION. DATA FROM THE. HE DIRCTION OF MOTION. DATA FROM TIME. BRIEF DESCRIPTION

-- AE-C, RICE------INVESTIGATION NAME- CAPACITANCE MANOMETER

WSSDC ID- 73-101A-16 INVESTIGATIVE PROGRAM CUDE .ST

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES

PERSONNEL P1 - C.J. RICE

AEROSPACE CORP

BRIEF DESCRIPTION BRIEF DESCRIPTION THE CAPACITANCE MANOMETER WAS PRIMARILY AN ENGINEERING EXPERIMENT TO PROVIDE DATA ON SPACECRAFT OPERATIONS. HOUVER, DATA FROM THIS EXPERIMENT WERE ALSO CORRELATED WITH ACCELEROMETER AND ION GAUGE DATA IN EVALUATING SATELLITE DARGS. THE MANOMETER, ALSO REFERRED TO AS PRESSURE SENSOR D (PSD), MEASURED ATMOSPHERIC PRESSURE IN THE REGION BELOW 20D XM. THE ACQURACY OF THE PSD GAUGE VARIED FROM ABOUT 10 PERCENT AT 120 KH TO ABOUT 4D PERCENT AT 180 KM. THE PSD CONSISTED OF TWO SPHERICAL, THERMALLY CONTROLLED CHAMMERS, SEPARATED BY A THIN MENDRAME STRETCHED FLAT AND UNDER RADIAL TENSION. ANY DEFLECTION OF THE DIAPRAGM CAUSED BY A PRESSURE DIFFERENTIAL DETWEEN THE TWO SIDES CAUSED A CHAMGE IN CAPACITANCE BETWEEN THE DIAPRAGM AND ANALACENT ELECTRODE WILG'I IS HEASUMED BY AN AC BRIDGE CIRCUIT. AIR WAS PERMITTED INTO ONE OF THE CHAMDENS THROUGH TWO PORTS 180 DEG APANT AND PERPENDICULAR TO THE SPACECARST SPIT. AXIS. THURS, THE WARE-RAM PRESSURE DIFFERENTIAL WAS SAMPLED TWICE EACH SPACECRAFT REVOLUTION.

- AE-C, SPENCER------

INVESTIGATION NAME- NEUTRAL ATMOSPHERE TEMPERATURE (NATE)

NSSDC 10- 73-101A-09

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES Atmospheric physics

NASA-GSFC U OF NICHIGAN

PERSONNEL

PI - N.W. SPENCER DI - G.R. CARIGNAN

BRIEF DESCRIPTION

DI - G.R. CARIGNAN U OF MICHIGAN BRIEF DESCRIPTION THIS EXPERIMENT MEASURED THE KINETIC TEMPERATURE OF THE NEUTRAL ATMOSPHERE BY DETERMINING THE INSTANTANEOUS DENSITY OF MOLECULAR NITROGEN IN A SPHERICAL CHAMDER COUPLED TO THE ATMOSPHERE THROUGH A KNIFFC-DOGED DRIFICE. ANALYSIS OF THE MEASURED MOLECULAR NITROGEN DENSITY VARIATION OVER A SPIN CYCLE MITH A KNOWLEDGE OF THE SATELLITE'S MOTION AND ORE A SPIN CYCLE MITH A KNOWLEDGE OF THE SATELLITE'S MOTION AND ORENTATION LEAD TO A DETERMINATION OF THE AMBIENT TEMPERATURE. INDEPENDENT OF SCALE HEIGHT. A MEASUREMENT OF THE AMBIENT TIMPOGEN DENSITY WAS ALSO ODTAINED. AN ALTERNATE MEASUREMENT OF NEUTRAL TEMPERATURE WAS ALSO UPOENTAKEN, USING A BAFFLE INSERIED IN FRONT OF THE ORIFICE TO, INTERCEPT A PORTION OF THE GAS PARTICLE STREAM ENTERING THE CHAMBER. WHEN THE SATELLITE WAS IN THE DESPUN MODE, THE BAFFLE WAS MADE TO OSCILLATE IN THE STEPWISE FASHION TO INTERRUPT THE PARTICLE STREAM SEEN BY THE ORIFICED CHAMBER. THESE CHAMBER DENSITY VARIATIONS WERE INTERPRETED TO YIELD THE NEUTRAL GAS KINETIC TEMPERATURE. A DUAL-FILAMENT ION SOURCE SAMPLED THE THERMALIZED MOLECULAR NITROGEN IN THE C'AMBER AND PRODUCED AN ION BEAM JENSITY PROPORTIONAL TO THE NITROGEN CHAMBER DENSITY. FROM THE SOURCE. ANALYZER, TUNED TO PASS THOSE PARTICLES WHOSE MASS-TO-CHARGE ANALYZER, TUNED TO PASS THOSE PARTICLES MHOSE MASS-TO-CHARGE ANALYZER, TUNED TO PASS THOSE PARTICLES MODE. THE NITROGEN BEAN MAS ONCE PER SPIN PRIOD, HOM THE SOURCE OF ARA MITROGEN IN THE CHAMBER AND PRODUCED AN 10M SEAM JENSITY PULSES WERE AMPLIFIED AND COUNTED IN A 16-BIT ACCUMULATOR. WHEN THE SATELLITE WAS IN THE SPINING MODE, THE NITROGEN DENSITY WAS MEASURED ONCE PER SPIN PRIOD, HOMITALLY EVENT 15 S. THE NITROGEN KINETIC TEMPERATURE WAS MEASURED TWITRE EACH PERIOD WITHOUT THE SAFFLE OPERATING AND NEEPER SPIN PERIOD WITHOUT THE SAFFLE OPERATING AND NEEPER SPIN PERIOD WITH BAFFLE. THE SENSOR WAS VACUUM-SEALED PRIOR TO LAUNCH MODE DID THE ANTOPHER AFTER THE SPACECRAFT WAS IN DEBESH BY THE BA

SPACECRAFT COMMON NAME- AE-D Alternate Names- S-60, pl-7238 Atmosphere Explorer-D, Explorer 54

NSSDC 10- 75-096A

I

LAUNCH DATE- 10/06/75 Launch Site- Vandenberg AFB, united States Launch Vehicle- Delta WEIGHT- 681. KG

SPONSORING COUNTRY/AGENCY United States

INITIAL ORBIT PARAMETERS	
ORBIT TYPE- GEOCENTRIC	EPOCH DATE- 10/07/75
ORBIT PERIOD- 126.3 MIN	INCLIMATION- 90.1 DEG
PERIAPSIS- 154. KH	APDAPSIS- 3816. KM
PERSONNEL	
NG - F.W. GAETAND	NASA HEADQUARTERS
SC - E.A. SCHMERLING	NASA READQUARTERS
PM - 0.W. GRIMES	NASA-GSFC
PS - N.W. SPENCER	RASA-GSFC

NASA-055

BRIEF DESCRIPTION THE PURPOSE OF THE AE-D MISSION WAS TO CONTINUE THE INVESTIGATION BEGUN BY AE-C OF THE CHEMICAL PROCESSES AND ENERGY TRANSFER MECHANISMS THAT CONTROL THE STRUCTURE AND BEHAVIOR OF THE EARTH'S ATMOSPHERE ND IONOSPHERE IN THE REGION OF HIGH ABSORPTION OF SOLAR ENERGY. THIS MISSION WAS PLANNED TO SAMPLE THE NIGH LATITUDE REGIONS AT THE SAME TIME THAT THE AE-E MISSION WAS SAMPLING THE COUNTRIL AND LOW LATITUDE REGIONS. THE SAME TYPE OF SPACECRAFT AS AE-C WAS USED, AND THE PAYLOAD CONSISTED OF THE SAME TYPES OF INSTRUMENTS EXCEPT FOR DELETION OF THE EXTREME SOLAR UN MONITOR AND THE SEMMETT ION MASS SPECTROMETER, WHICH WERE PART OF THE AE-E PAYLOAD. THE POLAR ORDIT PROVIDED THE SAMPLING OF ALL LATITUDES AND THE PERIGEE WOULD MOVE THROUGH ALL LATITUDES IN ABOUT 3 MONTHS AND BRIEF DESCRIPTION

N550C ID- 75-096A-04

INVESTIGATIVE PROGRAM

INVERTIGATION DISCIPLINE(S) 10xOSPHERES FLANETARY ATMOSPHERES

PERSONNE	EL.					
PI ∸	₩.8.	HANSON	ü	3 F	TEXAS.	DALLAS
01 -	D.R.	ZUCCARO	U	0F	TEXÁS -	DALLAS
01 -	5.	SANATANI	U	ÛF	TEXAS,	DALLAS
01 -	C.R.	LIPPENCOTT	υ	0 F	TEXA5,	DALLAS

01 - S. SANATANI U DY TERAS, DALLAS 01 - C.R. LIPPENCOTT U OF TERAS, DALLAS 01 - C.R. LIPPENCOTT U OF TERAS, DALLAS BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO DETERMINE OBSERVATIONS OF VECTOR ION DRIFT VELOCITIES, ION CONCENTRATION AND TEMPERATURE, AND SPACECRAFT POTENTIAL. AN IONOSPHERIC IRREGULARTY INDEX WAS ALSO OBTAINED FROM THE ION CONCENTRATION SENSOR. THE EXPERIMENT CONSISTED OF A RETARDING POTENTIAL AMALYZER WITH HOUR PLANAR SENSOR HEADS. THE SENSOR HEAD USED FOR ION DRIFT RESULPENTS WAS CO-LOCATED WITH ANOTHER HEAD, AND ALL WERE SPACED NEARLY EQUALLY, LOUKING OUTWARD FROM THE SATELLITE EQUATOR. SINCE THE SATELLITE SPIN AXIS WAS PERPENDICULAR TO THE ORBIT PLANE, THESE HEADS COULD OBSERVE ALONG THE SPACECRAFT VELOCITY VECTOR IN EITHER THE SPIN AXIS WAS PERPENDICULAR TO THE ORBIT PLANE, THESE HEADS COULD OBSERVE ALONG THE SPACECRAFT SPACECRAFT. THE PRIMARY PURPOSE OF THIS EXPERIMENT WAS TO PROVIDE ACCURATE ION TEMPERATURES WITH OTHER MEASUREMENTS BEING OF SECONDARY IMPORTANCE. THREE OF THE SENSOR HEADS WERE SIMILAR. THEY HAD TWO GROUNDED ENTRANCE GRIDS, TWO RETARDING GRIDS, A SUPPRESSOR GRID, A SHIELD GRID, AND A COLLECTOR. A LINEAR SWEEP VOLTAGE (32 OR 22 TO 3 V. UP OR DOWN) WAS NORMALLY APPLIED TO THE RETARDING GRIDS IN 0.75 S. INTERPRETATION OF THE RESULTING CURRENT-WOLTAGE PROFILES PROVIDED THE ION TEMPERATURE, THE ION AND ELECTRON CONCENTRATION, SOME ONLY APPLIED, THE INFORMATION, VEHICLE POTENIAL AND PLASMA DRIFT VELOCITY PARALLEL TO THE VELOCITY VECTOR. TWO OF THE THREE SIGNIFICANT FEATURE OF THESE TWO SENSORS WAS THAT A SMALL POSITIVE COLLECTOR BIAS COULD BE APPLIED TO ASSURA DEGUATE SIGNIFICANT FEATURE OF THESE TON SENSORS WAS THAT A SMALL POSITIVE COLLECTOR DIAS COULD NEARURENTS, THE OTHER SIGNIFICANT FEATURE OF THESE TON SENSORS WAS THAT A SMALL POSITIVE COLLECTOR DIAS COULD BE APPLIED TO ASSURA DEGUATE SIGNIFICANT FEATURE OF THESE TON SENSORS WAS THAT A SMALL POSITIVE COLLECTOR DIAS COULD PARAMETERS WERE MEASURED IN A MANNER SIGNIFICANT FEATURE OF FOR THE LINEAR SWEEP VOLTAGE (-3 OR -2

--- AÉ-D, HAYS-------

INVESTIGATION NAME- VISIBLE AIRGLOW PHOTOMETER (VAE)

NSSDC 10- 75-0964-13 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES Atmospheric physics

ERSONNEL		
P1 - P.8.	HAYS	U OF MICHIGAN
01 - G.G.	SHEPHERD	YORK U
01 - G.R.	CARIGNAN	U OF HICHIGAN
. ÓÌ – J_C_G	-WALKER	ARECTRO OBS

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE VISIBLE AIRGLOW EXPERIMENT PROVIDED VOLUME EMISSION RATES FOR SEVERAL DAYGLOW, NIGHIGLOW, AND AURORAL OPTICAL GMISSION FEATURES. A PHOTOMETER CONTAINING TWO SEPARATE OPTICAL CHANNELS WAS USED. SPECTRAL SELECTION WAS ACCOMPLISHED WITH A COMMON FILTER WHEEL THAT CONTAINED SIX INTERFERENCE FILTERS AND A DARK AND CALIBRATE POSITION. THE WAVELENGTHS MEASURED IN PAIRS (IN ANGSTROMS) WERE -- 7319 AND 4861, 5200 AND OAKK, 5577 AND 7319, 4278 AND 5200, 6300 AND 5577, CALIB AND 4278, AND 4861 AND 6300, THE TWO CHANNELS WERE SEPARATED IN ANGLE BY 90 DEG. ONE CHANNEL HAD A LARGE FIELD OF VIEW (3) DEG HALF-ANGLE) FOR HIGH SENSITIVITY NORMALLY POINTING TOWARD THE LOCAL ZENITH, AND THE SECOND CHANNEL HAD A SMALL FIELD OF VIEW (0,75 DEG HALF-ANGLE) FOR HIGH SPATIAL RESOLUTION, POINTING TANGENT TO THE SURFACE OF THE EARTH WHEN THE SATELLITE WAS IN THE DESPIN MODE. BOTH CHANNEL WERE PROTECTED FROM STRAY LIGHT CONTARINATION DURING DAYTIME BY MULTISTAGE BAFFLE SYSTEMS. PHOTONS' THAT HAD BEEVERAL WADES, E.G., FIXED FILTER STO COULD BE OPERATED IN SEVERAL MODES, E.G., FIXED FILTER STATALLY SELECTED WERE SENSED BY A PULSE-COUNTING PHOTONULTIPLIER SYSTEM CAPABLE OF COUNTING AT A RATE OF S.EG COUNTS/S. THE FILTERS COULD BE OPERATED IN THE SEVERAL MODES, E.G., FIXED FILTER MOD AUTOMATIC FILTER CHANGES COULD BE SYNCHRONIZED FITHER TO SATELLITE ORIENTATION ON TO A FIXED-TIME BASE. MORE EXPERIMENT ON ATMOSPHERE EXPLORER,' P.B. HAYS ET AL, RADIO SCIENCE, B, 4, 309, APRIL 1973.

----- AE-D, HEDIN--

INVESTIGATION NAME- NEUTRAL ATMOSPHERE COMPOSITION (NACE)

INVESTIGATIVE PROGRAM CODE ST

> INVESTIGATION DISCIPLINE(S) IDNOSPHERES PLANETARY ATMOSPHERES ATMOSPHERIC PHYSICS

> > NASA-GSFC

NASA-GSFC U OF MICHIGAN

PERSONNEL PI - A.E. OI - C.A. OI - G.R. HEDIN PEBER CARIGNAN

NSSDC 10- 75-096A-08

01 - C.A. PEBER 01 - G.R. CARIGNAN BRIEF DESCRIPTION THIS ERPERIMENT MEASURED IN SITU THE SPATIAL DISTRIBUTION AND TEMPORAL CHANGES OF THE CONCENTRATIONS OF THE NEUTRAL ATMOSPHERIC SPECIES. IN ADDITION. NEW INSIGHT INTO IN SITU MEASUREMENT S WITH OTHER ANDORAD EXPERIMENTS. NAMELY --OPEM-SOURCE SPECIFONETER (75-006A-007). SOLAR EUV SPECTROPHOTOMETER (70-007). SOLAR EVERTROPHOTOMETER (70-007). HE THE SPACECRAFT WAS SPINNING AT 4 RPM. MESUBERENTS OF THE PRINCIPAL ATMOSPHERIC SPECTROMERAL MEASUREMENTS VAS SPECTROPHOTOMETIC SPECTROMERAL MEASUREMENTS VAS SPECTROPHOTOMETER INS PRECISE WERE SOLAR FOUNDAL SPECTROPHOTOMETER NAME AT 12-KM INTERVALS WHEN THE SPACECRAFT WAS DESPIN. IN SPECTROPHONENTIAL AT AND SPECTROMETER WAS DESED ORDITICE INTO THE SPECALED SPECTROMERAL PARAGE SO THAT A MASS

-- AE-D, HINTEREGGER

INVESTIGATION NAME- SOLAR EUV SPECTROPHOTOMETER (EUVS)

NSSOC 10- 75-0964-06 INVESTIGATIVE PROGRAM CODE 51

> INVESTIGATION DISCIPLINE(S) IONOSPHERES PLANETARY ATMOSPHERES Solar Physics

PERSONNEL		100 C 100 C		
PI - H.E.	HINTEREGGER	USAF	GEOPHYS	LAB
01 - D.E.	BEDO	USAF	GEOPHYS	LAB
01 - L.A.	HALL	USAF	GEOPHYS	LAÐ
01 - C.W.	CHAGNON	USÁF	GEOPHYS	LÁB
01 - J č.	MANSON	USAF	GEOPHYS	LAB
	and the second			

BRIEF DES.RIPTION EUNS WAS USED TO OFSERVE THE VARIATIONS IN THE SOLAR EUN FLUX IN THE WAVELENGTH RANGE FROM 140 TO 1050 A AND THE ATROSPHERIC ATTENUATION AT VARIOUS FIXED WAVELENGTHS. THIS PROVIDED QUANTITATIVE ATMOSPHERIC STRUCTURE AND COMPOSITION DATA. THE INSTRUMENT CONSISTED OF 24 GRAZING-INCIDENCE GRATING MONOCHROMATORS, USING PARALLEL-SLIT SYSTEMS FOR ENTRANCE COLLIMATION AND PHOTOELECTRIC DETECTORS AT THE EXIT SLITS. TWELVE OF THESE ROMOGRAGORATORS HAD WAVELENGTH SCAN CAPABILITY, EACH WITH 128 SELECTABLE WAVELENGTH POSITIONS, WHICH COULD ALSO

ALL LOCAL TIMES IN 4 MONTHS. UNFORTUNATELY, & FAILURE IN THE SOLAR POWER PANELS RESULTED IN THE TERMINATION OF OPERATIONS ON 1/29/76 AFTER SLIGHTLY LESS THAN 4 MONTHS OF USEFUL LIFE. HOWEVER, ALL THE REGIONS AT THE PERIGEE ALLITUDES WERE SAMPLED DURING THIS TIME. THE SPACECRAFT RE-ENTERED THE ATMOSPHERE ADOUT 1 MONTH AFTER CESSATION OF TELEMERY. TO CONTINUE THE CORRELATED OBSERVATIONS WITH THE AE-E MISSION, AE-C WAS REACTIVATED ON 2/20/76 TO PEPLACE AE-D.

INVESTIGATION NAME- ULTRAVIOLET NITREC-OXIDE EXPERIMENT NSSDC 10+ 75-0964-11

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) - Rlanetary Atmospheres Atmospheric Physics

PERSVANEL						
P1 - C.A.	BARTH		ម	ØF	COLORADO	
01 - D.V.	RUSCK		U	0F	COLORADO	
01 - A.I.	STEWART		u	ΟF	COLORADO	

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS ULTRAWIGLET NITRIC-OXIDE EXPERIMENT (UWNO) CONSISTED OF A TWO-CHNINEL FIXED-GRATING EDERT SPECTROMETER, WHICH MEASURED THE AIRGLOW IN THE (1,0) GAMMA BAND IN A 12-A REGION CENTERED AT 2150 A. THE OBSERVED INTENSITY HAS PRODUCED BY RESONANCE FLUORESCENCE BY SUNLIGHT OF THE NITRIC-OXIDE MOLECULES IN THE INSTRUMENT'S FIELD OF VIEW. THE INTENCITY PROFILES OBTAINED VIELDED ALTITUDE PROFILES OF NITRIC-OXIDE MEASURED ALONG THE TRACK OF THE SATELLITE AT TIMES WHEN IT WAS OF THE UNNO EXPERIMENT PERMITTED HEASUREMENTS OF NITRIC-OXIDE TO DE MADE AT ALTITUDES BOTH ABOVE AND BELOW SATELLITE PERIGEE. AS THE PROCERAFT SPUN. THE SPECTROMETER, WHICH LOOKED OUTWARD THROUGH THE RIN OF THE SATELLITE, REPEATEDLY HAD ITS FIELD OF VIEW CARIED DOWN THROUGH THE ATMOSPHEME ONTO THE CARTM'S LIND, AND ALTITUDE PROFILES OF THE ENTITED ALROADW SATELLITE PERIGE. IS ON THE UNION THROUGH THE ATMOSPHEME ONTO THE CARTM'S LIND, AND ALTITUDE PROFILES OF THE ENTITED ALROADW INTENSITY WERE OBTAINED. BELOW SOME ALTITUDES THE MEASURED SIGNAL AT 2150 A THE TWO CHANNELS WERE OFTIGHES THE MEASURED SIGNAL AT 2150 A. THE TWO CHANNELS WERE OFTIGHT AND SELECTRICALLY INDEPENDENT. NITRIC-OXIDE ALROADW THESE TWO MEASURED SIGNAL AT 2150 A. THE TWO CHANNELS WERE OFTIGHT AND ELECTRICALLY INDEPENDENT. NITRIC-OXIDE ALROADW THESE TWO MEASURED SIGNAL AT 2150 A. THE TWO CHANNELS WERE OFTIGALLY AND ELECTRICALLY INDEPENDENT. NITRIC-OXIDE ALROADW THESE TWO MEASURED SIGNAL AT 250 A. THE TWO CHANNELS WERE DITIGHT ON THE GRATING. THE SCATTERED LIGHT INTENSITY HAS DETERMINED BY TAKING THE DIFFERENCE DETWEEN THESE TWO MEASUREMENTS. THE SENSOR'S SPHERICAL FUSED OUNTLY AND SELECTRICALLY INDEPENDENT. NITRIC-OXIDE ALROAD THE SETTION THE CIGHT STRUKE ONE HALSO F THE SPECTROMETER. FROM THISS SLIT THE LIGHT GOLLIANCE SLIT OF THE SPECTROMETER. FROM THISS SLIT THE LIGHT COLLIANTES OF THE SUBST. THE SPECTROMETER FILLO OF VIEW WAS D DEG 15 AIN BY 4 DEG 3- MIN. IN NORMAL OPERATION CAND FOLUSED IT ON TWO EXIT SLITS. THE SPECTROMETER THIS ULTRAVIOLET NITRIC-OXIDE EXPERIMENT (UVNO) CONSISTED

---- AE-D, BRACE-----

INVESTIGATION NAME- EVEINORICAL ELECTROSTATIC PROBE (CEP)

CODE ST

INVESTIGATIVE PROGRAM NSSOC 10- 75-0964-01

INVESTIGATION DISCIPLINE(S) Ionospheres Planetary Atmospheres

PERSONNEL			÷	1 + Q	
PI - L.H.	BRACE			MASA-GSF	÷¢.
01 - R.F.	THEIS			NASA-GSF	÷C
01 - A.	DALGARNO	 		HARVARD	Ð -

. 27

OI - A. DALGARNO HARVARE U URIEF DESCRIPTION THE CEP CONSISTED OF TWO IDENTICAL INSTRUMENTS DESIGNED TO MEASURE ELECTRON TEMPERATURES, ELECTRON AND ION CONCENTRATIONS. ION MASS, AND SPACECRAFY POTENTIAL, ONE PROBE UAS DRIENTED ALONG THE SPIN AXIS OF THE SPACECRAFY (KORMALLY PERPENDICULAR TO THE ORBIT PLANE), AND TNE OTHER RADIALLY SO THAT IT COULD OBSERVE IN THE DIRECTION OF THE VELOCITY VECTOR ONCE EACH 15-S SPIN PERICD. EACH INSTRUMENT WAS A RETARDING POTENTIAL LANGMUIR PROBE DEVICE THAT PRODUCED A CURRENT-VOLTAGE (I-V) CURVE FOR A KNOWN VOLTAGE PATTERN PLACED ON THE COLLECTOR. ELECTROMETERS WERE USED TO MEASURE FHE CURRENT. THERE WERE TWO SYSTEMS OF OPERATION (INE WITH TWO NODES AND ANOTHER WITH THREE MODES) USING COLLECTOR VOLTAGE PATTERNS BETTMEEN PLUS AND BLINUS 5 VOLTS. MOST MODES INVICED ANDYOR ELECTROMETER DUTYUT) SUCH THAT THE REGION OF INTEREST (AND/OR ELECTROMETER DUTYUT) SUCH THAT THE REGION OF INTEREST ON THE I-V PROFILE PROVIDED HIGH RESOLUTION. EACH SYSTEM WAS DESIGNED FOR UGE WITH ONLY ONE OF THE PROBES, BUT THEY COULD BE INTERSHITCHED. TO PROVIDE HACKUP. REDUNDANCY. THE WEST MERSHITCHED IN THE NOST FAVORABLE MODES PROVIDED ONE SECOND

TIME RESOLUTION; ELECTRUN TEMPERATURE BETWEEN 3DU AND 10.00G DEG K 110 PERCENT ACCURACY); ION DENSITY BETWEEN 10.000 AND 10E7 PER CUBIC CM (1D-70 PERCENT ACCURACY); ELECTRON DENSITY BETWEEN 50 AND IDEG PER CUBIC CM, AND 100 MASS AT ION DENSITIES ADOVE 10,000 PER CUBIC CM, EACH PROBE HAD A COLLECTOR FLECTRODE EXTENDING FROM THE CENTRAL AXIS OF A CVLINDRICAL GUARD RING. THE 2.5-CM LONG GUARD RING WAS AT THE END OF A 25-CM BODM, AND THE COLLECTOR EXTENDED ANOTHER 7.5 CM BEYOND THE GUARD RING. THE BOOM, GUARD, AND COLLECTOR WERE 0.2 CM IN OTA. MORE DETAILED INFORMATION CAN BE FOUND IN "RADIO SCIENCE," 8, 4, APRIL 1973.

--- AF-D. CHAMPION---INVESTIGATION NAME- ATMOSPHERIC DENSITY ACCELERONETER (MESA)

N55DC 10- 75-0964-02

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) IONGSPHERES PLANETARY ATMOSPHERES

USAF GEOPHYS LAB USAF GEOPHYS LAB

PERSONNEL PI - K.S.W.CHAMPION DI - F.A. MARCOS

BRIFE DESCRIPTION

BRIEF DESCRIPTION MESA OBTAINED DATA ON THE NEUTRAL DENSITY OF THE ATMOSPHERE IN THE ALTITUDE RANGE OF 720 KM TO 400 KM BY THE HEASUREMENTS OF SATELLITE DECELERATION OUE TO ACROMINANTC DRAG. THE INSTRUMENT CONSISTED OF THREE SINGLEAXIS ACCELERONTERS, MOUNFED MUTUALLY AT RIGHT ANGLES, TWO IN THE SPACECRAFT X-Y PLANE AXIS AND THE OTHER IN THE Z-AXIS. THE INSTRUMENT DETERMINED THE APPLIED ACCELERATION FROM THE ELECTROSTATIC TORGE REQUIRED TO RECENTER A PROOF MASS, THE OUTPUT OF THE DEVICE WAS. A DIGITAL PULSE RATE PROPORTIONAL TO THE APPLIED ACCELERATION. THE MEASUREMENTS ALLOWED NETERMINATION OF THE DENSITY OF THE NEUTRAL ATMOSPHERE, MONITORED THE THRUST OF THE DENSITY OF THE NEUTRAL ATMOSPHERE, MONITORED THE MARSLIT NINMM ALTITUDE, MASSNED SPACECRAFT MUTATIONS OF LESS THAN 0.01 DEGREES WERE MONITORED. THE INSTRUMENT HARE SENSITIVITY RANGES -- 8.E-3 G IN OAPS MONITOR MODE; 4.E-4 G RETWEEN 120 KM (PLUS OR MINUS 2 PERCENT) AND 760 KM (PLUS OR MINUS 10 PERCENT); AND 21E-5 G DETWEEN 180 KM (PLUS OR MINUS 2 PERCENT) ANN 400 KM (PLUS OR MINUS 10 PERCENT). NUMBERS IN PARENTHESES REFESENT ERRORS; IN ADDITION. THREE MAY BE A SYSTEMATIC ERROR OF UP TO PLUS OR MINUS 5 PERCENT DUE TO PRAG GOEFFICIENT UNCERTAINTY. THE HIGHEST ALITIONE WAS DETERMINED ASSUMENTS SCALE.

-- AE-D, DOERING-----

INVESTIGATION NAME- PHOTOELECTRON SPECTROMETER (PES)

INVESTIGATIVE PROGRAM NSSDC 10- 75-0964-03 CODE ST

> INVESTIGATION DISCIPLINE(5) IGNOSPHERES Planetary Atmospheres

> > JOHNS HOPKINS H APPLIED PHYSICS LAB

PERSONNEL PI - J_P_ DOERING OI - C.O. BOSTROM OI - J.C. ARMSTRONG

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO PROVIDE INFORMATION ON THE INTENSITY, ANGULAR DISTRIBUTION, ENERGY SPECTRUM, AND NET FLOWS ALONG FIELD LINES, OF ELECTRONS IN HE THEKNÖSPHERE WITH ENERGIES DETWEEN 2 AND 500 EV. THE INSTRUMENT CONSISTED OF TWO IDENTICAL, OPPOSITELY DIRECTED, HEMISPHERICAL, ELECTROSTATIC ANALYZEKS. EACH SPECTROMETER HAD A RELATIVE ENERGY RESOLUTION OF PLUS OR MINUS 2.5 PERLENT AND A GEOMETRIC FACTOR ON THE SECOND SQ CM STER, INDEPENDENT OF ELECTRON ENERGY. THREE SEPRARIE ENERGY RANGES COULD BE SENSED -- 0 TO 25 EV. O TO 100 EV. OR 10 500 EV. MESLIBENENTS FROM THESE INTERVALS COULD DE SEQUENCED IN 5 DIFFERENT WAYS. DATA COULD BE TAKEN FROM EITHER SENSOR SCPARATELY, OR ALTERNATELY WITH 11M RESOLUTION VARYING FROM 0.25 TO 8 S. THIS ALLOWED A CHOICE OF EITHER SCHARGED IN 64 STEPS, AND WAS ODNE AT 4 OR 16 STEPS PER TELEMETRY FRAME. WITH 16 FRAMES/S, THIS ALLOWED A CHOICE OF EITHER ONE 64-POINT SPECTRUM, OR FOUN 16-POINT SPECTRA IN ONE SECOND. THE LONGEST (8 S) CYCLE OF DATA INVOLVED OBSERVATIONS USING INCREASING VOLYAGE STEPS FOR THE LOWEST, MIDDLE, LOWEST, HEN HIGHEST ENERGY FANGES (IN THAT ORDER) FOR 1 S EACH. A REPEAT FOR DECREASING VOLTAGE STEP COMPLETED THE CYCLE. A. MORE DETAILED DESCRIPTION OF THIS CYPERTED THE CYCLE. A. MORE DETAILED DESCRIPTION OF THIS CAPELATED. FOUND IN 'RADIO SCIENCE' 8, 4, 387-392, APRIL 1973.

-- AE-D. HANSON------INVESTIGATION NAME- RETARDING POTENTIAL ANALYZER/DRIFT METER

(RPA)

AUTOMATICALLY STEP SCAN THROUGH THESE POSITIONS. THE OTHER 12 MUNOCHROMATORS OPERATED AT FIXED WAVELENGTHS WITH FIELDS OF VIEW SMALLER THAN THE FULL SOLAR DISK TO AID IN THE ATMOSPHERIC ABSORPTION AHALYSIS. THE SPECTRAL RESOLUTION VARIED FROM 2 TO 54 A DEPENDING UPON THE PARTICULAR INSTRUMENT. THE FIELD OF VIEW VARIED FROM 60 X 60 ARC MIN DOWN TO 3 X 6 ARC MIN. ALL 24 MONOCHROMATOR-ENTRANCE ARES WERE CO-ALIGNED PARALLEL. A SOLAR POINT SYSTEM COULD POINT TO 256 DIFFERENT POSITIONS, EXECUTE A 16-STEP ONE-DIRENSIONAL SCAN OR A FULL 256-STEP RASTER. THE TIME RESOLUTION VARIED FROM 0.5 S FOR OBSERVING 12 FIXED WAVELENGTHS UP TO 256 S FOR PROGRAMMING THE EUVS THROUGH ALL POSSIBLE MODES. MORT DETAILS CAN BE FOUND IN "RADIO SCIENCE," 8, 4, 349-360, APRIL 1973.

--- AE-D, HOFFMAN-----

INVESTIGATION NAME+ MAGNETIC ION-MASS SPECTROMETER (MIMS)

NSSDE	10-	75-0964-10	INVESTIGATIVE PROGRAM
			SOLAR-TERRESTRIAL PHYSICS

INVESTIGATION DISCIPLINE(5) VESTIGATION DISCIPLIN 10NOSPHERES PLANETARY ATMOSPHERES ATMOSPHERIC PHYSICS

PERSONNEL		
P1 - J.H.	HOFFMAN	U OF TEXAS. DALLAS
01 - E.E.	FERGUSON	NOAA-ERL
-8-W - 10	HANSON	U OF TEXAS, DALLAS
01 - C.R.	LIPPENCOTT	U OF TEXAS, DALLAS

01 - 0.0. HANSON D OF TEXAS, DALLAS 01 - C.R. LIPPENCOTT U OF TEXAS, DALLAS BRIEF DESCRIPTION A MAGNETIC ION MASS SPECTROMETER WAS FLOWN TO MEASURE IN SITU THE CONCENTRATIONS OF THE AMBIENT POSITIVE ION SPECIES IN THE MASS RANGE FROM 1 TO 90 ATOMIC MASS UNITS (U). MOUNTED ON THE SATELLITE EQUATOR NORMAL TO THE SPIN AXIS, THE ENTRANCE APERTURE FACED FORMAD WHEN THE SPACEMENT WAS IN THE DESPUN MODE. THE ELECTRIC AND MAGNETIC FIELDS WERE ARRANGED TO PRODUCE A MASS SPECTROMETER VAS IN THE DESPUN MODE. THE ELECTRIC AND MAGNETIC FIELDS WERE ARRANGED TO HE ASS RATIOS 1-4-16 U. IONOSPHERIC IONS WERE ACCELERATED NTO THE ANALYZER. THREE SLITS WERE PLACED ALONG THE FOCAL PLANE IN APPROPRIATE PLACES TO SIMULTANEOUSLY COLLECT IONS IN THE MASS RATIOS 1-4-16 U. IONOSPHERIC IONS WERE ACCELERATED INTO THE ANALYZER SYSTEM BY A NEGATIVE VOLTAGE THAT VARIED FROM -1040 TO -225 V. THE THREE MASS RANGES MAESURED SIMULTANFOUSLY YERE 1 TO 4, 4 TO 16, AND 16 TO 64 U. FOLLOWING EACH SLIT WAS AN ELECTRON MULTIPLIER AND LOGARITHMIC ELECTROMETER -MPLIFIER DETECTOR. THE DETECTOR OUTPUT WAS EITHER MEASURED DIRECTLY FOR AN NALOG OUTPUT, OR WAS SUPPLIED TO A 'PEAK' CIRCUIT THAT DETERTINED THE ARALIDUE OF EACH PEAK IN THE SPECTRUM. ONLY THE ANPLITUDE OF EACH PEAK WAS TFLEMETERED IN THE 'PEAK' MODE, AND IN THIS MODE THE TIME REQUIRED TO SIMULTANFOUSLY SWEEP ALL THREE MASS RANGES WAS 1 S. OTHER MODES OF OPERATION WERE POSSIBLE. IN THE ANALOG SHORT MODE, THE THREE MASS RANGES WERE SWEPT IN 3 S, ALTERNATING WITH 1-S 'PEAK' MODE SCANS. AN 8-S SWEEPT IM 3 S, ALTERNATING WITH 1-S 'PEAK' MODE SCANS. AN 8-S SWEEPT IME ANALOG TO CONTINUOUSLY MEASURE ANY SET OF MASS NUMBERS IN THE RATIO 1-4-16 TO GIVE HIGH SPATIAL RESOLUTION ERISTED IN THE LOCKED MODE TO CONTINUOUSLY MEASURE ANY SET OF MASS NUMBERS IN THE RATIO 1-4-16 TO GIVE HIGH SPATIAL RESOLUTION AGE SPECTROMETER ON ATMOSPHERE EXPLORER' J. H. HOFFMAN ET AL, RADIO SCIENCE, 8, 4, 315-322, APRIL 1973.

--- AF-D, HOFFMAN-------

INVESTIGATION NAME- LOW-ENERGY ELECTRONS (LEE)

INVESTIGATIVE PROGRAM Sõlar-terrestrial physics NSSDC 10- 75-096A-12 INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL		
PI - R.	.A. HOFFMAN	NASA-GSFC
d - 10	S. EVANS	NGAA-ERL
01 - J	L. BURCH	NASA-MSFC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT FURNISHED DIRECT MEASUREMENTS OF THE ENERGY INPUT INTO THE UPPER ATMOSPHERE DUE TO ELECTADNS AND PROTONS (JONS) IN THE ENERGY RANGE 0.2 TO 25 KEV. THE EXPERIMENT ACQUIRED DIFFERENTIAL MEASUREMENTS OF THE EMERGY INFLUX AND AMOULAR DISTRIBUTION. THERE WAS ONE DETECTOR MEASURING PROTONS FROM 0.2 TO 25 KEV) STEPPEO EMERGY AMALYZERS ORIENTED AT DIFFERENT ANGLES. (THE RESOLUTION OF 1 5), AND 16 FIXED-EMERGY DETECTORS, WHICH COULD OBTAIN HIGH TIME RESOLUTION (0.06 S) AMOULAR DISTRIBUTIONS AT 5 EMERGIES BETWEEN 0.2 AND 5 (OF 0.7 AND 17.5) KEV. EACH DETECTOR CONSISTED OF A CYLINDICAL ELECTROSTATIC AMALYZER FOR SPECIES AND EMERGY DIFFERENT FIXED OR STEPPED VOLTAGES TO THE DEFLECTION PLATES. DIFFERENT FIXED OR STEPPED VOLTAGES TO THE DEFLECTION PLATES. DIFFERENT FIXED OR STEPPED VOLTAGES TO THE DEFLECTION PLATES. DIFFERENT FIXED OR STEPED VOLTAGES TO THE DEFLECTION PLATES. DISTRIBUTIONS IN ANGLE WERE MEASURED BY USING THE SPACECRAFT SPIN AND MOUNTING THE DETECTORS AT AN ANGLE. IN THE SPINNING MODE, ANGULAR DISTRIBUTIONS SO FOR DEFUS ON DES FROM THE SPACECRAFT EQUATOR (NORRALLY RADIALLY AWAY FROM THE CATH). DETECTOR LON ANGLES WERE (MEDSEN DETECTONS WERE DETAINED. IN THE DESPUN MODES, MEASUREMENTS WERE OBTAINED AT PLUS OR MINUS 7 DEG, PLUS 35 DEG, AND PLUS GO DES FROM THE SPACECRAFT EQUATOR (NORRALLY RADIALLY AWAY FROM THE ARTH). DETECTOR LOOK ANGLES WERE (MEDSEN TO GIVE ONTING THEMENTIC PITCH-ANGLE COUFGAGE WHEN THE SPACECRAFT WAS MOVING ELTHER POLEWARD OR EQUATORWANLA ALL DETECTORS WERE IDENTICAL IN CONSTRUCTION AND USED 3- X 6-MM ENTRANCE APERTURES WITH THE

EXCEPTION OF THE 12 LOWEST ENERGY (FIXED ENERGY) DETECTORS, WHICH USED 1-MM CIRCULAR APERTURES. THREE MODES OF OPERATION WERE AVAILABLE. IN THE MONITOR MODE, 3 STEPPED-ENERGY DETECTORS MEASURED ENERGY SPECTRA AT -7 AND +60 DEG FROM THE 4 AXIS (IN THE SPACECRAFT EQUATORIAL PLANE), AND IN THE TWO OTHER MODES (LOW ENERGY .2 TO 5 KEV, AND HIGH ENERGY .7 TO 18 KEV) UP TO 7 DIFFERENT ENERGIES WERE OBSERVED AT UP TO 4 DIFFERENT ANGLES. MORE DETAILS OF THIS EXPERIMENT MAY BE FOUND IN "RADIO SCIENCE," 8, 4, 393-40D, APRIL 1973.

- AE-D. NIER---------INVESTIGATION NAME- OPEN-SOURCE NEUTRAL MASS SPECTROMETER

(055)

DC 10- 75-0968-07	INVESTIGATIVE PROGRAM CODE ST
	INVESTIGATION DISCIPLINE(5)
	10NOSPHERES
	PLANETARY ATHOSPHERES
	ATMOSPHERIC PHYSICS
SONNEL	
PI - A.O.C.NIER	U OF MINNESOTA

 - W.E. - K.	บ	0 F	MINNESOTA

NSS

PER

01 - W.E. POTTER U OF HINNESOTA 01 - K. MAUERSBERGER U OF HINNESOTA BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT WAS TO CONTRIBUTE TO A STUDY OF THE CHEMICAL, DYNAMIC, AND ENERGETIC PROCESSES THAT IN SITU MEASURMENTS OF BOTH MAJOR AND MINOR NEUTRAL ATMOSPHERIC CONSTITUENTS HAVING MASSES IN THE RANGE FROM 1 TO 48 ATOMIC MASS UNLIPS (U). A DOUBLE-FOCUSING MATTACH-HERIOG MAGNETIC DEFLECTION MASS SPECTROMETER WITH AN IMPACT 10N SOURCE HAS, FLOWN. TWO 10N COLLECTORS WERE INCLUDED TO MEASURE 10NS DIFFERING IN MASS BY A FACTOR OF & I.E., THE TWO MASS RANGES COVERED WERE TO BU AND 7 TO 48 U. IN THE 10M SOURCE THE NEUTRAL SPECIES WAS IONIZED BY MEANS OF ELECTRON IMPACT. IHE ELECTRON ENERGIES WERE SELECTABLE, 75 EV FOR THE HIGH-EW MODE AND 25 EV FOR THE LOW-EW MODE. AT ALTITUES GREATER THAN SHO KM. ION CURRENTS WERE MEASURED WITH AN ELECTRON MUMERA. WHILE COMPLETE MASS SPECTRA COULD BE SWEPT, IN THE COMMON MODE OF OPERATION PEAK SIEPPING WAS EMPLOYED. WITH READINGS ON THE PRINCIPAL PEAKS IN THE MASS SPECTRUM BEING REPEATED APP'ORIMATELY EVERY 0.5 S AND DHER SPECTES LESS FREQUENTLY. DATA BELOW 380 KM WERE MEASURED WITH AN ELECTRON MUMERA. WHILE COMPLETE MASS SPECTRA COULD BE SWEPT, IN THE COMMON MODE OF OPERATION DEAK SIEPPING WAS EMPLOYED. WITH READINGS ON THE PRINCIPAL PEAKS IN THE MASS SPECTRUM BEING REPEATED APP'ORIMATELY EVERY 0.5 S AND DHER SPECTES LESS FREQUENTLY. DATA BELOW 380 KM WERE MEASURED WING AN ELECTRONTHER. IN ADDITION TO THE PEAK SIEPPING WAS EMPLOYED. WITH READINGS ON THE PRINCIPAL PEAKS IN THE MASS SPECTRUM BEING REPEATED APP'ORIMATELY EVERY FORMED, ANBLENT PARTICLES STRIKING THE COMMON MODE OF OPERATING MODE, THE ION SOURCE VOLTAGES WERE ADJUSTED SO THAT HERE WAS NO ELECTRICT FIELD TO DAWN IONS OUT OF THE ELECTRON BEAM WHEN THEY WERE FORMED, ANBLENT PARTICLES STRIKING THE ION. SOURCE RETAIN ENERGIES LESS THAN 0.1 EV, WHICH IS NOT HIE FULT-THAOUGH MODE, THE INSTEMMENT YANTICLES THAT DIP MOT STRIKE THE ION SOURCE RETAINED THEIS SUICHAS SO SO THAT HER NOMAL MODE O

- AE-D, RICE-

INVESTIGATION NAME- CAPACITANCE MANDMETER

NSSDC 10- 75-096A-14

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES

PERSONNEL .PI - C.J. RICE

AEROSPACE CORP

PI - C.J. RICE AEROSPACE CURP BRIEF DESCRIPTION THE CAPACITANCE MANOMETER WAS PRIMARILY AN ENGINEERING EXPERIMENT TO PROVIDE DATA ON SPACECRAFT OPERATIONS. HONEVER-DATA FROM THIS EXPERIMENT WERE ALSO CORRELATED WITH ACCELEROMETER AND ION GAUGE DATA IN EVALUATING SATELLITE DRAG. THE MAMONETER, ALSO REFERRED TO AS PRESSURE SENSOR BUT PROVIDED A DIRECT MEASURE OF ATMOSPHERIC PRESSURE IN THE REGION BELOW 200 KM. THE ACCURACY OF THE PSB GAUGE VARIED FROM ABOUT 10 PERCENT AT 120 XM TO ABOUT 40 PERCENT AT 180 KM. THE PSB CONSISTED DF TWO SPHERICAL, THERMALLY CONTROLLED CAMBERS, SEPARATED BY A THIN MEMBRANE STRETCHED FLAT AND UNDER RADIAL TEMSION. ANY DEFLECTION OF THE DIAPHRAGE CAUSED BY A PRESSURE DIFFERENTIAL BETWEEN THE TWO SIDES CAUSED A CHANGE IN KAPACITANCE BETWEEN THE DIAPHRAGE AN AN ADJACENT ELECTRODE WHICH BIASED AN AC BRIDGE CIRCUIT. AIR WAS ALLOWED INDER PROJUCULAR TO THE SPACECRAFT SPIN AXIS. THUS THE WAKE-RAM PRESSURE DIFFERENTIAL WAS SAMPLED TWICE EACH SPACECRAFT REVOLUTION.

AE-D, RICE-----INVESTIGATION WAME+ COLD CATHODE ION G/JGE

NSSDC ID- 75-0964-15

--- AE-D, SPENCER

NSSDC ID- 75-0964-09

PERSONNEL PI - N.W. Spencer DI - G.R. Carignan DI - H.B. Niemann

BRIEF DESCRIPTION

NSSDC 10- 75-107A

PERSONNEL PI - C.J. RICE

BRIEF DESCRIPTION

CODE ST INVESTIGATION DISCIPLINE(S) Planetary atmospheres

AEROSPACE CORP

INVESTIGATIVE PROGRAM

INVESTIGATION NAME- NEUTRAL ATMOSPHERE TEMPERATURE (NATE)

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) Planetary atmospheres Atmispheric physics

NASA-GSFC U ÓF MÍCHIGAN NASA-GSEC

CODE ST

PERSONNEL

SPONSORING COUNTRY/AGENCY UNITED STATES

NG - F.W. GAETAND SC - E.R. SCHMERLING PM - J.E. KUPPERIAN, JR. PS - N.W. SPENCER

PS - N.W. SPENCER NASA-GSFC BRIEF DESCRIPTION THE PURPOSE OF THE AE-E MISSION WAS TO INVESTIGATE THE CHEMICAL PROCESSES AND EMERGY TRANSFER MECHAMISMS THAT CONTROL THE STRUCTURE AND BEHAVIOR OF THE EARTH'S ATMOSPHERE AND L'WOSPHERE IN THE REGION OF HIGH ABSORPTION OF SOLAR EMERGY AT LOW AND EQUATORIAL LATITUDES. THE SIMULTAMEOUS SAMPLING AT HIGHER LATITUDES WAS CARRIED OUT BY THE AE-D SPACECRAFT UNTLL ITS FAILURE ON 1/20/76 AND THEN BY AE-C. THE SAME TYPE OF SPACECRAFT AS AE-C WAS USED, AND THE PAYLOAD CONSISTED OF THE SAME TYPES OF INSTRUMENTS EXCEPT THAT THE LOW EMERGY ELECTROM AND UV NITRIC OXIDE EXPERIMENTS WERE DELETED AND A BACKSCATTER UV SPECTROMETER WAS ADDED TO MONITOR THE DOTORE CONTENT OF THE ATMOSPHERE. THE TWO EXPERIMENTS THAT WERE DELETED WERE MORE APPROPRIATE FOR THE HIGH LATITUDE REGIONS. THE PERIDES USED THROUGH MORE THAN SIX FULL LATITUDE REGIONS. THE PERIDES USED THROUGH MORE THAN SIX FULL LATITUDE REGIONS. THE PERIDES USED THROUGH MORE THAN SIX FULL LATITUDE REGIONS. THE PERIDES USED THROUGH MORE THAN SIX FULL LATITUDE REGIONS. THE PERIDES USED THROUGH MORE THAN SIX FULL LATITUDE CALES AND TWO LOCAL TIME CYCLES DURING THE FIRST YEAR AFTER LAUNCH WHEN THE ORBIT WAS 400 KM. THE CICULARIZATION OF THE OMBIT AROUND 390 KM WAS HADE ON 11/20/76 AND, SINILAR TO AE-C, WAS RAISED TO THIS HEIGHT WHENEVER IT WOULD DECAY TO ABOUT 250 KM.

INVESTIGATION NAME- CYLINDRICAL ELECTROSTATIC PROBE (CEP)

INVESTIGATIVE PROGRAM CODE ST

IONOSPHERES

INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC ORBIT PERIOD+ 117.29 MIN PERIAPSIS- 156. KM

NASA-GSS EPOCH DATE- 11/25/75 Inclination- 19.7 deg Apoapsis- 2983. Km

> INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES

> > NASA-GSFC NASA-GSEC HARVARD U

NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSFC

NASA-GSEC

PI - L.H. BRACE OI - R.F. THEIS OI - A. DALGARNO

PERSONNEL

OI - R.F. THEIS OI - A. DALGARNO BRIEF DESCRIPTION THE CEP CONSISTED OF TWO IDENTICAL INSTRUMENTS DESIGNED TO MEASURE ELECTRON TEMPERATURES, ELECTRON AND ION CONCENTRATIONS, ION MASS, AND SPACECYAFT POTENTIAL. ONE PROBE WAS ORIENTED ALONG THE SPIN AXIS OF THE SPACECRAFT (NDRMALLY PERPENDICULAR TO THE OBBIT PLANE), AND THE OTHER RADIALLY SO THAT IT COULD OBSERVE IN THE DIRECTION OF THE VELOCITY VECTOR POTENTIAL LANGNIIR PROBE DEVICE THAT PROUCED A CURRENT-VOLTAGE (I-V) CURVE FOR A KNOWN VOLTAGE PATTERN PLACED ON THE COLLECTOR. ELECTRONETERS WERE USED TO MEASURE THE CURRENT. THERE WERE TWO. SYSTEMS OF OPERATION (OME WITH TWO MODES AND ANOTHER WITH THREE MODES) USING COLLECTOR VOLTAGE LIMITS (AMD/OR ELECTROMETERS URE USED TO MEASURE THE CURRENT. (AMD/OR ELECTROMETERS URENT OF COLLECTOR VOLTAGE LIMITS (AMD/OR ELECTROMETER OUTPUT) SUCH THAT THE REGION OF INTEREST ON THE I-V PROFILE PRC.IDED HIGH RESOLUTION, EACH SYSTEM WAS DESIGNED FOR USE MITH DULY ONE OF THE PROBES, BUT THEY COULD BE INTERSWITCHED TO PROVIDE BACKUP REDWNANCY. IHE BESI NEASURENENTS IN THE MOST FAVORABLE MODES PROVIDED DNE SECOND TIME RESOLUTION; ELECTRON TEMPERATURE BETWEEN 100 AND 10.000 DEG K (10 PERCENT ACCURACT); ION DENSITY BETWEEN 100 AND 10.000 DEG FOR CUBIC CM (10-20 PERCENT ACCURACT); ELECTRON DENSITY BEIGRENTS IN THE MOST FAVORABLE MODES AND AND 10.000 DEG FOR CUBIC CM (10-20 PERCENT ACCURACT); ELECTRON DENSITY BETWEEN SO AND 10E0 FER CUBIC CR; AND ION MASS AT ION DENSITY BETWEEN SO AND 10E0 FER CUBIC CM, EACH PROBE HAD A COLLECTOR ELECTRODE EXTENDING FROM THE CENTRAL AXIS OF A CYLINGRIAL BACAUR BING. THE 2.5-CM LONG GUARD RING WAS AT THE END OF A 25-CM BOOM. AND THE COLLECTOR EXTENDED AND THE ROUE HAD A COLLECTOR ELECTRODE EXTENDING FROM THE CENTRAL AXIS OF A CYLINGRIAL 25-CM BOOM. AND THE COLLECTOR EXTENDED AND THE FOUND IN 'RADIO SCIEMCE.* 0, 4, APRIL 1973.

AE-E, BRINTON-----

INVESTIGATION NAME- ION COMPOSITION AND CONCENTRATION

INVESTIGATIVE PROGRAM CODE 57

INVESTIGATION DISCIPLINE(S) IONOSPHERES PLANETARY ATMOSPHERES ATMOSPHERIC PHYSICS

LAUNCH DATE- 11/20/75 Launch Site- Cape Canaveral, United States Launch Vehicle- Delta WEIGHT- 735. KG

SPACEGRAFT COMMON NAME- AE-E Alternate Names- 5 66, Atmosphere Explorer-e Explorer 55, AE 5

UN THEN HIERMAN BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MEASURE THE KINETIC TEMPERATURE OF THE NEUTRAL ATMOSPHERE BY DETERMINING THE INSTANTANEOUS DENSITY OF NOLECULAR NITROGEN IN A SPHERICAL CHAMBER COUPLED TO THE ATMOSPHERE THROUGH A KNIFE-EDGE ORIFICE. ANALYSIS OF THE HEASURED MOLECULAR NITROGEN DENSITY WAIATION OVER A SPIN CYCLE WITH A KNOULEOGE OF THE SATELLITE'S MOTION AND ORIENTATION LED TO A DETERMINATION OF THE AMBIENT TEMPERATURE, INOEPENDENT OF SCALE MEIGHT. A MEASUREMENT OF THE AMBIENT NITROGEN DENSITY WAS ALSD OBTAINED. AN ALTERNATE MEASUREMENT OF MEUTRAL TEMPERATURE ALSO WAS UNDERTAKEN, USING A BAFFLE INSERTED IN FRONT OF THE ORIFICE TO INTERCEPT A PORTION OF THE GAS PARTICLE STREAM ENTERING THE CHAMBER. THESE CHAMBE DATILITE STREAM SEEN BY HE ORIFICED CHAMBER. THESE CHAMBER ENSITY VARIATIONS WERE INTERPRETED TO YIELD THE MEUTRAL GAS KINETIC TEMPERATURE ALSO. A OUAL-FILAMENT ION SOURCE SAMPLED THE THERALIZED MOLECULAR NITROGEN IN THE SOURCE SAMPLED THE THERALIZE MOLECULAR NITROGEN IN THE CHAMBER AND PRODUCED AN ION BEAM DENSITY PROPORTIONAL TO THE NITROGEM CHAMBER ANDAUDLE ANALYZER, TUNED TO PASS THOSE PARTICLES WHOSE AND ON THE ANDLECLAR NITROGEN IN THE CHAMBER AND PRODUCED AN ION DEAM DENSITY DROPORTIONAL TO THE NITROGEM CHAMBER THET HERMALIZED MOLECULAR NITROGEN IN THE CHAMBER AND PRODUCED AN ION BEAM DENSITY DROPORTIONAL TO THE NITROGEM CHAMBER ANDEN DENSITY FROPORTIONAL TO THE ANTIOGEN BEAM THEN PASSED ON TO AN ELECTRON MULTIPLIER. THE OUTPUT PULSES WERE ARPLIFIED AND CONTE IN A 16-BIT ACCUMULATOR. THE SENSOR WAS VACUUM-SEALED PRIOR TO LAUNCH AND OPENED TO THE ATMOSPHERE AFTER THE SPACECRAFT WAS IN ORBIT. MORE EXPERIMENT DEFINIENT. Y. N. W. SPENCER ET AL, RADID SCIENCE, 8, 4, 287-296, APRIL 1973.

PERSONNEL PI - H.C. 01 - N.H. 01 - H.A. BRINTON H.A.

N55DC 10- 75-1074-10

19

PHARO, 3RD TAYLOR, JR.

NASA-65FC NASA-GSFC NASA-GSFC

-- AE-E, BRACE--

NSSDC 10- 75-1074-01

BRIEF DESCRIPTION THIS EXPERIMENT WAS FLOWN TO MEASURE, THROUGHOUT THE OKBIT, THE INDIVIDUAL CONCENTRATIONS OF ALL THERMAL ION SPECIES IN THE MASS RANGE 1 TO 72 ATOMIC MASS UNITS (U) AND IN THE AMDIENT DENSITY RANGE FROM S IONS PER CC TO 5 MILLION IONS PER CC EACH. THE MASS RANGE IS NORMALLY SCANNED IN 1.6 S, BUT THE SCAN TIME PER RANGE CAN BE INCREASED BY COMMAND. LABORATORY AND IN-FLIGHT DETERMINATION OF SPECTROMETER EFFICIENCY AND MASS DISCRIMINATION PERMITTED DIRECT CONVERSION OF MEASURED ION CURRENTS IO ANDIENT CONCENTRATIONS. CORRELATION OF THESE MEASURED DATA WITH THE RESULTS FROM COMPANION EXPERIMENTS. "ELECTROSTATIC PROBE (75-107A-01)" AND 'RETARDING POTENTIAL ANALYZER (75-107A-04)." PERMITTED INDIVICUAL ION CONCENTRATIONS TO BE DETERMINED WITH HIGH ACCURACY. THE EXPERIMENT'S FOUR PRIMARY MECHANICAL COMPONENTS WERE -- GUARD RING AND IOM-AMALYZER TUBE, COLLECTOR AND PREAMPLIFIER ASSEMBLY, VENT, AND MAIN ELECTRONICS HOUSING. A THREE-STAGE BENNETT TUBE WITH 7- TO S-CYCLE DRIFT SPACES WAS FLOWA, AND HAS BEEN MODIFIED TO PERMIT ION CONCENTRATION MEASUREMENTS TO BE OBTAINED DOWN TO 120 KM ALTITUDE, SPECIFICALLY, A VENT WAS PROVIDED AT THE REAR OF THE SPECTROMETER, AND THE USUAL FLAT-DISK, ION-CURRENT COLLECTOR WAS REPLACED BY A STACK OF MIREMENT MODARDIFIET BALANCE BETWEEN ION-CURRENT SENSITIVITY AND MASS-RESOLUTION IN A BENNETT SPECTROMETER MAY BE ALTERED BY CHANGING APPROPRIATE UOLTAGES. THESE VOLTAGE CHANGES WERE CONTROLLED INDEPENDENTLY BY GROUND COMMAND FOR EACH ONE OF THE THREE MASS RANGESS -- 1 TO 4, 2 TO 18, AND B TO 72. THE INSTRUMENT CONFIGURATION SELECTED FOR A PARTICULAR PASS WILL DEPEND PRIMARILY ON THE DATA REQUIREMENTS OF THE SCIENCE PROBLEM UNDER INVESTION TO HE DATA BENNETT SPECTROMETER MAY BE ALTERED BY CHANGING APPROPRIATE OF THE SPACECRAFT SPIN MODE. MORE COMPLETE EXPERIMENTION SELECTED FOR A PARTICULAR PASS WILL DEPEND PRIMARILY ON THE DATA REQUIREMENTS OF THE SCIENCE PROBLEM UNDER INVESTION TO HE DATA BE ADALEMENTS OF THE SCIENCE PROBLEM UNDER INVESTIONT

- AE-E- CHAMPION-

INVESTIGATION NAME- ATMOSPHERIC DENSITY ACCELEROMETER (MESA)

NSSDC 10- 75-107A-02

PI - K.S.W.CHAMPION 01 - F.A. MARCOS

INVESTIGATION DISCIPLINE(S) Planetary Atmospheres Ionospheres

INVESTIGATIVE PROGRAM CODE ST

PERSONNEL

USAF GEOPHYS LAB USAF GEOPHYS LAB

BRIEF DESCRIPTION

URIEF DESCRIPTION MESA OBTAINED DATA ON THE NEUTRAL DENSITY OF THE ATMOSPHERE IN THE ALTITUDE RANGE OF 120 KM TO 400 KM BY THE MEASURENTS OF SATELLITE DECELERATION DUE TO AERODYNAMIC DRAG. THE INSTRUMENT CONSISTED OF THREE SINGLEAXIS ACCELEROMETERS, MOUNTED MUTUALLY AT RIGHT ANGLES. TWO IN THE SPACECRAFT X-Y PLANE AXIS AND THE OTHER IN THE Z-AXIS. THE INSTRUMENT DETERMINED THE APPLIED ACCELERATION FROM THE ELECTROSTATIC FORCE REQUIRED TO RECENTER A PROOF MASS. THE OUTPUT OF THE DEVICE WAS A DIGITAL PULSE RATE PROPORTIONAL TO THE APPLIED ACCELERATION, THE MEAURENTS ALLOWED DETERMINATION OF THE DENSITY OF THE NEUTRAL ATMOSPHERE, MONITORED THE THRUST OF THE ORBIT-ADJUST PROPULSION SYSTEM, DETERMINED THE SATELLITE MINIMUM ALTITUDE, MEASURED SPACECRAFT ROLL, AND PROVIDED SOME ATTITUDE-SENSING INFORMATION. SPACECRAFT NUTATIONS OF LESS THAN 0.01 DECRES WERE MONITORED. THE INSTRUMENT HAD THREE SENSITIVITY RANGES --- 8.E-3 G IN OAPS MONITOR MODE; 4.E-4 G DETWEEN 120 KM (PLUS OR MINUS 2 PERCENT) AND 280 KM (PLUS OR MINUS 10 PERCENTJ? AND 24.E-5 G BETWEEN 180 KM (PLUS OR MINUS 2 PERCENT) AND 400 KM (PLUS OR MINUS 10 PERCENT). NUMBERS IN AVAINUS 2 PERCENT) AND 400 KM (PLUS OR MINUS 10 PERCENT). NUMBERS IN AVAINESS REPRESENT ERRORS; IN ADDITION, THERE MAY BE A SYSTEMATIC ERROR OF UP TD PLUS OR MINUS 5 PERCENT DUE TO DRAG COEFFICIENT UNCERTAINTY. THE HIGHEST ALLITUDE WAS DETERMINED ASSUMING THE INSTRUMENT COULD SENSE TO 0.2 PERCENT OF FULL SCALE.

---- AE-E, DOERING-----

INVESTIGATION NAME- PHOTOELECTRON SPECTROMETER

NS50C 10- 75-107A-03 INVESTIGATIVE PROGRAM CODE ST

> INVESTIGATION DISCIPLINE(S) IONDSPHERES PLANETARY ATMOSPHERES

PERSONNEL		
PI - J.P. 01 - C.O. 01 - J.C.		JOHNS HOPEINS U Applied physics Unknown

BRIFF DESCRIPTION

BPIFF DESCRIPTION THIS EXPERIMENT, WAS DESIGNED TO PROVIDE INFORMATION ON THE INFEMSITY, ANGULAR DISTRIBUTION, ENERGY SPECTRUM, AND NET FLOUS ALONG FIELD LINES, OF ELECTRONS IN THE THERMOSPHERE WITH ENERGIES METWICH 2 AND SOD EV. THE INSTRUMENT CONSISTED OF TWO IDEWTICAL, OPPOSITELY DIRECTED, HEMISPHEREICAL, ELECTROSTATIC ANALYZERS. EACH SPECTROMETER HAD A RELATIVE EMERGY RESOLUTION OF PLUS OR MINUS 2.5 PERCENT AND A BEGMETRIC FACTOR ON THE ORDER OF 0.001 SQ CM STER, INDEPEMDENT OF ELECTRON EMERGY. THREE SEPARATE ENERGY RANGES COULD BE SENSED - 0 TO 25 EV. 0 TO 100 EV. OR 0 TO 500 EV. MEASUREMENTS FROM THESE INTERVALS COULD BE SEQUENCED IN 5 DIFFERENT WAYS. DATA COULD BE TAKEN FROM. ETHER SENSOR SEPARATELY, OR ALTERNATELY. WITH TIME

RESOLUTION VARYING FROM 0.25 TO 8 S. THERE WERE TWO DEFILECTION VOLTAGE SCAN RATES DEFERMINED BY SPACECRAFT CLOCK. THIS VOLTAGE WAS CHANGED IN 64 STEPS, AND WAS DONE AT 4 OR 16 STEPS PER TELEMETRY FRAME. WITH 16 FRAMES/S, THIS ALLOWED A CHOICE OF EITHER ONE 64-POINT SPECTRUM, OR FOUR 16-POINT SPECTRA IN ONE SECOND. THE LONGEST (8 S) CYCLE OF DATA INVOLVED DESERVATIONS USING INCREASING VOLTAGE STEPS FOR THE LOWEST, RIDDLE, LOWEST, THEN HIGHEST ENERGY RANGES (IN THAT ORDER) FOR 1 S EACH. A REPEAT FOR DECREASING VOLTAGE STEPS COMPLETED THE CYCLE. A MORE DETAILED DESCRIPTION OF THIS EXPERIMENT MAT BE FOUND IN "RADIO SCIENCE," 8, 4, SBT-392, APRIL 1973.

- AE-E, HANSON------

INVESTIGATION NAME- RETARDING POTENTIAL ANALYZER/DRIFT METER

NSSDC 10- 75-1074-04

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PLANETARY ATROSPHERES Ionospheres

PERSONNEL		
PI - W.B.	HANSON	U OF TEXAS, DALLAS
01 - D.R.		U OF TEXAS, DALLAS
01 - S.		U OF TEXAS, DALLAS
0I - C.R.	LIPPENCOTT	U OF TEXAS, DALLAS

01 - S. SAMATANI 01 - S. SAMATANI 01 - C.R. LIPPENCOTT U OF TEXAS, DALLAS DIF TEXAS, DALLAS, DIF DIF TEXAS, DALLAS, DALLAS, DIF DIF TEXAS, DALLAS, DIF DIF TEXAS, DALLAS, DALLAS, DIF DIF TEXAS, DALLAS, DIF DIF DIF TEXAS, DALLAS, DIF DIF DIF TEXAS, DALLAS, DIF DIF DIF TEXAS, DALLAS, DALLAS, DIF DIF DIF TEXAS, DALLAS, DALAS, DALLAS, DALLAS, DALLAS, DALAS, DALLAS, DALLAS, DALLAS, DALLA

---- ÁE-E, HÁYS---INVESTIGATION NAME- VISIBLE AIRGLOW PHOTOMETER (VAE)

NSSDC 10- 75-1074-11

INVESTIGATIVE PROGRAM CODE ST

PERSONNEL		
PI - P.B. HAYS		U OF MICHIGA
QI - G.G. SHEPHERD		YORK U
OI - G.R. CARIGNAN		U OF MICHIGA
DI - J_C_G_WALKER	and the second	ARECIBO OBS

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT PROVIDED DETAILED DATA ON THE RATES OF EXCITATION OF THE ATOMIC AND MOLECULAR CONSTITUENTS OF THE THERMOSPHERE. THE NAVELENGTH RANGE COVERED, EXPRESSED IN ANGSTRONS, WAS NEASURED IN PAIRS -- 7319 AND 6563, 5300 AND DARK, 5577 AND 7519, 2800 AND 5200, 6300 AND 577, CALIB AND 2800, AND 6563 AND 6300. A PHOTOMETER WI USED, WHICH CONTAINED TWO SEPARATE OPTICAL CHANNELS, A NARM FIELD OF VIEW AND A WIDE FIELD OF VIEW. SPECTRAL SELECTION I S ACCOMPLISHED WITH A FILTER WHEEL THAT CONTAINED SIX INTERFER. IE FILTERS AND 4 DARK AND CALIBRATE POSITION. THE TWO CHANNEL! WERE SEPARATED BY 90 DEG. ONE CHANNEL HAD A 3-DEG HALF-ANGL CONE FIELD OF VIEW FOR HIGH SENSITIVITY AND POINTED NORMALLY TOWARD THE LOCAL ZENITH. THE SECOND HAD A FIELD OF VIEW OF 0.75-DEG HALF CONE

LAB

FOR HIGH SPATIAL RESOLUTION POINTING TANGENT TO THE SURFACE OF THE EARTH WHEN THE SATELLITE WAS IN THE ORIENTED MODE. BOTH CHANNELS WERE PROTECTED FROM STRAY LIGHT CONTAMINATION DURING THE DAYTHEE WITH MULTISTAGE BAFFLE SYSTEMS. FILTERS WERE OPERATED IN SEVERAL MODES. THE TWO SEPARATE OPTICAL CHANNELS WERE MONITORED AT TIME INTERVALS CONSISTENT WITH THEIR ANGULAR RESOLUTION IN THE SPINNING MODE. HORE EXPERIMENT OF TAILS CAN BE FOUND IN 'THE VISABLE-AIRGLOW EXPERIMENT OH ATMOSPHERE EXPLORER,' P.B. HAYS, ET AL, RADIO SCIENCE, 8, 4, 369, 1973.

----- AE-E, HEATH-------

INVESTIGATION NAME- EXTREME SOLAR UV MONITOR (ESUN)

INVESTIGATIVE PROGRAM NSSDC 10- 75-1074-05 CODE ST INVESTIGATION DISCIPLINE(S) Solar Physics

PERSONNEL P1 - D_F_ HEATH DI - J_F, DSANTOWSKI NASA-GSFC NASA-GSFC

DRIEF DESCRIPTION ESUM MADE ABSOLUTE BROADBAND SPECTRO-RADIOMETRIC MEASUREMENTS OF THE SOLAR EUV FLUX FROM 200 A THROUGH LYMAN-ALPHA AT 1216 A AND MADE PRECISE MEASUREMENTS OF THE TEMPORAL VARIABILITY - APPROXIMATELY ONE PERCENT PER SOLAR ROTATION. THE INSTRUMENT CONSISTED OF TWO IDENTICAL WINDOWLESS EUV PHOTODODOS WITH ALUMINUM OXIDE CATHODES AND A FILTER WHEEL CONTAINING THO SET'S OF UNBACKED METALLIC FILTERS (ALUMINUM, TIN, INDIUM) AND AN OPEN POSITION. A VISIBLE LIGHT DIODE MEASURED THE PINHOLE TRANSMITIANCE OF THE FILTERS TO DETERMINE THE WHITE LIGHT BACKGROUND. THE TILI ANGLE OF THE INSTRUMENT RELATIVE TO THE 12 SPACECRAFT AXIS WAS OPTIMIZED FOR THE MAXINUM VIEWING TIME OF THE SUN IN BOTH SPINNING AND DESPUN SPACECRAFT MODES. THE INSTRUMENT FIELD OF VIEW WAS 60 DEG. THE NOMINAL BANDWIDTHS (FOR 50 PERCENT OF SIGNAL) WERE 270 TO S5D A, 570 TO 584 A, 800 TO 935 A, AND 1215 A.

INVESTIGATION NAME- BACKSCATTER U/ SPECTROMETER (BUV)

INVESTIGATIVE PROGRAM NSSDC 10- 75-1074-16

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES

PERSONNEL PI - D.F. HEATH

NASA-GSFC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE PACKSCATTER ULTRAVIOLET INSTRUMENT (BUV) MONITORED THE SPATIAL DISTRIBUTION OF ATMOSPHERIC OZONE BY NEASURING THE INTENSITY OF THE UV RADIATION BACKSCATTERED FROM THE FARTH'S ATMOSPHERE. TO OBTAIN THIS OZONE DISTRIBUTION, THE BUV SUBSYSTEM MEASURED DIRECT SOLAR RADIATION AND BACKSCATTERED UV RADIATION FROM THE DAYTIME SUN-ILLUMINATED ATMOSPHERE. THE EXPERIMENT CONSISTED OF A SPECTROMETER (MONOCHROMATOR) AND A PHOTOMETER. THE MONOCHROMATOR NEASURED THE INTENSITY OF UV RADIATION BACKSCATTER AND REFLECTED ADIATION FROM THE EARTH'S ATTOSPHERE IN 12 WAYELENGTHS (2555 A TO 339% A) IN WHICH DZONE ATTENNATION OCCURS. THE PHOTOMETER MEASURED THE REFLECTED UV RADIATION IN A SINGLE WAYELENGTH SPAN IN WHICH ATTENUATION BY OZONE DOES NOT OCCUR. THE BUV HAD FOUR OPERATING MODES.

~~ AE-E, REDIN---

INVESTIGATION NAME- NEUTRAL ATMOSPHERE COMPOSITION (NACE)

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES Ignospheres Atmospheric Physics

PERSONNEL

PI - A.E.	HEDIN	NASA-GSFC
01 - C.A.	REDER	WASA-GSFC
01 - G.R.	CARIGNAN	U OF MICHIGAN

NSSOC 10- 75-107A-08

91 - G.R. CARIGNAN U UT RICHIGAN. BRIEF DESCRIPTION THIS EXPERIMENT MEASURED IN SITU THE SPATIAL DISTRIBUTION AND TEMPORAL CHANGES OF THE CONCENTRATIONS OF THE NEUTRAL ATMOSPHERIC SPECIES. IN ADDITION, NEW INSIGHT INTG IN SITU MEASURENENT TECHNIQUES WERE OBTAINED FROM COMPARISONS OF THESE MEASURENENT TECHNIQUES WERE OBTAINED FROM OTHER ONBOARD EXPERIMENTS. NAMELY -- OPEN SOURCE SPECTROMETER (75-107A-07), SOLAR EUV SPECTROPHOTOMETER (75-107A-06), AND DENSITY-ACCELEROMETER (75-107A-06), THE MASS-SPECTROMETER (75-107A-06), SOLAR EUV SPECTROPHOTOMETER (75-107A-06), AND DENSITY-ACCELEROMETER (75-107A-02), THE MASS-SPECTROMETER (MANDER AND ION SOURCE, A HYPERBOLIC ROD BUADRUPOLE AMALYZER, AND AN OFF-ANTS ELECTRON MULTIPLIER, WHEN OPERATING IN THE 'NORMAL' FORMAT, THE ANALYZER MEASURED ALL MASSES IN THE RANGE 1 TO 44, WITH EMPHASIS ON HYDROGEN, HELIUM, DXYGEN, NITROGEN, AND ANGTH. ANDTHER FORMAT WAS OPTIMIZED FOR MINGE CONSTITUENT STUDIES DF LAS SPECIES IN THE MEASURED RANGE. SPATIAL RESOLUTION WAS DETERMINED PRIMARILY BY THE MODE OF SPACECRAFT

OPERATION. IN ORBIT, THE PRESEALED SPECTROMEYER WAS OPENED, AND THE ATMOSPHERIC CONSTITUENTS PASSED THROUGH A KNIFE-EDGED ORIFICE INTO THE THERMALIZATION CHAMBER AND ION SOURCE, SELECTED IONS LEFT THE QUADRUPOLE ANALYZER THROUGH A WEAK FOCUSING LENS AND WERE ACCELERATED INTO AN ELECTRON MULITPLIER, WHERE THEY WERE TURNED 90 DEG TO STRIKE THE FIRST DYNODE. THE SPECTROMETER HAS A RESOLUTION OF BEITER THAN 1 U FOR ALL MASSES BETWEEN 1 AND 44, AND THE REASUREMENT SYSTEM HAS A DYNAMIC RAMGE OF APPROXIMATELY 1.E8. THERE IS PROVISION FOR THE INSTRUMENT ORIFICE TO BE COVERED DURING SPACECRAFT THENTS FOR THE STRUMENT ORIFICE TO BE COVERED DURING SPACECRAFT THENTS FOR THE EXPLOREM -C. -D., -E.' D. T. PELZ ET AL, RADIO SCIENCE, B, 4, 772, 1973. 272, 1973.

-- AE-E, HINTEREGGER------

INVESTIGATION NAME- SOLAR EUV SPECTROPHOTOMETER (EUVS)

NSSDC 10- 75-107A-06 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) Atmospheric Physics Solar Physics

PERSONNEL		
	HINTEREGGER	USAF GEOPHYS LAB
01 - D.E.		USAF GEOPHYS LAB
01 - L.A.		USAF GEOPHYS LAB
01 - E.		USAF GEOPHYS LAB
01 - C.W.	CHAGNON	USAF GEOPHYS LAB

DI - C.W. CHAGNON DI - C.W. CHAGNON BRIEF DESCRIPTION EUVS WAS USED TO OBSERVE THE VARIATIONS IN THE SOLAR EUV FLUX IN THE WAVELENGTH RANGE FROM 140 TO 1850 A AND THE ATMOSPHERIC ATTENUATION AT VARIOUS FIXED WAVELENGTHS. THIS PROVIDED QUANTITATIVE ATHOSPHERIC STRUCTURE AND COMPOSITION DATA. THE INSTRUMENT CONSISTED OF 24 GRAZING-INCIDENCE GRATING MONDCHROMATORS, USING PARALLEL-SLIT SYSTEMS FOR ENTRANCE COLLIMATION AND PHOTOELECTRIC DETECTORS AT THE EXIT SLITS. TWELVE OF THESE MONOCHROMATORS HAD WAVELENGTHS WHICH COULD ALSO AUTOMATICALLY STEP SCAN THROUGH THESE POSITIONS. THE OTHER 12 MONOCHROMATORS OPERATED AT FIXED WAVELENGTHS WITH FIELDS OF VIEW SMALLER THAN THE FULL SOLAR DISK TO ATD IN THE ATMOSPHERIC ABSORPTION ANALYSIS. THE SPECTRAL RESOLUTION VARIED FROM 2 TO 54 A DEPENDING UPON THE PARTICULAR INSTRUMENT. THE FIELD OF VIEW VARIED FROM 6D X 6D ARC MIN DOWN TO 3 X 6 ARC MIN. ALL 24 MONOCHROMATOR-ENTRANCE AXES WERE CO-ALIGNED PARALLEL. A SOLAR POINT SYSTEM COULD POINT TO 256 DIFFERENT POSITIONS, EXECUTE A 16-STEP ONE-DIMENSIONAL SCAN OR A FULL 256-STEP RASTER. THE TIME RESOLUTION WARIED FROM 0.5 S FOR OBSERVING 12 FIXED WAVELENGTHS UP TO 256 S FOR PROGRAMMING THE ELUS STIENCE. # A 349-360, APRIL 1973.

- AE-E, NIER+

INVESTIGATION NAME- OPEN-SOURCE NEUTRAL MASS SPECTROMETER (055)

NSSDC 10- 75-1074-07

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) Idnospheres Planetary Atmospheres Atmospheric Physics

PERSONNEL

PI	-	A.0.0	.NIER	U	0F	MINNESOTA
01	-	W.E.	POTTER	U	QF	MINNESOTA
01	-	K.,	MAUSRSBERGER	U	ÜF	MINNESOTA

01 - W.E. PANIER U OF MINNESOTA 01 - K. MAUMERSBERGER U OF MINNESOTA BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT WAS TO CONTRIBUTE TO A STUDY OF THE CHEMICAL, DYNAMIC, AND ENERGETIC PROCESSES THAT CONTROL THE STRUCTURE OF THE TREMOSPHERE BY PROVIDING DIRECT, IN SITU MEASUREMENTS OF BOTH MAJOR AND MINOR NUUTRAL ATMOSPHERIC CONSTITUENTS HAVING MASSES IN THE RANGE FROM 1 TO 48 ATOMIC MASS UNITS (U). A DOUBLE-FOCUSING, MATTACH-HER JG MAGNETIC DEFLECTION MASS SPECTROMETER WITH AN IMPACT ION SOURCE UAS FLOWN. TWO ION COLLECTORS MERE INCLUDED TO MEASURE IONS DIFFERING IN MASS BY A FACTOR OF S. I.E., THE TWO MASS RANGES COVERED WERE 1 TO B U AND 7 TO 48 U. IN THE ION SOURCE THE NEUTRAL SPÈCIES WAS IONIZED BY MEANS OF ELECTRON IMPACT. THE ELECTRON ENERGIES WERE SELECTABLE, 75 EV FOR THE HIGH EY MODE AND 25 EV FOR THE LON EV MODE. AT ALTITUDES GREATER THAN 3AO KR. ION CURRENTS WERE MEASURED WITH AN ELECTRON MUTPLIER MUITAL SPÈCIES WAS STEPPING TO A DIFFERENT MASS MUMBER. INTIL CONDITION PEAK STEPPING WAS ENPLOYED, WITH READINGS ON THE PRINCIPAL PEAKS IN THE MASS SPECTRA COULD BE SWEPT, IN THE CORMON MODE OF OPERATION PEAK STEPPING WAS ENPLOYED, WITH READINGS ON THE PRINCIPAL PEAKS IN THE MASS SPECTRUM BEING AN ELECTRONETER. IN ADDITION TO THE LON S'S COUNTS WERE ALCOMULATED FOR 1/20 S DEFORE AUTOMATICALLY SWITCHING TO A DIFFERENT MASS NUMBER. MILLE CORDICTE MASS STEPPING WAS ENPLOYED, WITH READINGS ON THE PRINCIPAL PEAKS IN THE MASS SPECTRUM BEING AN THE COMMON MODE OF OPERATION PEAK STEPPING WAS ENPLOYED, WITH READINGS ON THE PRINCIPAL PEAKS IN THE MASS PECTRUM BEING AN ELECTROBUENTLY. DATA BELOM 330 KM WERE MEASURED USING AN ELECTROBUENTLY. DATA BELOM 330 KM WERE MEASURED USING AN ELECTROBUENTLY. DATA BELOM 330 KM WERE MEASURED USING AN ELECTROBUENTLY. DATA BELOM 330 KM WERE MEASURED USING AN ELECTROBUENTLY. DATA BELOM 330 KM WERE MEASURED USING AN ELECTROBUENTLY. DATA BELOM AS NO ELECTRIC FIELD TO DAWN IONS OUT OF THE ELECTROM BEAM WHEN THEY WERE FORMED. ANDEL AND ON AUT OF THE

THE IONS IN THE BEAM. THOSE AMBIENT PARTICLES THAT DID NOT STRIKE THE ION SOURCE RETAINED THEIR INCOMING EMERGY OF SEVERAL EV AFTER IOMIZATION AND ESCAPE INTO THE ACCELERATING REGION OF THE ANALTZER. THE ELECTRON ACCELERATING POTENTIAL IS 75 EV IN NORMAL MODE OPERATION AND IS 25 EV IN THE FLT-THROUGH MODE. IN ANOTHER OPERATING MODE, THE INSTRUMENT SWITCHED AUTOMATICALLY TO A SEQUENCE OF MASTES OF PARTICULAR INTEREST SUCH AS, E.G., BETWEEN MASSES 16 AND 32 OR BETWEEN MASSES 28 AND 32, SWITCHING TOK PLACE AT 1/16-S INTERVALS, AND IONS WERE COUNTED ONLY DURING THE LAST D.OS S OF THE INTERVAL. MORE EXPERIMENT DETAILS CAN BE FOUND IN 'THE OPEN SOURCE MEUTRAL MASS SPECTROMETER ON AE-C, -D, AND -E,' A. O. C. NIER, ET AL, RADIO SCIENCE, 8, 4, 271, 1973.

--- AE-E, R1CE-----INVESTIGATION NAME- CAPACITANCE MANOMETER

NSSOL 10- 75-1074-17 INVESTIGATIVE PROGRAM

CODE ST

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES

FERSONNEL PI - C.J. RICE

AEROSPACE CORP

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE CAPACITANCE NANOMETER FLOWN ON AE-E WAS PRIMARILY AM ENGINEERING EXPERIMENT TO PROVIDE DATA ON SPACECRAFT OPERATION. HOWEVER, DATA FROM THIS EXPERIMENT WERE ALSO CORRELATED WITH ACCELEBOMETER AND ION GUAGE DATA IN EVALUATING SYTELLITE DARG. THE MANOMETER, ALSO REFERED TO AS PRESSURE SINSOR B (PSD), PROVIDED A DIRECT MEASURE OF ATMOSPHENIC PRESSURE IN THE REGION BELDW 200 KM. THE ACCURACY OF THE PSB GUAGE VARIED FROM ABOUT 10 PERCENT AT 120 KM TO ABOUT 40 PERCENT AT 180 KM. THE PSB CONSISTED OF TWO SPHERICAL, THERMALLY CONTROLLED CHAMBERS, SEPARATED BY A THIN MEMBRANE STRETCHED FLAT AND UNDER RADIAL TENSION, ANY DEFLECIION OF THE DIAPHRAGM CLOSED BY A PRESSURE DIFFEMENTIAL BETWEEN THE THE JIAPHRAGM AND AN ADJACENT ELECTODE WHICH BIASED AN AC BRIDGE CIRCUIT. AIR WAS ALLOWED INTO OME OF THE SPACECRAFT SPIN AXIS. THUS THE WAKE-RAM PRESSURE DIFFERENTIAL WAS SAMPLED TWICE EACH SPACECRAFT REVOLUTION.

----- AE-E, RICE------

INVESTIGATION NAME- COLD CATHODE ION GAUGE

NSSDC 10- 75-1074-13 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES

PERSONNEL PI - C.J. RICE

AEROSPACE CORP

BRIEF DESCRIPTION THE COLD CATHODE-ION GAUGE WAS PRIMARIAU AN ENGINEERING EXPERIMENT TO PROVIDE DATA ON SPACECRAFT OPERATION. HOWEVER, DATA FROM THIS EXPERIMENT WAS CORRELATED WITH ACCELEROMETER AND CAPACITANCE. THE ION GUAGE, ALSO REFERRED TO AS PRESSURE SENSOR A (PSA), MEASURED ATMOSPHERIC PRESSURE IN THE REGION BETWEEN 120 TO 370 KM ABOVE THE EARTH'S SURFACE FOR VALUES OF ATMOSPHERIC PRESSURE BETWEEN 1.3E-3 TO 1.3E-7 MB. THE ESTIMATED ACCUMACY OF THE PSA WAS PLUS OR MINUS 20 PERCENT. THE CYLINDRICALLY-SHAPED SENSOR PACKAGE CONSISTED OF A WEDGE-SHAPED ORIFICE, A CATHODE NEAR GROUND POTENTIAL, AN ANDE OPERATING AT ABOUT 1300 VDC, AND A PERMANENT MAGNETIC FIELD EMISSION AND WAS SELF-SUSTAINING AT A PRESSURE ABOVE 1.3E-7 MG. THE ION CURRENT WAS COLLECTED AT THE CATHODE. THE SENSOR WAS MOUNTED ON THE SPACECRAFT, WITHE GRIFTE PERPENDICULAR TO THE SPACECRAFT SPIN AXIS, WHICH WAS NORMAL TO THE SENSITA ALTERNATED SALECERAFT, WAS IN A SPINNING MODE, SPINNING AND DESPUN. WHEN THE SPACECRAFT WAS IN A SPINNING MODE, HE PSA ALTERNATELY SAMPLED THE DESPUN MODE, THE PSESSURE. WHEN TH THE SPINED ON THE SPACECRAFT WAS IN A SPINNING MODE, THE PSA ALTERNATELY SAMPLED THE RAM AND WAKE PRESSURE. WHEN TH SPACECRAFT WAS IN THE DESPUN MODE, THE PSESSING AND WAS NORMED ON THE SPACECRAFT WAS IN A SPINNING MODE, THE PSA ALTERNATELY SAMPLED THE RAM AND WAKE PRESSURE. WHEN TH SPACECRAFT WAS IN THE DESPUN MODE, THE PSA FACED 30 DEG FROM THE DIRLETION OF MOTION, DATA FROM THIS EXPERIMENT WAS NOT THE DIRLET TO DESERVED IN REAL TIME. BRIEF DESCRIPTION

-- AE-E, SPENCER------

INVESTIGATION NAME- NEUTRAL ATMOSPHERE TEMPERATURE (NATE)

INVESTIGATIVE PROGRAM Code St

INVESTIGATION DISCIPLINE(5) Planetary atmospheres Atmospheric physics

NASA-GSFC U OF MICHIGAN NASA-GSFC

PERSONNEL PI - N.W. SPENCER DI - G.R. CARIGNAN DI - H.B. NIEMANN

N550C ID- 75-107A-09

GRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MEASURE THE KINETIC TEMPERATURE OF THE NEUTRAL AIMOSPHERE BY DETERNINING THE INSTANTAMEOUS DENSITY OF MOLECULAR NITROGEN IN A SPHERICAL IMMOER COUPLED TO THE ATMOSPHERE THPOUGH A KNIFFE-EDGED ORIFICE. ANALYSIS OF THE MEASURED MOLECULAR NITROGEN DENSITY VARIATION OVER A SPIN CYCLE WITH A KNOWLEDGE OF THE SATELLITE'S MOTION AND ORIENTATION LED TO A DETERNIATION OF THE AMBICHT TEMPERATURE, INDEPENDENT OF SCALE HEIGHT. A MEASURENENT OF THE MBSICHT NITROGEN DENSITY WAS ALSO OBIAINED. AN ALTERIATE MEASUREMENT OF NEUTRAL TEMPERATURE WAS ALSO UNDERTAKEN, USING A BAFFLE INSERTED IM FRONT OF THE ORIFICE TO INTERCEPT A PORION OF THE GAS PARTICLE STREAM ENTERING THE CHAMBER. WHEN THE SATELLITE WAS IN THE DESPUN MODE, THE BAFFLE WAS MADF TO OSCILLATE IN A STEPHISE FASHION IN ORDER TO INTERRUPT THE PARTICLE STREAM SEEN BY THE ORIFICED CHAMBER. THESE CHAMBER NON BEAM DENSITY PROPORTIONAL TO THE NITROGEN GEAM WAS KINETIC TEMPERATURE ALSO, A DUAL-FILAMENT ION SOURCE SAMPLED THE THERMALIZED MOLECULAR NITROGEN IN THE CHAMBER AND PRODUCED. AM ION BEAM DENSITY PROPORTIONAL TO THE NITROGEN CHAMBER DENSITY. FROM THE SOURCE, THIS IONIZED NITROGEN CHAMBER DENSITY. FROM THE SOURCE, THIS INTROGEN MEAM WAS DIRECTED INTO A QUADUPLE ANALYZEN, TUNED TO PASS THOSE PARTICLES MHOSE MASS-TO-CHARGE RATIO (M/E) IS Z8, AND ON TO AND COUNTED. THE SENSOR WAS VACUUM-SEALED PRIOT OLANCH AND COUNTED. THE SENSOR WAS VACUUM-SEALED PRIOT TO LANCH AND OPENED TO THE ATNOSPHERE AFTENE THE SPRECERAFT WAS IN ORBIT. MORE EXPERIMENT DETAILS CAN BE FOUND IN, 'THE NEUTRAL-ATMOSPHERE AFCHTHE SPACECRAFT WAS IN ORBIT. MORE EXPERIMENT DETAILS CAN BE FOUND IN, 'THE NUTRAL-ATHOSPHERE TEMPERATURE INSTRUMENT,'N. W. SPENCER, ET AL, RRADIS SLENCE, B, 4, 287-290. 1973.

SPACECRAFY COMMON NAME- AEROS 2 Alternate Names- Aeros-B

NSSDC 10- 74-055A

LAUNCH DATE- 07/16/74 WEIGHT- 125, KG LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- SCOUT

SPONSORING COUNTRY/AGENCY FED REP OF GERMANY G₽¥ NASA-OSS UNITED STATES

INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCEMTRIC Orbit Period- 95.5 Min Periapsis- 217, KM PERSONNEL MG - J.R. HOLTZ SC - E.R. SCHMERLI PM - C.L. WAGNER,

KIEUNE LAENMERZAHL BAUER

	NASA HEADQUARTERS	
ING	NASA HEADQUARTERS	
JR.	NASA-GSFC	

GES FUR WELTRAUMFORSCH MPI-NUCLEAR PHYS NASA-GSFC

EPOCH DATE- 07/17/74 INCLINATION- 97.4 DEG APOAPSIS- 868. KM

PS - S.J.

PP - N. PS - P.

BRIEF DESCRIPTION THE AEROS 2 SATELLITE HAD A CYLINDRICAL SHAPE, A DIAMETER OF 0.914 %, AND A HEIGHT OF 0.710 M. IT WAS LAUNCHED INTO AN ELLIPTICAL, POLAR, NEARLY SUN-SYNCHRONOUS EARTH ORBIT. THE SPACECRAFT WAS SPIN-STABILIZED AT 10 RPM AND DRIENTED WITH THE SPIN AXIS TOWARD THE SUN, THE PURPOSE OF THE NISSION WAS TO STUDY THE STATE AND BENAVIOR OF THE UPPER ATMOSPHERE AND IONGSPHERIC F REGION, ESPECIALLY WITH REGARD TO THE INFLUENCE OF THE SOLAR ULTRAVIOLET RADIATION. FIVE EXPERIMENTS PROVIDED DATA WHICH INCLUDED THE TEMPERATURE AND DENSITY OF ELECTRONS, IONS, AND NEUTRAL PARTICLES, THE COMPOSITION OF IONS AND MEUTRAL PARTICLES, AND SOLAR ULTRAVIGLET FUX.

AFROS 2. KRANKQUSKY----

INVESTIGATION NAME~ MASS SPECTROMETER (MS)

INVESTIGATIVE PROGRAM CODE EL/CO-OP N550C 10- 74-055A-01

INVESTIGATION DISCIPLINE(S) ATMOSPHERIC PHYSICS IDNOSPHERES

PERSONNEL

PI. - D.K.H.KRANKOWSKY DI - P. LAEMMERZAHL

MPI-NUCLEAR PHYS MPI-NUCLEAR PHYS

BRIEF DESCRIPTION PROVIDED MEASUREMENTS OF THE NEUTRAL AND IONIZED CONSTITUENTS IN THE UPPER ATMOSPHERE, THIS A QUARUPOLE MASS SPECTROMETER. THE MAJOR SENSOR COMPONENTS WERE THE STAINLESS STEEL ION SOURCE, QUADRUPOLE ANALTZER, AND THE ION DETECTION SYSTEM. THE MASS RANGE FROM TO 64 U WAS THE SAME FOR BOTH THE NEUTRAL AND ION MEASUREMENT MODE, AND WAS COVERED IN 610 MS. IN THE STANDARD FORMAT FOR COLLECTING DATA, NEUTRAL MEASUREMENTS WERE MADE FOR ONE SPIN PERIOD FOLLOWED BY ION MEASUREMENTS DURING THE NEXT SPIN PERIOD. IN THE NEUTRAL MODE OF OPERATION, THE GAS PARTICLES WERE IONIZED BY A 75-EV, 100-MICADOAMP ELECTRON PEAM ENTITED FROM EITHER OF TWO FILMMENTS. THE POSITIVE SOURCE, WHEN OPERATING IN THE ION MODE, THE SOURCE POTENTIAL PREVENTED POSITIVE IONS FROM ENTERING THE ION SOURCE, WHEN OPERATING IN THE ION MODE, THE SOURCE POTENTIAL PREVENTED THE ION SOURCE THE ATMOSPHERIC IONS. LEAVING THE ANALYZER, THE ION CURRENT ENTERED A 16-STAGE, COPPER-BERTLLIUM ELECTRON MULTIPLIER. THE BRIEF DESCRIPTION

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ELECTRON MULTIPLIER OUTPUT CURRENT WAS RECORDED BY A LOG ELECTROMETER WITH A RANGE FROM 5.E-12 TO 5.E-6 AMP. APPROXIMATELY ONE-HALF OF THE ION BEAM TO THE MULTIPLIER WAS INTERMUPTED BY A ION COLLECTOR GRID AND RECORDED BY A LINEAR ELECTROMETER. THE FULL RANGE SENSITIVITY OF THIS ELECTROMETER CHANGED PERIODICALLY FROM 1.E-10 TO 1.E-11 AMP. NEGLECTING THE RAM CONTRIBUTION, THE BASIC SENSITIVITY OF THE INSTRUMENT WAS 0.23 AMP/TORR. IN THE ION MODE FOR SMALL ANGLES OF ATTACK, THE SENSITIVITY WAS 1.E-18 AMP/IONS M TO THE MINUS 3. OVERALL SENSITIVITY WAS 1.E-18 AMP/IONS M TO THE MINUS 3. OVERALL SENSITIVITY WAS 1.E-18 BY COMMAND. MORE EXPERIMENT OF TALS CAN BE FOUND IN THE PAPER BY D.K.H. KRANKOWSKY, ET AL, JOURNAL OF GEOPHYSICS, 40, 5, 601, 1974.

-- AEROS Z, NESKE-----

INVESTIGATION NAME- ELECTRON CONCENTRATION IN THE IONOSPHERE

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) IONOSPHERES

PERSONNEL P1 - E. 01 - R. NESKE 6151

INST FUR PHYS WELTRAUM INST FUR PHYS WELTRAUM

N55DC 10- 74-055A-03

BRIEF DESCRIPTION THE IMPEDANCE PROBE AND VEHICLE BODY COMPRISED TWO PLATES OF A CONDENSER. IMPEDANCE CHANGES DUE TO THE CANAGE IN DIELECTRIC (PLASMA) CHARACTERISTICS OF THE CONDENSER WERE OBSERVED BY MEASURING RESONANCE FREQUENCIES, THE ELECTRON DENSITY WAS COMPUTED FROM THE OBSERVED RESONANCE FREQUENCY. FREQUENCIES RANGED FROM D.6 TO 10 MHZ, WHICH CORRESPONDED TO ELECTRON DENSITIES FROM S.ES TO 1.66 ELECTRONS/CM CUBED.

INVESTIGATION NAME- ATMOSPHERIC DRAG ANALYSIS

INVESTIGATIVE PROGRAM CODE ST/CO-OP NSSDC 10- 74-055A-06

> INVESTIGATION DISCIPLINE(5) ATMOSPHERIC PHYSICS

PERSONNEL PI - M. 01 - C. ROEMER WULF-MATHIES 1: OF BONN U OF BONN

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT PROVIDED INDIRECT NEASUREMENTS OF UPPER ATMOSPHERIC DENSITY NEAR SATELLITE PERIGEE. THE DENSITY VALUES WERE DERIVED FROM SEQUENTIAL OBSERVATIONS OF THE SATELLITE ST POSITION. THE SATELLITE TRACKING VIELDED SYSTEMATIC CHANGES IN DENSITY AS A FUNCTION OF ALTITUDE, LATITUDE, AND TIME. THE DATA OBTAINED WAS CORPELATED WITH DENSITY VALUES SIMULTAMEOUSLY DERIVED FROM DIRECT MEASUREMENTS USING AN ONBOARD NEUTRAL DENSITY GAUGE.

--- AEROS 2, SCHMIDTKE-----

INVESTIGATION NAME- SOLAR EUV RADIATION

INVESTIGATIVE PROGRAM CODE ST/CO-OP NSSDC 10- 74-055A-04

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL

NSSDC 10- 74-0554-05

INST FUR PHYS WELTRAUM Inst fur phys weltraum SCHMIDTKE PI - G. 01 - W. SCHWEIZER

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF A GRATING SPECTROMETER, A Solar Collimator, and a photomultiplier. It operated in two Channels, 150 to \$10 a and 300 to 1070 a, and measured the flux ANI Spectral Distribution of the sclar EUV radiation and its TEMPORAL AND SPATIAL VARIATIONS.

- AEROS 2, SPENCER-

INVESTIGATION NAME- NEUTRAL ATMOSPHERE TEMPERATURE

INVESTIGATAVE PROGRAM Code St/Lo-op

INVESTIGATION DISCIPLINE(5) ATMOSPHERIC PHYSICS

PERSONNEL						
PT - N.W.	SPENCER	÷ .		÷.	 NASA-GSFC	
01 - D.T.	PELZ		11.1		NASA-GSFC	
01 - G.P.	NEWTON				NASA-GSFC	
01 - G.R.	CARIGNAN				 U OF MICHIGAN	
01 - H.B.	HIERANN				NASA-GSFC	

BRIEF DESCRIPTION THIS EMPERIMENT WAS FLOWN TO PROVIDE IN SITU MEASUREMENTS OF THE KINETIC TEMPERATURE OF NOLECULAR MITROGEN IN THE THERMOSPHERE, THE TOTAL GAS DENSITY, AND THE MITROGEN IN THE DENSITY. THE SENSOR, MOUNTED AT THE SPALSCRAFT PERIPHERT, WAS A GUADUPOLE MASS SPECTROMETER WHOSE ION SOURCE WAS COUPLED THROUGH A HIGH COMDUCTANCE PATH TO A SPHERICAL STAINLESS STEEL ANTECHAMBER, WHICH WAS OPEN TO THE ATAOSPHERE THROUGH A MITROGEN ENLICH WAS OPEN TO THE ATAOSPHERE THROUGH A MITROGEN ENSITY OF NEUTRAL MOLECULAR NITROGEN IN THE SPHERICAL ANTECHAMBER, ANALYSIS OF THE MEASUREMENT SYSTEM WAS DESIGNED TO PROVIDE A DIGITAL OUTPUT THAT WAS PROPORTIONAL TO THE INSTANTAMEORS DENSITY OF NEUTRAL MOLECULAR NITROGEN IN THE SPHERICAL ANTECHAMBER, ANALYSIS OF THE MEASURED NOLECULAR NITROGEN DENSITY WARIATION OVER A SPIN CYCLE/ WITH A KNOWLEDGE OF THE SATELLITE MOTION AND ORIENTATION, LED TO A DETERMINATION OF AMBIENT TEMPERATURE INDEPENDENT OF SCALE MEIGHT. THE VOLTAGES WERE PERIODICALLY CHANGED TO PERMIT THE MEASUREMENT OF THE CONCENTRATIONS OF THE OTHER MEUTRAL GAS SPECIES, SO THAT INTE CONCENTRATIONS OF THE OTHER MEUTRAL GAS SPECIES, SO THAT INTE STEM INCLUDED A PULSE COUNTER, DATA PROCESSOR, POWER SUPPLIES, AND LOGIC. THE INSTANTAMEOUS VALUE OF THE DENSITY WAS SAMPLED 44 TIMES PER SPIN PERIOD, WITH INCREASED THE REOLUTION IN THE REGION WHERE THE ORIFICE PLANE MADE A 500 DEG ANGLE WITH THE VELOCITY VECTOR. FOR A TEMPERATURE UNCERTAINTY OF S PERCENT AND A DENSITY UNCERTAINTY OF 2.5 PERCENT, THE UPPER ALLITUDE LIMITS WERE 270 AND 380 KM, DEPENDING ON THE EXOSPHERIC TEMPERATURE. AT THE PERIGES ANGLE WITH THE VELOCITY VECTOR. FOR A TEMPERATURE EXOSPHERIC TEMPERATURES UP TO APPROXIMATELY 1000 K. MORE DETAILS ARE GUVIN IN THE MEDAPHER BY N.W. SPENCER, ET AL., JOURNAL OF GEOPHYSICS, 40, 5, 613, 1974.

- AEROS 2, SPENNER-----

INVESTIGATION NAME- ENERGY DISTRIBUTION OF IONS AND ELECTRONS

NSSDC 10- 74-055A-02

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) IGNOSPHERES

INST FUR PHYS WELTRAUM INST FUR PHYS WELTRAUM

EPOCH DATE- 02/28/71 INCLINATION-

APOAPS15

79.1 DEG

2922. K'I

PERSONNEL SPENNER PI - K. 01 - A. DUMBS

BRIEF DESCRIPTION BRIEF DESCRIPTION A RETARDING POTENTIAL ANALYZER MEASURED THE ENERGY DISTRIBUTION OF ELECTRONS AND IONS. THE CORRESPONDING TEMPERATURES WERE DERIVED FROM THESE DISTRIBUTIONS. THE EXPERIMENT OPERATED IN AN ELECTRON MODE AND IN AN ION MODE. THE INSTRUMENT WAS ESSENTIALLY A COLLECTOR, SHIELDED BY PARALLEL PLANE GRIDS. BY SWEEPING THE RETARDING VOLTAGE O' THE GRID, THE ENERGY SFECTRA OF THE IONOSPHEPIC CHARGED PARTICLES WAS OBTAINED. THE PARTICLES ONLY PASSED THROUGH THE GRID AND REACHED THE COLLECTOR IF THEIR KINETIC ENERGY EXCLEDED THE RETARDING POTENTIAL.

SPACECHAFT COMMON NAME- ALOUETTE 2 Alternate Names- Alouette-0, 5 278 ISIS-x, 01604

NSSDC 10- 65-0984

LAUNCH DATE- 11/29/65 Launch Site- Vandenberg AFB, United States Launch Vehicle- Thor WEIGHT- 145. KG

SPONSORING COUNTRY/AGENCY CANADA UNITED STATES NASA-055

NASA-055

ORBIT PARAMETERS Orbit type- Geocentric Orbit Period- 120.7 Min

PERIAPSIS	•	508.	KM	
PERSONNEL				

MG - F.S.	GALTANO	NASA HEADVUARTERS
MG - J.S.	JOHNSON	COMMUN RESVANCH CENTRE
SC - E.R.	SCHMERLING	NASA HEADQUARTERS
PH = E.D.	NELSON	NASA-GSFC
PS - G.L.	NELMS	DEFENCE RESEARCH ESTAB

BRIEF DESCRIPTION

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BRIEF DESCRIPTION ALOUETTE 2 WAS A SMALL IONOSPHERIC DESERVATORY INSTRUMENTED WITH A SWEEP FREQUENCY IONSPHERIC SQUNDER, A VLT RECEIVER, TWO ENERGETIC PARTICLE EXPERIMENTS, A COSMIC MOISE EXPERIMENT, AND AN ELECTROSTATIC PROBE. THE SPACECRAFT USED TWO LONG DIPOLE ANTENNA (78.9 R AND 22.8 R LONG, RESPECTIVELY) FOR THE SOUNDER, VLF, AND COSMIC EXPERIMENTS. THE SATELLITE WAS SPIN-STABILIZED AT ABOUT 2.25 RPM AFTER ANTENNA DEPLOYMENT. END PLATES ON THE LONG ANTENNA CORRECTED THE RAPID DESPIN OCCURING ON ALOUETTE I. WHICH WAS BELIEVED TO RESULT FROM THERMAL DISTORTION OF THE ANTENNA AND FROM RADIATION PRESSURE. THERE WAS NO THE SPACECRAFT WAS IN LINE OF SIGHT OF TELEMETRY STATIONS. TELEMETRY STATIONS WERE LOCATED SO THAT PRIMARY DATA COVERAGE WAS NEAR THE BD DEG N MENIDAN PLUS AREAS NEAR HAWAIL, SINGAPORE, AUSTRALIA, ENGLAND, INDIA, NORWAY, AND CENTRAL

AFRICA.	E	A PLASTIC SCINTILLATOR THAT The Energy Bange From 100 to 40	DETERMINED THE PROTON SPECTRA
ALOUETTE 2, BELROS	E		F STUDIED, NO ALDHA DADTTELE NA
INVESTIGATION NAME- VLF RE	CEIVER	WERE ODIAINED FROM THIS EXPERIM	TENT.
NSSDC 10- 65+098A-02	INVESTIGATIVE PROGRAM Code St/Co-op	INVESTIGATION NAME- SHEEF FREEL	
	INVESTIGATION DISCIPLINE(S) Ionospheres and radio physics	NSSOC ID- 65-0984-01 IN	
PERSONNEL PI - J.S. BELROSE DI - F.H. PALMER	COMMUN RESEARCH CENTRE Commun Research Centre		WESTIGATION DISCIPLINE(5) IONOSPHERES AND RADIO PHYSICS
BRIEF DESCRIPTION		PI - J.H. WHITIEKER	COMMUN RESEARCH CENT
A PASBAND FROM 0.05 TI ANTENNA. THE INSTRUMENT M ANTENNA. THE INSTRUMENT M THE ALQUETTE 1 RECEIVER SONOGRAM (GRAPH) THAT SHI FREQUENCY. WHISTLERS, IOI OBSERVED IN THIS VERY I SPECTRUM.	AS A WIDEBAND HIGH-GAIN RECEIVER WITH D SD KHZ THAT USED THE LONG SOUNDER AS A CONSIDERABLY IMPROVED VERSION OF THE STANDARD VLF DATA FORM WAS A SUBOL SIGNAL AS A FUNCTION OF TIME AND NOSPHERIC NOISE, VLF NOISE, ETC. WERE LOW REGION OF THE RADIO FREQUENCY REGION OF THE RADIO FREQUENCY RICAL ELECTROSTATIC PROBE	01 - J.E. JACKSON 01 - J.H. KING 01 - L. COLIN 01 - J. TURNER 01 - C. TAILB 01 - C. HOLT 01 - G. HOLT 01 - G.L. NELMS 02 - Y. OGATA 03 - R. RAGHAVARAD	NASA-GSEC APPLETON LAB NASA-ARC IONOSPHÉRIC PRED SER CNET AURORAL OBS DÉFENCE RESEARCH LAB PHYSICAL RESEARCH LAB PHYSICAL RESEARCH LAB
INVESTIGATION NAME - PHILIP	TICAL ELECTROSTATIC PROBE	DI - G.E.K - OCKWOOD	COMMUN RESEARCH CENT
NSSDC 10- 65-098A-05	RICAL ELECTROSTATIC PROBE Investigative program Code Si/Co-op Investigation discipline(S) Ionospheres	BRIEF DESCRIPTION The Sweep Frequency Transhitter/receiver that Rec	IONOSONDE WAS A RAD Orded the time delay between
	INVESTIGATION DISCIPLINE(S) IONOSPHERES	FREQUENCIES BETWEEN 0.12 AND 32 S. A MULTIPLICITY OF DELAY T BIREFRINGENCE OF THE INNER	FREQUENCY PULSE, A CONTINUUM 14.5 MHZ WERE SAMPLED ONGE EVE IMES WAS USUALLY OBSERVED DUE
PERSONNEL PI - L.H. BRACE	NA5A-G5FC	A FUNCTION OF DISTANCE TRAV DENSITY ALONG THE PROPAGATIO	ERSED BY THE SIGNAL, ELECTS
CONSISTING OF A COLLECTOR AXIS OF A CYLINDRICAL GUARD FROM THE SPACECRAFT AND THE TWO SENSORS WERE MODINIED ON	ECTROSTATIC PROBE OBSERVED ELECTRON E. IT WAS A TYPE OF LANGMUIR PROBE ELECTRODE EXTENDING FROM THE CENTRAL FING. THE GUARD RING EXTENDED 23 CM COLLECTOR ELECTRODE EXTENDED 46 CM. OPPOSITE SIDES OF THE LOWER PORTION	TIME STANDARD DATA FORM IS A TIME VENTUAL DISTANCE OF SIGNA VERSUS FREQUENCY. TWO OTHER CO FROM THE INDOGRAMS. THEY ARE I HEIGHT VALUES OF CHARACTERI COMPUTATIONS OF ELECTRON DENSIT	N IGNOGRAM (GRAPH) SHOWING DEL L REFLECTION FROM THE SAFELLIT: MMON FORMS OF DATA WERE PREPAR Digital frequency and/or virtu, STIC Ignospheric features ai Y profiles.
DEG TO THE SPACECRAFT S Northward direction in T IPERATED SEQUENTIALLY.	EXTENSES DOWNLARD AT AN ANGLE OF 45 PIN AXIS, WHICH WAS DRIENTED IN A HE ORBITAL PLANE. THE SENSORS WERE	SPACECRAFT COMMON NAME- ANS Alternate Names- Astro Netherlan	
INVESTIGATION NAME- COSMIC			
NSSDC 10- 65-098A-03	INVESTIGATIVE PROGRAM	LAUNCH DATE- 08/30/74 Launch Site- Vandenberg Afb, UX Launch Vehicle- Scout	WEIGHT- 129.8 KG 1120 STATES
t e e	INVESTIGATION DISCIPLINE(S) ASTRONOMY	SPONSORING COUNTRY/AGENCY THE NETHERLANDS NI UNITED STATES N/	IVR ASA-055
	COTHUN RESEARCH CENTRE	INITIAL ORBIT PARAMETERS	
ROM THE IGNOSPHERE, GALAXT 33 AND 73 M LONG. THE RE VERY 32 S. THE RECEIVER B. ANGE WAS BO DB. THE REC ADIG EMISSION OBSERVATIO HIZ. THE EXPERIMENT FUNCT	D THE IOHOSONDE RECEIVER AUTOMATIC GE TO MEASURE BACKGROUND RADIO NDISE , AND SUN. THE ANTENNAS WERE DIPOLES CEIVER SWEPT THE RANGE D.1 TO 15 MHZ ANDWIDTH WAS 40 KHZ, AND THE DYNAMIC EIVER SENSITIVITY PERMITTED GALACTIC UNE SAT FREQUENCIES GREATER THAN 0.6 LONED SATISFACTORILY, PROVIDING GOOD	PERSONNEL MG - J.R. HOLTZ SC - N.G. ROMAN PM - W. BLOEMENDAL PM - E.W. HYMOWITZ PS - T.P. STECHER	NASA HEADQUARTERS
READENCY RESOLUTION MILL K	ELATIVELY POOR FLUX RESOLUTION.	BRIEF DESCRIPTION The Astronomical Hetherl Farth-Orbiting Sub-Exaction	ANDS SATELLITE (ANS) WAS A
NVESTIGATION NAME- ENERGET	ID IC PARTICLE DETECTORS	ASTRONOMICAL OBSERVATORY. ATTITUDE-CONTROLLED BY MAGNETI	THE SPACECRAFT WARD AS A COULS, REACTION WHEELS, AND
SSDC 1D- 65-098A-04	INVESTIGATIVE PROGRAM CODE ST/CO-OP INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS	HORIZON SENSORS, AND STAR SE Object being observed senved as	CARRIED OUT BY SOLAR SENSOR: NSORS. TWO GUIDE STARS NEAR TH THE FINAL POINTING REFERENCES
• .	INVESTIGATION DISCIPLINE(S) Particles and fields		
PI - I.B. MCDIAAMID	NATL RES COUNC OF CAN	ANS. BRINKMAN	
RIEF DESCRIPTION			
THE ALQUETTE 2 COSHI Omposed of Seven Detectors UBES. The First Despond	C PARTICLE DETECTION EXPERIMENT WAS Four of these were geiger-mueller to electrons greater than 3.9 Mey		ESTIGATIVE PROGRAM DDE SA/CO-OP ESTIGATION DISCIPLINE(S)
RODM AND RESPONDED TO E Rotons greater than 500 ke Reater than 40 key and	40 MEV. THE SECOND HAD A MAGNETIC LECTRONS GREATER. THAN 250 KEV AND V. THE THIRD RESPONDED TO ELECTRONS	PERSONNEL	-RAY ASTRONOMY
MACE ON IUBES WERE PERFEMO M TUBE WAS 10 DEG FROM LECTRONS GREATER THAN 40 KE HE FIFTH DETECTOR WAS A SIL ND ALPHA PARTISLES WITH ESPECTIVELY, AND MAXIMU ESPECTIVELY, AND MAXIMU	TRUINDS GREATER THAN SOD KEV, THESE ICULAR TO THE SPIN AXIS. THE FOURTH THE SPIN AXIS AND RESPONDED TO V AND PROTONS GREATER THAN SOD KEV, ICON JUNCTION THAT DETECTED PROTONS MININUM EMERGIES OF 1 AND 5 MEV, M ENERGIES OF 8 AND 24 MEV, ETECTOF WAS A GEIGER TELESCOPE THAT N 100 MEV. THE SEVENTH DETECTOR WAS	PI - A.C. BRINKMAN BRIEF DESCRIPTION THE INSTRUMENTATIONI CO PROPORTIONAL COUNTER (44- TO Focus of A grazing incidence r titanium-window proportional cou 4- To 12-A, and 2- To 4-A) Collimator, the sensors, which	SS-A PASSBAND), LOCATED AT TH Ing Paraboloid telescope, and NTER (Passbands of 27- to 35-A

BRIEF DESCRIPTION THE INSTRUMENTATIONT CONSISTE OF A MYLAR-WINDOW PROPORTIONAL COUNTER (44- TO SS-A PASSBAND), LOCATED AT THE FOCUS OF A GRAZING INCIDENCE RING PARABOLGLD TELESCOPE, AND A TITANIUM-WINDOW ROPORTIONAL COUNTER (PASSBANDS OF 27- TO 35-A, 4- TO 12-A, AND 2- TO 4-A) LOCATED BEHIND A HOMEYCOMB COLLIMATOR, THE SENSORS, WHICH DESERVED X RAYS FROM COSMIC

1

SOURCES, REQUIRED AN INSTRUMENT POINTING ACCURACY OF 0.1 DEG.

 ANS.	GUR\$K ¥

INVESTIGATION NAME- HIGH ANGULAR AND SPECTRAL RESOLUTION Observations of cosmic X-ray sources

INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PERSONNEL PI - H. GURSKY OI - H.W. SCHNOPPER

NSSDC 10- 74-070A-03

HARVARD COLLEGE OBS MASS INST OF TECH

PERSONNEL PI-H. GURSKY 01-H.W. SCHNOPPER ARSS INST OF TECH BRIEF DESCRIPTION GRIEF DESCRIPTION TIS EXPERIMENT WAS DESIGNED TO DETECT COSMIC X-RAY EMISSIONS IN THE ENFRGY RANGE FROM 1 TO 30 KEV. THE PRINCIPAL SCIENTIFIC OBJECTIVES OF THE EXPERIMENT WERE -- (1) TO GATHER SPECTAAL OATA WITH AN ENERGY RESOLUTION OF 20 PERCENT, (2) TO DETECT SILICON EMISSION LINES IN THE 1-TO 4-KEW RANGE AT AN ENERGY RESOLUTION OF (15) FERCENT, (3) TO STUDY PERIODIC AND RANDOM INTENSITY VARIATIONS OF SOURCES OVER A TIME RANGE OF 4 MILLISECONDS TO SEVERAL MINUTES. (4) TO OBTAIN DATA ON X-RAY LIGHT CURVES, AND (5) TO DEFINE POSITIONS OF SOURCES WITH A PRECISION APPROACHING 1 ARC-MIN. THE EXPERIMENTAL PACKAGE CONTAINED THREE MAJOR COMPONENTS -- (1) A COLLIMATOR ASSEMBLY. (2) A LARGE AREA DETECTOR (LAD) UNIT FOR MEASURING 1- TO 30-KEY X-RAYS, AND (3) A BRAGG-CRYSTAL SPECTROMETER TUNED FOR DETECTION OF SILICON LINES IN THE 1-TO 4-KEV INTERNAL. THE LAD AND BRAGG SPECTROMETER DETECTORS WERE VERY SENSITIVE. BEING ABLE TO DETECT 3.E-3 PHOTONS/(SG CM-S). X-RAYS INCIDENT ON THE FRONT FACE OF THE PACKAGE PASSED THAUGH THE COLLIMATOR ASSEMBLY ONTO EITHER THE LAD OR A SERIES OF FOUR BRAGG CRYSTALS THAT WERE ORIENTED AT ABOUT 45 DEG MITM RESPECT TO HE INCIDENT ASSEMBLY ONTO EITHER THE LAD OR A SERIES OF FOUR BRAGG CRYSTALS THAT WERE ORIENTED AT ABOUT 45 DEG MITM RESPECT TO HE INCIDENT DEAM. THE COLLIMATOR (10 ARC-MIN FWHM) AND A COARSE COLLIMATOR MAD A SEPARATE ARGON FILLED PROPORTIONAL COUNTER WAS A COMBINATION OF A FINE COLLIMATOR (10 ARC-MIN FWHM) AND A COARSE COLLIMATOR BING CENTERED ON SIGHTLY DIFFERENT POINTS ON THE SKY. EACH COLLIMATOR MAD A SEPARATE ARGON FILLED PROPORTIONAL COUNTER WAS PROCESSED BY A 55-CHAMNEL LOGARITHMIC PULSE-HEIGHT ANALYZER, ALL CHANNELS OF WICH WERE RECORDED IN MEMORY EITHER EWERY 4 S OR 64 S. INGRET THE WINDOWS. THE EFFECTIVE DETECTION FOR THE COLLIMATOR A SIGNEL ANNEL ANALYZER WAS USED TO RECORD THE INTERNALS. ONLY THE COARSE COLLIMATOR AND A DETECTION FOR THE COULD BAGG OPET CR

--- ANS, VANDUINEN------

INVESTIGATION NAME- UV TELESCOPE

NSSDC ID-	74-07()4-01	INVESTIGATIVE PROGRAM Code Sa/Co-op
		INVESTIGATION DISCIPLINE(S) Astronomy
PERSONNEL	·	

OI - J. BORGMAN U OF SKONINGEN

BRIEF DESCRIPTION THIS EXPERIMENT, WHICH REQUIRED A POINTING ACCURACY OF 1 ARC-MIN, CONSISTED OF A SMALL CASSEGRAIN TELESCOPE COUPLED TO A GRATING SPECTROGRAPH. THE SPECTROGRAPH COVERED FIVE WAVELENGTH BANDS BETWEEN 1500 AND 3205 A, USING PHOTOMULTIPLIERS AS DETECTORS. THE EXPERIMENT WAS DESIGNED TO BE SENSITIVE ENOUGH TO OBSERVE STARS UP TO THE 10TH MAGNITUDE.

SPACECRAFT COMMON NAME- APOLLO 11 LH/EASEP -Alternate names- 04041, Apollo 11 LH

NSSDC 10- 69-0590

LAUNCH DATE- D7/16/69 Launch Site- Cape Canaveral, United States Launch Vehtcle- Saturn WEIGHT- 4240. KG

SPONSORING COUNTRY/AGENCY United States NASA-DHSP

INITIAL ORBIT PARAHETERS ORBIT TYPE - ; UNAR LAN UNAR LANDER

PERSONNEL

MG - F.I. ROBERSON SC - J.B. HANLEY PM - W.F. EICHELMAN PS - NONE ASSIGNED

BRIEF DESCRIPTION THE LUNAR MODULE (LN) WAS A TWO-STAGE VEHICLE DESIGNED FOR SPACE OPERATIONS NEAR AND ON THE MOON, THE LM STOOD 7 M HIGH AND WAS 9.4 M WIDE (DIAGONALLY ACROSS THE LANDING GEAR). THE ASCENT AND DESCENT STAGES OF THE LM OPERATED AS A UNIT UNTIL STAGING, WHEN THE ASCENT STAGE FUNCTIONED AS A SINGLE SPACECRAFT FOR RENDEZVOUS AND DOCKING WITH THE COMMAND MODULE (CM). INCLUDED IN THE DESCENT STAGE WERE THE EARLY APOLLO SCIENTIFIC EXPERIMENT PACKAGE (EASSEP) EXPERIMENTS, WHICH WERE SOLAR WIND COMPOSITION, THE SOIL MECHANICS, AND THE SAMPLE COLLECTION EXPERIMENTS. THE FASEP EXPERIMENTS INCLUDED THE PASSIVC SEISMOGRAPH, THE DUST DETECTOR, AND THE LASER RANGING RETROREFLECTOR. THE LM WAS ON THE LUNAR SURFACE JULY 20-21, 1969. 1969.

----- APOLLO 11 LN/EASEP. ALLEY-----

INVESTIGATION NAME- LASER RANGING RETROREFLECTOR

N550C 10- 69-059C-04

PERSONNEL PI - C.O. ALLEY

INVESTIGATIVE PHOGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Celestial Mechanics Geodesy and Cartography

U OF MARYLAND

EXIEF DESCRIPTION THE LASER RANGING RETROREFLECTOR (LRRR), WHICH WAS LEFT ON THE LUMAR SURFACE BY THE APOLLO 11 CREW, WAS A RETROREFLECTOR ARRAY WITH A FOLDING SUPPORT STRUCTURE FOR AINING AND ALIGNING THE ARRAY TOWARD EARTH. THE ARRAY WAS BUILT OF CUBES OF FUSED SILICA. LASER RANGING BEAMS FROM EARTH WERE REFLECTED BACK TO THEIR POINT OF ORIGIN FOR PRICISE MEASUREMENT OF EARTH-MOON DISTANCES, MOTION OF THE MOON'S CENTER OF MASS, MOTON'S CENTER OF MASS, LUNAR RADIUS, AND EARTH GEOPHYSICAL INFORMATION.

- SPACECRAFT CONMON NAME- APOLLO 12 LM/ALSEP ALTERNATE NAMES- 04246, ALSEP 12 Lem 12, Apollo 12C

N55DC ID- 69-099C

LAUNCH DATE- 11/14/69 Launch Sité- Cape Canaveral, United States Launch Vehicle- Saturn ₩E1GHT- 4379. KG

INITIAL ORBIT PARAMETERS ORBIT TYPE~ LUNAR LANDER

PERSONNEL

SONNEL		
MG - F.I.	ROBERSON	NASA HEADQUARTERS
SC - J.8.	HANLEY	NASA HEADQUARTERS
PH - W.F.	EICHELMAN	NASA-JSC
PS ~	NONE ASSIGNED	

PS - NONE ASSIGNED BRIEF DESCRIPTION THE LUNAR MODULE (LM) WAS A TWO-STAGE VEHICLE DESIGNED FOR SPACE OPERATIONS NEAR AND ON THE MODIL. THE LM STOOD 7 M HIGH AND WAS 9.4 M WIDE (DIAGONALLY ACROSS THE LANDING GEAR). THE ASCENT AND DESCENT STAGES OF THE LM OPERATED AS A UNIT UNTIL STAGING, WHEN THE ASCENT STAGE FUNCTIONED AS A SINGLE SPACECRAFT FOR RENDERVOUS AND DOCKING WITH THE COMMAND MODULE (CM). THE ALSEP EXPERIMENTS INCLUDED --- (1) THE PASSIVE SEISMOGRAPH, WHICH WAS DESIGNED TO MEASURE SIISNIC ACTIVITY AND PHYSICAL PROPERTIES OF THE LUNAR CRUST AND INTERIOR. (2) THE SUPRATHERMAL ION DETECTOR, DESIGNED TO MEASURE THE FLUX (CMPOSITION, ENERGY, AND VELOCITY OF LOW-ENERGY POSITIVE IONS. (3) THE COLD CATHODE ION GAUGE, DESIGNED TO MEASURE THE ATMOSPHERE AND ANY VARIATIONS WITH THE OR SOLAR ACTIVITY SUCH ATMOSPHERE NAY HAVE, (4) THE CHARGED PARTICLE EUNAR SURFACE AND IO PROVIDE DATA ON ENERGY DISTRIBUTION OF THESE SOLAR PARTICLELS. (5) THE LUNAR SURFACE MAGNETOMETER (LSM), DESIGNED TO MEASURE THE MAGNETIC FIELD AT THE LUNAR SURFACE, AND (6) THE SURAR ALTA SURFACE THE MAGNETIC FIELD AT THE LUNAR SURFACE, AND REASURE THE MAGNETIC FIELD AT THE LUNAR SURFACE, AND SPECTRA OF THE ELECTRONS AND PROTONS THAT EMANATE FROM THE SUN AND REACH THE LUNAR SURFACE. THE LM ITSELF WAS ON THE LUNAR SURFACE NOVEMBER THE MAGNETIC, THELM ISSELF WAS ON THE LUNAR SURFACE NOVEMBER THE PAGE.

NASA-JSC

----- APOLLO 12 LH/ALSEP, FREEMAN-----

INVESTIGATION NAME- SUPRATHERMA: ION DETECTOR

	CODE VL
:	INVESTIGATION DISCIPLINE(S) Particles and fields
PERSONNEL	

PERSONNEL		
P1 − J.W.	FREEMAN	RICE U
01 - F.C.	MICHEL	SICE U
01 - H.K.	HILLS	RICE U

MEENC TA- 40-0000-00

01 - H.K. HILLS RICE U DRIEF DESCRIPTION THIS EXPERIMENT, WHICH WAS PART OF THE ALSEP PACKAGE, STUDIET THE IDNIC ENVIRONMENT OF THE MOON BY DETECTING FREE-STREAKING AND THERMALIZED SOLAR WIND IONS AND THOSE IONS THAT RESULT FRUM UITRAVIOLET IDNIZATION OF THE LUNAR ATMOSPHERE, A LOW-ENERGY CURVEO-PLATF MASS AMALYZER (MA), WITH A VELOCITY FILTER OF CROSSED SUSCITIC AND MACHNETIC FIELDS. DETERMINED THE PARTICLE FLUX IN 20 INTERVALS OVER THE RAHGE 0.2 TO 48.6 EV PER UNIT CHARGE, WITH SPECIES DISCITINATION OF MASSES UP TO TODO AMU, ANOTHER ANALYZER (TOTAL ION DETECTOR-TID) WITHOUT A VELOCITY FILTER DETECTED HIGHME-MERGY PARTICLES IN 20 ENERGY INTERVALS BETWEEN TO AND SOD EV. THE POTEMTIAL OF ONE INSTRUMENT (FOR EACH INSTRUMENT PLATE) RELATIVE TO THE LUNAR SUFFACE WAS VARIED THROUGH 26 STEPS EVERY 9.6 MIN, AND FOR EACH STEP THE POTENTIAL OF THE OTHER INSTRUMENT PLATE RELATIVE TO THE FIRST IS VARIED THROUGH 20 STEPS. OUE TO IS ORIENTATION, THIS INSTRUMENT DID NOT OBSERVE SOLAR WIND PARTICLES EXCEPT IN THE SHEATH AND TAIL. HOWEVER, IT DID OBSERVED UPSTREAMING PARTICLES FROM THE EARTH'S BOW SHOCK.

--- APOLLO 12 LH/ALSEP, LATHAN------

INVESTIGATION NAME- PASSIVE SEISHIC (PSE)

NSSDC ID- 69-0990-03 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PLANETOLOGY

BRIEF DESCRIPTION THE PSE WAS PLACED ON THE LUNAR SURFACE AS PART OF THE ALSEP PACKAGE, IT WAS LOCATED AND DEPLOYED 100 M FROM THE LM IN THE VICINITY OF SURVEYOR 3. THE SEISMOGRAPH EXPERIMENT MEASURED SEISMIC ACTIVITY OF THE MOON AND DISTAINED INFORMATION ON THE PHYSICAL PROPERTIES OF THE LUNAR CRUST AND INTERIOR. THE PSE DETECTED SURFACE TILT PRODUCED BY TIDAL DEFORMATIONS, MOORGUAKES, AND NETEORITE IMPACTS. IT WAS NUCLEAR POWERED (SNAP-27) AND COULD OPERATE CONTINUOUSLY. THE THREE COMPONENTS OF THE SENSOR ASSEMBLY WERE ALIGNED ALONG THE TWO HORIZONTAL AXES LPX, LPY, AND THE VERTICAL AXIS LPZ. A LEVELING STOOL, THERMAL SHROUD, AND RADIOSOFDE HEATERS COMPRISED THE REST OF THE EXPERIMENT PACKAGE.

-- APOLLO 12 LM/ALSEP, SNYDER------

INVESTIGATION NAME- SOLAR WIND SPECTROMETER

NSSOC 10- 69-0990-02 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) Particles and fields Solar Physics

PERSONNEL		
PI − C.W.	SNYDER	NASA-JPL
01 - D.R.	CLAY	NASA-JPL
0I - N.M.	NEUGEBAUER	NASA-JPI

BRIEF DESCRIPTION THE SOLAR WIND SPECTROMETER WAS PART OF THE APOLLO 12 ALSEP PACKAGE LEFT ON THE LUMAR SURFACE. IT CONSISTED OF SEVEN MODULATED FARADAY CUPS OPENED TOWARD DIFFERENT, BUT SLIGHTLY OVERLAPPING, PORTIONS OF THE LUMAR SKY. THE INSTRUMENT WAS USED TO OBSERVE THE DIRECTIONAL INTENSITIES OF THE ELECTRON (6-1330 EV) AND POSITIVE ION (18-9780 EV) COMPONENTS OF THE SOLAR WIND AND MAGNETOTAIL PLASMA THAT STRIKE THE SURFACE OF THE MONN THE BOOM

**************************** APOLLD 14 LN/ALSEP*********************

SPACECRAFT CONMON NAME- APOLLO 14 LM/ALSEP ALTERNATE NAMES- ALSEP 14, LEN 14 04905, Apollo 140

NSSDC 10- 71-0080

LAUNCH DATE- 01/31/71 WEIGHT- 4857. KG LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- SATURN

SPONSORING COUNTRY/AGENCY UNITED STATES

NASA-ONSF NASA-OSS INITIAL ORBIT PARAMETERS ORBIT TYPE- LUNAR LANDER

PERSONNE

RSONNEL		
MG - f.1.	ROBERSON	NASA HEADQUARTERS
SC - J.B.	HANLEY	NASA HEADQUARTERS
PM ~ ₩.F.	EICHELMAN	NASA-JSC
PS -	NONE ASSIGNED	

BRIEF DESCRIPTION THE APOLLO 14 LUNAR MODULE (LM) CONSISTED DF A LUNAR LANDING CRAFT AND AN APOLLO LUNAR SURFACE EXPERIMENT PACKAGE (ALSEP) THAT CONTAINED SCIENTIFIC EXPERIMENTS LEFT ON THE LUNAR SURFACE AFTER COMPLETION OF THE MANNED PORTION OF THE MISSION. THE LM LANDED IN THE LUNAR KIGHLANDS (3 DEG 39 MIN 1 S SOUTH LATITUDE, 17 DEG 27 MIN 55 S WEST LONGITUDE). THE NUCLEAR-POWERED ALSEP WAS DEPLOYED AT THE ANOING SITE AND INCLUDED EXPERIMENTS TO STUDY THE SEISNIC WAVES, MAGNETIC FIELDS, SOLAR WIND CCAPOSITION AND INTERACTION WITH THE MODH. LUNAR ATMOSPHERE, AND IONIC ENVIRONMENT. THE LM WAS ON THE LUNAR SURFACE FEBPUARY 5-6, 1971.

-- APOLLO 14 LM/ALSEP, FALLER------INVESTIGATION NAME- LASER RANGING RETROREFLECTOR

NSSDC 10- 71-0080-09

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE (...) Celestial mechanics Geodesy and Cartography

U OF COLORADO

PERSONNEL PI - J. FALLER

PI-J. FALLER U OF COLORADO BRIEF DESCRIPTION THE PURPOSE OF THIS EXPERIMENT WAS TO PERMIT GROUND-BASED STATIONS TO CONOUCT SHORT-PULSE LASER RANGING TO A CORNER REFLECTOR ARRAY ON THE LUNAR SURFACE AT THE FRA MAURO SITE. THIS INSTRUMENT, THOSE AT APOLLO 11 (TRANGULLITY DASE), AND AT THE APOLLO 15 SIT. IN TH/ HADLEY/APENNINE REGION PROVIDED A NETWORK OF STATIONS (WELL-SEPARATED IN LONGITUDE AND LATITUDE) TO PERMIT A COMPLETE GEOMETRICAL SEPARATION OF THE LUNAR LIBRATIONS, THE REFLECTORS PERMITTED A DISCRIMINATION OF THE S-TR PHYSICAL LIBRATIONS. THEY ALSO PROVIDED INFORMATION ABOUT THE EARTH AND ITS CONTINENTAL DRIFT MOTIONS, AS WELL AS VERY ACCURATE DETERMINATIONS OF THE EARTH-MOON DISTANCE AND THE METWORK OT DIDINS. THE EARTH-MOON DISTANCE AND THE MOON'S ORBITAL ROTIONS. THE EARTH-MOON DISTANCE AND THE MOON'S ORBITAL ROTIONS. THE EARTH-MOON SISTION COULD BE DETERMINED TO PLUS OR NINUS 15 CM. THE INSTRUMENT WAS AN DIAMETER. II WAS DEPLOYED ON THE FIRST EVA, 30 M WEST OF THE CENTRAL STATION (200 M WEST OF THE LM), WAS LEVELED, AND WAS FACED TOWARD THE EARTH. EACH CORNER CUBE REFLECTED LIGHT PARALLEL TO THE INCIDENT DIRECTION, INSURING THAT THE REFLECTED LASER PULSE RETURNED TO TIS PLACE OF ORIGIN ON THE EARTH.

INVESTIGATION NAME+ ACTIVE SEISHIC

INVESTIGATIVE PROGRAM CODE SL NSSDC 10- 71-008C-05

INVESTIGATION DISCIPLINE(S) PLANETOLOGY

PERSONNEL PI - R.L. KOVACH OI - J.S. WATKINS

STANFORD U U OF TEXAS, GALVESTON

01 - J.S. WATKINS U OF TEXAS, GALVESTON BRIEF DESCRIPTION THE PURPOSE OF THIS EXPERIMENT WAS TO GENERATE AND MONITOR SEISHIC WAVES IN THE MOON MEAR THE SURFACE IN ORDER TO STUDY THE INTERNAL STRUCTURE TO A DEPTH OF 460 M. THE SEISHIC ENERGY SOURCE USED WAS THE 'THUMPER' DEVICE, WHICH CONTAINED 21 SMALL EXPLOSIVE CHARGES. THE NORTAR PACKAGE CONTAINING FOUR PIGH-EXPLOSIVE CHARGES. THE NORTAR PACKAGE CONTAINING FOUR PIGH-EXPLOSIVE CHARGES. THE NORTAR PACKAGE CONTAINING FOUR PIGH-EXPLOSIVE GRENADES WAS PLANTED 91 M FROM THE LM, BUT ITS DETONATION FROM EARTH WAS POSTFONED UNTIL THE OTHER EXPERIMENTS WERE COMPLETED TO AVOID DAMAGING. THEM. THE THUMPER DEVICE WAVE VELOCITY OF TAG M/S, AND A SUBLAYER STARTING AT A DEPTH OF 6.5 M H/S A VELOCITY OF 299 M/S. ESTIMATES OF THE THICKNESS OF THIS SUBSTRATUM RANGE FROM 3B TO 76 M, WHICH IS PROBABLY IMDIFATION ON THE CONSISTED OF A STAFF WITH THE CHARGE INTIATORS. FOUNTED ON THE LOWER END OF ITS BASE, A CABLE CONNECTING THE STAFF (THUMPER) TO THE CENTRAL STATION, GEOPHONES (MINIATURE STAFF (THUMPER) TO THE CENTRAL STATION, GEOPHONES (MINIATURE SEISMOMETERS) FOR RECORDING THE WAVES, AND A THREE-CHANNEL AMPLIFIER WITH LOG COMPRESSOR FOR TELEAETERING T. THE EARTH.

- APOLLO 14 LM/ALSEP, LATHAM---------INVESTIGATION NAME- PASSIVE SEISMIC (PSE)

INVESTIGATIVE PROGRAM NSSDC ID- 71-0L8C-04 CODE SL

INVESTIGATION DISCIPLINE(S) PLANETOLOGY

ERSONNEL		
P1 - G.V.		U OF TEXAS, GALVESTON
ot - w.M.	EWING(DECEASED)	
01 - F.	PRESS	MASS INST OF TECH
01 - G.H.	SUTTON	U OF HAWAIT

PE

BRIEF DESCRIPTION THE PSE WAS PLACED ON THE LUNAR SURFACE AS PART OF THE ALSEP. IT WAS LOCATED AND DEPLOYED 98 M FAON THE LM, THIS EXPERIMENT WAS DESIGNED TO MEASURE SEISMIC ACTIVITY OF THE MON AND TO DBTAIN INFORMATION ON THE PHYSICAL PROPERTIES OF THE LUNAR CRUST AND INTERIOR. THE PSE WAS ALSO DESIGNED TO DETECT SURFACE TILL PRODUCED BY TIDAL DEFORMATIONS, MODNUMAKES, AND METEORITE IMPACTS. THE EXPERIMENT WAS NUCLEAR POWERED (SNAP-27) AND COULD OPERATE CONTINUMULY. THE COMPONENTS WERE THE SENSOR ASSEMBLY, THE LEVELING, STOOL, THE THERMAL SHROUD, AND THE PADIOISOTOPE HEATERS. READINGS FROM THE SENSORS WERE SENT TO THE ALSEP CENTRAL STATION, WHICH TRANSMITTED THE DATA BACK TO EARTH. THE AL EARTH.

----- APOLLO 14 LM/ALSEP, O'BRIEN------

INVESTIGATION NAME- CHARGED PARTICLE LUNAR ENVIRONMENT

INVESTIGATIVE PROGRAM NSSDC 10- 71-0080-08 CODE SL

> INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL PI - B.J. O'BRIEN OI - D.L. REASONER

DEPT OF ENVIRON PROT NASA-MSFC

01 - D.L. REASONER NASA-MSFC DRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED IG MEASURE THE ENERGY SPECTRA OF LOW-ENERGY CHARGED PARTICLES STRIKING THE LUMAR SURFACE. THE NAIN PART OF THE INSTRUMENTATION CONSISTED OF TWO ELECTROSTATIC ANALYZERS. ONE OF THESE POINTED IGNARD 'OCAL LUNAR VERTICAL, AND THE OTHER TO A POINT 6D DEG FROM VERTICAL TOWARD LUMAR WEST, AS A FIRST APPROXIMATION, BOTH DETECTORS COULD BE CONSISTED OF A SET OF DIRECTION-DEFINING SLITS, DEFLECTION PLATES, FIVE SMALL-APERTURE, C-SHAPED CHANNEL ELECTRON MULTIPLIERS, AND ONE LARGE-APERTURE, C-MANNEL CHARNEL ELECTRON MULTIPLIERS, AND ONE LARGE-APERTURE, C-MANNEL CHARNEL ULMAR WERE ARRANGED TO COUNT PARTICLES OF ONE POLARITY WITH DIFFERING ENERGIES, WHILE THE LARGE-APERTURE, MULTIPLIER NADE A WIGE-GAND MEASUREMENT OF PARTICLES OF HE OPPOSITE POLARITY. DURING EACH 19.2-S INTERVAL IN THE AUTOMATIC MODE OF EXPERIMENT OPERATION, DEFLECTION VOLTAGES OF LECT TON PLUS AND MIC''S 35, 350, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 35, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 35, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 35, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 35, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 35, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 36, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 36, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 36, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 36, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 36, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 37, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 36, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 36, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 36, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 36, SSO, AND 3500 WENE APPLIED TO THE DEFLECTION PLUS AND MIC''S 36, SSO, AND 3500 WENE AP

SPACECRAFT COMMON NAME- APOLLO 15 LM/ALSEP Alternate Names- Apollo 15C, Alsep 15 Lem 15, Rover 15 05366

NSSDC 10- 71-0630

LAUNCH DATE- 07/26/71 Launch Site- Cape Canaveral, United States Launch Vehicle- Saturn WEIGHT- 12700. KG

SPONSORING COUNTRY/AGENCY UNITED STATES UNITED STATES NASA-DMS.F NASA-DSS

INITIAL ORBIT PARAMETERS ORBIT TYPE- LUNAR LANDER

PERSO	NNI	EL	
ĦG	-	F-I-	ROBERSON
5 C	-	J.8.	HANLEY
PM	-	H.F.	EICHELMAN
25	-		NONE ASSIGNE

BRIEF DESCRIPTION THE APOLLO 15 LUNAR MODULE (LA) CONSISTED OF A LUNAR IANDING CRAFT, A LUNAR ROVING VEHICLE AND AN APOLLO LUNAR SUNFACE EXPERIMENTS PACKAGE (ALSEP) THAT CONTAINED SCIENTIFIC EXPERIMENTS TO BE LEFT ON THE MOON AFTER COMPLETION OF THE MAYMED PORTION OF THE MISSION. THE LW LANDED IN THE NORTH (ANORE. THE ALSEP MAS DEPLOYED AT THE FOOT OF THE APENNINE MOUNTAIN VANGE. THE ALSEP MAS DEPLOYED AT THE LANDING SITE. THE LNV WAS USED DURING THE EXTRAVEHICULAR ACTIVITIES (EWA) TO EXTEND THE CONTAINED SEISNIC. MACHETIC FIELDS, LUNAR ATMOSPHERIC CONTAINED SEISNIC. MACHETIC FIELDS, LUNAR ATMOSPHERIC CONTOSITION, 10N COMPOSITION. LUNAR DUST, SOLAR WIND COMPOSITION, THE LN WAS DN THE LUNAR SURFACE JULY 30-AUGUST 2, 1971. 1971.

--- APOLLO 15 LN/ALSEP, BATES------INVESTIGATION NAME- LUNAR DUST DETECTOR

NSSPC 10- 71-063C-09 INVESTIGATIVE PROGRAM

CODE SL

INVESTIGATION DISCIPLINE(S) DUST

NASA-JSC.

NASA HEADQUARTERS NASA HEADQUARTERS

HASA-JSC

121 3

PERSONNEL PI - J.R. BATES

BRIEF DESCRIPTION THE FUNCTION OF THE EXPERIMENT WAS TO SEPARATE AND MEASURE HIGH-ENERGY RADIATION DAMAGE TO THREE SOLAR CELLS. TO MEASURE REDUCED SOLAR CELL OUTPUT DUE TO DUST ACCIMULATION, AND TO MEASURE REFLECTED INFRARED ENERGY AND TEMPERATURES FOR USE IN COMPUTING LUNAR SURFACE TEMPERATURES. THE DUST DETECTOR HAD TWO COMPONENTS — A SENSOR PACKAGE MOUNTED TO THE TOP OF THE CENTRAL STATION SUN SHIELD, AND A PRINTED CIRCUIT BOARD LOCATED WITHIN THE CENTRAL STATION THAT INTERFACED WITH THE POWER DISTRIBUTION UNIT OF THE ALSEP DATA SUBSYSTEM, THE EXPERIMENT WAS SIMILAR TO THAT DEPLOYED ON APOLLD 12 AND 14.

- APOLLO 15 LM/ALSEP, FALLER------

INVESTIGATION NAME- LASER RANGING RETROREFLECTOR

NSSDC 10- 71-063C-08

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Celestial Mechanica Geodesy and Cartography

PERSONNEL PI - J. FALLEP

U OF COLORADO

BRIEF DESCRIPTION THE LASER RANGING RETROREFLECTOR EXPERIMENT (LRRR), PART OF THE ALSER PACKAGE, WAS A CORNER REFLECTOR FOR LASER RANGING FROM EARTH. THE RANGING DATA OBTAINED INCLUDED INFORMATION UNAR MOTION, LUNAR LIBRATIONS, AND EARTH ROTATION. THE LRRR EXPERIMENT CONSISTED OF A FOLDED PANEL STRUCTURE INCORPORATING SOO INDIVIDUAL FUSED-SILICA OPTICAL CORNER REFLECTORS, A SIMPLE ALIGNMENT/LEVELING DEVICE, AND AN AIM-HANDLE MECHANISM. THE LUNAR ROVING VEHICLE (LRV) WAS USED TO CARRY THE LRRR TO HADLEY RILL SITE. THE LRRR BECAME PASSIVE AFTER DEPLOYMENT. A CAMERA (GO-MM LENS) WAS USED TO PHOTOGRAPH THE EXPERIMENT. THE USED IN CONJUNCTION WITH DATA FROM THE APOLLD 11 AND 14 LRR EXPERIMENTS, PERMITED MORE REFINED DISTANCE MEASUREMENTS THAN WERE PREVIOUSLY AVAILABLE. NOW THAT SMALLER TELESCOPES CAN BE USED, THE EXPERIMENT IS PROVIDING GREATER QUANTITIES OF MORE ACCURATE DATA.

--- APOLLO 15 LM/ALSEP, FREEMAN-----

INVESTIGATION NAME- SUPRATHERMAL ION DETECTOR

NSSDC 10- 71-0630-05

CODE SL INVESTIGATION DISCIPLINE(S) Particles and fields

RICE U RICE U RICE U

INVESTIGATIVE PROGRAM

PERSONNEL			÷
PI - J.W.	FREEMAN		
01 - F.C.	MICHEL		
01 - H.K.	HILLS	÷.,	

BRIEF DES/RIPTION TPS ALSEP SUPRATHERMAL ION DETECTOR EXPERIMENT MEASURED IONS GENERATED FROM ULTRAVIOLET IONIZATION OF THE LUMAR ATMOSPHERE AND FROM THE FREE-STREAMING SOLAR WIMO/LUMAR SURFACE INTERACTION. FLUX, NUMBER DENSITY, VELOCITY, AND ENERGY PER UNIT CHARGE WERE DETERMINED FROM THE DATA OBTAINED. A CURVED-PLATE ANALVZER AND E-CROSS-B VELOCITY SELECTOR DETECTED IONS WITH NORMAL VELOCITIES FROM 0.4 TO 93.5 KM/S AND ENERGIES FROM D.2 TO 48.6 EV. SPECIES DISCRIMINATION OF MASSES UP TO 120 U WAS POSSIBLE. A SEPARATE CURVED-PLATE ANALYZER COUNTED SOLAR WIND FROTONS IN 20 ENERGY INTERVALS FROM 10 TO 3500 EV. THE POTENTIAL OF ONE INSTRUMENT (FOR EACH INSTRUMENT PLATE) RELATIVE TO THE LUMAR SURFACE IS VARIED THROUGH 26 STEPS EVERY INSTRUMENT PLATE RELATIVE TO THE FIRST IS VARIED THROUGH 20 STEPS.

---- APOLLO 15 LM/ALSEP, JOHNSON--------

INVESTIGATION NAME - COLD CATHODE ION GAUGE

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES

U OF TEXAS, DALLAS

PERSONNEL PI - F.S. JOHNSON OI - D.E. EVANS

NSSDC 10- 71-0630-07

P1 - F.S. JUNNSUM 01 - D.E. EVANS UNKNOWN BRIEF DESCRIPTION THE CCGE WAS DESIGNED TO MEASURE THE AMOUNT OF GAS PRESENT ON THE LUNAR SURFACE. A COLD CATHODE IONIATION GAGE WAS USED FOR THIS PUPPOSE. THE STAILESS STEEL ENVELOPE AND ELECTRODES WERE PLACED IN AN AXIAL MAGNETIC FIELD OF 0.09 T (900G). A MAGNETIC SHIELD WAS MOUNTED AROUND THE GAGE AND ITS MAGNET. THE DEVICE WAS SENSITIVE TO GAS DENSITY RATHER THAN PRESSURE. THE RESPONSE VARIED SOMEWAAT WITH GAS COMPOSITION ELECTRODES DUE TO THE UNCHRAINTIES IN COMPOSITION WERE EXPECTED TO BE WITHIN A FACTOR OF TWO. THE CATHODE WAS CONNECTED TO A AUTO-RANGING. AUTO-ZEROING ELECTROMETER THAT MASURED CURRENTS IN THE RANGE 1.0E-13 TO 1.0E-16 AMPS. A TEMPERATURE DETECTOR WAS INCLUDED TO ENABLE CONVERSION OF THE READINGS TO EQUIVALENT PRESSURE. THE DATA FROM THE EXPERIMENT HAVE BEEM EXPRESSED AS EQUIVALENT DENSITY FOR A NITROGEN LUNAR ATMOSPHERE. THE CCGE HAD THREE AUTO-SWITCHED, OVERLAPPING. SENSIFIVITY RANGES ENABLING DETECTION OF THE LUNAR ATMOSPHERE FROM 2.45 TO 1.2E-11 PARTICLES/ CUBIC CM CEQUIVALENT NITROGHENE IN THE NORMAL GEMERATIONAL MODE THE BASIC CYCLE REPEATED FIJWE MEASURENTS (SEPARATED BY 2.4 S) AND THREE MEASUREMENTS (SEPARATED BY 40 S) EVERY 2.5 MIN. TEMPERATURE AND OTHER MEASURENTS WAS OBTAINED BY 2.4 S, WITH MO OTHER MEASURENTS WAS OBTAINED BY 2.4 S, WITH MO OTHER MEASURENTS WAS OBTAINED EVERY 2.4 S, WITH NO OTHER MEASURENTS WAS OBTAINED BY 2.4 S, AND THREE MEASUREMENTS (SEPARATED BY 40 S) EVERY 2.5 MIN. TEMPERATURE AND OTHER MEASURENTS WAS OBTAINED HUNCTIONS WERE ALSO SAMPLED WITHIN THIS 2.5-MIN CYCLE, IN A GROUND COMMANDED SPECIAL MODE, ONE MEASURENTS WAS OBTAINED EVERY 2.4 S, WITH MO OTHER MEASURENTS WAS OBTAINED EVERY 2.4 S, WITH MO OTHER MEASURENTS WAS OBTAINED AVER 0F THE MEASURENTS WAS OBTAINED AV

-- APOLLO 15 LM/ALSEP, LANGSETH-----

INVESTIGATION NAME- HEAT FLOW

NSSDC 10- 71-0630-06 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S)

PLANETOLOGY

PI - M.G. LANJSETH DI - S.P. CLARK, JR.

PERSONNEL

LAMONT-DOHERTY GED OBS

BRIEF DESCRIPTION THE HEAT FLOW EXPERIMENT (HFE), WHICH WAS PART OF THE ALSEP, WAS DESIGNED TO DETERMINE THE RATE OF HEAT LOSS FROM THE LUMAR INTERIOR. THE EXPERIMENT DETECTED LUMAR TEMPERATURES OF THE FOLLOWING TYPES AND RANGES, WITH CORRESPONDING ACCURATIES NOTED IN PARENTHESES -- HIGH-SENSITIVITY MEASUMEMENTS OF PLUS OR MINUS 2 DEG C (0.003 DEG C) TEMPERATURE DIFFERENCE, LOW-SENSITIVITY MEASUMEMENTS OF PLUS OR MINUS 20 DEG C (0.03 DEG C) TEMPERATURE DIFFERENCE, PROBE ANDIENT TEMPERATURES FOM 200 K TO 250 K (0.1 K), THERMOCOUPLE REFERENCE TEMPERATURES FOM 200 DEG C TO -60 DEG C (0.1 DEG C) AND PROBE CABLE ANDIENT TEMPENATURES FROM 90 K TO 250 K (0.3 K). THE INSTRUMENTATION CONSISTED OF TWO 1.2-M PROBES THAT WERE INSERTED INTO THE LUMAR SUBFACE, A SPELIAL TOOL FOR PROBE INSERTION, AND AN ELECTRONICS PACKAGE THAT WAS CADLE-CONNECTED TO THE PROBES INTO THE LUMAR SUBFACE, A SPELIAL TOOL FOR PROBE INSERTION, AND AN ELECTRONICS PACKAGE THAT WAS CADLE-CONNECTED TO THE PROBES INTO THE LUMAR SUBFACE, A SPELIAL TOOL FOR PROBE INSERTION, AND AN ELECTRONICS PACKAGE THAT CAS CADLE-CONNECTED TO THE PROBES INTO THE LUMAR SUBFACE, THO 3-4 MLES WERE DRILLED IN THE SUBFACE BY ASTRONAUT SCOTT USING THE APOLLO LUMAR SUBFACE DRILL (ALSD). THE ALSD WAS BUTAS, A BORE BIT/DRILL ADAPTER, A TREADLE, AND A BORE STEM/CORE STEM WRENCH. THE BORE STEM ASSEMBLIES USED IN BRILLING REMAINED IN THE HOLES IO. PROVIDE A CASING TO PREVENT COLLAPSE OF THE HOLE WALLS DURING INSERTION OF THE PROBES. BRIEF DESCRIPTION

-- APOLLO 15 LH/ALSEP, LATHAM-

INVESTIGATION NAME- PASSIVE SEISHIC

NSSDC 10- 71-063C-01

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) PLANETOLOGY

PERSONNEL		
PI - G.V. 01 - W.M.	LATHAM Ewing(deceased)	U OF TEXAS, GALVESTON
01 - F. 01 - G.H.	PRESS	MASS INST OF TECH U of Hawaii

OI - G.H. SUTTON U OF HAWAII BRIEF DESCRIPTION THE PASSIVE SEISMIC EXPERIMENT (PSE). PART OF THE APOLLO LUNAR SUBFACE EXPERIMENTS PACKAGE (ALSEP), MEASURED BEISMIC ENERGY ON THE MOON. THE MEASUREMENTS OBTAINED HAVE BEEN USED TO DETERMINE THE INTERNAL STRUCTURE OF THE MOON, THE RATE OF EMERGY RELEASE. AND THE MUMBERS AND MASSES OF METEOROIDS IMPACTING THE LUNAR SUFFACE. THE LUNAR SUFFACE INFACTS OF THE SPENT S-IVB AND IM ASCENT STAGES WERE USED AS EXTERNAL CALIBRATION SOURCES FOR THE SEISMORETERS. THE KNOWN MASS AND VELOCITY OF THESE STAGES AT SUFFACE INFACTS OF THE PART HAVE THE POINT OF EMERGY APPLICATION OF EMERGY GENERATED AT IMPACT AND THE POINT OF EMERGY SOURCES.) THE CALIBRATION CHARACTERISTICS WERE OF THE LL, COMSISTED OF THO SEISMONETER RESPONSE TO THESE ENABLED THE LM, COMSISTED OF THO SEISMIC ASEMBLIES — A LONG PENIOT (LP) SEISMONETER (TRIAIAL) ASEMBLIES — A LONG PENIOT (LP) SEISMONETER (TRIAIAL) ORTHOGONAL) WITH A SEISMIC FREQUENCY RESPONSE FROM 0.004 TO 3 MZ (80-DB DYNAMIC RANGE) AND A SHORT PERIOD (SP)'S SEISMONETER ROUNDED IN THE BOITON, WITH A SEISMIC FREQUENCY FREMOMENTS (FON 0.024 OF THE PSE SEISMONETERS WERE HOUSED IN A DRUM-SHARTED ENCLOSURE TO 20 HZ (80-DB DYNAMIC RANGE). THE MINIMUM DETECTANCE IGNAL OF THE SEISMONETERS WERE HOUSED IN A DRUM-SHARTED ENCLOSURE ROUNDED IN THE BOITON. THIS ENCLOSURE RESTED ON A SUPPORT STRUCTURE (STOOL) AND WAS COVERED BY A THERMAL SHROUD AFTER DEPLOYMENT OF THE BOTTON. THIS ENCLOSURE ROUNDED IN THE BOTTON. THIS ENCLOSURE RESTED ON A SUPPORT STRUCTURE (STOOL) AND WAS COVERED BY A THERMAL SHROUD AFTER DEPLOYMENT OF THE EXPERIMENT.

SPACECRAFT COMMON NAME- APOLLO 16 LM/ALSEP ALTERNATE NAMES- ALSEP 16, LEM 16 ROVER 16, 06005 APOLLO 160

NSSDC 10- 72-031c

LAUNCH DATE- 04/16/72 Launch Site- cape canaveral, united states Launch vehicle- saturn WEIGHT- 5040, KG

> NASA-055 NASA-OMSE

SPONSORING COUNTRY/AGENCY UNITED STATES UNITED STATES

INITIAL ORBIT PARAMETERS ORBIT TYPE- LUNAR LANDER

PERSONNEL		
MG - F.I. SC - J.B. PN - K.F. PS +	HANLEY	WASA NASA NASA-

BRIEF DESCRIPTION THE APOLLO 10 LUNAR MODULE (LM) CONSISTED 0, A LUNAR LANDING CRAFT, A LUNAR ROVING VEHICLE (LRV), AND AN APOLLO LUNAR SURFACE EXPERIMENTS PACKAGE (ALSEP) THAT CONTAINED SCIENTIFIC EXPERIMENTS LEFT ON THE LUNAR SURFACE AFTER COMPLETION OF THE MANNED PORTION OF THE MISSION. THE LM LANDED IN THE DESCARTES HIGHLAND REGION JUST NORTH OF THE CRATER POLLAND AT 8 DEG 59 MIN 55 S SOUTH LATITUDE, AND 15 DEG 31 MIN SITE. THE LAV WAS USED DURING EXTRAVENCULAR ACTIVITIES (EVA) TO EXTEND THE ALNED OF MANNED LUNAR SURFLORATION, THE HICLEAR-POWERED ALSEP PACKAGE CONTAINED SEISMIC, MAGNETIC FIELD, AND HEAT FLOW EXPERIMENTS. THE LM ITSELF WAS ON THE LJNAR SURFACE APRIL 21-24, 1972.

INVESTIGATION NAME- LUNAR SURFACE MAGNETOMETER

NSSDC ID- 72-0310-03

INVESTIGATIVE PROGRAM CODE 5L

INVESTIGATION DISLIPLINE(S) Particles and fields

PERSONNEL DÝAL Parkín Sonett 01

HASA-ARE NASA-ARC U OF ARIZONA

HEADQUARTERS HEADQUARTERS

121

APOLLO 16 LM/ALSEP, DYAL-----

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF A TRIAXIAL FLUXGATE THIS EXPERIMENT CONSISTED OF A TRIAXIAL FLUXGATE NACHETOHETER AND WAS PART OF A THREE-STATION NETWORK (APOLLO 12.15.163 INTENDED TO YIELD INFORMATION ON THE INTERNAL ELECTROMAGNETIC CHARACTERISTICS OF THE MOON. FLIPPABLE SENSORS WERE LOCATED 75 CM ABOVE THE LUNAR SURFACE AT THE ENDS OF THREE ORTHOGONAL 100-CM BOOMS. SENSOR ORIENTATION WAS INITIALLY DETERMINED BY THE ASTRONAUTS' USING A BUBBLE LEVEL AND SHADOWGRAPH, AND HAS BEEN SUBSEQUENTLY MONITORED (WITH AM ACCURACY OF 0.2 DEGREES) BY GRAVITY-LEVEL SENSORS. EACH SENSOR 200LD BE OPERATED IN THE RANGES FROM MINUS TO PLUS SO, 100, OR 2010 GAMMAS, WITH A 0.1-GAMMA RESOLUTION. FREQUENCY RESPONSE WES FROM O TO 3 HZ. BRIEF DESCRIPTION WAS FROM D TO 3 HZ.

--- APOLLO 16 LN/ALSEP, KOVACH------

INVESTIGATION NAME- ACTIVE SEISMIC

NSSDC IP-	10-	72-0310-02	INVESTIGATIVE PROBRAM		
				CODE SL	

INVESTIGATION DISCIPLINE(S) Planetology

PERSONNEL STANFORD U U OF TEXAS, GALVESTON PI - R.L. KOVACH DI - J.S. WATKINS

UL - J.S. WATKINS DRIEF DESCRIPTION THE PURPOSE OF THE (S-033) ACTIVE SEISMIC EXPERIMENT (ASE) WAS TO ACQUIRE DATA TO DETERMINE THE PHYSICAL PROPERTIES OF THE LUNAR SUBFACE AND SUBSURFACE MATERIALS. BOTH NATURAL AND ARTIFICIALLY PRODUCED SEISMIC WAVES WERE MONITORED. THE ARTIFICIALLY PRODUCED SEISMIC WAVES WERE MONITORED. THE ARTIFICIALLY PRODUCED SEISMIC WAVES WERE MONITORED. THE ARTIFICIAL WAVES WERE PRODUCED BY SHOTGUN-LIKE CHARGES FIRED BY A THUMPER' DEVICE AND EXPLOSIVE GRENADE CHARGES FIRED BY A THUMPER'S DEVICE AND EXPLOSIVE GRENADE CHARGES FIRED UFA A THUMPER'S DEVICE AND ASSEMBLY. A MORTAR PACKAGE ASSEMBLY, INTERCONNECTING CABLES, AND AN ELECTRONICS ASSEMBLY MOUSED IN THE CENTRAL STATION, THE ASE GENERATED AND HONITORED SEISMIC WAVES IN THE RANGE 3 TO 250 HZ WITH A FREDUENCY RESPONSE OF PLUS ON MINUS 3 DB IN THE FREQUENCY RANGE OF 3 TO 100 HZ. NATURAL SEISMIC WAVES WERE ALSO MONITORED WITHIN THIS RANGE WHILE THE ALSEP STATION WAS DHERATION IN THE ASE RODE. THE DATA-GATHERING INTERVAL WAS SMALL, BECAUSE THE CENTRAL STATION OPERATED IN THE ASE MODE ON THE AVERAGE OF ONLY 30 MIN/WEEK. THE THUMPER CONTAINED 21 STANDARD INITIATORS MOUNTED PREPENDICULAR TO ITS BASE PLATE, WHICH WAS SELECTED AND HIXED BY AN ASTRONAUT. THE THUMPER WAS CABLE-CONNECTED TO THE CENTRAL STATION AND WAS FIRED AT INTERVALS OF 5 N. THUMPER FINGS BY OND APPROXIMATELY 40 M PROULCED WERE ANDLIFIED. ONNECTED TO THE CONTAINENT L'H THUMPER WAS CABLE-CONNECTED TO THE CENTRAL STATION, DAY BASE WARE MADAUCED MAR SIGNADES. WERE BY AN ASTRONAUT. THE THUMPER WAS CABLE-CONNECTED TO THE CENTRAL STATION ON TO LAUNCH WARE SIGNALS. ONE P-WAVE VELOCITY OF 134 M/SEE WARE MEASURED. THE GEOPHONES WERE BY AN ASTRONAUT. THE CHARA STATION, THE WARE AMPLIFIED, DIGITIZED, AND PRONTAMATELY 150, 300, AND 900 MF FOM THE CABLE-CONNECTED TO THE CENTRAL STATION NOT TO LAUNCH ASSEMBLY DIGITIZED, AND ASSEMBLY. THE DECISION NOT TO LAUNCH GRENADE MO. 1 (1SDOR DAY WAS MASE BECAUSE THE LAUNCH ASSEMBLY PITCH-ANGLE SENSOR WENT OFFICICLE HI

- APOLLO 16 LM/ALSEP, LATHAM------

INVESTIGATION NAME- PASSIVE SEISMIC (PSE)

INVESTIGATIVE PROGPAM NSSDC 10- 72-0310-01 CODE SL

> INVESTIGATION DISCIPLINE(S) PLANETOLOGY

PERSONNEL PI - G.V.			TEXAS, GALVESTON Inst of tech
01 - F. 01 - G.H.	PRESS SUTTON		HAWAII

BRIEF DESCRIPTION THE PURPOSE OF THE PSE (S-031), WHICH WAS PART OF THE ALSEP, WAS TO NEASURE SEISMIC SUGALS FROM ALL EXTERNAL AND INTERNAL SOURCES OF SEISMIC ENERGY ON THE MOON. THE DATA FROM THIS EXPERIMENT WILL BE USED TO DETERMINE THE INTERNAL LUNAR STRUCTURE, RATE OF ENERGY RELEASE, AND NUMBERS AND MASSES OF IMPACTING METEORS. THIS EXPERIMENT USED THE DATA FROM EXPERIMENTS ON THE INPACTS OF THE S-IV B AND LM ASCENT STAGES AS EXTERNAL CALIBRATION SOURCES. THE INSTRUMENT PACKAGE REPRESENTED THE FOURTH ACTIVE INSTRUMENT AVAILABLE IN THE LUNAR SELSMIC NETWORK AND ENABLED SCIENTISTS TO LOCATE REGIONS OF SEISMIC ACTIVITY HORE PRÉCISELY. THE INSTRUMENT PACKAGE WAS COMPOSED OF TWO ASSEMBLIES --- (1) A LONG-PERIOD, TRAXIAL-ORTHOGONAL SEISMOMETER WITH A SEISMIC FREQUENCY RESPONSE FROM 0.004 TO 3 HZ (80-DB) DYNAMICAL RANGE AND (2) A SHORT-PERIDO, UNIAXIAL, VERTICAL MOTION SEISMOMETER WITH A SEISMIC FREQUENCY MESPONSE FROM O.US TO 20 HZ (80-DB) DYNAMICAL RANGE AND THE MINIMUM DETECTABLE SIGNALS OF 0.3 MICROMETER AT A FREQUENCY MINIMUM DETECTABLE SIGNALS OF 0.3 MICROMETER AT A FREQUENCY ALSEP POWER STATION, WHICH WAS DEPLOYED BY THE ASTRONAUTS.

SPACECRAFT COMMON NAME- APOLLO 17 LM/ALSEP Alternate Names- Apollo 17C, 06307 Lem 17, Rover 17 Alsep 17

NSSDC 10- 72-0960

WEIGHT- 5050. KG LAUNCH DATE- 12/07/72 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- SATURN

SPONSORING COUNTRY/AGENCY UNITED STATES UNITED STATES NASA-OMSF NASA-OSS

INITIAL CREIT PARAMETERS ORBIT TYPE- LUNAR LANDER

PERSONNEL

NG - F.I. ROBERSON SC - J.B. HANLEY PN - W.F. EICHELMAN PS - NONE ASSIGNED	NASA HEADQUARTERS NASA HEADQUARTERS NASA-JSC
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BRIEF DESCRIPTION THE APOLLO 17 LUNAR SURFACE EXPERIMENTS PACKAGE (ALSEP) THE APOLLO 17 LUNAR SURFACE EXPERIMENTS PACKAGE (ALSEP) HAS DEPLOYED BY THE ASTRONAUTS IN THE NORTHEASTERN PORTION OF THE MOON (LATITUDE 20 DEG 10 RIN N, LONGITUDE 30 DEG 48 MIN F) OM THE SOUTHEASTERN RIM OF MARE SERENITATIS IN A DARK DEPOSIT BETWEEN MASSIVE UNITS OF THE SOUTHWESTERN TAURUS NOUNTAINS SOUTH OF LITTRG, CRATER. THE ALSEP EXPERIMENTS WERE POWERED BY A NUCLEAR POWER SOURCE AND INCLUDED STUDY OF THE AIMOSPHERIC AND INIC ENVIRONMENT OF THE MOON, HEAT LOSS FROM THE LUNAR INTERIOR, LUNAR SUBFACE GRAVIMETES, LUNAR SEISHTC PROFILING AND LUNAR SUBFACE GRAVIMETES. THE LM WAS ON THE LUNAR SURFACE DECEMBER 11-13, 1972.

- APOLLO 17 LH/ALSEP, BERG------

INVESTIGATION NAME- LUNAR EJECTA AND METEORITES

NSSDC 10- 72-0960-05

INVESTIGATION DISCIPLINE(S)

PERSONNEL PI - 0.E. BERG

NASA-GSEC

PERSONNEL P1 - 0.E. BERG BRIEF DESCRIPTION THE APOLLO TI LUNAR EJECTA AND RETEORITE EXPERIMENT MEASURED THE FREQUENCY WITH WHICH THE MOON IS IMPACTED BY PRIMARY COSMIC DUST PARTICLES AND THE EFFECT OF THE LUNAR EJECTA EMANATING FROM THE SITES OF METEORITE INPACTS ON THE LUNAR SURFACE. THE EXPERIMENT HAD THE FOLLOWING SPECIFIC OBJECTIVES -- (1) TO DETERNINE THE BACKGROUND AND LONG-TERM VARIATIONS OF COSMIC DUST INFLUX RATES IN CISLUMAR SPACE, (2) TO DETERMINE THE EXTENT AND NATURE OF LUNAR EJECTA PRODUCED BY METEORITE IMPACTS ON THE LUNAR SURFACE, (3) TO DETERMINE THE EATIVE CONTRIBUTION OF COMETS AND ASTEROIDS TO THE EARTH'S RETEOROID ENSEMBLE, (4) TO STUDY POSSIBLE CORRELATIONS BETWEEN SURFACE. STSTEM PASSES THROUGH GALACTIC SPACE, AND (6) TO DETERMINE THE EXTENT OF THE CONTRIBUTION OF INTERSTELLAR PARTICLES TOWARD THE MAINTENANCE OF THE SOLAR STATEMANS, (5) TO DETERMINE THE EXTENT OF THE CONTRIBUTION OF INTERSENCE. SUSAR STSTEM PASSES THROUGH GALACTIC SPACE, AND (6) TO INVESTIGATE TWC EXISTENCE OF AN EFFECT CALLED 'EARTH FOCUSING OF DUST PARTICLES.' THE EQUIPANT FOR MISTING THE EXTERNAL UNIT NASS PART OF THE ADOLLO 17 ALSEP, INCLUDED ONE DEPLOYABLE WITH NASS PART OF THE ADOLLO 17 ALSEP, INCLUDED ONE DEPLOYABLE WITH INT ME CENTRAL SIATION. THE EXTERNAL UNIT COMPONENTS OR SENSORS CONSISTED OF SUPPRESSOR AND COLLECTOR PLATES, INPACT PARTICLES, FILM FRAMES, AND MICROPHONES. THE SENSOR HAD A FIELD OF UNING 26 DEG. IT MEASURED PARTICLE IMPACTS IN AN EMERGY OF PLUS ON MINUS 26 DEG. IT MEASURED PARTICLE IMPACTS IN AN EMERGY FIG. 6-4 INPACTS/SM M'S. THE EXTERNAL UNIT WAS ERECTED AND SENSORY CONSISTED OF SUPPRESSOR AND COLLECTOR PLATES, INPACT PLATES, FILM FRAMES, AND MICROPHONES. THE SENSOR HAD A FIELD OF DETERMINE STATE ON THE LUNAR SURFACE ADOUT BA NOUTH OF THE ALSEP OF PLUS OR MINUS 26 DEG. IT MEASURED PARTICLE IMPACTS IN AN EMERGY FIG. 6-4 INPACTS/SM M'S. THE EXTERNAL UNIT WAS ERECTED AND SENSORY ON THE LUNAR SURFACE ADOUT BA SOUTH OF THE ASUREMENT OF PLUS ON MINUS 26 DEG. IT MEA

-- APOLLO 17 EN/ALSEP, KOVACH-----

INVESTIGATION NAME- LUNAR SEISMIC PROFILING EXPERIMENT

NSSDC 10- 72-0960-06

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(5) PLANETOLOGY

INTERPLANETARY DUST

INVESTIGATIVE PROGRAM

CODE SL

PERSONNEL

PI - R.L. KOVACH 01 - J.S. WATKINS

STANFORD U U OF TEXAS, GALVESTON

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE PURPOSE OF THE LUMAR SEISMIC PROFILING EXPERIMENT (S-203) WAS TO ACQUIRE DATA ON THE PHYSICAL PROPERTIES OF THE (UNAR NERA-SURFACE MATERIALS. SPECIFIC OBJECTIVES INCLUDED MEASURING THE LUMAR SEISMIC SIGNALS PRODUCED BY DETONATION OF EAPLOSIVE CHARGES ON THE SURFACE, MONITORING MATURAL SEISMIC ACTIVITY RESULTING FROM MOOMULAKES OR METEORITE IMPACTS. RECORDING THE SEISMIC SIGNALS RESULTING FROM THE ASCENT OF THE LM, AND RECORDING THE SEISMIC SIGNALS RESULTING FROM THE MACTOF THE SPENT LM ASCENT STAGE. THIS EXPERIMENT YIELDED DETAILED INFORMATION ON LUMAR GEOLOGIC CHARACTERISTICS TO DEPTHS OF 3 GEOPHONE MODULE WITH A MARKER FLAG, AN ELECTRONICS PACKAGE IN THE ALSE CENTRAL STATION. A TRANSMITTER, AN ANTENNA, AND SIGHT CXPLOSIVE PACKAGES. THE EXPLOSIVE PACKAGE MAJOR COMPONENTS WERE A RECEIVING ANTENNA, A RECEIVER, AN EXPLOSIVE TRAIN, A SIGNAL PROCESSOR, AND A FIRING PULSE GEMERATOR. THE CREW DEPLOYED THE GEOPHONES AND THE GEOPHOME RODULE MARKED WITH FLAGS AND THEN PHOTOGRAPHED THE ALSO OFFLOYED AND CONNECTED TO THE ALSEP CENTRAL STATION. THE SEPLOSIVE PACKAGES WERE DEPLOYED THE GEOPHONES AND THE MARY A RECEIVER, AND ELECTRONICS PACKAGE WERE ALSO DEFLOYED AND CONNECTED TO THE ALSEP CENTRAL STATION. THE EXPLOSIVE PACKAGES. ------ APOLLO 17 LH/ALSEP, LANGESTH-------

--- APOLLO 17 LH/ALSEP, LANGSETH-----

INVESTIGATION NAME- HEAT FLOW

NSSDC 10- 72-0960-01

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PLANETOLOGY

LABONT-DOHERTY GEO OBS

LEHMAN COLLEGE

ERSOI	INI	EL			
ΡI	-	M.G.	LANGSEI	F#	
01	-	S.P.	CLARK,	JR.	
01	-	Jaka	CHUTE,	JR.	

OI - J.L. CHUTE, JR. LEHMAN COLLEGE BRIEF DESCRIPTION THE PURPOSE OF THE HEAT FLOW EXPERIMENT (S-037) WAS TO DETERMINE THE RATE OF HEAT LOSS FROM THE LUNAR INTERIOR. SPECIFIC DBJECTIVES WERE -- (1) MEASUREMENT OF THE SUBJECT VERTICAL TEAPERATURE GRADIENTS IN THE LUNAR SURFACE LATER AS A FUNCTION OF TIME, (2) MEASUREMENT OF THE ABSOLUTE TEMPERATURE OF THE LUNAR SUBSURFACE AS A FUNCTION OF TIME, (3) DETERMINATION OF THE THERMAL CONDUCTIVITY OF THE LUNAR SUBSURFACE MATERIAL, AND (6) MEASUREMENT OF THE SURFACE PROVIDED DATA ON THE LUNAR SOLL HIMERNAL CONDUCTIVITY OF THE SURFACE MOVIDED PACE BASES, AND ESTABLISHED LIMITS OF CONSTRAINT ON THE INTERIOR PROCESSES, AND ESTABLISHED LIMITS OF CONSTRAINT ON THE INTERIOR REDEGS, AND THE STABLISHED LIMITS OF CONSTRAINT ON THE INTERIOR REDEGS, AND ESTABLISHED LIMITS OF CONSTRAINT ON THE INTERIOR REDEGS, AND ESTABLISHED LIMITS OF CONSTRAINT ON THE INTERIOR RAD THE LONGES (EACH ABOUT 1.2 M IN LENGTH), A SPECIAL TOOL FOR PROBES INSERTION SADIELDS FOR EACH PROBES AND AND CHE ALSEP CONTROLS STATION SHALEDS FOR TEACH PROBES AND AND LALE ABOUT 10 M APART. THE BORE SYSTEMS REMAINED IN THE LUNAR SURFACE ABOUT 10 M APART. THE BORE SYSTEMS REMAINED IN THE PROBE WAS INSERTED INTO EACH HOLE, AND THE DEPTH OF THE PROBE WAS RECORDED.

-- APOLLO 17 UN/ALSER, WEBER-----

INVESTIGATION NAME- LUNAR SURFACE GRAVINETER

NSS0C 10- 72-096C-09 INVESTIGATIVE PROGRAM Code SL

INVESTIGATION DISCIPLINE(S) PLANETOLOGY

PERSONNEL PI - J. 01 - J.V.

U OF MARYLAND

BRIEF DESCRIPTION

WEBER

LARSON

BRIEF DESCRIPTION THE PURPOSE OF THE LUNAR SURFACE GRAVIMETER EXPERIMENT (S-207) WAS TO OBSTAIN HIGHLY ACCURATE MEASUREMENTS OF THE LUNAR SURFACE GRAVITATIONAL ACCELERATION AND ITS TEMPORAL VARIATIONS AT A SELECTED POINT ON THE SURFACE. SPECIFIC OBJECTIVES WERE DETERMINATION OF THE SURFACE. SPECIFIC OBJECTIVES WERE GRAVITY (WITH AN ACCURACY OF ABOUT 1 PART IN 1.E5), OEFFGINATION OF THE MAGNITODE OF LUNAR GRAVITY RELATIVE TO EARTH GRAVITY (WITH AN ACCURACY OF ABOUT 1 PART IN 1.E5), OEFFGINATION OF THE MAGNITODE OF LUNAR SURFACE DEFORMATION DUE TO TIDAL FORCES, MEASUREMENT OF VERTICAL COMPONENTS OF LUNAR NATURAL SEISNICITY, AND MONITORING OF FREE OSCILLATIONS OF THE MOON THAT MAY BE INDUCED BY GRAVITATIONAL RADIATION FROM COSNIC SURACES. THE EQUIPMENT CONSISTED OF ELECTRONICS, SENSORS (SPRING MASS SUSPENSION CAPACITOR PLATES), A SUNSHIELD, AND A RIBBON CABLE TO THE CENTRAL STATION ELECTRONICS. THE CRUM DEFLOYED THIS EXPERIMENT ABOUT B N FROM THE ALSEP CENTRAL STATION. THIS PROCEDURE CONSISTED OF LEVELING AND ALIGNMENT WITHIN PLUS OR MINUS I DEG, DISKIG THE SUNSHIELD SHADOW, AND MATING THE CABLE TO THE CENTRAL STATION.

SPACECRAF1	CONNOL	NAME- AS	ТАННАТИ			
ALTERNATE	NAMES-	ARIABAT,	INDEAN	SCIENTIFIC	SAT.	
		INDASAT				

ARYABHATA************

NSSDC 10- 75-033A

LAUNCH DATE- 04/19/75 LAUNCH SITE-	WEIGHT- 360, KG
LAUNCH VEHICLE- INTROOS II	

ISRO

SPONSORING COUNTRY/AGENCY INDIA

INITIAL ORBIT PARAMETERS Orbit Type- Geocentric Orbit Periud- 96.5 min Periapsis- 568. Km	EPOCH DATE- 04/20/75 Inclination- 50.7 deg Apgapsis- 411. Km		
PERSONNEL PD - U.R. RAO MG - UNKNOWN SC - UNKNOWN PS - U.P. RAO	ISSP, VSSC Unknown Unknown ISSP, VSSC		

PS - U.P. RAO ISSP. VSSC BRIEF DESCRIPTION THIS SPACECRAFI, NAMED AFTER THE FAMOUS INDIAN ASTRONOMCR, WAS INDIA'S FIRST SATELLITE AND WAS COMPLETELY DESIGNED AND FABRICATED IN INDIA. IT WAS LAUNCHED BY A SOVIET ROCKET FROM A SOVIET COSMODROME. THE SPACECRAFT WAS GUASISPHERICAL IN SHAPE CONTAINING 26 SIDES AND CONTAINED THREE EXPERIMENTS FOR THE MEASUREMENT OF COSMIC X-RAYS, SO'AR ALONG WITH A UV SENSOR, THE SPACECRAFT WEIGHED 360 KG, USED SOLAR PANELS ON 24 SIDES TO PROVIDE 46 WATTS OF POWER, USED A ALONG WITH A UV SENSOR, THE SPACECRAFT WEIGHED 360 KG, USED SOLAR PANELS ON 24 SIDES TO PROVIDE 46 WATTS OF POWER USED A APASSIVE THERMAL CONTROL SYSTEM, CONTAINED BATTERIES, AND A SPIN-UP GAS JET SYSTEM TO PROVIDE A SPIN RATE OF NOT MORE THAM 40 RPM. THERME WERE A SET OF ALITIDUS SENSORS COMPRISED OF A ATAIAXIAL MAGNETOMETER, A DIGITAL ELEVATION SOLAR SENSOR, AND FOUR ALIMUTH SOLAR SENSORS. THE DATA SYSTEM INCLUDED A TAPE RECORDER AT 256 B/S WITH PLATBACK AT 10 THES THAT RATE. THE PCM-FM-FM TELEMETRY SYSTEM OPERATED AT 137.44 MHZ. THE ESTABLISHED AT SHAR CENTRE IN SRIHARIKOTA, ANDHRA FRADESH.

- ARYABHATA, DANIEL------

INVESTIGATION NAME- SOLAR NEUTRON AND GAMMA RAYS

NSSDC ID-	75-0334-02	INVESTIGATIVE PROGRAM Science
		INVESTIGATION DISCIPLINE(\$) Solar physics
PERSONNE' PI - R.F	ANIEL	· · · · · · · · · · · · · · · · · · ·
01 - P.J		TATA INST OF FUND RES
01 - S.V		TATA INST OF FUND RES TATA INST OF FUND RES

PERSONNE"			
PI - R.R. 01 - P.J. 01 - S.V.	LAVAKARE	ТАТА Тата Тата	

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DI -S.V. DAMLE TAA INST OF FUND RES DI -S.V. DAMLE TAA INST OF FUND RES BRIEF DESCRIPTION THIS INVESTIGATION WAS CONCERNED WITH THE STUDY OF THIS INVESTIGATION WAS CONCERNED WITH THE STUDY OF THIS INVESTIGATION WAS CONCERNED WITH THE STUDY OF TO 24 MEY. ALTHOUGH IT WAS INTENDED TO MEASURE THOSE PARTICLES AND PHOTONS ASSOCIATED WITH VIOLENT OUTBURSTS FROM THE SUN, THE DATA WERE ONLY ACCUMULATED IN REAL TIME FROM 11 ORBITS. THIS PERMITED A STUDY OF ATMOSPHERIC NEUTRONS AND GAMMA RAYS. OURING THIS INE, SOME EVENTS SHOWING SUDDEN INCREASES IN GAMMA RAY COUNTING RATES WERE RECORDED. THE DETECTOR SYSTEM CONSISTED OF A 12.5-CM-DIAMETER, 1.27-CM-THICK CSI (TL) CRYSTAL COUPLED TO A 12.5-CM-DIAMETER PM TUBE THAT WAS COMPLETELY ENCLOSED IN A 1-CM THICK, PLASTIC, SCINTILLATOR ANTICOINCIDENCE SHIELD. THIS SHTELD WAS VIEWED BY FOUR 3.8-CH-DIAMETER PM TUBES. A PULSE SHAPE DISCRIMINATOR WAS USED FOR EMERGY DEPOSITION IN THE CSI CRYSTAL GREATER THAN 5 MEV TO DISTINGUISM ACCOMPLISHED BY A 64-CHANNEL ANALYTER. FOR PULSES BELOWS MAS ACCOMPLIED TO 0.4, 0.4 TO 1 AND 1 TO 4 MEV WERE MEASURED. THE COINCIDENCE RATES BETWEEN THE CENTRAL AND SHIELD CRYSTALS AS WELL AS THE SINGLES RATE OF THE SHIELD LARSURED. THE COINCIDENCE RATES BETWEEN THE CENTRAL AND SHIELD CRYSTALS AS WELL AS THE SINGLES RATE OF THE SHIELD THE DATA RATES WERE SCANNED EVERY SECOND AND TRANSHITED THROUGH THE SPACECRAFT TELEMETRY. FURTHER OETAILS OF THE EXPERIMENT ARE PUBLISHED IN 'PRAMANA' 7, 355, 1976.

- ARTABHATA, PRAKASH------

INVESTIGATION NAME- IONOSPHERIC ELECTRON TRAP AND UV CHAMBERS

NSSDC ID- 75-0334-03

INVESTIGATIVE PROGRAM SCIENCE

INVESTIGATION DISCIPLINE(S) JONOSPHERES ATHOSPHERIC PHYSICS

PERSONNEL PI - S. PRAKASH OI - B.H. SUBBARAYA

THIS EXPERIMENT OBJECTIVE WAS TO USE AN ELETTRON TRAP TO MEASURE ELECTRON EMERGIES UP TO 100 EV, AND TO UJE UV CHAMBERS To momitor the scattered lyman-alpha radia" on and oxygen Emissions in the night SKY.

SCIENCE

INVESTIGATION NAME- X-RAY ASTRONOMY

-- ARYABHATA, RAO-

INVESTIGATIVE PROGRAM NSSDC 10- 75-0334-01

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PERSONNEL P1 - U.R. 01 - K. RAG Kasturirangan ISSP/ VSSC ISSP/ VSSC

BRIEF DESCRIPTION THIS EXPERIMENT USED AN NAI (TL) SCINTILLATOR AND A Proportional counter to measure x rays in the energy range 2 to 100 kev from both celestial sources and cosmic background.

SPACECRAFT COMMON NAME- ASTP-APOLLO Alternate names- apollo soyuz test proj., soyuz apollo

NSSDC 10- 75-066A

LAUNCH DATE- 07/15/75 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- SATURN WEIGHT- 14856. KG

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-OMSF

INITIAL ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 88.91 Min Periapsis- 217. KM	EPOCH DATE- 07/18/75 Inclination- 51.75 deg Apoapsis- 231. KM		
PERSONNEL TD - G.S. LUNNEY SC - R.T. GIULI PM - C.M. LEE	NASA-JSC NASA-JSC NASA HEADQUARTERS		

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE UNITED STATES AND THE U.S.S.R. LAUNCHED AN APOLLO SPACECRAFT AND A SOYUZ SPACECRAFT, RESPECTIVELY, AS A JOINT EFFORT CALLED THE APOLLO-SOYUZ TEST PROJECT (ASTP). THE SOYUZ SPACECRAFT WAS LAUNCHED FIRST, WITH A TWO-MAH CREW WHO MANEUVERED THEIR SPACECRAFT INTO A DOCKING ORBIT. THE APOLLO SPACECRAFT WAS LAUNCHED 7 1/2 HR LATER, WITH A THREE-MAN CREW WHO PLACED THEIR SPACECRAFT INTO A PROPER CONFIGURATION FOR SPACECRAFT WAS LAUNCHED 7 1/2 HR LATER, WITH A THREE-MAN CREW WHO PLACED THEIR SPACECRAFT. THE DOCKING ORBIT. THE APOLLO SPACECRAFT OCCURRED ON THE THIRD DAY. AFTER DOCKING, CREW TRANSFERS TOOK PLACE WITH THE APOLLO CREW FIRST VISITING THE SOYUZ. THE COMBINED APOLLO-SOYUZ CREWS PERFORMED JOINT EXPERIMENTS AND PRESENTED RADIO AND TW REPORTS. AFTER JOINT EXPERIMENTS WERE COMPLFIED, THE SPACECRAFT DISENGAGED AND EACH CONTINUED ITS SEPARATE MISSION.

-- ASTP-APOLLOV AKOEV-

INVESTIGATION NAME- ZONE FORMING FUNGI

INVESTIGATIVE PROGRAM CODE SB INVESTIGATION DISCIPLINE(S) Space Biology

PERSONNEL PI - I.G. AKOEV

NSSDC 10- 75-0664-24

NINKNOWN

BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT WAS TO INVESTIGATE THE EFFECT OF SPACE FLIGHT CONDITIONS ON THE RHYTHMS OF VEGETATIVE AND SPORE PHASE CHARACTERISTICS OF STREPTONYCES LEVORIS. THIS SPECIES WAS ISOLATED, NAMED, AND PROVIDED BY THE U.S.S.R. AND WAS USED AS THE PRIMARY TEST SPECIMEN FOR THIS EXPERIMENT. THE CULTURAL CHARACTERISTICS OF THIS ORGANISM PERMIT IN SITU COMPARISON OF SPORE RING FEATURES AND DEVELOPMENT RATES IN PREFLIGHT, FLIGHT. AND POSTFLIGHT PERIODS OF THE APOLLO-SOVUZ TEST PROJECT. WITHIN A SINGLE CULTURE. ASPECTS OF THE EXPERIMENT THAT WERE SINDIED INCLUDED -- (1) CULTURES THAT HAD GENN INITIATED WITHIR, A IN-NR PHASE SHIFT WERE EACHANGED DURING THE FLIGHT, (2) THE EFVECTS OF LOCAL RADIATION OM GENERIC CHANGES WERE STUDIED. (3) CHARACTERISTICS OF SECONDARY CULTURES THAT WERE DERIVED FOOM DIFFERENT SECTORS OF THE PRIMARY CULTURES WERE STUDIED AND COMPARED, AND (4) MONPHOLOGICAL AMP CULTUREL PROFILES OF DIFFERENT NUTRIENT MEER EACONDED. EACH FLIGHT DEVICE HELD TWO PETRI DISHES THAT CONTAINED STREPTORYCES CULTURES. RADIATION DETECTORS UF CLULUSES THAT WERE CULTURES. RADIATION DETECTORS UF CLULUSES THAT WERE STUDIED AND COMPARED, AND (4) MONPHOLOGICAL AMP CULTURES URRE STUDIED AND PETRI DISHES THAT CONTAINED STREPTORYCES CULTURES. RADIATION DETECTORS UF CELLULOSE THIACTATE, CELLULOSE NITRATE, AND LEXAN WERE USED TO REGISTER

PARTICLES THAT PASSED THROUGH THE BIOLOGICAL TEST SYSTEMS, AND THEY WERE PLACED BENEATH THE PETRI DISHES AS WELL AS IN A MOVABLE LID. ALL FLIGHT AND CONTROL SPECIMENS WERE PHOTOGRAPHED AT 12-H (PLUS OR MINUS 3 H) INTERVALS FROM THE TIME THE CULTURES WERE SELECTED FOR THE EXPERIMENT UNTIL TERMINATION. ADDITIONAL DETAILS OF THE EXPERIMENT AND ITS PERFORMANCE CAN BE FOUND IN, '20NE FORMING , 'MGI - EXPERIMENT AN-147-4 T. D. ROGE'S ET AL., APOLLO-SOYUL TEST PROJECT, PRELIMINARY SCIENCE REPORT, TM-X-58173, 15.1-15.17, 1976.

---- ASTP-APOLLO, ALLEN------

CODE SB

INVESTIGATION NAME- ELECTROPHORESIS TECHNOLOGY

INVESTIGATIVE PROGRAM NSSDC 10- 75-0664-20

INVESTIGATION DISCIPLINE(5) Space Biology

NASA-MSFC

PERSONNEL P1 - R.E. ALLEN

PI-R.E. ALLEN NASA-MSFC BRIEF DESCRIPTION THE ELECTROPHORESIS TECHNOLOGY EXPERIMENT WAS DESIGNED TO TEST ELECTROPHORESIS HARDWARE THAT WOULD CONTINUE THE DEVELOPMENT OF TECHNOLOGY FOR ELECTROPHORETIC SEPARATION OF MATERIALS IN SPACE. SPECIFICALLY, THE OBJECTIVES WERE -- (1) TO CONDUCT ENGINEERING AND OPERATIONAL TESTS OF A SPACE RATED STATIC ELECTROPHORESIS SEPARATION APPARATUS, (2) TO FUTHER CURRENT RESEARCH EFFORTS THROUGH THE SEPARATION OF SIMILAR CELLULAR SPECIES, (3) TO REDUCE OR ELIMINATE ELECTRO-OMOSIS THROUGH SEPARATION OF SIMILAR CELLULAR SPECIES, (4) TO APPLY BIOLOGICAL SAMPLES PAECISELY WITHOUT PERTURBING THE SUBSEQUENT ELECTROPHORESIS, (5) TO MAINTAIN VIABLE BIOLOGICAL SAMPLES DURING ALL PHASES OF THE EXPERIMENT PROCEDURE, (6) TO DEMONSTRATE ISOTACHOPHORESIS OF RED BLOOD CELLS IN SPACE. THERE WERE FOUR MAJOR ELEMENTS IN THE EXPERIMENT EQUIPMENT --(1) AN ELECTROPHORESIS WHIT (EU), (2) A CAYOGENIC FREEZER (CF)). (3) EIGHT EXPERIMENT COLUMNS, AND (4) EIGHT SAMPLE INSERTION SLIDES, THE FOLLOWING SIDAUGICAL SUBSTANCES WERE CONTAINED IN THE SAMPLE SLIDES FOR THE EIGHT EXPERIMENT SIAGES -- (1) COLUMNS 1 AND 5 - RABBIT AND HUMAN, ARD HORSE FIXED RED BLOOD LUMPHOCYTES, (3) COLUMNS 3 AND 7 - HUMAN FETAL KIDNEY CELLS, (4) COLUMNS 4 - FIXED RABBIT AND HUMAN RED BLOOD CELLS, 6); CULUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); CULUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); COLUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); COLUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); COLUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); COLUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); COLUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); COLUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); COLUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); COLUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); COLUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); COLUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); COLUMN 8 FRESH RABBIT AND HUMAN RED BLOOD CELLS, 6); COLUMN 8 FRESH RABBIT

- ASTP-APOLLO, ANG-

INVESTIGATION NAME- INFLUENCE OF WEIGHTLESSNESS ON THE Immiscibility of Honotectic Alloy Systems

NSSDC ID-	75-066A-06	INVESTIGATIVE PROGRAM CODE ESS
		6000 600

INVESTIGATION DISCIPLINE(S) TECHNOLOGY

NASA-MSFC NASA-MSFC

PERSONNEL PI - C.Y. ANG DI - L.L. LACY

31

BRIEF DESCRIPTION THIS EXPERIMENT WAS FLOWN TO STUDY THE EFFECTS OF WEIGHTLESSNESS ON THE MELTING AND SOLIDIFICATION OF TWO NATERIAL SY'IFMS -- LEAD ZINC (PDZN) AND ALUNTNUN ANTIHONY (ALSO). SPICIFICALLY, THE OBJECTIVES WERE --- (A) TO STUDY PMASE SEGREGATION EFFECTS IN LOW 'G' FOR THE INFLUENCE OF LOW'G SOLIDIFICATION ON THE MICROSTRUCTURAL HOMOGENEITY AND STOICHIOMETRY OF THE SEMICONDUCTING COMPOUND ALSO. TESTS WERE PERFORMED ON THE GROUND THAT WERE SIMILAR TO THOSE DOME IN SFACE SO THAT SAMPLE COMPARISONS COULD BE PERFORMED. FOR THE PATOMIC PERCENT ZN, AND FOR ALSO BOTH CONSTITUENTS WERE SOM THE THO ALSO AND INFE MICROSTRUCTURAL HOMOGENEITY AND ATOMIC PERCENT ZN, AND FOR ALSO BOTH CONSTITUENTS WERE SOM ATOMIC PERCENT ZN, AND FOR ALSO BOTH CONSTITUENTS WERE SOM ATOMIC PERCENT ZN, AND FOR ALSO MOTH CONSTITUENTS WERE COMPOSED OF MATERIALS HAVING TOTAL INFURITIES LESS THAN 10 PPM. THERE WERE LOADED IN GRAPHITE CRUCIBLES AND SEALED WITH GRAPHITE CHEMENT. THE PDZN SYSTEM WAS HEATED IN A SUS-CH. MOT-ZONE TUBE FURMACE, AND THE ALSD SAMPLES WERE HEATED BY A HIGH-FREQUENCY INDUCTION FURMACE. IN FLIGHT, THE ALSD TEMPERATURE SOAK WAS ESTIMATED TO OCCUR AT 3399 K AND ITSE PERFORMANCE CAN BE FOUND AND FOT ALLS EXPERIMENT AND ITS PERFORMANCE CAN BE FOUND IN THE REPORT. 'MONOTECTIC AND STYLET CLLOYS EXPERIMENT FAN-044.' C. Y. ANG AND L. L. LACY, APOLLO-SOYUZ TEST PROJECT; PRELIMINARY SCIENCE REPORT, THA'SB173, Z4.1-24.25, 1976.

-- ASTP-APOLLO, BOWYER-----INVESTIGATION NAME- EXTREME ULTRAVIOLET ASTRONOMY INVESTIGATIVE PROGRAM HSSDC 10- 75-066A-01 INVESTIGATION DISCIPLINE(S) ASTRONOMY PERSONNEL P1 - C.S. BOWYER U OF CALIF, BERKELEY BRIEF DESCRIPTION THIS ASTP EXPERIMENT SEARCHED FOR SOURCES OF EXTREME Ultraviolet (EUV) radiation in the night SKY. The principal Instrument was a flux-collecting gaazing-incidence telescope with an euv detector at its focal point, rounted outside the SPACECRAFT ----- ASTP+APOLLO, BOWYER-----

INVESTIGATION NAME- HELIUM GLOW

INVESTIGATIVE PROGRAM CODE SA NS50C 10- 75-0664-02 INVESTIGATION DISCIPLINE(S) Astronomy.

PERSONNEL PI - C.S. BOWYER U OF CALIF, BERKELEY

BRIEF DESCRIPTION THIS ASTP FXPERIMENT MEASURED THE INTENSITY AND SPATIAL DISTRIBUTION OF HELLUM-FLUGRESCENT RADIATION IN SELECTED REGIONS OF THE NIGHT SKY. THE MEASUREMENTS COULD GIVE THE DISTRIBUTION OF HELIUM IN INTERPLANETARY SPACE, AND INDICATE THE PENETRATION OF INTERFLELAR HELIUM INTO THE SOLAR SYSTEM. MEASUREMENTS WERE MADE WITH A NARROW-PASSBAND PHOTOMETER, SENSITIVE TO HELIUM RADIATION, AND POINTED TO AN ACCURACY DF 4 DEG.

--- ASTP-APOLLO, BUCKER------

INVESTIGATION NAME+ BIOSTACK

INVESTIGATIVE PROGRAM CODE 58 NESDC 10- 75-0664-15

INVESTIGATION DISCIPLING(S) Space Biology

PERSONNEL PI - H. BUCKER

U OF FRANKFURT

ERIEF DESCRIPTION THE OBJECTIVES OF THIS EXPERIMENT WERE -- TO STUDY THE DIDLOGICAL EFFECTS OF HIGH-ENERGY LOSS (HZE) HEAVY COSMIC PARTICLES NOT AVAILABLE ON EARTH, TO STUDY THE MECHANISM BY WHICH HZE PARTICLES DATAGE BIOLOGICAL MATERIALS, AND TO ESTIMATE THE RADIATION HAZAROS TO MAN IN SPACE. THE EXPERIMENT PACKAGES CONTAINED BACTERIAL SPORES, PROTOZOA CYSTS, PLANT SEEDS, SHRIMP EGGS, AND INSECT EGGS, TOGETHER WITH OIFFRENT PHYSICAL RADIATION DETECTORS -- NUCLEAR EMULSIONS, PLASTICS, SILVER CLORIDE CRYSTALS, AND LITHIUM FLUORIDE THERMOLUMINESCENCE DOSINETERS. EIGHT BIOLOGICAL SYSTEMS AND SEVEN DOSIMETRIC DETECTORS WERE FLOWN. THE BIOLOGICAL OBJECTS WERE ARANGED IN MONDLAYERS THAT WERE STACKED BETWEEN THE TRACK DETECTOR SHEETS SO THAT -- (1) IN RELATION TO THE BIOLOGICAL OBJECTS THE PARTICLE 'ACKS COULD BE, LOCATED, AND (2) THE PHYSICAL PROPERTIES. C' THESE PARTICLES COULD BE DETEMINED, MOST OF THE BIOLOGICAL OBJECTS WERE EMBEDDED IN POLYUNYL ALCOHOL, A SINGLE BACTERIAL SPORE FROM THE HILGHT PLATES COULD BE TRANSFERRED TO THE NUTHIENT MEDIUM, TO OBSERVE CHANGES IN DEVELOPMENT, GROWTH KINETICS, AND CELL MORPHOLOGY. RORE DETAILS CAN BE FOUND IN 'BIOSTACK III - EXPENIMENT MA-107,' H. BUKKER, ET AL, APOLLOSOTUZ TEST PROJECT, PRELIMINARY SCIENCE REPORT, TH-X-SB173, 14,1-14.28, 1976.

- ASTP-APOLLO, BUDINGER----

INVESTIGATION NAME- LIGHT FLASHES AND DTHER SENSATIONS FROM COSMIC PARTICLES

NSSDE 10- 75-8664-16 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S)				
SPACE BIOLOGY CDSMIC RAYS				
CUARIC RAIS				

PERSONMEL PI - T.F. BUDINGER U OF CALIF. BERKELEY

BRIEF DISCRIPTION THE OBJECTIVE OF THIS EXPERIMENT WAS TO DETERMINE QUANTITATIVELY THE FREQUENCY, CHARACTER, LAITUQINAL DEPENDENCE, AND THE IDENTITY OF COSMIC PARTICLES THAT CAUSE THE LIGHTFLASH PHENDERON. THE DATA OBTAINED SHOULD CONTRIBUTE TO MAKING AN ASSESSMENT OF THE RADIATION HAZARDS FOR LONG-TERM EARTH-ORBITING AND INTERPLANETARY MISSIONS. THE EXPERIMENT INVOLVED THE MEASUREMENT OF DARK ADAPTION AND THE MEASUREMENT DF THE CHARACERISTICS OF THE COSMIC PARTICLE ENVIRONMENT HEAR

THE EVE, AND THE CONTINUOUS ONBOARD ACCUMULATION OF THE LIGHTFLASH OBSERVATIONS FROM ASTRONAUTS AND PARTICLE DETECTORS THROUGHOUT ONE CONTINUOUS ORBIT. DURING THE FIRST OF TWO ORBIT3 DEVOTED TO THIS EXPERIMENT, A SILICON TELESCOPE-SPECTRONETER WAS DEPLOYED FOR THE MEASUREMENT OF THE TRAJECTORT, ATOMIC CHARGE J. AND THE VELOCITY OF COSMIL PARTICLES WITH STOPPING POWER OF 10 KEY PER NICROMETER OR GREATER. THE APOLLO COMMANDER AND THE VELOCITY OF COSMIL DARK-ADAPTED DURING THE SECOND ORBIT. THE DOCKING MODULE PILOT OPERATED THE EXPERIMENT CONTFOL UNIT, WHICH RECEIVED DATA FROM SILICON DETECTORS AND FROM S.LVER CHLORIDE CADATUM-DOPED LAGO (CD)) CRYSTALS THAT WERE USED TO REGISTER PARTICLE TRACKS IN FOUR SECTURS OF THE ORBIT CORRESPONDING TO NORTHERN LATITUDES, EQUATORIAL LATITUDES, THE SAA, AND SOUTHERN LATITUDES, AT ECORDED ON THE DIGITAL TAPE AND THE VERBALD DESCRIPTION WAS RECORDED ON THE DIGITAL TAPE AND THE VERBALD SECRAPTION WAS RECORDED ON THE DIGITAL TAPE RECORDER. FURTHER DETAILS CAN BE OBTAINED FROM "AUMNITATIVE OBSERVITION OF LIGHT FLASH SEMATIONS - STEPRENENT MA-106,' T. F. BUDINGER, ET AL., APOLLO-SOVUL TEST PROJECT, PRELIMINARY SCIENCE REPORT, ANDE FROM 'ALMANTIATIVE OBSERVATION OF LIGHT FLASH SEMATIONS - STEPRENENT MA-106,' T. F. BUDINGER, ET AL., APOLLO-SOVUL TEST PROJECT, PRELIMINARY SCIENCE REPORT, AND 'ALMANTIATIVE OBSERVATION OF LIGHT FLASH SEMATIONS - STEPRENENT MA-1070,' T. F. BUDINGER, ET AL., APOLLO-SOVUL TEST PROJECT, PRELIMINARY SCIENCE REPORT, THX-S8173, 13.1-13.16, 1970.

- ASIP-APOLLO, CRISWELL---

INVESTIGATION NAME- EFFECTS OF SPACE FLIGHT ON THE CELLULAR Response of Man

INVESTIGATIVE PROGRAM NSSDC ID- 75-0664-14

CODE 58 INVESTIGATION DISCIPLINE(S)

BAYLOR U

SPACE BIOLOGY

PERSONNEL PI - B.S. CRISWELL

DATLUR U DATLUR U BRIEF DESCRIPTION THE OBJECTIVE OF THE CELLULAR IMMUNE REPONSE EXPERIMENT MAS TO CHARACTERIZE LYMPHOCYTES FOR THEIR PRE- AND POSIFLIGHT RESPONSIVENESS. SPECIFICALLY, THE CELLULAR IMMUNE RESPONSE OF THE THREE ASTRONAUTS OF THE ASTP SPACE FLIGHT WAS STUDIED BEFORE AND AFTER THE FLIGHT. RESULTS ARE TO BE CORRELATED WITH LYMPHOCYTIC CHANGES THAT WERE NOTED DURING THE SKYLAB SPACE FLIGHT. ALTHOUGH NO SIGNIFICANT QUANTITATIVE CHANGES WERE NOTED AMONG THE LYMPHOCYTIC POPULATION, SIGNIFICANT CHANGES IN PHA LYMPHOCYTIC RESPONSIVENESS OCCURRED IN THE RESPONSE OF THE THREE ASTRONAUTS DUBLING THE FLIGHT. PARAMETERS STUDIED WERE WHITE BLOOD CELL CONCENTRATIONS, LYMPHOCYTE NUMBERS, B- AND INFLUENZA VIRUS ANTIGEN. SAMPLES OF HEPARANIALLA AND LYMPHOCYTE RESPONSIVENESS TO PHA. POKENEED NITGEN. CONCANAVALIN A. AND INFLUENZA VIRUS ANTIGEN. SAMPLES OF HEPARANIALED PEREPHERAL UNDS BLOOD (10 CC) WERE OBTAINED AND WERE PREFORMED WITHIN 1 TO 24 H AFTER COLLECTION. BEFORE SEPARATION, 5TAINED WITH A LEMOLYTONETE AND/OR A COULTER COUNTER. AND DIFFRENTIAL COUNTS WERE DETERMINED USING SLIDE PREFARATIONS STAINED WITHE WHITE BLOOD CELL (WHICY) COUNTER WERE PERFORMED WITH NUMER RESPONSE OF THEN AND ON A COULTER COUNTER. AND DIFFRENTIAL COUNTS WERE DETERMINED USING SLIDE PREFARATIONS STAINED WITH A HEMOLYTONETER AND/OR A COULTER COUNTER. AND DIFFRENTIAL WINTENT'S STAIN. LYMPHOCYTE SEPARATED BY FICOLL-HYPAQUE WRIEMT'S STAIN. LYMPHOCYTE SEPARATED SECON ADDITIONAL EXPERIMENT DETIRIFUGATION ACCORDING TO BOYNM'S METHOD. OR BY USING A TECHNICON LYMPHOCYTE SEPARATED BY FICOLL-HYPAQUE RESPONSE A TECHNICON LYMPHOCYTE SEPARATED BY FICOLL-HYPAQUE IMMUNE RESPONSE EXPERIMENT MA-031,' B. S. CRISWELL, APOLLO-SOVUZ TEST PROJECT. PRELIMINARY SCIENCE REPORT, TH-X-SB173,17-1 TO 17-7, 1960.

- ASTP-APOLLO, DONAHUE------

INVESTIGATION NAME- ULTRAVIOLET ATMOSPHERIC ABSORPTION

INVESTIGATIVE PROGRAM NSSDC 10- 75-0664-03

CODE 51

INVESTIGATION DISCIPLINE(S) ATMOSPHERIC PHYSICS

PERSONNEL PI - T.M. DONAHUE

32

U OF MICHIGAN

PI-T.M. DONAHUE U OF MICHIGAN BRIEF DESCRIPTION THIS ULTRAVIOLET ABSORPTION EXPERIMENT (UVA) WAS THIS ULTRAVIOLET ABSORPTION EXPERIMENT (UVA) WAS THIS ULTRAVIOLET ABSORPTION EXPERIMENT (UVA) WAS HITROGEN IN THE ATMOSPHERE BY USE OF ULTRAVIOLET ABSORPTION AND HITROGEN IN THE ATMOSPHERE BY USE OF ULTRAVIOLET ABSORPTION AND RESOMANCE-SCATTERING SPECTROSCOPY. A BEAM OF ATOMIC OXIGEN AND ATOMIC NITROGEN RESONANCE RADIATION (1304 AND 1200 A), STRONG HAD VISIBLE RADIATION STRUCK THE RETROREFLECTOR ASSEMBLY ON THE SOVUZ AND WERE FOCUSED ON THE ENTRANCE SLIT OF A 0.75-M DEBRY-FASTIE SCANNING SPECTROPHOTOMETER. THE DEMSITY OF ATOMIC OXIGEM AND ATOMIC MITROGEN, BETWEEN THE TWO SPACECRAFT, WAS MEASURED WHEN THE LINE JOINING APOLLO AND SOVUZ WAS PERPENDICULAR TO THEIR VELOCITY RELATIVE TO THE ATMOSPHERE, BY OBSERVING THE APOLLO SPACECRAFT TO DRIFT AT FIXED RANGES OF 150. SOO, AND 1LOO M THROUGH AN ARC OF PLUS ON MINUS 15 DEG WITH TEMPERATURE OF THE GAS COULD BE OBTAINED FROM THE DOPPLER LINE THE PERFENDICULAR TO THE VELOCITY VELOT. THE TEMPERATURE SAVED WITH TEMPERATURE OF THE GAS COULD BE OBTAINED FROM THE DOPPLER LINE PROFILE. THE PERFENDICULAR TO THE VELOCITY VECTOR. THE TEMPERATURE OF THE GAS COULD BE OBTAINED FROM THE DOPPLER LINE PROFILE. THE PERFENDICULAR TO THE VELOCITY VECTOR. THE ABORPTION EXPERIMENT RA-059.' I. M. DONAMUE, ET AL. APOLLO-SOVUZ TEST PROJECT - PRELIMINARY SCIENCE REPORT. THX-S8173, 8.1-8.19, 1970.

----- ASTP-APOLLO, EL-BAZ--INVESTIGATION NAME- EARTH OBSERVATIONS AND PHOTOGRAPHY

INVESTIGATIVE PROGRAM CODE ER

INVESTIGATION DISCIPLINE(S) EARTH RESOURCES SURVEY

PERSONNEL PI - F.

NSSDC 10- 75-0664-21

SHITSCONIAN INST

-- ASTP-APOLLO, FRIEDMAN-----

INVESTIGATION NAME- SKY-EARTH X-RAY OBSERVATIONS

NSSDC 10- 75-066A-04

CODE SA INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

INVESTIGATIVE PROGRAM

PERSONNEL PL - H.D. FRIEDMAN

US NAVAL RESEARCH LAB

BRIEF DESCRIPTION THIS ASTP EXPERIMENT WAS INTENDED TO PRODUCE A DETAILED THIS ASTP EXPERIMENT WAS INTENDED TO PRODUCE A DETAILED RANGE. ROCKET OBSERVATIONS HAVE DETECTED A DIFFUSE BACKGROUND SOFT X-RAY RADIATION, BUT A SYSTEMATIC SKY SURVEY HAS NEVER BEEN MADE IN THE 0.1-DOSERVATIONS PROVIDED FINER ANGULAR RESOLUTION AND STATISTICS DESERVATIONS PROVIDED FINER ANGULAR RESOLUTION AND STATISTICS HEDEDED TO DETERMINE THE VARIOUS SOURCES THAT CONTRIBUTE. THE HEMPEDDW, SOFT X-RAY DETECTOR WAS MOUNTED IN A BAY OF THE APOLLO SERVICE MODULE.

--- ASTP-APOLLO, GATOS------

INVESTIGATION NAME- DETERMINATION OF ZERO-GRAVITY EFFECTS ON Electronic materials processing

NSSOC 10- 75-066A-08

INVESTIGATION DISCIPLINE(S) Technology Space processing

INVESTIGATIVE PROGRAM Code ES

PERSONNEL

91 - H.C. GATOS 01 - A.F. WITT

MASS INST OF TECH Mass inst of tech

BRIEF DESCRIPTION THE GERMANIUM (GE) CRYSTAL GROWTH EXPERIMENT HAD AS ITS THE GERMANIUM (GE) CRYSTAL GROWTH EXPERIMENT HAD AS ITS OBJECTIVE THE GUANTITATIVE STUDY OF THE BASIC SOLDDIFICATION BEHAVIOR OF HIGH-TEMPERATURE MELTS IN MEAR ZERO-G CONDITIONS. BEHAVIOR OF HIGH-TEMPERATURE MELTS IN MEAR ZERO-G CONDITIONS. PECIFICALLY, IT WAS DESIGNED TO DETERMINE THE FOLLOWING — (1) SPECIFICATION, (3) THE DOPANT SEGREGATION BEHAVIOR AND ITS SOLIDIFICATION, (3) THE DOPANT SEGREGATION BEHAVIOR AND ITS SOLIDIFICATION, (3) THE DOPANT SEGREGATION BEHAVIOR AND ITS SOLIDIFICATION, (3) THE DOPANT SEGREGATION STATEMATE, (4) THE FUNCTIONAL DEPENDENCE ON THE MICROSCOPIC GROWTH MATE, (4) THE TRANSFËR CHARACTERISTICS OF A SOLIDIFICATION SYSTEM IN THE HEAT ABSENCE OF FREE CONVECTION. THE EXPERIMENT INVOLVED THE GROWTH ADSENCE OF FREE CONVECTION. THE EXPERIMENT INVOLVED THE GROWTH ADSENCE OF FREE CONVECTION. THE REPERIMENT INVOLVED THE GROWTH ADSENCE OF FREE CONVECTION. THE GROWTH SYSTEM TAS EQUIPPED FOR AND C100) ORIENTATION. THE GROWTH SYSTEM THAS EQUIPPED FOR AND C100) ORIENTATION. DURING SOLIDIFICATION THROUGH 20-AMP CURRENT PULSING (60 MS DURATION) AT 4-5 INTERVALS. CURRENT PULSING WAS APPLIED TO THE GROWTH SYSTEM THROUGHOUT THE HEAT PULSING WAS APPLIED TO THE GROWTH SYSTEM THROUGHOUT THE HEAT PULSING WAS APPLIED TO THE GROWTH SYSTEM THROUGHOUT THE HEAT DUP, THEMMAL SOAKING, AND ENSUING COOLING CYCLE, WHILE IT WAS IN UP, THEMMAL SOAKING, AND ENSUING COOLING CYCLE, WHILE IN WAS IN THE MULTIPURPOSE FURNACE. THE DIRECT COMPARISON OF THE MULTIPURPOSE FURNACE. THE STEM THAT IN NEAR ZERD-G SOLIDIFICATION DEHAVIOR ON EARTH WITH THAT IN NEAR ZERD-G

CONDITIONS WAS MADE. ONE USE OF THE DATA ODTAINED HERE WOULD BE TO PROVIDE A BASIS FOR FEASIBILITY STUDIES OF ZERO-G. PROCESSING EXPERIMENTS TO BE CONDUCTED IN THE SPACE SHUTTLE. MORE DETAILS CAN BE FOUND IN 'INTERFACE MARKINGS IN CHTSTALS -EXPERIMENT MA-DOOD' H. C. GATOS ET AL, APOLLD-SOYUL TS PROJECT, PRELIMINARY SCIENCE REPORT, TMX-58173, 25.1-25.8, 1976. 1976.

-- ASTP-APOLLO, HANNIG------

INVESTIGATION NAME- ELECTROPHORESIS

NSSDC 10- 75-0664-11

INVESTIGATION DISCIPLINE(S) Technology Space Biology

INVESTIGATIVE PROGRAM CODE SB

MPI-EXTRATERN PHYS

PERSONNEL P1 - K. HANNIG

PERSONNEL P1-K. NANNIG
DEFINITION
AND DESCRIPTION
IN THE ELECTROPHORESIS EXPERIMENT (EPE), A CONTINUOUS, FREE-FLOW ELECTROPHORESIS STUDY WAS CONDUCTED TO EVALUATE THE PREE-FLOW ELECTROPHORESIS STUDY WAS CONDUCTED TO EXAMPLE PREE-FLOW ELECTROPHORESIS STUDY WAS CONDUCTED THE PREE-FLOW ELECTROPHORESIS STUDY WAS DESIGNED FOR THE SEPARATION OF FOUR MATCH CONTINUOUSLY PREE-FLOW ELECTROPHORESIS STUDY WAS PREE-FLOW RATES, DUFFER FLOW RATES, AND ELECTRIC TIELD GRADIENTS. THE SEPARATION SAMPLE CONTINUOUSLY PREE-FLOW ELECTROPHORESIS WERE DEFLECTED FROM THE FLOW DIRECTION OF THE PREE-FLOW ELECTRIC FIELD WAS APPLIED PERFEMDICULAR FLOW FIELD ENTITIES WERE DEFLECTED FROM THE FLOW DIRECTION OF THE PREE-FLOW AN ANGLE DETERMINED BY THE ELECTROPHORESIC CONSISTED OF TWO FLAMENALY. WHEN AN ELECTRIC TO MATE, LEAVING THE LOWER ANALYZED BY PREARMING THE SEPARATION CHAMBER, THE SEPARATED ONES WERE ANALYZED BY PREARMING THE SEPARATION CHAMBER CONSISTED OF TWO FLAMENALY. AND FORM A GAP OF ABOUT A 28- X 3.8-M CROSS SECTION. ALLONG THE SIDES, ELECTROPORSITY PARALLEL TO SUPPLY LATERS THAT WERE ADJUSTED TO BE EXACTLY PARALLEL TO SUPPLY LATERS THAT WERE ADJUSTED TO BE EXACTLY PARALLEL TO SUPPLY LATERS THAT WERE ADJUSTED TO THE SEPARATED ONES NOT FARATIONS. THE SEPARATION CHAMBER TO THE SEPARATED TO STOKEN HERE SECTION. ALLONG THE SIDES, ELECTROPORSITY PARALLEL TO SUPPLY LATERS THAT WERE ADJUSTED TO THE SEPARATION OF THE SEPARATION OF

---- ASTP-APOLLO, LARSON------

INVESTIGATION NAME- ROLE OF CONVECTION IN SOLIDIFICATION PROCESS IN HIGH COERCIVE STRAIGHT MAGNET

INVESTIGATIVE PROGRAM NSSDC 10- 75-0664-07 CODE ESS

> INVESTIGATION DISCIPLINE(5) TECHNOLOGY

> > GRUMMAN AEROSPACE CORP U OF CONNECTICUT

PERSONNEL I-ARSON PI - D. LARSON 01 - T.Z. KATTAMIS

DI-T.Z. KATTAMIS U OF CONNECTICUT BRIEF DESCRIPTION THE OBJECTIVES OF THE ZERO-G PROCESSING OF MAGNEIS EXPERIMENT WERE --- (A) TO STUDY THE SOLIDIFICATION OF MAGNEIS EXPERIMENT WERE --- (A) TO STUDY THE SOLIDIFICATION OF MAGNEIS STUDY THE FLUID-STATIC CONFIGURATIONS IN LOW-G BY VARIATION OF STUDY THE FLUID-STATIC CONFIGURATIONS IN LOW-G BY VARIATION OF FUNDAMENTAL PARAMETERS SUCH AS --- FILL FACTOR-FUNDAMENTAL PARAMETERS SUCH AS --- FILL FACTOR-BOTH MAGNETIC COMPOUNDS STUDIED --- MANGANESE BISMUIH (AM BIJ DOTH MAGNETIC COMPOUNDS STUDIED --- MANGANESE BISMUIH (AM BIJ OF MIGH COERCIVE STREMGTH. FROM THE RESULTS OBTAINED, IT OF MIGH COERCIVE STREMGTH. FROM THE RESULTS OBTAINED, TO FUNDAWING CHEMICAL HONOGENEITY, MORPHOLOGICAL PERFECTION, BY IMPROVING CHEMICAL HONOGENEITY, MORPHOLOGICAL PERFECTION, EXPERIMENT OPERATED IN THE MULTIPURPOSE FUNANCE FACILITY. OF THE THREE EXPERIMENT CATREIGGES USED, AMPOULES I AND 2 WERE THE THREE EXPERIMENT CATREIGGES USED, AMPOULES I AND 2 WERE THE THREE EXPERIMENT CATREIGGES USED, AMPOULES I AND 2 WERE THE THREE EXPERIMENT CATREIGGES USED, ANDULLS I AND 2 WERE THE THREE EXPERIMENT CATREIGGES USED, ANDULLS I AND 2 WERE THE THREE EXPERIMENT CATREIGGES USED, ANDULLS I AND 2 WERE THE THREE EXPERIMENT CATREIGGES USED, ANDULLE 1 AND 2 WERE THE THREE EXPERIMENT CATERIGGES USED, ANDULLE 1 AND 2 WERE THE THREE EXPERIMENT CATERIGGES USED, ANDULLE 1 AND 2 WERE THE THREE EXPERIMENT CARELONG THE COPPER-COBALT-CERIUM MANGANESE, ANDULLE 2 CONTAINED A EUTECTIC ALLOY, AND AMPOULE 3 USAS TEMPERATURE, FURMACE REQUIRED APPROXIMATELY 3.3 H TO REACH ODD. A EUTECTIC ALLOY, AND AMPOULE 3.5 HEATON A FURMACE REQUIRED APPROXIMATELY 3.5 H PERIOD. FURTHER THEATING THEN MAS HELD AT SOLVEY OVER A 10.5 H PERIOD. FURTHER THEATING THEN GOLLED SOULT TEST FROJECT, PRELIMINARY SCIENCE REPORT, THE-SB173, 26.1-26.6, 1976.

-- ASTP-APOLLO, LIND----

INVESTIGATION NAME- CRYSTAL GROWTH

NSSDC 10- 75-0664-18

INVESTIGATIVE PROGRAM Code es INVESTIGATION DISCIPLINE(S)

TECHNOLOGY SPACE PROCESSING

PERSONNEL P1 - M.D. LIND

ROCKWELL INTL CORP.

PI - M.D. LIND ROCKWELL INTL CORP BRIEF DESCRIPTION THE CRYSTAL GROWTH EXPERIMENT INVOLVED A NOVEL PROCESS FOR GROWING SINGLE CRYSTALS OF INSOLUBLE SUBSTANCES BY ALLOWING INFOURS A BREATANT SOLUTIONS TO DIFFUSE TOWARD EACH OTHER IHROUGH A REGION OF PURE SOLVENT IN ZERO GRAVITY. THE APROACH USED TOOK ADVANTAGE OF THE ABSENCE OF GRAVITY DRIVEN CONVECTION THAT, ON EARTH, PREDOMINATES OVER DIFFUSION AS A MECHAMISM OF AATERIAL TRANSPORT. THE THREE CRYSTALS INVESTIGATED MERE --CALCIUM TARTRATE, CALCIUM CARBONATE, AND LEAD SULFIDE. EXPERIMENT APPAATUS CONSISTED OF SIX SPECIALLY DESIGNED AND FARICATED REACTORS, EACH ONE HAVING THREE COMPARTMENTS THAT WERE SEPARATED BY VALVES OPERATED BY THE KNOBS AT EACH END. TO PERMIT MAPTOGRAPHY OF THE PROCESS OF DIFFUSION AND AT 12-H INTERVALS FOR 16 H OF FLIGHT, AN ASTRONAUT TON CHISA SILLED WITH WATER, BEGINNING AT TIME OF ACTIVATION AND AT 12-H PHOTOGRAPHS OF THE 6 REACTOR, AND THE CENTRAL COMPARTMENT SILLED WITH WATER, BEGINNING AT TIME OF ALL ACTIVATION AND AT 12-H PHOTOGRAPHS OF THE 6 REACTOR, AND THE CENTRAL COMPARTMENT MAD SILLED WITH WATER, DEGINNING AT TIME OF ALL RATIVATION AND AT 12-H PHOTOGRAPHS OF THE 6 REACTOR, AND THE CENTRAL COMPARTMENT MAD SILLED WITH WATER, DEGINNING AT TIME OF ALL RATIVATION AND AT 12-H PHOTOGRAPHS OF THE 6 REACTOR, AND THE CENTRAL COMPARTMENT MAD SILLED WITH EXPERIMENT MA-028, M. D. LIND, APOLLO-SOVUL TEST PROJECT, PRELIMINARY SCIENCE REPORT, TM-X-S8173, 30,1-30,5, 1970.

----- ASTP-APOLLO, MARTIN-----

INVESTIGATION NAME- POLYMORPHONUCLEAR LEUKOCYTE RESPONSE TO

NSSDC 10- 75-0664-13

INVESTIGATIVE PROGRAM CODE SE

INVESTIGATION DISCIPLINE(5) SPACE BIOLOGY

PERSONNEL PI - R.R. MARTIN

BAYLOR U

BRIEF DESCRIPTION

DATE AND ADDRESS OF A DESCRIPTION. DEFENDENCE OF STOLEN OF STOLES

-- ASTP-APOLLO' PEPIN------

INVESTIGATION NAME- STRATOSPHERIC AEROSOL NEASUREMENT

INVESTIGATIVE PROGRAM

CODE SU

INVESTIGATION DISCIPLINE(S) UPPER ATMOSPHERE RESEARCH

U OF WYONING

PI - T.J. PEPIN

NSSOC 10- 75-0664-19

PERSONNEL

BRIEF DESCRIPTION THE STRATOSPHERIC AEROSOL MEASUREMENT (SAM) EXPERIMENT WAS FLOWN TO DEMONSTRATE THAT SOLAR OCCULTATION MEASUREMENTS BY PHOTORETER AND CAMERA CAN BE USED FOR DETERMINING THE VERTICAL DISTRIBUTION OF STRATOSPHERIC LOSOLS. THE INSTRUMENT USED FOR MAKING THESE AEROSOL MEASUREMENTS CONSISTED OF A PHOTOMET AND ASSOCIATED ELECTRONICS THAT PROVIDED A SIGNAL TO THE COMMAND MODULE (CM) LELEMETRY. SOLAR PHOTOGRAPHS, TAKEN WITH THE ACCORPANTING CAMERA, COROBORATED THE REFRACTION MODEL USED

HERE AND FOR SIMILAR EXPERIMENTS ON FUTURE FLIGHTS. THE PHOTOMETER HAD A PIN DIDDE DETECTOR WITH A 10-DEG FIELD OF VIEW. A HASSELBLAD DATA CAMERA EQUIPPED WITH A SPECIAL INFRARED FILM AND FILTER WAS USED TO PHOTOGRAPH A SERIES OF TIMED SPACECRAFT SUNSETS AND SUWRISES. SPECIFICALLY, APPROACHED THE SHADOW OF THE EARIN, THE LIME OF SIGHT TO THE SUM PASSED FIRST THROUGH THE UPPER LAYERS OF THE STRATOSPHERE. DURING THE 1.5 MIN REQUIRED FOR THE INSTRUMENT LIME OF SIGHT INTENSITY WAS RECORDED BY THE PHOTOMETER AND SOLAR DISK CHANGES FECORDED BY THE CAMERA. THE SUMRISES. SPECIFICALLY, APPROACHED THE LOWER SO THE INSTRUMENT LIME OF SIGHT APPROACHED THE SHADOW OF THE EARING THE LIME OF SIGHT TO THEN STEADILY DOWN TO THE LOWER LAYERS OF THE TROPOSPHERE. DURING THE 1.5 MIN REQUIRED FOR THE INSTRUMENT LIME OF SIGHT INTENSITY WAS RECORDED BY THE PHOTOMETER AND SOLAR DISK CHANGES FECORDED BY THE CAMERA. THE SAME MEASURING PASCEDURES WERE FOLLOWED WHEN THE SPACECRAFT EMERGED FROM THE DARKSIDE. FROM THE MEASURED VARIATION OF SOLAR INTENSITY AS A FUNCTION OF ITAL AIR MASS DISTRIBUTED ALONG THE LIME-OF-SIGHT, THE TOTAL EXTINCTION WAS REDUCED PRINCIPALLY BY ATMOSPHERIC AEROSOLS, AND THE MEASUREMENTS ODTAINED WERE USED TO DETERMINE AEROSOLS, CONCENTRATIONS. TO VERIFY THE OPRATION OF THE SAME EXPERIMENT, GROUND TRUTH DATA WERE OBTAINED WERE USED TO DETERMINE AEROSOL OPTICAL COUNTER (DUST-SONOE) AND A GROUND-BASED LASER RADAR (LIDAR) SYSTEM. FURTHER DETAILS CAN BE ADALLON-BORNE AEROSOL (DIDAR SYSTEM. FURTHER DETAILS CAN BE FOUND IN 'STRATOSPHEREIC REPORT, TM-X-SR173, 9.1 TO 9.8, 1976.

----- ASTP-APOLLO, REED------

INVESTIGATION NAME- SURFACE-TENSION-INDUCED CONVECTION IN Encapsulated liquid metals in zero-g

INVESTIGATIVE PROGRAM CODE ES

INVESTIGATION DISCIPLINE(5) TECHNOLOGY SPACE PROCESSING

PERSONNEL PI - R.E. REED OI - F.J. BRUNI

BRIEF DESCRIPTION

NSSDC 10- 75-0664-05

OAK RIDGE NATE LAD Holifield Nate Lad

BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT WAS TO STUDY POSSIBLE SUFFACE-TENSION-INDUCED CONVECTION, CAUSED BY A STEPMISE COMPOSITIONAL WARIATION IN A LIQUID METAL CONTAINED IN BOTH WETTING AND NOM-WETTING AMPOULES, WITH MINIMUM TEMPERATURE GRADIENTS. SPECIFICALLY, THE PLANS WERE TO SET UP, IN A MICROGRAVITY ENVIRONMENT, A LIQUID DIFFUSION COUPLE OF LEAD AND LEAD-O.OS ATOMIC PERCENT GOLD ALLOY. TWO TYPES OF AMPOULES WERE USED TO CONTAIN THE COUPLES -- A STEL CONTAINER THAT THE LIQUID METAL WOULD WET AND A GRAPHITE CONTAINER THAT THE LIQUID METAL WOULD NOT WET. THE COUPLES WERE IN THE ROLTEN STATE FOR APPROXIMATELY 2 H TO ALLOW THE GOLD TO IFFUSE APPROXIMATELY 2.5 CM. IF THEME WAR NO CONVECTIVE STIRRING DUE TO THE SUFFACE TENSION DIFFERENCE BETWEEN THE LEAD AND LEAD-GOLD ALLOY. THEN A NORMAL CONCENTRATION-DISTANCE PROFILE FOR THE GOLD COULD BE FARMETERS FOR GOLD IN LEAD CAN BE ESTIMATED BECAUSE THERE WERE INO DIFFERENCE DIFUSION COUPLES. THE LIQUID DIFFUSION PARAMETERS FOR GOLD IN LEAD CAN BE ESTIMATED BECAUSE THERE WERE THE JUNG AMPOULES WAS EXAMINED. THE TOTAL SPECIMEN LENGTH WAS APPROXIMATELY 3 CM, AND THE DIARCTER WAS APPROXIMATELY 1 CM. THE 3-MM LEAD-GOLD ALLOY DISK WAS COLD-PRESSURE WELDED TO THE EAD TO AMPOULES MAS EXAMINED. THE TOTAL SPECIMENT ENGTH WAS APPROXIMATELY 3 CM, AND THE DIARCTER WAS APPROXIMATELY 1 CM. THE 3-MM LEAD-GOLD ALLOY DISK WAS COLD-PRESSURE WELDED TO THE EAD. APOLLOSSOVUS TEST PROJECT, PRELIMINART SCIENCE REPORT, THE-TANS APOLLOS TOTUS CAN BE FOUND 1N, 'SURFACE-TENSION-THOUSED CONVECTION EXPERSIVE WELDED TO THE FACED. APOLLOS SOVUS TEST PROJECT, PRELIMINART SCIENCE REPORT, THA-X-SBIT3, 23.1-23.11, 1976.

- ASTP-APOLLO, SCHELD-

INVESTIGATION NAME- KILLIFISH HATCHING-ORIENTATION

INVESTIGATIVE PROGRAM CODE SB

INVESTIGATION DISCIPLINE(S) Space Biology

PERSONNEL PI - H.W. SCHELD BRIEF DESCRIPTION

NSSDC 10- 75-0664-23

NASA-JSC

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE WAS TO MAKE IN-FLIGHT OBSERVATIONS OF ORIENTATION BEHAVIOR IN ZERO GRAVITT, AND TO EVALUATE THE GRAVITY DEPENDENCE OF SENSORY STRUCTURE AND FUNCTIONAL DEVELOPMENT DURING EMBRYOGENSIS OF THE KILLISISH. THE EXPERIMENT CONSISTED OF TWO PARTS. FOR THE FIRST PART, IT WAS PLANNED TO HAVE SEVERAL SAMPLES, PRECONDITIONED IN VARIOUS UTSUAL CUES AND DISTURBANCES. VIDEO OR CIME RECORDINGS WERE TO BE MADE OF THE ORIENTATION BEHAVIOR OF HATCHLINGS FROM THE EXPERIMENT, A GRADED SENES OF THE SECOND PART OF CO BE MADE OF ORTENTATION BEHAVIOR OF HATCHLINGS FROM THE EXPERIMENT, A GRADED SENES OF INERSTOR PART OF THE EXPERIMENT, A GRADED SENES OF INERSTOR RECORDINGS WERE OF VELOPMENTAL STAGED WERE PLACED ON BOARD. AFTER RECOVERY. THESE FLIGHT TEST SPECIFIEMES AND SUITABLE GROUND CONTROLS WERE OBSERVED FOR --- (1) NORNALCY IN VESTIBULAR FUNCTIONING, AND (2) RICROSCOPIC AND PHYSIOLOGICAL CHANGES.

----- ASTP-APOLLO, TROMBKA---

INVESTIGATION NAME- CRYSTAL ACTIVATION INVESTIGATIVE PROGRAM

NSSDC 10- 75-066A-22

INVESTIGATION DISCIPLINE(S) TECHNOLOGY

PERSONNEL P1 - J.I. TROMBKA

NASA-GSEC

PI - J.I. TROMBKA BRIEF DESCRIPTION THE OBJECTIVE OF THE CRYSTAL ACTIVATION EXPERIMENT WAS TO THE OBJECTIVE OF THE CRYSTAL ACTIVATION EXPERIMENT WAS TO THE OBJECTIVE OF THE CRYSTAL ACTIVATION THAT DEFINE THE BACKGROUND CAUSED BY DETECTOR ACTIVATION THAT INTERFERES WHEN GAMMA RADIATION IS MEASURED IN THE 0.02-TO INTERFERES WHEN GAMMA RADIATION IS MEASURED HERE, TO-MEW RANGE FROM EARTH ORBIT. THE RESULTS OBTAINED HERE, TO-MEW RANGE FROM EARTH ORBIT. THE RESULTS OBTAINED HERE, TO-MEW RANGE FROM EARTH OBEAN ACTIVATION MEASUREMENTS AND DOGETHER WITH ACCELERATION BEAM ACTIVATION MEASUREMENTS. THE RACKGROUND LEVEL FOR FUTURE FLIGHT EXPERIMENTS. THE EXPERIMENT GAKSROUND LEVEL FOR FUTURE FLIGHT EXPERIMENTS. THE EXPERIMENT CONSISTED OF TWO SAMPLE PACKAGES THAT WERE FLOWN IN THE CONMAND MODULE, AND WERE RETURNED TO EARTH TO BE ANALYZED FOR RADIDACTIVITY INDUCED IN THEM DURING FLIGHT. ONE PACKAGE CONTAINED THE APOLLO NAI(TL) CRYSTAL ASSEMBLY, AND THE OTHER CONTAINED THE APOLLO NAI(TL) CRYSTAL ASSEMBLY, AND THE OTHER CONTAINED THE APOLLO NAI(TL) CRYSTAL ASSEMBLY, AND THE OTHER CONTAINED THE APOLLO NAI(TL) CRYSTAL ASSEMBLY, AND THE OTHER CONTAINED THE APOLLO NAI(TL) CRYSTAL ASSEMBLY, AND THE OTHER CONTAINED THE APOLLO WANIUM. AFFER TESTS WERE PERFORMED ONBOARD THE RECOVERY CARRIER, THE TEST ITEMS WERE RETURNED TO CABORATORIES IN THE UNITED STATES FOR FURTHER COUNTING. PRIOR LABORATORIES IN THE UNITED STATES FOR FURTHER COUNTING. PRIOR LABORATORIES NHERE TAKEN ON ALL MATERIALS IN THE LABORATORIES NHERE POSTFLIGHT LOW LEVEL COUNTING WAS LABORATORIES NHERE DETAILS CAN BE FOUND IN 'CRYSTAL ACTIVATION - EXPERIMENT MA-DS1,' J. 1. TROMBKA' ET AL., APOLLO-SOVUZ TEST PROJECT - PRELININARY SCIENCE REPORT, TH-X-58173, 7.1-7.10, 1976. 1976.

-- ASTP-APGLLO, VONBUN------

INVESTIGATION NAME- GEODYNAMICS

NSSDC 10- 75-0664-17

INVESTIGATIVE PROGRAM CODE ES INVESTIGATION DISCIPLINE(S) Geodynamics

NASA-GSFC

PERSONNEL PI - F.O. VONBUN

PICTOR NUMBERS
P

-- ISTP-APOLLO, WEIFFENBACH-----

INVESTIGATION NAME - SPACECTAFT-TO-SPACECRAFT DOPPLER TRACKING

INVESTIGATIVE PROGRAM NSSDC 10- 75-0668-12

INVESTIGATION DISCIPLINE(S) GEODESY

35

SAO

PERSONNEL PI + G.C. WEIFFENBACH

BRIEF DESCRIPTION THE DOPPLER TRACKING EXPERIMENT WAS DESIGNED TO DETERMINE THE DOPPLER TRACKING A HORIZONTAL SCALE OF 250 TO 1000 KM, GRAVITY FEATURES HAVING A HORIZONTAL SCALE OF 250 TO 1000 KM, BY USING THE LOW SATELLITE-TO-SATELLITE TRACKING METHOD. A BY USING THE LOW SATELLITE-TO-SATELLITE TRACKING METHOD. A SCONDARY GOAL WAS TO MEASURE SOME 10NOSPHERIC PROPERTIES. THE SCONDARY GOAL WAS TO MEASURE SOME 10NOSPHERIC PROPERTIES. THE SCONDARY GOAL WAS TO MEASURE SOME 10NOSPHERIC PROPERTIES. THE SCONDARY GOAL WAS TO MEASURE SOME 10NOSPHERIC PROPERTIES. THE STORMALIES. THE RELATIVE VELOCITY OF DOPLER SHIFT BETWEEN THE ANOMALIES. THE RELATIVE VELOCITY OR DOPLER SHIFT BETWEEN THE ANOMALIES. THE RELATIVE VELOCITY OR DOPLER SHIFT BETWEEN THE ANOMALIES. THE RELATIVE VELOCITY OR DOPLER SHIFT BETWEEN THE ANOMALIES. THE RELATIVE VELOCITY OR DOPLER SHIFT BETWEEN THE ANOMALIES IN THE ARDH'S GRAVITATION FIELD CAN BE MEASURED WITH INCREASED TO 475 KM BY THE END OF THE EXPERIMENT. LOCALIZED HAS THRESHOLD SENSITIVITY OF BETTER THAN -0.15 MM/S SG, FROM THE A THRESHOLD SENSITIVITY OF BETTER THAN -0.15 MM/S SG, FROM THE A THRESHOLD SENSITIVITY OF BETTER THAN -0.15 MM/S GG, FROM THE A THRESHOLD SENSITIVITY OF BETTER THAN -0.15 MM/S GG, FONT HE A THRESHOLD SENSITIVITY OF METTER THAN -0.15 MM/S GG, FONT HE A THRESHOLD SENSITIVITY OF BETTER THAN -0.15 MM/S GG, FONT HE A THRESHOLD SENSITIVITY OF METTER THAN -0.15 MM/S GG, FONT HE A THRESHOLD SENSITIVITY OF METTER THAN -0.15 MM/S GG, FONT HE A THRESHOLD SENSITIVITY OF METTER THAN -0.15 MM/S GG, FONT HE A THRESHOLD SENSITIVITY OF METTER THAN -0.15 MM/S GG, FONT HE A THRESHOLD SENSITIVITY OF METTER THAN -0.15 MM/S GG, FONT HE A THRESHOLD SENSITIVITY OF METTER THAN -0.15 MM/S GG, FONT HE A THRESHOLD SENSITIC AND A HIEL ACCLERATION PRODUCED BY THE ATMOSPHERIC DRAGE FORT AND THE A CACELERATION PRODUCED BY THE ATMOSPHERIC DRAGE FORT, MATTING ACCOUNT BY USING THE MEASURED ORDITAL AND ALITUDE MOTIONS OF BOTH BY USING THE MEASURED ORDITAL AND ALIT

- ASTP-APOLLO, WIEDEMEIER--

INVESTIGATION NAME- CRYSTAL GROWTH FROM THE VAPOR PHASE IN Zero-gravity environment INVESTIGATIVE PROGRAM

NSSOC 10- 75-0664-09

INVESTIGATION DISCIPLINE(S) TECHNOLOGY Space processing

PERSONNEL PI - H. WIEDENEIER RENSSELAER POLYTECHNIC

PI-H. WIEDEREJER BRIEF DESCRIPTION THE CIJECTIVES OF THE CRYSTAL GROWTH FROM THE VAPOR PHASE EXPERIMENT WERE TO STUDY THE EFFECTS OF MICROGRAVITY ON THE MORPHOLOGY OF SINGLE CRYSTALS OF MIXED SYSTEMS AND TO EVALUATE INFORMATION WERE TO STUDY THE EFFECTS OF MICROGRAVITY ON THE MORPHOLOGY OF SINGLE CRYSTALS OF MIXED SYSTEMS AND TO EVALUATE INFORMATION TECHNIQUE. THESE RESULTS SNOULD HELP TO PRODUCE RANSPORT TECHNIQUE. THESE RESULTS SNOULD HELP TO PRODUCE RANSPORT TECHNIQUE. THESE RESULTS SNOULD HELP TO PRODUCE THE VAPOR TRANSPORT PROCESS. YWEE VAPOR TRANSPORT EXPERIMENTS WERE PERFORMET ON RULTICOMPONINT SYSTEMS CONTAINING DIFFERENT PARTS OF GEMMANIUM SELINIDE, TE LURIUM, GEMANIUM TETRAIDIDE, ANTERLAS WIRE ENCLOSED IN EVACUATE SEALED ANPOULES OF FUSED SILICA AND WERE TRANSPORTED IN A TEMPERATURE GRADIENT OF THE MULTIPURPOSE ELECTRIC FURNACE. AFTER A HEAT-UP PRIOD OF APPROXIMATELY 2 H, THE DESIRED TEMPERATURE GRADIENT OF S77-780 K WAS ACHIEVED, AND MINITAINED FOR TO H. MORE DETAILS CAN BE FOUND IN 'CRYSTAL GROWTH FROM THE VAPOR PHASE - EXPERIMENT NA-OBS' H. WIEDEMEIR, ET AL, APOLLOSOUZ TEST PROJECT, PRGLIMINARY SCIENCE REPORT, TMX-58173, 27.1-27.20, 1976.

----- ASTP-APOLLO, YUE------INVESTIGATION NAME- ZERO-GRAVITY SOLIDIFICATION OF NACL-LIF

EUTECTIC

NSSPC ID- 75-0664-10	INVESTIGATIVE PROGRAM CODE ES
	INVESTIGATION DISCIPLINE(S) Technology Space processing
PERSONNEL PI - A.S. YUE	U OF CALIF, LA U of Calif, La

PI - A.S. YUE DI - C.W. YEH

OI - C.W. YEH U OF CALIF, LA BRIEF DESCRIPTION THE HALIDE EUTECTIC GROWTH EXPERIMENT WAS FLOWN TO STUDY THE HALIDE EUTECTIC GROWTH EXPERIMENT WAS FLOWN TO STUDY THE NO VISRATION AND CONVECTION CURRENTS IN THE MELT. ARE NO VISRATION AND CONVECTION CURRENTS IN THE MELT. ARE NO VISRATION AND CONVECTION CURRENTS IN THE MELT. ARE NO VISRATION AND CONVECTION CURRENTS IN THE MELT. ARE NO VISRATION AND CONVECTION CURRENTS IN THE MELT. ARE NO VISRATION AND CONVECTION CURRENTS IN THE SOLIDIFICATION WEPE PRODUCED IN SPACE BY THE DIRECTIONAL SOLIDIFICATION LITHIUM FLOURIDE SOLIDIFIED, LITHIUM FLOURIDE FORMED THE FIBER LITHIUM FLOURIDE SOLIDIFIED, LITHIUM FLOURIDE AND BY THE PRESENCE OF A SOLIDIFICATION. THESE DEFECTS CAUSE SOLID-STATE EUTECTIC SOLIDIFICATION. THESE DEFECTS CAUSE SOLIDIFIED AND DEVICES TO BE INEFFICIENT AND USELESS. THE SODIUM CHLORIDE AND 28.8 WEIGHT PERCENT LITHIUM FLUORIDE EUTECTICS MITURES, WERE ANDE FROM 99.90 WEIGHT PERCENT SOLIM CHLORIDE AND 99.90 WEIGHT MADE FROM 99.90 WEIGHT PERCENT SOLIDIFIED IN AN PERCENT LITHIUM FLUORIDE. THE MIXINGE WERE SOLIDIFIED IN AN INDUCTION HEATING UNIT UNDER A PROTECTIVE ATMOSPHERE. INGOTS NOF SODIUM CHLORIDELITHIUM FLUORIDE EUTECTICS D.79 WEIGHT DIAMETER AND 6.4-CH LONG WERE GROWN. ADDITIONAL DETAILS CAN BE FOUND IN 'HALIDE UNITETIC FORGENT A EXPERIMENT MA-131,' A. S. FOUND IN 'HALIDE EUTECTIC SOURT A EXPERIMENT MA-131,' A. S. VUE ET AL, APOLLO-SOYUZ TEST PROJECT, PRELIMINARY SCIENCE

REPORTA TH-X-581/34 28.1-28.84 1976.

SPACECRAFT COMMON NAME- ASTP-SOYUZ Alternate Names- Apollo Soyuz Test Proj., Soyuz Apollo

NS50C 10- 75-0654

LAUNCH DATE- 07/15/75 WEIGHT- 6800. (G Launch Site- Tyuratam (Baikonur Cosmodrome), U.S.S.R. Launch Vehicle- Unknown

SPONSORING COUNTRY/AGENCY SAS U.S.S.R.

INITIAL ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 88.92 Min Periapsis- 218. KM EPOCH DATE- 07/16/75 Inclination- 51.76 deg Apoapsis- 231. KN

P	€	R	5	0	N	N	E	ļ

TD - K.D. SC - Y.K.	UNKNOWN UNKNOWN

ERIEF DESCRIPTION

ERIEF DESCRIPTION THE UNITED STATES AND THE U.S.S.R. LAUNCHED AN APOLLO SPACECRAFT AND A SOTUZ SPACECRAFT, RESPECTIVELY, AS A JOINT EFFORT CALLED THE APOLLO-SOTUZ TEST PROJECT (ASTP). THE SOTUZ SPACECRAFT WAS LAUNCHED FIRST, WITH A TWO-MAN CREW WHO RANEUVERED THEIR SPACECRAFT INTO A POCKER CONFIGURATION FOR UNG PLACED THEIR SPACECRAFT INTO A PROFER CONFIGURATION FOR DOCKING WITH THE SOTUZ SPACECRAFT. THE DOCKING OF THE TWO SPACECRAFT WAS LAUNCHED 7 1/2 HR LATER, WITH A THREE-MAN CREW HIG PLACED THEIR SPACECRAFT. INTO A PROFER CONFIGURATION FOR DOCKING WITH THE SOTUZ SPACECRAFT. THE DOCKING OF THE TWO SPACECRAFT OCCURRED ON THE THIRD DAT. AFTER DOCKING, CREW TRANSFERS TOOK PLACE, WITH THE APOLLO CREW FIRST VISITING THE SOTUZ. THE COMBINED APOLLO-SOTUZ CREWS PERFORMED JOINT EXPERIMENTS AND PRESENTED RADIO AND TW REPORTS. AFTER JOINT EXPERIMENTS WERE COMPLETED, THE SPACECRAFT DISENGAGED AND EACH CONTINUED ITS SEPARATE MISSION.

ASTP-SOYUZ, AKDEV------

INVESTIGATION NAME- ZONE FORMING FUNGI

N550C 10- 75-065A-03

INVESTIGATIVE PROGRAM CODE SE/CO-OP

INVESTIGATION DISCIPLINE(S) Space biology

PERSONNEL P1 - 1.G. AKOEV

UNKNOWN

BRIEF JESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT WAS TO INVESTIGATE THE EFFECT OF SPACE FLIGHT COMDITIONS ON THE RHTHMS OF VEGETATIVE RAND SPORE PHASE CHARACTERISTICS OF STREPTONYCES LEVORTS. THIS SPECIES WAS ISOLATED, NAMED, AND PROVIDED BY THE U.S.S.R. AND WAS USED AS THE PRIMARY TEST SPECIMEN FOR THIS EXPERIMENT. THE CULTURAL. CHARACTERISTICS OF THE PRIMENT IN SITU COMPARISON OF SPORE RING FEATURES AND PEVELOPMENT ARTES IN PREFLIGHT, FLIGHJ, AND POSIFLIGHT PRIDOS OF THE APOLLO-SOYUZ TEST PROJECT, WITHIN A SINGLE CULTURE. ASPECTS OF THE EXPERIMENT THAT WERE STUDIED INCLUDED -- (1) CULTURES THAT HAD BEEN INITIATED WITHIN A 12-H PHASE SHIFT WERE EXCHANGED DURING FLIGHT, (2) THE EFFECTS OF LOCAL RADIATION ON GENERIC CHANGES WERE STUDIED, AND COMPARED, AND LOCAL RADIATION ON GENERIC CHANGES WERE STUDIED, AND COMPARED, AND LEXAN WERE LASS IN A MOVADLE FLIGHT DE JCE HELD TWO PETRI DISHES THAT CONTAINED STREPTOMYCES CULTURES. KADIATION DETECTORS OF THE PRIMARY CULTURES THAT PASES THROUGH THE BIOLOGICAL TEST SYSTEMS, AND THEY WERE PLACED BENEATH THE PIRIN DISHES TAAT CONTAINED STREPTOMYCES CULULDSE NITRATE, AND LEXAN WERE USED TO REGISTER FARTICLES THAT PASES THROUGH THE BIOLOGICAL TEST SYSTEMS, AND THEY WERE PLACED BENEATH THE PIRIN DISHES THAT CONTAINED STREPTOMYCES CULULUSSE NITRATE, AND LEXAN WERE USED TO REGISTER FARTICLES THAT PASES THROUGH THE BIOLOGICAL TEST SYSTEMS, AND THEY WERE PLACED BENEATH THE PERINDISHES AS WELL AS IN A MOVABLE LID, ALL FLIGHT AND CONTROL SPECIMENS WERE PHOTOGRAPHED AT 12-H (FLUS OR MINUS 3H) INTERVALS FROM THE TIME THE CULTURES WERE SELECTED FOR THE EXPERIMENT UNTIL TEMPINANCE CAN BE FOUND IN, '20NE FORMING FUNGI' - EXPERIMENT UNTIL TEMPINANCE CAN BE FOUND IN, '20NE FORMING FUNGI' - EXPERIMENT MA-147-' T. D. ROGERS ET AL, APOLLO-SOUZ IEST PROJECT, PRELIMINARY SCIENCE REPORT, THM-S8173, 15.1-15.12, 1970. BRIEF DESCRIPTION

-- ASTP-SOYUZ, IVANOV-

INVESTIGATION NAME- USSR MULTIPLE MATERIAL HELTING

INVESTIGATIVE PROGRAM NSSDC 10- 75-0654-02 CODE ES/CO-OP

IVANOV

INVESTIGATION DISCIPLINE(S) TECHNOLOGY

PERSONNEL PI - I.

SAS-IPA

BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT WAS TO DETERMINE THE DEGREE OF IMPROVEMENT OF MATERIALS PROCESSED IN ZERO-G. CONVECTIVE STIRTING DURING SOLIDIFICATION AND SEGREGATION IN THE MELT DUE TO GRAVITY CONTRIBUTE TO NOM-HONGGENEITIES, VOIDS AND STRUCTURAL IMPERFECTIONS IN MATERIALS WHEN PROCESSED ON EARTH, THE ONBOARD MULTIPURPOSE FURMACE STSTEM WAS USED. THREE DIFFERENT MATERIAL SYSTEMS WERE USED. IN THE HOT ISOTHERMAL REGION, A SAMPLE OF ALLUMINUM WITH TUNGSTEM SPHERES WAS MELTED AND SOLIDIFIED. A GERMANIUM ROD CONFINING 2 ATOMIC PERCENT OF SILICON WAS PARTIALLY MELTED AND SOLIDIFIED IN "ME IN THE GRADIENT ZONE TO PHOCESS AN AMPOULE OF POWDERED ALUMINUM.

-- ASTP-SOYUZ, NIKOLSKY---

INVESTIGATION NAME- ARTIFICIAL SOLAR ECLIPSE

INVESTIGATIVE PROGRAM NSSDC 10- 75-065A-04

CODE ST/CD-OP

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL PI - G.M. NIKOLSKY

SOVIET ACAD OF SCI

BRIEF DESCRIPTION THE OBJECTIVE OF THIS ARTIFICIAL SOLAR ECLIPSE EXPERIMENT WAS TO DETECT THE EXTENDED REGION OF THE CORNA BY PHOTOGRAPHING IT FROM THE SOYUZ SPACECRAFT AGAINST THE BLACK SPACE BACKGROUND WHILE THE DISK OF THE SUM WAS OCCULTED BY THE APOLLO SPACECRAFT. THE SOYUZ CREW WAS RESPONSIBLE FOR PERFORMING THE CREDURED SPACECRAFT MANEUVERS AND FOR PHOTOGRAPHING THE CREDURED SPACECRAFT MANEUVERS AND FOR THE SUM TO A SEPARATION DISTANCE AT WHICH THE APOLLO CREW WAS OF APOLLO WAS APPROXIMATELY 2 SOLAR DIAMETERS. APOLLO TOTALLY OF CULTED THE SUM DUSTANCE AT WHICH THE APPARENT DIAMETER OF APOLLO WAS APPROXIMATELY 2 SOLAR DIAMETERS. APOLLO TOTALLY OCCULTED THE SUM DURING THE SEPARATION MANEUVER, AND THE SOYUZ PEFFORMED AUTOMATIC SEQUENCE PHOTOGRAPHY IN THE SOLAR DIRECTION DURING THE SUM DURING THE SEPARATION MANEUVER, AND THE SOTUZ THE WAVELENGTH RANGE OF APPROXIMATELY 4COG TO 7500 A. A MECHANIZED MAGAZINE CONTAINING HIGHLY SENSITIFED KODAK 2465 FILM WAS KOUNTED TO THE BACK OF THE CANERA. THE APOLLO CREW THE WAVELENGTH RANGE OF APPROXIMATELE NO RESULT OF ALLO ALL CREW BEFLORMED AUTOMATEL TO THE BACK OF THE CANERA. THE APOLLO CREW THE MAS KOUNTED TO THE BACK OF THE CANERA. THE APOLLO CREW THE MAS ROUNTED TO THE BACK OF THE CANERA. THE APOLLO CREW BEFLORDED A U.S.S.R. LIGHT BAFFLE ON THE ADD REFLECTED LIGHT THAT ENTERD THE OPTICAL PATH OF THE CANERA. THE APOLLO CREW WINDOW TO MINIMIZE THE AMOUNT OF SCATTERED AND REFLECTED LIGHT THAT ENTERD THE OPTICAL PATH OF THE CANERA. THE APOLLO CREW WINDOW TO MINIMIZE THE AMOUNT OF SCATTERED AND REFLECTED LIGHT THAT ENTERD THE OPTICAL PATH OF THE CANERA. THE APOLLO CREW WINDOW TO MINIMIZE THE AMOUNT OF SCATTERED AND REFLECTED LIGHT THAT ENTERED THE OPTICAL PATH OF THE CANERA. THE APOLLO CREW WINDOW TO MINIMIZE THE AMOUNT OF SCATTERED AND REFLECTED LIGHT THAT ENTERED THE OPTICAL PATH OF THE CANERA. THE APOLLO CREW WINDOW TO MINIMIZE THE AMOUNT OF SCATTERED AND REFLECTED LIGHT THAT ENTERED THE OPTICAL PATH OF THE CANERA. THE APOLLO CREW WINDOW BRIEF DESCRIPTION

----- ASTP-SOYUZ, TAYLOR------

INVESTIGATION NAME- MICROBIAL EXCHANGE TEST

NS50C 10- 75-065A-01

INVESTIGATIVE PROGRAM CODE SB/CO-OP

INVESTIGATION DISCIPLINE(5) Space Biology

NASA-JSC

PERSONNEL PI - G.R. TAYLOR

PERSONNEL PI-G.R. TAYLOR NASA-JSC BRIEF DESCRIPTION THE OBJECTIVE OF THE MICROBIAL EXCHANGE EXPERIMENT WAS TO DETERMINE THE COMPONENTS OF THE INFECTIOUS DISEASE PROCESS IN SPACE FLIGHT BY MEASURING CHANGES IN THREE FACTORS -- (1) THE COMPOSITION OF THE MICROBIAL POPULATIONS INHABITING THE CREM MEMBERS AND SPACECRAFT, (2) THE MBILITY OF EACH CREM MEMBER'S DEFENSE MECHANISM TO RESIST INFECTION, AND (3) THE ADILITY OF CERTAIN MICROBGANISMS IO ORIGINATE INFERTION, HEACES OF BOTH THE APOLLO AND SOTUL SPACECRAFT. THE NORMAL AUTOFLORA AND IMMUNOCOMPETENCE LEVEL OF EACH CREW MEMBER WAS ESTABLISHED BEFORE FLIGHT THROUGH REPEATED. SANPLING AND NALYSIS. SELECTED MICROORGANISMS RECOVERED FROM THE ADILITY OF THE MICHOORGANISM TO BECOME PATHOGENIC, INFECTIVE, OR TOXIC TO MAN. AT SOME IMME, CERTAIN IMMUNDLOGICAL PARAMFTERS OF THE BLOOD AND SAL'YA OF EACH CREW MEMBERS WERE SUDIED TO DEFECT CHANGES IN THE ADILITY OF THE INDIVINUAL TO RESIST INFECTION. SPECIFIENS WERE TIME, CERTAIN IMMUNDLOGICAL PARAMFTERS OF THE BLOOD AND SAL'YA OF EACH CREW MEMBER VERE SUDIED TO DEFECT CHANGES IN THE ADILITY OF THE INDUSTINUAL TO RESIST INFECTION. SPECIFIENS WERE THES BEFORE, DURING, AND ATTER THE FLIGHT, FOR INILIGHT SAMPLES, A SPECIALLY DEVELOPED SAMPLE COLLECTION SWALE ON A USED THAT CONSISTED OF A COTION-SPECIFIENS WERE THANSFERRED FROM THE SUBLACES OF EACH SPACECRAFT AT SPECIFIC THES BEFORE, DURING, AND ATTER THE FLIGHT, THE MOLLO WEE THANSFERRED FROM THE SUBLACES OF BACH. SPACECRAFT AT SPECIFIC THES DEFORE, DURING CONSERVATION FLIGHT SAMPLES, A SPECIALLY DEVELOPED SAMPLE COLLECTION SWALE ON A ACTIVITY AND RETURNED TO THE SOUL AT THE END OF THE LAST JOINT ACTIVITY. ALL SAMPLES COLLECTED DURING FLIGHT WERE RETURNED TO THE SOUL AT THE END OF THE LAST JOINT ACTIVITY. ALL SAMPLES COLLECTED DURING FLIGHT WERE RETURNED TO MOSCOW FOR PRELIMINARY ANALYSIS AND DIVISION BETWEEN U.S. AND U.S.S.R. LABORATORIES. MORE EXPERIMENT DETAILS AND SOME FLIGHT RESULTS CAN BE FOUND IN MALFORDIN' DETAILS AND SOME FLIGHT RESULT

16.1-16.31. 1976.

SPACECRAFT COMMON NAME- ATS 5 Alternate Names- PL-6920, Ats-e 04068

NSSPC 10- 69-069A

LAUNCH DATE- 08/12/69 Launch Site- Cape Canaveral, United States Launch Vehicle- Atlas WEIGHT- 821. KG

SPONSDRING COUNTRY/AGENCY UNITED STATES NASA-DA

INITIAL ORBIT PARAMETERS Orbit type- geocentric orbit period- 1435.9 Min	EPOCH DATE- 11/01/69 Inclination- 2.5 deg
PERIAPSIS- 35777. KM	AFOAPSIS- 35790. KM
PERSONNEL	
NG – UNKNOWN	
SC – UNKNOWN	
PH - J.E. KUPPERIAN, JR.	NASA-GSFC

P5 - 8. LEDLEY NASA-GSFC BRIEF DESCRIPTION

BRIEF DESCRIPTION ATS 5 WAS AN EQUATORIAL-ORBITING, SYNCHRONOUS-ALTITUDE TECHNOLOGY SATELLITE INTENDED TO TEST VARIOUS COMMUNICATIONS AND EARTH OBSERVATIONAL SYS(EMS. ALSO INCLUDED ON BG/TO WERE PARTICLE, ELECTRIC FIELD, AND MAGNETIC FIELD EXPE. MENTS. STABILIZATION MECHANISM COULD 'OT BE DEPLOYED. AND ATS 5 WAS STABILIZATION MECHANISM COULD 'OT BE DEPLOYED. AND ATS 5 WAS STABILIZATION MECHANISM COULD 'OT BE DEPLOYED. AND ATS 5 WAS STABILIZED IN A SPINNING NODE ABOUT THE SPACECRAFT Z-AXIS AT APPROXIMATELY 71 RPM. ALL EXPERIMENTS THAT DEPENDED ON THE PLANNED GRAVITY GRADIENT STABILIZATION WERE ADVERSELY AFFECTED TO VARYING DEGREES, AND THE MISSION WAS DECLARED A FAILURE. HOWEVER, SOME OF THE SCIENCE EXPERIMENTS, INCLUDING THE MAGNETIC FIELD MONITOR AND THE PATILLE EXPERIMENTS RETURNED USABLE DATA. ATS 5 WAS POSITIONED AT ABOUT 105 DEG W LONGITUDE OVER THE PACIFIC OCEAN.

--- ATS 5, DAROSA-----

INVESTIGATION NAME- RADID BEACON

HSSDC 10- 69-069A-12 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) Ionospheres and radio physics

PERSONNE

FJ - A.V.	DAROSA	STANFORD U
	GARRIOTT	NASA-JSC

DETECTOR

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF PHASE-COHERENT RADIO FREQUENCIES CONTINUOUSLY TRANSMITTED AT 137.350 AND 412.050 MHZ (SRD HARMONIC). THE TOTAL ELECTRON CONTENT ALONG THE PROPAGATION PATH WAS CALCULATED BY ANALYSIS OF THE FARADAY ROTATION ANGLE MEASUREMENTS ON THE LOVER FREQUENCY OR ANALYSIS OF DIFFERENTIAL DOPPLER FREQUENCY RECORDINGS OF BOTH FROUDENCIES. IONOSPHERIC IRREGULARIT'ES AND SCINTILLATION WAS ALSO OBSERVED.

----- ATS 5, NCILWAIN-----

INVESTIGATION NAME- OMNIDIRECTIONAL HIGH-ENERGY PARTICLE

NSSDC 10- 69-0694-03 INVESTIGATIVE PROGRAM CODE ST

> INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL U OF CALIF. SAN DIEGO PI - ... MCILWAIN

BRIEF DESCRIPTION THREE PLASTIC SCINTILLATOR DETECTORS, EACH WITH A 2-PI SOLID ANGLE FIELD OF VIEW, MEASURED ELECTRONS IN 12 INTERVALS IN THE ENERGY RANGE O.S TO 5 MEV. SOLAR COSMIC RAYS WITH ENERGIES GREATER THAN 12, 16, AND 24 MEV WERE ALSO MEASURED. THE DETECTORS HAVE FUNCTIONED NORMALLY FROM LAUNCH TO AUGUST 1972, AFTER WHICH THE THE DATA ACQUISITION WAS LIMITED TO SELECTED TIMES. THE SPJ "CRAFT SPIN DID NOT DEGRADE THE EXPERIMENT DATA.

--- ATS 5. MOZER------

INVESTIGATION NAME- TRI-DIRECTIONAL, NEDIUM-ENERGY PARTICLE

NSSDC ID- 69-0694-04

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL PI - F.S. MOZER

U OF CALIF, BERKELEY

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF THREE ESSENTIALLY IDENTICAL SCINTILLATION PHOTORULTIPLIER DETECTORS, EACH INTENDED TO MEASURE (SEPARATELY) ELECTRONS AND PROTONS IN THREE ENERGY WINDOWS CENTERED RESPECTIVELY AT 40, 75, AND 120 KEV AND 60, 120, AND 165 KEV. TWO DETECTORS, LOOKING IN OPPOSITE DIRECTIONS, WERE TILTED BY 12 DEG FROM THE SATELLITE Z-AXIS AND ONE WAS ORIENTED PERPENDICULAR TO THIS CONFIGURATION. OVER MOST OF ITS DATA COLLECTING LIFETIME, THE SATELLITE WAS SPINNING ABOUT ITS 2-AXIS, WITH A SPIN PERIDD OF 0.78 S. DUE TO AN UNPLANNED SPACECRAFT SPIN SOON AFTER LAUNCH, A SHUTTER SYSTEM WAS ACTIVATED THAT RENDERED THE PERFENDICULAR DETECTOR INEFFECTIVE. THEEFORE, MEASUREMENTS WERE MADE ONLY IN DIRECTIONS APPROXIMATELY PARALLEL AND ANTIPARALLEL TO THE LOCAL MAGNETIC FIELD. THE SPECIES ANALYSIS WAS PERFORMED PY A THREE-CHANNEL, PULSE-HEIGHT ANALYZER, AND PARTICLE COUNTS WERE AND COMMANDABLE READULT HARIED FROM 0.2 TO 5.12 S. DEPENDING TO A COMMADABLE READULT NODE. FOR INFORMATION REGARDING EXPERIMENT DOUBLE-LAYERED SCINTILLATOR FOR SEPARTING AND DETECTING LOW-ENERGY PROTONS AND ELECTRONS, BY F. S. NOZER, F. H. BOGUT, AND C. W. BATES, JR., IEEE TRANS. ON NUCL. SCI., NS-15, 144, 1968.

----- ATS 5, SUGIURA------

INVESTIGATION NAME- MAGNETIC FIELD MONITOR

INVESTIGATIVE PROGRAM NSSDC 10- 69-069A-13 CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

NASA-GSEC NASA-GSEC

PERSONNEL PI - M_ OI - R.A. SUGIURA LANGEL

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO STUDY THE PROCESSES TAKING PLACE ON THE AURORAL MAGNETIC SHELLS. IT ALSO INTENDED TO PROVIDE CORRELATIVE DATA FOR THE OTHER EXPERIMENTS ON THE SATELLITE. THE EXPERIMENT WAS PART OF THE MAGNETIC STABILITATION SYSTEM THAT WAS THE BACKOP FOR THE GRAVITY-GRADIENT SIABILIZATION SYSTEM. THE SENSOR SYSTEM CONSISTED OF A TRIAXIAL FLUXGATE MAGNETOMETER. THE SYSTEM MEASURED THE MAGNETIC FIELD ALONG THREE AXES BY COMBINING A FINE RANGE (PLUS OR NINUS 25 GAMMAS) AND A COARSE RANGE OF 32 INCREMENTS (32.8 GAMMA EACH) TO GIVE THE TOTAL RANGE PLUS AND MINUS SOO GAMMAS. THE FINE AND COARSE READINGS WERE SANFLED ONLY WERE RECORDED ON THE PINE THEY ALS. THE FINE RANDED PLUS AND THE PFM TELEMETRY AT 5.75 INTERVALS. THE PCM COARSE READINGS WERE SUBCOMMUTATED AT 95-S INTERVALS. A 10-GAMMA CALIBRATION PULSE WAS INITIATED TWICE A DAY FOR 5.6 MIN. THE FAST SPIN RATE OF THE SATELLITE, THE SLOW SAMPLE RATE OF THE DATA, AND THE RESULTING ALIGNING PROBLEMS BEGRADED THE DATA IN THE SPIN PLANE. DATA IN THE SPIN PLANE.

SPACECRAFT COMMON NAME- ATS 6 ALTERNATE NAMES- PL-721A, ATS-F, ATS-F 7318

NSSDC 10- 74-039A

LAUNCH DATE- 05/30/74 VEIGHT- 930. KG LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNGH VEHICLE- TITAN

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-DA

INITIAL ORBIT PARAMETERS Orbit type- Geoceutric Orbit Feriod- 14.603 min Periapsis- 35763.0 km

EPOCH DATE- 05/31/74 Inclination- 1.8 deg Apoapsis- 35818.0 km

PERSONNEL PM - J.E. KUPPERIANJ JR. PS - E.A. WOLFF NASA-GSEC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE PRIMARY OBJECTIVES OF ATS 6 (APPLICATIONS TECHNOLOGY SATELLITE) WERE TO ERECT IN ORBIT A LARGE HIGH-GAIN STEERABLE ANTENNA STRUCTURE CAPABLE OF PROVIDING A GOOD QUALITY TV SIGHAL TO A GROUND-BASED RECEIVER AND TO MEASURE AND EVALUATE THE PERFORMANCE OF SUCH AN ANTENNA. A SECONDARY OBJECTIVE WAS TO DEMONSTRATE NEW CONCEPTS ON SPACE TECHNOLOGY IN THE AREAS OF AIRCRAFT CONTROL, LASER COMMUNICATIONS, AND VISUAL AND INFRAPED MAPPING OF THE EARTH/AIMOSPHERE SYSTEM. THE SPACECRAFT WAS ALSO CAPABLE OF -- (T) MEASURING RADIO FREQUENCY INTERFERENCE

IN SHARED FREQUENCY BANDS AND PROPAGATION CHARACTERISTICS OF MILLIMETER WAVES, (2) PERFORMING SPACECRAFT-TO-SPACECRAFT COMMUNICATION AND TRACKING EXPERIMENTS, AND (3) MAKING PARTICLE AND RADIATION MEASUREMENTS OF THE GEOSTWCHRONOUS ENVIRONMENT. CONFIGURED SUREWHAT LIKE AN OPEN PARASOL. THE ATS 6 SPACECRAFT CONSISTED OF FOUR MAJOR ASSEMBLIES -- (1) A 9.15-M-DIAM DISH ANTENNA, (2) TWO SOLAR CELL PADDLES MOUNTED AT RIGHT ANGLES TO EACH OTHER ON OPPOSITE SIDES OF AN UPPER EVIPMENT MODULE, (3) AN EARTH-VIEVING EOUTPMENT MODULE (EVM) CONVECTED BY A TUBULAR MAST TO THE UPPER EQUIPMENT MODULE, AND (4) AN ATTITUDE CONTROL STABLIZATION SYSTEM. THE EVN, IN ADDITION TO HOUSING THE EARTH-VIEWING EXPERIMENTS, PROVIDED SUPPORT FOR THE PROPULSION SYSTEM ANT TANKS, BATTERIES, A MULTIFREQUENCY TRANSPONDER, AND THE TELEMETRY, COMMAND, AND THERMAL CONTROL SYSTEMS. THE UPPER EQUIPMENT MODULE PROVIDED A PLATFORM FOR THE SPACE-VIEWING EXPERIMENTS. INERTIA WHELS WILL BE THE PRIME MEANS FOR TORQUING THE SPACECRAFT, WITH BOTH HYDRAZINE AND AMNONIA MULTIJET THRUSTER SYSTEMS INCLUDED TO PROVIDE THE NECESSARY TORQUES FOR UNLADATION THE YACE. AND ARAGINE PROVENDED AND ANTORALINE AND AMNONIA MULTIJET THRUSTER SYSTEMS INCLUDED TO PROVIDE THE NECESSARY TORQUES FOR UNLADATION THE WHELS. ALSO INCLUDED IS A SPACE TORQUENT MODILE SPACECRAFT, WITH BOTH HYDRAZINE AND AMNONIA MULTIJET THRUSTER SYSTEMS INCLUDED TO PROVIDE THE NECESSARY TORQUES FOR UNLADATION THE WHELS. ALSO INCLUDED IS A SPACE SEVERAL PARTICLE EXPERIMENTS.

----- ATS 6, COLEMAN, JR.-----

INVESTIGATION NAME- MAGNETOMETER EXPERIMENT

NSSDC 10- 74-039A-02 INVESTIGATIVE PROGRAM COLE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

FERSONNEL

PI - P.J. COLEMAN, JR. OI - W.D. CUMMINGS

U OF CALIF, LA GRAMBLING COLLEGE

BRIEF DESCRIPTION

BRIEF DESCRIPTION A THREE-AYIS, BOOM-MOUNTED FLUXGATE MAGNETOMETER SYSTEM OBTAINED MEASUREMENTS OF THE AMBIENT MAGNETIC FIELD AT SYNCHRONOUS ALITUDE. THE DETECTOR WAS SIMILAR TO THAT FLOWN BY UCLA ON OGO 5 AND ATS 1. II CONSISTED OF A BASIC MAGNETOMETER WITH A DYNAMIC RANGE OF -16 TO 416 NT (GAMMA), AND A RESOLUTION OF 1/16 NT. CDILS WERE USED TO NULL THE AMBIENT FIELD SUCH THAT THE RESULTANT WAS WITHIN THE DYNAMIC RANGE OF THE BASIC MAGNETOMETER. THIS OFFSET FIELD GENERATOR PERMITTED FIELDS FROM -512 TO 4512 NT TO BE MEASURED (IN 16 STEPS). THE MAGNETOMETER WAS SAMPLED AT 8 VECTORS PER S, AND THE OFFSET FIELD STATE WAS SAMPLED AT 4 VECTORS PER S. THE ELECTROMICS AND SENSOR SYSTEM HAS EQUIPPED WITH AN 'ALLASING' FILTER, WITH AN UPPER LIMIT OF 2.25 HZ. AT 4 HZ, REJECTION WAS 20 DB, OFFSET STABILITY WAS ESTIMATED TO BE 1 NT PER 6 MONTHS. THE SPACECARAFT FIELD WAS ESTIMATED, DURING A ROLL MANEUVER, TO BE LESS THAN 2 NT TRANSVERSE AND LESS THAN S NT EARTHWARD. THE NOMINAL INSTRUMENT NOISE LEVEL WAS ESTIMATED TO BE SLIGHTLY IN EXCESS OF THE 1/16 NT DIGITAL RESOLUTION OF THE MAGNETOMETER.

----- ATS 6, DAVIES------

INVESTIGATION NAME- RADIO DEACON

N550C	10-	74-039A-09	INVESTIGATIVE Fode St	PROGRAM
BEREAL				DISCIPLINE(S) AND RADIO PHYSICS
PERSON	1951			

CENSONNEL		
PI - K.	DAVIES	WDC-A, SOLAR-TERR PHYS
01 - R.B.	FRITZ	NGAA-ERL
01 - R.N.	GRUBB	NOAA-ERL

DI - R.M. GRUBB DI - R.M. GRUBB THE PURPOSE OF THIS EXPERIMENT WAS TO STUDY VARIATIONS OF THE PURPOSE OF THIS EXPERIMENT WAS TO STUDY VARIATIONS, IRREGULARITIES, AND ABSORPTION) WITH TIME AND SOLAR AND MAGNETIC ACTIVITY, AND TO STUDY THE RELATION OF THESE VARIATIONS TO IONOSPHERIC PROCESSES. THE RADIO BEACOM EXPERIMENT PROVIDED THREE COMERENT CARRIER FREQUENCIES (40.0100 MH2, 14.0.056 HH2 AND 500.1440 HH2) FOR INVESTIGATION OF PARTICLES AFFECTING RADIO PROPAGATION. THE BEACON WAS DESIGNED FOR SEVERAL TYPES. OF MEASUREMENTS, PRINCIPALLY FARADAT ROTATION, DIFFERENTIAL PHASE (DOPPLER), PHASE AND AMPLITUDE SCINTILLATION, AND SIGNAL AMPLITUDE (ABSORPTION). THE 40-MH2 CARRIER WAS AMPLITUDE STAGLLIZE TO ENABLE ACCURATE ABSORPTION WERE POSSIBLE WITH CARRIERS AND SIDEBANDS. THE MODE OF OPERATION CALLED FOR CONTINUOUS EMISSION ON ALL FREQUENCIES STUDIES OF THE RADIO BEACON USING GROUND RECEIVERS BASED ON A UNIT DESIGNED BY THE NATIONAL OCENNIES CONDUCIED STUDIES OF THE RADIO BEACON USING GROUND RECEIVERS BASED ON A UNIT DESIGNED BY THE NATIONAL OCENNIES LONDING FROM ADMINISTRATION. GROUND STATIONS RANGING FROM ADMINISTRATION. TO CONTINENT TO SIMPLE MANAL UNITS WERE LOCATED AT POINTS'IN NORTH AND SUTH AMERICA, EUROPE, THE WIDDLE EAST, INDIA. AND AFRICA. MANY OF THE UNITS WERE HOBILE AND HOVED FROM CONTINENT TO CONTINENT TO KEEP THE SPACECRAFT IN SIGHT WHEN ITS ORBIT SHIFTED ALDNG THE EQUATOR.

----- ATS OF DUNKFRLY------

INVESTIGATION NAME- SOLAR CELL RADIATION DAMAGE

INVESTIGATIVE PROGRAM CODE EC

INVESTIGATION DISCIPLINE(S) COMMUNICATIONS

PERSONNEL P1 - W. DUNKERLY

NSSDC ID- 74-0394-16

HUGHES AIRCRAFT CO

BAIEF DESCRIPTION BRIEF DESCRIPTION THIS EXPERIMENT WAS FLOWN TO ISOLATE THE PREDOMINANT DEGRADATION MECHANISM(S) ASSOCIATED WITH PRESENTLY USED SOLAR CELLS, AND TO ELIMINATE ANOMALOUS DATA THROUGH INCREASED DATA POINTS AND IMPROVED INSTRUMENTATION ACCURACY. A TOTAL OF 80 SOLAR CELLS WERE INDIVIDUALLY MONITORED ON THE FLIGHT EXPERIMENT. TWELVE CURRENT-VOLTAGE POINTS AND TEMPERATURE DATA FOR EACH SOLAR CELL WERE TRANSMITTED TO GROUND ON A REAL-TIME BASIS. FIVE SOLAR CELLS OF 16 TYPES HAVE BEEN INCLUDED TO PROVIDE A STATISTICALLY MEANINGFUL SAMPLE SIZE. A SOLAR ASPECT SENSOR INSURED THAT THE SUN IS NORMAL TO THE TEST CELLS AT THE TIME OF THE MEASURE' 'TS.

ATS 6/ FRIT2-----

IGATION NAME- REASUREMENT OF LOW-ENERGY PROTONS

NSSDC 10- 74-0394-01 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIFIDS

PERSONNEL		
PI - T.A.	FRITZ	NOAA-ERL
0I - A.	KONRADI	NASA-JSC
01 - 0.J.	WILLIAMS	NDAA-ERL

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF FOUR 2-ELEMENT SOLID-STATE TELESCOPES, MOUNTED IN A PLANE SUCH (HAT TWO (A AND H) LINKED RADIALLY AWAY FROM THE EARTH. THE THIRD TELESCOPE (B) WAS AT 90 DEG RELATIVE TO A AND H AND LINKED 13 DEG EAST OF SOUTH, AND THE FOURTH TELESCOPE (C) LINKED NORTHWARD, 45 DEG FROM A AND H. TELESCOPES A, B, AND C MAD GEOMETRIC FACTORS (G,F.) 6.6E-4 THROUGH 7.E-4 CM-SG STER, AND TELESCOPE H AND A 1.E-3 CM-SG STER G, T THE APFRTURE OF EACH TELESCOPE H AND A 1.E-3 CM-SG STER G, T. THE APFRTURE OF EACH TELESCOPE DERIVED A CONICAL LOGARITHMICALLY BOUAL ENERSY CHANNELS BETWEEN 25.5 AND 234 KEV AND, ONCE EVERY 16 S, .234 TO 2.8-MEV PROTON FLUXES. THESE MODES HAD NG ELECTRON OR HIGHER ENERGY PROTON BACKGROUND. FROM THE H TELESCOPE, DE/DX VS E FLUXES OF 1.2 TO 1.8 AND 1.2 TO 3.6 MEY ALPHA PARTICLES AND OF HEAVIER PARTICLES IN THE 2 RANGES 3 INROUGH 6 AND 6 THROUGH 8 WERE DETERMINED FOR OUTPUT OF THE FIRST H SENSOR ONLY, BUT AT FIVE DISGRITINATION LEVELS. THESE CORRESPONDED MAINLY TO ALPHA PARTICLES IN THE .5 TO .0 AND .8 TO 2.7 MEY RANGES AND HEAVIER PARTICLES WITH Z VALUES GRATER THAN 72, S, AND 8. PROTOM FLUXES IN STHE 2 WAND.6 THAN 72, S, AND 8. PROTOM FLUXES IN THE 2 RANGES 3 THAN 72, S, AND 8. PROTOM FLUXES IN THE 2 RANGES.5 ETHAVEN .302 AND 1.1 MEY WERE ALSO DETERMINATION LEVELS. THESE CORRESPONDED MAINLY TO ALPHA PARTICLES WITH Z VALUES GRATER THAN 72, S, AND 8. PROTOM FLUXES IN SEVEN ADDITIONAL CHANNELS DETWEEN .302 AND 1.1 MEY WERE ALSO DETERMINED ONCE EACH 5.3 S BY USE OF APPORPIATE H-TELESCOPE DISCRIMINATION LEVELS. FOR FURTHER DETAILS, SEE FRITZ AND CESSNA, IEEE TRANS, AES-11, 1145, 1975.

---- ATS 6, GALICINAO------

INVESTIGATION NAME- TRACKING AND DATA RELAY

INVESTIGATIVE PROGRAM CODE EC

INVESTIGATION DISCIPLINE(S) COMMUNICATIONS

NASA~GSFC

PERSONNEL PI - I.Y. GALICINAO

NSSDC ID~ 74-039A-18

BRIEF DESCRIPTION THIS EXPER

BRIEF DESCRIPTION THIS EXPERIMENT PROVIDED EXPERIENCE AND INFORMATION USED IN DESIGNING TRACKING AND DATA RELAY SYSTEMS. THE SPECIFJ-OBJECTIVES WERE TO -- (1) ESTABLISH THE ORDIT OF A LOW-ORBITIN. SPACECRAFT FROM A HIGHER ORBITING SPACECRAFT. AND (2) DEMONSTRATE THE TECHNOLOGY OF COMMAND AND TELEMETRY DATA TRANSMISSION BETWEEN A LOW-ALTITUDE SATELLITE AND A GROUND STATION USING A GEOSYMCHRONOUS SATELLITE AS A COMMUNICATIONS RELAY. THIS EXPERIMENT USED THE ATS 6 AS A REPEATER FOR INFORMATION TRANSMISSION BETWEEN EARTH AND A SECOND SATELLITE SUCH AS NIMBUS. IT WAS A DUPLEX LINK THAT REQUIRED THE TRANSPONDER TO TRANSMIT AND RECEIVE ON TWO CHANNELS SIMULTANEOUSLY. SEVERAL SATELLITE-TO-SATELLITE. EXPERIMENTS WERE PLANNED USING ATS 6. WHICH WAS IN A GEOSYNCHROMOUS-EQUATORIAL ORBIT AND THE GEODETIC EARTH ORBITING SATELLITE-C (GEOS 3), WHICH IS IN A MEAR-EARTH, NEAR-CLICULAR ORBIT.

-- ATS 6. GALICINAO----INVESTIGATION NAME- POSITION, LOCATION AND AIRCRAFT Communication

INVESTIGATIVE PROGRAM CODE EC

INVESTIGATION DISCIPLINE(S) COMMUNICATIONS

NASA-GSFC NASA-GSFC

PERSONNEL

PI - I.Y. GALICINAD DI - A.F. GHAIS

NSSDC 10- 74-039A-19

BRIEF DESCRIPTION THE POSITION LOCATION AND AIRCRAFT COMMUNICATION EXPERIMENT (PLACE) WAS USED TO DETERMINE THE OPERATIONAL FEASIBILITY OF AIR TRAFFIC CONTROL AND MARITIME SATELLITE SYSTEMS OPERATING IN THE AERONAUTICAL L-BAND. THE FIRST OBJECTIVE WAS TO PROVE THE FEASIBILITY OF TWO-WAY COMMUNICATIONS RELAYED BY SATELLITE BETWEEN GROUND TERMINALS AND AIRCRAFT OR SHIPS, INCLUDING -- (1) THE USE OF ATS 6 AS A SYNCHRONOUS SATELLITE FOR RELAYING COMMUNICATIONS, (2) THE 'SS OF THE AERONAUTICAL L-BAND FOR SATELLITE/AIRCRAFT AND SATELLITE/SHIP LINKS, (3) THE USE OF ATS ASTELLITE FOR AIRCRAFT/GROUND AND SHIP/SHORE MULTIPLE ACCESS COMMUNICATIONS. THE SECOND OBJECTIVE WAS TO INVESTIGATE THE FEASIBILITY AND TO EVALUATE THE ABSOLUTE AND RELATIVE ACCURACIES OF SEVERAL POSITION LOCATION TECHNIQUES USING SATELLITES. THESE TECHNIQUES RELAY VARIOUS SIGNALS FROM THE AIRCRAFT OR SHIP VIA THE SECOND OBJECTIVE WAS TO INVESTIGATE THE FEASIBILITY AND TO EVALUATE THE ABSOLUTE AND RELATIVE ACCURACIES OF SEVERAL POSITION LOCATION TECHNIQUES USING SATELLITES. THESE TECHNIQUES RELAY VARIOUS SIGNALS FROM THE AIRCRAFT OR SHIP VIA THE SATELLITE TO THE CONTROL CENTER FOR DATA PROCESSING AND POSITION DETERMINATION.

-- ATS 6, HENRY-

INVESTIGATION NAME- RADIO FREQUENCY INTERFERENCE

NSSDC 10- 74-039A-11 INVESTIGATIVE PROGRAM CODE EC

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INVESTIGATION DISCIPLINE(S) COMMUNICATIONS

PERSONNEL PI - V.F. HENRY

NASA-GSEC

BRIEF DESCRIPTION

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BRIEF DESCRIPTION THE RADIO FREQUENCY INTERFERENCE (RFI) EXPERIMENT PROVIDED REALISTIC DATA ON MUTUAL RF INTERFERENCE IN THE C-BAND SPECTRUM SHARED BETWEEN SATELLITE AND TERRESTRIAL TELECOMMUNICATIONS SYSTEMS. THE EXPERIMENT MEASURED AND EVALUATED THE EFFECTS OF RFI IN THE SHARED COMMON-CARRIER FREQUENCY BAND. 5925 TO 0425 MHZ. THE TECHNICAL OBJECTIVES UF THE C-BAND RFI EXPERIMENT WERE TO -- DETERMINE THE FLUX DENSITY OF THE 6-GHI INTERFERENCE POWER AT THE SATELLITE. ESTABLISH FREQUENCL GAIN-TO-MOISE RATIO LIMITS FOR THE SATELLITE. ESTABLISH REALISTIC SATELLITE PROTECTION RAT'OS. DETERMINE BOTH GEOGRAPHICAL AND FREQUENCY DISTRIBUTION OF ERRESTRIAL RF NOTSE SOURCES. AND TO INVESTIGATE THE FEASIBILITY OF ESTABLISHING MATHEMATICAL MODELS FOR PREDICTING RFI.

-- ATS 6, HYDE------

INVESTIGATION NAME- COMSAT PROPAGATION (13-AND 18-GHZ)

INVE TIGATIVE PROGRAM NSSDC ID- 74-0394-21

> INVESTIGATION DISCIPLINE(S) COMMUNICATIONS

PERSONNEL PI - G. COMMUN SATELLITE CORP HYDE

BRIEF DESCRIPTION THE PURPOSE OF THE EXPERIMENT WAS TO COLLECT SUFFICIENT LONG-TERM DATA ON PROPAGATION ATTENUATION CAUSED BY PRECIPITATION FOR A LARGE NUMBER OF LOCATIONS IN THE U.S. THIS WILL PERMIT DETERMINATION OF MINIMUM-POWER MARGINS NEEDED IN SPACECRAFT COMMUNICATIONS SYSTEMS OPERATIMG AT FREQUENCIES ABOVE 10 GHZ. THE EXPERIMENT WILL INVOLVE ANALYSIS OF DATA GATHERED FROM 15 WIDELY SEPARATED DUAL-FREQUENCY SITES, AND ROVIDE THE UNIQUE CAPABILITY OF MAKING INSTANTAMEOUS CORRELATIONS OF SIGNALS BETHEEN ANY NUMBER OF STATIONS. THE EXPERIMENTAL SYSTEM CONSISTED OF THREE MAIN PARTS -- (1) 15 SMALL, WIDELY SEPARATED (GREATER THAN 100 MILES APART) EARTH STATIONS, EACH TRANSMITING AT APPROXIMATELY 13 AND 18 GHZ, AND 0 CLOSELY SPACED LIESS THAN 25 MILES APART) 18-GHI TRANSMITING TERMINALS, (2) A SPACECRAFT TRANSPONDER RECEIVING FROM THE SMALL ANTH TFANSMITING THESE SIGNALS AT ABOUT 4 GHZ, AND 18 GHZ, AND RETRANSMITING THESE SIGNALS AT ABOUT 4 GHZ, AND (3) OME 4-GHZ EARTH STATION FOR RECEIVING AND RECORDING THE PROPAGATION DATA FROM THIS EXPERIMENT.

-- ATS 6, IPPOLITO-----

INVESTIGATION NAME- MILLIMETER WAVE PROPAGATION

NSSDC 10- 74-0394-13

CODE EC INVESTIGATION DISCIPLINE(S) COMMUNICATIONS

INVESTIGATIVE PROGRAM

PERSONNEL PI - L.J. IPPOLITO

NASA-GSEC

BRIEF DESCRIPTION THE ATS 6 MILLIMETER WAVE (MNW) PROPAGATION EXPERIMENT EVALUATED THE PROPAGATION CHARACTERISTICS OF SPACE-EARTH LINKS CENTERED AT 20 AND 30 GHZ DURING MEASURED METEOROLOGICAL CONDITIONS. THE OBJECTIVES OF THIS EXPERIMENT WERE TO ---PROVIDE ENGINEERING DATA ON SPACE-EARTH COMMUNICATIONS LINKS OPERATING AT 20 AND 30 GHZ. INVESTIGATE TECHNIQUES FOR PREDICTING AT 20 AND 30 GHZ. INVESTIGATE TECHNIQUES FOR PREDICTING AT 20 AND 30 GHZ. INVESTIGATE TECHNIQUES FOR PREDICTING AT 20 AND 30 GHZ. INVESTIGATE TECHNIQUES FOR PREDICTING AT 20 AND 70 GHZ. INVESTIGATE TECHNIQUES FOR PREDICTING AN PROPAGATION EFFECTS FROM INDIRECT MEANS SUCH AS RADIOMETRIC SKY TEMPERATURE AND RADAR DACKSTATTER. AND ESTABLISH A RODEL FOR THE MMW CHANNEL "INDER DEFINED METEOROLOGICAL CONDITIONS.

INVESTIGATION NAME- SPACECRAFT ATTITUDE CONTROL

N550C 10- 74-0394-20

INVESTIGATIVE PROGRAM CODE EC

INVESTIGATION DISCIPLINE(5) COMMUNICATIONS

PERSONNEL PI - W.C. ISLEY

NASA-GSEC

BRIEF DESCRIPTION THE SPACECRAFT ATTITUDE PRECISION POINTING AND SLEWING THE SPACECRAFT ATTITUDE PRECISION POINTING AND SLEWING THE SPACECRAFT ATTITUDE (SAPPSAC) OBJECTIVES WERE TO DEMONSTRATE -- (1) THE ABILITY TO MAINTAIN PRECISE ATTITUDE STABILIZATION OF A GIVEN SPACECRAFT POINTING WERTOR (SUCH AS THE ANTENNA) IN A FIXED DIRECTION, FOR AN EXTENDED PERIOD OF TIME IN THE PRESENCE OF ALL DISTURBING SUPUTS. WHEN USING THE GROUND ATTITUDE COMMAND AND TELEMETRY LINK RELIABILITIES FOR AN EXTENDED PERIOD OF TIME, (3) THE RELATIVE ATTITUDE MEASUREMENT CAPABILITIES FOR THE AVAILABLE SENSORS DURING EXTEMDED TERM PRECISION ATTITUDE SINGLE-ATTITUDE SLEWING MANEUVER BETWEEN TWO REFERENCE GROUND LOCATIONS IN A MANNER PRESCRIBED (SUCH AS MANEUVER TIME, REACTION JET-PROPELLANT EXPENDITURE, ROMENTUR-WHEEL SPEED CHANGES, MAXIMUM ALLOWABLE ATTITUDE RATES, OR IN VARIOUS COMBINAND THACK GENERATION, (6) THE ABILITY TO TRACK ANOTHER OBJECT IN 'LIGHT IN A MANNER THAT MINITIES JET-PROPELLANT EXPENDENT IN EXPENDING AT A GROUND OF SULAR-TORUME PROSILAUNCH DIAGNOSTICS, SUCH AS VERIFICATION OF SULAR-TORUME PROSILAUNCH DIAGNOSTICS, SUCH AS VERIFICATION OF SULAR-TORUME PROFILES, REACTION-JET BEHAVIOR, MOMENTUM-WHEEL BEMAVIOR, LOW-FREQUENCY JITTER AND SENSOR BEHAVIOR, AMD (8) THE ABILITY OF CONBINED THACK AND SENSOR BEHAVIOR, AND (8) THE ABILITY TO DESCRIPTIONE THACK BENERT PRESTRIBED GROUND PATTERNS, SUCH AS ANTENNA MAPPING AT A GROUND OF SULAR-TORUME PROFILES, REACTION-JET BEHAVIOR, AND (8) THE ABILITY TO TRACK ANOTHER OBJECT IN 'LIGHT IN A MANNER THAT MINITIES JET-PROPELLANT EXPENDINGE AND SINGLES BEHAVIOR, AND (8) THE ABILITY OF COMBINED THACK AND SENSOR BEHAVIOR, AND (8) THE ABILITY OF COMBINED THO-STATION INTERFEROMETER AND EARTH SENSOR (OR THREE-STATION INTERFEROMETER) GROUND TELEMETRY TO DETERMINE REAL-TIME ORBIT STATE.

-- ATS 6, KAMPINSKY----

INVESTIGATION NAME- R.F.INTERFEROMETER SUBSYSTEM

INVESTIGATIVE PROGRAM NSSDC 10- 74-0394-29 CODE EC

INVESTIGATION DISCIPLINE(\$) COMMUNICATIONS

PERSONNEL KARPINSKY NASA-GSEC P1 - A.

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PI - A. KANPINSKY AAA-DUTC BRIEF DESCRIPTION THE RADIO FREQUENCY INTERFEROMETER (RFI), WHEN USED IN CONJUNCTION WITH TWO GROUND TRANSMITTERS, PROVIDES THE MEANS OF DETERMINING SPACECRAFT ATTITUDE IN ROLL, PITCH, AND COMPUTED YAW TO AN ACCURACY OF PLUS OR MINUS D.018 DEG, WITHIN A 12.5-DEG CONICAL FOV AND TO PLUS OR MINUS D.025 DEG WITHIN A TO DEG CONICAL FOV CENTERED ON THE SPACECRAFT Z-AXIS. THE INTERFEROMETER CONTAINED -- (1) AN ANTENNA ARRAY, WHICH CONSISTED OF TWO ORTHOGONAL BASELINES WAS MOUNTED ON THE EARTH-VIEWING SUBFACE OF THE EARTH-VIEWING MOULE, (2) A TWO-CHANNEL RECEIVER, ONE FOR REFERENCE SIGNAL AND ONE FOR COMPARISON SIGNAL, (3) A SPACECRAFT DATA CONVERTER, WHICH MEASURED THE PHASE RELATIONSHIP OF THE RECEIVER OUTPUT SIGNALS WITH RESPECT TO A COMERENT REFERENCE SIGNAL, AND WHICH CONVERTED THESE MEASUREMENTS TO DIGITAL FORM WHICH CAN BE TELEMETERED TO GROUND OR CONNECTED TO THE ALTITUDE CONTROL SYSTEM (A COMPLETE MEASURGMENT CAN BE MADE EVERY 230 MS AND TLEMETERED DATA LINK, WHICH WAS THE RESULTANT OUTPUT OF THE DIGITAL CONVERTER PHASE-COUNT GATE AND A 4-RHZ OSCILLATOR.

--- ATS 6. KIRKPATRICK

INVESTIGATION NAME- ADVANCED THERMAL CONTROL FLIGHT

NSSDC JD- 74-0394-22

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(5) TECHNOLOGY

PERSONNEL KIRKPATRICK

BRIEF DESCRIPTION

NASA-ARC

BRIEF DESCRIPTION THE OBJECTIVES OF THE ADVANCED THERMAL CONTROL FLIGHT TYPERIMENT (ATFE) WERE -- (1) TO EVALUATE, IN SPACE, THE PERFORMANCE OF AN ACTIVE, FEEDBACK-CONTROLLED, VARIABLE-CONDUCTANCE HEAT PIPE A THERMAL DIODE CONE-WAY HEAT PIPEJ, AND A PHASE-CHANGE HEAT RESERVOIR OR THERMAL ACCUMULATOR, (2) TO DEMONSTRATE THE EFFECTIVENESS OF THESE TEMPERATURE OF SPACECRAFT COMPONENTS WHICH UNDERGO MARKED CHANGES IN POWER DISSIPATION AND/OR THERMAL ENVIRONMENT. TO AVOID THE USE OF SPACECRAFT POWER TO PROVIDE HEAT INPUT, THE EXPERIMENT INCLUDED A SOLAR ABSORBER PARE AND A THERMAL DIODE. THE SOLAR ABSORBER WAS ORIENTED SO, IN SYNCHRONOUS ORDIT, IT WILL BE EXPOSED TO ONE FULL DAILY RANGE OF INSOLATION.

-- ATS 6. NASI FY--------

INVESTIGATION NAME- SOLAR COSMIC RAYS AND GEOMAGNETICALLY TRAPPED RADIATION

NSSDC 10- 74-0394-06 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) Particles and fields

PERSONNEL PI - A.J. MASLEY OI - P.R. SATTERBLOM

AEROJET ELECTROSYSTEMS MCDONNELL-DOUGLAS CORP

BRIEF DESCHIPTION THO SC.ID-STATE TELESCOPES, ONE DIRECTED PERPENDICULAR TO AND THE OTHER DIRECTED PARALLEL TO THE LOCAL MAGNETIC FIELD DIRECTION, EACH MEASURED PROJONS FROM 0.2 TO 300 MEV IN 12 ENERGY INTERVALS AND ALPHA PARTICLES FROM 1.2 TO 180 MEV IN 10 ENERGY INTERVALS, THO MAGNETIC ELECTRON SPECTROMETERS, ORIENTED PARALLEL TO THE THO TELESCOPES, MEASURED ELECTRONS FROM 50 TO 800 KEV IN FOUR ENERGY INTERVALS.

----- ATS 6, HCILBAIN------

INVESTIGATION NAME- AURORAL PARTICLES EXPERIMENT

NSSDC 10- 74-0394-05 INVESTIGATIVE PROGRAM

CODE 51

INVESTIGATION DISCIPLINE(5) Particles and fields

PERSONNEL PI - C.E. MCILWAIN OI - R.W. FILLIUS

U OF CALIF, SAN DIEGO U OF CALIF, SAN DIEGO

U OF CALIF, SAN DIEGO BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT WAS TO DETERMINE THE PROCESSES THAT ACCELERATE CHARGED PARTICLES NEAR THE EARTH, WITH PARTICULAR EMPHASIS ON PROCESSES ASSOCIATED WITH THE FORMATION OF AURORAS AND SUBSTORMS. FIVE ELECTROSTATIC AMALYZERS WERE CAPABLE OF MEASURING PARTICLES OF EMERGY LESS THAN 1 EV TO 81 KEV IN 64 CHANNELS WITH AN ENERGY RESOLUTON OF ABOUT 0.22E+2 EV. THE GEOMETRIC FACTOR IS APPROXIMATELY 2.4E-4 50 CM STER FOR PROTONS AND 3.66-4 SQ CM STER FOR ELECTRONS. THESE ARE DIFFERENT BECAUSE HALF OF EACH ELECTRON APERTUME AND ONE-FOURTH OF EACH ION APERTUME WERE COVERED IN ORDER TO AVOID INTERFERING EQUIPMENT WITHIN THE FIELD OF VIEW. FOUR OF THE ANALYZERS WERE MOUNTED IN TWO ROTATING HEADS IN SETS OF WO EACH, ONE OF WHICH WAS SENSITIVE TO ELECTRONS. AND ONE TO POSITIVE IONS. THE HEADS WERE MOUNTED MUTUALLY PERPENDICULAR TO EACH OTHER AND COLLD BE ROTATED THROUGH 220 DEG GACH. TH EXPERIMENT HAD MAKY MODES OF OPERATION. FOR MORE DETAIL SEE 'IEEE TRANS.,' AES-11, 6, P 1125.

--- ATS O, HILLER------

INVESTIGATION NAME- SATELLITE INSTRUCTIONAL TV

NSSDC 10- 74-0394-17 INVESTIGATIVE PROGRAM CODE EC

INVESTIGATION DISCIPLINE(S) COMMUNICATIONS

NASA-GSFC

PERSONNEL PI - J.E. MILLER

BRIEF DESCRIPTION THE GENERAL OBJECTIVES OF THE EXPERIMENT WERE -- (1) TO GAIN EXPERIENCE IN THE DEVELOPING, TESTING, AND MANAGING OF A SATELLITE-BASED INSTRUCTIONAL TV SYSTEM, PARAMETERS, (2) TO DEMONSTRATE THE POTENTIAL VALUE OF SATELLITE TECHNOLOGY IN THE RAPID DEVELOPMENT OF EFFECTIVE MASS COMMUNICATIONS IN DEVELOPING COUNTRIES, (3) TO DEMONSTRATE THE POTENTIAL VALUE OF SATELLITE BROADCAST TV IN THE PRACTICAL INSTRUCTION OF VILLAGE

INMABITANTS, AND (6) TO STIMULATE NATIONAL DEVELOPMENT IN INDIA, WITH IMPORTANT MAMAGERIAL, ECONOMIC, TECHNOLOGICAL, AND SOCIAL IMPLICATIONS. THE SPACECRAFT WAS POSITIONED AT APPROXIMATELY 35 DEG E LONGITUDE. A FREQUENCY MOULTED TY CARRIER AT 6 GHZ WAS TRANSMITTED TO THE ATS 6 CARTIN-COVENAGE ANTENNA FROM ONE OF TWO EARTH STATIONS -- AMMEDABAD GH DOLHI. THE SIGNAL WAS PROCESSED AND RETRANSMITTED AT DOTA 4 GHZ AND 860 MHZ. THE 860-MHZ DOWNLINK TESTED THE CONCEPT OF A HYBRID SYSTEM INVOLVING BOTH DIRECT RECEPTION BY LOW-COST AUGMENTED IN WECEIVERS AS WELL AS HIGHER SENSITIVITY EARTH STATIONS FOR REBROADCAST AT VHF TO CONVENTIONAL SETS WERE LOCATED IN SODD VILLAGES. THE DIRECT RECEPTION TERMINALS WERE LOCATED IN CLUSTERS OF ABOUT 400 EACH IN 6 STATES OF INDIA, WHILE THE CONVENTIONAL SETS WERE LOCATED IN VILLAGES NEAR EXISTING OR PLANNED VHF TV TRANSMITTERS.

- ATS 6> MILLER-

INVESTIGATION NAME- TELEVISION RELAY USING SMALL TERMINALS

INVESTIGATIVE PROGRAM CODE EC

INVESTIGATION DISCIPLINE(5) COMMUNICATIONS

NASA-GSEC

PERSONNEL PI - J.E. MILLER

NSSDC ID- 74-0394-28

PI - J.E. MILLER NASA-CSFC BRIEF DESCRIPTION THE PURPOSE OF THE TELEVISION RELAY USING SMALL TERMINALS (TRUST) EXPERIMENT WAS TO ADVANCE AND PROMOTE THE TECHNOLOGY OF WIDE-MAND SATELLITE COMMUNICATIONS TO SMALL GROUND TERMINALS, BY DEVELOPING AND DEMONSTRATING A PILOT SYSTEM USING THE ATS 6 SPACECRAFT WITH ITS HIGH-GAIN PARABOLIC REFLECTOR, SPECIFIC GOALS WERE -- (1) TO TEST AND EVALUATE AN EXPERIMENTAL SYSTEM ASSOCIATED SOUND) BETWEEN THE ATS 6 SPACECRAFT AND A UHF RECEIVING FACILITY, (2) TO EVALUATE THE PERFORMANCE OF THE PILOT SYSTEM RELATIVE TO EXPERIMENT DESIGN UDJECTIVES AND INTERNATIONALLY RECOGNIZED AND ACCEPTED STANDARDS FOR INTERNATIONALLY, RECOGNIZED AND HERICALD, OTHER SYSTEM VARIABLES, AND COMPARE WITH THEORETICAL PREDICTIONS, AND 143 TO PROVIDE INTERESTED UNDERDEVELOPED COUNTRIES AN OPPORTUNITY TO PARTICIPATE IN TESTS AND DENDSIGNITATIONS OF A HIGH EFFECTIVE ISOTROPIC RADIATION TV USING INEXPENSIVE RECEIVERS. THE BASIC EXPERIMENT SYSTEM CONSISTED OF A HIGH-EFFECTIVE TANNONITING TERMINAL FOR EARTH-TO-SATELLITE SUITABLE FOR NATIONAL EDUCATION TV USING INEXPENSIVE RECEIVERS. THE BASIC THE SPACECRAFT WITH AND INFORMUTE ATIONS REPEATER, AND A PILOT MOBILE UHF GROVADE TO HERE COMMUNICATIONS A HIGH-PROVER CERPENSIVE RECEIVERS. THE BASIC TRANSMITTING TERMINAL FOR EARTH-TO-SATELLITE COMMUNICATIONS AND A PILOT MOBILE UHF GROVADE TANNE A PILOT MOBILE UHF GROVADE TANNEL A PILOT MOBILE UHF GROVADE TANNEL A PILOT MOBILE UHF GROVADE

-- ATS 6, PATTERSON-

INVESTIGATION NAML- TELEVISION CAMERA

NSSDC 10- 74-0394-31

INVESTIGATIVE PROGRAM INVESTIGATION DISCIPLINE(S) COMMUNICATIONS

NASA-GSEC

PERSONNEL

PI - G.C. PATTERSON

BRIEF DESCRIPTION BRIEF DESCRIPTION A SUBMINIATURE TV CAMERA WAS MOUNTED INSIDE THE EARTH-VIEWING MODULE WITH THE LENS ATTACHED THROUGH A HOLE IN THE PRIME-FOCUS FEED PLATE TO VIEW THE 30-FT PARABOLIC REFLECTOR. ITS PRIMARY PURPOSE WAS TO VERIFY PROPER REFLECTOR DEPLOYMENT AND TO INDICATE POSSIBLE ANOMALIES SUCH AS TEARS, HOLES, FOLDS, AND OTHER DISTORTIONS. ITS SECONDARY PURPOSE WAS TO PERIODICALLY DETERMINE ANY CHANGE IN THE STATUS OF THE REFLECTOR. ITHIS INFORMATION WAS USED IN OPERATING AND ANALYZING THE COMMUNICATIONS SYSTEM. THE TV CAMERA USED THE COMMUNICATIONS SUBSYSTEM WIDE-BAND DATA UNIT TO TRANSMIT PICTURES TO THE GROUND.

- ATS 6, PAULIKAS------

INVESTIGATION NAME- OMNIDIRECTIONAL SPECTROMETER

NSSDC 10- 74-039A-07 INVESTIGATIVE PROGRAM

CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

AEROSPACE CORP

AEROSPACE CORP

PERSONNEL PI - G.A. PAULIKAS DI - J.B. BLAKE

BRIEF DESCRIPTION BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF FOUR SOLID-STATE INSTRUMENTS. OME OF THESE WAS A TWO ELEMENT TELESCOPE WITH A 30-DEG CONE ANGLE AND THE OTHER THREE WERE OMNIDIRACIJONAL DETECTORS. PARTICLES MEASURED WERE ELECTRONS DETWEEN 140 AND 600 KEV. ELECTRONS ABOVE 0.7, 1.55, AND 3.9 MEV, PROTONS IN THE INTERVALS 2.12-20, 20-52, 40-90, 58-68, 85-96. 58-90, 86-109, 58-108, AND 86-13220-52, AND 40-90 MEV AND ALPHA PARTICLES IN THE INTERVALS 9.4-21232-265 AND 344-37021.2, AND 46-100 MEV. THE LOWEST ENERGY ELECTRON MODE AND THE TWO LOWEST ENERGY PROTON AND ALPHA PARTICLE MODES WERE DIRECTIONAL. ALL OTHER MODES WERE OMNIDIRECTIONAL. COUNTS WERE ACCUMULATED OVER 0.25 5 EVERY 4 S FOR EACH ELECTRON MODE AND OVER 1 S EVERY 8 S FOR EACH PROTON MODE. FOR MORE DETAIL, SEE P 1138 OF 'IEEE TRANS.,' AES-11, 6, NOVEMBER 1975. FOR MORE DETAILS SEE PAULIKAS, G.A., 6 LAKE, J.B., IMANOTO, S.S., 'ATS 6 ENERGETIC PARTICLE RADIATION MEASUREMENIS AT SYNCHRONOUS ALTITUDE' IEEE TRANS. AEROSPACE AND ELECTRONIC SYSTEMS, AES-11, NO. 6, PAGE 1138.

---- ATS 6, ROGERS------

INVESTIGATION NAME- QUARTZ CRYSTAL MICROBALANCE

NSSDC ID- 74-039A-23 INVESTIGATIVE PROGRAM

CODE EC

INVESTIGATION DISCIPLINE(S) TECHNOLOGY

PERSONNEL PI - J.F. ROGERS

NASA-GSEC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE QUARTZ CRYSTAL MICROBALANCE CONTAMINATION MONITOR SEARCHED FOP POSSIBLE SPACECRAFT CONTAMINANTS. THE INSTRUMENT USED WAS A QUARTZ CRYSTAL MICROBALANCE THAT MEASURES EXTREMELY SMALL MASS ACCRETIONS. THE SENSOR WAS MOUNTED ON A FACE WHICH VIEWS SPACE, AND RAN AT TEMPERATURES WEAR 200 K. SOURCES OF POSSIBLE CONTAMINANTS ON THE SPACECRAFT, IN ADDITION TO GENERAL OUTGASSING, INCLUDED THE EJECTA FROM THE SPACECRAFT PROPULSION SUBSYSTEMS AND PROPULSION EXPERIMENT. THE EXPERIMENT FLIGHT HARDWARE CONSISTED OF TWO PARTS -- A SENSOR ASSEMBLY MOUNTED EXTERNALLY ON THE NORTH FACE OF THE EARTH-VIEWING MODULE, AND THE GLECTRONIC UNIT MOUNTED INTERNALLY ON THE SAME FACE. THE QUARTZ CRYSTALS. THE DESIGN GOAL TEMPERATURE OF 200 K FOR THE GUARTZ CRYSTALS. THE DESIGN GOAL TEMPERATURE OF 200 K FOR THE EXTERNAL THERMAL CONTROL, AND THERMAL INSULATORS FOR MOUNTERS FOR EXTERNAL THERMAL CONTROL, AND THERMAL INSULATORS FOR MOUNTERS FOR EXTERNAL THERMAL CONTROL, AND COMMAND CIRCUITRY.

----- ATS 6, WHALEN------

INVESTIGATION NAME- HEALTH AND EDUCATION TELECOMMUNICATIONS

INVESTIGATIVE PROGRAM CODE EC

INVESTIGATION DISCIPLINE(S) COMMUNICATIONS

PERSONNEL

PI - A.A. WHALEN

NSSDC 10- 74-0394-24

NASA-GSEC

BRIEF DESCRIPTION THE S-BAND HEALTH, EDUCATION, TELECOMMUNICATIONS (HET) EXPERIMENT WAS FLOWN TO EVALUATE THE PERFORMMENCE AND EFFECTIVENESS OF SATELL.TE RELAY OF EDUCATIONAL PROGRAMMING AND HEALTH CARE DELIVERY TO FACILITIES SUCH AS SCHOOLS, HEW LEARNING CENTERS, #/SPITALS, CLINICS, AND COMMUNITY ANTENNA TELEVISION DISTRIBUTION SYSTEMS. THE SPACECRAFT WAS EQUIPPED WITH A TWO-CHANNEL TV TRANSMITTING CAPABILITY IN THE 2.5- TO 2.49-GHZ BAND. THE HET EXPREMIMENT PROVIDED THE FIRST OPPORTUNITY TO USE SATELLITE COMMUNICATIONS FOR THE TRANSMISSION OF TV AND MULTIPLE VOICE CHANNELS TO LOW-COST EARTH STATIONS. THE SPACECRAFT INCLUDED A PRIME-FOCUS FEED COMPLEX HAVING A CROSSED-XARAY OF SWITCHABLE BROADBAND S-GAND FEED ELEMENTS. TWO OF THESE FEED ELEMENTS WERE USED FOR THE HET EXPERIMENT. SIX EXPERIMENT COMPONENTS REQUIRING SEVEN DIFFERENT SPACECRAFT ON THINGS ARE INVOLVED IN THIS EXPERIMENT. THE SIX COMPONENTS ARE -- (1) APHALACHIAN REGIONAL COMISSION SATELLITE TECHNOLOGY DEMONSTRATION, (4) WASHINGTON, ALASKA, MONTAMA, AND IDAHO EXPERIMENTS, (5) ALASKA HEALTH SENVICES EXPERIMENTS, AND (6) ALASKA EDUCATION. EXPERIMENTS, EXPERIMENTS, AND (6) ALASKA EDUCATION EXPERIMENTS, EXPERIMENTS, AND (6) ALASKA EDUCATION. EXPERIMENTS, EXPERIMENTS, AND (6) ALASKA EDUCATION. BRIEF DESCRIPTION

- ATS 6. WINCKLER-----

INVESIGATION NAME- PARTICLE ACCELERATION MELHANISMS AND Dynamics of the outer trapping region

NSSDC 10- 74-039A-04 INVESTIGATIVE PROGRAM Code St

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

U OF MINNESOTA U OF WASHINGTON

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PERSONNEL PI - J.R. WINCKLER DI - G.K. PARKS

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE INSTRUMENT CONSISTED OF TWO, NEARLY IDENTICAL DETECTOR ASSEMBLIES TO INVESTIGATE THE ORIGIN AND DYNAMICS OF ENERGETIC ELECTRONS AND PROTONS IN THE OUTER RADIATION BELF AND THE MEAR FEARTH PLASMA SHEET. EACH OF THE DETECTOR ASSEMBLIES WAS A MAGNETIC SPECTROMETER CONTAINING FOUR GOLD-SILICON SURFACE BARRIER DETECTORS. ELECTRONS WERE DEFLECTED INTO TWO OF THESE DETECTORS DEPENDING ON THEIR MOMENTUM. MORE ENERGETIC ELECTRONS, AND PROTONS, MOVED DIRECTLY THROUGH THE 10 DEG TUM. MORE ENERGETIC THROUGH THE 10 DEG

ANGULAR APERTURE TO A TWO-DETECTOR TELESCOPE IN WHICH THE FRONT DETECTOR MEASURES PROTONS AND THE REAR DETECTOR SENSED HIGHER EMERGY PROTONS. USING PULSE HEIGHT ANALYSIS, THE FOLLOWING NOMINAL RANGES OF PARTICLES WERE MEASURED -- PROTONS, 30-50 KEV, SO-160 KEV, AND 120-514 KEVI ELECTRONS, 30-50 KEV, 150-214 KEV, AND .GT. 500 KEV. ONE DETECTOR ASSCHULY MAS MOUNTED IN A FIXED POSITION AND THE OTHER WAS ROTATED THROUGH A 180 DEG RANGE. DATA WERE TRANSMITTED FROM THE EXPERIMENT AS HIGH AS ELGHT MEASUREMENTS PER S. THE 150-214 KEV ELECTRON CHANNEL PROVIDED NO DATA FOR THE WHOLE MISSION. HIGHER THAN ANTICIPATED TEMPERATURES GRUSED THE PROTON DETECTOR IN THE FIXED SPECTROMETER TO FAIL ABOUT 9 MONTHS AFTER LAUNCH. IN ADDITION, THE LOWER THRESMOLD CHANNELS COULD ONLY BE OPERATED DURING COOLER PERIODS AS THE MISSION PROGRESSED. THE EXPERIMENT FAILED IN JANUARY 1977, AND NO FURTHER DATA WERE OBTAINED. ADDITIONAL DETAILS ON THIS EXPERIMENT MAY BE FOUND ON PP 1331-1137 IN 'IEEE TRANS. AEROSPACE AND ELECTRONIC

SPACECRAFT CONMON NAME- BE-C Alternate Names- Explorer 27, 5 66C 01328

NSSDC 10- 65-0324

LAUNCH DATE- 04/29/65 WEIGHT-LAUNCH SITE- WALLOPS FLIGHT CENTER, UNITED STATES LAUNCH VEHICLE- SCOUT WEIGHT- 60. KG

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-OSS

ORBIT PARAMETERS Orbit type- geocentric

PERIAPSIS-	107.7 MIN 927. KM	
and the second second		
FRSONNEL		

RSONNEL MG - NONE ASSIGNED SC - NONE ASSIGNED PM - F.T. HARTIN PS - L.H. BRACE

PS - L.H. BRACE NASA-GSFC BRIEF DESCRIPTION DE-C (EXPLORER 27) WAS A SMALL IONOSPHERIC RESEARCH SATELLITE INSTRUMENTED WITH AN ELECTROSTATIC PROBE, RADIO BEACONS, A PASSIVE LASER TRACKING REFLECTOR, AND A DOPPLER NAVIGATION EXPERIMENT. ITS PRIMARY ODJECTIVE WAS TO OBTAIN WORLOWIDE OBSERVATIONS OF TOTAL ELECTRON CONTENT BETWEEN THE SPACECRAFT AND THE EARTH. TYE SATELLITE WAS INITIALLY SPIN STABILIZED, BUT DESPUN AFTER SOLAR PADDLE ERECTION. SUBSEQUENT STABILIZED INFORMATION ON THE SATELLITE AXIS OF SYMMETRY WITH THE LOGAL MAGNETIC FIELD BY MEANS OF A STRONG BAR MAGNET AND DAMPING RODS. A THREE-AXIS MAGNETOMETER AND SJUN SENSORS THEOR AND NAFE RECORDER ABOARD SO THAT SATELLITE PERFORMANCE DATA AND ELECTROSTATIC ROBE DATA WERE OBSERVED ONLY WHEN THE SATELLITE WAS WITHIN RANGE OF A GROUND TELEMETRY STATION. CONTINUOUS TRANSMITTERS OPERATED AT 162 AND 324 MHZ TO PERMIT PRECISE TRACKING BY 'TRANSIT' TRACKING STATIONS FOR NAVIGATION AND GEODETIC STUDIES.

-- BE-C, BERBERT---

INVESTIGATION NAME- LASER TRACKING REFLECTOR

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) GEODESY

PERSONNEL PI - J.H. BERBERT

NSSDC 10- 65-0324-03

NASA-GSEC

EPOCH DATE- 02/28/77 Inclination- 41.1 Deg Apoapsis- 1320. Km

NASA-GSFC NASA-GSFC

BRIEF DESCRIPTION THE PASSIVE OPTICAL LASER EXPERIMENT, WHICH CONSISTED OF NIME PANELS ON THE SPACECRAFT, WAS USED TO DETERMINE THE SPACECRAFT RANGE AND ANGLE. EACH PANEL WAS COVERED WITH 40 GUARTZ CUBE-CORNER PRISMS THAT PROVIDED LASER TRACKING CAPABILITIES FOR OPTICAL TRACKING STUDIES. THE GROUND-BASED OPTICAL TRANSMITTER WAS A PULSED 1-MS RUBY LASER. A PHOTO DETECTOR DETERMINED WHETHER THE LASER BEAM INTERRUPTED THE SPACECRAFT.

SPACECRAFT COMMON NAME- COS-B Alternate Names- cosmic ray satellite-b, pl-741b NSSDC 10+ 75-0724

LAUNCH DATE- UB/09/75 Launch Site- Vandenberg AFB, United States-Launch Vehicle- Delta WEIGHT- 277.5 KG

CODE ESE

SPONSORING COUNTRY/AGENCY International

INITIAL ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 2227.0 min Periapsis- 339.6 km

PERSONNEL KLEEN Altmann NG - ₩. PM - G.

ESA ESA-ESTEC

EPOCH DATE- 08/12/75 Inclination- 90.13 deg Apdapsis- 99876. KH

FR. G. ALIMAN ESA-ESTEL
FUROPEAN SPACE AGENCY (ESA) TO STUDY EXTRATERRESTRIAL GAMMA RADIATION IN THE 2S-MEV TO 1-GEV ENERGY RANGE FROM A HIGHLY ELLIPTICAL ORBIT OF ROUGHLY 100-000-KM APOGEE, 3SO-M PERIGEE, AND NEAR-POLAR INCLINATION, NASA PROVIDED, ON A FULLY REIMBURSABLE BASIS, THE DELTA LAUNCH VEHICLE AND THE ASSOCIATED LAUNCH SERVICES. THE OGS-B SPACECRAFT, WEIGHING 277,5KG (610) LB), WAS A CYLINDER WITH A DIAMETER OF 140 CM AND A HEIGHT OF 172. CM OTHL MANOPOLE ANTENNAS, PROTRUDING 51.2 CM OTHL EFFECTIVE HEIGHT OF 172.2 CM. THE SPACECRAFT ATOTAL EFFECTIVE HEIGHT OF 172.2 CM. THE SPACECRAFT AND AN ASTRONOMY EXPERIMENT CONSISTING OF A SPARK CHAMBER MOUNTED IN A CENTRAL TUBE AND SURROUNDED BY EQUIPMENT PLATFORMS, TRIGGERING TELESCOPES, PHOTOMUTIPLIERS, UPPER AND LOWER GEIGER COUNTERS, AND AN ENERGY CALORMETER. THE SPACECRAFT OBTAINED OR IIS MOMENTUM VECTOR WITH RESPECT TO INERTIALS SPACE USING DATA FROM AN EARTH ALBEDO SENSOR, SPACECRAFT ATTITUDE WAS ADJUSTED BY A NITRGEN COLD-GAS ATTITUDE CONTROL SYSTEM (ACS). THE ASPACECOMFIT HAD A PCM/PSK/PM SYSTEM WITH A DIAL TARMSHITER AND A PCM/PSK/PM SYSTEM WITH UP-LINK/DOWN-LINK, RANGE-TOME COMMAND SYSTEM, POWER WAS SUPPLIED BY A FACECRAFT HAD A PCM/PSK/PM SYSTEM WITH A CONTROL SYSTEM VESTEM WITH A CONTROL SYSTEM VESTEM WITH A DALY TRANSMITTER AND A PCM/PSK/PM SYSTEM WITH A CONTROL SYSTEM WITH AND A CONTROL OF THE COS-B SALELLITE IN ORBIT WERE PROVIDED BY THE ESA ESTRACK METHORK. BRIEF DESCRIPTION THE COS-B EUROPEAN SFACE A RADIATION IN THE ELLIPTICAL ORBIT

ESA

----- COS-8, CARAVANE COLLABOR.-----

INVESTIGATION NAME- GAMMA-RAY ASTRONOMY SPARK CHAMBER Experiment (25 - 1000 NeV)

INVESTIGATIVE PROGRAM

NSSDC 10- 75-0724-01

SCIENCE

INVESTIGATION DISCIPLINE(S) GAMMA-RAY ASTRONOMY

CARAVANE COLLABOR.

PERSONNEL

PERSONNEL P1 CARAVANE COLLABOR. BRIEF DESCRIPTION GAMMA-RAY ASTRONOMY IN THE 25-TO 1000- MEY ENERGY INTERVAL. THIS EXPERIMENT USED A 14-DECK SPARK CHAMBER TO PERFORM INTER DESCRIPTION GAMMA-RAY ASTRONOMY IN THE 25-TO 1000- MEY ENERGY INTERVAL. THE SO-CALLED LINE-SOURCE OF RADIATION IN THE GALACTIC PLANE, CONCLUSE OF ADIATION IN THE GALACTIC PLANE, CONCLUSE OF ADIATION IN THE GALACTIC PLANE, CONCLUSE, SUPERNOVA REMANANTS, QUASARS, NOVAE, PLANE, GAMMA-RAYS (E.G., SUPERNOVA, MERMANTS, QUASARS, NOVAE, PLANE, CALLED LINE-SOURCE OF RAMANTS, QUASARS, NOVAE, PLANE, CANDATION FROM ALL OBSERVED SOURCES, (S) TO SEARCH FOR RADIATION FROM ALL OBSERVED SOURCES, (S) TO SEARCH FOR SEARCH FOR SHORT-PERIOD PULSATIONS FROM SOURCES, AND (6) TO DE PULSARS AT OTHER WAVELENGTHS AND TO DETECT GAMA-RAY UNSTS. THE INSTRUMENT CONTAINED THE FOLLOWING KEY ELEMENTS (TOP-TO-BOTTON) -- (1) ANTICOINCIDENCE SCINTILLATION DOME, (2) TO DE PULSARS AT OTHER WAVELENGTHS AND TO DETECT GAMA-RAY BURSTS. THE INSTRUMENT CONTAINED THE FOLLOWING KEY ELEMENTS (TOP-TO-BOTTON) -- (1) ANTICOINCIDENCE SCINTILLATION PLASTIC. (ITCK, VIEWED BY NINE PHOTONULITIPLIER TUBES (PMT). IT DETECTED THE ENTRY OF CHARGED PARTICLES AND THINBITED THE FAIR OF ORTHOGONAL GRIDS OF 192 PARALLEL WIRES. THE TOP 12 CASADE-PARTICLE PLASTIC SCINTILLATION PLASTIC. 1L DETECTED THE ENTRY OF CHARGED OF SCINTILLATION PLASTIC. TRIGGENING OF THE SC. THE SC MAD 19 DECKS, EACH COMPOSED OF A DECKS WITH MOLYDENOUN PLATES. THE SC MAD THE LODER (AGMMA RAY INTO AN ELECTRON-POSITRON PLATES AND THE LODER (AGMMA RAY INTO AN ELECTRON-POSITRON PLATES AND THE GAMA RAY OULD BE DETERMINED. THE PLATES AND FILE DOWN AND A SECOND WHICH THE ARRIVAL DIRECTION, AND A SECOND FUES MAS APPLIED ACROSS THE DECKS CASING SPARK DISCHARGE TH WHICH AN E-P PAIR LEFT THE SC A CERENCY COUNTER (C) OF AGMMA RAY INTO AN ELECTRON-POSITRON FAIR, AN 8-KY VOLTAGE ALONG THE LEASTANINE BY THE PLATES OF THE GAMMA RAY OULD BE DETERMINED. THE RECHARGE THE SC A CERENTRY THE FIELD OF INFORMATION ON T

ABSORBED AT LOW ENERGIES. AT HIGHER ENERGIES THE CASCADE PENETRATED TO THE FINAL PLASTIC SCINTILLATOR COUNTER, C. THE OUTPUT OF D WAS ANALYZED TO MEASURE THE NUMBER OF PAPIICLES ESCAPING. INFORMATICE: FROM THE TT COUNTERS AND FROM THE SC PROVIDED A MEASURE OF THE ENERGY DE ADDED TO THE CALOPIMETER ABSORPTION. THIS QUANTITY MUST BE ADDED TO THE CALOPIMETER SIGNAL TO DERIVE THE ENERGY OF THE INCIDENT GAMMA RAY.

LAUNCH DATE- 09/27/75 VEIGHT- 115. KG Launch Site- Kourou (centre spatial guyanais), france Launch Vehicle- Diamant

CNRS

SPACECRAFT COMMON NAME- D28 Alternate Names- Astronomy satellite D28

NSSDC 10- 75-092A

PERSONNEL

SPONSORING COUNTRY/AGENCY FRANCE

INITIAL ORBIT PARAMETERS ORBIT TYPE~ GEOCENTRIC ORBIT PERIOD- 96.5 MIN PERIAPSIS- 477. KM

NG -SC -PM - D. P5 -UNKNOWN UNKNOWN UNKNOWN UNKNOWN UNKNOWN SACOTT UNKNOW BRIEF DESCRIPTION THIS SPACECRAFT ATMOSPHERIC INVESTIGAT

BRIEF DESCRIPTION THIS SPACECRAFT CARRIED AN EUV EXPERIMENT FOR SOLAR AND ATMOSPHERIC INVESTIGATIONS AND A SET OF UV EXPERIMENTS FOR MAKING STELLAR, ZODIACAL LIGHT, AND INTEGRATED SKY BACKGROUND AND STELLAR, ZODIACAL LIGHT, AND INTEGRATED SKY BACKGROUND 0.25 RPM ABOUT AN AXIS THAT WAS DIRECTED TOWARD THE SUN. THE DATA TRANSMISSION RATE WAS 256 B/S FOR REAL-TIME DATA AND 11 THE MEMORY CAPACITY WAS 1.6 MB. THE CYLINDRIC AT AND 11 THE MEMORY CAPACITY WAS 1.6 MB. THE CYLINDRICHAR TO THE SUL SUL SUL STORM SOLAR PAWELS SITUATED PERPENDICULAR TO THE CYLINDRICAL AXIS PROVIDED POWER FOR THE MISSION. THE STABILIZATION SYSTEM FAILED ON DECEMBER 28, 1976, THEREBY TERMINATING OPERATION OF THE SPACECRAFT.

- D2B, CRUVELIER-

INVESTIGATION NAME- SOLAR FLUX NONITOR, FLARE EVOLUTION (174 TO 1315 A)

INVESTIGATIVE PROGRAM SCIENCE

INVESTIGATION DISCIPLINE(S) ASTRONOMY

CNRS-LAS

CNRS-LAS

EPOCH DATE- 09/28/75 Inclination- 37.1 ApoApsis- 707. KH

37.1 DEG 707. KH

PERSONNEL PI - P. CRUVELIER

NSSDC 10- 75-0924-02

BRIEF DESCRIPTION THE INSTRUMENT CONSISTED OF A SPECTROHELIOMETER COVERING THE WAVELENGTH RANGE FROM 1216 TO 3100 A WITH A RESOLUTION OF 2.75 A. THE TIME RESOLUTION FOR DATA COLLECTION WAS 1 S. THE INSTRUMENT MEASURED THE INTEGRATED LIGHT DUE TO THE SKY BACKGROUND AT 90 DEG TO THE SATELLITE-SUN DIRECTION. THE FIELD OF VIEW WAS 1.3 DEG.

- D28, CRUVELIER--

INVESTIGATION NAME- ATMOSPHERIC COMPOSITION BY SOLAR Absorbtion (177 to 1216 A)

NSSDC 10- 75-092A-03 INVESTIGATIVE PROGRAM Science

> INVESTIGATION DISCIPLINE(5) ASTRONOMY

PERSONNEL PI - P.

CRUVELIER

BRIEF DESCRIPTION

THIS EXPERIMENT MEASURED THE STELLAR UV RADIATION IN THE ANTISOLAR DIRECTION WITH A LOW SPECTRAL RESOLUTION (ABOUT 400 A) BETWEEN 792 AND 3075 A. THE SENSITIVITY OF THE INSTRUMENT ALLOWED DETECTION OF BO TYPE STARS DOWN TO BTH MAGNITUDE. IN ADDITION, A UBV PHOTOMETER MEASURED THE RADIATION FROM THE STARS AND THE SKY BACKGROUND.

- DZB, DE LABOUDINIERE------

INVESTIGATION NAME- SOLAR ACTIVITY STUDY (174 TO 1315 A)

42

NSSOC 1D- 75-092A-01

INVESTIGATIVE PROGRAM Physics and Astronomy

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

CNRS-LPSP

EPOCH DATE- 05/18/75 Inclination- 29.90 deg Apoapsis- 1271. Km

PERSONNEL PI - J.P. DE LABOUDINIERE

BRIEF DESCRIPTION

ARIEF DESCRIPTION IHIS EXPERIMENT USED TWO SPECTROMETERS TO OBSERVE THE SOLAR DISK AT 17 DIFFERENT, DISCRETE WAVELENGTHS BETWEEN 174 AND 1315 A (SPECTRAL RESOLUTION WAS 10 A) AND DETERMINED ATMOSPHERIC ABSORPTION AT SUMRISE AND SUNSET FOR 11 DISCRETE MAVELENGTHS BETWEEN 177 AND 1216 A. THE ABSORPTION MEASUREMENTS YIELDED INFORMATION ON THE COMPOSITION OF THE SPATIAL RESOLUTION WAS OF THE ORDER OF 1 MIN OF ARC.

SPACECRAFT COMMON NAME+ D5-B ALTERNATE NAMES+ CASTOR, D7802

NSSOC 10- 75-0398

LAUNCH DATE- D5/17/75 WEIGHT- 76. KG Launch Site- Kourou (Centre Spatial Guyanais), France Laungh Vehicle- Diamant

CNES

SPONSORING COUNTRY/AGENCY FRANCE

INITIAL DRBIT PARAMETERS ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 100-3 MIN PERIAPSIS- 272. KM PERSONNEL

CNES CERGA

PM - A. OLIVERO PS - F.E. BARLIER BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS FRENCH SPACECRAFT HAD A 26-FACE POLYHEDRON SHAPE WITH A DIAMETER OF 80 CM. THE PRIMARY MISSION DBJECTIVE WAS TO STUDY THE UPPER ATMOSPHERE DENSITY VARIATIONS. SECONDARY DBJECTIVES INCLUDED A STUDY OF GRAVITY FIELD PERTURDATIONS AND A STUDY OF MICROMETEORITE IMPACTS. A THREE-AXIS MAGNETOMETER WAS USED TO PROVIDE ATTITUDE INFORMATION. EACH ONE OF THE MEASURED EITHER EVERY U.1 S OR EVERY 2.8 S. THE DATA TRANSMISSION RATE WAS 1024 BITS/S FROM THE TAPE RECORDER AND EITHER 256 OR 512 BITS/S DIRECTLY FROM THE TAPE RECORDER AND WERE CONDUCTED BY THE OPENATIONS CENTER IN TOULOUSE USING THE EXPECTED LIFETIME IS 8 MONTHS.

- DS-UP SARLIER-

INVESTIGATION NAME- UPPER ATMOSPHERE DENSITY STUDY USING ON-BOARD Accelerometer

NSSOC ID- 75-0398-01 INVESTIGATIVE PROGRAM Science

INVESTIGATION DISCIPLINE(S) Atmospheric physics

PERSONNEL PI - F.E. BARLIER

PERSONNEL.

PI - F. 01 - G.

. E.

BARLIER BALMINO

CERGA

BRIEF DESCRIPTION THIS ATMOSPHERIC DENSITY ACCELEROMETER EXPERIMENT PROVIDED DENSITY DATA FROM MEASUREMENTS OF THE SATELLITE DECELERATION DUE TO ATMOSPHERIC DRAG. THE ACCELEROMETER CONSISTED OF A BALL SUPPENDED IN A SPHERICAL CAVITY FORMING A CAPACITOR. DISPLACEMENT OF THE BALL WITH RESPECT TO THE CAVITY WAS MEASURED BY CAPACITANCE CHANGE. THE RANGE OF MEASUREMENT WAS 1.E-5 TO 1.E-9 M/S SC WITH AN ACCURACY OF 1.S PERCENT. IN-FLIGHT QUALIFICATION WAS ACHIEVED BY DISPLACING THE ACCELEROMETER WITH SAALL MASSES AND BY SPINNING THE SATELLITE TO INDUCE ARTIFICIAL INERTIA FORCES.

- DS-B, BARLIER-----

INVESTIGATION NAME- GRAVITY FIELD PERTURBATIONS STUDY

NSSDC ID- 75-0398-02

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) GEODESY

CERGA

PERSONNEL AFGNC STAFF PI

NSSDC 10- 74-0634-01

GLOBAL WEATHER CTR

INVESTIGATIVE FROGRAM OPERATIONAL MET SYSTEM

INVESTIGATION DISCIPLINE(5) ATNOSPHERIC PHYSICS METEOROLOGY

BRIEF DESCRIPTION THE FOUR-CHANNEL SCANNING RADIOMETER, DESIGNATED THE SENSOR AVE (AEROSPACE VEHICLE ELECTROMICS) PACKAGE (SAP), WAS THE PRIMARY EXPERIMENT ON THE DMSP SPACECRAFT. THE PURPOSE OF OF CLOUDCOVER AND CLOUD TEMPERATURE MEASUREMENTS TO SUPPORT DEPARTMENT OF DEFENSE REQUIREMENTS FOR OPERATIONAL WEATHER ANALYSIS AND FORECASTING. THE RADIOMETER OPERATED IN THO SPECTRAL INTERVALS -- (1) VISIBLE AND NEAR INFRARED (0.4 TO 1.1

NSSDC 10- 75-0398-03 INVESTIGATIVE PROGRAM Science INVESTIGATION DISCIPLINE(S) INTERPLANETARY DUST PI - F.E. BARLIER CERG/ BRIEF DESCRIPTION THE OBJECTIVE MICROMETEORITE IMPACTS. 0 F THIS EXPERIMENT WAS TO STUDY SPACECRAFT CONMON NAME- DMSP(74-063A) ALTERNATE NAMES- DAPP(74-063A), DSAP(74-063A) DMSP 9532, 07411 N550C 10- 74-063A LAUNCH DATE- 08/09/74 Launch Site- Vandenberg Afb, United States Launch Vehigle- Thor

BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT WAS TO STUDY GRAVITY FIELD PERTURBATIONS USING ACCURATE LASER TRACKING AND ELIMINATING THE ATMOSPHERIC DRAG PERTURBATION FROM THE ORBIT CALCULATIONS.

SPONSORING COUNTRY/AGENCY UNITED STATES DOD-USAF INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC Orbit Period- 101.7 min Periapsis- 803.0 km EPOCH DATE- 08/10/74 Inclination- 98.9 Deg Apoapsis- 872.0 km

PERSONNEL

PERSONNEL

UNKNOWN US AIR FORCE

- D5-8, BARLIER-

INVESTIGATION NAME- NICROMETEORITE STUDY

PERSONNEL PM - UNKNOWN US AIR FORCE BAIEF DESCRIPTION DMSP (72-DASA), ALSO KNOWN AS DMSP 9532, WAS DNE OF A SERIES OF METEOROLOGICAL SATELLITES DEVELOPED AND OPERATED BY THE AIR FORCE UNDER THE DEFENSE METEOROLOGICAL SATELLITE PROGRAM. THIS PROGRAM (DAPP), WAS CLASSIFIED UNTIL MARCH 1973. THE OBJECTIVE OF THIS PROGRAM VAS TO PROVIDE GLOBAL VISUAL AND DATA TO SUPPORT DEPARTMENT OF DEFENSE REQUIREMENTS. OPERATIONALLY, THE PROGRAM CONSISTED OF TWO SATELLITES IN 830 KM SUN-SYNCHRONOUS POLAR ORBITS, WITH THE ASCENDING NODE OF ONE SATELLITE NEAR THE SUNGSE TERMINATOR AND THE OTHER MEAN LOCAL OPERATIONALLY, THE PROGRAM CONSISTED OF TWO SATELLITES IN 830 KM SUN-SYNCHRONOUS POLAR ORBITS, WITH THE ASCENDING NODE OF ONE SATELLITE NEAR THE SUNSSE TERMINATOR AND THE OTHER MEAN LOCAL MOON. THE SATELLITE, SHAPED LIKE THE FRUSTUM OF A POLYHEDRON, GONS ISTED OF FOUR SUBASSEMBLIES -- (1) A SOLAR ARRAY HAT, (2) A BASE-PLATE ASSEMBLY, (3) A SENSOR AEROSPACE VEHICLE ELECTRONICS (AVE) PACKAGE (SAP), AND (4) A DATA PROCESSING SYSTEM. THE PRIMARY SENSOR (SAP) WAS A FOUR CHANNEL SCANNING RADIORITER. SECONDARY SENSORS (SAP) WAS A FOUR CHANNEL SCANNING RADIORITER. SECONDARY SENSORS (SAP) WAS A FOUR CHANNEL SCANNING RADIORITER. SECONDARY SENSOR SINCLUDED A VERTICAL TEMPERATURE PROFILE RADIOMER (SUPPLEMENTARY SENSOR J/2 - SSJE), WICH WERE MOUNTER (SUPPLEMENTARY SENSOR J/2 - SSJE), WICH WERE ASSEMBLY. SPACEGRAFT STABLIZIATION WAS CONTROLLED BY A COMBINATION FLYWHEEL AND MAGNETIC CONTROL COLL SYSTEM SO THAT THE SATA PROCESSING SYSTEM INCLUDED ATARE PROFILE RECORDERS GAPABLE OF STORING A TOTAL OF GAAD MIN OF DATA, WHICH ALLOVED DATA WERE TRANSMITTED TO GROUND RECEIVING SITES VIA AM S-BAND LOGARE FORCE GLOBAL WEATHER CENTRAL, OFFUT AFE, NAD RELATED DATA WERE TRANSMITTED TO GROUND RECEIVING SITES VIA AM S-BAND LOGARE ARE READ OUT AT MOBILE TACTICAL SITES LOGARED AROUND THE DATA WERE READ OUT AT MEDILE TACTICAL SITES LOGARED AROUND THE DATA WERE READ OUT AT MOBILE TACTICAL SITES LOGARED AROUND THE

--- DMSP(74-063A), AFGWE STAFF------INVESTIGATION NAME- SCANNING RADIOMETER

MICROMETERS) AND (2) INFRARED (8 TO 13 MICROMETERS). THE FOUR-CHANNEL RADIOMETER WAS ESSENTIALLY TWO SCAMPING RADIOMETERS DRIVEN BY A COMMON MOTOR. ONE RADIOMETER PRODUCED HIGH RESOLUTION (HR) VISUAL AND INFRARED (IR) DATA WITH NADIR RESOLUTIONS OF 3.7 AND 4.4 KM, RESPECTIVELY. THE OTHER RADIOMETER PRODUCED VERY HIGH RESOLUTION (WHR) VISUAL AND INFRARED (WHR) DATA WITH NADIR RESOLUTIONS OF .63 AND .67 KM, RESPECTIVELY. ONBORAD RECORDERS HAD A STORAGE CAPACITY OF 210 MIN OF BOTH HR AND IR DATA AND A TOTAL OF 20 MIN OF VHR AND WHR DATA. FOR DIRECT READOUT TO TACTICAL SITES, THE EXPERIMENT WAS PROGRAMED SO THAT VHR AND IR DATA WERE OBTAINED DURING THE INFRARED CHANNELS (WHR AND IR DATA WERE OBTAINED DURING THE INFRARED CHANNELS (WHR AND IR OF A DATA WERE OBTAINED AT NIGHT. THE INFRARED CHANNELS (WHR AND IR OVERED A TEMPERATURE RANGE OF 210 TO 310 K WITH AN ACGURACY OF 1 DEG C. ELECTRONIC CLIRCUITRY IN THE SENSOR CONVERTED THE SENSED INFRARED SOLAR INPUT AND WAS USED TO TAMASMISSION TO GROUND SITES. THE HARNEL INFLOED PRIDE TO TRANSMISSION TO GROUND SITES. THE HARNEL AND THA OUTPUT SIGHAL THAT REPRESENTS SCHE ALBED. THIS FEATURE ALSO MADE IT POSSIBLE TO OBTAIN USEFUL VISUAL DATA AT NIGHT. THE SENSON INCORPORATED SUNSHARDES AND GLARE SUPPRESSION DEVICES IM CONJUNCION WITH A LONG-SCAN AUTOMATIC GAIN CONTROL WHICH ALLOWED THE HR CHANNEL TO PROVIDE USABLE DATA THROUGH THE DAY/NIGHT TERMINATOR. IDENTICAL EXPERIMENTS WERE FLOWN ON ALL DMSP BLOCK 5 SPACECRAFT.

- DHSP(74-063A), AFGWC STAFF------

INVESTIGATION NAME- VERTICAL TEMPERATURE PROFILE RADIOMETER

NSSDC ID- 74-0634-02

AFGNC STAFF

INVESTIGATION DISCIPLINE(S) Atmospheric physics

INVESTIGATIVE PROGRAM Earth observations

PERSONNEL PI

GLOBAL WEATHER CTR

EPOCH DATE- 09/14/76 Inclination- 98.7 deg Apoapsis- 848. KM

USAF-SAMSO

BRIEF DESCRIPTION SUPPLEMENTARY SENSOR E (SSE) WAS A VERTICAL TEMPERATURE PROFILE RADIOMETER. THE OBJECTIVE OF THIS EXPERIMENT WAS TO OBTAIN VERTICAL TEMPERATURE. AND WATER VAPOR PROFILES OF THE ATMOSPHERE TO SUPPORT DEPARTMENT OF DEFENSE REGUIREMENTS IN OPERATIONAL WEATHER ANALYSIS AND FORECASTING. THE SSE WAS AN EIGHT-CHANNEL SENSOR WITH SIX CHANNELS (668.5, 677, 695, 708, 725, AND 747 (M-1) IN THE CO2 15-MICROMETER ADSORPTION BAND, OME CHANNEL (835 CM-1) IN A WATER VAPOR PROFILES OF TWO ATMOSPHERE 10, 555 CM-1) IN A WATER VAPOR ABSORPTION BAND, OME CHANNEL (835 CM-1) IN A WATER VAPOR ABSORPTION BAND, AND THE EXPENIMENT CONSISTED OF AN OPTICAL SYSTEM, DETECTOR AND ASSOCIATED ELECTRONICS, AND A SCANNING MIRROR. THE SCANNING MIRROR STEPPED ACROSS THE SATELLITE SUBTRACK, ALLOWING THE SSE TO VIEW 25 SEPARATE COLUMNS OF THE ATMOSPHERE EVERY 32 SO VER A CROSS TRACK GROUND SWATH OF 185 KM. WHILE THE SCANNING MIRROR MAS STOPPED AT A SCENE STATION. THE CHANNEL FILTERS WERE TOTALED. THROUGH THE FIELD OF VIEW. THE SUBFACE RESOLUTION OF THE SEE WAS APPROXIMATELY 37 KM AT NADIR. THE CO2 BAND RADIATION DATA WERE TRANSFORMED TO A TEMPERATURE PROFILE BY A MATHEMATICAL INVERSION FECHNIOUE. BY A SIMILAR TECHNIQUE, THIS INFORMATION COULD BE COMBINED WITH WATER VAPOR BAND DATA TO OBTAIN A WATER VAPOR PROFILE. IDENTICAL EXPERIMENTS HAVE GEEN FLOWN ON ALL DRSP SPACECRAFT LAUMCHED SINCE 1972.

SPACECRAFT CONMON NARE- DMSP-F1 Alternate Names- DMSP 12535, DMSP BLOCK 50-1 D7415, DMSP501

NSSDC 10- 76-091A

LAUNCH DATE- 99/11/76 Launch Site- Vandenberg AFB, united States Launch Vehicle- Thor WEIGHT- 450, KG

SPONSORING COUNTRY/AGENCY UNITED STATES DOD-USAF

INITIAL ORBIT PARAMETERS	
ORBIT TYPE- GEOCENTRIC Orbit Period- 101.6 Min Periapsis- 818. KH	
NERTANOTO - GIOP KH	

PERSONNEL PM - W.D. MYER

BRIEF DESCRIPTION DHSPSDT, ALSO KNOWN AS DMSP BLOCK SD, IS ONE OF A SERIES OF METEOROLOGICAL SATELLITE- DEVELOPED AND OPERATED BY THE AIR FORCE UNDER THE DEFENSE METEOROLOGICAL SATELLITE PROGRAM (DMSP). THIS PROGRAM PREVIOUSLY KNOWN AS DAPP (DATA ACQUISITION AND PROCESSING PROGRAM, WARE TO PROVIDE GLOBAL VISUAL AND INFRARED CLOUD COVER DATA AND SPECIALIZED ENVIRONMENTAL DATA TO SUPPORT DEPARTMENT OF DEFENSE REQUIREMENTAL DATA TO SUPPORT DEPARTMENT OF DEFENSE REQUIREMENTAL DATA TO SUPPORT DEPARTMENT OF THE ASCENDING NODE OF ONE SATELLITE IN EARLY MORNING AND THE OTHER AT LOCAL NOON. THE S.4-R LONG SPACECRAFT IS SEPARATED THE FOUR SECTIONS. -- (1) A PRECISION MOUNTING PLATFORM (PMP) FOR SENSORS AND EQUIPMENT REQUIRING PRECISE ALIGNMENT, (2) AN

EQUIPMENT SUPPORT MODULE (ESM) CONTAINING THE ELECTRONICS, REATION WHEELS, AND SOME RETEOROLOGICAL SENSORS, (3) A REACTION CONTROL EQUIPMENT (RCE) SUPPORT STRUCTURE (THAT MAS THE THIRD-STAGE MOTOR, HYDRAZINE REACTION CONTROL SYSTEM) WHICH SUPPORTS (4) A 100-SQ-FY SOLAR CELL PAKEL. THE BLOCK 5D SPACECRAFT STABILIZATION IS CONTROLLED BY A COMBINATION FLYWHEEL AND MACHETIC CONTROL COIL SYSTEM SO SENSORS ARE MAINTAINED IN THE DESIRED 'EARTH-LOOKING' MODE. A NEW FEATURE OF BLOCK 5D IS THE PRECISION-POINTING ACCURACY OF THE PRIMARY IMGGER TO 0.01 DEG PROVIDED BY A STAR SENSOR AND UPDATED EPHEMERIS NAVIGATION SYSTEM. THIS ALLOWS AUTOMATIC GEOGRAPHICAL MAPPING OF THE DIGITAL IMAGERY TO THE NEAREST PICTURE ELEMENT. THE OPERATIONAL LINE SCAN SYSTEM (OLS) GUILI BY WESTINGHOUSE, IS THE PREVIDED MULTI-ORBIT. DAY-AND-NIGHT VISUAL MAD INFARED IMAGERY AT 1/3 NAUTICAL MILE RESOLUTION FOR ALL MAJOR LAND MASSES. 1-1/2 NAUTICAL MILE RESOLUTION FOR ALL MAJOR LAND MASSES. AND THE PRIMARY DATA ACQUISITION FOR COMPLETE GLOBAL COVERAGE, AND PROVIDES WITH THIS DATA CALIBRATION, TIMING, AND OTHER AUXILIARY SIGHALS TO THE SPACECRAFT FOR DIGITAL TRANSMISSION TO THE GROUND. A SUPPLEMENTARY SENSOR RADIOMETER, IS THE INFRARED TEMPERATURE-HUNHDITY-OZONE SOUNDER. THE DATA PROCESSING SYSTEM, WHICH INCLUDES THREE HIGH-DENSITY TAPE RECORDERS, IS CAPABLE OF STORING A TOTAL OF 400 MIN OF DATA, EACH ALLOWS FULL GLOBAL COVERAGE TWICE DIALY. EITHER READ OUT TO TRACKING SITES LOCATED AT FAIRCHILD AFD. WAA AND LORING AFB. ME. AND RELAYED VIA SATCOM TO AR FORCED DATA ARE READ OUT TO TARKING SITES LOCATED AT ANDER FORDED ON REAL-TIME DATA ARE TRANSMITTED TO GROUND-RECEIVING SITES VIA TWO REDUMDANT S-BAND TRANSMITTERS. RECORDED DATA ARE READ OUT TO TARKING SITES LOCATED AT ARCRETA OUTA ARE READ OUT TO TARKING SITES LOCATED ATAL READ FOR GLOBAL ANDREL TACTICAL SITES LOCATED AROUND THE WORLD. A MOGE COMPLETE DESCRIPTION OF THE BEORDLOGICAL SATELLITE CAN BE FOUND GN THE REPORT, 'THE DEFENSE METEOROLOGICAL SATELLITE CAN BE FOUND GN ANDEL DATICAL ENGINEERING, 14

---- DMSP-F1, AFGWC STAFF-----INVESTIGATION NAME- OPERATIONAL LINESCAN SYSTEM (OLS)

NSSDC 10- 76-0914-01

INVESTIGATIVE PROGRAM Operational met system

INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL AFGHC STAFF

GLOBAL WEATHER CTR

PI- AFGWC STAFF GLOBAL WEATHER CTR PI- AFGWC STAFF GLOBAL WEATHER CTR PRIEF DESCRIPTION THE OPERATIONAL LINESCAN SYSTEM (OLS) WAS THE PRIMARY EXPERIMENT ON THE DMSP BLOCK SD SPACECRAFT. THE PURPOSE OF THIS EXPERIMENT WAS TO PROVIDE GLOBAL, DAY/HIGHT OBSERVATIONS OF OLOUD COVER AND CLOUD TEMPERATURE MEASUREMENTS TO SUPPORT DEPARTMENT OF DEFENSE REGUIREMENTS FOR OPERATIONAL WEATHER AMALYSIS AND FORECASTING. THE OLS EMPLOYED A SCANNING DFTICAL TELESCOPE DRIVEN IM AN OSCILLATING MOTION, WITH OFTICAL COMPENSATION FOR IMAGE NOTION, WHICH RESULTED IN NEAR-CONSTANT RESOLUTION THROUGHOUT THE SENSOR FIELD OF VIEW. THE RADIOMETER OPERATED IN TWO ("LIGHT" AND "THERMAL") SPECTRAL INTERVALS --(1) VISIBLE AND NEAR INFRARED (OL-4 TO 1.1 MICROMETERS) AND (2) INFRARED IN TWO ("LIGHT" AND "THERMAL") SPECTRAL INTERVALS --(1) VISIBLE AND NEAR INFRARED (OL-4 TO 1.1 MICROMETERS) AND (2) INFRARED (B TO 13 MICROMETERS). THE RADIOMETER PRODUCED, WITH ONDOARD PROCESSING, DATA IN FOUR MODES -- LF (LIGHT FINE) AND TF (THERMAL FINE) DATA WITH A RESOLUTION OF 5.6 KM AND LS (LIGHT SMOOTHED) AND TS (THERMAL SMOOTHED) DATA WITH A RESOLUTION OF 2.8 KM. THREE ONBOARD RECORDERS, EACH MAD A STORAGE CAPABILITY OF 400 MIN OF BOTH LS AND TS DATA OR 20 RTM OF LF AND TF DATA. FOR DIRECT READOUT TO TACTICAL SITES, THE EXPERIMENT WAS PROGRAMMED DATA (TF AND TS) COVERE, A TEMPERATURE RANGE OF 210 TO 310 K WITH AN ACCURACY OF 1 DEG C. THE LS DATA NODE PROVIDED VISUAL DATA THROUGH A DYNAMIC RANGE FROM FULL SUNLIGHT DOWN TO A GUARTER MOON. THIS MODE ALSO AUTOMATICALLY ADJUSTED THE GAIN ALONG SCAN TO ALLOW USERL DATA ON TO BE OHTAINED ACROSS THE TEMPINATION. ADJITIONAL INFORMATION ON THIS EXPERIMENT IS CONTAINED IN THE REPORT, "PRIMARY OPTICAL ENGINEERING, 14, NO. 4, JULY-AUGUST 1975.

- DMSP-F1, AFGUC STAFF-----

INVESTIGATION NAME- VERTICAL TEMPERATURE PROFILE RADIOMETER Supplementary sensor H (SSH)

INVESTIGATIVE PROGRAM OPERATIONAL MET SYSTEM

INVESTIGATION DISCIPLINE(5) METEOROLOGY

PERSONNEL AFGWC STAFF

NSSDC ID- 76-0914-02

GLOBAL WEATHER CTR

BRIEF DESCRIPTION SUPPLEMENTARY SENSOR H (SSN) WAS A VERTICAL TEMPERATURE PROFILE RADIONETER (VTRP). THE OBJECTIVE OF THIS EXPERIMENT WAS TO OBTAIN VERTICAL TEMPERATURE, WATER VAPOR, AND OZONE PROFILES OF THE ATMOSPHERE TO SUPPORT DEPARTMENT OF DEFENSE REQUIREMENTS IN OFFRATIONAL WEATHER ANALYSIS AND FORECASTING. THE SSN WAS A 16-CHANNEL SENSOR WITH ONE CHANNEL (1022 GM-1) IN THE 10-MICROMETER OZONE ABSORPTION BAND, ONE CHANNEL (835 GM-1) IN THE 12-MICROMETER ATMOSPHERIC WINDOW, SIX CHANNELS (747, 725, 708, 695, 676, 668.5 GM-1) IN THE 15-MICROMETER CO2 ABSORPTION BAND, AND EIGHT CHANNELS (535, 406.5, 441.5, 420, BRIEF DESCRIPTION

374, 397.5, 355, 353.5, CM-1) IN THE 22- TO 30-MICROMETER ROTATIONAL WATER VAPOR ABSORPTION BAND. THE EXPERIMENT CONSISTED OF AN OPTICAL SYSTEM, DETECTOR AND ASSOCIATED ELECTRONICS, AND A SCANNING MIRROR. THE SCANNING MIRROW MAS STEPPED ACROSS THE SATELLITE SUBTRACK, ALLOWING THE SSH TO VIEW 25 SEPARATE COLUMNS OF THE ATMOSPHERE EVERY 32 S OVER A CROSS TRACK GROUND SWATH OF 2000 KM. WHILE THE SCANNING MIRROW MAS STOPPED AT A SCENE STATION, THE CHANNEL FILTERS WERE SEQUENCED THROUGH THE FIELD OF VIEW. THE SURFACE RESOLUTION WAS APPROXIMATELY 39 KM AT NADIR. RADIANCE DATA WAS TRANSFORMED INTO TEMPERATURE WATER VAPOR AND OZONE PROFILES BY A MATHEMATICAL INVERSION TECHNIQUE. A MORE COMPLETE DESCRIPTION OF THE EXPERIMENT CAN BE FOUND IN THE REPORT, 'DMSP BLOCK SD SPECIAL' METEOROLOGICAL SENSOR H, OPTICAL SUBSYSTEM,' D. A. NICHOLS, OPTICAL ENGINEERING, 14, NO. 4, 284-288, JULY-AUGUST 1975. NICHOLS, 1975.

----- DMSP-F1, BLAKE-----

INVESTIGATION NAME- RADIATION DOSIMETER

INVESTIGATIVE PROGRAM SOLAR-TERRESTRIAL PHYSICS NSSDC ID- 76-0914-03

INVESTIGATION DISCIPLINE(S) Particles and fields

PERSONNEL			
PI - J.B.	BLAKE	AEROSPACE C	ORP
01 - S.J.	INAMOTO	AEROSPACE C	
01 - N.	KAT2	AEROSPACE C	
01 - W.A.	KOLASINSKI	AEROSPACE (ORF

01 - W.A. KOLASINSKI AEROSPACE CORP BRIEF DESCRIPTION THE PURPOSE OF THE GFE-3R DOSIMETER WAS TO MEASURE THE RADIATION DOSE IN SILICON UNDER ALUMINUM SHIELDING OF FOUR THICKNESSES REPRESENTATIVE OF BLOCK 5D DMSP SPACECRAFT. THE DOSIMETER, BUILT BY THE AEROSPACE CORPORATION SPACE SCIENCE LABORATORY, CONSISTED OF FOUR SEPARATE, SINGLE-DETECTOR UNITS. THESE OWNIDIRECTIONAL SENSORS WERE SMALL, CUBICAL, INFLUD-DRITTED, SILICON DETECTORS CENTERED UNDER HEMISPHERICAL SHELLS, AND HEAVILY SHIELDED (RELATIVE TO THE HEMISPHERICAL SHELLS) OVER THE REAR 2 PI SOLID ANGLE. THE SHIELDING DOMES FOR THE FOUR SENSORS WERE 35, 75, 125, AND 200 MILS OF ALUMINUM, RESPECTIVELY. THE DOSIMETER DIRECTLY MEASURED IN THE SHIELDING BOWES FOR THE FOUR SENSORS WERE 35, 75, 125, AND 200 MILS OF ALUMINUM, RESPECTIVELY. THE DOSIMETER DIRECTLY MEASURED IN THE ONIZATION AND SOLO CUBE CAUSED BY THE NATURAL RADIATION AND SERVED SOF ENERGETIC ELECTRONS AND PROTONS ENCOUNTERED IN THE HUENCES OF ENERGETIC ELECTRONS AND PROTONS ELECTRON, AND SCHWENES WITH THRESHOLDS CORRESPONDING TO DEPOSITED ENERGY OF 25, 75, 300, AND SOOD KEV, WERE USED TO ANALYZE THE PULSES FROM THE 25, 300, AND SOOD KEV, WERE USED TO ANALYZE THE PULSES FROM THE 25, 300, AND SOOD KEV, WERE USED TO ANALYZE THE PULSES FROM THE 25, 300, AND SOOD KEV, WERE USED TO ANALYZE THE PULSES FROM THE 25, 300, AND SOOD KEV, WERE OUNTED IN SCALING REGISTERS, WHICH ARE READ OUT AND RESET BY THE TELEMETRY SYSTEM EVERY THREE SECONDS. PULSES CORRESPONDING TO A DOSE OF 8.DEFER, THESE REGISTERS WERE READ OUT EVERY THREE SECONDS BUT NOT RESET BY THE TELEMETRY SO THAT THE NUMBER OF COUNTS READ OUT AT ANY THE REGISTERS WERE READ OUT EVERY THERE SECONDS BUT NOT RESET BY THE TELEMETRY SO THAT THE NUMBER OF COUNTS READ OUT AT ANY THESE REGISTERS WERE READ OUT EVERY THERE SECONDS BUT NOT RESET BY THE TELEMETRY SO THAT THE NUMBER OF COUNTS READ OUT AT ANY INFER REPRESENTS THE TOTAL ENERGY IN MEY DEPOSITED IN THE SILICON ACTIVE VOLUME DURING THE MISSION LIFE. MAINNE ADDITIONAL

SPACECRAFT COMMON NAME- DMSP-F2 ALTERNATE NAMES-

NSSDC 10- 77-0444

WEIGHT- 450. KG LAUNCH DATE- 06/05/77 LAUNCH SITE- VANDENBERG AF-, UNITED STATES LAUNCH VEHICLE- THOR

SPONSORING COUNTRY/AFENCY UNITED STATES DOD-USAF

INITIAL ORBIT PARAMETERS Orbit type- geocentric Orbit period- 101.7 Min Periapsis- 811. Km

PERSONNEL PM - W.D. MYER

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BRIEF DESCRIPTION DMSP-F2 IS ONE OF A SERIES OF METEOROLOGITAL SATELLITES DEVELOPED AND OPERATED BY THE AIR FORCE UNDER THE DEFENSE METEOROLOGICAL SATELLITE PROGRAM (DMSSP). THIS PROGRAM PREVIOUSLY KNOWN AS DAPP (DATA ACQUISITION AND PROCESSING PROGRAM), WAS CLASSIFIED UNTIL MARCH 1973. THE ODJECTIVES OF THIS PROGRAM LARE TO PROVIDE GLOBAL VISUAL AND INFRARED LOUDD COVER DATA AND SPECTALIZED ENVIRONMENTAL DATA TO SUPPORT DEPARTMENT OF DEFENSE REQUIREMENTS. OPERATIONALLY, THE PROGRAM CONSISTS OF TWO SATELLITES IN 830-KM SUM-SYNCHRONOUS POLAR ORBITS, WITH THE ASCENDING NODE OF ONE SATELLITE IN EARLY MORMING AND THE OTHER AT LOCAL NOON. THE 5.4-M LONG SPACECRAFT IS SEPARATED INTO FOUR SECTIONS -- (1) A PRECISION MOUNTING PLATFORM (PMP) FOR SENSORS AND EQUIPMENT REQUIRING PRECISE

EPOCH DATE- 06/06/77 INCLINATION-APOAPSIS-

11SAE-SAMSO

99. DEG

869. KM

ALIGNMENT, (2) AN EQUIPMENT SUPPORT NODULE (ESM) CONTAINING THE ELECTRONICS. REACTION WHELS, AND SOME METEOROLOGICAL SENSORS, (3) A REACTION CONTROL EQUIPMENT (RCE) SUPPORT STRUCTURE (THAT HAS THE THIRD-STAGE MOTOR, HYDRAIINE REACTION CONTROL SYSTEM) WHICH SUPPORTS (4) A 100-SQ-FT SOLAR CELL PAMEL. THE SPACECRAFT STABILIZATION IS CONTROLLED BY A COMBINATION FLYWHEEL AND MAGNETIC CONTROL COIL SYSTEM SO SENSORS ARE MAINTAINED IN THE DESIRED 'EARTH-LOOKING' MODE. A NEW FEATURE IS THE PRECISION-POINTIMG ACCURACY OF THE PRIMARY IMAGER TO 0.01 DEG PROVIDED BY A STAR SENSOR AND UPDATED EPHEMENTS NAVIGATION SYSTEM. THIS ALLOWS AUTOMATIC GEOGRAPHICAL MAPPING OF THE DIGITAL IMAGERY TO THE NEAREST PICTURE ELEMENT. THE OPERATIONAL LINE SCAN SYSTEM (OLS) BUILT BY WESTINGHOUSE, IN THE PRIARY DATA ACQUISITION SYSTEM THAI PROVIDES REAL-TIME OR STORED, MULTI-ORBIT, DAY-AND-NIGHT VISUAL AND INFRARED IMAGERY AT 1/3 NAUTICAL MILE RESOLUTION FOR COMPLETE GLOBAL COVERAGE. AND PROVIDES WITH THIS DATA CALIBRATION, TIMING, AND OTHER AUXILIARY SIGNALS TO THE SPACECRAFT FOR DIGITAL TRANSMISSION TO THE GROUND. A SUPPLEMENTARY SENSOR PACKAGE, THE DATA PROCESSING SYSTEM. WHICH INCLUDES THATE HIGH-DENETY. THE INFRARED TRAPERATURE-HUMIDITY-DZONE SOUNDER. THE DATA RECORDED OR REAL-TIME DATA ARE TRANSMITTED TO GROUND-RECEIVING SITIES UIA TWO RECOMDINGS, IS SYSTEM. WHICH INCLUDES THATE HIGH-DENETY TAPE RECORDED OR REAL-TIME DATA ARE TRANSMITTED TO GROUND-RECEIVING SITIES UIA TWO RECOMDINGS, IS STATEM. WHICH INCLUDES THARE HIGH-DENETY TAPE RECORDENS, IS CAPABLE OF STORING A TOTAL OF 400 MIN OF DATA. EACH ALLOWS FULL GLOBAL COVERAGE THIE DATA ARE READ OUT AT WOR RECOMDENS, IS CAPABLE OF STORING A TOTAL AFT READ OLD ATA ARE RECORDED OR RAL-TIME DATA ARE TRANSMITTED. TO GROUND-RECEIVING SITES UIA TWO REDUNDANT S-BAND TRANSMITTERS. RECORDED DATA ARE READ OUT TO TRACKING SITES LOCATED AF ARTONING A AND READ OUT TO TRACKING SITES LOCATED AF ALTIME DATA ARE READ OUT AT WOR BEDINDANT FERLATED VIA SATEMINE A ARE READ OUT AT WOR BEDINDANT FERLATED VIA SATE

- DMSP-F2, AFGUC STAFF

INVESTIGATION NAME- OPERATIONAL LINESCAN SYSTEM (OLS)

INVESTIGATIVE PROGRAM OPERATIONAL MET SYSTEM

INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL AEGHC STAFF

NSSDC 10- 77-0444-01

GLOBAL WEATHER CTR

DEPENDENCE PI- AFGWC STAFF GLOBAL WEATHER CTR BRIEF DESCRIPTION THE OPERATIONAL LINESCAN SYSTEM (OLS) WAS THE PRIMARY EXPERIMENT ON THE OWSP-F2 SPACECRAFT. THE PURPOSE OF THIS EXPERIMENT WAS TO PROVIDE GLOBAL, DAV/NICHT OBSERVATIONS OF CLOUD COVER AND CLOUD TEMPERATURE MEASUREMENTS TO SUPPORT DEPARTMENT OF DEFENSE REQUIREMENTS FOR OPERATIONAL WEATHER ANALYSIS AND FORECASTING. THE OLS EMPLOYED A SCANNING OPTICAL COMPENSATION FOR IMAGE MOTION, WHICH RESULTED IN MEAR-CONSTANT RESOLUTION THROUGHOUT THE SENSOR FIELD OF VIEW. THE RADIOMETER OPERATED IN TWO ("LIGHT" AND "THERMAL") SPECTRAL INTERVALS --(1) VISIBLE AND NEAR INFRARED (0.4 TO 1.1 MICROMETERS) AND (2) INFRAMED (8 TO 13 MICROMETERS). THE RADIOMETER ROBUCED, WITH ONBOARD PROCESSING, DATA WITH A RESOLUTION OF .56 KM AND LS (LIGHT SMOOTHED) AND TS (THEEMAL") SUCTABLE ON AND (2) COMPENSION OF 2.8 KM. THREE ONDARD RECORDERS, EACH HAD A STORAGE CAPABILITY OF GOD MIN OF BOTH LS AND TS DATA WERE OBTAINED AT NICHT. THE INFRARED DATA (IF AND TS) COVERED A TEMPERATURE ANDE OF 2.10 TO 310 K WITH AN ACCURACY OF 1 DEG C. THE LS OATA MODE PROVIDED DATA. (IF AND TS) COVERED A TEMPERATURE RAMGE OF 210 TO 310 K WITH AN ACCURACY OF 1 DEG C. THE LS OATA MODE PROVIDED DATA (IF AND TS) COVERED A TEMPERATURE RAMGE OF 210 TO 310 K WITH AN ACCURACY OF 1 DEG C. THE LS OATA MODE PROVIDED DATA (IF AND TS) COVERED A TEMPERATURE RAMGE OF 210 TO 310 K WITH AN ACCURACY OF 1 DEG C. THE LS OATA MODE PROVIDED DATA (IF AND TS) COVERED A TEMPERATURE RAMGE OF 210 TO 310 K WITH AN ACCURACY OF 1 DEG C. THE LS OATA MODE PROVIDED DATA (IF AND TS) COVERED A TEMPERATURE RAMGE OF 210 TO 310 K WITH AN ACCURACY OF 1 DEG C. THE LS OATA MODE PROVIDED ATA (IF AND TS) COVERED A TEMPERATURE SUBLIGHT DOWN TO A QUARTER MOON. THIS MODE ALSO AUTOMATICALLY ADJUSTED THE GAIN ALONG SCAN TO ALLOW USEFUL DATA TO BE OBTAINED ACROSS THE TERMINATOR. ADDITIONAL IMFORMATION OF THIS EVERTMENT. IS CONTAINED IN THE REPORT, 'PRIMARY OPICAL SUBSYSTEMS FOR DMSPS,'D.'A. NICHOLS, OPTICAL ENGINE

- DMSP-F2+ AFGWC STAFF-----

INVESTIGATION NAME- VERTICAL TEMPERATURE PROFILE RADIOMETER Supplementary Sensor H (SSH)

NSSDC ID-	77-0444-02	INVESTIGATIVE PROGRAM Operational met system

AFGWC STAFF

INVESTIGATION DISCIPLINE(S) RETEOROLOGY

PERSONNEL

GLOBAL WEATHER CTR

5 4

BRIEF DESCRIPTION SUPPLEMENTARY SENSOR H (SSH) WAS A VERTICAL TEMPERATURE PROFILE RADIOMETER (VTPR). THE OBJECTIVE OF THIS EXPERIMENT WAS TO OBTAIN VERTICAL TEMPERATURE, WATER VAPOR, AND OZONE PROFILES OF THE ATMOSPHERE TO SUPPORT DEPARTMENT OF DEFENSE REQUIREMENTS IN OPERATIONAL WEATHER ANALYSIS AND FORECASING. THE SSH WAS A 16-CHANNEL SENSOR WITH ONE CHANNEL (1022 CM-1) IN THE 10-MICROMETER OZONE ABSORPTION BAND, ONE CHANNEL (1022 CM-1) IN THE 12-MICROMETER ATMOSPHERIC WINDOW, SIX CHANNELS (747, 725, 708, 605, 668,5 CM-1) IN THE 15-MICROMETER C2 ABSORPTION BAND, AND EIGHT CHANNELS (535, 408,5, 441,5, 420, 374, 397,5, 355, 353,5 CM-1) IN THE 22- TO 30-MICROMETER ROTATIONAL WATER

VAPOR ABSORPTION BAND. THE EXPERIMENT CONSISTED OF AN OPTICAL SYSTEM, DETECTOR AND ASSOCIATED ELECTRONICS, AND A SCANNING MIRROR. THE SCANNING MIRROR WAS STEPPED ACROSS THE SATELLITE SUBTRACK, ALLOWING THE SSH TO VIEW 25 SEPARATE COLUMNS OF THE ATMOSPHERE EVERY 32 SOVER A CROSS TRACK GROUND SWATH OF 2000 KM. WHILE THE SCANNING MIRROR WAS STOPPED AT A SCENE STATION, THE CHANNEL FILTERS WERE SEQUENCED THROUGH THE FIELD OF VIEW. THE SUBTRACE RESOLUTION WAS APPROXIMATELY 39 KM AT NADIR. RADIANCE DATA HANSFORMED INTO TEMPERATURE WATER VAPOR AND COMPLETE DESCRIPTION OF THE EXPERIMENT CAN BE FOUND IN THE REPORT, 'DNSP SPECIAL METEOROLOGICAL SENSOR H, OPTICAL SUBSYSTEN,' D. A. NICHOLS, OPTICAL ENGINEERING, 14, NO. 4, 284-288, JULY-AUGUST 1975.

SPACECRAFT COMMON NAME- ESA GEOS Alternate names- geos, esgeo

N550C 11- 77-029A

LAUNCP DATE- 04/20/77 Laun'h Site- cape canaveral, united states Launch vehicle- delta WEIGHT- 260, KG

SPONSORING COUNTRY/AGENCY INTERNATIONAL ESA

INITIAL ORBIT PARAMETERS

ORBIT TYPE- GEOCENTRIC DABIT PERIOD- 720.06 HIN PERIAPSIS- 2110. KM

PERSONNEL

PM - D.E. MULLINGER PS - K. Knult

ESA-ESTEC

EPOCH DATE- 04/25/77

INCLINATION-APOAPSIS- 3

ON- 26.25 DEG 38357. KM

PERSONNEL PS - K. KNUTI ESA-ESTEC ESA ESTA-ESTEC ESA ESTA-ESTEC ESA ESTA-ESTEC ESA-ESTEC ESA-ESTEC ESA ESTA-ESTEC ESA-ESTEC NSSDC ID- 77-029A-06

---- ESA GEOS, BEGHIN-----

INVESTIGATION NAME- WAVE FIELD IMPEDANCE NSSDC 10- 77-029A-11

INVESTIGATIVE PROGRAM SCIENCE

> INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS

PERSONNEL PI - C. BEGHIN

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS INVESTIGATION WAS PART OF ESA EXPERIMENT NO. S-300 AND TADE USE OF ONE SET OF MESHED ELECTRIC SPHERES MOUNTED ON THE END OF THE AXIAL BOOMS (PART OF 77-029A-10, UNGSTRUP) AND THE TWO VITREOUS CARGON SPHERES MOUNTED ON THE END OF THE 20 M RADIAL BOOMS (77-029A-10, PECERSEN), THE MESHED SPHERES WORE USED AS TRANSMITTING ELEMENTS FOR FREQUENCIES FROM 0.2 TO 76 IMPEDANCE DETWEEN THE MESHED AND LONG-BOOM CARGON SPHERES WERE FREQUENCIES AND ANTI-RESONANCES AT THE HYDRID RESONANCE FREQUENCIES AND ANTI-RESONANCES AT THE SUPROUNDING PLASMA. FREQUENCIES ON DANTI-RESONANCES AT THE SUPROUNDING PLASMA. SWEPT-FREQUENCIES ON DA ADIGITAL CORRELATION COULD BE FREQUENCIES UP TO 450 HZ COULD BE TELEMETERED DIRECTLY. AND SWEPT-FREQUENCY ANALYZERS AND A DIGITAL CORRELATION COULD BE FREQUENCIES UP TO ASTAIN THE AUTO- AND/OR CROSS-CORRELATION UP TO 77 KHZ WITH SELECTABLE BANDWIDTHS OF 2.5 S.O., OR 10.0 KHZ.

- ESA GEOS, GEISS------

INVESTIGATION NAME- LOW-ENERGY ION COMPOSITION NSSDC 10+ 77-029A-03

INVESTIGATIVE PROGRAM SCIENCE

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS

CNRS, CTR FOR SPECTROM

PERSONNEL

PI - J. GEISS PI - H.R. ROSENBAUER OI - P.X. EDERHARDT OI - H. BALSIGER OI - P. HIRT OI - A. GHIELMETTI OI - H. LOIDL	U OF BERNE Mpi-exiraterr Phys U of Berne U of Berne U of Berne U of Berne U of Berne U of Berne
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01 - H. LOIDL U OF BERNE BRIEF DESCRIPTION THIS INSTRUMENT. (ESA EXPERIMENT NO. S-303) MEASURED THE ENERGY ANOULAD DISTRUCTION AND COMPOSITION OF POSITIVE IONS USING A CYLINORICAL ELECTROSTATIC ANALYZER (ESA) FOLLOWED BY A GROUP OF THE CALL AND MAGNETIC FIELD ANALYZER (FA) TO SELECT THE ENERGY AND VELOCITY. THE ENERGY (PER UNIT CHANGE) RANGED FAON 0.001 TO 17.2 KEV IN 32 STEPS WITH A DELTA E/E OF G.03 AND A MASS RANGE OF 1 TO 140 AMU IN 64 LOGARITHMICALLY SPACED FAON 0.001 TO 17.2 KEV IN 32 STEPS WITH A DELTA E/E OF G.03 AND A MASS RANGE OF 1 TO 140 AMU IN 64 LOGARITHMICALLY SPACED FAON 0.001 TO 17.2 KEV IN 32 STEPS WITH A DELTA E/E OF G.03 AND A MASS RANGE OF 1 TO 140 AMU IN 64 LOGARITHMICALLY SPACED FAON 0.001 TO 17.2 KEV IN 32 STEPS WITH A DELTA E/E OF G.03 AND A MASS RANGE OF 1 TO 140 AMU IN 64 LOGARITHMICALLY SPACED FOR THERE WAS A THERMAL MODE IN WHICH A RETARDING GRID IN PARTICLES THAT OVERCAME THIS GRID VOLTAGE WERE ACCLERATED TO 3 FOR THANGE SULT WAS USED FOR ANALYSIS BELOW 0.1 KEV. ALL FOR MINUS 30 DEG IN ELEVATION (REFERENCED TO THE AXIS). FOR THE HERGES WERE PLUS OR MINUS 6 DEG IN AZIMUIH AND PLUS OF MINUS 30 DEG IN ELEVATION (REFERENCED TO THE IAXIS). FOR HINDS 30 DEG IN ELEVATION (REFERENCED TO THE IAXIS). FOR HEN HERGES WERE PLUS OR MINUS 6 DETAL THE IONS LEAVING THE ESA MERE COUNTED BY A CHANNELTRON. THE REMAINING 97 PERCENT UTHE HIGHEST ELEVATION OF HELIUM AND DETECTED BY AN ELECTRON MULTIPLIER. THIS SIGNAL WAS PULSE HEIGHT ANALYZED BY ONE FILSED IDENTIFY THE SOURCES. OF LOW-ENERGY THE INTERNING TO THE SATED IDENTIFY THE SOURCES. FARLIER IN THE LIFE OF THE SATELLITED NAME ONE VARIABLE DISCRIPTIANTOR TO OBTAIN BETTER MASS TO IDENTIFY THE SOURCES. FARLIER IN THE LIFE OF THE SATELLITED NAME OSFHERE, TIME VARIATIONS OF THE HELIUM AND DETECTED BY ONE FILSED IDENTIFY THE SOURCES. FARLIER IN THE LIFE OF THE SATELLITED A CORRELATIVE EXPERIMENT WITH THE CESSIUM ION MEUTRALIZATION GUM AS FOR ATS 6 WAS PERFORMED WHEN THE TWO SATELLITES WERE WITHING A CORRELATIVE THE SAME

-- ESA GEOS, GENDRIN------

INVESTIGATION NAME- MAGNETIC WAVE FIELDS

INVESTIGATIVE	PROGRAM
Setenes	

INVESTIGATION	DISCIPLENE (C)
PARTICLES AN	ID FIELDS
MAGNETOSPHER	IC PHYSICS

IONDSPHERIC RES GROUP DANISH SPACE RES INST

PERSONN	EL		
PI - 01 - 01 -	J .M.	GENDRIN Etcheto Ungstrup	

BRIEF DESCRIPTION THE INSTRUMENT USED TWO SETS OF THREE-AXIS SEARCH COIL RAGNETOMETERS, ONE FOR THE VLF/ELF RANGE (0.1 TO 450 HZ) AND ONE FOR THE VLF RANGE (0.3 TO 30 HZ). EACH SEARCH COIL CONSISTED OF A HIGH-PERMEABILITY MATERIAL WITH A HIGH DENSITY PICK-UP WINDING. EACH SET OF THE THREE COILS IS BUILT INTO A SINGLE ASSEMBLY. AND MOUNTED ON E LOCKING 3 H BOOMS AT A DISTANCE OF 2 M FROM THE SPACECRAFT. TYPICAL SENSITIVITIES OF AT 0.1 HZ, 2.0E-4 AT 10 HZ, AND ABOUT 3.0E-6 AT 1 KHZ. THESE

SENSORS AND SOME ASSOCIATED ELECTRONICS CONSISTING OF (1) A LARGE NUMBER OF CHANNEL-SELECTION SWITCHES, (2) A NUMBER OF GADDASS FILTERS, (3) SIX SWEPT-FREQUENCY ANALYZERS (SFA), (4) A DIGITAL CORRELATOR, AND (5) EIGHT STEPPED-GAIN AMPLIFIES, (2) COMPRISE PART OF THE ESA WAVE EXPERIMENT NO. S-300. THESE COMPON' WITS WERE EMPLOYED FOR THE SENSORS DESCRIBED IN 7-0. A-07 (PEDERSEN) AND -10 (UNGSTRUP), AND ALSO THE INVESTIGATIONS DESCRIBED IN <math>-05 (PETIT) AND -11 (DEGMIN). SIX ANALOG CHANNELS OF 450 HZ BADDUGTH AND THE DIGITAL CORRELATOR THE SENSORS COVERED THE FREQUENCY RANGE UP TO 77 KHI IN 256 PARTLY OVERLAPPING STEES. THE CORRELATOR PROVIDED AN AUTO-CORRELOGRAM OF 128 POINTS WITHIN 29 MS. ITS BANDWIDTH COULD BE SELECTED TO BE 2.5. 5.0.0 on 10.0 KH2. CORS-CORRELOGRAM DETWEEN AUTO- AND CROSS-CORRELATION.

----- ESA GEOS, HULTQVIST-----

INVESTIGA).ON NAME- LOW-ENERGY ELECTRON AND PROTON PITCH Angle distribution

NSSDC 10- 77-029A-04 INVESTIGATIVE PROGRAM

SCIENCE

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS

PERSON						
PI -	÷	9.K.G.	HULTAVIST	KIRUNA	GEOPHYS	INST
01 -	-	н.	BORG	KIRUNA	GEGPHYS	INST
01 -	- 1	L.A.	HOLNGREN	KIRUNA	GEOPHYS	INST

OI - L.A. HOLMGREN THIS INSTRUMENT (ESA EXPERIMENT NO. S-31D) MEASURED THE FREERY AND PITCH ANGLE DISTRIBUTION OF ELECTRONS AND PROTONS IN THE ENERGY RANGE 0.2 TO 20 KEV WITH EXTENSIVE ANGULAR COVERAGE CONCENTRATED IN THE LOSS COME REGION. THE DUAPOSE OF THE INVESTIGATION WAS TO INPROVE THE UNDERSTANDING OF AURORAL PARTICLE ACCELERATION AND PRECIPITATION MECHANISMS BY COMPARING NEAR-EQUATORIAL PARTICLE DISTRIBUTIONS WITH COORDINATED GROUDD-BASED OBSERVATIONS AT THE FOOT OF THE MAGNETIC FIELD UNER PROVIDED TO STUDY WAVE-PARTICLE INTERACTIONS. THE EXPERIMENT OF WILKEN (77-029A-01) IS COMPLIAENTION OF THE INSTRUMENT WERE PROVIDED TO STUDY WAVE-PARTICLE INTERACTIONS. THE EXPERIMENT OF WILKEN (77-029A-01) IS COMPLIAENTARY TO THIS ONE, EXTENDIOS TO HIGH ENDRGY RANGES BOTH ELECTRON AND PROTON OBSERVATIONS. A TOTAL OF 10 CURVED-PLATE ANALYZERS WITH CHANNEL ELECTRON MULTPLIERS FOR PARTICLE DISTERT NOT MERE USED. AITHOUGH NORMALLY EIGHT ANALYZENS WERE USED TO DETECT ELECTRON AND TWO TO DETECT PROTONS, A COMPLEX ARRANGEMENT WITH FOUR SEPARATE HV SUPPLIES ALLOKED INDEPENDENT SWITCHING FOUR DETECTOR GROUPS. THE ANALYZING PLATE VOLTAGES COULD OPERATE IN A STEPTING MODE, A SWEETING MODE, OR A CONSTANT-VOLTAGE MODE. IN ADDITION, THE TIME ACCUMULATION COULD BE VARIED WITH A NUMINAL FRAME DURATION OF 43 NS. HOWEVER, THIS DURATION COULD DATA FROM CERTAIN DETECTORS IN THE EXPENSE OF OBTAINING DATA FROM CERTAIN DETECTORS IN THE EXPENSE OF OBTAINING DATA FROM CERTAIN DETECTORS IN THE LOSS COME. THE EWERGY INTERVALS IN THE STEPPING MODE CONSISTED OF JOUR ANTICLE FACTOR (D) DATA FROM CERTAIN DETECTORS IN THE VOLTAGES WORKE FAST TEMPORAL VARIATIONS WERE ENCOUNTERED IN THE LOSS COME. THE EWERGY INTERVALS IN THE STEPPING MODE CONSISTED OF SUBARTIC FACTOR (D) DATA FROM CERTAIN DETECTORS IN THE SOLES WHERE FAST TEMPORAL VARIATIONS WERE ENCOUNTERED IN THE LOSS COME. THE EWERGY INTERVALS IN THE STEPPING MODE CONSISTED OF SUCHA. THE EWERGY INTERVALS IN THE STEPPING MODE CONSISTED OF SUBALTIC FACTOR TANING DAT

---- ESA GEUSA MARIANI------

SCIENCE

INVESTIGATION NAME- TRIAXIAL FLUXGATE MAGNETOMETER

N5506 10- 77-029A-09

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS MAGNETOSPHERIC PHTSICS

CNR, SPACE PLASMA LAB NATL RES COUNC ITALY NASA-GSEC

47

INVESTIGATIVE PROGRAM

PERSONNEL

PI - F. MARIANS OI - M. CANDIOL OI - D.H. FAINFIELD

BRIEF DESCRIPTION

HRIEF DESCRIPTION A TRIAXIAL FLUXGATT MAGNETOMETER 15. EMPLOYED FOR SINULTANEOUS MEASUREMENTS OF THE THREE COMPONENTS OF THE MAGNETIC FIELD, THE FREQUENCY RANGE COVERED BY THE INSTRUMENT EXTENDS FROM DC UF TO SH2. IN. THE NORMAL ORIENTATION OF THE SATELLITE THE MAIN CORPONENT OF THE FIELD COINCIDES WITH THE 2-AXIS OF THE INSTRUMENT, WHICH IS ALIGNED WITH THE SPIN AXIS OF THE SATELLITE. THE EXPERIMENT HAS BEEN DESIGNED WITH THE SENSITIVITY RANGES FOR THE X AND Y COMPONENTS FOR WHICH THE MAGNETIC FIELD COMPONENT IS ONLY A FRACTION OF THE TOTAL FIELD AND IS MODULATED BY THE ROTATION OF THE SPACECRAFT. THIS LAST FEATURE MAKES THE RANGE SWITCH TECHNIQUE PREFERABLE TO A BLAS OFFSET TECHNIQUE. THE TWO SELECTED SENSITIVITY RANGES ARE PLUS OF MINUS GU GAMMAS AND PLUS OR MINUS 180 GAMMAS RESPECTIVELT.

IN & AXIS, WHERE THE FIELD IS HIGHER AND NOT MODULATED BY THE SATELLITE ROTATION, A SINGLE SENSITIVITY RANGE OF PLUS OR MINUS GD GAMMAS IS USED. THE SIGNAL IS KEPT WITHIN RANGE BY SUPERIAPOSING POSITIVE AND NEGATIVE BIAS LEVELS OF 60 GAMMAS EACH, SUCH THAT A RANGE PLUS OR MINUS 420 GAMMAS WITH A CONSTANT GUANTIZATION ERROR OF PLUS OR MINUS 6125 USING A 9-BIT DIGITISATION IS OBTAINED. THE NOISE LEVEL OF THE SENSORS IS COMPARABLE TO THIS QUANTIZATION ERROR. THIS INSTRUMENT ATURATES AT GEOCENTRIC DISTANCES LESS THAN ABOUT 4.5 EARTH RADII.

--- ESA GEOS, MELZNER-----

INVESTIGATION NAME- DC ELECIRIC FIELD AND GRABIENT B Electron beam deflection INVESTIGATIVE PROGRAM SCIENCE

NS5DC 10- 77-029A-08

INVESTIGATION DISCIPLINE(S
PARTICLES AND FIELDS
MAGNETOSPHERIC PHYSICS

PERSONNEL PI - F.	MELZNER	MPI-EXTRATERR PHYS
01 - H.	VOLK	MPL-EXTRATERR PHYS
01 - G.	NETZNER	MP1-EXTRATERR PHYS

01 - R. VULK MITTERREM MATTERRATERR PHYS 01 - G. METTREE WILE DESCRIPTION THE PRIME OBJECTIVE OF THIS EXPERIMENT (ESA EXPERIMENT NO. S-320) WAS THE RESAUREMENT OF THE DC ELECTRIC FIELD IN THE PLANE PERPENDICULAR TO THE LOCAL MAGNETIC FIELD (D). THE EXPERIMENT ALSO MEASURED THE SPATIAL GRADIENT OF DI N THE VICINITY OF THE SPACERAFT. WITH THIS DATA. A MAPPING OF THE ELECTRIC FIELDS IN THE EQUATORIAL MAGNETICFIELD AN WELL AS DETERMINING PLASMA CONVECTION AND PARTICLE FLOW WITHIN THE FURSHA SHEET. THE INSTRUMENT CONSISTED OF FOUR ELECTRON GUNS SPACED LOGARITHAICALLY FROM THE ELECTRON DETECTOR. TWO OF THE GUNS WERE MOUNTER ON ONE OF THE 3-M RADIAL ROOMS. THE GUNS VERE USED ONE. A TIME TO GENERATE AN ELECTRON DETACTOR. TWO OF THE GUNS WERE MOUNTER ON ONE OF THE 3-M RADIAL ROOMS. THE GUNS WERE USED ONE. A TIME TO GENERATE AN ELECTRON DETACTOR. TWO OF THE GUNS WERE MOUNTER ON ONE OF THE S-M RADIAL ROOMS. THE GUNS WERE USED ONE. A TIME TO GENERATE AN ELECTRON DETACTOR. TWO OF THE GUNS WERE MOUNTER ON ONE OF THE S-M RADIAL ROOMS. THE GUNS WERE USED ONE. A TIME TO GENERATE AN ELECTRON DETAMOT FACTOR GUNS WERE MOUNTER ON ONE OF THE S-M RADIAL ROOMS. THE GUNS WERE USED ONE. A TIME TO GENERATE AN ELECTRON DETAMOT FACTOR GUNS WERE MOUNTER. ON ONE OF THE SPIN RADIAL ROOMS. THE GLOW RECEIVED A SINUSOIDAL SIGNAL FROM THE MAGNETOMETER EXPERIMENT TO INSURE THAT THE BEAM WAS ALVATS AT IGHT ANGLES TO B. IN SPITE OF THE ANGLE OF DEFLECTION PLATES THAT REMOVED THE ELEVATION CONFECTION GUVENTLY. THE BEAM BY THE MAGNETOMETER SIGNAL. A CURVED PLATE ENERGY FILTER, AND A PHOTOMULTPLIER MADE AN ANGLE DF O DR 180 DEG TO THE ELECTRIC FILED. ALL POSSIBLE DISPLACEMENTS USES THAN THE DISTANCE BETWEEN THE GUN AND THE DETECTOR. THE VALUES OF THE SPIN ANGLE AT WHICH THE GEAM MAS DETECTOR. THE VALUES OF THE SPIN ANGLE AT WHICH THE GUN AND AND RECEIVER, ALLOWED THE DETERMINATION OF THE ELECTRIC FILED. ALL A POSSIBLE CONTRIBUTION FAOM THE SPIN ANGLE AT WHICH THE GUN AND THE DETECTOR. THE VALUES OF THE SPIN ANGLE AT WI IN THE LIFE OF THE EXPERIMEN ELECTRIC FIELDS COULD BE STUDIED.

-- ESA GEOS, PEDERSEN--

INVESTIGATION NAME- DC FIELDS BY DOUBLE PROBE

INVESTIGATIVE PROGRAM NSSDC 10- 77-0294-07 SCIENCE

	INVESTIGATION DISCIPLINE(S)
	MAGNETOSPHERIC PHYSICS
	10NDSPHERES AND RADIO PHYSICS

PERSONN	EL.				
P1 -	· A.	PEDERSEN	1	ESAWESTEC	
61 -	D .	JONES		ESA-ESTEC	•
a i	κ.	KNOTT		ESA-ESTEC	
C 3	9.2.1	.GRARD		ESA-ESTEC	

BRIEF BESTUIPTICE THUS INSTRUMENT CONSISTED OF TWO WITRIOUS CARGON SPHERES THUS INSTRUMENT CONSISTED OF TWO WITRIOUS CARGON SPHERES ROUNTED AS THE TIPS OF THE 20 M CABLE BOOMS, WHICH EXTEND RADIALLY FROM THE SPACECRAFT PERPENDICULAR TO THE SPIN AXIS AND COMPRISED PART OF THE ESA NO.5-300 WAVE EXPERIMENT. THIS INVESTIGATION WAS CONCERNED WITH THE DC SINCE AXIS ELECTRIC FIELD ANALYSIS. THE TWO DUTPUT SIGNATION FOR FURTH, A TRAKTMENT IN THE ANALYSIS OF AC ELECTRIC FIELD AND CONDITIONS FOR FURTH, A TRAKTMENT IN THE ANALYSIS OF AC ELECTRIC FIELDS. THE DUTPUT AND ONE SPHERE WAS SIGNAL CONDITIONED ON A LINEAR SCALES FOR DIFFERENTIAL OUTPUT FROM THE TWO OUTPUTS WERE PASSED LOGARITHMTCALLY. IN ADDITION, THE TWO OUTPUTS WERE PASSED THROUGH AS: HZ TO 77 KHT BRIEF DESCRIPTION

FILTERS. THESE FILTERED SIGNALS WERE DIFFERENCED AND ALL THREE SIGNALS MADE AVAILABLE FOR ANALYSIS BY THE SWEPT-FREQUENCY ANALYZERS AND DIGITAL CORRELATOR AS PART OF 77-029A-DS (PET/I), -10 (UNGSTRUP), AND -01 (BEGHIN) INVESTIGATIONS. THU SENSITIVITY OF THIS PROBE WAS ABOUT 1.DE-4 V/M AT DC AND 1.DE-B V/M TIMES THE SQUARE ROOT OF HZ.

ESA GEOS, PETIT-

INVESTIGATION NAME- VLF PLASMA RESONANCES

NSSDC	10-	77-0294-05	INVESTIGATIVE	PROGRAM
			SCIENCE	

INVESTIGATION DISCIPLINE(S) PARTICLÉS AND FIELDS MAGNETOSPHERIC PHYSICS

PERSONNEL P1 - M.

CNET

PETIT

GRIEF DESCRIPTION THIS INVESTIGATION (PART OF ESA EXPERIMENT NO. S-300) UTILIZED THE 20 M BOOMS (NORMAL TO THE SPACECRAFT SPIN AXIS) AS A DIPOLE ANTENNA, AND THE CARGON SPHERES (PART OF 77-029A-07, PEDERSEN) AS THE RECEIVING ELEMENT, FREQUENCIES FROM 0.3 TO 77 KHI WERE EMPLOYED. ON TRANSMISSION OF A VLF SIGNAL OF LIMITED DURATION, A TRANSIENT SIGNAL WAS OBSERVED FOR A MUCH LONGER PERIOD THAN THE PULSE LENGTH, PROVIDED THE SPECTRUM OF THE TRANSMITTED SIGNAL INCLUDED ONE OF THE RESONANCE FREQUENCIES OF TH' PLASMA. THE AMBIENT PLASMA DENSITY COULD BE INFERREN FROM THE DETERMINATION OF THE RESONANT FREQUENCIES. RECEIVED FREQUENCIES UP TO 450 HIZ WERE TELEMETERED DIRECTLY, AND SIX SWEPT-FREQUENCY ANALYZERS AND A DIGITAL CORRELATOR PROVIDED AUTO- AND CROSS-CORRELATIONS UP TO 77 KHIL BANDHIDTHS OF 2.5, 5.0, OR 10.0 KHIZ COULD BE SLECTED FOR THE CORRELATOR.

----- ESA GEOS, UN6_ *PUP-----

INVESTIGATION NAME- ELECTR. T WAVE FIELDS

1.1VESTIGATIVE PROGRAM Science NSSUC 10- 77-0294-10

UNGSTRUP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS

PERSONNEL PI - E.

DANISH SPACE RES INST

BRIEF DESCRIPTION THIS INVESTIGATION WAS PART OF THE ESA NO. 5-300 WAVE EXPERIMENT AND FMPLOYED THE FOUR MESH SPHERES MOUNTED AT THE END OF THE 2.5 M AXIAL WOOMS, DNE OF THESE BOOMS ONLY EXTENDED TO 1.95 M- BUT THIS OLIN NOT AFFECT THE INSTRUMENT EXCEPT TO REQUIRE A RECALIBRATION. DIFFERENTIAL MEASUREMENTS FROM THESE SENSORS PROVIDED THE THREE VECTOR COMPONENTS OF THE ELECTRIC FIELD. FREQUENCIES FROM 50 HZ TO 77 KHZ COULD BE ANALYZED WITH THE SWEPT-FREQUENCY ANALYZER AND THE DIGITAL CORRELATOR. RECOURCIES UP TO 450 HZ COULD BE TELEMETERED DIRECTLY. AND AUTO- AND/OR CROSS-CORRELATION OF THE SENSOR OUTPUTS UP TO 77 KHZ COULD BE ACCOMPLISHED WITH SELECTABLE BANDHIDTHS OF 2.5, 5.0, OR TO.0 KHZ. THE SENSITIVITY OF THE MESH SPHERE PROBES AT TO KHZ WAS 1.0E-6 V/M TIRES THE SQUARE ROOT OF HZ. BRIEF DESCRIPTION

- ESA GEOS, WILKEN-----

INVESTIGATION NAME- ELECTRON AND PROTON PITCH ANGLE DISTRIBUTION

NS50C ID- 77-029A-01

INVESTIGATIVE PROGRAM SCIENCE

INVESTIGATION DISCIPLINE(5) PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS

PERSONNEL		
PI - B.	WILKEN	MPI-AERONOMY
QI — G.	PFOTZER(RETIRED)	MPI-AERONOMY
01 - E.	KEPPLER	MPI-AERONOMY
01 - A.	KORTH	MP1-AERONOMY
01 - J.	NUENCH	MPI-AERONDMY
		· · · · · · · · · · · · · · · · · · ·

01 - J. MUENCH MPI-AERGONDMY BRIEF DESCRIPTION THIS INSTRUMENT (ESA EXPERIMENT NO. S-321) MEASURED THE ENERGY AND PITCH ANGLE DISTRIBUTION OF HIGHER ENERGY ELECTRONS AND PROTONS THAN THAT OF HULTQVIST (77-029A-04), AND WAS COMPLIMENTARY TO THAN INSTRUMENT. THE DETECTOR SYSTEM CONSISTED OF TWO SEPARATE HAGNETIC SPECTROMETERS FOR ELECTRONS HITH IND PROTON TELESCOPES ASSOCIATED WITH SACH OF THE MAGNETS THAT SERVED TO FOCUS THE ELECTRONS AWAY FROM THE PROTON DETECTORS. THERE WERE FIVE RECTANGULAR SOLID-STATE DETECTORS MOUNTED ALONG THE FOCAL LINE OF EACH SPECTROMETER TO MEASURE THE ELECTRONS. EACH SPECTROMETER COYERED AN ANGULAR APERTURE IM ELEVATION ANGLE (RELATIVE TO THE FPIN AXIS) OF 60 DEG. THE WO DEFLECTIN MAGNETS WERE POSITIONED SO THAT ELEVATION ANGLES (REFLERED TO THE SPIN AXIS) FROM TO TO 120 DEG, ON 10 DEG CENTRES, WERE COVERED FOR ELECTRONS, GLVING ELEVATION ANGLES (REFLECTED S. BAND 106 DEG FOR THE PROTON TELESCOPES. THESE IELESCOPES CONS:3:ED OF A FRONT. SUBFACE-BARRIER DETECTOR AND A #/AR, SOLID-STATE DETECTOR. ELECTRON ENERGIES FROM 3D TO 200 KEY AND PROTON FYREGIES FROM 0.64 10 1.4 MEY WERE COVERED. THESE

E FECTIVE ANGULAR APERTURES FOR PROTONS WERE 10 DEG X 4 DEG (ELEVATION X AZIMUTH) AND FOR ELECTRONS WERE 6 DEG X 4 DEG. GEOMETRIC FACTORS IN UNITS OF 1.0E-4 (M SQ STER WERE FIVE FOR PROTONS AND ONE FOR ELECTRONS. A 12 CHANNEL PULSE-HEIGHT AMALVZER (PHA) FOR POTONS COULD BE USED FOR ANY ONE OF THE FOUR FRONT DETECTORS, PROVIDED A FRONT-REAR COINCIDENCE WAS DETECTED, AND A 15 CHANNEL PHA COULD BE USED FOR ANY ONE OF THE TO ELECTRON DETECTORS. THE SINGLES RATE FOR ONE OF THE FOUR PROTON TELESCOPES COULD BE SELECTED. THERE WERE THREE MODES FOR DATA SELECTION -- MODE 0, INTEGRAL COUNT RATES AND SPECTRAL MEASUREMENTS FOR ALL 14 DETECTORS; MODE 1, INTEGRAL COUNT RATES AND SPECTRAL MEASUREMENTS OF GOOD TIME RESOLUTION FOR ENERGY SPECTRAL MEASUREMENTS - GOOD TIME RESOLUTION FOR ENERGY SPECTRAL MEASUREMENTS - GOOD TIME RESOLUTION FOR ENERGY SPECTRAL THE MINIMUM TIME FOR A COMPLETE SPECTRUM WAS 648 M5; THE MINIMUM TIME FOR A COMPLETE SPECTRUM WAS 648 M5; THE MINIMUM TIME FOR A COMPLETE SPECTRUM WAS 648 M5; THE MINIMUM TIME FOR A RESOLUTION OF DELTA E/E = 0.35.

-- ESA GEOSA WRENN------

INVESTIGATION NAME+ THERMAL PLASMA FLOW

NSSDC ID-	77-029A-02	INVESTIGATIVE	PROGRAM
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	GATION DISCIPLINE(5)	
	CLES AND FIELDS	
MAG26	TASDUSUIT DUVETER	

PERSONNEL PI - G.L. WRENN	
01 - R.L.F.BOTD	V COLLEGE LONDON U COLLEGE LONDON
QI ~ K. NORMAN Di - W.J. Raitt	U COLLEGE LONDON U COLLEGE LONDON

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE INSTRUMENT (ESA EXPERIMENT NO. S-302) EMPLOYED ING HEMISOPHERICAL ELECTROSTATIC AMALYZERS MOUNTED ON ONE OF THE LOCKING BOOMS FOR THE MEASUREMENT OF ELECTRONS OR PROTOMS OVER THE RANGE D.S TO 500 EV ARRIVING CLOSE TO PARALLEL AND CLOSE TO PERPENDICULAR TO THE LOCAL MAGNETIC FIELD. THE ENERGY RANGE WAS COVERED IN 64 SIEPS WITH A RELATIVE EMERGY RESOLUTION OF O.11. OME AMALYZER HAD ITS APERTURE POINTING ALONG THE NEGATIVE (2) SPIN AXIS WITH AN OPENING ANGLE OF 18 DEG X 18 DEG PROVIDING A GEOMETRICAL FACTOR (6) OF 6.0E-4 CM SQ SIER, THE OTHER ANALYZER HADE AN ANGLE OF 10 DEG WITH RESPECT TO THE +2 AXIS WITH AN OPENING ANGLE OF 8 DEG X 30 DEG FROVIDING AG OF 5.0E-4 CM SQ SIER. BOTH DETECTORS HAD TO MEASURE THE SAME TYPE OF PARTICLES AT THE SAME TIME. THE COLLIMATORS OF THESE INSTRUMENTS COULD BÉ SET AT ANY VOLTAGE FROM -28 TO 432 V IN SIEPS OF 0.1 V TO COMPENSATE FOR THE POTENTIAL DIFFERENCE BETWEEN THE INSTRUMENT AND THE UNDISTURBED PLASMA ENVIRONMENT. THIS VOLTAGE DETERMINED THE SPACECRAFT POTENTIAL.

SPACECRAFT COMMON NAME- ESSA B ALTERNATE NAMES- PL-691A, TOS 03615

NSSDC 10- 68-114A

LAUNCH DATE- 12/15/68 Launch Site- Vandenberg Afb, united states Launch Vehicle- Delta WEIGHT- 297. KG

SPONSORING COUNTRY/AGENCY UNITED STATES

ESSA

BIT PARAMETERS	
ORBIT TYPE- GEOCENTRIC	EPOCH DATE+ 02/28/77
Grbit Period- 114.6 Min	Inclination- 101_4 Beg
Periapsis- 1416. Km	ApoApsis- 1465. Km

PERSONNEL PM - W.W. JONES

0R

PH - W.W. JONES NASA-GSFC DRIEF DESCRIPTION ESSA & WAS A SUN-SYNCHRONOUS OPERATIONAL METEOROLOGICAL ESSA & WAS A SUN-SYNCHRONOUS OPERATIONAL METEOROLOGICAL SATELLITE DESIGNED TO PROVIDE REAL-TIME EARTH CLOUDCOVER TV PICTURES TO PROPERLY EQUIP GROUND RECEIVING STATIONS FOR USE IM WEATHER ANALYSIS AND FORECASIING. THE SATELLITE HAD ESSENTJALLY THE SAME CONFIGURATION AS THAT OF A TIROS SPACECRAFI. 1.E.. AM 18-SIDED RIGHT PRISM. 107 CM ACROSS OPPOSITE CORNERS AND 56 CM HIGH, WITH A REINFORCED BASEPLATE CARPTING MOST OF THE SUBSYSTEMS AND A. COVER ASSEMBLY (HAI). ELECTRICAL POWER WAS PROVIDED BY APPROXINATELY 10.DOD 1- BY 2-CM SOLAR CELLS THAT WERE MOUNTED ON THE COVER ASSEMBLY AND BY 21 MICKEL-CADMIUM BATTERIES. TWO REDUNDANT WIDE-ANGLE AUTOMATIC PICTURE TRANSMISSION (API) CAMERAS WERE MOUNTED ON OPPOSITE SIDES OF THE SPACECRAFT WITH THEIR OFTICAL AYES PAREMDICULAR TO THE SUBSYSTEMS (ASSOCHDIPOLE COMMAND RECEPTION ANTENNAS. A MONOPOLE TELEMETRY. (136.500 MHZ) AND RECEPTION ANTENNAS. A MONOPOLE TELEMETRY. (136.500 MHZ) AND RECEPTION ANTENNAS. A MONOPOLE ATTIEVADE FINN RATE WAS CONTROLLED BY MEANS OF A MAGNETIC ATTIEVIDE SPIN RATE WAS CONTROLLED BY MEANS OF A MAGNETIA TO THE ORBITAL PLANE (CARTIMEEL ORBIT MODE) TO WITHIN PLUS DR MINUS 1 DEG. WITH THE SPIN THE SPIN AXIS MAINTAINED NORMAL 10. THE ORBITAL PLANE (CARTIMEEL ORBIT MODE) TO WITHIN PLUS DR MINUS 1 DEG. THE MASC WAS AND THES PIN MAIS MAINTAINED NORMAL 10. THE COVER ASSEMBLY. THE MAGNETIC FIELD INDUCED BY THE CURRENT INTERACTED WITH THE EARTH'S MAGNETIC FIELD TO PROVIDE THE TORGUE MECESSARH TO MAINTAIN A DESIRED SPIN RATE OF TO, SRP.

NASA-GSFC

---- ESSA 8, NESS STAFF-----

INVESTIGATION NAME- AUTOMATIC PICTURE TRANSMISSION (APT) S¥STE#

NSSDC ID- 68-114A-01

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL NESS STAFF PI

NOAA-NESS

SPACECRAFT COMMON NAME- GEOS 2 Alternate Names- Geos-B, Explorer 36 03093

NS50C 10- 68-002A

WEIGHT- 469. KG LAUNCH DATE- 01/11/68 Launch Site- Vandenberg AFB, United States Launch Vehicle- Delta

SPONSORING COUNTRY/AGENCY United States NASA-OSS

GRBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 112.2 Min Periapsis- 1083. KM	EPOCH DATE- 02/28/77 Inclination- 105.7 deg Apoapsis- 1577, KM
PERSONNEL PM - J.D. Rosenberg P5 - N.G. Roman	NASA HEADQUARTERS NASA HEADQUARTERS

BRIEF DESCRIPTION EXPLORER 36 (GEOS 2) WAS A GRAVITY-GRADIENT-STABILIZED, SOLAR-CELL-POWERED SPACECRAFT THAT CARRIED ELECTROMIC AND GEODETIC INSTRUMENTATION. THE GEODETIC INSTRUMENTATION STSTEMS INCLUDED (1) FOUR OPTICAL BEACONS, (2) TWO C-BAND RADAR TRANSPONDERS, (3) A PASSIVE RADAR REFLECTOR, (4) A SECOR RADIO RANGE TRANSPONDER, (5) A GODDARD RANGE AND RANGE RATE (GRARR) TRANSPONDERS, (6) LASER REFLECTORS, AND (7) DOPPLER BEACONS. NON-GEODETIC SYSTEMS INCLUDED A LASER DETECTOR AND A MITTRAK INTERFENDETER BEACON. THE OBJECTVES OF THE SPACECRAFT WERE TO OPTIMIZE OPTICAL STATION VISIBILITY PERIODS AND TO PROVIDE COMPLEMENTARY DATA FOR INCLINATION-DEPENDENT TEMPS ESTAB: SHED BY THE EXPLORER 29 (GEOS 1) GRAVIMETRIC STUDIES. THE SPACECRAFT WAS PLACED INTO A RETROGRADE ORBIT TO ACCOMPLISH THESE OBJECTIVES. OPTATIONAL PROBLEMS OCCURRED IN THE MAIN POMER SYSTEM, OFTICAL BEACON FLASH SYSTEM, AND THE SPACECRAFT CLOCK. AND ADJUSTNENTS IN SCHEDULING RESULTED IN NOMINAL OPERATIONS. BRIEF DESCRIPTION

-- GEOS 2, PLOTKIN----

INVESTIGATION NAME- LASER TRACKING REFLECTOR

INVESTIGATIVE PROGRAM NSSDC 10- 68-002A-02 CODE ESE

> INVESTIGATION DISCIPLINE(S) GEODESY

BRIEF DESCRIPTION LASER CORNER REFLECTORS, COMPOSED OF 322 TUSED QUARTZ CUBES WITH SILVERED REFLECTING SURFACES, WERE USED FOR DETERMINING THE SPACECRAFT RANGE AND ANGLE. THE CUBES, WHICH WERE MOUNTED ON FIBERGLASS PANELS ON THE BOTTOM RIM OF THE SPACECRAFT, PROVIDED A TOTAL REFLECTING AREA OF D.18 SQ M. THE REFLECTORS CONSERVED THE NARROW DEAMWIDTH OF INCOMING LIGHT AND PROVIDED A MAXIMUM SIGNAL TO THE GROUND ALMOST EXACTLY TO WHERE IT ORIGINATED. FIFTY PERCENT OF THE LIGHT THAT STRUK THE PRISM AREA AT A 90-DEG ANGLE WAS REFLECTED WITHIN A BEAM OF ZO ARC-S. REFLECTED LIGHT RECEIVED BY GROUND TELESCOPES WAS AMPLIFIED BY A PHOTOMULTIPLIER TUBE THAT CONVERTED THE OPTICAL IMPULSE TO AN ELECTRICAL SIGNAL. THE TIME REQUIRED FOR THE BEAM TO RETURN TO GARTH WAS RECORDED BY A DIGITAL COUNTER. THE REFLECTED LUASER PULSE WAS ALSO PHOTOGRAPHED AGAINST THE STELLAR BACKGROUND, AND THE OPTICAL LASER TRACKING SYSTEM. LASER TRACKING, IS THE RESPONSIBILITY OF AFCRL, SAD, GSFC OPTICAL RESEARCH, AND INTENATIONAL LASER STATIONS.

SPACECRAFT COMMON NAME- GEOS 3 Alteknate names- geodetic satellite-c, geoc-c

N550C 10- 75-027/

WE'GHT- 340, KG LAUNCH DATE- 34/09/75 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- DELTA

SPONSORING COUNTRY/AGENCY United State\$ NASA-0A

INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 101.82 MIN PERIAPSIS- 839. KM	EPOCH DATE- 04/10/75 Inclination- 114,96 deg Apoapsis- 853. Km
PERSONNEL MG - C.J. FINLEY SC - J.P. MURPHY PM - NONE ASSIGNED PS - H.R. STANLEY	NASA HEADQUARTERS Nasa Headquarters Nasa-WFC

THE FLATE STATEMENT NASA AN OCTAMEDRON, TOPPED BY A TRUNCATED THE SPACECRAFT WAS AN OCTAMEDRON, TOPPED BY A TRUNCATED PYRAMID, WITH A PARABOLIC REFLECTOR FOR A RADAR ALTIMETER ON THE FLAT BOTTON SIDE. A METAL RIBBON BOON WITH HEN MASS EXTERNED UNWARD APPROXIMATELY 6.1 M FROM THE TOP OF THE PYRAMID. ...SIVE LASTER RETRORFLECTOR CUBES WERE MOUNTED IN A RING AROUND THE PARABOLIC REFLECTOR WITH THE NORMAL VECTOR FROM RING AROUND THE PARABOLIC REFLECTOR WITH THE NORMAL VECTOR FROM RING AROUND THE PARABOLIC REFLECTOR WITH THE NORMAL VECTOR FROM RING AROUND THE PARABOLIC REFLECTOR WITH THE NORMAL VECTOR FROM RING AROUND THE PARABOLIC REFLECTOR WITH AND UNF FREQUENCIES AND SCHARATE ANTENNAS FOR EARTH-VIEWING, 32-C-MHZ DOPLER, C-BAND, AND S-BAND TRANSPONDERS WERE MOUNTED SEPARATELY ON FLAT SURFACES NEXT TO THE PARABOLIC REFLECTOR. THE DIRKSION ARODS THE FLATS OF THE OCTAHEDRON WAS \$.22 R, AND THE SPACELRAFT WAS INTARCES NEXT TO THE PARABOLIC REFLECTOR. THE DIRKSION ARODS THE FLATS OF THE OCTAHEDRON WAS \$.22 N, AND THE SPACELRAFT WAS INTARCES NEXT TO THE PARABOLIC REFLECTOR. THE DIRKSION ARODS THE FLATS OF THE OCTAHEDRON WAS \$.22 N, AND THE SPACELRAFT WAS INTARCES NEXT TO THE PARABOLIC REFLECTOR. THE DIRKSION ARODS THE FLATS OF THE OCTAHEDRON WAS \$.22 N, AND THE SPACELRAFT WAS AND S-BAND TRANSPONDERS WERE MOUNTED SETWERS THE HATIONAL GEODETIC SATELLITE PROGRAM. IT PROVIDED DATA TO REFINE THE MISSION PROVIDED THE STEPPING STORE BETWEEN THE MATIONAL GEODETIC AND GEOPHYSICAL RESULTS OF THE NGSP AND SERVED AS A SATELLITE ALTIMENT EXPERIMENT IN ORBIT. TO SUPPORT FURTHER THE CALIBRATION AND POSITION DETERMINATION OF NASA AND OTHER AGENCY CHAMO RADAR SYSTEMS, AND TO SERVERS TO SATELLITE TRACKING EXPERIMENT INTH THE ATS 6 SPACECRAFT USING AS -BAND STATEMETRY DATA RELAY THROUGH ATS 6, TO SUPPORT FURTHER THE INTERCOMPARISON OF TRACKING SYSTEMS, TO INVESTIGATE THE CALIBRATION AND POSITOR DETERMINATION TECHNIQUES AND DTHE THACKING, TO REFINE FURTHER ORBIT DETERMINATION TECHNIQUES AND DETERMINE, THE INTERCOMPARISON OF TRACKING SYSTEM

-- GEOS 37 ANDERLE---

INVESTIGATION NAME- US NAVY DOPPLER SYSTEM

INVESTIGATIVE PROGRAM NSSDC 10- 75-0274-05 CODE ESE/CO-OP

INVESTIGATION DISCIPLINE(5) NAVIGATION GEODEST

PERSONNEL PI - R.J. ANDERLE USH SURFACE WEAPNS CTR

ARIEF DESCRIPTION

ORIEF DESCRIPTION THE DOPPLER TECHNIQUE OF TIMING AND MEASURING THE FREQUENCY SHIFT OF RADIO TRANSMISSIONS FROM A MOVING SPACECRAFT WAS USED TO OBTAIN DATA THAT FURTHER ESTABLISHED THE STRUCTURE OF THE EARTH'S GRAVITATIONAL FIELD THROUGH THE COMPARISON OF NEW WITH ESTABLISHED GEODETLC REASUREMENTS. TWO TRANSMITTERS WERE OPERATED AT FREQUENCIES OF 162 AND 324 FML. THE DIAL WERE OPERATED COHERENTLY RELATED AND UTILIZED IN CONJUNCTION MITH GROUND DOPPLER RECEIVING STATIONS TO OBTAIN PRECISION

NASA-GSFC

SATELLITE RANGE-RATE DATA. THE DUAL FREQUENCIES WERE GENERATED BY A NIGHLY STABLE OSCILLATOR ORIVING TWO FREQUENCY MULTIPLIERS, BOTH FREQUENCIES WERE USED SIMULTANEOUSLY TO PROVIDE COMPARISON DATA OF THE EFFCT OF THE IONSPHERE ON THE SIGNALS, WHICH WERE TO CORRECT THE DATA FOR THIS EAROR SOURCE. THIRTEEN OR MORE FIXED GROUND RECEIVING STATIONS OPERATED BY THE U.S. NAVY DOPPLER TRACKING NETWORK (TRANET) AND 12 PORTABLE GEOCEIVERS OPERATED BY THE U.S. ARMY, U.S. NAVY, AND U.S. AIR FORCE -- ALL UNDER THE DIRECTION OF THE DEFUSE MAPPING AGENCY (DMA) -- ARE EXPECTED TO BE IN OPERATION. DBSERVATIONS RADE FORM THEE OR MORE KNOWN STATIONS ALLOWED DEDUCTION OF DRBITAL FARMETERS. RANGE-RATE DATA FROM EITHEN THE FIXED STATIONS OR THE GEOCEIVERS WERE ESTINATED TO BE ACCURATE WITHIN U.S CM/S.

----- GEOS 3, GALICINAO------

INVESTIGATION NAME- SATELLITE-TO-SATELLITE TRACKING

INVESTIGATIVE PROGRAM NSSDC 10- 75-0274-06

INVESTIGATION DISCIPLINE(S) NAVIGATION

PERSONNEL PI - I.Y. GALICINAG NASA-GSEC

BRIEF DESCRIPTION THE SATELLITE-TO-SATELLITE TRACKING (SST) SYSTEM USED CONSISTED OF --- (1) THE GROUND-BASED APPLICATION TECHNOLOGY SATELLITE RANGING (ATSR) SYSTEM (MODIFIED FOR SATELLITE-TO-SATELLITE TRACKING), (2) THE WIDEBAND COMMUNICATION TRANSPONDER ON THE ATS & GEOSTMCHROHOUS SPACECRAFT, AND (3) THE RANGING TRANSPONDER ON THE LOW-ORBITING SATELLITE. SATELL STE.

----- GEOS 3, JACKSON------

INVESTIGATION NAME- C-BAND SYSTEM

NSSDC 10- 75-0274-03 INVESTIGATIVE PROGRAM CODE ER

> INVESTIGATION DISCIPLINE(S) NAVIGATION

> > NASA-WEC

PERSONNEL PI - E.B. JACKSON

WRLEF DESCRIPTION THE C-BAND TRANSPONDER SUBSYSTEM CONSISTED OF ING TRANSPONDERS, DNE THE GEOS 2 NONCOHERENT TYPE AND THE OTHER A COHERENT C-BAND TRANSPONDER. THE NONCOHERENT TRANSPONDER PROVIDED FOR RANGE AND ANGLE MEASUREMENTS, WHILE THE COHERENT TRANSPONDER PROVIDED FOR BOTH RANGE, RANGE-RATE, AND ANGLE MEASUREMENTS. BOTH TRANSPONDERS RECEIVED SIGNALS AT 5690 MHZ. THE COHERENT TRANSPONDER TRANSMITTED AT 5765 NHZ. EACH C-BAND TRANSPONDER TRANSPONDER TRANSMITTED AT 5765 NHZ. EACH C-BAND TRANSPONDER TRANSPONDER TRANSMITTED AT 5765 NHZ. EACH C-BAND TRANSPONDER TRANSMITTED ONE PULSE FOR EACH CODED GROUP OF PULSES TRANSMITTED ON A GROUND TRACKING C-BAND RADAR, THE INTERNAL DELAY BETWEEN THE RECEIVED GROUND TRANSMITTED PULSE CODE AND THE TRANSPONDER TRANSMITTED PULSE WAS CALIBRATED PULSE CODE AND THE TRANSPONDER THE CETIVED GROUND TRANSMITTED PULSE CODE AND THE TRANSPONDER THE STANDBY OR OVERRIDE MODE. IN STANDBY, THE RECEIVER DECAME OPERATIONA STEPA THATELY OR SIMULTANEOUSLY) OPERATED IN EITHER STANDBY OR OVERRIDE MODE. IN STANDBY, THE RECEIVER DECAME OPERATIONS AFTER JENGEED BY THE EXTERNAL COMMAND AND THE WARM-UP DELAY CIRCUIT NYPASSED AFTER THE TUBE WARHED UP, THUS ALLOWING THE TRANSPORDER TO RESPOND IMMEDIATELY TO INTERROGATION STALOWING THE TRANSPORDER TO RESPONDER THE TRANSPONDER INTER DECAMENTED FOR THE TRANSPORDER TO STANDERY, THE RECEIVER DECAME OPERATIONS THE OUTPUT (UBE TO DARM UP. IN OVERRIDE, THE OUTPUT TUBE FILMENT WAS ENERGIZED BY THE EXTERNAL COMMAND AND THE WARM-UP DELAY CIRCUIT NYPASSED AFTER THE TUBE WARKED UP, THUS ALLOWING THE TRANSPORDER TO RESPOND IMMEDIATELY TO INTERROGATION STALOWING THE TRANSPORDER TO SECONDE REDUCED GROUND COMMAND REQUIREMENTS AND CONSERVED SPACECRAFT POWER. BRIEF DESCRIPTION

--- GEOS 3, PURDY-----

INVESTIGATION NAME- RADAR ALTIMETER SYSTEM

N550C 10- 75-0274-01

INVESTIGATION DISCIPLINE(S) NAVIGATION GEODEST

NASA-WEC

INVESTIGATIVE PROGRAM

CODE ESE

PERSONNEL PI - C.L. PURDY

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE RADAR-ALTIMETER EXPERIMENT WAS THE HIGHEST PRIORITY EXPERIMENT ON GEOS 3. THE GUJECTIVÉS WERE TO DETERMINE THE FEASIBILITY AND UTILITY OF A SPACEBORNE RADAR ALTIMETER FOR MAPPING THE TOPOGRAPHY OF THE OCENN SURFACE WITH AN ABSOLUTE ACCURACY WITHIN 5 R, AND WITH A RELATIVE ALCURACY OF 1 TO 2 M. TO DETERMINE THE FEASIBILITY OF MEASURING THE DEFLECTION OF THE VERTICAL AL SEA. TO DETERMINE THE FEASIBILITY OF MEASURING WAVE HEIGHT, AND TO CONTRIBUTE TO THE TECHNOLOGY LERAING TO A FUTURE OPERATIONAL ALTIMETER-SATELLITE SYSTEM WITH A 16-CM MEASUREMENT CAPABILITY. TO MEET THE EXPERIMENT OBJECTIVES, THE ALTIMETER HAD TWO DISTINCT DATA GATHERING MODES -- A LONG-PULSE ALTIMETER MAD TWO DISTINCTERISTICS OF THE ALTIMETER USFFERED FOR THE OF THE SATE OPERATING CHARACTERISTICS OF THE ALTIMETER JEFFERED FOR THE FOR THE SATE OPERATING CHARACTERISTICS OF THE ALTIMETER JEFFERED FOR THE FOR THE SATE ADDISTINCT AND A SHORT-PULSE MODE. - A LINGFERE JEFFERED FOR THE SATE OPERATING CHARACTERISTICS OF THE ALTIMETER FOR THE DIFFERED FOR THE SATE ADDISTINCT AND A SHORT-PULSE MODE. - A CONS-PULSE ALTIMETER MAD TWO AND A SHORT-PULSE MODE. - A CONS-PULSE ALTIMETER PARABOLIC ANTENNA. HAD A MAXIMUM RANGE ACGUISITION TIME OF 65,

AND HAD AN ALTITUDE GRANULARITY OF PLUS OR MINUS 0.2 M. DIFFERING CHARACTERISTICS WERE -- (1) ALTITUDE DATA RATE FOR LONG PULSE WAS 2 READING/S AND FOR SHORT PULSE 6 READING/S, AND (2) INPUT POWER FOR LONG PULSE WAS SO W, FOR SHORT PULSE 100 W, THE GEOS 3 RADAR ALTIMETER HAD SEVERAL FEATURES IN COMMON WITH THE ALTIMETER USED ON THE SKYLAB SATELLITE. BUT HAD ADVANTAGES OVER THE SKYLAJ ALTIMETER BECAUSE OF INPROVED ACCURACY AND ABJLITY TO OPERATE OVER EXTENDED AREAS FOR GREATER PERIODS OF TIME, THEREBY PROVIDING THE CAPABILITY TO EXAMINE THE EARTH OVER LONGER ARCS AND OBSERVE EXTENSIVE OCEAN AREAS.

----- GEOS 3, SALZBERG------

CODE EN

INVESTIGATION NAME- S-BAND TRACKING SYSTEM

NSSDC 10- 75-0274-02

PERSONNEL

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(5) NAVIGATION

NASA-GSFC

- I.M. SALZBERG

PERSONNEL PI - J.M. SALIBERG NASA-GSFC BRIEF DESCRIPTION THE S-BAND TRANSPONDER SUBSYSTEM PROVIDED METRIC TRACKING DATA (RANGE, RANGE-RATE). II TRANSMITTED TELEMEIRY DATA BUT DID NOT RECEIVE COMMANDS. THE TRANSPONDER NG OPERATE IN THE FOLLOWING THREE MODES -- (1) SATELLITE-TO-SATELLITE TRACKING (SST) FROM THE ROSMAN OR EUROPEAN ATS GROUND STATIONS THROUGH ATS 6 TO GEOS 3 AND BACK, (2) DIRECT USE (JOPPLER ONLY) GROUND STATION TRACKING OF GEOS 3. AFTER 'HE USD GROUND STATIONS ARE MODIFIED, AND (3) DIRECT USE (JOPPLER ONLY) GROUND STATION TRACKING OF GEOS 3. AFTER 'HE USD GROUND STATIONS THROUGH ATS 6 TO GEOS 3. THE TRANSPONDER SUBSYSTEM CONSISTED FA SINGLE-CHANNEL TRANSPONDER, A POVER AMPLIFIR, A C PLEXER, AND AN EARTH-VIEWING AND ATS-VIEWING ANTENNA SYSTEM. THE ANTENNAS WERE SELECTABLE BY GROUND COMMAND., THE EAYTH-VIEWING ANTENNA MERE SELECTABLE BY GROUND COMMAND., THE EAYTH-VIEWING ANTENNA MITHIN 60 DEG OF THE SPACECRAFT LAXIS. THE S.'T ANTENNA SYSTEM CONSISTED OF AN IN-TRACK ARRAY THAT PROVIDED A 1-06 GAIN MITHEN DIRECT TRACKING WITH THE USB AND GRARM ROUND STATIONS HAD APPROXIMATELY HEMISPHERICAL COVERAGE AND A SIJIMUM OF G-DB GAIN WITHIN 60 DEG OF AN IN-TRACK ARRAY THAT PROVIDED A 1-06 GAIN IN THE DIRECTION OF ATS FOR GEOS ASCENDING AND DESCENDING NODE PASSES, WHICH CROSSED THE EQUATOR WITHIN PLUS OR MINUS 20 DEGREES OF THE AYS SUBSATELLITE POINT. IN THE SST OPERATION MODE, THE INSTRUMENTATION TO THE ATS 6 SPACECRAFT. ATS SPACECRAFT INSTRUMENTATION COHERENTLY ALTERED THE SIGNAL, MAKING II COMPATIBLE WITH THE INPUT FREQUENCY (2)69.1125 MH2) OF THE S-BAND TRANSPONDER NO GEOS 3. AND TRANSMITTED THE SIGNAL, MAKING II COMPATIBLE WITH THE INPUT FREQUENCY (2)69.1125 MH2) OF THE S-BAND TRANSPONDER NO GEOS 3. AND TRANSMITTED THE SIGNAL, MAKING II COMPATIBLE WITH THE INPUT FREQUENCY (2)649.1125 MH2) OF THE S-BAND TRANSPONDER NO GEOS 3 WAS ASSO TRACKED HY THE USB AND GRART STON STATION. ATS CARRIER FREQUENCIES (206-,1125 MH2 WARE OBTAINED BY COMPARING THE INTERROSTION AND RESPONSE SIG

-- GEOS 3, STEPHANIDES-------

INVESTIGATION NAME- LASER CUBE SYSTEM

NSSDC ID- 75-027A-04 INVESTIGATIVE PROGRAM

CODE ESE

INVESTIGATION DISCIPLINE(S) NAVIGATION GEODESY

NASA-JSFC

PERSONNEL PI - C.C. STEPHANIDES

BRIEF DESCRIPTION

BRIEF DESCRIPTION LASER CORNER REFLECTORS, COMPOSED OF 270 (MINIMUN) 35-MM FUBES, AND GROUND-BASED LASER SYSTEMS HERE USED TO ODTAIN PRECISE SATELLITE TRACKING INFORMATION. THE APPLIED PHYSICS LABDRATORY PROVIDED THE LASER CUBE REFLECTOR PANELS. THE CUBES UNERE CONFIGURED ON THE LASER CUBE REFLECTOR PANELS. THE CUBES LABDRATORY PROVIDED THE LASER CUBE REFLECTOR PANELS. THE CUBES UNERE CONFIGURED ON THE LASER CUBE REFLECTOR PANELS. THE CUBES LABDRATORY PROVIDED THE LASER CUBE REFLECTOR PANELS. THE CUBES LABDRATORY PROVIDED THE LASER CUBE REFLECTOR PANELS. THE COURS. LARTH-ORIENTED SURFACE OF THE SPACECRAFT AT A 45-DEG ANGLE. THE BASE OF THE FRUSTUM MEASURED APPROXIMATELY 0.9 METERS IN DIAM. WHEN JLLUMINATED DY A LASER LIGHT PULSE FROM THE GROUND. EACH RETROREFLECTOR CUBE IN THE ARRAY REFLECTED THE LIGHT RAY BACK TO A SPECIAL TELESCOPE RECEIVER ON THE GROUND. THE REFLECTED LIGHT WAS PICKED UP BY THE TELESCOPE AND THE OPTICAL IMPULSES CONVERTED TO AN ELECTRICAL SIGNAL. A DIGITAL COUNTER RECORDED THE TIME WHEN THE LIGHT BLAM WAS RETURNED TO THE GROUND. THE TOTAL TRAVEL TIME OF THE LIGHT PULSES, FROM GROUNT OF SATELLITE AND BACK TO THE GOLIND, MEASURED THE DISTANCE TO THE SATELLITE, THUS FORMING THE BASIS OF THE SATELLITE DISTANCE ACQUIRE THE NECESSART DATA ---- MASA/WALLOPS LASER RANGING SYSTERS, SAO LASER RANGING SYSTEMS, GSFC LASER RANCING SYSTEMS, AND OTHER MATIONAL AND INTERNATIONAL LASER STATIONS AS DETERMINED. DETERMINED.

SPACECRAFT CONNON NAME- GRS Alternate Names- Geostation.Meteorol Sat.

NSSDC 10- 77-065A

LAUNCH DATE- 07/14/77 Launch Site- cape canaveral, united states Launch vehicle- delta WEIGHT- 647. KG

SPONSURING COUNTRY/AGENCY Japán Japan	NASDA JMA
INITIAL ORBIT PARAMETERS DRBIT TYPE- GEOCENTRIC DRUIT PERIOD- 649.7 MIN PERIAPSIS 187, KM	EPDCH DATE- 07/15/77 Inclination- 27.6 deg Apdapsis- 36745, km
PERSONNEL PM — R.J. GOSS PM — K. WATANABE PS — UNKNOWN	NASA-GSFC Natl Satell Dev Agcy Japanese meteorol Agcy

PS - UNKNOWN JAPARESE RELEVANT AND SRIEF DESCRIPTION THE GEOSTATIONARY RETEGROLOGICAL SATELLITE (GMS) IS JAPAR'S CONTRIBUTION TO THE INTERNATIONAL GARP (GLOBAL ATMOSPHERIC RESEARCH PROGRAM), ESA, USSR, USA, AND JAPAN PROVIDE GEOSTATIONARY SATELLITES FOR THIS PROGRAM, AND THE USA AND USSR PROVIDE POLAR, SUN-STWICHRONOUS SATELLITES. THE MAJOR OBJECTIVE OF GARP IS TO OBTAIN STHOPTIC GLOBAL RETEDROLOGICAL PREDICTION. IT IS HOPED THAT DETERMINATION. CAN BE RADE OF THE TIME LINITATION FOR SHORT-TERM MODELS FOR METEOROLOGICAL REDUCTIVE OLINARICAL WITH A MEIGHT OF 345 CM AND DIAMETER DF 216 CM. THE CYLINDRICAL SUMFACE IS COVERED WITH SOLAR CELLS WHICH CAN PROVIDE 225 W. THE SATELLITE IS SPIN-STABILIZED WITH A DESPUN EARTH-POINTING ANTENNA. THE SATELLITE IS POSITIONED NEAR 140 DEG E AND IS DESIGNED TO OPERATE FOR S YEARS.

GHS, JHA STAFF-

INVESTIGATION NAME+ VISIBLE AND INFRARED SPIN-SCAN Radiometer (VISSR)

JHA STAFF

NSSDC ID- 77-065A-01 INVESTIGATIVE PROGRAM Applications satellites

INVESTIGATION DISCIPLINE(S) Méteorology

PERSONNEL P1 -

N550C 10- 77-065A-02

NSSDC ID- 77-065A-03

METEOROL AGCY

BRIEF DESCRIPTION THE VISIBLE IR SPIN-SCAN RADIOMETER (VISSR) IS SIMILAR TO VISSR EXPERIMENTS ON OTHER GARP (GLOBAL ATMOSPHERIC RLSEARCH PROGRAM) SATELLITES SUCH AS GOES 1. IT CAN MAKE BOTH NIGHT (IR 10.5 TO 12.5 MIGROMETERS) AND DAY IR PLUS VISIBLE (.5 TO .75 MIGROMETERS) PHOTOMETRIC OBSERVATIONS OF THE SUBSATELLITE AREA AT 30 MIN INTERVALS. REAL-TIME TRANSMISSION IS AVAILABLE TO THE DATA ACQUISITION STATION IN JAPAN, WITH FURTHER DATA TRANSMISSION TO OTHER METEOROLOGICAL USERS AS NEEDED.

--- GHS, JHA STAFF------

INVESTIGATION NAME- SPACE ENVIRONMENT MONITOR (SEM)

INVESTIGATIVE PROGRAM AFFLICATIONS SATELLITES INVESTIGATION DISCIPLINE(S)

PARTICLES AND FIELDS

PERSONNEL PI JNA STAFF JAPANESE RETEOROL AGEY BRIEF DESCRIPTION

BRIEF DESCRIPTION THE SPACE ENVIRONMENT MONITOR (SEM) EXPERIMENT OBSERVES THE IN SITU CHARGED PARTICLE ENVIRONMENT. SOLAR PROTONS (1 TO 500 MV), ALPHA PARTICLES (8 TO 390 MV) AND SOLAR ELECTRONS (GREATER THAN 2 MV) ARE DISCRIMINATED, AND THEIR RESPECTIVE ENERGIES MONITORED BY MEANS OF A NUMBER OF SOLID-STATE DETECTOR

- GHS, JHA STAFF------

INVESTIGATION NAME- WEATHER COMMUNICATIONS FACILITY

INVESTIGATIVE PROGRAM Applications satellites

INVESTIGATION DISCIPLINE(S) CORMUNICATIONS METEOROLOGY

PERSONNEL PT JHA STAFF

JAPANESE HETEOROL AGEY

EPDCH DATE- 10/17/75 INCLINATION- 1-0

APOAPSIS-

NASA-GSFC NASA-GSFC

0N~ 1.0 DEG 36458. KM

BRIEF DESCRIPTION THE GRS INCLUDES A COMMUNICATIONS FACILITY (OR EXPERIMENT). THE OBJECTIVES OF THIS EQUIPMENT ARE (1) TO COLLECT AND RELAY WEATHER OBSERVATIONS FROM REMOTE STATIONS, INCLUDING BUOYS, SHIPS, AND UNMANNED STATIONS, AND (2) TRANSMIT WEATHER INFORMATION AND AMALYSES FROM THE CENTRAL WEATHER FACILITY TO OTHER WEATHER STATIONS.

SPACECRAFT COMMON NAME- GOES 1 Alternate Names- SMS-C, Goes-A

NSSDC ID- 75-100A

LAUNCH DATE- 10/16/75 Launch Site- cape canaveral, united states Launch vehicle- delta WEIGHT- 631, KG

SPONSORING COUNTRY/AGENCY United States United States	NDAA-NESS NASA-DA
INITIAL ORBIT PARAMETERS	

IN/TIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 1412.0 MIN PERIAPSIS- 34165. KM

PERSONNEL PM - R.H. PICKARD PS - W.E. SHENK

PM - R.H. PICKARD PS - W.E. SHENK BRIEF DESCRIPTION GOES 1 (SMS-C) WAS A NASA-DEVELOPED, NGAA-OPERATED SPACECRAFT. THE SPIN-STABILIZED, EARTH-STHCHRONOUS SPACECRAFT CARIED (1) A VISIBLE INFRARED, SPIN SCAN RADIONETER (VISSA) TO PROVIDE HIGH-GUALITY DAY AND NIGHT CLOUDCOVER DATA AND TO TAKE RADIANCE TEMPERATURES OF THE EARTH-ATMOSPHERE SYSTEM (2) A METEOROLOGICAL DATA COLLECTION AND TANKENTSSION SYSTEM TO RELAY PROVESED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL APT-EQUIPPED REGIONAL STATIONS AND TO COLLECT AND RELAY PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL APT-GUIPPED REGIONAL STATIONS AND TO COLLECT AND RELAY PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL APT-GUIPPED REGIONAL STATIONS AND TO COLLECT AND RELAY PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL APT-GUIPPED REGIONAL STATIONS AND TO RELEAY PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL APT-GUIPPED REGIONAL STATIONS AND TO RELEAY PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL APT-GUIPPED REGIONAL STATIONS AND TO RELEAY PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL APT-GUIPPED REGIONAL STATIONS AND TO RELEAY PROCESSED DATA FROM CENTRAL WEATHER PASSED PLATFORMS, AND GO AN ELECTRON, AND SOLAR X-RAY FLUXES AND MAGNETIC FIELDS. THE CYLINDRICALLY SHAPED SPACECRAFT MEASURED 190.5 CM IN DIMETER NO 230 CM IN LENGTH, EXCLUSIVE OF A MAGNETOMETER THAT EXTENDED AN ADDITIONAL 83 CM BEYOND THE CYLINDER SHELL. THE PRIMARY SIRUCTURAL MEMBERS WERE A HONEYCOMBED GOUPHENT SHELF AND THRINGST TUBE. THE VISSR TELESCOPE MAS MOUNTED 100 THE EQUIPMENT SHELF AND VIEWED THE EARTH THROUGH A SPECIAL APERTURE IN THE SPACECRAFT'S SIDE. A SUPPORT STRUCTURE SITEMED AND AND ROUTOED THE PRIMARY SOURCE OF ELECTRICAL POWER. LOCATED IN THE PRIMARY SOURCE OF ELECTRICAL POWER. LOCATED IN THE PRIMARY SOURCE OF ELECTRICAL POWER. LOCATED IN THE PRIMARY SOURCE OF LECTRICAL POWER. LOCATED IN THE PRAMELS WERE STATIONNEEPING AND DIMANTELS CONTROL EQUIPMENT, BATTERIES, AND MOST OF THE SEM EQUIPMENT. P

-- GOES 1. NESS STAFF-----

INVESTIGATION NAME- VISIBLE-INFRARED SPIN-SCAN RADIOMETER (VISSR)

NSSDC 10- 75-1004-91

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING

INVESTIGATION DISCIPLINE(S) METEOROLOGY

NOAA-NESS

PERSONNEL NESS STAFF

PI - NESS STAFF NOAA-NESS BRIEF DESCRIPTION THE VISIBLE INFRARED SPIN SCAN RADIOMETER (VISIR) FLOWM ON GOES 1 PROVIDED DAY/NIGHT OBSERVATIONS OF CLOUD.OVER AND EARTH/CLOUD RADIANCE TEMPERATURE MEASUREMENTS FROM A EXTURTRONOUS, SPIN-STABILIZEG, GEOSTATIONARY SATELLIE FOR USE IN OPERATIONAL WEATHER ANALYSIS AND FORECASTING. THE TWO-CHANNEL INSTRUMENT WAS ABLE TO TAKE BOTH FULL AND PARTIAL PICTURES OF THE EARTH'S DISK. THE INFRARED CHANNEL (TO.5 TO 12.6 MICROMETERS) AND THE VISIBLE CHANNEL (D.55, TO 0.70 MICROMETER) USED A COMMON OPTICAL SYSTEM. INCOMING RADIATION WAS RECEIVED BY AN ELLIPTICALLY-SHAPED SLAN MIRROR AND MIRROR WAS SET AT A NOMINAL ANGLE OF 45 DEG TO THE VISSR OPTICAL AXIS, WHICH WAS ALIGNED PARALLEL TU THE SPIN AXIS OF THE SPACECRAFT. THE SPINNIAM MOTION OF THE SPACECRAFT (APPROXIMATELY TO RPM) PROVIDED A WEST-TO-EAST SCAN MOTION WAS RISS. THE SPINNIAM SAS ACCOMPLISHED BY SEQUENTALLY TILTING THE SPINNIAM GARING NORTH TO SOUTH AT THE COMPLETION OF EACH SPIN. A FULL PICTURE TOOK 18.2 MIN TO

COMPLETE AND ABOUT 2 MIN TO RETRACE. DURING EACH SCAN, THE FIELD OF VIEW ON THE EARTH WAS SWEPT BY A LINEAR ARRAY OF EIGHT VISIBLE-SPECTAUM DETECTORS, EACH WITH A GROUND RESOLUTION OF C.9 KM AT ZERD MADIR ANGLE. A MERCURY-CAORIUM TELLURIDE DETECTOR SENSED THE INFRARED PORTION OF THE SPECTRUM WITH A HORIZONTAL RESOLUTION OF APPROXIMATELY 8 KM AT ZERO MADIR ANGLE. THE INFRARED PORTION OF THE DETECTOR MEASURED RADIANCE TEMPERATURES BETWEEN 180 AND 315 K WITH A PROPOSED SENSITIVITY BETWEEN 0.4 AND 1.4 K. THE VISSR OUTPUT WAS DIGITIZED AND TRANSMITTED TO THE NATIONAL DECRANGERAPHIC AND ATMOSPHERIC AMINISTRATION (NOAA) COMMAND DATA ACGUISITION STATION (CDA), WAL(OPS ISLAND, VA. THERE THE SIGNAL WAS FED INTO A 'LINE STRETCHER' WHERE IT WAS STORED AND TIME-STREICHED FOR TRANSMISSION BACK TO THE SATELLITE AT REDUCED BANDAIDTH FOR RE-BROACAST TO DATA WITLIZATION STATIONS (DUS). THE VISSR DATA, AS WITH ALL OPERATIONAL TYPE DATA, WERE HANDLED BY NOAA AND THE MAJORITY OF RATELLITE DATA WERE HANDLED BY NOAA AND THE MAJORITY OF RESEARCH-ORIENTED DATA WERE COLLECIED BY NAASA AND WERE MAINTAINED AT SERVICE BRANCH, SUITLAND, MD. LIMITED AROUNTS OF RESEARCH-ORIENTED DATA WERE COLLECIED BY NAASA AND WERE MAINTAINED AT NESDC.

GOES 1. NESS STAFF ----

INVESTIGATION NAME- METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM

NSSDC 10- 75-100A-05

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING INVESTIGATION DISCIPLINE(S) MÉTEOROLÓGY

PERSONNEL

NESS STAFF

NOAA-NESS

P1 - NESS STAFF POAR-NESS BRIEF DESCRIPTION THE METEORULOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM WAS AN EXPERIMENTAL COMMUNICATIONS AND DATA HANDLING SYSTEM DESIGNED TO RECEIVE AND PROCESS METEOROLOGICAL DATA COLLECTED FROM REMOTELY LOCATED EARTH-BASED DATA COLLECTION COBSERVATION) PLATFORMS (DCP). THE COLLECTED DATA WERE RETRANSMITTED FROM THE SATELLITE TO SMALL, GROUND-BASED, FOR THE RETRANSMISSION OF NARROW-BAND WEFAX TYPE) DATA FROM CENTRALIZED WEATHER FACILITIES TO SMALL, GROUND-BASED APT RECEIVER STATIONS. THIS COMMUNICATIONS SYSTEM OPERATED ON S-BAND FREQUENCIES. THE MINIMUM DATA COLLECTION SYSTEM FOR ONE SMALL METEOROLOGICAL INTELLITE CONSISTED OF APPROXIMATELY 3500 DCP STATIONS FOR CONTACT IN A 6-H PERIOD OF. THE AND 600K HITS, DEPENDING OH THE CODING TECHNIQUES. DATA RECEIVED FROM HINDIVIDUAL STATIONS VARIED FROM 5D TO 3000 BITS, DEPENDING ON THE TYPES AND VARIETIES OF SENSORS USED AT AN INDIVIDUAL DCP STATION.

--- GOES 1, WILLIARS

INVESTIGATION NAME- ENERGETIC PARTICLE MONITOR

NSSDC 10- 75-100A-02

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING INVESTIGATION DISCIPLINE(5) Particles and fields

PERSONNEL PI - D.J. WILLIAMS

NOAA-ERL

BRIEF DESCRIPTION A NUMBER OF SEPARATE SILICON SOLID-STATE DETECTORS, EACH HAVING A TAILORED MODERATOR THICKNESS AND A SEPARATE ELECTRONICS UNIT FOR PULSE AMPLIFICATION AND PULSE-HEIGHT DISCRIMINATION, WERE USED TO OBIAIN PARTICLE-TYPE/ENERGY MEASUREMENTS. SEVEN CHANNELS MEASURED PROTONS IN THE RANGE 1 TO 50 MEV. SIX CHANNELS REASURED ALPHA PARTICLES IN THE RANGE 4 TO 400 MEV. ONE CHANNEL MEASURED ELECTRONS GREATER THAN 0.5 MEV.

-- GOES 1, WILLIAMS------

INVESTIGATION NAME- SOLAR X-RAY MONITOR

NSSDC 11- 75-100A-03

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING

INVESTIGATION DISCIPLINE(5) Solar Physics

NOAÁ-ERL

PERSONNEL PI - D.J. WILLIAMS

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE X-RAY COUNTER WAS COMPOSED OF A COLLIMATOR, TWD IONIZATION CHAMBERS, AND TWO ELECTROMETERS. A SMALL ANGULAR APERTURE WAS CHOSEN FOR THE TELESCOPE COLLIMATOR, WHICH WAS MOUNTED SO THAT THE DECLIMATION OF ITS AXIS COULD BE CONTROLLED BY GROUND COMMAND TO INSURE THAT THE SUN WAS VIEWED BY THE TELESCOPE ONCE DURING EVERY VEHICLE ROTATION. ONE ION CHAMBER WAS FILLED WITH ARGON AT 3 ATM FOR DETECTION OF 1- TO 8-A X RAYS AND HAD A 5-MIL BERYLJUM WINDOW TO EXCLUDE X RAYS OF LONGER WAVELENGTHS. THE OTHER (HAMBER WAS FILLED WITH XENON AND HAD A 50-MIL PERYLJUM WINDOW FOR MEASUREMENTS OF X RAYS IN THE WAVELENGTH RAYGE 0.5- TO 3-A.

----- GOES 1, WILLIAMS------

INVESTIGATION NAME- MAGNETIC FIELD MONITOR

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING NSSDC 10- 75-100A-04

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS

NDAA-ERL

PERSONNEL PI - D.J. WILLIAMS

BRIEF DESCRIPTION A SHORT BOOM DEPLOYED (2 FT) BIAXIAL, CLOSED-LODP, FLUXGATE MACKETOMETER WITH ONE SENSOR ALIGHED PARALLEL TO THE SPACECRAFT SPIN AXIS AND THE OTHER PERPENDICULAR TO THIS AXIS MEASURED THE MAGNETIC FIELD AT SYNCHRONOUS ALTITUDE. EACH SENSOR HAD A SELECTABLE RANGE (+50, 100, 200, OR 400 GAMMAS), AN OFFSET FIELD CAPABILITY (PLUS OR MINUS 1200 GARMAS IN 40-GAMMA STEPS), AND AN IN-FLIGHT CALIBRATION CAPABILITY.

SPACECRAFT COMMON NAME- GOES 2 Alternate Names- Goes-B

NSSOC ID- 77-0684

WEIGHT- 294, KG LAUNCH DATE- 06/16/77 Launch Site- cape canaveral, united states Launch vehicle- delta

SPONSORING COUNTRY/AGENCY	
UNITED STATES	NOAA-NESS
UNITED S.ATES	NASA-DA
INITIAL ORBIT PARAMETERS	
ORBIT TYPE- GEOCENTRIC	EPOCH DATE- 06/21/77
ORBIT PERIOD- 1436. MIN	INCLINATION- 0.88 DEG
PERIAPSIS- 35266. KR	APOAPSIS- 36304, KM
PERSONNEL	
PM - A.H. PICKARD	NASA-GSFC
PS - W.F. SHENK	NASA-GSFC

PM - R.H. PICKARD PS - W.E. SHENK

PS - W.E. SHENK NASA-GSFC BRIEF DESCRIPTION GOES 2 IS A NASA-DEVELOPED, NOAA-DPERATED SPACECRAFT. THE SPIN-STABILIZED, EARTH-SYNCHRONOUS SPACECRAFT CARRIES (1) A VISIBLE-INFRARES SPIN-SCAN RADIOMETER (VISSR) TO PROVIDE HIGH-QUALITY DAY/NIGHT CLOUDCOVER DATA AND TO TAKE RADIANCE TEMPERATURES OF THE EARTH/AIMOSPHERE SYSTEM, (2) A METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM TO RELAY PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL APT-EQUIPPED REGIONAL STATIONS AND TO COLLECT AND RETRANSMIT DATA FROM REMOTELY LOCATED EARTH-DASED PLATFORRS, AND (3) A SPACE ENVIRONMENT MONITOR (SEM) SYSTEM TO MEASURE PROTON, ELECTRON, AND SOLAR X-RAY FLUXES AND MAGNETIC FIELDS. THE CYLINDRICALLY-SNAPED SPACECRAFT MEASURES 190.5 CM IN DIAM AND 250 CM IN LENGTH, EXCLUSIVE OF A MAGNETOMETRE THAT EXTENDS AN ADDITIONAL 83 CM BEYOND THE CYLINDER SHELL. THE PRIMARY STRUCTURAL MEMBERS ARE A HUNEYCOMBED EQUIPMENT SHELF AND THRUST THBE. THE VISSR TELESCIPE IS MOUNTED ON THE EQUIPMENT SHELF AND VIEWS THE EARTH THROUGH A SPECIAL APERTURE IN THE SY/CECRAFT'S SIDE. A SUPPORT STRUTURE EXTENDS RADIALLY OUT FROM THE UNTER WALLS OF THE SPACECRAFT AND NOW DE DOW THE DOW THE DIAL SOURCE OF ELECTRICAL POWER. LOCATED IN THE ANDULUS-SHAPED SPACE BETWEEN THE THRUST TUBE AND THE SOLAR PANELS, AND MOSI OF THE SEM EQUIPMENT, PROPER SPACECRAFT ANTITUDE AND PROVIDE THE PRIMARY SUBJECT OF LECTRICAL POWER. LOCATED IN THE SOLAR PANELS AND MOSI OF THE SEM EQUIPMENT, RADERS SPACECRAFT ANTITUDES AND SPIN RATE (APPROXIMATELY TOO FRH SPACECRAFT ANTIALED BY NO SEPARATE SETS OF JET THRUSTERS MOUNTED AND THE SOLAR PANELS ARE AND ACTIVATED THE GROUPMENT FRAUTHED SINCLS ARE STAIDONKEPTING AND SPAND FREQUENCIES IN ITS TELEMETRY AND SUBSYSTEM. A LOW-POWER WH TRANSPONDER PROVIDES TELEMENT AND COMMAND SUBSYSTEM. A LOW-POWER WH TRANSPONDER PROVIDES TELEMETRY AND COMMAND AURING LAUNCH AND THES SPACECRAFT HAS ATTAINED BYNCHRONOUS ORBIT.

- GOES 2, NESS STAFF----

INVESTIGATION NAME- VISIBLE-INFRARED SPIN-SCAN RADIOMETER (VISSR)

NSSDC ID- 77-0484-01

INVESTIGATIVE PROGRAM Operational Environ. Monitoring

INVESTIGATION DISCIPLINE(S) RETEOROLOGY

PERSONNEL NDAA-NESS NESS STAFF. PI

BRIEF DESCRIPTION THE VISIBLE INFRARED SPIN SCAN RADIOMETER (VISSR) FLOWN ON GOES 2 IS CAPABLE OF PROVIDING BOTH DAY AND NIGHT OBSERVATIONS OF CLOUD COVER AND EARTH/CLOUD RADIANCE TEMPERATURE MEASUREMENTS FROM A SYNCHRONOUS, SPIM-STABILIZIS GEOSTATIONARY SATELLITE FOR USE IN OPERATIONAL MEATHER ANALYSIS AND FORECASTING. THE TWO-CHANNEL INSTRUMENT IS ABLE TO TAKE

ARCHIVING

-- GOES 2, NESS STAFF------

INVESTIGATION NAME- METEOROLOGICAL DATA COLLECTION AND Transmission system

NESS STAFF

NSSDC 10- 77-0484-05

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING

INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL 91 .

NOAA-NESS

PIC NESS STAFF NORMALS AND AND TRANSMISSION THE METEGROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM IS AN EXPERIMENTAL COMMUNICATIONS AND DATA HANDLING COLLECTED FROM KEMOTELY LOCATED EARTH-BASED DATA COLLECTION (DBSERVATION) PLATFORMS (DCP). THE COLLECTED FROM KEMOTELY LOCATED EARTH-BASED DATA COLLECTION (DBSERVATION) PLATFORMS (DCP). THE COLLECTED BATA ARE RETARAMITTED FROM THE SATELLITE TO SMALL, GROUND-BASED, REGIONAL DATA UTILIZATION CENTERS. DATA FROM UP TO 10.00D DCP STATIONS CAN BE HANDLED BY THE SATELLITE TO SMALL, GROUND-BASED, FOR THE RETRANSMISSION DF NARROW-BAND (WEFAX TYPE) DATA FROM CENTRALIZED WEATHER FACILITIES TO EXISTING SMALL, GROUND-BASED APT RECEIVING STATIONS. THIS COMMUNICATIONS SYSTEM OPERATES ON S-BAND FREQUENCIES. THE XINIMUM DATA COLLECTION SYSTEM FOR ONE SMALL METEOROLOGICAL SATELLITE CONSISTS OF APPROXIMATELY 3500 DCP STATIONS TO BE CONTACTED IN A 6-H PERIOD. THE TOTAL AMOUNT OF DATA COLLECTED DURING THE 6-H PERIOD. THE TOTAL AMOUNT OF DATA COLLECTED DURING THE 6-H PERIOD. THE TOTAL AMOUNT OF DATA COLLECTED DURING THE 6-H PERIOD. DATA RECEIVEN FOW INDIVIDUAL STATIONS VARIES FROM 50 TO 3000 BITS, DEPENDING ON THE CONSIST USED AT AN INDIVIDUAL DCP STATION. STATION.

GOES 2, WILLIAMS-----

INVESTIGATION NAME- ENERGETIC PARTICLE MONITOR

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING NSSDC 10- 77-048A-02

INVESTIGATION DISCIPLINE(S) Particles and fields

NDAA-ERL

PERSONNEL PI - D.J. WILLIAMS

BRIEF DESCRIPTION

BRIEF DESCRIPTION A NUMBER OF SEPARATE SILICON SOLID-STATE DETECTORS, EACH WITH A TAILORED MODERATOR THICKNESS AND A SEPARATE ELECTRONICS UNIT FOR PULSE AMPLIFICATION AND PULSEHEIGHT DISCRIMINATION, ARE USED TO OBTAIN THE FOLLOWING PARTICLE TYPE ND ENERGY MEASUREMENTS -- SEVEN CHANNELS MEASURE PROTONS IN THE RANGE 1 TO SUD MEY, SIX CHANNELS MEASURE PROTONS IN THE RANGE 1 TO SUD MEY, SIX CHANNEL MEASURE ALPHA PARTICLES IN THE RANGE 1 TO SUD MEY, SIX CHANNEL MEASURE ELECTRONS GREATER THAN 0.5 MEY. MEV.

---- GOES Z. WILLIAMS------

INVESTIGATION NAME- SOLAR X-RAY MONITOR

NSSDC 10- 77-0484-03

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONORY Solar Physics

PERSONNEL PI - D.J. WILLIAMS

NOAA-ERL

BRIEF DESCRIPTION THE X-RAY COUNTER WAS COMPOSED OF A COLLIMATOR, TWO INITIATION CHAMBERS, AND TWO ELECTROMETERS. A SMALL ANGULAR APERTURE WAS CHOSEN FOR THE TELESCOPE COLLIMATOR, WHICH WAS ROUNTED SO THAT THE DECLIMATION OF ITS AXIS CAN BE CONTROLLED BY GROUND COMMAND TO INSURE THAT THE SUM IS VIEWED BY THE TELESCOPE ONCE OUPING EVERY VEHICLE ROTATION, ONE ION CHAMBER WAS FILLED WITH ARGON AT 1 ATM FOR DETECTION OF 1 TO 8-A X RAYS AND HAS À 5-MIL BERVLLIUM WINDOW TO EXCLUDE X RAYS OF LONGER WAVELENGTHS. THE OTHER CHAMBER WAS FILLED WITH XENON AT 1.5 TO 2 ATM, AND HAD A SO-MIL BERVLLIUM WINDOW FOR REASUREMENT OF X RAYS IN THE WAVELENGTH RANGE D.5-TO 3-A. BRIEF DESCRIPTION

---- GOES 2, WILLIARS------

INVESTIGATION NAME- RAGNETIC FIELD RONITOR

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING NSSDC 10- 77-0484-04

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS

NOAA-ERL

PERSONNEL PI - D.J. WILLIAMS

BRIEF DESCRIPTION INE MAGNETOMETER IS A BIAXIAL, CLOSED-LOOP, FLUXGATE MAGNETOMETER WITH THE TWO SENSORS ALIGNED AT RIGHT ANGLES TO ONE ANOTHER. AFTER MOUNTING ON A SHORT BOOM (AFFROXINATELY 2 FT) ONE SENSOR IS ALIGNED PARALLEL TO THE SPACECRAFT SPIN AXIS AND THE OTHER PERPENDICULAR TO THIS AXIS. EACH SENSOR HAS A SELECTABLE RANGE (SO, 100, 200, OR 400 GAMMAS), AN OFFSET FIELD CAPABILITY (PLUS OR MINUS 1200 GAMMAS) IN 40-GAMMA STEPS), AND AN IN-FLIGHT CALIBRATION CAPABILITY. BRIEF DESCRIPTION

SPACECRAFT COMMON NAME- HAWKEYE 1 Aliernate names- injun-f, neutral point explorer Explorer 52

NSSDC 10- 74-0404

LAUNCH DATE- 06/03/74 WEIGHT- 26.1 KG LAUNCH SITE- VANDENG(N: AFB, UNITED STATES LAUNCH VEHICLE- SCOUT

SPONSORING COUNTRY/AGENCY UNITED STATES

INITIAL ORBIT PARAMETERS Orbit Type- Geocentric	EPOCH DATE- 06/04/74
ORBIT PERIOD- 3032.4 MIN	INCLINATION- 89.8 DEG
PERIAPSIS- 469.0 KM	APGAPSIS- 125570. KM
PERSONNEL	
NG - J.R. HOLTZ	NASA HEADQUARTERS
SC - E.R. SCHMERLING	NASA HEADQUARTERS
PR - J.E. ROGERS	U OF IOWA
PM - C.W. COFFEE, JR.	NASA-LARC
DC - I A. VAN ALLEN	U OF IOWA

BRIEF DESCRIPTION THE PRIMARY MISSION OBJECTIVE WAS TO CONDUCT PARTICLES AND FIELDS INVESTIGATIONS OF THE POLAR MAGNETOSPHEME OF THE EARTH OUT TO 21 EARTH RADII. SECONDARY OBJECTIVES WERE TO STUDY MAGNETIC FIELD AND PLASMA DISTRIBUTION MEASUREMENTS IN THE SOLAR WIND, AND TO STUDY TYPE III RADIO EMISSIONS CAUSED BY ACCOMPLISH THESE OBJECTIVES, THE SPACECRAFT WAS INSTRUMENTED WITH A MAGNETORER, AN ENERGETIC PLASMA ANALYZER, AND AN ELF-VLF WAVE INSTRUMENT. THE SPACECRAFT WAS SPIN STABILIZED WITH A NOMINGL ROTATIONAL PERIOD OF 11 SEC. IN CEESTRIAL COORDINATES, THE POSITIVE SPIN AXIS CONDINATES WERE RIGHT ASCENSION 299.4 DEG (PLUS OR MINUS 1.1 DEG) AND DECLINATION 8.6 DEG (PLUS DR MINUS 1.5 DEG). THERE WAS NO ONBOARD ORIENTATION OR SPIN RATE CONTROL, BUT THE ORIENTATION OF THE SPIN KAIS MAS STABLE. AN OPTICAL ASPECT SYSTEM OPERATED FROM LAUNCH UNTIL MISTRUMENTS HAD A RASS OF 22.65 KG. POURG 02 ZO 36 WATTS, DEPENDING ON SOLAR ASPECT, WAS OBTAINED FROM SOLAR CELLS. HAWKEYE 1 PARTICLRATED IN THE INTERNATIONAL BEAGUSISTION WAS CONFINED TO IMS SPECIAL INTERVALS. FOR MORE TORS SOLAR CELLS. HAWKEYE 1 PARTICLAR ASPECT, WAS OBTAINED FROM SOLAR CELLS. INA SPECIAL REPORT, U. OF IOWA 77-6, "MARKEYE 1.", JANUARY 1977, DATA WERE OBTAINED IN THE ANT ONLY AT A FREQUENCY OF 136 THE AND OD MINES THE DIA THE ONLY AT A FREQUENCY OF 136 THE AND OD ON SULAR REPORT, U. OF IOWA 77-6, "MARKEYE 1.", JANUARY 1977, DATA WERE OBTAINED IN REAL TIME ONLY AT A FREQUENCY OF 136 THE AND OD MIX AT 100 B/S OR 20 AS EXPECTED IN 4/78.

-- HAWKEYE 1, FRANK------

INVESTIGATION NAME- LOW-ENERGY PROTONS AND ELECTRONS

53

VAN ALLEN J.A.

HASA-OSS

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS

PERSONNEL		
. PI - L.A.	FRANK	U OF IOWA
	CRAVEN	U OF IOWA
01 - 0.H.	YEAGER	U OF IOWA

GI - U.H. TENGER U UT IUWA BRIEF DESCRIPTION THIS PARTICLE SPECTROMETER (LEPEDEA) ENPLOYED TWO ELECTROSTATIC ANALYZERS TO MEASURE PROTRONS AND ELECTRONS SIMULTANEOUSLY. A GM TUBE WAS AN ADDITIONAL DETECTOR SENSITIVE TO PROTONS ABOVE 60G KEV AND ELECTRONS ABOVE 45 KEV. THE SENSORS WERE MOUNTED NORMAL TO THE SPACECRAFT SPIN AXIS. ANGULAR DISTRIBUTIONS OF PARTICLES WERE DETERNINED WITH A SECTOR RESOLUTION OF 50 DEG FOR ANALYZER VOLTAGE STEPS AND 10 DEG FOR ANALYZERS HAD A FIELD OF VIEW OF 8 DEG X 30 DEG AND MEASURED PROTONS AND ELECTRONS FROM 0.05 TO 40 KEV. THE GM MODES OF OPERATION WERE USED -- OWE INSTRUMENT CYCLE OF 156 INTENSITY MEASUREMENTS EVERY 46 SOR ONE CYCLE OF 312 INTENSITY MEASUREMENTS EVERY 92 S. FOR MORE DETAILS OF THE LEPEDEA INSTRUMENT SEE "J. GEDPHYS. RES," 72, 185, 1967.

-- HAWKEYE 1. GURNETT--

INVESTIGATION NAME- ELF/VLF RECEIVERS

INVESTIGATIVE PROGRAM NS50C 10- 74-0408-03 CODE ST

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS

PERSONNEL PI - D.A. GURNETT OI - G.W. PFEIFFER

U OF IOWA

OI - G.W. PFEIFFER GUILDER CONTRACTION OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF CONTRACT OF

-- HAWKEYE 1, VAN ALLEN------

INVESTIGATION NAME- TRIAXIAL FLUXGATE MAGNETOMETER

INVESTIGATIVE PROGRAM NSSDC 10- 74-040A-01 CODE ST

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS

PERSONNEL				
PI - J.A.	VAN ALLEN	U	QF	IOWA
	OLIVEN(DECEASED)	U	DF	IONA
	CAHILL, JR.	U	0 F	MINNESOTA

BRIEF DESCRIPTION

BRIEF DESCRIPTION A 4-RANGE, TRIAXIAL FLUXGATE MAGNETOMETER MOUNTED ON A 1.52-M BOON, WAS USED TO NEASURE TYE AMBIENT MAGNETIC FILLO. THE THREE AXES WERE SAMPLED SEQUENTIALLY THREE TIMES EACH 5.72 S. SENSITIVITY, AND (ACCURACY) WAS PLUS OR MINUS 150 (1.2), 450 (3.5), 1,500 (11.7) AND 25,000 (195.3) NT, RESPECTIVELY. THE SENSITIVITY WAS SWITCHED BY GROUND COMMAND. FREQUENCY RESPONSE WAS DC TO 1 HZ (FLAT); DOWN 3 DB AT 10 HZ; THEN FALLING AT 6 DB PER OCTAVE AT HIGHER FREQUENCIES. SATELLIT, STRAF FIELDS WERE CONSTRAINED TO DE LESS THAN 0.1 NT, WITCH WAS ALSO THE RMS INSTRUMENT NOISE LEVEL. IN-FLIGHT CALIBRATION WAS PERFORMED ONCE EVERY 98 MINUTES.

SPACECRAFT COMBON NAME- HEAD I Alternate Names- High Energy Astron Obs-A- Head-A

N550C 10- 77-075A

WEIGHT- 2660. KG LAUNCH DATE- D8/12/77 Launch Site- Cape Canaveral, United States Launch Vehicle- Atlas

SPONSORING COUNTRY/AGENCY UNITED STATES

ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 93.5 Min 440. KM PERIAPSIS-

PE

ERSONNEL		
HG - R.E.	HALPERN	NASA HEADQUARTERS
SC - A.G.		NASA HEADQUARTERS Nasa-Msfc
PM - F.A. PS - F.B.		HASA-GSFC

PM - 1-A. SPEER NASA-BSFC PS - F.B. MCDONALD NASA-BSFC NASA-BSFC NASA-GSFC BRIEF DESCRIPTION HIGH ENERGY ASTRONOMY OBSERVATORIES DESIGNED TO CONTINUE SERIES OF THREE SATELLITE OBSERVATORIES DESIGNED TO CONTINUE THE X-RAY AND GAMMA-RAY STUDIES INITIATED BY ANS, OAO 3, UK 5, THE 0SO SERIES, THE SAS SERIES, AND THE GAMMA-RAY BURST DISCOVERIES OF THE VELA SATELLITES. THESE MISSIONS WERE DESIGNED TO SURVEY AND MAP THE CELESTIAL SPHERE FOR X-RAY SOURCES AT AN INTENSITY LEVEL OF 1.E-6 OF THE BRIGHTEST KNOWN SOURCES (SCO X-1), AND TO INVESTIGATE THE STRUCTURE AND SHAPE OF GALACTIC AND EXTRAGALACTIC COSMIC-RAY NUCLEI THROUGH THEIR SFRIES HAD A COMMON SPACECRAFT EQUIPMENT MODULE (SEM) AND A UNIQUE EXPERIMENT MODULE (EM). THIS MISSION WAS SPECIFICALLY DESIGNED TO MAP X-BAY AND GAMMA-RAY SOURCES FROM 150 EV TO 10 REV, TO ESTABLISH THE SIZE AND PRECISE LOCATION OF X-RAY SOURCES WITH AN ENERGY RANGE OF I KEV TO 15 KEV, TO DEFLAMING THE MAILS OF X-RAY SOURCES CONTINUE TIME VARIATIONS OF X-RAY SOURCES. CONTINUOUS CELESTIAL SCANS WERE MADE PERPENDICULAR TO 2-AXIS (POINTING TO THE SUND DURING THE SUM UP TO 7 DEG FOR SHORT OBSCHAILON, SCAN REVOLUTIONS/MIN. THE ENTIRE CELESTIAL SYNERE MOULD BE SCANNED IN 6 MONTHS. SPECIAL MANEUVERS OF UP TO 5 TIMES/WEEK, TO OFFSET FROM THE SUM UP TO 7 DEG FOR SHORT OBSCHAILON PERIODS, WERE PAAT OF THE RISSION'S OBJECTIVES. WHEN PASSING OVER THE SOURTH ATLANTIC ANOMALY (SAA), HIGH VOLTAGE SUMPLIES WERE TURNED OFF OR REDUCED TO PREVENT DAMAGE DUE TO SATURATION PERIODS, WERE PART OF THE RISSION'S OBJECTIVES. WHEN PASSING OVER THE SOURTH ATLANTIC AND THE SUM OF TO A DEG FOR SHORT OBSCHAILDN SCHARET URNED OFF OR NEDUCED TO PREVENT DAMAGE DUE TO SATURATION PERIODS, WERE PART OF THE RISSION'S OBJECTIVES. WHEN PASSING OVER THE SOURTH ATLANTIC ANOMALY (SAA), HIGH VOLTAGE SUMPLIES WERE TURNED OFF OR REDUCED TO PREVENT DAMAGE DUE TO SATURATION NONINALLY FOR 1 YR. THE SILSIDEN TAAD AT A A DATA RATE OF 6.S KB/S FOR REAL-TIME DATA AND THE SETSING TO SECONDER SYSTEMS.

- HEAD 1, BOLDT--------

INVESTIGATION NAME- COSMIC X-RAY EXPERIMENT

INVESTIGATIVE PROGRAM NSSDC 10- 77-075A-02 ASTROPHYSICS

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PI - E.A.	80101	NASA-GSFC
		CALIF INST OF TECH
01 - G.P.	GARMIRE	
ot - C.S.	BOWYER	U OF CALIF, BERKELEY
01 - R.		U OF CALIF, BERKELEY
01 - G.B.	FIELD	540
		U OF CALIF, BERKELEY
0I - M.L.	LAMPTON	
0I - J I.	SILK	U OF CALIF, BERKELEY
01 - 5.5.	HOLT	HASA-GSFC
		CALIF INST OF TECH
01 - G.	AGRAWAL	
01 - G.R.	RIEGLER	BENDIX CORP

54

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MEASURE THE DIFFUSE X-RAY THIS EXPERIMENT WAS DESIGNED TO MEASURE THE DIFFUSE X-RAY BACKGROUND IN THE ENERGY RANGE OF 0.15 TO 60 KEV. OBJECTIVES WERE TO MEASURE RELATIVE DIFFUSION AND ABSORPTION OF DIFFUSE HARD AND SOFT X-RAYS AT HIGH GALACTIC LATITUDES, AND THEN CORFLATE THESE MEASUREMENTS WITH KADIO AND OPTICAL STUDIES; DETERMINE DISCRETE SOURCE BACKGROUND CONTRIBUTION; DETFET LARGE-SCALE GLOBAL ANISOTROPIES ASSOCIATED WITH SOLAR SYSTEM NOTION WITH RESPECT TO DISTANT EMISSION SOURCES; MAKE BROADBAND SPECTRAL CLASSIFICATIONS OF DIFFUSE AND DISCRETE X-RAY SOURCES; AND ESTABLISH TEMPORAL VARIATIONS OF MULTI-COMPONENT SPECTRAL SOURCES. THREE TYPES OF NULTIANODE, MULTILAYER COUNTERS WEAE USED FOR THIS EXPERIMENT. THREE HIGH ENERGY DELECTORS (HED) WITH XÃNON FILLED COUNTERS COVARED THE ENERGY DELECTORS (HED) WITH XAN EFFECTIVE AREA OF 900 CM SG. THE MINIMUM DETECTABLE FLUX IN A 1.0E3 SOBSENVATION WAS 1.0E-4/SG CM-S-KEV FOR ENERGY DETECTOR (MED) WITH AN ÁRGON/METHANE FILLED COUNTER SAME AS FOR THE HED'S. THE TWO LOW-ENERGY DETECTIVE AREA OF THIS COUNTER WAS 900 CM SG. THE MINIMUM DETECTABLE FLUX IN AN 1.0E3 SOBSENVATION WAS 1.0E-4/SG CM-S-KEV COVERED THE ENERGY RANGE 1.5-15 KEV. THE EFFECTIVE AREA OF THIS COUNTER WAS 900 CM SG. THE MINIMUM DETECTABLE FLUX IS THE SAME AS FOR THE HED'S. THE TWO LOW-ENERGY DETECTORS (LED) WERE THIN-WINDOW, PROPAME GAS, FLOM COUNTERS TO COVER THE ENERGY RANGE OF 0.15 TO 3 KEV. THE LED USED PERMANENT MAGNETS TO PREVENT INCIDENT ELECTRONS FROM REACHING THE DIFECTIVE AREA OF PREVENT INCIDENT ELECTRONS FROM REACHING THE DIFECTION WINDOW AND A SUMSNADE WHENEVER DIRECT SUNLIGHT WAS NEAR THE FIELD OF VIEW. IT HAD A 600 SG CM EFFECTIVE AREA. THE MINIMUM DETECTABLE FLUX FOR A 1.0C3 SO OBSERVATION WAS 1.0C-3/SG CR-S-KEV FOR THE 0.15 TO 0.28 KEV BAND AND FOR THE 0.5 TO 3.0 KEV BAND.

NASA-055

EPOCH DATE- DB/13/77 Inclination- 22.8 deg Apoapsis- 452. KM

---- HEAO 1, FRIEDMAN--

INVESTIGATION NAME- LARGE ARE? COSHIC X-RAY SURVEY

INVESTIGATIVE PROGRAM ASTROPHYSICS NSSDC 10- 77-075A-01

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PERSONNEL		
́РІ − Н.Р.	FRIEDMAN	US NAVAL RESEARCH LAB
01 - T.A.	CHUBB	US NAVAL RESEARCH LAB
01 - E.T.	BYRAM	US NAVAL RESEARCH LAB
01 - 6.6.	FRITZ	US NAVAL RESEARCH LAB
01 - J.F.	MEEKINS	US NAVAL RESEARCH LAB
01 - F.	SCHULMAN	US NAVAL RESEARCH LAB

01 - F. SCHULMAN US HAVAL RESEARCH LAB BRIEF DESCRIPTION THIS INSTRUMENT WAS A MODULAR ASSEMBLY OF SEVEN INGE-RARA, THIN-WINDOW, PROPORTIONAL COUNTER SENSOR MODULES TO RECORD INCIDENT X-RAY FLUXES. THE DBJECTIVES WERE TO MAP THE CELESTIAL SPHERE IN THE ENERGY RANGE FROM .IS TO 20 KEV WITH GREATER SENSITIVITY THAN ACHIEVED HERETOFORE AND TO MEASURE THE SPECTRA, LOCATION, AND TIME VARIATIONS OF X-RAY SOURCES WITH A O.1 TO 1 DEG ANGULAR RESOLUTION, EACH OF THE SENSOR MODULES CONSISTED OF A PROPORTIONAL COUNTER BODY FRAME ON WHICH WAS MOUNTED A WINDOW SUPPORT STRUCTURE, COUNTER BACK STRUCTURE WITH INTEGRAL CONTROL COUNTER, COLLIMATOR ASSEMBLY, AND ELECTRONIC SUBASSEMBLIES. A HONEYCOMB CELL CONSTRUCTION FOR THE BASIC COUNTER PROVIDED X-RAY COLLIMATION OF 80 DEG BY 4 DEG FWMM. A BACK LAYER OF THE THREE-LAYENED COUNTER PROVIDED ANTICONCLDENT PROTECTION AGAINST CHARGED PARTICLE EVENTS. THE FRONT LAYER WAS THE MAIN X-RAY SENSOR FOR MOST ENERGY RANGES. ALL THREE LAYERS PROVIDED ATA AT HIGHER ENERGIES. THE COLLIMATOR ON SENSOR MODULES 1 THROUGH 4 PROVIDED 1 DEG BY 4 DEG COLLIMATION, SENSOR MODULES 5 AND 6 PROVIDED 1 DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED 1 DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED 1 DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED 1 DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED 1 DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED 1 DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED 1 DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED 1 DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED A DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED 1 DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED 1 DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED NO DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED NO DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDED NO DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE 7 PROVIDE 1 DEG BY 2 DEG COLLIMATION, AND ON SENSOR MODULE COUNTER TO COMPENSATE FOR GAS DENSITY CHANGES AND HIGH MAIN VOLTAGE DRIFTS.

- HEAD 1, GURSKY------

INVESTIGATION NAME- X-RAY SCANNING MODULATION COLLIMATOR

NSSDC 10- 77-075A-03 INVESTIGATIVE PROGRAM ASTROPHYSICS

INVESTIGATION DISCIPLINE(S) K-RAY ASTRONOMY

PERSONNEL	
PI - H. GURSKY	HARVARD COLLEGE OBS
OI - H.V.D.BRADT	MASS INST OF TECH
01 - G.W. ELARK	MASS INST OF TECH
OI - W.H.G.LEWIN	MASS INST OF TECH
OI - 5. RAPPAPORT	MASS INST OF TECH
OI - G. SPADA	MASS INST OF TECH
DI - R. DOXSEY	MASS INST OF TECH
DI - R. GIACCONI	HARVARD COLLEGE OBS
OI - P. GORENSTEIN	HARVARD COLLEGE OBS
Ol — E.M. KĖLLOGG	HARVARD COLLEGE OBS
OI - H. TANANBAUM	HARVARD COLLEGE 085
AT - B CCULADIT	HARVARD COLLEGE OBS

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT USED A SCANNING MODULATION COLLIMATOR (SMC) INSTRUMENT TO DETERMINE, FOR SELECTED X-RAY SOURCES. THEIR POSITION WITHIN S ARC-SEC: THEIR AMGULAR SIZE TO A PRECISION OF 5-10 ARC-SEC IN THREE EMERGY INTERVALS FROM 1-15 KEV7 AND TO STUDY THE STRUCTURE OF THEIR X-RAY EMISSION TO 4 PRECISION OF 10 ARC-SEC IN THREE EMERGY INTERVALS FROM 1-15 KEV7. THE SMC WAS COMPRISED OF TWO PARTS, EACH CONTAINING FOUR WIRE GRID PLANES. EACH PROVIDED A LOCATION AND ANGULAR SIZE MEASUREMENT IN OME DIMENSION. AN ADDITIONAL COLLIMATOR LOCATED FORMARD TO THE FRONT GRID RESTRUCTED THE OVERALL INSTANTAMEOUS FIELD OF VIEW TO 4 DEG X 4 DEG FWMM FOR EACH SMC. THE ONTWARD VIEW DIRECTION IS PERPENDICULAR TO THE SPACECAFF SPIN AXIS (Z-AXIS) AND HENCE THE INSTRUMENT SCANS A GREAT CIRCLE BAND OM THE SKY. THE TWO PARTS OF THE SMC DIFFER BY HAVING THEIR PLANE OF MAXIMU TRANSMISSION INCLINED. THO DEG AND -10 DEG TO THE SCAN DIRECTION. PRECISE TWO-DIMENSIONAL LOCATIONS ARE DETERMINE OB Y THE INTERSECTIONS OF THE LOCATIONS OF THE TWO SMC COMPONENTS WAS 30 AND 120 ARC-SEC, WHICH EXTENDED THE DYMANIC RANGE UP TO 16 ARC-MIN OVER WHICH ANGULAR SIZE AND STRUCTURE MASUREMENTS WERE MADE. THE SMC LINSTRUMENT HAS CAPABLE OF DETERMINE OB YTHE INTERSECTIONS OF THE SMC DIFFER BY HAVING THE FORMANIC COMPONENTS WAS 30 AND 120 ARC-SEC, WHICH EXTENDED THE DYMANIC COMPONENTS WAS 30 AND 120 ARC-SEC, WHICH EXTENDED THE DYMANIC CANNOR UP TO 16 ARC-MIN OVER WHICH ANGULAR SIZE AND STRUCTURE MASUREMENTS WERE MADE. THE SMC LINSTRUMENT HAS CAPABLE OF DETECTING X-RAY SOURCES WITH AN INTERSISTION AND STRUCTURE MEASUREMENTS WERE MADE. THE SACL DESTRUMENT HAS CAPABLE OF DETECTING X-RAY SOURCES WITH AN INTERSISTION OF SOURCES. ENSORS TO PROVIDE DATA ON THE SARC-SEC POSITION OF SOURCES.

INVESTIGATION NAME- LOW-ENERGY GAMMA-RAY AND HARD X-RAY 5K

-- HEAQ 1, PETERSON------

NSSDC 10- 77-0754-04

INVESTIGATIVE PROGRAM ASTROPHYSICS

INVESTIGATION DISCIPLINE(5) GAMMA-RAY ASTRONOMY

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01 - G.W. CLARK MASS INST OF TECH 01 - S. RAPPAPORT MASS INST OF TECH BRIEF DESCRIPTION THIS EXPERIMENT MEASURED POINT AND DIFFUSE SOURCES OF X-RAYS AND GAMMA RAYS IN THE 10 KEV TO 10 MEV RANGE. THE INSTRUMENT CONSISTED OF SEVEN NAI(TI)/CSI(MA) PHOSWICH SCINTILLATORS SURROUNDED BY EIGHT LARGÉ CSI(MA) SCINTILLATORS THAT PROVIDED SHIELDING AND DEFINED THE FIELDS OF VIEW. THERE WERE THREE DETECTOR TYPES. THE INTERMEDIATE ENERGY DETECTORS HAD AN EMERGY RANGE OF 10-200 KEV, AN AREA OF 225 SQ CM, CSI SHIELDING OF 2 IN., AND A FIELD OF VIEW (FWHM) OF 1 DEG X 20 DEG. THE SLAT COLLIMATORS OF THE INTERMEDIATE ENERGY DETECTORS HAD AN EMERGY RANGE OF 10-200 KEV, AN AREA OF 225 SQ CM, CSI SHIELDING OF 2 IN., AND A FIELD OF VIEW (FWHM) OF 1 DEG X 20 DEG. THE SLAT COLLIMATORS OF THE INTERMEDIATE ENERGY DETECTORS HAD AN EMERGY RANGE OF 10-200 KEV, AN AREA OF 225 SQ CM, CSI SHIELDING OF 2 IN., AND A FIELD OF VIEW (FWHM) OF 1 DEG X 20 DEG. THE SLAT COLLIMATORS OF THE INTERMEDIATE ENERGY DETECTORS HAD AN EMERGY RANGE OF 10-200 KEV, AN AREA OF 205 SG CH CSI SHIELDIN. THE POINT MOGE DETECTORS HAD AN ENERGY RAMGE OF 0.1-5 MEV, AN AREA OF 180 SQ CM, CSI SHIELDING OF ABOUT A IN., AND A FIELD OF VIEW (FWHM) OF 10 DEG. SOURCES DETECTOR AT ABOUT 100 KEV. THE DIFFUSE MODE DETECTORS HAD AN ENERGY RAMGE OF 0.2-10 MEV, AN AREA OF 125 SQ CM, CSI SHIELDING OF ABOUT A IN., AND A FIELD OF VIEW (FWHM) OF 10 DEG. POINT SOURCES MEASUMED BY THE DIFFUSE MODE DETECTORS WERE RELATED TO THOSE WITH SIMILAR SPECTRA IN THE POINT MODE DETECTORS. EACH OF THE DETECTORS WAS EQUIPPED WITH A PULSE SHAPE ANALYZER AND DISCRIMINATOR WHICH DETECTORS WERE RELATED TO THOSE WITH SIMILAR SPECTRA IN THE POINT AND VETOED CSI(MA) EVENTS. THE COMBINATION OF SHIELD UPPER AND LOWER LEVEL DISCRIMINATORS (NOMINALLY KNOWN TO 0.1 S ACCURACY. THIS COULD BE INFROVED TO 5 MS OR 2.00E-5 S BY COMMAND. EVENTS STILFYING THE ANTICOINCIDENCE WERE SELECTABLE BY COMMAND. EVENT SITH A ANALYZER (NOMINALLY KNOWN TO 0.1 S ACCURACY. THIS COULD BE INFROMED TO STRONG X-RAY SOURCES THAT WERE GREATE 0.8, AND 1.6 MEV.

SPACECRAFT COMMON NAME- HELIOS-A Alternate Names- Helio-a, pl-741A Helios 1

N55DC 10- 74-097A

LAUNCH DATE- 12/10/74 Launch Site- Cape Canaveral, United States Launch Venicle- Titan WEIGHT- 210. KG

SPONSORING COUNTRY/AGENCY

FED REP OF GERMANY	BMWF
UNITED STATES	NASA-OSS
ORBIT PARAMETERS	
ORBIT TYPE- HELIOCENTRIC	EPOCH DATE- 01/16/75
ORBIT PERIOD- 190.15 DAYS	INCLINATION- 0.02 DEG
PERIAPSIS- 0.3095 AU RAD	APOAPSIS- 0.985 AU RAD
PERSONNEL	
NG - F.D. KOCHENDORFER	NASA HEADQUARTERS
SC - A.G. DPP	NASA HEADQUARTERS
PH - A. KUTZER	GES FUR WELTRAUMFORSCH
PH - G.W. DUSLEY	NASA-GSFC
PS - H. PORSCHE	ORG FOR SPACE RES
PS - J.H. TRAINOR	NASA-65FC

BRIEF DESCRIPTION THIS SPACECRAFT WAS ONE OF A PAIR OF DEEP SPACE PROBES DEVELOPED BY THE FEDERAL REPUBLIC OF GERMANY (FRG) IN A COOPERATIVE PROGRAM WITH NASA. EXPERIMENTS WERE PROVIDED BY SCIENTISTS FROM BOTH FRG AND THE U.S. NASA SUPPLIED THE TITAN/CENTAUR LAUNCH VEHICLE. THE SPACECRAFT WERE EQUIPPED WITH TWO BOORS, AND A 32-M ELECTRIC DIPOLE. THE PAYLOAD CONSISTED OF A FLUXGATE MAGNETOMETER; ELECTRIC AND MAGNETIC.

WAVE EXPERIMENTS, WHICH COVERED VARIOUS BANDS IN THE FREQUENCY RANGE 6 HZ TO 3 MHZ; CHARGED PARTICLE EXPERIMENTS, WHICH COVERED VARIOUS ENERGY RANGES STATING WITH SOLAR WIND THERMAL ENERGIES AND EXTENDING TO 1 GEV; A ZODICAL LIGHT EXPERIMENT; AND A MICROMETEOHOID EXPERIMENT. THE PURPOSE OF THE MISSION WAS TO MAKE PIONEENING MEASUREMENTS OF THE INTERPLANETARY MEDIUM FROM THE VICINITY OF THE EARTH'S ORBIT TO D.3 AU. THE SPIN AXIS WAS MORAL TO THE ECHTPIC, AND INFE MORINAL SPIN RATE WAS 1 RPS. THE OUTER SPACEERAFT SURFACE WAS DIELECTRIC, EFFECTIVELY (BECAUSE OF THE SHEATH POTENTIAL) RAISING THE LOW-ENERGY THRESHOLD FOR THE SOLAR WIND PLASMA EXPERIMENT TO AS MIGH AS 10D EV. ALSO, SHEATH RELATED COUPLING CAUSED BY THE SPACECRAFT ANTENNAS PRODUCED INTERFERENCE WITH THE WAVE EXPERIMENTS. THE SPACECRAFT WAS CAPABLE OF DEING OPERATED AT UNITES FROM 4006 TO B ARS, VARIABLE BY FACTORS OF TWO. WHILE THE SPACECRAFT WAS MOVING TO PERIMELION, IT WAS GEMERALLY GFERATED FROM 40 40 TO DS ADS, VARIABLE BY FACTORS OF TWO. WHILE THE SPACECRAFT WAS MOVING TO PERIMELION, IT WAS GEMERALLY GFERATED FROM 40 TO ATTENT OF UNCHNER AND POLE. THE MAXIS OF THE 32-M, 11P-TO-TIP, DIPOLE ANTENNA, ONE AXIS WAS SHORTED, CAUSING THE ANTENNA TO FUNCTION AS A MONDOUCE ANDEPATED AT THE HIGHEST BIT RATE. BECAUSE OF A DEPLOTMENT FAILURE OF GME AXIS OF THE S2-M, 11P-TO-TIP, DIPOLE ANTENNA, ONE AXIS WAS SHORTED, CAUSING THE ANTENNA TO FUNCTION AS A MONDOLE THE MAJOR EFFECT OF THIS ANOMALY WAS TO INCREASE THE EFFECTIVE INSTRUMENT THRESHOLDS, AND TO INTRODUCE ADDITIONAL UNGERTAINIES IN THE EFFECTIVE ANTENNA LENGTH.

-- HELIDS-A, FECHTIG-

INVEFTIGATION NAME- MICROMETEOROID DETECTOR AND ANALYZER

NSSDC 10- 74-0974-12 INVESTIGATIVE FOUGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Interplanetary physics Interplanetary dust

PERSONNEL

PI - H. 01 - J. FECHTIG WEIHRAUCH

BRIEF DESCRIPTION

MPI-NUCLEAR PHYS MPI-NUCLEAR PHYS

--- HELIOS-A, GURNETT

INVESTIGATION NAME- COARSE FREQUENCY, FINE TIME RESOLUTION Spectrum Analysis

NSSDC 10- 74-097A-04 INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Ionospheres and radio physics particles and fields

U OF IOWA V OF Minnesota NASA-GSFC NASA-GSFC

DI - R.G. STONE NASA-GSFC BRIEF DESCRIPTION THIS EXPERIMENT SHARED THE 32 M TIP-TO-TIP ELECTRIC ANTENNA WITH EXPERIMENTS -DS AND 'DG. THE INSTRUMENT CONSISTED OF A 15 CHANNEL SPECTRUM ANALYIER WITH APPROXIMATELY LOGARITHMICALLY EQUISPACED CENTER FREQUENCIES, 10 LOG COMPRESSORS, 16 R-C INTEGRATORS FOR AVERAGING THE LOG COMPRESSED ELECTRIC FIELD AMPLITUDE BETWEEN READOUTS, THE 10 AVERAGES AND 16 PEAK LOG VALUES WERE SAMPLED ALMOST SIMULTANEOUSLY. THE CHANNELS HAD CENTER FREQUENCIES, THE 16 AVERAGES AND 16 PEAK LOG VALUES WERE SAMPLED ALMOST SIMULTANEOUSLY. THE CHANNELS HAD CENTER FREQUENCIES FOR THE CHANNELS FROM 3T H2 TO 1.78 KH2 AND 16 PERCENT FROM 31 H2 TO 178 KH2. AND 8AMDMIDTHS OF 2D PERCENT FOR THE REMAINING CHANNELS. THESE CHANNELS GUERAGE FOR THE RANGE OF ABOUT 20 H2 TO 200 KH2. THE LOG COMPRESSORS HAD A DYNAMIC RANGE OF 100 DB. SAMPLING RATE DEPENDED IN DETAIL ON THE SPACECRAFT BIT RATE AND TELEMETRY FORMAT. THE FASTEST REAL TIME TELEMETERED RATE WAS FOR 16 WHENEVER A VERY STRONG SIGNAL WAS DETECTED IN A PRE-SELECTED CHANNEL, THE SHOCK ALARM DATA MODE WAS INITATED IN WHICH THE ELECTRIC FIELD SPECTAUM, MAGNETIC FIELD, AND PLASMA DETA WEAR RECORDED INTO SPACEGRAFT MEMORY FOR A PERIOD START HE AND TERMENTRY SAMPLED. THE SHOCK ALARM DATA NODE WAS INITATED IN WHICH THE ELECTRIC FIELD SPECTRUM, MAGNETIC FIELD SAMPLED EVERT 1.125 S. CHANNEL, THE SHOCK ALARM DATA MODE WAS INITATED IN WHICH THE ELECTRIC FIELD SPECTRUM, MAGNETIC FIELD, AND PLASMA DATA WEAR RECORDED INTO SPACEGRAFT MEMORY FOR A PERIOD STARTING BEFORE AND TERRINATING RATE OF THE TRIGGERING SIGNAL TIME. THE MAXIMUM SAMPLING RATE OF THE TREGGERING DATA IN THIS MODE WAS TA.2 SAMPLES PER S FOR EACH CHANNEL. ONE HALF OF THE DIPOLE ANTENNA

FAILED TO EXTEND PROPERLY AND WAS SHORT CIRCUITED TO THE SPACEGRAFT GROUND. THE RESULTANT CONFIGURATION WAS THAT OF A MONOPOLE WHICH WAS CALCULATED TO HAVE AN EFFECTIVE LENGTH OF APPROXIMATELY 8 M. THE PRIMARY DETREMENTAL EFFECTS WERE THE LOSS OF 6 DB IN E FIELD SENSITIVITY DUE TO THE SHORTENED ANTENNA AND THE INCREASE IN THE 178 KHZ CHANNEL BY 25 DB. SOLAR CELL AND SHEATH EFFECTS CAUSED INTERFRENCE IN THE LOWEST 6 CHANNELS (WHICH WAS LESS SEVERE WITH INCREASING CHANNEL FREQUENCY). FOR MORE DETAILS, SEE JGR. 82, P 652, 1975.

-- HELLOS-A, GURNETT-------INVESTIGATION NAME- FINE FREQUENCY, COARSE TIME RESOLUTION Spectrum Amalisis

NSSDC 10- 74-0974-05 STIGATIVE PROGRAM

C 19-	19-	14-09/8-03	INVESTIGATIVE (2
			CODE ST/CO-OF	3

INVESTIGATION DISCIPLINE(S) Ionospheres and radio physics Particles and fields

PERSONNEL		
PI - D.A. DI - P.J. DI - S.J. UI - R.G.	KELLOGG BAUER	U OF IOWA U OF Minnesota Nasa-GSFC Nasa-GSFC

01 - 5.J. BAUER NASA-GSFC UI - R.G. STONE NASA-GSFC WASA-GSFC BRIEF DESCRIPTION THIS EXPERIMENT SHARED THE 32-M, TIP-TO-TIP, ELECTRIC DIPOLE ANTENNA WITH EXPERIMENTS -04 AND -06. INSTRUMEMIATION CONSISTED OF THREE TUNABLE PLASMA WAVE RECEIVERS, A FIXED-FREQUENCY WIDEBAND RECEIVER, AND A WAVE FORM SAMPLER. THE TUNABLE RECEIVERS AND WIDEBAND RECEIVER PROVIDED DATA FOR DIRECT TELEMETRY TO EARTH. THE DATA FROM THE WAVE FORM SAMPLER WERE STORED IN THE SPACECRAFT MEMORY FOR A SHORT PERIDD STARTING BEFORE AND ENDING AFTER THE SNOCK ALARM LIRCUIT HAD BEEM TRIGGERED. EACH OF THE TUNABLE RECEIVERS COVERED A DIFFERENT FREQUENCY BAND IN THE RANGE 1 HZ TO 200 KH2. THE HIGH FREQUENCY BEILING AFTER THE SNOCK ALARM LIRCUIT HAD BEEM TRIGGERED. EACH OF THE TUNABLE RECEIVERS COVERED A DIFFERENT FREQUENCY BENDING AFTER THE SNOCK ALARM LIRCUIT HAD BEEM TRIGGERED. EACH OF THE TUNABLE RECEIVERS COVERED A DIFFERENT FREQUENCY BEDING AFTER THE SNOCK ALARM LIRCUIT HAD BEEM TRIGGERED. EACH AND COVERED THE SNOCK ALARM LIRCUIT HAD BEEM TRIGGERED. EACH AND COVERED THE SNOCK SEPARATED BY ABOUT 4 PERCENT AND COVERED THE FREQUENCY SETTINGS SEPARATED BY ABOUT 5 PRECENT AND COVERED THE RANGE 11 HZ TO 30G HZ. THE RESPONSE TIME OF THE LOW-FREQUENCY RECEIVER HAD 24 SETTINGS SEPARATED THE OFTAIN INFORMATION ADOUT THE ANGULAR DISTRIBUTION OF WAVES APPEARING IN THE LOW-FREQUENCY RECEIVER WAS APPROXIMATELY 1 S. NECESSITATING THE INCLUSION OF THE MIDEGANA RECEIVER TO OBTAIN INFORMATION ADOUT THE ANGULAR DISTRIBUTION OF WAVES APPEARIMENT OPERATIONAL MODE. UNENT THE INSCR ALARM MODE BECAME ACTIVATED, DATA FROM THE SAVE FORM SAMPLER WERE READ INTO SPACECRAFT MEMORY FOR A PERIOD STATING RATE, AND HEXENT OPERATIONAL FOR DEFENDED IN DETAIL ON THE SPACECRAFT TELEMETRY FORMAT. BIT RATE, AND EXPERIMENT OPERATIONAL MODE. UNENT THE INSTANTAMEOUS VOLTAGE ACTIVATED, DATA FROM THE SAVE FORM SAMPLER WERE READ INTO SPACECRAFT MEMORY FOR A PERIOD STATING RATE, AND BECAME ACTIVATED, DATA FROM THE SAVE FORM SANPLER WERE READ INTO SPACECRAFT MEMORY FOR A PERIOD STATING REFO

HELIOS-A, GURNETT-

INVESTIGATION NAME- 50-KHZ TO 2-MHZ RADIO WAVE

NSSDC 10- 74-0974-06 INVESTIGATIVE PROGRAM

CODE	51/00-0	P
INVEST	GATION	DISCIPLINE(S)

RADIO PHYSICS PARTICLES AND FIELDS Solar Physics

PERSONNEL		
PI - D.A. DI - P.J. OI - R.R. OI - R.G.	KELLOGG Veðer	U OF IOWA U OF MINNESOTA NASA-GSFC NASA-GSFC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT SHARED THE 32-M, TIP-TO-TIP, ELECTRIC DIPOLE ANTENNA WITH EXPERIMENTS -04 AND -05. A DUAL CREDUNDANT) 16-FREQUENCY CHANNEL RADIOMETER, WITH APPROXIMATELY LOGARITHMICALLY SPACED CHANNELS, WAS USED TO DEFECT TYPE III RADIO EMISSIONS ASSOCIATED WITH SOLAR FLARE EVENTS IN THE FREQUENCY BAND 26.5 KHZ TO 3 MHZ. THE EXPERIMENT SAMPLING RATE WAS SYNCHRONIZED SUCH THAT EACH SPACECRAFT REVOLUTION WAS DIVIDED INTO 32 SECTORS. THE SEQUENCE AND FREQUENCY OF SAMPLING DEPENDED ON THE INSTRUMENT OPERATIONAL HODE (ONE OF FOUR) AND THE SPACECRAFT BIT RATE. THE 405T RAPID SAMPLING POSSIBLE FOR A SINGLE FREQUENCY CHANNEL WAS ONCE EVERY 1/32 OF A SATELLITE SPIN PERIDD, OR ABOUT. 03 SEC. A TYPICAL SAMPLING SECTORS (1/2 REVOLUTION), FOLLOWED BY THE WEXT. ONE-HALF OF THE 32-M DIPDLE FAILED TO EXTEND PROPERLY DIRING DEPLOYMENT, AND WAS SHORTED TO GROUND. THE RESULTING ANTENIA CONFIGURATION WAS THAT OF A NONOPOLE WITH AN OPERATIONAL EFFELTIVE LENGTH GF

B N. THIS SHORTER CONFIGURATION RESULTED IN INCREASED RADIO FREQUENCY INTERFERENCE (RFI) OF FROM 3 TO 30 DB, ABOVE EXPECTED LEVELS, AND A LOSS OF δ DB IN GAIN. THE SECOND PROBLEM WAS UNEXPECTED INTERFERENCE BETWEEN THE HIGH-GAIN TELEMETRY ANTENNA. THIS ADDED 60 DB RFI AT 27.5 KHZ, DECREASING WITH INCREASING FREQUENCY, SO THAT ABOVE 200 KHZ IT PRODUCED NO DETECTABLE INTERFERENCE. FOR MORE DETAILS ABOUT THE INSTRUMENT AND RODES OF OPERATION SEE P 250 OF "RAUMFAHRTFORSCHUNG," 19, 1975.

----- HELIOS-A, KEPPLER------

INVESTIGATION NAME- ENERGETIC ELECTRON DETECTOR

INVESTIGATIVE PROGRAM CODE ST/CO-OP NSSDC 10- 74-0974-10

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL		
₽1 - E.	KEPPLER	MPI-AERONOMY
0I - B.	WILKEN	MPI-AERONOMY
01 - D.J.	WILLIANS	NGAÁ-ERL

BRIEF DESCRIPTION THE OBJECTIVE OF THE EXPERIMENT WAS TO STUDY THE ORIGIN AND THE DISTRIBUTION MECHANISM OF LOW-ENERGY ELECTRONS AD PROTONS. THE INSTRUMENT, A MAGNETIC SPECTROMETER, CONSISTED OF SIX SEMICONDUCTOR DETECTORS WITH APERTURES POINTING INTO THE PLANE OF THE ECLIPTIC, SPECIES SEPARATION WAS ACHIEVED BY AM INHOMOGENEOUS MAGNETIC FIELD ORIENTED PERPENDICULAR TO THE PARTILLE PATH. FOUR ELECTRON AND TWO PROTON DETECTORS MEASURED ELECTRONS FROM 2D TO 10DD KEV AND PROTONS FROM 8D TO 1000 KEV. THE PROTON MEASUREMENTS WERE MADE WITH A TWO-DETECTOR TELESCOPE EMPLOYING COINCIDENCE AND ANTICOINCIDENCE LOGINES. THROUGH PULSE MEIGHT ANALYSIS. FOR FURTHER INFORMATION SEE PP 261-263 OF 'RAUMFAHRTFORSCHUNG,' 19, 5, SEPTEMBER/OCTOBER 1975.

----- HELIOS-A, KUNDT------

INVESTIGATION NAME- CELESTIAL MECHANICS

INVESTIGATIVE PROGRAM CODE ST/CO-OP NSSDC ID- 74-0974-14

> INVESTIGATION DISCIPLINE(S) ASTRONOMY Celestial Mechanics

> > U OF HAMBURG Nasa-jpl

PERSONNEL

PI - W. KUNDT DI - W.G. MELBOURNE

BRIEF DESCRIPTION

THIS EXPERIMENT USED THE TRACKING DATA TO OBTAIN A Detailed spacecraft orbit and improved knowledge of the orbital elements of the earth-moon system and general relativity ELÉMENTS Ó PARAMETERS.

----- HELIOS-A, KUNOW------

INVESTIGATION NAME- COSMIC-RAY PARTICLES

2.4.4

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NSSDC ID- 74-0974-07
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INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

INVESTIGATIVE PROGRAM

CODE ST/CO-OF

PERSONNE

KUNON	U OF KIEL
WIBBERENZ	U OF KIEL
GREEN	U OF KIEL
MUELLER-MELLIN	U OF KIEL
WITTE	U OF KIEL
HEMPE	U OF KIEL
	WIBBERENZ Green Muéller-Nellín Witte

01 - H. HEMPE U OF KIEL BRIEF DESCRIPTION THE OBJECTIVE OF THE EXPERIMENT WAS TO STUDY HIGH-ENERGY, CHARGED, COSNIC-RAY PARTICLES OF SOLAR, PLANETARY, AND GALACTIC ORIGIN IN INTERPLANETARY SPACE. PROTONS AND ALPHA PARTICLES WITH ENROIES.G. 1.3 REV/NULLEON, AND ELECTRONS. GT. 0.3 MEY WERE MEASURED WITHIN INTERPLANETARY SPACE OVER THE RANGE FROM 0.3 TO 1.0 AU. THE INSTRUMENT, A PARTICLE TELESCOPE WITH A 55 DEG FIELD OF VIEW, CONSISTED OF FIVE SEMICONDUCTOR DETECTORS, ONE SAPPHIRE-CERENKOV COUNTER, AND ONE SCINTILLATION COUNTER, ALL ENCLOSED BY AN ANTICOINCIDENCE CYLINDER. THE TELESCOPE HITH A BEEN CALIBRATES PRIOR TO LAUNCH USING RADIDACTIVE SOURCES, PARTICLE ACCELERATORS, AND GROUND-LEVEL MUONS. IT MEASURED PROTONS AND ALPHA PARTICLES IN SIX CHANNELS (1.3-3.3, 3.3-13, 13-27, 27-37, 37-45, AND .GT. 45 MEV/MULLEON) AND ELECTRONS IN FIVE ENERGY CHANNELS (0.3-0.8-2, 2-3, 3-4, AND .GT. MEV), FOR MORE DETAIL SEE PP 253-257 OF 'RAUMFAHRTFORSCHUNG,' 19, 5, SEPTEMBER/OCTOBER 1975.

-- HELIOS-A, LEINERT-------INVESTIGATION NAME- ZODIACAL LIGHT PHOTOMETER

INVESTIGATIVE PROGRAM CODE ST/CO-OP NSSDC 10- 74-0974-11

INVESTIGATION DISCIPLINE(\$) Interplanetary physics 2001acal light

PI - C. 01 - E. LEINERT PITZ

PERSONNEL

HPI-AERONOMY HPI-AERONOMY

BRIEF DESCRIPTION BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF THREE PHOTOMETERS LOOKING AT 15 DEG, 30 DEG, AND 90 DEG FROM THE ECLIPTIC. THESE PHOTOMETERS DESERVED THE INTENSITY AND POLARIZATION OF THE 20DIACAL LIGHT IN UV, BLUE, AND VISUAL BANDS. THE PURPOSE OF THIS EXPERIMENT WAS TO OBTAIN INFORMATION ABOUT THE SPATIAL DISTRIBUTION, SIZE, AND NATURE OF INTERPLANETARY DUST PARTICLES.

-- HELIOS-A, NESS------INVESTIGATION NAME- FLUXGATE MAGNETOMETER FOR AVERAGE FIELDS

NSSDC 10- 74-097A-02 INVESTIGATIVE PROGRAM

CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Particles and fields

PERSONNEL		
PI - N.F.	NESS	NASA-GSFC
01 - F.	MARIANI	CNR, SPACE PLASMA LAB
01 - L.F.	BURLAGA	NASA-G5FC
01 - S.C.	CANTARAND	U DF ROME

BRIEF DESCRIPTION THIS EMPERIMENT CONSISTS OF A BOOM-MOUNTED, TRIAKIAL-FLUXGATE MAGRETOMETER, AN AUTOMATIC IN-FLIGHT RAMGE SWITCH SYSTEM SELECTS THE OPTIMUM OF FOUR RANGES THAT ARE MINUS TO PLUS 16, 48, 144, AND 432 GAMMAS PER SENSOR. THESE HAVE CORRESPONDING DIGITIZATION RESOLUTIONS OF MINUS TO PLUS 0.09, 0.28, AND 0.84 GAMMAS. A SENSOR FLIPPER IS ACTUATED EVERY 36 H TO ASSIST IN SENSOR ZERO LEVEL DETERMINATION. FOR TELEMETRY BIT RATES ABOVE 256 BPS, VECTOR MEASUREMENTS ARE MADE AT RATES BETWEEN 1 AND 16 PER SECOND, DEPENDING ON BIT RATES. AT LOWER BIT RATES, AVERAGES AND VARIANCES ARE COMPUTED ON BOARD FOR TRANSMISSION TO EARTH.

-- HELIOS-A, NEUBAUER---

INVESTIGATION NAME+ FLUXGATE MAGNETOMETER FOR FIELD FLUCTUATIONS

NS5DC ID- 74-097A-01 INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL PI - F.M. OI - A. NEUDAUER Maier

BRAUNSCHWEIG TECH U Braunschweig tech u

BRIEF DESCRIPTION THE INSTRUMENT CONSISTED OF A TRIAXIAL FLUXGATE MAGNETOMETER MOUNTED ON A 2.75-M BOON TO MAKE MAGNETIC FIELD MEASUREMENTS UP TO 4 HZ. DATA FROM EACH AXIS WERE FIRST SENT THROUGH A LOW-PASS FLLTER WITH THE 3 DB ATTENUATION POINT AT 4 HZ. DEPENDING ON THE TELEMETER FORMAT AND BIT RATE, THE DATA WERE FED EITHER INTO A TIME-AVERAGING COMPUTER OR DIRECTLY CONNECTED TO TELEMETRY. A SHOCK IDENTIFICATION COMPUTER TRIGGERED IME STORAGE OF RAFID RATE DATA IN THE SACECHAFT MEMORY WHEN THERE WERE DISCONTINUITIES IN THE VARIATIONS OF THE AMBIENT MAGNETIC FIELD. THO MEASUREMENT RANGES WERE USED, PLUS OR MINUS 100 AND 400 NT WITH RESOLUTIONS OF PLUS OR MINUS 0.2 AND D.8 NT, RESPECTIVELT. THE INSTRUMENT WAS EQUIPPED WITH A FLIPPER MECHANISM, WHICH RE-ORIENTED EACH SENS BY 90 DEG PERIODICALLY. FOR DETAILED INFORMATION, SEE P 23Z OF "RAUMFARTFORSCHUNG," 19, 1975. BRIEF DESCRIPTION

--- HELIOS-A, NEUBAUER-

INVESTIGATION NAME- SEARCH COIL MAGNETOMETER

NSSDC 10- 74-0974-03

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL P1 - F.M. 01 - G. NEUBAUER DEHMEL

BRAUNSCHWEIG TECH U Braunschweig tech u

57

INVESTIGATIVE PROGRAM CODE ST/CO-OP

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO INVESTIGATE THE MAGNETIC COMPONENT OF ELECTROMAGNETIC WAVES IN THE SOLAR WIND FROM 0.3 TO 1.0 AU. BY MEANS OF ITS WAVEFORM CHANNEL (WFC) THE RAPID VARIATIONS OF THE MAGNETIC FIELD WERE MEASURED UP FROM PLUS OR MINUS B.75 NT TO PLUS OR MINUS 275 NT IN THREE ORTHOGONAL DIRECTIONS FROM 4 TO 128 HZ. A SPECTRUM ANALYZER OBSERVED THE FIELD COMPUNENTS IN THE ECLIPTIC FLANE AND PERFENSICULAR TO IT, TO OBTAIN THE POWER SPECTRAL DENSITY AND PEAK VALUES FOR B LOGARITHMICALLY SPACED CHANNELS IN THE HANGE FROM 4.7 TO 2200 HZ. BECAUSE OF THE LARGE AMOUNT OF DATA PRODUCED BY THE INTERESTING TIME INTERVALS SELECTED BY THE FLUXGATE MAGNETOMETER (MEUBAUER) OR GURNETT (-04), WAVEFORM DATA COULD BE READ INTO AN ON-BOARD MEMORY AT A APPID RATE TO BE TRANSMITTED SLOWLY AFTERWARDS. FOR MORE DETAILED INFORMATION SEE P 241 IN "RAUMFAHRTFORSCHUNG," 19, 1975.

- HELIOS-A, ROSENBAUER-----

INVESTIGATION NAME- PLASMA DETECTORS

INVESTIGATIVE PROGRAM CODE ST/CO-OP NSSDC 10- 74-0974-09

INVESTIGATION DISCIPLINE(S) Particles and fields

PERSONNEL PI - H.R. ROSENBAUER OI - H. PELLKOFER OI - J.H. WOLFE

MPI-EXTRATERR PHYS MPI-EXTRATERR PHYS NASA-ARC

OI - J.H. WOLFE HASA-ARC BRIEF DESCRIPTION THIS EXPERIMENT ENPLOYED 3 PLASMA AMALYZERS FOR POSITIVE IONS AND ONE FOR ELECTRONS. ALL DETECTORS WERE MOUNTED NORMAL TO THE SPIN AXIS. POSITIVE IONS WITH EMERGY PER CHARGE WITHIN THE RANGE D.155 TO 15.32 KEVG WERE MEASURED IN TWO ANGULAR DIMENSIONS USING A COMBINATION OF A HEMISPHERICAL, A GUADRISPHERICAL, AND A SINUSOIDALLY SHAPED ELECTROSTATIC AMALYZER, ELECTRONS WITH EMERGY FOR D.5 TO 1660 EV WERE MEASURED WITH A HEMISPHERICAL ELECTROSTATIC AMALYZER IN ONE DIMENSIONS THE EXPERIMENT OPERATED IN SEVERAL MODES WITH DIFFERING TIME RESOLUTION DEPENDING IN DETAIL ON TELENETRY FORMAT AND SATELLITE BIT RATE. TYPICAL TIMASUTION MAS ON THE GADER OF A MINUTE. ALSO, WHENEVER THE SPECIAL SHOCK ALARM MODE WAS TRIGGERED BY EXPERIMENTS -04 GR -01, HIGH IME RESOLUTION VELASMA DATA WAS RECONDED INTO SPACECRAFT MEMORY FOR LATER 'TRAMSMISSION. BECAUSE THE SPACECRAFT BODY WAS DIELECTRIC, SHEATH POTENTIALS OF UP TO 1000 PEREGED THE USEFULNESS OF THE ION DATA. FOR MORE DETAILED INFORMATION SEE P 226 OF "RAUMFARTFORSCHUNG," 19, 1975, WHEN AN EVENT WAS ENTERED BT EXPERIMENT -04.A SHOCK ALARM MODE FOR PATION WAS ENTERED BT WHICH FAST TIME RESOLUTION DATA WER RECORDED INTO ONBOARD STORAGE MEMORY FOR A PERIOD BEFORE AND AFTEN THE EVENT.

- HELIOS-A, TRAINOR------

INVESTIGATION NAME- GALACTIC AND SOLAR COSMIC RAYS

NSSOC 10- 74-0974-08 INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) COSMIC RAYS

ΡĒ	R	50	N4	(F1

PI - J.H. DI - E.C. DI - B.J. OI - F.B. OI - F.B. TRAINOR Roelof Teegarden NASA-GSFC Applied physics LAB NASA-GSFC MCDONALD MCCRACKEN NASA-GSEC CSTRO

01 - K.G. MCCRACKEN CSIRD DRIEF DESCRIPTION THE DETECTOR COMPLEMENT CONSISTED OF THREE SEPARATE DELTA THE DETECTOR COMPLEMENT CONSISTED OF THREE SEPARATE DELTA FYDELTA X VS E TELESCOPES AND A PROPORTIONAL COUNTER FOR MONITORING SOLAR X RAYS IN THE RANGE 2-8 KEV. THE HIGH ENERGY TELESCOPE HAD A GEOMETRIC FACTOR OF 0.22 SG CM STER AND MEASURED ELECTRONS IN THREE RANGES BETWEEN 2 AND 8 MEV. AND PROTONS AND ALPHA PARTICLES IN THREE RANGES METWEEN 20 AND 56 NEV/N. PROTONS ABOVE 230 MEV ARE ALSO MEASURED. THE FIRST LOW-ENERGY TELESCOPE (GEOMETRIC FACTOR WAS 0.155 SG CM STER) MEASURED PROTONS AND 2.1 MEV. ALPHA PARTICLES IN THREE RANGES BETWEEN 3 AND 21 MEV/N. THE SECOND LOW-ENERGY TELESCOPE (GEOMETRIC FACTOR WAS 0.015 SG CM STER) MEASURES PROTONS IN SEVERAL RANGES BETWEEN 0.12 AND 2.1 MEV. ALPHA PARTICLES IN THR EANGES 0.6-2.1 AND 6-21.2 MEV/N. AND ELECTRONS IN FOUR RANGES BETWEEN 0.12 AND 2 MEV. FOR A NUMBER OF COINCIDENCE MODES, COUNTING DATA SECTORED INTO EIGHT 45 DEG SECTORS WERE OBTAINED. THE DATA CYARIABLE BETWEEN 4096 AND 8 DITS/S) AND FORMAT. UNDER OPTINUM CONDITIONS, FIVE EVENTS PER SECOND ARE PULSE HEIGHT ANALYZED AND THE RATE DATA CYCLE IS OF THE GROMENT, A COMPLETE DATA CYCLE REQUIRES ABOUT 2.5 HOURS. SEE "IEEE TRANS. ON NUC. SCI.,*" NS-22, 570, 1975, FOR FURTHER DETAILS.

SPACECRAFT COMMON NAME- HELIOS-8 Alternate Names- Helio-8, pl-751A Helios 2

NSSOC 10- 76-003A

LAUNCH DATE- 01/15/76 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- TITAN WEIGHT- 210. KG

SPONSORING COUNTRY/AGENCY FED REP OF GERMANY	BMVF
UNITED STATES	NASA-DSS
INITIAL ORBIT PARAMETERS	
ORBIT TYPE- HELIOCENTRIC	EPOCH DATE- 07/21/76
ORBIT PERIOD- 185.6 DAYS	INCLINATION- O. DEG
PERIAPSIS- 0.289 AU RAD	APOAPSIS- 0.983 AU RAD
PERSONNEL	
MG - F.D. KOCHENDORFER	NASA IEADQUARTERS
SC - A.G. OPP	NASA HEADQUARTERS
PM – A. KUTZER	GES FUR WELTRAUM
PM - G.W. OUSLEY	NASA-GSFC
PS - H. PORSCHE	ORG FOR SPACE RES
PS - J.H. TRAINOR	NASA-GSFC

URIEF DESCRIPTION

URLEF DESCRIPTION THIS SPACECRAFT WAS ONE OF A PAIR OF DEEP SPACE PROBES DEVELOPED BY THE FEDERAL REPUBLIC OF GERMANY (FRG) IN A COOPERATIVE PROGRAM WITH NASA. EXPERIMENTS WERE PROVIDED BY SCIENTISTS FROM BOTH FRG AND THE U.S. NASA SUPPLIED THE TITAN/CENTAUR LAUNCH VEHICLE. THE SPACECRAFT WERE EQUIPPED WITH TWO BOOMS, AND A 32-M ELECTRIC DIPOLE. THE PAYLOAD CONSISTED OF A FLUXGATE MAGNETOMETER; ELECTRIC AND MAGNETIC WAVE EXPERIMENTS, WHICH COVERED VARIOUS BANDS IN THE FREQUENCY WAVE EXPERIMENTS, WHICH COVERED VARIOUS BANDS IN THE FREQUENCY WAVE EXPERIMENTS, WHICH COVERED VARIOUS BANDS IN THE FREQUENCY WAVE EXPERIMENTS, WHICH COVERED VARIOUS BANDS IN THE FREQUENCY WAVE EXPERIMENTS, WHICH COVERED VARIOUS BANDS IN THE FREQUENCY WAVE EXPERIMENTS, WHICH COVERED VARIOUS BANDS IN THE FREQUENCY WAVE EXPERIMENTS, WHICH COVERED VARIOUS BANDS IN THE FREQUENCY WAVE EXPERIMENTS, WHICH COVERED VARIOUS BANDS IN THE FREQUENCY WAVE EXPERIMENTS, WHICH TO TENERS STATING WITH SOLAR WIND THERMAL ENERGIES AND EXTENDING TO 1 GEYA LODICAL LIGHT EXPERIMENT; AND A MICROMETEOROID EXPERIMENT, THE PURPOSE OF THE MISSION WAS TO MAKE PIONEERING MEASUREMENTS OF THE INTERPLANETARY MEDIUM FROM THE VICINITY OF THE EARTHYS ORBIT TO G.3 AU. THE SPACECRAFT WAS SPIN STABILIZED WITH THE SPIN AXIS NORMAL TO THE ECLIPTIC, AND A NOMINAL SPIN RATE OF 1 RPS, THE OUTER SURFACE WAS COATED WITH A CONDUCTIVE MATERIAL, RESULTING IN A PLASMA SHEATH POTENTIAL OF TYPICALLY SEV. SHEATH RELATED COUPLING CAUSED BY THE SPACECRAFT ANTENNAS PRODUCED INTERFERENCE WAS DIFFERENT THAN THAT OBSERVED ON THE HELDS 1 SPACECRAFT. INE SPACECRAFT WAS CAPABLE OF DEFINED AT BIT RATES OF FROM 4096 TO 8 BPS, VARIABLE BY FACTORS OF TVO. WHILE THE SPACECRAFT WAS MOVING TO PERIHELION, IT WAS GENERALLY OPERATED FROM 64 TO 256 BPS; VARIABLE BY FACTORS OF TVO. WHILE THE SPACECRAFT WAS MOVING TO PERIHELION, IT WAS GENERALLY OPERATED FROM 64 TO 256 BPS; AND NEAR D.S AND, IT WAS GENERALLY OPERATED FROM 64 TO SENSE. AND MEAR D.S AND, IT WAS GENERALLY OPERATED

----- HEL105-8, FECHTIG------

INVESTIGATION WAME- MICROMETEDROID DETECTOR AND ANALYZER

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Interplanetary dust Interplanetary physics

MPI-NUCLEAR PHYS MPI-NUCLEAR PHYS

PERSONNEL PI - H. 01 - J. FECHTIG Weihrauch

N550C ID- 76-003A-12

BRIEF DESCRIPTION

58

BRIEF DESCRIPTION THE PURPOSE OF THIS EXPERIMENT WAS TO INVESTIGATE SOME THEUGIES ABOUT THE INTERPLANETARY DUST INCLUDING WHETHER -- (1) THE NUMBER OF PARTICLES INCREASES TOWARD THE SUM, (2) THE CUT OFF FOR SMALL PARTICLES INCREASES TOWARD THE SUM, (2) THE CUT OFF FOR SMALL PARTICLES INCREASES TOWARD THE SUM, AND (3) THE NUMBER DENSITIES OF PARTICLES CHANGE HERE THE SUM, AND (3) THE NUMBER DENSITIES OF PARTICLES HARDET THE SUM, AND (3) THE NUMBER DENSITIES OF PARTICLES CHANGE HERE THE ORBITS OF PLANETS. THE DETECTOR UTILIZED THE FACT THAT THE KIMETIC EMERGY OF DUST PARTICLES HITTING A TARGET WITH HIGH VELOCITY (SEVERAL "M/S) CAUSES THE MATERIAL TO VAPORIZE AND BECOME PARTIALLY IONIZED. THE GENERATED PLASMA CLOUD WAS SEPARATED BY APPROPRIATE VOLTAGES INTO ITS NEGATIVE (ELECTRON) PART AND INTO POSITIVE IONS. FROM THE IMPULSE HEIGHTS. THE MASS AND THE ENERGY OF THE DUST PARTICLES WAS DETERMINED. A TIRE-OF-FLIGHT MASS SPECTROMETER IN CONNECTION WITH THE TARGET ALLOWED THE INVESTIGATION OF THE CHEMETOR DETERMINATION OF THE DUST PARTICLES. THE THRESHOLD FOR THE DETECTION OF A PARTICLE WAS ABOUT 1.E-15 GM. MASS AND EMERGY DETERMINATION WAS POSSIBLE FOR PARTICLES LARGER THAN ABOUT 1.E-14 GM. FOR PARTICLES LARGER THAN 1.E-13 GM, A MASS SPECTRUM MAY BE GATHERD.

-- HELIOS-8, GURNETT------

INVESTIGATION NAME- COARSE FREQUENCY, FINE TIME RESOLUTION Specthum Analysis

NSSDC ID-	76-003A-04	INVESTIGATIVE PROGRAM Code St/Co-op

INVESTIGATION DISCIPLINE(S) Particles and fields Ignospheres and radio physics

PERSONNEL PI - D.A. GURNETT OI - P.J. KELLOGG OI - S.J. BAUER OI - P.G. STONE	U OF IOWA U OF MINNESOTA NASA-GSFC NASA-GSFC
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QI - S.J. BAUER QI - R.G. STONE BRIEF DESCRIPTION THIS EXPERIMENT SHARED THE 32 M TIP-TO-TIP ELECTRIC THIS EXPERIMENTS -OS AND -OG. THE INSTRUMENT CONSISTED OF A 15 CHANNEL SPECTRUM ANALYZER WITH APPROXIMATELY LOGARINHICALLY EQUISPACED CENTER FREQUENCIES, 16 LOG COMPRESSORS, 16 R-C INTEGRATORS FOR AVERAGING THE LOG COMPRESSOR ELECTRIC FIELD AMPLITUDE BETWEEN READOUTS, THE 16 AVERAGES AND 16 PEAK LOG VALUES WERE SAMPLED ALMOST SIMULTAMEDUSLY. THE CHANNELS HAD CENTER FREQUENCIES FOR THE CHANNELS FROM 31 N2 TO 1.78 KTZ AND 16 PERCENT FROM 31 HZ TO 178 KHZ, AND BANDWIDTHS OF 20 PERCENT FOR THE REMAINING CHANNELS. THESE CHANNELS OVERLAPPED SO AS TO PROVIDE ESSENTIALLY CONTINUOUS FREQUENCY COVERAGE FOR THE RANGE OF ABOUT 20 HZ TO 200 KHZ. THE LOG COMPRESSORS HAD A OTNARIC RANGE OF 100 DB. SAMPLING RATE DEPENDED IN DETAIL ON THE SPACECRAFT BIT RATE AND TELEMETAY FORMAT. THE FASTEST REAL TIME TELEMETERED RATE WAS FOR 16 AVERAGES AND 16 PEAK VALUES TO BE SAMPLED EVEN 1.125 S. WHENEVER A VERY STRONG SIGNAL WAS DETECTED IN A PRE-SELECTED CHANNEL, THE SHOCK ALLARN DATA HODE WAS INITATED IN WHICH THE ELECTRIC FIELD SPECTRUM, MACHETIC FIELD, AND FLASMA DATA WERE RECORDED INTO SPACECART THE TRIGGERING SIGNAL TIME. THE MAINUM SAMPLING RATE OF THE SPECTRUM DATA IN THIS MODE WAS 14.2 SAMPLES PER S FOR EACH CHANNELS WHICH WAS CAUSED BY SOLAR CELLA NOISE. AND MARMONICS RELATED TO THE SPECTRUM DATA IN THIS MODE WAS 14.2 SAMPLES PER S FOR EACH CHANNELS WHICH WAS CAUSED BY SOLAR CELLA NOISE. AND MARMONICS RELATED TO THE SPECTRUM DATA IN THIS MODE WAS 14.2 SAMPLES PER S FOR EACH CHANNELS WHICH WAS CAUSED BY SOLAR CELLA NOISE. AND MARMONICS RELATED TO THE SPECTRUM DATA FROM THE SPACE

-- HELICS-B+ GURNETT------

INVESTIGATION NAME- FINE FREQUENCY, COARSE TIME RESOLUTION Spectrum Analysis

INVESTIGATIVE PROGRAM NSSDC 10- 76-003A-05 CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Particles and fields Ionospheres and radio physics

PERSONNEL		U OF TOWA
PI - D.A.	GURNETT	U OF MINNESOTA
01 - P.J. 01 - S.J.	The states	NASA-GSFC
01 - R.G.	STONE	HASA-GSFC

Sec. is in case

01 - S.J. BAUER 01 - R.G. STONE BRIEF DESCRIPTION THIS EXPERIMENT SHARED THE 32-M, TIP-TO-TIP, ELECTRIC DIPOLE ANTENNA WITH EXPERIMENTS -04 AND -06. INSTRUMENTATION CONSISTED OF THREE TUMABLE PLASMA WAVE FORM SAMPLER. FIXED-FREQUENCY WIDEDAND RECEIVER, AND A WAVE FORM SAMPLER. THE TUMABLE RECEIVERS AND WIDEDAND RECEIVER, AND A WAVE FORM SAMPLER. THE TUMABLE RECEIVERS AND MIDEDAND RECEIVER TROUTDED DATA FOR WERE STORED IN THE SPACECRAFT MEMORY FOR A SHORT PERIOD STARTING BEFORE AND ENDING AFTER THE SHOCK ALARM CIRCUIT HAD BEEN TRIGGERED. EACH OF THE TUMABLE RECEIVERS COVERED A DIFFERENT REQUENCY RECEIVER HAD 96 FREGUENCY SETINGS SEPARATED DY ABOUT 4 PERCENT AND COVERED THE REQUENCY SETINGS SEPARATED DY ABOUT 5 PERCENT AND COVERED THE RADUENCY WALL TO SEPARATED BY ABOUT 5 PERCENT AND COVERED THE RANGE 208 HZ TO 5.07 KHZ. THE HIC-MARGE RECEIVER HAD 48 FREQUENCY SETINGS WITH 15 SPERCENT SEPARATION AND COVERED THE RANGE 11 HZ TO 309 HZ. THE RESPONSE TIME OF THE LOW-FREQUENCY RECEIVER WAS DEPROXINATELT 1 S, NECESSITATING THE INCLUSION OF THE WIDEBAND RECEIVER TO OUTIAN INFORMATION ADDIT THE ANGULA DISTRIBUTION OF WAVES APPERATION IN THE LOW-FREQUENCY RECEIVER WAS APPROXINATELT 1 S, NECESSITATING THE INCLUSION OF THE WIDEBAND RECEIVER TO OUTIAN INFORMATION ADDIT THE ANGULA THE SHOCK ALARM MODE BECAME ARDUT AND COVERED THE RANGE 11 HZ TO 309 HZ. THE FREQUENCY RANGE 1 HZ TO 200 HZ. THE TIME RESOUNED THE APPERATION IN THE LOW-FREQUENCY BAON. THIS RECEIVER TO OUTIAN INFORMATION ADDIT THE ANGULA THE WIDEBAND RECEIVER TO DETAIL ON THE SPACECRAFT IELEMETRY FORMAT, BIT RATE, AND EXPERIMENT OPERATIONAL MODE. WHEN THE SHOCK ALARM MODE BECAME ACTIVATED, DATA FROM THE WAS PASSED THROUGH ALOW PASS FILTER WITH THE TRIGGERING EVENT. IN THIS MODE THE INSTANTANEOUS VOLTAGE ACTOSS THE ANTENNA WAS PASSED THROUGH ALOW PASS FILTER WITH CORNER FREQUENCY DEPENDENT ON THE SAMPLING RATER AND MEAS FILTER WITH CORNER FREQUENCY DEPENDENT ON THE SAMPLING RATER AND MEASURED AT DISCUSSION SEE P 248 OF "RAUMFAMETFO

-- HELIOS-B, GURNETT-----

INVESTIGATION NAME- 50-KHZ TO 2-MHZ RADIO WAVE NSSDC 10- 76-003A-06

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Solar Physics Ionospheres and Radio Physics

PERSONNEL PI - D.A. 01 - P.J. 01 - R.R. 01 - R.G.	WEBER	U OF IOWA LI OF MINNESOTA NASA-GSFC NASA-GSFC
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BRIEF DESCRIPTION THIS EXPERIMENT SHARED THE 32-M, TIP-TO-TIP, ELECTRIC DIPOLE ANTENNA WITH EXPERIMENTS -04 AND -05. A DUAL (REDUNDANT) 16-FREQUENCY CHANNEL RADIOMETER, WITH APPROXIMATELY LOGARITHMICALLY SPACED CHANNELS, WAS USED TO DETECT TYPE III RADIO EMISSIONS ASSOCIATED WITH SOLAR FLARE EVENTS IN THE FREQUENCY BAND 26.5 KHZ TO 3 MHZ. THE EXPERIMENT SAMPLING RATE WAS SYNCHRONIZED SUCH THAT EACH SPACECRAFT REVOLUTION WAS DIVIDED INTO 32 SECTORS. THE SEQUENCE AND FREQUENCY OF SAMPLING DEPENDED ON THE INSTRUMENT OPERATIONAL MODE (ONE OF FOUR) AND THE SPACECRAFT BIT RATE. THE HOST RAPID SAMPLING SEQUENCE WAS FOR ONE FREQUENCY CHANNEL WAS ONCE EVERY 1/32 OF A SATELLITE SPIN PERIOD, OR ABOUT .03 SEC. A TYPICAL SAMPLING SEQUENCE WAS FOR ONE FREQUENCY CHANNEL TO BE SAMPLED FOR TO SECTORS (1/2 REVOLUTION), FOLLOWED BY THE NEXT. FOR MORE DETAILS ABOUT THE INSTRUMENT AND MODES OF OPERATION SEE P 250 OF "RAUMFAHRTFORSCHUMG," 19, 1975.

HELIOS-B, KEPPLER-

INVESTIGATION NAME- ENERGETIC ELECTRON DETECTOR

INVESTIGATIVE PROGRAM CODE ST/CO-OP N550C 10- 76-003A-10

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL MPI-AERONOMY MPI-AERONOMY NOAA-ERL P1 - E. 01 - B. 01 - D.J. KEPPLER WILLIAMS

BRIEF DESCRIPTION THE OBJECTIVE OF THE EXPERIMENT WAS TO STUDY THE ORIGIN AND THE DISTRIBUTION MECHANISM OF LOW-ENERGY ELECTRONS AND PROTONS. THE INSTRUMENT, A MAGNETIC SPECIROMETER, CONSISTED OF SIX SEMICONDUCTOR DETECTORS WITH APERTURES POINTING INTO THE PLANE OF THE ECLIPTIC. SPECIES SEPARATION WAS ACHIEVED BY AN INHOMGGENEOUS MAGNETIC FIELD ORIENTED PERPENDICULAR TO THE PARTICLE PATH. FOUR ELECTRON AND FROTONS FROM 80 TO 1000 KEV. THE PROTON MEASURETMENTS WERE MADE WITH A TWO-DETECTOR TELESCOPE EMPLOYING COINCIDENCE AND ANTICOINCIDENCE LOGICS. BOTH PARTICLE SPECIES WERE MEASURED IN 16 ENERGY CHANNELS THROUGH PULSE WEIGHT ANALYSIS. FOR FURTHER INFORMATION SEE PP 261-263 OF 'RAUMFAHRTFORSCHUNG,' 19, 5, SEPTEMBER/OCTOBER 1975.

----- HELIOS-8, KUNDT-----

INVESTIGATION NAME- CELESTIAL MECHANICS

INVESTIGATIVE PROGRAM NSSDC 10- 76-003A-14 CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) CELESTIAL MECHANICS

ASTRONOMY

PERSONNEL U OF HAMBURG NASA-JPL PI - W. KUNDT DI - W.G. MELBOURNE

URIEF DESCRIPTION THIS EXPERIMENT USED THE TRACKING DATE TO OBTAIN A DETAILED SPACECRAFT ORBIT AND TO OBTAIN IMPROVED KNOWLEDGE OF THE ORBITAL ELEMENTS OF THE EARTH-MOON SYSTEM AND GENERAL RELATIVITY PARAMETERS.

-- HELIOS-8, KUNOW-

INVESTIGATION NAME- COSMIC-RAY PARTICLES

INVESTIGATIVE PROGRAM NSSDC 10- 76-003A-07

CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL	and the second sec		· · · · · · · · · · · · · · · · · · ·
PI - H.	KUNDY		U OF KIEL
07 - G.H.	WIBBERENZ		U OF KIEL
01 - G.	GREEN		J OF KIEL
01 - H-	MUELLER-MELLIN	÷.,	U OF KIEL
<u>01 — М.</u>	WITTE		U 07 K1EL
01 - H.	HEMPE		U OF KIEL

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BRIEF DESCRIPTION THE OBJECTIVE OF THE EXPERIMENT WAS TO STUDY HIGH-EMERGY, CHARGED, COSMIC-RAY PARTICLES OF SOLAR, PLANETARY, AND GALACTIC ORIGIN IN INTERPLANETARY SPACE. PROTONS AND ALPHA PARTICLES WITH ENRAGIES. CI. 1.3 MEV/NUCLEON, AND ELECTRONS, GT, O.3 MEY, WERE MEASURED WITHIN INTERPLANETARY SPACE OVER THE RANGE FROM 0.3 TO 1.0 AU. THE INSTRUMENT, A PARTICLE TELESCOPE WITH A 35 DEG FIELD OF VIEW. CONSISTED OF FIVE SEMICONDUCTOR DETECTOR; ONE SAPPHIRE-CERENKOV COUNTER, AND ONE SCINTILLATION COUNTER, ALL ENCLOSED BY AN ANTICOLNCIDENCE CYLINDER. THE TELESCOPE HOTM BEGN CALIBRATED PRIOR TO LAUNCH USING RADIOACTIVE SOURCES, PARTICLE ACCELERATORS, AND GROUND-LEVEL MUONS. IT MEASURD, PARTICLE ACCELERATORS, AND .GT. 45 MEVINUCLEON) AND ELECTRORS IN 13-27, 27-37, 37-45, AND .GT. 45 MEVINUCLEON) AND ELECTRORS IN FIVE ENREGY CHANNELS (0.3-0.8-2, 2-3, 3-4, AND .GT., MEV). FOR MORE DETAIL SEE PP 253-257 OF 'RAUMFAHRTFORSCHUNG,' 19, 5, SEPTEMBER/OCTOBER 1975.

--- HELIOS-A, LEINERT-----

INVESTIGATION NAME- ZODIACAL LIGHT PHOTOMETER

LEINERT

P112

NSSDC 10- 76-003A-11 INVESTIGATIVE FROGRAM

INVESTIGATION DISCIPLINE(S) Interplanetary physics Zodiacal light

PERSONNE. PI - C. 01 - E.

MPI-AERONOMY MPI-AERONOMY

BRIEF DESCRIPTION

ORIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF THREE PHOTOMETERS LOOKING AT TS DEG, 30 DEG, AND 90 DEG FROM THE ECLIPTIC. THESE PHOTOMETERS OBSERVED THE INTENSITY AND POLARIZATION OF THE ZODIACAL LIGHT IN UV, BLUE, SELECTED VISUAL BANDS, AND WHITE LIGHT. THE PURPOSE OF THI EXPERIMENT WAS TO OBTAIN INFORMATION ABOUT THE SPATIAL DISTRIBUTION, SIZE, AND NATURE OF INTERPLANETARY DUST PARTICLES.

----- HELIDS-8, NESS---

INVESTIGATION NAME- FLUXGATE MAGNETOMETER FOR AVERAGE FIELDS

NS5DC 10- 76-003A-02 INVESTIGATIVE PROGRAM CODE ST/CD+OP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNER

PI - N.F.	NESS	NASA-GS FC
01 · F.	MARIANI	CNR, SPACE PLASHA LAB
01 - L.F.	BURLAGA	NASA-GSFC
0I + S.C.	CANTARANO	U OF ROME

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF A BOOM-MOUNTED, TRIAXIAL-FLUXGATE MAGNETOMETER, AN AUTOMATIC IN-FLIGHT RANGE SWITCH SYSTEM SELECTED THE OPTIMUM OF FOUR RANGE THAT ARE MINUS TO PLUS 16, 48, 144, AND 432 GAMMAS PAR SENSOR, THESE HAD CORRESPONDING DIGITIZATION RESOLUTIONS OF MINUS TO PLUS 0.03, 0.09, 0.28, AND 0.84 GAMMAS, A SENSOR FLIPPER WAS ACTUATED EVERY 36 H TO ASSIST IN SENSOR ZERO LEVEL DETERMINATION. FOR TELEMETRY BIT RATES ABOVE 256 BPS, VECTOR MEASUREMENTS WERE MADE AT RATES BEHEEN 1 AND 16 PER SEC, DEPENDING ON BIT RATES. AT LOWER BIT RATES, AVERAGES AND VARIANCES WERE COMPUTED ON BOARD FOR TRANSMISSION TO EARTH.

-- HELIOS-B, NEUBAUFR--

INVESTIGATION NAME- FLUXGATE MAGNETOMETER FOR FIELD -FLUCTUATIONS

NSSDC ID- 76-003A-01 INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL PI - F.M. 01 - A.

NEUBAUER MAIER

BRIEF DESCRIPTION

BRAUNSCHWEIG TECH U Braunschweig tech U

BRIEF DESCRIPTION THE INSTRUMENT CONSISTED OF A TRIAXIAL FLUXGATE MAGNETOMETER MOUNTED ON A 2.75-M BOOM TO MAKE MAGNETIC FIELD MEASUREMENTS UP TO 4 HZ. DATA FROM EACH AXIS WERE FIRST SENT THROUGH A LOW-PASS FILTER WITH THE 3 DB ATTENUATION POINT AT 4 HZ. DEPENDING ON THE TELEMETRY JORMAT AND BIT RATE, THE DATA WERE FED EITHER INTO A TIME-AVEPAGING COMPUTER OR DIRECTLY CONNECTED TO TELEMETRY. A SHOCK IDENTIFICATION COMPUTER TRIGGERED THE STORAGE OF RAFID RATE DATA IN THE SPACECRAFT MEMORY WHEN THERE WERE DISCONTINUITIES IN THE VARIATIONS OF THE AMBIENT MAGNETIC FIELD. TWO MEASURENENT RANGES WERE USED, PLUS OR MINUS 100 AND 400 NT WITH RESOLUTIONS OF PLUS OR MINUS D.2 AND 0.8 NT, RESPECTIVELY. THE INSTRUMENT WAS EQUIPPED WITH A FLIPPER MECHANISM, WHICH RE-ORIENTED EACH SENSOR BY 90 DEF PERIODICALLY. FOR DETAILED INFORMATION, SEE P 232 OF "RAUMFAHRTFORSCHUNG," 19, 1975.

----- HELIDS-B. NEURAUFR------

INVESTIGATION NAME- SEARCH COIL MAGNETOMETER

NS5DC 10- 76-003A-03

INVESTIGATION DISCIPLINE(S) Particles and fields

INVESTIGATIVE PROGRAM CODE ST/CO-DP

PERSONNEL PI - F.M. 01 - G. NEUBAUER

BRAUNSCHWEIG TECH U Braunschweig tech U

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO INVESTIGATE THE MAGNEIIC COMPONENT OF ELECTROMAGNETIC WAVES IN THE SOLAR WIND FROM 0.3 TO 1.D AU. BY MEANS OF ITS WAVEFORM CHANNEL (WFC) THE RAPID VARIATIONS OF THE MAGNETIC FIELD WERE MEASURED UP FROM PLUS OR MINUS 8.75 NT TO PLUS OR MINUS 275 NT IN THREE ORTHOGONAL DIRECTIONS FROM 4 TO 128 HZ. A SPECTRUM ANALYZER OBSERVED THE FIELD COMPONENTS IN THE ECLIPTIC PLANE AND FERFENDICULAR TO IT, TO OBTAIN THE POWER SPECTRAL DENSITY AND PEAK VALUES FOR B LOGARITMMICALLY SPACED CHANNELS IN THE RANGE FROM 4.7 TO 2200 HZ. RECAUSE OF THE LARGE AMOUNT OF DATA PRODUCED BY THIS EXPERIMENT AN ADAPTIVE DATA REDUCTION WAS APPLIED. FOR MAGNETOMETER (NEUBAUER) OR GURNETT (-04), WAVEFORM DATA COULD BE READ INTO AN ON-BOARD MEMORY AT A RAPIZED INFORMATION SEE P 241 IN "RAUMFAHRTFORSCHUNG," 19, 1975. BRIEF DESCRIPTION

---- HELTOS-B. POSENBANER.

INVESTIGATION NAME- PLASMA DETECTORS

N53DC 10- 76-003A-09

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Particles and fields

NASA-ARC

MPI-EXTRATERR PHYS MPI-EXTRATERR PHYS

PERSONNEL PI – H.R. ROSENBAUER OI – H. Pelikofer OI – J.H. Wolfe

BRIEF DESCRIPTION

DRIEF DESCRIPTION THIS EXPERIMENT ENPLOYED 3 PLASMA ANALYZERS FOR POSITIVE IONS AND ONE FOR ELECTRONS. ALL DETECTURS WERE MOUNTED NORMAL TO THE SPIN AXIS. POSITIVE IONS WITH ENERGY PER CHARGE WITHIN THE RANGE 0.155 TO 15.32 KEV/Q WERE MEASURED IN TWO ANGULAR THE RANGE 0.155 TO 15.32 KEV/Q WERE MEASURED IN TWO ANGULAR AGUARISPHERICAL, AND A SINUSOIDALLY SHAPED ELECTROSTATIC ANALYZER. ELECTRONS WITH ENERGY FROM 0.5 TO 1660 EV WERE MEASURED WITH A HENISPHERICAL ELECTROSTATIC ANALYZER IN ONE DIMENSION. THE EXPERIMENT OPERATED IN SEVERAL MODES WITH DIFFERIMES TIME RESOLUTION DEPENDING IN DETAIL ON TELEMETRY FORMAT AND SATELLITE BIT RATE. TYPICAL TIME RESOLUTION MAS ON MEDDER OF A MIMUTE. ALSO, WHENEVER THE SPECIAL SHOCK ALARM MODE WAS TRIGGERED BY EXPERIMENTS -04 OR -01, HIGH TIME RESOLUTION PLASMA DATA WAS RECORDED INTO SPACECRAFT MENDRY FOR LATER TRANSMISSION. BECAUSE THE SPACECRAFT BODY WAS COATED WITH A CONDUCTIVE COATING, THE SHEATH POTENTIALS WERE ABOUT S EV, CAUSING FAR LESS DEGRADATION IN THE USEPLINESS OF DATA TAKEN IN THE LOWER ELECTRON ENERGY CHANNELS THAN ON THE HEADOUT SFY FORMATION SEE P 226 OF "RAUMFARTFORSCHUNG," 19, 1975. MIEM AN EVENT WAS DETECTED IN WITH A SHORMATION SEE WITH A MODE OF OPERATION SEE ENTERTION THE IDN DATA. FOR MORE DETAILED INFORMATION SEE P 226 OF "RAUMFARTFORSCHUNG," 19, 1975. MIEM AN AVENT WAS DETECTED IN WITH A SHORMATION SEE ANTRED THAN ON THE HEADON ALARM MODE OF OPERATION WAS DETECTED IN WITH A SHORMATION SEE FOR EARD ATA THE RESOLUTION DATA WERE RECORDED IN TO SHORMATIFY FOR A PEFIDD BEFORE AND AFTER THE EVENT.

- HELIOS-B, TRAINDR------

INVESTIGATION NAME- GALACTIC AND SOLAR COSNIC RAYS NSSDC 10- 76-003A-08

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Particles and fields cosmic rays

PERSONNEL PI - J.H. DI - E.C. OI - B.J. OI - F.B. OI - F.B. TRAINOR Roelof Teegarden McDonald MCCRACKEN

NASA-GSFC APPLIED PHYSICS LAB NASA-GSFC NASA-GSFC

BRIEF DESCRIPTION THE DETECTOR COMPLEMENT CONSISTED OF THREE SEPARATE DELTA F/DELTA X VS E TELESCOPES AND A PROPORTIONAL COUNTER FOR MONITORING SOLARX RAYS IN THE RANGE 2-B KEV. THE MIGH ENERGY TELESCOPE HAD A GEOMETRIC FACTOR OF 0.22 SG CM STER AND MEASURED ELECTRONS IN THREE RANGES BEIWEEN 20 AND SG MEVIN. PROTONS AND ALPHA PARTICLES IN THREE RANGES BEIWEEN 20 AND SG MEVIN. PROTONS ADDVE 230 MEV ARE ALSO MEASURED. THE FIRST LOW-ENERGY TELESCOPE (GEOMETRIC FACTOR WAS 0.155 SG CM STER) MEASURED PROTONS AND 2.GT. 1 PARTICLES IN THREE RANGES BEIWEEN 2 AND 21 MEVIN. THE SECOND LOW-ENERGY TELESCOPE (GEOMETRIC FACTOR WAS 0.015 SG CM STER) MEASURES PROTONS IN SEVERAL RANGES BETWEEN 0.12 AND 2.1 MEV. ALPHA PARTICLES IN THE RANGES 0.6-2.1

AND 6-21.2 MEV/N, AND ELECTRONS IN FOUR NANGES BETWEEN 0.12 AND 2 MEV. FOR A NUMBER OF COINCIDENCE MODES, COUNTING DATA SECTORED INTO EIGHT 45 DEG SECTORS WERE OBTAINED. THE DATA CYCLE TIME WAS DEPENDENT ON THE SPACECRAFT TELEMETRY RATE (WARIABLE BETWEEN 4096 AND 8 BITS/S) AND FORMAT. UNDER OPTIMUM CONDITIONS, FIVE EVENTS PER SECOND ARE PULSE HEIGHT ANALVZED AND THE RATE DATA CYCLE IS OF THE ORDER OF 5 MINDIES. AT THE SLOWEST COMBINATION OF BIT RATE AND FORMAT, A COMPLETE DATA CYCLE REQUIRES ABOUT 2.5 HOURS. SEE "IFEE TRANS. ON NUC. SCI.," NS-22, S70, 1975, FOR FURTHER DETAILS.

SPACECRAFT COMMON NAME- HEOS 1 Alternate NAMES- HEOS-A1, HEOS-A 03595

NSSDC 15- 68-109A

WEIGHT- 105. KG LAUNCH DATE- 12/05/68 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- DELTA

SPONSORING COUNTRY/AGENCY ESA INTERNATIONAL

PERSONNEL

NONE ASSIGNED None Assigned Vandenkerckhove HG -SC -PM - J. PS - B.G. TAYLOR

BRIEF DESCRIPTION HEOS 1 WAS AN EARTH ORBITING, SPIN-STABILIZED SATELLITE THAT WAS LAUNCHED BY ESA (FORMERLY ESRO). II WAS BASICALLY CYLINDRICAL WITH AN AXIAL BOOM SUPPORTING THE AMTENNA AND THE MAGNETOMETERS, THE SPIN AXIS ATTITUDE AND SPIN RATE WERE CHANGED BY ONBOARD GAS JETS. THE SPACECRAFT OBJECTIVES WERE TO STUDY THE INTERPLANETARY MAGNETIC FIELDS, COSMIC RAYS, SOLAR WIND, AND THE MAGNETOSHEATH. THE SPACECRAFT ODFRATION WAS FULLY SATISFACTORY FOR 16 MONTHS, AFTER WHICH INTERMITTENT LOSS OF SOME SOLAR GATE (ATTITUDE REFERENCE) PULSES OCCURRED. BY 1974, SPACECRAFT TELEMETRY COVERAGE WAS OP FERENT, AND ONLY THE MAGNETIC FIELD EXPERIMENT WAS OPERATIONAL. THE SPACECRAFT REEWTERED THE EARTH'S ATMOSPHERE ON OCTOBER 28, 1975.

- HEOS 1, ELLIOT--

INVESTIGATION NAME- FLUXGATE MAGNETOMETER

INVESTIGATIVE PROGRAM NSSDC 10- 68-109A-02 SCIENCE

> INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

> > IMPERIAL COLLEGE Imperial college

EPOCH DATE- 12/24/69 Inclination- 25.1 deg Apoapsis- 227699, KM

ESA-ESTEC

PERSONNEL PI - H. ELLIGT OI - P.C. HEDGECOCK

OI - P.C. HEDGELOCK BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MEASURE MAGNETIC FIELDS IN THE RANGE PLUS TO MINUS 64 GAMRAS WITH AN ACCURACY OF 0.23 GAMMA USING A GOOM-MOUNTED TRIAXIAL FLUXGATE MAGNETIOMETER. THE HEOS-AI SPACEERAFT WAS LAUNCHED INTO A HIGHLY ECCENTRIC ORDIT SO THAT THE MAGNETOMETER MEASURED RAGNETIC FIELDS WITHIN THE MAGNETOSPHERE AND THE TRANSITION AND INTERPLANETARY REGIONS. THE MAGNETOMETER OPERATED CONTINUOUSLY IN TWO MODES. ONE GAVE A CONTINUOUS SERIES OF VECTORS SAMPLED AT 48-5 INTERVALS. THE OTHER OPERATED VIA A 16-KILOBIT DATA STORE WITH A VARIETY OF MEASUREMENT PROGRAMS WITH OPTIONS INCLUDING COMMAND OR AUTOMATIC REPLAY, SHOCK TYPE EVENT DETECTION, ETC. THE EXPERIMENT OPERATION WAS NORMAL UNTIL SPACECRAFT REENTRY (OCTOBER 28, 1975). HOWEVER, DATA ACQUISITION BECAME INTERMITTENT LATE IN THE SPACECRAFT LIFF, AND DATA ACCURACY DECREASED SOMEWHAT. FOR FURTHER DETAILS, SEE HEDGECOCK, SP. SCI. INSTRUM., VOL 1, PS3, 1975.

SPACECRAFT COMMON NAME- HERMES ALTERNATE NAMES- CAS-C, COMMUN. TECHNOL. SAT. Cooperative Applica Sat., CTS

N550C 10- 76-0044

WEIGHT- 680_ KG LAUNCH DATE- 01/17/76 Launch Site- Cape Canaveral, United States Launch Vehicle- Delta

SPONSORING COUNTRY/AGENCY NASA-DA UNITED STATES CRC

INITIAL ORBIT PARAMETERS Orbit type+ geocentric Orbit period- 1392. Min Periapsis- 33814. KM PERSONNEL NG - I. PAGHIS NG - A.J. CERVENKA PN - J.N. BARRY PS - A.S. BROWN

COMMUN RESEARCH CENTRE NASA HEADQUARTERS NASA HEADGUARTERS Commun Research Centre Commun Research Centre

EPOCH DATE- 01/18/76 Inclination- 0.7 deg Apoapsis- 36022. Km

BRIEF DESCRIPTION THIS THREE-AXIS STABILIZED SATELLITE WAS DESIGNED AS A TEST VEHICLE TO CARRY COMMUNICATIONS-RELATED FOUIPMENT. THE PURPOSE OF ITS LAUNCH INTO AN EQUATORIAL, EARTH-STNCHRONOUS ORBIT WAS -- (1) TO DEMONSTRATE NEW TECHNOLOGY, (2) TO CONDUCT COMMUNICATIONS METHODOLOGY IN CONJUNCTION WITH GROUND-BASCD COMPONENTS. THE SPACECRAFT WAS A SHORT (1.17-M) RIGHT CYLINDER (1.3-M DIAMETER) WITH TWO PARALLEL (1.72-M APART) PLANE SURFACES SYMMETRICALLY TRUNCATING THE CURVED SURFACE. THESE PLANE SURFACES WERE ALSO PARALLEL (1.74-M) SIGHT CYLINDER ANDRE COMPLETE DESCRIPTION MAY HE FOUND IN THE 'NASA-SSFC MISSION OFERATION PLAN, SECTION 1,' AND IN THE MISSION OPERATION PLAN.

- HERMES, DAY-----

INVESTIGATION NAME- SUPER-HIGH-FREQUENCY (12 AND 14 GHZ) -Transmitter experiment package (tep)

INVESTIGATIVE PROGRAM CODE EC/CD-OP NSSDC 10- 76-004A-01

INVESTIGATION DISCIPLINE(5) Communications

PERSONNEL P1 - J.W.B.DAY

COMMUN RESEARCH CENTRE

BRIEF DESCRIPTION THIS COMMUNICATIONS LXPERIMENT CONSISTED OF A 20-W LOW-POWER SUPER-HIGH-FREQUENCY (SHF) COMMUNICATIONS TRANSPONDER, A 200-W HIGH-POWER SHF TRANSMITTER PACKAGE, AN SHF BEACON, AND ANTENNA SUBSYSTEMS. THE PURPOSE OF THIS EXPERIMENT WAS -- (1) TO EVALUATE ECHNICAL PERFORMANCE OF THE COMPONENTS AND (2) TO EVALUATE CUERALL TECHNICAL OPERATION OF THE SYSTEM. BOTH TYPES OF TESTS WERE DONE OVER A 2-YR PERIOD, REFER:NCE WAS SOMETIMES MADE TO THE TWO DIFFERENT TYPES OF EVALUATION AS TWO DIFFERENT EXPERIMENTS. EVALUATION OF THE OVERALL OPERATION WAS THEM REFERRED TO AS A 'COMMUNICATION SYSTEM' EXPERIMENT.

--- HERMES, DONOUGHE-----

INVESTIGATION NAME- UNITED STATES USER EXPERIMENTS

NSSBC ID- 76-0044-05

INVESTIGATION DISCIPLINE(S) Communications

HSKNOWS

INVESTIGATIVE PROGRAM

CODE _C/CO-OP

PERSONNEL DONOUGHE PI -

BRIEF DESCRIPTION THIS EXPERIMENT INVOLVED EXPLANATION OF FUTURE POSSIBLE USES OF HIGH-POWERED COMMUNICATIONS SATELLITES. EXPERIMENTATION BY T3 DIFFERENT EXPERIMENTERS INVOLVED MEDICINE, EDUCATION, COMMUNITY SERVICES, SPECIAL SERVICES, AND COMMUNICATIONS TECHNOLOGY.

- HERMES, KERR--

INVESTIGATION NAME- CANADIAN COMMUNICATIONS EXPERIMENTS

NSSOC 10- 76-004A-04

CODE EC/CO-OP

INVESTIGATION DISCIPLINE(S) COMMUNICATIONS

UNKNOWN

PERSONNEL **KËRR** PI -

BRIEF DESCRIPTION THIS EXPERIMENT INVOLVED INVESTIGATION OF PRACTICAL TECHNIQUES FOR USE OF THE SATELLITE COMMUNICATIONS SYSTEMS BEING TESTED. IT INCLUDED COMMUNICATION TECHNIQUES FOR USE IN REDIGITHE, EDUCATION, COMMUNITY DEVELOPMENT OAN INTERACTION, AND DATA TRANSMISSION. IT ALSO INCLUDED DEVELOPMENT OF COMPATIBLE GROUND FACILITIES. ABOUT 30 DIFFERENT EXPERIMENTS BY OVER 20 DIFFERENT ORGANIZATIONS HAVE BEEN APPROVED BY A JOINT WORKING GROUP, WHICH APPROVED AND COORDINATED CANADIAN AND U.S. EXPERIMENTS FOR THIS SATELLITE EQUIPMENT.

INVESTIGATIVE PROGRAM

--- HERMES, VIGNERON------INVESTIGATION NAME- SOLAR ARRAY TECHNOLOGY EXPERIMENT (SATE) INVESTIGATIVE PROGRAM CODE EC/CO-OP NSSDC 10- 76-004A-02 INVESTIGATION DISCIPLINE(S) COMMUNICATIONS PERSONNEL PI - F.R. VIGNERON COMMUN RESEARCH CENTRE BRIEF DESCRIPTION BRIEF DESCRIPTION THIS EXPERIMENT WAS TO STUDY THE MECHANICAL, DYNAMIC, AND ELECTRICAL PROPERTIES OF A NEW TYPE OF EXTENDABLE SOLAR ARRAY OVER AN EXTENDED TIME PERIOD. THE TWO 1.3- X 6.5-M ARRAYS WERE UNFOLDED FROM THEIR PACKS BY UNFURLING A SUPPORTING TUBE THAT WAS ATTACHED TO THE EXTREMITY OF THE ARRAY. PER ----- HERMES, VIGNERON-- -----INVESTIGATION NAME- ATTITUDE CONTROL SYSTEM EXPERIMENT(ACS) NS50C ID- 76-004A-03 INVESTIGATIVE PROGRAM CODE EC/CO-OP INVESTIGATION DISCIPLINE(S) NAVIGATION PERSONNEL PI - F.R. VIGNERON COMMUN RESEARCH CENTRE CUMPUN RESEARCH CENTRE BRIEF DESCRIPTION THIS WAS A TECHNOLOGY EXPERIMENT TO EVALUATE THE DYNAMICS OF SPACECRAFT MECHANICAL FLEXIBILITY ON ACS (ATTITUDE CONTROL SYSTEM) OPERATION AND TO DEMONSTRATE THAT ATTITUDE CONTROL FLIGHT PERFORMANCE IS IN ACCORDANCE WITH STABILITY AND CONTROL THEORY. SPACECRAFT COMMON NAME- IMP-H Alternate Names- PL-713A, Explorer 47 IMP 7, D6197 NSSDC 10- 72-073A LAUNCH DATE- 09/23/72 Launch Site- Cape Canaveral, united states Launch Vehicle- délta WEIGHT- 390. KG SPONSORING COUNTRY/AGENCY UNITED STATES NASA-OSS INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC DRBIT PERIOD- 17702. Min Periapsis- 201599. KN EPOCH DATE- 09/23/72 Inclination- 17.2 Deg Apoapsis- 235639. KM PERSONNEL NG - J.R. HOLTZ SC - E.R. SCHMERLING PN - M.A. DAVIS PS - J.H. KING NASA HERUJUARTERS Nasa headduarters Nasa-gsfc Nasa-gsfc BRIEF DESCRIPTION IMP-H CONTINUED THE STUDY BEGUN BY EARLIER IMP SPACECRAFT OF THE INTERPLANETARY AND MAGNETOTAL REGIONS FROM A NEARLY CIRCULAR ORBIT, NEAR 37 EARTH RADII. THIS 16-SIDED BUM-SHAPED, SPACECRAFT WAS 157 CM HIGH AND 135 CM IN DIAM, IT WAS DESIGNED 10 MEASUME ENERGETIC PARTILLES, PLASMA, AND ELECTRIC AND MAGNETIC FIELDS. THL SPIN AXIS WAS NORMAL TO THE ECLIPTIC PLANE, AND THE SPIN PERIOD WAS 1.3 S. THE SPACECRAFT WAS POWEREO BY SOLAR CELLS AND A CHEMICAL BATTERY. SCIENTIFIC DATA WERE TELEMETERED TO EARTH AT 1600 BPS (WITH A SECONDARY 400-BPS RATE AVALLABLE). RATE AVAILABLES. NSSDC 10- 72-0734-04 ----- IMP-H, BAME INVESTIGATION NAME- NEASUREMENT OF SOLAR PLASMA NSSOC 10- 72-073A-10 INVESTIGATIVE PROGRAM CODE ST INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS PERSONNEL PI - 5.J. BAME OI + J.R. ASBRIDGE LOS ALAMOS SCI LAB Los Alamos sci lab

BRIEF DESCRIPTION BRIEF DESCRIPTION A MEMISPHERICAL ELECTROSTATIC ANALYZER WAS USED TO STUDY THE DIRECTIONAL INTENSITY OF POSITIVE IONS AND ELECTRONS IN THE SOLAR WIND, MAGNETOSHEATH, AND MAGNETOTALL IONS AS HEAVY AS OXYGEN WERE RESOLVED WHEN THE SOLAR WIND TEMPERATURE WAS LOW. ENERGY ANALYSIS WAS ACCOMPLISHED BY CHARGING THE PLATES TO KNOWN VOLTAGE LEVELS AND ALLOWING THEM TO DISCHARGE WITH KNOWN RC TIRE CONSTANTS. IN THE SOLAR WIND, POSITIVE IONS FROM 200 EV TO 5 KEV (15 PERCENT SPACING, 3 PERCENT RESOLUTION) AND ELECTRONS FROM 5 EV TO 1 KEV (30 PEPCENT SPACING, 15 PERCENT RESOLUTION) WERE STUDIED. IN THE MAGNETOSHEATH, POSITIVE IONS FROM 20D EV 10 5 KEV (15 FERCENT SPACING, 3 PERCENT RESOLUTION) AND FROM ; 30 EV TO 2 KEV (30 PERCENT SPACING, 15 PERCENT RESOLUTION) AND ELECTRONS FROM 5 EV TO 1 KEV (30 PERCENT SPACING, 15 PERCENT RESOLUTION) WERE STUDIED, IN THE MACHETOTAIL, POSITIVE IONS FROM 20D EV TO 20 KEV (30 PERCENT SPACING, 15 PERCENT RESOLUTION) AND ELECTRONS FROM 5 EV TO 1 KEV (30 PERCENT RESOLUTION) AND ELECTRONS FROM 5 EV TO 1 TO 20 KEV (15 PERCENT RESOLUTION) WERE STUDIED,

----- IMP-H, BRIDGE------------

INVESTIGATION NAME- MEASUREMENT OF SOLAR PLASMA

INVESTIGATIVE PROGRAM CODE ST NSSDC 10- 72-0734-02

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

RSONNE	1,				
P1 -	H.S.	BRIDGE	MASS	INST OF TECH	
01 -	A.J.	LAZARUS	MASS	INST OF TECH	
01 -	1.H.	BINSACK	MASS	INST OF TECH	
ci -	E.f.	LYON	MASS	INST OF TECH	

BRIEF DESCRIPTION A MODULATED SPLIT-COLLECTOR FARADAY CUP, WHICH WAS PERPENDICULAR TO THE SPACECRAFT SPIN AXIS, WAS USED TO STUDY THE DIRECTIONAL INTENSITY OF POSITIVE IONS AND ELECTRONS IN THE SULAR WIND, TRANSITION REGION, AND MAGNETOTAIL, ELECTRONS WERE MEASURED IN EIGHT LOGARITHMICALLY EQUISPACED CHANNELS BCTWEEN 17 EV AND 7 KEV. POSITIVE IONS WERE MEASURED IN LIGHT CHANNELS BETWEEN SD EV AND 7 KEV. A SPECTRUM WAS OBTAINED EVERY EIGHT SPACECRAFT REVOLUTIONS, ANGULAR INFORMATION WAS OBTAINED IN EITHER 15 EQUALLY SPACED INTERVALS DURING A 360-DEG REVOLUTION OF THE SATELLITE OR IN 15 ANGULAR SEGMENTS CENTERED MORE CLOSELY ABOUT THE SPACECRAFT SUN LINE.

IMP-H/ CLINE---

INVESTIGATION NAME- STUDY OF COSMIC-RAY, SOLAR, AND Magnetospheric electrons

NSSOC 10- 72-0738-13 INVESTIGATIVE PROGRAM

CODE S

INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Cosmic Rays

NASA-GSEC

PERSONNEL PI - T.L. CLINE

PI - T.L. CLINE NASA-GSFC BRIEF DESCRIPTION THIS EXPERIMENT STUDIED GA.ACTIC AND SOLAR ELECTRONS AND POSITRONS IN THE KINETIC ENERGY RANGE 50 KEV TO 2 MEV. INFORMATION ON PROTONS BETWEEN 0.5 AND 4.D MEV WAS ALSO OBTAINED. A COLLIMATED SILLERNE CRYSTAL SCINTILATOR LOOKING PERPENDICULAR TO THE SPACECRAFT SPIN AXIS SERVED AS THE PRINCIPAL DETECTOR. A SIMILAR, FULLY SHIEDEL CRYSTAL SERVED AS THE OF ELECTRONS AND PROTONS GENERATED WITHIN THE PRINCIPAL DETECTOR BY GAMMA RAYS AND NEUTRONS, RESPECTIVELY. A FULLY SHIELDED CSI CRYSTAL SERVED AS A GAMMA-RAY SPECTROMETER AND WAS USED IN COINCIDENCE WITH THE PRINCIPAL DETECTOR DISTINGUISH ELECTRONS FROM POSITRONS. COUNT RATES FROM EACH DETECTOR OBTAINED IN EIGHT ANGULAR SECTORS PER REVOLUTION WERE GENERATED IN THE PRINCIPAL DETECTOR BY THE FIGHT AND HAS LECTRONS FROM POSITRONS. TO NOT AND SHAPE OF THE FLASE STUDIES AND SHAPE WERE TO TIELD ENERGY (10 PERCINT RESOLUTION) AND PARTICLE SPECIES INFORMATION.

-- IMP-H, FRANK------

INVESTIGATION NAME- MEASUREMENT OF LOW-ENERGY PROTONS AND Electrons

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

U OF LOWA

PERSONNEL PI - L.A. FRANK

62

BRIEF DESCRIPTION THIS EXPERIMENT MEASURED THE ENERGY SPECTRA OF LOW-ENERGY ELECTRONS AND PROTONS IN THE GEOCENTRIC RANGE 30 TO 40 R(E) TO FURTHER UNDERSTAND GEORAGNETIC STORMS, AURORA, TAIL AND NEUTRAL SHEET, AND OTHER MAGNETOSPHERIC PHENOMENA. THE DETECTOR WAS A DUAL-CHANNEL, CURVED-PLATE, ELECTROSTATIC ANALYZER (LEPEDEA LOW-ENERGY PROTON AND ELECTRON DIFFERENTIAL ANALYZER) WITH 16 ENERGY INTERVALS BETWEEN 5 EV AND 50 KEV. IT HAD AN ANGULAR FIELD OF WIEW OF 9 DEG BY 25 DEG IN FOUR DIRECTIONS PERPENDICULAR TO THE SPACECRAFT SPIN ANIS. THE DETECTOR WAS OPERATED IN ONE OF TWO MODES (1) OWE PROVIDING GOOD ANGULAR RESOLUTION (16 DIRECTIONS FOR EACH PARTICLE EMERGY BAND) DACE EACH 272 S, AND (2) OKE PROVIDING GOOD PENFORAL RESOLUTION TO EACH 272 S, AND (2) ONE PROVIDING GOOD PENPORAL RESOLUTION IN WHICH THE ENTIRE ENERGY RANGE IN FOUR DIRECTIONS WAS MEASURED EVERY 68 S.

-- IMP-H, GLOECKLER---

INVESTIGATION NAME- IONS AND ELECTRONS IN THE ENERGY RANGE TO 2 HE

NSSDC	10-	72-073A-93	INVESTIGATIVE CODE ST	PROGRAM

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

P1 -	G.	GLOECKLER
	C.Y.	
01 -	Ď.K.	HOVESTADT

RERSONNEL

U OF MARYLAND U OF ARIZONA RPI-EXTRATERR PHYS

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO DETERMINE THE COMPOSITION AND EMERGY SPECTRA OF LOW-EMERGY PARTICLES ASSOCIATED WITH SOLAR ACTIVITY AND INTERPLAMETARY PROCESSES. THE DETECTORS USED WERE (1) AN ELECTNOSTATIC ANALYZER (TO SELECT PARTICLES OF THE DESIGNATED EWERGY PER CHARGE) COMBINED WITH AN ARRAY OF WINDOWLESS SOLID-STATE DETECTORS (TO MEASURE THE EMERGY LOSS) AND SURFOUNDED BY AN ANTICOINCIDENCE SHELDING AND (2) A PARTICLE TELESCOPE CONSISTING OF A SILICON SURFACE BARRIER DETECTOR AND A FLAT TWO-CHAMBER PROPORTIONAL COUNTER EMCLOSED IN AM ANTICOINCIDENCE, SCINTILLATOR CUP-, THE EXPERIMENT MEASURED PARTICLE ENERGIES FROM 0.1- TO 2-MEV PER CHARGE IM 12 BANDS AND UNIQUELT IDENTIFIED POSITRONS AND ELECTROMS AS WELL AS NUCLEI WITH CHARGES OF Z FROM 1 TO B (CHARGE GROUP RESOLUTION FOR Z BETWEEN 9 AND 28J, TWO 1000-CHAMMEL PULSE HEIGHT ANALYZERS, ONE FOR EACH ELEMENT OF THE TELESCOPE, WERE HICLUDED IN THE EXPERIMENT PANDAD, THE TELESCOPE, WERE HICLUDED IN THE EXPERIMENT PANDAD. THE TELESCOPE, WERE HICLUDED IN THE DENTERNIT PANDAD. THE TELESCOPE, WERE HICLUDED IN THE DENTERNIT PANDAD. THE TELESCOPE, WERE HICLUDED IN THE DEST ONE FOR EACH BLEMENT OF THE TELESCOPE, WERE HICLUDED IN THE EXPERIMENT PANDAD. THE TELESCOPE, WERE HICLUDED IN THE EXPERIMENT PANDAD. THE TELESCOPE, WERE HICLUDED IN THE DEST DUE T/, EXPOSURE TO UW RADIATION. BRIEF DESCRIPTION

-- IMP-H. KRINIGIS-

INVESTIGATION NAME- CHARGED PARTICLE MEASUREMENTS EXPERIMENT

INVESTIGATIVE PROGRAM NSSDC 10- 72-0734-08

INVESTIGATION DISC*PLINE(S) PARTICLES AND FIELDS

PERSONNEL		
PI - S.M.	KRIMIGIS	APPLIED PHYSICS LAB
01 - T.P.	ARMSTRONG	U OF KANSAS
- A. L - 10	VAN ALLEN	U OF IOWA

BRIEF DESCRIPTION THREE SOLID-STATE DETECTORS IN AN ANTICOINCIDENCE PLASTIC SCINITULATOR OBSEVED ELECTRONS BETWEEN 0.2 AND 2.5 MEV, PROTONS BETWEEN 0.3 AND SOO MEV, ALPHA PARTICLES BETWEEN 2.0 AND 200 MEV, HEAVY PARTICLES WITH ATOMIC NUMBERS RANGING FROM 2 TO S WITH ENERGIES GREATER THAN 8 MEV, HEAVY PARTICLES WITH 2 VALUES RANGING BETWEEN 6 AND 8 WITH ENERGIES GREATER THAN 32 REV, AND INTEGRAL PROTONS AND ALPHAS OF EVERGIES GREATER THAM SO MEV/NUCLEON, ALL WITH DYNAMIC RANGES OF 1 TO 1 MILLION (PER SQ CM-S-STER). FIVE THIN WINDOW GEIGER-WIELLER TUBES OBSERVED ELECTRONS OF ENERGY GREATER THAM 15 KEV, PROTONS OF ENERGY SKEATER THAN 250 KEV, AND X-RAYS WITH WAVELENGTHS BETWEEN 2 AND 10 A. ALL WITH A DYNAMIC RANGE OF 10 TG 100 MILLION (PER SG CM-S-STER). PARTICLES AND X-RAYS PRIMAMILY OF SOLAR ORIGIN WERE STUDIED, BUT THE DYNAMIC RANGE AND RESOLUTION OF THE INSTRUMENT PERMITTED COSMIC RAYS AND MAGNETOTAIL PARTICLES TO BE OBSERVED.

- IMP-H, NCDONALD-----

INVESTIGATION NAME- SOLAR AND CRISNIC-RAY PARTICLES

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) Particles and fields

PERSONNEL		
P1 - F.B.	NCDONALD	NASA-GSFC
01 - D.E.	HAGŪE	UNKNDWN
01 - B.J.	TEEGARSEN	NASA-GSFC

N350C 10- 72-073A-09

OI - B.J. TEEGARSEN NASA-GSFC BRIEF DESCRIPTION THE GSFC COSMIC-RAY EXPERIMENT MEASURED ENERGY SPECTRA, COMPOSITION, AND ANGULAR DISTRIBUTION OF SOLAR AND GALACTIC ELECTROMS, PROTONS, AND MEAVIER NULLEI UP TO Z = 30. THREE DISTINCT DETECTOR SYSTEMS WERE USED. THE FIRST STSTEM CONSISTED OF A PAIR OF SOLID-STATE TELESCOPES THAT MEASURED INTEGRAL FLUXES ABOVE 150, 350, AND 700 XEV AND OF PROTONS ABOVE 0.05, 0.15, 0.70, 1.0, 1.2, 2.0, 2.5, S.0, 15, AND 25 MEV. EXCEPT FOR THE JDS-MEV PROTON MODE, ALL COUNTING MODES MAS A SOLID-STATE DE/DX VS E TELESCOPE THAT MEASURED PERPENDICULAR TO THE SPIN AXIS. THIS TELESCOPE THAT LOOKED PERPENDICULAR TO THE SPIN AXIS. THIS TELESCOPE THAT LOOKED COUNTS OF PRATICLES IN THE 0.5- TO 4-MEV/NUCLEON RANGE, WITH NO CHANGE RESOLUTION, WERE OBTAINED AS COUNTS IN THE DE/DX. BUT NOT IN THE E. SINSOR. THE THIRD DETECTOR SYSTEM MAS THREFELEMENT CSI SCINTILIATOR TELESCOPE MASS. THE MAS A ANDLE OF 30 DEG WITH RESPECT TO THE SPIN AXIS. THE INSTRUMENT RESPONDED TO ELECTRONS BETWEEN 2 AND 12 MEV AND NUCLEI FROM TO IN THE ENROR TELESCOPE WHORS AXIS MADE AN ANGLE OF 30 DEG WITH RESPECT TO THE SPIN AXIS. THE INSTRUMENT RESPONDED TO ELECTRONS BETWEEN 2 AND 12 MEV AND NUCLEI FROM TO IN THE ENRORY RANGE 2U TO SOD MEV/NUCLEON. FOR

PARTICLES BELON 80 MEV, THIS INSTAUMENT ACTED AS A DE/DX Defector. Above 80 Mev, it acted as a bidirectional triple de/dx defector. Flux directionality information was obtained by dividing certain pobritons of the data from fach defector system into eight angular sectors.

- IMP-H, OGILVIE-----

INVESTIGATION NAME- SOLAR WIND ION COMPOSITION

N550C 10- 72-0734-12 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Particles and fields

NASA-GSFC

PERSONNEL PI - K.W. OGILVIE

BRIEF DESCRIPTION AN ELECTROSTATIC ANALYZER AND WEIN-TYPE VELOCITY SELECTOR WERE USED TO GAIN EXPLORATORY DATA ON HEAVY ION COMPOSITION IN THE SOLAR WIND. THE BULK VELOCITES OF 4 HE++ 4 HE+ 3 HE++; AND O (ISOTOPES INDISTINGLISHABLE) IONS IN ALL IONIATION STATES WERE SEPARATELY SUDIED. DURING 30 SUCCESSIVE SPACECRAFT SPIN PERIODS, IONS OF A GIVEN SPECIES WERE STUDIED IN 30 LOGARITHMICALLY EQUISPACED BULK VELOCITY CHANNELS FROM 200 TO 600 KW/S. A COMPLETE SET OF MEASURENETS REQUIRED ABOUT 10 MIN AND CONSISTED OF 30 ONE-STEP SEQUENCES FOR 4 HE++ IONS AND FIVE 30-STEP SEQUENCES FOR EACH OF THE THREE OTHER SPECIES.

--- INP-H# SCARF----

INVESTIGATION NAME- PLASMA WAVE

NSSDC 10- 72-0734-11

INVESTIGATIVE PROGRAM INVESTIGATION DISCIPLINE(S)

MAGNETOSPHERIC PHYSICS PARTICLES AND FIELDS

PERSONNEL		
P1 - F.L.	SCARF	TRW STATEMS GROUP
01 - G.R.	CROOK	GAINE: M. CROOK ASSOC
01 - I.M.	GREEN	TRW SISTEMS GROUP
01 - R.W.	FREDERICKS	TRW EYSTEMS GROUP

01 - R.W. FREDERICKS DRIEF DESCRIPTION ELECTRIC FIELD COMPONENTS PERPENDICULAR TO THE SPACECRAFT ELECTRIC FIELD COMPONENTS PERPENDICULAR TO THE SPACECRAFT SPIN AXIS AND THE MAGNETIC FIELD COMPONENT PARALLEL TO THAT AXIS WERE MEASURED BY AN ELECTRIC DIPOLE ANTENNA AND A SEARCH COLL MAGNETONETER, BOTH SENSORS WERE MOUNTED ON A 3.05-M BOCM. DATA WERE OBTAINED IN EIGHT FREQUENCY CHANNELS FROM TODE, TWO CHANNELS, CENTERED AT 67 AND 600 HZ, HAD 10-DB FALL-OFF POINTS OF 17 AND 150 HIZ, AND 270 AND 810 HZ. RESPECTIVELT, THE REMAINING SIX CHANNELS WERE NATHON-BANDUDITH CHANNELS CHERED AT 1,3, 2,3, 5,4, 10.5, 30, AND 70 KHZ. IN THE NORMAL MODE, THE SPACECRAFT SPIN PERIOD. DURING THE NEXT PERIOD, THE SEARCH COLL WAS SAMPLED MANY TIMES IN THE SAME FREQUENCY CHANNEL MARY TIMES DURING A GIVEN MEASUREMENT PERIOD (COMPARABLE TO THE SPACECRAFT SPIN PERIOD. DURING THE NEXT PERIOD, THE SEARCH COLL WAS SAMPLED MANY TIMES IN THE SAME FREQUENCY CHANNEL. NEXT, THE ANTENNA WAS SAMPLED IN THE SAME FREQUENCY CHANNEL. NEXT, THE STIST SAMPLED IN THE SAME FREQUENCY CHANNEL NEXT, THE INCAEMENTED, AND THE SAMELED SENSORS WERE ALTESMATED UNTIL A FULL SET OF DATA MAS OBTAINED IN 16 MEASUREMENT PERIODS (APPROXIMATELY 20 S). IN THE SNAPSHOT MODE, OHLY ELECTRIC FIELD DATA WERE TRANSMITTED, AS FOLLOWS. THE ANTENNA WAS SAMPLED IN A GIVEN FREQUENCY CHANNEL MANY TIMES DURING A GIVEN MEASUREMENT PERIOD. IN THE NAPSHOT MODE, OHLY ELECTRIC FIELD DATA WERE TRANSMITTED, AS FOLLOWS. THE ANTENNA WAS SAMPLED IN THO SEQUENCES OF EIGHT FREQUENCY CHANNELS. THIS TWO-PERIOD MEASUREMENT PERIOD. IN THE NAPSHOT MODE, ONLY WELL, AND NO USABLE DATA WERE GOTAINED SIDIED IN EVERY OTHER HEINGNENT PERIODS. IN ADDITION, AN AALOG RODE, SAMPLING THE SONJUNCTION WITH THE SPECIAL PURPOSE ANALOG RODE, SAMPLING THE CONJUNCTION WITH THE SPECIAL PURPOSE ANALOG RODE, SAMPLING THE STATEMAR AND SEARCH COIL FROM 10 TO 100 HZ, WAS USED IN CONJUNCTION WITH THE SPECIAL PURPOSE ANALOG SUE INTEFFERENCE WAS EXPERIENCED FROM THE ASYMMETRIC PLASHA SHEATH ASSO

- IMP-H, SIMPSON----

INVESTIGATION NAME- SOLAR FLARE HIGH-Z/LOW-E AND LOW-Z 1 SOTOPE

N55DC 10- 72-0734-07

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(5) PARTICLES AND FIELDS

PERSONNEL PI - J.A. SIMPSON GI - M. GARCIA-MUNOZ

GRIEF DESCRIPTION

GRIEF DESCRIPTION THIS EXPERIMENT USED TWO TELESCOPES TO MEASURE THE COMPOSITION AND ENERGY SPECTRA OF SOLAR (AND GALACTIC) PARTICLES ABOVE ABOUT 0.5 MEV/NUCLEON. THE MAIN TELESCOPE CONSISTED OF FIVE COLIMEAR ELEMENTS (THREE SOLID STATE, ONE CSI, AND ONE SAPPHIRE CERENKOY SURROUNDED BY A PLACTIC ANTICOINCIDENCE SHIELD. THE TELESCOPE HAD A 60-DEG, FULL-ANGLE ACCEPTANCE CONE WITH 1TS AXIS PAPPORIMATELY NORMAL TO THE SPACECRAFT SPIN AXIS PERMITTING 8-SECTORED INFORMATION ON PARTICLE ARIVAL DIRECTION. FOUR ELEMENTS OF THE MAIN TELESCOPE WERE PULSE-HEIGHT ANALYZED, AND THE MAIN OF THE ELEMENTS H THROUGH NI OR OF THE ELECTRONS AND THE ISOTOPES OF THE AND HE AND _IGHT NUCLEI. A SELECTION-PRIORITY SCHEME WAS INCLUDED TO PERMIT SAMPLING OF LESS ABUNDANT PARTICLE SPECIES UNDER NORMAL AND SOLAR-FLARE CONDITIONS. THE LOW-ENERGY TELESCOPE WAS ESSENTIALLY A TWO-ELEMENT, SHIELDED, SOLID-STATE DETECTOR WITH AXS PULS-HEIGHT ANALYZED, AND DATA WERE RECORDED BY SECTORS.

-- INP-H, STONE---------

INVESTIGATION NAME- ELECTRONS AND HYDROGEN AND HELIUM ISOTOPES

N550C 10- 72-073A-06

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL PI - E.C. STONE DI - R.E. VOGT

CALIF INST OF TECH CALIF LNST OF TECH

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MEASURE SOLAR AND GALACTIC ELECTRONS, POSITRONS, AND NULLEJ, AND TO SEPARATE ISOTOPES THROUGH OXYGEN. THE ENERGY RANGES COVERED WERE 0.16 TO 5 MEV (ELECTRONS), D.16 TO 2 MEV (POSITRONS), AND ABOUT 1 TO 40 MEVYN (NULLEI), THE INSTRUMENT WAS A TELESCOPE CONSISTING OF 11 COLIMEAR, FULLY DEPLETED, SILICON SURFACE BARRIER DETECTORS INSIDE A PLASTIC SCINTILLATOR ANTICOINCIDENCE SMIELD. FOUR OF THE TOP FIVE SISNORS WERE ANNULAR WHILE THE REMAINDER WERE SOLID DISKS. THIS ARRANGEMENT GAVE NAAROW GEOMETRY (ANTICOINCIDENCE IN ANNULAR SENSORS) AND NIOE GEOMETRY MODES WITH HALF-ANGLE ACCEPTANCE COMES OF ABOUT 24 AND 36 DEG. THE TELESCOPE AXIS WAS PERPENDICULAR TO THE SPACERAFT SPIN AXIS. DATA RETURNED CONSISTED OF 8-SECIDRED AND SPIN-INTEGRATED COUNT RATES FOR 8 DIFFERENT COINCIDENCE/ ANTICOINCIDENCE MODES AND 2 PARAMETER PULSE HEIGHT ANALYSES FOR 32 PARTICLES EVERY 20.48 S. THE COINCIDENCE MODE CHOSEN FOR PULSE HEIGHT AMALYSIS IN ANY G.46 S INTERVAL WAS FIXED BY A FIVE-LEVEL PRIORITY SYSTEM. THE PRINCIPAL CONTRIBUTORS TO EACH COINCIDENCE MODE RATE WERE ---(1) 0.16- TO 5-MEV ELECTRONS AND 13- TO 43-MEV/N NUCLEI, (2) 1-TO 3-MEV ELECTRONS, (6) 1.2- TO 2.4-MEV/N NUCLEI, (7) 4- TO 3-MEV ELECTRONS, (6) 1.2- TO 2.4-MEV/N NUCLEI, (7) 4- TO 3-MEV HALECTRONS, (6) 1.2- TO 3.4-MEV/N NUCLEI ABOVE 30 MEV/N.

--- IMP-H, WILLIAMS------

INVESTIGATION NAME- ENERGETIC ELECTRONS AND PROTONS

NSSDC 10- 72-0734-05 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNES

CKJURNEL			
PI - 0.J.	WILLIAMS	NOAA-ERL	
01 - C.O.	BOSTROM	APPLIED PHYSICS LA	B
0I - J'H'	TRAINOR	NASA-GSFC	

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE PURPOSES OF THIS EXPERIMENT WERE (1) TO STUDY THE PROPAGATION CHARACTERISTICS OF SOLAR COSMIC RAYS THROUGH THE PROPAGATION CHARACTERISTICS OF SOLAR COSMIC RAYS THROUGH THE GEOMAGNETICATEL AND WEAR AND PROTON PATCHES THROUGHOUT THE GEOMAGNETIC TAIL AND NEAR AND THROUGH THE FLANKS OF THE MAGNETOPAUSE, AND (3) TO STUDY THE ENTRY OF SOLAR COSMIC RAYS INTO THE GEOMAGNETIC FIELD. THE INSTRUMENTATION CONSISTED OF A THREE-ELEMENT TELESCOPE CONFIGURATION EMPLOYING SOLID-STATE DETECTORS WERE USED TO DEFLECT ELECTRONS DEFLECTED BY THE MAGNET. THO ANDITIONAL SOLID-STATE DETECTORS WERE USED TO DETECTORS WERE USED TO DETECT. THE SLECTRONS DEFLECTED BY THE EXPERIMENT WAS DESIGNED TO MERSUME (1) PROTON FLUKES FROM 30 KEV TO GREATER THAN 8.6 MEV IN SIX RANGES, (2) ELECTRON FLUXES FROM 30 KEV TO GREATER THAN 15 KEV, (4) ALPHA PARTICLES FROM 30 KEV, TO GREATER THAN 1.6 MEV. 2.2 TO 8.8 MEV. AND 8.8 TO 35 MEV, AND (5) CHARGED PARTICLES OF 2 GREATER THAN 2.A THE EREATER THAN 0.5 MEV.

SPACECRAFT COMMON NAME- IMP-J Alternate Names- PL-723A, IMP 8 Explorer 50, 6893

N350C 10- 73-078A

LAUNCH DATE- 10/26/73 WEIGHT- 371. KG LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- DELTA

SPONSORING COUNTRY/AGENCY UNITED STATES

INITIAL ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 17286, Min Periapsis- 141224, Km EPOCH DATE - 10/27/73 Inclination - 28.7 Deg Apoapsis - 288940. KM PERSONNEL NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSFC NASA-GSFC

NASA-055

MG - J.R. HOLTZ SC - E.R. SCHMERLING PM - M.A. DAVIES FS - J.H. KING

BRIEF DESCRIPTION IMP B (EXPLOREN SD), THE LAST SATELLITE OF THE IMP SERIES, WAS A DRUM-SHAPED SPACECRAFT, 133.6 CM ACROSS AND 157.4 CM HIGH, INSTRUMENTED FOR INTERPLANETARY AND MAGNETOTAIL STUDIES OF COSMIC RAYS, ENERGETIC SOLAR PARTICLES, PLASMA, AND ELECTRIC AND MAGNETIC FIELDS. ITS INITIAL ORBIT WAS MORE ELLIPTICAL THAN INTENDED, WITH ANDORE AND PERIGEE DISTANCES OF ABOUT 45 AND 25 EARTH RADII. ITS ECCENTRICITY DECEASED AFTER LAUNCH. THE SPACECRAFT SPIN AXIS WAS NORMAL TO THE ECLIPTIC PLANE, AND THE SPIN RATE WAS 23 RPM. THE DATA TELEMETRY RATE WAS 160D BPS.

INVESTIGATION NAME- ELECTROSTATIC FIELDS

-- IMP-J, AGGSON------

NSSDC 10- 73-0784-11

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) Ignospheres and radio physics Particles and fields

PERSONNEL

PI - T.L. AGGSON OI - J.P. HEPPNER

BRIEF DESCRIPTION

DRIEF DESCRIPTION THE INSTRUMENT WAS DESIGNED TO MEASURE AMBIENT ELECTRIC FIELDS IN THE SOLAR WIND AND THE EARTH'S MAGNETOSHEATH DC UP TO I KH2 IN FREQUENCY. THE SENSOR CONSISTED OF A PAIR OF 70-M WIRE ANTENNAS (140 M, TIP-TO-TIP), WHICH WERE HELD RIGID BY WIRES WERE INSULATED FROM THE PLASMA, EXCEPT FOR THEIR SHORT DUTER SECTIONS, TO REMOVE THE ACTIVE PROBE AREA FROM THE PACECRAFT SMEATH. THE ANTENNA SERVED AS A DOUBLE FLOATING PROBE. THE DC ELECTRIC FIELD PROJECTED INTO THE PLAME PERPENDICULAR TO THE SPIN AXIS (THE ECLIPTIC PLAME), AND MEASUREMENTS WERE OBTAINED EVERY 1/4 SPACECAFT REVOLUTION (ABOUT 0.75 S). ULF AND VLF MEASUREMENTS WERE OBTAINED USING SEVEN 60 PERCENT BANDMIDTH FILTERS WITH CENTER FREQUENCY CHANNELS HAD AN INTRINSIC SENSITIVITY OF 1.0E-S V/M, AND A PEAK RANGE OF 1.0E-2 V/M. HOWEVER, THE EFFECTIVE LOW-FREQUENCY FILTER THRESHOLD WAS DETERMINED BY INTERFERENCE DUE TO HARMOMICS OF THE SPACECAFT SINNING WITHIN AN ASYMMETRIC SHEATH. THE OTHER MAJOR LIMITATION WAS ALSO DUE TO SHEATH ABOUT 10 PARTICLES CM TO THE POWER -3, THE SHEATH OVERLAPPED THE ATTIVE ANTENNA PORTIONS AND PRECLUDED MEANINGFUL MEASUREMENTS OF AMBIENT FOR THE POWER -3, THE SHEATH OVERLAPPED THE ATTIVE ANTENNA PORTIONS AND PRECLUDED MEANINGFUL MEASUREMENTS OF AMBIENT CONDITIONS.

-- IMP-J, BARE-

INVESTIGATION NAME- MEASUREMENT OF SOLAR PLASMA

NSSDC ID- 73-078A-10 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL P1 - S.J. BAME 01. - J.R. ASBRIDGE .

BRIEF DESCRIPTION A HEMISPHERICAL ELECTROSTATIC ANALYIER MEASURED THE DIRECTIONAL INTENSITY OF POSITIVE IONS AND ELECTRONS IN THE SOLAR WIND, RAGNETOSHEATH, AND MAGNETOTALL IONS AS HEAVY AS OXYGEN WERE RESOLVED WHEN THE SOLAR WIND TEMPERATURE IS LOW. ENERGY ANALYSIS WAS ACCOMPLISHED BY CHARGING THE PLATES TO KNOWN WOLTAGE LEVELS AND ALLOWING THEM TO DISCHARGE WITH KNOWN RC TIME CONSTANTS. IN THE SOLAR WIND, POSITIVE IONS FROM 200 EV TO S KEV (15 PERCENT SPACING, 3 PERCENT RESOLUTION) AND ELECTRONS FROM 5 EV TO 1 KEV (3D PERCENT SPACING, 15 PERCENT RESOLUTION) WERE STUDIED. IN THE MAGNETOSHEATM, POSITIVE IONS

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NASA-GSFC NASA-GSFC

FROM 200 EV TO 5 KEV (15 PERCENT SPACING, 3 PERCENT RESOLUTION) AND FROM 200 EV TO 20 KEV (30 PERCENT SPACING, 15 PERCENT RESOLUTION) AND ELECTRONS FROM 5 EV TO 1 KEV (30 PERCENT SPACING, 15 PERCENT RESOLUTION) WERE STUDIED. IN THE MAGHETOTAIL, POSITIVE IONS FROM 200 EV TO 20 KEV (30 PERCENT SPACING, 15 PERCENT RESOLUTION) AND ELECTRONS FROM 5 EV TO 1 KEV (30 PERCENT SPACING, 15 PERCENT RESOLUTION) AND FROM 100 EV TO 20 KEV (15 PERCENT RESOLUTION) WERE STUDIED.

INVESTIGATION NAME- MEASUREMENT OF SOLAR PLASMA

--- IMP-J, BRIDGE-----

NSSDC 10- 73-078A-02 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) Particles and fields

PERSONNEL		
PI - 845.	BRIDGE	MASS INST OF TECH
01 - A.J.	LAZÁRUS	MASS INST OF TECH
0I - J.H.	BINSACK	MASS INST OF TECH
01 - E.F.	LYON	MASS INST OF TECH

BRIEF DESCRIPTION

BRIEF DESCRIPTION A MODULATED SPLIT-COLLECTOR FARADAY CUP, PERPENDICULAR TO THE SPACECRAFT SPIN AXIS, WAS USED TO STUDY THE DIRECTIONAL INTENSITY OF POSITIVE IONS AND ELECTRONS IN THE SOLAR WIND, TRANSITION REGLON, AND MACHETOTALL. ELECTRONS WERE STUDIED IN FIGHT LOGARITHMICALLY EQUISPACED ENERGY CHANNELS BETWEEN 17 EV AND 7 KEV. POSITIVE IONS WERE STUDIED IN FIGHT CHANNELS BETWEEN 50 EV AND 7 KEV. A SPECTRUM WAS OBTAINED EVERY EIGHT SPACECRAFT REVOLUTIONS. ANGULAR INFORMATION WAS OBTAINED IN EITHER 15 EQUALLY SPACED INTERVALS DURING A 360-DEG REVOLUTION OF THE SATELLITE OR MORE CLOSELY ABOUT THE SPACECRAFT SUMLINE.

---- IND-J. FRANK-----

INVESTIGATION NAME- MEASUREMENT OF LOW-ENERGY PROTONS AND Electrons

NSSDC 10- 73-0784-04 INVESTIGATIVE PROGRAM

CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

U OF LOWA

PERSONNEL P1 - L.A. FRANK

ERIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MEASURE THE ENERGY SPECTRA OF LOW-ENERGY ELECTRONS AND PROTONS IN THE GEOCENTRIC RANGE 3D TO 40 R(E) TO GIVE FURTHER DATA ON GEOMAGNETIC STORMS, AURORA, TAIL AND NEUTRAL SHEET, AND OTHER MAGNETOSPHERIC PHENOMENA. THE DETECTOR WAS A DUAL-CHANNEL CURVED PLATE ELECTRON DIFFERENTIAL ANALYZER) WITH 16 ENERGY FROTON AND ELECTRON DIFFERENTIAL ANALYZER) WITH 16 ENERGY INTERVALS BETWEEN 5 EV AND 50 KEV. IT HAD AN ANGULAR TIELD OF VIEW OF JO DEG BY 25 DEG. THE DETECTOR WAY BE OPERATED IN ONE OF TWO MODES -- (1) ONE PROVIDING GOOD ANGULAR RESOLUTION (16 DIRECTIONS FOR FRACH PARTICLE ENERGY BAND) ONCE EACH 272 5, AND (2) ONE PROVIDING GOOD TEMPORAL RESOLUTION IN WHICH THE ENTIRE ENERGY RANGE IN FOUND DIRECTIONS IS MEASURED EVERY 68 5.

--- IMP-J, GLOECKLER--

INVESTIGATION NAME- SOLID-STATE DETECTORS

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL U OF MARYLAND U OF ARIZONA Mpi-extraterr Phys PI - G. GLOECKLER Ol - C.Y. FAN Ol - D.K. HOVESTADT GLOECKLER

NSSDC 10- 73-0784-03

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO DETERMINE THE COMPOSITION AND EMERGY SPECTRA OF LOW-EMERGY PARTICLES OBSERVED DURING SOLAR FLARES AND 27-DAY RECURRENT EVENTS. THE DETECTORS USED INCLUDES (1) AN ELECTROSTATIC ANALYZER (TO SELECT PARTICLES OF THE DESIRED EMERGY PER CHARGE) COMBINED WITH AN ARRAY OF THE DESIRED EMERGY PER CHARGE) COMBINED WITH AN ARRAY OF HINDOULES'S SOLLO-STATE DETECTORS (TO MEASURE THE EMERGY LOSS) AND SURROUNDED BY AN ANTICOINCIDENCE SHIELDING AND (2) A THIN WINDOW PROPORTIONAL COUNTER, SOLLO-STATE PARTICLE TELESCOPE. THE EXPERIMENT MEASURES PARTICLE EMERGIES FRAN 0.1 TO 10 MEV PER CHARGE IN 12 BANDS AND UNIQUELY IDENTIFIES POSITRONS AND ELECTRONS AS WELL AS NUCLEI WITH CHARGES OF Z FROM 1 TO 8 (NO CHARGE RESOLUTION FOR Z GREATER THAN 80. TWO 100D-CHANNEL PULSE HEIGHT ANALYZERS, ONE FOR EACH DETECTOR, ARE INCLUDED IN THE EXPERIMENT PAYLOAD.

--- THP-J. GURNETT----

INVESTIGATION NAME- ELECTROSTATIC WAVES AND RADIO NOISE INVESTIGATIVE PROGRAM N550C 10- 73-0784-12

CODE ST

INVESTIGATION DISCIPLINE(5) IONOSPHERES AND RADIO PHYSICS Particles and fields

U OF 1.744 NASA-GSEC U OF IDWA

PERSONNEL PI - D.A. GURNET3 OI - T.L. AGGSON OI - G.W. PFEIFFER BRIEF DESCRIPTION

BRIEF DESCRIPTION A WIDE-BAND RECEIVER WAS USED TO OBSERVE HIGH-RESOLUTION FREQUENCY-TIME SPECTRA, AND A SIX-CHANNEL NARROW-HAND RECEIVER WITH A VARIABLE CENTER FREQUENCY WILL BE USED TO OBSERVE WAVE CHARACTERISTICS. THE RECEIVERS OPERATED FROM THREE ANTENNA SYSTEMS. THE FIRST SYSTEM CONTAINED A PAIR OF LONG DIPOLE ANTENNAS LONE, EXTENDABLE TO 400 FT, NORMAL TO THE SPACERAFT SPIN AXIS, AND THE OTHER ANTENNA, EXTENDABLE TO 20 FT, ALONG THE SPIN AXIS, AND THE OTHER ANTENNA, EXTENDABLE TO 20 FT, ALONG THE SPIN AXIS, AND THE OTHER ANTENNA, EXTENDABLE TO 20 FT, ALONG THE SPIN AXIS, AND THE OTHER ANTENNA, EXTENDABLE TO 20 FT, ALONG THE SPIN AXIS, AND THE OTHER ANTENNA, EXTENDABLE TO 20 FT, ALONG THE SPIN AXIS, AND THE OTHER ANTENNA, EXTENDABLE TO 20 FT, ALONG THE SPIN AXIS, AND THE OTHER ANTENNA, EXTENDABLE TO 20 FT, ALONG THE SPIN AXIS, AND THE OTHER ANTENNA, THE THIRD SYSTEM CONSISTED OF A BOOM-MOUNTED 20-IN, SPIN AXIS DIPOLE. THE MAGNETIC AND ELECTRIC FIELD INTENSITIES AND FREQUENCY SPECTRA, POLARIZATION, AND DIRECTION OF ARTIVAL OF MATURALLY OCCURRING RADIO NOISE IN THE MAGNETOSPHERE WERE OBSERVED. PHENOMENA STUDIED WERE THE TIME-SPACE DISTRIBUTION, ORIGIN, FROPARATION, DISPERSION, AND OTHER CHARACTERISTICS OF RADIO NOISES OCCURRING ACROSS AND ON EITHER SIDE OF THE MAGNETOSPHERIC BOUNDARY REGION. THE FREQUENCY RANGE FOR ELECTRIC FIELDS WAS 0.3 HZ TO 200 KHZ AND FOR MAGNETIC FIELDS, 11 WAS 20 HZ TO 200 KHZ.

- INP-1, KRINIGIS++++-----

CODE ST

INVESTIGATION NAME- CHARGED PARTICLE MEASUREMENTS Experiment

N55DC 10- 73-078A-08 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

APPLIED PHYSICS LAU U of Kansas U of Iowa

PERSONNEL P1 - S.M. KRIMIGIS 01 - T.P. Armstrong 01 - J.A. VAN ALLEN

GREATER THAM 25 KEV, AND X-RAYS WITH WAVELENGTHS BETWEEN 2. AND SERVED. THRE SOLID-STATE DETECTORS IN AN ANTICOINCIDENCE PLASTIC SCINTILLATOR OBSERVED ELECTORS BETWEEN 0.2 AND 2.5 MEV, PROTONS BETWEEN 0.3 AND 500 MEV, ALPHA PARTICLES BETWEEN 2.0 AND 200 MEV, HEAVY PARTICLES WITH 2 VALUES RANGING FROM 2 TO 5 WITH ENERGIES GREATER THAN 8 MEV. HEAVY PARTICLES WITH 2 VALUES RANGING BETWEEN 6 AND B WITH ENERGIES GREATER THAN 32 MEV. AND INTEGRAL PROTONS AND ALPHAS OF ENERGIES GREATER THAN 32 MEV. AND INTEGRAL PROTONS AND ALPHAS OF ENERGIES GREATER THAN 32 MEV. AND INTEGRAL PROTONS AND ALPHAS OF ENERGIES GREATER THAN 32 MEV. AND INTEGRAL PROTONS OF ENERGY GREATER THAN 15 KEV, PROTONS OF ENERGY ELECTRONS OF ENERGY GREATER THAN 15 KEV, PROTONS OF ENERGY GREATER THAM 250 KEV. AND X-RAYS WITH WAVELNGTHS BETWEEN 2 AND 10 A. ALL WITH A DYNAMIC RANGE OF 10 TO 100 MILLION (PER SQ CM-S-STER). PARTICLES AND X-RAYS PRIMARILY OF SOLAR ORIGIN WILL BE STUDIED, BUT THE DYNAMIC RANGE AND RESOLUTION OF THE INSTRUMENT PERMITIED OBSERVATION OF COSHIC RAYS AND MAGNETOTALL PARTICLES OBSERVED. PARTICLES OBSERVED

-- IMP-J, HCDONALD

INVESTIGATION NAME- SOLAR AND COSMIC-RAY PARTICLES

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

ERSONNEL		
PI - F.B. 01 - D.E.	MCDUNALD Hagge Teegarden	NASA-GSFC Unknown Nata-gsfc

PI

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NSSDC 10- 73-0784-09

DI-BJ. TEEGARDEN NABA-GSTC DRIEF DESCRIPTION THE GSFC COSMIC-RAY EXPERIMENT WAS DESIGNED TO MEASURE ENERGY SPECTRA, COMPOSITION, AND ANGULAR DISTRIGUTIONS OF SOLAR AND GALACTIC ELECTRONS, PROTONS, AND HEAVIER NUCLEI UP TO Z = 30. THREE DISTINCT DETECTOR SYSTEMS WERE USED. THE FIRST SYSTEM CONSISTED OF A PAIR OF SOLID-STATE TELESCOPES THAT MEASURED INTEGRAL FLUXES OF ELECTRONS ABOVE 150. 350, AND 700 KEV AND OF PROTONS: ABOVE .05, 15, .50, .70, 1.0, 1.2, 2.2, 2.5, S.0, 15, AND 25 MEV. EXCEPT FOR THE 0.5-MEV PROTON MODE, ALL COUNTING MODES HAD UNIQUE SPECIES IDENTIFICATION. THE SECOND DETECTOR SYSTEM WAS A SULD-STATE DE/DX VS E TELESCOPE MEASURED Z = 1 TO 16 NUCLEI WITH ENERGIES BETWEEN 4 AND 20 MEV/MUCLEON. COUNTS OF PARTICLES IN THE 0.5- TO 4-REV/NUCLEON REV/MUCLEON. THE SECONT AND CHARGE RESOLUTION, WERE OBTAINED AS COUNTS IN THE DE/DX BUT NOT IN THE ESENSOR. THE THIRD DETECTOR SYSTEM WAS A THREE-ELEMENT THELESCOPE WHOSE AXIS WADE AN ANDELEO INTEGRA TO THAT LOOKED PERFENDICULAR TO THE SPIN AXIS. THE THIRD DETECTOR REV/MUCLEON. COUNTS OF PARTICLES IN THE 0.5- TO 4-REV/NUCLEON THE DE/DX BUT NOT IN THE ESENSOR. THE THIRD DETECTOR SYSTEM WAS A THREE-ELEMENT THELESCOPE WHOSE AXIS WADE AN ANDELE OF 30 DEG WITH RESPECT TO THE SPIN AXIS. THE MIDDLE ELEMENT WAS A CSI SCINTILLATOR, WHILE THE OTHER THO ELEMENTS WERE SOLID-STATE

SENSORS. THE INSTRUMENT RESPONDED TO ELECTHONS BETWEEN 2 AND 12 MEV AND TO 2 = 1 TO 30 NUCLEI IN THE ENERGY RANGE 20 TO 500 MEV/NUCLEON. FOR PARTICLES BELOW 80 MEV. THIS INSTRUMENT ACTED AS A DE/OX DETECTOR. ABOVE 80 MEV. IT ACTED AS A BIDIRECTIONAL TRIPLE DE/DX DETECTOR. FUN SUBTAINED BY DIVIDING CERTAIN PORTIONS OF THE DATA FROM EACH DETECTOR INTO EIGHT ANGULAR SECTORS.

INVESTIGATION NAME- MAGNETIC FIELD EXPERIMENT

NSSDC 10- 73-0784-01

-J. NESS-

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL PI - N.F. NESS DI - C.S. SCEARCE DI - J.B. SEEK

NASA-GSFC NASA-GSEC NASA-GSFC

BRIEF DESCRIPTION BRIEF DESCRIPTION THIS EXPERIMENT CONS_STED. OF A BOOM-MOUNTED TRIAKIAL FLUXGATE MFGMETOMETER DESIGNED TO STUDY THE INTERPLANETARY AND GEOMAGNETIC TAIL MAGNETIC FIELDS. EACH SENSOR HAD THREE DYNAMIC RANGES, PLUS OR MINUS 12, PLUS OR MINUS 36, AND PLUS OR MINUS 108 GAMMAS. WITH THE AID OF A BIT COMPACTION SCHEME (DELMA MODULATION), THERE WERE 25 VECTOR MEASUREMENTS MADE AND TELEMETERED PER SECOND. THE EXPERIMENT OPERATED NORMALLY FROM LAUNCH UNTIL MID-1975, ON JULY 11, 1975, BECAUSE OF A RANGE 36-GAMMA RANGE, THE DIGITATION ACCURACY IN THIS RANGE IS ABOUT PLUS OR MINUS D.3 GAMMA.

--- IMP-J, SIMPSON------

INVESTIGATION NAME- SOLAR FLARE HIGH-2/LOW-E AND LOW-2 NSSDC 10- 73-0784-07

INVEST: GATIVE PROGRAM

CODE 57

INVESTIGATION DISCIPLINE(S) Particles and fields

PERSONNEL

PI - J.A. SIMPSON DI - M. GARCIA-MUNOZ U OF CHICAGO U OF CHICAGO

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT USED TWO TELESCOPES TO MEASURE THE COMPOSITION AND ENERGY SPECTRA OF SOLAR (AND GALACTIC) PARTICLES ABDVE ABOUT D.S MEV/NUCLEON. THE MAIN TELESCUPE CONSISTED OF FIVE COLINEAR ELEMENTS (THREE SOLID STATE, ONE CSI, AMD ONE SAPPHIRE CERENKOV) SURROUNDED BY A PLASTIC ANTICOINCIDENCE SHIELD. THE TELESCOPE HAD A 60-DEG, FULL-ANGLE ACCEPTANCE CONE WITH ITS AXIS APPROXIMATELY NORMAL TO THE SPACECRAFT SPIN AXIS PERMITING 8-SECTORED INFORMATION ON PARTICLE ARRIVAL DIRECTION. FOUR ELEMENTS OF THE MAIN TELESCOPE WERE PULSE-HEIGHT ANALYZED, AND LOW- AND HIGH-GAIN MODES COULD BE SELECTED BY COMMAND TO PERMIT RESOLUTION OF THE ELEMENTS H THROUGH NI OR OF THE ELECTAINS AND THE ISOTOPES OF H AND HE AND LIGHT NUCLEI. A SELECTION-PRIORITY.SCHEME WAS INCLUDED TO PERMIT SAMPLING OF LESS ABUNDANT PARTICLE SPECIES UNDER NORMAL AND SOLAR-FLARE CONDITIONS. THE LOW-ENERGEY TELESCOPE WAS ESSENTIALLY A TWO-ELEMENT, SHIELDED, SOLID-STATE DETECTOR WITH A 70-DEG, FULL-ANGLE ACCEPTANCE CONE. THE FIRST ELEMENT WAS PULSE-HEIGHT ANALYZED, AND DATA WERE RECORDED BY SECTORS.

-- IMP-J, STONÉ-----

INVESTIGATION NAME- ELECTRONS AND HYDROGEN AND HELIUM ISOTOPES

N550C ID- 73-078A-06

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) Particles and fields

PERSONNEL PI - E.C. STONE 01 - R.E. VOGT

CALIF INST OF TECH

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MEASURE THE DIFFERENTIAL ENERGY SPECTRA OF THE ISOTOPES OF HYDROGEN THROUGH OXIGEN FROM 2 TO 49 MEWINUCLEON, AND OF ELECTRONS FROM 0.2 TO 5 MEW. THE 1 STRUMENT CONSISTED OF A STACK OF 11 FULLY DEPLETED, SILICON, SOLID-STATE, DETECTORS SURROUNDED UT A PLASTIC SUINTILLATOR ANTICOLOLEDENCE CUP. THE OUTER TWO SOLID-STATE DETECTORS WERE ANNULAR, PERMITING MEASUREMENTS IN BOTH MARROW GEOMETRY CTYPICAL GEOMETRICAL FACTOR WAS 0.2 SQ CM STERY AND WIDE COINCIDENCE MODES. ANISOTROPY DATA (45 DEG ANGULAR AND 20 S TEMPORAL RESOLUTION) WERE OBTAINED. FOR FURTHER DETAILS SEE P 931 IM 'ASTROPHYS. J., 205.

---- IMP-J, WILLIAMS-----INVESTIGATION NAME~ ENERGETIC ELECTRONS AND PROTONS NSSDC 10- 73-0784-05 INVESTIGATIVE PROGRAM CODE ST INVESTIGATION DISCIPLINE(S) Particles and fields PERSONNEL PI - D.J. WILLIAMS 01 - C.O. BOSTROM 01 - J.H. TRAINOR NDAA-ERL Applied physics las NASA-GSFC

OI - J.H. TRAINOR MASA-GSFC BRIEF DESCRIPTION THE PURPOSES OF THIS EXPERIMENT WERE (J) TO STUDY THE PROPAGATION CHARACTERISTICS OF SOLAR COSMIC RATS THROUGHOUT THE INTERPLANETARY MEDIUM OVER THE ENERGY RANGES INDICATED BELOW, (2) TO STUDY ELECTRON AND PROTON PATCHES THROUGHOUT THE MAGNETOPAUSE, AND (S) TO STUDY THE ENERGY RANGES INDICATED BELOW, GEOMAGNETIC TAIL AND NEAR AND THROUGH THE FLANKS OF THE MAGNETOPAUSE, AND (S) TO STUDY THE ENTRY OF SOLAR COSMIC RATS INTO THE GEOMACNETIC FIELD. THE INSTRUMENTATION CONSISTED OF A THREF-ELEMENT TELESCOPE CONFIGURATION EMPLOYING SOLID-STATE DETECTORS AND A MAGNETIC FIELD TO DEFLECT THE ELECTRONS DEFLECTED BY THE MAGNET. THO ADDITIONAL SOLID-STATE DETECTORS WERE USED TO DETECT VERY LOW CHARGED PARTICLES OF 2 GREATER FLANKS, ALPHA PARTICLES, AND CHARGED PARTICLES OF 2 GREATER FLANKS, FROM 3D KEV TO GREATER THAN 8.50 MENJ RANGES, (2) LECETRON FLUXES FROM 3D KEV TO GREATER THAN 15 KEV, (4) ALPHA PARTICLES IN, FOUR RANGES, GREATER THAN 55 MEV, GREATER THAN 1.6 MEV, 2.2. TO B.B. MEV, AND 8.3 TO 35 MEV, AND (5) CHARGED PARTICLES OF Z GREATER THAN 2 AT E GREATER THAN 5 MEV.

SPACECRAFT COMMON NAME- INTASAT ALTERNATE NAMES- INTA SATELLITE

NSSDC 10- 74-089C

LAUNCH DATE- 11/15/74 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- DELTA

SPONSORING COUNTRY/AGENCY Spain United States	CNIE-INTA NASA-OSS
INITIAL ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 114,9 Rin Periapsis- 1440.0 Km	ÉPOCH DATE- 11/16/74 Inclination- 107.7 deg Apoapsis- 1457.0 km
PERSONAL.	

PERSONNEL		
	SCHMERLING DORADO	NASA HEADQUARTERS NASA HEADQUARTERS Comite-inta NASA-GSFC Comie-inta NASA-GSFC

INTASAT, SAGREDO----

INVESTIGATION NAME- IONOSPHERIC BEACON

NSSDC 10- 74-0890-01

66

INVESTIGATION DISCIPLINE(S) IONOSPHERES

INVESTIGATIVE PROGRAM

PERSONNEL P1 - J.L. SAGREDO ----- INTERCOSMOS 14. LIKHTER-----ATMI-BINGS INVESTIGATION NAME- ELF/VLF RECEIVER SRIEF DESCRIPTION THIS BEACON EXPERIMENT CONSISTED OF A TWO-FREQUENCY (40.0100 AND 40.01025 MHZ) TRANSMITTER, THAT CONTINUOUSLY RADIATED LIMEARLY POLARIZED, STABLE AND UNMODULATED SIGMALS AT A MINIMUM POWER LEVEL OF ZOO MW. THE TWO-BEACON MONPOPLE ANTENNA, ONE BEACON FOR EACH FREQUENCY, EXTENDED FROM THE TOP AND BOTTOM OF THE SPACECRAFT ALONG THE SPACECRAFT AXIS. OVER 40 EXPERIMENTERS IN 21 DIFFERENT COUNTRIES PARTICIPATED. THE EXPERIMENTERS CALCULATED TOTAL ELECTRON CONTENT ALONG THE PROPAGATION PATH FROM SATELLITE TO GROUND AND OBSERVED IONOSPHERIC IRREGULARITIES AND SCINTILLATIONS. BRIEF DESCRIPTION NSSDC 10- 75-115A-03 INVESTIGATIVE PROGRAM Intercosmos INVESTIGATION DISCIPLINE(S) Particles and fields Magnetospheric physics PERSONNEL PI - J.I. LINHTER PI - P. TRISKA IZMIRAN CZECH ACAD OF SCI BRIEF DESCRIPTION THE RECEIVER DETECTS THE SIGNALS ON ANTENNAS THAT ALLOW THE RECEIVER DETECTS THE SIGNALS ON ANTENNAS THAT ALLOW THE MEASUREMENT OF THE ELECTRIC AND MACHETIC FIELDS PARALLEL AND PERPENDICULAR TO THE DIRECTION OF THE GEOMAGNETIC FIELD THE RECEIVER COVERS THE RANGE D.OS-20 KHZ. THE PERPENDICULAR MAGNETIC FIELD CHANNEL / ONTAINS A 1D-FREQUENCY SPECTRUM ANALYZER FOR ELF/VLF EMISSIONS. BOTH ELECTRIC-FIELD RECEIVER CHANNELS HAVE TWO NARROW-BAND FILTERS AT 0.72 AND 4.D KHZ. SELF AND MUTUAL IMPEDANCE GF THE SPHERICAL PROBE ELECTRIC ANTENNAS ARE MEASURED. SPACECRAFT COMMON NAME- INTERCOSMOS 14 ALTERNATE NAMES- IK-14 NS50C 10- 75-115A LAUNCH DATE- 12/11/75 Launch Site-Launch Vehicle-WEIGHT- KG ---- INTERCOSHOS 14, NAZAROVA-----SPONSORING COUNTRY/AGENCY U.S.S.R. INTERCOS INVESTIGATION NAME+ HIGROMETEORITE DETECTOR INITIAL ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 105.3 Min Periapsis- 345. Km NSSDC 10- 75-115A-04 INVESTIGATIVE PROGRAM INTERCOSMOS EPOCH DATE- 12/12/75 INCLINATION-APOAPSIS-- 74. DEG 1707. KM INVESTIGATION DISCIPLINE(S) Interplanetary dust Dust PERSONNEL PM - UNKNOWN PS - J.I. LIKHTER PERSONNEL PI - T.N. NAZAROVA PI - I. ZAKHAROV PI - I. APATHY IZMIRAN SOVIET ACAD OF SCI CZECH ACAD OF SCI HUNGARIAN ACAD OF SCI BRIEF DESCRIPTION THE SPACECRAFT WAS A CONTRIBUTION TO THE INTERNATIONAL MAGNETOSPHERIC STUDY (INS) PROGRAM INVOLVING THE SCIENTIFIC COMMUNITY OF SOCIALIST COUNTRIES. THE SPACECRAFT CONTAINED FIVE EXPERIMENTS WHICH PROVIDE MEASUREMENTS OF EXTREMELY LOW-F.(EQUENCY (ELF) AND VERY LOW-FREQUENCY (VLF) EMISSIONS IN THE MAGNETOSPHERE, OF THE VARIATION OF IONOSPHERIC PLASMA DENSITY AND ELECTRON TEMPERATURE ALONG THE ORDIT, OF VARIATIONS OF TOTAL ELECTRON TEMPERATURE ALONG THE ORDIT, OF VARIATIONS OF TOTAL ELECTRON TEMPERATURE ALONG THE ORDIT, OF VARIATIONS OF TOTAL ELECTRON TEMPERATURE ALONG THE ORDIT, OF VARIATIONS OF TOTAL ELECTRON TEMPERATURE ALONG THE ORDIT, OF VARIATIONS OF TOTAL STREMACTERISTICS OF METEOR SHOWERS. THE SPACECRAFT WAS MAGNETICALLY ORIENTED AND CONTAINED BOTH A STAMOARD TELEMETY SYSTEM AND A WIDEBAND SYSTEM WHICH TRANSMITS WIDEBAND TAPE RECORDER (0.05-15 KH2). A LARGE NUMBER OF GROUND-BASED OBSERVATORIES IN THE SOCIALIST COUNTRISS WERE INVOLVED IN MEASURING IONOSPHERIC CONDITIONS, GEOMAGNETIC FIELD VARIATIONS, AND VLF EMISSIONS IN CONJUNCTION WITH THE SATELLITE. OPERATIONS TERMINATED ON 6/28/76. BRIEF DESCRIPTION BRIEF DESCRIPTION THE MICROMETEORITE DETECTOR GIVES STATISTICAL INFORMATION, PARTICULARLY DURING THE OCCURENCE OF INTENSIVE - INTERCOSMOS 14, SCHMILAUER------INVESTIGATION NAME- FOUR FREQUENCY BEACON NSSDC 10- 75-1154-05 INVESTIGATIVE PROGRAM INTERCOSMOS INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS Communications Ionospheres and radio physics -- INTERCOSMOS 14, GDALEVICH---PERSONNEL PI - J.I. SCHMILAUER CZECH ACAD OF SCI INVESTIGATION NAME- SPHERICAL ION TRAPS BRIEF DESCRIPTION THE INSTRUMENT CONSISTS OF A BEACON TRANSMITTER THAT RADIATES AT THE FOUR COHERENT FREQUENCIES -- 20.004 MHZ, 40.008 MHZ, 180.036 MHZ, AND 360.072 MHZ -- AND IS USED TO MEASURE TOTAL ELECTRON CONTENT BETWEEN THE SPACEGRAFT AND A NSSDC 10- 75-115A-01 INVESTIGATIVE PROGRAM Intercosmos INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS GROUND-RECEIVING STATION. PERSONNEL ************* PI - G.L. GDALEVICH PI - K.B. SERÁFIMÓV BULGARIAN ACAD OF SCI SPACECRAFT COMMON NAME- ISIS 1 Alternate Names- ISIS-A, 03669 **ERIEF DESCRIPTION** THE EXPERIMENT CONSISTS OF TWO SPHERICAL ION TRAPS DIATED ON BOOMS THAT EXTEND FROM OPPOSITE POINTS ON THE SPACEGRAFT BOOM TO REMOVE SPACEGRAFT VELOCITY EFFECTS ON THE MEASUREMENT OF POSITIVE ION DENSITY. THE SPATIAL RESOLUTION OF THE MEASUREMENT IS ABOUT 10 M IN THE REAL-TIME MODE AND 500 M IN THE STORAGE MODE. NSSDC 10- 69-009A LAUNCH DATE- 01/30/69 WEIGHT- 532. KG LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- DELTA -- INTERCOSMOS 14, GRINGAUZ------SPONSORING COUNTRY/AGENCY CANADA UNITED STATES CRC NASA-055 INVESTIGATION NAME- PERPENDICULAR AND PARALLEL ELECTRON Temperature INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC Orbit Peridd- 128.42 Min Periapsis- 578. Km NSSDC 10- 75-1154-02 INVESTIGATIVE PROGRAM INTERCOSMOS EPOCH DATE- 02/04/69 Inclination- 88.42 deg Apoapsis- 3526. Km INVESTIGATION DISCIPLINE(S) Particles and fields Magnetospheric physics PERSONNEL NG - F.W. GAETANO MG - C.D. FLORIDA PM - C.A. FRANKIN PM - E.D. NELSEN PS - J.E. JACKSON PS - G.L. NELMS NASA HEADQUARTERS Commun Research Centre Commun Research Centre NASA-GSFC PERSONNEL PI - K.I. GRINGAUZ PI - J.I. SCHMILAUER CZECH ACAD OF SCI NASA-GSE DEFENCE RESEARCH ESTAB BRIEF DESCRIPTION URIEF DESCRIPTION THE INSTRUMENT HAS TWO FLAT MUTUALLY PERPENDICULAR SENSORS FOR MEASURING ELECTRON TEMPERATURES ALONG AND PERPENDICULAR TO THE GEOMAGNETIC FIELD. THE DYNAMIC RANGE OF THE DEVICE IS 400 TO 10.000 K. THE RATIO OF THE TWO TEMPERATURES IS ALSO MEASURED.

BRIEF DESCRIPTION ISIS 1 WAS AN IONOSPHERIC OBSERVATORY INSTRUMENTED WITH SWEEP- AND FIXED-FREQUENCY IONOSONDES, A VLF RECEIVER, ENERGETIC AND SOFT PARTICLE DETECTORS, AN ION MASS SPECTROMETER, A DELECTROSIATIC PROBE, AN ELECTROSTATIC ANALYZER, A BEACON TRANSMITTER, AND A COSMIC NUISE EXPERIMENT. THE SOUNDER USED TWO DIPOLE ANTENNAS (78, Y AND 20, 2M LONG, RESPECTIVELY). THE SATELLITE WAS SPIN-STRGILLIZED AT ABOUT 2, 9 RPM AFTER ANTENNA DEPLOTMENT. SOME CONTROL COULD BE EXERCISED OVER THE SPIN RATE AND ATTITUDE BY USING MAGNETITALLY INDUCED TORQUES TO CHANGE THE SPIN RATE AND TO PRECESS THI SPIN ATIS. A TAPE RECORDER WITH 1-M CAPACITY WAS INCLUDED ON THE SATELLITE, THE SATELLITE COULD BE PROGRAMMED TO TAKE RECORDED DOSERVATIONS FOR FOUR DIFFERENT TIME PERIODS FOR EACH FULL RECORDING PERIOD. THE RECORDER WAS DUMPED ONLY AT OTTAMA. FOR NON-TAPE-RECORDED OBSERVATIONS, DATA FOR THE SATELLITE AND SUBSATELITE RECORDED OBSERVATIONS, MATA FOR THE SATELLITE AND NON-TAPE-RECORDED OBSERVATIONS, MATA FOR THE SATELLITE AND NON-TAPE-RECORDED OBSERVATIONS, MATA TO THELEMETERED WHEN THE SPECETERTY STATIONS WERE IN RAFAS FOR THE SATELLITE AND NON-TAPE-RECORDED OBSERVATIONS, MATA FOR THE SATELLITE AND NOTATAPE-RECORDED OBSERVATIONS, MATA FOR THE SATELLITE AND NOTATAPE-RECORDED OBSERVATIONS WERE AND TELEMETERED WHEN THE SPACECRAFT WAS IN THE LINE OF SIGHT OF TELEMETREED WHEN THE SATELITE RECORDED OBSERVATIONS VERE IN AND TELEMETREED WHEN THE SPACECRAFT WAS AN THE AD DEC AND CHARAL AND IN AREAS NEAR HAWALLITE RELEMETARY SATIONS, AND C

----- ISIS 1/ BARRINGTON------

INVESTIGATION NAME- VLF RECEIVER

NSSDC 10- 69-0094-03

CODE \$1/CO-08 INVESTIGATION DISCIPLINE(S) Ionospheres and radio physics Particles and fields

INVESTIGATIVE PROGRAM

PERSONNEL

PI - R.E. BARRINGTON DI - F.H. PALMER

COMMUN RESEARCH CENTRE Commun research centre

PIT NEC. DARMINGON
 DITENTION
 COMMON RESEARCH CENTRE
 DITENT
 COMMON RESEARCH CENTRE
 URIEF DESCRIPTION
 THE VLF EXPERIMENT WAS LOW-FREQUENCY, BROADBAND RECEIVER
 THAT SENSED SIGNALS RECEIVED BY THE 70-M DIPOLE (SPLIN
 MONOPOLE) ANTENNA, BETWEEN Q.DS AND 30 KHZ. THIS SAME ANTENNA
 WAS USED FOR RECEIVEN HAD A WIDE DYNAMIC RANGE (BD DD) THAT
 MAS ACHIEVED BY USE OF AN AUTOMATIC GAIN CONTROL SYSTEM. THIS
 VLF EXPERIMENT INCLUEED AN OPTIDNAL-USE ONBOARD EXCITER THAT
 OPERATED OVER A FREQUENCY CYCLE FROM O TO 0.3 TO 0 TO 11 TO 0
 KHZ OVER A 3.5-S 'FRAME' PERIOD. THE TRANSMISSION AT 0.3 KHZ
 OCCURED FOR ABOUT 2.5, THE NORLINEAR SWEEP TO 11 KHZ REQUIRED D.9
 S. TRANSMISSION AT 11 KHZ FOR ABOUT 0.3 S. THE FRAMES
 SEQUENCED THROUGH FOUR STEPS WHERE THE TRANSMISSION WERE
 ANDINIERAR SWEEP BACK TO D TOOK ABOUT 0.3 S. THE FRAMES
 SEQUENCED THROUGH FOUR STEPS WHERE THE TRANSMISSION WERE
 ATTENNATED BY D. 20.20, THEN 40 DB, THUS REQUIRING 14.5 FOR
 THE AND THE SHORT ANTENNAS AND THE RECEIVER SENSED THE
 SIGNALS COUPLED BETWEEN THE TWO ANTENNAS BY THE AMBIENT (ASMA, PLUS ANY NOISE SIGNALS WHICH WERE EXCITED IN THE FLASMA.
 EXCITER OPERATION PERMITTED THE CONTROLLED STUDY OF 10
 RESONANCES IN ADDITION TO STUDY OF NATURAL AND OTHER MAN-MADE
 VLF RADIO NOISE. THIS VLF EXPERIMENT ALSO PERMITTED ANTENNA
 EXCITE MORTAL MERMENTS, WITH O AN WITHOUT A DC BIAS ON THE
 ANTENNA. THE REAL-TIME DATA WERE TRANSMITTED ON 136.08-MHZ
 THEF RECORDER (AND BACK-UP REAL-TIME) DATA WERE
 TAPE RECORDER (AND MERMENT, FURTHER DETAILS GAN BE FOUND IN THE 'ISIS A TECHNICAL PLAN.'

---- ISIS 1, BRACE--

INVESTIGATION NAME- CYLINDRICAL ELECTROSTATIC PROBE

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Ionospheres and Radio Physics

PERSONNEL PI - L.H. BRACE DI - J.A. FINDLAY

NSSDC 10- 69-0094-07

NASA-GSEC NASA-GSEC

BRIEF DESCRIPTION THE PURPOSE OF THIS EXPERIMENT WAS TO STUDY THE GLOBAL VARIATIONS OF ELECTRON TEMPERATURE AND ELECTRON CONCENTRATION AT SPACECRAFT (SC) ALTITUDES DURING SOLAR MAXIMUM, AND TO STUDY CHARACTERISTICS OF THE SC ION SMEATH, THIS CYLINDRICAL PROBE WAS A TYPE OF LANGMUIR PROBE THAT OBSERVED CURRENT FLOW FOR A GIVEN VOLTAGE PROFILE PLACED ON THE COLLECTOR. FROM THIS CURRENT-VOLTAGE PROFILE, THE ELECTRON DENSITY AND ELECTRON TEMPERATURE COULD BE CALCULATED. THERE WAS A BOOM PROBE AND AN AXIAL PROBE EXTENDING FROM THE SC. IME AXIAL PROBE EXTENDED 48,3 CM FROM THE SC, ALONG THE SPIN AXIS, AND WAS CENTERED AMONG THE FOUR TELEMETRY ANTENNAS ON THE UNDERSIDE OF THE SC. THIS PROBE WAS CAPABLE OF MEASUREMENTS UNDISTUBBED BY THE SATELLITE MOTION ONLY WHEN THE PROBE PRECEDED THE SC IN IS MOTION THROUGH THE PLASMA. THE BOOM PROBE EXTENDED AND OUTWARD (IN SC FRAME OF REFERENCE) FROM A BOOM 1 M LONG, which IN TURN EXTENDED FROM ANDER SURTACE OF THE SATELLITE AT AN ANGLE OF ABOUT 45 DEG TO THE SPIN AXIS, THIS PROBE PROVIDED SOME OBSERVATIONS DURING EACH SC SPIN CYCLE THAT WAS FREE OF SC WARE EFFETS. THE PROBES STEEL TUBES. THE OUTERT (0.24-CM DIAM AND 23-CM LONG) TUBE FLOATED AT INS OWN BRIEF DESCRIPTION

EQUILIBRIUM POTENTIAL AND SERVED TO PLACE THE COLLECTOR WELL AWAY FROM THE SC PLASMA SHEATH. THE CENTER TUBE (0.165-CM DIAM) EXTENDING 23 CA OUTWARD FROM THE OUTER TUBE ACTED AS AN ELECTRICAL GUARD FOR THE COLLECTOR. ITS ELECTRICAL POTENTIAL WAS CONTROLLED. THE COLLECTOR (0.058-CM DIAM) EXTENDED 23 CM OUTWARD FROM THE DRIVEN GUARD. OURING EACH ?-HIN SEQUENCE , A VOLT-AMPERE CUBYF XAS OBTAINED FROM THE SAWTOOTH VOLTAGE (-2 TO +TOY) APPLIED TO THE COLLECTOR. THIS CAN BE INTERPRETED IN ELECTRICON DENSITIES OVER A RANGE FROM 100 TO 1,500-C000 ELECTRONS PER CM CUBED, AND TEMPERATURES FROM ABOUT 400 TO 50,600 CK.

----- 1515 1, CALVERT------

INVESTIGATION NAME- FIXED-FREQUENCY SOUNDER

NSSDC 10- 69-0094-07 INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(5) Ionospheres and radio physics

PERSONNEL	
PI - W. CALVERT	UNKNOWA
OI - R.B. NORTON	NOAA-ERL
OI — J.M. WARNOCK	NOAA
OI - G.L. NELRS	DEFENCE RESEARCH ESTAB
OT - G.E.K.LOCKWOOD	COMMUN RESEARCH CENTRE
OI — J.H. WHITTEKER	COMMUN RESEARCH CENTRE
01 - C.E. PETRIE	COMMUN RESEARCH CENTRE
OI — T.E. VAN ZANDI	HOAA-ERL

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE FIXED-FREQUENCY SOUNDER OPERATED FROM THE SAME ANTENNA, TRANSMITTEP, AND RECEIVER USED FOR THE SWEEP-FREQUENCY EXPERIMENT. IT NORMALLY OPERATED FOR 5 S DURING THE FREQUENCY FLYBACK PENIOD OF THE SWEEP-FREQUENCY OPERATION THAT WAS EVENT 19 OR 29 S. ONE OF SIX FREQUENCIES (0.25, 0.48, 1.00, 1.95, 4.00, OR 9.303 MH2) WAS CHOSEN FOR USE BY THE FAPENIARITER AS DESIRED. OTHER MODES OF OPERATION WERE AVAILABLE. INCLUDING CONTINUOUS OBSERVATION AT A SELECTED FREQUENCY, AND A SPECIAL MIXED MODE WITH TRANSMISSION AT THE FIXED FREQUENCY OF 0.82 MH2 AND SWEEP RECEPTION. THIS EXPERIMENT WAS DESIGNED TO STUDY IONOSPHERIC FEATURES OF A SMALLER SCALE THAN COULD BE DETECTED BY THE SWEEP RECEPTION. THIS EXPERIMENT AND RESIGNANCES. PARAMETERS MEASURED WERE VIRTUAL RANGE (A FUNCTION OF PROPAGATION TIME OF THE REFLECTED PLUSE) AND TIME (A FRUCTION OF GEOGRAPHICAL POSITION). THESE DATA WERE NORMALLY OBSERVED ONLY WHEN THE SPACECRAFT WAS IN RANGE OF THE TELEMETRY STATION.

-- ISIS 1, FORSYTH------

INVESTIGATION NAME- RADIO BEACON

NSSDC 10- 69-009A-09

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) IONOSPHERES AND RADIO PHYSICS

ERSONNEL		
PI - P.A	. FORSYTH	WESTERN ONTARIO U
01 - G.F	. LÝON	WESTERN ONTARIO U
01 - E.H	_ TULL	WESTERN ONTARIO U

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT WAS DEVISED TO STUDY THE IONOSPHERIC IRREGULARITIES GIVING SPECIAL ATTENTION TO THE DISTUMBED IONOSPHERIC CONDITIONS. EEACON TRANSMITTERS ABOARD THE SATELLITE RADIATED POLARIZED RADIO EMISSIONS ON COMMAND, AT 136.41 AND 137.95 MHZ. THE SIGNAL POLARIZATION, HE AMPLITUDE OF THE SIGNAL. THE RELATIVE PHASE OF THE SIGNAL, AND THE INCIDENT DIRECTION OF THE SIGNAL WERE OBSERVED FROM GROUND STATIONS. CDINCIDENT OBSERVATIONS WEAR MADE AT STATIONS ABOUT 1DD WAVELENGTHS APART. FROM KNOWN SPACECRAFT POSITION INFORMATION AND THESE OBSERVATIONS, IONOSPHERIC, IRREGULARITIES COULD BE ALMOST COMPLETELY DESCRIBED IN TERRS OF HEIGHT, MADIAL DISTRIBUTION OR ELECTRON FLAK CONCENTRATION, AND RADIAL DISTRIBUTION OR ELECTRONS. AN IMPORTANT PAT OF THESE DESCRIPTIONS WAS TO ORIGINATE FROM THE COMPUTED VALUES OF TOTAL ELECTRON CONTENT TECE) OBSERVATIONS. REFERENCE VISIS TECHNICAL PLAN, 'PP. 84, 85 FOR FURTHER DETAILS.

- 1515 1, HARTZ---

INVESTIGATION NAME- COSNIC RADIO NOISE

NSSDC ID- 69-009A-10

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(5) ASTRONOMY IONOSPHERES AND RADIO PHYSICS

PERSONNEL PI - T.R. HARTZ

COMMUN RESEARCH CENTRE

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BRIEF DESCRIPTION BRIEF DESCRIPTION THIS EXPERIMENT USED THE SWEEP FREQUENCY IONOSONDE Receiver Automatic Gain Control (AGC) voltages to measure Galactic And Solar Radio Noise Levels. The receiver Swept From 0.1 to 20 MH2. The dynamic Range Was 50 BB, AND THE BANDWIDTH Was 55 KH2. The Antennas Used Were 18.75-M AND 73.15-M Dipoles.

----- ISIS 1, NCDIARNID------

INVESTIGATION NAME- ENERGETIC PARTICLE DETECTORS

NSSDC 10- 69-009A-04 INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Ionospheres and radio physics Particles and fields

PERSONNE	L						
. P1 -	1.8.	MCDIARMID	NATL	RËS	COUNC	01	CAN
01 -	J.R.	BURROWS	NATL	RES	COUNC	DF	CAN
01 - 10	R.C.	ROSE	NATL	RES	COUNC	0 F	CAN

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF FOUR SETS OF DETECTORS. THE FIRST SET, COMPRISING FOUR GEIGER COUNTERS, MEASUMED ELECTRONS GREATER THAN 20 AND 4D KEV AND PROTONS GREATER THAN 3UD AND 500 KEV PARALLEL AND PERPENDICULAR TO THE SATELLITE SPIN AXIS. ALL REMAINING DETECTORS MEASURED PARTICLES PERPENDICULAR TO THE SPIN AXIS. THE SECOND SET CONSISTED OF SOLID-STATE SILICON JUNCTION DETECTORS. THESE RESPONDED TO ELECTRONS GREATER THAN 25 AND 140 KEV, ELECTRONS IN THE RANGE 200 TO 770 KEV, AND PROTONS GREATER THAN 200 AND 400 KEV, THE THIRD SET CONSISTED DF FIVE SILICON JUNCIION DETECTORS THAT RESPONDED TO PROTONS BETWEEN 0.15 AND 30 MEV. THE FOURTH SET CONSISTED OF CESIUM IODIDE SCINTILLATION-PHOTOMULTIPLIER SYSTEMS. EACH SYSTEM OPRATED IN TWO MODES AND KESPONDED TO LECTRONS GREATER THAN 8, 40, AND 60 KEV AND PROTONS GREATER THAN 50 KEV AND IN THE RANGE 50 TO 70 KEV.

----- ISIS 1, SAGALYN---

INVESTIGATION NAME- SPHERICAL ELECTROSTATIC ANALYZER

NSSDC 10- 69-009A-08 INVESTIGATIVE PROGRAM

CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) IONDSPHERES PARTICLES AND FIELDS ATMOSPHERIC PHYSICS

renaunnet			
PI - 9.C.	SAGAL YN		GEOPHYS LAD
0L - M.	SMIDDY	USAF	GEOPHYS LAB

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE OBJECTIVE OF THE SPHERICAL ELECTROSTATIC ANALYZER (SEA) EXPERIMENT WAS TO MEASURE THE TEMPORAL AND SPATIAL VARIATIONS IN THE CONCENTRATIONS AND ENERGY DISTRIBUTION OF THE CHARGED PARTICLES THROUGHOUT THE ORBIT. SPECIFICALLY, THE OBJECTIVES WERE TO MEASURE THE FOLLOWING PARAMETERS -- (A) THE DENSITY OF POSITIVE IDNS HAVING THERMAL ENERGY IN THE CONCENTRATION RANGE FRON 1.21 TO 1.26 IONS PER CUBIC CENTIMETER (UGGARITHMIC AMPLIFIERS WERE USED IN THE INPUT CINCUT), (B) THE KINETIC TEMPERATURE OF THE THERMAL LONS IN THE RANGE FROM 70D TO 4000 K, (C) THE SLUX AND ENERGY SPECTAUN OF PROTONS IN THE RANGE FROM 0 TO 2 KEV, AND (D) THE SATELLITE POTENTIAL WITH RESPECT TO THE UNDISTURBED PLASMA. TWO UNITS ANDE UP THE ELECTRONICS PACKAGE -- A 96-CM BOOM THAT SUPPORTED THE SENSOR AND MADE POSSIBLE ONNIDIRECTIONAL MEASUREMENTS, AND AN ELECTRONICS PACKAGE (CONSIDERED TO INCLUDE THE SENSOR AND MADE POSSIBLE ONNIDIRECTIONAL MEASUREMENTS, AND AN ELECTRONICS PACKAGE (CONSIDERED TO INCLUDE THE SENSOR AND MADE FORM THE HEASUREMENTS AND TO PROTESS THE DATA INTO A SUITABLE FORM FOR TELEMENTS AND TO PROTESS THE DATA INTO A SUITABLE FORM FOR TELEMENTS AND TO PROTESS. THE DATA SUPOF THREE CONCENTRIC SPHERICAL MESHED GRIDS HAVING RADII OF 3.458, 2.54, AND 1,90 CM. THE INNERMOST GRID MASTING RADII OF 3.458, 2.54, AND 1,90 CM. THE INNERMOST GRID MASTING RADII OF 3.458, 2.54, AND 1,90 CM. THE INNERMOST GRID MASTING COLLETOR. THESE CONCENTRIC SPHERICAL MESHED OLTAGES WERE APPLIED TO THE GRIDS, THIS INSTRUMENT WAS OPERATED IN SEVERAL MODES. THE ION DENSITIES WERE MADE FROM TUNGSTEN MESH AND HAD A TRANSPARENCY OF 80 TO 90 PERCENT. TO MEASURE THE PARAMETERS LISTED ABOVE, SUITABLE SWEEP AND STE POLITAGES WERE APPLIED TO THE GRIDS. THIS INSTRUMENT WAS OPERATED IN SEVERAL MODES. THE ION DENSITIES WERE SAMPLED AND STER ASSENDING TO A SPATIAL RESOLUTION OF 150 M. ONCE PER MIN THE RAILO OF MASS TO TEMPERATURE WAS SAMPLED, AND THE ENERGY DISTRIBUTION WAS SAMPLED ONCE EVERY 2 MIN.

- ISIS 1, WHITTEKER-----

INVESTIGATION NAME- SWEEP-FREQUENCY SOUNDER

NSSDC 10- 69-0094-01 INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) IGNOSPHERES AND RADIO PHYSICS

ERSCI	tNE	EL.	
			WHITTEKER
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01	-	G.L.	NELMS
01	-	J.E.	JACKSON
10	+.	ا ي 🗟 و 🐌 ا	KING
01	÷	۵.	TURNER
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COMMUN RESEARCH CENTRE
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NASA-GSFC
APPLETON LAB
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U.T.	- u.	NULI .	AURURAL UBS
0Ì	- Y.	OGATA	RÀDIO RESEARCH LAB
01	- R.	RAGHAVARAO	PHYSICAL RESEARCH LAB
01	~ ¥.	CALVERT	UNKNOWN
01	- 1.	E. VAN ZANDT	NOAA-ERL
01	- L.	COLIN	NASA-ARC
01	- 8.	B. NORTON	NGAA-ERL
10	- c.	E. PETRIE	COMMUN RESEARCH CENTRE
10	÷ K.	L. CHAN	NASA-ARC
10	- R.	S. UNWIN	DEPT OF SCI+INDUST RES

OI - R.S. UNWIN DEPT OF SCI-INDUST RES BRIEF DESCRIPTION THE ISIS 1 IONOSONDE WAS A RADIO TRANSMITTER/RECEIVER THAT RECORDED THE TIME DELAY BETWEEN A TRANSMITTED AND A RETURNED RADIO FREQUENCY PULSE. A CONTINUUM OF FREQUENCIES BETWEEN 0.1 AND 20 NRZ WAS SAMPLED ONCE EVERY 19 OR 29 S. AND ONE OF SIX SELECTED FREQUENCY BODES OF DEFATION, A MIXED MODE WAS 0 S BUING THIS 19- OR 20-5 PERIOD. IN ADDIION TO THE SW(2P- ANS FIXED-FREQUENCY MODES OF DEFATION, A MIXED MODE WAS POSSIBLE WRERE THE TRANSMITTER FREQUENCY WAS FIXED AT 0.82 MIX WHILE THE RECEIVER SWEPT. SEVERAL VIRTUAL WEIGHT (DELAY TIME) TRACES WERE NORMALLY OBSERVED DUE TO GROUND REFLETIONS, PLASMA RESONAICES, BIRTFRINGENCE OF THE IONOSHPERE, NOWVERTICAL PROPAGATION, ETC., VIRTUAL HEIGHT AT A GIVEN FREQUENCY WAS FRIGHTION, ETC., VIRTUAL HEIGHT AT A GIVEN FREQUENCY WAS UNITUAL HEIGHT AS A FUNCTION OF DISTANCE TRAVERSED BY THE SIGNAL, LECTRON DEMSITY ALONG THE PROPAGATION PATH, AND MODE OF DATA WERE COMMONLY PREPARED FROM THE IONOGRAM SHOWING UIRTUAL. HEIGHT AS A FUNCTION OF FREQUENCY. TWO OTHER FORMS OF DATA WERE COMMONLY PREPARED FROM THE IONOGRAMS. THEY WERE DIGITAL FREQUENCY MODOR FREQUENCY AND COMPUTATIONS OF CHARACTERISTIC IONOSPHERIC FEATURES AND COMPUTATIONS OF CHARACTERISTIC IONOSPHERIC FEATURES AND COMPUTATIONS OF ELECTRON DENSITY REPARED FROM THE IGNOTAS. THEY WERE DIGITAL FREQUENCY AND/OR VIRTUAL HEIGHT VALUES OF CHARACTERISTIC IONOSPHERIC FEATURES AND COMPUTATIONS OF ELECTRON DENSITY PROFILES.

SPACECRAFT COMMON NAME- ISIS 2 Alternate Names- ISIS-B, PL-701F 05104

NESDE 10- 71-024A

LAUNCH DATE- 04/01/71 Launch Site- Vandenberg AFB, United States Launch Vehicle- Délta WEIGHT- 570. KG

SPONSORING COUNTRY/AGENCY

CANADA United States INITIAL ORBIT PARAMETERS Orbit type- geocentric orbit period~ 113.6 min Periapsis~ 1358. km

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ĤG - F.₩.	GAETANO	NASA HEADQUARTERS
NG - C.D.	FLORIDA	COMMUN RESEARCH CENTRE
5C - E.R.	SCHMERLING	NASA HEADQUARTERS
PH - C.A.		COMMUN RESEARCH CENTRE
PH - E.D.	NELSEN	NASA-GSFC
PS - J.E.	JACKSON	NASA-GSFC
PS - G.L.	NELHS	DEFENCE RESEARCH ESTAB

BRIEF DESCRIPTION

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BRIEF DESCRIPTION ISIS 2 WAS AN IONOSPHERIC OBSERVATORY INSTRUMENTED WITH A SWEEP AND A. FIXED-FREQUENCY IONOSPHOE, A VLF RECEIVER, ENERGETIC AND SOFT PARTICLE DETECTORS, AN ION MASS SPECTROMETER, AN ELECTROSTATIC PROBE, A RETARDING POTENTIAL AMALYZER, A BEACON TRANSMITTER, A COSRIC NOISE EXPERIMENT, AND TWO PHOTOMETERS. THE SOUNDER USED TWO LONG CROSSED-DIPOLE ANTENNAS (78.9 AND 20.2 M LONG) FOR THE SOUNDING, VLF, AND COSMIC NOISE EXPERIMENTS. THE SPACECRAFT WAS NOMIMALLY SPIN-STABILIZED WITH SPIN AXIS IN THE ORBIT PLANE TO ABOUT 2 PROFEMDICULAR TO THE ORBIT PLANE WAS MADE AVAILABLE OCCASIONALLY FOR PERIODS OF A FEW MONTHS, THIS WAS DONE TO PROVIDE RAM AND WAKE DATA FOR SOME EXPERIMENTS FOR EACH SPIN NEFORMATION WAS OBTAINED FROM A THREE-AND ATIITUDE AND SPIN INFORMATION WAS OBTAINED FROM SHIT PLANE TO ABOUT 2 SUM SENSOR. CONTROL OF ATIITUDE AND SPIN WAS POSSIBLE BY MEANS OF MAGNETIC TORUBING. THE EXPERIMENT FOR NONECOREDO DESERVATIONS, DATA FROM SATELLIE AND SUBSATELLITE LOCATIONS WERE TELEMETERED WHEN THE SPACECRAFT WAS IN LINE OF SIGHT OF A THEOREMATION, ATA FROM SATELLIE AND SUBSATELLITE LOCATIONS WERE TELEMETERED WHEN THE SPACECRAFT WAS IN LINE OF SIGHT OF A THEORY DATA COVERAGE WAS MARE THE BO DEG M NERIDIAN AND NEAR HAMAII, SINGAPORE, AUSTRALLA, ENGLAND, FRANCE, NORMAY, INDIA, JAPAN, ANTARCTICA, NEW ZEALAND, AND CENTRAL AFRICA.

- ISIS 2, ANGER---

INVESTIGATION NAME- 3914- AND 5577-A PHOTOMETER

INVESTIGATIVE PROGRAM NSSDC 10- 71-0244-11 CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Ionospheres and Radio Physics Particles and fields Planetary Atmospheres ATMOSPHERIC PHYSICS

CRC NASA-OSS EPOCH DETE- 04/02/71 Inclination- 88-1 deg Apoapsis- 1428. KN

PERSONNEL F1 - C.D.

ANGER

U OF CALGARY

DI O GALGARY PI - C.D. ANGER DI O GALGARY DI O CALGARY
----- ISIS 2, BARRINGTON----

INVESTIGATION NAME- VLF RECEIVER

INVESTIGATIVE PROGRAM Code St/Co-OP NSSDC 10- 71-024A-03

INVESTIGATION DISCIPLINE(S) IONOSPHERES AND RADIO PHYSICS

PERSONNEL PI - R.E. BARRINGTON DI - F.H. PALMER COMMUN RESEARCH CENTRE Commun research centre

BRIEF DESCRIPTION THE VERY LOW-FREQUENCY (VLF) EXPERIMENT WAS A LOW-FREQUENCY (LF) BROADBAND RECEIVER THAT OBSERVED SIGNALS FROM THE 79-M LONG DIPOLE (SPLIT MONOPOLE) ANTENNA BETWEEN D.DS AND 3D KHZ, THIS SAME ANTENNA WAS USED FOR RECEIVING SIGNALS BELOW 5 MHZ ON THE IONOSONDE. THE VLF RECEIVER HAD A WIDE DYNAMIC RANGE THAT WAS ACHIEVED BY USE OF AN AUTOMATIC GAIN CONTROL (AGC) SYSTEM. THIS VLF EXPERIMENT INCLUDED AN ONBOARD EXCITER THAT WAS ACHIEVED BY USE OF AN AUTOMATIC GAIN CONTROL (AGC) SYSTEM. THIS VLF EXPERIMENT INCLUDED AN ONBOARD EXCITER THAT WAS ACHIEVED BY USE OF AN AUTOMATIC GAIN TONTOL (AGC) SYSTEM. THIS VLF EXPERIMENT INCLUDED AN ONBOARD EXCITER THAT SWEPT AT A NONLINEAR RATE FROM SO TO O HZ, THEN TO SYDU OF ION RESONANCES SITMULATED BY THE EXCITER, IN ADDITION TO STUDY OF NATURAL AND OTHER RAN-HADE VLF RADIO NOISE. THE EAPERIMENT ALSO PERMITTED ANTENNA. THE REAL-TIME DATA WERE TRANSMITTED ON 136.08-MHZ TELEMETRY. THE VLF DATA COULD BE RECORDED ON ONE OF THE FOUR TAPE RECORDER CHANNELS WHEN THE SPACECARET TAPE RECORDER WAS OPERATING. TAPE RECORDED (AND BACKUP. REAL-TIME CAPABILITY) DATA WERE TRANSMITTED ON 400-MHZ TELEMETRY.

- ISIS 2, BRACE------

INVESTIGATION NAME- CYLINDRICAL ELECTROSTATIC PROBE

INVESTIGATI1 PROGRAM CODE ST/CO-OP NSSDC 10- 71-0244-07

INVESTIGATION DISCIPLINE(S) IONOSPHERES PLANETARY ATMOSPHERES

NASA-GSEC NASA-GSEC

PI - L.H. BRACE 01 - J.A. FINDLAY

PERSONNEL

BRIEF DESCRIPTION THE PURPOSE OF THIS EXPERIMENT WAS TO STUDY THE GLOBAL VARIATIONS OF ELECTRON TEMPERATURE AND ELECTRON CONCENTRATION AT SPACEGRAFT (SC) ALTITUDES DURING SGLAR MAXIMUM, AND THE CHARACTERISTICS OF THE SC ION SHEATH. THIS CYLINGNETAL PROBE WAS A TYPE OF LANGHUIR PROBE THAT OBSERVED CURRENT FLOW TO THE PROBE FOR A GIVEN VOLTAGE PROFILE PLACED ON THE COLLECTOR, FAOM THIS CURRENT-VOLTAGE PROFILE PLACED ON THE COLLECTOR, FAOM THIS COURENTS AND ELECTRON DENSITY AND ELECTRON

AXIAL PROBE EXTENDING FROM THE SC. THE AXIAL PROBE EXTENDED 48.3 CM FROM THE SC, ALONG THE SCI MAXIS, AND WAS CENTERED BETWEEN THE FOUR TELEMETRY ANTENNAS ON THE UNDERSIDE OF THE SC. THIS PROBE WATLOW ONLY WHEN THE PROBE PRECEDED THE SC IN ITS SATELLITE MOTION ONLY WHEN THE PROBE PRECEDED THE SC IN ITS MOTION THROUGH THE PLASMA. THE BOOM PROBE EXTENDED HORIZONTALLY AND OUTWARD (IN SC FRAME OF REFERENCE) FROM A BOOM I AN LONG, WHICH IN TURN EXTENDED FROM AN UPPER SURFACE OF THE SATELLITE ANGLE OF ABOUT 45 DEG TO THE SPIN AXIS. THIS FROBE PROVIDED SOME OBSERVATIONS DURING EACH SC SPIN CYCLE, WHICH WERE FREE OF SC MAXE EFFECTS. THE PROBES CONSISTED OF THREE. THRE OUTER TO.2.4 CK IN DIAM AND 23 CM LONG) TUBE FLOATED AT ITS OWN EACH THE SC PLASMA SHEATH. THE CENTER TUBE COLLECTOR WELL AWAY FROM THE SC PLASMA SHEATH. THE CENTER TUBE ACTED AS AN CLEAR LA GUARD FOR THE COLLECTOR. IS ELECTRICAL ON FON THE COLLECTOR. IS ELECTRICAL SO OFTAMILES OFTAMISE A AND CLEAR THE AT DAS AND AND SATAINED THAT CAN BE INTERPRETED IN ELECTRICAL GUARD FOR THE COLLECTOR FOM 1400 FROM THE DISTANCE ARANGE THAT CAN BE INTERPRETED IN ELECTRICAL WAS OBTAINED THAT CAN BE INTERPRETED IN ELECTRON DENSITIES OFTAMINES OFTAMINES OND FOR THE DAILES OFTAMINES ONTROLLED. AND IN TEMPERATURE VALUES FROM 400 TO SO,000 K.

----- 1515 2, CALVERT-----

INVESTIGATION NAME- FIXED-FREQUENCY SOUNDER

NSSDC 10+ 71-0244-02

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) IONOSPHERES AND RADIO PHYSICS

PERSONNEL	
PI - W. CALVERT 01 - R.B. NORTON 01 - G.L. NELMS 01 - C.E. PETRIE 01 - G.E.K.LOCKWOOD	UNKNOWN Nôaa-Erl Defence Research Estab Commun Research Centre Commun Research Centre Commun Research Centre
Öİ — J.H. WHITTEKER Dı — J.M. Warndck Dı — T.E. Van Zandt	NOAA NGAA-ERL

BRIEF DESCRIPTION. THE FIXED-FREQUENCY SOUNDER OPERATED FROM THE SAME ANTENNA, TRANSMITTER, AND RECEIVER USED FOR THE SWEEP-FREQUENCY EXPERIMENT. IT NORMALLY OPERATED FOR 3 TO 5 S DURING THE FREQUENCY FLYBACK PERIOD OF THE SWEEP-FREQUENCY OPERATION WHICH MAS EVERY 14 OR 21 S. ONE OF SIX FREQUENCIES (0.12, 0.48, 1.DO, 1.95, 4.0D, OR 9.303 MM2) WAS CHOSEN FOR USE BY THE EXPERIMENTER, AS DESIRED. OTHER MODES OF OPERATION WERE AVAILABLE INCLUDING COMMINNOUS OBSERVATION AT A SELECTED AVAILABLE INCLUDING COMMINNOUS OBSERVATION AT A SELECTED THIS EXPERIMENTER, AS DESIX FIXID FREQUENCIES AND SWEEP FRECEPTION. THIS EXPERIMENT WAS DESIGNED TO STUDY IONOSPHERIC FEATURES OF A SMALLER SCALE THAN COULD BE DETECTED BY THE SWEEP SOUNDER AND TO STUDY PLASMA RESONANCES, PARAMETERS MERSUARE WERE VITHE (A FUNCTION OF GEOGRAPHICAL POSITION). THESE DATA WERE NORMALLY FUNCTION OF GEOGRAPHICAL POSITION). THESE DATA WERE NORMALLY STATION. STATION.

-- TSIS 2, FORSYTH-----

INVESTIGATION NAME- RADIO BEACON

NSSDC IP-	71-0244-09	INVESTIGATIVE PROGRAM
		CODE ST/CO-OP

INVESTIGATION	DISCIPLINE(S)
Ignospheres	AND RADIO PHYSICS

PERSONNEL PI - P.A. FORSYTH 01 - G.F. Lyon 01 - E.H. TULL WESTERN ONTARIO U Western Ontario u Western Ontario u

BRIEF DESCRIPTION A CW TRANSMITTER (137 TO 138 NHZ BAND) RADIATING ABOUT 100 NW AND OPERATING IN COMJUNCTION WITH TRACKING BEACON (134 TO 137 NHZ BAND) PROVIDED FACILITIES FOR OBSERVING SCINITLLATIONS FROM IRREGULARITIES, DETERMINING MAGNITUDES AND POSITIONS, AND EVALUATING ELECTRON CONTENT BETWEEN GROUND DESERVER AND SATELLITE

---- ISIS 2. HARTZ-----

INVESTIGATION NAME- COSMIC RADIO NOISE

INVESTIGATIVE PROGRAM CODE ST/CO-OP NSSDC 10- 71-024A-10

> INVESTIGATION DISCIPLINE(S) STRONONY IONOSPHERES AND RADIO PHYSICS

PERSONNEL PI - T.R. HARTZ CONMUN RESEARCH. CENTRE

BRIEF DESCRIPTION THIS EXPERIMENT USED THE SWEEP FREQUENCY IONOSONDE RECEIVER AUTOMATIC GAIN CONTROL (AGC) VOLTAGES TO MEASURE GALACTIC AND SOLAR RADIO NOISE LEVELS. THE RECEIVER SWEPT FOO 0.1 TO 20 MHZ. THE DYNAMIC RANGE WAS 50 DB. AND THE BANDWIDTH WAS 55 KHZ. THE ANTENNAS USED WERE 20.2-M AND 78.9-M DIPOLES.

----- ISIS 2, HEIKKILA-----

INVESTIGATION NAME- SOFT-PARTICLE SPECTROMETER

NSSDC 10- 71-024A-05

INVESTIGATIVE PROGRAM INVESTIGATION DISCIPLINE(S) TONOSPHERES PARTICLES AND FIELDS

PERSONNEL PI - W.J. HEIKKILA

U OF TEXAS, DALLAS

BRIEF DESCRIPTION THE SOFT-PARTICLE SPECTROMETER (BASICALLY AN ELECTROSTATIC ANALYZER) WAS USED TO STUDY THE DIRECTIONAL INTENSITY AND DIFFERENTIAL ENERGY SPECTRA OF PROTONS AND ELECTRONS TO OBTAIN A GREATER UNDERSTANDING OF AUMORAS, GEOMAGNETIC DISTURBANCES, AND VARIOUS IONOSPHEPTC FEATURES. DIFFERENTIAL EMERGY SPECTRA WERE OBTAINED IN THE ENERGY RANGE 10 EV TO 10 KEV WITH A 20 PERCENT ENERGY RESOLUTION. THE VOLTAGE SWEEP PROGRAM OF THE ANALYZER WAS FLEXIBLE.

INVESTIGATION NAME- ION MASS SPECTROMLTER

--- ISTS 2. HOFFPAN----

INVESTIGATIVE PROGRAM CODE ST/CO-OP NSSDC 10- 71-024A-06

INVESTIGATION DISCIPLINE(S) IONOSPHERES Planetary atmospheres Atmospheric Physics

PERSONNEL PI - J.H. HOFFMAN

U OF TEXAS, DALLAS

BRIEF DESCRIPTION THIS MAGNETIC ION MASS SPECTROMETER EXPERIMENT WAS FLOWN TO MEASUME THE DISTRIBUTION OF THE CONCENTRATIONS OF THE ION SPECIES AS A FUNCTION OF THE AND POSITION. WITH PARTICULAR INTEREST FOCUSED ON THE POLAR WIND PARTICLES. THE INSTRUMENT HAD TWO ION DETECTOR SYSTEMS. AND MASS SCANNING THROUGH THE RANGE FROM 1 TO 64 AMU WAS ACCOMPLISHED IN TWO SECTIONS —— 1 TO 8 AMU AND 8 TO 64 AMU TWO ION BEAMS EMERGED FROM THE MAGNETIC SECTOR OF THE INSTRUMENT AND WERE SIMULTANEOUSLY DETECTED BY ELECTRON MULTIPLIERS AND LOG ELECTROMETER AMPLIFIERS. A CIRCUIT FOLLOWING EACH AMPLIFIER OFTECTED THE PEAK AMPLIFIERS. A CIRCUIT FOLLOWING EACH AMPLIFIER OFTECTED THE PEAK AMPLIFIERS. A CIRCUIT FOLLOWING EACH AMPLIFIER OFTECTED THE PEAK AMPLIFIERS. A CIRCUIT FOLLOWING EACH AMPLIFIER OFTECTED THE PEAK AMPLIFIERS. A CIRCUIT FOLLOWING EACH AMPLIFIER OFTECTED THE PEAK AMPLIFIERS. A CIRCUIT FOLLOWING EACH AMPLIFIER OFTECTED THE PEAK AMPLIFIERS. A CIRCUIT FOLLOWING EACH AMPLIFIER OFTECTED THE PEAK AMPLIFIERS. A CIRCUIT FOLLOWING EACH AMPLIFIER OFTECTED THE PEAK AMPLIFIERS. A CIRCUIT FOLLOWING EACH AMPLIFIER OFTECTED THE PEAK AMPLIFIERS. A CIRCUIT FOLLOWING EACH AMPLIFIER OFTECTED THE PEAK AMPLIFIERS. A CIRCUIT FOLLOWING EACH AMPLIFIER OFTECTED THE PEAK AMPLIFIERS. A CIRCUIT FOLLOWING EACH AMPLIFIER OFTECTED THE PEAK AMPLIFIERS. A CIACUA MAS TRANSMITTED IN GROEF TO REDUCE THE REQUIRED TELEMETRY BANDWIDT. IN THIS MODE OF OPERATION, THE COMPLETE MASS RANGE WAS SCANNED IN 1 S. A BACKUP MODE WAS PROVIDED THAT PRODUCED AN ANALDG OUTPUT WITH A SWEEP PERIOD OT 8 S. THIS EXPERIMENT INTHE PEAK MODE. FOR ABOUT 2 MIN PER PASS OVER OTTAWA, CANADA INTHE PEAK MODE. FOR ABOUT 2 MIN PER PASS OVER OTTAWA, CANADA INTHE PEAK MODE. FOR ABOUT 2 MIN PER PASS OVER OTTAWA, CANADA INTESSERPERIMENT OFTEATED IN THE AMALDG MODE. IN-FLIGHT CALIBRATION WAS ACHIEVED BY COMPARING ION CONCENTRATION SPEFIES PREDIMINATED, WITH ELECTRON DATA FROM THE SOUNDER ON BOARD. OTHER COMPARISONS WERE MADE BETWEEN THE SPECTROMETER ON BOAR

--- ISIS 2, MAIER------

INVESTIGATION NAME- RETARDING POTENTIAL ANALYZER

N55DC ID- 71-024A-08

INVESTIGATION DISCIPLINE(S) IONDSPHERES PLANETARY ATMOSPHERES

INVESTIGATIVE PROGRAM CODE ST/CO-OP

PERSONNEL		A second s
PI - E.J.	MÁIER	NASA-GSFC
01 - X.	SMIDDY	USAF GEOPHYS LAB
01 - 8.E.	TROY, JR.	US NAVAL RESEARCH LAB
01 - J.L.	DONLEY	NASA-GSFC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT MEASURED ION AND/OR ELECTRON CURRENT IN ORDER TO STUDY HEAT TRANSFER PROCESSES THAT ARE IMPORTANT IN THE DYNAMICS OF THE IDNOSPHERE. THIS RETARDING POTENTIAL ANALYZER CONSISTED OF THREE GRIDS (APERTURE GRID, RETARDING GRID AND A SUPPRESSOR GRID) THAT PROVIDED & VOLT-AMPERE CURVE RELATING SWEEP VOLTAGE ON THE RETARDING GRID TO CURRENT FLOW TO THE COLLECTOR. ANALYSIS OF THE CURVES PROVIDE JOM/ELECTROM TEMPERATURES AND DENSITIES. THIS EXPERIMENT WAS DESIGNED TO OPERATE ONLY WITH THE SATELLITE IN A CARTWHEEL MODE OF OPERATION. IN THIS MODE. THE SATELLITE ANALYZER APERATURE TO FACE THE DIRECTION OF SATELLITE MOTION ONCE EACH SPIN PERIOD.

INVESTIGATION NAME- ENERGETIC PARTICLE DETECTORS

INVESTIGATIVE PROGRAM Code St/CO-OP NSSDC 10- 71-0244-04

--- ISIS 2, MCDIARMID-----

INVESTIGATION DISCIPLINE(S) IONOSPHERES PARTICLES AND FIELDS

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PERSONNEL PI - I.B. MCDIARMID 01 - J.R. BURROWS

BRIEF DESCRIPTION

-- 1515 2, SHEPHERD---------

INVESTIGATION NAME- 6300-A PHOTOMET'R

INVESTIGATIVE PROGRAM CODE SI/CO-JP

INVESTIGATION DISCIPLINE(S) IONOSPHERES Planetáry atmospheres Atmospheric Physics

YORK U

PERSONNEL PI - G.G. SHEPHERD

NSSDC ID- 71-024A-12

Pin - G.G. SHEPHERD YORK U DRIF DESCRIPTION I NO-CHANNEL PHOTONETER WAS USED TO MEASURE DIRECTLY AND MAP THE INTENSITY OF THE ATOMIC OXYGEN RED LINE AT GAOD A IN AND THILIGHT, AND NIGHT AIRGON AND AURORA. EACH CHANNEL HAG INTUISHT, AND NIGHT AIRGON AND AURORA. EACH CHANNEL HAG INTUISHT, AND NIGHT AIRGON AND AURORA. EACH CHANNEL HAG INTUISHT, AND NIGHT AIRGON AND AURORA. EACH CHANNEL HAG INTUISHT, AND NIGHT AIRGON AND AURORA. EACH CHANNEL HAG INTUISHT, AND NIGHT AIRGON AND AURORA. EACH CHANNEL HAG INTUISHT, AND NIGHT AIRGON AND AURORA. EACH CHANNEL HAG INTUISHT, AND NIGHT CONTERNATION INPUTS WERE ROUNTED AT THE AXES AT 90 DEG TO THE SPACECRAFT, SEPARATED BY 180 DEC, WITH THEIR INTUISHT HE GASDO-A LINE OF AIDTIC OXYGEN, AND THE OTHER INPUT INTUISHT HE GASDO-A LINE OF AIDTIC OXYGEN, AND THE OTHER INPUT INTUISHT HE GASDO-A LINE OF AIDTIC OXYGEN, AND THE OTHER INPUT INTUISHT HE GASDO-A LINE OF AIDTIC OXYGEN, AND THE OTHER INPUT INTUISHT HE GASDO-A LINE OF AIDTIC OXYGEN, AND THE OTHER INFO INTUESH THE PHOTOMETER TO ALTERNATELY VIEW THE EARTH. THE OTHER SENSOR SAM THE SKY. BOTH SENSOR VIEWED THE EARTH. THE SAME INTUISHT MASSURGENTS WAS FRAM ABOUT 10 IT TO ROPE THAN INTUISHT MASSURGENTS WAS FRAM ABOUT 10 IT OR FORE THAN INTUISHT MASSURGENTS WAS FRAM ABOUT 10 IT OR FORE THAN INTUISHIN TO EARTH-REFELCTED LIGHT. THE DATA WERE NOT DEGRAPHED BAY INTUISHIN TO SAMTH-REFLECTED LIGHT. THE DATA WERE NOT DEGRAPHED HAY INTUISHIN, PERMITTING NORMAL OPERATION IN THE REGION OF THE SUNLIGHT, PERMITTING NORMAL OPERATION IN THE REGION OF THE INTUESHIN, PERMITTING NORMAL OPERATION IN THE REGION OF THE INTUESHING THE SPACECRAFT WAS INA WENT SULL OF AXIS. IN THE SUNLIGHT, PROMITTING NORMAL OPERATION IN THE REGION OF THE INTUE WHEN THE SPACECRAFT SYSTEM AND WIGH FOR THEELT INTUE ONTO TO PRESENT THE MEASURGENTS IN A FORM INTUESTION TO EARTH-REFLECTED LIGHT LEVELS AND KORE OFT AXIS. IN THE SUNLIGHT, PROTECTION CIGCULTRES TO MANDE FOR AXIS, AND THE SUCKNON INTERSITY OF HIGHT CEVELS. TO FERFORM THE MASURATION F

----- 1515 2. HHITTEKEP---INVESTIGATION NAME- SWEEP-FREQUENCY SOUNDER

NSSDC 10- 71-0244-01 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) Ionospheres and radio physics

CODE 51/CO-GP

PERSONNEL		
PI - J.H.	WHITTEKER	COMMUN RESEARCH CENTRE
01 - G.E.K	LOCKWOOD	COMMUN RESEARCH CENTRE
01 - G.L.	NELMS	DEFENCE RESEARCH ESTAB
ai — 1*	TURNER	IONOSPHERIC PRED SERV
01 - M.	SYLVAIN	LGE
01 - 0.	HOLT	AURORAL OBS
0I - Y.	OGATA	RADIO RESEARCH LAB
	RAGHAVARAO	PHYSICAL RESEARCH LAB
01 - J.E.		NASA-GSFC
01 - C.E.		COMMUN RESEARCH CENTRE
01 - T.E.	VAN ZANDT	NOAA-ERL
01 - L.	COLIN	NASA-ARC
01 - W.	CALVERT	DNKNOWN
01 - R.O.	NORTON	NOAA-ERL
01 - J.W.	KING	APPLEION LAB
01 - K.L.		NASA-ARC
01 - RS.	UNWIN	DEPT OF SCI+INDUST RES
		· · · · · · · · · · · · · · · · · · ·

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE ISIS 2 IONOSONDE WAS A RADIO TRANSMITTER THAT RECORDED THE TIME DELAY BETWEEN A TRANSMITTED AND RETURNED RADID FREQUENCY PULSE. A CONTINUUM OF FREQUENCIES BETWEEN 0.1 AND 20 HHZ WAS SAMPLED EVERY 14 OR 21 S, AND ONE OF SIX SELECTED FREQUENCIES WAS ALSO USED FOR SOUNDING FOR A FEW SECONDS DURING EACH 14- OR 21-S PERIOD, IN ADDITION TO THE SWEEP-AND FIXED-FREQUENCIES WAS ALSO USED FOR SOUNDING FOR A FEW SECONDS DURING EACH 14- OR 21-S PERIOD, IN ADDITION TO THE SWEEP-AND FIXED-FREQUENCIES WHILE THE RECEIVER SWEEP. SEVERAL VIRTUAL RANGE (DELAY TIME) TRACES RESULTING FROM GROUND REFLECTIONS, PLASMA RESONANCES, DIREFRIMEENCE OF THE IONOSPHERE, NONVERTICAL PROPAGATION, ETC., WERE NORMALLY OBSERVED. VINTUAL RANGÉ AT A GIVEN FREQUENCY WAS FRIMAILY A FUNCTION OF DISTANCE TRAVERSED BY THE SIGNAL, ELECTRON DENSITY ALONG THE PROPAGATION PATH, AND MODE OF PROPAGATION. THE STANDARD DATA FORM WAS AN IONOGRAMS, THEY WARE DIGITAL FREQUENCY ANDY VIRTUAL HEIGH FROMENT. TWO OTHER FORMS OF DATA WERE COMMONLY PREPARED FROM THE IONOGRAMS. THEY WERE DIGITAL FREQUENCY ANDY OF VIRTUAL HEIGHT VALUES OF CHARACTERISTIC IONOSPHERIC FEATURES AND CONPUTATIONS OF ELECTRON DENSITY PROFILES.

SPACECRAFT COMMON NAME- ISS 1 ALTERNATE NAMES- IONOSPHERE SOUNDING SAT., JISS

NCSDC 10- 76-0194

LAUNCH BATE- 02/29/76 Launch Site- Tànggashima, Japa Laungh Vehicle- Nu	WĖIGHT- 135. KG N
SPONSORING COUNTRY/AGENCY	
JAPAN	NASDA
· JAPAN.	RRL
INITIAL ORBIT PARAMETERS	
ORBIT TYPE- GEOCENTRIC	EPOCH DATE- 03/01/76
ORBIT PERIOD- 105. MIN	INCLINATION- 69.7 DEG
PERIAPSIS- 984. KM	APOAPSIS- 1017. KM
PERSONNEL	
PM - Y. OGATA	RADIO RESEARCH LAÐ
PS - K. TAO	RADIO RESEARCH LAB

PS - K. TAO RADIO RESEARCH LAB BRIEF DESCRIPTION THÉ IGNOSPHERE SOUNDING SATÉLLITE WAS DEVELOPED AS PART OF JAPAN'S CONTRIBUTION TO THE INTERNATIONAL MAGNETOSPHERIC STUDY (INS). ITS OBJECTIVES WERE TO ACCUMULATE DATA FOR STUDY OF THE TOPSIDE IGNOSPHERE AND TO UPVEY RADIO NOISE AT FOUR FREQUENCIES, FROM BOTH EARTH AND COSNIC SOURCES. IT WAS PLANNED TO PREPARE WORLDWIDE MAPS OF F2 CRITICAL FREQUENCY FROM THE IGNOSPHERE SOUNDING DATA. THE ISS WAS A SMALL OBSERVATORY WITH FOUR EXPERIMENTS ON BOARD. THE SPACECRAFT, A RIGHT CVLINDER 82-CH LONG AND 93.5-CH IN DIAMETER, WAS SPIN STABILIZED AT ABOUT TO REM WITH THE SPIN AXIS NORMAL TO THE EGLIPTIC PLANE. TWO PAIRS OF CROSSED DIPOLE ANTENNAS EXTEMDED FROM THE CENTRAL PART OF THE SATELLITE AND LAY PERPENDICULAR TO THE SPIN AXIS. THESE ANTENNAS, JO.8-AND 11.4-H LONG, WERE UNFURLED IN OBDIT AND WERE SHARED BY IONOSPHERIC SOUNDING AND RADIO NOISE EXPERIMENTS. A SPHERICAL RETARDING POTENTIAL THAP SENSOR WAS MOUNTED ON A BOON PERPENDICULAR TO THE SPIN AXIS. AMGMETIC ATTITUDE SCHOR WAS SPECTROMETER WITH TWO SENSOR FLUSH MOUNTED ON A PROSITE ENDS OF THE RMAINING EXPERIMENT INVOLVED A BENNETT-TYPE MASCERAFT. THE REMAINING EXPERIMENT INVOLVED A BENNETT-TYPE ASCERAFT. THE REMAINING EXPERAFT HIS POULDED FROM A BATTERY-SOLAR-CELL SYSTEM WITH SOLAR CELLS COVERING MOST OF THE CVLINDRICAL SURFACE. ONE TAPE RECORDED (FOR BOARD PERMITTED SPACECRAFT OPERATION IN EITHE

UP TO 112 MIN) OR REAL-TIME NODE. READOUT AND REAL-TIME Operation were planned to be from Kagoshima, Japan, and Soywa Station, Antarctica.

- ISS 1. EUGOND

INVESTIGATION NAME- POSITIVE ION MASS SPECTROMETER (PIC)

INVESTIGATIVE PROGRAM SCIENTIFIC SATEULITE

INVESTIGATION DISCIPLINE(S) IONOSPHERES Atmospheric physics

PADIO RESEARCH LAB Radio Research Lab

RADIO RESEARCH LAB

PERSONNEL PI - N. 01 - I. FUGONO IWAMOTO

NSSDC 10- 76-0194-04

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT WAS FLOWN TO MEASURE THE POSITIVE ION COMPOSITION OVER THE SPACECRAFT ORBIT. TWO BENNETT-TYPE ION MASS SPECTROMETERS WERE FLUSH MOUNTED ON OPPOSITE ENDS OF THE SPACECRAFT TO LOOK IN OPPOSITE DIRECTIONS ALONG THE SPIN AXIS. THE INSIDE DIAMETER OF THESE CYLINDRICAL SENSORS WAS 26 MM. THE MASS RANGE COVERED WAS 1 TO 20 U, AND THE ION COMCENTRATIONS WERE MEASURED OVER THE RANGE FROM 100 TO 1.E7 IONS DEF CF. IONS PER CC.

----- ISS 1, MIYAZARI------INVESTIGATION NAME- RETARDING POTENTIAL PROBE

NSSDC 10- 76-019A-03

INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE

INVESTIGATION DISCIPLINE(S) IONOSPHERES

PERSONNEL PI - 5-HEYAZAKI

BRIEF DESCRIPTION THIS PROBE WAS A SPHERICAL RETARDING POTENTIAL TRAP DESIGNED TO OBSERVE AMBIENT ION AND ELECTRON DENSITIES RANGING FROM 1.E3 TO 1.E6 PER CC. ANBIENT ION AND ELECTRON TEMPERATURES IN THE RANGE 1000 TO SOOD K WERE DETERMINED. AS WITH ALL RETARDING POTENTIAL INSTRUMENTS, THESE PARAMETERS WERE DERIVED FROM INTERPRETATION OF THE CURRENT FLOW MEASUREMENT WITH A GIVEN VOLTAGE SEQUENCE APPLIED TO THE COLLECTOR AND SCREEN GRIDS. THE SENSOR WAS MOUNTED ON A BOOM EXTENDING DERIVED ILLAR TO THE SPACECRAFT SPIN AXIS. IT CONSISTED OF A 2-CM DIAMETER COLLECTOR, CONCENTRICALLY ENVELOPED BY 6- AND 10-CM DIAMETER SPHERICAL WIRE GRIDS. THE CURRENT VUITAGE ANALOG DATA WERE TELEMETERED AND SUBSEQUENTLY ANALYZED BY THE EXPERIMENTER.

-- ISS 1, MURANAGA-------

INVESTIGATION NAME- RADIO HOISE NEAR 2.5,5,10+25 NHZ (RAN)

INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE NSSDC ID- 76-019A-02

INVESTIGATION DISCIPLINE(S) Planetary physics Ignospheres and radio physics

RADIO RESEARCH LAB

PERSONNEL PI - K RURANAGA

BRIEF DESCRIPTION THE OBJECTIVES OF THIS EXPERIMENT WERE TO OBSERVE AND STUDY --(1) THE GLOBAL DISTRIBUTION OF SPHERICS AND (2) THE THE WARIATION OF SPHERICS AND COSMIC NOISE. RADIO NOISE IN FOUR FREQUENCY CHANNELS -- 2,497, 4,997, 9,997, (OR 10,03), AND 24,994 (OR 25,006) MH2 -- WAS OBSERVED, CHARACTERISTICS OBSERVED AT EACH FREQUENCY WERE NOISE INTENSITY (RESOLUTION OF 1/12,8 S) AND OCCURENCE FREQUENCY OF IMPULSIVE NOISE (G.T. 15 DB ABOVE RESOLVED INTENSITY). DETAILS ON ISS PERFORMANCE MAY BE FOUND IN MATUURA'S 'REPORT ON DATA FROM SHORT-LIVED ISS.'

SPACECRAFT COMMON NAME- LAGEDS Alternate Names- Laser Geodynamic Sat.

NSSDC 10- 76-039A

WEIGHT- 411. KG

LAUNCH DATE- 05/04/76 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE+ DELTA SPONSORING COUNTRY/AGENCY UNITED STATES NASA-0A

INITIAL ORBIT PARAMETERS	
ORBIT TYPE- GEOCENTRIC	EPOCH DATE- 05/05/76
ORBIT PERIOD- 225.41 MIN	INCLINATION- 109.86
PERIAPSIS- 5837. KM	APDAPSIS- 5945, KH
PERSONNEL	
MG - J.P. MURPHY	NASA-HEADQUARTERS
PM - C.W. JOHNSON	NASA-HSFC
PM — C.C. STEPHANIDES	NASA-GSFC

BRIEF DESCRIPTION

BRIEF DESCRIPTION LAGGOS WAS A VERY DENSE (HIGH MASS-TO-AREA RATIO) LASER RETROREFLECTOR SATELLITE WHICH PROVIDED A PERMANENT REFERENCE POINT IN A VERY STABLE ORBIT FOR SUCH PRECISION EARTH-DYNAMICS HEASUREMENTS AS CRUSTAL MOTIONS, REGIONAL STRAINS, FAULT MOTIONS, POLAR MOTION AND EARTH-ROTATION VARIATIONS, SOLID EARTH TIDES, AND OTHER KINEMATIC AND DYNAMIC PARAMETERS ASSOCIATED WITH EARTHQUAKE ASSESSMENT AND ALLEVIATION, IM CONJUNCTION WITH APPROPRIATE LASSESSMENT AND ALLEVIATION, SOLID EARTH TIDES, AND OTHER KINEMATIC AND DYNAMIC PARAMETERS ASSOCIATED WITH EARTHQUAKE ASSESSMENT AND ALLEVIATION, IM CONJUNCTION WITH APPROPRIATE LASSESTMENT AND ALLEVIATION, IM GEOMETRIC MODE (MULTILATERATION) AND ORBITAL DYNAMIC MODE DETERMINATIONS OF POSITIONS OF POINTS ON THE EARTH. IT WAS THE FIRST SPACECRAFT DEDICATED EXCLUSIVELY TO HIGH-PRECISION LASER RANGING DATA THAT WERE NOT DEGRADED BY ERRORS DRIGINATING IN THE TARGET SATELLITE. THE HIGH-ACCURACY RANGE MEASUREMENTS FROM THIS PERMANENT-ORBITING REFERENCE POINT WERE USED TO ACCOMPLISH MANY EXTREME PRECISION EARTH-DYNAMICS MASUREMENTS REQUIRED BY THE EARTHQUAKE HAIARD ASSESSMENT AND ALLEVIATION DEJECTIVES OF THE EARTH AND OCEAN PHYSICS APPLICATIONS PROGRAM (EDPAP). THE PERFORMANCE IN DRBIT OF LAGEOS IS LIMITED ONLY BY DEGRADATION OF THE RETRORFLECTORS, SO MANY DECADES OF USEFUL LIFE CAN BE EXPECTED. THE HIGH MASS THIS AND ALLEVIATIONS DEGRADATION OF THE RETRORFLECTORS, SO MANY DECADES OF USEFUL LIFE CAN BE EXPECTED. THE HIGH MASS THIST ANTO AND THE PRECISE, STABLE (AT,ITUDE-INDEPENDENT) GEOMETRY OF THE PRECISE POSITION REFERENCE AVAILIABLE. BECAUSE IT IS VISIBLE IN ALL PARTS OF THE WORLD AND HAS AN EXTENDED DPERATION LIFE IN ORDIT, LAGEOS CAN SERVE AS A FUNDAMENTAL STANDARD FOR DECADES. DECADES

-- LAGEOS, STEPHANIDES------

INVESTIGATION NAME- LASER RETROFLECTORS

SSDC	10-	76-039A-01	INVESTIGATIVE PROGRAM
			CODE ESE

INVESTIGATION	<pre># DISCIPLINE(S)</pre>
CELESTIAL P	ECHANICS
GEODESY	

PERSONNEL PI - C.C. STEPHANIDES DI - H.H. PLOTKIN

NASA-GSEC NASA-GSEC

BRIEF DESCRIPTION

BRIEF DESCRIPTION LASER RETROREFLECTORS COVERING A VERY DENSE SPHERICAL SATELLITE WERE USED TO PROVIDE A PERMANENT REFERENCE POINT IN A VERY STABLE ORBIT FOR PRECISION EARTH-DYNAMICS MEASUREMENTS. THIS SPHERE WAS MACHINED LARGELY FROM DEPLETED URANIUM, WEIGHED ABOUT 411 KG, AND NAS COMPOSED OF A CUBICAL INNER CORE WITH SIX ATTACHED SPHERICAL CAPS. EACH OF THE SPHERICAL CAPS HAD MACHINED CAVITIES TO ACCOMODATE THE RETROREFLECTORS. THE SATELLITE WAS PLACED AT A MID-TO-HIGH ORBITAL INCLINATION AT AM ALITIUDE OF ABOUT 3700 KM AND TRACKED BY A NETWORK OF 13 LASER STATIONS OPERATED BY BOTH U.S. AND FOREIGN AGENCIES. THE PERFORMANCE IN ORBIT IS LIMITED ONLY BY DEGRADATION OF THE RETROREFLECTORS, AND A MINIMUM LIFETIME OF 50 YEARS IS EXPECTED. EXPECTED

SPACECRAFT COMMON NAME~ LANDSAT 1 Alternate Names- Earth Res tech Sat.-A, PL-724A Erts-A, 06126

NSSOC 10- 72-0584

LAUNCH DATE- 07/23/72 WEIGHT- 891. KG LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- DELTA

SPONSORING COUNTRY/AGENCY UNITED STATES

INITIAL ORBIT PARAMETERS Orbit type- geocentric Orbit Period- 103.1 min Periapsis- 897. Km	EPOCH DATE- 07/24/72 Inclination- 99.1 deg Apoapsis- 917. Km
PERSONNEL	
MG - H. MANNHEIMER	NASA HEADQUARTERS
SC - J.R. MORRISON	NASA HEADQUARTERS
PM - R.K. BROWNING	NASA-GSFC
PS - S.C. FREDEN	NASA-GSFC

NASA-GA

BRIFF DESCRIPTION

BRIEF DESCRIPTION LANDSAT T (FORMERLY ERTS 1) WAS A NODIFIED VERSION OF THE NINBUS 4 RETEOROLOGICAL SATELLITE. THE NEAR-POLAR ORBITING SPACECRAFT SERVED AS A STADILIZED, EARTH-ORIENTED PLATFORM FOR OBTAINING INFORMATION ON AGRICULTURAL AND FORESTRY RESOURCES, GEOLOGY AND MINERAL RESOURCES, HYDROLOGY AND WATER RESOURCES, GEOGRAPHY, CARTOGRAPHY, ENVIRONMENTAL POLLUTION, DCEANOGRAPHY

AND MARINE RESOURCES, AND METEOROLOGICAL PHENOMENA. TO ACCOMPLISH THESE OBJECTIVES, THE SPACECRAFT WAS EQUIPPED WITH (1) A FOUR-CHANNEL MULTISPECTRAL SCANNER (MSS), (2) A THREE-CAMERA RETURN BEAM VIDICON (RØV) TO OBTAIN HOTH VISIBLE AND IR PHOTOGRAPHIC AND RADIOAETRIC IMAGES OF THE EARTH, AND (3) A DATA COLLECTION SYSTEM TO COLLECT INFORMATION FROM REMOTE, INDIVIDUALLY EQUIPPED GROUND STATIONS AND TO RELAY THE DATA TO CENTRAL ACQUISITION STATEM TO COLLECT INFORMATION FROM REMOTE, INDIVIDUALLY EQUIPPED GROUND STATIONS AND TO RELAY THE DATA TO CENTRAL ACQUISITION STATIONS. LANDSAT I CARRIED TWO WIDE-BAND VIDEO TAPE RECORDERS (WØVTR) CAPABLE OF STORING UP TO 30 MIN OF SCANNER OR CAMERA DATA TO GIVE THE SPACECRAFT'S SENSORS A MEAR-GLOBAL COVERAGE CAPABILITY. AN ADVANCED ATTITUDE CONTROL SYSTEM CONSISTING OF HORIZON SCANNERS, SUN SENSORS, AND A COMMAND ANTENNA COMBINED WITH A FREON GAS PROPULSION SYSTEM PERMITTED THE SPACECRAFT'S ORIENTATION TO BE MAINTAINED WITHIN PLUS OR MINUS D.7 DEG IN ALL THREE AXES. SPACECRAFT COMMUNICATIONS INCLUDED A COMMAND SUBSYSTEM OPERATING AT 154.2 AND 2106.4 THZ AND A PCM NARKOM-BAND TELEMETRY SUBSYSTEM, OPERATING AT 2207.5 AND 137.86 MHZ, FOR SPACECRAFT HOUSEKEEPING, ATTITUDE, AND SENSOR PERFORMANCE DATA. VIDED DATA FROM THE THREE-CAMERA RBV SYSTEM WAS TRANSMITTED IN BOTH REAL-TIME AND TAPE-RECORDER MODES AT 2205.5 MHZ. HILE INFORMATION FROM THE NESS WAS CONSTRAINED TO A 20-MHZ RF BANDWIDTH AT 2229.5 MHZ.

-- LANDSAT 1, ARLUSKAS----

INVESTIGATION NAME- NULTISPECTRAL SCANNER (MSS)

N55DC 10- 72-056A-02 INVESTIGATIVE PROGRAM CODE ERN

INVESTIGATION DISCIPLINE(5) EARTH RESOURCES SURVEY

NASA~GSEC

PERSONNEL AREUSKAS PI - J.

DEG

PERSONNEL PI - J. ARLUSKAS NASA-GSFC BRIEF DESCRIPTION THE LANOSESIGNED TO PROVIDE REPETITIVE DAVITE ACQUISITION OF KIGS) WAS DESIGNED TO PROVIDE REPETITIVE DAVITE ACQUISITION OF KIGS) WAS DESIGNED TO PROVIDE REPETITIVE DAVITE ACQUISITION OF KIGS) WAS DESIGNED TO DEMONSTRATE THAT REMOTE SENSING FROM SPACE IS A FEASIBLE AND TO DEMONSTRATE THAT REMOTE SENSING FROM SPACE IS A FEASIBLE AND PRACTICAL APPROACH TO EFFICIENT MANAGEMENT OF THE EARTH'S RESOURCES IN ADDITION TO DOTAINING DATA FOR USE IN EARTH RESOURCE TYPE STUDIES, THE MSS SYSTEM WAS USED TO CONDUCT OCEANOGRAPHIC AND METERMINE SHOLOGICAL STUDIES, I.E., TO MAP SEA-ICE FIELDS, LOCATE AND TRACK MAJOR OCEAN LURRENTS, MONITOR BOTH AIR AND WATER POLLUTION, DETERMINE SOU COVER, INVESTIGATE SEVERE STORM ENVIRONMENTS, ETC. THE MSS CONSISTED OF A 22.66-CM DUBLE REFLECTOR-TYPE TELESCOPE, SCANNING MIRROR, FILTERS, DETECTORS, AND ASSOCIATED ELECTRONICS. THE SCANNER OPERATED IN THE FOLLOWING SPECTRAL INTERVALS -- BAND 1.0.5 TO D.6 MICROMETER, AND BAND 4.0.8 TO 1.1 MICROMETERS. INCOMING RADIATION WAS COLLECTED BY THE SCANNING MIRROR, WHICH OSCILLATED 2.89 DEG TO EITHER SIDE OF NADIR AND SCANNED CROSS-TRACK SWATHS IBS-KN WIDE. THE ALONG-TRACK SCAN WAS PRODUCED BY THE ORBITAL MOTION OF THE SPACETART. THE PRIMARY MAGE PRODUCED AT THE IMAGE PLANE OF THE TELESCOPE WAS RELAYED SUSS OF FIBER OPTIC BUNDLES TO DETECTORS WHERE CONVERSION TO AN ELECTRONIC SIGNAL WAS ACCOMPLISHED. OPTICAL FILTES WERE USED TO PRODUCE THE DESIRED SPECTRAL SPARATION. SIX DETECTORS WERE EMPLOYED IN EACH OF THE FUELS AS DETECTORS, AND BAND 1 HAGOUGH 3 USED PHOTOONULTIPLIER TUBES AS DETECTORS, AND BAND 1 HATA WARE TIME-MULTIPLEXED AND THEN CONVERTED TO A PULSE-COOR FRANCE SIGNAL BY AN A/O CONVERTER TO A PULSE-COOR FRANCE THE DESIGNAL WY AN A/O CONVERTER. THE DATA WERE THEN TARMART THE ARDE DA ANGE OF A MACQUISITION STATION OF AN THE FARTMENT ARE MANDLED BY AN A/O CONVERTER. THE DATA WERE THEN FRANCES TIMENT ARE MANDLED AN ACQUISITION ATA FROM THIS STATEM PROTOCESSED THE

--- LANDSAT 1, PAINTER-

INVESTIGATION NAME- DATA COLLECTION SYSTEM (DCS)

INVESTIGATIVE PROGRAM CODE ERN NS50C 10- 72-0584-55

INVESTIGATION DISCIPLINE(5) EARTH RESOURCES SURVEY

PERSONNEL PI - J.E. PAINTER NASA-GSEC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE PURPOSE OF THE LANDSAT 1 (FORMERLY ERTS 1) DATA COLLECTION. SYSTEM (DCS) WAS TO PROVIDE USERS WITH NEAR REAL-TIME DATA COLLECTED FROM VARIOUS REMOTE LOCATIONS, THE DCS WAS COMPOSED OF -- (1) THE DATA COLLECTION PLATFORMS (DCP'S), (2) THE SATELLITE EQUIPMENT, AND (3) THE GROUND DATA CENTERS, INCLUDING REMOTE RECEIVING SITES AND THE GROUND DATA ANDLING SYSTEM AT GSTC. THE DCS PROV.DED A CONTINUAL FLOW DF INFORMATION TO BE USED FOR NANAGEMENT OF WILDLIFE, MARINE, AGRICULTURE, WATER, AND FORESTRY RESOURCES. THESE DATA ALSO LEAD TO IMPROVED WEATHER FORECASTS, POLLUTION CONTROL, AND EARTHQUAKE PREDICTION AND WARNING. THE ENVIRONMENTAL SENSORS

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MOUNTED ON A DCP WERE SELECTED BY INDIVIDUAL INVESTIGATORS TO SATISFY THEIR PARTICULAR REQUIREMENTS. FROM A NOMINAL ORBIT OF APROXIMATELY 900 KM, THE SPACERAFT WAS CAPABLE OF ACQUIRING DATA FROM DCP'S WITHIN A RADIUS OF APPROXIMATELY 3100 KM FROM THE SUBSATELLITE POINT, THUS ALLOWING DATA TO BE DBTAINED FROM ANY REMOTE PLATFORM AT LEAST ONCE EVERY 12 H. THE DCF'S TRANSMITTER FREQUENCY WAS 1.55 MHZ. THE DCS EQUIPMENT, ESSENTIALLY A RECEIVER, RECEIVED AND RETRAMSMITTED DATA (AT 2287,5) TO SELECTED GROUND RECEIVING STATIONS. THERE WAS NO SIGMAL MULTIPLEXING OR DATA PROCESSING ON THE SATELLITE. THE LANDSAT DCS COULD ACCOMMODATE UP TO 1000 DCP'S DEPLOYED THROUGHOUT THE CONTINENTAL U.S. THE DCS INITIALLY CONSISTED OF A FILOT GROUP OF ONLY SIX DCP'S, WITH USER AGENCIES PROCURI'G, INSTRUMENTING, AND DEVELOPING ADDITIONAL PLATFORMS ACCORDING DISTRIBUTED TO THE VARIOUS PLATFORM INVESTIGATORS BY THE NASA DATA PROCESSING FACILITY, GSFC, GREENBELT, MD.

SPACECRAFT COMMON NAME- LANDSAT Z ALTERNATE NAMES- EARTH RES TECH SAT.-8; PL-733D ERTS-8; 07615

NSSDC 10- 75-004A

LAUNCH DATE- 01/22/75 WEIGHT- 816. KG LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- DELTA

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-0A

INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC Orbit Period- 103.28 Min Periapsis- 907. KM	EPOCH DATE- 01/25/75 Inclination- 99.09 DFG Apoapsis- 918. KM
PERSONNEL MG - H. MANNHELMER SC - J.R. MORRISON PM - R.K. BROWNING PS - S.C. FREDEN	NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSEC NASA-GSEC

PR - R.K. DRUMMING PS - S.C. FREDEN BRIEF DESCRIPTION LANDSAT 2 WAS THE SECOND OF A SERIES OF MODIFIED NIMBUS SATELLITES. THE NEAR-POLAR ORDITING SPACECRAFT SERVED AS A STABILIZED, EARTH-ORIENTED PLATFORM FOR GOR DATAINING INFORMATION ON AGRICULTURAL AND FORESTRY RESOURCES, GEOLOGY AND NIMERAL RESOURCES, HYDROLOGY AND WATER RESOURCES, GEOLOGY AND NIMERAL RESOURCES, HYDROLOGY AND WATER RESOURCES, GEOLOGY AND MARINE RESOURCES, AND METEOROLOGICAL PHENOMENA. TO ACCOMPLISH THESE GBJECTIVES THE SPACECRAFT WAS EQUIPPED WITH (1) A FIVE-CHANNEL MULTISPECTRAL SCANNER (MSS) AND A THREE-CAMERA RETURN BEAM VIDICON (RBV) TO OBTAIN BOTH VISIBLE AND IR PHOTOGRAPHIC AND RADIOMETRIC IMAGES OF THE EARTH, (2) A DATA COLLECTION SYSTEM TO COLLECT INFORMATION FROM REMOTE INDIVIDUALLY EQUIPPED GROUND STATIONS AND TO RELAY THE OATA TO CENTRAL ACQUISITION STATIONS. LANDSAT 2 CARRIED TWO VIDE-DAND VIDEO TAPE RECORDERS (WBVR) CAPABLE OF STORING UP TO 30 MIN OF SCANNER OR CAMERA DATA TO GIVE THE SPACECRAFT'S SENSORS A NEAR-GLOBAL CONSISTING OF HOFIZON SCANNERS, SUN SENSORS, AND A COMMAND ANTENNA COMBINE WITIN A FREON GAS PROPULSION SYSTEM PERMITED THE SPACECRAFT'S ORIENTATION TO BE CONTROLLED TO WITHIN PLUS OR MINUS 0.7 DEG IN ALL THREE AXES. SPACECRAFT COMMUNICATIONS INCLUDED A COMBINE WIDIS SCANNERS, SUN SENSORS, AND A COMMAND ANTENNA COMBINE WIN A FREON GAS PROPULSION SYSTEM PERMITED THE SPACECRAFT'S ORIENTATION TO BE CONTROLLED TO WITHIN PLUS OR MINUS 0.7 DEG IN ALL THREE AXES. SPACECRAFT COMMUNICATIONS INCLUDED A COMBINE WISTEM OPERATING AT 154.2 AND 2106.4 MIZ AND A PCM NARROW-BAND TELEMETRY SUBSYSTEM, OPERATING AT 2287.5 AND 317.86 MHZ, FOR SPACECRAFT HOUSEKEEPING, ATTITUDE, AND SENSOR MAR TRANSHITTED IN OGTH REAL JIME AND ROM WUSTR AT 2276.5 MHZ, WHILL INFORMATION FOR THE MSS WAS CONSTRAINED TO A 20-MHZ RF BANDWIDTH AT 2229.5 MHZ.

INVESTIGATION NAME- HULTISPECTRAL SCANNER (MSS)

INVESTIGATIVE PROGRAM NSSDC ID- 75-004A-02

-- LANDSAT 2, ARLUSKAS----

CODE ERN

INVESTIGATION DISCIPLINE(S) EARTH RESOURCES SURVEY

PERSONNEL PI - J. ARLUSKAS

NASA-GSEC

71

BRIEF DESCRIPTION THE LANDSAT 2 MULTISPECTRAL SCANNER (MSS) WAS DESIGNED TO PROVIDE REPETITIVE DAT-NIGHT ACQUISITION OF HIGH-RESOLUTION MULTISPECTRAL DATA OF THE EARTH'S SURFACE ON A GLOBAL BASIS. WHILE ITS PRIMARY FUNCTION WAS TO OBTAIN INFORMATION IN VARIOUS AREAS SUCH AS AGRICULTURE, FORESTRY, GEOLOGY, AND HYDROLOGT. THE MSS SYSTEM WAS ALSO USED FOR OCEANOGRAPHIC AND METEOROLOGICAL PURPOSES, 1.E., TO MAP SEA-ICE FIELDS, LOCATE AND TRACK RAJOR OCEAN CURRENTS, MONITOR BOTH AIR AND WATER POLLUTION, DETERNINE SWOW COVER, INVESTIGATE SEVERE STORM ENVIRONMENTS, EIC. THE MSS CGANSISTED OF A 22.86-CM DOUBLE REFLECTOR-TYPE TELESCOPE, SCANNING MIRROR, FILTERS, DETECTORS, AND ASSOCIATED ELECTRONICS. THE SCANNER OPERATED IN THE FOLLOWING SPECTRAL INTERVALS -- DAAD 1 - 0.5 TO 0.8 MICROMETER, BAND 2 - 0.4 TO 0.7 MICROMETER, BAND 3 - 0.7 TO 0.8 MICROMETER, BAND 4 - 0.8 TO 1.1 MICROMETERS, AND BAND 5 - 10.4 TO 12.6 ORIEF DESCRIPTION

MICROMETERS. THIS LAST BAND WHICH LIES IN THE THERMAL ('MISSIVE') PART OF THE SPECTRUM, GAVE LANDSAT 2 NIGHTTIRE SENSING CAPABILITIES. A FEATURE LACKING IN THE MSS ON LANDSAT 1. INCOMING RADIATION WAS COLLECTED BY THE SCANNING MIRROR, WHICH OSCILLATED 2.89 DEG TO EITHER SIDE OF NADIR AND SCANNED RROBUED BY THE ORBITAL MOTION OF THE SPACECRAFT. THE PRIMARY IMAGE PRODUCED AT THE IMAGE PLANE WAS RELAYED BY USE OF FIDER-OFTIC BUNDLES TO DETECTORS WHERE CONVERSION TO AM LECTRONIC SIGNAL WAS ACCOMPLISHED. OFTICAL FILTERS WERE USED TO PRODUCE THE DESIRED SPECTRAL SEPARATION. SIX DETECTORS WERE EMPLOYED IN EACH OF THE FIRST FOUR SPECTRAL BANDS AND TWO IN THE FIFTH BAND -- BANDS 1 THROUGH 3 USED PHOTOMULTIPLIER TUGES AS DETECTORS. BAND 4 USED SILLON PHOTOMULTIPLIER TUGES MERCURY-CADMIUM-TELLURIDE DETECTORS. A MULTIPLEXER INCLUDED IN THE MSS STSTEM PROCESSED THE SCANKER'S 26 CHANNELS OF DATA. THESE OATA WERE TIME-MULTIPLEXED AND THEN CONVERTED. TO A MULTIPLESED TO STATION OR STORED ON MAGNETIC TAPE FOR SUBSEQUENT PLANEAK THE MAS DETECTORS. BAND 4 USED SILLON PHOTOMULTIPLIER TUGES AND ALMONG THE PROCESSED THE SCANKER'S 26 CHANNELS OF DATA. THESE OATA WERE TIME-MULTIPLEXED AND THEN CONVERTED TO A PULSE-CODE MODULATED SIGNAL OF AN A/D CONVERTER. THE DATA WERE THEN TRANSMITTED (AT 2229.5 MH2) DIRECTLY TO AN ACQUISITION STATION OR STORED ON MAGNETIC TAPE FOR SUBSEQUENT PLANEAK THE NEXT TIME THE SPACEGRAFT COMES WITHEN COMPARENT ARE HANDED BY THE NASA DATA PROCESSING FACILITY. GSFC, GREENBELT, HD, AND ARE AVAILABLE TO APROVED INVESTIGATORS THROUGH ITS LANDSAT USERS SERVICES SECTION. ALL OTHER INTERSTED INDIVIDUALE MAY OBTAIN DATA THROUGH THE LEARTH RESOURCES DATA CENTER, DEPARTMENT OF THE INTERIOR, SIOUX FALLS, SD.

--- LANDSAT 2, PAINTER------

INVESTIGATION NAME- DATA COLLECTION SYSTEM (DCS)

NSSDC 10- 75-004A-03 INVESTIGATIVE PROGRAM CODE ERN

> INVESTIGATION DISCIPLINE(\$) EARTH RESOURCES SURVEY ATMOSPHERIC PHYSICS

> > NASA-GSEC

PERSONNEL PI - J.E. PAINTER

DRAFT DESCRIPTION THE PURPOSE OF THE LANDSAT 2 DATA COLLECTION SYSTEM (DCS) WAS TO PROVIDE USENS WITH NEAR REAL-TIME DATA COLLECTEO FROM VARIOUS REMOTE LOCATIONS. THE DCS WAS COMPOSED OF -- (1) THE DATA COLLECTION PLAIFORMS (DCP'S), (2) THE SATELLITE FOULPMENT, AND (3) THE GROUND DATA CENTERS, INCLUDING REMOTE RECEIVING SITES AND THE CROUND DATA CENTERS, INCLUDING REMOTE RECEIVING SITES AND THE GROUND DATA CENTERS, INCLUDING REMOTE RECEIVING SITES AND THE GROUND DATA CENTERS, INCLUDING REMOTE RECEIVING SITES AND THE CROUND DATA CENTERS, INCLUDING REMOTE RECEIVING SITES AND THE CROUND DATA CENTERS, INCLUDING REMOTE RECEIVING SITES AND THE CROUND DATA CENTERS, INCLUDING REMOTE RECEIVING SITES AND THE CROUND DATA CENTERS, INCLUDING REMOTE RECEIVING SITES AND THE CROUND DATA CENTERS, INCLUDING REMOTE RECEIVING SITES AND THE CROUND DATA COULD ALSO LEAD TO IMPROVED WEATHER FORECASTS, POLLUTION CONTROL, AND FARTHOUA, E PREDICTION AND WARNING. THE ENVIRONMENTAL SENSORS MOUNTED ON A DCP WERE SELECTED BY INDIVIDUAL INVESTIGATORS TO SATISFY THEIR PARTICULAR REGUIREMENTS. FROM A PLANNED ORBIT OF 972 KM. THE SPACECRAFT WAS CAPABLE OF ACCUIRING DATA FROM DCP'S WITHIN A RADIUS OF APPROXIMATELY SIOO KM FROM THE SUBSATELLITE POINT, THUS ALLOWING DATA TO BE OBTAINED FROM ANY REMOTE PLATFORM AT LEAST ONCE EVERY 12 H. THE DCP'S TRANSMITTER FREQUENCY WAS 401,55 MHZ. THE DCS EQUIPMENT, ESSENTIALLY A RECEIVER, RECEIVED AND RETRANSMITTED DATA (AT 2287.5 MHZ) TO SELECTED GROUND RECEIVING STATIONS. THERE WAS NO SIGNAL MULTIPLEXING OR DATA PROCESSING ON THE SATELLITE. THE LANDSAT DCS COULD ACCOMMODATE UP TO 1000 DCP'S DEPLOYED THROUGHOIT THE CONTINENTAL US. THE DCS INITIALLY CONSISTED OF ONLY A SMALL NUMBER OF INITIAL DCP'S WITH USER AGENITES PROCUBING INSTRUMENTING, AND DEVELOPING ADDITIONAL PLATFORMS ACCORDING TO HEIR NEEDS. DATA FROM THIS EXPERIMENT ARE HANDLED AND DISTRUMENTING, AND DEVELOPING ADDITIONAL PLATFORMS ACCORDING THE NASA DISTRUMENTING, AND DEVELOPING ADDITIONAL PLATFORMS ACCORDING TO HEIR

- LANDSAT 2, WEINSTEIN----

INVESTIGATION NAME- RETURN BEAM VIDICON (RBV) CAMERA SYSTEM

INVESTIGATIVE PROGRAM NSSOC 10- 75-0044-01 CODE ERN

INVESTIGATION DISCIPLINE(S) EARTH RESOURCES SURVEY

PERSONNEL		
P1 - 0.	WEINSTEIN	NASA-GSFC
01 - T_H_	RAGLAND	NASA-GSFC

DI - T.M. RAGLAND GRIEF DESCRIPTION THE LANDSAT 2 RETURN BEAM VIDICON (RBV) CAMERA SYSTEM CONTAIMED THREE INDEPENDENT CAMERAS COVERING THE THREE SPECTRAL BANDS FROM BLUE-GREEN (D.47 TO 0.575 MICROMETERS) THROUGH YELLOW-RED (0.58 TO 0.68 MICROMETER) TO NEAR IN (0.69 TO 0.83 MICROMETER). WHILE DESIGNED PRIMARILY TO OBTAIN INFORMATIOM FOR EARTH RESOURCE TYPE STUDIES, THE RBV CAMERA SYSTEM WAS ALSO USED TO CONDUCT METEOROLOGICAL STUDIES, I.E., TO INVESTIGATE ATMOSPHERIC ATTERNUATION AND TO OBSERVE MESOSCALE PHENOMEMA, MINTER MONSOON CLOUDS (JAPAN), SNOW COVER, ETC. THE THRE EARTH-ORIENTED CAMERAS WERE MOUNTED ON A COMMON GASE, STRUCTURALLY ISOLATED FROM THE SPACECRAFT TO MAINTAIN ACCURATE ALIGNMENT. EACH CAMERA CONTAINED AN OPTICAL LENS, A 5.08-CM RRV, A THERMOELECTRIC COOLER, DEFLECTION AND FOCUS COILS, A MECHANICAL SHUTTER, ERASE LAMPS, AND SENSOR ELECTROMICS. THE CAMERAS WERE STULAR EXCEPT FOR THE SPECTRAL FILTERS CONTAINED IN THE LENS ASSEMBLIES THAT PROVIDED SEPARATE SPECTRAL VIEUING REGIONS. THE VIEWED GROUND SCENE, 185 BY 185 KM IN AREA, VAS

TEMPORARILY STORED ON THE PHOTOSENSITIVE SURFACE OF THE CAMEHA TUDE. THE STORED INAGE WAS THEN SCANNED BY AN ELECTRON BEAM TO PRODUCE A VIDEO SIGNAL OUTPUT. EACH CAMERA WAS READ OUT SEQUENTIALLY, REQUIRING ABOUT 3.5 S FOR EACH OF THE SPECTRAL IMAGES. THE CANERAS WERE OPERATED EVERY 25 S TO PRODUCE OVERLAPPING IMAGES ALONG THE DIRECTION OF SPACECRAFT NOTION. VIDEO DATA FROM THE RBY WERE TRANSMITTED (AT 2265.5 MH2) IN OTH REAL-TIME AND TAPE-RECORDER MODES. FROM A NOMINAL SPACECRAFT ALTITUDE OF 912 KM, THE RBY HAD A HORIZONTAL RESOLUTION OF ABOUT D.7 KM. DATA FROM THIS EXPERIMENT ARE HANDLED BY THE NASA DATA PROCESSING FACILITY, GSFC, GREENBELT, MD, AND ARE MADE AVAILABLE TO APPROVED INVESTIGATORS AND AGENCIES THROUGH ITS LANDEAT USERS SERVICES SECTION. ALL OTHER INTERESTED INDIVIDUALS MAY OBTAIN DATA THROUGH THE EARTH RESOURCES DATA CENTER, DEPARTMENT OF THE INTERIOR, SIGUX FALLS, SD.

SPACECRAFT C	OPHON NAME-	MARINER 10	
ALTERNATE NA	HES- HARINE	R 73, PL-732A	
	MARINE	R-J VENUS/MERCURY	
	6919		

NSSDC 10- 73-0854

LAUNCH DATE- 11/03/73 Launch Sife- Cape Canaveral, United States Launch Vehicle- Atlas WEIGHT- 504. KG

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-055

INITIAL ORBIT PARAMETERS ORBIT TYPE- MERCURY FLYBY

PERSONNEL	
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RSUMEL NG - N.W. CUNNINGHAM SC - S.E. DUORNIK PM - W.E. GIBERSON PS - J.A. CUNNE	NASA HEADQUARTERS NASA HEADQUARTERS NASA-JPL NASA-JPL
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PM - W.E. GIBERSON PS - J.A. DUNNE BRIEF DESCRIPTION THIS SPACECRAFT WAS THE FIRST TO USE THE GRAVITATIONAL PULL OF ONE PLANET (VENUS) TO REACH ANOTHER (MERCURY). THE SPACECRAFT STRUCTURE WAS AN 18.15-KG (40 LB) , EIGHT-SIDED FRAMEWORK WITH EIGHT ELECTRONICS COMPARTMENTS. IT MEASURED 1.39 M DIAGONALLY AND 0.457 M IN DEPTH. TWO SOLAR PANELS, EACH 2.7 M LONG AND 0.57 M NIDE, WERE ATTACHED AT THE TOP, SUPPORTING 5.1 SQ M OF SOLAR CELL AREA. THE ROCKET ENGINE WAS LIQUID-FUELED, WITH TWO SETS OF REACTION JETS USED TO STABILIZE THE SPACECRAFT ON THREE AXES. IT CARRIED A LOW-GAIN OMNIDIRECTIONAL ANTENNA, COMPOSED OF A HONEYCOMD-DISC PARABOLIC REFLECTOR, 1.37 M IN DIAMETER, WITH FOCAL LENGTH SS CM. FEEDS ENABLED THE SPACECRAFT TO TRANSMIT AT S-BAND AND X-BAND FREQUENCIES. THE SPACECRAFT TO TRANSMIT AT S-BAND AND X-BAND FREQUENCIES. THE SPACECRAFT TO TRANSMIT AT S-BAND AND X-BAND FREQUENCIES. THO PARAECRAFT WAS INSULATED WITH MULTILAYER THERMAL BLARKETS AT TOP AND BOTTOR. A SUBSHADE WAS DEPLOYED SIDE. INSTRUMENTS ABOARD THE SPACECRAFT MAS INSULATED WITH MULTILAYER THERMAL BLARKETS AT TOP AND BOTTOR. A SUBSHADE WAS DEPLOYED SIDE. INSTRUMENTS ABOARD THE SPACECRAFT WAS INSULATED WITH MULTILAYER THERMAL BLARKETS AT TOP AND BOTTOR. A SUBSHADE WAS DEPLOYED SIDE. INSTRUMENTS ABOARD THE SPACECRAFT MASINGORETHY. ULTRAVIOLET AND VENUS. EXPERIMENTS INCLUDED TELEVISION PHOTOGRAPHY. MAGNETIC SUBFACE.ANT MAS HITFARED RADIOMETTY. ULTRAVIOLET AND WENUS. EXPERIMENTS INCLUDED TELEVISION PHOTOGRAPHY. MAGNETIC SUBFACE.ANT. MARINER TO WAS FLOWN FOR THE FIRST TIME ON THIS SPACECRAFT. MASINTER WAS FLOWN FOR THE FIRST TIME ON THE SUM AND RADID SCIENCE DETECTORS. AN EXPERIMENTAL X-BAND. HIGH-FREQUENCY TRANSMITTER WAS FLOWN FOR THE FIRST TIME ON THE SUM FROUTE TO VENDS. THE ORAGED IN A PARKING ORDIT ATTER LAUNCH FOR APPRDIIMATELY 25 MIN. THEN PLACED IN A DENTING ONDIT AGUND THE SUM FROUTE TO VENDS. THE ORAGED AND MAY NO VENUS. A SECON ENCOUNTER WITH MODITION THE SIN. MID-COURSE CORRECTIONS WERE RADE. THE SPACEC

- MARINER 10, BRIDGE------

INVESTIGATION NAME- MEASUREMENT OF PLASMA ENVIRONMENT

INVESTIGATIVE PROGRAM H550C 10- 73-085A-03 CODE SL

INVESTIGATION DISCIPLINE(5)

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PERSONNEL	
PI - H.S.	8RIDGE
01 - J.H.	BINSACK
01 - A.J.	LAZARUS
01 - 5.	OLBERT
01 - 5.J.	BAHE
	HONTGOMERY
01 + A_J.	HUNDHAUSEN

01 - J.R. 01 - K.W. 01 - L.F. 01 - R.E. 01 - R.E.	OGILVIE Burlaga Hartle Snyder	LOS ALAMOS SCI LAB NASA-GSFC NASA-GSFC NASA-GSFC NASA-JPL U OF CALIF, LA
01 - G.L.		U OF CALIF, LA

GI - G.L. SISLUE
 U DF CALLF, LA
 BRIEF DESCRIPTION THE EXPERIMENT WAS DESIGNED TO DETERMINE THE MODE OF INTERACTION BETWEEN THE PLANET MERCURY AND THE SOLAR WIND, TO MAKE A COMPREHENSIVE STUDY OF THE PLANEA REGIME AT MERCURY, TO WERIFY AND EXTEND PREVIOUS OBSERVATIONS OF THE SOLAR WIND INTERACTION WITH VENUS, TO CLARIFY THE ROLE OF ELECTRONS IN THE INTERACTIONS, AND TO STUDY THE SOLAR WIND FORM I TO 0.4 AU-INSTRUMENTATION FOR THE EXPERIMENT CONSISTED OF TWO SUMWARD FACING ELECTRONSTATIC ANALYZERS (SESA) AND ONE BACKWARD FACING FACING ELECTRONETER (BESA). THESE THREE DETECTORS WERE OUNTED ON A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG ROUNTED ON A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM, WHICH COULD BE SWEPT AT 1 DEG NOT A SCANNING PLATTORM DATA. THEY WERE TO MEASURE POSITIVE IONS FROM D.DB TO B KEV AND ELECTRON SFORM 4 TO 400 EV. THE BESA HAD A FAN-SCALED OF VIEW OF PLUS OR MINUS 3.5 DEG BY PLUS OR MINUS 13.5 DEG. THE LARGER ANGLE WAS NORMAL TO, AND STMMETRIC ABOUT. THE SCAN ARC. AN ELECTRON SPETTRUM WAS STAMETRIC ABOUT. THE SCAN ARC. AN ELECTRON SPETTRUM WAS OBTAINED EVERTY 6 S. AND CONSISTED OF FLUX MEASUREMENTS IN 15 LOGARITHMICALLY-SPACED EHERGY CHARGES INT THE SCALE WIND FUNCTION COMPARED TO WHAT WOULD BE OBSERVED IN THE SALGERAFT INTRODUCES ANGULAR DISTOBUTION THE ACHARGE SUCH AS

MARINER 10, CHASE, JR.-----

INVESTIGATION NAME- THO-CHANNEL IR RADIOMETER

INVESTIGATIVE FROGRAM NSSDC 10- 73-0854-06

CODE SL

INVESTIGATION DISCIPLINE(5) Planetary Atmospheres Planetology

ERSONNEL	CHASE, JR.	SANTA BARBARA RES ETR
		NASA-JPL
01 - E.D.	MINER	
01 - 9.	MORRISON	U OF HAWAII
01 - 6.	MUNCH	CALIF INST OF TECH
01 - 01	NEUGEBAUER	CALIF INST OF TECH
		COLUMN FRY OFF LAR
01 - J.H.	SAARI	BOEING SCI RES LAB

BRIEF DESCRIPTION AN INFRARED RADIOMETER HAVING TWO CHANNELS, 22 TO 39 NICROMETERS (80 K TO 500 K) AND 10 TO 17 MICROMETERS (200 K TO 650 K). WAS USED TO OBSERVE THE THERMAL EMISSION FROM VENUS AND NERCURY IN TWO BROAD SPECTRAL BANDS. THE IR THERMAL EMISSION FROM THE SURFACE OF MERCURY BETWEEN LATE AFTERMOON AND EARLY MORNING (LOCAL TIME) AND DEVIATIONS FROM THE AVERAGE THERMAL BEHAVIOR OF THE SURFACE WAS MASSURED. MEASUREMENTS WERE ALSO NADE OF THE BURFACE WAS MASSURED. MEASUREMENTS WERE ALSO LIMB DARKENING PHENOMENA. ATTEMPTS WERE MADE TO CORRELATE UNUSUAL TEMPERATURES OF VEHUSIAN CLOUD TOPS AND LIMB DARKENING PHENOMENA. ATTEMPTS WERE MADE TO CORRELATE MUSICAL TEMPERATURES OF VEHUSIAN CLOUD TOPS AND MEASUREMENTS BY OTHER INSTRUMENTS TO IDENTIFT MOUNTAINS/VALLEYS, VOLCANOES, AND UNUSUAL SURFACE MATERIALS.

--- MARINER 10, HOWARD--

INVESTIGATION NAME- S- AND X-BAND RADIO PROPAGATION

INVESTIGATIVE PROGRAM NSSOC 10- 73-085A-02

CODE SL

INVESTIGATION DISCIPLINE(S) CONOSPHERES AND RADIO PHYSICS Particles and Fields Planetary Atmospheres

0I - G.S. LE 01 - I.I. SH 01 - G. fJ 0I - A.J. KL	DWARD STANFORD 5 EVY NASA-JPL HAPIRO NASS INST JELOBO NASA-JPL LIORE NASA-JPL NDERSON NASA-JPL	
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BRIEF DESCRIPTION THIS EXPERIMENT USED X- (8400 MH2) AND S- (2113 MH2) BAND, ON-BOARD RADID SYSTEMS FOR WHATEVER SCIENTIFIC PURPOSES COULD BE DEVISED. TWO PRIMARY APPROACHES WERE MADE, ONE WILLIZING TRACKING INFORMATION, THE OTHER TAXING ADVANTAGE OF RADID TRAJECTORY VARIATIONS ASSOCIATED WITH OCCULTATION OF THE EARTH-SPACECRAFT SIGNAL. TRACKING INFORMATION WAS ANALYZED TO DETERMINE MASS AND GRAVITATIONAL CHARACIERISTICS (INCLUDING PLAMETARY INTERNAL COMPOSITION AND DENSITY ESTIMATES) DE BOTH VENUS AND RERCLUAR. FROM ANOMALOUS CHARACTERISTICS OBSERVED IN THE X- AND S-BA'D SIGNALS DURING SPACECRAFT PASSAGE THROUGH THE PLAMETARY ATHOSPHERES JUST PRIOR TO, AND SUBSQUENT TG,

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OCCULTATION, TEMPERATURE AND PRESSURE PROFILES WERE CALCULATED. THESE PROFILES WERE USEFUL TO ADJUST ATMOSPHERIC COMPOSITION Models. Signal cut-off provided useful information for determination of planetary radius.

-- MARINER 10, MURRAY----

INVEST	IGAT	ION NAME-	TELEVISION	PHOTOGRAPHY
NSSDC	10-	73-085A-0	1 11	VESTIGATIVE CODE SL

INVESTIGATION DISCIPLINE(S) Planetary atmospheres Planetology

PROGRAM

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KIII PEAK NATL OBS
U OF WISCONSIN
US GEOLOGICAL SURVEY
NASA-ARC
U OF PITTSBURGH
RAND CORP
PRINCETON U

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01 - M.E. DAVIES 01 - B.T. O'LEARY PRINCETON U BRIEF DESCRIPTION THE 0JJECIIVES OF THIS EXPERIMENT WERE 10 PHOTOGRAPH THE SURFACES (UPPER ATMOSPHERE IN THE CASE OF VENUS) OF THE PLANETS VENUS AND MERCURY. FOR VENUS, THE OBJECTIVES WERE TO INVESTIGATE THE TIME-DEPENDENT PROPERTIES OF THE DI CLOUDS. FOR MERCURY, THE OBJECTIVES WERE TO NAP ITS MAJOR PHYSIOGRAPHIC PROVINCES, DETERMINE ITS SPIN AXIS ORLENTATION. ESTABLISH A CARTOGRAPHIC COORDINATE SYSTEM, AND SEARCH FOR MERCURIAN SATELLITES. THE COUIPMENT CONSISTED OF TWO SPHERICAL (150 MM DIAMETERI CASSEGRIN TELESCOPES WITH EIGHT FILTERS, ATTACHED TO GEC 1-INCH VIDICON TUBE CAMERAS (1500 NM FOCAL LENGTH AND 0.5 DEG FIELD OF VIEW) FOR NARROW-ANGLE PHOTOGRAPHY. AN AUXILIARY OPTICAL SYSTEM MOUNTED ON EACH CAMERA PROVIDED WIDE-ANGLE (62 MM FOCAL LENGTH AND 11 X 14 DEG FIELD OF VIEW) PHOTOGRAPHY BY MOVING A MIRROW AND 11 X 14 DEG FIELD OF VIEW PHOTOGRAPHY BY MOVING A MIRROW A FILTER WHEEL TO A POSITION IN THE OPTICAL PATH. EXPCSURE TIME RANGED FROM 3 NS TO 12 SECS. AND EACH CAMERA TOOX A PICTURE VERY 42 SECS. THE TY PICTURE CONSISTED OF 700 SCAN LINES WITH 832 PICTURE ELEMENTS/LINE, WHICH WERE DIGITALLY CODED INTO 8-BIT WORDS FOR TRANSMISSION. THERE WERE EIGHT FILTER WHEEL POSITIONS: (1) WIDE-ANGLE IMAGE RELAT MIKROR, (2) BLUE DANDPASS, (3) DU POLARIZING, (4) MINUS UW HIGH PASS, (5) CLEAR, (6) UV BANDPASS, (7) DEFOCUSSING LENS (FOR CALIBRATION), AND (8) YELLOW BANDPASS, ABOUT 700D PHOTOGRAPHY WERE OBTINED OF VENUS AND MERCURY, WITH A MAXINUM RESOLUTION OF 100 M FOR MERCURY. THREE PHOTOGRAPHIC PASSES, SEPAATED BY SIX-MONTH INTERVALS WERE MADE FOR MERCURY. FURTHER DATALLS OF THE EXFERIMENT CAN BE OTATIONS, RESEARCH, '80, 17, JUNE 1975, AND ON VENUS IN 'SCIENCE,' 183, 4131, MARCH 1974.

----- MARINER 10, NESS---

INVESTIGATION NAME- FLUXGATE MAGNETOMETERS

NSSDC 10- 73-085A-04 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS PLANETOLOGY

PERSONNEL		
PI - N.F.	NESS	NASA-GSFC
0I - X H.	BEHANNON	HASA-GSFC
01 - R.P.	LEPPING	NASA-GSFC
01 - Y.C.		CATHOLIC U OF AMERICA

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF TWO TRIAVIAL FLUXGATE MAGNETOMETERS MOUNTED ON A COMMON BOOM 2.3 N AND 5.8 M FROM THE SPACECARFT AND DESIGNED TO MEASURE THE VECTOR MAGNETIC FIELD IN THE VICINITY OF MERCURY AND VENUS AND IN THE INTERPLANETARY MEDIUM. OUIPUIS FROM THE TWO MAGNETOMETERS WERE SIMULTANEOUSLY ANALYZED TO SEPARATE AMBIENT FIELDS FROM SPACECRAFT FIELDS. EACH SENSOR HAD DUAL OPERATING RANGES OF MINUS TO PLUS 10 GAMMAS AND 128 GAMMAS, MITH DIGITIZATION ACCUMACUES OF 0.03 GAMIS AND 0.26 GAMMAS, RESPECTIVELY. BIAS OFFSET CAPABILITY EXTENDED THE OPERATING RANGE TO NINUS OR PLUS 3188 GAMMAS. DURING THE PRIMARY PHASE OF THE 'SISION (NOVEMBER 3, 1973 TO MARCH 29, 1974) AND DURING THE SECOND AND THER PRIMARY OUTBOARD MAGNETOMETER AND TRANSMITTED TO EARTH. AT OTHER TIMES, A LOWER DATA RATE MODE WAS USED DURING WHICH FIVE VECTORS PER SECOND WERE TRANSMITTED. THE EXPERIMENT FUNCTIONED NORALLY THROUGHOUT THE LIFE OF THE SPACECRAFT. FOR FURTHER DETAILS, SEE NESS, N.F. ET AL, SCIENCE, 183, 1301.

-- MARINER 10, SIMPSON-----

INVESTIGATION NAME- ENERGETIC PARTICLES

NSSDC 10- 73-0854-07

PERSONNEL

CODE SL

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) Particles and fields

PI - J.A. SIMPSO OI - J.E. LAMPOR STARSON U OF CHICAGO U OF CHICAGO

DI - J.E. LAMPORT U OF CHICAGO DI - J.E. LAMPORT U OF CHICAGO THIS EXPERIMENT WAS DESIGNED TO MEASURE EMERGETIC ELECTRONS, PROTONS, AND ALPHA PARTICLES IN THE INTERPLANETARY MEDIUM AND IN THE VICINITIES OF VENUS AND MERCURY. THE INSTRUMENTATIOM CONSISTED OF A MAIN TELESCOPE AND A LOW-EMERGY SENSORS (FIVE SILICON DETECTORS AND OME CSI SCINTILLATORS) SURROUNDED BY A PLASTIC SCINTILLATOR ANTICOINCIDENCE CUP. OME INCIDENT PARTICLE WAS PULSE HEIGHT ANALYZED EVERY 0.33 S. AND COUNTS ACCUMULATED IN EACH COINCIDENCE/ANTICOINCIDENCE MODE VERE MERSURED EVERY D.G.S. PARTICLES IN THE FIRST SENSOR WERE PROTONS AND ALPHA PARTICLES IN THE RANGE 0.62-10.3 MEV/NUCLEON AND ALECTRONS ABOVE APPROXIMATELY 170 KEV. THE PARTOTONS AND ALPHA PARTICLES IN THE RANGE 0.62-10.3 MEV/NUCLEON AND CLECTRONS AND ALPHA PARTICLES IN THE FIRST SENSOR WERE 14 SD CM STER FOR ELECTRONS AND 7.4 SO CM STER FOR MAIONNED AND ALPHA PARTICLES. THE TELESCOPE, A TWO ELEMENT DECREASED TO 32 DEG FOR CUINCIDENT COUNTS IN THE FIRST AND TH/TO SENSORS. THE LOW ENERGY TELESCOPE, A TWO ELEMENT (PLUS AM CONCIDENCE) DETECTOR WITH A 38 DEG HALF ANGLE APERTUME AALF A D.49 SG CM STER GEOMETRICAL FACTOR, WAS DESIGNED TO MEASURE D.53-1.9 AND OLSERS OVER A WIDE RANGE OF ELECTRON ENERGIES AND INCIDENCE) DETECTOR WITH A 38 DEG HALF ANGLE APERTUME AND A D.49 SG CM STER GEOMETRICAL FACTOR, WAS DESIGNED TO MEASURE DISTING OVER A WIDE RANGE OF ELECTRON ENERGIES AND INTENSITIES. SEE 'JGR,' 80, 4015 AND REFERENCES THEREIN FOR INTENSITIES.

SPACECRAFT COMMON NAME- METEUROID TECHNOLOGY SAT Alternate Names- Metec, MIS 06142, Explorer 46

NSSDC 10- 72-061A

1

LAUNCH DATE- 08/13/72 WEIGHT LAUNCH SITE- WALLOPS FLIGHT CENTER, UNITED STATES LAUNCH VEHICLE- SCOUT 168**1- 90.** KG

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-DAST

NETIAL ORBIT PARAMETERS Orbit TYPE- GEOCENTRIC Orbit Period- 97.8 min Periapsis- 496. KM	EPOCH DATE- 08/13/72 Inclination- 37.7 deg Apoapsis- 814. Km	
ERSONNEL	NASA-LARC	
PM - C.V. WOERNER PS - W.H. KINARD	NASA-LARC	

PM - C.V. WOERNE PS - W.H. KINARD

BRIEF DESCRIPTION THE OBJECTIVES OF THE METEOROID TECHNOLOGY SATELLITE WERE TO MEASURE THE METEOROID PENETRATION RAIES IN A BUMPER-PROTECTED TARGET, AND TO OBTAIN DATA ON METEOROID VELOCITY AND FLUX DISTRIBUTION. THE CENTRAL HUB OF THE SATELLITE WAS 320 CM LONG AND CARRIED THE VELOCITY AND IMPACT EXPERIMENTS. BUMPER TARGETS EXTENDED FROM THE SATELLITE, GIVING IT AN OVERALL WIDTH OF 701.5 CM.

---- METEOROID TECHNOLOGY SAT, HUMES-----

INVESTIGATION NAME- METEOROID PENETRATION

INVESTIGATIVE PROGRAM NSSDC 10- 72-0614-01 CODE R

INVESTIGATION DISCIPLINE(S) INTERPLANETARY DUST

PERSJNNEL VI - D.H. HUMES 01 - W.H. KINARD

NASA-LARC NASA-LARC

BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT WAS TO MEASURE THE METEOROID PENETRATION RATES OF A BUMPER-PROTECTED TARGET. PRESSURE CELLS LOCATED BEMIND 1-MIL STAINLESS-SITEL BUMPERS. THESE 12 CELLS WERE MOUNTED ON 4 BUMPER PANELS WHICH EXTEMDED OUT FROM THE CYLINDRICAL SPATECRAFT BODY. DUE TO A MALFUNCTION, ONLT TWO OF THE FOUR BUMPER PANELS, DEPLOYED.

SPACECRAFT COMMON NAME- NI BUS 4 ALTERNATE NAMES- NIMBUS-D, PL-701E 04362

NSSOC 10- 70-025A

WEIGHT- 620. KG LAUNCH DATE- 04/08/70 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- THOR

SPONSORING COUNTRY/AGENCY

EPOCH DATE- 04/09/70
INCLINATION- 80.114 DEG
APOAPSIS- 1108. KM
NASA HEADQUARTERS
NASA HEADQUARTERS
NASA-GSF¢
NASA-GSFC

NASA-04

PH - N.A. DRUMMING PS - J.S. THEON NASA-65FC DRIEF DESCRIPTION NIMBUS 4. THE FOURTH IN A SERIES OF SECOND-GENERATION NETEOROLOGICAL A AND D SATELLITES, WAS DESIGNED TO SERVE AS A STABOLIZED, EARTH-ORIENTED PLAIFORM FOR THE TESTING OF ADVANCED METEOROLOGICAL SENSOR STSTEMS AND COLLECTING METEROLOGICAL DATA. THE POLAM-ORBITING SPACECRAFT CONSISTED OF THREE MAJOR STRUCTURES - (1) A RING-SHAPED SENSOR MOUNT BY A TRUSS AND THE CONTROL SYSTEM CONNECTED TO THE SENSOR MOUNT BY A TRUSS STRUCTURE, GIVING THE SATELLITE THE APPEARANCE OF AN OCEAN BUDY. NIMBUS (WAS NEARLY 3.7-M TALL, 1.45 M IN DIAMETER AT THE BASE, AND ABOUT 3 M ACROSS WITH SOLAR PADDLES CHARDED. INTE TORUS SENSOR MOUNT, WHICH FORMED THE SATELLITE BASE, HOUSED THE ELECTROMICS EQUIPMENT AND BATTERY MODULES. THE LOWER SURFACE OF THE TORUS RING PROVIDED MOUNTING SPACE FOR SENSORS AND TELEMETRY ANTENNAS. AN H-FRAME STRUCTURE HOUNTED VITHIN THE CENTER OF THE TORUS RING PROVIDED MOUNTING SPACE FOR SENSORS AND TELEMETRY ANTENNAS. AN H-FRAME STRUCTURE NOUNTED VITHIN THE CENTER OF THE TORUS RING PROVIDED MOUNTED SENSORS, HOUSING, WHICH WAS ON TOP OF THE SPACECRAFT, WERE SUN SENSORS, HORIZON SCANNERS, GAS NOTZLES FOR ATTITUDE CONTROL, AND A COMMAND ANTENNA. USE OF AN ADVANCED ATTITUDE CONTROL, AND A COMMAND ANTENNA. USE OF AN ADVANCED ATTITUDE CONTROL, AND A COMMAND ANTENNA. USE OF AN ADVANCED MATTITUDE CONTROL, AND A COMMAND ANTENNA. USE OF AN ADVANCED MODES, (2) A TEMPERATURE-HUNDITY INFRARED RADIGMETER (THIR) FOR MEASURING NATHIN PLUS OR MINUS 1 DEG FOR ALL THREE AXES (PITCH, ROLL, AND YAM). PRIMARY EXPERTIMES CONSISTED OF (1) AN IMAGE DISSECTOR ANTIME AND NIGHTIME SUBFACE AND CLOUDTOR TEMPERATURES AS WELL AS THE WATER VAPOR CONTENT OF THE LANGENERS, (3) AN INFRARED INTERFEROMETER SPECTROMETER (INIS) FOR DETERMINING THE HISION SPECTRA OF THE EARTHATMOSPHERE (S) AN INFRARADE SPECTROMETER (INIS) FOR DETERMINING THE ATMOSPHERE, (5) A NONTOR OF ULTRAVIOLET SOLAR ENERSY (MUSE) FOR DETECTING SOLAR UV RADIATION, (6) A HACKSCATTER ULTRAVI

----- NIMBUS 4, COTE------

INVESTIGATION NAME- INTERROGATION, RECORDING, AND LOCATION System (IRLS)

NS50C 10- 70-025A+07

CODE ERN

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) COMMUNICATIONS

NASA-GSFC

PERSONNEL P1 - C.E. COTE

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE NIMBUS 4 INTERROGATION, RECORDING, AND LOCATION SYSTEM (IRLS) EXPERIMENT WAS DESIGNED TO COLLECT AND RETRANSMIT METEOROLOGICAL, GEOPHYSICAL, AND OTHER EXPERIMENTAL DATA FROM REMOTE UNMANNED DATA COLLECTION STATIONS (PLATFORMS) DEPLOYED CM & GLOBAL SCALE, THE IRLS COULD ALSO DETERMINE THE LOCATION AND TRACK THE MOVEMENT OF SUCH PLATFORMS AS BALLOONS, OCEAN BUDYS, AND SHIPS TO WITHIN AN ACCURACY OF 2 KM. THE IRLS CONSISTED OF (1) A 466-MN2 RECEIVER, (2) A 401.5-MHZ TRANSMITTER, (3) DECODING AND CODING CIRCUITS, (4) A RANGE DETECTOR. AND (5) A 100-KB SATELLITE DATA MEMORY CAPABLE OF 'TORING DATA OBTAINED DURING EACH ORBIT FOR UP TO 370 DIFFERENT INTERROGATIONS. ON EACH ORBIT FAIS, WHEN THE SATELLITE WAS WITHIN RANGE OF AN ACQUISITION AND COMMAND STATION, THE SATELLITE COMMAND MEMORY WAS PROGRAMMED TO COMMUNICATE WITH SELECTED FLATFORMS DURING THE COMING ORBIT. THE SATELLITE STORED BOTH THE ADDRESS (NUMBER) OF EACH PLATFORM AND THE DESIRED TIME THAT EACH SHOULD BE CONTACTED. AT THE APPROPRIATE TIME IN ORDIT. THE SATELLITE INTERROGATED EACH PLATFORM AND THE STORED TIME THAT EACH SHOULD BE CONTACTED. AT THE APPROPRIATE TIME IN ORBIT. THE SATELLITE INTERROGATED EACH PLATFORM AND THE DESIRED TIME THAT EACH SATELLITE INTERROGATED EACH PLATFORM, MEASURED THE PROPAGATION THE OF THE RF SIGNAL, RECEIVED THE ANALOG DATA FROM THE PLATFORM, CONVERTED IT TO DIGITAL FORM, AND STORED IT. UPON RETURN TO THE LOCALE OF THE GROUND STATION,

THE STATION COMMANDED THE SATELLITE TO TRANSMIT THE STORED DATA AND TO ACCEPT NEW COMMANDS FOR THE NEXT ORBIT. A LISTING OF IRLS TRACKING DATA FROM CONSTANT-LEVEL BALLOONS (30 AND 50 MB) APPEARS IN THE 'NIMBUS 4 DATA CATALOG' VOLUME 4. COPIES OF COMPUTER OUTPUTS FROM INDIVIOUAL PLATFORM EXPERIMENTS ARE RETAINED AT THE NIMBUS/ATS DATA UTILIZATION CENTER, NASA-GSFC, COFENELT ND GREENBELT. MD

NIMBUS 4, HEATH------

INVESTIGATION NAME- BACKSCATTER ULTRAVIOLET (BUV) Spectrometer

N550C 10- 70-0254-05

INVESTIGATIVE PROGRAM CODE ERN

INVESTIGATION DISCIPLINE(S) ATMOSPHERIC PHYSICS

HEATH	NASA-GSFC
DAVE	UNKNOWN
KRUEGER	NASA-GSFC
MATEER	ENVIRONMENT CANAD
	JAVE Krueger

OI - A.J. KRUEGER DI - C.L. MATEEN BRIEF DESCRIPTION THE VIRBUS & BACKSCATTER ULTRAVIOLET (BUV) SPECTROMETER EXPERIMENT WAS DESIGNED TO MONITOR THE VERTICAL DISTRIBUTION AND TOTAL AMOUNT OF ATMOSPHERIC 020NE ON A GLOBAL SCALE BY MEASURING THE INTENSITY OF UV RADIATION BACKSCATTERED BY THE EARTHATMOSPHERE SYSTEM DURING DAT AND NIGHT IN THE 2500- TO 3400-A SPECTRAL BAND. THE PRIMARY INSTRUMENTATION CONSISTED OF A DOUBLE MONOCHROMATOR CONTAINING ALL REFLECTIVE GPTICS AND A PHOTOMULTIPLIER DETECTOR. THE DOUBLE MONOCHROMATOR WAS COMPOSED OF TWO FASTIE-EBERT TYPE MONOCHROMATORS IN TANDEM. EACH MONOCHROMATOR NAD A 64- BY 64-MM GRATING WITH 2400 LINES PER MM. LIGHT FROM A 0.05-STER SOLID ANGLE (SUBTENDING APPROXIMATELY A 222-KM-SQUARE AREA ON THE EARTH'S SUFFACE FROM A SATELLITE HEIGHT OF APPROXIMATELY 1100 KM) ENTERED THE NADIR-POINTING INSTRUMENT THROUGH A DEPOLARIZING FILTER. A MOTOR-DRIVEN CAM STEP ROTATED THE GRATINGS IN MANITOR THE INTENSITY OF 12 OZONE ABSORPTION WAVELENGTHS. THE DETECTOR WAS A PHOTOMULTIPLIER TUDE. FOR BACKGROUND READINGS, A FILTER. HOTOMULTIPLIER TUDE. FOR BACKGROUND READINGS, A FILTER. HOTOMETER MEASURED THE REFLECTED UV RADIATION IN AN OZONE FREE BOORPTION AREA MEAR 3500 A. SIGNALS FROM BOTH UNITS WERE FREAD BY SEPARATE RANGE-SWITCHING ELECTROMETERS WITH SEVEN RANGES. THE BUV EXPERIMENT CYCLE REQUIRED 6144 S. EACH CYCLE. IN TURN, MAS DIVIEDED INTO 192 BUV FRAMES OF 32-S DURATION. CALIBRATION BY ONBOARD LIGHT SDURGES WAS PERFORMED IN 26 OF THE 192 FRAMES. THE DUTHER FRAMES, THE MONOCHROMATOR MEASURED THE INTENSITY OF THES FRAMES, THE MONOCHROMATOR MEASURED THE INTENSITY OF THER FRAMES, THE MONOCHROMATOR MEASURED THE INTENSITY OF THER FRAMES, THE MONOCHROMATOR MEASURED THE INTENSITY OF THER FRAMES, THE WONDERDENT MAS SUBLE DATION THE NAND. THE DWELL TIME AT EACH WAVELENGTH WAS 1.6.S. AND, DURING AT 400-NS INTERVALS IN ADDITION TO AN INTEGRATED PULSE COUNT AND MOON DIRECTLY. THE MEASUREMENT RANGE OF THE SIGNAL UNRENT WAS FROM 0.2 TO SDOD MICROMATER MEASUREMENTS WERE TAKEN AT 400-NS INTERVALS IN

SPACECRAFT COMMON NAME- NIMBUS S Alternate NAMES- NIMBUS+E/ PL-721B 06305

NSSDC 10- 72-097A

LAUNCH DATE- 12/11/72 Launch Site- Vändenberg Afb, united States WEIGHT- 770. KG LAUNCH VEHICLE- DELTA

SPONSORING COUNTRY/AGENCY UNITED STATES

INITIAL ORBIT PARAMETERS	
ORBIT TYPE- GEOCENTRIC	EPOCH DATE- 12/11/72
ORBIT PERIOD- 107.2 MIN	INCLINATION- 99.9 DEG
PERIAPSIS- 1089. KM	APOAPSIS- 1101. KM
PERSONNEL	
HG - H. MANNHEIMER	NASA HEADQUARTERS
SC - N. TEPPER	NASA HEADQUARTERS
PM - R.K. BROWNING	NASA-GSFC
PS - J.S. THEON	NASA-GSFC

NASA-OA

BRIEF DESCRIPTION THE NIMBUS.5 R AND D SATELLITE WAS DESIGNED TO SERVE AS A STABILIZED, CARTH-ORIENTED PLATFORM FOR THE TESTING OF ADVANCED METEOPOLOGICAL SUBSOR SYSTEMS AND COLLECTING METEOPOLOGICAL AND GOLLOGICAL DATA DN A GLOBAL SCALE. THE POLAR-ORBITING SPACECRAFT CONSISTED OF THREE RAJOR STRUCTURES -- (1) A HOLLOW RING-SHAPED SENSOR MOUNT, (2) SOLAR PADDLES AND CONTROL SYSTEM HOUSING. THE SOLAR PADDLES AND CONTROL SYSTEM GIVING WERE CONNECTED TO THE SENSOR MOUNT BY A TRUSS STRUCTURE, GIVING THE SATELLITE THE APPEARANCE OF AN OCEAN BUOY. NIMBUS S WAS NEARLY 3.7 M TALL, 1.5 M IN DIARTER AT THE BASE, AND LONT SOL WIDE WITH SOLAR PADDLES EXTENDED. THE TORUS-SHAPED SENSOR MOUNT, WHICH FORMED THE SATELLITE BASE, HOUSED THE ELECTRONICS WIDE WITH HOUNT,

EQUIPMENT AND BATTERY MODULES. THE LOWER SURFACE OF THE TORUS PROVIDED MOUNTING SPACE FOR SENSORS AND ANTENNAS. A BOX-BEAM STRUCTURE MOUNTED WITHIN THE CENTER OF THE TORUS PROVIDED SUPPORT FOR THE LARGER SENSOR EXPERIMENTS. MOUNTED ON THE CONTADL SYSTEM HOUSING, WHICH WAS LOCATED ON TOO OF THE SPACECRAFT, WERE SUN SENSORS, HORIZON SCANNERS, AND A COMMAND ANTENNA. AN ADVANCED ATTITUDE CONTROL SYSTEM PERMITTED THE SPACECRAFT ORIENTATION TO BE CONTROLLES TO WITHIN PLUS OR WINNUS 1 DEG IN ALL THREE AXES. PRIMARY EXPERIMENTS INCLUDED (1) A TEMPERATURE/HUMIDITY INFRARED RADIOMETER (THR) FOR MEASURING DAT AND NICHT SURFACE AND CLOUDTOP TEMPERATURES, AS WELL AS THE WATER VAPOR CONTENT OF THE UPPER ATMOSPHERE, (2) AN ILECTRICALLY SCANNING MICROWAVE RADIOMETER (ESMP FOR MAPPING THE THERMAL RADIATION FROM THE EARTH'S SURFACE AND ATMOSPHERE, (3) AN INFRARED TEMPERATURE PROFILE RADIOMETER (ITMP) FOR COBTAINING VERICAL PROFILES OF TEMPERATURE AND MOISTURE, (4) A MICROWAVE SPECTROMETER (INTENS) FOR DETERMINING TROPOSPHERIC (SCR) FOR OBSERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESURING THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESURING THE GLOBAL TEMPERATURE STRUCTURE OF THE SCRN) FOR MESURING THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE GLOBAL TEMPERATURE STRUCTURE OF THE (SCR) FOR MESERVINS THE BARTH'S

- NIMBUS 5, HOUGHTON-----

INVESTIGATION NAME+ SELECTIVE CHOPPER RADIOMETER (SCR)

NSSDC 10- 72-0974-02 INVESTIGATIVE PROGRAM CODE ERN

INVESTIGATION DISCIPLINE(S) Atmospheric Physics Meteorology

OXFORD U Reading u

PERSONNEL

.P1 -	1.1.	HOUGHTON	
01'-	S.D.	SMITH	

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE NIMBUS 5 SELECTIVE CHOPPER RADIOMETER (SCR) WAS DESIGNED TO (1) OBSERVE THE GLOBAL TEMPERATURE STRUCTURE OF THE ATMOSPHERE UP TO 50 KM IN ALTITUDE, (2) MAKE SUPPORTING OBSERVATIONS OF WATER VAPOR DISTRIBUTION, AND (3) DETERMINE THE DENSITY OF ICE PARTICLES IN CIRRUS CLOUDS. TO ACCOMPLISH THESE OBJECTIVES, THE SCR MEASURED EMITTED RADIATION IN 16 SPECTRAL INTERVALS SEPARATED INTO THE FOLLOWING GROUPS -- (1) FOUR CQ2 CHANNELS BETWEEN 13.8 AND 14.8 MICROMETERS (2) AN IR WINDOW CHANNEL AT 11.1 MICROMETERS AND A WATER VAPOR CHANNEL AT 18.6 MICROMETERS, (3) TWO CHANNELS AT 49.5 AND 133.3 MICROMETERS, AND (4) 2.08, 2.59, 2.65, AND 3.5 MICROMETERS, FROM AN AVERAGE SATELLITE ALTITUDE OF 1100 MM, THE RADIAMETER YAPOR CHANNEL AT 48.4 CIRCLE ON THE EARTH'S SURFACE WITH A GROUND RESOLUTION OF ABOUT PLUS OR MINUS 1 DEG C. A SIMILAR EXPERIMENT WAS FLOWN ON NIMBUS 4. PLUS OR MINUS 1 DEG NIMBUS 4.

- NIMBUS 5, MCCULLOCH---

INVESTIGATION NAME- TEMPERATURE/HUMIDITY INFRARED RADIOMETER 111111

NS50C 10- 72-0974-08 INVESTIGATIVE PROGRAM CODE ERN

INVESTIGATION DISCIPLINE(S) Atmospheric Physics Meteorology

PERSONNEL PI - A.W. MCCULLOCH

NASA-GSFC

PI - A.W. MECULLOCH NASA-GSFC BRIEF DESCRIPTION THE NIMBUS 5 TEMPERATURE-HUMIDITY IMFRARED RADIONETER (THIR) WAS DESIGNED TO DETECT EMITTED THERMAL RADIATION IN BOTH THE 10,5- TO 12.5-MICROMETER REGION (IR WINDOW) AND THE 6.5- TO 7.0-MICROMETER REGION (WATER VAPOR). THE WINDOW CHANNEL MEASURED CLOUDTOP TEMPERATURES AND WAS CAPABLE OF PRODUCING CLOUDCOVER AND THERMAL GRADIENTS ON LAND AND WATER SURFACES IN (CLOUDCOVER AND THERMAL GRADIENTS ON LAND AND MATER SURFACES IN WATER VAPOR DISTRIBUTION IN THE LUPPER TROPOSPHERE AND STRATOSPHERE, SENSOR DATA FROM THESE TWO CHANNELS WERE PRIMARILY USED TO SUPPORT THE OTHER, MORE SOPHISTICATED NETEOROLOGICAL EXPERIMENTS ON BOARD NIBBUS 5. THE INSTRUMENT COMSISTED OF A 12.7-CM CASSEGRAIN SYSTEM, A SCANNING MIRROR GERNANIUM-IMMERSED THERMISTOR BOLOMETERS. IN CONTRAST TO TV. NO GERNANIUM-IMMERSED THERMISTOR BOLOMETERS. IN CONTRAST TO TV. HAGE WAS FORMED WITHIN THE RADIOMETER. INCOMING RADIANT ENERGY WAS COLLECIED BY A FLAT SCANNING MIRROR INCLINED AT 45 DEG TO THE OPTICAL ATIS. THE MIRROR ROTATED AT 46 BRM AND SCANNED IN A FOLNE PERPENDICULAR TO THE SPACECRAFT VECOUTY. THE ENERGY WAS FOLUSED ON A DICHRORATIC BEAM SPLITTER, MICH DIVIDED THE EMERGY SPECTRALLY AND SCANNED IN A SCANNED IN A FOLUSED ON A DICHRORATIC BEAM SPLITTER, MICH DIVIDED THE EMERGY SPECTRALLY AND SPATIALLY INTO THE TWO CHANNELS. BOTH CHANNELS OF THE THIS ON SPATIALLY INTO THE WORKED SUBJECTION MAGEMENTIC UNDER TRANSFORMED THE RECEIVED RADIATION INTG AN ELECTRIC OUTPUT (VOLTAGES), WHICH WAS RECORDED ON MAGNETIC TAPE FOR SUBSEQUENT PLAYBACK TO A GROUND ACQUISITION STATION.

--- NIMBUS 5, SMITH-

INVESTIGATION NAME- INFRARED TEMPERATURE PROFILE RADIOMETER (ITPR)

NSSDC ID- 72-097A-01 INVESTIGATIVE PROGRAM CODE ERN

INVESTIGATION DISCIPLINE(S) Atmospheric Physics Meteorology

NUAA-NESS HUAA-NESS

PERSONNEL PI - W.L. SMITH OI - D.R. WARK

01 - D.B. WARK BALEF DESCRIPTION THE NIMBUS 5 INFRARED TEMPERATURE PROFILE RADIOMCTER (ITPR) EXPERIMENT WAS DESIGNED TO TEST THE FEASJULIT AND OPERATIONAL APPLICATIONS OF A REMOTE SOUNDING TECHNIQUE USING SIMULTANEOUS MEDIUM-RESOLUTION (32 KM) MEASUREMENTS IN THE SPECTRAL INTERVALS. THE PADIOMETER SENSED SIX INTERVALS IN THE SPECTRAL INTERVALS. THE PADIOMETERS AND TWO SPECTRAL INTERVALS IN THE ATMOSPHERIC WINDOW REGIONS MEAR 5.8 AND 11 MICROMETER OTATIONAL BAND MEAR 20 MICROMETERS AND 11 MICROMETERS. IN THE ATMOSPHERIC WINDOW REGIONS MEAR 5.8 AND 11 MICROMETERS DISTRIBUTED SYMMETRICALLY ABOUT NADIR IN A PLANE NORMAL TO THE ORBITAL TRACK. FORTY-TWO GEOGRAPHICALLY INDEPENDENT SCAN SPOTS UERE TAKEN ALONG A SINGLE STRIP. AS THE SATELLITE PROGRESSED ALONG ITS ORBITAL PATH. THE RADIOMETER ODSERVED IS SUCH SEQUENCE REPEATED EVERY 24C S. THE MATRIX OF A WERE ECORDED ON MARNETIC TAPE FOR SUBSCUENT PLAYBACK TO A GROUND ACQUISITION STATION. MATRIX MEASUREMENTS TAKEN IN THE C02 AND MATER VAPOR ABORPTION BADS WERE USED TO CALCULATE TEMPERATURE PROFILES AND TOTAL WATER VAPOR CONTENT IN THE THOPOSPHERE AND LOWER STRATOSPHERE. THE THE THE USED TO CALCULATE TEMPERATURE PROFILES AND TOTAL WATER VAPOR CONTENT IN THE THOPOSPHERE AND COULS STRATOSPHERE. THE THE THE MADING THE RADIANCES, THUS SEMURACE REPEATED EVERY 24C S. THE MATRIX DATA WERE RECORDED NATER VAPOR ABORPTION BADS WERE USED TO CALCULATE TEMPERATURE PROFILES AND TOTAL WATER VAPOR CONTENT IN THE THOPOSPHERE AND LOWER STRATOSPHERE. THE THE WINDOW MEASUREMENTS THERED TO DETECT AND ELIMINATE CLOUD CONTAMINATION OF THE RADIANCES, THUS PERMITTING ACTUAL DETERMINATION OF PROFILES DOWN TO THE EARTH'S SUFFACE IN ALL AUT COMPETERLY OVERCAST AREAS.

-- NIMBUS 5, STAELIN----

INVESTIGATION NAME- NINBUS 5 MICROWAVE SPECTROMETER (NEMS)

INVESTIGATIVE PROGRAM CODE ERN

INVESTIGATION DISCIPLINE(S) EARTH RESOURCES SURVEY ATMOSPHERIC PHYSICS METEOROLOGY

PER

RSONNEL		
PI - D.H.	STAELIN	MASS INST OF TECH
01 - F.T.		NASA-JOL
01 - N.E.		L
01 - P.		NASA-GISS
01 - W.B.	LENGIR	NASA-JSC

NS5DC ID- 72-097A-03

DI - W.B. LENDIR NASA-JSC BRIEF DESCRIPTION THE MIMBUS 5 MICROWAVE SPECTROMETER (NEMS) WAS DESIGNED PRIMARILY TO DEMONSTRATE THE CAPABILITIES AND LIMITATIONS OF MICROWAVE SENSORS FOR MEASURING TROPOSPHERIC TEMPERATURE PROFILES, WATER VAPOR ABUNDANCES, CLOUD LIQUID WATER CONTENT. AND EARTH SURFACE TEMPERATURES, A SECONDARY PURPOSE WAS TO OBTAIN SUCH DATA FOR WEATHER PREDICTION PURPOSES. INE NEMS COULD CONTINUOUSLY MONITOR EMITTED THERMAL RADIATION AT WAVELENGTHS OF 11.1, 9.55, 5.50, 5.40, AND 5.10 MR. THE THREE CHANNELS NEAR THE 5-RM DAYGEM ABSORPTION BAND WE USED PRIMARILY TO DETERMINE THE ATMOSPHERIC TEMPERATURE PHOFILL. NEMS WOULD PROVIDE MEASUREMENTS FOR USE IN DERIVING TEMPERATURE (*OFFLES EVEN IN CLOUDCOVER CONDITIONS THAT NORMALLY RESTRICT THE USEFULNESS OF CONVENTIONAL IR DATA IN SUCH SITUATIONS. THE TWO WATER VAPOR CHANNELS NEAR 10 MM PERMITTED THE WATER VAPOR AND CLOUD LIQUID WATER CONTENT OVER OCEANS TO BE ESTIMATED AND ALSO YIELDED AN ESTIMATED TEMPERATURE ONCE THE SURFACE EMISSIVITY HAD BEEN CALIBRATED BY COMPARISON WITH DIRECT MEASUREMENTS. THE THREE OXYGEN CHANNELS SHARED A COMMON SIGNAL AND REFERENCE ANTENNA. BOTH WATER VAPOR MATHEN WAD KER WAPOR ALSO YIELDED AN ESTIMATED DER VAPOR CHANNELS HAD THEIR DATO ALSO YIELDED AN ESTIMATED DER VAPOR CHANNELS HAD THEIR DATO ALSO YIELDED AN ESTIMATED DATER VAPOR MATH DIRECT MEASUREMENTS. THE THREE OXYGEN CHANNELS SHARED A COMMON SIGNAL AND REFERENCE ANTENNA. BOTH WATER VAPOR CHANNELS HAD THEIR DATO ALSO YIELDED AN ESTIMATED DER COMPARISON WITH DIRECT MEASUREMENTS. THE THREE OXYGEN CHANNELS MARD A COMMON SIGNAL AND REFERENCE ANTENNA. BOTH WATER VAPOR CHANNELS HAD THEIR DATO DIAD REFERENCE ANTENNA. BOTH WATER CARDES SHARED A COMMON SIGNAL AND REFERENCE ANTENNA. BOTH WATER VAPOR CHANNELS HAD THEIR DATO SUBSEQUENT PLAYBACK TO A GROUND ACQUISITION STATION.

NIMBUS 5, WILHEIT, JR.

INVESTIGATION NAME- ELECTRICALLY SCANNING MICHOWAVE Radiometer (ESMR)

NSSDC ID- 72-0974-04 INVESTIGATIVE PROGRAM

INVEST.GATION DISCIPLINE(S) Atmospheric physics Meteorology

PERSONNEL PI - T.T. P1 0.1 WILHEIT, JR. - P. GLOERSEN

DI - P. GLOERSEN MASA-GSFC BRIEF DESCRIPTION THE PRIMARY OBJECTIVES OF THE NIMBUS 5 ELECTRICALLY SCANNING MICROWAVE RADIOMETER (ESMR) WERE (1) TO DERIVE THE LIQUID WATER CONTENT OF CLOUDS FROM BRIGHTNESS TEMPERTURES OVER OCEANS, (2) TO OBSERVE DIFFERENCES BETWEEN SES AS ICE AND THE OPEN SEA OVER THE POLAR CAPS, AND (3) TO TEST THE FEASIBILITY OF INFERRING SURFACE COMPOSITION AND SOLL MDISTURE, TO ACCOMPLISH THESE OBJECTIVES, THE ESMR WAS CAPABLE OF CONTINUOUS GLOBAL MAPPING OF THE 1.55-CM (19.36 GH2) RADIO THERMAL (MICROMAVE) RADIATION EVEN IN THE PRESENCE OF CLOUD CONTINUOUS THAT BLOCK CONVENTIONAL SATELLITE INFRAED SENSORS. A 90-BY 90-CM RADIOMETER ANTENNA SYSTEM, DEPLOYED AFTER LAUNCH, SCANNED THE EARTH SUCCESSIVELY AT VARIOUS ANGLES IN A PLANE PERPENDICULAR TO THE SCANCER OF THE SURFACE OF THE EARTH AND ITS ATMOSPHERE. THE SCANNING FROCESS WAS CONTROLLED BY A COMPUTER AND COULD FUNCTION EVEN IN THE PRESENCE OF THE EARTH AND ITS THAT BLOCK CONVENTIONAL SATELLITE INFRAED SENSORS. A 90-BY 90-CM RADIOMETER ANTENNA SYSTEM, DEPLOYED AFTER LAUNCH, SCANNED THE EARTH SUCCESSIVELY AT VARIOUS ANGLES IN A PLANE PERPENDICULAR TO THE SCANNING FROCESS WAS CONTROLLED BY A COMPUTER AND SOARD AND CONSISTED OF 78 SYMMETRICALLY DISTNEDUTER INDEPENDENT SCAN SPOTS EXTENDING 50 DEG TO EITHER SIDE OF NADIR. ANGULAR SEFARATION OF THE SCAN SPOTS ALLOWED FOR AM 8.5 PERCEMT OVERLAP BETWEEN VIEW POSITIONS. FROM A MEAN ORBITAL HEIGHT OF TIOD (M, THE RADIOMETER HAD AN ACCUMACY OF ABOUT PLUS OR MINUS 1 DEG C WITH A SPATIAL RESOLUTION OF ABOUT 25 KM. THE ESRM DATA WERE SIDNED ON MAGNETIC TAPE FOR TRANSMISSION TO GROUND ACQUIDSITION STATIONS.

SPACECRAFT COMMON NAME- NIMBUS 6 Alternate NAMES- PL+7318, NIMBUS-F

N550C 10- 75-052A

LAUNCH DATE- 06/12/75 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- DELTA WEIGHT- 585. KG

NASA-OA

EPOCH DATE- 05/12/75 Inclination- 100, deg Apoapsis- 1101,00 KM

NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSFC NASA-GSFC

SPONSORING COUNTRY/AGENCY UNITED STATES

INITIAL ORBIT PARAMETERS Orbit type- geocentric Orbit period- 107.3 min Periapsis- 1093.00 km

PEDCUPE.

RSONNEL	
MG - H.	MANNHEIMER
SC - N.	TEPPER
PR + R.K.	BROWNING
PS - 1.5.	. THEON

- NIMBUS &, GILLE----

INVESTIGATION NAME- LIMB RADIANCE INVERSION RADIOMETER (LRIR)

NSSDC 10- 75-0524-04

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INVESTIGATIVE PROGRAM CODE ERN INVESTIGATION DISCIPLINE(S) ATHOSPHERIC PHYSICS

METEOROLOGY

PERSONNEL				
PI -	J.C.	GILLE		
01 -	F.B.	HOUSE		
01 -	R.A.	CRAIG		
01 -	1.6.	BATES		

OI - J.C. BATES UNKNUMM BRIEF DESCRIPTION THE MIMBUS 6 LIMB RADIANCE INVERSION RADIOMETER (LRIR) PROVIDED CALIBRATED RADIANCE VERSUS ALTITUDE PROFILES BY INVERCEPTING RADIATION EMANATING FROM AN ATMOSPHERIC PATH WHICH IS TANGENTIAL TO A PARTICULAR GEOCENTRIC HEIGHT. THE LRIR SENSED RADIATION IN FOUR SPECTRAL INTERVALS -- (I) THI 14.6-TO 15.9-MICROMETER CO2 BAND, (2) THE 14.2-TO 17.3-MICROMETER CO2 BAND, (2) THE 14.2-TO 25-MICROMETER WATER VAPOR ROTATIONAL BAND, AMD 4.1 THE 20- TO 25-MICROMETER VATER VAPOR ROTATIONAL BAND, MEASUREMENTS TAKEN IN THE TWO CO2 CHANNELS AND THE WATER VAPOR CHANNEL WERE USED TO CALCULATE GLOBAL TEMPERATURE AND WATER VAPOR PHOFILES IN THE STRATOSPHEME AND LOWER MESCSPHERE. IN ADDITION, VALUES OF THE GEOSTROPHIC WIND UP TO 1 MB (APPROXIMATELY 48 XM) WERE DERIVED ANALYTICALLY FROM THE DEDUCED TEMPERATURE PROFILES. THE HADIOMETER INCLUDED AN OPIICAL SYSIEM, A SCANNING MIRROR, CHOPPERS, AND ASSOCIATED ELECTRONICS AND EMPLOYED AN AMMONIA-METHANE COULER SYSTEM FOR THREE OF THE FOUR DETECTOR CHANNELS. WHILE THE DEDUCED TEMPERATURE PROFILES AND READ DETECTOR CHANNELS, UNING SDEG AT HEIGHTS ABOVE 15 KM, THE VALUES FOR 020ME WERE ACCURATE TO WITHIN PLUS OR MINUS 20 PERCENT AT 1 MB. WATER VAPOR VALUES AT THE SAME HEIGHT WERE WITHIN 50 PERCENT. WITHIN 50 PERCENT.

- NIMBUS 6, HOUGHTON-

INVESTIGATION NAME- PRESSURE-MODULATED RADIOMETER

NSSDC 10- 75-0524-09

INVESTIGATION DISCIPLINE(S) Atmospheric Physics Metegrology

INVESTIGATIVE PROGRAM

CODE ERN

PERSONNEL		
P1 - 1.1	HONGHTON	OXFORD U
01 - C.D.	RODGERS	OXFORD U
	WILLIAMSON	CLARENDON LAB
		CLARENDON LAB
01 - 6.9	PESKETT	
ot - P.	CURTIS	OXFORD U

NIMBUS 6. JULIAN-----

INVESTIGATION NAME- TROPICAL WIND ENERGY CONVERSION AND Reference level experiment (Twerle)

NSSDC 10+ 75-0524-01	INVESTIGATIVE PROGRAM Code ERN
an an an an an an an an an an an an an a	INVESTIGATION DIS(IPLINE(S) Atmospheric Physics Meteorology Meteorology
PERSONNEL PI - P. JULIAN OI - W.W. KELLOGG OI - V.E. SUDMI OI - C.R. LAUGHLIN OI - R.L. TALLEY OI - W.R. BARDEEN	NATL CTR FOR ATHO NATL CTR FOR ATHO U DF WISCONSIN WASA-GSFC PROGRAM NETHODS, NASA-GSFC

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NASA-GSFC NASA-GSFC

BRIEF DESCRIPTION THE GOALS OF THE NIMBUS & TROPICAL WIND ENERGY CONVERSION AND REFERENCE LEVEL EXPERIMENT (TWERLED WERE CLOSELY ASSOCIATED THE THE OBJECTIVES OF GARP AND INCLODED (1) MEASURING UPPER ATMOSPHERIC WINDS OVER REMOTE REGIONS, (2) STUDYING THE RELATIVE AIR MOTION ALONG ISOBARIC SURFACES TO DETERMINE THE RELATIVE AIR MOTION OF ATMOSPHERIC POTENTIAL ENERGY INTO KINETIC ENERGY, AND (3) PROVIDING DIRECT MEASUREMENTS OF VARIOUS METEOROLOGICAL PARAMETERS THAT CAN SERVE AS REFERENCE POINTS IN AJUSTING INDIRECT TEMPERATURE SOUNDINGS MADE FROM SATELLITES. THE EXPERIMENT CONSISTED OF TWO BASIC COMPONENTS -- (1) APPROXIMATELY 300 CONSTANT LEVEL METEOROLOGICAL BALLOONS TO YIELD MEASUREMENTS OF WINDS, TEMPERATURE, AND PRESSURE IN THE TROPICS AND AT SOUTHEN HERISPHERE MIDIATIVUES AT ISO MB (ABOUT 13.6-KW ALTIVUE), AND (2) THE NIMBUS & RANOOM ACCESS MEASUREMENTS SYSTEM (RANS) TO PROVIDE DATA COLLECTION AND LOCATION DETERMINATIONS FROM THE BALLOONS, THE 3.5-M-DIAM POLYESTEM-MYLAR BALLOONS WERE EQUIPPED WITH A TRANSMITTER PACKAGE, SOLAR POWER SUPPLY, DIGITIZER/MODULATOR, AND SENSORS. THE SENSORS CONSISTED OF A RADIO ALTIMETER HAVING AN ACCURACY OF BETTER THAN PLUS OR MINUS 20 M. A BEAD THEMISTOR MONITORING THE ANDIENT AIR TEMPERATURE SENSOR MEASURENG THE ISD-MB FLIGHT ALTIJUDE TO AN ACCURACY OF PLUS OR MINUS O.5 MB. A MAGNETIC GUTDGYM DEVICE WAS ALSO INCLUED ON EACH BALLOONS OF THE NORTHER HEMISPHERE NORTH OF 2D DEG NL ATITUDE, THE RAMS ON BORD THE BALLOONS (THE BALLOON'S SIGNAL (COLL CAPABILITY OVER THE BALLOONS (THE BALLOON'S DERVEN THE RAMS ON BORD THE BALLOONS (THE BALLOON'S DERVEN THE AND AND SENSORS DATA. THIS INFORMATION, ALONG WITH REAVEL TO A GROUND ACOUSTION STATION, THE BALLOON'S DOESTIGN AND VENCE CAPABILITY OVER THE BALLOONS (THE BALLOON'S DEGNEL THE RAMS ON BORD THE BALLOONS (THE BALLOON'S DEGNEL THE RAMS ON BARD THE BALLOONS (THE BALLOON'S DEGNEL THE RAMS ON BARD THE BALLOONS (THE BALLOON'S DETION AND VECCITY WERE DERIVED FROM THE RELATIVE MOTION BETWEEN THE PLATFORM AND THE SATELLITE BY MASURING

--- NINBUS 6, MCCULLOCH------

INVESTIGATION NAME- TEMPERATURE/HUMIDITY INFRARED RADIDMETER CTHINS

NS50C ID- 75-052A-12

INVESTIGATIVE PROGRAM CODE ERN INVESTIGATION DISCIPLINE(S)

EARTH RESOURCES SURVEY ATMOSPHERIC PHYSICS OCEANOGRAPHY

PERSONNEL P1 - A.W. NCCULLOCH

NASA-GSEC

BRIEF DESCRIPTION THE NIMBUS 6 TEMPERATURE-HUMIDITY INFRARED RADIOMETER (THIR) DETECTED EMITTED THERMAL RADIATION IN BOTH THE 10.5- TO 7.0-MICROMETER REGION (IR WINDOW) AND THE 6.5 TO 7.0-MICROMETER REGION (WATER VAPOR). THE WINDOW CHANNEL MEASURED CLOUDORD TEMPERATURES AND WAS CAPABLE OF PRODUCING HIGH-RESOLUTION PICTURES OF CLOUD-FREE AREAS DURING BOTH THE DAT AND NIGH PORTIONS OF THE UNIT. THE OTHER CHANNEL OPERATED PRIMARILY AT NIGHT TO MAP THE WATER VAPOR DISTRIBUTION IN THE UPPER TROPOSPHERE AND THE STATUSPHER. SENSORY OATA FROM THESE TWO CHANNELS WERE USED PRIMARILY TO SUPPORT MORE SOMHISTICATED METEOROLOGICAL EXPERIMENTS ON BOARD NIMBUS 6. THE INSTRUMENT CONSISTED OF A 12.7-CM CASSEGRAIN SYSTEM AND SCANNING MIRROR COMMON TO BOTH CHANNELS, A BEAM SPLITTER, FILTERS, AND TWO GERMANIUM-IMMERSED THEMISTOR BOLOMETERS. IN CONTRAST TO TV- NO IMAGE WAS FORMED WITHIN THE RADIOMETER, INCOMING RADIANT ENERGY WAS COLLECTED BY A FLAT SCANNING MIRROR INCLINED AT 45 DEG TO THE OFICAL AXIS. THE MIRROR ROTATED THROUGH 300 DEG AT 48 RFM AND SCANNED IN A PLANE NORMARIA TO THE SPACECRAFT VELOCITY. THE ENERGY WAS THEN FOCUSED ON A DICHROMATIC DEAM SPLITTER WHICH DIVIDED THE ENERGY SO FICTALLY VAND SPATIALLY INTO THE TWO CHANNELS, BOTH CHANNELS OF CHE HIR SENSOR TRANSFORMED THE RECEIVED RADIATION INTO ELECTRIC OUTPUT (VOLTAGES), WHICH WERE RECORDED ON MAGENTAL COMPEND. BRIEF DESCRIPTION

-- NIMBUS 62 SMITH----

CODE ERN

INVESTIGATION NAME- HIGH RESOLUTION INFRARED RADIATION Sounder (Hirs)

NSSDC 10- 75-0524-02

INVESTIGATIVE PROGRAM INVESTIGATION DISCIPLINE(S) ATMOSPHERIC PHYSICS

PERSONNEL	1	and the second second second second second second second second second second second second second second second
PI ÷ ₩.L.	SMITH	NOAA-NESS
01 - A.W.	MCCULLOCH	NASA-GSFC
е1 — н.	JACOBOWITZ	NOAA-NESS
01 - 1.	RUEF	NOAA-NESS

BRIEF DESCRIPTION THE MIMBUS 6 HIGH-RESOLUTION INFRARED RACIATION SOUNDER (HIRS) SUPPORTED THE GARP DATA TEST SET BY PROVIDING VERTICAL TEMPERATURE PROFILES TWICE DAILY ON A GLOBAL BASIS, EXTENDING UP TO APPROXIMATELY GO KM, AND INFORMATION ON THE WATER VAPOR DISTRIBUTION IN THE TROPOSPHEHE, THE HIRS REASURED RADIANCES RFIMARILY IN FIVE SPECTRAL REGIONS -- (1) SEVEN CHANNELS IN AND INFORMATELY GO RADIES AND AND (2) TWO CHANNELS IN THE IR WINDOW, 11.1 AND 3.7 MICROMETERS, (3) TWO CHANNELS IN THE WATER VAPOR ABSORPTION BAND, 8.2 AND 6.7 MICROMETERS, (4) FIVE CHANNELS IN THE 4.3-MICROMETER BAND, AND (5) DNE CHANNEL IN THE VISIBLE 0.69-MICROMETER SCANNING MIRROR, DICHONATION BEAM SPLITTER, FILTER WHEEL, CHOPPER, AND ASSOCIATED ELECTRONICS. THE HIRS SCANNED THE EARTH'S SUBFACE IN A PLANE NORMAL TO THE SPACECRAFT'S ORBITAL PATH WITH A MAXIMUM SCAN ANGLE OF 30 DEG TO EITHER SUBMIN.

----- NINBUS 6, SNITH------

INVESTIGATION NAME- EARTH RADIATION BUDGET (ERB)

NSSDC 10- 75-0524-05 INVESTIGATIVE PROGRAM CODE ERN

> INVESTIGATION DISCIPLINE(S) EARTH RESOURCES SURVEY ATMOSPHERIC PHYSICS METEOROLOGY METEOROLDGY

PERSONNEL			
PI - W.L.	SHITH	NOAA-NESS	
01 — Á.J.	DRUMMOND	EPPLEY LAB, 1	ENC.
01 - 1	RUFF	NOAA-NESS	
$01 - J_{R}$	HICKEY	EPPLEY LAB, 1	INC
01 - W.J.	SCHOLES	EPPLÉY LAB, 1	CNC .
01 - D.T.	HILLEARY	NDAA-NESS	
BRIEF DESCRIP	11109		

01 - 0.T. HILLEARY 01 - 0.T. HILLEARY DRAA-MESS BRIEF DESCRIPTION THE NIMBUS 6 EARTH RADIATION BUDGET (ERB) EXPERIMENT MEASURED REFLECTED AND ENITTED TERRESTRIAL RADIATION FURKES IN CONJUNCTION WITH SOLAR RADIATION. THE RESULTS WERE USED (1) TO DETERMINE THE EARTH RADIATION. THE RESULTS WERE USED (1) TO DETERMINE THE EARTH RADIATION. THE RESULTS WERE USED (1) TO DETERMINE THE EARTH RADIATION. THE RESULTS WERE USED (1) TO DETERMINE THE EARTH RADIATION. THE RESULTS WERE USED (1) TO DETERMINE THE SAME STANDARD. INCOMING SOLAR RADIATION FOR VARIOUS HETEGROLOGICAL AND ... EOGRAPHIC REGIMES, AND (3) TO CORELATE MEASUREMENTS MADE USING IDENTICAL BUT INDEPENDENT CHANNELS CALIBRATED TO THE SAME STANDARD. INCOMING SOLAR RADIATION FROM 0.2 TO SO MICROMETERS WAS NORMALLY MONITORED IN TO SPECTRAL INTERVALS SEVERAL TIMES EACH DAY AND EVERY ORBIT DURING PERIODS OF SOLAR ACTIVITY. TERRESTRIAL RADIATION MEASUREMENTS WERE TAKEM CONTINUOUSLY IN THE 0.2 AND 4 MICROMETER, 0.7 TO 3 MICROMETER, AND 4 TO SO MICROMETER INTERVALS. THE MEASUREMENTS WERE TAKEM IN TWO WAYS. FOUR CHANNELS USING WIDE-ANGLE OPTICS (133.3-OEG FIELD OF VIEW), MEASURED THE TOTAL OUTGOING RACIATION INTEGRATED OVER THE ENTIRE EARTH DISK. THE SECOND SET OF MEASUREMENTS WAS OBTAINED FOR EIGHT HIG-PESOLUTION SCANNING CHANNELS THAT MEASURED THE TERRESTRIAL RADIATION EMENATING FROM RELATIVELY SMALL AREA OVER A RANGE OF VARIOUS INTIN A D21MUTH ANGLES. THE MULTICHANNEL RADIATION MEASUREMENTS TO BE OBTINED FROM THE FORMARD HORIZON TO THE AFT HORIZON IN A 64-S INTERVAL. EACH AXIS OF THE SECOND MICROMETER) AND FOUR LONGWAVE CHANNELS (4.D TO SO MICROMETER) WITH A 0.25- BY 5.14-DEG FIELD OF VIEN. THE CHANNELS WERE EMELOYED A BI-AKIAL SCANNING HECHANNEL RADIONETER ENTLOYED IN A DIRECTIONAL FAN THE CONTAVE CHANNELS (0.2 TO 4.0 MICROMETER) AND FOUR LONGWAVE CHANNELS (4.D TO SO MICROMETER) WITH A 0.25- BY 5.14-DEG FIELD OF VIEN. THE CHANNELS WERE EMESURED FROM UP TO 17 DIFFERENT ANGLES AS THE SPACECRAFT PASSED OVERHEAD.

- NIMBUS 6, STAELIN------

INVESTIGATION NAME- SCANNING MICROWAVE SPECTROMETER (SCAMS)

INVESTIGATIVE PROGRAM CODE ERN

INVESTIGATION DISCIPLINE(S) ATMOSPHERIC PHYSICS

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	01	-	F.T.	BARATH			NASA-	JPL		
	10	-	A.H.	BARRETT			MASS	INST	0F	TECH
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NSSDC 10- 75-052A-10

BRIEF DESCRIPTION THE NIMBUS & SCANNING MICROWAVE SPECTROMETER (SCAMS) WAS DESIGNED TO MAP TROPOSPHERIC TEMPERATURE PROFILES, WATER VAPOR ABUNDANCE, AND CLOUD WATER CONTENT AND TO OBTAIN SUCH DATA FOR WEATHER PREDICTION PURPOSES EVEN IN THE PRESENCE OF CLOUDS, WHICH BLOCK CONVENTIONAL SATELLITE INFRARED SENSORS. THE SCAMS ONTINUOUSLY MONITORED ENTITED THERMAL RADIATION AT WAVELENGTHS OF 13.5, 9.5, 5.7, 4.9, AND 4.6 MM. THE THREE CHANNELS NEAR THE S.G.-MM DYNGEN ABSORPTION BAND WERE USED PRIMARILY TO DEDUCE ATMOSPHERIC TEMPERATURE PROFILES. THE TWO CHANNELS NEAR TO MM PERMITTED WATER VAPOR AND CLOUD WATER CONTENT OVER CALM OCEANS TO BE ESTIMATED SEPARATELY. THE INSTANDENT, A DICKE-SUPERHETERODYNE TYPE, SCANNED PLUS OR NINUS 45 DEG NGMMAL TO THE GABITAL PLANE WITH A TO-DEG TIELD OF VIEW. THE THREE OXYGEN CHANNELS SHARED COMMON SIGNAL AND REFERENCE ANTENNAS. BOTH WATER VAPOR CHANNELS HAD THEIR OWN SIGHALS AND REFERENCE

NTENNAS. THE ABSOLUTE RMS ACCURACY OF THE OXYGEN CHANNELS WAS Letter than 2 K and that of the water vapor channels better Han 1 K. The dynamic range for all channels was 0-600 K. BETTER TI THAN 1 K.

----- NIMBUS 6, VONBUN-------

INVESTIGATION NAME- TRACKING AND DATA RELAY

NSSDC 10- 75-0524-13

INVESTIGATIVE PROGRAM CODE ERN INVESTIGATION DISCIPLINE(S) Communications Geodesy

NASA-GSFC

NASA-GSFC NASA-GSFC

PEASONNEL PI - F.O. 01 - P.E. 01 - J.P. VONBUN SCHMID BROWN

BRIEF DESCRIPTION THIS EXPERIMENT WILL PROVIDE THE NIMBUS PORTION OF A COMMUNICATION LINK FROM NIMBUS TO ATS TO A GROUND STATION. THE PURPOSE OF THE EXPERIMENT WAS TO GAIN INFORMATION ON THE USE OF SUCH A LINK FOR RANGE AND RATE COMMUNICATIONS (FOR SATELLITE GEODETIC PURPOSES) AND FOR DATA COMMUNICATION FROM A GROUND TELEMETRY STATION. THE INSTRUMENTATION INCLUDES AN S-BAND TRANSPONDER, A COMMAND DETECTOR/DECODER, AN ANTENNA S-BAND MIGHTAL EVALUATION MODULE, AN S-BAND ANTENNA, AND AN ANTENNA GINDAL ASSEMBLY. INITIAL EXPERIMENT OPERATION WAS NOMINAL. NOMENAL .

-- NIMBUS 6, WILHEIT, JR.--

INVESTIGATION NAME- ELECTRICALLY SCANNING MICROWAVE Radiometer (ESMR)

INVESTIGATIVE PROGRAM CODE ERN NSSDC 10- 75-052A-03

INVESTIGATION DISCIPLINE(S) EARTH RESOURCES SURVEY Atmospheric phys.cs

PERSONNEL PI - T.T. WILHEIT, JR. DI - A.T. EDGERTON

NASA-GSFC Aerojet electrosystems

BRIEF DESCRIPTION THE NIMBUS 6 ELECTRICALLY SCANNING MICROWAVE RADIOMETER (ESMR) MEASURED THE EARTH'S MICROWAVE EMISSION AT 37 GH2. THE LIQUID WATER CONTENT OF CLOUDS. THE DISTRIBUTION AND VARIATION OF SEA ICE COVER, AND GROSS CHARACTERISTICS OF LAND SURFACES (VEGETATION, SOIL MOISTURE, AND SNOW COVER) WERE OBTAINED FROM THESE MEASUREMENTS. THE DICKE-TYPE RADIOMETER CONSISTED OF A SINGLE TIME-SHARING RECEIVER AND AN ELECTRICALLY SCANNING PHASED ARRAY ANTENNA OPERATING AT 0.8 CM (37 GH2). THE ANTENNA DEAM ARRAY, A 90-BY 20- BY 12-CM BOX-LIKE STRUCTURE, WAS DOWN ED ON TOP OF THE SPACECRAFT'S FORWARD MOTION AND AT ILTED DOWN 40 DEG FROM THE SATELLITE VELOCITY VECTOR. THE ANTENNA DEAM SCANNED THE EARTH IN 100 DISCRETE STEPS FOR VARIOUS ANGLES EXTENDING UP TO 35 DEG ON EITHER SIDE OF THE ORBITAL PLANE. THE DEDUCED BORIGHTNESS TEMPERATURES WERE EXPECTED TO BE ACCURATE TO WITHIN 2 K. ACCURATE TO WITHIN 2 K.

SPACECRAFT COMMON NAME- NOAA Alternate NAMES- 1105-F, 6920

NSSDC 10- 73-086A

LAUNCH DATE- 11/06/73 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- DELTA WEIGHT- 746. KG

ONCORTNE CONSTRY/AGENCY

UNITED STATES	NOAA-NESS NASA-OA
INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 116.1 MIN PERIAPSIS- 1500.0 KM	EPOCH DATE- 11/07/73 Inclination- 102.1 deg Apoapsis- 1509.0 km
PERSONNEL SC - Unknown PM - S. Weiland PS - I.L. Golderg	UNKNOWN NASA-GSFC NASA-GSFC

ERIEF DESCRIPTION SATELLITES WITH NEW METEOROLOGICAL SENSORS ONBOARD TO EXPAND THE OPERATIONAL CAPABILITY OF THE ITOS S'STEM. THE PRIMARY OBJECTIVE OF NOAA 3 WAS TO PROVIDE GLOBAL DAVILME AND NIGHTIME UNITE OPERATIONAL CAPABILITY OF THE ITOS S'STEM. THE PRIMARY OBJECTIVE OF NOAA 3 WAS TO PROVIDE GLOBAL DAVILME AND NIGHTIME UNITE OPERATIONAL CAPABILITY OF THE ITOS S'STEM. THE PRIMARY OBJECTIVE OF NOAA 3 WAS TO PROVIDE GLOBAL DAVILME AND NIGHTIME SUN-SYNCHRÖNOUS SPACECRAFT WAS ALSO CAPABLE OF SUPPLYING GLOBAL ATMOSPHERIC TEMPERATURE SOUNDINGS AND VERY HIGH RESOLUTION INFRARED CLOUDCOVER DATA OF SELECTED AREAS IN EITHER A DIRECT READOUT OR A TAPE RECORDER MODE. A SECONDARY OBJECTIVE WAS TO

OBTAIN GLOBAL SOLAR PROTON ELUX DATA ON A ROUTINE DAILY BASIS. THE PRIMART SENSORS CONSISTED OF & VERY HIGH RESOLUTION RADIOMETER (VMRR), A VERTICAL TEMPEDATURE PROFILE RADIOMETER (VTPR), AND A SCANNING RADIOMETER (SR). THE VMRR, VTPR, AND SR WERE MOUNTED ON THE SATELLITE BASEPLATE WITH THEIR OPTICAL AKES DIRECTED VERTICALLY EARTHWARD. THE NARRLY CUBICAL SPACECRAFT DIRECTED VERTICALLY EARTHWARD. THE NATELLITE WAS EQUIPPED WITH THREE CURVED SOLAR PANELS THAT WERE FOLDED DURING LAUNCH ANU DEFLOYED AFTER ORBIT WAS ACHIEVED. EACH PANEL MEASUMED OVER 4.2 M IN LENGTH WHEN UNFOLDED AND WAS COVERED WITH 33CC SOLAR CELLS MEASURING 2 BY 2 CM. THE INCOMPARIES AND ATTITUDE CONTROL SYSTEM MAINTAINED DESIRED SPACECRAFT ORIENTATION THROUGH GYROSCOPIC PRINCIPLES INCORPORATED INTO THE SATELLITE DESIGN. EARTH ORIENTATION OF THE SATELLITE BODY WAS MAINTAINED BY TAKING ADVANTAGE OF THE PRECESSION NOICE FORM A MOMENTUM FLVWHEEL SO THAT THE SATELLITE BODY PRECESSION RATE OF ON REVOLUTION PER ORBIT PROVIDED THE DESIRED TREAT OF ONSING AND AND ATTITUDE. MINOR ADJUSTMENTS IN ATTITUDE AND ORIENTATION WER ATTING ADVANTAGE OF THE PRECESSION THE DESIGED OF PRECESSION RATE OF OR REVOLUTION PER ORBIT PROVIDED THE DESIRED THE SATELLITE MADE BY MEANS OF MAGNETIC COLS AND BY VARING THE SPEED OF THE MADE BY MEANS OF MAGNETIC COLS AND BY VARING THE SPEED OF THE MADE BY MEANS OF MAGNETIC COLS AND BY VARING THE SPEED OF THE MADE BY MEANS OF MAGNETIC COLS AND BY VARING THE SATELLI DATA IND SPACECRAFT OCH AT THE SATELLICENT DIAL TO THE SATELLI DATA IND ATTITUDE. MINOR ADJUSTENTS IN ATTITUDE AND ORIENTATION ACTION FOR MADE BY MEANS OF MAGNETIC COLS AND BY VARING THE SPEED OF THE MOMENTUM FLYWHEEL. THE SPACECRAFT BECAME THE OPERATIONAL ITOS SPACECRAFT ON MARCH 19-1974. OPERATIONS TERMINATED IN AUGUST 1976.

-- NOAA 3, WILLIAMS-----

INVESTIGATION NAME- SOLAR PROTON MONITUP

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS NSSDC 10- 73-086A-01

INVESTIGATION DISCIPLINE(S) Particles and fields

NDAA-ERL

PERSONNEL PI = D.J. WILLIAMS

BRIEF DESCRIPTION THREE SOLID-STATE DETECTORS MONITORED THE OMNIDIRECTIONAL THREE SOLID-STATE DETECTORS MONITORED TO, 30, AND 60 MEW, FLUXES OF SOLAR PROTONS WITH ENERGISS ABOVE 10, 30, AND 60 MEW, RESPECTIVELY. TWO TELESCOPES CONSISTING OF SOLID-STATE DETECTORS EACH MEASURED DIRECTIONAL FLUXES OF PROTONS BETWEEN 0.27 MEV AND 3.2 MEV (IN THREE INTERVALS), PROTONS BETWEEN AND 60 MEV, PROTONS ABOVE 60 MEV, AND AIPHA PARTICLES BETWEEN 12.5 AND 32 MEV. IN THE PLOAR CAP HEGION WHICH IS OF THE GREATEST INTEREST, THE TELESCOPES VIEWED PARALLEL TO, AND PERPENDICULAR TO, THE LOCAL MAGNETIC FIELD DIRECTIONAL ADDITIONAL SOLID-STATE DETECTOR MEASURED DIRECTIONAL FLUXES OF ELECTRONS OF ENERGIES GREATER THAN 140 KEV. THIS DETECTOR LODKED IN A DIRECTION PERPENDICULAR TO THE ORBIT PLANE.

SPACECRAFT COMMON NAME- NOAA 4 Alternate Names- 1105-g, 07529

N550C 10- 74-089A

WEIGHT- 339.7 KG LAUNCH DATE- 11/15/74 Launch Site- Vandenberg Afb, United States Launch Vehicle- Delta

SPONSORING COUNTRY/AGENCY UNITED STATES NGAA-NESS

INITIAL ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 114-9 Min Periapsis- 1443.0 KM	EPOCH DATE- 11/16/74 Inclination- 101_7 deg Apoapsis- 14570.0 KM
PERSONNEL	NASA HEADQUARTERS
TG - M.L. GARBACZ	NASA-GSFC

PM - G.A. BRANCHFLOWER PM - A. BUTERA PS - 1.L. GOLDBERG NOAA-NESS NASA-GSFC PS - I.L. GOLDBERG NASA-GSFC BRIEF DESCRIPTION ITOS-G WAS ONE IN A SERIES OF INPROVED TIROS-M SATELLITES LAUNCHED WITH NEW METEOROLOGICAL SENSORS ON BOARD TO EXPAND THE OPERATIONAL CAPABILITY OF THE ITOS (NOAA) SYSTEM. THE PRIMARY OPERATIONAL CAPABILITY OF THE ITOS (NOAA) SYSTEM. THE PRIMARY OBJECTIVE OF THE JTOS-G METEOROLOGICAL SATELLITE WAS TO PROVIDE GLOBAL DAYTIME AND NIGHTIME DIRECT READOUT CLOUDCOVER DATA ON GLOBAL ATMOSPHERIC TEMPERATURE SOUNDINGS AND VERY HIGH GLOBAL ATMOSPHERIC TEMPERATURE SOUNDINGS AND VERY HIGH RESOLUTION INFRRED CLODEOVER DATA OF SELECTED AREAS IN EITHER A DIRECT READOUT OR A TAPE RECORDER MODE. A SECONDARY A DIRECT READOUT OR A TAPE RECORDER MODE. A SECONDARY HIGH RESOLUTION INFRRED CLODEOVER DATA OF SELECTED AREAS IN EITHER ROUTIME DAILY BASIS. THE PRIMARY SENSORS CONSISTED OF A VERY HIGH RESOLUTION RADIONETER (WHRD). A VERTICAL TEMPERATURE HIGH RESOLUTION RADIONETER (WHRD). THE SATELLITE BASEPLATE WITH HER, VTRR, AND SR WERE MOUNTED ON THE SATELLITE BASEPLATE WITH HER, VTRR, AND SR WERE MOUNTED NO THE SATELLITE WAS COVERED WITH HEASURED OVER 4.2. IN LENGTH WERT IGALLY EARTHWARD. THE HEARLY CUBICAL SPACECRAFT MEASURED SOLAR PANELS THAT WERE TOLDED DURING EQUIPPED WITH THREE CLUSED SOLAR PANELS THAT WERE TOLDED DURING EQUIPPED WITH THREE CLUSED SOLAR PANELS THAT WERE TOLDED DURING EQUIPPED WITH THREE CLUED SOLAR PANELS THAT WERE TOLDED DURING EQUIPPED WITH THREE CLUED SOLAR PANELS THAT WERE TOLDED DURING EQUIPPED WITH THREE CLUED SOLAR PANELS THAT WERE TOLDED DURING EQUIPPED WITH THREE CLUED SOLAR PANELS THAT WERE TOLDED DURING EQUIPPED WITH THREE CLUED SOLAR PANELS THAT WERE TOLDED DURING EQUIPPED WITH THREE CLUED SOLAR PANELS THAT WERE TOLDED DURING EAND DEFLOYED AFTER ORDIT WAS ACHIEVED. EACH PANEL MAGE THREE CLUES PARTY ORIENTATION OF THE SATELLITE WAS ACTITUDE CONTROL SYSTEM MAINTAINED DESIRED SPACECRAFT TOTIENTION THROUGH GYNOSCOPIC PRINCIPLES INCORPORATED INTO THE SATELLITE DESIGN. EARTH ORIENTATION OF THE SATELLITE BODY MAS MAINTAINED BY

THE SPEED OF THE MOMENTUM FLYWHEEL. --- NOAA 4, NESS STAFF----

INVESTIGATION NAME- SCANNING RADIOMETER (SR)

NSSBC 10- 74-0894-02

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS INVESTIGATION DISCIPLINE(S) Atmospheric Physics Meteorology

NOAA-NESS

PERSONNEL

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- NDAA 4, NESS STAFF------

INVESTIGATION NAME- VERY HIGH RESOLUTION RADIOMETER (VHRR)

NSSDC 10- 74-089A-03

NESS STAFF

INVESTIGATION DISCIPLINE(S) Atmospheric Physics Meteorology

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

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-- NOAA 4, NESS STAFF------INVESTIGATION NAME- VERTICAL TEMPERATURE PROFILE RADIOMETER

NSSUC 10- 74-089A-04

INVESTIGATION DISCIPLINE(S) ATMOSPHERIC PHYSICS METEOROLOGY

PERSONNEL PI -NESS STAFF

NOAA-NESS

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

DRIEF DESCRIPTION THE ITOS-G VERTICAL TEMPERATURE PROFILE RADIOMETER (VIPR) SENSED THE RADIANT ENERGY FROM ATMOSPHERIC CO2 IN SIX NARROW SPECTRAL REGIONS CENTERED AT 15.0, 14.8, 14.4, 13.8, AND TS.4, MICHOMETERS. THE GROSS ATMOSPHERIC WATER VAPOR CONTENT MAS DETERMINED FROM MEASUREMENTS CENTERED AT 18.7 MICROMETERS. MEASUREMENTS WERE TAKEN IN THE 12.0-MICROMETER SPECIAL REGION TO DETERMINE SUFFACE/CLOUDION TEMPERATURES. THE VIPR CONSISTED OF AM OPTICAL SYSTEM, DETECTOR AND ASSOCIATED ELECTRONICS, AND A SCANNING MIROR. THE MIRNOR SCANNED THE EARTH'S SUBFACE FERPENDICULAR TO THE SATELLITE'S ORBITAL PATH. AS EACH ALA:A 15 SCANNED, THE OPTICAL SYSTEM COLLECTED, FILTERED, AND DETECTED THE RADIATION FROM THE EARTH AND SEPARATED IT INTO THE EIGHT SPECTRAL INTERVALS. THE GROUND AREA COVERED BY OME SAMPLE OF DATA WAS APPROXIMATELY SO BY 50 KM. THE RADIOMETER OPERATED CONTINUOUSLY, TAKING MEASUREMENTS OVER EVERY PART OF THE EARTH'S SURFACE TWICE A DAY. THE DATA WERE RECORDED THROUGHOUT THE ORBIT AND WERE PLAYED BACK UPON COMMAND MEN THE SATELLITE WAS WITHIN COMMUNICATION RANGE OF A COMMAND AND DATA ACOUNSITION STATION. GROUND PERSONNEL USED THE DATA MAS SO KM. ALL OPERATJY-SURFACE TWICE A TO MENT WERE HANDLED BY NOAA AND EVENTUALY ARCHIVED AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA. IDENTICAL EXPERIMENTS WERE FLOWN ON ITOS-D. -F. AND -F.

-- NOAA 4, WILLIAMS------

INVESTIGATION NAME- SOLAR PROTON MONITOR

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS NS5DC 10- 74-089A-01

INVESTIGATION DISCIPLINE(\$) Particles and fields

NOAA-ERL

PERSONNEL PI - D.J. WILLIAMS

BRIEF DESCRIPTION THIS EXPERIMENT CONTINUES THE ITOS SERIES OF JHU/APL EXPERIMENTS, WHICH ARE ALL TO BE THE SAME THROUGH ITOS-F. THREE SOLID-STATE DETECTORS MONITOR THE OMNIDIRECTIONAL FLUXES OF SOLAR PROTOMS WITH ENERGIES ABOVE 10, 30, AND 60 MEV, RESPECTIVELY. TWO TELESCOPES CONSISTING OF SOLID-STATE DETECTORS EACH MEASURE DIRECTIONAL FLUXES OF PROTONS BETWEEN 0.27 MEV AND 3.2 MEV (IN THREE INTERVALS), PROTONS BETWEEN ALS AND 32 MEV. IN THE POLAR CAP REGION, WHICH IS OF THE GREATEST INTEREST, THE TELESCOPES VIEW PARALLEL TO, AND PERPENDICULAR TO, THE LOCAL MAGNETIC FIELD DIRECTIONAL AN ADDITIONAL SOLID STATE DETECTOR MEASURES DIRECTIONAL AN ADDITIONAL SOLID STATE DETECTOR MEASURES DIRECTIONAL SULXES OF ELECTRONS OF ENERGIES GREATER THAN 14D KEV. THIS DETECTOR LOOKS IN A DIRECTION PERPENDICULAR TO THE ORBIT PLANE. BRIEF DESCRIPTION THIS EXPERIMENT EXPERIMENTS, WHICH AN

SPACECRAFT COMMON NAME- NOAA S Alternate names- itos-h+ o9057

NSSDC 10- 76-077A

82

WEIGHT- 336. KG LAUNCH DATE- 07/29/76 Launch Site- Vandenberg Afg, United States Launch Vehicle- Delta

UNITED STATES UNITED STATES	NGAA-NESS Nasa-da
INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 116.2 MIN PERIAPSIS- 1502. KM-	EPOCH DAT(:- 07/30/76 Inclination- 102,1 deg Apoapsis- 1520. KM
PERSONNEL MG — M.L. GARBACZ PM — A. Butera PM — G.A. Branchflower PS — 1.L. Goldberg	NASA HEADQUARTERS NGAA-HESS NASA-GSFC NASA-GSFC

BRIET DESCRIPTION NOAA 5 WAS ONE IN A SERIES OF IMPROVED TIROS-M TYPE SATELLITES LAUNCHED WITH NEW METEOROLOGICAL SENSORS ON POARD TO EXPAND THE OPENATIONAL CAPABILITY OF THE LTOS (NOAA) SISTEM-THE PRIMARY OBJECTIVES OF THE NOAA 5 (ITGS-H) METEOROLOGICAL SATELLITE WERE TO PROVIDE GLOBAL DAYTIME AND NIGHT TIME DIRECT READOUT CLOUDCOVER DATA ON A DAILY BASIS. THE SUM-SYNCHRONOUS

SPACECRAFT WAS CAPABLE OF SUPPLYING GLOBAL ATMOSPHERIC TEMPERATURE SOUNDINGS AND VERY HIGH RESOLUTION INFRAED CLOUDCOVER DATA OF SELECTED AREASI IN EITHER A DIRECT READOUT OR A TAPE RECORDER MODE. A SECONDARY OBJECTIVE WAS TO OBTAIN GLOBAL SOLAR PLOTON DENSITY DATA ON A ROUTINE DALLY BASIS. THE PRIMARY SENSCHS CONSISTED OF A VERY HIGH RESOLUTION RADIOMETER (WHR), A VERTICAL TEMPERATURE PROFILE RADIOMETER (VHR), AND A SCANING RADIOMETER (START, VHR, VTPR, AND SM WERE MOUNTED ON THE SATELLITE BASEPLATE WITH THEIR OPTICAL ARES DIRECTED VERTICALLY EARTHMARD. THE NEARLY CUBICAL SPACECRAFT MEASURED 1X 1 X. 1.2 M. THE SATELLITE WAS EQUIPPED WITH THREE CUCYED SOLAR PANELS THAT WERE FOLDED DURING LAUNCH AND DEPLOYED AFTER TORS OVER DALLY AND A TITUDE AND A SCOVERED WITH 342D SOLAR CELLS, EACH MEASURED ONE ALS TO REINTAILDE CONTROL STSTEM MAINTAINED DESIRED SPACECRAFT DAILY AND THROUGH OF ONE THE SATELLITE BODY THE SATELLITE BODY MAS MAINTAINED DESIRED STAKING ADVANTAGE OF THE PROVEDED INTO THE SATELLITE BODY MAS MAINTAINED THE SATELLITE BODY MAS MAINTAINED FOR THE SATELLITE BODY MAS MAINTAINED THE SATELLITE BODY MAS MAINTAINED FOR THE SATELLITE BODY MAS MAINTAINED FOR THE SATELLITE BODY MAS MAINTAINED FOR THE SATELLITE BODY MAS ANDIANTAINED FOR THE AND THE SATELLITE BODY MAS ANDIANTAINED FOR THE AND THE SATELLITE BODY MAS ANDIANTAINED FOR THE AND THE SATELLITE BODY MAS ANDIANTAINED FOR THE AND ADVIDED FROM A MOMENTUM FLYWHEEL. THE SATELLITE WAS PLACED IN A SUN-SYNCHRONOUS ORBIT WITH HE QUATORIAL CROSSING OF THE ASCENDING MODE NEAR DBJA.M., LOCAL TIME.

----- NOAA 5. NESS STAFF-----

INVESTIGATION NAME- VERY HIGH RESOLUTION RADIOMETER (VHRR)

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

INVESTIGATION DISCIPLINE(S) Meteorology

PERSONNEL

NSSDC 10- 76-0774-31

NESS STAFF

NOAA-NESS

BRIEF DESCRIPTION THE ITOS-H BRIEF DESCRIPTION THE ITOS-H VERY HIGH RESOLUTION RADIOMETER (VHAR) WAS CAPABLE OF PRVIDING GLOBAL DAVIIME AND HIGHTIIME EARTH CLOUDGOVER PICTURES ON A REGULAR DAILY BASIS FOR USE IN WEATHER ANALYSIS AND FORECASTING. THE NU- LIISPECTRAL SCANNING INSTRUMENT OPERATED IN BOTH REAL-TIME AND TAPE RECORDER MODES. THE FOUR-CHANNEL UNIT USED THE FOLLOWING SPECTRAL WAVELENGTHS -- CHANNEL 1 - G.S TO 0.7 MICROMETERS (VISIBLE), CHANNEL 2 C.75 TO 1.00 MICROMETERS (NEAR IR), CHANNEL 3 - 10.5 TO 12.5 MICROMETERS (IR WINDOW), AND CHANNEL 4 - 6.5 TO 7.0 MICROMETERS (WATER VAPOR). THE VISIBLE, NEAR IR, AND IR WINDOW CHANNELS HAD A GROWN RESOLUTION OF 1 KM. THE RESOLUTION OF THE WATER VAPOR CHANNEL WAS SOMEWHAT LESS -- ABOUT 4 KM AT NADIR. EACH CHANNEL HAD ITS OWN ELECTRONICS PACKAGE CONSISTING OF AN MMPLIFIER, AN ANALOG-TO-DIGITAL CONVERTER, AND OTHER AUXILIARY ELECTRONICS. IDENTICAL EXPERIMENTS WILL BE FLOWN ON ITOS-I AND -J.

----- NOAA 5, NESS STAFF------

INVESTIGATION NAME- VERTICAL TEMPERATURE PROFILE RADIONETER

NSSDC 10- 76-0774-02 INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

INVESTIGATION DISCIPLINE(S) Meteorology

PERSONNEL

NESS STAFF NOAA-NESS

P1- NESS STAFF NOAA-NESS GRIEF DESCRIPTION THE VERTICAL TEMPERATURE PROFILE RADIOMETER (VTPR) SUBSYSTEM WAS DESIGNED TO MAKE RADIANCE MEASUREMENTS IN THE SUBSYSTEM WAS DESIGNED TO MAKE RADIANCE MEASUREMENTS IN THE INFREATURE PROFILE FROM THE EARTH'S SUBFACE TO AN ALTITUDE OF SU KN OVER EVERY PART OF THE EARTH AT LEAST TWICE DAILY. A 12-MICROMETER LATER VAPOR EAAD VERE USED IN CONJUNCTION WITH SIX CO2 BAND MEASUREMENTS TO EVALUATE THE AMOUNT OF CLOUDCOVER, AND MEASUREMENTS WERE MADE CONTINUOUSLY BOTH DAY AND WIGHT. INF VTPR DATA WERE RECORDED THROUGHOUT THE DREIT AND WERE PLAYED BACK UPON COMAND WHEN THE SATELLITE WAS DUER A COMMAND AND DATA ACQUISITION (CDA) STATION, THE VTPH SUBSYSTEM CONSISTED OF AN OPTICAL SYSTEM, A DEFECTOR, AND ASSOCIATED ELECTRONICS. AS THE SATELLITE NOCEEDED IN IS ONBUT THE RADIOMETER SCANNED THE EARTH'S SURFACE PLUS OR MINUS 31.45 DEG FROM NADIE IN 23 DISCRETE STEPS. IT EACH STEP A RADIOMETRIC MEASUREMENT NA MADE SEQUENTIALLY IN EACH OF THE EGGETSPECTRAL BANDS. IMAGE MOTION COMPENSATION WAS PROVIDED BY STAGGENING THE FIELD STOPS LOCATED ON THE FLITER WHEEL. THE ASSOCIATED ELECTRONICS. PROCESSED THE SEQUENTIALLY ANALOG DATA AND CONVERTED IT TO DIGITAL FORMAT FOR FURTHER PROCESSING BY THE DATA CONSTITUTE OF AND ESCUENTIALLY IN EACH OF THE EGGENING THE FIELD STOPS LOCATED ON THE FLITER WHEEL. THE ASSOCIATED ELECTRONICS. PROCESSED THE SEQUENTIALLY ANALOG DATA AND CONVERTED IT TO DIGITAL FORMAT FOR FURTHER PROCESSING BY THE DATA COLLECTON CONFILMATER FOR FURTHER TRANSMISSION AND/OR RECORDING.

----- NOAA 5, NESS STAFF-----

INVESTIGATION NAME- SCANNING RADIOMETER (SR)

N550C 10- 76-0774-03

INVESTIGATION DISCIPLINE(S) METEOROLOGY

NOAA-NESS

PERSONNEL NESS STAFF

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE SCANNING RADIONÉTER (SR) SUBSYSTEM WAS A REDUNDANT RADIONETER AND TAPE RECORDER CONDINATION DESIGNED TO PROVIDE THE FOLLOWING DATA -- (1) REAL-TIME DAYLIGHT CLOUD COVER INFORMATION IN THE D.5- TO 1.0-MICROMETER REGION, TRANSMITTED OVER THE VHF DATA LINK, (2) REAL-TIME DAY AND NIGHT THERMAL RADIATION IN FORMATION IN THE TO.5- TO 12.5-MICROMETER REGION TRANSMITTED OVER THE VHF DATA LINK, (3) GLOBAL CLOUD COVER INFORMATION STORED ON RECORDERS AND PLAYED BACK TO COMMAND AND DATA. ACQUISITION (CDA) STATIONS VIA THE S-BAND DATA LINK, AND CAIA ACQUISITION (CDA) STATIONS VIA THE S-BAND DATA LINK, AND PLAYED BACK TO CCA STATIONS VIA THE S-BAND DATA LINK, THE SR SUBSYSTEM ELEMENTS INCLUDED TWO SCANNING RADI-MICTERS, A DUAL SR PROCESSOR, AND THAE'S RECORDERS, MAJOR CONTROL AND TIMING FUNCTIONS WERE PROVIDED BY THE SATELLITE 'S TIME-BASE AND COMMAND-DISTRIBUTION UNITS. AS THE SATELLITE STIME-BASE AND FUNCTIONS WERE PROVIDED BY THE SATELLITE STIME-BASE AND FUNCTIONS WERE PROVIDED BY THE SATELLITE STIME ACTION TRADA DISTRIBUTION UNITS. AS THE SATELLITE SUCCEDED IN ATS ORBIT. THE RADIONETER, DOLG CONTAINED BY AS USE ON TATING MIRROR. THE SCAN MIRROR WAS INCLINED BY 45 CEG TO ITS AXIS OF NOTATION, WHICH WAS COINCIDENT WITH A CONTINUOUSLY ROTATING MIRROR. THE SCAN MIRROR WAS INCLINED BY 45 CEG NO. IN & PLARE PERFENDICULAR TO THE SATELLITE'S VELOCITY VECTOR. IN THE THE FORDRESSED APPROXIMATELY 7.4 KM ALONG THE GRUIT RACK. AN ADJACENT AREA WAS THEN SCANNED AND SCANS WERE REPEATED THROUGHOUT THE ORBIT TO GENERATE A CONTINUOUSLY ROTATION. THRO AS THE SATELLITE'S VELOCITY VECTOR. AND TRACK. AN ADJACENT AREA WAS THEN SCANNED AND SCANS WERE REPEATED THROUGHOUT THE ORBIT TO GENERATE A CONTINUOUSLY RET THE ORDIT TO CONTINUE AND SCANS WERE REPEATED THROUGHOUT THE ORBIT TO CONTINUOUS PICTURE.

-- NOAA 5, WILLIAMS------

INVESTIGATION NAME- SOLAR PROTON MONITOR (SPM)

NSSDC 10- 76-0774-04

INVESTIGATIVE PROGRAM Operational weather observations

NOAA-ERL

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL PI - D.J. WILLIAMS

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO CONTINUOUSLY MONITOR DIRECTIONAL FLUXES OF -- (1) PROTONS IN FIVE CONTIGUOUS INTERVALS BETWEEN 0.15 AND 40 MEV (INTERVAL THRESHOLDS OF 0.15, 0.30, 0.40, 1.5, AND 6.6 MEV), (2) PROTONS IN THE RANGES 400 TO 600 AND 600 TO 1000 MEV, (3) PROTONS ABOVE 1000 MEV, (4) ALPHA PARTICLES IN FIVE CONTIGUOUS ENERGY INTERVALS BETWEEN 0.6 AND 11 100 MEV (INTERVAL THRESHOLDS OF 0.60, 0.90, 1.4, 3.5, AND 11 MEV), (5) ALPHA PARTICLES BETWEEN 330 AND 600 REV, (6) ALPHA PARTICLES ABOVE 600 MEV, AND (7) ELECTRONS ABOVE 25G KEV. OMNIDIRECTIONAL FLUXES OF PROTONS ABOVE 10, 30, AND 60 MEV WERE MONITORED.

SPACECRAFT COMMON NAME- DAD 3 Alternate NAMES- PL-701D, DAD-C Copernicus, 06153

NSSDC ID- 72-065A

LAUNCH DATE- C8/21/72 Launch Site- Cape Canaveral, united states Launch Vehicle- Atlas WEIGHT- 2150. KG

SPONSORING COUNTRY/AGENCY UPITED STATES NASA-OSS

INITIAL ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 99.7 Min Periapsis- 739. Km	EPOCH DATE- 08/21/72 Inclination- 35.0 deg Apoapsis- 751. Km
PERSONNEL	
NG - H.E. MEDONALD	NASA HEADQUARTERS
SC – N.G. ROMÁN	NASA HEADQUARTERS
PM - J.E. KUPPERIAN, JR.	NASA-GSFC
PS - J.E. KUPPERIAN, JR.	NA SA-GS F.C

BRIEF DESCRIPTION THIS MISSION WAS THE THIRD IN THE OAO PROGRAM AND ITS SECOND SUCCESSFUL SPACE PAFT TO OBSERVE THE CELESTIAL SPHERE FROM ABOVE THE EARTH'S ATMOSPHERE. A UV TELESCOPE WITH A SPECTROMETER MEASURED HIGH RESOLUTION SPECTRA OF THE STARS, GALAXIES, AND PLANETS WITH THE MAIN EMPHASIS ON THE DETERMINATION OF INTERSTELLAR ABSORPTION LINES. INREE X-RAY TELESCOPES AND A COLLIMATED, HADPORTIONAL COUNTER FMUVIDED MEASUREMENTS OF COSMIC X-RAY SOURCES AND INTERSTELLAR ARSORPTION BETWEEN 1 AND 70 A. THE OAO-3 SPACERAFT WAS AN OCTASONALLT SHAPED, ALUMINUM STRUCTURE WITH A 48-IN. HOLLOW, CENTRAL, TUBULAR AREA, WHICH HOUSED THE EXPERIMENT CONTAINER. SOLAR PANELS WERE MOUNTED ON EACH SIDE OF THE SPACECRAFT AT ANGLES OF 34 DEG AND HAD AN AREA OF 138 FT. A SUN BAFFLE PROTECTED THE EXPERIMENTS AND INCREASED THE LENGTH OF THE

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

SPACECRAFT TO 193 IN. TWO INERTIAL BALANCE BOOMS, ONE FORWARD AND ONE AFT, EXTENDED APPROXIMATELY 300 IN. THE SPACECRAFT WAS EQUIPPED WITH AN INTERNAL REFERENCE UNIT (A HIGH-PRECISION, THREE AXIS GYRO INERTIAL SYSTEM), SUN SENSORS, A MAGNETOMETER, AND STAR TRACKERS, WHICH ENABLED SPACECRAFT POINTING TO BE DETERMINED IN MANY DIFFERENT WAYS. A BORESIGHT STAR TRACKER SENSITIVE TO THE SIXTH MAGNITUDE CONTROLLED PITCH AND YAW TO WITHIN 5 ARC-SEC. IN ADDITION, THE HIGH RESOLUTION TELESCOPE PITCH AND YAW TO WITHIN DNE TENTH ARC-SEC. ON BRIGHT STARS. SPACECRAFT ATTIDE WAS CONTROLLED BY INERTIA WHEELS AND TRACKING OF THE SPACECRAFT. THO UHF (400.55 MHZ) TRANSMITTERS PROVIDED WIDEBAND TELEMETRY FOR TRANSMITTING DIGITAL DATA TO THE GROUND STATIONS. TWO REDUNDAND WHE (136.26 MHZ) TRANSMITTERS UREE USED IN A NARROW BAND TELEMETRY LINK USED PRIMARILY FOR TRANSMITTING SPACECRAFT HOUSEKEEPING DATA. ALTHOUGH THEY SERVED AS BACKUPS FOR THE WIDEBAND TELEMETRY CARRIED AS PART OF A COMMAND STSTEM CFAMALD RECEIVERS WERE CARRIED AS PART OF A COMMAND STSTEM COMMAND TALEMETRY MARE AND TRACKING IN THE SERVED AS BACKUPS FOR THE WIDEBAND TELEMETRY COMMANDS. DATA MERE JORDED IN AN ON-BOARD THE STORTING 1280 COMMANDS. DATAT MERE JOSTED IN AN ON-BOARD THE WIDEBAND TELEMETRY CARRIED AS PART OF A COMMAND RECEIVER WAS CARRIED THAT MONITORED TELEMETRY DATA. THAT COULD ISSUE COMMANDS, AND THAT WAS PROGRAMMED VIA THE COULD AND RECEIVER UPLINK.

----- DAO 3, BOYD------

INVESTIGATION NAME- STELLAR X-RAYS

INVESTIGATIVE PROGRAM NSSDC 10- 72-0654-02 CODE SA

INVESTIGATION DISCIPLINE(S) Astronomy

PERSONNEL

PI - R.L.F.BOY 01 - P.W. SANFORD

U COLLEGE LONDON U COLLEGE LONDON

BRIEF DESCRIPTION THIS EXPERIMENT USED THREE TELESCOPES AND A COLLIMATED PROPORTIONAL COUNTER TO OBSERVE COSMIC X-RAY SOURCES BETWEEN 1 AND 70 A. BETWEEN 1 ANG 3 Å PROPORTIONAL COUNTER LOCATED BEHIND A COLLIMATOR WAS USED IN COMJUNCTION WITH PULSE-SHAPE DISCRIMINATION TO REJECT BACKGROUND COUNTS. FROM 3 TO 9 Å AND 6 TO 18 Å, PROPORTIONAL COUNTERS LOCATED AT THE FOCUS OF TWO GRAZING-INCIDENCE REFLECTING TELESCOPES (5.5 SQ CM AND 12 SQ CM, RESPECTIVELY) WERE USED, WITH AN ANTICOINCIDENCIDE RAY COUNTS. AN DPEN CHANNEL NULTIPLIER LOCATED AT THE FOCUS OF A GRAZING-INCIDENCE TELESCOPE (23 SQ CM) WAS USED TO OBSERVE BETWEEN 20 AND 70 Å, DATA FROM THIS EXPERIMENT WERE USED TO DETERMINE THE INTERSTELLAR ABSORPTION OF SOFT X-RAYS.

- GAD 3, SPITZER

INVESTIGATION NAME- HIGH-RESOLUTION TELESCOPES

INVESTIGATIVE PROGRAM NSSDC ID- 72-065A-01 CODE SA

INVESTIGATION DISCIPLINE(S) ASTRONOMY

PERSONNEL	en17760	PRINCETON U
P] - L. 01 - J.	SPITZER Rogerson, JR.	PRINCETON U

SPACECRAFT CONMON NAME- 050 5 Alternate NAMES- 050-F, PL=6844 D3663

NSSDC 10- 69-006A

WEIGHT- 645. KG LAUNCH DATE- 01/22/69 Launch Site- Cape Canaveral, United States Launch Vehicle- Delta

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-OSS

INITIAL ORBIT PARAMETERS Orbit Type- geocentric Orbit Period- 95.48 min Periapsis- 536. Km	EPOCH DA/E- 01/22/69 Inclination- 32.95 deg Apdapsis- 561. KM		
PERSONNEL Mg - N.£. MCDONALD SC - G.K. GERTEL PM - R.H. PICKARD PS - S.P. MARAN	NASA HEADQUARTERS Nasa headquarters Nasa-gsfc Nasa-gsfc		

BRIEF DESCRIPTION THE OBJECTIVES OF THE OSO SATELLITE SERIES WERE TO THE OBJECTIVES OF THE OSO SATELLITE SERIES WERE TO PERFORM SOLAR PHYSICS EXPERIMENTS ABOVE THE ATNOSPHERE DURING A COMPLETE SOLAR CYCLE AND TO MAP THE ENTIRE CELESTIAL SPHERE FOR DIRECTION AND INTENSITY OF UV, X-RAY AND GAMMA RADIATION. THE OSO 5 PLATFORM CONSISTED OF A SAIL SECTION THAT POINTED TWO EXPERIMENTS CONTINUALLY TOWARD THE SUN AND A WHEEL SECTION THAT SPUN ABOUT AN ALIS PERFENDICULAR TO THE POINTING DIRECTION OF THE SAIL AND CARRIED SIX EXPERIMENTS. ATTISTUDE ADJUSTMENTS WERE PERFORMED BY GAS JETS AND A MAGNETIC TORQUING COLL. POINTING CONTROL PERMITTED THE POINTED EXPERIMENTS TO SCAN THE REGION OF THE SOLAR DISK IN A 40- BY 40-ARC-MIN RASTER PATTERN-IN ADDITION, THE POINTED SECTION COULD BE COMMANDED TO SELECT AND SCAN A 7.5- BY 7-ARC-MIN REGION NEAR THE SOLAR DISK. DATA WERE SIMULTANEOUSLY RECORDED ON TAFE AND TRANSMITTED BY PCM/PM TELEMETRY. A COMMAND SYSTEM PROVIDED FOR 155 GROUND-BASED COMMANDS.

- 050 5, BLAMONT------

INVESTIGATION NAME- REASUREMENT OF THE SELF-REVERSAL OF THE Sular Lyman-Alpha Line

INVESTIGATIVE PROGRAM NS50C ID- 69-006A-06 CODE ST

INVESTIGATION DISCIPLINE(S) Solar physics

PERSONNEL BLAMONT P1 - J.E. 01 - P. COUFLEAU

CNRS-LPSP PARIS OBSERVATORY

TI - J.C. DLARUMI OI - P. COUFLEAU BRIEF DESCRIPTION ' THIS FLIGHT INSTRUMENT WAS DESIGNED FOR STUDYING THE LIME SHAPS OF THE SOLAR LYMAN-ALPHA LINE SUMMED OVER TWE ENTIRE SHAPS OF THE SOLAR LYMAN-ALPHA LINE SUMMED OVER TWE ENTIRE SOLAR DISK. IT MADE USE OF THE OPTICAL RESONANCE OF HYDROGEN AND DEUTERIUM GASES. A GRATING AND MIRROR SYSTEM CONVERTED THE INCIDENT SOLAR RADIATION INTO A BEAM OF LYMAN-ALPHA LIGHT (1216 AL WITH A BANDWIDTH OF 100 A, WHICH ENTERED TWO RESONANCE CELLS. OME CELL WAS FILLED WITH MOLECULAR DEUTERIUM GAS. EACH CELL HAD A PHOTOMULTIPLIER MOUNTED AT ITS EXIT WINDOW TO MEASURE THE TOTAL INTENSITY OF THE SOLAR SPECTRUM IN THE 100-A BANDWIDTH. IN ADDITION- EACH CELL HAD A PHOTOMULTIPLIER MOUNTED AT RIGHT ANGLES TO THE CELL (I. E., A RIGHT ANGLES TO THE INCIDENT BEAM) THAT MEASURED THE INTENSITY OF ALCOMENTATIONS OF AIONIC SPECIES IN THE CELLS. WERE OBTAINED BY VARYING FILAMENT VOLTAGE. THE SIGNAL ON THE RIGHT ANGLE DETECTORS WAS PROPORTIONAL TO THE INTENSITY OF THE SOLORTH AND AT 1215.664 A FOR THE MYDROGEN CELL (0.015 A BANDWIDTH) AND AT 1215.334 A FOR THE BUETERIUM CELL (0.015 A BANDWIDTH) AND AT 1215.334 A FOR THE BUETERIUM TO PARACHING AND RECEDING VELOCITY OF THE SPACECRAFT WITH RELATION THE SUN AT ORBIT MORINIS AND EVENING. AN INTERNAL CALIBRATION LARP MAS INCLUDED IN THE EXPERIMENT. TH EXPERIMENT OPERALIBRATION LARP AND RECEDING VELOCITY OF THE SPACECRAFT WITH RELATION THE SUN AT ORBIT MORINIS AND EVENING. AN INTERNAL CALIBRATION LARP MAS INCLUDED IN THE EXPERIMENT. THE PAPER, "SOLAR LYMAN ALPHA CHANGES AND RELATED HYDROGEN DENSITY DISTRIBUTION AT THE EARTH'S EXDBASE (1969-1970).". VIDAL-MADJAR, ET AL, J. SEOPHYS. RES., 7B, 7, 1115-11444, MARCH 1973.

-- aso 5, BOYD------

INVESTIGATION NAME- X-RAY SPECTROHELIOGRAPH

INVESTIGATIVE PROGRAM N55DC IN- 69-006A-01 CODE ST

> INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS IONOSPHERES

PERSONNEL PI - R.L.F.BOTD 01 - E.A. STEWARDSON(DECEASED) 01 - A.P. WILLMORE 01 - K.A. POUNDS U-COLLEGE LONDON 11 OF BIRMINGHAM U OF LEICESTER

BRIEF DESCRIPTION PROPORTIONAL COUNTERS ATTACHED TO COLLIMATORS PROVIDED EIGHT-CHANNEL SPECTRAL INFORMATION AS WELL AS THE SPATIAL DISTRIBUTION OF SOLAR X-RAY SOLRCES. IN THE 8- TO 18-A REGION-THE COLLIMATOR WAS A GRAZING INC DENCE PARABOLIC REFLECTOR THAT YIELDED AN ANGULAR RESOLUTION 7F PLUS OR MINUS I ARC-MIN. IN THE 3- TO 9-A REGION, TWO PARALLEL SLITS COLLIMATED THE RADIATION IN ONE DIMENSION DNLY (3.3 ARC-MIN).

---- 050 5, NEY-----

INVESTIGATION NAME- ZODJACAL LIGHT MONITOR

HSSDC 10- 69-006A-07

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) ASTRONOMY PLANETARY ATMOSPHERES Solar Physics

PERSONNEL PI - E.P. NEY

U OF MINNESOTA

PI-E.P. NEW U OF MINNESOTA BIEF DESCRIPTION THIS EXPERIMENT, A. MODIFIED VERSION OF AN OSO 2 AND DEGREE OF POLARIZATION OF CODIACAL LIGHT AS A FUNCTION OF AUD DEGREE OF POLARIZATION OF CODIACAL LIGHT AS A FUNCTION OF AUD DEGREE OF POLARIZATION OF CADARGES IN ZODIACAL LIGHT RESULTING FROM SOLAR DISTUBBANCES. IT WAS ALSO INTENDED TO FUNCTION OF THE AIRGLOW CONTINUUM LAYER AND TO STUDY FUNCTION OF MIGHTIME LIGHTAINS STORMS. SIX APERTUREST (ALTINESTIT OF THE AIRGLOW CONTINUUM LAYER AND TO STUDY FUNCTIONE AND ORIENTERS WERE USED WITH VARIOUS APERTURES AND ORIENTATIONS. THESE PHOTOMETERS WERE PM-1, PM-2, APERTURES AND ORIENTATIONS. THESE PHOTOMETERS WERE PM-1, PM-2, APERTURES AND ORIENTATIONS. THESE PHOTOMETERS WERE PM-1, PM-2, APASTORES AND ORIENTATIONS. THESE PHOTOMETERS WERE PM-1, PM-2, APASTORES AND ORIENTATIONS. THESE PHOTOMETERS WERE PM-1, PM-2, APASTORES AND ORIENTATIONS. THESE PHOTOMETERS WERE PM-1, PM-2, AND AN ORIENTED ANTIPHALLEL TO THE SPIH AXIS WITH A 9.25- BY PM-3, PM-4, PM-5, AND DM-6, PM-1 WAS ORIENTED PARALLEL TO THE STOLE OFFSET, A 9,5-DEG-DIAMETER CONICAL FOV AND A BLUE ASSOCIAD. PM-4 WAS ORIENTED PARALLEL TO THE SPIH AXIS WITH A 9.25-BY ASSUAND. PM-4, WAS ORIENTED PARALLEL TO THE SPIH AXIS WITH A PASSBAND. PM-4, WAS ORIENTED PARALLEL TO THE SPIH AXIS WITH A ASSOCIA OFFSET, A 9,5-DEG-DIAMETER CONICAL FOV AND A BLUE (3500 TO 5000 A) PASSBAND. PM-5 WAS ORIENTED ANTIPARALLEL TO THE SPIH AXIS WITH A 9-DEG OFFSET, A 9,5-DEG-DIAMETER CONICAL FOV AND A RED (6000) AXIS WITH A 9-DEG OFFSET, A 9,5-DEG-DIAMETER CONICAL FOV AND A A BLUE IN AXIS WITH A 9-DEG OFFSET, A 9,5-DEG-DIAMETER CONICAL FOV AND A SECULE THE SDIN AXIS WITH A 9-DEG OFFSET, A 9,5-DEG-DIAMETER FON AND A RED (6000) AXIS WITH A 9-DEG OFFSET, A 9,5-DEG-DIAMETER FON AND A RED (6000) AXIS MITH A 9-DEG OFFSET, A 9,5-DEG-DIAMETER FON AND A RED (6000) AXIS MITH A 9-DEG OFFSET, A 9,5-DEG-DIAMETER FON AND A RED (6000) AXIS MITH A 9-DEG OFFSET, A 9,5-DEG-DIAMETER FON AND A RED (60000) AXIS MITH A 9-DEG OFFSET, A 9,5-DE

SPACECRAFT COMMON NAME- 050.8 ALTERNATE NAMES- 050-1, 050-EYE 7310

N550C ID- 75-057A

LAUNCH DATE- 06/21/75 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- DELTA WEIGHT- 4280. KG

SPONSORING COUNTRY/AGENCY UNITED STATES

	NASA-OSS
INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 95.7 MIN PERIAPSIS- 544. KM PERSONNEL	EPOCH DATE- 06/22/75 Inclination- 32.9 deg Apgapsis- 559. Km
NG - M.E. MCDONALD SC - D. Bohlin PM - J.E. Kupferian, Jr. PS - R. Thomas	NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSFC NASA-GSFC

PS - R. THOHAS NASA-GSFC BRIEF DÉSCRIPTION THE OBJECTIVES OF THE OSO SATELLITE SERIES WERE TO DERFORM SOLAR FHYSICS EXPERIMENTS ABOVE THE ATMOSPHERE DURING A COMPLETE SOLAR CYCLE AND TO MAP THE ENTIRE CELESTICAL SPHERE FOR DIRECTION AND INTENSITY OF UV LIGHT, X-RAY RADIATION, AND GAMMA MADIATION. THE OSO B PLATFORM CONSISTED OF A SALL SECTION, WHICH POINTED TWO EXPERIMENTS CONTINUALLY TOWARD THE SUL, AND CAN BEECTION, WHICH SPUN ABOUT AN AXIS PERPENDICULAR TO THE SECTION, WHICH SPUN ABOUT AN AXIS PERPENDICULAR TO THE ADJUSTMENT, POINTING CONTROL PERFORMED ATTINDE ADJUSTMENT, POINTING CONTROL PERFORMED ATTINDE TO SCAN THE REGION OF THE SOLAR DISK IN A 40- BY 40-ARC-MIN TO SECTION WAS CAPABLE OF BEING COMMANDED TO SELECT AND SCAN A 1-BY 1-ARC-MIN OR 5- BY 5-ARC-MIN REGION ANYWHERE ON THE SOLAR TRANSMITTED BY PCM/PM TELEMETRY. A COMMAND SYSTEM PROVIDED FOR AT LEAST 512 GROUND-BASED COMMANDS.

INVESTIGATION NAME- MAPPING K-RAY HELIOMETER

NSSDC 10- 75-0574-04

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) Solar Physics

PERSONNEL PI - L.W. ACTON OI - J.L. CULHANE OI - R.C. CATURA

LOCKHEED PALO ALTO U COLLEGE LONDON LOCKHEED PALO ALTO

BRISE DESCRIPTION

BRIGH DESCRIPTION THIS EXPERIMENT MEASURED THE LOCATION, SPECTRUM, AND INTENSITY OF MODERATE ENERGY X RAYS (2 TO 30 KEV) FOR INTENSITY OF MODERATE ENERGY X RAYS (2 TO 30 KEV) FOR INDIVIDUAL SOLAR ACTIVE REGIONS (INCLUDING FLARING REGIONS) AND FROM EXTRASOLAR X-RAY SOURCES. THE INSTRUMENT CONSISTED OF DATA ACCUMULATION/READOUT SYSTEM. THE COLLIM. OBS WERE 2.1 ARC-MIN BY TO DEG, FWHN. ONE COLLIMATOR WAS ORIENTED SO SPACECRAFT SPIN AXIS, THE OTHER TWO COLLIMATORS WERE INCLINED PLUS AND MINUS GO DEG RELATIVE TO THE SPIN AXIS. THE DETECTORS WERE PROPORTIONAL COUNTERS OF VARIOUS AREAS AND WINDOW OBSERVED.

----- 050 8. BARTH-----

INVESTIGATION NAME- HIGH-RESOLUTION ULTRAVIOLET SPECTROMETER Measurements

NSSDC 10+ 75-057A-01

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) Solar physics

U OF COLORADO Lockheed Palo Alto Natl CTR For Atmos Res

PERSONNEL PI - C.A. BARTH OI - E.C. BRUNER, JR. OI - R.G. ATHAY

01 - R.G. ATHAY NATL CTR FOR ATMOS RES BRIEF DESCRIPTION THIS EXPERIMENT MEASURED SOLAR ULTRAVIOLET LINES BETWEEN 10500 AND 2300 A AND THEIR VARIATION WITH TIME AND POSITION ON WAVELENGTHS. THE INSTRUMENT CONSISTED OF AN EXTENDED FOCAL LENGTH CASSEGRAIN TELESCOPE, AN EBERT MONOCHROMATOR, AND A SULT (VARIABLE FROM 1 BY SARC-S TO 1 ARC-S BY 15 ARC-MINA OF THE MONOCHROMATOR. THE TELESCOPE OF GOLUSED SULLIGHT ON THE SULT (VARIABLE FROM 1 BY SARC-S TO 1 ARC-S BY 15 ARC-MINA OF THE MONOCHROMATOR. THE 3600 LINES/MM GRATING IN THE SULT (VARIABLE OF BEING PROGRAMMED TO SCAM - (1) THE ENTIRE SPECTRUM, (2) SELECTED PORTIONS OF THE SPECTRUM, OR (3. COVERING THE RANGE FROM 1400 A, DETECTED THE ADJATION (1) THE ENTIRE SPECTRUM, (2) SELECTED DORTIONS OF THE SPECTRUM, OR (3. COVERING THE RANGE FROM 1400 A, DETECTED THE ADJATION (1) THE ENTIRE SPECTRUM, CONTAINED WITHIN THE EXPERIMENT CONTROLLED THE SMALL COMPUTER CONTAINED WITHIN THE EXPERIMENT CONTROLLED THE EXPERIMENT AND ALLOWED FLEXIBLE OBSERVING SEQUENCES.

-- 050 8, BONNET-----

INVESTIGATION NAME- CHROMOSPHERE FINE-STRUCTURE STUDY NSSDC 10- 75-057A-02

INVESTIGATIVE PROGRAM Code St/Co-op

INVESTIGATION DISCIPLINE(S) Solah Phyšics PERSONNEL $P1 = R_{*}H_{*}$ $01 = P_{*}$ $01 = A_{*}$ $01 = J_{*}C_{*}$ BONNEY Lemaire Vidal-Madjar Vial CNPS LPSP C.AS-LPSP CNRS-LPSP CNRS-LPSG

BRIEF DESCRIPTION

85

BRIEF DESCRIPTION THE EXPERIMENT WAS DESIGNED TO MEASURE SOLAR CHOMOSPHERIC SPATIAL AND WAVELENGTH STRUCTURE FOR THE FOLLOWING SPECTRAL LINES IN THE 1000-A TO 4000-A REGION --LYMAN-ALPHA, LYMAN-BETA, THE H AND K LINES OF RAGNESIUM II, AND THE H AND K LINES OF CALCIUM II. THE INSTRUMENT, WHICH WAS COMPOSED OF A CASSEGRAIN TELESCOPE AND A GRATING SPECTRORETER, MAS CAPABLE OF OPERATING IN TWO MODE A GRATING SPECTRORETER, FIXED SOLAR LOCATION AND SCAN THE SPECTRAL LINES, (2) IT COULD HOLD A SIMULTANEOUSLY FIX ON THREE OF THE SIX SPECTRAL LINES, (2) IT COULD A 1-ARC-MIN BY 1-ARC-MIN REGION OF THE SOLAR DISK. THE INSTRUMENT WAS CAPABLE OF AMOLAR RESOLUTIONS FROM 1 BY 1ARC-S LYMAN BETA, O.GOA). INSTRUMENT SEAUENCING WAS CONTROLLED BY GROUND COMMAND DNLY.

- 050 8, FROST---

INVESTIGATION NAME- HIGH-ENERGY CELESTIAL X RAYS

NSSDC 10- 75-0574-07

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) Astronomy

NASA-GSFC NASA-GSFC

PERSONNEL PI - K.J. FROST DI - B.R. DENNIS

BRIEF DESCRIPTION THE PURPOSE OF THIS EXPERIMENT WAS TO MEASURE THE ENERGY SPECTRA OF ALL KNOWN X-RAY SOURCES ABOVE THE INTENSITY THRESHOL OF 1.E-6 PHOTONS/CM-SQ-S-KEV IN THE ENERGY REGION .01 TO 1 MEV. THE INSTRUMENT CONSISTED OF 57-CM-SQ CSI (SOUGA) SCINTILLATION CRYSTALS SURROUNDED BY A HOMEYCOMB-TYPE CSI (SODIUM) ANTICOINCIDENCE COLLIMATOR, THAT PROVIDED AN ACCEPTANCE ANGLE OF 6.30 DEG FROM THE VIEWING AXIS. THE INSTRUMENT WAS MOUNTED ON THE OSO WHEEL SECTION NEARLY PARALLEL TO THE SATELLITE SPIN AXIS.

--- OSD 8, KRAUSHAAR-----

INVESTIGATION NAME- SOFT X-RAY BACKGROUND RADIATION Investigation

NSSDC 10- 75-0574-05

INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) ASTRONOMY

PL. SDNNEL U OF WISCONSIN U OF WISCONSIN PI - W.L. KRAUSHAAR OI - A.N. BUNNER

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE EXPERIMENT WAS DESIGNED TO MEASURE GALACTIC LATITUDE DEPENDENCE OF THE X-RAY BACKGROUND RADIATION IN THE D.150- TO (5-KEV REGIOW, EMPHASIZING THE SOFT X-RAY PORTION. TWO SETS OF THREE PROPORTIONAL COUNTERS MOUNTED ON THE OSO WHEEL VIEWED PARALLEL AND ANITPARALLEL TO THE WHEEL SPIN DIRECTION THROUGH A 3.5- BY 3.5-DEG (FULL-WIDTH, HALF-MAXIMUM) COLLIMATOR. SENSITIVITY WAS EXPECTED TO BE ABOUT 1 PERCENT S'ATISTICAL ACCUMACY NEAR THE GALACTIC POLES, AND ENERGY RESO.UTION MAS PROVIDED BY SELECTED FILTERS. SINCE TWO OF THE 'LUMTERS HAD THIN POLYCARGONATE WINDONS THROUGH WICH METHANE DIFFUSED. A HIGH PRESSURE METHANE RESERVOLR CARRIED ON THE SPACECRAFT REPLENISHED THOSE COUNTERS THROUGH A GAS FLOW SYSTEM.

- OSD 8. NOVICK-----

INVESTIGATION NAME- HIGH-SENSITIVITY CRYSTAL Spectroscopy of Stellar and Solar X RAYS

NSSDC 10-	75-857A-03	INVESTIGATIVE PROGRAM Code Sa
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INVESTIGATION DISCIPLINE(\$) ASTRONOMY SOLAR PHYSICS

PERSONNEL PI-R_ NOVICK	COLUMBIA U
01 - J.R.P.ANGEL	COLUMBIA U
QI - P.A. VANDENBOUT	COLUMBIA U
01 - M. WEISSKOPF	COLUMBIA U
AT - A C VALEE	COLUMBIA U

DRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED 10 MONITOR CONTINUOUSLY THE SUN'S EMISSION IN THE 2-B KEV RANGE, TO OBTAIN COMPLETE SOLAR SPECTRA OF THE SUN EVERY 10 SECONDS DURING FLARES, TO OBTAIN HIGH RESOLUTION SPECTRA OF MANY CELESTIAL X-RAY OBJECTS, AND TO MEASURE THE POLARIZATION OF X-RAY EMISSION FROM STELLAR SOURCES. THIS INSTRUMENT PACKAGE IS MOUNTLD IN THE WHEEL SECTION. THE SPECTROMETER IS ORIENTED PERPENDIZULAR TO THE SPIN AXIS AND USES LARGE AREA PANELS OF CRYSTALS (1100 SQ CM OF GRAPHITE, 194, SQ CM OF PET) TO REFLECT, YIL BRAGG REFLECTIONS. THE POLARIMETER WAS ORIENTED PARALLEL TO THE SPIN AXIS AND UTILIZED BRAGG ANGLE REFLECTION TO MEASURE POLARIZATION IN X RAYS FROM CELESTIAL SOURCES.

-- 050 8, SERLEMITS05------INCONTOUTION NAMES FORMED X-RAY SPECTROSCOPY

THAEPITOWITAU	HIM15E	 ~	 	 	

INVESTIGATIVE PROGRAM NS50C 10- 75-057A-06 CODE SA

INVESTIGATION DISCIPLINE(S) ASTRONOMY

PERSONNEL	
P1 - P.J.	SERLEMITSOS
01 - E.A.	BOLDI
01 - 5.5.	
D1 - D.	SCHWARTZ

GRIEF DESCRIFTION THIS EXPERIMENT WAS DESIGNED TO DETERMINE THE SPECTRA OF SOURCES AND THE DIFFUSE COSMIC X-RAY BACKGROUND IN THE ENERGY RANGE 2 IO 60 KEV AND TO MEASURE INTENSITY VARIATIONS AND POSSIBLE EMISSION LINES OF DISCRETE X-RAY SOURCES. PROPORTIONAL CHAMBERS (NULTIANODE PROPORTIONAL COUNTERS) ARE USED AS DETECTORS. ONE DETECTOR COMPLEMENT, CONSISTING OF A PROPANE-NEON FILLED CHAMBER AND A XENON-METHANE FILLED CHAMBER (240 SQ CH) WAS LOCATED BEHIND A S-DEG COLLIMATOR AND ORIENTED PARALLEL TO THE SPRACECRAFT SPIN AXIS. A SINGLE-VOLUME, ARGON-METHANE FILLED CHAMBER (75 SQ CH) WAS LOCATED BEHIND A 3-DEG COLLIMATOR AND WAS OFFSET SLIGHTLY FROM ANTI-PARALLEL TO THE SPIN AXIS. A XENON-METHANE FILLED CHAMBER (270 SQ CM) WAS LOCATED BEHIND A S-DEG COLLIMATOR AND WAS OR CONSTRUCTED LOCATED DEHIND A S-DEG COLLIMATOR AND WAS ORIENTED ANTI-PARALLEL TO THE SPIN AXIS. DATA WERE ACCUMULATED IN A BUFFER MENORY FOR 1-MIN INTERVALS, THE DATA FROM THE OFFSET DETECTOR BEING SECTORED IN AZIMUTH.

---- OFO 8, WELLER, JR.----

INVESTIGATION NAME- EUV FROM EARTH AND SPACE

INVESTIGATIVE PROGRAM Code ST NSSDC 10+ 75-0574-08

INVESTIGATION DISCIPLINE(S) ASTRONOMY

PERSONNEL PI - C.S. WELLER, JR.

US NAVAL RESEARCH LAB

BRIEF DESCRIPTION THIS EXPERIMENT, MOUNTED IN THE WHEEL SECTION, OBTAINED THIS EXPERIMENT, MOUNTED IN THE WHEEL SECTION, OBTAINED SPAILAL AND TEMPORAL MEASUREMENTS OF EXTREME ULTRAVIOLET (EUW) EMISSIONS OF HYDROGEN, HELIUM, AND OXYGEN IN THE EARTH'S ATMOSPHERE AND IN INTERPLANETARY AND GALACTIC SPACE. THREE PHOTOMETERS WERE DESIGNED TO MEASURE EUW RESONANCE RADIATION IN VARIOUS WAVELENGTHS, FROM 170 TO 1080 A AND IN PORTIONS OF THE 1125- TO 123D-A BAND. EACH PHOTOMETER CONSISTED OF A CONTINUOUS-CHANNEL ELECTRON MULTIPLIER USED AS A PHOTON DETECTOR, TOGETHER WITH A THIN METAL FILM OR A MAGNESIUM FLUORIDE-OXYGEN CELL TO SERVE AS OPTICAL GANDPIST FIGS. THERE WERE FOOR SUCH BANDPASS FILTERS -- (1) A THIN FILM OF 10D0-A-THICK ALUMINUM AND SOD-A-THICK CANBON (BANDWIDTH OF 170 TO 440 A), (2) A THIN FILM OF 10D0-A-THICK ALUMINUM (BANDWIDTH GE TOTO TO BOD A), (3) A THIN FILM OF 150D-A-THICK ALUMINUM (BANDWIDTH GE NOMWIDTH OF 73D TO 1020 A), AND (4) A CELL WITH A MAGNESIUM (LUORIDE WINDOW (BANDWIDTH OF 1130 TO 150D A). THESE BANDPASS FILTERS WERE MOUNTED ON A WHEEL IN FRONT OF THE PHOTON DETECTORS AND WERE NOTATED AT REGULAR INTERVALS TO CHANGE THE FILTERS. THIS MADE THREE OF THE INDICATED WAVELENGTH RANGES OPERATIONAL AT ANY GIVEN TIME. THE INSTRMENT KAS MOUNTED WITH AND WITH SUFFICIENT SAFFLING THAT THE PHOTOMETER SUUL NUM

SPACECRAFT COMMON NAME- OVS-6 Alternate NAMES- ER5 26# 03951

NS50C 10- 69-0468

LAUNCH DATE- 05/23/69 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- TITAN WEIGHT- 23. KG

SPONSORING COUNTRY/AGENCY UNITED STATES DOD-USAF

INITIAL ORBIT PARAMETERS DRBIT TYPE- GEOCENTRIC DRBIT PERIOD+ 3115.2 MIN PERIAPSIS- 16923. KM

EPOCH DATE- 15/24/69 Inclination- 32.86 PEG Appapsi5- 111636. KM

PERSONNEL PM - C.H. REYNOLDS PS - K. YATES

USAF GEOPHYS LAB USAF GEOPHYS LAB

BRIEF DESCRIPTION THE SATELLITE HAS AN OCTAGONAL CONFIGURATION, IS SPIN-STABILLIZED, AND WAS PLACED IN A MODERATELY ELIPTICAL EARTH ORBIT (ECCENTRICITY - 0.670) BY A TITAN 3C ON MAY 25, 1969. THE PURPOSE OF THE SATELLITE IS TO MONITOR X-RAY, ELECTROM, AND PROTON RADIATION ASSOCIATED WITH SOLAR ACTIVITY IN ORDER 10 DEVELOP DATA HANDLING TECHNIQUES IN NEAR REAL-TIME FOR USE BY THE AIR WEATHER EERVICE FORECAST CENTER IN FORECASTING SOLAR ELABES FLARES.

INVESTIGATION NAME- GEIGER-NUELLER TUBE, SOLAR X-RAY Detector, 2 to 12 a

NSSDC 10- 69-0468-01

INVESTIGATIVE PROGRAM Space Radiation Environment

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY SOLAR PHYSICS

PERSONNEL PI - K. YATES BRIEF DESCRIPTION

USAF CAMBRIDGE RES LAB

DRIEF DESCRIPTION TWO IDENTICAL GEIGER-MUELLER TUBES (EON 6213) WERE MOUNTED IN MUTUALLY ORTHOGOMAL POSITIONS AT 45 DEG AND 135 DEG WITH RESPECT TO THE SPACECRAFT SPIN AXIG. THESE DETECTORS, WHICH HAVE MICA WINDOWE, MEASURED THE SOLAR X-RAY FLUX IN THE 2- TO 12-A BAND.

----- 0V5-6, YATES----

INVESTIGATION NAME- SODIUM IODIDE SCINTILLATOR, GAMMA-RAY Detector, 19 to 1175 KeV

NSSDC ID- 69-0468-02

INVESTIGATIVE PROGRAM Space radiation environment INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY Solar Physics Garma-Ray Astronomy

PERSONNEL PI - K. YATES BRIEF DESCRIPTION

USAF CAMBRIDGE RES LAB

BRIEF DESCRIPTION THE PURPOSE OF THIS EXPERIMENT WAS TO MONITOR SOLAR RADIATION FLUX IN FOUR BANDS RANGING FROM HARD X RAYS TO HARD GAMMA RAYS. A DETECTOR CONSISTING OF A SODIUM IDDIDE CRYSTAL ELECTROMAGNETIC RADIATION IN THE 19- TO 76-KEV. 76- TO 232-KEV. 232- TO 1175-KEV, AND GREATER THAN 1175 KEV BANDS. THE SODIUM IDDIDE CRYSTAL IS 0.5 IN. IN DIAMETER AND 0.5 IN. LONG, AND WAS CONTAINED IM A HERMETICALLY SEALED ALUMINUM CAN WITH WALLS 0.010 IN. THICK. THE THICKNESS OF THE WALLS DETERMINED THE LOWER LIMIT OF THE DETECTOR'S TENSITIVITY.

- 0V5-6, YATES------INVESTIGATION NAME- PROTON ALPHA PARTICLE TELESCOPE NSSDC 10- 69-0468-03 INVESTIGATIVE PROGRAM Space radiation environment

INVESTIGATION DISCIPLINE(S)

PARTICLES AND FIELDS

PERSONNEL P1 - κ. YATES BRIEF DESCRIPTION

USAF CAMBRIDGE RES LAB

BRIEF DESCRIPTION THIS TELESCOPE CONSISTS OF TWO TOTALLY DEPLETED SILICON SURFACE BARRIER DETECTORS. THE INSTRUMENT LOOKS PERPENDICULAR TO THE SPACECRAFT SPIN AXIS. PROTONS IN THE ENERGY RANGES 5.3 TO 8, B TO 17, 17 TO 40, AND 4D TO 10D NEV AND ALPHA PARTICLES IN THE ENERGY RANGES 20 TO 32, 32 TO 68, AND 68 TO 10D NEV ARE MEASURED SEPARATELY. THE SATELLITE ROTATES A SIGNIFICANT AMOUNT DURING EACH COUNTING INTERVAL.

-- OV5-6, YATES-----

INVESTIGATION FIME- LOW-ENERGY ELECTRON DETECTOR NSSDC 10- 69-0468-05

INVESTIGATIVE PROGRAM Space radiation environment

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL $PI - \kappa$, YATES

USAF CAMBRIDGE RES LAB BRIEF DESCRIPTION

A PLASTIC SCINTILLATOR DETECTOR MEASURES THE DMNIDIRECTIONAL FLUXES OF ELECTRONS WITH ENERGIES GREATER THAN

SPACECRAFT COMMON NAME- PIONEER 6 Alternati Names- Pioneer-a, 01841

NSSDC 10- 65-105A

LAUNCH DATE- 12/16/65 Launch Site- Cape Canaveral, United States Launch Vehicle- Delta WEIGHT- 146. KG

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-055

ORBIT PARAMETERS Orbit Type- Heliocentric Orbit Period- 311.1 Days Periapsis- 0.813 Au Rad

EPOCH DATE- 07/15/75 INCLINATION- 0.168 - 0.168 DEG 0.983 AU RAD APOAPSIS-

	MG	-	F.D.	KUCHENDORFER
÷	S C	~	A.G.	OPP
	PH	-	C.F.	HALL
	PS	-	3 . H.	NOLFE

PERSONNEL

PM - C.F. HALL PS - J.H. WOLFE NASA-ARC MASA-ARC
INVESTIGATION NAME- SOLAR WIND PLASMA FARADAY CUP NSSDC 10- 65-105A-02

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Particles and fields Space plasmas

TECH TECH

NASA HEADQUARTERS NASA HEADQUARTERS NASA-ARC

PERSONNEL

01	- H.S. - A.J. - F.	URIDGE Lazarus Schero	MASS	INST OF INST OF WISCONST
			0 11	#13C0#31

INVESTIGATION NAME- COSMIC-RAY TELESCOPE

NSSOC 10- 65-105A-03

INVESTIGATIVE PROGRAM CODE SL INVESTIGATION DISCIPLINE(S) Particles and fields Cosmic Rays

PERSONNEL CI - J.A. SIMPSON DI - J.A. SIMPSON DI - J.E. LAMPOPT

U OF ARIZONA U OF CHICAGO U OF CHICAGO

URIEF DESCRIPTION THIS EXPERIMENT USED A CHARGED PARTICLE TELESCOPE COMPOSED OF FOUR SILICON SOLID-STATE DETECTORS TO STUDY THE ANISOTROPY AND FLUCTUATIONS OF SOLAR PROTONS AND ALPHA PARTICLES. THE PROTON ENERGY RANGES SAMPLED WERE 0.6 TO 13.PT HEV, 13.9 TO 73.2 MEV, 73.2 TO 175 MEV, AND E.GT. 175 MEV. THE ALPHA PARTICLE ENERGY RANGES SAMPLED WERE 2.4 TO 55.6 MEV. 55.6 TO 203 MEV. AND E.GT. 204 MEV. THE TIME RESOLUTION RANGED FROM ABOUT ONE MEASUREMENT PER 0.4 S TO ABOUT ONE MEASUREMENT PER 28 S DEPENDING ON THE TELEMETRY BIT RATE. THE DETECTOR WAS MOUNTED SO THAT IT MADE A 360-DEG SCAN IN THE ELIPTIC PLANE ABOUT ONCE PER SECOND. PULSE MEIGHT AMALYSIS OF DETECTOR WAS ACCOMPLISHED FOR THE LAST EVENT PRIOR TO EACH TELEMETRY READOUT FOR THE EXPERIMENT. FOR FURTHER DETAILS, SEE FA. TT AL, JGR, 73, 1555, 1968.

----- PIONEER 6, MCCRACKEN------

INVESTIGATION NAME- COSMIC-RAY ANISOTROPY

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Particles and fields Cosmic Rays

CSIRO NATL ACADEMY OF SCI INDIAN SCI SAT PROJ

PERSONNEL PI - K.G. MCCRACKEN DI - W.C. BARTLEY DI - R.U. RAO

NS50C 10- 65-105A-05

01 - W.L. BARILET 01 - W.L. BARILET 01 - R.U. BARILET 01 - R.U. BARILET DIRECTIONAL CHARACTERISTICS OF GALACTIC AND SOLAR COSHIC-RAY FUNES. THE PARTICLE DETECTOR WAS A CSI (T.) SCINTILLATOR CANSTAL THAT WAS SET INTO AN ANTICOINCIDENCE PLASTIC SCINTILLATOR COLLIMATOR CUP. SEPARATE PHOTOMULTIPLIER TUBES SCINTILLATOR COLLIMATOR CUP. SEPARATE PHOTOMULTIPLIER TUBES SCINTILLATOR COLLIMATOR CUP. SEPARATE PHOTOMULTIPLIER TUBES SCINTILLATOR COLLIMATOR CUP. SEPARATE PHOTOMULTIPLIER TUBES SCINTILLATOR COLLIMATOR CUP. SEPARATE PHOTOMULTIPLIER TUBES SCINTILLATOR COLLIMATOR USE HEIGHT ANALYZER, THE WINDOWS CORRESPONDING TO ENERGY DEPOSITIONS OF 7.4 TO 44.0, 44.0 TO T7.1. AND 123.8 TO 30.8 MEV. COUNTS IN THE TWO LOWER ENERGY WINDOWS WERE DUE MAINLY TO PROTONS WITH THE WINDOW ENERGIES. WHILE ONLY PARTICLES OF Z GREATER THAN OR EQUAL TO 2 WINDOWS WERE DUE MAINLY TO PROTONS WITH THE WINDOW ENERGIES. WILLE ONLY PARTICLES OF Z GREATER THAN OF EQUAL TO 2 WINDOWS WERE DUE MAINLY TO PROTONS WITH THE WINDOW ENERGIES. WINDOWS WERE OUE MAINLY TO PROTONS WITH THE WINDOW ENERGIES. WINDOWS WERE, DUE ANTICOINCIDENCE PULSES.) FOR EACH ENERGY WINDOWS WERE, DE GIN WIDTH, WITH THE SUN IN THE MIDDLE OF ONE SECTOR. HOWEVER, WHEN LARGE FLUXES WERE ENCONNERED, EACH ANGULAR SECTOR WAS REDUCED TO 11.2 DEG. WIN THE SUN NEAR THE MIDPOINT BETWEEN TWO SECTORS. A SPIN-THEFORTED (ISOTROPIC) MODE, IN WHICH ALL PARTICLES DEPOSITING 7.4 MEV IN THE CSI CRYSTAL (NO ANTICOINCIDENCE REQUIREMENT) WERE COUNTED, WAS ALSO DISED. ACCUMULATION TIMES FOR EACH OF THE 12 DIRECTIONAL MODES AND FOR THE OHNIDIRECTIONAL MODE VARIED BETWEEN 14 E ANA MAS ALSO DISED. ACCUMULATION FINES FOR EACH OF THE 12 DIRECTIONAL MODES AND FOR THE OHNIDIRECTIONAL MODE VARIED BETWEEN 15 TARA ANDRE DISPLA. ACCUMULATION FINES FOR EACH OF THE 12 DIRECTIONAL MODES AND FOR THE OHNIDIRECTIONAL MODE VARIED BETWEEN 15 TARA MARE DETAILEMETRY BIT RATE. SEE THE SPACECRAFT BRIEF DESCRIPTION (65-105A) FOR INFORMATION ON PERCENT TIME COVERAGE VS TIME, SEE BARILEY ET AL.,

----- PIONEER 6, WOLFE------INVESTIGATION NAME- ELECTROSTATIC ANALYZER

N550C IO- 65-105A-06

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

NASA-ARC

PERSONNEL PI - J.H. WOLFE

BRIEF DESCRIPTION A QUADRISPHERICAL ELECTROSTATIC ANALYZER WITH EIGHI CONTIGUOUS CURRENT COLLECTORS WAS USED TO STUDY THE DIRECTIONAL INTENSITY OF ELECTRONS AND POSITIVE IONS IN THE SOLAR WIND. INTENSITY OF ELECTRONS AND POSITIVE IONS IN THE SOLAR WIND. INTENSITY OF ELECTRONS AND POSITIVE IONS IN THE SOLAR WIND. INTENSITY OF ELECTRONS AND POSITIVE IONS IN THE SOLAR WIND. INTENSITY OF ELECTRONS AND POSITIVE IONS IN THE SOLAR WIND. INTENSITY OF ELECTRONS AND POSITIVE IONS IN THE SOLAR WIND. INTENSITY OF ELECTRON SOLAR POSITIVE IONS IN THE SOLAR WIND. INTEGHI COGARITHMICALLY EQUISPACED E/Q STEPS RANGING FROM 100 SOO V. THE EIGHT COLLECTORS MEASURED PARTICLES INCIDENT FROM EIGHT LOGARITHMICALLY EQUISPACED E/Q STEPS RANGING FROM 1100 SOO V. THE EIGHT COLLECTORS MEASURED PARTICLES INCIDENT FROM EIGHT DIFFERENT CONTIGUOUS ANGULAR INTERVALS RELATIVE TO THE SPACECRAFT EQUATORIAL PLANE (SAME AS THE ECLIPTIC PLANE). THERE WERE FOUR 15-DEG INTERVALS, THO 2C-DEG INTERVALS, AND TWO 30-DEG INTERVALS. AS THE SPACECRAFT WAS SPINNING, FLUXES WERE KEASURED IN 15 AZINUTHAL ANGULAR SECTORS. EIGHT OF THESE SECTOPS WERE 5-5/8 DEG WIDE, WERE CONTIGUOUS, AND BRACKETED THE SOLAR DIRECTION. THE REMAINING SEVEN SECTORS WERE 45 DEG WIDE. HITH THE MAXIMUM FLUX ODE AT EACH E/G STEP. IN THE FULL SCAN MODE, THE MAXIMUM FLUX OBERVED IN EACH OF THE 15 AZINUTHAN SECTORS AF THE SPACECRAFT ROTATED WAS RECORDED FOR A GIVEN SINGLE COLLECTOR AT A GIVEN E/G STEP, DURING 24 SUCCESSIVE OPERATIONS DF THE FULL SCAN MODE (46 SPACECRAFT REVOLUTIONS), THE 16 ION E/G STEPS AND ELGHT COLLECTORN WAS EXERTIONES. EXERCISED FOR A GIVEN AND COLLECTORN DURING 24 SUCCESSIVE SUCH PREADURES, FACH OF THE SUCLESTOR. DURING EIGHT SUCCESSIVE SUCH PREATIONS DF THE FULL SCAN MODE DATA REQUIRED 400 SPACECRAFT CYCLE OF FULL SCAN MODE DATA REQUIRED 400 SPACECRAFT BRIEF DESCRIPTION

REVOLUTIONS (ABOUT 400 SEC). SUCH CYCLES WERE REPEATED WITHOUT INTERRUPTION AT THE HIGH BIT RATE. IN THE MAXIMUM FLUX MODE, FOR THE E/Q STEP USED IN THE PRECEDING REVOLUTION OF FULL SCAN MODE OPERATION, ALL COLLECTORS WERE OUSERVED FOR ONE REVOLUTION, AND THE MAXIMUM FLUX OBSERVED WAS REPORTED ALONG WITH THE MUMBER OF THE COLLECTOR THAT OBSERVED IT AND THE ANGULAR DIRECTION (2-13/16-DEG RESOLUTION) OF THE OBSERVED WAS MAD THE NEXT HIGHEST BIT RATE (250 BPS), THE SNORT SCAN MODE WAS ALTERNATED EVERY SPACECRAFT REVOLUTION WITH THE MAXIMUM FLUX MODE. THE SNORT SCAN MODE WAS THE SAME AS THE FULL SCAN MODE EXCEPT THAT ONLY THE PEAK FLUX IN EACH OF THE EIGHT 5-5/8-DEG-WIDE AZIMUTHAL SECTORS WAS RECORDED. THUS, THIS CYCLE ALSO TOOK 400 SPACECRAFT REVOLUTIONS. AT THE LOW BIT RATES (64, 16, AND 8 BPS), THE MAXIMUM FLUX MODE ALONE WAS USED. THUS, MO IS AZIMUTHAL DISTRIBUTIONS WERE MASURED. AT THE COM BIT RATES (64, 16, AND 8 BPS), THE MAXIMUM FLUX MODE ALONE WAS USED. THUS, MO IS SEC FOR A COMPLETE SET OF ION MEASUREMENTS AND 16 SEC FOR A COMPLETE SLI OF FLECTRON MEASURED. AT 16 40 HPS, THE 10M ADD ELECTRON MEASUREMENTS WERE TAKEN AND IELEMETERED EVERY 330 SEC. AT 18 BPS, THEY WERE TAKEN AND TELEMETERED EVERY 336 SEC.

SPACECRAFT COMMON NAME- PIONEER 7 Alternate names- Pioneer-B, 02398

NS506 10- 66-0754

LAUNCH DATE- 08/17/66 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- DELTA WE16HT- 138, KG

SPONSORING COUNTRY/AGENCY UNITED STATES

NASA-055

POIT PARAMETERS	
ORBIT TYPE- HELIOCENTRIC DRBIT PERIOD- 402.9 DAYS PERIAPSIS- 1.009 AU RAD	EPOCH DATE+ 02/12/76 Inclination- 0.098 deg Apdapsis- 1.125 au rad
ERSONNEL	
MG - F_D. KOCHENDORFER	NASA HEADQUARTERS
SC - A.G. OPP	NASA HEADQUARTERS
PM - C.F. HALL	NASA-ARC
PS - J.H. WOLFE	NASA-ARC

PM - C.J. HALL NASA-ARC PS - J.H. WOLFE NASA-ARC BRIEF DESCRIPTION FIDMEER 7 WAS THE SECOND IN A SERIES OF SOLAR-ORBITING, SPIN-STABILIZED, AND SOLAR-CELL AND BATTERY-APOWERED SATELLIFS DESIGNED TO OBTAIN MEASUREMENTS OF INTERPLANETARY PHENOMENA FROM WIDELY SEPARATED POINTS IN SPACE ON A CONTINUING BASIS. THE SPACECRAFT CARRIED EXPERIMENTS OF INTERPLANETARY PHENOMENA FROM WIDELY SEPARATED POINTS IN SPACE ON A CONTINUING BASIS. THE SPACECRAFT CARRIED EXPERIMENTS TO STUDY POSITIVE IONS AND DENSITY (RADIO PROPAGATION EXPERIMENT), SOLAR AND GALVCTIC COSMIC RAYS, AND THE INTERPLANETARY MACHELL, IT! YAIN ANTENNA WAS A HIGH-GAIN DIRECTIONAL ANTENNA. THE SPACECRAF: WAS SPIN-STABILIZED AT ABOUT 60 RPM, AND THE SPIN ARIS WAS PERPENDICULAR TO THE ECLIPTIC PLANE AND POINTED APPROXIMATELY TOWARD THE SOUTH ECLIPTIC PLE. BY GROUND COMMAND, ONE OF FIVE BIT RATES, ONE OF FOUR DATA FORMATS, AND ONE OF FOUN OPERATING M'DES COULD BE SELECTED. THE FIVE BIT RATES WERE \$12, 256, 64, 16, AND E BPS. THREE OF THE FOUR DATA FORMATS CONTAINED PRIX'RILY SCIENTIFIC DATA FORMATS, AND ONE OF FOUN OPERATING M'DES COULD BE SELECTED. THE FIVE BIT RATES WERE \$12, 256, 64, 16, AND E BPS. THREE OF THE FOUR DATA FORMATS, CONTAINED PATA-RME ONE SCIENTIFIC DATA FORMAT WAS USED FOR THE TWORS PER 'AMF ONE SCIENTIFIC DATA FORMAT WAS USED FOR THE TWORS PER 'AMF ONE SCIENTIFIC DATA FORMAT WAS USED FOR THE TWORS PER 'AMF ONE SCIENTIFIC DATA FORMAT WAS USED FOR THE TWERS PATA. THE FOUR OPERATING MODES WERE (1) RFAL TIME, (2) TELEMETRY STORE, (3) DUTY CICLE STORE, AND (4) MENORY READOUT. IN THE REAL-TIME MODE, DATA WERE SANPED AND TRANSMITTED DIRETTLY (UITHOUT STRAGE) AS SPECIFIED BY THE DATA FORMAT AND BIT RATE SELECTED. IN THE DUTY CYCLE STORE, AND TARANSMITTED DIRETTLY (UITHOUT STRAGE) AS SPECIFIED BY THE DATA FORMAT AND BIT RATE SELECTED. IN THE DITY CYCLE STORE AND TARANSMITTED DIRETTLY (UITHOUT STRAGE) AS SPECIFIED AND TRANSMITTED DIRETTLY (UITHOUT STRAGE) AS SPECIFIED AND TRANSMITTED DIATA THE SELECTED. IN THE DITY CY

PIONEER 7, MCCRACKEN----

INVESTIGATION NAME- COSMIC-RAY ANISOTROPY

NSSDC 10- 66-0754-05

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS COSMIC RAYS

PERSONNEL PI - K.G. 01 - W.C.

NCCRACKEN BARTLEY RAO

CSIRO NATL ACADEMY OF SCI INDIAN SCI SAT PROJ

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EPPERIMENT WAS DESIGNED PRIMARILY TO MEASURE THE DIRECTIONAL CHARACTERISTICS OF GALACTIC AND SOLAR COSMIC RAY FLUYES. THE PARTICLE DETECTOR WAS A CSI (TL) SCINTILLATOR CRYSTAL THAT WAS SET INTO AN ANTICOINCIDENCE PLASTIC SCINTILLATOR COLLIMATOR CUP. SEPARATE PHOTONULTIPLIER TUBES SCINTILLATOR COLLIMATOR, CUP. SEPARATE PHOTONULTIPLIER TUBES SCINTILLATOR COLLIMATOR, CUP. SEPARATE PHOTONULTIPLIER TUBES WIEWEF THE TWO SCINTILLATORS, PULSES FROM THE CSI CRYSTAL THAT WERE NOT ACCOMPANIED BY PULSES FROM THE PLASTIC SCINTILLATOR WERE NOT ACCOMPANIED BY PULSES FROM THE PLASTIC SCINTILLATOR WERE SCOTED BY A THREE-WINDOW PULSE HEIGHT AMALTZER, THE WINDOWS CORRESPONDING TO ENERGY DEPOSITIONS OF 7.2 TO 47.4 47.4 TO 64.5. AND 64.5 TO 81.2 MEV. NO POSITIVE SPECIES IDENTIFICATION WAS MADE, ALTHOUGH MOST OF THE COUNTS IN EACH WINDOW WERE USUALLY DUE TO PROTONS WITH THE WINDOW ENERGIES. FOR EACH ENERGY WINDOW, COUNTS WERE SEPARATELY ACCUMULATED IN EACH OF FOUR ANGULAR SECTORS AS THE SPACECRAFT SPUN. EACH MINDOW MERE USUALLY DUE TO PROTONS WITH THE MIDDLE OF A SECTOR, BORMALLY 89.5 DEGIN WIDTH, WITH THE SUN EITHER NEAR A SECTOR BOUNDARY OR IN THE MIDDLE OF A SECTOR DEFENDING ON THE OPERATING MODE, HOWER, WHEN LARGE FLUXES WERE ENCOUNTERED, EACH ANGULAR SECTOR WAS REDUCED TO 11.2 DEG, WITH THE SUM EITHER IN A SECTOR OR NEAR THE MIDDINT BETWEEN TWO SECTORS. A SPIN-INTEGRATED (ISOTROPIC) MODE, IN WHICH ALL PARTICLES DEPOSITING 7.2 MEV IN THE CSI CRYSTAL (MO ANTICOLOBNCE AEQUIRENENT) WERE COUNTED, WAS ALSO USED. ACCUMULATION TIMES FOR EACH OF THE 12 DIRECTIONAL MODES AND FOR THE DRNIDISRECTIONAL MODE VARIED BETWEEN THA SALSO USED. ACCUMULATION TIMES FOR EACH OF THE 12 DIRECTIONAL MODES AND FOR THE DRNIDISRECTIONAL MODE VARIED BETWEEN IS AND FOR THE DRNIDAL MODE SALD ON THE ELEMETHY BIT RATE. SEE BARTLEY ET ALL, REV, SCI. INSTRUM, 38, PAGE 266, 1967, FOR A MORE DETAILED EXPERIMENT DESCRIPTION.

----- PIONEER 7, SIMPSON------

INVESTIGATION NAME- COSMIC-RAY TELESCOPE

NSSDC 10- 66-975A-06 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Particles and fields Cosmic Rays

PERSONNEL

P1 - J.A.	SIMPSON	1 1	F CHICAGO
01 - C.Y.		υα	F ARIZONA
01 - J.E.	LAMPORT	U 0	F CHICAGO

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT USED A CHARGED PARTICLE TELESCOPE COMPOSED OF FOUR SIJ,ICON SOLID-STATE DETECTORS TO STUDY THE ANISOTROPY AND FLUCTUATIONS OF SOLAR PROTONS AND ALPHA PARTICLES. THE PROTON DENERGY RANGES SAMPLED WERE 0.6 TO 12.7 MEV, 12.7 TO 73.0 MEV, 73.0 TO 165 MEV, AND E.GT. 165 MEV. THE ALPHA PARTICLE ENERGY RANGES SAMPLED WERE 2.5 TO 52 MEV, 52 TO 280 MEV, AND E.GT. 280 MEV. THE TIME RESOLUTION RANGED FROM ADOUT ONE MEASUREMENT PER 0.4 S TO ABOUT ONE MEASUREMENT PER 28 S DEPENDING ON THE TELEMETRY BIT RATE. THE DETECTOR WAS MOUNTED SO THAT IT MADE A 360-DEG SCAN IN THE ECLIPTIC PLANE ABOUT ONCE PER SECOND.

----- PIONEER 7, WOLFE-------

INVESTIGATION NAME- ELECTROSTATIC ANALYZER

N550C 10- 66-0754-03 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS SPACE PLASMAS

PERSONNEL

PI - J.H. NOLFE 01 - R.W. SILVA	

BRIFE DESCRIPTION

BRIEF DESCRIPTION A QUADRISPHERICAL ÉLECTROSTATIC ANALYZER WITH EIGHT CONTIGUOUS CURRENT COLLECTORS WAS USED TO STUDY THE DIRECTIONAL INTENSITY OF THE ELECTRONS AND POSITIVE IONS IN THE SOLAR WIND. IONS WERE DETECTED IN 16 LOGARITHMICALLY EQUISPACED ENERGY PER UNIT CHARGE (E/Q) STEPS FROM 200 TO TO,DOU V. THERE WAS AN ELECTRON MODE OF OPERATION IN WHICH ELECTRONS WERE REASURED IN EIGHT LOGARITHMICALLY EQUISPACED ENERGY PER CHARGE STEPS RANGING FROM O TO 500 V. THE EIGHT COLLECTORS MEREANED IN EIGHT LOGARITHMICALLY EQUISPACED ENERGY PER CHARGE STEPS RANGING FROM O TO 500 V. THE EIGHT COLLECTORS MEREASURED PARTICLES INCIDENT FROM EIGHT DIFFERENT CONTIGUOUS ANGULAR INTERVALS RELATIVE TO THE SPACECRAFT EQUATORIAL PLANE (SAMME AS THE ECLIPTIC PLANE). THERE WERE FOUR IS-DEG INTERVALS, TWO 20-DEG INTERVALS, AND TWO 30-DEG INTERVALS. AS THE SPACECRAFT WAS SPINNING, FLUXES WERE MEASURED IN 15 AZIMUTHAL ANGULAR SECTORS. EIGHT OF THE THESE SECTORS WERE 5-5/8 DEG WIDE, WERE CONTIGUOUS, AND BRACKETED THE SOLAR DIRECTION. THE REMAINING EVEN SECTORS WERE 45 DEG WIDE. THREE DIFFERENT MORF OF DATA COLLECTION WERE USED. AT THE HIGHEST BIT RATE (512 ..., PS), THE FULL SCAN MODE WAS ALTERNATED WITH THE MAXIMUM FLUX MODE AT EACH E/Q STEP. IN THE FULL SCAN MODE, THE MAXIMUM FLUX UBSERVED IN EACH OF THE 15 AZIMUTHAL SECTORS AS THE SPACECRAFT FOOTATED WAS RECORDED FOR A GIVEN SINGLE COLLECTOR AT A GIVEN E/9 STEP. DURING 24 SUCCESSIVE OPERATIONS OF THE FULL SCAN MODE (46 SPACECRAFT REVOLUTIONS), THE 16 ION E/0 AS THE SCAPES AND EIGHT.ELECTRON E/Q STEPS WERE EXERCISED FOR A GIVEN COLLECTOR. DURING EIGHT SUCCESSIVE SUCH PERIODS, EACH OF THE ELGHT COLLECTORS WAS EXERCISED. THE FULL CYCLE OF FULL SCAN MODE DATA REQUIRED 600 SPACECRAFT REVOLUTIONS (ABOUT 400 S), SUCH CYCLES WERE PERIED WITHOUT INTERVIDITION THE HIGH BIT RATE. IN THE MAXIMUM FLUX MODE, FOR THE E/Q STEP USED IN THE

PRECEDING REVOLUTION OF FULL SCAN MODE OPERATION, ALL COLLECTORS WERE OBSERVED FOR ONE REVOLUTION, AND THE MAXIMUM FLUX OBSERVED WAS REPORTED ALONG WITH THE NUMBER OF THE COLLECTOR THAT OBSERVED IT AND THE ANGULAR DIRECTION (2-137/16-DEG RESOLUTION) OF THE OBSERVATION, AT THE NEXT HIGHEST BIT RATE (256 BPS), THE SHORT SCAN RODE WAS ALTERNATED EVERY SPACECRAFT REVOLUTION WITH THE MAXIMUM FLUX MODE. THE SHORT SCAN MODE WAS THE SAME AS THE FULL SCAN, EXCEPT THAT ONLY THE PEAK FLUX IN EACH OF THE EIGHT 5-5/8-DEG-WIDE AZIMUTHAL SECTORS WAS RECORDED, THUS, THIS CYCLE ALSO TOOK 40G SPACECRAFT REVOLUTIONS, AT THE LOW BIT RATES (64, 16, AND 8 BPS), THE MAXIMUM FLUX MODE ALONE WAS USED. THUS, NO AZIMUTHAL DISTRIBUTIONS WERE MASURED, AT THE LOW BIT WATES, IT TOOK 32 S FOR A COMPLETE SET DF ION MEASUREMENTS AND 16 S FOR A COMPLETE SET OF ELECTRON MEASUREMENTS. AT 64 DPS, THE ION AND ELECTROM MEASIMEMENTS WERE TAKEN AND TELEMETERED EVERY 84 S. AT 16 BPS. THET WERE TAKEN AND TELEMETERED EVERY 86 S. AT 8 BPS, THEY WERE TAKEN AND TELEMETERED EVERY 36 S. AT 8 BPS, THEY WERE TAKEN AND TELEMETERED EVERY 36 S. AT 8 BPS, THEY WERE TAKEN AND TELEMETERED EVERY 36 S. AT 8

SPACECRAFT COMMON NAME- PIONEER B Alternate Names- Pioneer-C, 03066

N55BC 10- 67-1234

LAUNCH DATE- 12/13/67 WEIGHT- 146. KG LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- DELTA

SPONSORING COUNTRY/AGENCY United states NASA-OSS

ORBIT PARAMETERS GRBIT TYPE- HELIOCENTRIC GRBIT PERIOD- 387.5 DAYS PERIAPSIS- 0.992 AU RAD EPOCH DATE- 09/17/75 Inclination- 0.057 deg Apdapsis- 1.028 au rad PERSONNEL MG - F.D. KOCHENDORFER SC - A.G. OPP PM - C.F. HALL PS - J.H. WOLFE NASA HEACTUARTERS NASA HEADQUARTERS NASA-ARC NASA-ARC

PM - C.F. MALL NASA-ARC PS - J.H. WOLFE NASA-ARC BRIEF DESCRIPTION PIONEER 6 WAS THE THIRD IN A SERIES OF SOLAR-ORBITING, SPIN-STADILIZED, SOLAR-CELL, AND BATTERY-POWERED SATELLITES DESIGNED TO OBTAIN MEASUREMENTS OF INTERPLANETARY PHENOMEMA FROM WIDELY SEPARATED POINTS IN SPACE ON A CONTINUING BASIS. THE SPACECRAFT CARRIED EXPERIMENTS OF STUDY THE PUSITIVE IONS AND ELECTRONS IN THE SOLAR WIND, THE INTERPLANETARY PHENOMEMA FROM WIDELY SEPARATED POINTS IN SPACE ON A CONTINUING BASIS. AND ELECTRONS IN THE SOLAR WIND, THE INTERPLANETARY ELECTROM DENSITY (RADID PROPAGATION EXPERIMENTS OF STUDY THE PUSITIVE IONS AND ELECTRIC PROPAGATION EXPERIMENTS OF STUDY THE PUSITIVE IONS AND ELECTRIC PROPAGATION EXPERIMENTS OF STUDY THE PUSITIVE IONS AND ELECTRIC FIELDS. ITS MAIN ANTENNA WAS A HIGH-GAIN DIRECTIONAL ANTENNA. THE SPACECRAFT WAS SPIN-STABILIZED AT ABOUT 60 RPM, AND THE SOLAR DITHE SOUTH ECLIPTIC POLE. BY GROUND COMMAND, ONE OF FINE BIT RATES, ONE OF FOUR DATA FORMATS. AND ONE OF FOUN PERATING MODES COULD BE SLECTED. THE FIVE 91Y RATES WERE 512, 256, 64, 16, AND 8 BPS. THREE OF THE FOUR DATA FORMATS WERE USED PRIMARILY FOR SCIENTIFIC DATA FORMAT WAS USED AT THE TWO HIGHEST BIT RATES. ANOTHER WAS USED AT THE FOUR DATA FORMATS WERE USED PRIMARILY FOR SCIENTIFIC DATA FROM ONLY THE RADIO PROPAGATION EXPERIMENT, THE FOURTH DATA FORMAT WAS USED AT THE TWO HIGHEST BIT RATES. ANOTHER WAS USED AT THE AND TRANSMITTED DIRECTLY WITHOUT STORAGE) AS SPECIFIED BY THE DATA FORMAT AND BIT RATE SELECTED. IN THE TELEMETRY SIGNE MODE, AND AT THE BIT RATE SELECTED. IN THE TELEMETRY SIGNE MODE, AND AT THE BIT RATE SELECTED. IN THE DITY CYCLE STORE MODE, AT AND AT THE BIT RATE SELECTED. IN THE TELEMETRY SIGNE AND STORAGE OF SUCCESSIVE FRAMES COULD BE VARIED BY GROUND COMMAND STORAGE OF SUCCESSIVE FRAMES COULD BE VARIED BY GROUND COMAND STORAGE OF SUCCESSIVE FRAMES COULD BE VARIED BY GROUND COMAND STORAGE OF SUCCESSIVE FRAMES COULD BE VARIED BY GROUND COMAND STORAGE OF SUCCESSIVE FRAMES COULD BE VARIED BY

-- PIONEER B, BERG------

INVESTIGATION NAME- COSMIC DUST DETECTOR

NSSDC 10- 67-1234-04 JEVESTIGATIVE PROGRAM

CODE SL

INVESTIGATION DISCIPLINE(S) INTERPLANTIARY DUST

PERSONNEL

PI - O.E. BERG OI - L. SECRETAN(RETIRED)

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT WAS (FRIGHED TO (1) PEASURE THE COSMIC DUST FLUX DENSITY IN THE "AR STSTER, (2) DETERMINE THE DISTRIBUTION OF COSMIC DUST CONCENTRATIONS IN THE EARN'S ORBIT, (3) DETERMINE THE GRADIENT, FLUX DENSITY, AND SPEED OF PARTICLES IN METEOR STREAMS, AND (4) PERFORM AN IN-ILIGHT CONTROL EXPERIMENT ON THE RELABILITY OF THE MICROPHONE AS A COSMIC DUST SENSOR, THE EXPERIMENT INSTRUMENTATION, WHICH WAS

ROUNTED IN THE EQUATOR OF THE SATELLITE WITH ITS AXIS AADIAL TO THE SATELLITE SPIN AXIS FACING IN THE ECLIPTIC PLANE, CONSISTED OF A FROMI FILM-GRID SENSOR ARRAY AND A REAR FILM-GRID SENSOR ARRAY, SPACED 5 CM APART, AND AN ACOUSTICAL IMPACT PLATE UPOH WHICH THE REAR FILM WAS MOUNTED. THE SENSOR ARRAYS CONSISTED OF FOUR VERTICAL FILM STRIPS CROSSED BY FOUR HORIZONTAL GRID STRIPS TO FORM 16 FRONT AND 16 REAR FILM-GRID ARRAYS (EACH Z.S CM 50), CREATING 256 POSSIBLE COMBINATIONS, EACH GRID STRIP AND FILM STRIP WAS CONNECTED TO A SEPARATE OUTPUT AMPLIFIER WHUSE SIGNALS WERE USED TO DETERMINE THE SEGMENT IN WHICH AM IMPACT OCCURED. THE FRONT FILM SENSOR, WHICH WAS RECESSED 3 CM INTO THE EXPERIMENT HOUSING, CONSISTED OF AN EIGHT-LAYER COMPOSITE -- TOD-A PARYLENE ENCAPSULATION, 500-A COPPER, 300-A COPPER, SUPPORT MESH, AND 500-A PARTLENE ENCAPSULATION. EACH OF THE REAR SENSOR-ARRAY FILM STRIPS CONSISTED OF A 00-TSCRUMETER MOLTOBENUM SHEET CEMENTED TO A QUARTZ ACOUSTICAL SENSOR PLATE, SUPPORT MESH, AND 500-A PARTLENE ENCAPSULATION. EACH OF THE OTABATION OF THE SENSORS WAS DASED ON THD ASIC MEASURABLE PHENOMENA THAT OCCUR WHEN A HYFERVEDCITY PLATICLE IMPACTS ON A SURFACE --- (1) FORMATION OF PLASMA AND (2) TPANSFER OF MOMENTUM, WHEN THE FRONT FILM WAS PREMETEDED THA ADD-SIC REMERGY. HYFERVELOCITY PARTICLES SUEED AND DIRECTION, THREE GENERGY. HYFERVELOCITY PARTICLES (GREATER THAN 1 ERG), WHICH PRODUCED RESPONSES AT BOTH FRONT AND REAR FILM SENSOR, AND (3) RELATIVELY LARGE HIGH-VELOCITY PARTICLES (LESS THAN 1 ERG), WHICH PRODUCED RESPONSES ONLY AT THE FRONT FILM SENSOR, AND (3) RELATIVELY ARTENDED FILM STRIPS TO THE ACOUSTICAL SENSOR THA ACOUSTICAL SENSORS. THE SIGNED TO PERFORM AN IN-FILMENT A MESURABLE INFULSE TO THE ACOUSTICAL SENSOR, AND (3) RELATIVELY ARTENDED FOR THAN AT THE FRONT AND REAR FILM SENSOR, AND (3) RELATIVELY ANTENDED FOR A THEORY AND REAR FILM SENSOR, AND (3) RELATIVELY ARTENDED FOR THE ALTORED THE FRONT AND REAR FILM SENSOR. THE ACOUSTICAL SENSORS. THE SENSORS WERE CALLERATED THAN OL NATIATED BY GROUND

---- PIONEER 8, ESHLEMAN-------

INVESTIGATION NAME- TWO-FREQUENCY BEACON RECEIVER

N55DC ID- 67-1234-03 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) IONOSPHERĖS AND RADIO PHYSICS Planetary Atmospheres Particles and Fields Interplanetary dust

PERSONNEL

	P1 - V.R.	ESHLEMAN	STANFORD U
	01 - 1.A.	CROFT	STANFORD U
	01 - н.Т.	HOWARD	STANFORD U
	01 - N.L.	LEADABRAND	STANFORD RES INST
	01 - R.A.	LONG	STANFORD RES INST
	0I - A.R.	PETERSON	STANFORD U

BRIEF DESCRIPTION

BAIEF DESCRIPTION BOTH 423.3-MHZ AND ITS 2/17 SUBHARMONIC 49.8-MHZ JIGNALS WERE TRAMSMITTED FROM A 46-M STEERABLE PARABOLIC ANTENNA AT STANGAD UNIVERSITY TO THE TWO-FREQUENCY RADIO RECEIVER ON THE SPACEDRAFT. THE HIGH-FREQUENCY SIGNAL SERVED AS A REFERENCE SIGNAL SINCE ITS PROPAGATION TIME WAS NOT APPRECIABLY DELAYED. THE LOW-FREQUENCY SIGNAL WAS DELAYED IN PROPORTION TO THE TOTAL ELECTRON CONTENT IN THE PROPAGATION PATH, ON THE SPACECRAFT. A (HASE-LOCKED RECEIVER CONTRED THE BEAT FREQUENCY ZECO CROSSINGS OF THE RECEIVER CONTRED THE BEAT FREQUENCY ZECO CROSSINGS OF THE RECEIVER CONTRED THE BEAT FREQUENCY ZECO CROSSINGS OBSERVED, AND THESE VALUES WERE TELEMETERED TO THE GROUND STAINON, FROM CALCULATED TOTAL ELECTRON CONTENT VALUES, THE IONOSPHERIC EFFECT (UP TO A SELETED ALTITUDE OBTAINED FROM OTHER EXPERIMENTAL TECHNIQUES) COULD BE SUBTRACTED TO PRODUCE DATA DESCHIBING THE INTERPLANETARY ELECTRON CONTENT OF THE SOLAR WIND 4ND ITS VARIATIONS, FOR SINILAR EXPERIMENTS COVERING OTHER TIME PIRIODS, SEE 68-100A-03, 60-075A-04, 65-105A-04, AD 67-060A-02. A MORE DETAILED DESCRIPTION OF THE EMPERIMENT CAM BE FOUND IN 'JGR,' 17, 3325-3327, AND IN 'RADIO SCIENCE,' 6, 55-63.

----- PIONEER 8, RCCRACKEN---

INVESTIGATION NAME- COSMIC-RAY ANISOTROPY

NSSDC 10- 67-1234-05

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS COSMIC RAYS

PERSONNEL PI - K.G. MCCRACKEN 01 - R.U. RAG 01 - W.C. BARTLEY

BRIEF DESCRIPTION

01 - W.C. BARILEY NATL ACADEMY OF SCI BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF A CSI SCINTILLATOR AND THREE SOLID-STATE TELESCOPES. THE CSI SCINTILLATOR AND MAD A CONICAL APERTURE WITH A 38.2-DEG MALF-ANGLE. THE SCINTILLATOR WAS COLLIMATED BY AN ANTICOINCIDENCE PLASTIC SCINTILLATOR AND MAD A CONICAL APERTURE WITH A 38.2-DEG MALF-ANGLE. THE SCINTILLATOR LOOK DIRECTION WAS CENTERED IN THE ECLIPTIC PLANE. THE SCINTILLATOR LOOK DIRECTION WAS CENTERED IN THE ECLIPTIC PLANE. THE SCINTILLATOR LOOK DIRECTION WAS CENTERED IN A FAN ARRANGEMENT WITH RESPECT TO A FOURTH SOLID-STATE DETECTOR, SUCH THAT EACH OF THE FIRST THREE DETECTORS WERE ORIENTED IN A FAN ARRANGEMENT WITH RESPECT TO A FOURTH SOLID-STATE DETECTOR, SUCH THAT EACH OF THE THREE TELESCOPES THUS FORMED HAD AN ACCEPTANCE CONE OF 33-DEG HALF-ANGLE. THE MEAN VIEWING DIRECTIONS OF THE TELESCOPES WERE IN THE ECLIPTIC PLANE AND 48 DEG ABOVE AND BELOW THAT PLANE, RESPECTIVELY. TWO CONCURRENT MODES OF COUNTING WERE EMPLOYED. IN THE FIRST MODE, COUNTS WERE ACCUMULATED IN EIGHT SEPARATE 45-DEG INTRVALS DURING THE SPACECRAFT SPIN, WHILE, IN THE SECOND, SPI' NIEGRATED COUNTS WERE ACOUNED. IN THE FIRST MODE, THE SCINT TATOR SEFARATELY MEASURED PARTICLES WITH ENERGIES IN THE SES 7.4 TO 21.5 MEV/NUCLEON AND 19.7 TO 63.0 MEV/NUCL JN (NO SPECIES DISCRIMINATION) WHILE EACH SOLID-STATE TELESCOPE SEPARTIELY MEASURED PROTONS IN THE ENERGY RANGES 3.3 TO 3.6 MEV AND 3.6 TO 13. 21, AND 28 MEV/NUCLEON, WHILE EACH OF THE SOLID-STATE TELESCOPES SEPARATELY MEASURED PROTONS IN THE ENERGY RANGE 4 TO 8 MEVANUCLEON IN THE ENERGY RANGE 4.5 AND 40 MEV/NUCLEON WILLE PROTONS IN THE ENERGY RANGE 4 TO 8 MEVANUCLEON. IN THE SECOND NOBE, THE SCINTILLATOR SEPARATELY MEASURED PARTICLES IN SIX CONTIGUOUS ENERGY INTERVALS BETWEER 4.5 AND 40 MEV/NUCLEON (INTERVAL LOWER LIMITS AT 4.5, 7.0, 9.6 13. 21, AND 28 MEV/NUCLEON) WHILE EACH OF THE SOLID-STATE TELESCOPES SEPARATELY MEASURED PROTONS IN THE ENERGY RANGE 4 TO 8 MEV AND 400 ONE SECONDES AND FEFFORMED 9-BIT ACCUMULAT

- PIONEER B, NESS-

INVESTIGATION NAME- SINGLE-AXIS MAGGETOMETER

INVESTIGATIVE PROGRAM NSSDC 10- 67-123A-01

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

CS 180

INDIAN SCI SAT PROJ NATL ACADEMY OF SCI

PERSONNEL		
PI - N.F.	NESS	NASA-GSFC
01 - S_C_	CANTARANO	U OF ROME
Π1 - F.	MARIANI	CNR, SPACE PLASMA LAB

BRIEF DESCRIPTION A SINGLE, BODM-MOUNTED UNIAXIAL fLUXGATE MAGNETOMETER, WITH MCDE-DEFRENDENT RANGES OF PLUS OR MINUS 32 GAMMAS AND PLUS OR MINUS 96 GAMMAS AND CORRESPONDING RESOLUTIONS OF PLUS OR MINUS 0.125 GAMMA AND PLUS OR MINUS 0.375 GAMMA, UBTAINED A VECTOR MAGNETIC FIELD MEASUREMENT BY MEANS OF THREE MEASUREMENTS TAKEN AT EQUAL TIME INTERVALS DURING EACH SPACECRAFT SPIN PERIOD (APPRO.IMATELY 1 S). AT TELEMETRY BIF RATES LESS THAN OR EQUAL TO 16 OS, AVERAGES WERE COMPLIED ON BOARD FOR TRANSMISSION TO EART... FOR TURTHER DETAILS, SEE MARIANI AND MESS, JGR, 74, 5633, 1969.

PIONEER 8, WEBBER---

INVESTIGATION NAME~. COSMIC-RAY GRADIENT DETECTOR

NSSDL 10- 67-1234-06 INVESTIGATIVE PROGRAM

CODE SL

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS COSNIC RAYS

PERSONNEL PI - W.R. WEBBER

U OF NEW HAMPSHIRE

PI-W.R. WEBBER U OF NEW HAMPSHIRE BRIEF DESCRIPTION THI: EXPERIMENT UTILIZED A TELESCOPE COMPRISED OF FIVE SOLID-STATE SENSORS, A CERENKOV DETECTOR, AND AN ANTICOINCIDENCE SHIELD, THE TELESCOPE AXIS WAS PERPENDICULAR TO THE SPACECRAFT SPIN AXIS, AS DETERTINED BY TWO COINCIDENCE WODES AND ELECTRONIC DISCRIMINATION OF SENSOR OUTPUT PULSES, PARTICLES MEASURED WERE ELECTRONS IN THREE CONTIGUOUS ENERGY INTERVALS BETWEEN 0.34 AND 8.6 MEV, PROTOMS IN SIX CONTIGUOUS ENERGY INTERVALS BETWEEN 3.49 AND 6.4.5 MEV (ONE OF FIVE COUNT KATES WAS DUE TO THE SUM OF COUNTS IN TWO NONCONTIGUOUS ENERGY INTERVALS). AND ALPHA PARTICLES IN FOUR CONTIGUOUS ENERGY INTERVALS BETWEEN 0.64 AND 6.4.5 MEV/ NUCLED (ONE OF THREE COUNT KATES WAS DUE TO THE SUM OF COUNTS IN TWO NONCONTIGUOUS ENERGY INTERVALS). AND ALPHA PARTICLES IN FOUR CONTIGUOUS ENERGY INTERVALS BETWEEN 0.64 AND 6.4.7 MEV/NUCLEDN (ONE OF THREE COUNT KATES WAS DUE TO THE SUM OF COUNTS IN TWO NONCONTIGUOUS ENERGY INTERVALS). AND ALPHA PARTICLES IN FOUR CONTIGUOUS ENERGY INTERVALS BETWEEN 0.64 MEV AND AULEI ABOVE THE NO FOURTS DUE TO ELECTRONS ABOVE 0.6 MEV AND NUCLEI ABOVE TO HE SUM OF COUNTS INTERVALS). AND ALPHA PARTICLES NO REASURED THE SUM OF NUCLEI ABOVE TO HE SUM OF COUNTS INTERVALSD. ATHER CONCIDENCE MODE MEASURED THE SUM OF NUCLEI ABOVE TO SUMPLY INTERVALSION. AND ELECTRONS AND WERE THE SUM OF NUCLEI ABOVE TO SUMPLY INTERVALIENT AND ELECTRONS ABOVE 0.1 MEV SUBCECONS A FOURTH COINCIDENCE MODE MEASURED THE SUM OF NUCLEI ABOVE TO NOT COUNTS SUDISS. IN ALL CASES, THEY WERE LONGER THAN THE SPACECRAFT SPIN-INTEGRATED DIRECTIONAL FLUXES WERE MEASURED IN THE VARIOUS NTHE TELEMETRY BIT RATE AND WERE TYDICALLY IN TLNS OF SECONOS. IN ALL CASES, THEY WERE LONGER THAN THE SAUCHART AND HERICD. AT LOW TELEMETRY BIT RATES ACCUMULATOR SATURATION RENDERED SOME COUNTING MODES TO BE OF NO VALUE. FOR FURTHER DETAILS, SEE J. GEOPHYS RES, 76, 1605, 1971.

----- PIONEER 8, WOLFE-------INVESTIGATION NAME- ELECTROSTATIC ANALYZER

CODE SL

NSSDC 10- 67-1234-02 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS SPACE PLASMAS

PERSONNEL

PI - J.H. WOLFE DI - D.D. MCKIBBIN

MASA-ARC NASA-ARC

11 J. J. N. WUCK D. J. D.D. WUCKIBBIN
SRIET DESCRIPTION
A TRUMCATED HEMISPHERICAL ELECTROSTATIC ANALYZER (120-DEG TOTAL PARALLEL PLATE CURVATURE) WITH THREE CONTIGUOUS CURVENT COLLECTORS WAS USED TO STUDY THE DIRECTIONAL INTENSITY OF THE ELECTRONS AND POSITIVE 10NS IN THE SOLAR WIND. IDNS WERE DETECTED IN 3D LOGARITHMICALLY EQUISPACED ENERGY PER UNIT GARGE (E/GJ STEPS FROM 15D TO 15.00D V. THERE WAS AN ELECTRON MODE OF OPERATION IN WHICH ELECTRONS WERE MEASURED IN 14 LOGANITHMICALLY EQUISPACED E/G, OR BACKGROUND, STEP. THE INREE COLLECTORS MASURED PARTICLES INCIDENT FROM THRE DIFFERENT CONTIGUOUS ANGULAR INTERVALS RELATIVE TO THE SPACECRAFT EQUATORIAL PLANE (SAME AS THE ECLIPTIC PLANE). TWO COLLECTORS MASURED FLUX FROM 10 TO 85 DEG ON EITHER SIDE OF THE SPACECRAFT EQUATORIAL PLANE, AND THE THIRD MEASURED FLUX IN A 2D-DEG INTERVAL CENTERED ON THE SPACECRAFT EQUATORIAL PLANE. AS THE SPACECRAFT WAS SPINNING, FLUXES WERE MEASURED IN 23 POSSIBLE 2-13/16-DEG WIDE AZINUTHAL ANGULAR SECTORS. SEVENTEEN OF THESE SECTORS WERE CONTIGUOUS AND BRACKETED THE SOLAR DIRECTION. THE REMAINING SIX SECTORS WERE WIDELY SPACED. THE INTERVAL CENTERED OF ATA COLLECTION +- POLAR SCAN, AZINUTHAL SCAN. AND HAATHUM FLUX. AT THE TWO HIGHEST DIT RATES OF THESE SECTORS WERE CONSTIGUOUS AND BRACKETED THE SOLAR ON THE AZINUTHAL DIRECTION (TO 2-13/16 DEG) OF THE OSLAR ON THE AZINUTHAL DIRECTION (TO 2-13/16 DEG) OF THE OSLAR NODE, AND THE AZINUTHAL DIRECTION (TO 2-13/16 DEG) OF THE OSLAR MODE, AND THE AZINUTHAL SCAN MODE AT EACH E/G STEP. AT THE LOW BIT MATES ON THE AZINUTHAL SCAN AND BRACKETED, IN THE POLAR SCAN MODE, ALL THREE COLLECTORS WERE OSSERVED, AND THE PALAFILIX SCAN MODE, AND THE AZINUTHAL DIRECTION (TO 2-13/16 DEG) OF THE OSSERVATION WERE REPORTED FOLLOWED BY LITHER (1) FOR JONS, A POLAR SCAN AND ALL THREE COLLECTORS WERE OSSERVED, AND THE PALAFILIX SCAN MODE, ALL THREE COLLECTORS WERE OSSERVED, AND THE PALAFILIX SCAN MODE, AND THE AZINUTHAL SCAN AND BRACKEMENTS TOOK 37 S AND ONE SET OF THE SET OF MEASUREMENTS CONSISI

SPACECRAFT COMMON NAME- PIONESR 9 ALTERNATE NAMES- PIONEER-D, PL-684k 03533

NS\$0C ID- 68-100A

LAUNCH DATE- 11/08/68 WEIGHT- 147. KG LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- DELTA

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-OSS

ORBIT PARAMETERS ORBIT TYPE- HELIOCENTRIC ORBIT PERIOD- 297.6 DAYS PERIAPSIS- D.754 AU RAD EPOCH DATE- 02/27/76 Inclination- 0.086 deg Apoapsis- 0.990 AU RAD PERSONNEL MG - F.D. KOCHENDORFER SC - A.G. OPP PM - C.F. HALL PS - J.H. WOLFE NASA HEADQUARTERS MASA HEADQUARTERS NASA-ARC NASA-ARC

ERIEF DESCRIPTION PIONEER 9 WAS THE FOURTH IN A SERIES OF SOLAR-ORBITING, SPIN-STABILIZED, AND SOLAR-CELL AND BATTERY-POWERED SATELLITES DESIGNED TO OBTAIN MEASUREMENTS OF INTERPLANETARY PHENOMENA FROM WIDELY SEPARATED POINTS IN SPACE ON A CONTINUING BASIS. THE SPACECRAFT CARVIED EXPERIMENTS TO STUDY THE POSITIVE INS AND ELECTRUMS IN THE SOLAR WIND, THE INTERPLANETARY ELECTROM DENSITY (HAD'O PROPASATION EXPERIMENT), SOLAR AND GALCTIC COSNIC RATS, THE INTERPLANETARY MAGNETIC FIELD, COSMIC DUST, AND ELECTRIC FIELDS. ALSO, A NEW CODING PROCESS WAS IMPLEMENTED FOR PIONEER 9. ITS MAIN ANTENNA WAS A HIGH-GAIN DIRECTIONAL ANTENNA. THE SPACECRAFT WAS SPIN-STABILIZED AT ABOUT OU RPM, AND THE SPIN AXIS WAS PERPENDICULAR TO THE ECLIPTIC PLAME AND

POINTED TOWARD THE SOUTH ECLIPTIC POLE. BY GROUND COMMAND, ONE OF FIVE BIT RATES, ONE OF FOUR DATA FORMATS, AND ONE OF FOUR OPERATING RODES COULD BE SELECTED. THE FIVE BIT RATES WERE 512, 256, 64, 16, AND B BPS, THREE OF THE FOUR DATA FORMATS CONTAINED PRIMARILY SCIENTIFIC DATA AND CONSISTED OF 32 SEVEN-BIT WORDS PER FRAME. DHE SCIENTIFIC DATA FORMAT WAS USED AT THE TWO HIGHEST BIT RATES, ANDTHER WAS USED AT THE THREE LOWEST BIT RATES, AND THE THIRD CONTAINED DATA FORMAT WAS USED AT THE TWO HIGHEST BIT RATES, ANDTHER WAS USED AT THE THRE RADIO PROPAGATION EXPERIMENT. THE FOURD PLANTING MODES WERE REAL TIME, TELEMETRY STORE, DUTY CYCLE STORE, AND MEMORY READOUT. IN THE REAL-TIME MODE, DATA WERE SAMPLED AND TRANSMITTED DIRCTLY WITHOUT STORRED AS SPECIFIED BY THE DATA FORM AT AND BIT RATE SELECTED. IN THE TELEMETRY STORE MODE, DATA WERE STORE AND AT THE BIT RATE SELECTED. IN THE DUTY CYCLE STORE AND AT A FORE FRAME OF SCIENTIFIC DATA WAS COLLEF, TED AND STORED AT A RATE OF SIZ BFS. THE TIME PRODED BETWEEN WHICH SUCCESSIVE FRAMES WERE COLLECTED AND STORED COULD BE VARIAD BY GROUND COMMAND BETWEEN 2 AND 17 AS LIMITED STURE ANTA COVERAGE FOR PERIODS OF UP TO 19 H, AS LIMITED STORAGE TO THE BIT STORE CAPACITY. IN THE MENDARY READOUT MODE, DATA WERE READ OUT AT WHASEVER BIT RATE WAS APPROPRIATE TO THE SATELLIFE DISTANCE FROM THE EARTH.

---- PIONEER 9, BERG------

INVESTIGATION NAME- COOMIC DUST DETECTOR

INVESTIGATIVE PROGRAM CODE SI

INVESTIGATION DISCIPLINE(S) INTERPLANETARY DUST

NASA-GSEC

PERSONNEL PI - D.E. BERG BRIEF DESCRIPTION

NSSDC 10- 68-100A-04

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO (1) MEASURE THE CONNIC DUST FLUX DENSITY IN THE SOLAR STSTEM, (2) DETERMINE THE DISTRIBUTION OF COSMIC DUST CONCENTRATIONS IN THE EARTH'S ORBIT, (3) DETERMINE THE GRADIENT, FLUX DENSITY, AND SPEED OF PARTICLES IN METEOR STREAMS, AND (4) PERFORM AN IN-FLIGHT CONTROL EXPERIMENT ON THE RELIABILITY OF THE MICROPHONE AS A COSMIC DUST SENSOR. THE EXPERIMENT INSTRUMENTATION WAS IDENTICAL TO THAT CARRIED ON PIDNEER 6, CONSISTING ESSENTIALLY OF TWO THIN FILM-GRID DETECTORS (SEPARATED BY A DISTANCE OF S CONTANT PRODUCED AN ELECTRICAL SIGNAL WHEN THE FILM WAS PENETRATED BY A MICROPETEDROID, EACH FILM HAD A SENSITIVE AREA OF 100 SO CM AND THE TIME-OF-FLIGHT NEEDED FOM THE METEOROID TO THAVERSE THE S-CM DISTANCE BETWEEN THE FRONT FILM AND REAR FILM SENSOR, THE COMBINED RESULTS OF THE FIDNEER 5 AND 9 COSMIC DUST EXPERIMENTS LENT STRONG SUPPORT TO THE HYPOTHESIS THAT THE BULK OF METEOROID DUST IS OF COMETARY ORIGIN.

PIONEER 9, ESHLENAN-------

INVESTIGATION NAME- TWO-FREquency BEACON RECEIVER

INVESTIGATIVE PROGRAM CODE SL NSSEC 10- 68-1004-03

1NVESTIGATION DISCIPLINE(S) Particles and fields Ionospheres and radio physics

PERSONNEL			
PI - V_R.	ESHLEMAN	STANFORD U	
01 - T.A.	CROFT	STANFORD U	
0I - H.T.	HOWARD	STANFORD U	
01 - R.L.	LEADABRAND	STANFORD RES IN	S T
01 - R.A.	LONG	STANFORD RES IN	ST.
01 - A.M.	PETERSON	STANFORD U	

BRIEF DESCRIPTION

BRIEF DESCRIPTION BOTH 423.3-MHZ AND ITS 2/17 SUBHARMINIC 49.8-MHZ SIGNALS WERE TRANSMITTED FROM A 4.6-M STEERADLE PARABOLIC ANTIBANA AT STANFORD UNIVERSITY TO THE TWO-FREQUENCY RADIO RECEIVER. ON THE SPACECRAFT. THE HIGH-FREQUENCY SIGNAL SERVED AS A REFERENCE SIGNAL SINCE ITS PROPAGATION TIME WAS NOT APPRETIABLEY DELAYED. THE LOW-FREQUENCY SIGNAL WAS DELAYED IN PROPORTION TO THE TOTAL ELECTRON CONTENT IN THE PROPAGATION PATH. ON THE SPACECRAFT. A PHASE-LOCKED RECEIVER COUNTED THE BEAT FREQUENCY IERO CROSSINGS OF THE RECEIVED SIGNALS TO OBTAIN MEASUMEMENTS OF PHASE-PATH DIFFERENCES... DIFFERNITAL DELAY OF THE GROUP VELOCITY WAS ALSO RESERVED. AND WESE VALUES WERE TELEMETERED TO THE GROUND STATION AND USED T'. CALCULATE THE TOTAL ELECTRON CONTINT. THE IONOSPHERIC CONTRIBUTION TUP TO A SELECTED ALTITUDE OBTAINED FROM OTHER EXFERIMENTAL TECHNIQUESS (OULD BE SUBTRACTED TO PRODUCE DATA DESCRIBENTAL TECHNIQUES) FOR SIMILAR EXPERIMENTS FOR OTHER EXFERIMENTAL TECHNIQUES, FOR SIMILAR EXPERIMENTS FOR OTHER MAD AND ITS VARIATIONS. FOR SIMILAR EXPERIMENTS FOR OTHER THE PERIODS SEE 67-123A-03, GONTONT OF THE EXPERIMENT CAN BE FOUND IN J. GEOPHYS. RES., 71, 3325-3327, AND IN RADIO SCIENCE, 6, 55-63.

--- PIQNEER 9, MCCRACKEN-----

INVESTIGATION NAME- COSMIC-RAY ANISOTROPY

NSSDC ID- 68-100A-05 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) Particles and fields Cosmic Rays

PERSONNEL		
	MCCRACKEN	CSIRO
01 - R.U. 01 - W.C.		INDIAN SCI SAT PROJ Natl Academy of Sci

01 - W.C. BARTLEY NATL ACADEMY OF SCI ATL ACADEMY OF SCI BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF A CSI SCINTILLATOR AND THREE SOLID-STATE TELESCOPES. THE CSI SCINTILLATOR MAD AC CONLOAL APERTURE WITH A 38.2-DEG HALF-ANGLE, THE SCINTILLATOR LOX OTRECTION MAS CENTERED IN THE CLIPTIC PLANE. THREE SOLID-STATE DETECTORS WERE ORIENTED IN THE CLIPTIC PLANE. THREE SOLID-STATE DETECTORS WERE ORIENTED IN A FAN ARRANGEMENT WITH RESPECT TO A FOURTH SOLID-STATE DETECTOR SUCH THAT EACH OF THE FIRST THREE DETECTORS FORMED A TELESCOPE WITH THE FOURTH DETECTOR. EACH OF THE THREE TELESCOPES THUS FORMED HAD AN ACCEPTANCE COME OF THE THREE TELESCOPES THUS FORMED HAD AN ACCEPTANCE COME OF TELESCOPES WERE IN THE ECLIPTIC PLANE AND 48 DEG ABOVE AND BELOW THAT PLANE, RESPECTIVELY. TWO CONCURRENT HODES OF COUNTING WERE EMPLIYED, IN THE SECOND SPIM-INTEGRATED COUNTS WERE ACCUMULATED IN A THE FIRST MODE, THE SCINTILLATOR SEPARATELY MEASURED PARTICLES WITH EMERGES IN THE RANGES 7.4 TO 21.5 KEV/NUCLEON AND 19.7 TO 63.0 MEV/NUCLEON (NO SPECIES DISCRIMINATION) WHILLS IN SIX CONTIGUOUS ENERGY INTERVALS BETWEEN 4.5 AND 40 MEV/NUCLEON (INTERVAL DUER LIMITS AT 4.5, 7.0. 9.6 13.7 LES SEPARATELY MEASURED PROTONS IN THE ENERGY RANGES 1.3 TO 3.6 MEV AND 3.6 TO 4.7 NEV. IN THE SECOND MODE, THE SCINTILLATOR SEPARATELY MEASURED PARTICLES IN SIX CONTIGUOUS ENERGY INTERVALS BETWEEN 4.5 AND 40 MEV/NUCLEON (INTERVAL LOWER LIMITS AT 4.5, 7.0. 9.6 13.7 L, AND 28 MEV/NUCLEON, WHILE EACH OF THE SOLID-STATE 'ELESCOPES SEPARATELY MEASURED PROTONS IN THE ENERGY RANGES 1 10 8.1 TO 5, TO 3, AND 4 TO 3, MEV, DURING EACH OF THE SOLID-STATE 'ELESCOPES SEPARATELY MEASURED PROTONS IN THE ENERGY RANGES 1 10 8.4 TO 5, AND 4 O MEV/NUCLEON (INTERVAL SETWEM 4.5, AND 40 MEV/NUCLEON (INTERVAL LOWER LIMITS AT 4.5, 7.0. 9.6 13.7 L, AND 28 MEV/NUCLEON (INTERVAL SETWEM 4.5, AND 40 MEV/NUCLEON (INTERVAL DUER LIMITS AT 4.5, 7.0. 9.6 13.7 L, AND 28 MEV/NUCLEON (INTERVAL SETWEM 4.5, AND 40 MEV/NUCLEON (INTERVAL ACH ACH AT THE SOLID-STATE 'ELE

---- PIONEER 9, SCARF-----

INVESTIGATION NAME- PLASMA WAVE DETECTOR

NSSDC ID- 68-100A-37

INVESTIGATIVE PROGRAM CODE 51

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS SPACE PLASMAS

PERSONNEL

P1 - F1L1	SLAKP	TRW SYSTEMS GROUP
-M_1 - 10	GREEN	TRW SYSTEMS GROUP
01 - S.M.	CROOK	GAINES N. CROOK ASSOC
01 - R.W.	FREDERICKS	TRW SYSTEMS GROUP

BRIEF DESCRIPTION ELECTROSTATIC

BR164 DESCRIPTION ELECTP23TATIC AND ELECTROMAGNETIC PLASMA WAVES WERE MEASURED IN THE SOLAR WIND NEAR 1 AU USING AN UMBALANCED ELECTRIC DIPOLE ANTENNA. THE 423-MHZ STANFORD UNIVERSITY ANTENNA. WHICH SERVED AS THE SENSOR, WAS CAPACITIVELY COUPLED TO THR:E TELEMETRY CHANNELS. CHANNEL 1 WAS A 15-PERCENT BANDPA'S FILTER CENTERED AT 600 HZ. THESE CHANNELS WERE EACH SAMPLED 64 TIME: PER TELEMETRY SEQUENCE. CHANNEL WAS A FED INTO A COUNT RATE METER THAT MEASURED THE NUMBER OF POSITIVE GOLMG PLUSES FER UNIT TIME HAVING AMPLITUDES LARGE EHOUGH TO CROSS THE PRESENT TRIGGER LEVEL. THE TRIGGER LEWEL WAS VARIED THROUGH EIGHT STEPS. EIGHT TIMES PER TELEMETRY SEQUENCE. THE TRIGGER LEVELS. TO COUNT RATE AT EACH LEVEL, GAVE A MEASURE OF THE BROADBAND POWER SPECIRUM. DUE TO AMBLENT CONDITIONS, THESE GATA USUALLY REPRESENT THE POWER AT ABOUT 100 H2. THE TELEMETRY SEQUENCE WAS REPEATED OVER THE RITERY OF THE THAT THE COUNT RATE AT EACH LEVEL, GAVE A MEASURE OF THE BROADBAND POWER SPECIRUM.

----- PIONEER 9, SONETT----

INVESTIGATION NAME- TRIAXIAL MAGNETOMETER

NSS90 10- 68-1004-01 INVESTIGATIVE PROGRAM

PERSONNEL C.P. SONETT D.S. COLBUR PJ - C.P 01 - 0.5

U OF ARIZONA NASA-ARC

INVESTIGATION DISCIPLINE(S) Particles and fields

BRIEF DESCRIPTION A BOOM-MOUNTED, TRIAXIAL FLUXGATE MAGNETOMETER WAS USED TO STUDY THE INTERPLANETARY MAGNETIC FIELD AND ITS FLUCTUATIONS, THE SENSORS WERE ORIHOGONALLY HOUNTED WITH GRE AXIS PARALLEL TO THE SPACECRAFT SPIN PLANE WIT'I THE SENSOR ALONG THE SPIN AXIS, EMABLING IN-FLIGHT DETERMINATION OF ZERO LEVELS. EVERY 24 HP, THE INSTRUMENT WAS COMMANDED INTO A SELF-CALIBRATE SEQUENCE, AND THIS WAS OFTEN REPEATED AFTER THE SENSOR WERE FLIPPED. THE INSTRUMENT, WHICH HAD A DYNAMIC RANGE OF PLUS OR MINUS 200 GAMMAS WITH A RESOLUTION OF THE SIGNALS RECEIVED FROM THE TWO SENSORS IN THE SENDIATION OF THE SIGNALS RECEIVED FROM THE TWO SENSORS IN THE SPIN PLANE. BACH MAGNETIC FIELD COMPONENT WAS DIGITIZED INTO A 10-BIT TELEMETRY WORD. NINE MAGNETIC FIELD COMPONENTS, COMPRISING THREE MAGNETIC FIELD VECTORS, WERE TRANSMITTED IN EACH SPACECRAFT TELEMETRY FRAME.

--- PIONEER 9, WERBER-------

INVESTIGATION NAME- COSMIC-RAY TELESCOPE

NSSOC ID- 68-100A-06 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS COSMIC RAYS

U OF NEW HAMPSHIRE

PERSONNEL PI - W.R. WEBBER

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT UTILIZED A TELESCOPE COMPRISED OF FIVE SOLID-STATE SEMSORS, A CERENKOV DETECTOR, AND AN ANTICOINCIDENCE SHIELD. THE TELESCOPE AXIS WAS PERFENDICULAR TO THE SPACECRAFT SPIN AXIS. AS DETERMINED BY TWO COINCIDENCE MODES AND ELECTRONIC DISCRIMINATION OF SENSOR OUTPUT PULSES, PARTICLES MEASURED WERE ELECTRONS IN THREE CONTIGUOUS ENERGY INTERVALS BETWEEN 0.31 AND 5.1 REV. AND ALPHA PARTICLES IN THOSE CONTIGUOUS ENERGY INTERVALS BETWEEN 5.6 AND 42 MEVINUCLEON. A THIRD COINCIDENCE MODE MEASURED THE SUM 07 COUMYS DUE TO ELECTRONS ABDVL 0.6 MEV AND NUCLEI ABOVE 14 MEVINUCLEON. A FOURTH CDINCIDENCE MODE MEASURED THE SUM 07 NUCLEI ABOVE 42 MEVINUCLEON AND ELECTRONS ABOVE 5.1 MEV. SPACECRAFT SPIN-INTEGRAFED DIRCCTIONAL FLUXES WERE MEASURED IN EINER THE VARIOUS MODES. ACCUMULATION TIMES AND READOUT INTERVALS WERE DEPENDENT UN THE TELEMETRY BUT NAT END WERE THOLALLY IN THES OF SECONDS. IN ALL CASES, THEY WERE LONGER THAN THE SPACECRAFT SPIN PERID.

- PIONEER 9, WOLFE----

INVESTIGATION NAME- ELECTROSTATIC ANALYZER

NSSDC 10- 68-100A-02 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) SPACE PLASMAS PARTICLES AND FIELDS

NASA-ARE NASA-ARE

PERSONNEL PI - J.H. WOLFE OI - 1.0. MCKIBBIN

COMPLETE SET OF MEASUREMENTS CONSISTED OF SEVEN SETS OF 10M MEASUREMENTS (AT EACH E/Q STEPS) AND ONE SET OF ELECTRON MEASUREMENTS (AT EACH E/Q STEPS). AT THE HIGH BIT RATES (512 AND 265 DPS) ONE SET OF ION MEASUREMENTS TOOK δ_2 s and one set of lectrons measurements 38 s. At the LOW BIT RATES (64, 16, AND 8 BPS), ONE SET OF ION MEASUREMENTS TOOK 37 S AND ONE SET OF ELECTRON MEASUREMENTS 28 S. AT 66 APS, A COMPLETE SET OF MEASUREMENTS (SEVEN IONS PLUS ONE ELECTRON) WAS TAKEN AND TELEMETERE EVERY 402.5 S. AT 16 BPS, IT TOOK 1610 S, AND, AT E UPS, IT TOOK 220 S. E HPS, IT TOOK 3220 S.

SPACECRAFT COMMON NAME- PIONEER 10 ALTERNATE NAMES- PIONEER-F. PL-7230 35860

N550C 10- 72-6124

LAUNCH DATE- 03/03/72 LAUNCH SITE- CAPE CANVERAL, UNITED STATES LAUNCH VEHICLE- ATLAS

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-OSS

INITIAL ORBIT PARAMETERS ORBIT TYPE- JUPITER FLYBY

PERSONNEL

		NASA HEADQUARTERS NASA HEADQUARTERS NASA-ARC NASA-ARC
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SC A.G. OPP M. C.K. HALL M. MASA-ARC M. M

--- PIONEER 10, ANDERSON------

INVESTIGATION NAME- CELESTIAL RECHANICS

HSSDC 10- 72-0124-09

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(5) ASTRONOMY PLANETOLOGY CELESTIAL MECHANICS

PERSONNEL

PI - J.D. ANDERSON DI - G.W. NULL

NASA-JPL NASA-JPL

BRIEF DESCRIPTION

BRIEF DESCRIPTION TWO-WAY DOPPLER TRACKING OF THE SPACECRAFT WAS USED TO MAKE MORE PRECISE DETERMINATIONS OF PLANETANY MASSES, THE HELIOCENTRIC ORBIT OF JUPITER, AND THE GRAVITATIONAL FIELDS OF THE SUR, JUPITER, AND THE GALILEAN SATELLITES.

--- PIONEER 10, FILLIUS------

INVESTIGATION NAME- JOVIAN TRAPPED RADIATION NSSDC 10- 72-0124-05

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS

PERSONNEL PI - R.W. FILLIUS OI - C.E. MCILWAIN

U OF CALIF, SAN DIEGO U OF CALIF, SAN DIEGO

PI - R.W. TILLIUS U OF CALIF, SAN DIEGO OI - C.E. MCILWAIN U OF CALIF, SAN DIEGO DI OF CALIF, SAN DIEGO BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF AN ARRAY OF FIVE PARTICLE PETECTORS WITH ELECTRON THRESHOLDS IN THE RANGE OI TO 35 NEW AND PROTON THRESHOLDS IN THE RANGE O.IS TO 90 NEV. A CERENKOU COUNTER (C) HAD FOUR OUTPUT CHANNELS (C), C3, C3, AND COC SENSITIVE TO ELECTRONS HAVING ENERGIES ABOVE 6, 9, 13, ALD 1 NEV. RESPECTIVELY. AN ELECTRON SCATTER COUNTER (E) HAD THREE OUTPUT CHANNELS (I, 22, AND E3) SENSITIVE TO ELECTRONS HAVING ENERGIES GREATER THAN 35 NEV. M2 THAT MEASURED BACKGROUND, AND M3 THAT WAS SENSITIVE TO PROTONS HAVING ENERGIES GREATER THAN 80 NEV. THE LAST TWO SENSORS WERE SCINTILLATOR DETECTORS (SP AND SENSITIVITY TO ELECTRONS, THUS, THE SENSITIVITY OF THE SE DETECTOR TO PROTONS WAS ABOUT A FACTOR OF 10 LOWER THAM IIS SENSITIVITY TO ELECTRON FLUX, WHICH COULD THEN BESUBTRACTED FROM THE ELECTRONS HAVING CHARACTION FULLY SEVENAL OTHER CHANNELS LISTED ABOVE REQUIRED CHARACTED FROM THE SENSOL OF THE CHARACTIONS TO DETAIN THE SENSITIVITY TO ELECTRONS THOUSE TO DETAIN THE SENSITIVE TO THE SE DETECTOR TO PROTONS WAS ABOUT A FACTOR OF 10 LOWER THAM IIS SENSITIVITY TO ELECTRON FLUX, WHICH COULD THEN BE SUBTRACTED FROM THE SEPECTIVENT HAN AND SENSORS WERE SCINTILLATOR DETAIL FROM THE SEPEC CHANNELS LISTED ABOVE REQUIRED CORRECTIONS ID OBTAIN THE FLUXES OF THE EPECIES INDICATED. THREE OF THE CHANNELS (COC. AND SEDC WERE READ OUT IRROUGH A COMMON FLUXT. SEVERAL OTHER CHANNELS LISTED ABOVE FOULT THEN THE TO SAMPLE ONE CHANNEL SLISTED THATTERNS AT EACH OF THE EIGHT SPACECART BIT NATHE DETECTOR CHANNELS COULD BE PROGRAMMED FOR READ-OUT IN ANY ONE OF FOUR PATTERNS AT EACH OF THE EIGHT SPACECART BIT NATE MODES. DURING ENCOUNTER WHICH THE TO SAMPLE ONE DATA. THE DETECTOR CHANNELS COULD BE PROGRAMMED FOR READ-OUT IN ANY ONE OF FOUR PATTERNS AT EACH OF THE EIGHT SPACECART BIT NATE MODES. DURING ENCOUNTER WHICH THE TO SAMPLE ONE DATA WERE OBTAINED PERPEDICULAR TO THE SINGLES AND OWALE SEND IN AND OF OF FOUR PATT

- PIONEER 10, GEHRELS-----

INVESTIGATION NAME- IMAGING PHOTOPOLARIMETER (IPP)

N550C 10- 72-0124-07 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) ASTRONOMY PLANETART ATMGSPHERES

1 CKSDAUEL		
ΡΊ - Τ. ΟΙ - Ο.L. ΟΙ - J.	COFFEEN Hameen-Antila	U OF ARIZONA NASA-GISS U OF ARIZONA
01 - C.E. 01 - R.F. 01 - M.G. 01 - W.	TOMASKO	U OF ARIZONA Santa Barbara Res Ctr U Of Arizona U Of Arizona U Of Arizona

DEDCOMMEN

BRIEF DESCRIPTION BRIEF DESCRIPTION THE IMAGING PHOTOPOLARIMETER (IPP) EXPERIMENT WAS USED DURING JOUIAN ENCOUNTER TO MAKE SIMULTANEOUS TWO-COLOR (BLUE -SOOD TO 4000 A, RED - SOU TO 7000 A) POLARIMETIC AND ADIOMETRIC MSASUMEMENTS, AND MODERATE-RESOLUTION (ABOUT 200 KM AT BEST) SPIN-SCAN IMAGES OF JUFITER AND THE JOVIAN SATELLITES. THE POLARIMETRIC AND RADIOMETIC WORK WAS PERFORED USING AM 8- X 8- MRAD FIELD-STOP APERTURE, WHILE THE SPIN-SCAN IMAGING USED A 0.5+ BU D.5-MRAD APERTURE SYOP. RELATIVE RANDIMETRIC CALIBRATION WAS DERIVED USING AM INTERNAL IUNGSTEM LAMP. LONGSTERM ABSOLUTE CALIBRATION OF THE INSTRUMENT WAS ACCOMPLISHED IM THE SPACECRAFT ANIENNA STRUCTURE, I.E., PRIMARY RADIOMETRIC CALIBRATION WAS OBTAINED THROUGHOUT THE MISSION BY

PERIODICALLY COMMANDING THE TELESCOPE TO VIEW THIS DIFFUSE BACKLIGHTED (SUHLIGHT) SOURCE. THE EXPERIMENTAL TRAIN FOR THE IPP PACKAGE CONSISTED OF THE FOLLOWING ELEMENTS -- (1) A HEAR-DIFFRACTION-LIMITED 2.54-CM MAKSUTOV CATADIOPTIC TELESCOPE (F/J.4), (2) A FOCAL PLANE WHEEL CONTAINING FIELD-OF-VIEW APERTURES, DEPOLARIZERS, CALIBRATION SOURCE, ETC., (3) A WOLLASTOW PRISM TO SPLIT LIGHT INTO TWO ORIAGGONALLY POLARIZED BEAMS, (4) A 45-DEG DICHROMATIC MIRROR THAT REFLECTED WAVELENGTHS LESS THAN 5500 A (BLUE BEAM) AND TRANSMITTED ALL LIGHT OF GREATER WAVELENGTH (REL BEAM), (5) FOR EACH SPECTRAL BEAM (TWO POLARIZATIONS), A 'ILTERING COMED RELAY LENS AND FOLDING MIRRORS, AND (6) FON EACH SPECTRAL BEAM, TWO BENDIX CHANNELTRON DETECTORS (BLUE BIALKALI S-11 PHOTOCATHODES RED S-20 PHOTOCATHODES) TO REGISTER THE INTENSITY IN EACH POLARIZATION COMPONENT. (NOTE - THIS EXPERIMENT WAS ALSO ABDARD PIONEER 11.)

----- PIONEER 16. JUDGE------

INVESTIGATION NAME- ULTRAVIOLET PHOTOMETRY

NSSDC 10- 72-0124-06 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Astronomy Planetary Atmospheres

PERSONNEL

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BRIEF DESCRIPTION

PI - D.L. JUDGE DI - R.W. CARLSON

BRIEF DESCRIPTION THIS EXPERIMENT, CONSISTING OF A BROADBAND PHOTOMETER SENSITIVE BETWEEN 200 AND 800 A, OBSERVED EVIDENCE OF HELIUM, WHICH IN TURN INDICATED INTERACTIONS BETWEEN CHARGED PARTICLES AND NEUTRAL HYDROGEN, DURING THE CRUISE PHASE OF THE MISSION, THIS EXPERIMENT WAS USED FO SEARCH F0% THE SUPERSONIC TO SUBSONIC TRANSITION REGION IN THE SOLAR WIND, DURING THE JOVIAN ENCOUNTER, THIS EXPERIMENT WAS USED TO LOOK FON EVIDENCE OF AN AURORAL OVAL ON THE JOVIAN ATMOSPHERE, AND TO FIND THE RATIO HYDROGEN TO HELIUM IN THE JOVIAN ATMOSPHERE, AND TO FIND THE TEMPERATURE OF THE OUTER PORTION OF THE JOVIAN ATMOSPHERE.

----- PIONEER 10, KINARD-------

INVESTIGATION NAME- METEOROID DETECTORS

NSSDC 10- 72-0124-04 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(5) INTERPLANETARY DUST

PERSONNE

PER

RSVANEL		
PI - W.H.		NASA-CARE
01 R.E.		NASA-MSEC
01 - J.M.		NASA-LARC
01 - D.H.		NASA-LARC
01 - R.L.	O'NEAL	NASA-LARC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MEASURE THE NUMBER OF METGOROLD IMPACTS ON THE PIONEER 10 SPACECRAFT BY MEANS OF 12 PANELS, EACH CONTAINING 18 PRESSURIZED CELLS, MOUNTED ON THE BACK OF THE ANIENNA DISK. THE TOTAL EXPOSED AREA WAS 0,465 M SG. EACH PANEL OF GAS-CILLED COLLS CONSISTED OF A 1-MIL-THICK AND A 2-MIL-THICK SHEET OF STAINLESS SITEL #ELDED TOGETHER IN SUCH A WAY THAT MANY SNALL POCKETS OF GAS WERE LEFT BÉTWEEN THEM. WHENEVER A POCKET WAS PUNCTURED, THE GAS ESCAPED AND A COLD CATHODE DEVICE DETECTED THE HOLE MADE, AND THUS THE PARTICLE'S MASS AND INCIDENT ENERGY COULD BE DETERMINED. THE COMBINATION OF THESE DATA WITH TRAJECTORY DATA PROVIDED AN INDICATED THE SPATIAL DENSITY OF THE PARTICLES. THE INTERPLANETARY MEDIUM, AND PENETRATIONS OF THE CELLS FROM THAT SIDE INDICATED MORE. SOME 300 TO 400 HITS WERE EXPECTED BY THE ANDGRAM OR MORE. SOME 300 TO 400 HITS WERE EXPECTED BY THE ASTEROID BELT.

---- PIONEER 10, MCDONALD----

INVESTIGATION NAME- COSMIC-RAY SPECTRA

NSSDC ID- 72-0124-12 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS Cosmic Rays

NEW HARPSHIRE ED PHYSICS LAB

SONNEL		
PI — F.J.	RCDONALD	NASA-GSFC
	HECRACKEN	CSIRO
0I - ⊎.P.	WEODER	U OF NEW H
OI - E.C.	ROELÓF	APPLIED PH
01 - J.H.		NASA-GSFC
01 - S.J.	TEEGARDEN	NASA-GSEC

BRIEF DESCRIPTION THIS EXPERIMENT CONSISIED OF THREE MULTIELEMENT SOLID-STATE TELESCOPES, ALL LOOKING NORMAL TO THE SPACECRAFT SOLID-STATE TELESCOPE, HALL LOOKING NORMAL TO THE SPACECRAFT SPIN AKIS. THE HIGH-ENERGY TELESCOPE (HET) CONSISTED OF FIVE COLINEAR SENSORS AND MEASURED STOPPING PARTIELES (Z = 1 TO B) IN THE ENERGY RANGE 20 TO 30 MEV/NUCLEON. CHARGE RESOLUTION FOR PENETRATING PARTIELES WAS POSSIBLE UP TO 200 MEV/NUCLEON. THE FIRST LOM-ENERGY TELESCOPE (LET-1) HAD FOUR LLEMENTS AND MEASURED STOPPING (Z = 1 TO B) PARTICLES IN THE ENERGY RANGE 3 TO 32 MEV/NUCLEON. THE SECOND LOW-ENERGY TELESCOPE (LET-1) HAD THREE ELEMENTS AND MEASURED STOPPING ELECTRONS DETWEEN 50 AND TODO KEV AND STOPPING PROTONS DETWEEN 50 KEV AND 20 MEV. FOR EACH TILESCOPE, IOUNT RATES WERE OBTAINED FOR EACH OF SEVERAL SENSOR CJINCIDENCE-ANTICOINCIDENCE MODES. SOME OF THE RATES FROM EACH TILESCOPE WERE SECTORED INTO ELEGT OCLAINTS IN THE SPACECRY.T SPLY PLANE. IN ADDITION, THREE-SENSOR JULSE VEIGHT MALYSIS. UT: PRIORITY SCHEMES FAVORING THE ANALYSIS OF MEAVIER FAST (SUMPERS 10 SUMPERS) BRIEF DESCRIPTION THIS EXPERIMENT SOLID-STATE TELESCOPES,

--- PIONEER 10, SIMPSON-------

INVESTIGATION NAME- CHARGED PARTICLE COMPOSITION

N55DC 10- 72-012A-02 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(5) PARTICLES AND FIELDS

PERSONNEL		-	
PI - J.A.	SIMPSON	U 0	F CHICAGO
01 - J.J.	O'GALLAGHER		F Maryland
01 - A.	Tuzzolino		F Chicago

BRIEF DESCRIPTION

DRIEF DESCRIPTION THIS EXPERIMENT MEASURED CHARGED-PARTICLE COMPOSITION AND SPECIRA USING FOUR DETECTOR SYSTEMS -- (1) THE MAIN TELESCOPE. CONSISTING OF SEVEN ELEMENTS AND PROVIDING ENERGY SPECTRA (APPA-XIMATELY 3 TO 68 MEV FOR PROTONS AND 10 TO 150 MEV/NUCL. FOR OXYGEN), ELEMENT SESOLUTION (THROUGH GXYGEN), AND ISOTOPE RESOLUTION (FOR H AND HE), (2) THE LOW-INERGY SUBSYSTEM TELESCOPE, CONSISTING OF TWO ELEMENTS AND USING A VERY SMALL THIN FIRST ELEMENT TO EXTEND THE HIGH-SENSITIVITY PROTON MEASUBERENTS BELOW 1 MEV (0.3 TO 9 MEV) IN THE PRESENCE OF A DIGH GAMA-RAY BACKGROUND ABOARD THE SPACECRAFT, (3) THE ELECTRON-CURRENT OLTECTOR (OR EGG), CONSISTING OF A DERYLLUM-SHIELD SILLION DETECTOR OPERATED IN CURRENT MODE TO MEASURE HIGH FLUXES OF ELECTRONS WITH ENREGIES ABOVE 3 MEV, AND (4) THE FISSION CELL DETECTOR, RECORDING FISSION FRAGMENTS FROM THE NUCLEOF-INDUCED FISSION OF THORIUM 22 SANDWICHED BETWEEN TWO LARGE AREA SILLION DETECTORS TO MEASURE FLUXES OF PROTONS. THE EXPERIMENT SAMPLE TIME WAS SYNCHRONIZED WITH THE SPACECRAFT SPIN, PERMITTING SECTORING OF THE READOUT OF THE MAIN AND LOW-ENERGY TELESCOPES INTO ELEMENT OCTANIS ABOUT THE SPIN AXIS.

----- PIONEER 10, SMITH------

INVESTIGATION NAME- NAGNETIC FIELDS

NSSDC 10- 72-0124-01

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Particles and fields Planetary magnetic field Magnetospheric physics

PERSONNEL		
PI - E.J. 01 - D.S.		NASA-JPL
61 - P-	DYAL	2454-485 2454-485
01 - C.P. 01 - P.J.	SONETT Coleman, JR.	U OF ARIZONA U OF CALIF, LA
	DAVIS, JR.	CALIF INST OF TECH

BRIEF DESCRIPTION

ARLEF DESCRIPTION THIS TRIAXIAL VECTOR HELIUM MAGNETOMETER, DESIGNED TO MEASURE JOVIAH AND INTERPLANETARY MAGNETIC FIELDS, MEASURED THE HAREE FIELD COMPONENTS OVER THE FREQUENCY RANGE 0-16 HZ. AT ENCOUNTER THE DATA RATE WAS 1024 BITS/S AND THE MACHETOMETER SAMPLING RATE WAS 5.33 SAMPLES'S, TO AVOID POSSIBLE ALIASING, THE MAGNETOMETER PASSBAND WAS LIMITED TO FREQUENTIES BELOW THE MYGUIJT FREQUENCY (2.7 H7). BEFORE BEING DIGITIZED, THE THREE ANALOG WAVE 'ORMS WERE PASSED THROUGH A BUTTERWORTH FILTER HAVING A - DB POINT AT 3 HZ AND AN 18 DB/OCTAVE ROLL-OFF AT HIGHER FREQUENCIES. THE BROADBAND (10 HZ) ANALOG WAVE FORMS FROM ONE AXIS (PARALLEL TO THE SPACECRAFT SFIN AXIS) WERE ALSO FLOT O AN ANALGS SPECTRUM ANALYZER, WHICH RISOLVED THE FIELD FLUCTUATIONS INTO THREE PASSBANDS OF 0.1-1, 1-3, AND 3-10 NZ. THE MAGNETOMETER NOISE SPECTRUM WAS INDEPENDENT OF FREQUENCY WIJH A FIELD EQUIVALENT POWER SPECTRAL DENSITY OF 10 TO THE MINUS 4 POWER GAMMA SO/HZ. THE MAGNETOMETER AUTORATICALLY SELECTED ONE OF EIGHT RANGES BETNER FULL SCALE VALUES OF MINUS TO PLUS 4 GAMMAS AND 1.4 GAUSS (PER AXIS). DIGITIZATION RESOLUTION WAS ABUT 0.2 PERCENT. THE EXPERIMENT WORKED AS

PLANNED UNTIL NOVEMBER 1975, WHEN THE SPACECRAFT WAS NEAR 8 AU. No further useful data were obtained. For further details, see smith et al., "lere trans. On magnetics," 11, 962, 1975.

-- PIONEER 10, SOBERMAN-INVESTIGATION NAME- ASTEROID/METEOROID ASTRONOMY

N550C 10- 72-0124-03 INVESTIGATIVE PROGRAM CODE SL

> INVESTIGATION DISCIPLINE(\$) ASTRONOM ASTRONOMY PLANETARY ATMOSPHERES PLANETOLOGY INTERPLANETARY DUST

PERSONNEL PI - R.K. SOBERMAN DI - H.A. IDOK

GENERAL ELECTRIC CO NASA-JSC

DI - H.A. 200K NASA-JSC DRIEF DESCRIPTION THE OVERALL OBJECTIVE OF THIS EXPERIMENT WAS TO INVESTIGATE DUST PARTICLES AND METEOROIDS IN INTERPLANETARY SPACE. IT WAS ESSENTIALLY TWO EXPERIMENTS, USING TWO DIFFERENT TECHNIQUES. ONE METHOD WAS TO DETECT PARTICLES BY THE REFLECTION OF LIGHT FROM THEM, AND THE OTHER METHOD WAS TO DETECT THEM BY THEIR IMPACTS. THE OBJECTIVES WERE TO DETERMINE DISTANCE, TRAJECTORY, VELOCITY, RELATIVE SIZE, AND FLUX OF PARTICLES RANGING IN SIZE FROM MINUTE PARTICLES A FEW METERS DISTANCE, TRAJECTORY, VELOCITY, RELATIVE SIZE, AND FLUX OF PARTICLES RANGING IN SIZE FROM MINUTE PARTICLES A FEW METERS THOM THE TELESCOPE TO DISTANT ASTEROIDS. THE EQUIPMENT FOR THE DETECTION DF REFLECTION CONSISTED OF FOUR NON-IMAGING RITCHEY-CHRETIEN TELESCOPES WITH PRIMARY MIRRORS OF ZO-CM (8 H.J. DIAMETER, AND Z5-CM (10 IN.) FOCAL LENGTH, FIELDS OF VIEW (FOV) OF 0.2 RAD (8 DEG) EACH, SECONDARY OPTICS, AND A PHOTOMULTPLIER TUBE. THE LATTER DETECTS THE REFLECTED LIGHT COLLECTED BY THE TELESCOPES. AN EVENT WAS RECORDED WHEN AT LEAST THREE OF THE LIGHT ENABLED DETERMINATION OF PANGE AND VELOCITY. THE EQUIPMENT FOR THE IMPACT MODE CONSISTED OF 13 NITROGEM GAS, COVERING 0.65 SQ M (6.9 SQ FT) OF THE BACK OF THE ANTIMATENNA DISH. PENETRATION BY A PARTICLE RESULTED ON LIGHT MAIN ANTENNA DISH. PENETRATION BY A PARTICLE MESULTED OT IS PARELATE ON TA A RATE PROPORITORAL TO THE HOLE, WHICH MOULD BE RELATED TO IST MASS AND VELOCITY. PENETRATIONS WERE REGISTERED FROM PARTICLES AS SMALL AS JONODORO G.

---- PIONEER 10, VAN ALLEN------

INVESTIGATION NAME- JOVIAN CHARGED PARTICLES

NSSDC 10- 72-0124-11

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIFID MAGNETOSPHERIC PHYSICS

U OF IOWA

INVESTIGATIVE PROGRAM CODE SL

PERSONNEL PI - J.A. VAN ALLEN

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT USED SEVEN MINIATURE GEIGER TUBES IN THREE ARRAYS ID MEASURE PROTON AND ELECTRON FLUXES IN INTERPLANETARY SPACE AND IN THE VICINITY OF JUPITER. DETECTOR GROUPINGS WERE AS FOLLOWS -- (1) A THREE-ELEMENT (A, B, AND C) DIFFERENTIALLY SHIELDED TELESCOPE, WITH TUBE C SHIELDED OMNIDIRECTIONALLY AND USED FOR BACKGROUND SUBTRACTION TO PROVIDE DIRECTIONAL RATES SUCH AS A-C (ELECTRONS OF 0.55-21 MEV AND PROTONS OF 30-77.5 MEV) AND B-C (ELECTRONS OF 0.55-21 MEV AND PROTONS OF 0.6-77.5 MEV) AND B-C (ELECTRONS OF 0.55-21 MEV AND PROTONS OF 0.6-77.5 MEV) AND B-C (ELECTRONS ABOVE 31 MEV AND PROTONS ABOVE 77.5 MEV) AND B-C (ELECTRONS ABOVE 31 MEV AND PROTONS ABOVE 77.5 MEV) AND B-C (ELECTRONS ABOVE 31 MEV AND PROTONS ABOVE 77.5 MEV, AND (3) A THIN-WINDOW TUBE (G) WITH A GOLD-PLATED ELBON AS THE APERTURE WHICH ADMITS SCATTERED ELECTRONS ABOVE 0.06 MEV WHILE DISCRIMINATING STRONGLY AGAINST PROTONS. SINGLE ELEMENT RESS. THE TELEMETRED PROVAILING TURING THE JUPITER ENCOUNTER PERMITTED DIRECTIONAL SAMPLING IN INTERVALS OF ABOUT 14 DEG OF ROLL ABOUT THE SPIN AXIS. FCR FURITER DETAILS SEE BAKER AND VAN ALLEN, J. GEOPHYS. RES., 81, 617, 1970.

··· PIONEER 10, WEINBERG-----

INVESTIGATION NAME- ZODIACAL-LIGHT TWO-COLOR Photopolarimetry

NS50C 10- 72-012A-14

INVESTIGATIVE PROGRAM CODE 5L

INVESTIGATION DISCIPLINE(S) Astronomy Planetary atmospheres Zodiacal Light

SPACE ASTRONOMY LAB State U of New York

PERSONNEL #EINBERG

PI - J.L. DI - N.S. HANNER BRIEF DESCRIPTION THE IMAGING PHOTOPOLARIMETER (IPP) EXPERIMENT WAS USED TO OBTAIN MAPS OF THE ZODIACAL LIGHT DISTRIBUTION IN TWO COLDRS, BLUE (390D TO 4900 A) AND RED (SAOD TO 7000 A). IN FACH COLOR, THE MAPS WERE CONSTRUCTED OUT OF THE INTEGRATED-DETECTOR-RESPONSE (1764 OF A ROLL PERIOD), SPIN-SCAN POINT-THAGING DATA OBTAINED BY.VIEWING THROUGH A 40- BY 40-MRAD SG FIELD-STOP APERTURE. THIS WORK WAS PERFORMED DURING THE CRUISE PCRTION OF THE MISSION. DETAILED SIMULTANEOUS RADIOMETRIC AND POLARIMETRIC MAPS OF BOTH SKY COLORS WERE MADE AS THE SPACECRAFT SWEPT OUT A 360-DEG CLOCK ANGLE SWATH. AND THE TELESCOPE AND OPTICS WERE STEPPED IN CONE ANGLE (THE ANGLE BETWEEN SPACECRAFT SPIN AXIS AND THE TELESCOPE OPTICAL AXIS). AT EACH DISCRETE COME ANGLE, A 20-ROLL MEASUREMENT CYCLE OCCURRED, CONSISTING OF 10 ROLLS FOR THE ACCUMULATION OF THE DATA AND FOR CALIBRATION, ALTERNATED WITH 10-RCL, PERIODS USED FROM FOUR DETECTORS (2/COLOR) WERE INTEGRATED OVER A TIME INTERVAL EQUAL TO 1/64 OF THE ROLL PERIOD. THE FOUR CHANNELS PROVIDED SIMULTANEOUS MEASUREMENTS AT TWO ORTHOGONAL POLARIZATION MAS SAMPLED PARALLEL AND PERPENDICULAR TO THE PLAME CONTAINING THE SPACECATT SPIN AXIS AND THE OPTICAL AXIS, AT EACH DISCRES, DEPOLOR LALSUNG A DEPECTAL BANDS, THE PLAME CONTAINING THE SPACECATT SPIN AXIS AND THE OPTICAL AXIS FROM FOUR DETECTORE. THE EXPERIMENTS AT TWO ORTHOGONAL POLARIZATION MAS SAMPLED PARALLEL AND PERPENDICULAR TO THE PLAME CONTAINING THE SPACECATT SPIN AXIS AND THE OPTICAL AXIS GT THE TELESCOPE. THE SPICE CALIBRATION MAS PROVIDED BT A RADIOISOTOPE-ACTIVATED PHOSPHOR SOURCE. ALL SUCH DATA WERE COMISTED OF THE FOLLOWING ELEMENTS -- (1) A NEAR-DIFFRACTION-LIMITED 2.5A-CM MAXSUTOV CATADIOPTRIC TELESCOPE (7/3.4), (2) A FOCAL PLANE WHEEL CONTAINING THAN REFLECTED WAVELENGTHS LESS THAN SSOD A (BLUE BEAN), (3) FOR FAAR PELETED WAVELENGTHS LESS THAN SSOD A (BLUE BEAN), (3) FOR FAAR SPECTRAL BEAM (TWO POLARIZATIONS), A HILTERING CONTED RELAY LENS AND FOLDIAR MIRRORS, AND (6) FOR EACH SPECTRAL BE

--- PIONEER 10, WOLFE------

INVESTIGATION NAME- PLASMA

NS50C ID- 72-0124-13

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) PLASMAS PARTICLES AND FIELDS

PERSONNEL $\begin{array}{l} \text{RSONNEL} \\ \text{PI} & - J_.H. \\ \text{OI} & - L.A. \\ \text{OI} & - R. \\ \text{OI} & - D.S. \\ \text{OI} & - D.S. \\ \text{OI} & - V.T. \\ \text{OI} & - F.L. \\ \text{OI} & - H.R. \\ \text{OI} & - W.C. \\ \text{CI} & - Z.A. \end{array}$ NOLFE NASA-ARC U OF SOUTHERN CALLE NASA-ARC FRANK LUST LUSI INTRILIGA"OR MCKIBBIN ZAVIENTSE"F SCARF COLLARP FELDMAN NASA-ARC TRU SYSTEMS GROUP NASA-ARC LOS ALAMOS SCI LAB UNKNOWN SHITH

DI - W.C. FELDMAN DI - W.C. FELDMAN CI - Z.A. SMITH DIEF DESCRIPTION THE INSTRUMENT CONSISTED OF DUAL 9J DEG GUADRISPHERICAL ELECTROSTATIC ANALYZERS, ONE WITH 26 INDIVIDUAL PARTICLE DETECTORS AND THE OTHER WITH 5 CURRENT COLLECTORS. THE SYSTEM WAS CAPABLE OF MEASURING INCIDENT PLASMA DISTRIBUTION PARAMETERS OVER THE ENERGY RANGE OF 0.1 TO THE KEV FOR PROTONS AND APPROXIMATELY 1-SOU EV TOR ELECTRONS. THE HIGH RESOLUTION ANALYZER WITH A COUNTOUT OF 9 KEW/G PER KV APPLIED TO THE PLATES, HAD A MEAN PLATE RADIUS OF 9 CM AND SEPARATION OF 0.5 CM. THIS ANALYZER WAS USED TO MEASURE IONS ONLT AND HAD 20 CHANNELTRONS MOUNTED DM THE SEMICIRCULAR EXIT TO THE ANALYZER. THE APERTURE POINTED THROUGH A WIDE SLIT IN THE BACK OF THE SPACECRAFT HIGH-GAIN ANTENNA REFLECTOR AND POINTED ALONG THE SPIN AXIS TOWARD THE CARTH (AND THERFORGE THE SUN). THE EDGES OF THE ANTENNA REFLECTOR LIMITED THE VIEWING OF THE INSIRUMENT TO 73 OFG WITH RESPECT TO THE SPIN AXIS. THE CHANNELTRONS COVERED A RANGE OF PLUS OR NINUS 51 DEG. EACH CHANNELTRON NALAR THE CENTER COVERED 3 DEG AND APPROXIMATELT & DEG NEAR THE EDGES OF THE ANTENNA REFLECTOR LIMITED THE VIEWING OF THE INSIRUMENT THE CENTER COVERED 3 DEG AND APPROXIMATELT & DEG NEAR THE EDGES OF THE ANDITH RESPECT TO THE SPIN AXIS. THE DAGK OF THE SPIN AXIS TOWARD IN COMPLET TO THE ADDINA TO THE LONG MOULAR WIDTH WAS ABOUT 2 DEG. IN OME HALF A SPIN PERIDO THE MOULE CONE OF HALF ANGLIS ST DEG CENTERED OF THE SIN WAS SWEPT OUL. A MEDIUM ENERGY ANALYZER WITH A MAAR RADIUS OF 12 CM AND A 1 CM PLATE SEPARATION CONSTANT OF 6 KEV/G PER KV APPLIED) WAS USED TO DETECT BOTH IONS AND LEECTRONS. THE DETECIONS WREE FIVE FLAT-SURFACE CURRENT COLLECTORS. THE DETECTORS WREE FIVE FLATS-SURFACE CURRENT COLLECTORS. THE DETECTORS WREE FIVE THAT ON ELECTRON THE SPIN AXIS. THE THE ENTERNET; HOULAR WIDTH OF POSSIBLE OPERATING MODES FOR THE ARADIUAR RANGE OF PLUS OR TINUS 46.25. JEG FROM THE SPIN AXIS. THE THE EXPERIMENT; HOWEVER, THE PRINCIPAL MODE UTILIZED DURING THE EXPERIMENT; HOWEVE

SPACECRAFT COMMON NAME- PIONEER 11 Alternate NAMES- PIONEER-G, PL-733C 6421

NSSDC 10- 73-0194

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LAUNCH DATE- 04/06/73 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- ATLAS WEIGHT- 231. KG

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-055

INITIAL ORBIT PARAMETERS Orbit Type- Jupiter Flyby

ERSONNEL MG - F.D. SC - A.G. PM - C.F. PS - J.H.	HALL	NASA HEADOUARTERS NASA HEADOUARTERS NASA-ARC NASA-ARC
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SC - 4.G. OPP MASA HEADQUARTERS MASA HEADQUARTER

INVESTIGATION NAME- JOVIAN MAGRETIC FIELD

N550¢	10-	73-619A-14	INVESTIGATIVE PROGRAM Code SL
			INVESTIGATION DISCIPLINE(S) Magnetos.Heric Physics Planetary Magnetic Field Celestial Mechanics

FERSONNEL PI - M.H. ACUNA		NA5A-65FC
		NASA-GSEC
01 + N.F.	NESS	

BRIEF DESCRIPTION THIS INSTRUMENT, DESIGNED TO MEASURE THE JOVIAN MAGNETIC FIELD, CONSISTED OF A SINGLE-RANGE TRIAXIAL FLUXGATE FIELD, CONSISTED OF A SINGLE-RANGE TRIAXIAL FLUXGATE MEASURING FIELDS FROM 0.01 TO 10 GAUSS ALONG EACH ORHOGONAL AXIS. INSTANTANEOUS VECTOR MEASUREMENTS, USING A 10-BIT A-TO-O CONVERTER, VIFLOED A QUANTIZATION STEP SIZE OF MINUS TO PLUS GOOD GAMMAS FOR FIELDS LESS THAN 2 GAUSS. THESE ARE MADE ONE

EVERY THREE REVOLUTIONS OF THE SPACECRAFT (36 S) AND TRANSMITTED TO THE GROUND WITH NO FURTHER ON-BOARD PROCESSING. MORE INSTRUMENTAL DETAILS ARE GIVEN IN 'SP. SCI. INSTRUM.,' 1, 177. 1975. PRINCIPAL SCIENTIFIC RESULTS CAN BE FOUND IN 'JGR,' 81, 2917, 1976.

---- PIGNEER 11, ANDERSON------

INVESTIGATION NAME- CELESTIAL MECHANICS

NSSDC	- 61	73-0194-09	INVESTIGATIVE CODE SL	PROGRAM
			INVESTIGATION PLANETOLOGY ASTRONOMY	DISCIPLINE(S)

PERSONNEL PI - J.D. DI - G.W. ANDERSON NULL

NASA-JPL NASA-JPL

BRIEF DESCRIPTION TWO-WAY DOPPLER TRACKING OF THE SPACECRAFT WAS USED TO MAKE MORE PRECISE DETERMINATIONS OF PLANETARY MASSES, THE HELLOCENTRIC ORBIT OF JUPITER, AND THE GRAVITATIONAL FIELDS OF THE SUN, JUPITER, AND THE GALILEAN SATELLITES.

INVESTIGATION NAME+ JOVIAN TRAPPED RADIATION

 INVESTIGATIVE PROGRAM CODE SL NSSDC 10- 73-0194-05

> INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS

PERSONNEL

PI ~ R.W. FILLIUS U OF DI ~ C.E. NCILWAIN U OF		SIN DIEGO
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PI - R.W. FILLIUS DI - C.E. MCILWAIN U OF CALIF, SAN DIEGO U OF CALIF, SAN DIEGO GRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF AN ARRAY OF FIVE PARTICLE DETECTORS WITH FLECTRON THRESHOLDS IN THE RANGE 0.13 TO 35 MEY AND PROTON THRESHOLDS IN THE RANGE 0.15 TO 35 MEY AND PROTON THRESHOLDS IN THE RANGE 0.15 TO 35 MEY AND PROTON THRESHOLDS IN THE RANGE 0.15 TO 36 MEY AND PROTON THRESHOLDS IN THE RANGE 0.15 TO 36 MEY AND PROTON THRESHOLDS IN THE RANGE 0.15 TO 36 MEY AND PROTON THRESHOLDS IN THE RANGE 0.15 TO 36 MEY AND PROTON THRESHOLDS IN THE RANGE 0.15 TO 36 MEY AND PROTON THRESHOLDS IN THE RANGE 0.15 TO 36 MEY AND PROTON THRESHOLDS IN THE RANGE 0.15 TO 36 MEY AND PROTON THRESHOLDS IN THE RANGE 0.15 TO 36 MEY AND SEPLETIVELY. AN ELECTRON SCATTER COUNTER (E) HAD THRESHOLDS ITHE 00TPUT CHANNELS, MI SENSITIVE TO ELECTRONS ABOVE 0.16, .26, AND .40 MEY. A MINIMUM IDNIZATION COUNTER (H) HAD THRE 00TPUT CHANNELS, MI SENSITIVE TO ELECTRONS ANO MS THAT WAS SENSITIVE TO PROTONS HAVING ENERGIES GREATER THAN 80 MEV. THE LAST TWO SENSORS WERE SCINILLATOR DETECTORS (SP AND SED, BOTH OF WHICH HAD ENKOT THRESHOLDS OF 10 KEV FOR NO SED, BOTH OF WHICH HAD ENKOT THRESHOLDS OF 10 KEV FOR PROTONS AND 150 KEV FOR PROTONS. THE SEMSITIVITY OF THE SE DETECTOR TO PROTONS HAS ABOUT A FACTOR OF 10 LOVER THAN ITS DETECTOR TO PROTONS HAS ABOUT A FACTOR OF 10 LOVER THAN ITS DETECTOR TO PROTONS HAS ABOUT A FACTOR OF 10 LOVER THAN ITS DETECTOR TO PROTONS HAS ABOUT A FACTOR OF 10 LOVER THAN ITS DETECTOR TO PROTONS HAS ABOUT A FACTOR OF 10 LOVER THAN ITS DETECTOR TO PROTONS HAS ABOUT A FACTOR OF 10 LOVER THAN 10 FER CHANNEL RESPONSE 10 OGTAIN THE SEMSTITIVITY OF ELECTRONS AND A FACTOR FORM FALS COULD E PROGRAMMED FOR READ-OUT IN ANY ONE OF FOUR PATTEMES AT EACH 0F THE EIGHT SPACECAFT HIS ARTE MODES. DURING ENGONNER WHEN 11 LE PROCECAAFT WAS OPERATING IN THE HIGHEST BUT RATE MODE, THE 11 SENSITIVE TO SAMPLE ONE CHANNEL WAS TO B.5. SINCE 12 DIRECTIONAL DETECTORS FOINTER WERE MODINER WHEN 14 EFFACTURAFT WAS OPER

----- PIONEER 11, GEHRELS------

INVESTIGATION NAME- IMAGING PHOTOPOLARIMETER

NSSDC ID-	73-ū19A-07	INVESTIGATIVE CODE SL	PROGRAM	
			INVESTIGATION	DISCIPLINE(S)
		ASTRONOMY		
			PLANETARY A	TMOSPHERES

	PLA	NETUEDAT
ERSONNEL P1 - T. 01 - C.L. 01 - J. 01 - C.E. 01 - R.F. 01 - N.G. 01 - N.	GEHRELS Coffeen Hameen-Anttila Kenknight Hummer Tunasku Swindell	U DI ARIZONA NASA-GISS U OI ARIZONA U DI ARIZONA Santa Barbara res cir U OI Arizona U OI Arizona

BRIEF DESCRIPTION THE IMAGING PHOTOPOLARIMETER (IPP) EXPEPIMENT WAS USED DURING JOVIAN ENCOUNTER TO MAKE SIMULTANEOUS, TWO COLOP (BLUL 3000 IO 4900 A, RED - SEDO TO 7000 A) POLARIMETRIC AND RADIOMETRIC MEASUREMENTS, AND MEDERATE RESOLUTION (ABOUT 200 KM AT BEST) SPIN-SCAN IMAGES OF JUDITER AND THE JOVIAN SATELLITES. THE POLARIMETRIC AND RADIOMETRIC WORK WAS PERFORMED USING AN

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 $\delta-$ BY $\delta-\text{MRAD}$ FIELD-STOP APERTURE, WHILE THE SPIN-SCAN IMAGING USED A $\mathbb{Q}, 5-$ ay $\mathbb{Q}, 5-$ mrad aperture stop, relative radiometric calibration was derived using an internal turgsten lamp. Long-term arsolute calibration of the instrument was accomplished by means of a sunlight diffusion at internal turgsten lamp. Located in the spacecraft antenna structure. That is, primary radiometric calibration was obtained throughout the mission by periodically commanded the subscience to view this diffuse backlighted (sinlight) source. The experimental train for the instruments of the following elements -- (1) a mean-diffuse calibration source, (3) a wollaston prism to split the light into two ortho-onally polarized beams, (4) a focal plane wheel containing for apertures, that Source and training the spectral beams, (4) a source defined and the spectral beams, (4) a focal plane wheel containing for presented the spectral beams, (4) a source beform the spectral beams, (4) a source beams, (5) for each spectral beams, (4) a focal lamp of the spectral beams, (4) a focal (6) finally, (5) for each spectral beams of less that calibratic hirds, and transmits all light of less that calibratic bing of split the light into two transmits all light of less that for the beams, (5) for each spectral beam two bendix channels of of filtering the light of filtering coated relax less and folding different backling. And transmits all light of split (1) and (1) and (1) and (2) polarizations are separated) a filtering coated relax less and folding different backling. The periodication beams for the spectral beam two beams of the spectral beam two beams of the spectral beam two beams of the spectral beam two beams of the spectral beam two beams and the spectral beam the spectral beam the spectral beam the spectral beam the spectral beam the spectral beam the spectral beam the spectral beam the spectral beam the spectral beam the spectral beam the spectral beam the spectral beams the spectral beam the spectral beam the spectral beam th ABOARD PIONEER 10.)

----- PIONEER 11, JUDGE------

INVESTIGATION NAME- ULTRAVIOLET PHOTOMETRY

INVESTIGATIVE PROGRAM NS50C 10- 73-0194-06 CODE SL

INVESTIGATION DISCIPLINE(S) Astronomy Planetary Atmospheres

PERSONNEL PI - D.L. JUDGE DI - R.W. CARLSON U OF SOUTHERN CALIF U OF SOUTHERN CALIF

GRIEF DESCRIPTION THIS EXPERIMENT, A BROADBAND PHOTOMETER SENSITIVE BETWEEN 200 AND 800 A, OBSERVED EVIDENCE OF HELIUM, WHICH IN TURN INDICATED INTERACTIONS BETWEEN CHARGED PARTICLES AND NEUTRAL HYDROGEN. DURING THE CRUISE PHASE OF THE MISSION THIS EXPERIMENT WAS USED TO SEARCH FOR THE SUPERSONIC TO SUBSONIC TRANSITION REGION IN THE SOLAR WIND, DURING THE JOUAN ENCOUNTER, THIS EXPERIMENT WAS USED TO LOOK FOR EVIDENCE OF AN AURORAL OVAL ON THE JOVIAN ATMOSPHERE, AND TO FIND THE TEMPERATURE OF THE OUTER PORTION OF THE JOVIAN ATMOSPHERE.

---- PIONEER 11, KINARD-----

INVESTIGATION NAME- METEOROID DETECTORS

INVESTIGATIVE PROGRAM CODE SL NSSDC 10- 73-0194-04

> INVESTIGATION DISCIPLINE(5) ASTRONOMY INTERPLANETARY DIIST

ERSONNEL		NASA-LARC
P1 - W.H.	KINARD	NASA-LARC
0j — J.M.	ALVAREZ	
01 - D.H.	HUMES	NASA-LAR C

OI - D.H. HUMES BRIEF DESCRIPTION THE PIONEER 11 METEOROID DETECTION EXPERIMENT ATTEMPTED TO DETECT THE DISTRIBUTION IN INTERPLANETARY SPACE OF METEOROIDS TOO SMALL TO BE SEEN BY LIGHT SCATTERING TECHNIDUES. TWELVE PANELS. EACH CONTAINING 18 PRESSURIZED CELLS, WERE MOUNTED ON THE BACK OF THE SPACECRAFT ANTENNA DISH. THE PRESSURIZED CELLS CONSISTED OF A 2-MIL-THICK STAINLESS STEEL OUTER LAYER WELDED TO A 1-MIL-THICK STAINLESS STEEL INNER LAYER WITH A LARGE NUMBER OF SMALL POCKETS OF GAS TRAPPED BETWEEN HTH. ALOSS OF GAS PRESSURE FROM ANY OF THE CELLS INDICATED A HIT, AND THE RATE OF GAS LOSS INDICATED THE SIZE OF THE MOLETED MADE. THUS THE MASS AND INCIDENT EMERGY OF THE METEOROID MADE. THUS THE MASS AND INCIDENT EMERGY OF THE METEOROIDS TO BE DETERMINED. THE PANELS DETECTED IMPACTS, WITH PARTICLES TO BE DETERMINED. THE PANELS DETECTED IMPACTS, WITH PARTICLES AVING A MASS OF GREATER THAN 1.6-8 GM. SIMILAR EXPERIMENT HER EXPERIMENT WERE COMBINED WITH THOSE FROM A SIMILAR EXPERIMENT FLOWN ON PIONEER 10 TO DETERMINE THE RANGE IN MASS OF SMALL PARTICLES ON BOTH THE INNER AND OUTER BOUNDRIES AND WITHIN THE ASTEROID BELT. ASTEROID BELT.

----- PIONEER 11, KLIORE------

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INVESTIGATION NAME- S-BAND OCCULTATION

NSSDC ID- 73-019A-10

CODE SL INVESTIGATION DISCIPLINE(S) Ionospheres and radio physics Planetary atmospheres

INVESTIGATIVE PROGRAM

ERSONNEL PI - A.J. KLIORE OI - G. FJELDBO OI - D.L. CAIN OI - B.L. SEIDEL OI - S.I. RASOOL	NASA-JPL Nasa-JPL Nasa-JPL Nasa-JPL Nasa Headquarters
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BRIEF DESCRIPTION THIS EXPERIMENT UTILIZED THE S-BAND (2292 MHZ, B WATTS) SPACECRAFT RADIO TRANSMITTER SIGMAL CHARACTERIST, 5 TO OBTAIN INFORMATION ABOUT THE IDMOSPHERES AND ATMOSPHERES OF JUPITER AND ITS SATELLITE ID. ENTRANCE INTO AND EXIT FROM JUPITER AND IO OCCULTATION, PROVIDED CHANGES IN THE SIGMAL CHARACTERISTICS FROM WHICH ATMOSPHERIC TEMPERATURE, PRESSURE, AND ELF: RON DENSITY PROFILES COULD BE CALCULATED. TEMPERATURE AND PRE SURE RTMOTER SHEEL LITETO DEVELS ABOUT THE PRESSURE OF ONE (ATH ATMOSPHERE. SIGNAL OCCULTATION ALSO PROVIDED A DETERMIN .ION OF THE PLANETARY DIAMETER. BRIEF DESCRIPTION

----- PIONEER 11, MCDONALD-----

INVESTIGATION NAME- COSMIC-RAY SPECTRA

INVESTIGATIVE PROGRAM CODE SL NSSDC 10- 73-0194-12

> INVESTIGATION DISCIPLINE(5) PARTICLES AND FIELDS COSMIC RAYS

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ERSONNEL PI - F.B. OI - K.G. OI - W.R. OI - E.C.	METRACKEN Webber Roflof	NASA-GSFC CSIRO U OF NEW HAMPSHIRE Applied Physics LAB
0I - B.J.	TEEGARDEN	NASA-GSFC
01 - J.H.	TRAINDR	NASA-GSFC

PB

BRIEF DESCRIPTION THIS EXPERIMEN, CONSISTED OF THREE 3-ELEMENT TELESCOPES, ALL LOOKING NORMAL 10 THE SPACECRAFT SPIN AXIS. A BIDIRECTIONAL TELESCOPE MEASURED 20- TO BOO-MEV/NUCLEON PARTICLES WITH 5 TO 10 PERCENT ENERGY RESOLUTION. ANOTHER TELESCOPE MEASURED 3- TO 22-MEV/NUCLEON PARTICLES VITH 5 TO 10 PERCENT ENERGY RESOLUTION. ANOTHER PERCENT RESOLUTION. THESE TWO TELESCOPES MEASURED PARTICLES WITH 7 VALUES BETWEEN 1 AND 8. THE THIRD TELESCOPE MEASURED 50-KEV 7. MEV ELECTRONS AND 50-KEV TO 20-MEV PROTONS WITH 20 DETECTION SECONTION. PERCENT RESOLUTION.

PIONEER 11, MUNCH-----

INVESTIGATION NAME- INFRARED RADIOMETER

INVESTIGATIVE PROGRAM NSSDC 10- 73-0194-08 CODE SL

> INVESTIGATION DISCIPLINE(S) ASTRONOMY PLANETARY ATMOSPHERES LANETOLOGY

ERSONNEL		
P1 - G.	MUNCH	CALIF INST OF TECH
01 - R.W.	BOESE	NASA-ARC
01 - 5 C	CHASE, JR.	SANTA BARBARA RES CTR
01 - A.P.	INGERSOL	CALLE INST OF TECH
01 - G.	NEUGEBAUER	CALIF INST OF TECH
	TRAFTON	U OF TEXAS, AUSTIN

BRIEF DESCRIPTION THE PIDHEER 11 INFRARED RADIOMETER EXPERIMENT MEASURED THE JOVIAN THERMAL BALANCE, TEMPERATURE DISTRIBUTION IN THE OUTER ATMOSPHERE, GENERAL SURFACE COMPOSITION, INCLUING THE OVERALL HYDROGEN-TO-HELIUM RATIO, AND DARK SIDE TEMPERATURE. THE INSTRUMENT CONSISTED OF A 7.62-CH (3-in), Reflecting CASSEGRAIN TELESCOPE WITH A 1-DEG BY 3-DEG FIELD-OF-VIEW THAT ILLUMINATES A PAIR OF 88-CHANNEL, THIN-FILM BIMETALLIC THERMOPILES IN TWO BANDS OF THE IR SPECTRUM (14 TO 25 MICROMETERS) AND 19 TO 56 MICROMETERS) TO MEASURE THE IRRADIANCE. THE TWD-CHANNEL RADIOMETER WAS SIMILAR TO THOSE FLOWN ON MARINER 6 AND 7, BUT WAS MORE ACCURATE AND HAD BETTER STATIAL RESOLUTION. FLOWN ON MARINER SPATIAL RESOLUTION

-- PIONEER 11, SIMPSON-----

INVESTIGATION NAME- CHARGED PARTICLE COMPOSITION

INVESTIGATIVE PROGRAM NSSDC 10- 73-019A-02 CODE SL

INVESTIGATION DISCIPLINE(S) Particles and fields cosmic rays

PERSONNEL PI - J.A. OI - J.J. OI - A. SIMPSON O*GALLAGHER TUZZOLINO

U OF CHICAGO U OF MARYLAND U OF CHICAGO

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stie.

BRIEF DESCRIPTION THIS EXPERIMENT USED TWO TELESCOPES TO MEASURE THE THIS EXPERIMENT USED TWO TELESCOPES TO MEASURE THE COMPOSITION AND ENERGY SPECTRA OF SOLAR (AND GALACTIC) PARTICLES ABOVE ABOUT 0.5 MEV/NUCLEON. THE MAIN TELESCOPE CONSISTED OF FIVE COLINEAR ELEMENTS (THREE SOLD STATE, ORE CSI, AND ONE SAPPHIRE CEMENKOV) SUBROUNDED BY A PLASTIC ANTICOINCIDENCE SHIELD. THE TELESCOPE HAD A 60-DEG, FULL-ANGLE ACCEPTANCE CONF WITH ITS AXIS APPROXIMATELY NORMAL TO THE SPACECRAFT SPIN AXIS PERMITING 8-SECTORED INFORMATION ON PARTICLE ARRIVAL DIRECTION. FOUR ELEMENTS OF THE MAIN TELESCOPE WERE PULSE-HEIGHT ANALYZED, AND LOW- AND HIGH-GAIN MODES COULD BE SELECTED BY COMMAND TO PERMIT RESOLUTION OF THE ELEMENTS H THROUGH NI OR OF THE ELECTRONS AND THE ISOTOPES OF H AND HE AND LIGHT NUCLI. A SELECTION-FRIORITY SCHEME WAS UNDER NORMAL AND SOLAR-FLARE CONDITIONS. THE LOW-ENERGY TELESCOPE WAS ESSENTIALLY A TWO-ELEMENT, SHIELDED, SOLID-STATE DETECTOR WITH A 70-DEG, FULL-ANGLE ACCEPTANCE CONE. THE FLAST SECTORS. SECTORS.

---- PIONEER 11, SMITH------

INVESTIGATION NAME- MAGNETIC FIELDS

NSSDC 10- 73-01-4-01

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(5) Magnetospheric Physics Planetary Magnetic Field Particles and Fields

PERSONNEL PI - E.J. SMITH OI - D.S. COLBURN OI - P. DYAL OI - C.P. SONETT OI - P.J. COLEMAN, JR. OI - L. DAVIS, JR. OI - D.E. JONES	NASA-JPL NASA-ARC NASA-ARC U of Arizona U of Calif, la Calif inst of tech Brigham Young U
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OI - D.E. JONES BRIGHAN TOURD O BRIEF DESCRIPTION THIS TRIAXIAL VECTOR HELIUM MAGNETOMETER, DESIGNED TO MEASURE JOVIAN AND INTERPLANETARY MAGNETIC FIELDS, MEASURED THE THREE FIELD COMPONENTS 0. TR THE FREQUENCY RANGE 0-10 HZ. AT ENCOUNTER THE DATA RATE WAS 1024 DITS'S AND THE MAGNETOMETER SAMPLING RATE WAS 5.33 SAMPLES'S. TO AVOID POSSIBLE ALIASING, THE MAGNETOMETER PASSEAD WAS LINIT D TO FREQUENCIES DELOW THE NYQUIST FREQUENCY (2.7 HZ). BEFORE BEING DIGITIZED, THE THREE ANALOG WAVEFORMS WERE PASSED THROUGH A BUTTERWORTH FILTER NALOG WAVEFORMS WERE PASSED THROUGH A BUTTERWORTH FILTER THAVING A -3 DE POINT AT 3 HZ AND AN 18 DE/OCTAVE ROLL-OFF AT HIGHER FREQUENCIES. THE BROADBAND (10 HZ) ANALOG WAVEFORMS FEON DNE AXIS (PARALLEL TO THE SPACECRAFT SPIN AXIS) WERE ALSO FED TO AN ANALOG SPECTRUM WAS INDEFENDENT OF FAREQUENCY HITH A FIELD EQUIVALENT POWER SPECTRAL DENSITY OF 10 TO THE WITH A FIELD EQUIVALENT POWER SPECTRUM UAS INDEFENDENT OF ARGUMENT SELECTED ONE OF EIGHT RANDES BETWEEN LENSITY OF 10 TO THE WITH A FIELD EQUIVALENT POWER SPECTRUM VAS INDEFENDENT OF FAREQUENCY WITH A FIELD EQUIVALENT POWER SPECTRUM DENSITY OF 10 TO THE WITH A FIELD EQUIVALENT POWER SPECTRUM VAS INDEFENDENT OF ARGUMENT WITH A FIELD EQUIVALENT POWER SPECTRUM VAS INDEFENDENT OF ARGUMENT SELECTED ONE OF EIGHT RANDES BETWEEN FULL SCALE VALUES OF MINUS TO PLUS 4 GAMMAS AND 1.4 GAUSS (PER AXIS). DIGITIZATION RESOLUTION WAS ABOUT D.2 PERCENT. FOR FUHTHER DEIALS, SEE SMITH ET AL., "IEEE TRANS. ON MAGNETICS," 11, 962, 1975.

----- PIONEER 11, SOBERMAN--

INVESTIGATION WARE- ASTEROID/METEOROID ASTRONOMY

NSSDC 10- 194-03

INVESTIGATION DISCIPLINE(S) TRONOMY INTERPLANETARY DUST

INVESTIGATIVE PROGRAM

PERSONNEL P1 - R.K. SOBERMAN 01 - H.A. ZODK

GENERAL ELECTRIC CO NASĂ-JSC

01 - H.A. 200K ALSON

MERE OF SLIGHTLY GREATER MASS.

- PTONFER 11, VAN ALLEN-

INVESTIGATION NAME- JOVIAN CHARGED PARTICLES

NSSDE 10- 73-0194-11

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) Particles and fields MAGNETOSPHERIC PHYSICS

PERSONNEL PI - J.A. VAN ALLEN

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GRIEF DESCRIPTION THIS EXPERIMENT USES SEVEN MINIATURE GEIGER TUBES IN THREE ARRAUS TO MEASURE PROTON AND ELECTRON FLUXES NEAR JUPITER. DETECTOR GROUPINGS ARE AS FOLLOWS -- (1) A INFREFELEMENT (A, B AND C) DIFFERENTIALLY SHIELDED TELESCOPE. TUBE C IS SHIELDED OMNIDIRECTIONALLY AND IS USED FOR BACKGROUND SUBTRACTION TO PROVIDE RATES SUCH AS A-C (ELECTRONS OF 5 TO 21 MEV AND PROTONS OF 30 TO 77.5 MEV) AND B-C (ELECTRONS OF 0 D.55 TO 21 MEV AND PROTONS OF 6.6 TO 77.5 MEV) (2) A THREE-ELEMENT TRIANGULAR ARRAY, EACH ELEMENT RESPONDING TO ELECTRONS ABOVE 31 MEV AND PROTONS ABOVE 77.5 MEV, (3) A THIN-WINDOW TUBE (G) WITH A GOLD-PLATED ELEOW AS THE ENTRANCE APERTURE TO ADMIT SCATTERED ELECTRONS ABOVE 0.06 MEV WHILE DISCRIMINATING STRONGLY AGAINST PROTONS. FOR A DESCRIPTION OF THE SIMILAR EXPERIMENT ON PIONEER 10 SEE VAN ALLEN ET AL, JGR. 79, 3395, 1974. EARLY RESULTS ARE GIVEN IN SCIENCE, 188, 459, 1975.

- PIONEER 11, WEINBERG------

INVESTIGATION NAME- ZODIACAL-LIGHT TWO-COLDR Photopolarimetry

NSSDC 10- 73-0194-15

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Zodiacal light Planetary atmospheres Astronomy

SPACE ASTRONOMY LAB STATE U OF NEW YORK

PERSONNEL WEINBERG PI - J.L. 0I - M.S.

PI-JL. WEINBERG DI-M.S. HANNER BRIEF DESCRIPTION THE IMAGING PHOTOPOLARIMETER (IPP) EXPERIMENT WAS USED IO OBTAIN MAPS OF THE ZODIACAL LIGHT DISTRIBUTION IN TWO COLORS, BLUE (3900 TO 4900 A) AND RED (SADO TO 7000 A). IN EACH COLOR, BLUE (3900 TO 4900 A) AND RED (SADO TO 7000 A). IN EACH COLOR, HE MAPS WERE CONSTRUCTED OUT OF THE INTEGRATED-DETECTOR-RESPONSE (1/44 OF A ROLL PERIOD), SPIN-SCAM POINT-IMAGING DATA OBTAINED BY VIEWING THROUGH A 40- BY 40-MRAD SG FIELD-STOP APERTURE. THIS WORK WAS PERFORMED OURING THE CRUISE PORTION OF THE MISSION. IN DETAIL, SINUITANEOUS RADIOMETRIC AND POLARIMETRIC MAPS OF THE SXY IN BOTH COLORS WERE MADE AS THE SPACECRAFT SWEEPED OUT A 360-DEG CLOCK ANGLE SWATH, AND THE TELESCOPE AND OPTICS WERE STEPPED IN CONF ANGLE (THE ANGLE BETWEEN SPACECRAFT SPIN AXIS AND THE TELESCOPE OPTICAL AXIS). AT EACH DISCRETE CONE ANGLE, A 20-ROLL MEASUMENT CYCLE OCCURED, CONSISTING OF 10 ROLLS FOR THE ACCUMULATION OF THE DATA AND FOR CALIBRATION, ALTERNATED WITH 10-ROLL PERIODS USED FOR THE TELEMETRY OF THE DATA. DURING A DATA ROLL, THE SIGNALS FROM FOUR DETECTORS (2/COLOR) WERE INTEGRATED OVER A TIME INTERNAL EQUAL TO 1/64 OF THE ROLL PERIOD. THE FOUR CHANNELS PROVIDED SIMULTANEOUS MEASUREMENTS AT TWO ORTHOGOMAL POLARIZATION ÁZIMUTHS IN THE TWO SPECTRAL BANOS. THE POLARIZATION AZIMUTHS IN THE TWO SPECTRAL BANOS. THE POLARIZATION AZIMUTHS IN THE TWO SPECTRAL BANOS. THE POLARIZATION ANGLE AXSY MAP, 360 DEG IN CLOCK ANGLE BY 1A1 DEG IN CONFAMELES PROVIDED SIMULTANEOUS MEASUREMENTS AT TWO ORTHOGOMAL POLARIZATION AZIMUTHS IN THE TWO SPECTRAL BANOS. THE POLARIZATION FRIME TO SPULT THE LIGHTINO THO THE PLANE CONSISTED OF THE FOLLOWING ELEMENTS - (1) A NEAR-DIFRACTION-LIMITED LOSACH MASSUTOV CALIBRATION MAS PROVIDED BY A RADIOISOTOPE-ACTIVATED PHOSPHOR SOURCE. ALL SUCH PATA WERE FORMATTED TO PRODUCE A SXY MAP, 360 DEG IN CLOCK ANGLE BY 141 DEG IN CONFAMELS PROVIDED SIMULTANEOUS CALIBRATION SOURCE. FTC., (3) A WOLLASTON PRISM TO SPLIT THE LIGHTINO TWO FINDEGOMALLY POLARIZED BEARS, (4) A 45-DEG DICHMATIC MIRN

--- PIONEER 11, NOLFE---

INVESTIGATION NAME- PLASHA

NSSDC 10- 73-0194-13

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Space plasmas Particles and fields

PERSONNEL HOLFE FRANK PI - J.H. OI - L.A. OI - R. NASA-ARC U OF IOWA NPI-EXTRATERR PHYS U OF SOUTHERN CALIF NASA-ARC 1.057 0I - R. LUST 0I - D.S. INTRILIGATOR 0I - V.T. ZAVIENTSEFF 0I - Z.A. SMITH 0I - F.L. SCARF 0I - H.R. COLLARD 0I - H.R. COLLARD 0I - D.D. MCKIBBIN UNKNOWN TRW SYSTEMS GROUP NASA-ARC Los Alamos SCI LAB NASA-ARC

San Sharin

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OI - D.D. MCKIBBIN HASA-ARC BRIEF DESCRIPTION THE INSTRUMENT CONSISTED OF DUAL 90 DEG QUADRISPHERICAL ELECTORS TATIC ANALYZERS, ONE WITH 26 INDIVIDUAL PARTICLE DETECTORS AND THE DINER WITH 5 CURRENT COLLECTORS. THE SYSTEM WAS CAPABLE OF MCASURING INCIDENT PLASMA DISTRIBUTION PARAMETERS OVER THE C'AGGY RANGE OF D.1 TO 18 KEV FOR PROTONS AND APPROXIMATELY 1-500 EV FOR ELECTRONS. THE HIGH RESOLUTION MANLYZER WITH A COUNTOUT OF 9 KEV/O PER KV APPLIED TO THE PLAITES, HAD A MEAN PLATE RADIUS OF 9 CM AND SEPARATION OF D.5 CM. THIS ANALYZER WAS USED TO MEASURE INNS ONLY AND HAD 26 GHANNELTROMS MOUNTED ON THE SEMICIRCULAR EXIT TO THE ANALYZER. THE APERTURE POINTED INTOUGH A WIDD SLIT IN THE BACK OF THE SPICECRAFI HIGH-GAIN ANTENNA REFLECTOR AND POINTED ALONG THE SPIL AXIS IOWARD THE CARTH (AND THEREFORE THE SUN). THE EDGES OF THE ANTENNA REFLECTOR LIMITED THE VIEWING OF THE INSTRUMENT TO 73 DEG WITH RESPECT TO THE SPIN AXIS. THE CHAMNELTRONS OF THE ANALYZER. THE ANGULAR WIDTH PERPENDICULAR TO THE LONG ANGULAR WIDTH WAS ABOUT 2 DEG. IN ONE HALF A SPIN PERIOD THE WHOLE CONE OF HALF ANGLIS INTO THE ANALYZER. THE CHAMNELTRON NEAR THE CENTER COVERED 3 DEG AND APPROXIMATELY 8 DEG NEAR THE EDGES OUT. A WEDIUM ENERGY ANALYZER WITH A MEAN RADIUS OF 12 CM AND A 1 CM PLAIT SEPARATION (CONSTANT OF 6 KEV/Q PER KV APPLIED) THUS OF ONE TECT BOTH INDS AND COVERED THE ANGULAR AANGE OF PLUS OR MINUS 22.5 DEG FROM THE SET AXIS. THE TWRE CENTER VAS USED TO DETECT BOTH THE AND COVERED THE ANALYZER. THERE WERE A VARIETY OF POSSIEPE OPERATING MOES FOR THE EXPELIENT HUS OR MINUS 46.25 DEG FROM THE CENTER OF THE ANALYZER. THERE WERE A VARIETY OF POSSIEPE OPERATING MOES FOR THE EXPELIMENT; HOWEVER, THE PRINCIPAL MOLE THAN HEAD RADIUS REPLECOTARS WARE VAS ONE IN WHICH THE ANALYZER PLATE POTENTIAL WAS SEPPED WINUS 46.25 DEG FROM THE CENTER OF THE ANALYZER. THERE WERE A VARIETY OF POSSIEPE OPERATING MOES FOR THE EXPERIMENT; HOWEVER, THE PRINCIPAL MOLE THE AND MEDIUM RESOLUTION OF THE SPACECRAFT AND ALL CURRENT COLL

SPACEGRAFT COMMON NAME- PROGNOZ 4 ALTERNATE NAMES-NSSDC 10- 75-122A LAUNCH DATE- 12/22/75 LAUNCH SITE-WEIGHT- KG LAUNCH VEHICLE-SPONSORING COUNTRY/AGENCY U.S.S.R. SAS INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC Orbit Period- \$740. Min EPOCH DATE- 12/23/75 Inclination- 65. DEG ApoApsis- 1990gd. KM 634 KH PERIAPSIS-PERSONNEL PH - UNKNOWN PS - A.A. GALEEV IKI

BRIEF DESCRIPTION THE SPACECRAFT IS A CONTRIBUTION TO THE INTERNATIONAL MAGNETOSPHERIC STUDY (IMS) PROGRAM, WHICH CARRIES EXPERIMENTS TO INVESTIGATE SOLAR CORPUSCULAR, K-RAY, AND RADIO ENISSIONS, AS WELL AS TO MEASURE ENREGETIC PARTICLES, PLASMA, AND MAGNETIC FIELDS IN THE MAGNETOSPHERE AND THE INTERPLANETARY MEDIUM. IN A COOPERATIVE PROGRAM WITH SCIENTISTS OF THE SOCIALIST COUNTRIES, SOUNDING ROCKETS ARE LAUNCHED TO ALTITUDES GREATER THAN SIDD KM TO STUDY THE INTERACTION OF SHORTWAVE SOLAR RADIATION WITH THE ATMOSPHERE AND IONOSPHERE AND TO MAKE IN SITU MEASUREMENTS OF VARIOUS PARAMETERS IN THESE REGIONS OF COMPC

--- PROGNOZ 4, GRIGORYEVA-----

INVESTIGATION NAME- KILOMETRIC/HECTOMETRIC RECEIVER

NSSOC ID- 75-1224-05

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INVESTIGATIVE PROGRAM SPACE PHYSICS INVESTIGATION DISCIPLINE(S) Solar Physics Particles An. Fields

PERSONNEL PI - V.P. GRIGORYEVA

STERNBERG ASTRON INST BRIEF DESCRIPTION

THE INSTRUMENT IS A RECEIVER-ANTENNA SYSTEM THAT MEASURES RADIO MISSION IN THE 50 - 1000 KHZ BAND IN 10-FREQUENCY INTERVALS.

-- PROGNOZ 4, GRINGAUZ------

INVESTIGATION NAME- PLASMA DETECTOR

INVESTIGATIVE PROGRAM NSSDC 10+ 75-122A-02 SPACE PHYSICS

INVESTIGATION DISCIPLINE(S) Particles and fields Space Plasmas

PERSONNEL PI - K.I. GRINGAUZ

BRIEF DESCRIPTION

URIEF DESCRIPTION THE INSTRUMENT CONSISTS OF A DIFFERENTIAL ION PROBE THAT MEASURES THE SPECTRUM BETWEEN 0.1 AND 4.4 KEY AND AN ELECTRON PROBE THAT MEASURES THE DENSITY AND TEMPERATURE FOR ENERGIES LESS THAN 300 EV. BECAUSE OF THE NATURE OF THE ORBIT, SOLAR VIND, MAGNETOSPHERE, AND PLASMASPHERE, PLASMA PARAMETERS ARE OBTAINED.

- PROGNOZ 4, KACHAROV-----

INVESTIGATION NAME- SOLAR X-RAYS

INVESTIGATIVE PROGRAM Space physics NSSDC ID- 75-122A-03

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY Solar Physics

L'ENGRAD INST PHYS TECH

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PERSONNEL PI - G.YE. KACHAROV

BRIEF DESCRIPTION THE INSTRUMENT MEASURES X-RAYS IN THE ENERGY RANGE 2-511 KEV.

--- PROGNOZ 4, LOGACHEV------

INVESTIGATION NAME- ENERGETIC PARTICLES AND CHARGE COMPOSITION

NSSDC 10- 75-122A-04

INVESTIGATIVE PROGRAM SPACE PHYSICS

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS COSMIC RAYS

INST NUCLEAR PHYS Moscow State U

PERSONNEL PI - YU.I. LOGACHEV PI - I.A. SANENKO

BRIEF DESCRIPTION BRIEF DESCRIPTION THE INSTRUMENT CONSISTS OF VARIOUS DETECTORS FOR MEASURING THE SPECTRA, ANISOTROPY AND CHARGE COMPOSITION OF SOLAR AND GALACIIC COSMIS RAYS, AS WELL AS ENERGETIC PARTICLES IN THE MAGRETOSPHERE AND RADIATION BELTS. ELECTRON ENERGIES ABOVE 10 KEV AND PROTON ENERGIES ABOVE 50 KEV ARE COVERED IN SUFFICIENTLY WIDE INTERVALS. THE CHARGE COMPOSITION AT ENERGIES ABOVE 500 MEV PER NUCLEON IS OBTAINED AT CHARGE VALUES DETVIENT 2 - 2 - A, 15, 15, AND 50 BETWEEN 2 = 2, 6, 15, 35, AND 50.

PROGNOZ 4, SKREBTSOV------

INVESTIGATION NAME- ENERGETIC PARTICLE TELESCOPE

NSSDC 10- 75-122A-06

INVESTIGATIVE PROGRAM SOLAR-TERRESTRIAL PHYSICS

INVESTIGATION DISCIPLINE(S) Particles and fields Cosmic Rays

PERSONNEL PI - G.P. SKREBTSOV

LENGRAD INST PHYS TECH

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BRIEF DESCRIPTION AN ENERGETIC FOTICLE TELESCOPE WAS FLOWN TO MEASURE CHARGE COMPOSITION OF ENERGETIC PARTICLES WITHIN 0.9 TO 15 MEVVNUCLEON FOR Z .GE. 3, AND 0.2 TO 7.2 MEV/NUCLEON FOR Z EQUALS 1, 2.

---- PROGNOZ 4. YEROSHENKO-----

INVESTIGATION NAME- THREE AXIS FLUXGATE MAGNETOMETER

INVESTIGATIVE PROGRAM ---- PROGNOZ 5, KURT-----NS50C 10- 75-122A-01 SPACE PHYSICS INVESTIGATION NAME- ULTRAVIOLET PHOTOMETERS - HYDROGEN AND INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Particles and Fields HELTOM INVESTIGATIVE PROGRAM Solar-terrestrial physics NSSDC 10+ 76-112A+08 PERSONNEL PI - YE.G. YEROSHENKO INVESTIGATION DISCIPLINE(S) 12MIRAN SOLAR PHYSICS Interplanetary physics Astronomy BRIEF DESCRIPTION THE INSTRUMENT IS A TRIAXIAL FLUXGATE MAGNETOMETER FLOWN TO MEASURE VECTOR MAGNETIC FIELDS FROM 1 TO 60 GAMMAS. PERSONNEL PI - V.G. KURT PI - J.L. BERTAUX SPACE RES INST CNRS-LAS BRIEF DESCRIPTION THE OBJECTIVES OF THIS EXPERIMENT WERE TO -- (1) STUDY THE INTERPLANETARY MEDIUM NEUTRAL HYDROGEN, HELIUM DENSITY, AND TEMPERATURE, (2) STUDY THE RATIO OF NEUTRAL HE TO ATOMIC HYDROGEN, (3) DESERVE HE JONS IN PLASHASPHERE AND INTERPLANETARY MEDIUM, AND (4) TO STUDY THE GEOCORONA. THE THIN FILM PHOTOMETERS USED SPIRALTRONS AND THIN FILM FILTERS. ABSORPTION CELLS WERE ALSO USED. SPECIFICALLY, THE 304-A HE POSITIVE JON LINE, THE 584-A HE SOLAR LINE, AND THE 586-A HE LINE WERE MEASURED USING THIN FILM FILTERS. THE 1216-A H LYMAN-ALPHA LINE WAS MEASURED WITH AN ABSORPTION CELL. SPACECRAFT COMMON NAME- PROGNOZ 5 Alternate Names- 09557 NSSDC 10- 76-112A LAUNCH DATE- 11/25/76 Launch Site-Launch Vehicle-WEIGHT- KG SPONSORING COUNTRY/AGENCY UNKNOWN U.S.S.R. INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC Orbit Period- 5713. Min Periápsis- 510. Km --- PROGNOZ 5, LICKIN---EFOCH DATE- 11/26/76 Inclination- 65. Deg Apgapsis- 199000. KM INVESTIGATION NAME- SOFT X-RAYS INVESTIGATIVE PROGRAM ASTROPHYSICS NSSDC ID- 76-1124-07 PERSONNEL PH - UNKNOWN PS - A.A. GALEEV INVESTIGATION DISCIPLINE(S) 1K1 X-RAY ASTRONOMY BRIEF DESCRIPTION PROGNOZ 5 CARRIED SCIENTIFIC APPARATUS FOR RESEARCH OF RADIATION FROM THE SUN, SOLAR WIND, MAGNETIC FIELDS IN CIRCUMTERRESTRIAL SPACE, RADIO TRANSMITTER, RADIO SYSTEM FOR PRECISE MEASUREMENTS OF ORBIT ELEMENTS, AND RADIO TELEMETRY SYSTEM. PERSONNEL PI - 0.B. LICKIN PI - B. VAUNICEK IKI ASTRON DBS (KHARKOV) BRIEF DESCRIPTION SOFT X-RAYS WERE MEASURED IN ENERGY RANGE FROM 2 TO 100 KEV IN FIVE BANDS. ----- PROGNOZ 5, GRIGORYEVA-----INVESTIGATION NAME- KILOMETRIC/HECTOMETRIC RECEIVER ---- PROGNOZ 5, LOGACHEV------INVESTIGATION NAME- ENERGETIC PARTICLES CHARGE COMPOSITION INVESTIGATIVE PROGRAM NS50C ID- 76-112A-05 SPACE PHYSICS INVESTIGATIVE PROGRAM NSSDC 10- 76-112A-04 INVESTIGATION DISCIPLINE(S) Solar physics SPACE PHYSICS INVESTIGATION DISCIPLINE(5) PARTICLES AND FIELDS PERSONNEL PI - V.F. GRIGORYEVA STERNBERG ASTRON INST COSMIC RAYS A KILDMETRIC/HECTOMETRIC RECEIVER WAS FLOWN TO MEASURE Electric and magnetic fields from 50 kHz to 1 MHz in 10 Channels. PERSONNEL PI - YU.I. LOGACHEV INST NUCLEAR PHYS BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE WAS TO MEASURE SPECTRA, ANISOTROPY, AND CHARGE COMPOSITION ABOVE 500 MEW/NUCLEON FOR 2 FROM 2 TO 6, 6 TO 10, 15 TO 35, AND 35 TO 50. ----- PROGNOZ 5, GRINGAUZ----INVESTIGATION NAME- PLASHA DETECTOR INVESTIGATIVE PROGRAM Solar-Terrestrial Physics NSSDC ID- 76-1124-02 INVESTIGATION NAME- ENERGETIC PARTICLES CHARGE AND MASS COMPOSITION INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS INVESTIGATIVE PROGRAM SPACE PHYSICS NSSDC 10- 76-1124-06 PERSONNEL PI - K.1. GRINGAUZ INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS 1KI BRIEF DESCRIPTION A PLASMA DETECTOR KAS FLOWN ID NEASURE ION SPECTRA FROM 0.1 to 4.4 KeV. An Electron probe was also included to measure density and temperature below 300 eV. COSMIC RAYS PERSONNEL PI - V.N. LUTSENKO SPACE RES INST BRIEF DESCRIPTION THE EXPERIMENT WAS FLOWN TO MEASURE ENERGETIC PARTICLE CHARGE AND MASS COMPOSITION IN THE ENERGY RANGE FROM 7 TO 30 MEVVNUCLEON. ----- PROGNOZ 5, KACHAROV---INVESTIGATION NAME- SOLAR X-RAYS INVESTIGATIVE PROGRAM Solar-terrestrial physics NSSDC ID- 76-112A-03 ----- PROGNOZ 5. YERDSHENKO------INVESTIGATION NAME- THREE-AXIS FLUXGATE MAGNETOMETER INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY Solar Physics NSSDC ID- 76-112A-01 INVESTIGATIVE PROGRAM SPACE PHYSICS PERSONNEL INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Particles and fields PI - G.YE. KACHAROV LENGRAD INST PHYS TECH BRIEF DESCRIPTION Solar X-RAYS were measured from 2 to 511 KeV. PERSONNEL PI - YE.G. YEROSHENKO IZMIRAN

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BRIEF DESCRIPTION A THREE-AXIS FLUXSATE MAGNETOMETER WAS FLOWN TO MEASURE Vector fields from 1 to 60 gammas. - PROGNOZ 5, ZERTSALOV------INVESTIGATION NAME- PLASMA SPECTROMETERS INVESTIGATIVE PROGRAM Solar-Terrestrial physics NSSDC 10- 76-1124-09 INVESTIGATION DISCIPLINE(5) Particles and fields SPACE RES INST CESR PERSONNEL PI - A.A. ZERTSAL PI - J.M. BOSQUED GRIEF DESCRIPTION PLASMA SPECTROMETERS WERE FLOWN 10 MEASURE ELECTRONS FROM 3 EV TO 15 KEV, PROTONS FROM 3 EV TO 15 KEV, AND POSITIVE IONS FROM 3 EV TO 4 KEV WITH MASS RESOLUTION. SPACECRAFT COMMON NAME- RAE-0 Alternate Names- Radio Astronomy Explorer, PL-693B Explorer 49, 06686 6680 NSSDC ID- 73-039A WEIGHT- 328, KG LAUNCH DATE- D6/10/73 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- DELTA SPONSORING COUNTRY/AGENCY UNITED STATES NASA-055 INITIAL ORBIT PARAMETERS DRBIT TYPE- GEOCENTRIC Orbit Period- 221.17 Min Periapsis- 1052.98 KM EPOCH DATE- 06/21/73 Inclination- 55.7 deg Apoapsis- 1063.84 km PERSONNEL NASA HEADQUARTERS MASA HEADQUARTERS NASA-GSFC NASA-GSFC MG - J.R. HOLTZ SC - N.G. ROMAN PM - J.T. SHEA PS - R.G. STONE

PS - R.G. STONE NASA-GATU BRIEF DESCRIPTION THIS MISSION WAS THE SECOND OF A PAIR OF RADIO ASTRUMONY EXPLORER SATELLITES TO BE PLACED INTO ORBIT. IT WAS PLACED INTO LUNAR ORBIT ON JUNE 15, 1773, TO PROVIDE RADIO ASTRONOMICAL MEASUREMENTS OF THE PLANETS, THE SUM, AND THE RAILKY WAY OVER THE FREQUENCY RANGE OF 25 KM2 TO 13,1 MHZ. THE EXPERIMENT COMPLEMENT CONSISTED OF TWO RTLE-WONDERG RADIOMETERS (9 CHANNELS EACH), THREE SWEPT-FREQUENCY BURST RECEIVERS (32 CHANNELS EACH), THREE SWEPT-FREQUENCY BURST RECEIVERS (32 CHANNELS EACH), THREE SWEPT-FREQUENCY BURST RECEIVERS (32 CHANNELS EACH), THREE SWEPT-FREQUENCY BURST RECEIVERS (32 CHANNELS EACH), THRE DOWN THE MOON; A 183-M, LOWER V-ANTENNA POINTED AWAY FROM THE MOON; A 183-M, LOWER V-ANTENNA POINTED AWAY FROM THE MOON; A 183-M, LOWER V-ANTENNA SUFFACE. THE LOWER V-ANTENNA WAS EXTEMPED TO ITHE LUNAR SUFFACE. THE LOWER V-ANTENNA WAS EXTENDED TO ITHE CONSISTED OF A 1974. THE SPACECRAFT BODY WAS A TRUNCATED CYLLINGER 36.25 IN. IN DIAMETER APPROXIMATELY 31 IN. HIGH, WITH FOUR FIXED SOLAR PADDLES. THE MANEUVERING SYSTEM ONSISTED OF A HYDRAZIME VELOCITY CORRECTION PACKAGE, A COLD GAS ATITUDE CONTROL SYSTEM, AND A SOLID FUEL LUNAR INSERTION NOTOR. DATA WERE RETURNED TO THE EARTH VIA EITHER A LOW POWER, AND RANGE-RATE MEASUREMENTS AND SERVED PRINARLY FOR RANGE AND RANGE. A VHF TRANSMITTER IN REAL TIME, OR STORED IN AN NHF (400 MHZ) TRANSMITTER AND TRANSMITTED TO EARTH VIA A HIGH POWER UHF TRANSMITTER (400 MHZ). TWO TAPE RECORDERS PROVIDED BACKUP STORAGE. A VHF TRANSMITTER SERVED PRINARLY FOR RANGE AND RANGE-RATE MEASUREMENTS AND SERVED AS A BACKUP. COMMANDS AND RANGE-RATE MASUREMENTS AND SERVED TRIMARLY FOR ANDE AND RANGE-RATE MASUREMENTS AND SERVED TRIMARLY FOR ANDE AND RANGE-RATE MAGE AND RANGE-RATE SYSTEM. SPACECRAFT ATTITUDE VER UHF TRANSMITTER TO AND RANGEHART WAS ACUUP. COMMANDS NERGE STSIEM, AND (3) A PANORAMIC ATTITUDE SENSOR SYSTEM, AND VAS ACCURATE TO ONE DES. THE SPACECARATE WAS GRAVITY GRADIENT ORIENTED (7 AXIS PARALLEL TO LOCAL

--- RAE-B, STONE----

INVESTIGATION NAME- STEP FREQUENCY RADIOMETERS

NEEDG ID-	73-0394-01	INVESTIGATIVE	PROGRAM

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CODE SA INVESTIGATION DISCIPLINE(5)

ACTONNEY IONDSPHERES AND RADIO PHYSICS

ERSONNEL		NA5A-GSFC
PI - R.G.	STONE	NASA-GSEC
01 - R.R.	WEBER	NASA-GSFC
01 - L.W.	BROWN	NASA-GSFC
01 - J.F.	CLARK	NASA-GSEC

BRIEF DESCRIPTION THE RYLE-VONBERG RECEIVERS WELE DESIGNED TO PROVIDE THE RYLE-VONBERG RECEIVERS WELE DESIGNED TO PROVIDE GANDWIDTH. CHANGES. THERE WERE TWO RECEIVERS -- RV-1 CONNECTED TO THE UPPER V-ANTENNA AND RV-2 CONNECTED TO THE LOWER TO THE UPPER V-ANTENNA AND RV-2 CONNECTED TO THE LOWER TO THE WAS THE RADIONETERS HAD AN EFFECTIVE BANDWIDTH OF AD KHZ AND A POST-DETECTION TIME CONSTANT OF 0.1 S. A COANSE OUTPUT CHANNEL WAS OBTAINED FROM THE INTEGRATED SERVO-LOUP ERROR SIGNAL. AND A FINE OUTPUT CHANNEL WAS OBTAINED FROM THE TIME CONSTANT FOR THE FINE CHANNEL WAS 0.5 S. A THERMISTOR LOCATED IN THE RECEIVER MEASURED THE ANDIENT TEMPERATURE, WHICH WAS TELEMETERED EVERY 19.7 MIN IN THE HOUSEKEEPING DATA. THE RECEIVERS OPERATED AT NIME FREMENCIES FROM 0.45 TO 9.16 MHZ. RECEIVERS OPERATED AT NIME FREMENCIES FROM 100 FINE SAMPLES WERE TAKEN. OF THE EIGHT COARSE SAMPLES. THE FIRST WAS NOT RELIABLE SINCE NOT ENDUGT TIME HAD ELAPSED FOR THE RECEIVER TO STABILIZE ATTER THE FREQUENCY SWITCH WAS RADE.

- RAE-B, STONE------

INVESTIGATION NAME- RAPID-BURST RECEIVERS INVESTIGATIVE PROGRAM CODE SA

NSSDC 10- 73-039A-02

INVESTIGATION DISCIPLINE(S) ASTRONOMY MAGNETOSPHERIC PHYSICS Solar Physics

PERSONNEL PI = R.G. OI = J.K. OI = J. OI = J.F.	STGNÊ Alexander; Jr. Fainberg Clark Maittson	NASA-GSFC NASA-GSFC NASA-GSFC NASA-GSFC NASA-GSFC NASA-GSFC
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DI - J., FAIMBERG
 MALTISON
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 MALTISON
 BRIEF DESCRIPTION
 THE BURST RECEIVERS WERE 32-CHANNEL, STEPPED-FREQUENCY
 THE DUPER V-ANTENNA, AND DNE RECEIVER (BR-1) WAS CONNECTED TO
 TO THE UPPER V-ANTENNA, AND DNE RECEIVER (BR-2) WAS CONNECTED TO
 THE DIPOLE ANTENNA, BIT IT FAILED ON WE WERE INTO THE FLED POINT
 OF EACH HALF OF THE V-ANTENNA MAD DIE RECEIVER (WAS SOMPLETED TO
 THE LOWER V-ANTENNA, BIT THE AFF VOLTAGE AT THE FEED POINT
 OF EACH HALF OF THE V-ANTENNA MAD SAMPLE AT SAMPLIFIER OUTPUTS WERE
 COMBINED IN A BALUM TRANSFORMER MAD THE PREAMPLIFIER OUTPUTS WERE
 COMBINES IN A BALUM TRANSFORMER MAD THE PREAMPLIFIER OUTPUTS WERE
 COMBINES IN A BALUM TRANSFORMER MAD THE PREAMPLIFIER OUTPUTS WERE
 COMBINES IN A BALUM TRANSFORMER MAD THE PREAMPLIFIER WAS USED AS A
 STRIP WAS POWERED ON AT A GIVEN INCL. AND MIXERS. ONLY ONE IF
 RECEIVER PREVENTED STAILERS AT THE IMPUT OF THE BURST
 RECEIVER PREVENTED STAIL OF A MERSISTAL CONTROLLED IF AND MIXERS. MOLY OF INTER AND THE CONSTANT OF A MEXAMISTION UNAS INCLUDED
 THE HOUSSKEEPING DATA TELEMETRED EVERT 197 NIN. ALSO, THE
 NIN EVERY 19,7 NIN. AND CALIHARTION MAS INCLUDED
 NINE ANTENNA SIGNAL MENNERMENT SEQUENCE WAS INTERBUTED FOR
 NIN EVERY 19,7 NIN. AND CALIHARTION MOLES SUBJECE SIGNALS
 THE HE ADUSKEEPING DATA TELEMETRE DEVERT 19.7 NIN. ALSO, THE
 HORST RECEIVER NAS THE INFORMATION WAS INCLUDED
 NINE ANTONIC SECHVER AND THES SUBJECE SUBJECE SUBJECE SUBJECE
 NIN EVERY 19,7 NIN. AND CALIHARTION MOLES SUBJECE SIGNALS

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--- RAE-B, STONE------

INVESTIGATION NAME- IMPEDANCE PROBE

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----- \$3-1, #CI55AC------INVESTIGATIVE PROGRAM CODE SA NSSDC 10- 73-039A-03 INVESTIGATION NAME- ION DENSITY GAUGES INVESTIGATION DISCIPLINE(5) INVESTIGATIVE PROGRAM NSSDC 10- 74-085C-02 ASTRONOMY **IONDSPHERES AND RADIO PHYSICS** INVESTIGATION DISCIPLINE(5) Atmospheric physics PERSONNEL RSONNEL PI - R.G. STONE OI - J.L. DONLEY OI - J.E. GUTHRIE OI - J.A. KANE OI - R.C. SOMERLOCK NASA-GSEC NASA-GSEC NASA-GSFC NASA-GSFC NASA-GSFC PERSONNEL PI - J.R. MCISSAC USAF GEOPHYS LAB BRIEF DESCRIPTION TWO IONIZATION DENSITY SENSORS AND A COLD CATHODE ION GAUGE WERE USED TO OBSERVE ATMOSPHERIC MEUTRAL DENSITIES. THE NEUTRAL PARTICLES WERE IDMIZED BY THE DETECTOR, AND THE ION CURRENT TO A CHARGED COLLECTOR PROVIDED THE DATA FROM WHICH THE NEUTRAL DENSITY PROFILES WERE DETERMINED. IT WAS INTENDED TO OBTAIN NEUTRAL DENSITIES BETWEEN 175 AND 485 KM. WITH DATA LIMITED TO THE PERIGEE REGION OF THE ORBIT. THE 7-MONTH EXPERIMENT LIFETIME PROVIDED DATA COVERAGE OVER AN APPRECIABLE SPAN OF SOLAR TIME (DUE TO THE ORBIT PRECESSION) AND OVER ALL ALTITUDES (DUE TO PERIGEE MOTION). NASA-GSEC BRIEF DESCRIPTION THIS EXPERIMENT WAS AN ENGINEERING EXPERIMENT TO CHECK THE UPPER V-ANTENNA. IT WAS USED ONLY FOR ROUTINE CONFIRMATION OF ANTENNA CHARACTERISTICS EARLY IN THE FLIGHT. SPACECRAFT COMMON NAME+ S3-1 Alternate Names+ SESP P73-5, ST73-54 ----- 53-1, PHILBRICK+-+-----NSSDC 10- 74-085C INVESTIGATION NAME- MASS SPECTROMETER LAUSCH DATE- 10/29/74 Launch Site- Vandenberg Afb, United States Langen Vehicle- Titan WEIGHT- KG N550C 10- 74-085C-03 INVESTIGATIVE PROGRAM SESP SF NSORING COUNTRY/AGENCY INVESTIGATION DISCIPLINE(S) Atmospheric physics UNITED STATES DOD-USAF INITIAL ORDIT PARAMETERS ORDIT TYPE- GEOCENTRIC ORDIT PERIOD- 126.6 MIN PERIAPSIS- 152.0 KM EPOCH DATE- 10/31/74 Inclination- 97.0 deg Apoapsis- 3795.0 km PERSONNEL PI - C.R. PHILBRICK USAF GEOPHYS LAB BRIEF DESCRIPTION BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MEASURE THE COMPOSITION AND CONSTITUENT DENSITIES OF THE ATMOSPHERE BETWEEN 140 AND 500 KM. OF PARTICULAR INTEREST WERE CONSTITUENT AND CONSTITUENT-DENSITY CHANGES CAUSED BY SOLAR AND GEDMAGNETIC PERSONNEL PM - UNKNOWN PS - J.R. STEVENS AEROSPACE CORP BRIEF DESCRIPTION THIS SATELLITE CARRIED EIGHT CONPLEMENTARY TYPES OF EXPERIMENTS, DESIGNED TO STUDY ATMOSPHERIC DENSITY AND ITS CHANGES AT LOW ALTITUDES. THE SATELLITE WAS SPIN STABILIZED, WITH THE SPIN AXIS PERPENDICULAR TO ITS POLAR ORBIT. ORBIT PRECESSION, WHEN THE ORBIT IS INCLINED MORE THAN 70 DEG, WAS LIMITED TO LESS THAN 0.5 DEG PER DAY. THIS LIMITED DOBSERVATIONS FOR SAMPLING TO LESS THAN ONE-FOURTH OF THE POSSIBLE 24 H OF LOCAL TIME OVER THE 7-MONTH SATELLITE VARIATIONS. ----- 53-1, PRAG----------INVESTIGATION NAME- SOLAR UV EXPERIMENT INVESTIGATIVE PROGRAM SESP NSSDC 10- /4-0850-04 INVESTIGATION DISCIPLINE(S) Solar Physics Atmospheric Physics LIFETIME. ----- 53-1, KOONS------PERSONNEL INVESTIGATION NAME- ELF-VLF RECEIVER AEROSPACE CORP P1 - A.B. PRAG NSSDC 10- 74-0850-07 INVESTIGATIVE PROGRAM BRIEF DESCRIPTION SESP BRIEF DESCRIPTION THIS EXPERIMENT MEASURED THE ABSOLUTE INTENSITY OF THE SOLAR UV FLUX (BETWEEN 300 AND 1800 A) IN IDENT, ON THE EARTH'S ATMOSPHERE. THE WAVELENGTH BANGS OF PARTICULAR INTEREST (300 To 1000 A AND 1400 TO 1600 A) WERE (HOSE MOST CLOSELY RELATED TO NEUTRAL DENSITY VARIATIONS AND VARIATION IN COMPOSITION INVESTIGATION DISCIPLINE(S) ATMOSPHERIC PHYSICS COACE DI ACMAS PARTICLES AND FIELDS ABOVE 120 KM. PERSONNEL PI - H.C. KODNS -- 53-1, RICE-------AEROSPACE CORP INVESTIGATION NAME- ELECTROSTATIC ANALYZER BRIEF DESCRIPTION BRIEF DESCRIPTION THE PURPOSE OF THIS EXPERIMENT WAS TO OBSERVE THE AC ELECTRIC AND MAGNETIC FIELDS IN THE ATMOSPHERE ABOVE 120 KM. CORRELATIVE STUDIES OF THESE OBSERVATIONS WITH DENSITY (AND OTHER DENSITY-RELATED PHENDMENA) HELPED TO DETERMINE CAUSES FOR DENSITY VARIATIONS IN THE UPPER ATMOSPHERE. INVESTIGATIVE PROGRAM SESP NSSDC 10- 74-0850-05 INVESTIGATION DISCIPLINE(S) Athospheric physics SPACE PLASMAS --- S3-1, MARCOS------PERSONNEL INVESTIGATION NAME- ACCELEROMETER DENSITY OBSERVATIONS AEROSPACE CORP PT - C.J. JUL ST INVESTIGATIVE PROGRAM SESP NSSDC 10- 74-0850-01 BRIEF DESCRITTION THE PURPOSE OF THIS EXPERIMENT WAS TO OBSERVE THE ELECTRON AND ION FLUXES IN THE 120- TO 500-KM REGION OF THE ATMOSPHERE. CORRELATIVE STUDIES OF THESE (BSERVATIONS WITH DENSITY (OR OTHER DENSITY-RELATED PHENOMENA) HELPED DETERMINE CAUSES FOR DENSITY VARIATIONS IN THIS REGION. INVESTIGATION DISCIPLINE(S) Atmospheric physics PERSONNEL PI - F.A. MARCOS USAF GEOPHYSICS LAB -- S3-1, RICE---------BRIEF DESCRIPTION THIS EXPERIMENT STUDIED NEUTRAL DENSITY AND ITS VARIATIONS BETWEEN 135 AND 485 KM. THE EQUIPMENT CONSISTED TO TWO DIFFERENT ACCELENDRETERS. DENSITY PROFILES NEAR PERIGEE WERE COMPUTED FROM SPACECRAFT ACCELERATION DATA AND KNOULDGE OF THE SPACECRAFT SAMPE MASS, AND ALTITUDE. WITH DATA LIMITED TO THE PERIGEE REGION OF THE OUTPUT, THE 7-MONTH EXPERIMENT LIFFLIME PROVIDED DATA COVERAGE OVER AN APPRECIABLE SPAN OF SOLAR TIME (OUE TO THE ONEL PRECESSION) AND OVER ALL LATITUDES (DUE TO PERIGEE MOTION). INVESTIGATION NAME- RETARDING POTENTIAL ANALYZER NSSDC 10- 74-0850-06 INVESTIGATIVE PROGRAM SESP INVESTIGATION DISCIPLINE(S) Atmospheric physics Space plasmas

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PERSONNEL PI - C.J. RICE

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AEROSPACE CORP

BRIEF DESCRIPTION THE PURPOSE OF THIS EXPERIMENT WAS TO OBSERVE THE PLASMA TENPERATURES IN THE 120- TO 500-KM REGION OF THE ATMOSPHERL. Correlative Studies of these observations with density (or other obnity-related phenomena) helped to determine causes for density variations in this region. BRIEF DESCRIPTION

SPACEGRAFT CONMON NAME- 53-2 Alternate Names- Sesp 573+6

N550C 10- 75-1148

LAUNCH DATE- 12/03/75 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE-WEIGHT- KG

SPONSORING COUNTRY/AGENCY United States DOD-USAF

ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 96. Min Periapsis- 230. Km	ÉPOCK DATE- NOMINAL Inclination- 97. deg Apgap515- 900. Km
PERSONNEL	

PM - SANSO PS - J.R. STEVENS AEROSPACE CORP

BRIEF DESCRIPTION THIS SPACECRAFT WAS A SPIN-STABILIZED OBSERVATORY MDUNTING 13 SCIENCE EXPERIMENT SENSORS. THE PLANNED POLAR ORDIT (APPROXIMATELY 230 BY 900 KM) COVERED A SUFFICIENT VOLUME OF SPACE TO DOSERVE DENSITY CHANGES IN THE LOWER PART OF THE DRDIT AND OTHER PARAMITERS AT HIGHER LEVELS THAT RELATED TO THESE DENSITY VARIATIONS.

----- 53-2, FENNELL---

INVESTIGATION NAME- ENERGETIC ELECTRON (0.1+ 1.0 MEV) SENSOR

INVESTIGATIVE PROGRAM NSSDC 10- 75-1148-06 SESP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS

PERSONNEL		
PI - J.F. 01 - W.	FENNELL Noomey Kolasinski	AEROSPACE CORP Los Alanos SCI Lab Aerospace corp

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT EMPLOYED AN ELECTROMAGNETIC ANALYZER TO OBS' VE FLUX, ENERGY SPECTRA, AND DIRECTION OF ELECTRONS IN THE O. 10 1.0-MEV ENERGY RANGE, DESERVATIONS WERE MADE OVER THE TARE ORBIT (200 to 900 km) DURING A PERIOD OF INCREASING SOLAR ACTIVITY. THEY WERE USED WITH OTHER OBSERVATIONS MADE FROM THIS SPACECRAFT TO HELP DETERMINE CAUSES FOR DENSITY WARIATIONS IN THE NEUTRAL ATMOSPHERE.

- 53-2, FENNELL--------

SESP

INVESTIGATION NAME- PROTON TIME-OF-FLIGHT AND PROTON ALPHA Counters

NSSDC ID- 75-1148-14 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS Particles and fields

PERSONNEL AEROSPACE CORP P1 - J.F. FENNELL

BRIEF DESCRIPTION THIS EXPERIMENT MEASURED PROTONS FROM ABOVE 0.4 TO ABOVE 9 MEV IN 6 CHANNELS, PROTONS ABOVE 400 KEV, AND ALPHAS FROM 1 TO 34 HEV.

- 53-2, MARCOS------

INVESTIGATION NAME- TRIAXIAL PIEZOELECTRIC ACCELEROMETER

INVESTIGATIVE PROGRAM NSSDC 10- 75-1148-10 SESP

INVESTIGATION DISCIPLINE(S) Atmospheric physics

PERSONNEL PI - F.A. MARCOS OI - J.P. MCISAAC

USAF GEOPHYS LAB USAF GEOPHYS LAB

BRIEF DESCRIPTION THIS EXPERIMENT STUDIED ATMOSPHERIC DENSITY AND ITS VARIATIONS IN THE REGION NEAR SATELLITE PERIGEE. THE EXPERIMENT CONSISTED OF A CANTILEVENED PYROELECTRIC BEAM LOADED WITH A MASS. ATMOSPHERIC DRAG CHANGES PRODUCING PRESSURE CHANGES IN THE BEAM PRODUCE AN ELECTRIC CURRENT. THE THREE-COMPONENT CURRENT VALUES WERE USED TO COMPUTE DENSITY THREE-COMPONENT CURRENT PERIAMS OF THE ORDIT. VALUES IN THE ACCELERATING REGIONS OF THE ORDIT.

--- 53-2, #C155AC-----

INVESTIGATION NAME- NEUTRAL DENSITY EXPERIMENTS (COLD AND Hot cathode gauges)

INVESTIGATIVE PROGRAM NSSDC 10- 75-1148-01 SESP

INVESTIGATION DISCIPLINE(S) ATNOSPHERIC PHYSICS

PERSONNEL PI - J.P. MCISSAC

USAE GEORNYS LAB

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BRIEF DESCRIPTION THIS EXPERIMENT STUDIED MEUTRAL DENSITY WAR: ATIONS ABOVE 230 KM OVER A WIDE RANGE OF LATITUDE, OF PARTICULAR INTEREST WAS THE ASSOCIATION OF THE OBSERVED DENSITY WARIATIONS WITH GEOMAGNETIC AND SOLAR PARAMETERS TO BETTER IDENTIFY AND INVESTIGATE THE INTERELATIONSHIPS WHICH OCCURRED. THE FREE IONS WERE REMOVED MEAR THE INSTRUMENT APERTURE BY NEGATIVELY CHARGED PLATES. THE NEUTRALS WERE PASSED BETWEEN A HOT FILAMENT AND A COLLECTOR, ARRANGED AXIALLY WITHIN A GRID COIL. THE FILAMENT EMITTED ELECTRONS AND IONIZED THE MEUTRALS, WHICH THEN COULECTOR. DENSITIES WERE COMPUTED FROM THESE OBSERVED COLLECTOR-CURRENT VALUES. A COLL CATHODE INSTRUMENT WAS ALSO BE INCLUDED IN THIS EXPERIMENT AND OPERATED ON SIMILAR PRINCIPLES.

----- S3-2, PHILBRICK------

INVESTIGATION NAME- VELOCITY MASS SPECTROMETER

INVESTIGATIVE PROGRAM Sesp NSS00 10- 75-1148-02

INVESTIGATION DISCIPLINE(S) Atmospheric physics

USA, DEOPHYS LAB

PERSONNEL PI - C.R. PHILBRICK

BRIEF DESCRIPTION THIS EXPERIMENT IDENTIFIED ATMOSPHERIC CONSTITUENTS AND MEASURE THEIR DENSITIES. AMBIENT IONS WERE BE REMOVED, THE NEUTRALS IONIZED AND THE RESULTING IONS WERE THEN MASS SELECTED BY GRID-PRODUCED ELECTROSTATIC FIELDS. THE DIFFERENT IONS WERE BE SEQUENTIALLY SELECTED AND THEN GIVEN A KNOWN ACCELERATION. THE RESULTING TIME-OF-HIGHT DOWN A DRIFT TUBE IDENTIFIED THE ION MASS, AND A COUNTER AT THE END OF THE TUBE OBSERVED THE CONSTITUENT DENSITIES.

- \$3-2, RICE------

INVESTIGATION NAME- NEUTRAL DENSITY EXPERIMENT (COLD CATHODE GAGE)

INVESTIGATIVE PROGRAM NS50C 10- 75-1148-03 SESP

INVESTIGATION DISCIPLINE(5) Atmospheric Physics

AEROSPACE CORP

PERSONNEL PI - C.J. RICE

ORLET DESCRIPTION THIS EXPERIMENT STUDIED ATMOSPHERIC NEUTRAL DENSITIES AND THEIR LOCALIZED VARIATIONS. THE INSTRUMENT, AFTER REMOVING AMBIENT IONS. IONIZED NEUTRAL PARTICLES BY ELECTRON EMISSION FROM THE CATHODE. THE MEASURED PARAMETER WAS THE ION CURRENT TO A COLLECTOR.

-- 53-2; RICE----------

INVESTIGATION NAME- RETARDING POTENTIAL ANALYZER (RPA)

INVESTIGATIVE PROGRAM NSSDC 10- 75-1148-11

SESP INVESTIGATION DISCIPLINE(S)

IONOSPHERES ATHOSPHERIC PHYSICS

PERSONNEL PI - C.J. RICE

AEROSPACE CORP

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BRIEF DESCRIPTION THIS EXPERIMENT OBSERVEL UPWARD FLUX OF IONS FROM THE POLAR IONOSPHERE. DATA FROM THIS MERE USED IN CONJUNCTION WITH MEASURCHENTS OF OTHER POLAR REGION PARAMETERS AND THEIR VARIATIONS, INCLUDING COMPOSITION, CONSTITUENT AND TOTAL DENSITY. ENERGIZED PARTICLE FLUX, ETC. THE DBJECT OF THE STUDY WAS TO MORE ACCURATELY DEFINE PRODUCTION, LOSS, AND EQUILIBRIUM PROCESSES THAT OCCUR WITHIN AND NEAR THE AURORAL OVAL.

----- \$3-2, RICE-----PERSONNEL PI - P.J.L.WILDHAN INVESTIGATION NAME- RETARDING POTENTIAL ANALYZER USAF GEOPHYS LAB BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF A SPHERICAL ELECTRON SENSOR AND TWO ARRAYS OF FOUR PLANAR APERTURE ION SENSORS. BOTH IONS AND ELECTRONS FROM 0.1 TO 30 EV WERE MEASURED. ELECTRON DENSITIES FROM 10 TO 3.0 E+5 CM TO THE POWER -3 AND TEMPERATURES FROM 500 TO 10.000 DEG WERE OBTAINED. FOR IONS, THE DENSITY COULD BE OBTAINED BELOW ALTITUDE OF 5,000 KM. NS50C 10- 75-1148-13 INVESTIGATIVE PROGRAM SESP INVESTIGATION DISCIPLINE(5) IONOSPHERES ATNOSPHERIC PHYSICS PERSONNEL - 53-2, VATES-PI - C.J. RICE QI - P.J.L.WILDMAN AEROSPACE CORP USAF GEOPHYS LAB INVESTIGATION NAME- LOW ENERGY PROTON SPECTROMETER BRIEF DESCRIPTION NSSDC 10+ 75-1148-04 INVESTIGATIVE PROGRAM THIS EXPERIMENT USED AN ELECTROSTATIC ANALYZER TO OBSERVE ION AND ELECTRON DENSITY AS A FUNCTION OF ENERGY (2-300 EV) AND PITCH ANGLE. SESP INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS ---- 53-2, SHUNAN-------PERSONNEL PI ~ K. INVESTIGATION NAME- MAGNETOMETER YATES USAF CANBRIDGE RES LAB NSSDC ID- 75-1148-08 INVESTIGATIVE PROGRAM SESP BRIEF DESCRIPTION DRIEF DESCRIPTION THIS INSTRUMENT CONSISTED OF A SOLID-STATE PARTICLE TELESCOPE TO MEASURE PROTONS FROM 0.1 TO 6 NEV. THE ENERGY SPECTRUM WAS OBSTAINED BY A 12-CHANNEL ANALYZER. TRAPPED PROTONS IN BOTH THE INNER AND GUTER ZONE COULD BE MEASURED ALDNG WITH SOLAR PROTONS WHEN THE SATELLITE PASSED OVER THE POLAR CAPS. INVESTIGATION DISCIPLINE(S) Particles and fields PERSONNEL PI - 8.M. SHUMAN DI - M. SMIDDY USAF GEOPHYS LAB USAF GEOPHYS LAB ---- \$3-2, YATES-BRIEF DESCRIPTION BRIEF DESCRIPTION THIS EXPERIMENT MEASURED MAGNETIC FIELDS ASSOCIATED WITH THE AURORAL REGION IN QUIET AND SUBSTORM PERIODS. THESE OBSERVATIONS WERE USED IN CONJUNCTION WITH OBSERVATIONS FROM OTHER EXPERIMENTS TO STUDY THE MECHANISMS OF EMERGY FLOW INTO THE AURORAL REGIONS DURING QUIET AND SUBSTORM PERIODS. MODELS ASSOCIATING AURORAL-EVENT SOURCES AND TAIL-REGION PARTICLES INVESTIGATION NAME- PROTON-ALPHA PARTICLE DETECTOR NSSDC 10- 75-1148-05 INVESTIGATIVE PROGRAM SESP INVESTIGATION DISCIPLINE(5) Magnétosphéric Physics Particles and fields WERE IMPROVED. -- 53-2, SMIDDY-----------PERSONNEL P1 - K. 0I - ₩. VATES USAF GEOPHYS LAB Los alàmos sci lab INVESTIGATION NAME- ELECTRIC FIELD OBSERVATIONS HOOHEY NSSDC 10- 75-1148-07 BRIEF DESCRIPTION THIS EXPERIMENT OBSERVED PROTONS AND ALPHA PARTICLES BETWEEN 200 AND 900 KN. THESE OBSERVATIONS WERE MADE OVER THE ENTIRE ORBIT OWRING A PERIOD OF INCREASING SOLAR ACTIVITY. THE RELATIVE EFFECT OF PROTON AND ALPHA PARTICLE VARIATIONS ON NEUTRAL DENSITIES MEASURED FROM THIS SPACECRAFT WERE STUDIED. INVESTIGATIVE PROGRAM SESF INVESTIGATION DISCIPLINE(S) Ionospheres Particles and fields PERSONNEL PI - M. SMIDDY USAF GEOPHYS LAB ******************* BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF THREE-COMPONENT OBSERVATIONS OF THE IGNOSPHERIC ELECTRIC FIELDS ASSOCIATED WITH THE AURORAL ELECTROJET. THESE OBSERVATIONS WERE USED IN CONJUNCTION WITH OBSERVATIONS FROM OTHER EXPERIMENTS TO STUDY THE MECHANISMS OF ENERGY FLOW INTO THE AURORAL REGIONS DURING QUIET AND SUBSTORM PERIODS. SPACECRAFT COMMON NAME- 53-3 Alternate NAMES- SESP 574-24, 574-2 5574-24 NSSDC ID- 76-0659 LAUNCH DATE- 07/08/76 Launch Sité- Vandenberg AFB, United States Launch Vehicle-WEIGHT- KG ----- 53-2, VANCOUR-------INVESTIGATION NAME- ELECTROSTATIC ANALYZER SPONSORING COUNTRY/AGENCY UNITED STATES NSSDC 10- 75-1148-09 INVESTIGATIVE PROGRAM SESP DOD-USAF ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 176.6 Min Periapsis- 246. KM INVESTIGATION DISCIPLINE(S) EPOCH DATE- NOMINAL Inclination- 97.5 Apoapsis- 7856. Km 5 DEG ATMOSPHERIC PHYSICS PERSONNEL PERSONNEL PI - R.P. VANCOUR OI - M. SMIDDY USAF GEOPHYS LAB USAF GEOPHYS LAB PM - SAMSO / PS - J.R. STEVENS USAF-LAS Aerospace corp BRIEF DESCRIPTION HRIEF DESCRIPTION THIS EXPENSION OUSERVED PROTON AND ELECTRON FLUX FROM 1 TO 20 KEV ASSOCIATED WITH THE AURORAL REGIONS DURING QUIET AND SUBSTORM PERIDDS. THESE DATA WERE USED IN CONJUNCTION WITH OBSERVATIONS FROM OTHER EXPERIMENTS TO STUDY THE MECHANISMS OF ENERGY FLOW INTO THE AURORAL REGIONS. MODELS ASSOCIATING AURORAL-EVENT ENERGY SOURCES AND TAIL-REGION PARTICLES WERE THOPOWER. BRIEF DESCRIPTION BRIEF DESCRIPTION THIS SPACECRAFT WAS A SMALL OBSERVATORY IN A NEAR-POLAR ORDIT WITH EIGHT DIFFERENT SENSORS ON BOARD. IT WAS DESIGNED TO OBSERVE VARIOUS MAGNETOSPHERIC PARAMETERS AND THEIR INTERRELATIONSHIPS., SENSORS, WHICH OBSERVED ENERGETIC PROTONS AND ALPHA PARTICLES, ALSO PROVIDED REAL-TIME OBSERVATIONS FOR USE BY THE SPACE FORECAST FACILITY (USAF-AWS). IMPROVED - \$3-3, FENNELL--------- \$3-2, WILDMAN------INVESTIGATION NAME- ION-ELECTRON MASS SPECTROMETER INVESTIGATION NAME- LOW ENERGY ELECTRONS AND PROTONS N5SDC ID- 76-0658-08 INVESTIGATIVE PROGRAM NSSDC 10- 75-1148-12 INVESTIGATIVE PROGRAM SESP SESP INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS Space plasmas INVESTIGATION DISCIPLINE(S) IONOSPHERES ATNOSPHERIC PHYSICS

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----- 53-3, WILDHAN-----PERSONNEL AFROSPACE CORP INVESTIGATION NAME- ELEPTRIC FIELDS-ION DRIFT PI - J.F. FENNELL BRIEF DESCRIPTION THIS EXPERIMENT MEASURED THE H-HE PARTICL'S DISTRIBUTION AT INJECTION INTO RADIATION BELTS AND THROLGHOUT THE OUTER REGIONS OF THE MAGNETOSPHERE. THIS INSTRUMENT MEASURED THE FLUX OF 1H+, CHE++ IN THE ENERGY RANGE FROM 0.09 10.4 KEV/CHARGE AND ELECTRONS FROM 0.17 TO 8.4 KEV. INVESTIGATIVE PROGRAM SESP NSSDC 10- 76-0658-05 INVESTIGATION DISCIPLINE(S) Magnetospheric physics IONOSPHERES MAGNETOSPHERIC PHYSICS ----- 53-3, KOONS------PERSONNEL USAF GEOPHYS LAB USAF GEOPHYS LAB USAF GEOPHYS LAB PI - P.J.L.WILDMAN DI - R.C. SAGALYN DI - M. SMIDDY INVESTIGATION NAME- ELF/VLF RECEIVER INVESTIGATIVE PROGRAM NSSDC ID- 76-0658-06 SE5P BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF A SPHERICAL ELECTRON SEASOR AND TWO ARRAYS OF FOUR PLANAR APERTURE ION SEASORS. BOTH IONS AND ELECTRONS FROM D.1 TO 3D EV WERE MÉASURED. ELECTRON DENSITIES FROM 10 TO 3.0 E+5 CM TO THE POWER -3 AND TEMPERATURES FROM 50D TO 10,000 DEG WERE OBTAINED. FOR 10NS, THE DENSITY COULD BE OBTAINED BELOW ALTITUDE OF 5,000 KM. INVESTIGATION DISCIPLINE(S) SPACE PLASMAS PARTICLES AND FIELDS PERSONNEL AERUSPACE CORP NASA HEADQUARTERS PI - H.C. KOONS DI - D.P. CAUFFMAN - 53-3, YATES-BRIEF DESCRIPTION THIS EXPERIMENT MEASURED THE LINEAR AND NON-LINEAR EFFECTS OF THE ENVIRONMENT ON THE MEAR-EARTH MAGNETIC FIELD. IT PROVIDED ANTENNA IMPEDANCE MEASUREMENTS ON AN ELECTRIC-FIELD ANTENNA FOR FREQUENCIES FROM 0.1 TO 20 KHJ. THE EXPERIMENT WAS AUGHOTOSPHERE TO OBSERVE AMDIENT ELECTRIC FIELDS IN THE MAGHETOSPHERE TO DETERMINE THE EFFECTIVENESS OF WAVE-PARTICLE ; TERACTIONS AS A LOSS MECHANISM FOR EMERGITIC ELECTRONS FROM CME DUTER RADIATION ZONE. THE SENSING EQUIPMENT CONSISTED OF THE ANTENNA, AND THE ASSOCIATED RECEIVER ELECTRONICS PACKAGE. BRIEF DESCRIPTION INVESTIGATION NAME- LOW-ENERGY PHOTON SPECTROMETERS INVESTIGATIVE PROGRAM NSSDC ID- 76-0658-03 SESP INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS PERSONNEL USAF CAMBRIDGE RES LAB YATES P1 - K. ----- \$3-3, MOZER-----BRIEF DESCRIPTION THIS EXPERIMENT OBSERVED PROTONS (0.1 TO 1GD MEV) TRAPPED WITHIN THE GEOMAGNETIC CAVITY. DATA WERE MADE AVAILABLE FOR REAL-TIME USE AND RECORDED FOR LONG-TERM STUDY. THE DATA WERE USED TO AID THE USAF AIR WEATHER SERVICE IN PROVIDING SPACE ENVIRONMENT FORECASTS AND TO DEVELOP IMPROVED TECHNIQUES FOR PERFORMING THESE FORECASTS. INVESTIGATION NAME- OC ELECTRIC FIELDS INVESTIGATIVE PROGRAM NSSDC 10- 76-0658-01 SESP INVESTIGATION DISCIPLINE(S) Particlés and fields Space plasmás -- 53-3, VATES----INVESTIGATION NAME- PROTON TELESCOPE PERSONNEL P1 ~ F.S. MOZER U OF CALIF, BERKELEY INVESTIGATIVE PROGRAM NSSBC 10- 76-0658-04 ERIEF DESCRIPTION THIS EXPERIMENT MADE VECTOR ELECTRIC FIELD MEASUREMENTS, UNDER VARIOUS CONDITIONS, AT A VARIETY OF MAGNETOSPHERIC LOCATIONS. THE MEASUREMENTS WERE USED IN STUDYING VARIATIONS IN RADIO FREQUENCY, WAVE PROPAGATION, OPTICAL EMISSIONS, ETC., OBSERVED WITH DTHER EXPERIMENTAL EQUIPMENT. SESP INVESTIGATION DISCIPLINE(S) Particles and fields PERSONNEL PI - K. USAF CAMBRIDGE RES LAB YATES ----- \$3-3, SHARP------BRIEF DESCRIPTION THIS EXPERIMENT OBSERVED ALPHA-PARTICLE POPULATION (20-100 NEV) WITHIN THE GEOMAGNETIC CAVITY. DATA WERE MADE AVAILABLE FOR REAL-TIME USE AND ALSO RECORDED FOR LONG-TERM STUDY. THE PRIMARY USE OF THE DATA WAS BY USAF AIR WEATHER SERVICE IN PROVIDING SPACE ENVIRONMENT FORECASTS AND IN DEVELOPING IMPROVED TECHNIQUES FOR THESE FORECASTS. INVESTIGATION NAME- LOW-ENERGY PARTICLE SPECTROMETER INVESTIGATIVE PROGRAM NSSDC ID- 76-0658-02 INVESTIGATION DISCIPLINE(S) Particles and fields Magnetospheric physics Space plasmas SPACECRAFT COMMON NAME- SAN MARCO 4 Alternate Names- San Marco-C-2, 07154 SM-C2 PERSONNEL LOCKHEED PALO ALTO PI - R.D. SHARP BRIEF DESCRIPTION THIS INSTRUMENT CONSISTED OF AN ELECTROSTATIC ANALYZER FOLLOWED BY A CROSSED ELECTRIC-MAGMETIC FIELD VELOCITY SELECTOR TO MEASURE LONS FROM 1 TO 32 MASS UNITS (U) AND ABOVE 32 U. THE EMERGY/CHARGE RANGED FROM 0.5 TO 16 KEV. ELECTRONS WERE MEASURED FROM 0.07 TO 24 KEV. OBSERVATIONS WERE MADE PERPENDICULAR TO THE ORBIT PLANE. NSSDC 10- 74-009A WEIGHT- 164. KG LAUNCH DATE- 02/18/74 Launch Site- San Marco Platform, off coast of kenya Launch Vehicle- Scout SPONSORING COUNTRY/AGENCY UNITED STATES NASA-055 --- 53-3, VAMPOLA---CRA INVESTIGATION NAME- ENERGETIC ELECTRON MAGNETIC SPECTRONETER INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC Orbit Period- 96.3 Min Periapsis- 232.0 Km EPOCH DATE- 02/19/74 Inclination- 2.9 deg Apoapsis- 905.0 KM NSSDC 10- 76-0658-07 INVESTIGATIVE PROGRAM SESP INVESTIGATION DISCIPLINE(S) PERSONNEL NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSFC PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS MG - J.R. HOLTZ SC - E.R. SCHMERLING PM - A.J. CAPORALE PS - G.P. NEWT.A PERSONNEL PI - A.L. VAMPOLA NASA-GSEC AEROSPACE CORP BRIEF DESCRIPTION THE ITALIAN-BUILT SAN MARCO C-2 SPACECRAFT WAS PART OF A COOPERATIVE SPACE EFFORT DETWEEN THE ITALIAN SPACE COMMISSION (CRA) AND HASA. THE SCIENTIFIC OBJECTIVE OF SAN MARCO C-2 WAS TO PROVIDE MEASUREMENTS OF THE DIURNAL VARIATIONS OF EQUATORIAN NEUTRAL THERMOSPHERE DENSITY, COMPOSITION, AND TEMPERATURE FOR CORRELATION WITH SIMULTANEOUS ATMOSPHERIC EXPLORER (CAE-C) DATA, TO BE USED IN STUDIES OF THE PHYSICS AND DYNARIES OF THE LOWER THERMOSPHERE. THE SPACECRAFT CARRIED (1) A NEUTRAL BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF A 12-CHANNEL MOMETIC Spectrometer used to obtain values and monitor chanles in the Equatorial pitch-angle and energy distribution of 0.012 to 1.4-MeV electrons as a function of magnetic activity. The Experiment also measured protons from 0.08 to 3 MeV and Alpha Particles above 4 MeV.

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ATMOSPHERE, COMPOSITION EXPERIMENT (NACE) TO DETERMINE UPPER Atmospheric (160 km and above) concentrations of Argon, Helium, Atomic Divisen and Molecular Divisen and Nitrogen, (2) a Neutral Atmospheric temperature experiment to determine the temperature of Ambient Molecular Nitrogen and (3) an Accelerometer to Measure atmospheric density Near Satellite Perigee,

--- SAN MARCO 4. NEWTON---INVESTIGATION NAME- NEUTRAL ATMOSPHERE COMPOSITION

NSSOC ID- 74-009A-02 INVESTIGATIVE PROGRAM

CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Atmospheric physics

NASA-GSFC

PERSONNEL

PI - G.P. NEWTON D1 - N.W. SPENCER

GRIEF DESCRIPTION THIS EXPERIMENT WAS FLOWN AT EQUATORIAL LATITUDES TO THIS EXPERIMENT WAS FLOWN AT EQUATORIAL LATITUDES TO DETERMINE THE CONCENTRATIONS AND TEMPORAL (INCLUDING DIUWNAL) FLUCTUATIONS OF THE FOLLOWING NEUTRAL UPFER ATMOSPHERE CONSTITUENTS -- ARGON, MOLECULAR AND ATOMIC OXYGEN, MOLECULAR NITROGEN, AND HELIUM. THE MEASUREMENTS OBTAINED WERE CORRELATED WITH APPROPRIATE ATMOSPHERIC EXPLORER-C DATA. A MAGNETIC MASS SPECTROMETER WAS NEED. SPECTROMETER WAS USED

--- SAN MARCO 4, SPENCER------

INVESTIGATION NAME- NEUTRAL ATMOSPHERE TEMPERATURE

NSSDC 10- 74-009A-03 INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Atmospheric physics

PERSONNEL P1 - N.W. SPENCER

NASA-GSEC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT WAS FLOWN TO DETERMINE BY DIRECT MEASUREMENT THE TEMPERATURE AND DENSITY 25 MOLECULAR NITROGEN AT SEVERAL ALTITUDES IN THE UPPER ATMOSPHERE, THE DATA DUTAINED WERE USED TO STUDY TEMPORAL FLUCTUATICRS, AND THEY WERE ALSO CORRELATED WITH ATMOSPHERIC EXPLORER-C MEASUREMENTS. THE SENSOR WAS A SHALL DNEGATRON TUNED TO MEASURE MOLECULAR NITROGEN, AND HAD A SPECIALLY SHAPED APERTURE, TEMPERATURE WAS MEASURED DURING A SPIN-SCAN BY DOSERVING THE RESPONSE AS A FUNCTION OF ANGLE WITH THE SATELLITE VELOCITY VECTOR.

SPACECRAFT CONMON NAME- SAS-A ALTERNATE NAMES- SAS 1, EXPLORED 42 UHURU 1, PL-7610 04797

NSSDC 10- 70-107A

LAUNCH DATE- 12/12/70 WEIGHT-Launch Site- San Marco Platform, off coast of Kenya WEIGHT- 143, KG LAUNCH VEHICLE- SCOUT

SPONSORING COUNTRY/AGENCY United States

NASA-055A

INITIAL ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 95.7 Min Periapsis- 531. Km EPOCH DATE- 12/13/70 Inclination- 3.0 deg Apoapsis- 572, km PERSONNEL MG - J.R. HDLTZ SC - N.G. ROMAN PM - M.R. TOWNSEND PS - C.E. FICHTEL NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSEC NASA-GSEC

PS - C.E. FICHTEL NASA-GSFC BRIEF DESCRIPTION SAS-A WAS THE FIRST OF A SERIES OF SMALL SPACECRAFT WHOSE OBJECTIVES WERE TO SURVEY THE CELESITAL SPHERE AND SEARCH FOR SOURCES RADIATING IN THE X-RAY, GAMMA-RAY, UV, AND OTHER SPECTRAL REGIONS. THE PRIMARY HISSION OF SAS-A WAS TO DEVELOP A CATALOG OF CELESITAL X-RAY SOURCES BY SYSTEMATIC SCAMMING OF THE CELESITAL SPHERE IN THE ENERGY RANGE FROM 2 TO 20 KEV. THE SPACECRAFT WAS LAUNCHED DECEMBER 12, 1970, FROM THE SAN MARCO PLATFORM OFF THE COAST OF KENVA, AFRICA-INTO A NEAR-CIRCULAR EQUATORIAL ORBIT. THE CORDITING SPACECRAFT MAS IN THE SHAPE OF A CYLINDER APPROXIMATELY SO CM IN DIAMETER AND 110 CM IN LENGTH. FOUR SOLAR PADDLES WERE USED TO RECHARGE A 6-MMP-HP, EIGHT-CELL, NICKEL-CADNIUM BATTERY AND TO PROVIDE POWER TO THE SPACECRAFT AND EXPERIMENT. THE SPACECRAFT WAS STABLLIZED BY AN INTERNAL WHEL, AND A MAGNETICALLY TORQUED COMMANDABLE CONTROL SYSTEM MAS USED TO POINT THE SPIN AXIS OF THE SPACECRAFT TO ANY AND SUN SENSOR THAT SHARED THE SAME PROCESSING ELECTRONICS. DATA WERE STORED ON A OME-ORBIT STORAGE TAPE RECORDER AND SYSTEM WAS USED. SYSTEM WAS USED.

----- SAS-A, GLACCONI-------

INVESTIGATION NAME- ALL-SKY X-RAY SURVEY

NSSDC ID- 70-107A-01

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

INVESTIGATIVE PROGRAM CODE SA

PERSONNEL				
PI - A.	GIACCONI	HARVARD	COLLEGE	085
DI - E.M.	KELLOGG	HARVARD	COLLEGE	085
0I - H.	GURSKY	HARVARD	COLLEGE	085
01 - H.	TANANDAUM	HARVARD	COLLEGE	OBS

DI - H. TANAHBAUM HARVARD COLLEGE DBS DI - H. TANAHBAUM HARVARD COLLEGE DBS BRIEF DESCRIPTION THE X-RAY INSTRUMENT ABOARD SAS-A (EXPLORER 42) CONSISTED OF TWO NEARLY IDENTICAL SIDES BOTH PHYSICALLY AND ELECTRONICALLY. EACH SIDE CONTAINED AN X-RAY DETECTION SYSTEM COMPOSED OF A COLLIMATOR, PROPORTIONAL COUNTERS, ASSOCIATED PROCESSING ELECTRONICS, AND AN ASPECT SENSING SYSTEM. THE HIGH-RESOLUTION (SPATIAL) SIDE HAD A VIEWING ANGLE OF O.S DEG GY 5 DEG FWHM AND A DETECTION RANGE FROM 11 D 20 KEV. THE OTHER SIDE HAD A HIGH-SENSITIVITY (INTENSITY) COLLIMATOR WITH A VIEWING ANGLE OF 5 DEG BY 5 DEG FWHM. THIS SIDE HAD A DETECTION RANGE FROM 1 TO 10 KEV. THE CENTERS OF THE FIELDS OF VIEW OF THE TWO DAMKS WERE DISPLACED FROM THE EQUATORIAL PLANE OF THE SATELLITE, SUCH THAT THE FULL BANDWIDTH COVE-ED BY THE TWO DETECTORS DURING EACH SPIN WAS APPROXIMATELY 127 DEG. SIX PROPORTIONAL COUNTERS COMPOSED OF A BERYLLIUM SHELL WITH 2.5-MIL BERYLLIUM FOIL WINDOWS WERE GENIND EACH COULIMATOR. THE INTERIOR CONTAINED A 2-MIL TUNGSTEM ANDE WIRE AND A GAS COMPOSITION OF 90 PERCENT ARGON, 9.5 PERCENT COZON DIOXIDE FOR GUENCHING, AND 0.5 PERCENT HELIUM AT A PRESSURE OF 940 M OF IN-FLIGHT CALIBRATION OF THE INSTRUMENT. THE SPIN AXIS OF THE SPACECRAFT WAS HELD FIXED IN THE SKY FOR ABOUT A DAY AT A TIME. DURING THIS PERIOD A BAND OF APPROXIMATELY 10 DEG ABOUT THE SPACECRAFT WAS THELD FIXED IN THE SCHWENT TO A SINGLE SWEEP FROODENT HAS Y DAY ANT A TIME. DURING THIS PERIOD A BAND OF APPROXIMATELY 10 DEG ABOUT THE SPACECRAFT WAS THEN TO 'COUNT RATE VS AZIMUTH'S OT THE SPACECRAFT WAS HELD FIXED IN THE SCHWENT. THE SPIN AXIS DF THE SPACECRAFT WAS HELD FIXED IN THE SCHWENT TO ASINGLE SWEEP FROUGH THE SPIN AND DA BAND OF APPROXIMATELY TO ASIA DAT A REDUCTION OF JAR SIGN A BAND OF APPROXIMATELY TO ASIA DAT A REDUCTION OF AND AS TO SUPERIMPOSE THE X-RAY DATA RECORDED AS 'COUNT RATE VS TIME' TO 'COUNT RATE VS AZIMUTH'S OTHAT THE SUPERIMPOSIFION OATA WOULD BE EQUIVALENT TO A SINGLE SWEEP FINDUGH THE OBSERVING 1D-DEG BAND WITH A TOTAL DESERVING TIME OF

SPACECRAFT COMMON NAME- SAS-C ALTERNATE NAMES- PL+743D, SAS 3 Explorer 53

NSSDC 10- 75-037A

LAUNCH DATE- 05/07/75 WEIGHT-Launch Site- San Marco Platform, off coast of Kenya Launch Vehigle- Scout WEIGHT- 193. KG

SPONSORING COUNTRY/AGENCY UNITED STATES NÁSA-OSS

INITIAL ORBIT PARAMETERS
ORBIT TYPE- GEOCENTRIC
ORBIT PERIOD- 94.9 MIN

ORBIT PERIOD- 94.9 MIN	INCLINATION- 3.0 DEG
Periapsis- 509. Km	Apoapsis- 516. Km
PERSONNEL MG - J.R. HOLTZ 55 - N.G. ROMAN PM - M.R. TOWNSEND PS - C.E. FICHTEL	NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSFC NASA-GSFC

EPOCH DATE- 05/08/75

Sec. 14

PS - C.E. FIGHTEL NASA-GSFC BRIEF DESCRIPTION SAS C WAS THE THIRD OF A SERIES OF SMALL SPACECRAFT WHOSE OBJECTIVES WERR TO SURVEY THE CELESTIAL SPHERE FOR SOURCES RADIATING IN THE X-RAY, GAMMA-RAY, UV, AND OTHER SPECTRAL REGIONS. THE PRIMARY MISSIONS OF SAS 3 WERE TO REASURE THE A-RAY EMISSION OF DISCRETE EXTRAGALACTIC SOURCES, TO MONITOR THE INTENSITY AND SPECTRA OF GALACTIC X-RAY SOURCES FROM 0.2 TO GO KEW. AND TO MONITOR THE X-RAY INTENSITY OF SCORPIO-X-1. THE SPACECRAFT WAS LAUNCHED FROM THE SAN MARCO PLATFORM OFF THE COAST OF KENYA, AFRICA, INTO A NEAR CIRCULAR EQUATORIAL ORBIT. FOUR SOLAR PADDLES WERE USED IN CONJUNCTION WITH A 12-CELL. NICKEL-CADMIUM BATTERY TO PROVIDE 65 W OF AVERAGE POWER OVER THE ENTIRE ORBIT. THE SPACECRAFT WAS STABILIZED ALONG THE Z-AXIS AND TOTATES AT ABOUT 0.1 DEG/S. CHARGES TO THE SPIN AXIS ORIENTATION ARE BY GROUND COMMAND, EITHER DELAYED OR IN REAL TIME. THE SPACECRAFT COULD BE MADE TO DITHER GACK AND FORTH PLUS OR THINDS 2.5 DEG ACROSS A SELECTED SOURCE ALONG THE X-AXIS AT 0.01 DEG/SEC. THE EMPERIMENTS CAN LOOK ALONG THE Z-AXIS OF THE SPACECRAFT, PERPENDICULAR TO 17. OR AT AN ANGLE.

---- SAS-C, CLARK------INVESTIGATION NAME- ANALYSIS OF EXTRAGALACTIC X-RAY SOURCES

NS 5D C	19-	75-0374-01	INVESTIGATIVE PROGRAM	

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PERSONNEL	
PI - G.W. CLARK OI - H.V.D.BRADT OI - W.H.G.LEWIN OI - W.H.G.LEWIN	MASS INST OF TECH Mass Inst of Tech Mass Inst of Tech
01 - H.W. SCHNOPPER	MARE THEY OF SERVI

UT DATE SUBJUTER HASS INST UT FECH BRIEF DESCRIPTION THIS EXPERIMENT DETERMINED THE POSITIONS OF VERY WEAK EXTRAGALACTIC X-RAY SOURCES. THE INSTRUMENT VIEWED A TOD-DEG-SQ REGION OF THE SXT AROUND THE DIRECTION OF THE SPIN AXIS OF THE SATELLITE. THE NORINAL TARGETS FOR A 1-YEAR STUDY WERE --- (1) THE VIRGO CLUSTER OF GALAXIES FOR 4 MONINS, (2) THE GALACTIC EQUATOR FOR 2 MONTHS, (3) THE ANDROMEDA NEBULA FOR MONTHS, AND (4) THE RAGELLAMIC CLOUDS FOR 3 MONTHS, THE INSTRUMENTATION CONSISTED OF ONE 2.5-ARC-MIN AAM ONE 4.5-ARC-MIN FUHM MODULATION COLLIMATOR, AS WELL AS PROPORTIONAL COUMTERS SENSITIVE OVER THE ENERGY RANGE FROM 1.5 TO 10 KEV. THE EFFECTIVE AREA OF EACH COLLIMATOR WAS ABOUT 225 CM-SQ. THE ASPECT SYSTEM PROVIDED INFORMATION ON THE ORIENTATION OF THE COLLIMATORS TO AN ACCURACY OF 15 ARC-S.

INVESTIGATION NAME- ANALYSIS	OF GALACTIC K-RAY SOURCES
N55DC ID- 75-037A-02	INVESTIGATIVE PROGRAM Code Sa
	INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PERSONNEL	
PI - G.W. CLARK GI - H.V.D.BRADT	MASS ENSI OF TECH
01 - W.H.G.LEWIN	MASS INST OF TECH Mass inst of tech
DI - H.W. SCHNOPPER	MASS INST OF TECH

UI - M.W. SCHNUPPER THE OBJECTIVES OF THIS EXPERIMENT WERE TO LOCATE GALACTIC X-RAY SOURCES TO 15 ARC-S AND TO MONITOR THESE SOURCES FOR INTENSITY VARIATIONS. THE SOURCE POSITIONS WERE DETERMINED WITH THE USE OF THE MODILATION COLLIMATORS OF THE EXTRAGALACTIC EXPERIMENT DURING THE NOMINAL 2-MONTH DESERVATION OF THE GALACTIC EQUATOR. THE MONITORING OF THE X-RAY SKY WAS ACCOMPLISHED BY THE USE OF THREE SLIT COLLIMATORS. ONE COLLIMATOR, 1-BY-70-DEG FWHM, WAS ORIENTED PERPENDICULAR TO THE BOUATORIAL PLANE OF THE STELLITE, WHILE THE OTHER TWO EACH OF 0.5-BY-45-DEG FWHM, WERE ORIENTED SO DEG BELOW THE FIRST. THE DETECTOR BENIND EACH COLLIMATOR WAS A EFFECTIVE AREA OF ABOUT 100 CM SQ. THE 1.0-DEG COLLIMATOR HAS AN ADDITIONAL COUNTER OF THE SAME AREA, SENSITIVE FROM 8 TO 50 KEV. THREE LINES OF POSITION WERE OBTAINED FOR ANY GIVEN SOURCE WHEN THE SATELLITE IS BEING SPUN AT A STEADY ROTATION OF 4 ARC-MIN/S ABOUT THE Z-AXIS.

-- 545-C/ CLARK------

INVESTIGATION NAME- CONTINUOUS X-RAY FLUCTUATION MONITOR OF Scorpio X-1

SDC ID-	75-0374-03	INVESTIGATIVE PROGRAM Code Sa
		INVESTIGATION DISCIPLINE(5) X-RAY ASTRONOMY

PERSONNEL DI - G.W. CLARK DI - H.V.D.GRADT OI - W.H.G.LEWIN DI - H.W. SCHNOPPER MASS INST OF TECH MASS INST OF TECH MASS INST OF TECH MASS INST OF TECH

BRIEF DESCRIPTION

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BRIEF DESCRIPTION A 12-BY-50-DEG FWHM SLAT COLLINATOR WAS ORIENTED WITH ITS LONG AXIS PERPENDICULAR TO THE SATELLITE SPIN AXIS SUCH THAT A GIVEN POINT ON THE SKY CAN BE MONITORED FOR ABOUT 25 PERCENT OF A ROTATION. THIS COLLINATOR WAS INCLINED BY 31 DEG WITH RESPECT TO THE EQUATORIAL PLANE OF THE SATELLITE? SO THAT SCORPIO X-1 WAS OBSERVED WHILE THE Z-AXIS IS ORIENTED TO THE SCORPIO X-1 WAS OBSERVED WHILE THE Z-AXIS IS ORIENTED TO THAT SCORPIO X-1 WAS OBSERVED WHILE THE Z-AXIS IS ORIENTED TO THE EXPERIMENT WERE PROPORTIONAL COUNTERS WITH A 1-MIL BE WINDOW. THE EMERGY RANGE WAS FROM 1.0 TO 60 KEV, AND THE TOTAL EFFECTIVE AREA WAS ABOUT 40 CM SQ.

-- SAS-C. CLARK------

INVESTIGATION NAME- X-RAY ABSORPTION CONTOURS OF THE GALAXY

NSSDC 10- 75-0374-04 INVESTIGATIVE PROGRAM CODE 5A INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY PERSONNEL RSONNEL PI – G.W. CLARK OI – H.V.Q JRADT OI – H.H.G.LEVIN OI – H.W. SCHNOPPER MASS INST OF TECH MASS INST OF TECH MASS INST OF TECH MASS INST OF TECH BRIEF DESCRIPTION THE DENSITY AND DISTRIBUTION OF THE INTERSTELLAR MATTER WAS DETERMINED BY MEASURING THE VARIATION IN THE INTENSITY OF THE LOW-ENERGY DIFFUSE X-RAY BACKGROUND AS A FUNCTION OF GALACTIC LATITUDE, A 1-MICROMETER POLYPROPYLENE WINDOW PROPORTIONAL COUNTER WAS USED FOR THE 0.1- TO 0.25-KEV AND 0.5-0 1.0-KEV ENERGY RANGES, WHILE A 2-MICROMETER TITANIUM WINDOW COUNTER COVERED THE ENERGY RANGE FROM 0.3 TO 0.5 KEV. IN ADDITION, TWO 1-MIL BE WINDOW COUNTERS WERE USED FOR THE 1.0-TO 10-KEV ENERGY RANGE. THE CLIMATORS IN THIS EXPERIMENT HAD FIELDS OF VIEW OF 3 DEG FOR THE 1-MICROMETER COUNTER, 2 DEG FOR THE 2-MICROMETER COUNTER, AND 2 DEG FOR THE 1-MIL COUNTERS. SPACECRAFT COMMON NAME- SNS 1 Alternate Names- SMS-a, synch meteorol satell a Aeros, medi NSSDC 10- 74-033A LAUNCH DATE- 05/17/74 Launch Site- Cape Canaveral, United States Launch Vehicle- Delta WEIGHT~ 227. KG SPONSORING COUNTRY/AGENCY UNITED STATES UNITED STATES NOAA-NESS NASA-OA INITIAL ORBIT PARAMETERS Orbit type- geocentric orbit period- 1340.4 min periapsis- 32345.0 km EPOCH DATE- 05/23/74 Inclination- 1.9 Deg Apoapsis- 35439.0 Km PERSONNEL PM - A. BUTERA PS - W.E. SHENK PR - A. BUIERA PS - W.E. SHENK BRIEF DESCRIPTION THE SMS-1 WAS A NASA-DEVELOPED, NDAA-OPERATED SPACECSAFT. THE SPIM-STABILIZED, EARTH-SYNCHRONOUS SPACECRAFT CARRED (1) THE SMS-1 WAS A NASA-DEVELOPED, NDAA-OPERATED SPACECSAFT. THE SPIM-STABILIZED, EARTH-SYNCHRONOUS SPACECRAFT CARRED (1) A VISIBLE-INFRARED SPIM-SCAN RADIONETER (VISISA) TO PROVIDE HIGH GUALITY DAV/NIGHT CLOUDCOVER DATA AND MADE RADIANCE TEMPERATURES OF THE EARTH/ATMOSPHERE SYSTEM, (2) A METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM RELAYED PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL APT-EQUIPPED REGIONAL STATIONS AND COLLECTED AND RETRANSMITTED DATA FROM RENGTELY LOCATED EARTH-BASED PLATFORMS, AND (3) A SPACE ENVIRONMENTAL MONITOR (SEN) MEASURED PPOTON, ELECTRON, AND SOLAR X-RAY FLUXES AND MAGNETIC FIELDS. THE CVLINDRICALLY SHAPED SPACECRAFT MEASURED 190.5 CM IN DIAMETER AND 230 CM IN HENGETH, EXCLUSIVE OF A MAGNETIC FIELDS. THE PRIMARY STRUCTURAL B3 CM BEYOND THE CVLINDER SHELL. THE PRIMARY STRUCTURAL B4 DECOND THE CVLINDER SHELL. THE PRIMARY STRUCTURAL B5 DEL A SUPPORT STRUCTURE EXTENDED RADIALLY (UT FROM THE THE VISSR TELESCOPE WAS MOUNTED ON THE EQUIPMENT SHELF AND VIEWED THE EARTH THAQUEA A SPECIAL APERTURE IN THE SPACECRAFT'S SIDE. A SUPPORT STRUCTURE EXTENDED RADIALLY (UT FROM THE THRUST TUBE AND WAS AFFIXED TO THE SOLAR PANELS. WHICH FORMED B4 THE OUTER WALLS OF THE SPACECRAFT AND PROVIDE THE PRIMARY SOURCE OF ELECTRICAL POWER. LOCATED IN THE ANNULUS-SHAPED SPACE BETWEEN THE THRUST CONTROL EQUIPMENT, BATTERIES, AND NOST OF THE SERVEN AND DYMANICS CONTROL EQUIPMENT, BATTERIES, AND NOST OF ACT HAUSTERS MODUNED ANDUNED THE SPACECRAFT ATTIONE AND SUBSYSTEM. AND S-PARCH BETWEEN THE TARNSTO THE SPACECRAFT ATTINUE AND SUBSYSTEM. AND S-DAND FREQUENCIES IN ITS TELEMETRY AND COMMAND SUBSYSTEM. AND S-DAND FREQUENCIES IN ITS TELEMETRY AND COMMAND SUBSYSTEM. AND LAUNCH AND THEN SERVED AS A BACKUP FOR THE PRIMARD SUBSYSTEM. AND LAUNCH AND THEN SSCREP AS A BACKUP FOR THE PRIMARD SUBSYSTEM. AND COMMA NOAA-NESS NASA-GSFC

- SMS 1, NESS STAFF------

INVESTIGATION NAME- VISIBLE-INFRARED SPIN-SCAN RADIOMETER (VISSR)

NSSDC 10- 74-0338-01	INVESTIGATIVE PROGRAM Environ. Monitoring development
· · ·	INVESTIGATION DISCIPLINE(S) METEOROLOGY
PERSONNEL	· · · · · · · · · · · · · · · · · · ·

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WRIEF DESCRIPTION THE VISIBLE-INFRARED SPIN-SCAN RADIOMETER (VISSR) FLOWN ON SNS 1 PROVIDED DAY/MIGHT OBSERVATIONS OF CLOUDCOVER AND EARTH/CLOUD RADIANCE TEMPERATURE MEASUREMENTS FROM A SYNCHRONOUS, SPIN-STABLIZED, CEDSTATIONARY SATELLITE FOR USE IN DPERATIONAL WEATHER ANALYSIS AND FORECASIING. THE TWO-CHANNEL INSTRUMENT WAS ABLE TO TAKE BOTH FULL AND PARTIAL PICTURES OF THE EARTH VISIBLE CHANNEL (D.55 TO 0.70 12.6 MICROMETER) AND THE VISIBLE CHANNEL (D.55 TO 0.70 NICROMETER) USED A COMMON OPTICS SYSTEM. INCOMING RADIATION WAS RECEIVED BY AN ELLIPTICALLY-SHAPED SCAN MIRROR AND COLLECTED BY AN RITCHEY-CHARTIEN OPTICAL SYSTEM. THE SCAN MIRROR WAS SET AT A NORINAL ANGLE OF 45 DEG TO THE VISSR OPTICAL AXIS, WHICH WAS ALIGNED PARALLEL TO THE SPIN AXIS OF THE SPIN AXIS OF THE SPACEMAT WAS ANELTO THE SPIN AXIS OF THE SPIN AXIS OF THE SPACEMAT WAS ANELTO THE SPIN AXIS OF THE SPIN AXIS OF THE SPACEMAT WAS DIENTED PARALLEL WITH THE CARTM'S XIS OF THE SALECHAT WAS DIENTED PARALLEL WITH THE CARTM'S AXIS OF THE SCANNING MOTION OF THE SPACECRAFT (APPROXINATELY 100 RPM) PROVIDED A WEST-TO-EAST SCAN MOTION HEN THE SPIN AXIS OF THE SCANNING MORTH TO SOUTH AT THE COMPLETE AND ABOUT 2 MIN TO RETACE. DUBLING EACH SCAN, THE FIELD OF VIEG ON THE EARTH WAS SWEPT BY A LINEAR ARRAY OF EIGHT VISTULE-SPECTRUM DETECTORS, EACH WITH A GROUND RESOLUTION OF COP K AT ZERO NADIR ANGLE. A MERCURY-CARTIMUTTELLURIDE DETECTOR SENSED THE INFRARED PORTION OF THE SPECTRUM WITH A HURIZONTAL RESOLUTION OF APPROXINATELY 8 KM AT ZERO NADIR ANGLE. THE INFRARED PORTION OF THE DETECTOR MEASURED RADIANCE TEMPERATURES BETWEEN 180 AND 31S K WITH A PROPOSED SENSITIVITY BETWEEN 0.4 AND 1.4 K. THEY ESTORD AND THE SATING THEOLOGINAL AND THE INFRARED JORTION OF THE DETECTOR MEASURED BENSITIVITY BETWEEN 0.4 AND 1.4 K. THEY ESTORD AND TATAOUTS TON CODAJ. ANULLES THE INFRARED PORTION OF THE DETECTOR MEASURED FROATANENT TAMSHISTATION (NGAA) COMMAD 31S K WITH A PROPOSED SENSITIVITY BETWEEN 0.4 AND 1.4 K. THEY ESTORD AND THE

- 5M5 1, NESS STAFF----------

INVESTIGATION NAME- METEOROLOGICAL DATA COLLECTION AND Transmission system

NSSOC 10- 74-0334-05

INVESTIGATIVE PROGRAM Environ. Monitoring development INVESTIGATION DISCIPLINE(S) Meteorology

PERSONNEL

NOAA-NESS

NESS STAFE

PI - NESS STAFF NUMA-NESS BRIEF DESCRIPTION THE METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM WAS AN EXPERIMENTAL COMMUNICATIONS AND DATA HANDLING SYSTEM WAS AN EXPERIMENTAL COMMUNICATIONS AND DATA HANDLING SYSTEM DESIGNED TO RECEIVE AND PROCESS METEOROLOGICAL DATA COLLECTED FROM REMOTELY LOCATED EARTH-BASED DATA COLLECTION (DOSERVATION) PLATFORMS (DCP). THE COLLECTED DATA WIRE RETRANSMITTED FROM THE SATELLITE TO SMALL, GROUND-BASED, REGIONAL DATA UTILIZATION CENTERS, DATA FROM UP TO 10-0000 DCP STATIONS COULD BE HANDLED BY THE SYSTEM. THE SYSTEM ALSO ALLOWED FOR THE RETRANSMISSION OF NARROW-BANG (WEFAX TYPE) DATA TO EXISTING SMALL GROUND-BASED AFT RECEIVING STATIONS FROM A LARGER WEATHER CENTRAL FACILITY. THIS COMMUNICATIONS SYSTEM OPERATED ON S-BAND FREQUENCIES. THE MINIMUM DATA COLLECTION SYSTEM FOR ONE SMS CONSISTED OF APPROXIMATELY 3500 DCP STATIONS TO BE CONTACTED IN A 6-H PERIOD, THE TOTAL AMOUNT OF DATA COLLECTED DURING THE 6-H PERIOD WAS BETWEEN 350K AND 600K BITS, DEFWENDS ON THE CODING TECHNIQUES. DATA MIDED FORM INDIVIDUAL STATIONS VARIED FROM SOL AT AN INDIVIDUAL DCP STATION. STATION.

-----SHS 1, WILLIAMS------

INVESTIGATION NAME- ENERGETIC PARTICLE MONITOR

INVESTIGATIVE PROGRAM Environ. Monitoring development NS50: ID- 74-0334-02

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELPS

PERSONNEL PI - D.J. WILLIAMS

NDAA-ERL

BRIEF DESCRIPTION 0.5 MEV

---- SHS 1, WILLIAMS-------

INVESTIGATION NAME- SOLAR X-RAY MONITOR

INVESTIGATIVE PROGRAM Environ. Monitoring development HSSDC 10- 74-033A-03

INVESTIGATION DISCIPLINE(S) Solar physics

PERSONNEL PI - D.J. WILLIAMS

NOAA-ERL

BRIEF DESCRIPTION THE X-RAY COUNTER WAS COMPOSED OF A COLLINATOR, TWO IONIZATION CHANBERS, AND TWO ELECTROMETERS. A SMALL ANGULAR APERTURE HAS DEEN CHOSEN FOR THE FELESCOFE COLLIMATOR, WHICH WAS MOUNTED SO THAT THE DECLINATION OF ITS AXIS CAN BE CONTROLLED BY GROUND COMMAND TO INSURE THAT THE SUN IS VIEWED BY THE TELESCOPE ONCE DURING EVERY VEHICLE ROTATION, ONE ION CHAMBER WAS FILLED WITH ARGON AT 1 ATN FOR DETECTION OF 1- TO S-A X RAYS, AND HAD A S-MIL BERYLLIUM WINDOW TO EXCLUDE X RAYS OF LONGER WAVELENGTHS. THE OTHER CHAMBER WAS FILLED WITH XEMON AT 9.5 TO 2 ATM AND HAD A SO-MIL BERYLLIUM WINDOW FOR MEASUREMENTS OF X RAYS IN THE WAVELENGTH RANGE 0.5- TO 3-A. BRIEF DESCRIPTION

----- SHS 1, WILLIAMS------

INVESTIGATION NAME- MAGNETIC FIELD MONITOR

NSSOC 10- 74-033A-04

INVESTIGATIVE PROGRAM Environ. Monitoring development

NDAA-NESS NASA-GSFC

Provide States and a second

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS

PERSONNEL PI - D.J. WILLIAMS

NOAA-ERL

BRIEF DESCRIPTION BRIEF DESCRIPTION A BIAXIAL, SHORT BOOM-MOUNTED (2 FT) CLOSED-LOOP, FLUXGATE MAGNETOMETER WAS ORIENTED WITH ONE AXIS ALONG THE S/C SPIN AXIS, AND ONE IN THE SPIN PLANE. EACH SENSOR HAD A SELECTABLE RANGE (+50, 100, 200, OR 400 GAMMAS), AN OFFSET FIELD CARABILITY (PLUS OR MINUS 1200 GAMMAS IN 40-GAMMA STEPS), AND AN IN-FLIGHT CALIBRATION CAPABILITY.

SPACECRAFT COMMON NAME- 5MS 2 Alternate names- pl-731e, synch meteorol satell B SMS-B, med2

NSSDC 10- 75-011A

LAUNCH DATE- 02/06/75 Launch Site- Cape (Anaveral, United States Launch Vehicle- Delta WEIGHT- 243. KG

SPONSORING COUNTRY/AGENCY UNITED STATES UNITED STATES

NDAA-NESS NASA-QA INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 1436-2 Min Periapsis- 35778. KM EPOCH DATE- 04/01/75 Inclination- 1.0 deg Apoapsis- 35799. Km PERSONNEL

BUTERA PN - A. BUTER PS - N.E. SHENK

BRIEF DESCRIPTION THE SMS 2, A NASA-DEVELOPED, NOAA-OPERATED SPACECRAFT, CARNIED (1) A VISIBLE-IMFRARED SPIN-SCAN RADIOMETER (VISSR) TO PROVIDE HIGH-QUALITY DAY/HIGHT CLOUDCOVER DATA AND TO TAKE RADIANCE TEMPERATURES OF THE EARTH/ATMOSPHERE SYSTEM, (2) A METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM TO RELAY PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL APT-EQUIPPED REGIONAL STATIONS AND TO COLLECT AND RETANSMIT DATA FROM REMOTE EARTH-BASED PLATFORMS, AND (3) A SPACE ENVIRONMENT MONITOR (SEM) SYSTEM TO MEASURE PROTON, ELECTRON, AND SOLAR X-RAY FLUXES AND MAGNETIC FIELDS. THE SPIN-STABILIZED, EARTH-SYNCHRONOUS, AND CYLINDRILALLY SHAPED SPACECRAFT MEASURED 190.5 CM IN DIAM AND 230 CM IM LENGTH, EXCLUSIVE '/F A MAGNETOMETER THAT EXTENDED AN DOITIONAL 83 CM BEYOND THE CYLINDER SHELL. THE PRIMARY STRUCTURAL MEMBERS WERE A HOMEYCOMB EQUIPMENT SHELF AND A THRUST TUBE. THE VISSR A HOMEYCOMB EQUIPMENT SHELF AND A THRUST TUBE. THE VISSR A HOMEYCOMB EQUIPMENT SHELF. ND A THRUST TUBE. THE VISSR A HOMEYCOMB EQUIPMENT SHELF AND A THRUST TUBE. THE VISSR A HOMEYCOMB EQUIPMENT SHELF AND A THRUST TUBE. THE VISSR A HOMEYCOMB EQUIPMENT SHELF AND A THRUST TUBE. AND VISS MOUNTED ON THE CAUENDE THE USER AND VISS AND WAS AFFIXED TO THE SOLAR PANELS, WHICH FORMED THE UTER AND WAS AFFIXED TO THE SOLAR PANELS, WHICH FORMED THE UTER AND WAS AFFIXED TO THE SOLAR PANELS, WHICH FORMED THE UTER AND WAS AFFIXED TO THE SOLAR PANELS, WHICH FORMED THE UTER AND WAS AFFIXED TO THE SOLAR PANELS, MHICH FORMED THE UTER AND WAS AFFIXED TO THE SOLAR PANELS, MHICH FORMED THE UTER AND WAS AFFIXED TO THE SOLAR PANELS, MHICH FORMED THE DUTER AND WAS AFFIXED TO THE SOLAR PANELS, MHICH FORMED THE DUTER AND Y THE SEM EQUIPMENT. PROPER SPACECRAFT SIDE BETWE!N THE THRUST TUBE AND THE SOLAR PANELS, WARE STATIO:XEEPING AND DYNAMICS CONTROL EQUIPMENT, BATTERIES, AND NOST OF THE SEM EQUIPMENT, PROPER SPACECRAFT SEQUATOR AND ACTIVATED BY GROUND COMMAND. BOTH WHE SPACECRAFT'S EQUATOR AND ACTIVATED BY GROUND COMAND. B

DURING LAUNCH AND THEN SERVED AS A BACKUP FOR THE PRIMARY Subsystem after the synchronous orbit was attained. ---- SMS Z/ NESS STAFF-----

INVESTIGATION NAME- VISIBLE-INFRARED SPIN-SCAN RADIOMETER (VISSR)

INVESTIGATIVE PROGRAM ENVIRON. MONITORING DEVELOPMENT NSSDC 10- 75-0114-04 INVESTIGATION DISCIPLINE(S) Meteorology

PERSONNEL NESS STAFF

NDAA-NESS

p1 -NESS STAFFBRIEF DESCRIPTIONTHE VISIBLE-INFRARED SPIN-SCAN RADIOMETER (WISSR) FLOWN
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STACHOUDDS, SPIN-STABILLIZED, GEOSTATIONARY SATELLITE FOR USE
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NOPCHANNES OF THE EARTH'S DISS. THE INSTRUMENT WAS ACCOMPLIES SYSTEM. INCOMING RADIATION
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NAS RECEIVED BY AN ELLIPTICAL SYSTEM. THE SCAN
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INFROR WAS SECENTATI. THE SPINNING MOTION OF THE SPACECRAFT
INFORVIDATIATELY TO READY SPIN. A FULL PICTURE TOOK 18.2 MIN TO
REATH'S AXIS. THE LATITUDIAL SCAN WAS ACCOMPLISHED BY
NEW THE SPIN AXIS OF THE SPACECRAFT IS ON INTROR NORTH TO SOUTH AT THE
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SEQUENTIALLY TILLING THE SCANNING MIRROR NORTH TO SOUTH AT THE
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-- SMS 2, NESS STAFF----INVESTIGATION NAME- METEOROLOGICAL DATA COLLECTION AND Transmission system

N55DC ID- 75-011A-05

INVESTIGATIVE PROGRAM ENVIRON. MONITORING DEVELOPMENT

NDAA-NESS

INVESTIGATION DISCIPLINE(S) ATMOSPHERIC PHYSICS

PERSONNEL NESS STAFF

PI- NESS STAFF NOAA-NESS BRIEF DESCRIPTION THE METEOROLOGICAL DATA COLLECTION AND TRANSMISSION THE METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM, AN EXPERIMENTAL COMMUNICATIONS AND DATA HANDLING SYSTEM, OPERATING ON S-GAND FREQUENCIES, RECEIVED AND PROCESSED DATA COLLECTION (OBSERVATION) PLATFORMS (DCP). THE COLLECTED DATA COLLECTION (OBSERVATION) PLATFORMS (DCP). THE COLLECTED DATA COLLECTION (OBSERVATION) PLATFORMS (DCP). THE COLLECTED DATA COLLECTION SHALL DATA UTILIZATION CENTERS. DATA FROM UP GROUND-BASED, REGIJANAL DATA UTILIZATION CENTERS. DATA FROM UP GROUND-BASED, REGIJANAL DATA UTILIZATION CENTERS. DATA TYPEN ALSO ALLOWED FOR THE RETRANSMISSION OF NARGOW-BAND (VEFAX TYPEN DATA TO EXISTING SMALL GROUND-BASED APT RECEIVING STATIONS FROM CONTACTED IN SHALL GROUND-BASED APT RECEIVING STATIONS FROM FOR ONE SPACECRAFT CONSISTED OF APPROXIMATELY 3500 DCP STATIONS CONTACTED IN 6 H. THE TOTAL AMOUNT OF DATA COLLECTED DURING THE 6 H WAS BETWEEN 350X AND 600K BITS, DEPENDING ON THE CODING THE 6 H WAS BETWEEN STATUCH FROM INDIVIDUAL STATIONS VARIED FROM 50 TO 3000 BITS, DEPENDING ON THE TYPE AND VARIETY OF SENSORS USED AT THE DOC STATION-

---- SMS 2, WILLIAMS-----

INVESTIGATION NAME- ENERGETIC PARTICLE MONITOR

NSSDC 10- 75-011A-01

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INVESTIGATIVE PROGRAM Environ. Monitoring development INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

BRIEF DESCRIPTION A NUMBER OF SEPARATE SILICON SOLID-STATE DETECTORS, EACH A NUMBER OF SEPARATE THICKNESS AND A SEPARATE ELECTRONICS WITH A TAILORED MODERATOR THICKNESS AND A SEPARATE ELECTRONICS UNIT FOR PULSE AMPLIFICATION AND PULSEHEIGHT DISCHIMINATION, UNIT FOR PULSE AMPLIFICATION AND PULSEHEIGHT DISCHIMINATION, UNIT FOR PULSE AMPLIFICATION AND PULSEHEIGHT DISCHIMINATION, NESD TO DETAIN THE FOLLOWING PARTICLE TYPE AND ENERGY MEASUREMENTS --- SEVEN CHANNELS MEASURE PROTONS IN THE RANGE 1 TO 500 MEV, SIX CHANNELS MEASURE ALPHA PARTICLES IN THE RANGE 4 TO 400 MEV, AND ONE CHANNEL MEASURE ELECTRONS GREATER THAN D.5 MEN MEV.

---- SNS 2, WILLIAMS------

INVESTIGATION NAME- SOLAR X-RAY MONITOR

N55DC 10- 75-011A-02

INVESTIGATIVE PROGRAM ENVIRON. MONITORING DEVELOPMENT

NOAA-ERL

NOAA-ERL

INVESTIGATION DISCIPLINE(S) Solar Physics

PERSONNEL PI - D.J. WILLIAMS

BRIEF DESCRIPTION THE X-RAY COUNTER WAS COMPRISED OF A COLLIMATOR, TWO THE X-RAY COUNTER WAS COMPRISED OF A COLLIMATOR, TWO IONIZATION CHAMBERS, AND TWO ELECTROMETERS, A SMALL ANGULAR HAPERTURE WAS CHOSEN FOR THE TELESCOPE COLLIMATOR. THE COLLIMATOR, MOUNTED SO ITS AXIS DECLINATION WAS COMTROLLED BY COULIMATOR, MOUNTED SO ITS AXIS DECLINATION WAS COMTROLLED BY GROUND COMMAND, VIEWED THE SUN ONCE EVERY VEHICLE ROITATION. GROUND COMMAND, VIEWED THE SUN ONCE EVERY VEHICLE ROITATION. OME ION CHAMBER, FILLED WITH ARGON AT \$ ATM, DETECTED 1- TO 8-A OME ION CHAMBER, FILLED WITH ARGON AT \$ ATM, DETECTED 1- TO 8-A IONGER WAVELENGTHS. THE OTHER CHAMBER WAS FILLED WITH XENON AT 1.5 TO 2 ATM AND HAD A 50-MIL BERYLLIUM WINDOW TO MEASURE X RAYS OF 0.5 TO 3 A.

--- SM5 2, WILLIAMS------

INVESTIGATION NAME- MAGNETIC FIELD MONITOR

NSSDC 10- 75-011A-03

INVESTIGATIVE PROGRAM ENVIRON, MONITORING DEVELOPMENT

NOAA-ERL

INVESTIGATION ISCIPLINE(S) Magnetospheric Physics Particles and fields

PERSONNEL P1 - D.J. WILLIAMS

BRIEF DESCRIPTION A SHORT BOOM DEPLOYED (2 FT) BIAXIAL, CLOSED-LOOP, A SHORT BOOM DEPLOYED (2 FT) BIAXIAL, CLOSED-LOOP, ELUXGATE MACNETOMETER WITH ONE SENSOR ALIGHED PARALLEL TO THE SPACECRAFT SPIN AXIS AND THE OTHER PERPENDICULAR TO THIS AXIS MEASURED THE VECTOR MAGNETIC FIELD. SELECTABLE RANGE (*5D, MEASURED THE VECTOR MAGNETIC FIELD. SELECTABLE RANGE (*5D, MINUS 1200 GAMMAS IN 40-STEPS), AND AN INFLIGHT CALIBRATION CAPABILITY.

SPACECRAFT COMMON NAME- SOLRAD 10 ALTERNATE NAMES- EXPLORER 44, SOLAR EXPLORER-C SE-C, SOLRAD-C PL-703A

NSSDC 10- 71-058A

LAUNCH DATE- 07/08/71 LAUNCH SITE- WALLOPS FLIGHT CENTER, UNITED STATES LAUNCH VENICLE- SCOUT WEIGHT- 260. KG

SPONSORING COUNTRY/AGENCY United States United States	NASA-DSS Dod-Navy
INITIAL ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC Orbit Perion- 95.3 Min Periapsis- 436. Km	EPOCH DATE- 07/09/71 Inglination- 51.0 d&G Apoapsis- 630. KM
PERSONNEL MG — J.R. HOLTZ SC — G.K. GERTEL PM — E.W. PETERKIN PS — R.W. KRÉPLIN	NASA HEADQUARTERS Nasa headquarters US Naval Research Lab US Naval Research Lab

BRIEF DESCRIPTION SOLARD 10, A SPIN-STABILIZED SATELLITE, WAS ONE IN A SOLARD 10, A SPIN-STABILIZED SATELLITE, WAS ONE IN A SERIES OF SPACECRAFT DESIGNED TO PROVIDE CONTINUOUS COVERAGE OF WAVELENGTH AND INTENSITY CHANGES IN SOLAR RADIATION IN THE UV, MAVELENGTH AND X-RAY REGIONS. (THE FIRST SPACECRAFT IN THIS SOFT, AND HARD X-RAY REGIONS. (THE FIRST SPACECRAFT IN THIS SERIES, SR-1, WAS LAUNCHED IN 1960.) SOLERAD 10 ALSO MAPPED THE CELESTIAL SPHERE USING A HIGH-SENSITIVITY X-RAY DETECTOR. THE SPACECRAFT WAS A 12-SIDED CYLINDER THAT MEASURED 76 CM IN SPACECRAFT WAS A 12-SIDED CYLINDER THAT MEASURED 76 CM IN DIAMETER AND SB CM IN HEIGHT. FOUR STMMETRICALLY PLACED 17.8-DIAMETER AND SOLAR CELL PANELS, HINGED AT THE CENTER SECTION OF THE STRUCTURE, SERVED AS THE ELEMENTS OF A TURNSTILE ANTENNA SYSTEM. EIGHTEEN SOLAR SENSORS WERE MOUNTED POINTED DIRECTLYAL TO THE SPIN AXIS OF THE SATELLITE, WHICH POINTED DIRECTLYAL THE SOLAR DISK. THE PLANE OF ROTATION SHIFTED ABOUT 1 DEG/DAY

SO THAT A STELLAR DETECTOR MOUNTED TO PDINT RADIALLY OUTWARD FROM THE AXIS SCANNED THE CELESTIAL SPHERE. DATA FROM ALL DETECTORS WERE STORED IN A 54-KDS CORE MEMORY AND TELEMETERED ON COMMAND TO THE NRL TRACKING STATION AT BLOSSOM PT., MD. DATA WERE ALSO TRANSMITTED IN REAL TIME A? 137.710 MHZ.

----- SOLRAD 10, KREPLIN-

INVESTIGATION NAME- SOLAR RADIATION DETECTORS

The Mathematic Stream and the second stream stream stream stream stream stream stream stream stream stream stre

INVESTIGATIVE PROGRAM CODE ST/CO-OP NSSPC ID~ 71-058A-01

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL

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10110-110 10110-110

PI + R.₩.	KREPLIN	US NAVAL RESEARCH LAB
01 - D.D.	BROUSSEAU	US NAVAL RESEARCH LAD
0I - E.T.	BYRAM	US NAVAL RESEARCH LAB
01 - J.H.	CARVER	U OF ADELAIDE
01 - R.E.	EISENHAUER	US NAVAL RESEARCH LAB
01 - G.G.	FR112	US NAVAL RESEARCH LAB
01 - D.M.	HORAN	US NAVAL RESEARCH LAB
01 - A.T.	HOCLINTON, JR.	PHOEN1X CORP
01 - R.G.	TAYLOR	US NAVAL RESEARCH LAB
0I - J.G.	WINKLER	US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

01 - J.G. WINKLER US NAVAL RESEARCH LAB BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MONITOR THE SOLAR X-RAY FLUX IN EIGHT BANDS AND THE SOLAR UV FLUX IN FIVE BANDS AS PART OF A LONG-TERM PROJECT TO GDSERVE SOLAR X-RAY AND UV ACTIVITY WITH SETS OF STANDARDIZED SENSORS OVER AN ENTIRE SOLAR CYCLE. THE X-RAY BANDS OBSERVED WERE 0.08 TO 0.8 A, 0.1 TO 1.0 A, 0.5 TO 3.A, 1 TO 5.A, 1 TO 8 A, 3 TO 1 6 A, 1 TO 2.0 A, AND 44 TO 60 A. ALL THE DETECTORS FOR THESE BANDS, WITH THE EXCEPTION OF THAT FOR THE 0.08-TO 0.8-A BAND, WERE ION CHAMBERS FITTED WITH A VARIETY OF WINDOW MATERIAL (BERYLLIWM, ALUMINUM, AND MILAR) OF VARIOUS THICKNESSES AND FILLED WITH SEVERAL DIFFERENT GASES (KRYPTON). ARGON, NITROGEN, CARBON TETRACHORIDE, AND XENON) AT VARIOUS PRESSURES. THF 0.08-TO 0.8-A BAND HAD AS A DETECTOR A SLIGUE (MA) SCINTILLATING CHYSTAL SURFOUNDED BY A PLASTIC SCINTILLATING MATERIAL VIEWED BY A SINGLE PHOTOMULTIPLIEM. THIS DETECTOR WAS DESIGNED TO COLLECT DATA ON THE VERY HIGH-ENERFY SOLAR X-RAY EMISSION OD SERVED ONLY DURING SOLAR FLARES. THE UV BANDS OBSERVED WERE 170 TO 500 A, 170 TO 700 A, 1080 TO 1350 A, 1225 TO 1350 A, AND 1450 TO 1600 A. THE THO SHORTER WAVELENGTH BANDS HAD LITHIUM FLUORIDE. PHOTOSENSITIVE SURFACES PROTECTOR, WHILE THE REMAINING BANDS HAD ION CHAMBERS WITH WINDOWS CORPOSED OF LITHIUM FLUORIDE. CALCIUM CULHATORS. THE DATA WERE TRANSMITTED OVER TWY SYSTEM SING HAD RAD AND HAD AND ADD THELEMETRY SYSTEMS IN ONE OF THREE FORMS -- STORED DATA, REAL-TIME DIGITAL (PCM) DATA, AND REAL-TIME WARDS -SOME DATA, REAL-TIME JIGITAL (PCM) DATA, AND REAL-TIME WARDS AND AND THE DERATED ALUMINUM OLLIMATORS. THE DATA WERE TRANSMITTED THAT DERATED ALUMINUM COLLIMATORS. THE DATA WERE TRANSMITTED TORE DATA, MAD APERTING CONDITIONS, TM 1 CONTINUOUSLY TRANSMITTED AND AND AND AND AND AND CONDITIONS. THE CANTERE FORMS -- STORED DATA, REAL-TIME JIGITAL (PCM) DATA, AND REAL-TIME WARDS TREM THAT OPERATED AT 130.700 WITH A RADIATED POWER OF 250 MW. UNDER NORMAL DPERATION CONDITIONS. THE CONTINUOUSL

SPACECRAFT COMMON NAME- .OLRAD 11A ALTERNATE NAMES- SRC-11A, SOLRAD HI-TRIP SESP NO. NRL-111-0264, NRL-111 SESP P74-1C

NSSDC 10- 76-0230

LAUNCE ATE U3/15/76 LAUNCH SITS CAPE CANAVERAL, UNITED STATES LAUNCH VEHILLE- TITAN WEIGHT- 102.15 KG

SPONSORING COUNTRY/AGENCY United States DOD-NAVY

INITIAL ORBIT PARAMETERS DNBIT TYPE- GEOCENTRIC Orbit Period- 7344.3 Min Heriapsis- 118383. Km EPOCH DATE- 07/01/76 Inclination- 25.7 deg Apgapsis- 119180. Km PERSONNEL

PH - E.W. PETERKIN PS - R.W. KREPLIN US NAVAL RESEARCH LAD US NAVAL RESEARCH LAD

SRIEF DESCRIPTION

SHIEF DESCRIPTION SUBAS 114 WAS ONE OF A PAIR OF IDENTICAL SATELLITES THAT WERE PLACED IN A CIRCULAR EQUATORIAL ORBIT OF 20 EARTH RADIT. "ME SATELLITES, WHICH WERE ORIENTED TOWARDS THE JUN, PROVIDED JUD PERCENT REAL-TIME, CONTINUOUS GONITORING OF SOLAR X-RAY. UV, AND ENERGETIC PARTICLE EMISSIONS. EXPERIMENTS INCLUDED BROADBAND ION CHAMBERS OBSERVING SOLAR X RAYS BETWEEN 0.1 AND 60 A, PROPORTIDNAL COUNTERS AND SCINTILATORS OBSERVING SOLAR X RAYS BETWEEN 2 AND 150 KEV, AN EUV DETECTOR COVERING THREE BANDS BETWEEN. 170 AND 1000 A, A VARIABLE RESOLUTICA EBERT-FASTIE SPECTROMETER COVERING THE WAVELENGTH RANGE OF 1100

TO 1600 A (RESOLUTION -- 1 TO 25 A), A SOLAR WIND MONITOR, SOLAR PROTON, ELECTRON, AND ALPHA PARTICLE MONITORS, TWO X-RAY POLARIMETERS (ONE UTILIZING BRAGG SCATTERING AND THE OTHER UTILIZING THOMPSON SCATTERING), A BRAGG SPECTROMETER OBSERVING MAGNESIUM-11 AND -12 LINES, A LARGE-AREA AUNORAL X-RAY DETECTOR, AND A PASSIVELY COOLED SOLID-STATE X-RAY DETECTOR TO REASURE BACKGROUND X-RAY EMISSIONS.

-- SOLRAD 11A, BLAKE----INVESTIGATION NAME- SOLAR PROTONS

INVESTIGATIVE PROGRAM NSSDC 10- 76-0230-14

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL PI - J.B. BLAKE DI - R.W. KREPLIN

AEROSPACE CORP US NAVAL RESEARCH LAB

BRIEF DESCRIPTION A PAIR OF IDENTICAL SENSORS WAS MOUNTED ON THE SPACEGRAFT, WITH ONE ON THE SOLAR-ORIENTED SURFACE (THIS ERPERIMENT) AND OME ON THE ANTISOLAR SURFACE (EXPERIMENT 76-D23C-23), EACH SENSOR WAS A TWO-ELEMENT COUNTER USING DISK-SHAPED SEMICONDUCTORS AS DETECTOR ELEMENTS, WITH SHIELDING MATERIAL IN FRONT OF AND BETWEEN THE TWO DETECTOR ELEMENTS. THE DETECTOR ELEMENTS WERE CONNECTED TO CHARGE-SENSITIVE AMPLIFIERS. COINCIDENCE AND PULSE HEIGHT ANALYSIS WERE USED TO SEPRATE PULSES PRODUCED BY 2-MEV PROTONS, 10-MEV PROTONS, 4.5-MEV ALPHA PARTICLES, 7.5-MEV ALPHA PARTICLES, AND HEAVY NUCLEI (Z GREATER THAN 2, E GREATER THAN 3 MEV PER NUCLEON). A COMPLETE SET OF DATA POINTS WAS OBTAINED EVERY 2 MIN.

----- SOLRAD 11A, BLAKE------INVESTIGATION NAME- OMNIDIRECTIONAL PROTONS

NSSBC ID- 76-023C-17

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

AEROSPACE CORP US NAVAL RESEARCH LAB

PERSONNEL

PI - J.B. BLAKE DI - R.W. KREPLIN

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MEASURE SOLAR PROTONS AND ALPHA PARTICLES. A SET OF FIVE SMALL SILICON CUBICAL SEMICONDUCTOR DETECTORS WAS USED TO SEPARATELY MEASURE THE OMNIDIRECTIONAL PROTON AND ALPHA PARTICLE FLUXES IN THE DENERGY/NUCLEON RANGES 5 TO 20, 10 TO 25, 20 TO 4G, 50 TO 90, AND 100 TO 160 MEV. A TWO-ELEMENT SEMICONDUCTOR TELESCOPE USED COINCIDENCE REQUIREMENTS AND PULSE-HEIGHT ANALYSIS TO DETERMINE PROTON FLUXES IN FIVE DIFFERENTIAL EMERGY CHANNELS FROM 20 TO 500 KEV AND IN THREE INTEGRAL CHANNELS AT 0.5, 1, AND 1.5 MEV. THE 36- TO 74-KEV DATA AND THE IMPED OF A PHOTOMULTIPLIER TUBE VIEWING A THIN PLASTIC SCINTILLATOR FOIL, PULSE-HEIGHT ANALYSIS WAS USED TO SCPARATE IONS INTO FIVE GROUPS ($\hat{z} = 1, 2, 6$ (z = 1 OR 2) THROUGH OLD SITE THAN 18). THE LONS HAD EMERGY THRESHOLDS OF 0.5 MEV/NUCLEON (2 = 1 OR 2) THROUGH 0.8 MEV/NICLEON (z GREATER THAN 18). THE LONS HAD EMERGY THRESHOLDS OF 0.5 MEV/NUCLEON (2 = 1 OR 2) THROUGH 0.5 MEV/NUCLEON (z = 1 OR 2) THROUGH 0.5 MEV/NUCLEON ONCE EVERY 2 MIN.

- SOLRAD 11A, BLAKE-

INVESTIGATION NAME- ANTISOLAR PROTONS

INVESTIGATIVE PROGRAM NSSDC 10- 76-023C-23

> INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL PI — J_B. BLAKE OI — R.W. KREPLIN

AEROSPACE CORP US NAVAL RESEARCH LAB

BRIEF DESCRIPTION A PAIR OF IDENTICAL SENSORS WAS MOUNTED ON THE SPACEGRAFT, WITH ONE ON THE ANTISOLAR SURFACE (THIS EXPERIMENT) AND ONE ON THE SOLAR-ORIENTED SURFACE (EXPERIMENT 76-023C-14). EACH SENSOR WAS A TWO-ELEMENT COUNTER TELECOPE USING DISK-SHAPED SENICONDUCTORS AS DETECTOR ELEMENTS, WITH SHIELDING MATERIAL IN FRONT OF AND BETWEEN THE TWO DETECTOR ELEMENTS. THE DETECTOR ELEMENTS WERE CONNECTED TO CHARGE-SENSITIVE AMPLIFIERS, COINCIDENCE AND PULSE-HEIGHT ANALYSIS WERE USED TO SEPARATE PULSES. PRODUCED BY 2-MEV PROTONS, 10-MEV PROTONS, 4.5-MEV ALPHA PARTICLES, 7.5-MEV ALPHA PARTICLES, AND HEAVY NUCLEI (2 GREATER THAN 2, E GREATER THAN 3 MEV PER NUCLEON). A COMPLETE SET OF DATA POINTS WERE OBTAINED EVERY 2 MIN. BRIEF DESCRIPTION

INVESTIGATION NAME- STELLAR/AURORAL X-RAYS

INVESTIGATIVE PROGRAM NSSDC 10- 76-0230-16

- SOLRAD 11A, BYRAN-

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY Planetary Atmospheres Astronomy

PERSONNEL PI - E.T. BYRAM

US NAVAL RESEARCH LAB US NAVAL RESEARCH LAB

UJ - U.H. HURAN US HAVAL RESERVEN LAB BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF THEE PROPORTIONAL COUNTERS SENSITIVE TO X RAYS BETWEEN 1 AND 8 A. THESE PROPORTIONAL COUNTERS WERE MOUNTED ON THE SIDE OF THE STITLELITE AND ORIENTED 45 DEG. 70 DEG. AND 135 DEG OFF THE STITLE AND AXIS. THE COUNTING CIRCUITS WERE CONTROLLED BY THE ROLL PERIDD AND SYNCHRONIZED TO THE STAR AND/GR EARTH PULSES SO THAT DATA SAMPLES COULD BE ASSOCIATED WITH PARTIONS OF THE SKY. THE STELLAR PORTION OF THIS EXPERIMENT HAS ABLE TO MAP CONTIC T-RAY SOURCES AND TO SWEEP THE ENTIAL SPHERE IN ABOUT 6 MONTHS. THE AURORAL PORTION OF THE EXPERIMENT WAS DESIGNED TO NONTIOR AURORAL X-RAY EMISSIONS FROM THE EARTH. THE STELLAR PORTION SAMPLING CYCLE TOOK 16 MIN, WHILE THE AURORAL PORTION REQUIRED 2 MIN FOR A SIMPLING CYCLE.

SESP

- SOLRAD 11A, DOSCHEK-----

INVESTIGATION NAME- THOMSON Y-RAY POLARIMETER

INVESTIGATIVE PROGRAM NSSDC 10- 76-023C-10 SESP

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY Solar Physics

PERSONNEL PI - G.A. DOSCHEK

US NAVAL RESEARCH LAB

PI-G.A. DUSCHEA BRIEF DESCRIPTION INCIDENT SOLAR X RAYS WERE SCATTERED BY A BLOCK OF INCIDENT SOLAR X RAYS WERE SCATTERED BY A BLOCK OF BERYLLIUM, POLARIZED X RAYS WERE PREFERENTIALLY SCATTERED HILE NON-POLARIZED X RAYS WERE SCATTERED ISOTROPICALLY. TWO PROPORTIONAL COUNTERS, EACH WITH A TWO-CHANNEL PULSE HEIGHT TO SO-KEV BANDS, WERE MOUNTED ON OPPOSITE SIDES OF THE SCATTERING BLOCK. AS THE SATELLITE ROLLED, THE SCATTERING BLOCK AND THE DETECTORS WERE ROTATED WITH RESPECT TO THE PLANE OF POLARIZATION OF THE INCIDENT X RAYS. THE DATA WERE GATED BLECTRONICALLY INTO ACCUMULATORS ASSOCIATED WITH AS-DEG SECTORS IN THE ROLL DIRECTION. CYCLIC PULSE-COUNT WARIATIONS FORS IN THE ROLL DIRECTION. CYCLIC PULSE-COUNT WARIATIONS THE DATA FROM THE 45-DEG SECTORS WERE ACCUMULATED FOR AN INTEGRAL NUMBERAL OF SYNTHE AND SECONS WERE ACCUMULATED FOR AN INTEGRAL DUT ON SCHMAND. A RADIOACTIVE SOURCE SWUNG OUT BETWEEN EACH DETECTOR AND THE SCATTERING BLOCK FOR CALIBRATION IN FLIGHT.

---- SOLRAD 114. EVANS------

INVESTIGATION NAMÉ- COSMIC GAMMA-RAY BURST AND BACKGROUND Detector (0.2 to 2.0 MeV)

INVESTIGATIVE PROGRAM NSSDC 10- 76-023C-25 SËSP

INVESTIGATION DISCIPLINE(S) GAMMA-RAY ASTRONOMY

351 230 24

PERSONNEL PI - W.D. EVANS PI - R.W. KLEBESADEL LOS ALAMOS SCI LAB Los Alamos sci lab

PI-R.W. KLEBESADEL LOS ALAMOS SCI LAB BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED FOR THE STUDY OF THE GAMMA-RAY BACKGROUND AND THE DETECTION OF GAMMA-RAY BURGTS. THE EXPERIMENTAL COMFIGURATION CONSISTS OF TWO IDENTICAL DETECTORS MOUNTED 18D DEG APART AND LOOKING OUTWARD RADIALLY. DETECTORS MOUNTED 18D DEG APART AND LOOKING OUTWARD RADIALLY. DETECTORS MOUNTED 18D DEG APART AND LOOKING OUTWARD RADIALLY. DETECTORS MOUNTED 18D DEG APART AND LOOKING OUTWARD RADIALLY. DETECTORS MOUNTED 18D DEG APART AND LOOKING OUTWARD RADIALLY. DETECTORS MOUNTED 18D DEG APART AND LOOKING OUTWARD RADIALLY. COMPONENTS OF EACH UNIT ARE -- (1) A CESIMI LODIDE CRYSTAL. (2) PHOTOMULTIPLIER WITH ASSOCIATED POWER SUPPLY AND AMPLIFIERS, AND (3) PULSE WEIGHT ANALYZERS. THE EMERGY COVERAGE 15 FROM 3.2 TO 2.0 MEW, AND 15 RESOLVED INTO PASSBANDS OF 0.2 TO 0.3, U-3 TO 0.4, 0.4 TO 0.6, 0.2 TO 2.0, AND 0.6 TO 2.0 MEV. BACKGROUND MONITORIG TS AFFECTED BY ACCUMULATION OF 20-S AVERAGES BUILT UP OF 14.6-MS SAMPLINGS OF EITHER THE 0.2-TO 2.0 GR 0.3-TO 2.0-MEV PASSBAND. THE SIGNATURE OF A BURST IS THE 00SERVATION OF A 7-SIGMA INCREASE IN THE BACKGROUND OVER ONE 628-MS PERIOD. DURING A BURST. 12 BLOCKS OF DATA ARE RECONDED. EACH BLOCK REPRESENTS EIGHT READOUTS OF THE 0.2-TO 2.0- OR 0.3-TO 0.3-TO 0.4-TO 0.4-TO 0.4-TO 0.4-TO 0.4-TO 0.4-TO 2.0-NEV PASSBANDS. IF THE BURST LASTS LONGER THAN ONE STORAGE CYCLE, UP TO SEVEN ADDITIONAL STORAGE CYCLES MAX BE USED. THE READOUT OF THE DATA FOR A FULL SET OF STORAGE CYCLES TAKES 64 MIN.

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-- SOLRAD 11A, FELDMAN------

INVESTIGATION NAME- 1175- TO 1800-A SOLAR UV SPECTROMETER

INVESTIGATIVE PROGRAM NSSDC 10- 76-0230-09 SESP

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL PI - P.D. FELDMAN QI - R.W. KREPLIN

IGHNS HOPKINS U US NAVAL RESEARCH LAB 「「「「「「「」」」」」

BRIEF DESCRIPTION THIS EXPERIMENT USED A ROTATABLE GRATING, OPERATING IN FIRST MORER TO MEASURE THE SOLAR ELECTROMAGNETIC SPECTRUM BETWEEN 1175 AND 1830 A. A PHOTOMULTIPLIER TUBE DETECTED RADIATION REFLECTED THROUGH AN OPTICAL SYSTEM FROM THE GRATING-TWO SCANNING RATES WERE AVAILABLE -- A FAST-RATE, LOW-RESOLUTION MODE IN WHICH THE ENTIRE 625-A RANGE WAS COVERED IN 93.75 S, USING 25-A SEGMENTS FOR EACH DATA SAMPLE, AND A SLOW-RATE, HIGH-RESOLUTION MODE IN WHICH THE 625-A RANGE WAS COVERED IN 12.5 MIN, USING 3.125-A SEGMENTS.

SESP

-- SOLRAD 11A, FRITZ-----

INVESTIGATION NAME- 15- TO 150-KEV SOLAR X-RAY MONITOR

INVESTIGATIVE PROGRAM NSSOC 10- 76-0230-01

INVESTIGATION DISCIPLINE(S)

X-RAY ASTRONOMY SOLAR PHYSICS

PERSONNEL PI - G.G. FSITZ

PE

115 NAVAL RESEARCH LAB

BRIEF DESCRIPTION
THIS EXPERIMENT USED A CESIUM IODIDE SCINTILLATOR
THIS EXPERIMENT USED A CESIUM IODIDE SCINTILLATOR
SURROUNDED BY A PLASTIC SCINTILLATOR DPERATED IN
ANTICOINCIDENCE TO SCREEN OUT BACKGROUND COUNTS, PULSE HEIGHT
ANALYSIS PROVIDED SOLAR SPECTRA IN THE RANGES FROM 15 TO 2D, 2D
TO 30, 30 TO 60, AND 60 TO 150 KEV. NORMALLY, DATA WERE
TELENETERED FROM EACH CHANNEL EVERY 7.5 S, ALTHOUGH AN OPTIONAL
MODE SELECTED THE 2D- TO 3D-KEV CHANNEL FOR TRANSMISSION EVERY
T, B75 S, INFLIGHT CALIBRATION WAS MADE USING A RADIGACTIVE
SOURCE THAT SWUNG IN FRONT OF THE DETECTOR UPON COMMAND AND
REMAINED THERE FOR A 2-MIN DELEMETRY CYCLE. THE OVERALL
DETECTOR DESIGN WAS THE SAME AS THAT USED ON SOLRAD 10 WITH
IMPROVED ELECTRONICS.

- SOLRAD 11A, FRITZ----

INVESTIGATION NAME- X-RAY BACKGROUND

NSSDE 10- 76-0230-24

INVESTIGATIVE PROGRAM SESP

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY ASTRONOMY

RSONNEL		US NAVAL RESEARCH LAB
P1 - G.G.	FRITZ	
		US NAVAL RESEARCH LAB
01 - R.	LUCKE	
01 - R.C.	HENRY	JOHNS HOPKINS U

GRIEF DESCRIPTION A SOLID-STATE DETECTOR (GERMANIUN OR LITHIUM-DRIFTED A SOLID-STATE DETECTOR (GERMANIUN OR LITHIUM-DRIFTED SILICON) WAS USED TO MEASURE THE GALACTIC X-RAY BACKGROUND IN THE 0.5- TO 2D-KEV RANGE WITH AN ENERGY RESOLUTION, OF BETTER THAN 0.3 KEV. TO REACH THE DESIRED 0.3-KEV ENERGY RESOLUTION, THE DETECTOR HAD TO BE PASSIVELY COOLED TO 70 TO 100 KELVIN. THE DETECTOR HAD TO BE PASSIVELY COOLED TO 70 TO 100 KELVIN. THE DETECTOR HAD TO BE PASSIVELY COOLED TO 70 TO 100 KELVIN. THE DETECTOR HAD TO BE PASSIVELY COOLED TO 70 TO 100 KELVIN. THE DETECTOR AND SWEPT OUT A BAND NEARLY 20-DEG WIDE, CENTERED NEAR THE ECLIPTIC PLANE AS THE SATELLITE MOVED AROUND THE SUN. THE DETECTOR OUTPUT UNDERWENT A 256-CHANNEL ANALYSIS TO PRODUCE THE ENERGY SPECTRUM. ALL 256 CHANNEL ANALYSIS TO PRODUCE THE ENERGY SOURCE MOUNTED ON A SHUTTER WAS USED TO PROVIDE INFLIGHT CALIBRATION OF THE DETECTOR.

-- SOLRAD 114, KREPLIN--

INVESTIGATION NAME- 1- TO 8-A SOLAR X-RAY MONITOR

INVESTIGATIVE PROGRAM SESP NSSDC 10- 76-0234-04

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

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ST. V. S. W.

ERSONNEL PI - R.W. OI - R.G. OI - D.M.	KREPLIN Taylor Horan	· . ·	US NAVAL	RESEARCH LAB Research Lab Research Lab	
01 - 0181	Henri				

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US NAVAL RESEARCH LAB US NAVAL RESEARCH LAB US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

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BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF TWO COMPLETE SETS OF IONIZATION-CHANBERS AND ELECTROMETER-AMPLIFIER COMBINATIONS. THE IONIZATION CHAMBERS WERE SENSITIVE TO SOLAR X RAYS IN THE 1- TO B-A RANGE. THE TWO SETS WERE DRIVEN BY SEPARATE POWER SUPCLIES, ALTHOUGH ONLY ONE SET WAS SELECTED FOR TELEMETRY TRANSMISSION. DATA WERE TRANSMITTED WITH A T5-S. TIME RESOLUTION. THE ELECTROMETER-AMPLIFIERS WERE ABLE TO CHANGE RANGES 'WTOMATICALLY OR MANUALLY. THE DETECTORS COULD NOT CALIBRATED IN FLIGHT, BUT THE ELECTROMETER-AMPLIFIERS COULD BE CALIBRATED ON EACH RANGE WITHOUT DETACHING THE DETECTOR.

-- SOLRAD 11A, KREPLIN------

INVESTIGATION NAME- 8- TO 16-A SOLAR X-RAY MONITOR

NSSDC 10- 76-0230-05 INVESTIGATIVE PROGRAM SÈSP

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY Solar Physics

PERSONNEL					
PI - R.W. OI - R.G. OI - D.M.	TATLOR	ÚS.	NAVAL	RESEARCH RESEARCH RESEARCH	LAB

URLEF DESCRIPTION THIS EXPERIMENT CONSISTED OF TWO COMPLETE SETS OF IONIZATION-CHAMBER AND ELECTROMETER-AMPLIFIER COMBINATIONS. THE IONIZATION CHAMBERS WERE SENSITIVE TO SOLAR X RAYS IN THE 8- TO 16-A RANGE. THE TWO SETS WERE DRIVEN BY SEPARATE POWER SUPPLES, ALTHOUGH ONLY ONE SET WAS SELECTED FOR TELEMETRY TRANSMISSION. DATA WERE TRANSMITTED WITH A 3D-S TIME RESOLUTION. THE ELECTROMETER-AMPLIFIENS WERE ABLE TO CHANGE RANGES AUTOMATICALLY OR MANUALLY. THE DETECTORS COULD NOT BE CALIBRATED IN FLIGHT, BUT THE ELECTROMETER-AMPLIFIERS COULD BE CALIBRATED ON EACH RANGE WITHOUT DETACHING THE DÉTECTOR.

--- SOLRAD 11A, KREPLIN---

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INVESTIGATION NAME- 44- TO 60-A SOLAR X-RAY MONITOR

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) Solar Physics

PERSONNEL

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ALC: NO POINT

PI - R.W. KREPLIN OI - D.M. HORAN OI - R.G. TAYLOR US NAVAL RESEARCH LAB Us naval research lab Us naval research lab

BRIEF DESCRIPTION

NSSC 10- 76-023C-06

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF TWO COMPLETE SETS OF IONIZATION-CHAMBER AND ÉLECTROMETER-AMPLIFIER COMBINATIONS. THE JONIZATION CHAMBERS WERE SENSITIVE TO SOLAR X RAYS IN THE 44- TO 60-A RANGE. THE TWO SETS WERE DRIVEN BY SEPARATE POWER SUPPLIES. ALTHOUGH ONLY ONE SET WAS ELECTED FOR TELEMETRY TRANSMISSION. DATA WERE TRANSMITTED WITH A 30-S TIME RESOLUTION. THE ELECTROMETER-AMPLIFIERS WERE ABLE TO CHAMGE CURRENT RANGES AUTOMATICALLY OR MANUALLY. THE ELECTROMETER-AMPLIFIERS COULD BE CALIBRATED ON EACH RANGE WITHOUT DETACHING THE DETETTOR. THE DETECTORS COULD BE CALIBRATED IN FLIGHT BY COMMANDING A SHUTTER-MOUNTED RADIOACTIVE SOURCE INTO POSITION.

SOLRAD 11A. KREPLIN---

INVESTIGATION NAME- 170- TO 1050-A SOLAR EUV MONITOR

N55DC ID- 76-023C-07 INVESTIGATIVE PROGRAM SËSP

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSURIES PI - R.W. KREPLIN DI - R.G. TAVLOR DI - D.M. HORAN

US NAVAL RESEARCH LAB US NAVAL RESEARCH LAB US NAVAL RESEARCH LAB

ERIEF DESCRIPTION

GRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF THREE SETS OF LITHIUM FLUORIDE PHOTOSENSITIVE SURFACE DETECTORS COUPLED TO FOUR-RANGE ELECTROMETER-AMPLIFIERS, THE THREE SETS WERE NOT REDUNDANT DUE TO THE DIFFERENT FILTERS BEING USED. A BENYLLIUM FILTER LIMITED ONE DETECTOR'S RESPONSE TO WAVELENGTHS FROM 170 TO 500 A. A TIN FILTER LIMITED A SECOND DETECTOR'S RESPONSE TO WAVELENGTHS FROM 45G TO 4850 A. AN INDIV FILTER LIMITED THE THAD DETECTOR'S RESPONSE TO WAVELENGTHS FROM 725 TO 105D A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FROM 725 TO 105D A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FROM 725 TO 105D A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FROM 725 TO 105D A. SUPPLIES. EACH DETECTOR WAS READ EVERY 7.5 S. THE DETACHING THE DETECTOR. ALTHOUGH THE DETECTORS COULD NOT BE CALIBRATED IN FLIGHT.

- SOLRAD 11A, KREPLIN--

INVESTIGATION NAME- 1080- TO 1350-A SOLAR UV MONITOR

INVESTIGATIVE PROGRAM SESP

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL PI — R.N. KREPLIN DI — R.G. TAYLOR DI — D.M. HORAN

NSSDC 10- 76-023C-08

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF ONE 4-RANGE ELECTRONETER-AMPLIFIER AND THREE IONIZATION CHAMBERS. TWO OF THE IONIZATION CHAMBERS WERE THE STANDARD GAS-FILLED CHAMBERS FLOWN ON PREVIOUS SOLRAD SATELLITES. THESE DETECTORS, ELECTRONICALLY AND MECHANICALLY PAIRED, WERE DESIGNATED AS DETECTOR 'A.' THE THIRD IONIZATION CHAMBER WAS AN EVACUATED CHAMBER WITH A LITHIUM FLUORIDE FHOTOSENSITIVE SURFACE, AND WAS DESIGNATED AS DETECTOR '8.' NORMALLY, DETECTOR B WAS CONTINUOSLY SELECTED FOR TELMETRY TRANSMISSION AND WAS REPLACED ONLY GCCASIONALLY BY DETECTOR A FOR CALIBRATING B AND SYPERIMENT 9. A MECHANICAL SHUTTER, MOVABLE BY COMMAND, SHIELDED THE WINDOW OF BA FROM THE SUN. THE ELECTROMETER-AMPLIFIER COULD BE CALIBRATED WITHDUT DETACHING THE DETECTOR FROM THE DETECTOR SYSTEM. DATA WERE SAMPLED AT TS-S INTERVALS,

---- SOLRAD 11A, KREPLIN----

INVESTIGATION NAME- 0.5- TO 3-A SOLAR X-RAY MONITOR

NSSDC 10- 76-023C-12 INVESTIGATIVE PROGRAM SESP

INVESTIGATION DISCIPLINE(S) Solar Physics

PERSONNEL			
PI - R.W. 01 - R.G. 01 - D.M.	TAYLOR	US NAVAL RESEA Us Naval Resea Us Naval Resea	RCH LAB

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF THREE IONIZATION CHAMBERS CONNECTED IN PARALLEL TO A SINGLE ELECTROMETER-AMPLIFIER. THE IONIZATION CHAMBERS WERE SENSITIVE TO SOLAR X RAYS IN THE 0.5 TO 3.0-A RANGE. DATA WERE TRANSMITTED WITH A 15-S TIME RESOLUTION. THE ELECTROMETER-AMPLIFIER WAS ABLE TO CHAMGE CURRENT RANGES AUTOMATICALLY OR RANUALLY. THE DETECTORS COULD NOT BE CALIBRATED IN FLIGHT, BUT THE ELECTROMETER-AMPLIFIER COULD BE CALIBRATED ON EACH RANGE WITHOUT DETACHING THE DETECTOR.

--- SOLRAD 11A, KREPLIN-----

INVESTIGATION NAME- 2- TO 20-A SOLAR X-RAY MONITOR

NSSDC ID- 76-0230-13 INVESTIGATIVE PROGRAM SESP

INVESTIGATION DISCIPLINE(S) Solar Physics

PERSONNEL				1.1.1
PI - R.W. 01 - R.G. 01 - D.N.	TAYLOR	•	US NAVAL	RESEARCH LAB Research Lab Résearch Lab

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF AN IONIZATION CHAMBER AND ONE ELECTROMETER-AMPLIFIER. THE IONIZATION CHAMBER WAS SENSITIVE TO SOLAR X RAYS IN THE T- TO 20-A RANGE, DATA WERE TRANSMITTED WITH A 30-S TIME RESOLUTION. THE ELECTROMETER-AMPLIFIER WAS ABLE TO CHANGE CURRENT RANGES AUTOMATICALLY OR MANUALLY. THE DETECTOR COULD NOT BE CALIBRATED IN FLIGHT, BUT THE ELECTROMETER-AMPLIFIER COULD BE CALIBRATED ON EACH RANGE WITHOUT DETACHING THE DETECTOR.

-- SOLRAD 11A, LAZARUS-

INVESTIGATION NAME- SOLAR WIND SPECTROMETER

NSSDC 10- 76-0230-15

INVESTIGATIVE PROGRAM **S**ÈSP

INVESTIGATION DISCIPLINE(5) PARTICLES AND FIELDS Space plasmas

PERSONNEL PT - A.J. LAZARUS OI - R.W. KREPLIN

MASS INST OF TECH US NAVAL RESEARCH LAB

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BRIEF DESCRIPTION TWO MODULATED GRID FARADAY CUPS (ONE DIRECTED ALONG THE SPIN AXIS FACING THE SUN, AND ONE IN THE SPIN PLAME) WERE USED TO MEASURE IONS AND ELECTRONS IN THE SOLAR WIND (S/C SPIN IS ABOUT 4 RPN). THE SOLAR POINTING DETECTOR HAD A SPLIT COLLECTOR TO DETERMINE THE POSITIVE ION ENERGY SPECTRUM IN 24 CONTIGUOUS ENERGY WINDOWS FROM APPROXIMATELY 200 VOLTS TO 5000 VOLTS. DIRECTION OF FLOW TO WITHIN 2 DEG WAS DETERMINED BY COMPARISON OF CURRENTS OBSERVED IN THE THREE 12D DEG SECTORS OF THE CUP COLLECTOR. TOTAL ION FLUX WAS DETERMINED BY MODULATING HE ENERGY WINDOW BETWEEN APPROXIMATELY 200 AND SODO VOLTS. ELECTRONS WERE DETECTED (IN THE S/C SPIN PLAME) WITH THE SECOND SOLID COLLECTOR. CUP IN 4 CONTIGUOUS ENERGY WINDOWS FROM 20 TO 120 EV. THE EXPERIMENT, OPERATED IN THREE SAMPLING MODES ---THOUS KEEPING A 6.798-S CYCLE WERE TELEMETERD, --1+MOUS ALEDING SAMPLES, I SAMPLES, IN NORMAL MODE, 33 SAMPLES OURING A 6.798-S CYCLE WERE TELEMETERD, --1+MOUS ALEDING SAMPLES, SEQUENCES WERE THELEMETERD, --1+MOUS ALEDING SAMPLES, SEQUENCES WERE THELEMETERD, --1+MOUS ALEDING SAMPLES, SEQUENCES WERE THELEMETERD OF THREE SAMPLES OUR ING A 6.798-S SEQUENCES WERE THELEMETERD OF THE FAST MODE, 10 OF ELEVEN 6.798-S SEQUENCES WERE TELEMETERED EVERY 2 MIN. IN THE FAST RATE FLUX MODE, THE EXPERIMENT RASUMES THE TOTAL PROTON FLUX. TOTAL ELECTRON FLUX. AND THE THREE 12D DEG SECTORS OF THE SPLIT COLLECTOR CUP, AND J POSITIVE ION HELM SAMPLES. THIS SEQUENCE SERVENTE DEVERY 2 MIN. IN THE FAST MODE, 10 OF ELEVEN 6.798-S SEQUENCES WERE TELEMETERED EVERY 2 MIN. IN THE FAST RATE FLUX MODE. THE EMPERIMENT RESUMES THE TOTAL PROTON FLUX. TOTAL ÉLECTRON FLUX. AND THE THREE 12D DEG SECTOR FLUXES EVERY 1.030 S FOR 6 TIMES (6.180 S), WAITS 11 S, AND REPEATS THE 4 SEQUENCES.

...... - SOLRAD 11A, MEEKINS------

INVESTIGATION NAME- CONTINUUN (8.8 A) AND MAGNESIUM LINE (9.17 A AND 8.42 A) MONITOR

INVESTIGATIVE PROGRAM NSSDC 10- 76-023C-03 SESP

INVESTIGATION DISCIPLINE(S) Solar physics

PERSONNEL PI - J.F. MEEKINS

US NAVAL RESEARCH LAB

BRIEF DESCRIPTION SOLAR X RAYS WERE OBSERVED IN THE MAGNESIUM-11 AND -12 LINES (9.17 A AND 8.42 A) AND IN THE CONTINUUM AT 8.8 A. THREE SHA CRYSTALS FIXED AT THREE DIFFERENT ANGLES ALLOWED SOLAR X RAYS TO UNDERGO FIRST-DRDER BRAGG REFLECTION INTO THREE PROPORTIONAL COUNTERS. IF THE SPACECRAFT SPIN AXIS HAD BECOME INFROPERLY ORIENTED, THE SPECTROMETER WOULD HAVE FUNCTIONED PROPERLY IF THE ASPECT ANGLE HAD BEEN NO MORE THAN 1 DEG OFF NOMINAL, ALTHOUGH THE INSTRUMENT WOULD THEN HAVE FUNCTIONED AS A SCANNING SPECTROMETER WITH AN EXTREMELY SMALL SPECTRAL RAGE IN THE VICINITY OF THE TARGET WAVELENGTHS. DATA WERE ACCUMULATED OVER INTERVALS OF 1/64 OF A SPACECRAFT'S SPIN PERIOD, AND THE EXPERIMENT, HAD A SAMPLING CYCLE DF APPROXIMATELY 1-NIN DURATION.

INVESTIGATION NAME- BRAGG X-RAY POLARIMETER

INVESTIGATIVE PROGRAM NSSDC 10- 76-023C-11 SESP

> INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY Solar Physics

PERSONNEL PI - J.F. MEEKINS

----- SOLRAD 14A, MEEKINS--

IIS NAVAL RESEARCH LAB

BRIEF DESCRIPTION THIS EXPERIMENT UTILIZED A LITHIUM FLUORIDE CRYSTAL, FIXED AT AN ANGLE TO ALLOW SOLAK RAYS OF ABOUT 2.8 A TO UNDERGO FIRST-ORDER BRAGG REFLECTION INTO A PROPORTIONAL COUNTER. SINCE THE REFLECTION OF POLARIZED RADIATION DEPENDED UPON THE ANGLE DETWEEN THE ELECTRIC VECTOR OF THE RADIATION ADT HE REFLECTING ANGLE OF THE CRYSTAL, THE SPIN OF THE SATELLITE MODULATED THE INTENSITY OF REFLECTED POLARIZED RADIATION. DATA PULSES ASSOCIATED WITH 45-DEG SECTORS IN THE ROLL DIRECTION WERE ELECTRONICALLY GATED INTO CORRESPONDING ACCUMULATORS. SIGMAL VARIATIONS FROM SECTOR TO SECIOR INDICATED THE PRESENCE OF POLARIZED RADIATION. DATA FOR EACH 45-DEG SECTOR ACCUMULATED FOR AN INTEGRAL NUMBER OF SPINS AND READ OUT ONCE IN EACH 2-MIN TELEMETRY CYCLE.

- SOLRAD 11A, SMATHERS-----

INVESTIGATION NAME- X-RAY MONITOR (0.1-1.6 A. 0.5-3 A. 1-4 A)

NSSDC 10- 76-023C-02

SESP INVESTIGATION DISCIPLINE(S) PHYSICS

INVESTIGATIVE PROGRAM

X-RAY ASTRONOMY

PERSONNEL SMATHERS PI - H.W.

US NAVAL RESEARCH LAB

BRIEF DESCRIPTION FOUR ELECTRONICALLY PAIRED, GAS-FILLED, PROPORTIONAL FOUR ELECTRONICALLY PAIRED, GAS-FILLED, PROPORTIONAL WINDOWS WERE USED TO MEASURE X-RAY EMISSION BETWEEN 4 AND 300 WINDOWS PLUS ADDITIONAL ALL FOUR DETECTORS HAD 10-MIL BERYLLIUM WINDOWS PLUS ADDITIONAL ALUMINUN OR BERYLLIUM MATERIAL MOUNTED IN FRONT OF THE DETECTORS, EACH DETECTOR WAS SAMPLED ONCE EVERY 7.5 S, ALTHOUGH AN OPTIONAL MODE TRANSMITTED DATA FROM ONLY ONE OR TWO DETECTORS, EFFECTIVELY QUAGE "PLING OR DOUBLING THE SAMPLING RATE OF THAT DETECTOR. IN-FLIGHT CALIBRATION WAS PERFORMED USING A RADIOACTIVE SOURCE THAT WAS MOVED IN FRONT OF THE DETECTORS UPON COMMAND.

--- SOLRAD 11A, VANPOLA-----

INVESTIGATION NAME- SOLAR FLARE ELECTRONS

INVESTIGATIVE PROGRAM SESP N55DC 10- 76-023C-22

INVESTIGATION DISCIPLINE(S) Solar Physics Particles and fields

PERSONNEL PI - A.L. 01 - J.B. 01 - R.W. AEROSPACE CORP Aeruspace corp US Naval Research LAB VAMPOLA BLAKE KREPLIN

BRIEF DESCRIPTION THIS EXPERIMENT MEASURED SQLAR ELECTRONS. TWO PERMANENT MAGNETS WERE USED TO MOMENTUM-ANALYZE INCIDENT ELECTRONS. ARRAYS OF SILICON DETECTORS COUNTED INCIDENT ELECTRONS IN 12 ENERGY CHANNELS FROM 11 KEV TO 1.5 MEV. SPIN-INTEGRATED DATA WERE OBTAINED ONCE EVERY 2 MIN, EXCEPT THAT 11-KEV AND 605-KEV DATA WERE SECTORED INTO QUADRANTS, AND 60-KEV AND 610-KEV DATA WERE OBTAINED WITH 15-S RESOLUTION.

-- SOLRAD 11A, WELLER, JR.----

INVESTIGATION NAME- GEOCORONAL-EXTRATERRESTRIAL EUV -Detector 1

INVESTIGATIVE PROGRAM SESP NSSDC 10- 76-0230-18

INVESTIGATIVE PROGRAM SESP

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES ASTRONOMY

PERSONNEL PI - C.S. WELLER, JR. US NAVAL RESEARCH LAB

BRIEF DESCRIPTION A COLLIMATED CHANNELTRON PHOTOMULTIPLIER MOUNTED BEHIND A FILTER WHEEL WAS USED TO MEASURE EUV RADIATION FROM NON SOLAR SOURCES. THE FILTER WHEEL ALLOWED VARIOUS EMISSION LINES BETWEEN 200 AND 1400 A TO BE ISOLATED, AS WELL AS ALLOWING IN-FLIGHT CALIBRATION THROUGH THE USE OF A RADIOACTIVE SOURCE. THE DETECTOR WAS MOUNTED TO LOOK 90 DEG OFF THE SPIN AXIS OF THE SPACECRAFT AND SWEPT THE CELESTIAL SPHERE IN ABOUT 6 MONTHS. EACH DATA SAMPLE WAS ACCUMULATED OVER INCREMENTS OF 1/64 OF THE SPACECRAFT'S SPIN, WITH THE SAMPLE SOURCE REFERENCED TO EITHER A STAR PULSE OR THE EATH PULSE. THE DATA WERE READ OUT IN 2-MIN INTERVALS. THIS EXPERIMENT OPERATED NO MORE THAN 1 H PER DAY.

- SOLRAD 11A, WELLER, JR.-----

INVESTIGATION NAME: GEOCORONAL-EXTRATERRESTRIAL EUV -Detector 2

NSSDC 10- 76-023C-19

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES ASTRONOMY

PERSONNEL PI - C.S. WELLER, JR.

US NAVAL RESEARCH LAB

BRIEF DESCRIPTION A COLLIMATED CHANNELTRON PHOTOMULTIPLIER MOUNTED BEHIND A FILTER WHEEL WAS USED TO MEASURE EUV RADIATION FROM NON SOLAR SOURCES. THE FILTER WHEEL ALLOWED VARIOUS EMISSION LINES BETWEEN 200 AND 1400 A TO BE ISOLATED, AS WELL AS ALLOWING IN-FLIGHT CALIFRATION THROUGH THE USE OF A RADIOACTIVE SOURCE. THE DETECTOR WAS MOUNTED TO LOOK 90 DEG OFF THE SPIN AXIS OF THE SPACE(RAFT AND SWEPT THE CELESTIAL SPHERE IN ABOUT 6 MONTHS. EACH DATA SAMPLE WAS ACCUMULATED OVER INCREMENTS OF 1/64 OF THL SPACE(RAFT'S SPIN, WITH THE SAMPLE SOURCE REFERENCED TO EITHER A STAR PULSE OR THE EARTH PULSE. THE DATA WERE READ OUT 1N 2-MIN INTERVALS. THIS EXPERIMENT OPERATED NOT MORE THAN 1 H PEN DAY.

- SOLRAD 11A. VATES------

INVESTIGATION NAME+ PROTON-ALPHA TELESCOPE

NS50C 10- 76-023C-20

INVESTIGATIVE PROGRAM Sesp

INVESTIGATION DISCIPLINE(S) Solar Physics Particles and fields

AFRSONNE PI ~ K. YATES 01 - R.W. KREPLIN

USAF CAMBRIDGE RES LAB US NAVAL RESEARCH LAB

HRIEF DESCRIPTION TWO TOTALLY DEPLETED SILICON SURFACE BARRIER DETECTORS IN A COINCIDENCE TELESCOPE ARRANGEMENT WERE USED TO DETECT 1- TO TOO-MEV PROTONS AND 10- TO 100-MEV ALPHA PARTICLES. PULSE HEIGHT ANALYSIS AND SUITABLE LOGIC ELEMENTS WERE USED TO PROVIDE 11 PROTON CHANNELS AND 4 ALPHA PARTICLE CHANNELS. THE TELESCOPE WAS INSENSITIVE TO LIGHT AND TO ELECTRONS. VERY LITTLE FLUX DIRECTIONALITY INFORMATION WAS OBTAINED.

- SOLRAD 11A, YATES----

INVESTIGATION NAME- LOW-ENERGY PROTON SPECTROMETER

INVESTIGATIVE PROGRAM NSSDC 10- 76-0230-21 SESP

INVESTIGATION DISCIPLINE(S) Solar Physics Particles and Fields

PERSONNEL

USAF GEOPHYS LAB US NAVAL RESEARCH LAB YATES PI - K. YATES OF - R.W. KREPLIN

BRIEF DESCRIPTION GRIEF DESCRIPTION TWO TOTALLY DEPLETED SILICON SURFACE BARRIER DETECTORS, MOUNTEC IN A SERIES, MEASURED PROTONS BETWEEN 150 KEV AND 6 MEV. PULSE HEIGHT ANALYSIS OF PULSES GENERATED IN THE FRONT DETECTOR, WHICH WERE UNACCOMPANIEÓ BY PULSES IN THE FRONT DETECTOR, SEPARTED THE PROTON COUNTS INTO 12 ENERGY CHANNELS PERMANENT MAGNETS WERE USED TO DEFLECT INCIDENT ELECTRONS WITH ENERGIES LESS THAN 2 MEV. VERY LITTLE FLUX DIRECTIONALITY INFORMATION WAS GETAINED. INFORMATION WAS OBTAINED.

SPACECRAFT COMMON NAME- SOLRAD 11B ALTERNATE NAMES- SOLRAD HI-TRIP, SESP P74-1D SP74-1D, SESP ND. NRL-111-0264 SRD-11B

NSSDC 10- 76-0230

LAUNCH DATE- 03/15/7	6		WEIGHT-	102.1	5 KG
LAUNCH SITE- CAPE CA	NAVERAL, UNITED	STATES			
LAUNCH VEHICLE- TITA	NN -				

SPONSORING COUNTRY/AGENCY United States DOD-NAVY

INITIAL ORBIT PARAMETERS Orbit Type- geocentric Orbit Period-7116.7 Min Periapsis- 115720. Km	EPOCH DATE- 07/01/76 Inclination- 23.6 Deg Apoapsis- 116645. KM
PERSONNEL PM - E.W. PETERKIN OS - D - XDEPIIN	US NAVAL RESEARCH LAB Us Naval research lab

ISONNEL PM – E.W. PETERKIN PS – R.W. KREPLIN

URIEF DESCRIPTION SOLRAD 11B WAS ONE OF A PAIR OF IDENTICAL SATELLITES THAT SOLRAD 11B WAS ONE OF A PAIR OF IDENTICAL SATELLITES THAT FRE PLACED IN A CIRCULAR EQUATORIAL ORBIT OF 20 EARTH RADIL. THE SATELLITES, WHICH WERE ORIENTED TOWARDS THE SUN, PROVIDED 100 PERCENT REAL-TIME, CONTINUOUS MONITORING OF SOLAR X-RAY. UW, AND ENERGETIC PARTICLE EMISSIONS. EXPERIMENTS INCLUDED EROADBAND ION CHAMBERS OBSERVING SOLAR X RAYS BETWEEN O.1 AND 60 A, PROPORTIONAL COUNTERS AND SCINTILLATORS OBSERVING SOLAR X RAYS BETWEEN 2 AND 150 KEV, AN EUV DETECTOR COVERING THREE BANDS BETWEEN 170 AND 100G A, A VARIABLE RESOLUTION GEERT-FASTIE SPECTROMETER COVERING THE AVUELENGTH RANGE OF 1100 TO 1600 A (RESOLUTION -- 1 TO 25 A), A SOLAR WIND MONITOR, SOLAR PROTON, ELECTRON, AND ALPHA PARTICLE MONITORS, THO X-RAY POLARIMETERS (ONE WITLIZING BRAGG SCATTERING AND THE OTHER UTILIZING THOMPSON SCATTERING), A BRAGG SPECTROMETER OBSERVING MAGNESIUM-11 AND -12 LINES, A LARGE-AREA AUMORAL X-RAY DETECTOR, AND A FASSIVELY COULD SOLID-STATE X-RAY DETECTOR TO MEASURE BACKGROUND X-RAY EMISSIONS.

--- SOLRAD 118, BLAKE---

INVESTIGATION NAME- SOLAR PROTONS

NSSDC 10- 76-0230-14

INVESTIGATIVE PROGRAM SE5F

INVESTIGATION DISCIPLINE(S) Solar physics

PERSONNEL PI - J.B. BLAKE DI - R.W. KREPLIN

BRIEF DESCRIPTION A PAIR OF IDENTICAL SENSORS WAS MOUNTED ON THE SPACECRAFT, WI'H ONE ON THE SOLAR-ORIENTED SURFACE (THIS EXPERIMENT) AND ONE ON THE ANTISOLAR SURFACE (EXPERIMENT 76-0230-23). EACH SENSOR WAS A TWO-ELEMENT COUNTER USING DISK-SHAPED SEMICONDUCTORS AS DETECTOR ELEMENTS, WITH SHIELDING MATERIAL IN FRONT OF AND BETWEEN THE TWO DETECTOR ELEMENTS. THE DETECTOR ELEMENTS WERE CONNECTED TO CHARGE-SENSITIVE AMPLIFIERS. COINCIDENCE AND PULSE HEIGHT ANALYSIS WERE USED TO SEPARATE PULSES PRODUCED BY 2-MEV PROTONS, 10-MEV PROTONS, 4.5-MEV ALPHA PARTICLES, 7.5-MEV ALPHA PARTICLES, AND HEAVY NUCLEI (Z GREATER THAN 2, E GREATER THAN 3 MEV PER NUCLEON). A COMPLETE SET OF DATA POINTS WAS OBTAINED EVERY 2 MIN.

-- SOLPAN 110 BLAKE-----

INVESTIGATION NAME- ORNIDIRECTIONAL PROTONS

NSSDC 10- 76-0230-17 INVESTIGATIVE PROGRAM SESP

INVESTIGATION DISCIPLINE(S) Solar Physics Particles and fields

PERSONNEL PI - J.B. BLAKÉ OI - R.W. KRÉPLIN

US NAVAL RESEARCH LAB

01 - R.W. KREPLIN US HAVAL RESEARCH LAU SRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MEASURE SOLAR PROTONS AND ALPHA PARTICLES. A SET OF FIVE SMALL SILICON CUBICAL SEMICONDUCTOR DETECTORS WAS USED TO SEPARATELY MEASURE THE ENERGY/NUCLEON RANGES 5 TO 20, 10 TO 25, 20 TO 60, 50 TO 90, AND 100 TO 160 MEV. A TWO-ELENEMENT SEMICONDUCTOR TELESCOPE USED GOINCIDENCE REQUIREMENTS AND PULSE-HEIGHT AHALYSIS TO DETERMINE PROTON FLUXES IN FIVE DIFFERENTIAL EMERGY CHANNELS FROM 20 TO SLOD KEV AND IN THREE INTEGRAL CHANNELS AT 0.5, 7, AND 1.5 MEV. THE 36- TO 74-KEV DATA AND THE 1-MEV DATA WERE SECTORED INTO QUADRANTS, WHILE THE REMAINING CHANNELS OF A PHOTOMULITIFLER TUBE VIEWING A THIN PLASTIC SCINTILLATOR FOIL, PULSE-HEIGHT HANALYSIS WAS USED TO SEPARATE IONS INTO FIVE GROUPS (Z = 1, 2, 6 TO 10, 12 TO 18, AND GREATER THAN 18). THE 2005 HAD ENERGY THRESHOLDS OF 0.5 MEV/NUCLEON (Z = 1 OR 2) THROUGH 0.8 MEV/NUCLEON (Z GREATER THAN 18). THE 2=AND Z=6 THROUGH 0.8 MEV/NUCLEON (Z GREATER THAN 18). THE Z=6 THROUGH 0.8 MEV/NUCLEON (Z GREATER THAN 18). THE REMAINING DATA WERE SECTORED INTO FOUR QUADRANTS. THE REMAINING DATA WERE SPIN-INTEGRATED. A COMPLETE SET OF MEASUREMENTS WAS MADE ONCE EVERY 2 MIN. ONCE EVERY 2 MIN.

INVESTIGATION NAME- ANTISOLAR PROTONS

- SOLRAD 118, BLAKE-----

NSSDC 10- 76-0230-23

INVESTIGATIVE PROGRAM SESP

INVESTIGATION DISCIPLINE(S) Particles and fields

PERSONNEL PI - J.B. BLAKE DI - R.W. KREPLIN

AEROSPACE CORP US NAVAL RESEARCH LAB

BRIEF DESCRIPTION A PAIR OF IDENTICAL SENSORS WERE MOUNTED ON THE SPACECRAFT, WITH OME ON THE ANTISOLAR SURFACE (THIS EXPERIMENT) AND ONE ON THE SOLAR-ORIENTED SURFACE (EXPERIMENT 76-023D-16). EACH SENSOR WAS A TWO-ELEMENT COUNTER TELECOPE USING DISK-SHAPED SEMICONDUCTORS AS DEFECTOR ELEMENTS, WITH SHIELDING MATERIAL IN FRONT OF AND BETWEEN THE TWO DETECTOR ELEMENTS. THE DETECTOR ELEMENTS WERE CONNECTED TO CHARGE-SENSITIVE AMPLIFIERS. COINCIDENCE AND PULSE-HEIGHT ANALYSIS WERE USED TO SEPARATE PULSES PRODUCED BY 2-MEV APOTONS, TO-MEV PROTONS, 4.5-MEV ALPHA PARTICLES, 7.5-MEV ALPHA PARTICLES, AND HEAVY NUCLEI (2 GREATER THAN 2, E GREATER THAN 3 MEV PER NUCLEON). A COMPLETE SET OF DATA POINTS WAS OBTAINED EVERY 2 MIN.

---- SOLRAD 118. BYRAM-----

INVESTIGATION NAME- STELLAR/AURORAL & RAYS

INVESTIGATIVE PROGRAM NSSDC 10- 76-0230-16 ŞËSP

> INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY Astronomy PLANETARY ATMOSPHERES

PI - E.'. DI - D.M. BYRAM HORAN US NAVAL RESEARCH LAB US NAVAL RESEARCH LAB

PERSONNEL

AEROSPACE CORP US NAVAL RESEARCH LAB

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AEROSPACE CORP

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF THREE PROPORTIONAL COUNTERS SENSITIVE TO X RAYS BETWEEN 1 AND 8 A. THESE PROPORTIONAL COUNTERS WERE MOUNTED ON THE SIDE OF THE SATELLITE AND ORIENTED 45 DEG, 90 DEG, AND 135 DEG OFF THE SPIN AXIS. THE COUNTING CIRCUITS WERE CONTROLLED BY THE ROLL PERIOD AND SYNCHMONIZED TO THE STAR AND/OR EARTH PULSES 30 THAT DATA SAMPLES COULD BE ASSOCIATED WITH PORTIONS OF THE SKY. THE STELLAR PORTION OF THIS EXPERIMENT WAS ABLE TO MAP COSMIC X-RAY SOURCES AND TO SWEEP THE ENTIRE CELESTIAL SPHERE IN ABOUT 6 MONTHS. THE AURORAL PORTION OF THE EXPERIMENT WAS DESIGNED TOMONITOR AURORAL X-RAY EMISSIONS FROM THE EARTH. THE STELLAR PORTION SAMPLING CYCLE TOOK 16 MIN, WHILE THE AURORAL PORTION REQUIRED 2 MIN FOR A SAMPLING CYCLE.

--- SOURAD 118, DOSCHEK------

INVESTIGATION NAME- THOMSON K-RAY POLARIMETER

INVESTIGATIVE PROGRAM N550C 10- 76-0230-10 SESP

Construction of Barling Barling Street Street

INVESTIGATION DESCIPLINE(S) X-RAY ASTRONOMY Solar Physics

PERSONNEL PI - G.A. DOSCHEK

US VAVAL RESEARCH LAB

BRIEF DESCRIPTION INCIDENT SOLAR X RAYS WERE SCATTERED BY A BLOT OF LOW-DENSITY MATERIAL SUCH AS LITHIUM, LITHIUM HYDRIGE OR BERYLLIUM, POLARIZED X RAYS WERE PREFERENTIALLY SCATTERED WHILE NON POLARIZED X RAYS WERE SCATTERED ISOTROPICALLY. TWO ANALVZER TO PROVIDE ENERGY RESOLUTION IN 2- TO 10-KEV AND 10-TO 50-KEV BANDS, WERE MOUNTED ON OPPOSITE SIDES OF THE SCATTERING BLOCK. AS THE SATELLITE ROLLED, THE SCATTERING BLOCK. AND THE INCIDENT X RAYS. THE DATA WERE GATED OF FOLARIZATION OF THE INCIDENT X RAYS. THE DATA WERE GATED ELECTRONICALLY INTO ACCUMULATORS ASSOCIATED WITH 45-DEG SECTORS IN THE ROLL DIRECTION. CYCLIC PULSE-COUNT VARIATIONS FROM SECTOR TO SECTOR REVEALED POLARIZATION IF PRESENT. THE DATA FROM THE 45-DEG SECTORS WERE ACCUMULATED FOR AN INTEGRAL NUMBER OF SPINS DURING EACH 30-S SAMPLING CYCLE AND THEN READ OUT ON COMMAND. A RADIOACTIVE SOURCE SWUNG OUT GETWEEN EACH DETECTOR AND THE SCATTERING BLOCK FOR CALIBRATION IN FLIGHT.

-- SOLRAD 118, EVANS

SESP

INVESTIGATION NAME- COSMIC GAMMA-RAY BURST AND BACKGROUND Detector (G.2 to 2.0 MeV)

N550C 10- 76-0230-25

INVESTIGATION DISCIPLINE(S) GANNA-RAY ASTRONOMY

INVESTIGATIVE PROGRAM

PERSONNEL PI - W.D. EVANS PI - R.W. KLEBESADEL

LOS ALAMOS SCI LAB Los Alamos sci lab

PI-R.W. KLEBESADEL LOS ALAROS SCI LAB BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED FOR THE STUDY OF THE GARMA-RAY BACKGROUND AND THE DETECTION OF GAMNA-RAY BURSTS. THE EXPERIMENTAL CONFIGURATION CONSISTS OF TWO IDENTICAL DETECTORS MOUNTED 180 DEG APART AND LOOKING OUTWARD RADIALLY. DETECTORS MOUNTED 180 DEG APART AND LOOKING OUTWARD RADIALLY. DETECTORS MOUNTED 180 DEG YART AND LOOKING OUTWARD RADIALLY. DETECTORS MOUNTED 180 DEG YART AND LOOKING OUTWARD RADIALLY. DETECTORS MOUNTED 180 DEG APART AND LOOKING OUTWARD RADIALLY. COMPONENTS OF EACH UNIT ARE -- (1) A CESIUM 10DIDE CRYSTAL, (2) PHOTOMULTIPLIER WITH ASSOCIATED POWER SUPPLY AND AMPLIFIERS, AND (3) PULSE HEIGHT ANALYZÊRS. THE ENERGY COVERAGE IS FROM OL 2 10 C.4, 0.4 TO 0.6, 0.2 TO 2.0, AND 0.46 TO 2.0 MEV. BACKGROUND MONITORIS IS AFFECTED BY ACCUMULATION OF 20-S AVERAGES BUILT UP OF 14.6 MS SAMPLINGS OF EITHER THE 0.2- TO 2.0 OR 0.3- TD 2.0-MEV PASSBAND. THE SIGNATURE OF A BURST IS THE 0BSERVATION OF A 7-SIGMA INCREASE IN THE BACKGROUND OVER ONE 628-MS PERIOD. DURING A BURST, 12 BLOCKS OF DATA ARE NECORDED. EACH BLOCK REPRESENTS EIGHT READOUTS OF THE 0.2- TO 2.0- OR 0.3- TD 2.0-MEV PASSBAND, PLUS OME READING OF EACH OF 2.0- OR 0.3- TD 2.0-MEV PASSBAND, PLUS OME READING OF FACH OF 2.0- OR 0.3- TD 0.6- MEV PASSBAND, PLUS OME READING OF FACH OF 2.0- OR 0.3- TD 0.6- MEV PASSBAND, PLUS OME READING OF FACH OF 2.0- OR 0.3- TO 0.5- NEV PASSBAND, PLUS OME READING OF FACH OF 2.0- OR 0.3- TO 0.6- MEV PASSBAND, PLUS OME READING OF FACH OF 1HE 0.2- TO 0.3- 0.3- 10 0.4-7 AND 0.4- TO 2.0-INE 0.2- TO 0.3- 0.3- 10 0.4-7 AND 0.4- TO 2.0-INE 0.2- TO 0.3- 0.3- 10 0.4-7 AND 0.4- TO 2.0-INE 0.2- TO 0.3- 0.7 O.3- 10 0.4-7 AND 0.4- TO 2.0-INE 0.2- TO 0.3- 0.7 O.3- 10 0.4-7 AND 0.4- TO 2.0-INE 0.2- TO 0.3- 0.7 O.3- 10 0.4-7 AND 0.4-7 AND 0.4-INE 0.2- TO 0.3- 0.7 O.3- 10 0.4-7 AND 0.4-INE 0.4-7 AND 0.4-7 AND 0.4-7 IN 0.4-INE 0.4-7 AND 0.4-7 AND 0.4-7 IN 0.4-INE 0.4-7 AND 0.4-7 AND 0.4-7 IN 0.4-INE 0.4-7 AND 0.4-7 AND 0.4-7 AND 0.4-7

--- SOLRAD TIB, FELDMAN-----

INVESTIGATION NAME- 1175- TO 1800-A SOLAR UV SPECTROMETER

INVESTIGATIVE PROGRAM NSSDC 10- 76-0230-09 SESP

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INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL PI - P.D. FELDMAN DI - R.W. KREPLIN

BRIEF DESCRIPTION THIS EXPERIMENT USED A ROTATABLE GRATING, DPERATING IN FIRST ORDER TO MEASURE THE SOLAR ELECTROMAGNETIC SPECTRUM BETWEEN 1175 AND 1800 A. A PHOTOMULTIPLIER TUBE DETECTED RADIATION REFLECTED THROUGH AN OPTICAL SYSTEM FROM THE GRATING. TWO SCANNING RATES WERE AVAILABLE --- A FAST-RATE, LOW-RESOLUTION MODE IN WHICH THE ENTIRE 625-A RANGE WAS COVERED IN 93.75 S. USING 25-A SEGMENTS FOR EACH DATA SARPLE, AND SLOW-RATE, HIGH-RESOLUTION MODE IN WHICH THE 625-A RANGE WAS COVERED IN 12.5 MIN, USING 3,125-A SEGMENTS.

- SOLRAD 118, FRITZ----

INVESTIGATION NAME- 15- TO 150-KEV SOLAR X-RAY MONITOR

INVESTIGATIVE PROGRAM NSSDC 10- 76-0230-01 SE SP

> INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY Solar Physics

JOHNS HOPKINS U US Naval Research Lab

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PERSONNEL PI - G.G. FRITZ US NAVAL RESEARCH LAB

BRIEF DESCRIPTION THS EXPERIMENT USED A CESIUM 10DIDE SCINTILLATOR SURROUNDED BY A PLASTIC SCINTILLATOR OPERATED IN ANTICOINCIDENCE TO SCREEN OUT BACKGROUND COUNTS. PULSE HEIGHT ANTICOINCIDENCE TO SCREEN OUT BACKGROUND COUNTS. PULSE HEIGHT ANTICOINCIDENCE TO SCREEN OUT BACKGROUND COUNTS. PULSE HEIGHT TO 30, 30 TO 60, AND 60 TO 150 KEV. NORMALLY 0ATA WERE TELEMETERED FROM EACH CHANNEL EVERY 7.5 S. ALTHOUGH AN OPTIONAL MODE SELECTED THE 20- TO 30-KEV CHANNEL FOR TRANSMISSION EVERY 1.875 S. IN-FLIGHT CALIBRATION WAS MADE USING A RADIDACTIVE SOURCE, WHICH SWUNG IN FRONT OF THE DETECTOR UPON COMMAND AND REMAINED THERE FOR A 2-MIN TELEMETRY CYCLE. THE OVERALL DETECTOR DESIGN WAS THE SAME AS THAT USED ON SOLRAD 10 WITH IMPROVED ELECTRONICS.

---- SOLRAD 118, FRITZ---

INVESTIGATION NAME- X-RAY BACKGROUND

HSSDC 10- 76-0230-24

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY ASTRONOMY

INVESTIGATIVE PROGRAM

PERSONNEL PI - G.G. FRITZ OI - R. LUCKE OI - R.C. HENRY

US NAVAL RESEARCH LAB US NAVAL RESEARCH LAB TOWNS HOPKINS U

BRIEF DESCRIPTION A SOLID-STATE DETECTOR (GERMANIUN OR LITHIUM-DRIFTED A SOLID-STATE DETECTOR (GERMANIUN OR LITHIUM-DRIFTED SILICON) WAS USED TO NEASURE THE GALACTIC X-RAT SACKGROUND IN THE 0.5- TO ZO-KEV RANGE WITH AN ENERGY RESOLUTION OF BETTER THAN 0.3 KEV. TO REACH THE DESIRED 0.3-KEV ENERGY RESOLUTION, THE DETECTOR HAD TO BE PASSIVELY COULED TO 70 TO 100 KELVIH. THE DETECTOR HAD TO BE PASSIVELY COULED TO 70 TO 100 KELVIH. THE DETECTOR HAD TO BE PASSIVELY COULED TO 70 TO 100 KELVIH. THE DETECTOR AND SWEPT OUT A BAND NEARLY 20-DEG WIDE- CENTERED NEAR THE ECLIPTLY PLANE AS THE SATELLITE NOVED AROUND THE SUN. THE DETECTOR OUTPUT UNDERVENT A 256-CHANNEL ANALYSIS TO PRODUCE THE ENERGY SPECTRUM, ALL 256 CHANNEL ANALYSIS TO PROUT THE ENERGY SPECTRUM, ALL 256 CHANNEL ANALYSIS TO PROUT THE ENERGY SPECTRUM, ALL 256 CHANNEL ANALYSIS TO PROUT THE ENERGY SPECTRUM, ALL 256 CHANNEL ANALYSIS TO PROUT IN FLIGHT CALIBRATION OF THE DETECTOR.

SOLRAD 118- KREPLIN----

INVESTIGATION NAME- 1- TO B-A SOLAR X-RAY MONITOR

INVESTIGATIVE PROGRAM NSSDC 10- 76-0230-04 SESP

> INVESTIGATION DISCIPLINE(5) SOLAR PHYSICS

NAVAL Naval	RESEARCH	LAB
1	IAVAL	IAVAL RÉSEARCH IAVAL RESEARCH

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF TWO COMPLETE SETS OF IONIZATION-CHAMBER AND ELECTROMETER-AMPLIFIER COMBINATIONS. THE IONIZATION CHAMBERS WERE SENSITIVE TO SOLAR X RAYS IN THE 1- TO 8-A RANGE. THE TWO SETS WERE DRIVEN BY SEPARATE POWER SUPPLIES, ALTHOUGH ONLY ONE SET WAS SELECTED FOR TELEMETRY TRANSMISSION. DATA WERE TRANSMITTED WITH A 15-S TIME RESOLUTION. THE ELECTROMETER-AMPLIFIERS WERE ABLE TO CHAMGE RANGES AUTOMATICALLY OR MANUALLY. THE DETECTONS COULD NOT BE CALIBRATED IN FLIGHT, BUT THE ELECTROMETER-AMPLIFIERS COULD NE CALIBRATED ON EACH RANGE WITHOUT DETACHING THE DETECTOR.

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----- SOLRAD 118, KREPLIN------

INVESTIGATION NAME- 8- TO 16-A SOLAR X-RAY MONITOR

N550C 10- 76-0230-05 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PERSONNEL

PI ~ R.	W. KREPLIN	US NAVAL RESEARCH LAD
	G. TAYLOR M. Horan	US NAVAL RESEARCH LAB
01 - 0.1	5. HUKAN	US NAVAL RESEARCH LAB

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BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF TWO COMPLETE SETS OF IONIZATION-CHAMBER AND ELECTROMETER-ANDLIFIER COMBINATIONS. THE IONIZATION CHAMBERS WERE SENSITIVE TO SOLAR XE MAYS IN THE 8-TO 16-A RANGE. THE TWO SETS WERE DRIVEN BY SEPARATE POWER SUPPLIES, ALTHOUGH ONLY ONE SET WAS SELECTED FOR TELEMETRY TRANSMISSION. DATA WERE TRANSMITTED WITH A 30-S TIME RESOLUTION. THE ELECTROMETER-MPLIFIERS WERE ABLE TO CHAMGE RANGES AUTOMATICALLY OR MANUALLY. THE DETECTORS COULD NOT BE CALIBRATED IN FLIGHT, BUT THE ELECTROMETER-AMPLIFIERS COULD BE CALIBRATED ON EACH RANGE WITHOUT VETACHING THE DETECTOR.

----- SOLRAD 118, KREPLIN------

INVESTIGATION NAME- 44- TO 60+A SOLAR X-RAY RONITOR

NSSDC 10- 76-0230-06 INVESTIGATIVE PROGRAM SESP

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL PI - R.W. KREPLIN DI - D.M. Horan DI - R.G. Taylor

US NAVAL RESEARCH LAB US NAVAL RESEARCH LAB US NAVAL RESEARCH LAB

DATES	DECENTORIAN.	

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF TWO COMPLETE SETS OF IONIZATION-CHAMBER AND ELECTROMETER-AMPLIFIER COMBINATIONS. THE IONIZATION CHAMBERS WERE SENSITIVE TO SOLAR X RAYS IN THE 44- TO 60-A RANGE. THE TWO SETS WERE DRIVE, GY SEPARATE POWER SUPPLIES, ALTHOUGH ORLY ONE SET WAS SELECTED FOR TELEMETRY TRANSMISSION. DATA WERE TRANSMITTED WITH A 30-S TIME RESOLUTION. THE ELECTROMETER-AMPLIFIERS WERE ADLE TO CHANGE CURRENT RANGES AUTOMATICALLY OR MANUALLY. THE ELECTROMETER-AMPLIFIERS COULD BE CALIBRATED ON EACH RANGE WITHOUT DETACHING THE DETECTOR. THE DETECTORS COULD BE CALIBRATED IN FLIGHT BY COMMANDING A SHUTTER-MOUNTED RADIOACTIVE SOURCE INTO POSITION.

-- SOLRAD 118, KREPLIN---

INVESTIGATION NAME- 170- TO 1050-A SOLAR EUV MONITOR

N550C 10- 76-0230-07 INVESTIGATIVE PROGRAM SESP

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL				
₽1 - R.W.	KREPLIN	US	NAVAL	RESEARCH LAB
01 - R.G.	TAYLOR	US	NAVAL	RESEARCH LAB
01 - 0.N.	HORAN	US	NAVAL	RESEARCH LAB

NSSDC 10- 76-0230-08

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF THREE SETS OF LITHIUM FLUORIDE PHOTOSENSITIVE SURFACE DETECTORS COUPLED TO FOUR-ANAGE ELECTROMETER-AMPLIFIERS. THE THREE SETS WERE NOT REDUNDANT DUE TO THE DIFFERENT FILTERS BEING USED. A DERVLLUM FILTER LIMITED ONE DETECTOR'S RESPONSE TO WAVELENGTHS FROM 170 TO 500 A. A TIN FILTER LIMITED A SECOND DETECTOR'S RESPONSE TO WAVELENGTHS FROM 450 TO 850 A. AN INDIUM FILTER LIMITED THE THIRD DETECTOR'S RESPONSE TO WAVELENGTHS FROM 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 TO 1050 A. THE DETECTOR'S RESPONSE TO WAVELENGTHS FOW 725 A. THOM THOUS DETECTOR'S ALL DETECTOR WAVELENGTHS FOW 75 S. CALLBRATED IN FILGHT. CALIBRATED IN FLIGHT.

-- SOURAN 118, KREPLIN------

INVESTIGATION NAME- 1080- TO 1350-A SOLAR UV MONITOR

INVESTIGATIVE PROGRAM

SESP

INVESTIGATION DISCIPLINE(S) Solar physics

US NAVAL RESEARCH LAB US NAVAL RESEARCH LAB US NAVAL RESEARCH LAB

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PI	- R.N.	KREPLIN	
01	- R.G.	. TAŸLOR	
- 01	- D.H.	HORAN	

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF ONE 4-RANGE ELECTROMETER-AMPLIFIER AND THREE IONIZATION CHAMBERS. TWO OF THE IONIZATION CHAMBERS WERE THE STANDARD GAS-FILLEO CHAMBERS FLOWN ON PREVIOUS SOLRAD SATELLITES. THESE DETECTORS, ELECTRONICALLY AND MECHANICALLY PAIRED, WERE DESIGNATED AS DETECTOR 'A.' THE THIAD IONIZATION CHAMBER WAS AN EVACUATED CHAMBER WITH A LITHIUM FLUORIDE PHOTOSENSITIVE SURFACE, AND WAS DESIGNATED AS DETECTOR 'B.' NORMALLY, DETECTOR & MAS CONTINUOUSLY SELECTED FOR TELEMETAY TRANSMISSION AND WAS REPLACED ONLY OCCASIONALLY BY DETECTOR A FOR CALIBRATING B AND EXPERIMENT 9. A MECHANICAL SHUTTER, MOVAGLE BY COMMAND, SHIELDED THE WINDOW OF 8 A FROM THE SUN. THE ELECTOMETER-AMPLIFLER COULD BE CALIBRATED WITHOUT DETACHING THE DETECTOR FROM THE DETECTOR SYSTEM. DATA WERE SAMPLED AT 15-S INTERVALS.

-- SOURAD 118, KREPLIN------

INVESTIGATION NAME- 0.5- TO 3-A SOLAR X-RAY MONITOR

NSSPC ID- 76-0230-12 INVESTIGATIVE PROGRAM

SESP

INVESTIGATION DISCIPLINE(S) Solar Physics

ERSO	NNI	EL				
Pİ	-	R.¥.	KREPLIN	US	NAVAL	RESEARCH LAB
01	-	R.G.	TAYLOR	82	NAVAL	RESEARCH LAB
01	-	D.M.	HORAN	5 US	NAVAL	RESEARCH LAB

BRIEF DESCRIPTION BRIEF DESCRIPTION THIS EXPENIMENT CONSISTED OF THREE IONIZATION CHAMBERS CONNECTED IN PARALLEL TO A SINGLE ELECTROMETER-AMPLIFIER. THE IONIZATION CHAMBERS WERE SENSITIVE TO SOLAR X RAYS IN THE 0.5-TO 3.D-A RANGE. DATA WERE TRANSMITTED WITH A 15-S TIME RESOLUTION. THE ELECTROMETER-AMPLIFIER WAS ABLE TO CHAMGE CURRENT RANGES AUTOMATICALLY OR RANUALLY. THE DETECTORS COULD NOT BE CALIBRATED IN FLIGHT, BUT THE ELECTROMETER-AMPLIFIER COULD BE CALIBRATED ON EACH RANGE WITHOUT DETACHING THE DETECTOR.

--- SOLRAD 118, KREPLIN------

INVESTIGATION NAME- 2- TO 10-A SOLAR X-RAY MONITOR

NSSDC 10- 76-0230-13 INVESTIGATIVE PROGRAM

SESP

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

US NÁVAL RESÉARCH LAÐ US NAVAL RESEARCH LAÐ US NAVAL RESEARCH LAÐ

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PERSO	NNI	EL.		
PI	-	R.W.	KREPLIN	
01	-	R.G.	TAYLOR	
01	-	D.M.	HORAN	

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF AN IONIZATION CHAMBER AND ONE ELECTROMETER-AMPLIFIER. THE IONIZATION CHAMBER WAS SENSITIVE TO SOLAR X RAYS IN THE 1- TO 20-A RANGE, DATA WERE TRANSMITTED WITH A 30-S TIME RESOLUTION. THE ELECTROMETER-AMPLIFIER WAS ABLE TO CHANGE CURRENT RANGES AUTOMATICALLY OR MANUALLY. THE DETECTOR COULD NOT BE CALIBRATED IN FLIGHT, BUT THE LECTROMETER-AMPLIFIER COULD BE CALIBRATED IN EACH RANGE WITHOUT DETACHING THE DETECTOR.

- SOLRAD 118, LAZARUS------

INVESTIGATION NAME- SOLAR WIND SPECTROMETER

NSSDC 10- 76-0230-15 INVESTIGATIVE PROGRAM SESP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS SPACE PLASMAS

3.00

PERSONNEL PI - A.J. LATARUS OI - R.W. KREPLIN

BRIEF DESCRIPTION

BRIEF DESCRIPTION TWO MODULATED GRID FARADAY CUPS (ONE DIRECTED ALONG THE SPIN AXIS FACING THE SUN, AND ONE IN THE SPIN PLANE) WERE USED TO MEASURE IONS AND ELECTRONS IN THE SOLAR WIND (S/C SPIN IS ABOUT 4 RPM). THE SOLAR POINTING DETECTOR HAD A SPLIT (COLLECTOR TO DETERMINE THE POSITIVE ION ENERGY SPECTRUM IN 24. CONTIGUOUS ENERGY WINDOWS FROM APPROXIMATELY 200 VOLYS TO 5000 VOLTS. DIRECTION OF FLOW TO WITHIN 2 DEG WAS DETERMINED BT COMPARISON OF CURRENTS OBSERVED IN THE THREE 120 DEG SECTORS OF THE CUP COLLECTOR. TOTAL ION FLUX WAS DETERMINED BY MODULATING THE CUP COLLECTOR. TOTAL ION FLUX WAS DETERMINED BY MODULATING THE CUP COLLECTOR. TOTAL OLD THE SINE 200 AND SOLO VOLTS. ELECTRONS WERE DETECTED (IN THE SIZE VOLANDAY FROM 20 TO SOLID COLLECTOR. TOTAL OF ALTED IN THREE SAMPLING MODES -NGRMAL, FAST, AND FAST RATE FLUX MODES. IN NORMAL MODES -30 SAMPLES DURING A 6.798-S (VCLE WERE TELEMETERED, --T-MOUSEKEEPING SAMPLES, 1 SAMPLE FROM EACH OF THREE 120 DEG SECTORS OF THE SPLIT COLLECTOR CUP, AND 1 POSITIVE ION FLUX SAMPLE, THIS SEQUENCE WAS REPEATED EVERY 2 HIN. IN THE FAST MODE, 10 OF ELEVEN 6.798-S SEQUENCES WERE TELEMETERED EVERY 2

MIN. IN THE FAST RATE FLUX MODE, THE EXPERIMENT MEASURES THE Total proton flux, total electron flux, and the three 120 deg Sector fluxes evert 1.030 s for 6 times (6.180 5), waits 11 s, and repeats the 6 sequences. PERSONNEL PI - A.L. DI - J.H. DI - R.W. HIN. TOTAL AEROSPACE CORP AEROSPACE CORP VAMPOLA BLAKE KREPLIN US NAVAL RESEARCH LAB - SOLRAD 118, MEEKINS---BRIEF DESCRIPTION BRIEF DESCRIPTION THIS EXPENIENT MEASURED SOLAR ELECTRONS. TWO PERMANENT MAGNETS WERE USED TO MOMENTUM-ANALYZE INCIDENT ELECTRONS. ARRAYS OF SILICON DETECTORS COUNIED INCIDENT ELECTRONS IN 12 ENERGY CHANNELS FROM 11 KEV TO 1.5 MEV. SPIN-INTEGRATED DATA WERE OBTAINED ONCE EVERY 2 MIN, EXCEPT THAT 11-KEV AND 605-KEV DATA WERE SECTORED INTO GUADRANTS, AND 60-KEV AND 610-KEV DATA WERE OBTAINED WITH 15-S RESOLUTION. INVESTIGATION NAME- CONTINUUM (8.8 A) AND MAGNESIUM LINE (9.17 A AND 8.42 A) MONITOR N550C ID- 76-0230-03 INVESTIGATIVE PROGRAM SESP INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS - SOLRAD TIB, WELLER, JR.-----INVESTIGATION NAME- GEOCORONAL-EXTRATERRESTRIAL EUV Detector 1 PERSONNEL PI - J.F. MEEKINS US NAVAL RESEARCH LAB BRIEF DESCRIPTION SOLAR X RAYS WERE OBSERVED IN THE MAGNESIUM-11 AND -12 LINES (9.17 A AND 8.42 A) AND IN THE CONTINUUM AT 8.8 A. THREE SHA CRYSTALS FIXED AT THREE DIFFERENT ANGLES ALLOWED SOLAR X RAYS IO UNDERGO FIRST-ORDER BRAGG REFLECITON INTO THREE PROPORTIONAL COUNTERS. IF THE SPACECRAFT SPIN AXIS HAD BECOME IMPROPERLY ORIENTED, THE SPECTROMETER WOULD HAVE FUNCTIONED FORDERLY ORIENTED, THE SPECTROMETER WOULD HAVE FUNCTIONED AS SCANNIG SPECTROMETER WOULD THEN HAVE FUNCTIONED AS A SCANNIG SPECTROMETER WITH AN EXTREMELY SMALL SPECTRAL RANGE IN THE VICINITY OF THE TARGET WAVELENGTHS. DATA WERE ACCUMULATED OVER INTERVALS OF 1/64 OF A SPACECRAFT'S SPIN PERIOD, AND THE EXPERIMENT HAD A SAMPLING CYCLE OF APPROXIMATELY 1-KIN DURATION. NSSDC 10- 76-0230-18 INVESTIGATIVE PROGRAM BRIEF DESCRIPTION SESP INVESTIGATION DISCIPLINE(S) Planetary atmospheres Astronomy PERSONNEL PI - C.S. WELLER, JR. US NAVAL RESEARCH LAB BRIEF DESCRIPTION A COLLIMATED CHANNELTRON PHOTOMULTIPLIER MOUNTED DEHIND A FILTER WHEEL WAS USED TO MEASURE EUV RADIATION FROM MONSOLAR SOURCES. THE FILTER WHEEL ALLOWED VARIOUS EMISSION LINES BETWEEN 200 AND 1400 A TO BE ISOLATED, AS WELL AS ALLOWING IN-FLIGHT CALIBRATION THROUGH THE USE OF A RADIOACTIVE SOURCE. THE DETECTOR WAS MOUNTED TO LOOK 90 DEG OFF THE SPIN AXIS OF THE SPACECRAFT AND SWEPT THE CELESITAL SPHERE IN ABOUT 6 MONTHS. EACH DATA SAMPLE WAS ACCUMULATED OVER INCREMENTS OF 1/64 OF THE SPACECRAFT'S SPIN, WITH THE SAMPLE SOURCE REFERENCED TO EITHER A STAR PULSE OR THE EARTH PULSE. THE DATA WERE READ OUT IN 2-MIN INTERVALS. THIS EXPERIMENT OPERATED HO NORE THAN 1 H PER DAY. - SOLRAD 118, MEEKINS---INVESTIGATION NAME- BRAGG X-RAY POLARIMETER NS5DC 10- 76-0230-11 INVESTIGATIVE PROGRAM SESP INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY Solar Physics - SOLRAD 118, WELLER, JR.-----INVESTIGATION NAME- GEOCORONAL-EXTRATERRESTRIAL EUV Detector 2 PERSONNEL PI - J.F. MEEKINS US NAVAL RESEARCH LAB BRIEF DESCRIPTION THIS EXPERIMENT UTILIZED A LITHIUM FLUORIDE CRYSTAL, FIXED AT AN ANGLE TO ALLOW SOLAR X RAYS OF ABOUT 2.8 A TO UNDERGO FINST-ORDER BRANG REFLECTION INTO A POPORTIONAL COUNTER. SINCE THE REFLECTION OF POLARIZED RADIATION DEPENDED UPON THE ANGLE BETWEEN THE ELECTRIC VECTOR OF THE RADIATION AND THE REFLECTING ANGLE OF THE CRYSTAL, THE SPIN OF THE SATELLITE MODULATED THE INTENSITY OF REFLECTED POLARIZED RADIATION. DATA PULSES ASS°CIATED WITH 45-DEG SECTORS IN THE ROLL DIRECTION MERE ELECTNONICALLY GATED INTO CORRESPONDING ACCUMULATORS. SIGNAL VARIATIONS FROM SECTOR TO SECTOR INDICATED THE PRESENCE OF POLARIZED FOR ANIMTEGRAL NUMBER OF SPINS AND READ DUT ONCE IN EACH 2-MIN TELEMETRY CYCLE. INVESTIGATIVE PROGRAM SESP NSSDC 10- 76-0230-19 INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES ASTRONOMY PERSONNEL PI - C.S. WELLER, JR. US NAVAL RESEARCH LAB BRIEF DESCRIPTION A COLLTATED CHANNELTRON PHOTOMULTIPLIER MOUNTED BEHIND A FILTER WHEEL WAS USED TO MEASURE EUV RADIATION FROM NONSOLAR SOURCES. THE FILTER WHEEL ALLOWED VARIOUS EMISSION LINES BETWEEN 200 AND 1400 A TO BE ISOLATED, AS WELL AS ALLOWING IN-FLIGHT CALIBRATION THROUGH THE USE OF A RADIOACTIVE SOURCE. THE DETECTOR WAS MOUNTED TO LOOK 90 DEG OFF THE SPIN AXIS OF THE SPACECRAFT AND SWEPT THE CELESTIAL SPHERE IN ABOUT 6 MONTHS. EACH DATA SAMPLE WAS ACCUMULATED OVER INCREMENTS OF 1/64 OF THE SPACECRAFT'S SPIN, WITH THE SAMPLE SOURCE REFERENCED TO EITHER A STAR PULSE OR THE EARTH PULSE. THE DATA WERE READ OUT IN 2-MIN INTERVALS. THIS EXPERIMENT OPERATED NOT MORE THAN 1 H PER DAY. -- SOLRAD 118, SMATHERS INVESTIGATION NAME- X-RAY MONITOR (0.1-1.6 A, 0.5-3 A, 1-4A) INVESTIGATIVE PROGRAM NSSDC 10- 76-0230-02 INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY Solar Physics ----- SULRAD 118, VATES--INVESTIGATION NAME- FONTON-ALPHA TELESCOPE PERSONNEL PI - H.W. SMATHERS US NAVAL RESEARCH LAB BRIEF DESCRIPTION FOUR ELECTRONICALLY PAIRED GAS-FILLED PROPORTIONAL COUNTERS WERE USED TO MEASURE X-RAY EMISSION BETWEEN 4 AND 100 KEV IN FOUR CHANNELS. ALL FOUR DETECTORS HAD 10-ML BERYLLIUM WINDOWS PLUS ADDITIONAL ALUMINUM OR BERYLLIUM MATERIAL MOUNTED IN FRONT OF THE DETECTORS. EACH DETECTOR WAS SAMPLED ONCE EVERY 7-5 S, ALTHOUGH AN OPTIONAL MODE TRANSMITTED DATA FROM ONLY ONE OR TWO DETECTORS. EFFECTIVELY QUADRUPLING OR DOUBLING THE SAMPLING RATE OF THAT DETECTOR. IN-FLIGHT CALIBRATION WAS PERFORMED USING A RADIOACTIVE SOURCE, WHICH WAS NOVED IN FRONT OF THE DETECTORS UPON COMMAND. NSSOC 10- 76-0230-20 INVERTATIVE PROGRAM SESP INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS PARTICLES AND FIELDS PERSONNEL USAF GEOPHYS LAB US NAVAL RESEARCH LAB PI - K. YATES DI - R.W. KREPLIN BRIEF DESCRIPTION TWO TOTALLY DEPLETED SILICON SURFACE BARRIER DETECTORS IN A COINCIDENCE TELESCOPE ARRANGEMENT WERE USED TO DETECT 1 - TO TOD-MEV PROTONS AND 10- TO 100-MEV ALPHA PARTICLES, PULSE HEIGHT ANALISIS AND SUITABLE LOGIC ELEMENTS WERE USED TO PROVIDE 11 PROTON CHANNELS AND FOUR ALPHA PARTICLE CHANNELS. THE TELESCOPE WAS INSENSITIVE TO LIGHT AND TO ELECTONS. VERY LITTLE FLUX DIRECTIONALITY INFORMATION WAS OBTAINED. -- SOLRAD 11B, VANPOLA-----INVESTIGATION NAME- SOLAR FLARE ELECTRONS NSSDC 10- 76-0230-22 INVESTIGATIVE PROGRAM SESP INVESTIGATION DISCIPLINE(S) Solar Physics Particles and fields --- SOLRAD TIR. VATES-------INVESTIGATION NAME- LOW-ENERGY PROTON SPECTROMETER

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N550C 10- 76-0230-21 INVESTIGATIVE PROGRAM PERSONNEL PI - K. DI - K. SESP HIRAD OYAMA U OF TOKYO U OF TOKYO INVESTIGATION DISCIPLINE(S) BRIEF DESCRIPTION ELECTRON TEMPERATURES WERE DIRECTLY MEASURED WITH AN Improved type of electron temperature probe for structural Study of the ionosphere. The instrument operation was terminated on 11/03/76. SOLAR PHYSICS PARTICLES AND FIELDS PERSONNEL YATES Kreplin USAF GEOPHYS LAB US NAVAL RESEARCH LAB 01 - R.W. - SRATS, MATSUDKA----BRIEF DESCRIPTION BRIEF DESCRIPTION TWO TOTALLY DEPLETED SILICON SURFACE BARAIER DETECTORS, MOUNTED IN A "SERIES, MEASURED PROTONS BETWEEN 150 KEV AND 6 MEV. PULSE HEIGHT ANALYSIS OF PULSES GENERATED IN THE FRONT DETECTOR, WHICH WERE UNACCOMPANIED BY PULSES IN THE REAR DETECTOR, SEPARATED THE PROTON COUNTS INTO 12 ENERGY CHANNELS. PERMANENT MAGNETS WERE USED TO DEFLECT INCIDENT ELECTRONS WITH ENERGIES LLSS THAN 2. NEW. VERY LITTLE FLUX DIRECTIONALITY INFORMATION WAS OBTAINED. INVESTIGATION NAME- SOLAR X-RAY MONITOR NSSDC 10- 75-014A-01 INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS PERSONNEL PI - M. MATSUCKA U OF TOKYO BRIEF DESCRIPTION Continuous measurement of the total disk intensity of Solar X Rats of spectral range 6 to 12 keV were nade with Proportional counters. SPACECRAFT COMMON NAME- SRATS ALTERNATE NAMES- TAIYO N550C 10- 75-014A - SRATS, MIYAZAKI-----. LAUNGH DATE- 02/24/75 Launch Site- Kagoshima, Japan / Launch Vehicle- Nu WEIGHT- 86, KG INVESTIGATION NAME- RETARDING POTENTIAL ANALYZER NSSDC 10- 75-0144-06 INVESTIGATIVE PROGRAM Solar-terrestrial physics SPONSORING COUNTRY/AGENCY Japan IS'AS INVESTIGATION DISCIPLINE(S) INTERPLANETARY PHYSICS INITIAL ORBIT PARAMETERS Orbit type- geocentric Orbit Period- 120,06 Min Periapsis- 249. Km EPOCH DATE- 02/25/75 Inclination- 31.54 deg Apcapsis- 3129. Km PERSONNEL PI - 5. HIYAZAKI RADIO RESEARCH LAD PERSONNEL PM ~ K. HIRAO U OF TOK 10 PH - K. HAND BRIEF DESCRIPTION SRATS/TAIYO (SOLAR RADIATION AND THERMOSPHERIC SATELLITE) WAS AN AEROMONY RESEARCH SATELLITE. IT HAD AN OCTAGONAL COLUMN FORM (75 CM IN DIAM AND 65 CM IN HEIGHT). IN WHICH THE EXPERIMENT INSTRUMENTS WERE MOUNTED. THE SATELLITE WAS SPIN STABILIZED IN A ROLLING WHEEL MODE BY A GEONAGNETIC ATTITUDE CONTROL SYSTEM. FOUR PLASMA PROBES WERE EXTENDED PERPENDICULAR TO THE SPIN AXIS BY 0.5-M METALLILE BOOMS. POWER AT AN AVERAGE RATE OF 15 W WAS PROVIDED BY 6000 SILICON N-P SOLAR CELLS. THE GBLECTIVES OF THE SATELLITE WERE TO STUDY THE IONOSPHERE SYSTEMATICALLY BY SIMULTANEOUSLY OBSERVING SOLAR IONIING RADIATIONS (HYDROGEN LTMAM-ALPHA AND X RAYS), THE ULTRAVIOLET ALBEDO OF THE EARTH. POSITIVE ION COMPOSITIES AND TEMPERATURES IN THE IONSPHERE. -- SRATS, FUGONO-----INVESTIGATION NAME- IONIC COMPOSITION NSSDC 10- 75-014A-07 INVESTIGATIVE PROGRAM Scientific satellite INVESTIGATION DISCIPLINE(S) ATNOSPHERIC PHYSICS ------ SRATS, 05H10------INVESTIGATION NAME- HYDROGEN LYMAN-ALPHA PERSONNEL P1 - N. 01 - 1. 01 - T. RADIO RESEARCH LAB Radio Research Lab Radio Research Lab FIIGONO NSSDC 10- 75-0144-02 INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE IWAMOTO SUITZ 01 - T. SUITZ RADIU HESCARLE LAD BRIEF DESCRIPTION THE PPIMARY OBJECTIVE OF THIS ION COMPOSITION EXPERIMENT WAS TO MEASURE THE CONCENTRATION OF DIFFERENT ION SPECIES AND THEIR HEIGHT DISTRIBUTIONS AS A FUNCTION OF LOCATION, TIME, AND SOLAR AND GEOMAGNETIC ACTIVITY. THE 'COMPOSITION OF POSITION OF POSITIVE IONS IN THE HANGE OF 250 TO 3000 KM. IT CONSISTON OF POSITIVE IONS IN THE HANGE OF 250 TO 3000 KM. IT CONSISTON OF A THREE-STAGE SECONDARY ELECTRON MULTIPLIER AND CONTROL ELECTRONCIS. THE SENSOR MEASURED IN SEQUENCE THE COMPOSITION OF THE FOLLOWING ION SPECIES -- ATOMIC OXYGEN, HELIW, AND HYDROGEN. THESE MEASUREDNIS WERE NADE CYAL OXYGEN, HELIW, AND HYDROGEN. THESE MEASUREDNIS EVERY 4 SECONDS. MSR RESOLUTION AND INSTRUMENT SENSITIVITY WERE CHANGED BY A COMMAND. THE CPI INSTRUMENT WAS MOUNTED WITH ITS APERIME ON THE SIDE WALL OF THE SATELLIFE. MORE EXPERIMENT DETAILS CAN BE FOUND IN 1. GEOMAGE. GEOELECIR., 27, 303-310, 1975. INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS PERSONNEL PI - T. 05H10 OSAKA CITY U BRIEF DESCRIPTION Continuous measurement of solar hydrogen lyman-alpha Emission was made with a lithium flouride oxide ionization CHAMBER . - SRATS, OYA--

INVESTIGATION NAME- ELECTRON DENSITY MEASUREMENT INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE

INVESTIGATION DISCIPLINE(S) IONOSPHERES AND RADIO PHY RADIO PHYSICS

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INVESTIGATIVE PROGRAM Scientific satellite

INVESTIGATION DISCIPLINE(S) Ionospheres and radio physics

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--- SRATS, HIRAD--

INVESTIGATION NAME- ELECTRON TEMPERATURE

NS50C ID- 75-0144-05

GRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO STUDY THE ELECTROM TEMPERATURE STRUCTURE OF THE IONOSPHERE BY MEANS OF A GYRO-PLASMA PROBE. THIS PROBE USED A RADIO-FREQUENCY IMPEDANCE TECHNIQUE TO DETERMINE THE CAPACITANCE OF A SPHERICAL ELECTRODE THAT IS SEPARATED FROM THE SATELLITE BY A SUPPORTING BOOM. CAPACITANCE MEASUREMENTS WERE MADE AS FREQUENCIES FROM .3 TO 13 HIZ AND WERE SWEPT OVER A PERIOD OF 1 S. TO THE ELECTRODE. INTERPRETATION OF THIS FREQUENCY-CAPACITANCE RELATIONSHIP WAS USED TO DETERMINE ELECTRON TEMPERATURES, ELECTRON DENSITIES, AND ION/ELECTRON FLUX. MORE DETAILED DESCRIPTIVE INFORMATION IS CONTAINED IN J. GEOMAG. AND GEOELECTR. 331-361, 1975.

- SRATS, TOHMATSU-

INVESTIGATION NAME- GEOCORONAL UV GLOW AND EARTH UV ALBEDO

INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE NS50C 10- 75-014A-03

INVESTIGATION DISCIPLINE(S) Atmospheric physics

PERSONNEL PI - T. OI - K. OI - T.	TOHMATSII Suzuki Ogađa	Ű	0F	70KYO 10KYO 70KYO	
01 - Τ.	OGAMA		•••		

OI - T. OGAWA U OF TOKYO BRIEF DESCRIPTION THE INSTRUMENTATION FOR THIS EXPERIMENT CONSISTED OF TWO NIDDLE UV RADIONETERS AND FOUR VACUUM UV PHOTON COUNTERS. THE RADIONETERS WERE DESIGNED TO NEASURE THE SOLAR RADIATION AT 2550 AND 2900 A FOR STUDY OF THE OZONE DISTRIBUTION IN THE MESCOSPHERE AND UPPER STRATOSPHERE, EACH SENSOR CONSISTED OF A MECHANICAL COLITATOR, AN INTERFERENCE FILTER, AND A PHOTORULTIPLIER TUBE. THE RADIONETER HAD A 3-DEG DIAMETER FOV. THE PHOTON COUNTERS WERE DESIGNED TO MEASURE RADIATION AT THE FOLLOWING WAVELENGTHS (IN ANGSTROMS) - 304, 584, 833, 1300 AND 1216, TO STUDY AIRGLOGY, GEOCOMA, AND INTERFLANETART GLOW. EACH OF THE FOUR PHOTON COUNTERS CONSISTED OF A MECHANICAL COLLIMATOR, AN EUV TRANSMITTING FILTER, AND A CHAMNEL NULTIPLIER, AND HAD A CIRCULAR FOV OF ABOUT 3 DEG IN DIAMETER. IN THE NORMAL OPERATIONAL MUDE. AS THE SATELLITE SPUN. THE SENSORS MEASURED RADIATION AT ZO DIRECTIONS IN A GREAT CIRCLE CONTAINING LOCAL NADIR AND ZENITH OF THE SATELLITE. NORE EXPERIMENT DETAILS CAN BE FOUND IN J. GEOMAG. GEOELECTR., 27, 295-301, 1975. ***********************

SPACECRAFT COMMON NAME- TIP 1 ALTERNATE NAMES- TRIAD 1, TRIAD 01 1X Q1172, 06173

NSSDC 10- 72-069A

State States

WEIGHT- 94. KG LAUNCH DATE- 09/02/72 Launch Site- Vandenberg AFB, United States Launch Vehicle- Scout

SPONSORING COUNTRY/AGENCY DOD-NAVT UNITED STATES INITIAL ORBIT PARAMETERS Orbit type- Géocentric Orbit Period- 100.7 Nin Periapsis- 716.0 KM EPOCH DATE- 09/04/72 Inclination- 90.1 deg Apoapsis- 863.0 KM PERSONNEL NONE ASSIGNED None Assigned

MG - NONE ASS SC - NONE ASS PM - J. DASSOULA PS - R.E. FISCHELL APPLIED PHYSICS LAB Applied physics LAB DASSOULAS

BRIEF DESCRIPTION THIS THREE BODY SPACECRAFT IS CONNECTED BY BOOMS WHICH SERVE AS GRAVITY GRADIENT STABILIZERS IN THE RADIAL DIRECTION. A MOMENTUM WHEEL WAS USED FOR STABILIZATION IN ROLE AND YAW. THE PRIMARY FUNCTION OF THE SPACECRAFT WAS TO TEST VARIOUS CONCEPTS FOR IMPROVING THE USN TRANSIT MAVIGATION SYSTEM. THE POWER WAS SUPPLIED BY A RADIO ISOTOPE THERMAL ELECTRIC GENERATOR (RTG).

- TIP 1, POTEMRA-----

INVESTIGATION NAME- TRIAXIAL FLUXGATE MAGNETOMETER

INVESTIGATIVE PROGRAM NAVIGATION TECHNOLOGY NSSDC 10- 72-0694-01

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS

APPLIED PHYSICS LAB

PERSONNEL POTEMRA ÷ T.

GRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF A TRIAXIAL FLUXGATE MAGNETORETER DESIGNED TO MEASURE VECTOR FIELDS WITH MAGUITUDES UP TO SO-000 GAMMAS. MEASUREMENTS WERE MADE BY SAMPLING EACH AXIS SEQUENTIALLY AT A RATE OF 2.25 SAMPLES/S. DIGITIZATION RESOLUTION WAS ABOUT 10 GAMMAS AS GIVEN BY A 13-BIT AMALOG TO DIGITAL CONVERTER, BUT ZERO LEVEL DRIFTS WERE NOT READILY CHECKED. AS SUCH, THE EXPERIMENT WAS MOST USEFUL IN STUDIES OF MAGNETIC FLUTUATIONS. DUE TO THE REAL-TIME DATA TRANSMISSION AND THE LOCATIONS OF THE TRACKING STATIONS, MOST OF THE DATA OBTAINED RELATED TO NORTHERN AND SOUTHERN HEMISPHERE HIGH LATITUDES. OBTAINED LATITUDES.

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SPACECRAFT COMMON NAME" UK 5 Alternate Names" United Kingdom 5, pl-732b Artel 5

NSSDC 10- 74-077A

LAUNCH DATE- 10/15/74 WEIGHT- 135. KG Launch Site- San Marco Platform, off coast of kenya Launch Vehicle- Scout

SPONSORING COUNTRY/AGENCY United Kingdom United States SRC NASA-055

- INITIAL ORBIT PARAMETERS Orbit type- geocentric Orbit period- 95.3 min Periapsis- 512.0 km
- PERSONNEL
 - NASA HEADQUARTERS Nasa headquarters Unknown NG - J.R. HOLTZ SC - N.G. ROMAN PN - H.L. EAKER PS - S.S. HOLT MASA-65FC

BRIEF DESCRIPTION THE UK 5 SPACECRAFT WAS DESIGNED TO CARRY SIX EXPERIMENTS THAT MEASURE THE SPECTRUM, POLARIZATION, AND PULSAR FEATURES OF NONSOLAR X-RAY SOURCES. THE SPACECRAFT WAS SPIN STABILIZED, AND TWO EXPERIMENTS SCANNED THE SAY PERPENDICULAR TO THE SPIN AXIS, WHILE FOUR EXPERIMENTS POINTED PARALLEL TO THE SPIN AXIS. DATA WAS STORED ON COARD THE SPACECRAFT IN A CORE STORAGE AND DUMPED TO GROUND STATIONS ONCE PER ORBIT.

INVESTIGATION NAME- 0.3- TO 30-KEV COSMIC X RAY WITH Rotation collimator

INVESTIGATIVE PROGRAM CODE SA/CO-OP NSSDC 10- 74-077A-01

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PERSONNEL PI - R.L.F.BOYD OI - A.P. WILLMORE OI - P.W. SANFORD

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EPOCH DATE- 10/16/74 Inclination- 2.9 deg Apoapsis- 557.0 Km

BRIEF DESCRIPTION THIS EXPERIMENT COMBINED THE FUNCTION OF OBSERVING X RAYS IN DIFFERENT ENERGY RANGES WITH THAT OF STAR TRACKING. THE EXPERIMENT CONTAINED A ROTATION COLLIMATOR, UTILIZING THE SATELLITE SPIN. BEHIND WHICH THERE ARE THREE DETECTORS. THE FIELD OF VIEW WAS A COME WITH A SEMI-ANGLE OF 10 DEG TO 20 DEG. DEPENDING ON THE TYPE OF RADIATION VIEWED BY THE DIFFERENT DETECTORS. THE FIRST DETECTOR WAS A VISIBLE LIGHT PHOTOMULTIPLIER THAT ENABLED. THE SPIN AXIS TO BE ACCURATELY DETECTORS. THE FIRST COVERING THE MACLENTRANGE 0.3 TO 6 KEV. THER, THERE WAS A GROUP OF PROPORTIONAL COUNTERS COVERING THE RANGE 2.5 TO 30 KEV. IT WAS ESTIMATED THAT SOURCES. SOURCES.

--- UK 5/ BOYD

INVESTIGATION NAME- HIGH-RESOLUTION SOURCE SPECTRA

INVESTIGATIVE PROGRAM CODE SA/CO-OP NSSDC 10- 74-0778-03

INVESTIGATION DISCIPLINE(5) X-RAY ASTRONOMY

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 $PI = R_{*}L_{*}F_{*}BOYD$ $01 = A_{*}P_{*}$ Willmore $01 = P_{*}W_{*}$ Sanford

PERSONNEL

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF A HIGH-RESOLUTION PROPORTIONAL COUNTER SPECTROMETER WITH A 128-CHANNEL PULSE HEIGHT ANALYZER AND RESPONDED TO PHOTONS IN THE 2-TO 30-KEV HEIGHT ANALYZER AND RESPONDED TO PHOTONS IN THE 2-TO 30-KEV ENERGY RANGE. THE SPECTRA OF SOURCES WERE EXARINED IN GREATER DETAIL THAN HAD BEEN PREVIOUSLY POSSIBLE. LINE EMISSION FOR CERTAIN ELEMENTS (E.G., IRONJ COULD ALSO BE IDENTIFIED. THE DETECTOR VIEWED IN A DIRECTION PARALLEL TO THE SPIN AXIS AND, THEREFORE, CONTINUED TO OBSERVE THE SAME PIECE OF SKY FOR AS LONG AS THE POSITION OF THE SATELLITE SPIN AXIS PENAINED UNALTERED. THE EXPERIMENT AXIS POINTED APPRCXIMATELY 2 DEG OFF THE SPIN AXIS THE SOURCE PASSED IN AND OUT GF THE FIELD OF VIEW DURING EACH ROTATION. THIS PERMITED THE BACKGROUND FLUX TO BE SAMPLED EVERY SPIN PERIOD BY RECORDING THE SPECTAAL INFORMATION IN FOUR SETS OF LOCATIONS, EACH CORRESPONDING TO A QUADRANT OF THE SPIN CYCLE. THIS SHOULD HAVE OVERCOME THE LACK OF INFORATION ON POSSIBLE FLUCTUATIONS IN THE BACKGROUND FLUX OURING AN ONDH'S INTEGATION. THE EXPERIMENT COULD ALSO HAVE BEEN OPERATED IN A MODE IN WHICH PERIMENT COULD ALSO HAVE BEEN OPERATED IN A MODE IN WHICH PERIODICITIES IN THE RANGE TYPICAL OF PULSAR FREQUENCIES WERE DETECTED.

---- UK 5, ELLIOT------INVESTIGATION NAME- HIGH-ENERGY COSMIC X-RAY SPECTRA

INVESTIGATIVE PROGRAM

NSSDC ID- 74-0774-05 CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PERSONNEL		
P1 - H.	ELLIOT. Quenby Engel	IMPERIAL COLLEGE Imperial college Imperial college

----- UK 5, HOLT----

OI - A.R. ENGEL IMPERIAL COLLECC BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO EXTEND THE SPECTRAL INFORMATION ON SELECTED X-RAY SQURCES IN THE ENERGY REGION ABOVE 20 KEV. MEASUREMENTS WERE POSSIBLE UP TO 2 MEV, ALTHOUGH THE EFICIENCY OF THE DETECTOR FELL STEEPLY AT THIS EMERGY. THE DETECTOR AXIS WAS INCLINED A FEW DEG WITH RESPECT TO THE SATELLITE SPIN AXIS SO THAT IS COMED AS THE SATELLITE SPUN THE COUNTING RATE RESULTING FROM A POINT SOURCE A FEW DEG FROM THE SPIN AXIS WAS THUS MODULATED WITH THE SPIN PERIOD. THIS MODULATION WAS DETECTED BY DIVIDING THE SPIN CYCLE INTO FOUR. SECTORS AND AMALYZING THE DIFFERENT COUNTING RATES IN EACH. IN THIS WAY, THE SOURCE INTENSITY COULD BE DETERMINED FROM THE AMPLITUDE OF THE MODULATION. FOR PULSAR ODSERVATIONS, A LARGE EMERGY WINDOW AT THE LOWER END OF THE DETECTOR RANGE MAS USED. THE ODSERVATIONS IN THIS ENERGY REGION WERE AMALYZED FOR A PULSAR PERIODICITY IN A SPECIAL SYSTEM THAT WAS PART OF THE SPACECRAFT HANDLING ELECTRONICS.

INVESTIGATION NAME- ALL-SKY MONITOR

INVESTIGATIVE PROGRAM CODE SA/CO-OP HSSDC 10- 74-077A-06

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PERSONNEL.			
PI - S.S. DI - E.A.	HOLT Boldt Serlehitsos	 NASA-GSFC NASA-GSFC NASA-GSFC	

BRIEF DESCRIPTION THIS EXPERIMENT SCANNED THE X-RAY EMISSION FROM THE ENTIRE CELESTIAL SPHERE AT ALL TIMES, THEREBY COVERING THE LARGE AREAS THAT LAY OUTJOE THE FIELD OF VIEW OF OTHER ONBOARD EXPERIMENTS. IT 434 VALUABLE AID IN PROGRAMMING SATELLITE MANEUVERS SO THAT TRANSIENT EVENTS IN THE X-RAY SKY, SUCH AS NEARBY NOVAE AND X-RAY FLARES, COULD BE RAPIDLE MADE AVAILABLE FOR STUDY WITH GREATER RESOLUTION BY THE OTHER EXPERIMENTS.

-- UK 5, POUNDS------

INVESTIGATION NAME- 2- TO 10-KEV SKY SURVEY

INVESTIGATIVE PPOGRAM CODE SA/CO-OM NSSDC ID- 74-0774-02

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PERSONNEL PI - K./.	2011105	. U. OF	LESCESTER	
01 - B.A.			LEICESTER	
01 - D.J.		 UOF	LEICESTER	1
	GRIFFITH5	U OF	LEICESTER	

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF A LARGE-AREA PROPORTIONAL COUNTER ARRANGED TO VIEW IN A DIRECTION PERPENDICULAR TO THE SATELLITE SPIN AXIS. THE SATELLITE ROTATION, THEREFORE, ALLOWED A SCAN OF A 350-DEG BAND OF THE SKY. WHEN THE SATELLITE SPIN AXIS WAS ARRANGED TO POINT AT A GALACTIC PULE, THE WHOLE OF THE MILKY WAY COULD BE SCANNED AT ONCE. THE

EXPERIMENT COVERED THE PHOTOM ENERGY RANGE 1.5 TO 20 KEV AND EFFECTED A HIGH-SENSITIVITY SURVEY. OBTAINING SOURCE LOCATIONS, INTENSITY, AND SPECTRA. A NUMBER OF DIFFERENT MODES OF OPERATION WAS USED IN WHICH THE AVAILABLE STORAGE SPACE IN THE CORE STORE OBTAINED SPATIAL INFORMATION AT THE EXPENSE OF SPECTRAL RESOLUTION OR CONVERSELY. THE SENSITIVITY OF THE EXPERIMENT ALLOWED THE DETECTION OF SOURCES DF HE ORDER OF 1.E-4 TIMES THE INTENSITY OF SCO XR-1, WITHIN THE TIME OF ABOUT 1.D. THE ABILITY OF THE SURVEY INSTRUMENTS TO DETERMINE THE POSITIONS OF A SOURCE DEPENDED ON THE STRENGT HOF THE SOURCE AND THE NUMBER OF OTHER SOURCES IN A GIVEN PART OF THE SKY. A SOURCE OF S.E-3 TIMES THE STRENGTH OF SCO XR-1. COULD BE LOCATED WITH A PRECISION OF ABOUT 15 ARC-MIN.

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- UK 5, POUNDS

INVESTIGATION NAME- POLARIMETER/SPECTROMETER

INVESTIGATIVE PROGRAM NSSDC ID- 74-0778-04 COUE SA/CO-OP

		INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY
PERSONNEL PI - X.A. OI - B.A. OI - D.J. OI - R.E.	FOUNDS Cooke Adams Griffit (S	U OF LEICESTER U OF LEICESTER U OF LEICESTER U OF LEICESTER

BRIEF DESCRIPTION THIS EXPERIMENT WAS A POLARIMETER/SPECTROMETER OPERATING IN THE 2- TO 6-KEV RANGE. IT USED TWO LARGE PLANE CRYSTALS, LITHIUM HYDRIDE AND GRAPHITE, IN A BRAGG SPECTROMETER WITH A HONEYCOMB COLLIMATOR. IT WAS MOUNTED TO VIEW ALONG THE SATELLITE SPIN AXIS AND TO EXAMINE THE RADIATION OF INDIVIDUAL X-RAY SOURCES FOR POSSIBLE POLANIZATION AND/OR THE EXISTENCE OF LINE EMISSIONS. IN A SOURCE OF THE BRIGHTNESS OF THE CRAB NEBULA, A POLARIZATION OF 2.5 PERCENT COULD BE DETECTED. THE EXPERIMENT ALSO CONDUCTED SFARCHES FOR PULSAR ACTIVITY. THE MATURE OF THE EXPERIMENT MADE IT POSSIBLE TO EXAMINE THE POLARIZATION OF THE PULSAR ITSELF BY LOOKING FOR DIFFERENT FULSAR BEHAVIOR IN THE SEPARATE PULARIZATION COMPONENTS.

SPACECRAFT COMMON NAME- VELA 5A Alternate Names- Vela 9 (trw), 03954 Vela 5A (USAF)

NS50C 10- 69-0460

WEICH1- 259. KG LAUNCH DATE~ 05/23/69 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- TITAN 3C

SPONSORING COUNTRY/AGENCY UNITED STATES DOD-USAF

INITIAL ORBIT PARAMETERS Orbit type-geocentric Orbit Period- 6703. Min Periapsis- 110900, KM		EPOCH DATE- 05/24/69 Inclination- 32.8 deg Apoapsis- 112210. K#		
PERSONNEL	ARPA STAFF	ARPA/WASH≠ DC		
NG	Samso	USAF∼LAS		
PM -	Klebesadel	Los Alamos SCI Lab		

PS - R.W. KLEBESABEL LOS ALAMOS SCI LAB BRIEF DESCRIPTION VELA SA WAS DNE OF TWO SPIN-STABILIZED, ICOSAHEDRAL VELA SA WAS DNE OF TWO SPIN-STABILIZED, ICOSAHEDRAL THE ORBITS OF THE TWO SATELLITES ON EACH LAWNCH WERE BASIGALLY (IRCULAR AT ABOUT 17 EARTH RADII, INCLINED AT 60 DEG TO THE ECLIPTIC, AND SPACED 180 DEG APART, THUS PROVIDING A MONITORING CAPABILITY OF OPPOSITE SIDES OF THE EARTH. THE DEJECTIVES OF THE SATELLITES WERE (1) TO STUCY SOLAR AND COSMIC X RAYS, EUV-SOLAR PROTONS, SOLAR WIND, AND NEUTRONS, (2) TO CARRY OUT RESEARCH AND DEVELOPHENT ON METHODS OF DETECT.4G NUCLEAF EXPLOSIONS BY MEANS OF SATELLITE-BORNE INSTRUMENTATION; AND (3) TO PROVIDE SOLAR FLARE DATA IN SUPPORT OF MANN'D SPACE MISSIONS. VELA SA, AN IMPROVED VERSION OF THE EARLER VELA SERIES SATELLITES, HAD BETTER COMMAND CAABILITIES, INCREASED DATA STORAGE, IMPROVED POUER REQUIREMENTS, BETTER INCRAASED MOUNTED ON 24 OF THE SPACECRAFT'S 26 FACES. A ROTATION RATE OF 78 RPM DURING TRANSTER ORBITS AND I APM AFTER FINAL ORBIT INSERTION MAINTAINED NOMINAL ATTITUE CONTROL. EIGHT WHIP ANTENNAS AND FOUR STUB ANTENNA ARRAYS AT OPPOSITE ENDS OF THE SPALECRAFT STRUCTURE WERE USED FOR GROUND COMMANDS AND TELEMETRY. TELEMETRY.

----- VELA 54, BAME-----

INVESTIGATION NAME- SOLAR WIND

NSSDC 10- 69-0460-05

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N. 639.4

NUCLEAR DETECTION

INVESTIGATION DISCIPLINE(5) Particles and fields Magnetospheric physics

LOS ALAMOS SCI LAB Los Alamos sci lab Los Alamos sci lab

PERSONNEL PI - S.J. BAME 01 - J.R. ASBRIDGE 01 - H.E. FELTHAUSER

UI - H.E. FELTHAUSER LOS ALANOS SCI LAB BRIEF DESCRIPTION TWO ELECTROSTATIC ANALYZER-ELECTRON MULTIPLIER UNITS WERE USED TO STUDY THE INTERPLANETARY SOLAR WIND (INCLUDING HEAVY IONS) AND PROTONS AND ELECTRONS IN THE MAGNETOTAIL. ENERGY ANALYSIS WAS ACCOMPLISHED BY CHARGING THE PLATES TO KNOWN VOLTAGE LEVELS ALLOWING THEM TO DISCHARGE WITH KNOWN RESISTANCE CAPACITOR (NC) TIME CONSTANTS. PARTICLES IN A 6-DEG BY 100-DEG CAPACITOR (NC) TIME CONSTANTS. PARTICLES IN A 6-DEG BY 100-DEG CAPACHAPED ANGULAR BANGE WERE ACCEPTED FOR ANALYSIS DURING A DECAVING VOLTAGE CYCLE. THE 100-DEG DIRENSION WAS PARALLEL TO THE SPACECRAFT SPIN AXIS FOR BOLAR WIND ELECTRONS IN THE ENERGY RANGE FROM 7.5 EV TO 16.5 KEV AND SOLAR WIND POSITIVE IONS (MAINLY PROTENS AND ALPHA PARTICLES) IN AN EMERGY PER CHARGE RANGE FROM 7.20 V TO 5 KV. THE OTHER UNIT STUDIED SOLAR WIND HEAVY IONS IN THE ENERGY PER CHARGE RANGE BETHEEN 1 KV AND 8.3 KV.

----- VELA SA, BAME-----

INVESTIGATION NAME- NEUTRON DETECTOR

INVESTIGATIVE PROGRAM NSSDC 10- 69-0460-07 NUCLEAR DETECTION

INVESTIGATION DISCIPLINE(S)

PARTICLES AND FIELDS

PERSONNEL PI - S.J. BAME GI - J.R. ASBRIDGE

LOS ALAMOS SCI LAB Los Alamos Sci Lab

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE NEUTRON DETECTOR CONSISTED OF A LARGE (ABOUT 8 LB) POLYETHYLENE MODERATOR SURROUNDING TWO HELLUN-3 FILLED PROPORTIONAL COUNTERS. NEUTRONS BETWEEN 1 AND 100 MEV WERE THEAMALIZED BY THE MODERATOR AND DETECTED BY THE COUNTERS. THE INSTRUMENT WAS ALSO SENSITIVE TO PROTONS ABOVE 25 MEV.

-- VELA SA, CHAMBERS----

INVESTIGATION NAME- SOLAR X-RAY DETECTORS, 0.5 TO 3.0 A. 1 TO 8 A. 1 TO 16 A. 44 TO 60 A

INVESTIGATIVE PROGRAM NUCLEAR DETECTION NSSDC 10- 69-0460-02

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY Solar Physics

PERSONNEL PI - W.H. CHAMBERS OI - J.C. FULLER OI - W.E. Kunz	LOS ALANOS SCI LAB Los alamos sci lab Los alamos sci lab
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01 - J.C. FULLER 01 - J.C. FULLER 01 - J.E. KUNZ BRIEF DESCRIPTION THIS EXPERIMENT MAS DESIGNED TO MONITOR THE SOLAR AMBIENT AND FLARE-PRODUCED FLUX OF X RATS IN THE 0.3- TO 60-A MAVELENGTH REGION. TWO JOENICAL X-RAY SENSOR UNITS WERE MOUNTED AT DIAMETRICALLY OPPOSED APEX POSITIONS ON THE SATELLITE. EACH UNIT CONTAINED FOUR DETECTORS -- THREE ION CHAMBER HAD A HEMISPHERICAL WINDOW, THE COMBINED OUTPUT SIGNALS FROM IDENTICAL CHAMBERS IND THE FORDING WINDOW MATERIALS, GAS FILLS AND WAVELENGTH RESPONSES. CHAMBER 1 -- S.E-3 IN, OF BERYLLIUM, 0.9 ATM OF ANGON + 0.1 ATM OF HELLUM, 1 TO 8A. CHAMBER 2 -- 2.5E-4 IN. OF MYLAR OVERCOATED WITH ABOUT AN 8500-A LATCH OF ALUMINUM, 0.5 ATM OF NITROGEN. 1 TO 16 A. CHAMBER 3 -- 2.5F-4 IN. OF MYLAR, 0.5 ATM OF OF INTROGEN. 1 TO 16 A. CHAMBER 3 -- 2.5F-4 IN. OF MYLAR, 0.5 ATM OF IN NITROGEN. 1 TO 16 A AND 44 19 60 A. THIS COMBINATION OF ION CHAMBERS ALLOWED SCLAR X-RAY FLUX MEASUREMENTS IN THE BANDS 1 TO 16 A., CHAMBER 3 -- 2.5F-4 IN. OF MYLAR, 0.5 ATM OF OF NITROGEN. 1 DO NITROGEN. 1 TO 16 A AND 44 19 60 A. THIS COMBINATION OF ION CHAMBERS ALLOWED SCLAR X-RAY FLUX MEASUREMENTS IN THE BANDS 1 TO 36 A., 1 TO 6A & STO 16 A AND 44 TO 60 A TO BE OBTAINED UPON SUITABLE AMALYSIS OF THE DAYA. THE SCINTILLATION DETECTOR USED FOR THE .3- TO 3-A MAVELENGTH REGION CONSISTED OF A HALLIWA-ACTIVATED HAI CRYSTAL OPTICALLY COUPLED TO A PRIVE THE ON CHAMBERS ALLOWED BY A FLAT 10-ALL-THICK BERYLLIUM MINDOW. THE CHYSTAL COVERED BY A FLAT 10-ALL-THICK BERYLLIUM MINDOW. THE MORE SENSITIVE DETECTOR HAA ON AN HALF-INCH-DIAMETER, 1-MM-THICK CRYSTAL COVERED BY A FLAT 10-ALL-THICK BERYLLIUM MINDOW. THE AND A ONE-OUNTERT-THICK BERYLLIUM DOME WINDOM IM ADDITION TO THE FLAT 10-RICH-THICK BERYLLIUM DOME WINDOM IM ADDITION TO THE FLAT 10-RICH FUNCH FED A THAT THE FLOT SENSOR UNITS WERE NOT IDENTICAL. THE MORE SENSITIVE DETECTOR HAA ONCH-MALF-INCH-DIAMETER, 1-MM-THICK CRYSTAL COVERED BY A FLAT 10-ALL-THICK CRYSTAL AND A 0.NE-OUNTED AND SCINTILLATION DETECTORS WERE CAPABLE OF D

-- VELA 54, KLEBESADEL-----

INVESTIGATION NAME- GANNA BAY ASTRONOMY

INVESTIGATIVE PROGRAM NUCLEAR DETECTION

INVESTIGATION DISCIPLINE(S) Astronomy

PERSONNEL PI - R.W. KLEBESADEL OI - I.B. STRONG OI - R.A. OLSON	LOS ALANOS SCI LAB Los Alamos sci lab Los Alamos sci lab
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NSSDC 10- 69-0460-08

OI - R.A. DLSON BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF SIX 10-CM-CUBED CESIUM IODIDE SCINTILLATION COUNTERS DISTRIBUTED TO ACHIEVE HEARLY ISOTROPIC SENSITIVITY. INDIVIDUAL DETECTORS RESPONDED TO IMERGY DEPOSITIONS OF 0.2 TO 1.0 MEV WITH A DETECTION EFFICIENCY RANGING FROM 17 TO 50 PERCENT. THE SCINTILLATORS WERE SHICLDED AGAINST DIRECT PEMETRATION AY ELECTRONS BELOW 0.75 MEV AND PROTONS BELOW 20 NEW. NO ACTIVE ANTICOINCIDENCE SHIELDING WAS PROVIDED. NORMALIZED OUTDUT PULSES FROM THE SIX DETECTORS WERE SUMMED INTO COUNTING AND LOGICS CIRCUITRY. LOGICAL SENSING OF AAFID, STATISTICALLY SIGNIFICANT COUNT RATE INCREASES INITIATED THE RECORDING OF DISCRETE COUNTS IN A SERIES OF LOGARITHMICALLY INCREASING TIME INTERVALS. THIS CAPABILITY PROVIDED CONTINUOUS TEMPORAL COVERACE, WHICH, COUPLED WITH THE ISOTROPI RESPONSE, IS UNIQUE IN ASTRONOMY. A THE MEASUREMENT WAS ALSO ASSOCIATED WITH EACH RECORD. THE DATA ACCUMULATIONS INCLUDED A BACKGROUND COMPONENT DUE TO COSNIC PARTICLES AND THEIR SECONDARY EFFECTS. THE OBSERVED BACKGROUND RATE, WHICH WAS A FUNCTION OF THRESHOLD ENNEGY, WAS ABOUT 15D COUNTS/S.

SPACECRAFT COMMON NAME- VELA 5B Alternate Names- Vela 10 (trw), 03955 Vela 58 (USAF)

NSSOC 10- 69-046F

WEIGHT- 259. KG LAUNCH DATE- 05/23/69 Launch Site- Vandenderg Afd, United States Launch Vehicle- 11tan 3c

SPONSORING COUNTRY/AGENCY United States DOD-USAT

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INITIAL ORBIT PARAMETERS EPOCH DATE- 05/25/69 ORDIT TYPE- GEGCENTRIC Orbit Period- 4709. Min Periapsis- 110920. KM INCLINATION- 32.8 APOAPSIS- 112283. KH PERSONNEL ARPA/WASH-DC MG -PM -PS - MR. ARPA-STAFF USAF-LAS RLEBESADEL SAMSO

BRIEF DESCRIPTION VELA SB WAS ONE OF TWO SPIN-STABILIZED, ICOSAHEDRAL VELA SB WAS ONE OF TWO SPIN-STABILIZED, ICOSAHEDRAL THE ORBITS THAT COMPRISED THE SIXTH LAUNCH IN THE VELA PROGRAM. THE ORBITS OF THE TWO SATELLITES ON EACH LAUNCH WERE BASICALLY CIRCULAR AT ABOUT 17 EARTH RADIL, INCLINED AT 6D DEG TO THE ECLIPTIC, AND SPACED 180 DEG APART, THUS PROVIDING A MONITORING CAPABILITY OF OPPOSITE SIDES OF THE EARTH. THE DBJECTIVES OF THE SATELLITES WERE -- (1) TO STUDY SOLAR AND COSMIC K RAYS, EUV, SOLAR PROTONS, SOLAR WIND, AMC MEUTRONS, (2) TO CARRY OUT RESEARCH AND DEVELOPMENT ON RETHODS OF DETECTING NUCLEAR EXPLOSIONS BY MEANS OF SATELLITE-BORNE INSTRUMENTATION, AND (3) TO PROVIDE SOLAR FLARE DATA IN SUPPORT OF MANNED SPACE MISSIONS. VELA SB, AN IMPROVED VERSION OF THE EARLIER VELA SERIES SATELLITES, HAD BETER COMMAND CAPABILITIES, INCREASED DATA STORAGE. IMPROVED POWER REQUIREMENTS, UETTER THERMAL CONTROL OF OPTICAL SENSORS, AND GKEATER EXPERIMENTATION WEAGHT. POWER SUPPLIES OF THE SPACECRAFT'S 26 FACES. A ROTATION RATE OF 78 RPM DURING TRANSFER ORDITS AND 1 RPM AFTER FINAL ORDIT INSERTION MAINTAINED MONINAL ATTITUDE CONTROL. EIGHT WHIP ANTENNAS AND FOUR STUB ANTENNA ARRAYS AT OPPOSITE ENDS OF THE SPACECRAFT STRUCTURE WERE USED FOR GROUND COMMAND AND TELEMETRY.

-- VELA 50, DAME---INVESTIGATION NAME- SOLAR WIND

NSSDC 10- 69-046E-05

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INVESTIGATIVE PROGRAM NUCLEAR DETECTION

INVESTIGATION DISCIPLINE(S) Particles and fields Ragnetospheric physics

als:

PERSONNEL PI - S.J. DI - J.R. DI - H.E. BAME ASBRIDGE Felthauser LOS ALAMOS SCI LAB Los Alamos sci Lab Los Alamos sci lab

INVESTIGATIVE PROGRAM

BRIEF DESCRIPTION TWO ELECTROSTATIC AMALVZER-ELECTHON MULTIPLIER UNITS WERE USED TO STUDY THE INTERPLANETARY SOLAR WIND (INCLUDING HEAVY IONE) AND PROTONS AND ELECTRONS IN THE RAGUETOTALL. ENERGY MALVISTS WAS ACCOMPLISHED BY CHARGING THE PLATES TO KNOWN VOLTAGE LEVELS AND ALLOWING THEM TO DISCHARGE WITH KNOWN RESISTANCE CAPACITOR (RC) TIME CONSTANTS. PARTICLES IN A 6-DEG BY 100-DEG FAN-SHAPED ANGULAR RANGE WERE ACCEPTED FOR ANALYSIS DURING A DECATING VOLTAGE CYCLE. THE 100-DEG DIRENSION WAS PARALLEL TO THE FAACEFART SPIN AXIS FOR BOTH DETECTORS. ONE DETECTOR UNIT WAS USED TO STUDY MAGNETOTALL PROTONS OR ELECTRONS BETWEEN 20 EV AND 33 KEV AND SOLAR WIND HEAVY LONS OR THE ENERGY PER CHARGE RANGE BETWEEN 1 KV AND 8.3 KV. THE OTHER DETECTOR UNIT, WHICH FALLEP, WAS DESIGNED 3D STUDY JLAR WIND ELECTORS IN THE ENERGY RANGE FROM 7.5 EV TO 18.5 KEV AND SOLAR WIND POSITIVE IONS (MAINLY PROTONS AND ALPHA PARTICLES) IN AN ENERGY PER CHARGE RANGE FROM 120 V TO 5 KV.

-- VELA 58, BANE------

INVESTIGATION NAME- NEUTRON DETECTOR

RSSDC 10- 69-046E-07 INVESTIGATIVE PROGRAM NUCLEAR DETECTION

INVESTIGATION DISCIPLINE(5) PARTICLES AND FIELDS

PERSONNEL PI - S.J. BAME 01 - J.R. ASBRIDGE LOS ALAMOS SCI LAR Los Alamos sci Lar

BRIEF DESCRIPTION THE NEUTRON DETECTOR CONSISTED OF A LARGE (ABOUT B LB) POLYETHYLENE MODERATOR SURROUNDING TWO HELIUM-3 FILLED PROPURTIONAL COUNTERS. NEUTRONS BETWEEN 1 AND 100 MEV WERE THERMALIZED BY THE MODERATOR AND DETECTED BY THE COUNTERS. THE INSTRUMENT WAS ALSO SENSITIVE TO PROTONS ABOVE 25 MEV.

----- VELA 58- BELIAN------

INVESTIGATION NAME- COSMIC X RAYS

NESDE 10- 69-046E-06

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(5) X-RAY ASTRONÓMY

PERSONNEL		
PI - R.D.	BELIAN	LOS ALANDS SCI LAB
01 - W.D.	EVANS	LOS ALAROS SCI LAB
01 - J.P.	CONNER	LOS ALAMOS SCT LAB

BRIEF DESCRIPTION THE COSMIC X-RAY DETECTOR WAS A LARGE-AREA 26 CM SQ SODZUM IODIDE SCINTILATOR WITH A 5-MIL BERYLLIUM WINDOW. THE EXPERIMENT WAS DESIGNED 'O PROVIDE MEASUREMENTS OF THE LOCATION, INTENSITY, AND INTENSITY VARIATIONS OF NONSOLAR X-RAY SOURCES OVER A LONG PERIOD OF TIME. THE DETECTOR WAS SCHRÖITINE TO X-RAY PHOTONS IN TWO ENERGY INTERVALS - (3 TO 6 KEV AND 3 TO 12 KEV), AND WAS SUFFICIENTLY SENSITIVE TO MONITOR FROM 6 TO 12 CALACTIC X-RAY SOURCES. ANY ONE SOURCE WAS VIEWED FOR APPROXIMATELY 1 H, AND EVERY 2 DAYS EACH SOURCE WAS VIEWED FOR APPROXIMATELY 1 H, AND EVERY 2 DAYS EACH SOURCE WAS DACK IN VIEW. THREE MODES OF READOUT WERE AVAILABLE - (1) THE PEAL TIME MORNAL MODE, IN WHICH COUNTS FROM EACH ENERGY CHANNEL WERE TRANSMITTED EVERY \$, (2) THE HIGH RESOLUTION MODE, IN WHICH ONLY THE 3- TO 12-REW CHANNEL WAS TRANSMITTED EIGHT TIMES PER 5, AND (3) THE STORE MODE, IN WHICH ONLY THE 3- TO 12-KEY CHANNEL WAS STORED. CHANNEL WAS STORED.

---- VELA 58, HIGBLE------

INVESTIGATION NAME- SOLAR PARTICLE TELESCOPES

INVESTIGATIVE PROGRAM Nuclear detection NSSDC 10- 69-046E-03

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONVEL PI - P.R. HIGBIE OI - M.D. MONTGOMERY

LOS ALAMOS SCI LAD Los Alamos sci Lad

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE SOLAR TELESCOPE EXPERIMENT WAS DESIGNED TO MEASURE THE EMERGY SPECTRUM AND ANGULAR DISTRIBUTION OF SOLAR PROTONS BETWEEN 0.3 AND SO MEY AND OF SOLAR ALPHA PARTICLES BETWEEN 2 AND 100 MEY, IN ADDITION, THE EXPENIMENT WAS DESIGNED TO DEMTIFY AND MONITOR THE FLUX OF DEUTRIUM, TRITIUM, AND MELIUN-3 NUCLEI WHICH MAY BE ENTITED DURING A SOLAR PARTICLE FLARE AND TO MONITOR THE INTENSITY OF MORE HEAVILY IONIZED PARTICLES. THERE WERE THREE TELESCOPES IN A SINGLE PLANE, ORIENTED AT ANGLES OF 45 DEG, 90 DEG, AND 135 DEG RELATIVE TO THE SPACEGRAFT SPIN AXIS. EACH INSTRUMENT CONSISTED OF COLLIMATING TUBE (PROVIDING AN AMGULAR VIEW OF 30 DEG) IN FRONT OF A SOLID-STATE DE/DX VS E PARTICLE DETECTOR.

INVESTIGATION NAME- ELECTRON DETECTORS

-- VELA 58, HIGBLE-----

INVESTIGATIVE PROGNAM NUCLEAR DETECTION NSSDC 10- 89-046E-04

INVESTIGATION DISCIPLINE(S) Particles and Fields

PI - P.R. HIGBLE DI - M.D. MONTGONERY

PERSONNEL

LOS ALAMOS SCI LAB Los Alamos sci lab

BRIEF DESCRIPTION TWO SETS OF THREE SOLID-STATE ELECTRON DETECTORS IN A TELESCOPIC ARKANGEMENT WITH AN ANGULAR VIEW OF 30 DEG WERE USED TO OBSERVE ELECTRONS OVER THE RANGE 30 TO 150 KEV. PROTONS OF ENERGY LESS THAN'S 300 XEV AND GREATER THAN 50 MEV COULD ALSO BE DETECTED. ONE SET OF DETECTORS VIEWED THE PARTICLES DIRECTLY. THE OTHER STILLZED A SCATTER GEOMETRY TO IMPROVE ABILITY TO DOSSERVE ELECTRONS IN THE PRESENCE OF MUCH LARGER FLUXES OF PROTONS. EACH OF THE THREE DIRECT VIEW DETECTORS AND EACH OF THE THREE SCATTER GEOMETRY DEFECTORS LAY IN A SINGLE PLANE AND MADE ANGLES OF 45 DEG, 90 DEG, AND 135 DEG WITH THE SPACECRAFT SPIN AXIS.

-- VELA SB, KLEBESADEL-----

INVESTIGATION NAME- GAMMA RAY ASTRONOMY

NSSOC 10- 69-046E-08 INVESTIGATIVE PROGRAM NUCLEAR DETECTION

INVESTIGATION DINCIPLINE(S) Astronomy

PERSONNEL		
	KLEBESADEL	LOS ALAMOS SCI LAB
01 - I B		LOS ALAMOS SCI LAB
01 - R.A.	OLSON	LUS ALAMOS SCI LAB

DI - R.A. OLSON COSTICALS AND THE SATANOS SELE LAB BRIEF DFJGRIPTION INIS EXPERIMENT CONSISTED OF SIX 1D-CM-CUBED CESIUM IOTIDE SCINTILLATION COUNTERS DISTRIBUTED TO ACHIEVE NEARLY ISOTROPIC SENSITIUITY. INDIVIDUAL DETECTORS RESPONDED TO ENERGY DEPOSITIONS OF D.2 TO 1.0 MEV WITH A DETECTION EFFICIENCY RANGING FROM 17 TO 5D PERCENT. THE SCINTILLATORS WERE SHIELDED GGAINST DIRECT PENETRATION BY ELECTRONS RELOW D.75 MEV AND PROTONS BELOW 20 MEV. NO ACTIVE ANTICOINCIDENCE SHIELDED MERE SUMMED INTO COUNTING AND LOGICS CIRCUITAT. LOGICAL SENSING OF RAPID, STATISTICALLY SIGNIFICANT COUNT RATE INCREASES INITIATED THE RECORDING OF DISCRETE COUNTS IN A SERIES OF LOGANITHWICALLY INCREASING TIME INTERVALS. THIS CAPABILITY PROVIDED CONTINUOUS TEMPORAL COVERAGE, WHICH, COUPLED WITH THE ISOTROPIC RESPONSE, IS UNIQUE IN ASTRONOMY. A TIME MEASUREMENT WAS ALSO ASSOCIATED WITH EACH RECORD. THE DATA ACCUMULATIONS INCLUDED A BACKGROUND COMPONENT, DUE CO COSNIC PARTICLES AND THER SERIES AFLO ACHARY CONDARY, WAS ABOUT 15D CONTE, WHICH WAS A FUNCTION OF THRESHOLD ENERGY, WAS ABOUT 15D CONTES.

SPACECRAFT COMMON NAME- VELA 6A Alternate Names- PL-702B, Vela 11 (TRW) 04366, Vela 6A (USAF)

N550C ID- 70-027A

LAUNCH DATE- 04/08/70 Launch Site- cape canaveral, united states Launch vehicle- titan WEIGHT~ 261. KG

SPONSORING COUNTRY/AGENCY

UNITED STATES	DOD-USAF
INITIAL ORBIT PARAMETERS ÓRÓIT TYPE- GEOCENTRIC Orðit Period- 6729. Nin Periapsis- 111210. Km	EPOCH DATE- 04/09/70 Inclination- 32.41 deg Apgapsis- 112160. Km
PERSONNEL NG - ARPA-STAFF	ARPA/WASH,DC

USAF-LAS Los Alàmos SCI: LAB PM - SAMSO PS - R.W. KLEBESADEL

GRIEF DESCRIPTION

GRIEF DESCRIPTION VELA GA WAS ONE OF TWO SPIN-STABILIZED, ICOSAHEDRAL SATELLITES THAT COMPRISED THE SIXTH LAUNCH IN THE VELA PROGRAM. THE ORBITS OF THE TWO SATELLITES ON EACH LAUNCH WERE BASICALLY CIRCULAR AT ABOUT 17 EARTH RADII, INCLINED AT 60 DEG TO THE ECLIPTIC, AND SPACED 180 DEG APART. THUS PROVIDING A MONITORING CAPABILITY OF OPPOSITE SIDES OF THE EARTH. THE OBJECTIVES OF THE SATELLITES WERE (1) TO STUDY SOLAR AND COSMIC X RAYS, EUV, SOLAR PROTONS, SOLAR WIND, AND NEUTRONS, (2) TO CARRY OUT RESEARCH AND DEVELOPMENT ON METHODS OF DETECTING. NUCLEAR EXPLOSIONS BY REAMS OF SATELLITE-BORE INSTRUMENTATION, AND (3) TO PROVIDE SOLAR FLARE DATA IN SUPPORT OF MANNED SPACE MISSIONS, VELA GA WAS AN IMPOVED VERSION OF THE EARLIER VELA SERIES SATELLITES HAVING BETTER COMMAND CAPABILITIES, INCREASED DATA STORAGE, IMPROVED POWER REQUIREMENTS, BETTER THERMAL CONTROL OF OPTICAL SENSORS, AND GREATER EXPERIMENTATION WEIGHT.

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POWER SUPPLIES OF 120 W WERE PROVIDED BY 22,500 SCLAR CELLS MOUNTED ON 24 OF THE SPACECRAFT'S 26 FACES, ROTATIO4 RATES OF 78 RPM DURING TRANSFER ORDITS AND 1 RPM AFTER FINAL ORDIT INSERTION MAINTAINED NOMINAL ATTITUDE CONTROL. 21GHT WHIP ANTENNAS AND FOUR STUD ANTENNA ARRAYS AT OPPOSITE ENDS OF THE SPACECRAFT STRUCTURE WERE USED FOR GROUND COMMANDS AND TELEMETRY. THE LAUNCH OF VELA 6A AND 60, PLUS THE TWO ACTIVE VELAS STILL IN ORDIT (VELA 5A AND 5D), COMPLETED THE OBJECTIVES OF THE VELA PROGRAM.

INVESTIGATION NAME- SOLAR WING EXDERIMENT

-			HENRY CALIFORNIA
N550C	10-	70-0274-05	INVESTIGATIVE PROGRAM NUCLEAR DETECTION

	PARTICLES		ON DISCIPLINE(S) And Fields Heric Physics		>
PERSONNEL					
PI - S.J.		LOS	ALAMOS	5 C I	LAB
01 - J.R.			ALAHOS		
01 - H.E.	FELTHAUSER		ALAHO5		

SRIEF DESCRIPTION

GRIEF DESCRIPTION TWO ELECTROSTATIC ANALYZER-ELECTRON MULTIPLIER UNITS WERE USED TO STUDY THE INTERPLANETARY SOLAR WIND (INCLUDING HEAVY IONS) AND PROTONS AND ELECTRONS IN THE MAGNETOTALL. ENERGY ANALYSIS WAS ACCOMPLISHED BY CHARGING THE PLATES TO KNOWN VOLTAGE LEVELS ALLOWING THENT TO DISCHARGE WITH KNOWN RESISTANCE CAPACITOR (RC) TIME COMSTANTS. PARTICLES IN A 5-DEG BY 100-DEG FAN-SHAPUD ANGULAR RANGE WERE ACCEPTED FOR ANALYSIS DURING A DECAYING VOLTAGE (YCLE, THE 100-DEG DIRENSION WAS PARALLEL TO THE SPACECRAFT SPIN AXIS FOR BOTH DETECTORS. ONE ANALYZER-MULTIPLIER UNIT STUDIED SOLAR WIND ELECTORS, ONE ANALYZER-MULTIPLIER UNIT STUDIED SOLAR WIND ELECTORS, ONE CHARGE RANGE FROM 7.5 EV TO 18.5 KEV AND SOLAR WIND POSITIVE JONS (MAINLY PROTONS AND ALPHA PARTICLES) IN AN ENERGY PER CHARGE RANGE RAME FROM 7.5 OR ELECTRONS BETWEEN 20 EV AND 33 KEV AND SOLAR WIND HEAVY IONS IN THE ENERGY PER CHARGE RANGE BETWEEN 1 KV AND 8.3 KV. KV AND 8.3 KV

--- VELA 64, BANE-----

INVESTIGATION NAME- NEUTRON DETECTOR

N550C 10- 70-027A-07

INVESTIGATIVE PROGRAM NUCLEAR DETECTION

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL PI - S.J. BAME OI - J.R. ASBRIDGE

LOS ALAMOS SCT LAG Los alamos sci lab

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE NEUTRON DETECTOR CONSISTED OF A LARGE (ABOUT 8 LB) POLYETHYLENE MODERATOR SURROUNDING TWO HELIUM-3 FILLED PROPORTIONAL COUNTERS. NEUTRONS BETWEEN 1 AND 100 MEY WERE THERMALIZED BY THE MODERATOR AND DETECTED BY THE COUNTERS. THE INSTRUMENT WAS ALSO SINSITIVE TO PROTONS ABOVE 25 MEV.

-- VELA AA, CHANDERS----

INVESTIGATION NAME- SOLAR X-RAY DEFECTORS, G.5 TO 3.D A, 1 TO B A: 1 TO 16 A, 44 TO 60 A

NSSOC 10- 70-0274-02

INVESTIGATIVE PROGRAM NUCLEAR DETECTION

INVESTIGATION DISCIPLINE(S) R-RAY ASTRONOMY Solar Physics

PI - W.H. OI - J.C. OI - W.E.	FULLER	LOS ALAMOS SCI LAB Los alamos sci lab Los alamos sci lab
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BRIEF DESCRIPTION

REDGONNEL

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO MONITOR THE SOLAR AMBIENT AND FLARE-PRODUCED FLUX OF X RAYS IN THE 0.3- TO 60-A WAVELENGTH REGION. TWO IDENTICAL X-RAY SENSOR UNITS WERE MOUNTED AT DIAMETRICALLY OPPOSED APEX POSITIONS ON THE SATELLITE. EACH UNIT CONTAINED FOUR DETECTORS -- THREE ION CHAMBER AND A SCINTILLATION (NAI(T)) DETECTOR. AS EACH ION CHAMBER AND A SCINTILLATION (NAI(T)) DETECTOR. AS EACH ION CHAMBER AND A SCINTILLATION (NAI(T)) DETECTOR. AS EACH ION CHAMBER AND A HEMISPHENICAL WINDOW, THE CONDINED OUTPUT SIGNAL'S FROM IDENTICAL CHAMBERS IN EACH SENSOR UNIT APPROXIMATED THE RESPONSE OF AN IDEAL DETECTOR WITH A 4-PI STERADIAN FIELD OF VIEW, THE ION CHAMBERS IN EACH SENSOR UNDOW MATERIALS, CAS FILLS, AND WAVELENGTH RESPONSES. CHAMBER 1 -- 5.E-3 IN. "F BERYLLIUN. D.9 ATM OF ARGON + D.1 ATM OF HELIUM, I TO 8 A. CHAMBER 2 -- 2.5E-4 IN. OF MYLAR OVERCOATED WITH ABOUT 4N BSOO A LAYER OF ALUMINUM, 0.5 ATM OF NITROGEN, 1 TO 16 A. CHAMBER 3 -- 2.5E-4 IN. OF SITON GHIARGOR, 1 TO 16 A. STO 4 THE SCINTILLATION OF SITON CHAMBERS ALLOWED SOLAR X-NAT FLUX MEASUREMENTS IN THE BANDS I TO 8 A. I TO 16 A. STO 4 AND 44 TO 60 A TO BE OBTAINED UPON SUITABLE ANALYSIS OF THE DATA. THE SCINTILLATION DETECTOR USED FOR THE 0.3- TO 3-A MAVELENGTH REGIOD A THALLUM-ACTIVATED NAI CRYSTAL OPTICALLY COUPLED TO A PMT, THE OUTPUT OF WHICH FED A

FIVE-LEVEL, INTEGRAL, JELSE-HEIGHT ANALYZER. UNLIKE THE ION CHANGERS, THE TWO SCINTILLATION DETECTORS IN THE TWO SENSOR UNITS WERE NOT IDENTICAL. THE MORE SENSITIVE DETECTOR HAD A ONE-HALF-INCH-DIAMETER, 1-MM-THICK CRYSTAL COVERED BY A FLAT 10-MIL-THICK BERVLLIUM WINDOW. THE LESS SENSITIVE DETECTOR (1.E-2 ERGS/SG CM-5) HAD A OME-QUARTER-IN.-DIAMETER, 1-MM-THICK CRYSTAL AND A 0.00 IV.-THICK BERVLLIUM DOME WINDOW IN ADDITION TO THE FLAT 10-MIL WINDOW MOUNTED ON THE FACE OF THE CRYSTAL. BOTH ION CHARBERS AND SCINITLATION DETECTORS WERE CARABLE OF DOSERVATIONS WITH TIME RESOLUTIONS OF 2 5. THE AVERAGE DETECTIVE EFFICIENCIES FOR THE IGN AND SCILITLATION DETECTORS WERE OF THE ORDER OF 20 AND 60 PERCENT, RESPECTIVELY.

----- VELA 6A, HIGBLE-----

INVESTIGATION NAME- SOLAR PARTICLE TELESCOPES

NSSDC 10- 70-027A-03 INVESTIGATIVE PROGRAM NUCLEAR DETECTION

INVESTIGATION DISCIPLINE(S) Solar physics

PERSONNEL PI - P.R. HIGBIE GI - M.D. MONTGOMERY LOS ALAMOS SCI LAB Los A'Amos Sci Lab

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE SOLAR TELESCOPE EXPERIMENT WAS DESIGNED TO MEASURE THE ENERGY SPECTRUM AND ANGULAR DISTRIBUTION OF SOLAR PROTONS BETWEEN 0.3 AND SO MEV AND OF SOLAR ALPMA PARTICLES DETWEEN 2 AND 100 MEV. IN ADDITION, THE EXPERIMENT WAS DESIGNED TO IDENTIFY AND MONITOR THE FLUX OF DEUTERIUM, TRITIUM, AND HELIUM-3 NUCLEI WHICH MAY BE EMITTED DURIN: A SOLAR PARTICLE FLARE AND TO MONITOR THE INTENSITY OF MOKE HEAVILY IDNIZED PARTICLES. THERE WERE THREE TELESCOPES IN A SINGLE PLANE, ORIENTED AT ANGLES OF 45 DEG, YO DEG, AND 135 DEG RELATIVE TO THE SPACECRAFT SPIN AXIS. EACH INSTRUMENT CONSISTED OF A COLLIMATING TUBE (PROVIDING AN ANGULAR VIEW OF 30 L.") IN FRONT OF A SOLID-STATE DE/DX VS E PARTICLE DETECTOR.

----- VELA 64, HIGHIF-----

INVESTIGATION NAME+ ELECTRON DETECTORS

NSSBC 10- 70-0274-04 INVESTIGATIVE PROGRAM NUCLEAR DETECTION

INVESTIGATION DISCIPLINE(5) PARTICLES AND FIELDS

LOS ALAMOS SCI LAB LOS ALAMOS SCI LAB

PERSONNEL PI - P.R. HIGBIE OI - M.D. MONTGUMERY

BRIEF DESCRIPTION

BRIEF DESCRIPTION TWO SETS OF THREE SOLID-STATE ELECTRON DETECTORS IN A TELESCOPIC ARRANGEMENT WITH AN ANGULAR VIEW OF 3G DEG WERE USED TO OBSERVE ELECTRONS OVER THE RANGE 3D TO 150 KEV. PROTONS OF ENERGY LESS THAN 300 KEV AND GREATER THAN 5G MEV COULD ALSO BE DETECTED. ONE SET OF DETECTORS VIEWED THE PARTICLES DIRECTLY. THE OTHER UTILIZED A SCATTER GEOMETRY TO IMPROVE ITS ABILITY TO OBSERVE ELECTRONS IN THE PRESENCE OF MUCH LARGER FLUXES OF PROTONS. EACH OF THE THREE DIRECT-VIEW DETECTORS AND EACH OF THE THREE SCATTER GEOMETRY DETECTORS LAID IN A SINGLE PLANE AND MADE ANGLES OF 45 DEG, 90 DEG, AND 135 OEG WITH THE SPACECRAFT SPIN AXIS.

---- VELA 6A, KLEBESADEL------

INVESTIGATION NAME- GAMMA-RAY ASTRONOMY

NS5DC 10- 70-027A-08

INVESTIGATIVE PROGRAM NUCLEAR DETECTION

INVESTIGATION DISCIPLINE(S) ASTRONOMY

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PERSONNEL		
	KLEBESADEL	LOS ALAHOS SCI LAB
01 - 1.9.		LOS ALAMOS SEI LAB
01 - R.A.	OLSON	LGS ALAHOS SCI LAB

01 - R.A. OLSON BRIEF DESCRIPTION THIS EXPERIMENT CONSISTED OF SIX 10-CM-CUBED CESIUM 10DIDE SCINTILLATION COUNTERS DISTRIBUTED TO ACHIEVE NEARLY ISOTROPIC SENSITIVITY. INDIVIDUAL DETECTORS RESPONDED TO ENERGY SEPOSITIONS OF 0.3 TO 1.5 MEV WITH A DETECTION EFFICIENCY RANGING FROM 17 TO SO PERCENT. THE SCINTILLATORS WERE SHIELDED AGAINST DIRECT PENETRATION BY ELECTRONS BELOW 0.75 MEV AND PROTONS BELOW 20 MEV. NO ACTIVE ANTICOINCIDENCE SHIELDING WAS UNMED. INTO COUNTING AND LOGICS CIRCUITRY. LOGICAL SENSING OF RAPID- STATISTICALLY SIGNIFICANI COUNT RATE INCREASES INITIATED THE REFORDING OF DISCRETE COUNTS IN A SERIES OF LOGARITHMICALLY INCREASING THE INTERVALS. THIS CAPABILITY PROVIDED CONTINUOUS TEMPGRAL COVERAGE WHICH, COUPL2D WITH HE ISTROPIC RESPONSE, WAS UNIQUE IN ASTRONOMY. A TIME MEASUREMENT WAS ALSO ASSOCIATED WITH EACH RECORD. THE DATA ACCUMULATIONS INCLUDED A BACKGROUND COMPONENT, DUE TO COSMIC PARTIL ES AND THEIN SECONDARY EFFECTS. THE OBSERVED BACKGROUND RATE, WHICH WAS A FUNCTION OF THRESHOLD ENERGY, WAS ABOUT 20 COVYS/S.

SPACECRAFT COMMON NAME- VELA 68 Alternate NAMES- PL-702C, VELA 12 (TRW) 04368, VELA 68 (USAF)

NSSDC 10- 70-0278

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A CLARKER

LAUNCH DATE- 04/08/70 WEIGHT- 261. KG LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- 1ITAN

SFONSORING COUNTRY/AGENCY UNITED STATES DOD-USAF

INITIAL ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 6745. Min Periapsis- 111500. Km EPOCH DATE- 04/11/70 Inclination- 32.52 deg Apoapsis- 112210. KN

PERSONNEL		
MG - PM -	ERDA-LTAFF Samso	ERDA/WASH/DC USAF-LAS
PS - R.W.	KLEBSACC	LOS ALAMOS SCI LAB

SRIEF DESCRIPTION VELA 6B WAS ONE OF TWO SPIN-STABILIZED, ICOSAHEDRAL SATELLITES THAT COMPRISED THE SIXTH LAUNCH IN THE VELA PROGRAM. THE ORBITS OF THE TWO SATELLITES ON EACH LAUNCH WERE BASICALLY CIRCULAR AT ABUGUT 17 EARTH RADII, INCLINED AT 60 DEG TO THE ECLIPTIC, AND SPACED 180 DEG APART, THUS PROVIDING A MOMITORING CAPABILITY UF OPPOSITE SIDES OF THE EARTH. THE OBJECTIVES OF THE SATELLITES WERE (1) TO STUDY SOLAR AND COSMIC X RAYS, EUV, SOLAR PROTONS, SOLAR WIND, AND NEURONS, (2) TO CARPT OUT RESEARCH AND DEVELOPMENT ON METHODS OF DETECTING NUCLEAR TYPLOSIONS UF MEANS OF SATELLITE-BORNE INSTRUMENTATION, AND (3) O FROVIDE SOLAR FLARE DATA IN SUPPORT OF MANNED SPACE MISSIONS, VELA 6B WAS AN IMPROVED VERSION OF THE EARLIER VELA SERIES SATELLITES HAVING BETTER COMMAND CAPABILITIES, INCREASED DATA STORAGE, IMPROVED POWER REQUIREMENTS, BETTER THERMAL CONTROL OF OPTICAL SENSORS, AND GREATER EXPERIMENTATION WEIGHT. POWER SUPPLIES OF 720 W WERE PROVIDED BV 22,500 SOLAR CELLS MOUNTED ON 24 OF THE SPACECRAFT'S 26 FACES, A ROTATION RATE OF 78 RPM DURING TRANSFER ORBITS AND 1 RPM AFTER FINAL OBBIT INSERTION MAINTAINED NOMINAL ATTITUDE CONTROL. EIGHT WHP ANTENNAS AND FOUR STUD ANTENNA ARRAYS AT OPPOSITE ENDS OF THE SPACECRAFT STULCTURE WERE USED FOR GROUND COMMANDS AND TELEMETRY. THE LAUNCH OF VELA 6A AND 6B, PLUS THE TWO ACTIVE VELA 500 RAME.

--- VELA 682 BAME-

INVESTIGATION NAME- NEUTRON DETECTOR

NSSOC 10- 70-0278-07 INVESTIGATIVE PROGRAM NUCLEAR DETECTION

> INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL LOS ALAMOS SCI LAB Los Alamos sci Lab PI - S.J. BAME 01 - J.R. ASBRIDGE

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE NEUTRON DETECTOR CONSISTED OF A LARGE (ABOUT B LB) POLYETHYLENE MODENATOR SURROUNDING TWO HELIUM-3 FILLED PROPORTIONAL COUNTERS. HEUTRONS DETWEEN 1 AND 100 MEV WERE THERMALIZED BY THE KODERATOR AND DETECTED BY THE COUNTERS. THE INSTRUMENT WAS ALSO SENSITIVE TO PROTONS ABOVE 25 MEV.

----- VELA 68, HIGBIE-----

INVESTIGATION NAME- SOLAR PARTICLE TELESCOPES

NSSDC 10- 70-0278-03

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL PI - P.R. HIGBLE DI - M.D. MONTGOMERY LOS ALAMOS SCI LAB Los Alamos sci lab

ERIEF DESCRIPTION THE SOLAR TELESCOPE EXPERIMENT WAS DESIGNED TO MEASURE THE ENERG, SPECTRUM AND ANGULAR DISTRIBUTION OF SOLAR PROTONS DETWEEN 0.3 AND SO MEV AND OF SOLAR ALPHA PARTICLES BETWEEN 2 AND 100 MEV. IN ADDITION, THE EXPERIMENT WAS DESIGNED ATO DENTIFY AND MONITOR THE FLUX OF DEUTERIUM, TATTUM, AND HELIUM-3 NUCLEI WHICH MAY BE EMITTED DURING & SOLAR PARTICLE FLARE AND TO MONITOR THE INTENSITY OF MORE HEAVILY IONIZO PARTICLES. THERE WERE THREE TELESCOPES IN A SINGLE PLAME, ORIENTED AT ANGLES OF 45 DEG, 90 DEG, AND 135 DEG RELATIVE TO THE SPACECRAFT SPIN AXIS. EACH INSTRUMENT CONSISTED OF COLLIMATING TUBE (PROVIDING AN ANGULAR VIEW OF 30 DEG) IN FROMT OF A SOLID-STATE DE/DX VS E PARTICLE DETECTOR. BRIEF DESCRIPTION

- VELA &8, HIGBLE------INVESTIGATION NAME- ELECTRON DETECTORS

INVESTIGATIVE PROGRAM NUCLEAR DETECTION NSSOC ID- 70-0278-04

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL PI - P.R. Higbiê 01 - M.D. Montgomery

BRIEF DESCRIPTION

NSSDC ID- 70-0278-08

LOS ALAMOS SCI LAB Los Alamos sci LAB

BRIEF DESCRIPTION TWO SETS OF THREE SOLID-STATE ELECTRON DETECTORS IN A 'ELESCOPIC ARRANGEMENT WITH AN ANGULAR VIEW OF 3C DEG WERE USED TO OBSERVE ELECTRONS OVER THE RANGE 3C TO 150 KEV. PROTONS OF ENERGY LESS THAN 3CO KEV AND GREATER THAN 50 MEV COULD ALSO BE DETECTED. ONE SET OF DETECTORS VIEWED THE PARTICLES DIRECTLY. THE OTHER UTILIZED A SCATTER GEOMETRY TO IMPROVE ITS ABILITY TO DESERVE ELECTRONS IN THE PRESENCE OF MUCH LARGER FLUXES OF PROTONS. EACH OF THE THREE DIRECT-VIEW DETECTORS AND EACH OF THE THREE SCATTER GEOMETRY DETECTORS AND EACH OF AND EACH OF THE THREE DIRECT-VIEW DETECTORS AND EACH OF NADE ANGLES OF 45 DEG, 90 DEG, AND 135 DEG WITH THE SPACECRAFT SPIN ATYS. SFIN AXIS.

----- VELA 68, KLEBESADEL------

INVESTIGATION NAME- GAMMA-RAY ASTRONOMY

INVESTIGATIVE PROGRAM NUCLEAR DETECTION

INVESTIGATION DISCIPLINE(S) ASTRONOMY

PERSONNEL		
PI - R.W.	KLEBESADEL	LOS ALAMOS SCI LAB
0I - I.B.	STRONG	LOS ALAMOS SCI LAB
01 - H.A.	OLSON	LOS ALANOS SCI LAD

CIT - N.A. OLSON CONSISTED OF SIX 10-CM-CUBED CESIUM THIS EXPERIMENT CONSISTED OF SIX 10-CM-CUBED CESIUM IODIDE SCINTILLATION COUNTERS DISTRIBUTED TO ACHIEVE NEARLY ISOTROPIC SENSITIVITY. INDIVIDUAL DETECTORS RESPONDED TO ENERGY DEPOSITIONS OF 0.3 TO 1.5 MEV WITH A DETECTION EFFICIENCY RANGING FROM 17 TO 50 PERCENT. THE SCINTILLATORS WERE SHIELDED AGAINST DIRECT PENETRATION BY ELECTRONS GELOW 0.75 MEV AND PROVIDED. NORMALIZED OUTPUT PULSES FROM THE SIX DETECTORS WERE SUMMED INTO COUNTING AND LOGICS CIRCUITRY. LOGICAL SENSING OF RAPID. STATISTICALLY SIGNIFICANT COUNT RATE INCREASES INITIATED THE RECORDING OF DISCRETE COUNTS IN A SERIES OF LOGARITHMICALLY INCREASING TIME INTERVALS, THIS CAPABILITY PROVIDED CONTINUOUS TEMPORAL COVERAGE, WHICH, COUPLED WITH THE ISOTROPIC RESPONSE, WAS UNIQUE IN ASTRONOMY. A TIME MEASUREMENT WAS ALSO ASSOCIATED WITH EACH RECORD. THE DATA ACCUMULATIONS INCLUDED A BACKGROUND COMPONENT, DUE TO COSNIC PARTICLES AND THEIR SECOBARY EFFECTS. THE OBSERVED BACKGROUND RATE, WHICH WAS A FUNCTION OF THRESHOLD ENERGY, WAS ABOUT 20 COUNTS/S.

------ VIKING 1 LANDER**************

SPACECRAFT COMMON NAME- VIKING 1 LANDER Alternate Names- Viking-B Lander, Viking-B

NSSDC 10- 75-875C

LAUNCH DATE- 28/20/75 Launch Si'e- Cape Canaveral, United States WEIGHT- 598. KG LAUNCH VEHICLE- TITAN

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-055

INITIAL ORBIT PARAMETERS ORBIT TYPE- MARS LANDER

PERSONNEL NASA HEADQUARTERS NASA HEADQUARTERS NASA-LARC JAKOBOWSKI MG - W. JAKO SC - L.G. GOFF PH - G.C. BROOME PS - G.A. SOFFEN

BRIEF DESCRIFTION THIS SPACECRAFT WAS THE LANDING VEHICLE FOR THE TWO-PART SPACECRAFT MISSION. IT SOFT-LANDED AT 22,48 DEG N LATITUDE, 47,96 DEG W LONGTUDE ON THE MARTIAN SURFACE. THE ORBITER HAD THE CAPABILITY OF BEING MADE SYNCHRONOUS WITH THE LANDER TO PROVIDE FOR DAILY RELAY AND LANDING SITE OBSERVATION. IT ALSO WAS CAPABLE OF OBTAINING DATA FOR THE SELECTION OF LANDING SITES FOR FUTURE MISSIONS. THE LANDER VEHICLE CARRIED INSTRUMENTS TO STUDY THE BIOLOGY, CHEMICAL COMPOSITION (ORGANIC AND INORGANIC) METEOROLOGY, SEISMOLOGY, MAGNETIC PROPERTIES, SURFACE AND ATMOSPHERE. THE LANDER WEIGHS APPROXIMATELY 91 KG (200 LD). THIS SPACECRAFT WAS ONGINALLY SCHEDULED TO BE THE SECOND VIKING MISSION, BUT BECAUSE OF A MALFUNCTION IN VIKING-A, IT WAS LAUNCHED FIRST.

NASA-LARC

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INVESTIGATIVE PROGRAM NUCLEAR DEFECTION

---- VIKING 1 LANDER, ANDERSON--------

INVESTIGATION NAME- SELSMOLOGY

INVESTIGATIVE PROGRAM Code SL NSSDC 10- 75-075C-08

> INVESTIGATION DISCIPLINE(S) PLANETOLOGY PLANETARY PHYSICS

PERSONNEL		
TL - 0.L.	ANDERSON	CALIF INST OF TECH
TH - H.N.	TOKSOZ	MASS INST OF TECH
TM - G.H.	SUTTON	U OF HAWAII
TM - R.L.		STANFORD U
TM - G.V.		U OF TEXAS, GALVESTON

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TH - G.V. LATHAM U OF TEXAS, GALVESTON TH - G.V. LATHAM U OF TEXAS, GALVESTON BRIEF DESCHIPTION THE SEIMOLOGY EXPERIMENT WAS DESIGNED TO DETERMINE THE LEVEL OF SEISMIC ACTIVITY ON MARS AND ITS INTERNAL STRUCTURE. THE SEISMOLOGY INSTRUMENT CONSISTED OF A 15-CM CUBICAL PACKAGE THAT WEIGHED APPROXIMATELY 2.3 KG. IN THE PACKAGE WERE THREE THAT WEIGHED APPROXIMATELY 2.3 KG. IN THE PACKAGE WERE THREE THAT WEIGHED APPROXIMATELY 2.3 KG. IN THE PACKAGE WERE THREE THATWEIGHED APPROXIMATELY 2.3 KG. IN THE PACKAGE WERE THREE THATWEIGHED APPROXIMATELY 2.3 KG. IN THE PACKAGE WERE THREE THATWEIGHED APPROXIMATELY 2.3 KG. IN THE PACKAGE WERE THREE THATWEIGHED APPROXIMATELY 2.3 KG. IN THE PACKAGE WERE THREE THISTRUMENT FRAME ON A SHORT BOOM, SO THE COIL PROJECTS INTO A MAGNET, INDUCED BY THE MASS'S REACTION TO GOUND MOTION, WAS DESIGNED TO GENERATE A VARYING VOLTAGE THAT WAS THEN INPUT TO AN AMPLIFIEN. MODES WERE — (1) SELECTION PF VARIOUS FLITERS TOR FRE QUENCY CONTENT OR TO ADJUST TO UEST RECEPTION OF SPECIFIC TYPES OF DATA, (2) A LOW SAMPLING RATE FOR GENEPAL ACTIVITY, (3) A HIGM DATA RATE FOR DETAILED EXAMINATION OF EVENTS, AND (4) A COMPRES SED MEDIUM RATE FOR CONTINUOS MONITORING OF MARSQUAKES THAT WERE DORMAL GROUND NOISSION TO CARTH BY AVERAGING THE AMPLITUDE OF NORMAL GROUND NOISSION TO AN EVENT. THE DATA WERE TO BE COMPRESSED FOR TRANS MISSION TO CARTH BY AVERAGING THE AMPLET THAT SAMPLEO THE ARPLITUDE SAMPLE A HIGHER DATA RATE MODE THAT SAMPLEO THE ARPLITUDE SAMPLE PER S TO INDICATE ITS SHAPE. AT THE SAME TIME, THE CHANGE IN POLARITY OF THE DATA SIGNAL CAUSED BY CROSSING THE ZERO AXISSY WAS SAMPLED ONCE A S. THE SHAPE OF THE ENVELOPE AND ITS INCREMENTAL FREQUENCY CONTENT WOULD THEN BE TRANSMITTED 10 EARTH AND RECONSTRUCTED TO APPROSIMATE THE ORIGINAL EVENT. THE INSTRUMENT FAILED TO FUNCTION ON THE MARTIAN SURFACE.

----- VIKING 1 LANDER, BIEMANN----

INVESTIGATION NAME- MOLECULAR ANALYSIS

INVESTIGATIVE PROGRAM NSSDC ID- 75-0750-04

> INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES PLANETARY BIOLOGY PLANETOLOGY

PERSONNEL		when they or teru
ΤL - K .	BIEMANN	MASS INST OF TECH
TM - H.C.	UREY	U OF CALIF, SAN DIEGO
TH - D.B.		
TM - T.		STATE U OF NEW YORK
TM - J.	0R0	U OF HOUSTON
TM - L.E.	ORGEL	SALK INST BIOL STUDIES
TH - A.O.C.	.NIER	U OF MINNESOTA
TM - P.	TOULMIN# 3RD	US GEOLOGICAL SURVEY

TM - P. TOULMIN, 3RD US GEOLOGICAL SURVEY BRIEF DESCRIPTION THE MOLECULAR ANALYSIS EXPERIMENT WAS DESIGNED TO SEARCH THE MOLECULAR ANALYSIS EXPERIMENT WAS DESIGNED TO SEARCH UPPER SURFACE LAYER OF MARS, DETERMINE THE ATMOSPHERIC COMPOSITION NEAR THE SURFACE, AND MONITOR COMPOSITION CHANGES. THE ANALYSES WERE PERFORMED BY A GAS CHROMATOGRAPH MASS SPECTROMETER (GCMS), WHICH HAD HIGH SENSITIVITY, HIGH STRUITURAL SPECIFICITY, AND BROAD APPLICABILITY TO A WIDE RANGE OF COMPOUNDS. DRGANIC SUBSTANCES. WERE VAPORIZED FROM THE SURFACE MATERIAL BY HEATING TO 200 DEC WHILE CARBON DIOXIDE (LABELED WITH C-13) SWEPT THROUGH. THE MATERIAL WAS THEM CARRIED INTO A TEMEX GAS-CHROMATOGRAPHIC COLUMN THAT WAS SWEPT MITH HYDROGEN AS A CARRIER GAS. WHILE PASSING THROUGH THE COLUMN, SUBSTANCES WERE SEPARATED FROM EACH OTHER BY THEIR DIFFERENT DEGRESS OF RETENTION BY THE TEMEX. THE RESIDUAL STREAM MOVED INTO THE MASS SPECTROMETER (AFTER HYDROGEN WAS REMOVED. BY HYDROGEN-ONLY PERMEABLE PALLADIUM) AND A MASS REMOVED. BY HYDROGEN-ONLY PERMEABLE PALLADIUM AND THE 84 MIN OF THE GAS CHROMATOGRAM. THE DATA WERE STORED AND THEN 17 HYDROGEN TO EARTH. AFTER THE INITIAL ANALYSIS THE SAME SAMPLE WAS HEATED TO 500 DEG C TO OBTAIN LESS VOLATILE MATERIALS AND TO PERDLATE SUBSTANCES THAT WERE NOT VOLATILE MATERIALS AND TO PERDLATE SUBSTANCES THAT WERE NOT VOLATILE MATERIALS AND TO PERDLATE SUBSTANCES THAT WERE NOT VOLATILE MATERIALS AND TO PERDLATE SUBSTANCES THAT WERE NOT VOLATILE MATERIALS AND TO PERDLATE SUBSTANCES THAT WERE NOT VOLATILE MATERIALS AND TO PERDLATE SUBSTANCES THAT WERE NOT VOLATILE MATERIALS AND TO PERDLATE SUBSTANCES THAT WERE NOT VOLATILE MATERIALS AND TO PERDLATE SUBSTANCES THAT WERE NOT VOLATILE MATERIALS AND TO PERDLATE SUBSTANCES THAT WERE NOT VOLATILE MATERIALS AND TO PERDLATE SUBSTANCES THAT WERE NOT VOLATILE MADE THE GCMS. THE GCMS.

--- VIKING 1 LANDER, HARGRAVES--

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INVESTIGATION NAME: MAGNETIC PROPERTIES

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PLANETOLOGY

PERSONNEL TL - R.O. HARGRAVES

PRINCEION U

ARIEF DESCRIPTION THE MACHETIC PROPERTIES EXPERIMENT WAS DESIGNED TO DETECT THE MACHETIC PROPERTIES EXPERIMENT WAS DESIGNED TO DETECT THE PRESENCE OF MAGNETIC PARTICLES IN MARTIAN SUBFACE MATERIAL AND TO DETERMINE THE IDENTITY AND QUANTITY OF THESE PARTICLES. IT USED A SET OF TWO PERMANENT, SAMARIUM-COBALT MAGNETIC PARS MOUNTED ON THE BACKHOE OF THE SUBFACE-SAMPLER COLLECTOR HEAD. EACH PAIR CONSISTED OF AN QUTER RING MAGNET ABOUT 2.5 CM IN DIAMETER WITH AN INNER CORE MAGNET OF OPPOSITE POLARITY. THE MAGNETS WERE MOUNTED ON THE OUTER SUBFACE OF THE BACKHOE AT DIFFERENT DEPTHS TO INSURE A GRADIENT. IN MACHETIC FIELD STRENGT. ADDITIONALLY, A SIMILAR MAGNETIC FAIR WAS MOUNTED ON THE PHOTOMETRIC TARGET ATOP THE LANCET TO ATTRACT MAGNETIC PARTICLES PRESENT IN WINDERDUN DUST. THE MACHETS URER DIRECTLY IMAGED BY THE CAMERA SYSTEM IN BLACK AND WHITE AND IN COLOR. A S-POWER GNIFYING MIRROR WAS USED FOR MAXIMUM RESOLUTION.

---- VIXING 1 LANDER, HESS-----

INVESTIGATION NAME- METEOROLDGY EXPERIMENT

INVESTIGATIVE PROGRAM CODE SL NSSDC 10- 75-0750-07

INVESTIGATION DISCIPLINE(S) Planetary atmospheres Planetary Biology

PERSONNEL TL - S.L. TM - C.B. TM - R.N. TM - J.A.	HENRY RYAN	FLORIDA STATE U U OF WASHINGTON NASA-LARC MCDONNELL-DOUGLAS COR U OF W.SHINGTON
18 - J.E.		U OF W.SHINGTON

BRIFF DESCRIPTION THIS EXPERIMENT MEASURED THE METEOROLOGICAL ENVIRONMENT NEAR THE PLANETARY SURFACE AND OBTAINED INFORMATION ABOUT MOTION SYSTEMS OF VARIOUS SCALES. THE ELEMENTS THAT WERE DETERMINED ARE PRESSURE, TEMPERATURE, AND WIND SPEED AND DIRECTION OF THE MARTIAN ATMOSPHERE, DIURNAL AND TEMPORTANCE. YARIATIONS OF THE PARAMETERS WERE OF PARTICULAR IMPORTANCE. THE SAMPLING RATES AND DURATIONS FOR ANY OME MARTIAN DAY WERE SELECTABLE BY GROUND COMMAND. ALL MEASUREMENTS WERE CONTINUED FOR THE LANDER LIFETIME. THE SENSORS WERE MOUNTED ON AN SELECTABLE BY FOR THE LANDE ERECTABLE BOOM.

----- VIKING 1 LANDER, KLEIN------

INVESTIGATION NAME- BIOLOGY INVESTIGATION

INVESTIGATIVE PROGRAM NSSDC 10- 75-0750-03 CODE SL

INVESTIGATION DISCIPLINE(S) PLANETARY BIOLOGY

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PERSONNEL TL - H.P. TM - J. TM - A. TM - N.H. TM - V.I. TM - G.V.	KLEIN LEDERĐERG Rich Horowitz Dyama Levin	NASA-ARC Stanford U Mass INST of Tech Callf Inst of Tech NASA-ARC BIOSPHERICS, INC
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TH - G.W. LEVIN TH - G.W. LEVIN BIOSPHERICS, INC BRIEF DESCRIPTION THE BIOLOGY EXPERIMENT WAS DESIGNED TO SEARCH FOR THE PRESENCE OF MARTIAN ORGANISMS BY LODKING FOR PRODUCTS OF THEIR RETABOLISM. THREE DISTINCT INSTRUMENTS -- (1) PYROLYTIC RELEASE (PR), (2) LABELED RELEASE (LR), AND (3) GAS EXCHANGE (GEX) -- INGUBATED SAMPLES OF THE MARTIAN SUBFACE UNDER A NUMBER OF DIFFERENT ENVIRONMENTAL CONDITIONS. SOIL SAMPLES ACQUIRED BY THE SUBFACE SAMPLES WERE ELIVERED TO THE WIKING BIOLOGY INSTRUMENT (VBI). THESE SAMPLES WERE THEN DISTRIBUTED, ACQUIRED BY THE SUBFACE SAMPLES WERE FIRSTRUMENTS FOR INCUBATION IN #CASURED ANOUNTS, TO THE THREE INSTRUMENTS FOR INCUBATION THE INCUBATION CHAMBERS EACH OF WHICH MEASURED ONE SAMPLE WAS STERILIZED AND REPROCESSED AS A CONTACL. THE PRONTAINED FINGES ING. CHEMICAL FIXATION OF CO2 OR CCO CONTAINING PHOTOSYNTHETIC OR CHEMICAL FIXATION ON FOR A S-DAY INCUBATION, THE SAMPLE WAS ADDED AND A XEMON ARC LAMP SIMULATING THE SUN'S ENERGY WAS TURNED ON FOR A S-DAY INCUBATION, GASSES. AT ANOTHER 'STATION,' THE SAMPLE WAS HEATED TO 625 DEG C WHILE PURGING IT WITH HELI'M, THE WAS HEATED TO 625 DEG C WHILE PURGING IT WITH HELI'M, THE WAS HEATED TO 625 DEG C WHILE PURGING IT WITH HELI'M, THE WAS HEATED TO 625 DEG C WHILE PURGING IT WITH HELI'M, THE WAS HEATED TO 625 DEG C WHILE PURGING IT WITH HELI'M, THE WAS HEATED TO 625 DEG C WHILE PURGING IT WITH HELI'M, THE WAS HEATED TO 625 DEG C WHILE PURGING IT WITH HELI'M, THE WAS HEATED TO 625 DEG C WHILE PURGING IT WITH HELI'M, THE WAS HEATED TO 625 DEG C WHILE PURGING IT WITH HELI'M, THE WAS HEATED TO VERIST THEORY THAT THE SAMPLE WAS THEATED TO THE SAMPLE WAS HEATED TO VERIST THEORY ON THAT THE DAY HELE PARSING THE COZ CONSISTING OF UNREACTED COZ/CO. THE SAMPLE WAS THEN HEATED AND PURGED GA''S PASSED THROUGH AN ORGANIC VAPOR THAP (OV) THAT RETAINED ORGANIC COMPOUNDS AND FRAMENTS WHILE PASSING THE COX CONSISTING OF UNREACTED TO 70 DEG C AND KICH WAS DOWN TO PRE-PYROLYSIS BACKOROUND COUNT. THE TRAPPED ORGANIC MATERIA

NS50C 10- 75-075C-10

LABELED NUTRIENTS. THE ATMOSPHERE ABOVE THE SAMPLE WAS CONTINUOUSLY MONITORED FOR 12 DAYS, THE DETECTION OF RADIDACTIVE CO2 PRODUCED A METABOLIC CURVE AS A FUNCTION OF TIME, THE SHAPE OF WHICH WAS USED TO DETERMINE IF GROWTH TOOK PLACE. THE GEW MEASURED THE PRODUCTION OR UPTAKE OF CO2, NITROGEN, CH.A, MYDROGEN, AND CAYGEN DURING INCUBATION OF A SOIL SAMPLE. THE SAMPLE WAS SEALED AND PURGED BY HELIUM, THEN A MIXTURE OF HELIUM, KRYPTON, AND CO2 WAS INTRODUCED AS AN NITIAL INCUBATION ATMOSPHERE. AFTER THE ADDITION OF A SELECTED QUANTITY OF A NUTRIENT SOLUTION THE SAMPLE WAS INCUBATED FOR 12 DAYS. AT DAY GO, 1.2, 4.8, AND 12. SAMPLES OF THE ATMOSPHERE WERE REMOVED AND AMALYZED EY A GAS CHROMATOGRAPH WITH A THERRAL CONDUCTIVITY DETECTOR. INE FIRST FUNCTIONED NOMINALLY AS OF AUGUST 19, 1976.

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- VIXING 1 LANDER, MICHAEL, JR.------

INVESTIGATION NAME- RADIO SCIENCE

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NSSDC	10-	75-0756-11	INVESTIGATIVE PROGRAM
			CODE SL

INVESTIGATION DISCIPLINE(S) ASTRONOMY IONOSPHERES PLANETARY ATMOSPHERES PLANETOLOGY

PERSONNEL		
TL - W.H.	MICHAEL/ JR.	NASA-LARC
19 - 1.1.	SHAPIRO	MASS INST OF TECH
TH - G.	FJELDBO	NASA-JPL
TM - J.G.	OÁVIES	U OF MANCHESTER
TH - 0.L.		NASA-JPL
TH - N.O.		RAYTHEON CORP
TM - G.L.	TYLER	STANFORD U
19 - J.	BRENKLE	NASA-JPL
TM - R.H.	TOLSON	NASA-LARC
TH - C.T.	STELZRIED	NASA-JPL

DRIEF DESCRIPTION THIS EXPERIMENT UTILIZED THE LANDER-TO-EARTH AND ORBITER-TO-EARTH S-BAND COMMUNICATIONS LINK (INCLUDING RANGE AND RANGE-RATE CAPABILITIES), THE LANDER-TO-ORBITER UHF RELAY LINK, AND THE ORBITER-TO-EARTH X-BAND DOWNLINK. THE RESULTING DATA WILL BE USED TO DEFERMINE THE MARTIAN GRAVITATIONAL FIELD, AXIS OF ROTATION, EPHEMERIS, FIGURE, ATMOSPHENE, STRUCTURE, IONOSPHERE, AND SURFACE PROPERTIES. IN ADDITION, THE DATA WILL BE USED TO DETERMINE THE LANDER LOCATION, TO STUDY RELATIVITY, TO STUDY THE INTEPPLANETARY MEDIUM, AND, IF CONDITIONS PERMIT, TO STUDY THE SOLAR CORONA.

----- VIKING T LANDER, MUTCH-----

INVESTIGATION NAME- FACSIMILE CAMERA

NSSDC 10	- 75-0756-	06 INVEST Cöde		PROGRAM
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INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES PLANETARY BIOLOGY LANETOLOGY

PF	RS	ោស	NÈ	L

TL - T.A.	MUTCH	BROW" U
TM - C.	SAGAN	CORNELL '
TM - A.B.		SCIENCE APPL, INC
TM - E.C.	HORRIS	US GEOLOGICAL SURVEY
TM - F.O.	HUCK	N. SA-LARC
TH - E.C.	LEVINTHAL	STANFORD U
TM - 5.	LIËBES, JR.	STANFORD U

BRIEF DESCRIPTION THE PUGPOSE OF THE IMAGING INVESTIGATION FROM THE LANDER WAS TO CHARACTERIZE VISUALLY THE LANDING SITE, PROVIDING DATA WITH BILDGICAL, GEOLOGICAL, AND METEOROLOGICAL RELEVANCE. TWO CAMERAS WITH A 0.04-DEG SCANNING RESOLUTION WERE REQUIRED. THE VERTICAL FIELD OF VIEW FOR EACH CAMERA WAS 2D DEG WITH A CAPABILITY OF OBTAINING A COMPLETE O- TO 360-DEG HORIZONTAL PANDRAMA. VERTICAL POINTING BY COMMAND FOR ANGULAR COVERAGE FROM 4D DEG ABDVE TO 4D DEG DELOW COUTER EDEG OF FIELD-OF-VIEW) THE HORIZONTAL PLANE OF THE LANDER IN 10-DEG INCREMENTS WAS REQUIRED. AZIMUTH POINTING BY COMMAND WAS IN 2.5-DEG INCREMENTS. THE CAMERAS WERE MOUNTED AT LEAST 1.3 M ABOVE THE MARTIAN SURFACE AND WERE CAPABLE OF VIEWING TWO FOOTPADS AND AT LEAST 9D PERCENT OF THE AREA ACCESSIBLE TO THE SURFACE SAMPLER. EACH CAMERA WAS CAPABLE OF OBTAINING VISUAL COLOR IMAGERY. PROVISION WAS MADE TO OPERATE IN IR SPECTRAL BANDS BETWEEN D.B AND 1.1 MICROMETERS. HORIZONTAL STEREO WITH A MINIMUM DASE OF G.B M WAS REQUIRED. G.8 M WAS REQUIRED.

-- VIKING 1 LANDERS NIÈR-----

INVESTIGATION NAME- ENTRY-ATMOSPHERIC STRUCTURE

INVESTIGATIVE PROGRAM NSSDC 10- 75-075C-02 CODE SL

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES

PERSO			
TL	-	A.0.	C.NIER
TM	-	М.В.	MCELROY
11	-	N.B.	HANSON
TB	-	N.W.	SPENCER
TM	-	A.	SEIFF

BRIEF DESCRIPTION BRIEF DESCRIPTION THE PARTICULAR ELEMENTS OF MARTIAN ATMOSPHERIC STRUCTURE DETERMINED WERE PRESSURE, TEMPERATURE, AND DENSITY VARIATIONS AT UIFFRENT ALTITUDES IN THE LOWER MARTIAN ATMOSPHERE. THE MEASUREMENTS MADE TO DETERMINE THESE ATMOSPHERIC PARAMETERS WERE SPACECRAFT ACCELERATION, PRESSURE, AND TEMPERATURE. THE ACCELEROMETER OF THE GUIDANCE AND CONTROL SYSTEM WERE USED FOR THE ATMOENDEDUC TOUCTURE INVESTIGATION THE ATMOSPHERIC STRUCTURE INVESTIGATION.

--- VIKING 1 LANDER, NIER------

INVESTIGATION NAME- ENTRY-ATMOSPHERIC COMPOSITION

NSSDC 10- 75-075C-12

CODE SL
INVESTIGATION DISCIPLINE(S)
IONDSPHERES
PLANETARY ATMOSPHERES

INVESTIGATIVE PROGRAM

U OF MINNESOTA Harvard U U of Texas, Dai Nasa-gsfc

NASA-ARC

DALLAS

PERSONNEL RSONNEL TL - A.O.C.NIER TM - N.W. SPENCER TM - M.B. MCELROY TM - W.B. HANSON TM - A. SEIFF U OF MINNESDTA NASA-GSFC HARVARD U OF TEXAS, DALLAS NASA-ARC

TM - W.B. MANSON TM - A. SEIFF BRIEF DESCRIPTION THE VIKING ENTRY-ATMOSPHERIC COMPOSITION EXPERIMENT WAS DESIGNED TO PROVIDE THE COMPOSITION DATA (FOR BOTH NEUTRAL AND CHARGED TO PROVIDE THE COMPOSITION DATA (FOR BOTH NEUTRAL AND CHARGED SPECIES) NEEDED TO DEFINE THE PRESENT PHYSICAL AND CHARGED SPECIES) NEEDED TO DEFINE THE PRESENT PHYSICAL AND CHARGED SPECIES) NEEDED TO DEFINE THE PRESENT PHYSICAL AND CHARGED SPECIES) NEEDED TO BEFINE THE PRESENT PHYSICAL AND CHARGED SPECIES) NEEDED TO BEFINE THE PRESENT PHYSICAL AND DOWNER RECESSED BELOW THE SURFACE OF THE AEROSHELL, A DOUBLE-FOCUSING (ELECTROSTATIC AND MAGNETIC) MASS SPECTROMETER WAS USED TO NEASURE THE CONCENTRATIONS OF THE ATMOSPHERIC SPECIES THAT HAVE MASS-TO-CHARGE RATIOS FROM 1 TO 49. TWO COLLECTORS WERE USED, ONE FOR THE MASS RANGE FROM 7 TO 49 U. MASS SPECTRA WAS OBTAINED BY SWEEPING THE ION ACCELERATION VOLTAGE AND THE DEFLECTION VOLTAGE ACROSS THE ELECTROSTATIC PLATES. THE SWEEP PERIOD WAS APPROXIMATELY FIVE S, AND A DYNAMIC RANGE OF 1.ES WAS PROVIDED WITHIN EACH SPECTRUM. A RETARDING POTENTIAL ANALYZER (PRA) MEASURED THE IOMOSPHERIC PROPERTIES OVER APPROXIMATELY FLVE S. MAS AUTON THE SUBFACE, WHICH WAS MADE CONDUCTING IN THE REGION OF THE RAR ALI INDOSPHERIC PROPENTIES OVER APPROXIMATELY FLVE GRIDS WHOSE PARTICLES THAT THE ENTRANCE GRID WAS NEARLY FLUST TO THE SUBFACE, WHICH WAS MADE CONDUCTING IN THE REGION OF THE RAR TO THE OULD CLOR WAS LECTRICALLY SEGNENTED BY FIVE GRIDS WHOSE PARTICLES THAT REACHED THE COLLECTOR. THREE DIFFERENT LINEAR VOLTAGE RAMPS WERE APPLIED IN SUCCESSION TO THE ERTARDING GRID. ONE RAMP WAS USED TO MEASURE SOLAR WIND ELECTRONS AND IONOSPHERIC PHOTOELECTRONS COVERED THE VOLTAGE RANGE FROM -75 V TO 0 V (IN ABOUT 1 5). ANOTHER RAPP MEASURED ELECTRONS AND IONOSPHERIC PHOTOELECTRONS COVERED TROM -15 V TO 0 V (IN ABOUT 2.). MORE EXPERIMENT DETAILS CAN BE FOUND IN, "ENTRY SCIENCE EXPERIMENT FOR VIKING 1975.'A. O. NIER, ET AL. ICARUS, 16, 74-91, 1972.

.----- VIRING 1 LANDER, SHORTHILL------

INVESTIGATION NAME- PHYSICAL PROPERTIES INVESTIGATION

SDC 10-	75-0750-01	INVESTIGATIVE CODE SL	PROGRAM
		INVESTIGATION Planetology	DISCIPLINE(S)

PERSONNEL TL - R.W. TM - R.E. TM - H.J. TM - R.F. U OF UTAH TRW SYSTEMS GROUP US GEOLOGICAL SURVEY CALIF INST OF TECH SHORTHILL HUTTON MOORE, 11 SCOTT

BRIEF DESCRIPTION

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BRIEF DESCRIPTION THE PURPOSE OF THE PHYSICAL PROPERTIES EXPERIMENT INVESTIGATION WAS TO DETERMINE THE PHYSICAL PROPERTIES OF THE MARTIAN SURFACE AND ENVIRONMENT AT THE LANDING SITE, PRIMARILY USING ENGINEERING MEASUREMENTS AND SCIENTIFIC INSTRUMENTS REQUIRED TO MEET OTHER MISSION OBJECTIVES. IN PARTICULAR, IT ATTEMPTED TO DETERMINE' SUCH PROPERTIES AS BULK DENSIT, BELARING STRENGTH, ANGLE OF REPOSE, COMESION, ANGLE OF INTERNAL FRICTION, PARTICLE CHARACTERISTICS, THERMAL PARAMETERS, EOLIAN TRANSPORTABLLITY, TOPOGRAPHY, AND CERTAIN ENVIRONMENTAL PROPERTIES SUCH AS WIND, TEMPERATURE, AND SOLAR FLUX LEVELS. MAXIMUM USE WAS MADE OF HARDWARE AND INSTRUMENTS INTENDED FOR OTHER APPLICATIONS, SUCH AS THE MECHANICAL SUBSTSTEMS AND LANDER CAMERAS. ONLY PASSIVE DEVICES, SUCH AS MIROPS AND LANDING LEG STROKE GAUGES, WERE ADDED FOR THIS EXPERIMENT.

-- VIKING 1 LANDER, TOULMIN, 3RD------ARECENCE SPECIROMETER

INVESTIGAT	ION NAME- X-WAY	FLUORCACENCE OF CLUMPHELEN
NSSDC ID-	75-0756-13	INVESTIGATIVE PROGRAM Code SL

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INVESTIGATION DISCIPLINE(5)

5 - 2 C - 1

PLANETOLOGY

PERSONNÉL TL – P. TOULMIN, 3RD TM – A.K. BALRD TM – K. Keil TM – H.J. Rose TM – B.C. CLARK	US GEOLOGICAL SURVEY Porona college U of New Rexico US geological Survey Nartin-Marietta Aerosp
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BRIEF DESCRIPTION THIS EXPERIMENT ULILIZED AN ENERGY-DISPERSIVE, X-RAY FLUDRESCENCE SPECTROMETER IN WHICH FOUR SEALED, GAS-FILLED PROPORTIONAL COUNTERS DETECTED X RAYS EMITTED FROM SAMPLES OF THE MARTIAN SURFACE MATERIALS (RRADIATED BY X RAYS FROM RADIOISOTDPE SOURCES (IRON-55 AND CADMIUM-109). THE OUTPUT OF THE PROPORTIONAL COUNTERS WAS SUBJECTED TO PULSE HEIGHT THA PADOPORTIONAL COUNTING SINGLE-CHANNEL ANALYZER WITH ADJUSTABLE COUNTING PERIODS. THIS INSTRUMENT WAS LOCATED INSIDE THE LANDER BODY, AND SAMPLES WERE DELIVERED TO IT BY THE LANDER SURFACE SAMPLER. CALIBRATION STANDARDS WERE AN INTEGRAL PART OF THE INSTRUMENT. RECONSTRUCTED SPECTRA YIELDED SUBFACE COMPOSITION WITH ACCURACIES RANGING FROM A FEW TENS OF PARTS PER MILLION FOR TRACE ELEMENTS TO A FEW PERCENT FOR MAJOR ELEMENTS, DEPENDING UPON THE ELEMENT IN QUESTION.

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SPACECRAFT COMMON NAME- VIKING 1 ORBITER Alternate NAMES- PL-7330, Viking-B Orbiter Vikng-B

NSSDC 10- 75-0754

WEIGHT- 1170. KG LAUNCH DATE- D8/20/75 Launch Site- Cape Canaveral, United States Launch Vehicle- Titan

SPONSORING COUNTRY/AGENCY NASA-055 UNITED STATES

ORBIT PARAMETERS DRBIT TYPE- MARSCENTRIC Orbit Period- 1476. Min Periapsis- 1500. KM	EPOCH DATE- 06/20/76 Inclination- 37.74 de Apoapsis- 33000. KM		
PERSONNEL MG – W. JAKPBOWSKI SC – L.G. GOFF PM – G.C. BROOME PS – G.A. SDIFEN	NASA HEADQUARTERS NASA HEADQUARTERS NASA-LARC NASA-LARC		

BRIEF DESCRIPTION THE VIKING SPALECRAFT CONSISTED OF AN ORBITER AND A LANDER. A LANDER SEPARATED FROM THE ORBITER, ENTERED THE MARTIAN ATMOSPHERE, AND SOFT-LANDED ON THE SURFACE ON JULY 20,1976. ORBITAL, ENTRY, AND SCIENTIFIC DATA FROM THE LANDER WERE COLLECTED AND TRANSMITTED TO EARTH. THE SPACECRAFT WAS A SOLAR-CELL-POWERED SATELLITE STABILIZED IN THREE AXES, USING SOLAR-CELL-POWERED SATELLITE STABILIZED. IN THREE AXES, USING SOLAR-CELL-POWERED SATELLITE AND A 70-W CAPACITY FOR THE LANDER. SCIENTIFIC AND PHOTOGRAPHIC ANALYSIS INSTRUMENTS WEIGHED APPROXIMATELY 7Z KG (158 LB).

--- VIKING 1 ORBITER, CARR-

INVESTIGATION NAME- ORBITER IMAGING

INVESTIGATIVE PROGRAM NSSDC 10- 75-0754-01 CODE SL

INVESTIGATION DISCIPLINE(S) Planetary atmospheres Planetology

PERSONNEL TL - N.H. CAR TM - M.A. BAUM TM - H. MASURSKY TM - G.A. BRIGGS TM - J.A. CUTTS	US GEOLOGICAL SURVEY Lowell observatory US geological survey NASA-JPL Science APPL, INC
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BRIEF DESCRIPTION THE PURPOSES OF THE VIKING ORBITER TV IMAGING EXPERIMENT INVESTIGATION WERE TO AID IN THE SELECTION OF LANDING SITES FOR THE VIKING LANDERS AND FUTURE MISSIONS, TO MONITOR THE REGON SUPROUNDING THE LANDER, AND TO STUDY THE GEOLOGIC AND DYNAMIC CHARACTERISTICS OF MARS. THE GEOMETRIC RESOLUTION OF THE CHARACTERISTICS OF MARS. THE GEOMETRIC RESOLUTION OF THE ALTITUDE OF 1500 KM, WITH IMAGE SHEARING FROM ORBITER MOTION TO BL LESS THAN 50 PERCENT OF THIS RESOLUTION. THE DYNAMIC RANGE WAS 80 TO 1, AND THE SENSITIVITY WAS SUFFICIENT TO OBTINUM PICTURES AS CLOSE TO THE TERMINATOR AS 30 DEG WITH OPTINUM IMAGE QUALITY AND AS CLOSE AS 5 DEG TO THE TERMINATOR WITH DEGRADED IMAGE QUALITY. PRIOR TO LANDER SEPARATION THE ORBITER

WAS REQUIRED TO PHOTOGRAPH WITH CONTIGUOUS PICTURES A SWATH AT Least 40-km cross-track by 500-km down-track on a single Orbital pass from the near-apoapsis portion of the orbit. After lander separation, complete coverage obtained with Contiguous Pictures of an area at least 50 km in radius Centered on the Lander.

--- VIKING 1 ORBITER, FARMER-----

CODE SL

INVESTIGATION NAME- IR SPECTROMETER -- WATER VAPOR MAPPING INVESTIGATIVE PROGRAM NSSOC 10- 75-075A-03

INVESTIGATION DISCIPLINE(S) Planetary atmospheres Planetary Biology Planetology

TL - C.B. FARMER TH - D.D. LAPORTE

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NASA-JPL SANTA BARBARA RES CTR S. S. S.

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BRIEF DESCRIPTION THE OBJECTIVES OF THE IR SPECTROMETRY EXPERIMENT WERE TO THE OBJECTIVES OF THE IR SPECTROMETRY EXPERIMENT WERE TO DETERNING THE SELECTION OF LANDING SITES FOR THE VIKING LANDERS, AND (FOR TUTURE MISSIONS) TO MONITOR THE REGION SURROUNDING THE LANDER AND STUDY THE DYNAMIC CHARACTERISTICS OF MARS. THE INFRARED SPECTROMETER WAS MORESIGHTED WITH THE IMAGINE SYSTEM. IT WAS OPERABLE FROM THE PERIAPSIS AND APOAPSIS REGIONS OF THE ORBIT. THE WATER VAPOR MEASUREMENT RANGE WAS FROM 1 TO 100D MICROMETERS OF PRECIPITABLE WATER WITH AN ACCURACY OF 1 MICCROMETER DIALE MICLOMETERS AND 5 PERCENT BETWEEN 20 AND 100D MICROMETERS. THE INSTANTANEOUS FIELD OF VIEW OF THE INSTRUMENT WAS 2 BY 16 MILLIRADIANS.

- VIKING 1 ORBITER, KIEFFER-----

INVESTIGATION NAME- IR RADIOMETRY -- THERMAL MAPPING

INVESTIGATIVE PROGRAM NSSDC 10- 75-0754-02 CODE SL

INVESTIGATION DISCIPLINE(S) Planetary aimospheres Planetary biology Planetology

PERSONNEL TL - N.H. KIEFFER TM - G. MUNCH TM - E.D. MINER TM - G. NEUGEBAUER TM - S.C. CHASE, JR.

U OF CALIF; LA Calif Inst of tech Nasa-Jpl Calif Inst of tech Santa Barbaha res ctr BRIEF DESCRIPTION THE PURPOSE OF THE THERNAL MAPPING EXPERIMENT WAS TO THE PURPOSE OF AREAS ON THE SURFACE AND OF THE OBTAIN TEMPERATURES OF AREAS ON THE SURFACE AND OF THE ATMOSPHERE OF MARS WITH AN INFRARED THERMAL MAPPER (IRTM) INSTRUMENT. IT ALSO MEASURED THE AMOUNT OF SUNLIGHT REFLECTED BY THE PLANET. THE IRTM WAS A MULTI-CHANNEL RADIOMETER MOUNTED BY THE PLANET. THE IRTM WAS A MULTI-CHANNEL RADIOMETER MOUNTED BY THE PLANET. THE IRTM WAS A MULTI-CHANNEL RADIOMETER MOUNTED BY THE PLANET. THE IRTM WAS A MULTI-CHANNEL RADIOMETER MOUNTED BY THE PLANET. THE IRTM WAS A MULTI-CHANNEL RADIOMETER MOUNTED BY THE PLANET. THE IRTM WAS A MULTI-CHANNEL RADIOMETER MOUNTED BY THE PLANET. THE INFRARED DETECTORS, WERE AIMED PARALLEL TO THE VISUAL IMAGING OPTICAL AXIS. THE INSTRUMENT WAS CAPABLE OF MEASURING DIFFERENCES OF 1 DEG C. THE INSTRUMENT WAS COPABLE OF MEASURING DIFFERENCES OF 1 DEG C. THE INSTRUMENT WAS 20 X OF MINUS 13D DEG C TO PLUS 57 DEG C. THE INSTRUMENT WAS 20 X 25 X 30 CM AND HAD A MININUM SPATIAL RESOLUTION OF B KM ON THE SURFACE.

SURFACE.

SPACEGRAFT COMMON NAME- VIKING 2 LANDER Alternate Names- Viking-A Lander, Viking-A

NSSDC 10- 75-083C

LAUNCH DATE- 09/09/75 Launch Site- cape canaveral, united states Launch vehicle- titan WEIGHT- 598. KG

SPONSORING COUNTRY/AGENCY United States

INITIAL ORBIT HARAMETERS Orbit type- Mars Lander

ERSONNEL NG - W. SC - L.G. PM - G.C. PS - G.A.	JAKOBOWSKI Goff Broome Soffen	NASA HEADQUARTERS NASA HEADQUARTERS HASA-LARC NASA-LARC
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NASA-055

BRIEF DESCRIPTION THIS SPACECRAFT WAS THE LANDING VEHICLE FOR THE TWO-PART SPACECRAFT MISSION. IT SOFT-LANDED AT 47.97 DEG N LATITUDE, 225.71 DEG N LONGTUDE ON THE MARTIAN SURFACE. THIS SECOND MARS LANDER WAS CAPABLE OF ACCOMPLISHING THE FIRST LANDER MARS LANDER WAS CAPABLE OF ACCOMPLISHING THE FIRST LANDER MARS LANDER WAS CAPABLE OF ACCOMPLISHING THE FIRST LANDER MISSION AS A BACKUP. THE LANDER CARRIED INSTRUMENTS TO STUDY THE BIOLOGY, CHEMICAL COMPOSITION (ORGANIC AND INORGANIC). METEOROLOGY SEISMOLOGY, MAGNETIC PROPERTIES, SURFACE APPEARANCE, AND PHYSICAL PROPERTIES OF THE MARTIAN SURFACE AND ATMOSPHERE. IT HAD A 70-W POWER CAPACITY AND A SCIENTIFIC

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PAYLOAD OF APPROXIMATELY 91 KG (2001B). THIS SPACECRAFT WAS ORIGIMALLY SCHEDULED TO BE THE FIRST MISSION, BUT BECAUSE OF A MALFUNCTION, IT WAS LAUNCHED SECOND.

VIKING 2 LANDER, ANDERSON

INVESTIGATION NAME- SEISHOLOGY

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INVESTIGATIVE PROGRAM CODE SL NS5DC ID- 75-083C-08

INVESTIGATION DISCIPLINE(S) ANETOLOGY PLANETARY PHYSICS

PERSONNEL TL - D.L.	ANDERSON	CALIF INST OF TECH
16 - 0.6.	ANDER 10H	MASS INST OF TECH
TR - H.N.	TUKSUZ	U DE HAWAII
TH - G.H.		STANFURD U
TH - R.L.	KOVACH	U OF TEXAS, GALVESTON
TM - G.V.	LATHAM	0 01 1241101 200101

TH - G.V. LATHAM U OF TEXAS, GALVESTON UNITEF DESCRIPTION THE SEISMOLOGY EXPERIMENT WAS DESIGNED TO DETERMINE THE LEVEL OF SEISMOLOGY EXPERIMENT WAS DESIGNED TO DETERMINE THE LEVEL OF SEISMOLOGY EXPERIMENT WAS DESIGNED TO DETERMINE THE THE SEISMOLOGY INSTRUMENT CONSISTED OF A 1- CM CUBICAL PACKAGE THAT WEIGHED APPROXIMATELY 2.3 KG (5 LB). IN THE PACKAGE WERE THAT WEIGHED APPROXIMATELY 2.3 KG (5 LB). IN THE PACKAGE WERE THAT WEIGHED APPROXIMATELY 2.3 KG (5 LB). IN THE PACKAGE WERE THAT WEIGHED ON THE FRAME. RELATIVE MOTION OF THE COIL PACKAGE INSTRUMENT FRAME ON A SHORT BOOM, SO THE CCIL PROJECTS INTO A MAGNET MOUNTED ON THE FRAME. RELATIVE MOTION OF THE COIL AND MAGNET, INDUCED BY THE MASS'S REACTION TO GROUND MOTION, WAS SOLIT TO A THE MASS'S REACTION TO GROUND MOTION, WAS FOR TREQUENCY CONTENT OR TO ADJUST TO BEST RECEPTION, OF FOR TREQUENCY CONTENT OR TO ADJUST TO BEST RECEPTION, OF FOR TREQUENCY CONTENT OR TO ADJUST TO BEST RECEPTION, OF FOR TREQUENCY CONTENT OR TO ADJUST TO BEST RECEPTION, OF FOR TREQUENCY CONTENT OR TO ADJUST TO BEST ARE AND THATION OF EVENTS. AND (4) A COMPRESSED FOR TRANSMISSION TO FARTH BY TVENT. THE DATA WERE COMPRESSED FOR TRANSMISSION TO FARTH BY TVENT. THE DATA WERE COMPRESSED FOR TRANSMISSION TO FARTH BY TVENT. THE DATA WERE COMPRESSED FOR TRANSMISSION TO FARTH BY TVENT. THE DATA WERE COMPRESSED FOR TRANSMISSION TO FARTH BY TWELOPE, WHEN AN EVENT OCCURRED, A TRIGGER ACTIVATED A HIGHER ENVELOPE, WHEN AN EVENT OCCURRED, A TRIGGER ACTIVATED A HIGHER FOR THE DATA SIGNAL (CAUSED BY CROSSING THE ZERO AND TISE SAMPLED ONCE A S. THE SHAPE OF THE ENVELOPE AND ITS SAMPLED ONCE A S. THE SHAPE OF THE ENVELOPE AND ITS SAMPLED ONCE A S. THE SHAPE OF THE ENVELOPE AND ITS SAMPLED ONE A SIGNAL (CAUSED BY CROSSING THE ZERO AND SIGN THE SEISMORETER FAILED TO APPROXIMATE THE ORIGINAL EVENT. THE VIKING TO SEISMORETER FAILED TO APPROXIMATE THE ORIGINAL EVENT. AND WITTED TO ARTH AND RECONSTRUCTED TO APPROXIMATE THE ORIGINAL EVENT. THE VIKING TO SEISMIC NETWORK WITH THE

----- VIKING 2 LANDER, BIEMANN-----

INVESTIGATION NAME- MOLECULAR ANALYSIS

NSSDC 10- 75-0830-04

INVESTIGATION DISCIPLINE(S) Planetary Aimospheres Planetary biology PLANETOLOGY

INVESTIGATIVE PROGRAM CODE SL

PERSONNEL TL - K. E	BIEMANN	MASS INST OF TECH
TH - H.C. L	UREY	U OF CALIF+ SAN DIEGO USA-CRREL
TH - D.H. /	ANDERSON	STATE U OF NEW YORK
TM − T+ 1		U DE HOUSTON
TM - J. 4 TM - L.E. 4	ONG	SALL INST BIOL STUDIES
TH - 4.0.C.		U OF MINNESOTA US SEOLOGICAL SURVEY
TH - P.	TOULMIN. 3RD	DS SEDEUBICKE SURVER

TH - P. TOULMIN, 3RD US GEOLOGICAL SURVEY BRIEF DESCRIPTION THE MOLECULAR ANALYSIS EXPERIMENT WAS DESIGNED TO SEARCH FOR AND IDENTIFY ORGANIC (ANU SOME INDRGANIC) COMPOUNDS IN THE UPPER SURFACE LAYER OF MARS, DETERMINE THE ATMOSPHENIC (OMPOSITION NEAR THE SURFACE AND MONITOR COMPOSITION COMPOUNDS, THE ANALYSES WERE PERFORMED BY A GAS CHROMATOGRAPH MASS SRECTROMETER (GCMS), WHICH HAD HIGH SENSITIVITY, HIGH STRUCTURAL SPECIFICITY, AND BROAD APPLICABILITY TO A WIDE RABGE SURFACE MATERIAL BY HEATING TO 20D DEG C WHILE CARBON DIXIDE SURFACE MATERIAL BY HEATING TO 20D DEG C WHILE CARBON DIXIDE INTO A TEMEX GAS-CHROMATOGRAPHIC COLUMN THAT WAS SWEPT (LABELED WITH C-13) SWEPT THROUGH. THE MATERIAL WAS THEN (LABELED WITH C-13) SWEPT THROUGH. THE MASK SWEPT UTH HYDROGEN AS A CARRIER GAS. WHILE PASSING THROUGH THE VIH HYDROGEN AS A CARRIER GAS. THE REAL WAS SWEPT STREAM MOVED INTO THE SEPTARTED FROM EACH OTHER BY THEIR DIFFERENT DEGREES OF RETENTION BY THE TEMEX. THE RESIDUAL DIFFERENT DEGREES OF AFTER THOUGH AND A MASS SREADVED BY HYDROGEN-ONLY PERMEABLE PALLADIUM), AND A MASS SPECTRUM (FROM MASS 12 TO 20D) VAS OBTAINED EVERT 10 S FOR THE SAMPLE WAS HEATED TO SUD THAT THE DATA WERE STORED AND THE TANDSMITTED TO EARTH. AFTER THE INITIAL ANALYSIS THE SAM STARAM MOVED INTO THIS SUBSTANCES THAT WERE NOT VOLATILE SAMPLE WAS HEATED. TO SUD SAMPLE SUBSTANCES THAT WERE NOT VOLATILE SAMPLE WAS HEATER TO SUD THE MASS THEN THE INITIAL ANALYSIS THE SAMPLE MATERIALS AND TO PYROLYZE SUBSTANCES THAT WERE NOT VOLATILE ENOUGH TO EVAPORATE. THIS MATERIAL WAS THEN ALSO ANALYZED BY THE GCMS.

--- VIKING 2 LANDERS HARGRAVES------

INVESTIGATION NAME- MAGNETIC PROPERTIES

INVESTIGATIVE PROGRAM CODE SL NSSDC 10- 75-083C-10

INVESTIGATION DISCIPLINE(S) PLANETOLOGY

PRINCETON U

PERSONNEL TL - R.D. HARGRAVES

DRIEF DESCRIPTION THE MAGNETIC PROPERTIES EXPERIMENT WAS DESIGNED TO DETECT THE MAGNETIC PROPERTIES IN MARTIAN SURFACE MATERIAL AND TO DETERMINE THE IDENTITY AND QUANTITY OF THESE PARTICLES. AND TO DETERMINE THE IDENTITY AND QUANTITY OF THESE PARTICLES. TUSED A SET OF TWO PERMANENT. SAMARIUM-COBALT MAGNETIC PAIRS IT USED A SET OF TWO PERMANENT. SAMARIUM-COBALT MAGNETIC PAIRS MOUNTED OH THE BACKHOE OF THE SURFACE SAMPLER COLLECTOR HEAD. THEY CORSISTED OF AN OUTER RING MAGNET ABOUT 2.5 CM IN DIAMETER WITH AN INNER CORE MAGNET OF OPPOSITE POLARITT. THE MAGNETIC MITH AN INNER CORE MAGNET OF OPPOSITE POLARITT. THE MAGNETIC MOUNTED OF THE MAGNET WAS APPROXIMATELY 2500 G. AND THEY WERE MOUNTED ON THE OUTER SURFACE OF THE BACKHOE AT DIFFERENT DEPTHS TO ENSURE A GRADIENT IN MAGNETIC FIELD STRENGTH. ADDITIONALLY, A SIMILAR MAGNETIC PAIR WAS ON THE PHOTOMETRIC TAAGET ON TOP OF THE LANDER TO ATTRACT MAGNETIC PARTICLES PRESENT IN WINDBLOWN DUST. THE MAGNETS WERE DIRECTLY IMAGED BY THE CAMERA SYSTEM IN DLACK AND WHITE AND IN COLOR. A S-POWER MAGNIFYING MIRROR WAS USED FOR MAXIMUM RESOLUTION.

----- VIKING 2 LANDER, HESS-----

INVESTIGATION NAME- MELEOROLOGY EXPERIMENT

NSSDC 10- 75-0830-07

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(5) Planetary Atmospheres

PERSONNEL TL - S.L. HESS TM - C.B. LEOVY TM - R.M. HENRY TM - J.A. RYAN TM - J.E. TILMAN	FLORIDA STATE U U OF WASHINGTON NASA-LARC Wolonhell-douglas corp U OF WASHINGTON
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BRIEF DESCRIPTION THIS EXPERIMENT MEASURED THE METEOROLOGICAL ENVIRONMENT THIS EXPERIMENT MEASURED THE METEOROLOGICAL ENVIRONMENT NEAR THE PLANETARY SURFACE AND OBTAINED INFORMATION ABOUT NEAR THE PLANETARY SURFACE AND DIRECTION OF THE MARTIAN TEMPERATURE, AND WIND SPEED AND DIRECTION OF THE MARTIAN ATNOSPHERE WERE OF PARTICULAR IMPORTANCE. THE SAMPLING THE PARAMETERS WERE OF PARTICULAR IMPORTANCE. THE SAMPLING RATES AND DURATIONS FOR ANY ONE MARTIAN DAY WERE SELECTABLE BY RATES AND DURATIONS FOR ANY ONE MARTIAN DAY WERE SELECTABLE BY LIFETIME. THE SENSORS WERE MOUNTED ON AN ERECTABLE BOOM.

-- VIKING 2 LANDER, KLEIN------

INVESTIGATION NAME- BIOLOGY INVESTIGATION

NSSOC 10- 75-0830	-03
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INVESTIGATIVE PROGRAM INVESTIGATION DISCIPLINE(S)

PLANETARY BIOLOGY

PERSONNEL TL - H.P. TM - J.	TL - H.P. KLEIN	NASA-ARC Stanford U Mass Inst of tech		
TM - N.H. TM - V.I.		CALIF INST OF TECH NASA-ARC Bigspherics, inc		

DIVERTICLE IN DIVERSES AND LEAST INCLUSTION CONTRACTOR OF AND UNDER AND UNDER CONTRACTOR OF AND UNDER AND UNDER AND UNDER AND UNDER AND A XENDA AND UNDER CONTRACTOR OF AND UNDERE

LR INCUBATED A SAMPLE WITH RADIOACTIVELY LABELED NUTRIENTS. THE ATMOSPHERE ABOVE THE SAMPLE WAS CONTINUOUSLY MONITORED FOR 12 DAYS. THE DETECTION OF RADIOACTIVE CO2 PRODUCED A METABOLIC CURVE AS A FUNCTION OF TIME, THE SHAPE OF WHICH WAS USED TO DETERMINE IF GROWTH TOOK PLACE, THE GEX MEASURED THE PRODUCTION OR UPTAKE OF CO2, NITROGEN, CH4, HYDROGEN, AND OXYGEN DURING INCUBATION OF A SOIL SAMPLE, THE SAMPLE WAS SEALED AND PURGED BY HELIOW, THEN A MIXTURE OF HELIOW, KRYPTON, AND CO2 WAS INTAODUCED AS AN INITIAL INCUBATION ATMOSPHERE. AFTER THE ADDITION OF A SELECTED QUANTITY OF A NUTRIENT SOLUTION THE SAMPLE WAS INCUBATED FOR 12 DAYS. SAMPLES OF THE ATMOSPHERE WERE REMOVED AND ANALYZED BY A GAS CHROMATOGRAPH WITH A THERMAL CONDUCTIVITY DETECTOR.

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H OF MINNESOTA HARVARD U U DF TEXAS, DALLAS NASA-GSFC NASA-ARC

BRIEF DESCRIPTION THIS EXPERIMENT WAS DESIGNED TO DETERMINE THE PRESSURE, TEMPERATURE, AND DENSITY VARIATIONS AT DIFFERENT ALTITUDES IN THE LOWER MARTIAN ATMOSPHERE THROUGH MEASUREMENT OF ACCELERATION, PRESSURE, AND TEMPERATURE. THE ACCELERADETER OF THE GUIDANCE AND CONTROL SYSTEM WERE USED FOR THE ATMOSPHERIC STRUCTURE INVESTIGATION.

----- VIKING 2 LANDER, NIER--

INVESTIGATION NAME- ENTRY-ATMOSPHERIC COMPOSITION

NSSDC 10-	10-	25-0836-12	INVESTIGATIVE	PROGRAM
	13-0034 (4	CODE SL		

INVESTIGATION DISCIPLINE(S) Interplanetary physics Planetary atmosp res

PERSONNEL TL - A.O.C.NIEH TM - N.H. Spencer TM - M.B. McELROY	U OF MINNESOTA Nasa-GSFC Harvard u	
TM - N.B. RLECKOT TM - V.B. HANSON TM - A. SEIFF	U OF TEXAS, DALLAS NASA-ARC	

TH - W.B. HANSON TH - A. SEIFF BRIEF DESCRIPTION THE VIKING ENTRY-AIMOSPHERIC COMPOSITION EXPERIMENT WAS DESIGNED TO PROVIDE THE COMPOSITION DATA (FOR BOTH NEUTRAL AND CHARGED SPECIES) NEEDED TO DEFINE THE PRESENT PHYSICAL AND CHARGED SPECIES) NEEDED TO DEFINE THE PRESENT PHYSICAL AND CHARGED SPECIES) NEEDED TO DEFINE THE PRESENT PHYSICAL AND CHEMICAL STATE OF THE HARTIAN ATMOSPHERE. MOUNTED IN AN OPENING IN THE AEROSHELL WITH ITS ELECTROM-IMPACT OPEN 10N SOURCE RECESSED BELOW THE SURFACE OF THE AEROSHELL, A DOUBLE-FOCUSING THE CARDENTATIONS OF THE ATMOSPHERIC SPECIES THAT HAVE MASS-TO-CHARGE RATIONS OF THE ATMOSPHERIC OLUMASS SPECTRA WERE OBTAINED BY SWEEPING THE MASS RANGE FROM 7 TO 49 U. MASS SPECTRA WERE OBTAINED BY SWEEPING THE MASS RANGE FROM 7 TO 49 U. MASS SPECTRA WERE OBTAINED BY SWEEPING THE ANSE FROM 7 TO 49 U. MASS SPECTROMETER. ITS FRONT END WITHIN EACH SPECTRUM. A DYNAMIC RANGE OF 1.ES WAS PROVIDED WITHIN EACH SPECTRUM. A DYNAMIC RANGE OF 1.ES WAS PROVIDED WITHIN EACH SPECTRUM. A DYNAMIC RANGE OF 1.ES WAS PROVIDED WITHIN EACH SPECTRUM. A RETARDING POTENTIAL ANALYZER (FRA) MEASURED THE ENDRSPHERIC ROPERTIES OVER APPROXIMATELY THE SAME ALTITUDE RANGE AS THE MASS SPECTROMETER. ITS FRONT END MATE TO THE SURFACE, WHICH WAS MADE COMDUCTING IN THE REGION OF THE RARGE AND COLLECTOR WAS GENOUND PLANE. THE SPACE BETWEEN THE MATARCE AND COLLECTOR WAS DETERMINED THE SPECTROR. THREE DIFFERENT LIMEAR VOLTAGE RAMPS VANDE CONDUCTING IN THE REGION OF THE MARGE APANICLES THAT CAN REACH THE COLLECTOR. THREE DIFFERENT LIMEAR WOLTAGE RAMPS WERE APPLIED IN SUCCESSION TO THE RETARDING GRID. OLLECTOR WAS DETERMINED THE SPACE BETWEEN THE ONTARDE POTOELECTOR WAS RETERMINED THE ENTRACE AND FORVIDED ION THERARDING FROM HASURED SOLAR WIND ELECTRONS AND IDNOSPHERIC PHOTOELECTOR. ANOTHER COVERED FROM -1.5 TO O V (IN

VIKING 2 LANDER, SHORTHILL------INVESTIGATION NAME- PHYSICAL PROPERTIES INVESTIGATION

INVESTIGATIVE PROGRAM NSSDC 10- 75-0830-01

CODE SL

INVESTIGATION DISCIPLINE(5) PLANETOLCGY

PERSONNEL TL - R.W. SHORTHILL TM - R.E. HUITON TM - H.J. MOORE, II TM - R.F. SCOTI	U OF UTAH TRW SYSTEMS GROUP US geological survey Calif inst of tech
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RRIEF DESCRIPTION THE PURPOSE OF THE PHYSICAL PROPERTIES EXPERIMENT THE PURPOSE OF THE PHYSICAL PROPERTIES OF THE INVESTIGATION WAS TO DETERMINE THE PHYSICAL PROPERTIES OF THE MARTIAN SUBFACE AND ENVIRONMENT AT THE LANDING SITE. PRIMARLLY MARTIAN SUBFACE AND ENVIRONMENT AT THE LANDING SITE. PRIMARLY ISING ENGINEERING MEASURCHENTS AND SCIENTIFIC INSTRUMENTS USING ENGINEERING MEASURCHENTS AND SCIENTIFIC INSTRUMENTS ATTEMPTED TO DETERMINE SUCH PROPERTIES AS BULK DENSITY. BEARING STREMGTH. ANGLE UF REPOSE, COMESION, ANGLE OF INTERNAL FRICTION, PARTICLE CHARACTERISTICS, THERMAL PARAMETERS, EOLIAN TRANSFORTABLITY. TOPOGRAPHY, AND CENTAL ENVIRONMENTAL PROPERTIES SUCH AS MIAD, TEMPERATURE, AND SOLAR FLUX LEVELS. MAXIMUM USE WAS MADE C'HARDWARE AND INSTRUMENTS INTENDED FOR OTHER APPLICATIONS, SULH AS THE MECHANICAL SUBSYSTEMS AND LANDER CAMERAS. ONLY FASSIVE DEVICES, SUCH AS MIRRORS AND LANDING LEG STROKE GAGES; WERE ADDED FOR THIS EXPERIMENT.

------ VIKING 2 LANDER, MICHAEL, JR.------

INVESTIGATION NAME- RADIO SCIENCE

#ssac 10- 75-0830-11

INVESTIGATION DISCIPLINE(S) ASTRONOMY LONOSPHERES AND RADIO PHYSICS PLANETARY ATNOSPHERES PLANETOLOGY

INVESTIGATIVE PROGRAM

CODE SL

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ERSONNEL		NASA-LARC
ŤL − ₩.H.	MICHAEL# JR+	MASS INST OF TECH
18 - 1.1	SHAPIRO	
TM — G.	FJELDBO	NASA-JPL U OF MANCHESTER
TN - J.G.	DAVIES	NASA-JPL
TM - 0.L.	CAIN	RAYTHEON CORP
TM - M-D-	GROSSI Tyler	STANFORD U
	BRENKLE	NASA-JPL
1H - J.	TOLSON	NASA-LARC
TM - R.H. TM - C.T.	STELZRIED	NASA-JPL

BRIEF DESCRIPTION THIS EXPERIMENT UTILIZED THE LANDER-TO-EARTH AND ORBITER-TO-EARTH S-BAND COMMUNICATIONS LINK (INCLUDING RANGE AND RANGE-RATE CAPABILITIES), THE LANDER-TO-DABITER UHF RELAY LINK, AND THE ORBITER-TO-EARTH X-BAND DOWNLINK, THE RESULTING DATA WAS USED TO DETERMINE THE MARTIAN GRAVITATIONAL FIELD, AXIS DF ROTATION, EPHEMEXIS, FIEURE, ATMOSPHERE, STRUCTURE, IONOSPHERE, AND SURFACE PROPERTIES. IN ADDITION, THE DATA WERE USED TO DETERMINE THE LANDER LOCATION, TO STUDY RELATIVITY, TO STUDY THE INTERPLANETARY MEDIUM, AND, IF CONDITIONS PERMITED, TO STUDY THE SALAR CORDAL. TO STUDY THE SOLAR CORONA.

--- VIKING 2 LANDER, MUTCH-----

INVESTIGATION NAME- FACSIMILE CAMERA

INVESTIGATIVE PROGRAM NSSDC ID- 75-0830-06 CODE SL

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES PLANETARY BIOLOGY PI ANETOLOGY

RSONNEL		BRAUN II
TL - T.A. TM - C. TN - A.B. TM - E.C. TM - F.G.	MORRIS	BROWN U CORNELL U Science Appl, inc US geological Survey Nasa-larc Stanford U
TH - 5	LIEBES, JR.	STANFORD D

PE

TR - S. LIEBES, JR. STANFORD U DRIEF DESCRIPTION THE PURPOSE OF THE IMAGING J'JESTIGATION FROM THE LANDER WAS TO CHARACTERIZE VISUALLY TH' LANDING SITE, PROVIDING DATA WITH BIOLOGICAL, GEOLOGICAL, AND METEROLOGICAL RELEVANCE. TWO CAMERAS WITH A O.O.G-DEG SCANNING RESOLUTION WERE REQUIRED. THE VERTICAL FIELD OF VIEW FOR ERSOLUTION WERE REQUIRED. THE CAMERAS WITH A O.O.G-DEG SCANNING A COMPLETE G-TO 30G-DEG HORIZONTAL CAPABILITY OF OBTAINING BY COMMAND FOR ANGULAR COVERAGE FROM 4D DEG INGRUENTS WAS REQUIRED. AZIMUTH POINTING BY COMMAND WAS IN 2.5-DEG INCREMENTS. THE CAMERAS WERE MONTED AT LEAST 1.3 M ABOVE THE MARTIAN SURFACE AND WERE CAPABLE OF VIEWING TWO FOOTPADS AND AT LEAST 90 PERCENT OF THE AREA ACCESSIBLE TO THE SURFACE SAMPLER. EACH CAMERA WAS CAPABLE OF OBTAINING VISUAL COLOR IMAGENY. PROVISION WAS MADE TO OPERATE IN IR SPECTRAL BANDS DETWEEN 0.8 AND 1.1 MICROMETERS. HORIZONTAL STEREO WITH A MINIMUM BASE OF 0.8 M WAS REQUIRED.

--- VIKING 2 LANDER, NIER-----

INVESTIGATION NAME- ENTRY-ATMOSPHERIC STRUCTURE

NSSDC 10- 75-0830-02

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES

INVESTIGATIVE PROGRAM

12

CODE SL

TO PHOTOGRAPH WITH CONTIGUOUS PICTURES A SWATH AT LEAST 40-KM CROSS-TRACK BY 500-KM DOWN-TRACK ON A SINGLE ORDITAL PASS FROM The meam-apoapsis portion of the orbit. After lander Separation complete coverage with contiguous pictures of An Area at least 50 km in radius centered on the lander was obtained. --- VIKING 2 LANDERS TOULHINS 3RD-----INVESTIGATION NAME- X-RAY FLUORESCENCE SPECTROMETER INVESTIGATIVE PROGRAM NSSBC 10- 75-083C-13 CODE SL ----- VIKING 2 ORBITER, FARMER-----INVESTIGATION DISCIPLINE(S) PLANETOLOGY INVESTIGATION NAME- IN SPECTROMETER -- WATER VAPOR MAPPING PERSONNEL US GEOLOGICAL SURVEY Pomona college U of New Mexico US Geological Survey Martin-Mariettà Aerosp INVESTIGATIVE PROGRAM NSSDC 10- 75-083A-03 RSONNEL TL + P. TOULMI TM + A.K. BAIRD TM - K. KEIL TM - H.J. ROSE TM - B.C. CLARK TOULMIN, 380 INVESTIGATION DISCIPLINE(S) Planetary Atmospheres Planetary Biology Planetology BRIEF DESCRIPTION THIS EXPERIMENT UTILIZED AN ENERGY-DISPERSIVE X-RAY THIS EXPERIMENT UTILIZED AN ENERGY-DISPERSIVE X-RAY FLUDRESCENCE SPECTROMETER IN WHICH FOUR SEALED, GAS-FILED PROPORTIONAL COUNTERS DETECTED X RAYS EMITTED FROM SAMPLES OF THE MARTIAN SURFACE MATERIALS IRRADIATED BY X RAYS FROM RADIOISOTOPE SOURCES (IRRON-SS AND CADMIUM-109). THE OUTPUT OF THE PROPDRTIONAL COUNTERS WAS SUBJECTED TO PULSE HEIGHT ANALYSIS BY AM ONBOARD STEP-SCANNING SINGLE-CHANNEL AMALYZER WITH ADJUSTABLE COUNTING PENIODS. THIS INSTRUMENT WAS LOCATED INSIDE THE LANDER BODY. AND SAMPLES WERE DELIVERED TO IT BY THE LANDER SURFACE SAMPLER. CALIBRATION STANDARDS WERE AN INTEGRAL PART OF THE INSTRUMENT. RECONSTRUCTED SPECTRA YIELDED SURFACE COMPOSITION WITH ACCURACIES RANGING FROM A FEW TENS OF PARTS PER MILLION FOR TRACE ELEMENTS TO A FEW PERCENT FOR MAJOR ELEMENTS, DEPENDING UPON THE ELEMENT IN QUESTION. PERSONNEL TL - C.B. FARMER TN - D.D. LAPORTE NASA-JPL Santa Barbara Res CTR BRIEF DESCRIPTION THE OBJECTIVES OF THE IR SPECTROMETRY EXPERIMENT WERE TO DETERMINE THE SPATIAL AND TEMPORAL DISTRIBUTION OF WATER VAPOR-TO AID IN THE SELECTION OF LANDING SITES FOR THE VIKING LANDERS, AND (FOR FUTURE MISSIONS) TO MONITOR THE REGION SURROUNDING THE LANDER AND STUDY THE DYNAMIC CHARACTERISTICS OF MARS. THE IR SPECTROMETER WAS BORESIGHTED WITH THE IMAGING SYSTEM. IT WAS OPERABLE FROM THE PERIAPSIS AND APAPSIS REGIONS OF THE ORBIT. THE WATER WASAURMENT WARAPENES FROM 1 TO 1000 MICROMETERS OF PRECIPITABLE WATT WITH AN ACCURACY OF 1 MICROMETER BETWEEN 1 AND 20 MICROMETERS AND S FRICH DETWEEN 20 AND 1000 MICROMETERS. THE INSTANTANEOUS FIELD OF VIEW OF THE INSTRUMENT IS 2 BY 16 MILLIRADIANS. SPACECRAFT COMMON NAME- VIKING 2 ORBITER ALTERNATE NAMES- PL-733A, VIKING-A VIKING-A ORBITER ---- VIKING 2 ORBITER, KIEFFER-----INVESTIGATION NAME- IR RADIOMETRY -- THERMAL MAPPING NSSDC 10- 75-083A INVESTIGATIVE PROGRAM NSSDC 10- 75-0834-02 LAUNCH DATE- 09/09/75 Launch Site- Cape Canaveral, United States Launch Vehicle- Titan CODE SL WEIGHT- 1092. KG INVESTIGATION DISCIPLINE(5) Planetary Atmospheres Planetary Biology SPONSORING COUNTRY/AGENCY United States PLANETOLOGY NASA-055 RERSONNEL ORBIT PARAMETERS Orbit type- Marscentric Orbit Period- 1476. Min Periapsis- 1500. KM RSONNEL TH - H.H. KIEFFER TM - G. MUNCH TN - E.D. MINER TM - G. NEUGEBAUER TM - S.C. CHASE, JR. U OF CALIF, LA Calif Inst of tech Nasa-JPL Calif Inst of tech EPOCH DATE- 08/07/76 Inclination- 55. deg Apoapsis- 35000. Km SANTA GARBARA RES ETR PERSONNEL NASA HEADQUARTERS BRIEF DESCRIPTION THE PURPOSE OF THE THERMAL MAPPING EXPERIMENT WAS TO THE PURPOSE OF AREAS ON THE SURFACE AND OF THE ATMOSPHERE OF MARS WITH AN INFRARED THERMAL MAPPER (IRTM) INSTRUMENT. IT ALSO MEASURED THE AMOUNT OF SUNLIGHT REFLECTED. BY THE PLANET. THE IRTM WAS A MULTI-CHANNEL RADIOMETER MOUNTED ON THE ORBITER'S SCAN PLATFORM. FOUR SMALL TELESCOPES. EACH WITH SEVEN SENSITIVE INFRARED DETECTORS, WERE AIMED PARALLEL TO THE VISUAL IMAGING OPTICAL AXIS. THE INSTRUMENT WAS CAPABLE OF MEASURING DIFFERENCES OF 1 DEG C THROUGNOUT AN EXPECTED TEMPERATURE RANGE OF MINUS 130 DEG C TO PLUS ST DEG C. THE INSTRUMENT WAS 20 X 25 X 30 CM AND HAD A MINIMUM SPATIAL RESOLUTION OF B KM ON THE SURFACE. MG - W. JAKOBOU SC - L.G. GOFF PM G.C. BROOME PS - G.A. SOFFEN J'AKOBOWSKI NASA-LARC NASA-LARC BRIEF DESCRIPTION THE VIKING SPACECRAFT CONSISTED OF AN ORBITER AND A LANDER. A LANDER SEPARATED FROM THE ORBITER, ENTERDE THE MARTIAN ATMOSPHERE, AND SOFT-LANDED ON THE SURFACE ON SEPTEMBER 4, 1976. ORBITAL, ENTRY, AND SCIENTIFIC DATA FROM THE LANDER WAS COLLECTED AND TRANSMITTED TD EARTH. THE SPACECRAFT WAS A SOLAR-CELL-POWERED SATELLITE STABLIZED IN THREE AZES, USING INERTIAL AND CELESTIAL REFERENCES. THERE WAS A 500-W POWER CAPACITY FOR THE ORBITER AND A 70-W CAPACITY FOR THE LANDER. SCIENTIFIC AND PHOTOGRAPHIC ANALYSIS INSTRUMENTS WEIGHED APPROXIMATELY 72 KG (158 LB). ----- VIKING Z ORBITER, CARR-----SPACECRAFT COMMON NAME- VOYAGER 1 Alternate Names- Mariner Jupiter/Saturn A, Outer Planets A Hariner 77A, Mjs 77A INVESTIGATION NAME- ORBITER INAGING NSSDC 10- 75-0834-01 INVESTIGATIVE PROGRAM NSSDC 10- 77-084A CODE SL LAUNCH DATE- 09/D5/77 Launch Site- Cape Canaveral, United States Launch Vehicle- Titan WEIGHT- 700. KG INVESTIGATION DISCIPLINE(S) Planetary Atnospheres Planetology SPONSORING COUNTRY/AGENCY UNITED STATES PERSONNEL US GEOLOGICAL SURVEY Lowell observatory US geological survey NASA-JPL NASA-055 RSONNEL TL — M.H. CARR TM — W.A. BAUM TM — H. MASURSKY TM — G.A. BRIGGS TM — J.A. CUTTS INITIAL ORBIT PARAMETERS ORBIT TYPE- JUPITER FLYBY SCIENCE APPL, INC. PERSONNEL NASA-HEADQUARTERS NASA HEADQUARTERS NASA HEADQUARTERS CALIF INST OF TECH MG - R.A. MILLS SC - M.A. MITZ PM - J.R. CASANI PS - E.C. STONE

130

BRIEF DESCRIPTION THE PURPOSES OF THE VIKING ORBITER TV IMAGING EXPERIMENT INVESTIGATION WHERE TO AID IN THE SELECTION OF LANDING SITES FOR THE VIKING LANDERS AND FUTURE MISSIONS, TO MONITOR THE REGION SURROUNDING THE LANDER, AND TO STUDY THE GEOLOGIC AND DYNAMIC CHARACTERISTICS OF MARS. THE GEONETRIC RESOLUTION OF THE ORBITING IMAGING SYSTEM WAS 40 M PER LINE AT A REFERENCE ALTITUDE OF 1500 KM, WITH IMAGE SMEARING FROM ORBITER MOTION LESS THAN SO PERCENT OF THIS RESOLUTION. THE DYNAMIC RANGE WAS AS CLOSE TO THE TERMINATOR AS 30 DEG WITH OPTINUM IMAGE QUALITY AND AS CLOSE AS 5 DEG TO THE TERMINATOR WITH DEGRADED IMAGE QUALITY, PRIOR TO LANDER SEPARATION THE ORBITER WAS REQUIRED

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BRIEF DESCRIPTION THE OVERALL OBJECTIVES OF THE TWO SPACECRAFT, VOTAGER 1 AND VOTAGER 2, ARE TO CONDUCT EXPLORATORY INVESTIGATIONS OF THE PLANETARY SYSTEMS OF JUPITER AND SATURN AND OF THE INTEMPLANETARY MEDIUN OUT TO SATURN. PRIMARY EMPHASIS IS PLACED ON COMPARATIVE STUDIES OF THESE TWO PLANETARY SYSTEMS BY OBTAINING (1) MESSUREMENTS OF THE ENVIRONMENT, ATMOSPHERE, AND BODY CHARACTERISTICS OF THE PLANETS AND ONE OF MORE OF THE

. S.L.

SATELLITES OF EACH PLANET, (2) STUDIES OF THE NATURE OF THE RINGS OF SATURH, AND (3) EXPLORATION OF THE INTERPLANETARY (OR INTERSTELLAR) MEDIUM AT INCREASING DISTANCES FROM THE SUN. THESE OBJECTIVES ARE ATTAINED BY USING A VARIETY OF INSTRUMENTS AND METHODS INCLUDING TV, A COHERENT S- AND X-BAND RF RECEIVER, AN INFRARED INTERFERMETER AND RADIOMETER, UV SPECTROMETER, FLUXGATE MAGNETOMETERS, FARADAY CUPS, A CHARGED PARTICLE ANALYZER, PLASTM DEFECTOR, PLASMA WAVE RADIO RECEIVER, COSMIC RAY TELESCOPES, PHOTOPOLARIMETER, AND A SWEEP FREQUENCY RADIO RECEIVER.

-- VOYAGER 1, BRIDGE-------INVESTIGATION NAME- PLASMA SPECTROMETERS

INVESTIGATIVE PROGRAM NSSDC 10- 77-0844-06 CODE SL

INVESTIGATION DISCIPLINE(S) Particles and fields Space plasmas

PERSONNEL		
PI + H.S.	BRIDGE	MASS INST OF TECH
01 - J.W.	BELCHER	MASS INST OF TECH
01 - J.H.	BINSACK	MASS INST OF TECH
01 - A.J.	LAZARUS	MASS INST OF TECH
01 + S.	OLBERT	MASS INST OF TECH
01 - V.M.	VASYLIUNAS	HP1-AERONOMY
01 - L.F.	BURLAGA	NASA-GSFC
01 - R.E.	HARTLE	NASA-GSFC
01 - X.W.	DGILVIE	NASA-GSFC
01 - G.L.	SISCOE	U OF CALIFA LA
01 - A.J.	HUNDHAUSEN	NATL CTR FOR ATMOS RES

BRIEF DESCRIPTION THE PLASMA INVESTIGATION MAKES USE OF TWO FARADAY CUP DETECTORS, ONE POINTED ALONG THE EARTH-SPACECRAFT LINE AND ONE AT RIGHT ANGLES TO THIS LINE. THE EARTH-POINTING DETECTOR DETERMINES THE MACROSCOPIC PROPERTIES O THE PLASMA IONS, OBTAINING ACCUPATE VALUES OF THEIR VELOCITY, DENSITIES, AND PRESSURE. THREE SEQUENTIAL ENERGY SCANS ARE EMPLOYED WITH (DELTA E)/E EQUAL TO 20, 7.2, AND 1.8 PERCENT, ALLOWING A COVERAGE FROM SUBSONIC TO HIGHLY SUPERSONIC FLOW. THE SIDE-LOOKING FARADAY CUP MEASURES ELECTRONS IN THE ENERGY RANGE FROM 5 EV TO 1 KEV. FROM 5 EV TO 1 KEV

- VOYAGER 1, BROADFOOT

INVESTIGATION NAME- ULTRAVIOLET SPECTROSCOPY

INVESTIGATIVE PROGRAM NSSDC 10- 77-0844-04 CODE SL

INVESTIGATION DISCIPLINE(S) PLANETARY ATHOSPHERES

PERSONNE

- CKJVANEL	
PI - A.L. BROADFOOT	KITT PEAK NATL OBS
01 - H.W. MOOS	JOHNS HOPKINS U
OI - H.J.S.BELTON	KITT PEAK NATL OBS
01 - D.F. STROBEL	KITT PEAK NATL 085
OI - T.M. DONAHUE	U OF MICHIGAN
01 - M.B. MCELROY	HARVARD U
01 - J.C. MCCONNELL	HARVARD U
01 - R.H. GDODY	HARVARD U
01 - A. DALGARNO	HARVARD D
OI - J.E. BLANONT	CHRS-LPSP
OI - J.L. BERTAUX	CNES

BRIEF DESCRIPTION THÉ UV SPECTROMETER IS DESIGNED TO MEASURE ATMOSPHERIC PROPERTIES AND MEASURCS RADIATION IN THE WAVELENGTH RANGE FROM 400 TO 1600 A. TWO MODES OF INSTRUMENT OPERATION ARE PLANNED. AIRGLOW AND OCCULTATION. IN THE AIRGLOW MODE THE ATMOSPHERIC RADIATION IS MEASURED. THIS RADIATION IS PREDOMINANTLY RESONANCE SCATTERED SOLAR RADIATION, WHERE THE SCATTERING IS BY MOLECULAR OR ATOMIC ATMOSPHERIC CONJITUENTS SUCH AS, WYDROGEN (1216 A.) CR HELIUM (584 A). IN THE OCCULTATION MODE SUNLIGHT IS REFLECTED INTO THE SPECTROMETER, AND THE SCATTERING IS RECORDED. AS THE ATMOSPHERE MOVES DEIWEEN THE SPACECRAFT AND THE SUN, THE ABGORPTION CHARACTERISTICS OF THE ATMOSPHERE ARE OBTAINED OVER THE MEASURED WAVELENSTH REGION. THE ABSORPTION SPECTRUM IS USED TO IDENTIFY THE AUSCRORE A WELL AS TO MEASURE ITS ADUNDANCE IN THE LINE OF SIGHT TO THE SUN. IN ADDITION-THE ATMOSPHERIC THERMAL STRUCTURE CAN 9E INFERRED.

- VOYAGER 1, ESHLEMAN----

INVESTIGATION NAME- RADIO SCIENCE TEAM

NSSDC 10- 77-084A-02

INVESTIGATION DISCIPLINE(S) Atmospheric Physics CELESTIAL MECHANICS IONOSPHERES AND PADIO PHYSICS

INVESTIGATIVE PROGRAM CODE SL

LEK2ANNEP		
TL - V.R.	ESHLEMAN	STANFORD
TM - J.D.	ANDERSON	NASA-JPL
TH - T.A.	CROFT	STANFORD
TH - G.L.	TYLER	STANFORD
	FJELDBO	NASA-JPL
TH - G.S.	LEVY	NAŠA-JPL

BRIEF DESCRIPTION

VOYAGER 1, HANEL-

INVESTIGATION NAME- INFRARED SPECTROSCOPY AND RADIOMETRY

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(5) PLANETARY ATMOSPHERES

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RSONNEL	· · ·	· · · · · · · · · · · · · · · · · · ·
P1 - R.A.	HANEL	NASA-GSFC
01 - B.J.	CONRATH	NASA-GSFC
01 - V.G.	KUNDE	NA5A-GSFC
01 - P.D.	LOWMAN, JR.	NASA-GSFC
01 - W C	MAGUIRE	NASA-GSFC
01 - 1.0	PEARL	NASA-GSFC
01 - J.	PIRRAGLIA	NASA-GSFC
01 - R.E.	SANUELSON	NASA-GSFC
01 - T.E.	BURKE	NASA-JPL
D1 - P.	GIERASH	CORNELL U
0I - C.A.	PONNAMPERUMA	U OF MARYLAND
-		

MSSDC 10- 77-084A-03

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DI - C.R. FUNRAMERICAN BRIEF DESCRIPTION THIS INVESTIGATION IS CARRIED OUT USING AN INFRARED RADIOMETER AND AN INTERFEROMETER SPECTROMETER SINILAR IN DESIGN TO THE MARINER-MARS-71 IRIS, COMBINED INTO A SINGLE INSTRUMENT. THE INVESTIGATION STUDIES BOTH GLOBAL AND LOCAL ENERGY BALANCE, USING INFRARED SPECTRAL MEASUREMENTS IN CONJUNCTION WITH BROAD-BAND MEASUREMENTS OF REFLECTED SOLAR EMERGY. ATMOSPHERIC COMPOSITION IS ALSO INVESTIGATED, INCLUDING DETERMINATION OF THE M2/WE RATIO, AND THE ADUNDANCE OF CH2 AND NH3. VERTICAL TEMPERAJURE PROFILES ARE OBTAINED ON THE PLANETS AND SATELLITES WITH ATMOSPHERES. STUDIES OF THE COMPOSITION, THERRAL PROPERTIES, AND JILE OF PARTICLES IN SATURN'S RINGS ARE CONDUCTED. THE INTERFEROME'RE HAS A SPECTRAL RAMEG OF 200 TO 4000 1/CM. WHILE THE RADIOMETER RANGE COVERS 5000 TO 33,000 1/CM. THE INSTRUMENT V555 A SINGLE PRIMARY MIRROR 51 CM IN DIAM. WITH A FIELD OF VIEW OF 0.25 DEG.

VOYAGER 1, KRINIGIS

INVESTIGATION NAME- LOW-ENERGY CHARGED PARTICLE ANALYZER AND TELESCOPE

N55DC ID- 77-084A-07 INVESTIGATIVE PROGRAM

CODE SL

INVESTIGATION DISCIPLINE(S) Cosmic Rays Magnetospheric Physics Particles And Fields

RSONNEL			1.
PI - S.M.	KRIMIGIS	- ⁶⁶	APPLIED PHYSICS LAB
01 - C.Y.	FAN		U OF ARIZONA
01 - 6.	GLOECKLER		U OF MARYLAND
01 - L.J.	LANZEROTTL		BELL TELEPHONE LAB
01 - T.P.	ARMSTRONG		L OF KANSAS
01 - W.I.	AXFORD		MPI-AFRONONY
01 - C.O.	BOSTROM		APPLIED PHYSICS LAB

PER

BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT IS TO STUDY THE MAGNETOSPHERES OF JUPITER AND SATURN USING A LOW-ENERGY MAGNETOSPHERIC PARTICLE ANALYZER. THIS DETECTOR MAKES MEASUREMENTS IN (1) THE DISTANT MAGNETOSPHERE AND BOW SHOCK OF UPITER, (2) THE POSSIBLE MAGNETOSPHERE OF SATURN, AND (3) THE TRAPPED RADIATION BELTS IN THE VICINITY OF JUPITER, ADDITIONALLY, THIS DETECTOR IS ARLE TO STUDY LOW-ENERGY PARTICLES IN THE INTERPLANETARY MEDIUM. THE ENERGY RANGE OF THIS DETECTOR IS 10 KEV TO 1.1 MEV FOR ELECTRONS AND 10 KEV TO THOM FOR IDNS, OURING THE INTERPLANETARY CRUSE PERIOD. PROTONS, ALPHA PARTICLES, AND HEAVIER NUCLEI (Z FROM 3 TO 26) PROTONS, ALPHA PARTICLES, AND HEAVIER NUCLEI (Z FROM 3 TO 26) THESCOPE.

VOYAGER 1, LILLIE-----

INVESTIGATION NAME- HULTIFILTER PHOTOPOLARIMETER, 2200-7300 A

550C 10-	77-0844-11	INVESTIGATIVE PROGRAM Code SL
		INVESTIGATION DISCIPLINE(S)
		INTERPLANETARY DUST
		ZODIACAL LIGHT
		PLANETARY ATMOSPHERES

PERSONNÉL		
PI - C.F.	LILLIE	U OF COLORADO
0I - C.W.	HORD	U OF COLORADO
ÓI — K.	PANG	U OF COLORADO
01 - J.W.	HANSEN	U OF ARIZONA
01 - D.L.	COFFEEN	NASA-GI55

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Salar Salar

N. C. Start

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTS OF AN 8-IN. F/1.1 TELESCOPE THAT CAN SEND ITS ODSERVATIONS THROUGH A POLARIZER AND A FILTER FOR ONE OF EIGHT BANDS IN THE 2200- TO 7300-A SPECTRAL REGION THEN ON TO A PHOTOMULTIPLER TUBE. BY STUDY OF THESE EMISSION INTENSITY DATA, INFORMATION ON SURFACE TEXTURE AND COMPOSITION OF BOTH PLANETS (JUPITER AND SATURN) CAN BE OBTAINED, ALONG WITH INFORMATION ON SIZE DISTRIBUTION AND COMPOSITION SATURN RINGS AND INFORMATION ON ATMOSPHERIC SCATTERING PROPERTIES AND DENSITY FOR BOTH PLANETS. MOLECULAR SCALE HEIGHTS FOR BOTH PLANETS CAN ALSO BE DETERMINED FROM THESE DATA.

--- VOYAGER 1, NESS-----------

INVESTIGATION NAME- TRIAXIAL FLUXGATE MAGNETOMETERS

NSSDC 10- 77-084A-05 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PLANETARY NAGNETIC FIELD PARTICLES AND FIELDS INTERPLANETARY MAGNETIC FIELDS

ERSONNEL		
P1 - N.F.	NESS	NASA-GSFC
01 + M.H.	ACUNA	NASA-GSFC
61 - K.W.	BEHANNON	NAŠA-GŠFC
01 - L.F.	BURLAGA	NASA-GSFC
01 - R.P.	LEPPING	NASA-65FC
01 - F.M.	NEUBAUER	BRAUNSCHWEIG TECH U

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO INVESTIGATE THE MAGNETIC FIELDS OF JUPITER AND SATURN, THE SOLAR WIND INTERPATION WITH THE MAGNETOSPHERES OF THESE PLANETS, AND THE INTERPLANETARY MAGNETIC FIELD TO THE EXTENT OF THE SOLAR WIND SOUNDARY WITH THE INTERSTELLAR MAGNETIC FIELD AND BEYOND, IF CROSSED, THE INVESTIGATION IS CARRIED OUT USING TWO HIGH-FIELD AND THO LOW-FIELD TRIAXIAL FLUXCATE MAGNETORTERS. DATA ACCURACY OF THE INTERPLANETARY FIELDS IS PLUS OR MINUS 0.1 GAMMA AND IHE RANGE OF REASUREMENTS IS FROM 0.D1 GAMMA TO 20 GAUSS.

- VOYAGER 1, SCARF-----

INVESTIGATION NAME- PLASMA WAVE

NSSDC 10- 77-084A-13 INVESTIGATIVE PROGRAM CODE SL

1	NVESTIGATION DISCIPLINE(S)	
	PARTICLES AND FIELDS	
	MAGNETOSPHERIC PHYSICS	
	PLANETARY IONOSPHERES	
1		

PE	Kaunnel			
	PI - F.L.	SCARF		TRW SYSTEMS GROUP
	01 - D.A.	GURNETT		U OF IOWA
	· · · ·			

THIS INVESTIGATION PROVIDES CONTINUOUS, SHEAT 4-INDEPENDENT MEASUREMENTS OF THE ELECTRON DENSITY PROFILES AT JUPITER AND SATURN. IT ALSO GIVES BASIC INFORMATION ON LOCAL WAVE-PARTICLE INTERACTION REGURED TO CARRY OUT COMPA'AATIVE STIDIES OF THE PHYSICS OF THE JUPITER AND SATURN MAGMETOSPHERES. THE INSTRUMENTATION CONSISTS OF A 16-CHANNEL STEP FREQUENCY RECEIVER AND A LOW-PREGUENCY WAVEFORM RECEIVER WITH ASSOCIATED ELECTRONICS. THE FREQUENCY RAVEFORM RECEIVER WITH ASSOCIATED ELECTRONICS. THE FREQUENCY RAVEFORM SATURN TO ANTENNAS DEVELOPED FOR THE PLANETARY RADIO ASTRONOMY INVESTIGATION.

-- VOYAGER 1, SHITH-----

INVESTIGATION NAME- TV PHOTOGRAPHY

NS5DC 10- 77-084A-01 INVESTIGATIVE PROGRAM CODE SL

> INVESTIGATION DISCIPLINE(S) METEOROLOGY PLANETARY ATMOSPHERES

PERSOI	NNI	EL.	
₽I	-	B.A.	SMITH
01	-	G.A.	BRIGGS
01	-	A.F.	C00K
10	-	G.	DANIELSON
01	-	H.E.	DAVIES
01	-	G.E.	HUNT
01	•	τ.	OWEN
01	-	с.	SAGAN
01	-	L.A.	SODERBLOM
01	-	V.E.	SUOMI

NEW MEXICO STATE U NASA-JPL Smithsonian inst NASA-IRI NASA-JPL Rand Corp Meteorological office State U of New York CORNELL U US GEOLOGICAL SURVEY U OF WISCONSIN

DI - V.E. SUDMI U OF WISCONSIN BRIEF DESCRIPTION THE TV PHOTOGRAPHIC EXPERIMENT USES A TWO-CAMERA SYSTEM, BASED ON THE MARINER 10 TV SYSTEM. THIS SYSTEM INCLUDES ONE NARROW-ANGLE, LONG FOCAL LENGTH CAMERA AND ONE WIDE-ANGLE, SHORT FOCAL LENGTH CAMERA. THE MAXIMUM RESOLUTION ACHIEVABLE DEPENDS ON THE ACTUAL TRAJECTORY ON THIS MULTI-ENCOUNTER MISSION, BUT THE RESOLUTION WILL BE AS HIGH AS 0.5 TO 1.0 KM ON THE CLDSEST APPROACHES TO SOME OBJECTS. AT JUPITER AND SATURN, THE RESOLUTION IS EXPECTED TO BE 20 KM AND S KM, RESPECTIVELY. THE OBJECTIVES OF THE EXPERIMENT ARE TO PHOTOGRAPH GLOBAL NOTIONS AND CLOUD DISTRIBUTIONS ON JUPITER AND SATURN, GROSS DYNAMICAL PROPERTIES, ZOMAL ROTATION, ORIENTATION OF SPIN AXIS, ZOMAL SHEAR, VERTICAL SHEAR, FLOW INSTABILITIES, SPOTS, AND SPECTRUM OF SCALE OF ATMOSPHERIC MOTIONS IN TIME AND SATGE. ADDITIONAL OBJECTIVES INCLUDE THE STUDY OF THE MODE OF RELEASE OF INTERNAL ENERGY FLUX (SEARCH FOR CONVECTION CELLS AND ROLLS). STUDY OF GROWTH, DISSIPATION, MORPHOLGGY, AND VERTICAL STRUCTURE OF CLOUD COMPLEXES, GROSS OPTICAL PROPERTIES, GLOBAL AND LOCALIZED SCATTERING FUNCTION IN THE VISIBLE SPECTRUM, POLARIMETRY, NATURE OF CHROMOPHORES, THEIR STRUCTURE AND DEVELOPRENT, AND HIGM RESOLUTION OF THE GREAT RED SPOT. THE OBJECTIVES OF THE SATELLITE ENCOUNTERS INCLUDE -- (1) GROSS CHARCTERISTICS - SIZE, SHAPE, ROTATION, SPIN AXIS, CARTOGRAPHY, INPROVED EPHEMERTDES AND MASSES, (2) GEOLOGY --MAJOR PHYSIOGRAPHIC PROVINCES, IMPACT AND VOLCANIC FEATURES, AND LOCALLIZED SCATS, AND LIMB STRATIFICATION, SPIN AXIS, OF BRIGHTNESS VARIATION, AND SEARCH FOR NEW SATELUTES. STUDIES, FROSTS, AND LIMB STRATIFICATION OF AREDSOLS, (3) SURFACE PROPERTIES - COLORIARTY, SCATTERING FUNCTION, NATURE OF BRIGHTNESS VARIATION, AND SEARCH FOR NEW SATELUTES, NCLUDY -- (1) RESOLUTION OF INDIVIDUAL RING COMPONENTS OR ATMOSPHERES, FROSTS, AND LIMB STRATIFICATION OF ATTRENTS. OLIGHTMESS OF ANTERIAL, (2) VERTICAL AND MADIAL DISTRIBUTION OF ATMOSPHERES, FROSTS, AND LIMB STRATIFICATION, GALTERIS BRIEF DESCRIPTION

VOYAGER 1, VOGT-----

INVESTIGATION NAME- HIGH- AND MODERATELY LOW-ENERGY Cosmic-Ray telescope

NSSDC ID- 77-084A-08

INVESTIGATIVE PROGRAM CODE 5L

> INVESTIGATION DISCIPLINE(S) COSMIC RAYS MAGNETOSPHERIC PHYSICS

ERSONNEL		
PI - R.E.	VOGT	CALIF INST OF TECH
01 - J.R.	JOKIPII	U OF ARIZONA
01 - E.C.	STONE	CALIF INST OF TECH
01 - F.B.	MCDONALD	NASA-GSFC
01 - B.J.	TEEGARDEN	NASA-GSFC
01 - J.H.	TRAINOR	NASA-GSFC
QI — W.R.	VEBBER	U OF NEW HAMPSHIRE

BRIEF DESCRIPTION THIS INVESTIGATION STUDIES THE ORIGIN AND ACCELERATION THIS INVESTIGATION STUDIES THE ORIGIN AND ACCELERATION PROCESS, LIFE HISTORY, AND DYNAMIC CONTRIBUTION OF INTERSTELLAR COSMIC RAYS, ITE NUCLEOSYNTHESIS OF ELEMENTS IN COSMIC-RAY SOURCES, THE BEHAVIOR OF COSMIC RATS IN THE INTERLANETARY MEDIUM, AND THE TRAPPED PLANETARY ENERGETIC PARTICLE ENVIRONMENT. THE INSTRUMENTATION INCLUDES A HIGH-ENERGY TELESCOPE SYSTEM (HEIS) AND A LOW-CNERGY TELESCOPE SYSTEM (LETS), THE HETS COVERS AN ENERGY RANGE BETWEEN 6 AND 500 MEV/NUCLEON FOR NUCLEI RANGING IN ATOMIC NUMBERS FROM 1 THROUGH 30. IN ADDITION ELECTRONS IN THE ENERGY RANGE BETWEEN 3 AND 100 MEV/NUCLEON ARE MEASURED BY THIS TELESCOPE AND AN ELECTRON TELESCOPE (TTI). THE LETS MEASURES THE ENERGY RAND DETERTINES 14E IDENTITY OF NUCLEI FOR ENERGIES BETWEEN ,15 AND 30 MEV/NUCLEON AND ATOMIC NUMBERS FROM 1 TO 30. THE INSTRUMENTS ALSO MEASURE THE ANISTROPIES OF ELECTRONS AND NUCLEI. IN ADDITION, ELECTRONS IN THE ENERGY RANGE BETWEEN 3 AND 100 MEV/NUCLEON ARE MEASURED AN ALCTRON TELESCOPE (TET). BRIEF DESCRIPTION

VOYAGER 1, WARWICK

INVESTIGATION NAME- PLANETARY RADIO ASTRONOMY

INVESTIGATIVE PROGRAM Code SL SSDC 10- 77-084A-10

INVESTIGATION DISCIPLINE(S) Magnetospheric Physics SPACE PLASMAS

PERSONNEL RSONNEL PI - J.W. OI - J.K. OI - T.O. OI - F.T. OI - A. DI - C.C. OI - Y. OI - Y. OI - S. OI - R. U OF COLORADO NASA-GSFC U OF FLORIDA U OF MICHIGAN MASS INST OF TECH WARWICK ALEXANDER/ JR. CARR HADDOCK STAELIN BOISCHOT MEUDON OBS Paris observatory Meudon obs HARVEY LEBLANC BROWN, JR. GULKIS PHILLIPS NASA-JPL NASA-JPL NASA-JPL

記事長

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Contractions,

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BRIEF DESCRIPTION THIS EXPERIMENT CONSISTS OF A SWEEP-FREQUENCY RACIO RECEIVER OPERATING IN BOTH POLARIZATION STATES, DETWEEN 20 KHZ AND 40.5 MHZ. THE SIGNAL IS RECEIVED BY A PAIR OF ORTHOGON/L 10-M MONOPOLE ANTENNAS. STUDY OF THE RADIO EMISSION SIGNAL FROM JUPITER AND SATURN OVER THIS RANGE OF FREQUENCIES YIELDS DATA CONCERNING THE PHYSICS OF MAGNETOSPHERIC PLASMA RESOMANCES AND NONTHERMAL RADIO EMISSIONS FROM THESE PLANETARY REGIONS.

SPACECRAFT COMMON NAME- VOYAGER 2 Alternate Names- Wariner Jupiter/Saturn B, Outer Planets B Mariner 778, MJS 778

NSSDC 10- 77-0764

LAUNCH DATE- 08/20/77 Launch Site- Cape Canaveral, united states Launch Vehicle- Titan WEIGHT- 700. KG

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-055

INITIAL ORBIT PARAMETERS Orbit type- Jupiter Flyby

PERSONNEL NASA HEADQUARTERS Nasa Headquarters Nasa-JPL Calif Inst of Tech MG - R.Á. HILLS SC - M.A. HITZ PM - J.R. CASANI PS - E.C. STONE

PS - E.C. STONE CALLF INST OF TECH BRIEF DESCRIPTION THE OVERALL OBJECTIVES OF THE SPACECRAFT, VOYAGER 1 AND VOYAGER 2, ARE TO COMOUCT EXPLORATORY INVESTIGATIONS OF THE PLANETARY SYSTEMS OF JUPITER AND SATURN AND OF THE INTERPLANETARY MEDIUM OUT TO SATURN. PRIMARY EMPHASIS IS INTERPLANETARY MEDIUM OUT TO SATURN. PRIMARY EMPHASIS IS OBTACH ON COMPARATIVE STUDIES OF THESE TWO PLANETARY SYSTEMS BY OBTAINING (1) MEASUREMENTS OF THE ENVIRONMENT, ATMOSPHERE, AND BODY CHARACTERISTICS DF THE PLANETS AND ONE OF THE SATELLITES OF EACH PLANET, (2) STUDIES OF THE INTERPLANETARY (OR INTERSTELLAR) NEDIUM AT INCREASING DISTANCES FROM THE SUN. THESE OBJECTIVES ARE OBTAINED USING A VARIETY OF INSTRUMENTS AND MENDOS INCLUDING TV, A COHENTS - AND X-BAND RF RECEIVER, AN IR INTERFEROMETER AND RADIOMETER, A UV SPECTROMETER, FLUXGATE MAGNETIOMETERS, FARADAY CUPS, A CHARGED PARTICLE ANALYZER, PLASMA DETECTOR, PLASMA WAVE RADIO RECEIVER, COSMIC-RAV TELESCOPES, PHOTOPOLARIMETER, AND A'S SWEEP FREQUENCY RADIO RECEIVER.

- VOYAGER Z. BRIDGE--

INVESTIGATION NAME- PLASMA SPECTROMETERS

NS50C 10- 77-0764-06

INVESTIGATIVE PROGRAM CODE SL INVESTIGATION DISCIPLINE(S) SPACE PLASMAS

PARTICLES AND FIELDS

PERSONNEL		WARE THET AS TELL
P1 - H.S.	BRIDGE	MASS INST OF TECH
01 - A.J.		HASS INST OF TECH
	LHLANGS	MASS INST OF TECH
01 - S.	OLBERT	
· 01 - J.W.	BELCHER	MASS INST OF TECH
01 - 0.80		MPI-AERONOMY
01 - V.M.	VASYLIUNAS	
01 - L.F.		NASA-GSFC
		MASS INST OF TECH
0I - J.H.		
01 - G.L.	SISCOE	U OF CALIF, LA
		NATL CTR FOR ATMOS RES
01 - A.T.	HUNDHAUSEN	NASA-GSFC
01 - R.E.	HARTLE	
01 - K.H.		NASA-GSFC

BRIEF DESCRIPTION THE PLASMA INVESTIGATION MAKES USE OF TWO FARADAY CUP THE PLASMA INVESTIGATION MAKES USE OF TWO FARADAY CUP DETECTORS, ONE POINTED ALONG THE EARTH-SPACEGRAFT LINE AND CRE AT RIGHT ANGLES TO THIS LINE. THE EARTH-POINTING DETECTOR DETERMINES THE MACROSCOPIC PROPERTIES OF THE PLASMA IONS, OBTAINING ACCURATE VALUES OF THEIR VELOCITY, DENSITIES, AND PRESSURE. THREE SEQUENTIAL ENERGY SCANS ARE EMPLOYED WITH DELTA EJ/E EQUAL TO 29, 7.2, AND 1.8 PERCENT, ALLOWING A. COVERAGE FROM SUBSONIC TO HIGHLY SUPERSONIC FLOW. THE SIDE-LOOKING FARADAY CUP MEASURES OF ELECTRONS IN THE ENERGY SUBSCIENCE SEW TO 1 KEV. COVERAGE FROM SUBSONI SIDE-LOOKING FARADAY CU Range from 5 ev to 1 kev.

--- WOYAGER 2, BROADFOOT-----

INVESTIGATION NAME- ULTRAVIOLET SPECTROSCOPY INVESTIGATIVE PROGRAM N558C 10- 77-076A-04

INVESTIGATION DISCIPLINE(S) Planetary atmospheres

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SONNEL		WERE OF WARE OF
PI - A.L.	BROADFOOT	KITT PEAK NATL OBS
01 - A.		HARVARD U
01 - J.C		HARVARD U
01 - R.H		HARVARD U
	DONAHUE	U OF MICHIGAN
	, MCELROY	HARVARD U
		KITT PEAK NATL UBS
	.S.BELTON	KITT PEAK NATL OBS
01 - D.F	, STRÖBEL	JOHNS HOPKINS U
01 - H.W	. NOOS	
01 - J.E	. BLAMONT	CNRS-LPSP
		CNES

PER

OI - J.L. BERTAUX CHLL GRIEF DESCRIPTION THE UV SPECTROMETER IS DESIGNED TO MEASURE ATMOSPHERIC PROPERTIES AND MEASURES RADIATION IN THE WAVELENGTH RANGE FROM 400 TO 1600 A. TWO RODES OF INSTRUMENT OPERATION ARE PLANNED AIRGLOW AND OCCULTATION. IN THE AIRGLOW MODE THE ATMOSPHERIC RADIATION WILL BE MEASURED. THIS RADIATION IS PREDOMINANTLY RESONANCE SCATTERED SOLAR RADIATION, WHERE THE SCATTERING WILL BE BY THE MOLECULAR OR ATOMIC ATMOSPHERIC CONSTITUENTS SUCH AS, FOR EXAMPLE, HYDROGEN (1216 A) DR HELIUM (584 A). IN THE OCCULTATION MODE SUNJEGHT WILL BE REFLECTED INTO THE SPECTROMETER, AND THE SOLAR SPECTRUM WILL BE RECORDED. AS THE ATMOSPHERE MOVES BETWEEN THE SPACECRAFT AND THE SUN, THE ADSORPTION CHRACTERISTICS OF THE ATMOSPHERE WILL BE DATAINED OVER THE MEASURED MAVELENGIN REGION. THC ADSORPTION SPECTRUM WILL BE USED TO IDENTIFY THE ABSORDER AS WELL AS TO MEASURE ITS ABUNDANCE IN THE LIME OF SIGHT TO THE SUN. IN ADDITION, THE ATMOSPHERE ST HERMAL STRUCTURE CAN BE INFERED.

----- VOYAGER 2, ESHLEMAN------

INVESTIGATION NAME- RADIO SCIENCE TEAM

NCSOC	T D -	7 7-076A- 02	INVESTIGATIVE PROGRAM		
	••		CODE SL		

INVESTIGATION DISCIPLINE(S) Atmosphéric Physics Celestial Mechanics Idnospheres and Radio Physics

RSONNEL TL - V.R.	ESHLEMAN	STANFORD U
	FJELDBO	NASA-JPL
TN - G. TN - G.S.	LEVY	NASA-JPL
TH - T.A.	CROFT	STANFORD U
TH - 5.L.	TYLER	STANFORD U
TN - J.D.	ANDERSON	NASA-JPL

TH - J.D. ANDERSON BRIEF DESCRIPTION THE RADIO SCIENCE TEAM USES THE TELECOMUNICATIONS SYSTEMS OF THE VOYAGER SPACECRAFT TO PERFORM THEIR STUDIES. THE SYSTEM IS A COMERENT S- AND X-BAND DOWNLINK AND S-BAND UPLINK. THE SCIENCE OBJECTIVES OF THE RADIO SCIENCE INVESTIGATION ARE --(1) DETERMINE THE PHYSICAL PROPERTIES OF PLANETARY AND SATELLITE IONOSPHERES AND ATMOSPHERES BY EXAMINING THE PROPAGATION ÉFFECTS ON A DUAL-FREQUENCY RADIO SIGNAL DURING IMMERSION OF SPACECRAFT OCCULTATION BY THE SUDJECT BODY, (2) DETERMINE PLANETARY AND SATELLITE MASSES, GRAVITY FIELDS AND DETERMINE THE AMOUNT AND SIZE DISTRIBUTIONS OF MATERIAL IN SATURY'S RINGS AND THE RING DIMENSIONS BY EXAMINING THE PROPAGATION EFFECTS ON A DUAL-FREQUENCY RADIO SIGNAL TROM THE SPACECRAFT DURING THE ENCOUNTER PERIOD, AND (3) DETERMINE THE AMOUNT AND SIZE DISTRIBUTIONS OF MATERIAL IN SATURN'S RINGS AND THE RING DIMENSIONS BY EXAMINING THE PROPAGATION FERETS ON A DUAL-FREQUENCY RADIO SIGNAL TASSES THROUGH EACH RING IN SUCFACE.

- VOYAGER 2. HANEL

INVESTIGATION NAME- INFRARED SPECTROSCOPY AND RADIOMETRY

INVESTIGATIVE PROGRAM NSSDC 10- 77-0764-03 CODE SL

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES

PERSONNEL		
P1 - 8.A.	HANEL	NASA-GSFC
01 - C.A.	PONNAMPERUMA	U OF MARYLAND
	BURKE	NASA-JPL
01 - T.E.		CORNELL U
0I - P.	GIERASH	NASA-GSFC
01. – J.	LIKXUDET4	NASA-GSFC
01 - R.E.	SAMUELSON	
01 - W.C.	MAGUIRE	NASA-GSFC
01 - J.C.	PEARL	NASA-GSFC
01 - V.G.	KUNDE	NASA-GSEC
01 - P.D.	LOWMAN, JR.	NASA-GSEC
01 - 8.4.	CONRATH	NASA-GSFC

BRIEF DESCRIPTION THIS INVESTIGATION IS CARRIED OUT USING AN INFRARED RADIOMETER AND AN INTERFEROMETER SPECTROMETER SIMILAR IN DESIGN RADIOMETER AND AN INTERFEROMETER SPECTROMETER SIMILAR IN DESIGN TO THE MARINER-MARS-71 IRIS, COMBINED INTO A SINGIZ INSTRUMENT. THE INVESTIGATION STUDIES BOTH GLOBAL AND LOCAL EMERGY WITH BADAD-BAND MEASUREMENTS OF REFLECTED SOLAR EMERGY. ATMOSPHERIC COMPOSITION IS ALSO INVESTIGATED, INCLUDING DETERMINATION OF THE H2/ME RATID, AND THE ABUNDANCE OF CH2 AND NHS. VERTICAL TEMPERATURE PROFILES ARE OBTAINED ON THE PLANETS AND SATELLITES WITH ATMOSPHERES, STUDIES OF THE COMPOSITION, THERMAL PROPERTIES, AND SIZE OF PARTICLES IN SATURN'S RINGS ARE CONDUCTED. THE INTERFEROMETER HAS A SPECTRAL RANGE OF 200 TO 4GOO 1/CR, WHILE THE RADIOMETER RANGE COVERS 500D TO 33.00D 1/CM. THE INSTRUMENT USES A SINGLE PRIMARY MIRROR S1 CM IN DIAM. WITH A FIELD OF VIEW OF 0.25 DEG.

VOYAGER 2, KRINIGIS-----

INVESTIGATION NAME- LOW-ENERGY CHARGED PARTICLE ANALYZER AND TELESCOPE

NSSDC 10- 77-076A-07	INVESTIGATIVE CODE SL	PROGRAM
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INVESTIGATION DISCIPLINE(S) COSMIC RAYS Magnetospheric physics Particles and fields

PERSONNEL

KZANNEE		APPLIED PHYSICS LAB		
P1 - 5.M.	KRIMIGIS	APPLIED PHYSICS LAB		
01 - C.O.	BOSTROM	U OF KANSAS		
01 - T.P.	ARMSTRONG	MPI-AERONOMY		
01 - W.I.	AXFORD	U OF MARYLAND		
01 - G.	GLOECKLER	HELL TELEPHONE LAB		
01 - L.J.	LANZEROTTI	U OF ARIZONA		
01 - 0.1.	FAN	0 of witter		

BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT IS TO STUDY THE MAGNETOSPHERES OF JUPITER AND SATURN USING A LDW-ENERGY MAGNETOSPHERIE PARTICLE ANALYZER. THIS DETECTOR MAKES MAGNETOSPHERIE PARTICLE ANALYZER. THIS DETECTOR MAKES MAGNETOSPHERIE NATHE ANTOSPHERE OF SATURN, AND (3) THE JUPITER, (2) HE POSSIBLE MAGNETOSPHERE OF SATURN, AND (3) THE JUPITER, (2) HE POSSIBLE MAGNETOSPHERE OF SATURN, AND (3) THE JUPITER, (2) HE DOSSIBLE MAGNETOSPHERE OF SATURN, AND (3) THE ADDITIONALLY, THIS DETECTOR IS ABLE TO STUDY LOW-ENERGY PARTICLES IN THE INTERPLANETARY MEDIUM. THE ENERGY RANGE OF THIS DETECTOR IS 10 KEV TO 1.1 MEV FOR ELECTRONS AND 10 KEV 10 150 MEV FOR IONS. DURING THE INTERPLANETARY CRUISE PERIOD. SAD MEV FOR IONS. DURING THE INTERPLANETARY CRUISE PERIOD ARE SEPARATELY IDENTIFIED AND THEIR ENERGY MEASURED IN THE RANGE FROM 0.05 TO 3D MEV, USING A LOW-ENERGY PARTICLE THELESCOPE. TELESCOPE .

-- VOYAGER Z, LILLIE------INVESTIGATION NAME- MULTIFILTER PHOTOPOLARIMETER, 2200-7300 A

NSSDC ID- 77-0764-11

INVESTIGE ION DISCIPLINE(S) INTERPLANETARY DUST ZODIACAL LIGHT PLANETARY ATMOSPHERES

INVESTIGATIVE PROGRAM

CODE SL

PERSONNEL		U OF COLORADO
PI - C.F.	LILLIE	U OF COLORADO
01 - C_W.	HORD	U OF COLORADO
01 - K.	PANG	U OF ARIZONA
OI - J.W. HANSEN	NASA-GISS	
01 - D.L.	COFFEEN	NASK-0135

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTS OF AN B-IN. F/1.1 TELESCOPE, THAT SENDS ITS DESERVATIONS THROUGH A POLARIZER AND A FILTER FOR ONE OF EIGHT BANDS IN THE 2200- TO 7300-A SPECTRAL REGION, THEN ON TO A PHOTOMULTIPLER TUBE. BY STUDY OF THESE EMISSION INTENSITY DATA, INFORMATION ON STRACE TEXTURE AND COMPOSITION INTENSITY DATA, INFORMATION ON SATURN) CAN BE DETAINED, ALONG OF BOTH PLANETS (JUPITER AND SATURN) CAN BE DETAINED, ALONG MITH INFORMATION OF SIZE DISTRIBUTION AND COMPOSITION OF SATURN'S RINGS AND DENSITY FOR BOTH PLANETS. MOLECULAR SCALE MEIGHTS FOR BOTH PLANETS CAN ALSO BE DETERMINED FROM THESE DATA. HEIGHTS DATA.

--- VOYAGER 2, NESS-- -----

INVESTIGATION NAME- TRIAXIAL FLUXGATE MAGNETOMETERS

INVESTIGATIVE PROGRAM N550C 10- 77-0764-05

CODE SL INVESTIGATION DISCIPLINE(S) PLANETARY MAGNETIC FIELD PARTICLES AND FIELDS Interplanetary magnetic fields

GI - F.M. GI - K.W.	LEPEING Neubauer Dehannon Burlaga	NASA-GSFC NASA-GSFC Braunschweig tech u Masa-gsfc NASA- <u>Gs</u> fc
01 - L.F.		NASA-GSFC

GSFC GSFC GSFC

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO INVESTIGATE THE MAGNETIC THIS EXPERIMENT IS DESIGNED TO INVESTIGATE THE MAGNETIC FIELDS OF JUPTITER AND SATURN, THE SOLAR WIND INTERACTION WITH THE MACHTOSPHERES OF THESE PLANETS, AND THE INTERPLANE MAGNETIC FIELD TO THE EXTENT OF THE SOLAR WIND BOUNDARY WITH THE INVERSTELLAR MAGNETIC FIELD, AND BEVOND, IF CROSSED. THE INVESTIGATION IS CARRIED OUT USING TWO HIGH-FIELD AND TWO LOW-FIELD TO THE KINGATE MAGNETOMETERS, DATA ACCURACY OF LOW-FIELD TRIAXIAL FLUKGATE MAGNETOMETERS, DATA ACCURACY OF THE INTERPLANETARY FIELDS IS PLUS OR WINUS 0.1 GAMMA, AND THE RANGE OF MEASUREMENTS IS FROM U.01 GAMMA TO ZO GAUSS.

----- VOTAGER 2/ SCARF-----

INVESTIGATION NAME- PLASMA WAVE

NSSDC 10- 77-0764-13

PER

INVESTIGATIVE PROGRAM Code SL

INVESTIGATION DISCIPLINE(5) PLANETARY IONOSPHERES PARTICLES AND FIELDS MAGNETOSPHERIC PHYSICS

PERSONNEL PI - F.L. SCARF DI - D.A. GURNETT

TRW SYSTEMS GROUP U OF LOWA

BRIEF DESCRIPTION THIS INVESTIGATION PROVIDES CONTINUOUS, THIS INVESTIGATION PROVIDES CONTINUOUS, THIS INVESTIGATION OF THE ELECTRON DENSITY PROFILES AT JUPITER AND SATURA. IT ALSO GIVES BASIC INFORMATION ON LOCAL NAVE-PARTICLE INTERACTIONS REQUIRED TO CARRY OUT COMPARATIVE STUDIES OF THE PHYSICS OF THE JUPITER AND SATURN MACHETOSPHERES. THE INSTRUMENTATION CONSISTS OF A 16-CHANNEL STEP FREQUENCY RECEIVER AND A LOW-FREQUENCY MAVEFORM RECEIVER WITH ASSOCIATED ELECTRONICS, THE FREQUENCY RAVEFORM THIS INSTRUMENT IS FROM 10 HZ TO 56 KHZ. THIS INSTRUMENT SHARES THE 10-M ANTENNAS DEVELOPED FOR THE PLANETARY RADIO ASTRONOMY INVESTIGATION.

--- VOYAGER 2, SMITH---

INVESTIGATION NAME- TV IMAGING

INVESTIGATIVE PROGRAM CODE SL NSSDC 10- 77-0764-01

INVESTIGATION DISCIPLINE(S) METEOROLOGY PLANETARY ATMOSPHERES LANETOLOGY

ERSONNEL PI - B.A. OI - G.A. OI - A.F. OI - G.E. OI - T. OI - T. OI - C. OI - V.É.	SWITH BREIGGS COOK DANIELSON DAVIES HUNT DUEN SAGAN SODERBLOM SUDMI	NEW MEXICO STATE U NASA-JPL Smithsonian inst NASA-JPL Rand Corp Meteorological office State U of New York Cornell U US Geological Survey U of Wisconsin
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UI - L.A. SUDENHLON DI - V.E. SUDMI BRIEF DESCRIPTION THE TW PHOTOGRAPHIC EXPERIMENT USES A TWO-CAMERA SYSTEM. THE TW PHOTOGRAPHIC EXPERIMENT USES A TWO-CAMERA SYSTEM. THE TW PHOTOGRAPHIC EXPERIMENT USES A TWO-CAMERA SYSTEM. NARROW-ANGLE, LONG FOCAL LENGTH CAMERA AND ONE WIDE-ANGLE, NARROW-ANGLE, LONG FOCAL LENGTH CAMERA AND ONE WIDE-ANGLE, SHORT FOCAL LENGTH CAMERA. THE MAXIMUM RESOLUTION ACHIEVABLE DEPENOS GREATLY ON THE ACTUAL TRAJECTORY ON THIS DEPENOS GREATLY. ON THE ACTUAL TRAJECTORY ON THIS DEPENOS GREATLY. ON THE ACTUAL TRAJECTORY ON THIS DEPENOS GREATLY. ON THE ACTUAL TRAJECTORY ON THIS DEPENOS GREATLY. ON THE ACTUAL TRAJECTORY ON THIS DEPENOS GREATLY. ON THE ACTUAL TRAJECTORY ON THIS DEPENOS GREATLY. ON THE ACTUAL TRAJECTORY ON THIS DEPENOS GREATLY. ON THE ACTUAL TRAJECTORY ON THIS DEPENOS GREATLY. ON THE ACTUAL TRAJECTORY ON THIS DEPENOS GREATLY. ON THE ACTUAL TRAJECTORY ON THIS DEPENOS GREATLY. THE OBJECTIVES OF THE EXPÉRIMENT ARE TO PHOTOGRAPH GLOBAL MOI.ONS AND CLOUD DISTRIBUTIONS ON JUPITER HOTTONS IN TIME AND SPACE. ADDITIONAL OBJECTIVES INCLUDE THE MOTIONS IN TIME AND SPACE. ADDITIONAL OBJECTIVES INCLUDE THE STUDY OF THE MODE OF RELEASE OF INTERNAL ENERGY FLUX (SEARCH TOTIONS IN TIME AND SPACE. ADDITIONAL OBJECTIVES. GROSS MORPHOLOGY. AND VENTICAL STRUCTURE OF CLOUD CONTLEXES, GROSS MORPHOLOGY. AND VENTICAL STRUCTURE OF CLOUD CONTLEXES, GROSS MORPHOLOGY. AND VENTICAL STRUCTURE OF CANONPHORES. THE VISABLE SPECTRUM, POLARIMETRY, NATURE OF CHRONOPHORES. THE STRUCTURE AND DEVELOPMENT, HIGH RESOLUTION OF THE GREAT THEIR STRUCTURE AND DEVELOPMENT, HIGH RESOLUTION OF THE GREAT THEIR STRUCTURE AND DEVELOPMENT, HIGH ACOUNTERS INCLUDE - (1) GROSS CHARACTERISTICS - SIDE SHORTANIC FRATURTES. - NAJOR PHYSIOGRAPHIC PROVINCES. IMPACT AND VOLCANLIC FEATURES. - MAJOR PHYSIOGRAPHIC PROVINCES IMPACT AND VOLCANLIC FEATURES. - MAJOR PHYSIOGRAPHIC PROVINCES IMPACT AND VOLCANLIC FEATURES. - MAJOR PHYSIOGRAPHIC PROVINCES AND AND SEARCH FOR NEW SATELLITES. OF BRIGHTNESS VARIATION, A

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CLUMPS OF MATERIAL, (2) VERTICAL AND RADIAL DISTRIBUTION OF MATERIAL OF VERY HIGH RESOLUTION, (3) SCATTERING FUNCTION, (4) COARSE POLARIMETRY, (5) OCCULATION - OPTICAL DEPTH, AND (6) DISTINGUISHING DIFFERENT TYPES OF MATERIAL IN THE RINGS, OTHER OBJECTIVES ARE TO SEARCH FOR NEW COMETS, ASTEROIDS, AND TARGETS OF OPPORTUNITY.

----- VOYAGER 2, VOGT-----

INVESTIGATION NAME- HIGH- AND MODERATELY LOW-ENERGY LOSMIC-RAY TELESCOPE

NSSOC ID-	77-076A-08	INVESTIGATIVE PROGRAM Code SL
		INVESTIGATION DISCIPLINE(S) Cosnic Rays Magnetospheric Physics
PERSONNEL		ANDREIDSPHERIC PAISILS
P1 - R.E	. VOGT	CALIF I"ST OF TECH
01 - J.R	JOKIPII	U OF ARIZONA

01	-	W.R.	WEBBER	U OF NEW HAMPSHIRE
			TRAINOR	NASA-GSFC
			TEEGARDEN	NASA-GSFC
01	-	F.8.	HCDONALD	NASA-GSFC
			STONE	CALIF INST OF TECH
			JOKIPII	U OF ARIZONA

01 - W.R. WEBBER U OF NEW HARPSHIKE BRIEF DESCRIPTION THIS INVESTIGATION STUDIES THE ORIGIN AND ACCELERATION PROCESS, LIFE HISTORY, AND DYNAMIC CONTRIBUTION OF INTERSTELLAR COSMIC RAYS, THE NUCLEOSYNTHESIS OF ELEMENTS IN COSMIC-RAY SOURCES, THE BHAVIOR OF COSMIC RAYS IN THE INTERPLANETARY MEDIUN, AND THE TRAPPED PLANETARY ENERGETIC PAAFICLE ENVIRONMENT, THE INSTRUMENTATION INCLUDES A HIGH-ENERGY TELESCOPE SYSTEM (HETS) AND A LOW-ENERGY TELESCOPE SYSTEM (LETS). THE HETS COVERS AN ENERGY RANGE BETWEEN 6 AND 500 MEV/NUCLEON FOR NUCLEI RANGTHG IN ATOMIC NUMBERS FROM 1 THROUGH 30. IN ADDITION ELECTRONS IN THE ENERGY RANGE BETWEEN 3 AND 100 MEV/NUCLEON ARE MEASURED BY THIS TELESCOPE AND AN ELECTRON TELESCOPE (TET). THE LETS MEASURES THE ENERGY AND DETERMINES THE IDENTITY OF NUCLEI FOR ENERGIES BETWEEN .15 AND 30 MEV/NUCLEON ARD ATOMIC NUMBERS FROM 1 TO 30. THE INSTRUMENTS ALSO MEASURE THE AMISOTROPIES OF ELECTRONS AND NUCLEI. IN ADDITION, ELECTRONS IN THE ENERGY RANGE BETWEEN 3 AND 100 MEV/NUCLEON AND ATOMIC NUMBERS FROM 1 THSTRUMENTS ALSO MEASURE THE AMISOTROPIES OF ELECTRONS AND NUCLEI. IN ADDITION, ELECTRONS IN THE ENERGY RANGE BETWEEN 3 AND 100 MEV/NUCLEON AND ATOMIC NUMBERS FROM 1 TO 30. THE INSTRUMENTS ALSO MEASURE THE AMISOTROPIES OF ELECTRONS AND NUCLEI. IN ADDITION, ELECTRONS IN THE ENERGY RANGE BETWEEN 3 AND 100 MEV/NUCLEON ARD MEASURED BY AN ELECTRON THE ESCOPE (TET).

-- VOYAGER 2, WARWICK

INVESTIGATION NAME- PLANETARY RADIO ASTRONOMY

NS5DC 10- 77-0764-10

INVESTIGATIVE PROGRAM Code SL

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS Space plasmas

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PERSONNEL

PI	-	J.W.	WARWICK	U OF COLORADO
10	-	₩.€.	BROWN, JR.	NASA-JPL
01	-	S.	GULKIS	NASA-JPL
10	-	ċ.c.	HARVEY	PARIS OBSERVATORY
01	-	۲.	LEBLANC	MEUDON OBS
01	-	D., H.,	STAELIN	MASS INST OF TECH
101	-	A.,	BOISCHOT	MEUDON OBS
01	-	T.D.	CARR	U OF FLORIDA
01	•	F.T.	HADDOCK	U OF MICHIGAN
10	-	3.K.	ALEXANDER, JR.	NASA-GSFC
01	-	R	PHILLIPS	NASA-JPL

BRIEF DESCRIPTION RECEIVER OPERATING IN BOTH POLARIZATION STATES, BETWEEN 20 KHZ AND 40.5 MHZ. THE SIGNAL IS RECEIVED BY A PAIR OF ORTHOGONAL 10-M MONOPOLE ANTENNAS. THE PHYSICS OF MAGNETOSPHERIC PLASMA RESONANCES AND NONTHERMAL RADIO EMISSIONS FROM THESE PLANETARY REGIONS IS STUDIED BY INVESTIGATION OF THE RADIO EMISSION SIGNALS FROM JUPITER AND SATURN OVER THIS RANGE OF FREQUENCIES.

DESCRIPTIONS OF PLANNED SPACECRAFT AND EXPERIMENTS

3

3. DESCRIPTIONS OF PLANNED SPACECRAFT AND EXPERIMENTS

This section contains descriptions of spacecraft and experiments pertinent to this report that were planned as of June 30, 1977, and for which NSSDC has at least minimal documentation. A few changes subsequent to this date may appear, depending on time availability. The descriptions are sorted first by spacecraft common name. Within each spacecraft listing, experiments are ordered by the principal investigator's or team leader's last name. Explorer spacecraft prelaunch generic names are used as common names; e.g., IMP-H instead of Explorer 47. If the common name, as used by NSSDC, is not known, it can be found by referring to an alternate name found in the Index of Active and Planned Spacecraft and Experiments (Section 4).

Each spacecraft or experiment entry in this section is composed of two parts -- a heading and a brief description. The headings list characteristics of satellites and experiments. Definitions of many of the terms used in this section are included in Appendix C.

3.1 Contents of Spacecraft Entries

The heading for each spacecraft description in this section includes a set of initial or planned orbit parameters. These parameters consist of orbit type, orbit period, apoapsis, periapsis, and inclination for the spacecraft. No orbit parameters are listed for lander and flyby missions. In addition, the heading contains the spacecraft weight, launch date, launch site, launch vehicle, spacecraft common and alternate names, NSSDC ID code, sponsoring country and agency, and spacecraft personnel -- project manager (PM), project scientist (PS), program manager (MG), program scientist (SC), technical director (TD), and program director (PD). The spacecraft brief description is immediately below each heading. This terminology is standard for NASA missions; the equivalent functions for the missions of other countries and/or agencies have been given the same position names.

3.2 Contents of Experiment Entries

Each experiment entry heading includes the experiment name, the NSSDC ID code, the investigative program, the investigation discipline, and the name and affiliation or location of the principal investigator (PI) or team leader (TL) for the experiment as well as other investigators (OI) or team members (TM) associated with the experiment. The experiment brief description is immediately below each heading.

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3.3 Planned Spacecraft and Experiment Descriptions

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A spacecraft is included in the planned section of this report if it is an approved mission or a proposed mission where the experiments or investigations have already been selected.

PERSONNEL U OF TOKYO P1 - K. NISHI BRIEF DESCRIPTION THIS EXPERIMENT USES A BRAGG SPECTROMETER TO STUDY THE SPECTROSCOPY OF X-RAY EMISSION LIMES FROM HIGHLY IONIZED IRON IN SOLAR FLARES. THE SPECTRUM COVERED IS IN THE RANGE OF 1.5-2.0 A. WAVE LEMOTH SCANNING IS ACK.EVED BY SPACECRAFT ROTATION WITH THE SPIN-AXIS OFFSET SLIGHTLY FROM THE SUN. THE TIME RESOLUTION IS 6 S. BRIEF DESCRIPTION SPACECRAFT COMMON NAME- ASTRO-A Alternate Names-NSSDC ID- ASTRO-A LAUNCH DATE- 04/00/81 Launch Site- Kagdshima, Japan Launch Vehicle- M-35 WEIGHT- 120, KG --- ASTRO-A- TAKAKURA--INVESTIGATION NAME- SOLAR FLARE X-RAYS IN RANGE OF 10-60 KEY USING ROTATING COLLIMATOR IMAGING SPONSORING COUNTRY/AGENCY ISAS **JAPAN** PLANNED ORBIT PARAMETERS Orbit type- Geocentric Orbit Period- 94.2 Nin Periapsis- 350. KM INVESTIGATIVE PROGRAM Scientific satellite NSSDC ID- ASTRO-A-01 INCLINATION- 31, DEG APOAPSIS- 600. KM INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS PERSONNEL U OF TOKYO U OF TOKYO PH - Y. PS - 2. TANAKA PERSONNEL PI - T. SUEMOTO U OF TOKYO TAKAKUHA BRIEF DESCRIPTION BRIEF DESERTIONE THE MISSION OF ASTRO-A IS TO MAKE OBSERVATIONS OF Solar-Flare radiations during the Next Solar Naximum Period-BRIEF DESCRIPTION THIS EXPERIMENT USES ROTATING MODULATION COLLIMATORS TO IMAGE SOLAR FLARE X-RAYS IN THE ENERGY RANGE OF 10 TO 60 KEV. THE TIME RESOLUTION IS 6 SEC. ----- ASTRO-A, HIRAO--- ASTRO-A, TAKECUHI------INVESTIGATION NAME- ELECTRON DENSITY AND TEMPERATURE PLASMA INVESTIGATION NAME- ELECTRON FLUX ABOVE 100 KEV PARTICLE Detector monitor PROBES INVESTIGATIVE PROGRAM NSSDC 10- ASTRO-A-06 INVESTIGATIVE PROGRAM NSSDC ID- ASTRO-A-OS SCIENTIFIC SATELLITE SCIENTIFIC SATEULITE INVESTIGATION DISCIPLINE(S) IONOSPHERES AND RADIO PHYSICS Space plasmas IN/ESTIGATION DISCIPLINE(S) Solar Physics Particles and Fields PERSONNEL U OF TOKYO U OF TOHOKU PERSONNEL PI - K. PI - H. HIRAC INST PHYS + CHEM RES PI - H. TAKECUHI QYA BRIEF DESCRIPTION This experiment uses a particle detector to monitor solar Electron flux above 100 kev. BRIEF DESCRIPTION DESCHIPTION This experiment uses plasma probes to measure electron T and electron temperature during the solar maximum DENSITY PERIOD. - ASTRO-A, KONDO-----SPACEGRAFT COMMON NAME- EXOS-A Alternate Names- Exospheric Sat. A INVESTIGATION NAME- SOLAR FLARE GAMMA-RAY DETECTOR IN 0.4-7 MEV RANGE NSSDC ID- EXOS-A INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE NSSDC ID- ASTRO-A-04 LAUNCH DATE- 01/00/78 Launch Site- Kagoshima, Japan Launch Vehicle- M-3H **HETGHT- 95. KG** INVESTIGATION DISCIPLINE(S) Solar Physics SPONSORING COUNTRY/AGENCY PERSONNEL PI - 1. ISAS JAPAN U OF TOSTO KONDO PLANNED ORBIT PARAMETERS Orbit type- geocentric orbit period- 137. Min Periapsis- 350. KM BRIEF DESCRIPTION This experiment measures gamma rays from solar flares in The energy range of 0.4-7.0 MeV. INCLINATION- 65. DEG Apoapsis- 4500. KM -- ASTRO-A, MATSUCKA--PERSONNEL PM - K. U OF TOKYO HIRAO INVESTIGATION NAME- TIME PROFILE AND SPECTRA OF X-RAY FLARES IN THE 2-60 KEV RANGE BRIEF DESCRIPTION THIS SATELLITE IS PART OF JAPAN'S CONTRIBUTION TO THE INTERNATIONAL MAGNETOSPHERIC STUDY. THE DBJECTIVES ARE TO STUDY THE POLAR AURORA AND IDNOSPHERE. THE PAYLOAD CONSISTS OF AN AURORAL EUW TELEVISION CAMERA AND PLASMA PROBES DESIGNED TO STUDY THE ELECTRON AND ION DENSITY/TEMPERATURE AND ION COMPOSITION. THERE ARE ALSO ENERGETIC PARTICLE DETECTORS DESIGNED TO SJUDY THE FLUX OF ELECTRONS IN THE IONOSPHERE. ELECTROSTATIC WAVES, VLF EMISSIONS, GEOCORONA EMISSIONS, AND UV ALBEDO EMISSIONS ARE ALSO OBSERVED. INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE NSSDC ID- ASTRO-A-03 INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS PERSONNEL PI - M. MATSUOKA U OF TOKYD BRILF DESCRIPTION THIS EXPERIMENT USES X-RAY MONITORS TO RECORD TIME PROFILES AND SPECTRUM OF SOLAR X-RAY FLARES IN THE ENERGY RANGE OF 2-60 KEV--- EXOS-A, KANEDA--INVESTIGATION NAME- UV AURORAL TV IMAGING INVESTIGATIVE PROGRAM Scientific satellite NSSDC ED- EXOS-A -03 -- ASTRO-A, NISHI-----INVESTIGATION NAME- SOLAR FLARE X-RAY BRAGG SPECTROSCOPY IN 1.5-2.0 A RANGE INVESTIGATION DISCIPLINE(S) Atmospheric Physics INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE NSSDC 10- ASTRO-A-02 PERSONNEL U OF TOKYO U OF TOKYO P1 - E. 01 - N. KANEDA RIVA INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS ORIEF DESCRIPTION THIS EXPERIMENT OBSERVES UV AURORAL EMISSIONS OF THE POLAR IONOSPHERE BY USING TELEVISION. . .

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BRIEF DESCRIPTION THIS SATELLITE IS PART OF THE JAPANESE CONTRIBUTION TO THE INTERNATIONAL MAGNETOSPHERIC STUDY. THE SATELLITE STUDIES THE PLASMASPHERE UP TO GEOCENTRIC DISTANCES OF 30,000 KM. ITS PLASMA EXPERIMENTS STUDY THE ELECTRON/ION DENSITY AND NAVE PARTICLE INTERACTIONS. THE SPACEGRAFT CARRIES ENERGETIC PARTICLE DETECTORS TO STUDY THE ELECTRON AND PROTON FLUX IN THE ENERGY RANGE 50 TO 20,000 EV. IT ALSO CARRIES ELECTROMAGNETIC FIELD FLUCTUATION DETECTORS. ----- EXOS-A, HUKAI-----INVESTIGATION NAME- ENERGETIC PARTICLE DETECTORS INVESTIGATIVE PROGRAM Scientific Satellite NSSDC ID- EXOS-A -02 INVESTIGATION DISCIPLINE(S) Particles and fields Magnetospheric physics - EXOS-B. ADYAMA-PERSONNEL PI - T. NUKAI U OF TOKYO INVESTIGATION NAME~ FLUXGATE MAGNETOMETER BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO MEASURE THE FLUX OF Electrons and protons in the magnetosphere, using energetic particle detectors, especially in the polar regions. NSSDC 10- EXOS-8 -05 INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Particles and fields EXOS-A> NAKAMURA-PERSONNEL PI - I. 01 - A. 01 - F. INVESTIGATION NAME- UV GLOW SPECTROPHOTOMETER TOKAI U Tokyo u Tokai u AUYANA INVESTIGATIVE PROGRAM Scientific satellite NSSDC ID- EXOS-A -05 NISHIDA Toyama BRIEF DESCRIPTION MAGNETIC FIELD INTENSITIES ARE MEASURED USING A FLUXGATE Magnetometer with accuracy of Several Gammas. PC-1 pulsation Across the plasmapause is studied. INVESTIGATION DISCIPLINE(S) ASTRONOMY PLANETARY ATMOSPHERES PERSONNEL U OF TOKYO U OF TOKYO - EXOS-B, KAWASHIMA-----P1 - M. 01 - T. NAXAMURA TOHNATSU INVESTIGATION NAME- ENERGY SPEC.OF ELEC.-PROT.(.05-20KEV) BRIEF DESCRIPTION ULTRAVIOLET ULTRAVIOLET GLOW FRON THE THERMOSPHERE, MAGNETOSPHERE, AND INTERPLANETARY SPACE ARE OBSERVED WITH A SPECTROPHOTOMETER. NSSDC 10- EXOS-B -06 INVESTIGATIVE PROGRAM BIOSCIENCE INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS SPACE PLASMAS ----- EXOS-A, DYAMA-----INVESTIGATION NAME- IONOSPHERIC PROBES PERSONNEL U OF TOKYO U OF TOKYO U OF TOKYO U OF TOKYO U OF TOKYO U OF TOKYO INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE NSSDC ID- EXOS-A -01 PI - N. 01 - T. 01 - T. 01 - M. KAWASHIMA MUƘAI ARAƘAWA INVESTIGATION DISCIPLINE(S) IONOSPHERES EJIAI 01 — Н. 01 — Т. KUBD Kibune PERSONNEL BRIEF DESCRIPTION THE ELECTRON AND PROTON ENERGY SPECTRUM IS MEASURED IN AN ENERGY RANGE FROM 50 EV TO 20 KEV. THE RESOLUTION IS CONTROLLABLE. THE FINE STRUCTURE OF TIME VARIATION OF THE ENERGY SPECTRUM IS DETECTED AS A COOPERATING OPERATION WITH THE SIMULATED PLASMA-WAVE EXPERIMENT. РІ — К. 01 — І. OYANA U OF TOKYO Radio Research Lab INAMOTO BRIEF DESCRIPTION IONOSPHERIC IONOSPHERTC PROBES OBSERVE ELECTRON DENSITY AND TEMPERATURE IN ADDITION TO ION DENSITY, COMPOSITION, AND TEMPERATURE. EXOS-B, KAWASHIMA------ EXOS-A, YOSHINO-----INVESTIGATION NAME- WAVE-PARTICLE INTERACTIONS INVESTIGATION NAME- PLASMA WAVE DETECTOR NSSOC ID- EXOS-B -07 INVESTIGATIVE PROGRAM INVESTIGATIVE PROGRAM Scientific satellite NSSDC ID- EXOS-A -04 BIOSCIENCE INVESTIGATION DISCIPLINE(S) Particles and fields INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS SPACE PLASMAS PERSONNEL PERSONNEL PI - T. 01 - Y. YOSHINO U OF ELECTRO-COMMUN U of Tokyo PI - N. 01 - M. KAWASHIMA U OF TOKYO NAKAMURA EJIRI BRIEF DESCRIPTION Ejection of the electron beam in an energy range from 3 to 200 eV into the space plasma is designed for the controlled generation of the wave-particle interaction. BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO MEASURE ELECTROSTATIC WAVES AND VLF EMISSIONS EXCITED IN THE POLAR REGIONS. - EXOS-8, KIMURA-INVESTIGATION NAME- ELECTROMAGNETIC FIELD FLUCTUATION Detectors SPACECRAFT COMMON NAME+ EXOS-B Alternate Names- Exospheric Sat. B INVESTIGATIVE PROGRAM BIOSCIENCE NSSOC ID- EXOS-8 -03 NSSDC ID- EXOS-9 LAUNCH DATE- 01/00/79 Launch Site- Kagoshina, Japan Launch Vehicle- M-35 WEIGHT- 85. KG INVESTIGATION DISCIPLINE(5) MAGNETOSPHERIC PHYSICS Ionospheres and radio physics SPONSERING COUNTRY/AGENCY PERSONNEL ISAS **JAPAN** PI - 1. 01 - K. KINURA KYOTO U PLANNED ORBIT PARAMETERS ORBIT TYPE- GEDCENTRIC ORBIT PERIOD- 517. MIN PERIAPSIS- 300. KM HASHIMOTO KYOTO U BRIEF DESCRIPTION THE PHASE SHIFT OF THE VLF WAVES TRANSMITTED FROM THE EARTH'S STATIONS IS DETECTED FOU MEASUREMENT OF THE PLASMA DENSITY AND TEMPERATURE. DUCT FORMATION AND MOVEMENT IN THE PLASMASPHERE IS ALSO MONITORED BY THIS EXPERIMENT. INCLINATION- 30. DEG APOAPSIS- 30000. KH PERSONNEL PH - T. PS - N. PS - H. DBAYASHI Kawashima Dya U OF TOKYO U OF TOKYO U OF TOHOKU

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---- EXOS-B, OBAYASHI-----PERSONNEL PM - PROF. ODA INVESTIGATION NAME- INPEDANCE AND ELECTRIC FIELD U OF TOKYO RSSDC ID- EXOS-8 -04 BRIEF DESCRIPTION THE PURPOSE OF THIS SPACECRAFT IS TO MONITOR CHARGED PARTICLES AND X-RAY, GAMMA-RAY, UV, AND IR RADIATION FROM THE SUN AND GALAXIES. THE SPACECRAFT IS PUT INTO A CIRCULAR ORDIT OF 500-KM ALTITUDE AND IS CAPABLE OF PRECISE ATTITUDE CONTROL. FIVE DETECTOR SYSTEMS ARE USED TO ATTAIN THE GOALS OF THIS MISSION -- X-RAY TELESCOPES, A GAMMA-RAY TELESCOPE, A UV TELESCOPE, AN IR TELESCOPE, AND ENERGETIC PARTICLE DETECTORS. BRIEF DESCRIPTION INVESTIGATIVE PROGRAM BIOSCIENCE INVESTIGATION DISCIPLINE(S) Particles and fields Ionospheres and radio physics PERSONNEL PI - T. DI - M. DI - K. DI - T. OBAYASHI Ejiri U OF TOKYO U OF TOKYO U OF TOKYO Kyoto U -- EXOS-C, UNKNOWN-----TSURUDA OGAWA INVESTIGATION NAME- X-RAY AND GAMMA-RAY ASTRONOMICAL Telescopes BRIEF DESCRIPTION IMPEDANCE OF A DIPOLE ANTENNA IS MEASURED IN A WIDE FREQUENCY RANGE FROM 3 KHZ TO 10 MHZ TO OBTAIN AN ACCURATE DETERMINATION OF PLASHA DENSITY. THE ELECTRIC FIELD IS MEASURED BY A LONG DIPOLE ANTENNA (120 M TIP TO TIP) IN A FREQUENCY RANGE FROM DC TO 200 HZ. NSSDC ID- EXOS-C -01 INVESTIGATIVE PROGRAM BIOSCIENCE INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY GAMMA-RAY ASTRONOMY ----- EXOS-8, 0YA-----INVESTIGATION NAME- MAGNETOSPHERIC PLASMA PROBE PERSONNEL ér -UNKNOWN NSSOC 10- EXOS-B -01 INVESTIGATIVE PROGRAM BRIEF DESCRIPTION BIOSCIENCE THIS EXPERIMENT OBSERVES ASTRONOMICAL SOURCES WITH X-RAY AND GAMMA-RAY TELESCOPES. INVESTIGATION DISCIPLINE(S) Particles and fields Space plasmas Iongspheres and radio physics -- EXOS-C, UNKNOWN----INVESTIGATION NAME- ULTRAVIOLET TELESCOPE PERSONNEL PI - H. 0I - T. 0I - S. 0I - A. 0I - K. NSSOC 10- EXOS-C -O2 OVA Kamada Miyatake Horioka U OF TOHOKU Nagoya u Electro-communicatns u U of tohoku RRL-Posts + telecomm INVESTIGATIVE PROGRAM BIOSCIENCE INVESTIGATION DISCIPLINE(S) ATK YO GRIEF DESCRIPTION THE EXPERIMENT IS DESIGNED TO EXCITE PLASMA WAVES BY TRANSMITING 400-WATT SIGNALS FROM A 120 M (TIP) ANTENNA IN A FREQUENCY RANGE FROM 3 KHZ TO 10 MHZ. THE IMPRESSED FREQUENCIES CAN BE CHANGED IN A CONTINUOUS SWEEF OR STEPPED THROUGH FIXED FREQUENCIES TO INVESTIGATE THE RF HEATING EFFECT AND GENERATION OF INSTABILITIES. INVESTIGATION OF THE WAVE-WAVE INTERACTIONS AND MONLINEAR WAVE-PARTICLE INTERACT:ONS IS ONE OF THE PRINCIPAL PURPOSES OF THIS EXPERIMENT. BRIEF DESCRIPTION PERSONNEL PI -UNKNOWN BRIEF DESCRIPTION THIS EXPERIMENT IS USED TO OBSERVE ASTRONOMICAL OBJECTS In the UV Region of the spectrum. - EXOS-C, UNKNOWN------INVESTIGATION NAME- INFRARED TELESCOPE ----- EX05-8, OYA-----NSSDC ID- EXOS-C -03 INVESTIGATIVE PROGRAM BIOSCIENCE INVESTIGATION NAME- NATURAL PLASMA WAVES INVESTIGATION DISCIPLINE(S) NSSDC 10- EXOS-B -02 INVESTIGATIVE PROGRAM ASTRONOMY BIOSCIENCE PERSONNEL PI -. INVESTIGATION DISCIPLINE(5) PARTICLES AND FIELDS Space plasmas UNKNOWN BRIEF DESCRIPTION BRIEF DESCRIPTION THIS EXPERIMENT IS USED TO OBSERVE ASTRONOMICAL OBJECTS IN THE INFRARED REGION OF THE SPECTRUM. PERSONNEL PI - H. 01 - H. 01 - J. 01 - J. 01 - A. 01 - T. 01 - T. OYA Matsumoto U OF TOHOKU Kyoto u - EXOS-C, UNKNOWN------OUTSU IWAI Yoshino Ondoh NAGOYA U Nagoya U Nagoya U U of Electro-Commun RRL/Posts 4 Telecomm INVESTIGATION NAME- ENERGETIC PARTICLES NSSDC ID- EXOS-C -04 INVESTIGATIVE PROGRAM BIOSCIENCE BRIEF DESCRIPTION THE NATURAL PLASMA WAVES ARE MEASURED IN THREE FREQUENCY BANDS -- 3 TO 3D KH2, 3D TO 3DD KH2, AND 3OD KH2 TO 1D MH2, RESPECTIVELY, USING A 12D M (TIP TO TIP) DIPOLE AND LOOP PURPOSES. INVESTIGATION DISCIPLINE(S) Particles and fields Cosmic Rays PERSONNEL UNKNOWN BRIEF DESCRIPTION UNIEF DESURIFIION THE PURPOSE OF THIS EXPERIMENT IS TO MEASURE ENERGETIC CHARGED PARTICLES OF BOTH SOLAR AND GALACTIC ORIGIN. SPACECRAFT COMMON NAME- EXOS-C Alternate Names- ExoSpheric Sat. C ************************ NSSOC ID- EXOS-C LAUNCH DATE- 01/00/78 Launch Site- Kagoshina, Japan Launch Vehicle- M-45 SPACECRAFT COMMON NAME- GOES-C Alternate Names-WEIGHT- 100, KG NSSDC ID- GOES-C SPONSORING COUNTRY/ALENCY LAUNCH DATE- 07/00/78 Launch Site- cape canaveral, united states Launch vehicle- delta JAPAN ISAS WEIGHT- 294, KG PLANNED ORBIT PARAMETERS DRBIT TYPE- GEOCENTRIC ORBIT PERIOD- 94.5 MIN PERIAPSIS- 500. KM SPONSORING COUNTRY/AGENCY United States United States INCLINATION-0FG NDAA-NESS NASA-OA 500. KM APOAPSIS-

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PLANNED ORBIT PARAMETERS DRBIT TYPE- GEOCENTRIC Orbit Period- 1440. Min Periapsis- 35786. Km

PERSONNEL PM - R.H. PIGKARD PS - W.E. SHENK

 $= \frac{1}{2} \sum_{i=1}^{n} \sum_{j=1}^{n} \sum_{i=1}^{n} \sum_{i=1}^{n} \sum_{j=1}^{n} \sum_{i=1}^{n} \sum_{i=1}^{n} \sum_{j=1}^{n} \sum_{i=1}^{n} \sum_{i=1$

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PM - R.H. PICKARD PS - W.E. SHERK BRIEF DESCRIPTION GOES-C IS A NASA-DEVELOPED, NOAA-OPERATED SPACECRAFT. THE SPIN-STABILIZED, EARTH-SYNCHRONOUS SPACECRAFT CARRIES (1) A VISIBLE-INFRARED SPIN-SCAN RADIOMETER (VISSR) TO PROVIDE HIGH-GUALITY DAY/NIGHT. CLOUDCOVER DATA AND TO TAKE RADIANCE TEMPERATURES OF THE EARTHAINOSPHERE SYSTEM, (2) A METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM TO RELAY PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL APT-EQUIPPED REGIONAL STATIONS AND TO COLLECT AND RETRANSIT DATA FROM REMOTELY LOCATED EARTH-BASED PLATFORMS, AND (3) A SPACE ENVIRONMENT MONITOR (SEM) SYSTEM TO MEASURE POTON, ELECTRON, AND SOLAR K-RAY FLUXES AND MAGNETIC FIELDS. THE CYLINDRIM EMOTELY LOCATED ISANDWARD TO THE COLLECT NON RETRANSIT UBE, THE VISSR TELESCOPE IS MOUNTED ON THE COLUMNET SHELF AND VIEWS THE EARTH HANDERD SPACECRAFT MEASURES 190.5 CM IN DIAM AND STRUCTURAL MEMBERS ARE A HONEYCOMBED EQUIPMENT SHELF AND THRUST TUBE, THE VISSR TELESCOPE IS MOUNTED ON THE COLUMENT SHELF AND VIEWS THE EARTH HANDERD SPACECRAFT MASSIES 100 THE SALLY OUT FROM THE THRUST TUBE AND IS AFFIXED TO THE SOLAR PARELS, WHICH FROM THE THRUST TOBE AND IS AFFIXED TO THE SOLAR PARELS, WHICH FROM THE THRUST TOBE AND IS AFFIXED TO THE SOLAR PARELS, WHICH FROM THE STRUCTURE SALE AND STORED FOR THUES THELF AND VIEWS THE EARTH THROUGH A SPECIAL APERTURE IN THE FROM THE THRUST TOBE AND AS AFFIXED TO THE SOLAR PARELS, WHICH FROM THE THRUST TOBE AND AS AFFIXED TO THE SOLAR PARELS, WHICH FROM THE STRUCTURE MALLS OF THE SPACECRAFT TOBE AND THELF AND ULES SHOP AND AS AFFIXED TO THE SOLAR PARELS, WHICH FROM THE STATIONKEEPING AND DYNAMICS CONTROL EQUIPMENT SHELF AND SUURCE OF ELECTRICAL POWER.L DOATED IN THE PATHELS, AND MOST OF THE SEM EQUIPMENT. PROPER SPACECRAFT ANTIONS SHAPE STATION AND ACTIVATED IN THE MAINTAINED BATTERIES, AND MOST OF THE SEM EQUIPMENT.PROPER SPACECRAFT ANTION SEPARTE SETS OF JET THRUST ENDINGER MAINTAINED BATTERIES, AND NOST OF THE SEM EQUIPMENT.PROPER SPACECRAFT AND ACTIVATE

INVESTIGATION NAME- VISIBLE-INFRARED SPIN-SCAN RADIOMETER (VISSR)

NSSDC 10- GOES-C -01

INVESTIGATIVE PROGRAM Operational Environ, Monitoring

INVESTIGATION DISCIPLINE(S) Meteorology

PERSONNEL PI -NESS STAFF BRIEF DESCRIPTION

NOAA-NESS

P1 - NESS STAFF NOAA-NESS BRIEF DESCRIPTION THE VISIBLE IMMARED SPIN SCAN RADIOMETER (VISSR) FLOWM ON GOES-C IS CAPABLE OF PROVIDING BOTH DAY AND MIGHT OBSERVATIONS OF CLOUD COVER AND EARTH/CLOUD RADIANCE COMPETENTIAL MEASUREMENTS FROM A SYNCHROMOUS SPIN-STABILLIZED AND FORECASTING. THE FOR USEIN OPERATIONAL WEATHER ANALYSIS AND FORECASTING. THE TWO-CHANNEL INSTRUMENT IS ABLE TO TAKE BOTH FULL AND PARTIAL PICTURES OF THE EARTH'S DISK. BOTH THE INFRARED CHANNEL (10.5 TO 12.5 MICRONOUS DPIN-STABILLIZED INFRARED CHANNEL (10.5 TO 12.5 MICRONOUS CONTONING THE VISIBLE CHANNEL (0.55 TO 0.75 MICRON) USE A COMMON OPTICS SYSTEM. INFORM AND COLLECTED BY A RICHEY-CARETIEN OPTICALLY-SHAPED SCAN MIRROR IS SET AT A NOATHAL ANGLE OF 45 DEG TO THE VISS OPTICAL AXIS, WHICH IS ALIGNED PARALLEL TO THE SYSTEM. THE SCAN MIRROR IS SET AT A NOATHAL ANGLE OF 45 DEG TO THE VISS OPTICAL AXIS, WHICH IS ALIGNED PARALLEL TO THE SYSTEM. THE SPACECRAFT. THE SPINNING MOTION OF THE SPACECRAFT (APPROXIMATELY 100 RHM) PROVIDES A WEST-TO-FASTS SCAN MOTION HE EARTH'S AXIS. THE LATIVOTAL SCAN IS ACCOMPLISHED BY COMPLETE AND ABOUT 2 MIN TO RETRACE. OURING EACL SCAN, EIGHT WISH HE SPIN AXIS OF THE SPACECRAFT IS ORIENTED PARALLEL WITH SEQUENTIALLY TILLING THE SCANNING MIRROR NOATH TO SOUTH AT THE COMPLETE AND ABOUT 2 MIN TO RETRACE. OURING EACL SCAN, EIGHT WISH AT SCALL THE INFRARED PORTION OF THE SPECTRUM NITH A HORIZONAL RESOLUTION OF APPROXIMATELY 9 KM AT ZERO RESOLUTION OF 0.9 K AT ZERO MADIA ANGLE. A MERUMY-CADHUM WITH A HORIZONAL RESOLUTION OF APPROXIMATELY 9 KM AT ZERO RADIANCE TEMPERATURES BETWEEN 180 AND 315 DEG K WITH A TREO SUBJECTIVE BETWEEN 0.4 AND 14 ANGLE. A MERUMY-CADHUM NITH A HORIZONAL RESOLUTION OF APPROXIMATELY 9 KM AT ZERO RADIANCE TEMPERATURES BETWEEN 180 AND AND ATA ACQUISITION NITH A HORIZONAL RESOLUTION OF APPROXIMATELY 9 KM AT ZERO RADIANCE TEMPERATURES BETWEEN 180 AND AND AND TRANSMITTED TO THE ARE SIGNAL IS FEDETION NAD FRANSMITTED TO THE NAA AND EVENTIALLY SENTION STATION, WALLOPS ISLAND, VA. THERE THE SIGNAL IS FEDETCHEM F

GOES-C, NESS STAFF------

INVESTIGATION NAME- METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM

NASA-GSFC NASA-GSFC

NSSDC ID- GOES-C -05

INVESTIGATIVE PROGRAM Operational Environ. Monitoring INVESTIGATION DISCIPLINE(5)

NOAA-NESS

METEOROLOGY

PERSONNEL P1 -NESS STAFF

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE METEOBOLOGICAL DATA COLLECTION AND IRANSWISSION SYSTEM IS AN EXPERIMENTAL COMMUNICATIONS AND DATA HANDLING SYSTEM DESIGNED TO RECEIVE AND PROCESS METEOROLOGICAL DATA COLLECTED FROM REMOTILY LOCATED EARTH-BASED DATA COLLECTION (DOSERVATION) PLATFORMS (DCP). THE COLLECTED DATA ARE REFERNSMITTED FORM THE SATELLITE TO SMALL, GROUND-BASED, STATIONS CAN BE HANDLED BY THE SYSTEM. THE SYSTEM ALSO ALLOWS CENTRALIZED WEATHER FACILITIES TO EXISTING SMALL, GROUND-BASED STATIONS CAN BE HANDLED BY THE SYSTEM. THE SYSTEM ALSO ALLOWS CENTRALIZED WEATHER FACILITIES TO EXISTING SMALL, GROUND-BASED STATIONS CAN BE HANDLED BY THE SYSTEM. THE SYSTEM ALSO ALLOWS CENTRALIZED WEATHER FACILITIES TO EXISTING SMALL, GROUND-BASED STATIONS CAN BE HANDLED BY THE SYSTEM. THE SYSTEM ALSO ALLOWS CENTRALIZED WEATHER FACILITIES TO EXISTING SMALL, GROUND-BASED STATIONS CAN BE HANDLED BY THE SYSTEM. THE SYSTEM ALSO ALLOWS CENTRALIZED WEATHER FACILITIES TO EXISTING SMALL, GROUND-BASED STATIONS TO BE CONTACTED IN A 6-H PERIOD. SYSTEM OPERATES ON SMALL METEOROLOGICAL SATELLITE CONSISTS OF APPROXIMATELY 3SDD DFP STATIONS TO BE CONTACTED IN A 6-H PERIOD BETWEEN SOK AND 600K OITS, DEPENDING ON THE CODING TECHNIQUES. DATA RECEIVED FROM INDIVIDUAL STATIONS ON THE CODING TECHNIQUES. DATA RECEIVED FROM INDIVIDUAL STATIONS ON THE CODING TECHNIQUES. DATA RECEIVED FROM INDIVIDUAL STATIONS ON THE CODING TECHNIQUES. DATA RECEIVED FROM INDIVIDUAL STATIONS ON THE SOLO SOLO BITS, DEPENDING ON THE TYPE AND VARIETY OF SEMSORS USED AT AN INDIVIDUAL DCP

INVESTIGATION NAME- ENERGETIC PARTICLE MONITOR

NSSOC ID- GOES-C -02

INVESTIGATIVE PROGRAM Opërational Environ. Monitoring

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INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

NDAA-ERL

PERSONNEL PI - D.J. WILLIAMS

BRIEF DESCRIPTION A NUMBER OF SEPARATE SILICON SOLID-STATE DETECTORS, EACH WITH A TAILORED MODERATOR THICKNESS AND A SEPARATE ELECTRONICS UNIT FOR PULSE AMPLIFICATION AND PULSE-HEIGHT DISCRIMINATION, RE USED TO OBTAIN THE FOLLOWING PARTICLE TYPE AND ENERGY MEASUREMENTS -- SEVEN CHANNELS MEASURE ALPHA PARTICLES IN THE RANGE 1 TO 500 MEV, SIX CHANNELS MEASURE ALPHA PARTICLES IN THE RANGE 1 TO 400 MEV, AND ONE CHANNEL MEASURE ELECTRONS GREATER THAN 0.5

GOES-C, WILLIAMS------

INVESTIGATION NAME- SOLAR X-RAY HONITOR

NSSDC ID- GOES-C -03

INVESTIGATIVE PROGRAM Operational Environ. Monitoring

INVESTIGATION DISCIPLINE(S) Solar Physics

NOAA-ERL

BRIEF DESCRIPTION

PERSONNEL PI - D.J. WILLIAMS

BRIEF DESCRIPTION THE X-RAY COUNTER WAS COMPOSED OF A COLLIMATOR, TWO IONIZATION CHAMBERS, AND TWO ELECTROMETERS. A SMALL ANGULAR APERTURE WAS CHOSEN FOR THE TELESCOPE COLLIMATOR, WHICH WAS MOUNTED SO THAT THE DECLIMATION OF ITS AXIS CAN BE CONTROLLED BY GROUND COMMAND TO INSURE THAT THE SUN IS VIEWED BY THE TELESCOPE ONCE DURING EVERY VEHICLE ROTATION. ONE ION CHAMBER WAS FILLED WITH ARGON AT 1 ATM FOR DETECTION OF 1- TO 8-A X LONGER WAVELENGTHS. THE OTHER CHAMBER WAS FILLED WITH XENON AT 1.5 TO 2 ATM, AND HAS A SO-MIL BERYLLIUM WINDOW FOR MEASUREMENTS OF X RAYS IN THE WAVELENGTH RANGE 0.5 TO 3 A.

--- GOES-C, WILLIAMS------

INVESTIGATION NAME- MAGNETIC FIELD MONITOR

NSSDC ID- GOES-C -04

INVESTIGATIVE PROGRAM Operational Environ. Monitoring

INVESTIGATION DISCIPLINE(S) Magnetospheric physics Particles and fields

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NOAA-ERL

PERSONNEL .PI - D.J. WILLIAMS

BRLEF DESCRIPTION THE MAGNETOMETER IS A BIAXIAL, CLOSED-LOOP, FLUXGATE MAGNETOMETER WITH THE TWO SENSORS ALIGNED AT RIGHT ANGLES TO ONE ANOTHER, AFTER MOUNTING ON A SHORT BOOM (APROXIMATELY 2 FT) ONE SENSOR IS ALIGNED PARALLEL TO THE SPACECRAFT SPIN AXIS SELECTABLE RANGE (SD, 100, 200, DR 400 GAMMAS), AN OFFSET FIELD. CAPABILITY (PLUS OR MINUS 1200 GAMMAS IN 40-GAMMA STEPS), AN IN-FLIGHT CALIBRATION CAPABILITY.

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SPACECRAFT COMMON NAME- GOES-D Alternate names-

NS50C 10- GOES-0

Sales and

WEIGHT- 660. KG LAUNCH DATE~ 03/01/79 Launch Site- cape canaveral, united states Launch vehicle- delta

SPONSORING COUNTRY/AGENCY UNITED STATES NDAA-NESS

PLANNED ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC Orbit Peridd- 1440. Min Periapsis- 35786. Km INCLINATION- 1. DEG APOAPSIS~ 35786. KM PERSONNEL PM - R.H. PICKARD PS - W.E. SHENK NASA-GSFC NASA-GSFC

PM - R.H. PICKARD PS - W.E. SHENK BRIEF DESCRIPTION GOES-D IS THE FOURTH IN A SERIES OF NASA-DEVELOPED, NOAA-OPERATED SPACECRAFT. THE SPIN-STABILIZED, RATH-SYNCHRONDUS SPACECRAFT CARRIES (1) A VISIBLE INFRARED SPIN SCAN RADIOMETER (VISSR) ATMOSPHERIC SOUNDER (VAS) TO PROVIDE HIGH-GUALITY DAY/NIGHT CLOUDCOVER DATA, TO TAKE RADIANCE TEMPERATURES OF THE CARTH/ATMOSPHERIC SYSTEM, AND TO DETERMINE ATMOSPHERIC TEMPERATURE AND WATER CONTENT AT VARIOUS LEVELS, (2) A METEOROLOGICAL DATA COLLECTION AND TRANSMISSION LEVELS, (2) A METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM TO RELAY PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL AUTOMATIC PICTURE TRANSMISSION (APT)-GUIPPED ECOMAL STATIONS AND TO COLLE-T AND RETRANSMIT DATA FROM REMOTELY LOCATED EARTH-BASED PLATFORMS, AND (3) A SPACE ENVIRONMENT MONITOR (SEM) SYSTEM TO MEASURE PROTON, ELECTRON, AND SOLAR K-RAY FLUXES AND MAGNETIC TIELDS. THE CYLINDRICALLY SHAPED SPACECRAFT MEASURES 190.5 CM IN DIAM AND 230 CM IN LENGTH, STATIONAL BAY DROKED SOLOHENT SHELF AND VIEWS THE EARTH THROUGH A SPECIAL APERTURE IN THE EQUIPMENT SHELF AND VIEWS THE EARTH THROUGH A SPECIAL APERTURE IN THE SPACECRAFT'S SIDE. A SUPPORT STAUCTURE EXIEMDS RADIALLY FROM THE THRUST TUBE. THE VISSR TELESCOPE IS MOUNTED ON THE EQUIPMENT SHELF AND VIEWS THE EARTH THROUGH A SPECIAL APERTURE IN THE SPACECRAFT'S SIDE. A SUPPORT STAUCTURE EXIEMDS RADIALLY FROM THE THRUST TUBE. AND IS STATE TO THE SOLAR PANELS, WHICH FORMS THE OUTER WALLS OF THE SPACECRAFT TO ROVIDE THE PRIMARY SOURCE OF ELECTRICAL POWER. LOCATED IN THE ANNULLS-SHAPED SPACE BETWEEN THE THRUST TUBE AND IS SCATRUL EQUIPMENT, BATTERIES, AND MOST OF THE SEM EQUIPMENT, PROPER SPACECRAFT VISES RADIALLY FROM THE THRUST TUBE AND IS CONTROL EQUIPMENT, BATTERIES, AND MOST OF THE SEM EQUIPMENT, PROPER SPACECRAFT VISES BOTH UNF-BAND AND STIM RATE (APPROXINATELY 100 RPM) ARE ANDATED AT THUS SPARATE SETS OF JET THRUSTERS MOUNTED AROUND. THE SPACECRAFT'S EQUATOR AND ACTIVATED BY GROUNCENTREL AROUND. THE SPACE

- GOES-D, NESS STAFF-----

INVESTIGATION NAME- VISIBLE-INFRARED SPIN SCAN RADIOMETER (VISSR)

NSSDC ID- GOES-D -01

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING INVESTICA (JUS MISCIPLINE(S) NEYEONSLULT

NOAA-NESS

PERSONNEL NESS STAFF

PILSONNEL PI-0 NESS STAFF MESS LINE STRETCHER,' WHERE IT IS STORED AND TIME-STRETCHED FOR TRANSMISSION BACK TO THE SATELLITE AT REDUCED BANDWIDTH FOR Rebroadcast to apt user stations. As with all operational iype data, the vissr bata are handled by noar and eventually sent to the national climatic genter at asheville, north carolina, for THE NATI ARCHIVING

GDES-D, NESS STAFF-----

INVESTIGATION NAME- RETEOROLOGICAL DATA COLLECTION AND Transmission system

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING 1.550C 10- GOES-0 -05

INVESTIGATION DISCIPLINE(S) Meteorology

NOAA-NESS

PERSONNEL P1 -NESS STAFF

PI -NESS STAFFNOAA-NESSBRIEF DESCRIPTION
THE METEDROLOGICAL DATA COLLECTION AND TRANSMISSION
SYSTEM DESIGNED TO RECEIVE AND PROCESS METEOROLOGICAL DATA
COLLECTED FROM REMOTELY LOCATED EARTH-DASED DATA COLLECTION
COBSERVATION) PLATFORMS (DCP). THE COLLECTED DATA ARE
RETRANSMITTED FROM THE SATELLITE TO SMALL, GROUND-BASED
FREGIONAL DATA UTILIZATION CENTERS. DATA FROM UP TO 10/000 DCP
STATIONS CAN BE MANDLED BY THE SYSTEM. THE SYSTEM ALSO ALLOWS
FOR THE RETRANSMISSION OF NARROW-BAND (WEFAX TYPE) DATA FROM
CENTRALIZED WEATHER FACILITIES TO EXISTING SMALL, GROUND-BASED
AFT RECEIVING STATIONS. THIS COMMUNICATIONS SYSTEM OPERATES ON
S-BAND FREQUENCIES. THE NINUM DATA COLLECTION SYSTEM FOR ONE
STATIONS TO BE CONTACTED IN A 6-H PERIOD. THE TOTAL AMOUNT
OF DATA COLLECTED DUNING THE 6-H PERIOD. THE TOTAL AMOUNT
OF DATA COLLECTED DUNING THE 6-H PERIOD. SOAT AND ODOX
STATIONS TO BE CONTACTED IN A 6-H PERIOD. SOAT ARE USED ATA MOUNT
OF DATA COLLECTED DUNING THE 6-H PERIOD. SOAT ARE CEVED FROM
INDIVIDUAL STATIONS VARIES FROM 50 TO 3000 BITS, DEPENDING ON
THE TYPE AND VARIETY OF SENSORS USED AT AN INDIVIDUAL DCP
STATION. STATION.

--- GOES-D, WILLIAMS-----

INVESTIGATION NAME- ENERGETIC PARTICLE MONITOR

NSSDC ID- GUES-D -02

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL PI - D.J. WILLIAMS

NOAA-ERL

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE ENERGETIC PARTICLE MONITOR CONSISTS OF THREE DETECTOR ASSEMBLIES, EACH COVERING LIMITED REGIONS OF THE OVERALL ENERGY SPECTRUM. THE FIRST TWO DETECTOR ASSEMBLIES MONITOR PROTONS IN SEVEN ENERGY RANGES BETWEEN 0.8 AND SOU MEV. AND ALPHA PARTICLES IN SIX RANGES BETWEEN 4 AND .GT. 400 MEV. THERE IS ALSO ONE CHANNEL FOR THE MEASUREMENT OF ELECTRONS IN THE RANGE CONSTRUCTION .GE. 500 KEV.

- GOES-Dy WILLIAMS------

INVESTIGATION NAME- SOLAR X-RAY MONITOR

INVESTIGATIVE PROGRAM Operational environ. Monitoring NSSDC ID- GOES-D -03

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

NDAA-ERL

PERSONNEL PI - D.J. WILLIAMS

BRIEF DESCRIPTION UNIEF DESCRIPTION THE X-RAY MONITOR CONSISTS OF ION CHAMBER DETECTORS. THE RANGES AND MINIMUM USEFUL THRESHOLD SENSITIVITY ARE D.5 TO 3A, 1.66 ERG PER CM PER S AND 1 TO 8A, 1E-5 ERGS PER CM PER S WITH A DYMANIC RANGE OF 1.64.

-- GOES-D, WILLIAMS-----INVESTIGATION NAME- MAGNETIC FIELD MONITOR

NSSDC ID- GOES-0 -04

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS PARTICLES AND FIELDS

PERSONNEL PI - D.J. WILLIAMS

NOAA-ERL

BRIEF DESCRIPTION THE MAGNETOMETER HAS A RANGE OF PLUS OR MINUS 400 GAMMA (WITHOUT SATURATION) AND A RESOLUTION OF 0.1 GAMMA OVER A RANGE OF PLUS OR MINUS 50 GAMMA.

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SPACECRAFT COMMON NAME- GOES-E Alternate Names-

NSSDC ID- GOES-E

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LAUNCH DÀTE- 06/01/79 WEIGHT- 660. KG Launch Site- Cape Canaveral, United States Launch Vehicle- Delta

SPONSORING COUNTRY/AGENCY UNITED STATES NOAA~NESS

PLANNED ORBIT PARAMETERS Orbit Type- Geocemtric Orbit Period- 1440. Min Periapsis- 35786. KN INCLINATION- 1. APOAPSIS- 35766. KM 1. DEG PERSONNEL

PM - R.H. PS - W.E.	NASA-GSFC NASA-GSFC

PM - R.H. PICKARD PS - W.E. SHENK MASA-GSFC MASA-GSFC MASA-GSFC BRIEF DESCRIPTION GGES-E IS THE FIFTH IN A SERIES OF NASA-DEVELOPED, NDAA-OPERATED SPACECRAFT. THE SPIN-STABILIZED, EARTH-STYNCHRONOUS SPACECRAFT CARRIES (1) A VISIBLE INFRARED SFIN SCAR RADIJRETER (VISSR) ATMOSPHERIC SOUNDER (VAS) (O PROVIDE HIGH-GUALITY DAY/NIGHT CLOUDCOVER DATA, TO TAKE RADIANCE TEMPERATURES OF THE CARTH/ATMOSPHERIC SYSTEM, AND TO DETERMINE ATMOSPHERIC TEMPERATURE AND WATER CONTENT AT VARIOUS LEVELS, (2) A METEOROLOGICAL DATA COLLECTION AND TAANSMISSION SYSTEM TO RELAY PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMALL AUTOMATIC PICTURE TRANSMISSION (APT)-EQUIPPED REGIONAL STATIONS AND TO COLLECT AND RETRANSMISTID ATA FROM REMOTELY LOCATED EARTH-DASED PLATFORMS, AND (3) A SPACE ENVIRONMENT MONITOR (SEM) SYSTEM TO MEASURE PROTON, ELECTRON, AND SOLAR T-RAY FLUXES AND MAGNETIC FIELDS. THE CYLINDRICALLY SHAPED SPACECRAFT MEASURES 190.5 CM IN DIAM AND 230 CM IN LENGTH, EXCLUSIVE OF A MAGNETIC FIELDS. THE CYLINDRICALLY SHAPED SPACECRAFT MEASURES 190.5 CM IN DIAM AND 230 CM IN LENGTH, EXCLUSIVE OF A MAGNETIC FIELDS. THE CYLINDRICALLY SHAPED SPACECRAFT MEASURES 190.5 CM IN DIAM AND 230 CM IN LENGTH, EXCLUSIVE OF A MAGNETIC FIELDS. THE CYLINDRICALLY SHAPED SPACECRAFT MEASURES 190.5 CM IN DIAM AND 230 CM IN LENGTH, EXCLUSIVE OF A MAGNETIC FIELDS. THE CYLINDRICALLY SHAPED SPACECRAFT NEASURES 190.5 CM IN DIAM AND 230 CM IN LENGTH, EXCLUSIVE OF A MAGNETIC FIELDS. THE CYLINDRICALLY SHAPED SPACECRAFT TO PROVIDE THE THAT EXTENDS AND SUGLAR DAY THE SOLAR PANELS, WHICH FORM THE THRUST TUBE. THE VISST THE CYLINDRICAL SHELL. THE PRIMARY SURCE ON THE VISST THE SOLAR PANELS, AND THE GUIPMENT SHELF AND VIEWS THE EAST THROUGH A SPECIAL APERTURE IN THE SPACECRAFT SIGE. A SUPPORT STAUCTURE EXTENDS RADIALLY FROM THE THRUST TUBE. AND DAY AND SEPARATE SETS OF JET THRUST TUBE AND THE SPACECRAFT YS EQUATOR AND ACTIVATED BY GROUND THAND. THE SPACECRAFT MO SEPARATE SETS OF JET THRUSTERS MOUNTED AROUND THE SPACECRAFT S

-- GOES-E, NESS STAFF------

INVESTIGATION NAME- VISIBLE-INFRARED SPIN SCAN RADIOMETER (VISSE)

NSSDC 10- GOES-E -01

INVESTIGATIVE PROGRAM Operational Environ. Monitoring INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL

NOAA-NESS

NESS STAFF

PRESUMNEL PI - NESS STAFF NOAA-MESS BRIEF DESCRIPTION THE VISIBLE INFRARED SPIN SCAN RADIOMETER (VISSR) FLOWN ON GOES-E IS CAPABLE OF PROVIDING BOTH DAY AND NIGHT OBSERVATIONS OF CLOUD COVER AND EARTH/CLOUD RADIANCE TEMPERATURE MEASURGENTS FROM A SYNCHRONOUS, SPIN-STABILIZED, GEOSTATIONAR SATELLITE FOR USE IN OPERATIONAL WEATHER ANALYSIS AND FORECASTING. THE IWO-CHANNEL INSTRUMENT IS ABLE TO TAKE BOTH FULL AND PARTIAL PICTURES OF THE EARTH'S DISK. BOTH THE INFRARED CHANNEL (10.5 TO 12.5 MICRONETERS) AND THE VISIBLE CHANNEL (0.55 TO 0.75 MICRON) USE A COMMON OPTICS SYSTEM. INCOMING RADIATION IS RECEIVED BY AN ELLIPTICALLY-SHAPED SCAN MIRROR IS SEI AT A NOMINAL ANGLE OF 45 DEG TO THE VISSR OPTICAL AXIS, WHICH IS ALIGNED PARALLEL TO THE SPACECRAFT (APPROXIMATELY 100 RFM) PROVIDES A WEST-TO-EAST SCAN MOTION WHEN THE SPIN AXIS OF THE SPACECRAFT IS OPIENTED PARALLEL WITH THE EARTH'S AXIS. THE LATIUDINAL SCAN IS ACCOMPLISHED BY SCOMMITALLY TILLING THE SCANNING MIRROR NORTH TO SOUTH AT THE COMPLETE AND ABOUT 2 MIN TO RETRACE. DURING EACH SCAN, EIGHT VISIBLE-SPECTRUM DETECTORS SWEEP THE EARTH, WITH A GROUND RESOLUTION OF G.9 KM AT ZERO NADIA MAGLE, A MERCURY-CADMIUM NUTH A HORIZONAL RESOLUTION OF ARECOMPLISHED BY SCOLUTION DF 0.9 KM AT ZERO NADIA MAGLE, A MERCURY-CADMIUM NUTH A HORIZONAL RESOLUTION OF APPROXINATELY SKAN AT ZERO MADIR ANGLE. THE INFRARED PORTION OF THE DETECTOR MESURES SENSITIVITY BETWEEN 0.4 AND 1.4.K. THE VISSR OUTIAL ACQUISITION STATION, WALLOPS ISLAND, VA. THERE THE SIGNAL IS FED INTO A

LINE STRETCHER, WHERE IT IS STORED AND TIME-STRETCHED FOR TRANSMISSION BACK TO THE SATELLITE AT REDUCED BANDWIDTH FOR Redroadcast to apt user stations. As with all operational type data, the vissr data are handled by Ngaa and Eventually sent to the National Climatic Center at Asheville, North Carolina, for ARCHIVING.

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- GOES-E, NESS STAFF-----INVESTIGATION NAME- METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM

NSSDC 10- GOES-E -05 INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING INVESTIGATION DISCIPLINE(S) Meteorology

PERSONNEL NESS STAFF

PI- NESS STAFF NUMA-NESS BRIEF DESCRIPTION THE HETEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM IS AN EXPERIMENTAL COMMUNICATIONS AND DATA HANDLING SYSTEM DESIGNED TO RECEIVE AND PROCESS METEOROLOGICAL DATA COLLECTED FROM THENDTELL COATED EARTH-BASED DATA COLLECTION (OBSERVATION) PLATFORMS (DCP). THE COLLECTED DATA COLLECTION RETRANSMITTED FROM THE SATELLITE TO SMALL, GROUND-BASED, REGIONAL DATA UTILIZATION CENTERS. DATA FROM UP TO 10/000 DCP STATINS CAN BE HANDLED BY THE SYSTEM. THE SYSTEM ALSO ALLOWS FOR THE RETRANSMISSION OF NARROW-BAND CWEFAX TYPE) DATA FROM CENTRALIZED WEATHER FACILITIES TO EXISTING SMALL, GROUND-BASED APT RECEIVING STATIONS. THIS COMMUNICATIONS SYSTEM OPERATES ON S-BAND FREQUENCIES. THE MINIMUM DATA COLLECTION SYSTEM OPERATES ON S-BAND FREQUENCIES. THE SISTING SMALL, GROUND-BASED DCP STATIONS TO BE CONTACTED IN A 6-H PERIOD. THE TOTAL ANDOUNT OF DATA COLLECTED DURING THE 6-H PERIOD. THE TOTAL AND MON THE TYPE AND VARIETY OF SENSORS USED AT AN INDIVIDUAL DCP STATION. STATION

INVESTIGATION NAME- ENERGETIC PARTICLE MONITOR

NSSDC 10- GOES-E -02

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING

NOAA-ERL

NOAA-NESS

INVESTIGATION DISCIPLINE(5) PARTICLES AND FIELDS

PERSONNEL PI - D.J. WILLIAMS

BRIEF DESCRIPTION THE ENERGETIC PARTICLE MONITOR CONSISTS OF THREE DETECTOR ASSEMBLIES, EACH COVERING LIMITED REGIONS OF THE OVERALL ENERGY SPECTRUM. THE FIRST TWO DETECTOR ASSEMBLIES MONITOR PROTONS IN SEVEN ENERGY RANGES DETWEEN D.8 AND SOD NEV AND ALPHA PARTICLES IN SIX RANGES DETWEEN 4 AND .GT. 400 MEV. THERE IS ALSO ONE CHANNEL FOR THE MEASUREMENT OF ELECTRONS IN THE .GE. SOD KEV RANGE. RANGE .

INVESTIGATION NAME- SOLAR X-RAY MONITER

-- GOES-E, WILLIAMS------

INVESTIGATIVE PROGRAM Operational environ. Monitoring

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL PI - D.J. WILLIAMS

NSSDC 10- GOES-E -03

BRIEF DESCRIPTION THE X-RAY MONITOR CONSISTS OF ION CHAMBER DETECTORS. THE RANGES AND MINIMUM USEFUL THRESHOLD SENSITIVITY ARE 0.5 TO 3A, 1.E-6 ERG PER SQ CM PER S AND 1 TO 8A, 1.E-5 ERGS PER SQ CM PER S WITH A DYNAMIC RANGE OF 1.E4.

- GOES-E, WILLIAMS-

INVESTIGATION NAME- MAGNETIC FIELD MONITOR

NSSOC ID- GOES-E -04 INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING

> INVESTIGATION DISCIPLINE(\$) Magnetosphéric physics PARTICLES AND FIELDS

PERSONNEL PI - D.J. WILLIAMS

BRIEF DESCRIPTION THE MAGNETORETER WILL HAVE A RANGE OF PLUS OR MINUS 400 GAMMA (WITHOUT SATURATION) AND A RESOLUTION OF 0.1 GAMMA OVEP A RANGE OF PLUS OR MINUS SU GAMMA.

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SPACECRAFT COMMON NAME- GDES-F Alternate Names-

NSSDC ID+ GOES-F

LAUNCH DATE- 07/00/80 Launch Site- Cape Canayeral, united states Launch Vehicle- Delta WEIGHT- 660. KG

SPONSORING COUNTRY/AGENCY United States NÓAA-NESS

PLANNED ORBIT PARAMETERS Orbit type- geocentric Orbit Period- 1440. Min Periapsis- 35786. Km INCLINATION- 1 DEG APDAPSIS- 35786. KM PERSONNEL PM - R.H. PICKARD PS - W.E. SHENK NASA-GSFC NASA-GSFC

PS - W.E. SHENK NASA-GSFC BRIEF DESCRIPTION GOES-F IS THE SIXTH IN A SERIES OF NASA-DEVELOPED, NAA-DEPERATED SPACECRAFT. THE SPIN-STABILIZED, RATH-STWCHRONOUS SPACECRAFT. THE SPIN-STABILIZED, RATH-STWCHRONOUS SPACECRAFT. THE SPIN-STABILIZED, RATH-STWCHRONOUS SPACECRAFT. THE SPIN-STABILIZED, RATH-STWCHRONOUS SPACECRAFT. CARRIES (1) A VISIBLE INFRARED SPIN SCAN RADIOMETER (VISSR) ATMOSPHERIC SOUNDER (VAS) TO PROVIDE MIGH-QUALITY DAY/NIGHT CLOUDCOVER DATA, TO TAKE RADIANCE TEMPERATURES OF THE EARTH/ATMOSPHERE SYSTEM, AND TO DETERNINE ATMOSPHERIC TEMPERATURE AND NATER CONTENT AT VARIOUS EVELS, (2) A METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM TO RELAY PROCESSED DATA FROM CENTRAL WEATHER FACILITIES TO SMA.; AUTOMATIC PICTURE TRANSMISSION (APT)-EQUIPPED REGIONAL STATIONS :'NO TO COLLECT AND METRANSMIST DATA FROM REMOTELY LOCATED EAR, '-BASED PLATFORMS, AND (3) A SPACE ENVIRONMENT NONITOR (SEN) SYSTEM TO MEASURE PROTON, ELECTRON, AND SOLAR X-RAY FLUXES ANO MAGNETIC FILEDS. THE CYLINDRICALLY SHAPED SPACECRAFT MEASUR:'S 190.5 CM IN DIAM AND 230 CM IN LENGTH, NONITOR (SEN) SYSTEM TO MEASURE PROTON, ELECTRON, AND SOLAR X-RAY FLUXES ANO MAGNETIC FILEDS. THE CYLINDRICALLY SHAPED SPACECRAFT MEASUR:'S 190.5 CM IN DIAM AND 230 CM IN LENGTH, NONITOR (SEN) SYSTEM TO MEASURE PROTON, ELECTRON, AND SOLAR X-RAY FLUXES ANO MAGNETIC FILEDS. THE CYLINDRICALLY SHAPED SPACECRAFT MEASUR:'S 190.5 CM IN DIAM AND 230 CM IN LENGTH, STRUCTURE EXTENDED FONTER THAT EXTENDS AN ADDITIONAL BS CM BYOND THE CYLINDRICAL SHELL. THE PRIMARY STRUCTURAL MENDERS A MONEYCOMBED FOULDE THEN SHELF AND THUST TUBE. AND USAST CHER STRUCTURE EXTENDS RADIALLY FROM THE THRUST TUBE. AND IS AFFIXED TO THE SOLAR PANELS, WHICH FORMS THE OUTER WALLS OF THE SPACECRAFT TO ROVIDE THE PRIMARY SUBCECE FE ELETTICAL POWER. NOATHER SOLAR PANELS ARE STATIONAREFING AND D'S BARDER AND IS AFFIXED TO THE SOLAR PANELS ARE STATIONED AND ADD IS APOLYED AND SPACECRAFT MOS SPACELY SOUND AND ACTIVATED BY GROUND COMMAND. THE SPACECRAFT MOS SPACE

-- GOES-F, NESS STAFF------

INVESTIGATION NAME- VISIBLE-INFRARED SPIN SCAN RADIOMETER (VISSR)

NSSDC ID- GDES-F-G1

INVESTIGATIVE PROGRAM Operational Environ. Monitoring

INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL PI -NESS STAFF

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NOAA-NESS

BRIEF DESCRIPTION THE VISIBLE INFRARED SPIN SCAN RADIOMETER (VISSR) FLOWN THE VISIBLE INFRARED SPIN SCAN RADIOMETER (VISSR) FLOWN ON GOES-F IS CAPABLE OF PROVIDING BOTH DAY AND NIGHT OBSERVATIONE MEASUREMENTS FROM A SYNCHRONOUS, SPIN-STABILIZED, GEOSTATIONE MEASUREMENT IS TO A SYNCHRONOUS, SPIN-STABILIZED, GEOSTATIONE MEASUREMENT STOM A SYNCHRONOUS, SPIN-STABILIZED, GEOSTATIONE THE TWO-CHANNEL INSTRUMENT IS ABLE TO TAKE BOTH FULL AND PARTIM PICTURES OF THE EARTH'S DISK. BOTH THE INFRARED CHANNEL (10.3 10 12.S MICROMETERS) AND THE VISIBLE CHANNEL (10.55 TO 0.7; MICRON) USE A COMMON OPTICS SYSTEM. INCOMING RADIATION IS NECEIVED BY AN ELLIPTICALLY-SHAPED SCAN MIRROR AD COLLECTED BY A RICHEY-CHRETIEN OPTICAL SYSTEM. THE SCAN MIRROR IS SET AT A MOMINAL ANGLE OF 45 DEG TO THE VISS OPTICAL AXIS, WHICH IS ALIGNED PARALLEL TO THE SPIN AXIS OF THE SFACECRAFT. THE SPINNING MOTION OF THE SPACECRAFT (APPROXIMATELY 100 RPR) PROVIDES A WEST-TO-EAST SCAN MOTION MHEN THE SPIN AXIS OF THE SCANNING MIRROR MORTH TO SOUTH AT THE COMPLETION OF EACH SPIN. A FULL PICTURE TAKES 18.2 MIN TO COMPLETE AND ABOUT 2 MIN TO RETRACE. OURING EACH SCAN, EIGHT VISIBLE SPECTOR SENSES THE INFRARED PORTION OF THE SPECTORIMON RESOLUTION OF 0.9 KM AT ZERO NADIR ANGLE. A MERCURY-COMINN NELLORDE DETECTOR SENSES THE INFRARED PORTION OF THE ACCAMINE MADIF ANGLE. THE INFRARED PORTION OF THE AFECTOR MEASURES MADIF ANGLE. THE INFRARED PORTION OF THE APPONSED SENSITIVITY BETWEEN 180 AND 315 DEG K WITH A PROPOSES SENSITIVITY BETWEEN 0.4 AND 1.4 K. THE VISSR DUTPUT IS DIGITIZED AND TRANSMITTED TO THE NOAR ACQUISITION STATION, WALLOPS ISLAND, VA. THERE THE SIGNAL IS FED INTO A

'LINE STRETCHER," WHERE IT IS STORED AND TIME-STRETCHED FOR TRANSMISSION BACK TO THE SATELLITE AT REDUCED BANDWIDTH FOR Redroadcast to apt user stations. As with all operational type Data, the visse data are handled by noar and eventually sent to the national climatic center at asheville, north carolina, for apcintum. ARCHIVING.

-- GOES-F, NESS STAFF-----

INVESTIGATION NAME- METEOROLOGICAL DATA COLLECTION AND Transmissions system

NSSDC ID- GOES-F -05

INVESTIGATIVE PROGRAM Operational Environ. Monitoring INVESTIGATION DISCIPLINE(S) NETEOROLOGY

NDAA-NESS

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PERSONNEL NESS STAFF

PI - NESS STAFF HUMATHESS BRIEF DESCRIPTION THE METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM IS AN EXPERIMENTAL COMMUNICATIONS AND DATA HANDLING SYSTEM DESIGNED TO RECEIVE AND PROCESS METEOROLOGICAL DATA COLLECTED FROM PEMOTELY LOCATED EARTH-BASED DATA COLLECTION (DBSERVATION) PLATFORMS (DCP). THE COLLECTED DATA ARE RETRANSMITTED FROM THE SATELLITE TO SMALL, GROUND-BASED, RÉGIONAL DATA UJILIZATION CENTERS. DATA FROM UP TO 10-2000 DCP STATIONS CAN BE HANDLED BY THE SYSTEM. THE SYSTEM ALSO ALLOWS FOR THE RETRANSMISSION OF NARROW-BAND (WEFAX TYPE) DATA FROM CENTRALIZED WEATHER FACILITIES TO SMALL GROUND-BASED APT RECEIVING STATIONS. THIS COMMUNICATIONS SYSTEM OPERATES ON S-BAND FREDUENCIES. THE MINIMUM DATA COLLECTION SYSTEM FOR ONE SMALL METEOROLOGICAL SATELLITE CONSISTS OF APPAOXIMATELY 3500 DCP STATIONS TO BE CONTACTED IN A 6-H PERIDD. THE TOTAL AMOUNT OF DATA COLLECTED DURING THE 6-H PERIDD. ARE BETWEEN 30K KAND GON THE STYS. DATA INTIONS VARY FROM 50 TO 3000 BITS, DEPENDING ON THE TYPE AND VARIETY OF SENSORS USED AT AN INDIVIDUAL DCP STATION. STATION.

- GOES-F, WILLIAMS-----

INVESTIGATION NAME- ENERGETIC PARTICLE MONITOR

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON, MONITORING

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

NOAA-ERL

PERSONNEL PI - D.J. WILLIAMS

NSSDC ID- GOES-F-02

BRIEF DESCRIPTION BRIEF DESCRIPTION THE ENERGETIC PARTICLE MONITOR CONSISTS OF THREE DETECTOR ASSEMBLIES, EACH COVERING LINITED REGIONS OF THE OVERALL ENERGY SPECTRUM. THE FIRST TWO DETECTOR ASSEMBLIES MONITOR PROTONS SEVEN ENERGY RANGES BETWEEN 0.8 AND SOO MEV, AND ALPHA PARTICLES IN SIX RANGES BETWEEN 4 AND .GT. 400 MEV. THERE IS ALSO ONE CHANNEL FOR THE NEASUREMENT OF ELECTRONS IN THE .GE. SOO KEV RANGE.

--- GOES-F, WILLIAMS------

INVESTIGATION NAME- SOLAR X-RAY MONITOR NSSDC JD- GOES-F -D3

INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING

NÒAA-ERL

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL PI. - D.J. WILLIAMS

BRIEF DESCRIPTION THE X-RAY MONITOR CONSISTS OF ION CHAMBER DETECTORS. THE RANGES AND MINIMUM USEFUL THRESHOLD SENSITIVITY ARE 0.5 TO 3A, 1.E-0 ERG PER SQ CM PER S AND 1 TO BA ERGS PER SQ CM PER S WITH A DYNAMIC RANGE OF 1.E4.

- GOES-F, WILLIAMS-----

INVESTIGATION NAME- MAGNETIC FIELD MONITOR

NSSDC ID-	G0E5-F -04	INVESTIGATIVE PROGRAM OPERATIONAL ENVIRON. MONITORING
. *		INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Particles and fields

PERSONNEL PI - D.J. WILLIAMS NOAA-ERL

BRIEF DESCRIPTION THE MAGNETOMETER HAS A RANGE OF PLUS OR MINUS 400 GANNA (WITHOUT SATURATION) AND A RESOLUTION OF D_1 GANNA OVER A RANGE OF PLUS OR MINUS 50 GANNA.

SPACECRAFT COMMON NAME- HEMM Alternate Names- Sats, Appl Expl Mission B Heat Capacity Map NSN, Aem-A

NSSDC ID- AEM-A

LAUNCH DATE- 04/00/78 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- SCOUT+F WEIGHT- 117, KG

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-UA

ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 96.8 MIN PERIAPSIS- 620, KM	INCLINATION- 97.8 DEG Apoapsis~ 620. km
PERSONNEL	
MG - D.S. DILLER	NASA HEADQUARTERS
SC - B.B. SCHARDT	NASA HEADQUARTERS
PH - C.L. WAGNER, JR.	NASA-GSEC
PS - J.C. PRICE	NASA-GSFC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE OBJECTIVE OF THE HEAT CAPACITY MAPPING MISSION (HCMM) SPACECRAFT IS TO PROVIDE COMPREHENSIVE, ACCURATE, HIGH SPATIAL RESOLUTION THERMAL SURVEYS OF THE SURFACE OF THE EARTH. THE SPACECRAFT IS SPIN STABILIZED AT A RATE OF 14 RFM. THE HCMM CIRCULAR SUN-SYNCHRONOUS ORBIT ALLOWS THE SPACECRAFT TO SENSE SURFACE TEMPERATURE NEAR THE MAXIMUM AND MINIMUM OF THE DIUMAL CYCLE. THE ORBIT HAS AN ASCENDING OAYLIGHT MODE WITH MOMIMAL EQUATORIAL CROSSING TIME OF 2 PM, AND PROVIDES A ONE-THIRTY PM TO TWO-THIRTY AM CROSSING TIME OVER MIDDLE NORTHERN LATITUDES. THE ORBIT ALSO ALLOWS FOR REFLECTANCE MEASUREMENTS OURING DAYLIGHT PASSES.

----- HCMM, BARNES------

INVESTIGATION NAME- HEAT CAPACITY MISSION RADIOMETER

NSSDČ ID- AEM-A -01 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) EARTH RESOURCES SURVEY

PERSONNEL PI - W.L. BARNES

NASA-GSFC

CODE ER

PI - W.L. BARNES
 NASA-GSFC
 BRIEF DESCRIPTION THE ODJECTIVES OF THE MEAT CAPACITY MAPPING RADIONETER (HORN) ARE AS FOLLOUS — (1) TO PRODUCE THERMAL MAPS AT THE OPTIMUM TIMES FOR MAKING THERMAL INERTIA STUDIES FOR DISCRIPTIANTION OF ROCK TYPES AND MIMERAL RESOURCES LOCATION, (2) TO MEASURE PLANT CANOPY TEMPERATURES AT FREQUENT INTERVALS TO DETERMINE THE TRANSPIRATION OF WATER AND PLANT LIFE, (3) TO MEASURE SOIL MOISTURE EFFECTS BY OBSERVING THE TEMPERATURE CYCLE OF SOILS, (4) TO MAP THERMAL EFFLUENTS, BOTH NATURAL AND MANHADE, (5) TO INVESTIGATE THE FRASIBILITY OF GEOTHERMAL SOURCE LOCATION BY REMOTE SENSING, AND (6) TO PROVIDE FREDUENT COVERAGE OF SNOW FIELDS FOR WATER RUNOFPREDICTION, THE HORN TRANSMITS ANALOG DATA IN REAL TIME TO SELECTED RECEIVING STATIONS. IT IS DESIGNED TO PROVIDE ACCURATE, HIGH SPATIAL RESOLUTION THERMAL MAPS OF THE SURFACE OF THE EARTH AT AN OPTIMUM TIME FOR DETERMINATION OF THERMAL INERTIA. THE HIGH HERMAL RESOLUTION SURFACE COMPOSITION MAPPING RADIOMETER (HRSCM) OF NIMBUS 5 (72-097A). THE HORM HAS A SMALL INSTANTANEOUS GEOMETRIC FIELD OF VIEW (LESS THAN 1 BT 1 MILLIRADIANS). HIGH RADIOMETRIC ACCURACY, AND A WIDE CNOURE NACTORAGE ON THE GROUND SO THAT SELECTED AREAS ARE COVERAGE WITHIN THE 12-M PERIOD CORRESPONDING TO THE MAXIMUM AND MINIMUM OF TEMPERATURES OBSERVED. THE INSTRUMENT WILL OPERATE IN TWO GUANNELS, 10.5 TO 12.5 MICROMETRIC (ILS A RADIATION COLER TO COUCH ACE MAILDES). THE LATTER GHANNEL WILL BE MATCHED TO THE EARTH AT ANLOG MULTIPLEXES THA A SCEPTS THE ANALOG OUTPUT OF EACH DETECTOR AND 4. THE INSTRUMENT WILL BE MATCHED TO THE EARTH AT LODES AN ANALOG MULTIPLEXES THAT ACCEPTS THE ANALOG OUTPUT OF EACH DETECTOR AND MULTIPLEXES THEM IN A FORM SUITABLE FOR TRANSISTION BY THE SPACECRAFT S-BAND TRANSMITTER. IT IS PLANNED TO MAKE THE DATA A PROVIDE COMPLETE INFORMATION CAN BE FOUND IN SMITH, S.R. "APPDICATIONS EXPLORER MISSIONS (AEM) MISSION PLANNER'S HANDROW.'

SPACECRAFT COMMON NAME+ HEAD-B Alternate Names- High Energy Astron Obs-0

NSSOC ID- HEAD-8

LAUNCH DATE- 06/15/78 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- ATLAS WEIGHT- 2660. KG SPONSORING COUNTRY/AGENCY UNITED STATES PLANNED ORBIT PARAMETERS Orbit type- geocentric Orbit period- 93.4 min Periapsis- 435. km

NASA-055

INCLINATION- 23. DEG APDAPSIS- 435. KM

MG - R.E. HALPERN SC - A.G. OPP PM - F.A. SPEER PS - S.S. HOLT NASA HEADQUARTERS NASA HEADQUARTERS NASA-MŠFČ NASA-GSFC

BRIEF DESCRIPTION

PERSONNEL

DRIEF DESCRIPTION THIS SECOND MISSION IS A POINTING MISSION PROVIDING MORE DETAILED INFORMATION ABOUT PREVIDUSLY IDENTIFIED X-RAY SOURCES. A LARGE GRAZING-INCIDENCE X-RAY TELESCOPE PROVIDES IMAGES OF SOURCES THAT ARE THEN ANALYZED BY INTERCHANGEABLE INSTRUMENTS AT THE FOCAL PLANE OF THE TELESCOPE. THE TELESCOPE COLLECTS X-RAYS OVER AN ANGULAR RANGE OF APPROXIMATELY I DEG X 1 DEG WITH THE FOCAL PLANE INSTRUMENTS DETERMINING THE LIMITING RESOLUTION FOR EACH MEASUREMENT. THESE INSTRUMENTS ARE THE OTHER EXPERIMENTS LISTED AS THE PAYLOAD, NAMELY A SOLID-STATE X-RAY DETECTOR, A CURVED CRYSTAL BRAGG SPECTPIONETER AND AN IMAGING PROPORTIONAL COUNTER. IN ADDITIO', A MONITOR PROPORTIONAL COUNTER VIEWS THE SKY ALONG THE T.LESCOPE AXIS. THE SCIENTIFIC OBJECTIVES ARE TO -- (1) ACCU'ATELY LOCATE AND REAMINE X-RAY SOURCES IN THE ENERGY RANGE '.2 TO 4.0 KEY WITH MIAGING PROPORTIONAL COUNTER. IN ADDITIO', A MONITOR PROPORTIONAL COUNTER VIEWS THE SKY ALONG THE T.LESCOPE AXIS. THE SCIENTIFIC OBJECTIVES ARE TO -- (1) ACCU'ATELY LOCATE AND EXAMINE X-RAY SOURCES IN THE ENERGY RANGE '.2 TO 4.0 KEY WITH MIAGN RESOLUTION; (2) PERFORM HIGH '.-ECTRAL SENSITIVITY MEASUREMENTS WITH BOTH HIGH- AND LOW-DISCRISTON SPECTROGRAPHS; (3) PERFORM HIGH SENSITIVITY MEASUREMENTS OF TRANSIENT X-RAY BEHAVIOR. THE SAME ITPE OF SPACETRAFT USED FOR HEAD 1 IS EMPLOYED; I.E., A SIX-SIDED STRUCTURE S.68-M HIGH AND 2.07-M IN DIAMETER. DUWNLINK TELEMETRY IS AT A DATA RATE OF 6.5 KM/S FOR SYSTEMS, AN ALTITUDE CONTROL AND DETERTION SUBSYSTEM IS USED TO POINT AND MANEUVER THE SPACETRAFT. GYROS, SUN SENSORS, AND STAR TRACKERS ARE EMPLOYED AS SENSING DEVICES.

INVESTIGATION NAME- SOLID-STATE X-RAY DETECTOR

- HEAD-B. BOLDT-----

NSSDC 10- HEAO-B -05

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

NASA-GSFC

PERSONNEL PI - E.A. BOLDT

BRIEF DESCRIPTION THIS INSTRUMENT IS A COOLED SOLID-STATE SPECTROMETER AND IS USED TO DEFECT WEAK SOURCES AND WEAK SPECTAAL FEATURES OVER A BROAD BAND OF ENERGIES BY EMPLOYING A NONDISPENSIVE SPECTRAL TECHNIQUE. A LITHIUM-DRIFTED SOLID-STATE DETECTOR IS OPERATED AT A TEMPERATURE OF 12D K. THE PRIMARY DETECTOR IS OF AT A TEMPERATURE OF 12D K. THE PRIMARY DETECTOR IS OF AT A TEMPERATURE OF 12D K. THE PRIMARY DETECTOR IS OF AT A TEMPERATURE OF 12D K. THE PRIMARY DETECTOR IS OF AT A TEMPERATURE OF 12D K. THE PRIMARY DETECTOR IS OF AT A TEMPERATURE OF 12D K. THE PRIMARY DETECTOR IS OF AT A TEMPERATURE OF 12D K. THE PRIMARY DETECTOR IS OF AT A TEMPERATURE OF 12D K. THE PRIMARY DETECTOR IS OF AT A TEMPERATURE OF 12D K. THE PRIMARY DETECTOR IS OF AT A TEMPERATURE OF 12D K. THE PRIMARY DETECTOR IS OF A THO-STAGE SOLID CRYDGEN REFRIGERATOR IS USED TO COOL THE DETECTOR. SPECTRAL MEASUREMENTS ARE MADE BETWEEN 0.5 AND A KEV. WITH A RESOLUTION FROM 12D TO 15D EV; FWHM AND AN EFFICIENCY GREATER THAN 0.9.

---- HEAO-B, CLARK----

INVESTIGATION NAME- A CURVED-CRYSTAL BRAGG X-RAY Spectrometer

NSSDC ID- HEAD-B -03

INVESTIGATIVE PROGRAM CODE 5A

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOWY

MASS INST OF TECH

PERSONNEL PI - G.W. CLARK

BRIEF DESCRIPTION BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT IS TO SEARCH FOR N-RAY SPECTRAL LIME EMISSIONS ARISING FROM THE SELECTED CELESTIAL OBJECTS. THE SEARCH IS LIMITED TO THE ENERGY LEVEL FROM O.1 TO 3 KEV. THE INSTRUMENT IS A CURVED-CRYSTAL BRAGG SPECTROMETER USING SIX CRYSTALS. THE SELECTION OF SPECIFIC CRYSTALS IS MADE FROM AMONG PET. ADP. BERTL RAP. LEAD LAURATE. AND LEAD STEARATE. THE SPECTROGRAPH RESOLUTION DEPENDS ON THE FINAL SELECTION OF CRYSTALS. RAP AND ADP GIVE RESOLUTIONS IN LAMBDA/DELTA-LAMBDA OF GREATER THAN 2500. LEAD STEARATE AND LAURATE GIVE RESOLUTIONS OF APPROXIMATELY 100. THE X-RAY LINES ARE DETECTED BY A THIN-WINDOW POSITION-SENSITIVE PROPORTIONAL COUNTER. COUNTER

---- HEAD-D, GIACCON1-

INVESTIGATION NAME- MONITOR PROPORTIONAL COUNTER

HEA0-8 -01 INVESTIGATIVE PROGRAM CODE SA

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

14B

PERSONNEL HEAD-CA ISRAEL---P1 + R. GIACCONI HARVARD COLLEGE OBS INVESTIGATION NAME- HEAVY NUCLEII BRIEF DESCRIPTION THIS EXPERIMENT UTILIZES A MONITOR COUNTER AS A SUPPORT INSTRUMENT FOR CALIBRATION AND NORMALIZATION OF THE FOCAL PLANE INSTRUMENTATION. IT IS USED TO (1) NORMALIZE INTENSITY FLUCTUATIONS DURING SPECTROMETER OBSERVATIONS, (2) OBSERVE THE CONTINUUM DURING SPECTRAL LINE OBSERVATIONS, AND (3) CALIBRATE CERTAIN INSTRUMENTS IN FLIGHT. INVESTIGATIVE PROGRAM CODE SA NSSDC JD~ HEAU-C -03 INVESTIGATION DISCIPLINE(S) COSMIC RAYS HIGH ENERGY ASTROPHYSICS ---- HEAO-B, GIACCONI-PERSONNEL NSUMMEL PI - M.H. ISRAEL PI - E.C. STONE PI - C.J. WADDINGTON OI - W.R. BINNS OI - J. KLARNANN DI - R.E. VOGT WASHINGTON U Calif Inst of Tech U of Minnesota RCDGNNELL-DDUGLAS CORP WASHINGTON U INVESTIGATION NAME- HIGH-RESOLUTION IMAGER NSSDC ID- HEAD-8 -02 INVESTIGATIVE PROGRAM CODE SA CALIF INST OF TECH INVESTIGATION DISCIPLINE(S) BRIEF DESCRIPTION THE PURPOSE OF THIS EXPERIMENT IS TO MEASURE THE CHARGE SPECTRUM OF COSMIC-RAY NUCLEI OVER THE HUCLEAR CHARGE RANGE FROM 17 TO 120 IN THE ENERGY INTERVAL 0.3- TO 10-GEV/NUCLEON TO CHARACTERIZE COSMIC RAY SOURCES, PROCESSES OF SYNTMETICS, AND PROPAGATION MODES. THE DETECTOR CONSISTS OF A DOUBLE-ENDED INSTRUMENT OF UPPER AND LOWER HODOSCOPES AND THREE DUAL-GAP ION CHAMBERS, THE TWO ENDS ARE SEPARATED BY A CERENKOV RADIATOR. THE GEOMETRICAL FACTOR IS A 4 SO-M STER. THE ION CHAMBERS CAN RESOLVE CHARGE TO 0.24-CHARGE UNITS AT LOW ENERGY AND 0.39-CHARGE UNITS AT HIGH ENERGY AND HIGH Z. THE CERENKOV COUNTER CAN RESOLVE 0.3- TO 0.4-CHARGE UNITS. X-RAY ASTRONOMY PERSONNEL PI - R. GIACCONI HARVARD COLLEGE OBS BRIEF DESCRIPTION BRIEF DESCRIPTION THE OBJECTIVES OF THIS INVESTIGATION ARE TO (1) DETECT AND ACCURATELY LOCATE X-RAY SOURCES FROM 0.2 TO 4.0 KEV, (2) STUDY THE STRUCTURE OF OBJECTS LARGER THAN 2 ARC-S, AND (3) DEASURE THE INTENSITY AND TEMPORAL CHARACTERISTICS OF INDIVIDUAL SOURCES. THIS INSTRUMENT IS A LARGE GRAZING INCIDENCE X-RAY TELESCOPE THAY PROVIDES IMAGES OF SOURCES THAT ARE THEN AMALYZED BY THE OTHER INTERCHANGEABLE EXPERIMENTS AT THIS FOCAL PLANE OF THE TELESCOPE. -- HEAO-C. JACOBSON-------- HEAD-B, GURSKY------INVESTIGATION NAME- GAMMA-RAY LINE SPECTROSETER INVESTIGATION NAME- IMAGING PROPORTIONAL COUNTER NSSDC 10- HEAD-C -01 INVESTIGATIVE PROGRAM CODE 5A NSSOC ID- HEAD-B -04 INVESTIGATIVE PROGRAM INVESTIGATION DISCIPLINE(S) GARMA-RAY, ASTRONOMY X-64Y ASTRONOMY INVESTIGATION DISCIPLINE(S) -RAY ASTRONOM PERSONNEL PERSONNEL PI - A.S. JACOBSON DI - J.R. ARNOLD DI - A.E. METZGER DI - L.E. PETERSON NASA-JPL U OF CALIF, SAN DIEGO NASA-JPL U OF CALIF, SAN DIEGO GURSKY PI - H. HARVARD COLLEGE ORS BRIEF DESCRIPTION GRIEF DESCRIPTION THE OBJECTIVES OF THIS EXPERIMENT ARE (1) TO SURVEY X-RAY SOURCES OF AN EXTENDED NATURE IN THE ENERGY RANGE FROM 0.1 TO 4 KEV, WHERE RESOLUTION OF 1 ARC-MIN WILL BE SUFFICIENT, (2) TO STUDY THE ANGULAR STRUCTURE OF EXTENDED SOURCES, (3) TO SURVEY FOR WEAK SOURCES, AND (4) TO LOCATE OBJECTS WITH POORLY KNOWN PORTITION U OF CALIF, PETERSUN U OF CALIF, SAN DIEGO BRIEF DESCRIPTION THE BASIC GOALS OF THIS EXPERIMENT ARE TO SEARCH FOR GAMMA-RAY LINE EMISSIONS ADISING FROM A VARIETY OF SOURCE PHEMORENA. PARTICULAR EMPHASIS IS PLACED ON FINDING LINE FMISSIONS FROM NUCLEOSYNTHESIS PROCESSES IN SUPERNOVAE, AND "ROM POSITRON-ELECTRON ANNIHILATION, CAREFUL STUDY IS MADE OF THE SPECTRA AND TIME VARIATIONS OF KNOWN HARD X-RAY SOURCES. LOW-ENERGY COSMIC RAYS. IN ADDITION, CAREFUL STUDY IS MADE OF THE SPECTRA AND TIME VARIATIONS OF KNOWN HARD X-RAY SOURCES. INE EXPERIMENT IS CAPABLE OF MEASURING GAMMA-RAY LINES FALLING UNTING THE ENERGY INTERVAL FROM 0.06 TO 10 MEV, AND WITH AN ENERGY RESOLUTION BETTER VHAN 2.5 KEV AT 1.33 MEV AT A LINE SENSITIVITY FROM 1.2-4 TO 1.2-5 PHOTONSYCM SO'S, DEPENDING ON THE ENERGY. THE EXPERIMENTAL PACKAGE CONTAINS FOUR COOLED DRIFTED GERMANIUM DETECTRA'S SHIELDED BY CESIUM IODIDE. THE KEY EXPERIMENTAL PARAMETERS ARE -- CI) GEDNETRY FACTOR 09. TIAL SQ-CM STER, (2) A TIGLIO OF VIEW OF 27 DEG FWIM AND, (3) A TIME RESOLUTION OF LESS THAN 0.1 MS FOR THE GERMANIUM DETECTOR AND 10 S FOR THE CAREMIS POSITIONS. SPACECRAFT COMMON NAME- HEAD-C Alternate NAMES- High Energy Astron Obs-C NSSOC 1D- HEAD-C LAUNCH DATE- 07/15/79 WEIGHT- 2660, KG LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHIGLE- ATLAS SPONSORING COUNTRY/AGENCY UNITED STATES NASA-055 HEAD-C+ KOCH-----PLANNED ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 93.7 Min Periapsis- 480. Km INVESTIGATION NAME- ISOTOPIC COMPOSITION OF COSMIC RATS INCLINATION- 45. DEG APOAPSISH 480. KM NSSDC ID- HEAO-C -04 INVESTIGATIVE PROGRAM CODE SA PERSONNEL NG - R.E. HALPERN SC - A.G. OPP PN - F.A. SPEER PS - T.A. PARNELL INVESTIGATION DISCOPLINE(5) COSMIC RAYS HIGH ENERGY ASTROPHYSICS NASA HEADQUARTERS NASA HEADQUARTERS NASA-MSFC NASA-MSFC PERSONNEL PS - T.A. PARNELL NASA-MSFC BRIEF DESGRIPTION THIS THIRD MISSION PERFORMS A SKY SURVEY OF GAMMA RAYS AND COSMIC RAYS IN A MANNER SIMILAR TO HEAD T. A HIGHER GABITAL INCLINATION THAN THE PREVIOUS MISSIONS IN THIS SEPIES IS PLANNED SINCE THE PAYLOAD CONSISTS PRIMARILY OF COSMIC-RAY INSTRUMENTATION; GREATER COSMICRAY FLUX OCCURS NEAR THE EARTH'S MAGNETIC POLES. THE SCIENTIFIC OBJECTIVES OF THE HISSION ARE TO --- (1) DETERMINE THE ISOTOPIC COMPOSITION OF THE MOST ADUNDANT COMPONENTS OF THE COSMIC-RAY FLUX WITH ATOMIC MASS DETWEEN 7 AND 56. AND THE FLUX OF EACH ELEMENT WITH ATOMIC NUMBER (23 BETWEEN 2 = 4 AND 2 = 50; (2) SEARCH FOR SUPER-HEAVY MUCLEL UP TO 2 = 120. AND MEASUME THE COMPOSITION OF THE NUCLEI WITH Z .GT. 20; (3) STUDY INTENSITY. SPECTRUM, AND THE BEHAVIOR OF X-RAY AND GAMMARAY SOURCES BETWEEN 0.06 AND 10 MEY. AND MEASURE ISOTROPY OF THE DIFFUSE X-RAY AND GAMMA-RAY BACKGROUNDS AND (4) PERFORM AN EXPLORATORY SEARCH FOR X- AND GAMMARAY LINE EMISSIONS. THE NORMAL OPERATION GHOE IS A CONTINUOUS CELESTIAL SCAN ABOUT THE Z-AXIS (WHICH NOMINALLY POINTS TO THE SUN). RSONNEL PI - L. DI - J.P. DI - J.P. DI - A. DI - A. OI - P. OI - P. OI - K. OI - K. OI - O. KOCH PETERS MEYER ROUSSEL SOUTOIL CENS DANISH SPACE RES INST CENS CENS CENS CASSE CENS MESTREAU LUND OMO Corydon-Petersun CENS DANISH SPACE RES INST DANISH SPACE RES INST

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BRIEF DESCRIPTION

BRIEF DESCRIPTION 14:15 EXPERIMENT MEASURES THE RELATIVE COMPOSITION OF THE ISOTOPES OF THE PRIMARY COSMIC R.'S BETWEEN BERYLLIUM AND IRON (Z FROM 4 TO 26) AND THE ELERENTAL ABUNDANCES UP. TO TIM (2=50). CERENKOV COUNTERS AND HODOSCOPES TOGETHER WITH THE EARTH'S MAGNETIC FIELD FORM A SPECTROMETER. THEY DETERMINE CHARGE AND MASS D. JOSMIC RAYS TO A PRECISION OF 10 DETREMITE FOR THE MOST ABUNDANT ELEMENTS OVER THE MOMENTUM RANGE FROM 2 TO 25 GEV/C.

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SPACEC"AFT COMMON NAME- HELOS Alternate Names- Hi.eccen Lun Occult.Sat., exosat European X-ray OBS Sat. NSSDC ID- HELOS LAUNCH DATE- 12/00/80 Launch Sité- Vándénérg AFB, United States Launch Vehicle- Delta WEIGHT- KG SPONSORING COUNTRY/AGENCY INTERNATIONAL ESA PLANNED ORBIT PARAMETERS Orbit type- geocentric Orbit period- Mi Periapsis- KM MIN INCLINATION-DEG APOAPSIS-K Pł PERSONNEL NONE ASSIGNED None Assigned Unknown Unknown HG -SC -PH -PS -ESA-ESTEC ESA-ESTEC

BRIEF DESCRIPTION THE OBJECTIVES OF THIS MISSION ARE THE MEASUREMENT OF THE POSITION. STRUCTURAL FEATURES, SPECTRAL. AND TEMPORAL CHARACTERISTICS OF COSMIC X-RAY SOURCES. THE POSITION AND DIAMETER OF COSMIC X-RAY SOURCES ARE DETERMINED BY THE OBSERVATION OF THE TIME AND SPEED WITH WHICH THE SOURCES DISAPPEAR BEHIND THE NOON DURING LUNAR OCCULTATIONS. THE BUILTY TO CORRECT BUTH THE LORDIT AND THE DRIENTATION OF THE SPACECRAFT, COUPLED WITH THE HIGHLY ECCENTRIC ORDIT, ENABLES THE SPACECRAFT TO OBSERVE ANY PORTION OF THE SRY FOR LONG TENS OF MICROSECONDS TO TENS OF HOURS ARE OBSERVABLE, AS WELL AS ENERGY SPECTRUM OBSERVATIONS AND ANSOLUTE FLUX NEASUREMENTS OF DUJECTS WITH AN "YTENSITY GREATER THAN 5.5-5 THAT OF THE CRAB NEBULA. BRIGHT SUURCES ARE LOCATABLE TO WITHAN ARC-S IN POSITION. CRAB NEBULA. POSITION.

--- HELOS, UNKNOWN-

INVESTIGATION NAME- MEDIUM-ENERGY COSHIC X-RAY PACKAGE

INVESTIGATIVE PF)GRAM SCIENCE NSSDC 10- HELOS -31

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PERSONNEL

UNKNOWN

BRIEF DESCRIPTION THIS EXPERIMENT OBSERVES COSMIC X-RAY SOURCES IN THE ENERGY RANGE OF 1.5 TO 20 KEY AND CONSISTS OF PROPORTIONAL COUNTERS LOCATED BEHIND MODIFIED HONEYCOMB COLLIMATORS.

- HELOS, UNKNOWN----

INVESTIGATION NAME- LOW-ENERGY COSMIC N-RAY PACKAGE

INVESTIGATIVE PROGRAM SCIENCE

INVESTIGATION DISCIPLINE(5) X-RAY ASTRONOMY

PERSONNEL UNKNOWN

NSSDC ID- HELOS -02

BRIEF DESCRIPTION

THIS EXPERIMENT OBSERVES COSMIC X-RAY SOURCES IN THE 0.1-TO 2-KEV RANGE AND UTILIZES THIN-VINDOW, POSITION-SENSITIVE, Proportional counters located behing grazing-incidence mirrors.

SPACECRAFT COMMON NAME- IONOSONDE-IK Alternate Names-

NSSDC ID- IONO-IK

#

LAUNCH DATE- 00/00/73 Launch Site-Launch Vehicle-WEIGHT- KG SPONSORING COUNTRY/AGENCY INTERCOS

INCLINATION- 75. 1700. KM

PLANNED ORBIT PARAMETERS Orbit type- geocentric Orbit period- 150, Min Periapsis- 350, KM

PERSONNEL PS - V.V. MIGULIN

IZMIRAN

PS - V.V. MIGULIN LIMINAL MAGNETOSPHERE STUDY PERIOD AN DURING INTERNATIONAL MAGNETOSPHERE STUDY PERIOD AN INTERCOSMOS SPACECRAFI, IONDSONDE-IK WILL BE LAUNCHED INTO A HIGH INCLINATION ELLIPTICAL ORBIT WITH A LOW APOGEE, THE MAIM SCIENTIFIC OBJECTIVES OF IONOSONDE-IK ARE (1) THE STUDY OF ELECTRON DENSITY DISTRIBUTION FROM THE MAIN IONIZATION RAXIMUM OF F REGION UP TO THE SATELITE ALITIYUSE WITH A TOP-SIDE SOUNDER, AND THE CORRELATION OF THE TIME AND SPACE VARIATIONS WITH SOLAR ACTIVITY, CORPUSCULAR FLUXES AND OTHER GEOPHYSICAL PHENOMEMA, (2) GLOBAL MAPPING OF BASIC IONOSPHERIC PARAMETERS AND COMSTRUCTION OF A TOP-SIDE IONOSPHERE MODEL, (3) THE STUDY OF WAVE PROCESSES IN MAGNETOSPHERIC PLASMA IN THE FREQUENCY RANGE 100 HZ TO 5 MHZ, (4) THE STUDY OF TIME AND SPACE VARIATIONS STA LIMES, (5) THE STUDY OF TIME AND SPACE VARIATIONS CHARGED PARTICLES WITH ENERGIES BETWEEN 1D EV AND 50 NEV AND THEIR IONOSPHERIC EFFECT, AND (6) THE STUDY OF TIME AND SPACE VARIATIONS OF LOCAL ELECTRON AND ION DENSITIES AND OTHER SOCIALIST COUNTRIES.

SPACECRAFT COMMON NAME- IR ASTRON. SAT. Alternate names- infra-red astronom sat, iras

NSSDC ID- IRAS

LAUNCH DATE- 02/00/81 WEIGHT- 950. KG Launch Site- Vandenberg Afb, United States Launch Vehicle- Delta

SPONSORING COUNTRY/AGENCY NETHERLANDS UNITED STATES NIVR NASA-OSS

PLANNED ORBIT PARAMETERS Orbit type- geocentric Orbit Period- 103.1 Min Periapsis- 900, KM

PERSONNEL L. DONDEY N. BOGGESS E. K. Casani H. H. Aumann NG -5C -PN -95 -

PS - H. H. AUMANN JPL BRIEF DESCRIPTION THE BASIC GOAL OF THIS PLANNED 1-YEAR MISSION IS TO OBTAIN A DEEP, FULL-SKY SURVEY OVER THE APPROXIMATE WAVELENGTH RANGE FROM 8 TO 12D MICROMETERS. THE IRAS CONTAINS A 6-METER RITCHEY-CHRETIEN TELESCOPE COOLED BY HELIUM TO A TEMPERATURE OF MEAR 10 K. AN ARRAY OF ABOUT 100 DETECTORS IS USED TO DETECT THE INFRARED FLUX IN BANDS CENTERED AT 10, 20, 50, AND 100 MICROMETERS. THE SENSITUITY OF THE INSTRUMENT IS RESTRICTED BY THE PHOTON FLUCTUATIONS FROM THE 20DIACAL LIGHT. THE POSITIONS OF GALACTIC AND EXTRAGALACTIC SOURCES ARE DETERMINED TO AN ACCURACY OF 0.5 ARC-MIN. IN ADDITION TO THE FOCAL PLANE DETECTOR ARRAY USED FOR THE ALL SKY SURVEY. BOTH A LOW-RESOLUTION SPECTROGRAPHIC AND A LONG WAVELENCTH (GREATER THAN 10D MICROMETERS)FHOTOMETRIC CAPABILITY ARE INCLUDED ON THE IRAS. THE IRAS IS FLOUM IN A 900-FM ORBIT. WITH AN INCLINATION MEAR 99 DEG. TO EFFECT THE SCANNING OF THE SKY MEEDED FOR THE SURVEY. THE SATELLITE IS ROTATED AT A CONSTANT ANGULAR VELOCITY AROUND THE SUN VECTOR IN THE DIRECTION OF THE OBSETAL ANGULAR VELOCITY. THE IRAS IS ALSO ABLE TO DO POINTED ODSERVATIONS. HERE THE IRAS CAN BE POINTED AT A SELECTED CELESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CELESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CELESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CELESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CELESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CELESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CLESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CLESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CLESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CLESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CLESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CLESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CLESTIAL OBJECT FOR UP TO 17 MIN. THIS POINTED AT A SELECTED CLESTIAL OBJECT FOR UP TO 17 MIN. THIS POI

SPACEGRAFT COMMON NAME- ISEE-A Alternate NAMES- IMP-K, IME-M Mother, Intnl Sun Earth Expl-A

NSSDC ID- NOTHER

75. DEG

150

LAUNCH DATE- 10/13/77 VEIGHT- 340.2 KG Laungh Site- Cape Canaveral, united states Launch Vehicle- Delta

SPONSORING COUNTRY/AGENCY United States International NASA-OSS ESA

PLANNED ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC Orbit Period- 3522. Min Periapsis- 280. KM

INCLINATION-28.8 DEG APOAPSIS- 140344. KM

INCLINATION- 99. DEG 6F0AP515- 900. KM

NASA HEADQUARTERS NASA HEADQUARTERS JPL

PERSONNE	L		
MG -	F.W.	GAETANO	
ŞC -		SCHMERLING	
· PM -	1.1.	MADDEN	÷
P\$ -	K.₩.	DGILVIE	

(195)读 新生物

PS - K.W. DGILVIE NASA-GSFC BRIEF DESCRIPTION THE EXPLORER CLASS MOTHER SPACECRAFT IS PART OF THE MOTHER/DAUGHTER/HELIDCENTRIC MISSION (ISEE A, B, AND C). THE PURPOSES OF THE MISSION ARE--{1}' TO INVESTIGATE SOLAR/TERRESTRIAL RELATIONSHIPS AT THE GUTERMOST GOUMDARIES OF THE EARIM'S MAGNETOSPHERE, (2) TO EXAMINE IN DETAIL THE STRUCTURE OF THE SOLAR WIND NEAR THE EARTH AND THE SHOCK MAVE THAT FORMS THE INTERFACE BETWEEN THE SOLAR WIND AND EARTH, (3) TO CONTINUE THE INVESTIGATION OF COSMIC RAIS AND SOLAR FLARES IN THE INTERPLANETARY REGION NEAR 1 ALL THE MISSION THUS EXTENDS THE INVESTIGATIONS OF PREVIOUS IMP SPACECRAFT, THE MOTHER/DAUGHTER PORTION OF THE MISSION CONSISTS OF TWO SPACECRAFT WINTA A STATION-KEEPING CAPABILITY IN A HIGHLY ECGENTRIC EARTH ORBIT WITH APOGEE TO 23 EARTH RADII. THE SPACECRAFT MINTAINS A SMALL SEPARATION DISTANCE, AND MAKES SIMULTANEOUS COORDINATED MEASUREMENTS TO PERMIT SEPARAITION OF SPATIAL FROM TEMPORAL INSIDE THE MAGNETOSPHERE. THE SPIN MATE WILL BE SET AT 19.75 RPM, DIFFERING SLIGHTLY FROM THE ISEE-B SPACECRAFT. ISEE-B SPACECRAFT.

- ISEE-A, ANDERSON--

INVESTIGATION NAME- ENERGETIC ELECTRONS AND PROTONS

INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Particles and fields

NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSFC

NASA-GSFC

PERSONNEL		· · · · · · · · · · · · · · · · · · ·
P1 - K.A.	ANDERSON	U OF CALIF# BERKELEY
0I - C.I.	MENG	U OF CALIF, BERKELEY
01 - F.V.	CORONITI	U OF CALIF, LA
01 - J.M.	BOSQUED	CESR
01 - R.	PELLAT	CTR FOR THEORETIC PHYS
0I - G.K.	PARKS	U OF WASHINGTON
01 - R.P.	LIN	U OF CALIF, BERKELEY
01 - H.	REME	CESR

NSSDC 10- NOTHER -10

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO DETERMINE, BY USING IDENTICAL INSTRUMENTATION ON THE MOTHER/DAUGHTER SPACECRAFT, THE SPATIAL EXTENT, PROPAGATION VELOCITY, AND TEMPORAL BEHAVIOR OF A WIDE VARIETY OF PARTICLE PHENORENA. ELECTRONS ARE MEASURED AT 2 AND 6 KEV AND FROM 12 TO 200 KEV, AND PROTONS ARE MEASURED AT 2 AND 6 KEV AND FROM 12 TO 200 KEV, AND PROTONS ARE MEASURED AT 2 AND 6 KEV AND FROM 20 TO 380 KEV. IDENTICAL INSTRUMENTATION ON EACH SPACECRAFT CONSISTS OF A PAIR OF SURFACE BARRIER SENICONDUCTOR DETECTOR TELESCOPES (ONE WITH A FOIL AND ONE WITHOUT A FOIL) AND FOUR FIXED-ENERGY ELECTRONS ELECTRONS AND PROTONS SEPARATELY AT 2 AND 6 KEV.

-- ISEE-A, 8AME---

INVESTIGATION NAME- 50-EV TO 40-KEV PROTON AND 5-EV TO 20-KEV ELECTRON PLASMA PROBE

NSSDC	10-	MOTHER	~01	11

VVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Space Plasmas

PERSONNEL		
₽1 - Š.J.	BAME	LOS ALAMOS SCI LAB
01 - H.	MIGGENRIEDER	MPI-EXTRATERR PHYS
0I - K.	SCHINDLER	RUHR-U BOCHUM
0Ï - J.R.	ASBRIDGE	LOS ALAMOS SCI LAB
01 - H.R.	RÖSENBAUER	NPI-EXTRATERR PHYS
0I - H.	ADEK	MPI-EXTRATERR PHYS
01 - M_D_	NONTGOMERY	LOS ALAMOS SCI LAB
01 - G.	PASCHMANN	MPI-EXTRATERR PHYS
01 - W.C.	FELDMAN	LOS ALAHOS SCI LAB
01 - E.W.	HONES/ JR.	LOS ALAMOS SCI LAB

*

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED, IN CONJUNCTION WITH A SIMILAR INSTRUMENT PROVIDED BY G. PASCH-MANN OF MAX PLANCK INSTITUTE FOR FLIGHT ON THE DAUGHTER SPACECRAFT, TO STUDY THE PLASMA VELOCITY DISTRIBUTION AND ITS SPATIAL AND TEMPORAL VARIATIONS IN THE SOLAR WIND, BOW SHOCK, MAGNETOSHEATH, MAGNETOPAUSE, MAGNETOTALL, AND MACHETOSPHERE, PROTONS FROM SO EV TO 40 KEV AND ELECTRONS FROM S EV TO 20 KEV ARE MEASUARED IN ONE, THUS, AND THREE DIMENSIONS BY THREE 90-DEGS SPHERICAL ELECTROSTATIC ANALYZERS. THE EXPERIMENT, WHICH UTILIZES CHANNELTRON ELECTRON MUL!PLIERS AS DETECTORS, OPERATES IN FAO RANGES, WITH HEREGY RESOLUTION FOR SEVERAL STEPS IN EACH RANGE OF 10 PERCENT OF THE CENTER ENERGY LEVEL.

--- ISEE-A, FRANK--------

INVESTIGATION NAME- HOT PLASMA

NSSDC 10- HOTHER -03

INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Space Plasmas

U OF IOWA Mass Inst of tech U of Calify La

INVESTIGATIVE PROGRAM CODE SA/CO-OP

PERSONNEL PI - L.A. DI - V.H. DI - C.F. FRANK VASYLIUNAS Kennel

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO STUDY, BY MEANS OF IDENTICAL INSTRUMENTATION ON THE MOTHER/DAUGHTER SPACECRAFT, THE SPATIAL AND TEMPORAL VARIATIONS OF THE SOLAR WIND AND MAGNETOSHEATH ELECTRONS AND IONS, PROTONS AND ELECTRONS IN THE ENERGY RANGE FROM 1 EV TO 50 KEV ARE MEASURED IN 63 CONTIGUOUS EMERGY BANDS WITH AN ENERGY RESOLUTION (DELTA E/E) OF 0.17. A QUADRISPHERICAL LOW-EMERGY PROTON AND ELECTRON DIFFERENTIAL ENERGY ANALYZER (LEPEDEA), EMPLOYING SEVEN CONTINUOUS CHANNEL ELECTRON MULTIPLIERS IN EACH OF ITS TWO (DME FOR PROTONS AND ONE FOR ELECTRONS) ELECTROSTATIC ANALYZERS, IS FLOWN ON BOTH THE MOTHER AND DAUGHTER SPACECRAFT. ALL BUT 2 PERCENT OF THE FOUR-PI STER SOLID ANGLE FOR PARTICLE VELOCITY VECTORS ARE COVERED.

- ISEE-4, GUANETT------

INVESTIGATION NAME- 10-HZ TO 10-KHZ MAGNETIC AND 10-HZ TO ZOD-KHZ ELECTRIC FIELD TRIAXIAL PROBES

INVESTIGATIVE PROGRAM NSSDE ID- MOTHER -D7 CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS Particles and fields Particles and fields

U OF IOWA TRW SYSTEMS GROUP TRW SYSTEMS GROUP

PERSONNEL PI - D.A. 01 - F.L. 01 - R.W.

GURNETT Scarf Fredericks 01 - E.J. SMITH

BRIEF DESCRIPTION THIS EXPERIMENT, IN CONJUNCTION WITH A SIMILAR EXPERIMENT FLOWN ON THE ISEE-B SPACECRAFT, IS DESIGNED TO MEASURE WAVE PHENOMENA OCCURRING WITHIN THE MAGNETOSPHERE AND SOLAR WIND. TRIAXIAL SEARCH COILS WITH HIGH-PERMEABILITY CORES AND TRIAXIAL ELECTRIC DIPOLES ARE USED. THE SEARCH COILS MAVE A FREQUENCY RESPONSE OF 10 HZ TO 10 KHZ. THE TIME REQUIRED FOR ONE 16-CHANNEL TRIAXIAL SPECTRUM ANALYSIS IS 100 MS. BROADBAND DATA ARE ALSO AVAILABLE WITH A 10-KHZ BANDWIDTH ABOUT EVERY 1 MS. ELECTRIC FIELDS ARE MEASURED BY TWO ORTHOGONAL 123-M DIPOLE ALONG THE SPIN AXIS. THE TIME REQUIRED FOR TRIAXIAL 12-CHANNEL SPECTRUM ANALYSIS FON 10 HZ TO 200 KHZ IS 100 MS. BROADBAND DATA ARE AVAILABLE WITH A 10-KHZ BANDWIDTH AND 1-MS TIME RESOLUTION. BROADBAND DATA TIME RESOLUTION.

- ISEE-A, HARVEY-----

INVESTIGATION NAME- ACTIVE PLASMA EXPERIMENT

NSSDC ID- HOTHER -08

INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS SPACE PLASMAS

PERSONNEL	
PI - C.C. HARVEY	PARIS OBSERVATORY
OI - N. PETIT	CNET
01 - J.R. MCAFEE	NDAA-ERL
01 - D. JONES	ESA-ESTEC
01 - J.H. ETCHETO	CNET
01 - R.J.L.GRARD	ESA-ESTEC
OI - P.F. GENDRIN	ENET.

OI - R.E. GENORIN CREATED THE STORE THE PLASMA ELECTRON DENSITY NEAR THIS EXPERIMENT MEASURES THE PLASMA ELECTRON DENSITY NEAR THE MOTHER SATELLITE AND ALGO THE TOTAL ELECTRON CONTENT BETWEEN THE MOTHER AND DAUGHTER SPACECRAFT. THE EXPERIMENT CONSISTS OF TWO DISTINCT PARTS -- (1) THE MOTHER SPACECRAFT THAT CARRIES AN EXPERIMENT TO DETECT RESONANCES OF THE AMBIENT PLASMA. AFTER AM ANTENNA HAS BEEN MOMENTARILY EXCITED AT ONE OF THE CHARACTERISTIC FREQUENCIES OF THE PLASMA IN WHICH IT IS IMMERSED. A PRONOUNCED "RINGING" IS OBSERVED. THESE RESONANCES OCCUR AT THE PLASMA FREQUENCY. THE UPPER HYBRID RESONANCES OCCUR AT THE PLASMA FREQUENCY. THE UPPER HYBRID RESONANCES OCCUR AT THE PLASMA FREQUENCY. THE UPPER HYBRID RESONANCES THEIR FREQUENCIES PERMITS THE DETERMINATION OF SEVERAL PLASMA PARAMETERS, INCLUDING THE ELECTRON DENSITY. IN THIS EXPERIMENT, THE TRAMSMITTER IS DESIGNED TO STEP THROUGH A NUMBER OF SUB-BANDS. COVERING THE CHARACTERISTIC RESONANCE SEVERIMENT, THE TRAMSMITTER IS DESIGNED TO STEP THROUGH A NUMBER OF SUB-BANDS. COVERING THE CHARACTERISTIC RESONANCE SOUCH AT THE RASMALTER THE DETERMINATION OF SEVERAL PLASMA PARAMETERS IN CLUDING THE CHARACTERISTIC RESONANCE STEPERIMENT, THE TRAMSMITTER IS DESIGN TO STEP THROUGH A NUMBER OF SUB-BANDS. COVERING THE CHARACTERISTIC RESONANCE DETWEEN THE NOTHER AND THE DAUGHTER IS OBTAINED FROM A SECOND EXPERIMENT THAT MEASURES THE PHASE DELAY INTRODUCED BY THE

ANBLENT PLASMA ONTO A WAVE OF FREQUENCY ABOUT 1 MHZ TRANSMITTED FROM THE MOTHER AND RECEIVED ON THE DAUGHTER (EXPERIMENT 6). The phase is compared against a phase-coherent signal transmitted from the mother to the daughter by modulation onto a carrier of frequency high enough to be unaffected by the ANBIENT PLASMA.

----- ISEE-A, HELLIWELL-

INVESTIGATION NAME- VLF WAVE INJECTION

NSSDC ID- MOTHER -13

INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) Magnetospheric physics Particles and fields

PERSONNEL

PI - R.A. HELLIWELL OI - T. BELL STANFORD U

BRIEF DESCRIPTION THIS EXPERIMENT IS INTENDED TO PROVIDE DATA TO STUDY INTERACTIONS BETWEEN DISCRETE VLF WAVES AND ENERGETIC PARTICLES IN THE MAGNETOSPHERE. THE VLF WAVES ARE PRODUCED BY A GROUND-MASED TRANSMITTER. INJECTION OF THE WAVE BEYOND THE JONOSPHERE IS ASSURED BY TRANSMITTER LOCATION IN A REGION WHERE THE MAGNETIC LIMES OF FORCE ARE OPEN. IN THIS CASES SIPLE STATION, ANTARCTICA. THE INJECTED SIGNAL AND ANY STIMULATED VLF EMISSIONS ARE RECORDED THROUGH A LOOP ANTENNA BY A 3- TO 20-KHZ BROADBAND RECEIVER ON THE SATELLITE. THE OBSERVED PARAMETERS ARE INTENSITY OF RECEIVED RADIO FREQUENCY AS A FUNCTION OF TIME.

----- 1SEE-A, HEPPNER--------INVESTIGATION NAME- DC ELECTRIC FIELDS

NSSDC ID- MOTHER -11

INVESTIGATIVE PROGRAM CODE SA/CD+OP

INVESTIGATION DISCIPLINE(5) MAGNETOSPHERIC PHYSICS PARTICLES AND FIELDS

PERSONNEL

PI - J.P.		NASA-GSFC
0I - T.L.		NASA-GSFC
01 - N.C.	MAYNARD	NASA-GSFC
01 - D.A.		U OF IOWA
01 - D.P.	CAUFFRAN	NASA HEADQUARTERS

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT IS INTENDED TO STUDY QUASI-STATIC ELECTRIC FIELD AND LOW-FREQUENCY PLASMA WAVES IN THE PLASMASPHERE, MAGNETOSPHENE, MAGNETOSHEATH, AND SOLAR WIND. AN ORTHOGONAL PAIR OF 123-M TIP-TO-TIP DIPOLE ANTENNAE ARE USED TO MAKE DC AND AC ELECTRIC FIELD MEASUREMENTS IN THE FOLLOWING NINE FREQUENCY WINDOWS -- 0.1 TO 0.32 HZ, 0.32 TO 1 HZ, 1 TO 3.2 HZ, 3.2 TO 10 HZ, 10 TO 32 HZ, 32 TO 10D HZ, 10D TO 320 HZ, 320 TO 1000 HZ, AND 10DO TO 3200 HZ. OC MEASUREMENTS ARE MADE IN ANY OF 256 ANGULR SECTIONS THREE TIMES OR 24 TIMES PER S. DEPENDING ON THE BIT RATE. DC MODE MEASUREMENTS HAVE A TWO-STEP VARIABLE GAIN AMPLIFIER CONTROLLED FROM THE GROUND. THE RESOLUTION IN THE HIGHEST GAIN STATE IS 0.12 MV/M WITH A DYNAMIC RANGE OF PLUS OR MINUS 0.983 V/M. THE AC MEASUREMENTS LECTRONICS CONSIST OF YWO AMPLIFIER SECTIONS. ONE AMPLIFIER IS USED FOR LOW-FREQUENCY CHANNELS, AND ONE FOR HIGH-FREQUENCY CHANNELS. GAIN LINES FOR EACH AMPLIFIER AS CONTROLLABLE INDEPENDENTLY FROM THE GROUND. IN THE HIGHEST GAIN MODE, EACH ANALYZER CHANNEL HAS A SENSITIVITY OF 0.6 NICROVOLTS/M RRS. THE EXPERIMENT CAN BE RUN IN EITHER A SUM-SENSOR SYNCHRONIZED DR A FREE STATE AS CONTROLLED FROM THE GROUND. IN ANDING, FOR MANIZAR THE AC PORTION CAN BE RUN IN AN AVERAGING MODE, OR AN ALTERNATING AVERAGING. AND PEAK AMPLITUED DETECTION MODE KEYED TO THE TELEMETRY READOUT SEQUENCE.

-- ISEE-A, HOVESTADT------

INVESTIGATION NAME- LOW-ENER	IGY COSMIC-RAY COMPOSITION
NSSDÇ ID- MOTHER -05	INVESTIGATIVE PROGRAM Code 54/Co-op
	INVESTIGATION DISCIPLINE(S) Cosmic Rays Particles and Fields

PERSONNEL

PERDUNNEL		
	HOVESTADT	HPI-EXTRATERR PHYS
	0'GALLAGHER	U OF MARYLAND
01 - M.		MPI-EXTRATERR PHYS
0I + L.A.	FISK	NASA-GSFC
01 - C.Y.	FAN	U OF ARIZONA
01 - G.	GLOECKLER	U OF MARYLAND

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO STUDY, BY MEANS OF IDENTICAL INSTRUMENTATION ON THE HELIDCENTRIC AND MOTHER SPACECRAFT, THE NUCLEAR AND IONIC CHARGE AS WELL AS ISOTOPIC COMPOSITION OF INTERPLANETARY AND MAGNETOSPHERIC HEAVY PARTICLES. THE MEASUREMENTS ARE MADE OF THE FOLLOWING SPECIES IN THE DESIGNATED RANGES -- (1) SOLAR WIND IONS (2 TO 10

KEV/CHARGE), (2) SUPRATHERMAL MULTIPLE-CHARGED IG.55 (Z, Q LESS THAM OR EQUAL TO 26 IN THE ENERGY RANGE FROM 0.02 TO 13 NEW (HYDROBEN), 0.01 TO 30 MEV/NUCLEON (OXTGEN) AND 0.005 TO 50 HEV/NUCLEON (IRON)), AND (3) TRAPPED PARTICLES (0.01 TO 6 MEV/NUCLEON). THE INSTRUMENTATION CONSISTS OF THO SENSORS ON EACH SPACECRAFT WHICH USE ELECTROSTATIC DEFLECTION TECHNIQUES, THIM WINDOW PROPORTIONAL COUNTRES, AND POSITION-SENSITIVE SOLID-STATE DETFCTORS. THE SENSORS HAVE LARGE GEOMETRICAL FACTORS OVER THE ZITIRE ENERGY RANGE, I.E., 0.04 CM SQ STER FOR THERMAL AND SUPRATHERMAL GOLAR WIND MEASUREMENTS, AND 3 CM SQ STER FOR LOW ENERGY COSMIC RAY MEASUREMENTS.

--- ISEE-A, MOZER

INVESTIGATION NAME- DC TO 12-HZ ELECTRIC FIELD PROBE

NSSDC ID- MOTHER -06

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(5) MAGNETOSPHERIC PHYSICS PARTICLES AND FIELDS

PERSONNEL PI - F.S. NOZER DI - M.C. KELLEY

U OF CALIF, BERKELEY U OF CALIF, BERKELEY

BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT IS TO STUDY THE DUASI-STATIC ELECTRIC FIELD IN THE PLASMASPHERE, MAGHETOSPHERE, MAGNETOSHEATH, AND SOLAR WIND, THE 4-IN-DIAM SPHERES MOUNTED AT THE END OF A 30-M BOOM ARE POSITIONED IN THE SATELLITE SPIN PLANE. TO ATTEMPT TO OVERCOME THE SPACECRAFT SHEATH (A POTENTIAL PROBLEM WHICH PLAGUES ALL ELECTRIC FIELD DETECTORS), AN ELECTRON GUN IS INCLUDED ON THE SPACECRAFT BOOT. THE INSTRUMENT IS DESIGNED TO BE SEMSITIVE TO FIELDS. FROM A THRESHOLD TO 1 MV/M IN THE FREQUENCY BAND OF D TO 12 HZ.

---- ISEE-A, OGILVIE------

INVESTIGATION NAME- THREE-DIMENSIONAL (SIX AXES), 6-EV TO 10-KEV ELECTRON SPECTROMETER

INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) NAGNETOSPHERIC PHYSICS SPACE PLASMAS

NASA-GSFC NASA-GSFC

PERSONNEL PI - K.W. OGILVIE 01 - J.D. SCUDDER

NSSDI ID- MOTHER -02

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT STUDIES THE TRANSPORT COEFFICIENTS OF, TURBULENCE IN -- THE COLLISIONLESS PLASMA REPRESENTED BY THE INTERPLANETARY MEDIUM AND MAGNETOSHEATH, LOW-ENERGY SOLAR ELECTRON EVENTS, AND BOW SHOCK ASSOCIATED ELECTRONS, TWO TRIAXIAL SYSTEMS OF 127-DEG CYLINDRICAL ELECTROSTATIC ANALYZERS ARE USED TO MAKE THREE-DIMENSIONAL MEASUREMENTS OF THE ELECTRON DISTRIBUTION FUNCTION FROM 6 EV TO 10 KEV. MEASUREMENTS ARE MADE IN TWO ENERGY RANGES WITH AN ENERGY RESOLUTION COELTA E/ED OF 0.07. THE ENTIRE SET OF SIX SIMULTANEOUS SPECTROMETER MEASUREMENTS ARE TAKEN WHILE THE SATELLITE ROTATES THROUGH 60 DEG. EACH SPECTROMETER AXIS CONSISTS OF THE CURVED PLATE ANALYZER AND A CHANNELTRON DETECTOR.

- ISEE-A, RUSSELL----INVESTIGATION NAME- NAGNETIC FIELDS

NSSDC ID- MOTHER -04

INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Particles and Fields

Main

PERSONNEL		
PI - C.T.	RUSSELL	U OF CALIF, LA
	MCPHERRON	U OF CALIF, LA
01 - P.C.	HEDGECOCK	IMPERIAL COLLEGE
	GREENSTADT	TRW SYSTEMS GROUP
01 - M.G.	KIVELSON	U OF CALLE, LA

01 - M.G. RIVELSON U.UF LALIF, LA BRISF DESCRIPTION IN THIS TRIAXIAL FLUXGATE MAGNETOMETER, THREE RING CORE SENSORS IN AN ORTHOGOMAL TRIAD ARE ENCLOSED IN A FLIPPER MECHANISH AT THE END OF THE MAGNETOMETER BOOM. THE ELECTONICS UNIT IS ON THE MAIN BODY OF THE SPACECRAFT AT THE FOOT OF THE BOOM. THE MAIN BODY OF THE SPACECRAFT AT THE FOOT OF THE BOOM. THE MAGNETOMETER HAS TWO OPERATING RANGES OF PLUS OR NINUS S192 GAMMAS AND PLUS OR MINUS 512 GAMMAS IN EACH VECTOR COMPONENT. THE DATA ARE DIGITIZED AND AVERAGED WITHIN THE INSTRUMENT TO PROVIDE INCREASED RESOLUTION AND TO PROVIDE NTQUIST FLITERING. THERE ARE TWO MODES FOR THE TRANSMISSION OF THE AVERAGED DATA. IN THE DOUBLE-PRECISION MODE OF OPERATION THE AVERAGED OF DATA ARE TRANSMITTED. THIS PROVIDES A MAXIMUM RESOLUTION OF PLUS OR MINUS 1/4 GAMMA OR 1/32 GAMMA IN MODE, ANY B CONSECUTIVE BITS OF THE ABOVE 10 BITS ARE SELECTED BY GROUND COMMAND FOR TRANSMISSION AND THE TELEMETRY BANDWIDTHS OF THE MAGNETOMETER ARE DOUBLED. THIS BANDWIDTH VARIES FROM 2

HZ AT THE LOW TELEMETRY RATE DOUBLE-PRECISION EXPERIMENT MODE To 32 Hz at the high telemetry rate single-precision experiment MODE. INVESTIGATION NAME- PLASMA COMPOSITION NSSDC 10- NOTHER -12 INVESTIGATIVE PROGRAM CODE SA/CO-OP INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Space Plasmas PERSONNEL

 RSONNEL

 PI - R.D.
 SHAAP

 OI - G.
 HAERENDEL

 OI - H.R.
 ROSENBAUE

 OI - R.G.
 JOHNSON

 OI - E.G.
 SHELLEY

 OI - J.
 GEISS

 OI - H.X.
 EBERHARD

 OI - H.X.
 EBERHARD

 LOCKHEED PALO ALTO MPI-EXTRATERR PHYS MPI-EXTRATERR PHYS HAERENDEL ROSENBAUER JOHNSON SHELLEY HEISERTAATERR PHYS LOCKHEED PALO ALTO LOCKHEED PALO ALTO U OF BERNE U OF BERNE U OF BERNE 01 - C.R. CHAPPELL NASA-MSEC BRIEF DESCRIPTION BRIEF DESCRIPTION THE OBJECTIVE OF THIS INVESTIGATION IS TO DETERMINE THE ION COMPOSITION AND ENERGY SPECTRA OF THE PLASMA WITHIN THE MAGNETOSPHERE, MAGNETOSHEATH, AND SOLAR WIND, AND TO DETERMINE THE ANGULAR DISTRIBUTION OF THE PLASMA IN THE MAGNETOSHEATH. AN ENERGETIC ION MASS SPECTROMETER IS FLOWN THAT HAS AN ELECTROSTATIC ENERGY ANALYZER FOLLOWED BT A COMBINED CYLINDRICAL, ELECTROSTATIC/MAGNETIC MASS ANALYZER. A COMBINATION OF ELECTRON MULTIPLIENS IS USED AS THE DETECTORS. THE ENERGY-PER-UNIT-CHARGE RANGE MEASURED IS FROM 0 TO 17 KEV. THE MASS-PER-UNIT-CHARGE RANGE MEASURED EXTENDS FROM 1 TO 13B U. PERSONNEL --- ISEE-A, WILLIAMS------INVESTIGATION NAME- ENERGETIC ELECTRONS AND PROTONS NSSDC ID- MOTHER -09 INVESTIGATIVE PROGRAM CODE SA/CO-OP INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Particles and fields PERSONNEL PI ~ D.J. WILLIAMS OI - C.O. BOSTROM OI - B. WILKEN OI - T.A. FRITZ UIABEREN. NGAA-ERL Appliêd Physics Lab Mpi-Aeronomy Ngaa-erl FRITZ Wieberenz Kepplêr 01 - G. 01 - E. U OF KIEL MPI-AERONOMY BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO IDENTIFY AND TO STUDY PLASMA INSTABILITIES RESPONSIBLE FOR ACCELERATION, SOURCE AND LOSS MECHANISMS, AND BOUNDARY AND INTERFACE PHENOMENA THROUGHOUT THE ORBITAL RANGE OF THE MOTHER/DAUGHTER SATELLITE. A PROTON TELESCOPE AND AN ELECTRON SPECTRUMETER ARE FLOWN ON EACH SPACECRAFT TO MEASURE DETAILED ENERGY SPECTRUM AND ANGULAR DISTRIBUTIONS. THESE DETECTORS USE SILLICON SURFACE BARRIER TOTALLY DEPLETED SOLID-STATE DEVICES OF VARIOUS THICKNESSES, AREAS, AND CONFIGURATIONS. PROTONS IN 8 CHARNELS BETWEEN 20 KEV AND 2 MEV, AND ELECTRONS IN 8 CHARNELS BETWEEN 20 KEV AND MEASURES THE ENERGY SPECTRA AND PITCH-ANGLE DISTRIBUTIONS OF ALPHA PARTICLES AND HEAVY JONS IN THE ENERGY RANGE ABOVE 150 KEV PER NUCLEON. BRIEF DESCRIPTION NS50 PERS 0 01 - G. ************************ SPACECRAFT COMMON NAME- ISEE-B Alternate Hames- Imp-k prime, Ime-d Daughter, Inthl Sun Earth Expl-b NSSDC 10- DAUGHTR LAUNCH DATE- 10/13/77 WEIGHT- 165.78 KG Launch Site- Cape Canaveral, Unived States Launch Vehicle- Delta SPONSORING COUNTRY/AGENCY United States International INVESTIGATION NAME- HOT PLASMA NASA-OSS ESA PLANNED ORBIT PARAMETERS Orbit type- geocentric orbit period- 3572. Min periapsis- 280. Km INCLINATION- 28.8 DEG APOAPSIS- 140344. KM PERSONNEL PERSONNEL NG - J.A. HOLTZ SC - E.R. SCHMERLING PM - A. HAWKYARD PS - A.C. DURNEY NASA HEADQUARTERS NASA HEADQUARTERS ESA-ESTEC ESA-ESTEC

BRIEF DESCRIPTION THE EXPLORER CLASS DAUGHTER SPACECRAFT IS PART OF THE MOTHER/DAUGHTER/MELIOCENTRIC MISSION (ISEE A, B, AND C). THE PROPOSES OF THE MISSION ARE -- (1) TO INVESTIGATE SOLAR-TERRESTRIAL RELATIONSHIPS AT THE OUTERMOST BOUNDARIES OF THE EARTH'S MACHTOSPHERE, (2) TO EXAMINE IN DETAIL THE STRUCTURE OF THE SOLAR WIND NEAR EARTH AND THE SHOCK WAVE THAT FORMS THE INTERFACE BETWEEN THE SOLAR WIND AND EARTH, AND (3) TO CONTINUE THE INVESTIGATION OF COSMIC RAYS AND SOLAR FLARES IN THE INTERFLANETARY REGION NEAR 1 AU. THE MISSION THUS EXTENDS THE INVESTIGATION OF OF PREVIOUS IMP SPACECRAFT. THE MOTHER/DAUGHTER PORTION OF THE MISSION CONSISTS OF TWO SPACECRAFT WITH A STALION-KEEPING CAPABILITY IN A HIGHLY ECCENTRIC EARTH ORDIT WITH APOGEE OF 23 EARTH RADII. THE STALECRAFT HAINTANS A SMALL SEPARATION DISTANCE, AND MAKES SIMULTANEOUS COORDINATED MEASUREMENTS TO FEMIL SEPARATION OF SPATIAL FROM TEMPURAL IRREGULARITIES IN THE MEASUREMENTS HOLANG MAKES SIMULTANEOUS SOORDINATED MEASUREMENTS TO FEMIL SEPARATION OF SPATIAL FROM TEMPURAL IRREGULARITIES IN THE MEASUREMENTS HOLANGTANG HEAPING RATE OF THE SPACECRAFT WILL BE FIXED AT 19.8 RPM, DIFFERING SLIGHTLY FROM THE ISEL-A SPACECRAFT. BRIEF DESCRIPTION -- ISEE-By ANDERSON-----INVESTIGATION NAME- ENERGETIC ELECTRONS AND PROTONS NSSDC ID- DAUGHTR-UR INVESTIGATIVE PROGRAM CODE SA/CO-OP INVESTIGATION DISCIPLINE(S)

MAGNETOSPHERIC PHYSICS $\begin{array}{l} \text{RSONNEL} \\ P1 & \leftarrow \text{K.A.} & \text{ANLERSON} \\ \text{OI} & - \text{C.I.} & \text{MEVG} \\ \text{OI} & - \text{J.M.} & \text{BOSQUED} \\ \text{OI} & - \text{R.} & \text{PELLAT} \\ \text{OI} & - \text{R.V.} & \text{CORONIT} \\ \text{OI} & - \text{H.} & \text{REME} \\ \text{OI} & - \text{H.} & \text{REME} \\ \text{OI} & - \text{G.K.} & \text{FARKS} \\ \end{array}$ U OF CALIF, BERKELEY U DF CALIF, BERKELEY Cesa CTR For Theoretic Phys U of Calif, La CESR U OF CALIF, BERKELEY

U OF WASHINGTON

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE PURPOSE OF THIS EXPERIMENT IS TO DETERMINE, BY USING IDENTICAL INSTRUMENTATION ON THE MOTHER/DAUGHTER SPACECRAFT, THE SPATIAL EVIENT, PROPAGATION VELOCITY, AND TEMPORAL BEHAVIOR OF A WIDE VARIETY OF PARTICLE PHENOMENA. ELECTRONS ARE MEASURED IN TWO INTERVALS OVER THE ENERGY RANGE FROM 8 TO 200 KEV, AND PROTONS ARE MEASURED IN THREE INTERVALS OVER THE ENERGY RANGE FROM 10 TO 380 KEV. IDENTICAL INSTRUMENTATION ON EACH SPACECRAFT CONSISTS OF A PAIR OF SUBFACE BARRIER SEMICONDUCTOR DETECTOR TELESCOPES (ONE WITH A FOIL AND ONE WITHOUT A FOIL) AND FOUR FIXED-ENERGY ELECTRIC FIELD CHARGED PARTICLE ANALYZERS. THESE ANALYZERS ARE USED TO MEASURE ELECTRONS ANF PROTONS SEPARATELY AT 2 AND 6 KEV.

- 15EE-8, EGIDI-----

INVESTIGATION NAME- SOLAR WIND TONS

9C 10- 9	AUGHTR-D2	INVESTIGATIVE PROGRAM
		CODE SA/CO-OP
		INVESTIGATION DISCIPLINE(S)
		MAGNETOSPHERIC PHYSICS
		SPACE PLASMAS
SONNEL		
ч - м.	EGIĎI	CNR, SPACE PLASMA LAB
)1 - G.	HORENO	U OF ROME
)I - P.	CERULL1	U OF ROME
й – 2	FORMISANO	
		CNR, SPACE PLASMA LAB
11 - S.C.	CANTARANO	U OF ROME
)I - S	BAME	LOS ALAMOS SCI LAB
)I — G.	PASEHMANN	MPI-EXTRATERR PHYS
		TEATEALERK PHTS

BRIEF DESCHIPTION THE OBJECTIVE OF THIS EXPERIMENT IS TO GAIN A BETTER UNDERSTANDING OF THE INTERACTION OF THE SOLAR WIND WITH THE EARTH'S MAGNETIC FIELD BY MEASURING ION FLUXES AS FUNCTIONS OF DIRECTION AND ENERGY. AN ELECTROSTATIC ANALYZER IS USED TO MEASURE THE ION DISTRIBUTION FUNCTION FROM SO EV TO TO KEW PER UNIT CHARGE. THE ELECTROSTATIC ANALYZER HAS SEVERAL NAPROW ENERGY WINSOWS TO MAP THE ION DISTRIBUTION FUNCTION FUNCTION IN DETAIL.

----- ISEE-B, FRANK------

NSSOC ID- DAUGHTR-03

INVESTIGATIVE PROGRAM Code Sa/Co-op

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS Space Plasmas

PI - L.A. 01 - V.M. 01 - C.F. FRANK VASYLIUNAS KENNEL

OF TOWA MPI-AERONOMY U OF CALIF, LA

TANK STATISTICS

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25 799

11-200 AV

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO STUDY, BY MEANS OF IDENTICAL INSTRUMENTATION ON THE MOTHER/DAUGHTER SPACECRAFT, ITHE SPATIAL AND TEMPORAL VARIATIONS OF THE SOLAR WIND AND MAGNETOSHEATH ELECTRONS AND IONS. PROTONS AND ELECTRONS IN THE ENERGY BANDS WITH AN ENERGY RESOLUTION (DELTA E/E) OF D.17, A GUADRISPHERICAL LOW-ENERGY PROTON AND ELECTRON DIFFERENTIAL ENERGY MANALTER (LEPEDEA), EMPLOYING SEVEN CONTINUOUS CHANNEL ELECTRON MULTIPLIERS IN EACH OF ITS THO CANE FOR PROTONS AND ONE FOR ELECTRONS) ELECTROSISTIC ANALTERS ARE FLOWN ON BOTH MOTHER AND DAUGHTER SPACECRAFY. ALL BUT 2 PERCENT OF THE FOUR PI STER SOLID-ANGLE IS COVERED FOR PARTICLE VELOCITY VECTORS.

--- 1SEE-8, GURNETT------

INVESTIGATION NAME- 10-HZ TO 10-KHZ MAGNETIC AND 10-HZ TO 200-KHZ ELECTRIC FIELD MONOAXIAL PROBES

NSSDC ID- DAUGHTR-05 INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS PARTICLES AND FIELDS

PI - D.A.	GURNETT	U OF IOWA
01 - F.L.	SCARF	TRW SYSTEMS GROUP
0I - E.J.	SMITH	NASA-JPL
0Ï — R.W.	FREDERICKS	TRW SYSTEMS GROUP

PERSONNEL

BRIEF DESCRIPTION IN THIS EXPERIMENT, A SINGLE-AXIS SEARCH COIL MAGMETOMETER WITH A HIGH PERMEABILITY CORE AND A SINGLE ELECTRIC FIELD DIPOLE (RELATIVELY SHORT) MEASURES WAVE PHENOMEMON OCCURING WITHIN THE RAGHETOSPHERE AND SOLAR WIND IN CONJUNCTION WITH A SIATLAR EXPERIMENT FLOWN ON THE ROTHER SPACECRAFT. THE TIME REQUIRED FOR A 16-CHANNEL SPECTRUM ANALYSIS IN A RANGE OF 10 HZ TO 10 KHZ FROM THE SEARCH COIL IS 100 MS. THE TIME REQUIRED FOR A 16-CHANNEL SPECTRUM ANALYSIS IN A RANGE OF 10 HZ TO 200 KHZ FROM THE ELECTRIC DIPOLE IS ALSO 100 MS. THE TIPOLE IS MOUNTED PERPENDICULAR TO THE SPIN AXIS.

---- ISEE-B, HARVEY-----

INVESTIGATION NAME- RADIO PROPAGATION RECEIVER

DAUGHTR-06

INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Space Plasmas

INVESTIGATIVE PROGRAM CODE SA/CO-OP

PERSONNEL

P1 - C.C.	HARVEY	PARIS OBSERVATORY
01 - R.E.	GENDRIN	CNET
ÓI - J.R.	MCAFEE	NOAA-ERL
0I ÷ M.	PETIT	CNET
01 — D.	JONES	ESA-ESTEC
01 - J.M.	ETCHETO	CNET
01 - R.J.L	-GRARD	ESA-ESTEC

IEF DESCRIPTION

IEF DESCRIPTION THE TOTAL ELECTRON CONTENT BETWEEN THE MOTHER AND DAUGHTER WILL BE OBTAINED BY MEASURING THE PHASE DELAY INTRODUCED BY THE AMBIENT PLASMA ONTO A WAVE OF FREQUENCY ABOUT 1 MHZ-. TRANSMITTED FROM THE MOTHER (EXPERIMENT 8) AND RECEIVED ON THE DAUGHTER. THE F-ASE WILL BE COMPARED AGAINST A PHASE-COHERENT SIGNAL TRANSMITTED FROM THE MOTHER TO THE DAUGHTER 9Y MODULATION ONTO A CARTIER OF FREQUENCY HIGH ENOUGH TO BE UNAFFECTED BY THE AMBIENT PLASMA.

--- ISEE-B, KEPPLER----

INVESTIGATION NAME- ENERGETIC ELECTRONS AND PROTONS

INVESTIGATIVE PROGRAM CODE SA/CO-OP NSSDC ID- DAUGHTR-07

INVESTIGATION DISCIPLINE(S) WAGNETOSPHERIC PHYSICS

NPI-AERONDMY NDAA-ERL

ERSONNEL		
P1 - É.	KEPPLER	
01 - D.J.	HILLIAHS	
01 - T.A.	FRITZ	
01 - C.O.	90STROM	
0I - B.	WILKEN	
01 - G.	WIBBERENZ	

-	1.A.	FRITZ		NOAA-ERL	
-	C.O.	BOSTROM		APPLIED PHYSICS LA	B
-	9.	WILKEN		HPI-AERONOMY	
-	G.	VIBBERENZ	1	B OF KIEL	

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO IDENTIFY AND TO STUDY PLASMA INSTABILITIES RESPONSIBLE FOR ACCELERATION, EDURCE AND LOSS MECHANISHS, AND BOUNDARY AND INTERFACE PHIENOMENA THROUGHOUT THE ORBITAL RANGE OF MOTHER/ DAUGHTER SATELLITES. A PROTON TELESCOPE AND AN ELECTRON SPECTROMETER FLOWN OM EACH SPACECRAFT TO MEASURE DETAILED ENERGY SPECTRA AND ANGULAR DISTRIBUTIONS. THESE DETECTORS USE SILICON, SURFACE-BARRIER, TOTALLY DEPLETED SOLID-STATE DEVICES OF VARIOUS THICKNESSES, AREAS, AND CONFIGURATIONS. PROTONS IN 5 DIRECTIONS AND 12

ENERGY CHANNELS BETWEEN 25 KEV AND 2 MEV AND ELECTRONS IN 5 Directions and 12 Energy channels between 20 KeV and 1 mey are MEASURED.

--- ISEE-B, PASCHMANN-----

INVESTIGATION NAME- SO-EV TO 40-KEV PROTON AND 5-EV TO 20-KEV ELECTRON PLASMA PROBE

INVESTIGATIVE PROGRAM CODE SA/CO-OP NSSDC ID- DAUGHTR-01

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS

PERSONNEL		
₽I - G.	PASCHMANN	NPI-EXTRATERR PHYS
01 - ¥.C.	FELDMAN	LOS ALAHOS SCI LAB
01 - E.W.	HONES, JR.	LOS ALAHOS SCI LAB
0I - K.	SCHINDLER	INST FOR THEOR PHY
01 — H.	MIGGENRIEDER	MPI-EXTRATERR PHYS
0I - S.J.	BAME	LOS ALAHOS SCI LAB
01 - H.	VOLK	MPI-EXTRATERR PHYS
0I - H.R.	ROSENBAUER	MPI-EXTRATERR PHYS
01 - H.D.	MONTGOMERY	LOS ALAHOS SCI LAB
01 - J.R.	ASBRIDGE	LOS ALANOS SCT LAR

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO STUDY THE PLASMA VELOCITY DISTRIBUTIONS AND THEIR SPATIAL AND TEMPORAL VARIATIONS IN THE SOLAR WIND, BOW SHOCK, MAGNETSHEATH, MAGNETOPAUSE, AND THREE-DIMENSIONAL VELOCITY DISTRIBUTIONS FOR POSITIVE IONS AND THREE-DIMENSIONAL VELOCITY DISTRIBUTIONS FOR POSITIVE IONS AND ELECTRONS ARE MEASURED USING TWO 9D-DEG SPHERICAL ELECTROSTATIC ANALYZER WITH CHANNELTRON ELECTRON MULTIPLIERS AS DETECTORS. IN COMJUNCTION WITH SIMILAR INSTRUMENTATION FROVIDED BY S. J. BAMES/LASL FOR THE MOTHER FACECRAFT, PROTONS FROM SOLEY TO KEY (AND ELECTRONS FROM SEV TO 20 KEY) ARE MEASURED WITH 10 PERCENT ENERGY RESOLUTION IN TWO RANGES EACH.

- ISEE-B, RUSSELL------

INVESTIGATION NAME- MAGNETIC FIELDS

NSSDC ID- DAUGHTR-04

INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) Magnetospheric physics Particles and fields

PERSONNEL		
PI - C.T.	RUSSELL	U OF CALIF, LA
01 - R.L.	MCPHERRON	U OF CALIF, LA
01 - P.C.	HEDGECOCK	IMPERIAL CULLEGE
01 - E.W.	GREENSTADT	TRW SYSTEMS GROUP
61 - N C	KINEL COM	

01 - M.G. KIVELSON U OF CALIF, LA BRIEF DESCRIPTION IN THIS TRIAXIAL FLUXGATE MAGNETOMETER, THREE RING CORE SENSORS IN AN ORTHOGOMAL TRIAD ARE ENCLOSED IN A FLIPPER MECHANISM AT THE END OF THE MAGNETOMETER BOOM. THE ELECTRONICS UNIT IS ON THE MAIN BOOV OF THE SPACECRAFT AT THE FOOT OF THE BOOM. THE MAGNETOMETER HAS TWO DPERATING RANGES OF PLUS OR RINUS S192 GAMMAS AND PLUS OR MINUS 512 GAMMAS IN EACH VECTOR COMPONENT. THE DATA ARE DIGITIZED AND AVERAGED WITHIN THE INSTRUMENT TO PROVIDE INGREASED RESOLUTION AND TO PROVIDE NYQUIST FLITERING. THERE ARE TWO MODES FOR THE TRANSMISSION OF THE AVERAGED DATA. IN THE DOUBLE-PRECISION NDDE OF OPERATION THE LOW-AND HIGH-SENSITIVITY RANGES. IN THE SINGLE-PRECISION MODE, ANY 8 CONSECUTIVE BITS OF THE ANDUNE TO ARMYDIDTHS DY GROUND COMMAND FOR TRANSMISSION AND THE TELEMETRY BANDWIDTH THE LOW TELEMETRY RATE DOUBLE-PRECISION EXPERIMENT MODE 10 32 H2. AT THE HIGH TELEMETRY RATE SINGLE-PRECISION EXPERIMENT MODE.

SPACECRAFT COMMON NAME- ISEE-C Alternate Names- STP probe, Ime-H Heliocentric, Ininl sun Earth Expl-C

NSSDC ID- HELOCTR

LAUNCH DATE- 07/00/78 Launch Site- Cape Canaveral, United States Launch Vehicle- Delta WEIGHT- 469. KG

SPONSORING COUNTRY/AGENCY United States Internati /AL NASA-OSS ESA

PLANNED ORDIT PARAMETERS Orbit Type- Heliocentric Orbit Period- 365. Days Periapsis- 0.99 au Rad

INCLINATION-APDAPSIS-0. DEG 0.99 AU RAD

PERSONNEL

State State State

NG - F.W. SC - E.R. PM - J.J. PS - T.T. GAETANO SCHMERLING Maddèn Von Rosenvingè

BRIEF DESCRIPTION THE EXPLORER CLASS HELIOCENTRIC SPACECRAFT IS PART OF THE MOTHER/DAUGHTER/HELIOCENTRIC MISSION (ISEE A,BAAND C). THE PURPOSES OF THE MISSION ARE (3) TO INVESTIGATE SOLAR/TERRESTRIAL RELATIONSHIPS AT THE OUTERNOST BOUNDARIES OF THE EARTH'S MAGNETOSPHERE, (2) TO EXAMINE IN DETAIL THE STRUCTURE OF THE SOLAR WIND NEAR THE SOLAR WIND AND EARTH. AND THAT FORMS THE INTERFACE BETWEEN THE SOLAR WIND AND EARTH. AND (3) TO CONTINUE THE INTERFACE BETWEEN THE SOLAR WIND AND EARTH. THE EXTENDS THE INTERFACE BETWEEN THE SOLAR WIND AND EARTH. THE LAUNCH OF THREF LATER BETWEEN THE SOLAR WIND AND EARTH. THE EXTENDS THE INVESTIGATIONS OF PREVIOUS IMP SPACEGRAFT. THE EXTENDS THE INVESTIGATIONS OF PREVIOUS IMP SPACEGRAFT. THE LAUNCH OF THREF COORDINATES SPACECRAFT IN THIS MISSION PERMITS LAUNCH OF THREF COORDINATES SPACECRAFT IN THIS MISSION PERMITS LAUNCH OF THREF COORDINATES OF ADDIT 20 RPM. IT IS PLACED INTO AND FLARES IN THE INVESTIGATION OF SPATIAL AND TEMPORAL EFFECTS. THE HELIOCENTRIC SPACECRAFT HAS A SPIN AXIS NORMAL TO THE ECLIPTIC HAND AND DANGHT ABOUT THE LIBRATION POINT 235 EARTH RADII ON THE SUN SIDE OF THE EARTH WHER IT CONTINUOUSLY MONITORS ON THE SUN SIDE OF THE LATTH, WHERE IT CONTINUOUSLY MONITORS ON THE NON DAUGHTER SPACECRAFT INSTER ECCENTRIC GOCENTRIC CHANGES IN THE NEAR-EARTH INTERPLANETARY MEDIUM. BECAUSE BOTH THE MADIT 'Q AND DAUGHTER SPACECRAFT INTER ECCENTRIC GOCCENTRIC ON DAUGHTER SPACECRAFT HAS ANE COCENTRIC GOCCENTRIC ON THE NADANTORS DETWEEN THE HELIOCENTRIC SOLAR PLANEMAND THE AGANCTOSPHENE. FINALLY. THE HELIOCENTRIC SPACECRAFTALSON PUNJES A NEAR-EARTH BASE FOR MAKING COSMIC RAY AND OTHER PLANETARY MEASUREMENTS FOR COMPARISON WITH COINCIDENT MEASUREMENTS FROM DEEP-SPACE PROBES.

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----- ISEE ANDERSON------

INVESTIGATION NAME- X RAYS AND ELECTRONS

INVESTIGATIVE PROGRAM NSSDC ID- HELOCTR-D9 CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) Particles and fields Solar Physics

where we have been and and

NASA HEADQUARTERS

NASA HEADQUARTERS NASA-GSFC NASA-GSFC

PERSONNEL		U OF CALIF, BERKELEY
PI - K.A.		U OF CALIF, BERKELEY
01 - 8.P.		HIGH ALTITUDE OBS
01 - Þ.f.		U OF CALIF, BERKELEY
01 - 5.A.	KANE	• • • •

ERIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO STUDY SPECTRA AND ANISOTROPIES OF INTERPLANETARY AND SOLAR ELECTRONS (2 TO 800 KEV) IN THE TRANSITION ENERGY RANGE GETWEEN SOLAR WIND AND LOW-ENERGY COSMIC RAYS, AND TO STUDY WITH 1-5 RESOLUTION THE SPECTRA OF SOLAR X RAYS (6 TO 228 KEV). THE ELECTRONS ARE MEASURED BY A PAIR OF PASSIVELY COOLED, SURFACE BARRIER MEASURED BY A PAIR OF PASSIVELY COOLED, SURFACE BARRIER HEASURED BY A PLATE ELECTROSTATIC ANALYZER WITH CHANNEL-MULTIPLIED DETECTORS (2-18 KEV). THE X RAYS ARE MEASURED BY A PROPORTIONAL COUNTER (6-20 KEV) AND A SODIUM IODIDE SCINTILLATOR (12 TO 228 KEV).

- ISEE-C, BAME--

INVESTIGATION NAME- 150-EV TO 7-KEV PROTON AND 5-EV TO 2.5-KEV ELECTRON PLASMA PROBE

NSSDC ID- HELDCTR-01

INVESTIGATIVE PROGRAM CODE SA/CO-OP INVESTIGATION DISCIPLINE(S) Particles and fields Space plasmas

01 - E.W. 01 - M.D.	BAME ASBRIDGE Hones, JR. Montgomery	L05 L05 L05	ALAMOS ALAMOS ALAMOS ALAMOS ALAMOS	SCI SCI SCI	LAB LAB LAB	
01 - H-C -	FELDMAN	LUS	ALANUS		240	

DUS ALARUS SEI LAG BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO MAKE AN INTEGRATED STUDY OF THE NATURE, ORIGIN AND EVOLUTION OF STRUCTURE IN THE INTERPLANETARY MEDIUM. ALSO, THE THERMAL STATE OF THE INTERPLANETARY MEDIUM. ALSO, THE THERMAL STATE OF THE INTERPLANETARY MEDIUM. ALSO, THE THERMAL STATE OF THE INTERPLANETARY MEDIUM. ALSO, THE THERMAL STATE OF THE INTERPLANETARY MEDIUM. ALSO, THE THERMAL STATE OF THE INTERPLANETARY MEDIUM. ALSO, THE THERMAL STATE OF THE INTERPLANETARY MEDIUM. ALSO, WILL AND AND ELECTRON SOLAR PLASMA AGE MEASURED FROM TSO EV TO 7 KEV AND S EV TO 2.5 KEV IN 12 AND AGE MEASURED FROM TSO EV TO 7 KEV AND S EV TO 2.5 KEV IN 12 AND AGE MEASURED FROM TSO EVILUTION FOR EACH EMECT WINDOW IS 0.4.2 PRECENT. ELECTRONS ARE MEASURED BY A 90-DEG SPHERICAL ELECTROSTATIC ANALYZER, ALSO IN THO AND THREE DIMENSIONS. THE ELECTROSTATIC ANALYZER, ALSO IN THO AND THREE DIMENSIONS. THE ENERGY WINDOM PER STEP FOR ELECTRONS IS 10 PERCENT. CHANNELTRON ELECTRON MULTIPLIERS ARE USED AS DETECTORS FOR EACH DF THE ANALYZERS.

--- ISEE-C, HECKBAN-----

INVESTIGATION NAME- HIGH-ENERGY COSMIC RAYS INVESTIGATIVE PROGRAM Code SA/CO-OP

HSSDC ID- HELOCTR-OS

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS COSMIC RAYS

PERSONNEL PI - H.H. HECKMAN DI - D.E. GREINER LAWRENCE BERKELEY LAB U of Calif, Berkeley

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RESOLUTION.

- ISEE-C, HOVESTADT-----

INVESTIGATION NAME- LOW-ENERGY COSMIC-RAY COMPOSITION

INVESTIGATIVE PROGRAM NSSDC ID- HELOCTR-03 CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS COSMIC RAYS

01 - J.J. 01 - C.Y. 01 - G. 01 - M.	HOVESTADT O'GALLAGHER FAN Gldeckler Scholer	NPI-EXTRATERR PHYS U OF MARVLAND U OF ARIJONA U OF MARVLAND NPI-EXTRATERR PHYS NASA-65FE
01 - M. 01 - L.A.	FISK	NASA-GSFC

OI - L.A. FISK BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO STUDY, BY MEANS OF THIS EXPERIMENTATION ON THE HELIDGENTRIC AND MOTHER IDENTICAL INSTRUMENTATION ON THE HELIDGENTRIC AND BOTHER SPACEGRAFT, THE NUCLEAR AND IDNIC CHARGE AS WELL AS ISOTOPIC SPACEGRAFT, THE NUCLEAR AND IDNIC CHARGE AS WELL AS ISOTOPIC SPACEGRAFT, THE NUCLEAR AND IDNIC CHARGE AS WELL AS ISOTOPIC SPACEGRAFT, THE NUCLEAR AND IDNIC CHARGE AS WELL AS ISOTOPIC SPACEGRAFT, THE NUCLEAR AND IDNIC CHARGE AS WELL AS DESIGNATED RANGES -- (1) SOLAR WIND IONS (5 KEV/CHARGE TO 20 MEV/CHARGE), (2) SUPRATHERMAL MULTIPLE-CHARGED IONS (2 LE, 26 MEV/CHARGE), (2) SUPRATHERMAL MULTIPLE-CHARGED IONS (2 LE, 26 NT THE ENERGY RANGE 5 TO 5D KEV/NUCLEON), AND (4) TRAPED PARTICLES COSMIC RAYS (0.05 TO 20 WEV/NUCLEON), AND (4) TRAPED PARTICLES COSMIC RAYS (0.05 TO 20 WEV/NUCLEON), AND (4) TRAPED FARTICLES COSMIC RAYS (0.05 TO 20 WEV/NUCLEON), AND (4) TRAPED FARTICLES COSMIC RAYS (0.05 TO 20 WEV/NUCLEON), AND (4) TRAPED FARTICLES COSMIC RAYS (0.05 TO 20 WEV/NUCLEON), AND (4) TRAPED FARTICLES COSMIC RAYS (0.05 TO 20 WEV/NUCLEON), AND (4) TRAPED FARTICLES COSMIC RAYS (0.05 TO 20 WEV/NUCLEON), AND (4) TRAPED FARTICLES COSMIC RAYS (0.05 TO 20 WEV/NUCLEON), AND (4) TRAPED FARTICLES COSMIC RAYS (0.05 TO 20 WEV/NUCLEON), AND (4) TRAPED FARTICLES COSMIC RAYS (0.06 STO 70 OF THE ENTRE ENERGY RANGE, AND WE LARGE SENSITIVE SOLID-STATE DETECTORS. THE ENTRE ENERGY RANGE, I.E., 0.04 SQ COM STER FOR THERMAL AND SURRATHERAL SOLAR WIND MEASUREMENTS AND 3 SQ (M STER FOR LOW-ENERGY COSMIC RAY MEASUREMENTS.

----- ISCE-C, HYNDS------

INVESTIGATION NAME- ENERGETIC PROTONS

NSSDC ID- HELOCTA-08

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS

Sec.

STREAM COLLEGE

INVESTIGATIVE PROGRAM Code Sa/Co+op

O'SO SONNEL

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$ \begin{array}{llllllllllllllllllllllllllllllllllll$	IMPERIAL COLLEGE U OF UTRECHT U OF UTRECHT ESA-ESIEC U OF UTRECHT ESA-ESIEC ESA-ESIEC ESA-ESIEC ESA-ESIEC IMPERIAL COLLEGE
OI - D.E. PAGE OI - A. JALOGH OI - C. DE JAGER OI - H. Elliot	INPERIAL COLLEGE Space Research Lab Imperial College

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO STUDY PARTICLE ACCELERATION AND PROPAGATION PROCESSES IN INTERPLANETARY SPACE. MEASUREMENTS ARE MADE OF PROTONS FROM 0.03 TO 1.40 NEV USING THREE TWO-ELEMENT TELESCOPES. THE TELESCOPES ARE MOUNTED AT 30, 60, AND 135 DEG RELATIVE TO THE SPACECRAFT SPIN AXIS. EIGHT-SECTOR DATA ARE OBTAINED FOR SELECTED ENERGY CHANNELS.

--- ISEE-C# MEYER----

INVESTIGATION NAME- COSNIC-RAY ELECTRONS AND NUCLEI

NSSDC ID- HELOCTR-06

INVESTIGATIVE PROGRAM CODE SA/CO+OP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS COSMIC RAYS

PERSONNEL

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P1 - P. 01 - P. HEYER EVENSON

U OF CHICAGO U DF CHICAGO

01 - P. EVENSON U DF CHICAGO BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO STUDY PARTICLE PROPAGATION PITHIN THE SOLAR SYSTEM AND THE PROPERTIES OF THE INTEGRAL SOLETRUM FORM STO 400 MEV), (2) PROTONS (DIFFERENTIAL SPECTRUM FROM STO 400 MEV), (2) PROTONS (DIFFERENTIAL SPECTRUM FROM STO 400 MEV), (2) PROTONS (DIFFERENTIAL SPECTRUM FROM 60 TO 13.000 INTEGRAL SPECTRUM ABOVE 13 GEV), (3) HELIUM THROUGH SULFUR (2 FROM 2 THROUGH 16, DIFFERENTIAL SPECTRUM FROM 60 TO 13.000 (4) THE IRON GROUP (2) FROM 26 THROUGH 28, DIFFERENTIAL FROM 150 TO 13.000 MEV/NUCLEON, AND INTEGRAL SPECTRUM ABOVE 13 GEV/NUCLEON). A CHARGED-PARTICLE TELESCOPE IS USED TO MAKE THESE MEASUMEMENTS. IT CONSISTS OF A CURVED SOLID-STATE THESE MEASUMEMENTS. IT CONSISTS OF A CURVED SOLID-STATE DETECTOR, A GAS CENENKOV COUNTER, A SOLID-STATE DETECTOR, A GOUMTER, AND A QUARTZ CENENKOV COUNTER. THE DESIGN OF THE TELESCOPE IS BASED ON THAT USED IN EXPERIMENT 68-014A-09 FOR GOD 5.

----- ISEE-C, OGILVIE------

INVESTIGATION NAME- MASS SPECTROMETER

NSSDC ID- HELOCTR-11

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS SPACE PLASMAS

PERSONNEL	
PI - Ř.W. OGILVIE	NASA-GSFC
OI - J. GEISS	U OF BERNE
OI - M.H. ACUNA	NASA-GSFC
OI - M.A. COPLAN	U OF Maryland
OI - D.L. LIND	Nasa-JSC

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTS OF AN ELECTROSTATIC ENERGY ANALYZER AND A WIEN VELOCITY FILTER CONFIGURED AS A MASS SPECTROMETER TO DETERMINE THE CHARGE STATE AND ISOTOPIC CONSTITUTION OF THE SOLAR WIND. THE INSTRUMENT HAS AN ENERGY PER UNIT CHARGE RANGE OF D.47 TO 10.5 KEV PER CHARGE AND A MASS PER UNIT CHARGE RANGE OF 1 TO 5.6 U PER CHARGE.

-- ISÉÉ-C, SCARF-----INVESTIGATION NAME- 20-HZ TO 1-KHZ MAGNETIC AND 20-HZ TO 100-KHZ ELECTRIC FIELD DETECTORS

NSSOC ID- HELOCTR-07

INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(5) PARTICLES AND FIELDS SPACE PLASMAS

PERSONNEL	
PI - F.L. SCARF	TRW SYSTEMS GROUP
Ol - D.A. BURNETT	U of Iowa
01 - E.J. SMITH	NASA-JPL
01 - R.W. FREDERICKS	TRW SYSTEMS GROUP

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO PROVIDE DATA FOR PLASMA MAVE STUDIES UNDERTAKEN TO GAIN A BETTER UNDERSTANDING OF THE WAVE FARTICLE INTERACTION AND PLASMA INSTABILITIES, WHICH LEAD TO THE EQUIVALENT COLLISION PHENOMENA THAT PRODUCE APPARENT FLUID-LIKE BEHAVIOR IN THE SOLAR WIND NEAR 1 AU. AN ELECTRIC DIPOLE AND MAGNETIC SEARCH COIL, BOOM-MOUNTED AND ALIGNED ALONG THE SPACECRAFT SPIN AXIS, ARE USED TO MEASURE MAGNETIC FIELD WAVE LEVELS FROM 2D HZ TO 1 KHZ 1% EIGHT CHANNELS AND ELECTRIC FIELD LEVELS FROM 2D HZ TO 10D KHZ 1, 16 CHANNELS.

----- ISEE-C, SHITH------INVESTIGATION NAME- RAGNETIC FIELDS

NSSOC 10- HELOCTR-02

CONTRACTOR AND A DECK

INVESTIGATIVE PROGRAM Code SA/CO-OP

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INVESTIGATION DISCIPLINE(S) Interplanetary magnetic fields Particles and fields

PERSONNEL	+	
P1 - E.J. DI - L. DI - G.L. DI - D.E. DI - B.T.	SNITH DAVIS, JR. SISCOE Jones Tsurutani	NASA-JPL Calif inst of U of Calif, L/ Brigham Young NASA-JPL

BRIEF DESCRIPTION THE INSTRUMENTATION FOR THIS EXPERIMENT CONSISTS OF A BDOM-MOUNTED, TRIAXIAL VECTOR HELIUM MAGNETOMETER. MEASUREMENTS ARE MADE OF THE STEADY MAGNETIC FIELD AND IS LOW-FREQUENCY VARIATIONS. FOUR FIELD AMPLITUDE RANGES (MI DIS TO PLUS 4, 14, 42, AND 146 GAMMAS) ARE AVAILABLE. THE INSTRUMENT RANGES UP AND DAWN AUTOMATICALLY OR MAY BE COMMANDED INTO A SPECIFIC RANGE. THE FIELD EQUIVALENT MOISE POWEN SPECTRAL DENSITY IS 2.E-4 GAMMA SQUARED PER HERTZ (INDEPENDENT OF FREQUENCY), OR 0.01 GAMMA RMS IN THE PASSBAND O TO 0.5 HZ. A SINGLE-AXIS SPECTRUM ANALYZER MEASURES FLUCTUATIONS PARALLEL ID THE SPACECRAFT SPIN AXIS IN THERE FREQUENCY BANDS OF 0.1 TO 1, 1 TO 3, AND 3 TO TO HZ.

----- ISEE-C, STEINBERG---

INVESTIGATION NAME- 20-KHZ ID 3-MHZ RADIO MAPPING

NSSDC ID- HELOCTR-10 INVESTIGATIVE PROGRAM EDDE SA/CO-OP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS Radio Physics Solar Physics

PI - J.L. STEINBERG	
01 P. COUTURIER PAR 01 - R. KNOLL PAR 01 - J. F1NBERG NAS. 01 - R.G. STONE NAS. 01 - R.G. STONE NAS.	LS OBSERVATORY LS OBSERVATORY LS OBSERVATORY L-GSFC L-GSFC

BRIEF DESCRIPTION

ORTEF DESCRIPTION THIS EXPERIMENT CONSISTS OF FOUR SELF-CALIBRATING RADIOMETERS THAT STEP THROUGH 16 FREQUENCIES DETWEEN 20 KHZ AND 3 MHZ. THESE RADIOMETERS ARE CONNECTED TO DIPOLE ANTENNAS. TYPE 3 SOLAR RADIO BURSTS ARE USED TO MAP HAGNETIC LINES OF FORCE IN AND OUT OF THE ECLIPTIC DETWEEN D.OS AND 1 AU THEREBY PRODUCING A THREE-DIMENSIONAL DESCRIPTION OF THE SOLAR WIND.

----- ISEE-C, STONE----

INVESTIGATION NAME- COSMIC-RAY COMPOSITION

INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) Particles and fields Cosmic Rays

CALIF INST OF TECH Calif inst of tech

PERSONNEL PI - E.C. STON DI - R.E. VOGT STONE

NSSDC ID- HELOCTR-12

DI - K.E. VOUL BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO STUDY THE ISOTROPIC CONSTITUTION OF SOLAR MATTER AND GALACTIC COSMIC-RAY SOURCES. THE PROCESSES OF NUCLEOSYNTHESIS IN THE SUN AND IN THE GALAXY. AND THE ASTROPHYSICAL PARTICLE ACCELERATION PROCESSES. THE FOLLOWING SPECIES ARE TO BE RESOLVED -- LITHIUM THROUGH NICKEL (2 FROM 3 THROUGH 28 AND A FROM 6 THROUGH 64) IN THE ENERGY RANGE FROM 2 TO 200 MEV/NUCLEON. THE CORRESPONDING MASS RESOLUTION IS 0.063 TO G.083 PROTON MASS FOR LITHIUM, AND 0.18 TO D.22 PROTON MASS FOR IRON. THE ISOTROPIC ABUNDANCES AND ENERGY SPECTRA ARE MEASURED BY A HEAVY ISOTROPE SPECTROMETER TELESCOPE THAT USES SOLIO-STATE CHARGED PARTICLE DETECTORS. ANTICOINCIDENCE GUARD RINGS AND SOLID-STATE MATRIX HODOSCOPE DETECTORS ARE EMPLOYED TO IMPROVE MASS AND ENERGY RESOLUTION.

- ISEE-C, VON ROSENVINGE---

INVESTIGATION NAME- SOLAR AND GALACTIC ENERGETIC PARTICLES

INVESTIGATIVÉ PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) Particles and fields Cosnic Rays

PERSONNEL

· PI	- T.T.	VON ROSENVINGE	NASA-GSFC
	- L.A.	FISK	NASA-GSFC
	- J.H.	MCDONALD	NASA-GSFC
		TRAINOR Van Hollebeke	NASA-GSFC
¥1	- -	VAN NVLLEBEKE	NASA-GSEC

BRIEF DESCRIPTION

NSSOC ID- HELOCTR-04

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO STUDY THE COMPOSITION OF SOLAR COSNIC RAYS FROM MYDROGEN THROUGH IRON AND THE ELEMITAL ABUNDANCE OF GALACTIC COSMIC RAYS. THREE PARTICLE TELESCOPES PLUS A PROPORTIONAL COUNTER, FOR MALEMEMENT OF ELECTRONS AND X RAYS. COMPRISE THE INSTRUMENTATION. NUCLEI WITH 2 BETWEEN 1 AND 26 ARE MEASURED IN VARIOUS ENERGY WINDOWS IN THE RANGE 0.5 TO SOD MEV PER NUCLEON. ISOTOPES IN THE Z RANGES 1 TO 2, 3 TO 7, AND 8 TO 16 ARE MEASURED IN THE FRENGY RANGES 4 TO 80, 6 TO 120, AND 10 TO 200 MEV PER NUCLEON, RESPECTIVELY. ELECTRONS ARE MEASURED IN THE ENERGY RANGES 0.07 TO 0.2 MEV AND 0.3 TO 12 MEV. ANISOTROPY INFORMATION IS OBTAINED FOR THE ELECTRONS AND

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TECH

FOR 0.5 TO 150 MEV PER NUCLEON NUCLEI.

----- ISEE-C, WILCOX------

INVESTIGATION NAME- SOLAR AND INTERPLANETARY MAGNETIC FIELDS (CORRELATIVE STUDY)

NSSDC ID- HELOCTR-13

INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) SULAR PHISICS Interplanetary magnetic fields

PERSONNEL PI - J.M. WILCOX

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STANFORD II

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTS OF THE MEASUREMENT OF LARGE SCALE SOLAR MAGNETIC AND VELOCITY FIELDS WITH THE STANFORD GROUND-BASED SOLAR TELESCOPE, AND THE COMPARISON OF THESE MEASUREMENTS WITH MEASUREMENTS OF THE INTERPLANETARY MAGNETIC FIELD AND SOLAR WIND MADE BY OTHER EXPERIMENTS ON THIS SPATECRAFT. THE PURPOSE OF THE EXPERIMENT IS TO STUDY THE LARGE SCALE STRUCTURE OF THE SOLAR MAGNETIC FIELD AND ITS EXTENSION INTO INTERPLANETARY SPACE BY THE SOLAR WIND.

SPACECRAFT COMMON NAME- JSS 2 ALTERNATE NAMES- JONOSP SOUNDING SAT 2

N550C 10- 155-2

LAUNCH DATE- 02/00/78 Launch Site- Tanegashima, Ja Launch Vehicle- Nú	WEIGHT- 135. KG MPAN
SPONSORING COUNTRY/AGENCY Japan	RRL
PLANNED ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 105, Min Periapsis- 980, KM	INCLINATION- 75.0 DEC Apoapsis- 1015, km

PERSONNEL		
PM - Y.	DGATA	RADIO RESEARCH LAB
PS - K.	TAO	RADIO RESEARCH LAB

BRIEF DESCRIPTION

P

PERSONNEL

--- ISS 2, FUGONO-------

INVESTIGATION NAME- ION MASS SPECTROMETER

्रा

NS5DC ID- 155-2 -04 INVESTIGATIVE PROGRAM Scientific satellite

INVESTIGATION DISCIPLINE(S) IONOSPHERES Particles and fields

PI - N.	FUGONO	RADIO RESEARCH LAB	
01 - N.	Niwa	U of Tokyo	

BRIEF DESCRIPTIG. BRIEF DESCRIPTIO. THIS EXPERIMENT IS FLOWN TO MEASURE THE POSITIVE ION CONPOSITION OVER THE SPACECRAFT ORBIT. TWO BENNETT-TYPE ION MASS SPECTRONETERS ARE FLUSH MOUNTED ON OPPOSITE ENDS OF THE SPACECRAPT TO LOOK IN OPPOSITE DIRECTIONS ALONG THE SPIN AXIS. THE IN. _ DIAMETER OF THESE CYLINORICAL SENSORS IS. 36 MM. THE MASS RANGE COVERED IS 1 TO 2D U. AND THE ION CONCENTRATIONS ARE MEASURED OVER THE RANGE FROM 100 TO 1.27 JONS PER CC.

ISS 2, MATUURA-----

INVESTIGATION NAME- SWEEP FREQUENCY TOPSIDE IONOSPHERIC Sounder (Top)

NSSDC 10- 155-2 -01

INVESTIGATION DISCIPLINE(S) IONOSPHERES

INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE

PERSONNEL P1 - N. MATUURA

RADIO RESEARCH LAB

P1-N. MATUUXA RADIO RESEARCH LAB BRIEF DESCRIPTION THE IONOSPHERE SOUNDING SATELLITE (ISS) IONOSONDE IS A PULSED. RADIO TRANSMITTER AND RECEIVER THAT RECORDS THE TIME DELAY BETWEEN A TRANSMITTER AND RECEIVER THAT RECORDS THE TIME DELAY BETWEEN A TRANSMITTER AND RECEIVER THAT RECORDS THE TIME DELAY BETWEEN A TRANSMITTER AND RECEIVER THAT RECORDS THE TIME DELAY BETWEEN A TRANSMITTER AND RECEIVER THAT RECORDS THE TIME DELAY BETWEEN A TRANSMITTER AND RECEIVER THAT RECORDS THE TIME DELAY BETWEEN A TRANSMITTER OPLISE AND ITS RETURN. FREQUENCES BETWEEN 0.5 AND 14.B MHZ ARE SAMPLED IN 0.1-MHZ STEPS TO PROVIDE VIRTUAL RANGE (DELAY TIME) OF SIGNAL REFLECTIONS. MORE THAN ONE VIRTUAL RANGE (DELAY TIME) OF SIGNAL REFLECTIONS. MORE THASE RESULT FROM GROUND REFLECTIONS, PLASMA RESONANCES, DIRFRINGENCE OF THE IONOSPHERE, NORVERTICAL PROPAGATION, EIC. VIRTUAL RANGE AT A GIVEN FREQUENCY IS PRIMARILY A FUNCTION OF DISTANCE TRAVERSED BY THE SIGNAL, ELECTRON TENSITY ALONG THE PROPAGATION PATH, AND MODE OF PROPAGATION. HE STANDARD DATA FORM, AN IONOGRAM (GRAPH) SHOUNG VIRTUAL RANGE AS A FUNCTION OF RADID PULSE FREQUENCY, IS USED TO DISPLAY THESE IONOGRAMS. THEY ARE DIGITAL (FREQUENCY OF VIRTUAL RANGE) VALUES OF CHARACTERISTIC IONOSPHERIC FEATURES READ DIRECTLY THIS SOUNDING MODE OF OPERATION, CALLED TOP-B, REGULRES IS STONAL SAMPLE ALL FREQUENCY. IS CORRESPONDING VIRTUAL RANGE IS A SIGNAL AULABLE. IN THE TOP-A MODE, AN ITERATIVE LOGIC IS EMPLOYED WITH THE PULSED TRANSMISSION TO DETERMINE THE F2 REGION CRITICAL FREQUENCY. IS CORRESPONDING VIRTUAL HEIGHT, AND OTHER PELATED SUMPORTING DATA. WITH DATA FROM THE TOP-A MODE WORLD-WIDE MARS OF CRITICAL FREQUENCY AND FREADE. FOR BOTH THE TOP-A AND TOP-G MODES, THE COMPLETE CYCLE TIME BETWEEN SUCCESSIVE IONOGRAMS OR SUCCESSIVE CRITICAL FREQUENCY OBSERVATIONS IS 64 S.

--- ISS 2, MIYAZAKI---

INVESTIGATION NAME- RETARDING POTENTIAL TRAP

NSSDC 10- 155-2 -03 INVESTIGATIVE PROGRAM Scientific Satellite

INVESTIGATION DISCIPLINE(S)

IONOSPHERES PARTICLES AND FIELDS

RADIO RESEARCH LAB

P1 - 5. MIYAZAKI

50- 5-221 -di 3022N

PERSONNEL

PI - K.

BRIEF DESCRIPTION

PERSONNEL

BRIEF DESCRIPTION THIS PROBE IS A SPHERICAL RETARDING POTENTIAL TRAP DESIGNED TO OBSERVE AMBIENT ION AND ELECTRON DENSITIES RANGING FROM 10.63 TO 10.66 PER CC. AMBIENT ION AND ELECTRON TEMPERATURES IN THE RANGE 1000- TO 5000-DEG K ARE DETERMINED. AS WITH ALL RETARDING POTENTIAL INSTRUMENTS, THESE PARAMETERS ARE DERIVED FROM INTERPRETATION OF IHE CURRENT FLOW MEASUREMENT WITH A GIVEN VOLTAGE SEQUENCE APPLIED TO THE COLLECTOR AND SCREEN GRIDS. THE SENSOR IS MOUNTED ON A BOOM EXTENDING PERFENDICULAR TO THE SPACECRAFT SPIN AXIS. IT CONSISTS OF A 2-CM DIAMETER COLLECTOR. CONLETINICALLY ENVELOPED BY 6- AND 10-CM DIAMETER SPHERICAL, WIRE GRIDS. THE CURRENT VOLTAGE ANALOG DATA ARE TELEMETERED AND SUBSEQUENTLY ANALYZED BY THE EXPERIMENTER. EXPERIMENTER.

--- ISS Z, MURANAGA------

INVESTIGATION NAME- RADIO NOISE NEAR 2.5, 5, 10, AND 25 MHZ

INVESTIGATIVE PROGRAM SCIENTIFIC SATELLITE

INVESTIGATION DISCIPLINE(S) IONOSPHERES AND RADIO PHYSICS

HURANAGA

RADIO RESEARCH LAB

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BRIEF DFSCRIPTION THE OBJECTIVES OF THIS EXPERIMENT ARE TO OBSERVE AND STUDY --- (1) THE GLOBAL DISTRIBUTION OF SPHERICS AND (2) THE TIME VARIATION OF SPHERICS AND COSMIC NOISE. RADIO NOISE IN FOUR FREQUENCY CHANNELS -- 2.497. 4.997. (OR TO.DOI). AND 24.996 (OR 25.006) MHZ -- WILL BE OBSERVED. CHARACTERISTICS TO BE OBSERVED AT EACH FREQUENCY ARE NOISE INTENSITY (RESOLUTION 04.172.8 SEC) AND OCCURRENCE FREQUENCY OF IMPULSIVE NOISE (G.T. 15 DB ABOVE RESOLVED INTENSITY).

SPACECRAFT COMMON NAME- IVE Alternate Names- IN Ultraviolet Expl, Sas-d

NSSDE ID- SAS-D

LAUNCH DATE- 11/15/77 Launch Site- Cape Canaveral, united states Launch Vehicle- Delta WEIGHT- 669. KG

SPONSORING COUNTRY/AGENCY United States International	NASA-OSS ESA
PLANNED ORÐIT PARAMETERS Orðit type- geocéntric Orðit Períod- 1440. Min Períapsis- 24308. Km	INCLINATION- 26.50 DEG Apoapsis- 47263. Km
PERSONNEL	

MG - L. SC - N.G. PM - G.W. PS - A. OONDEY ROMAN LONGANECKER Boggess

BRIEF DESCRIPTION

DRIEF DESCRIPTION THE INTERNATIONAL ULTRAVIOLET EXPLORER (IUE, FORMERLY SAS-D) SATELLITE IS AN APPROVED MISSION FOR THE CONSTRUCTION OF A SPACEDORNE ULTRAVIOLET ASTRONOMICAL OBSERVATORY FOR USE AS AN INTERNATIONAL FACILITY. THE IUE CONTAINS A 45-CM TELESCOPE SOLELY FOR SPECTROSCOPY IN THE WAVELENGTH RANGE OF 1100 TO 3300 A. THE SATELLITE AND OPTICAL INSTRUMENTATION ARE PROVIDED BY THE GODDARD SPACE FLIGHT CENTER (GSFC). THE TELEVISION CAMERAS USED AS DETECTORS ARE PROVIDED BY THE UNITED KINGDOM SPACE RESEARCH COUNCIL (UKSRC). THE EUROPEAN SPACE AGEMCY (ESA FORMERLY ESRO) IS SUPPLYING SOLAR PADDLES FOR THE SATELLITE AND A EUROPEAN CONTROL CENTER. AFTER LAUNCH, TWO-THIRDS OF THE OBSERVING TIME IS DIRECTED FROM A CONTROL CENTER AT GSFC, AND ONE-THIRD OF THE TIME THE SATELLITE IS OPERATED FROM THE EUROPEAN CONTROL CENTER NEAR MADRID. THE IUE OBSERVATORY WILL GE LAUNCHED INTO A SYNCHRONOUS ONBIT. THE 45-CM RITCHERY-CHRETIEN F/15 TELESCOPE FEEDS A SPECTROGRAPH PACKAGE. INE SPECTROGRAPH PACKAGE, USING SEC VIDICON CAMERAS AS DETECTORS, COVERS THE SPECTRAL RANGE FROM 1100 TO 3300 A. IT OPERATES IN EITHER A HIGH-RESOLUTION OR A LOW-RESOLUTION MODE, WITH RESOLUTIONS OF APPROXIMATELY 0.2 AND 6 AN RESPECTIVELY. THE SEC VIDICONS CAN INTEGRATE THE SIGNAL FOR UP TO 1 H. THIS INTEGRATION TIME LIMITS DETECTION IN THE HIGH-AND LOW-RESOLUTION RODES TO APPROXIMATELY 0.2 AND 6.0.3 PHOTONS/(CM SG-S-MADSTRON), RESPECTIVELY, FOR A SIGNAL-TO-NOISE RATIO OF SG. GUEST INVESTIGATORS AND THEIR INVESTIGATIONS ARE LISTED IN APPENDIX B.

INVESTIGATION NAME- LOW-/HIGH-RESOLUTION, ULTRAVIOLET SPECTROGRAPH PACKAGE

NONE ASSIGNED

----- IUE, NONE ASSIGNED-----

NSSDC ID- SAS-D -01 INVESTIGATIVE PROGRAM Code Sa

INVESTIGATION DISCIPLINE(S) ASTRONOMY

NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSFC

NASA-GSEC

PERSONNEL

NASA-GSEC

PI- NONE ASSIGNED NASA-GSFC BRIEF DESCRIPTION THIS EXPERIMENT INCLUDES THE ULTRAVIOLET SPECTROGRAPH PACKAGE CARRIED BY THE IUE, CONSISTING OF THO PHYSICALLY DISTINCT ECHELLE-SPECTROGRAPH/CAMERA UNITS CAPABLE OF ASTROMOMICAL OBSERVATIONS. EACH SPECTROGRAPH IS A IHREE-ELEMENT ECHELLE SYSTEM. COMPOSED OF AN DFF-AXIS PARABOLOIDAL COLLIMATOR, AN ECHELLE GRATING, AND A SPHERICAL FIRST-ORDER GRATING THAT IS USED TO SFPARATATE THE ECHELLE ORDERS AND FOCUS THE SPECTRAL DISPLAY ON AN IMAGE CONVERTER-PLUS-SEC VIDICON CAMERA. (FOR EACH UNIT THERE IS A SPARE CAMERA). THE CAMERA UNITS ARE ABLE TO INTEGRATE THE SIGNAL. THE READOUT/PREPARATION CYCLE FOR THE CAMERAS TARES APPROXIMATELY 4 MIN. MAVELENGTH CALIBRATION IS PROVIDED BY THE USE OF A HOLLOW CATHODE COMPARISON LAMP. THE PHOTOMETRIC CALIBRATION IS ACCOMPLISHED BY OBSERVING STANDARD STARS WHOSE SPECTRAL FULXISS HAVE BEEN PREVIOUSLY CALIBRATED BY OTHER MEANS. BC:H FIGH-RESOLUTION (O.2 A) OR LOW-RESOLUTION (GA) PERFORMANCE. THE DUAL HIGH/LOW RESOLUTION CAPABILITY IS INPLEMENTED BY THE INSERTION OF A FLAT IN FRONT OF THE ECHELLE GRATING, SO THAT THE ONLY DISPERSION IS PROVIDED BY THE USE CONTAINED. THA ASIGNAL-TO-NOISE RATIO OF SU CAN BE OBTAINED FOR A BO STAR OF THE YTH AND 1ATH MAGE FARGE 1109. 10924 A IN THE HIGH-RESOLUTION MODE, AND 1135 TO 2005 A IN THE HIGH- AND CHARACTERISTICS OF THE UNITS ARE FROM 1893 TO 3031 A NAD ASIGNAL-TO-NOISE RATIO OF SU CAN BE OBTAINED FOR A BO STAR OF THE OTHER UNIT, THE RANGE SARE FROM 1893 TO 3031, A ND HA SIGNAL-TO-NOISE RATIO OF SU CAN BE OBTAINED FOR A SO STAR OF THE OTHER UNIT, AND FROM THE ADD HOW-RESOLUTION MODE. FOR THE OTHER UNIT, AND FACH FOR AS A RESULT THO MODE. FOR THE OTHER UNIT, AND FACE SARE FROM 1893 TO 3031 A AND 1800 TO 3255 A FOR THE HIGH- AND LOW-RESOLUTION MODE. FOR THE OTHER UNIT, AND FACE FORM 1992 TO 3031 A AND 1800 TO 3255 A FOR THE HIGH AND FORM AS A RESULT. THO BOBTANATIONAL OPTIONS ARE POSSIBLE -- (1) BOTH 3-ARC-S APERTURES EITHERFOR A 3-ARC-S HOLE OR A IN THE LOW-RESOLUTION M

THAT THE ENTRANCE APERTURES FOR EACH ARE DISTINCT AND SEPARATED ON THE SKY BY ABOUT 1 MIN OF ARC. AN ADDITIONAL RESTRICTION IS THAT DATA CAN BE READ OUT OF ONLY ONE CAMERA AT A TIME. HOWEVER, ONE CAMERA MAY BE EXPOSING WHILE ONE CAMERA IS BEING READ OUT. THE CHOICE OF HIGH OR LOW RESOLUTION CAN BE MADE INDEPENDENTLY FOR THE TWO SPECTROGRAPHS SO THAT THE OPERATIONAL MODES OF THE UNITS NEED NOT BE THE SAME.

SPACECRAFT COMMON NAME" LANDSAT-C Alternate names- earth res tech sat.-c, erts-c

NSSOC 10- ERTS-C

LAUNCH DATE- 09/29/77 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- DELTA WEIGHT- 960. KG

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-OA

PLANNED ORBIT PARAMETERS DRBIT TYPE- GEOCENTRIC Orbit Period- 99.1 Min Periapsis- 705. Km INCLINATION- 98.20 DEG APOAPSIS- 705. KM

PERSONNEL		
MG - #.	MANNHEIMER	NASA HEADQUARTERS
5C - J.R.	MORRISON	NASA HEADQUARTERS
PM - R.K.	BROWNING	NASA-GSFC
PS - S.C.	FREDEN	NASA-65FC

LANDSAT-C. ARLUSKAS

INVESTIGATION NAME- MULTISPECTRAL SCANNER

INVESTIGATIVE PROGRAM CODE ERN

INVESTIGATION DISCIPLINE(S) EARTH RESOURCES SURVEY

NASA-GSEC

PERSONNEL - 1. ARLUSKAS

NSSDC ID- ERTS-C -02

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE LANDSAT-C MULTISPECTRAL SCANNER (MSS) PROVIDES REPETITIVE DAY/MIGHT ACQUISITION OF HIGH-RESOLUTION MULTISPECTRAL DATA OF THE EARTH'S SUBFACE ON A GLOBAL BASIS. WHILE ITS PRIMARY FUNCTION IS TO OBTAIN DATA IN VARIOUS AREAS SUCH AS AGRICULTURE, FORSETRY, GEOLOGY. AND MYDROLOGY, THE MSS SYSTEM IS ALSO USED FOR OCEANOGRAPHIC AND METCOROLOGICAL PURPOSES, 1.E., TO MAP SEA-ICE FIELDS, LOCATE AND TRACK MAJOR DCEAN CURRENTS, MONITOR BOTH AIR AND WATER POLLUTION, DETERRINE SNOW COVER. INVESTIGATE SEVERE STORM ENVIRONMENTS, ETC. THE MIS CONSISTS OF A DOUBLE REFLECTOR-TYPE TELESCOPE, SCANNIG, MIRROR, FILTERS, DÉTECTORS, AND ASSOCIATED ELECTRONICS, THE SCANNER OPERATES IN THE FOLLOWING SPECTRAL INTERVALS -- BAND I - 0.5 TO 0.6 MICROMETER, BAND 4 - 0.6 TO 1.7 MICROMETER, BAND 3 - 0.7 TO 0.8 MICROMETER, BAND 4 - 0.8 TO 1.1 MICROMETERS, AND BAND 5 - 10.4 TO 12.6 MICROMETERS, THIS LAST BAND, WHICH LIES IN THE THERMAL (EMISSIVE) PART OF THE SPECTRUM, GIVES LANDSAT-C NIGHTIME SENSING CAPABILITIES, A FEATURE LACKING IN THE MSS INADIR AND AND IS 135-CM THE SIDE OF MADIR AND IS COLLECTED BY THE SCANNING MIRROR, WHICH OSCILLATES 2.89 DEG TO EITHER SIDE OF MADIR AND IS SCAN ROSS-TRACK SWATHS 135-KM WHOE. IN EALBORDTRACK SCAN IS PRODUCED AT THE IMAGE PLANE IS RELAYED BY USE OF FIDER-OFTIC BUNDLES 10 DETECTORS WHERE CONVERSION TO AM

ELECTRONIC SIGNAL IS ACCOMPLISHED. DIFICAL FILTERS ARE USED TO PRODUCE THE DESIRED SPECTRAL SEPARATION. SIX DETECTORS ARE EMPLOYED IN EACH OF THE FIRST FOUR SPECTRAL BANDS AND TWO IN THE SIFTH BAND -- DANDS 1 THROUGH 3 USE PHOTOMULTIPLIER TUDES AS DETECTORS, DAND 4. USES SILICON PHOTOBIODES, AND BAND 5 USES MERCURY-CADMIUM-TELLURIDE DETECTORS. THE MINIMUM DIMENSIONS THAT ARE RESOLVED BY THE MSS ARE BO M FOR DANDS 1 THROUGH 4 AND 240 M FOR BAND 5, A MULTIPLEXER INCLUDED IN THE MSS SYSTEM PROCESSED THE SCANNER'S 26 CHANNELS OF DATA. THESE DATA ARE TIME-MULTIPLEXED AND THEN CONVERTED TO A PCM SIGMAL BY AN A/D CONVERTER. THE DATA ARE TRANSMITTED (AT 2229,5 MH2) DIRECTLY TO AN ACQUISITION STATION OR STORED ON MAGNETIC TAPE FOR SUBSEQUENT PLAYBACK THE NEXT TIME THE SPACECRAFT COMES WITHIN COMMUNICATION RANGE OF AN ACQUISITION STATION. DATA FROM THIS EXPERIMENT ARE HANDLED BY THE MASA DATA PROCESSING FACILLITY, GSFC, GREENBELT, MD, AND ARE MADE AVAILABLE TO APPROVED INVESTIGATORS THROUGH ITS LANDSAT USERS SERVICES. ALL OTHER INVESTIGATORS THROUGH ITS LANDSAT USERS SERVICES. ALL OTHER INVESTIGATORS THAT GUBH AND THE ADD ATA THROUGH THE EARTH RESOURCES DATA GENTER, DEPARTMENT OF THE INTERIOR, SIGUX FALLS, SD.

INVESTIGATION NAME- DATA COLLECTION SYSTEM (DCS)

NSSDC ID- ERTS-C -03 INVESTIGATIVE PROGRAM CODE ERN

---- LANDSAT-C, PAINTER-

INVESTIGATION DISCIPLINE(S) METEOROLOGY EARTH RESOURCES SURVEY

PERSONNEL" P1 - J.E. PAINTER

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NASA-GSEC

PI-J.E. PAINTER NASA-GSFC BRIEF DESCRIPTION THE LANDSAT-C DATA COLLECTION SYSTEM (DCS) PROVIDES USERS WITH NEAR REAL-TIME DATA COLLECTED FROM VARIOUS REMOTE LOCATIONS. THE DCS IS COMPOSED OF -- (1) THE DATA COLLECTION PLATFORMS (DCF'S) WHICH MAY BE OCEAN BUOYS, CONSTANT PRESSURE BALLOONS OR AUTOMATIC GROUND STATIONS, (2) THE SATELLITE COUPMENT, AND (3) THE GROUND DATA CEMERS INCLUDING REMOTE RECEIVING SITES AND THE GROUND LITA HANDLING SYSTEM AT GSFC. USE OF THE LANDSAT SPACEDORME DCS PROVIDES A CONTINUAL FLOW OF MEATHER FORECASTS, POLLUTION CONTROL, AND EARTHQUAKE PREDICTION AND WARNING, THE ENVIRONMENTAL SENSORS NOUNTED ON A DCP ARE SELECTED BY INDIVIDUAL INVESTIGATORS TO SATISFY THEIR PARTICULAR REQUIREMENTS. FROM A PLANNED ORDIT OF 912 KM, THE SPACECRAFT IS CAPABLE OF ACQUIRING DATA FROM DCP'S WITHIN A. RADIUS OF APPROXIMATELY JIUD KM FROM THE SUBSATELLITE POINT, THUS ALLOWING DATA TO BE OFFS TRANSMIT AT 401-55 MHZ. THE SPACECRAFT IS CAPABLE OF ACQUIRING DATA FROM DCP'S MITHIN A. RADIUS OF APPROXIMATELY JIUD KM FROM THE SUBSATELLITE POINT, THUS ALLOWING DATA TO BE OBTAINED FROM ANY REMOTE PLATFORM AT LEAST ONCE EVERT 12 H. THE DCF'S TRANSMIT AT 401-55 MHZ. THE SATELLITE. THE LANDSAT-C DCS ACCOMMODATES UP TO 1000 DCP'S SCHOUPHENT, ESSENTIALLY A RECEIVER, RECEIVES AND RETAINONS. THERE IS MO SIGNAL MULTIPLEXING OR DATA PROCESSING ON THE SATELLITE. THE LANDSAT-C DCS ACCOMMODATES UP TO 1000 DCP'S SCHOUPED THROUGHOUT THE CONTINENTAL US. DATA FROM THIS EXPERIMENT ARE HANDLED AND DISTRIBUTED TO THE VARIOUS PLATFORM INVESTIGATORS UP THE NASA DATA PROCESSING FACILITY, GSFC, GREENBELT, MD. GREENBELT. MD.

-- LANDSAT-C, WEINSTEIN-----

INVESTIGATION NAME- RETURN BEAM VIDICON CAMERA (RBV)

INVESTIGATIVE PROGRAM CODE ERN NSSDC ID- ERTS-C -DT

INVESTIGATION DISCIPLINE(S) EARTH RESOURCES SURVEY

PI - 0.	WEINSTÉIN	NASÁ-GŠFC
01 - T.H.	Ràglànd	Nasá-gsfc

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01 - T.M. RAGLAND HASA-GSFC ERIEF DESCRIPTION THE LANDSAT-C RETURN BEAM VIDICON (RBV) CAMERA SYSTEM CONTAINS TWO IDENTICAL CAMERAS COVERING THE SPECTRAL BAND FROM 0.53 TO 0.75 MICROMETER. THE TWO EARTH-ORIENTED CAMERAS ARE MOUNTED TO A COMMON BASE, STUCTUALLY ISDLATED FROM THE SPACECRAFT TO MAINTAIN ACCURATE ALIGNMENT. EACH CAMERA CONTAINS AN OPTICAL LENS, A RBV SENSOR, A THERMOELECTRIC COOLER, DEFLECTION AND FOCUS COLLS, A MECHANICAL SHUTTER, ERASE LAMPS, AND SENSOR ELECTRONICS. THE CAMERAS ARE ALIGNED TO VIEW ADJACENT 84-KM SQUARE GROUMD SCENES WHICH OVERLAP SLIGHTLY SO THAT THE TOTAL WIDTH OF THE GROUND SCENES IN 18 SKM. THE CAMERAS ARE OPERATED EVERY 12.5 STO PRODUCE OVERLAPPING IMAGES ALONG THE DIRECTION OF SPACECRAFT MOTION. AFTER SHUTTERING, THE IMAGE IS SCANNED BY AN ELECTRON BEAM TO PRODUC. A VIDEO DUTPUT SIGNAL. THE TINING CYCLE IS ARKANGED SO THAT A 3.5-S OFFSET IS INTRODUCED BETWEEN THE READOUTS OF THE TWO CAMERAS, ALCHING STEUDETTIAL READOUT OF THE CAMERAS, ALLONING THE SAME TAPE RECORDER AND COMMUNICATIONS GHANNEL TO BE USED. VIDEO DATA FROM THE RBY ARE TRANSMITTED (AT 2265,5 MHZ) IN BOTH REAL-TIME AND TAPE-RECORDER MODES. FROM A MONINAL SPACECRAFT ALTITUDE OF 912.KM, THE RBY WILL HAVE A GROUND RESOLUTION OF AD M (TWICE THE LANDSED BY THE NASA DATA PROCESSING FACLILITY, GSFC, GREENBELT, MD, AND ARE MADE AVAILABLE TO APPROVED INVESTIGATORS AND AGENCIES THROUGH ITS LANDSAT USERS SERVICES SECTION. ALL OTHER INTERESTED INDIVIDUALS CAM OBTAIN DATA THROUGH THE EARTH RESOURCES DATA CENTER, DEPARTMENT OF THE THROUGH THE EARTH RESOURCES DATA CENTER, DEPARTMENT OF THE THROUGH THE EARTH RESOURCES DATA CENTER, DEPARTMENT OF THE

INTERIOR, STOUX FALLS, SD.

SPACECRAFT COMMON NAME- LANDSAT-D Alternate Names- Land Satellite-D1, LFO-A Landsat-D1

NSSDC ID- LAND-D

LAUNCH DATE- 03/00/81 LAUNCH SITE- VANDENBERG AFB, UNITED STATES WEIGHT- 1407. KG LAUNCH VEHICLE- DELTA

SPONSORING COUNTRY/AGENCY United states *****

PLANNED ORBIT PARAMETERS DRBIT TYPE- GEOCENTRIC ORBIT PERIOD- 98.8 MIN PERIAPSIS- 705. KM

INCLINATION-APOAPSIS-98.2 DEG 705. KM

PERSONNEL		
MG - H.	MANNHEIMER	NASA HEADQUARTERS
SC + J.R.	MORRISON	NASA HEADQUARTERS
PM - 8.K.	BROWNING	NASA-GSFC
PS - V.V.	SALOMONSON	NASA-GSFC

PS - U.U. SALOMONSON NASA-GSFC BRIEF DESCRIPTION THE LANDSAT-D SYSTEM IS AN EXPERIMENTAL EARTH RESOURCES NONITORING SYSTEM WITH THE NEW POWERFUL REMOTE SEMSING CAPABILITIES OF THE THEMATIC MAPPER. IT HAS A COMPLETE END-TO-END HIGHLY AUTOMATED DATA SYSTEM, WHICH IS DESIGNED TO BE A NEW GENERATION SYSTEM, AND IS A MAJOR STEP FORMARD IM GLOBAL REMOTE-SEMSING APPLICATIONS. THE LANDSAT-D MISSION CONSISTS OF AN ORBITING SATELLITE (SPACE SEGMENT) WITH THE NECESSARY WIDEBAND DATA LINKS AND SUPPORT SYSTEMS, AND A GROUND SEGMENT. THE LANDSAT-D SPACE SEGMENT CONSISTS OF TWO MAJOR SYSTEMS -- (1) THE INSTRUMENT MODULE, CONTAINING THE INSTRUMENT TOGETHER WITH THE MISSION UNIQUE SUBSYSTEMS, SUCH AS THE SOLAR ARRAY AND DRIVE, THE TDRS ANTENNA, THE WIDE-BAND MODULE (WBM), AND THE GLOBAL POSITIONING SYSTEM (GPS), AND (2) THE MOULTRISSION MODULAR SPACECRAFT (MRS) THAT CONTAINS THE MODULARIZED AND STANDARDIZED POWER, PROPULSION, ATTITUDE CONTROL, AND COMUNICATIONS AND DATA HANDLING SUBSYSTEMS, WHEN THE LANDSAT-D SATELLITE IS LAUNCHED, IT IS DEPLOYED AT AM ORBITAL ALTITUDE OF 705.3 KM, INCLINATION OF 98.2 DEG, AND A SUM ANGLE OF 9:30 A.M. AT THE DESCENDING NOLE. THIS ÖRBIT HAS A FREQUENCY OF 19-9/16 ORBITS PER DAY AND COVERS THE SEARTH IM THE DISTANCE BETHERE BETHER BETHER NUTH THE STACE SEGMENT IS DESIGNED WITH 3 YEARS NDMINAL LIFE-TIME IN ORBIT AND CAN BE EXTENDED IN CONJUNCTION WITH THE 185 KM SENSORS SWATH WIDTH-MEN USED IN CONJUNCTION MORE AND LOVERS THE SEGMENT IS DESIGNED WITH 3 YEARS NDMINAL LIFE-TIME IN ORBIT AND CAN BE EXTENDED THROUGH IN-ORBIT REPLACEMENT CAPABILITY WHEN THE SHUTTLE IS OPERATIONAL

- LANDSAT-D, RANGO------

INVESTIGATION NAME- THEMATIC MAPPER

NSSDC ID- LAND-D -01

INVESTIGATIVE PROGRAM CODE ERN

INVESTIGATION DISCIPLINE(5) EARTH RESOURCES SURVEY

PERSONNEL PI ~ A. RANGO

NASA-GSEC

BRIEF DESCRIPTION THE THEMATIC MAPPER (TH) IS A SIX-BAND, EARTH-LOOKING, SCANNING RADIOMETER WITH A 30-M GROUND ELEMENT RESOLUTION COVERING A 185-KN GROUND SWATH FROM A 705-KM ALTITUDE, THE INSTRUMENT CONSISTS OF PRIMARY IMAGING OPTICS, SCANNING MECHANISM, SPECTRAL BAND DISCRIMINATION OPTICS, DETECTOR ARRAYS, RADIATIVE COOLER, IN-FLIGHT CALIBRATOR, AND REGULARD OPERATING AND PROCESSING ELECTRONICS. THE SCANNING MECHANISM PROVIDES THE CROSS-TRACK SCAN WHILE THE PROGRESS OF THE SWATCH PROVIDES THE SCAN ALONG THE TRACK. THE OPTICAL SYSTEM IMAGES THE EARTH'S SURFACE ON A FIELD STOP OR A DETECTOR SIZED TO DEFINE AN AREA ON THE EARTH'S SURFACE 30-M SQ. SEVERAL LINES ARE SCANNED STIMULTANEOUSLY TO PERIT SUITABLE DWELL TIME FOR EACH RESOLUTION ELEMENT. THE VARIATION IN THE RADIANT FLUX PASSING THROUGH THE FIELD STOP ONTO THE PHOTO AND THERMAL DETECTORS CREATES AN ELECTRICAL DUTPUT THAT REPRESENTS THE RADIANT HISTORY OF THE LINE. SIX SPECTAL BANDS ARE USED TO PROVIDE THE SPECTRAL SIGNATURE CAPABILITY OF THE INSTRUMENT. THE INFORMATION DUTPUTS FROM THE DETECTOR CHANNELS ARE TRACKING AND DATA RELAT SATELLITES (TDRS) AND/OR DIRECT READUT TO LOCAL RECEIVING STATIONS. BRIEF DESCRIPTION

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SPACECRAFT COMMON NAME- MAGIC Alternate Names-

NSSDC ID- MAGIC

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LAUNCH DATE- 00/00/77 Launch Site-Launch Vehicle-WEIGHT- KG SPONSORING COUNTRY/AGENCY IZMIRAN PLANNED ORBIT PARAMETERS Orbit type- geocentric orbit period- 105. Min Periapsis- 350. Km

INCLINATION- 75. DEG Apdapsis- 1700. KM

UNKNOWN

PERSONNEL

BRIEF JESCRIPTION TO BE LAUNCHED DURING THE DMS PERIOD, THE SPACECRAFT EXPERIMENT HAS AS ITS OBJECTIVE TO STUDY THE CHARACTER OF THE IONOSPHERE-MAGNETOSPHERE COUPLING BY CONTINUING EXPERIMENTS SIMILAR TO THOSE ON INTERCOSMOS 10. BOTH REAL-TIME AND STORED DATA MODES ARE USED. THE SATELLITE MEASUREMENTS ARE ACCOMPANIED BY SIMULTANEOUS GROUND-BASED, BALLOON, AND ROCKET DBSERVATIONS. THE PARAMETERS MEASURED ARE -- GEOMAGNETIC FIELD CIS COMPONENTS). LOW-ENERGY PARTICLE FLUXES AND THEIR ANGULAR DISTRIBUTIONS (ELECTRONS AND POSITIVE IONS, 100 EV TO 50 KEV). VLF MAYES (100 H TO 16 KH) ELECTRIC AND MAGNETIC COMPONENTS. ELECTROSTATIC FIELDS OF MAGNLTOSPHERIC-DNOSPHERIC ORIGIN BY A DOUDLE-PROBE TECHNIQUE (3 COMPONENTS). ELECTRON AND ION DENSITIES AND TEMPERATURES USING SEVERAL TECHNIQUES, AND THE ION AND NEUTRAL COMPOSITION OF THE UPPER ATMOSPHERE.

UNKNOWN

SPACECRAFT COMMON NAME- MAGSAT Alternate names- Aem-C. Global Magnetic Surv MSN

NSSDC ID- AEM-C

LAUNCH DATE- 02/00/80 Launch Site- vandenberg AFD, united states Launch vehicle- scout WEIGHT- 158. KG

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-0A

PLANNED ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 94.5 MIN PERIAPSIS- 500. KM	INCLINATION- 97.79 DEG Apoapsis- 500. KM
PERSONNEL Mg - D.S. DILLER SC - J.P. Murphy	NASA HEADQUARTERS NASA HEADQUARTERS

PM - C.L. WAGNER, JR. P5 - R.A. LANGEL NASA-GSFC NASA-GSFC

BRIEF DESCRIPTION

-- MAGSAT, LANGEL-------INVESTIGATION NAME- SCALAR MAGNETOMETER

INVESTIGATIVE PROGRAM CODE ERF NSSDC ID- AEM-C -01

> INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS GEODYNAMICS

> > NASA-GSEC

PERSONNEL PI - R.A. LANGEL

BRIEF DESCRIPTION THE SCALAR NAGNETOMETER HAS TWO DUAL-CELL, CESIUM-VAPOR SENSE HEADS WHOSE OUTPUT FREQUENCY IS PROPORTIONED TO THE TOTAL MAGNETIC FIELD. WITH THIS SENSOR CONFIGURATION, ONLY TWO SMALL DIAMOND-SHAPED DEAD ZONES EXIST. THESE LIE ALONG THE ORBIT NORMAL (THE EAST-WEST DIRECTION) FOR THE ORBIT AND ATTITUDE CHOSEN FOR THIS MISSION AND A DIRECTION IN WHICH THE MAGNETIC FIELD WILL NEVER LIE. THE SCALAR MAGNETOMETER'S BASIC ACCURACY

IS ON THE ORDER OF 0.5 GAMMA. A PERIOD COUNT SYSTEM CONVERTS The magnetometer output frequency to a digital word acceptable to the spacecraft telemetry system. This digital data has a resolution and accuracy of between 0.5 and 1.0 gamma.

MAGSATA L NGEL---INVESTIGATION NAME- VECTOR MAGNETOMETER

NSSDC ID- AEM+C -02

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS GEODYNAMICS

NASA-GSFC

INVESTIGATIVE PROGRAM CODE ERF

PERSONNEL PI - R.A. LANGEL

BRIEF DESCRIPTION THE VECTOR MAGNETOMETER CONSISTS OF THREE FLUXGATE SENSING ELEMENTS ALIGNED ALONG ORTHOGONAL AKES. THE OUTPUT OF EACH VECTOR SENSOR IS CONVERTED TO A DIGITAL WORD BY AN ANALOG-TO-DIGITAL CONVERTER. THE OUTPUT OF ALL THESE AKES IS SAMPLED ESSENTIALLY SIMULTANEOUSLY. EACH VECTOR MEASUREMENT HAS A RESOLUTION OF BETTER THAN 1 GAMMA AND AN ABSOLUTE ACCURACY OF BETTER THAN 6 GAMMA R.S.S. WHEN REFERENCED TO A GEOCENTRIC COORDINATE SYSTEM.

SPACECRAFT COMMON NAME- METEOSAT-A Alternate Names- meteorological Sat-a, metosat

NSSDE ID- METOS-A

LAUNCH DATE- 11/03/77 Launch Site- Cape Canaveral, United States WEIGHT- 625.8 KG LAUNCH VEHICLE- DELTA

SPONSORING COUNTRY/AGENCY INTERNATIONAL ESA

PLANNED ORBIT PARAMETERS Orbit Type- geocentric Orbit Period- 1440. Min Periapsis- 35600. Km	INCLINATION- O. DEG Apoapsis- 35600, km
PERSONNEL	
HG – M. DELAHAIS	ESA-ESTEC
PM - D. LENNERTZ	ESA-ESTEC

PH - 0. LENNERTZ ESA-ESTEC BRIEF DESCRIPTION METOSAT-A IS A GEOSTATIONARY SPACECRAFT AND SERVES AS PART OF EUROPEAN SPACE AGENCY'S (ESA) CONTRIBUTION TO GARP. AS PART OF GARP, THE SATELLITE HELPS TO SUPPLY DATA REQUIRED FOR GLOBAL DATA SETS TO BE USED IN IMPROVEMENT OF MACHINE WEATHER FORECASTS. IN GENERAL, THE SPACECRAFT DESIGN, INSTRUMENTATION, AND OPERATION ARE SIMILAR TO SMS/GOES. THE SPIM-STABILIZED FORECASTS. IN GENERAL, THE SPACECRAFT DESIGN, INSTRUMENTATION, AND OPERATION ARE SIMILAR TO SMS/GOES. THE SPIM-STABILIZED HIGH-GUALITY DAY/NIGHT CLOUDCOVER DATA AND TO TAKE RADIANCE HIGH-GUALITY DAY/NIGHT CLOUDCOVER DATA AND TO TAKE RADIANCE HIGH-GUALITY DAY/NIGHT CLOUDCOVER DATA AND TO TAKE RADIANCE PLATFORMS, AND TO RELAY DATA FROM POLAR ORBITING SATELITES. INE CYLINDRICALLY-SHAPED SPACECRAFT MEASURES 210 CM IN DIAMETER AND 40 CM IN LENGTH, INCLUDING THE APOGEE BODST MOTOR. THE PRIMARY STRUCTURAL MEMBERS ARE AN EQUIPMENT PLATFORM AND A GENTRAL TUBE. THE RADIOMETER TELESCOPE IS MOUNTED ON THE EQUIPMENT PLATFORM AND VIENS THE LEARTH THROUGH A SPECIAL PARETURE IN THE SPACECRAFT SIDE. A SUPPORT STRUCTURE EXTENDS RADIALLY OUT FROM THE CENTRAL TUBE AND IS AFFIXED TO THE SPACE PARETS, WHICH FORM THE ODTER WALLS OF THE SPACEGRAFT AND PROVIDE THE PRITARY SUBCE OF ELECTRICAL FOWER. LOCATED IN THE ANNULUS-SHAPED SPACE BETWEEN THE CENTRAL TUBE AND IN SOLAR THE SOLAR PAMELS, WHICH FORM THE ODTER WALLS OFT THE SOLART AND BATTERIES, PROPER SPACECRAFT ATTITUDE AND SPEIN RATE (APPROVIDE THE PRITARY SOURCE OF ELECTRICAL FOWER. LOCATED IN THE ANNULUS-SHAPED SPACE BETWEEN THE CENTRAL TUBE AND SPEN RATE (APPROVIDE THE PRITARY SOURCE OF HELECTRICAL FOWER. LOCATED IN THE SALECRAFT AND COMMAND SUBSYSTEMS. A LOW-POWER WH TRANSPONDER PROVIDE THE PRITARY SOURCE OF HELECTRICAL FOWER. LOCATED IN THE SALECRAFT AND COMMAND SUBSYSTEMS. A LOW-POWER WH FRANSPONDER PROVIDES TELEMETRY AND COMMAND DURING LAUNCH AND THEN SERVES AS A BACKUP FOR THE PRIMARY SUBSYSTEM ONCE THE SPACECRAFT HAS ATTAINED SYNCHRONOUS ORB

-- METEOSAT-A, ESA STAFF------

INVESTIGATION NAME- INAGING RADIOMETER

NSSDC ID- HETOS-A-01 INVESTIGATIVE PROGRAM

APPLICATIONS

INVESTIGATION DISCIPLINE(S) Meteorology

PERSONNEL P1 ESA STAFE

ESA-ESTEC

GRIEF DESCRIPTION THE VISIBLE-IR RADIOMETER FLOWN ON METOSAT-A IS CAPABLE OF PROVIDING DAY/NIGHT OBSERVATIONS OF CLOUDCOVER AND EARTH/CLOUD RADIANCE TEMPERATURE MEASUREMENTS FROM A SYNCHROMOUS, SPIN-STABILIZED SATELLITE FOR USE IN (1) DPERATIONAL MEATHER ANALYSIS AND FORECASTING AND, (2) FOR SUPPORT TO GARP. THE FIVE-CHANNEL INSTRUMENT IS ABLE TO TAKE FULL PICTURES OF THE EARTH'S DISK. THE THREE IR CHANNELS (TWO IN THE 10.5- TO 12.5-MICROMETER REGION AND DME IN THE 5.7- TO 7.1-WICROMETER EGION). AND THE TWO VISIBLE CHANNELS (C.5 TO 0.9 MICROMETER) USE A COMMON DPTICS SYSTEM. INCOMMING RADIATION IS RECEIVED BY A SCAN MIRROR AND CHE IN THE 5.7-TO THE RADIOMETER OFTICAL AXIS, WHICH IS ALIGNED MOTION OF THE SPIN AXIS OF THE SPACECRAFT. THE SPINNING MOTION OF THE SPIN AXIS OF THE SPACECRAFT STEM. INCOMMINES NEISTEM. SPACECRAFT (APPROXIMATELY 100 RFM) PROVIDES A WEST-EAST SCAN MOTION WHEN THE SATIS AXIS. THE LATITUDINAL SCAN IS ACCOMPLETINED BY SEQUENTIALLY TILTING THE SCANMING MIRROR AT THE COMPLETION OF EACH SPIN.

-- HETEDSAT-A, ESA STAFF------

INVESTIGATION NAME- DATA COLLECTION PLATFORM (DCP)

INVESTIGATIVE PROGRAM NSSDE 10+ METOS-A-02

INVESTIGATION DISCIPLINE(S) Meteorology

PERSONNEL ESA STAFF

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ESA-ESTEC

BRIEF DESCRIPTION THE DATA COLLECTION PLATFORM IS DESIGNED TO (1) DISSEMINATE IMAGE DATA TO USER STATIONS, (2) COLLECT DATA FROM VARIOUS EARTH-BASED PLATFORMS, AND (3). PROVIDE FOR A SPACE-TO-SPACE RELAY FOR DATA FORM POLAR-ORBITING SATELLITES. THIS EXPERIMENT IS SIMILAR TO THE METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM (WEFAX) FLOWN ON SMS 1, SMS 2, AND GOES SERIES SPACECRAFT, THIS EXPERIMENT OPERATES ON S-BAND FREQUENCIES FOR WEFAX TYPE TRANSMISSIONS AND UHF FOR DATA COLLECTION PLATFORM REPORT AND INTERROGATION. BRIEF DESCRIPTION

SPACECRAFT COMMON NAME- METEOSAT-B Alternate Names- Meteorological Sat-B

NSSDC ID- METOS-B

LAUNCH DATE- 11/00/78 Launch Site- Cape Canaveral, United States Launch Vehicle- Delta WEIGHT- 625.8 KG

SPONSORING COUNTRY/AGENCY INTERNATIONAL ESA

PLANNED GRBIT PARAMÉTERS Grbit type- gegcentric Orbit period- 1440. Min Periapsis- 35600. KM INCLINATION- O. DEG APOAPSIS- 35600. KM

MG - M.	DELAHAIS	ESA-ESTEC
PM - D.	Lennertz	ESA-ESTEC

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MG - M. DELAMAIS ESA-ESTEC PM - D. LENNERTZ ESA-ESTEC BRIEF DESCRIPTION METOSAT-B IS GEDSTATIONARY SPACECRAFT AND SERVES AS PART OF EUROPEAN SPACE AGENCY'S (ESA) CONTREQUITION TO GARP. AS PART DF GARP. THE SATELLITE HELPS TO SUPPLY DATA REQUIRED FOR GLOBAL DATA SETS USED IN IMPROVEMENT OF MACHINE WEATWER FORECASTS. IN GENERAL, THE SPACECRAFT DESIGN, INSTRUMENTATION, AND OPEATION ARE SIMILAR TO SMS/GOES. THE SPIN-STABILIZED SPACECRAFT CARRIES (17 A VISIBLE-IR RADIOMETER TO PROVIDE HIGH-GUALITY DAY/NIGHT CLOUDCOVER DATA AND TO TAKE RADIANCE TEMPERATURES OF THE EARTH/ATMOSPHERE SYSTEM. (2) A METEOROLOGICAL DATA COLLECTION SYSTEM TO DISSEMINATE IMAGE DATA TO USER STATIONS, TO COLLECT DATA FROM VARIOUS EARTH-BASED PLATFORMS, AND TO RELAY DATA FROM POLAR-ORBITING SATELLITES. THE CYLINORICALLY-SHAPED SPACECRAFT MEASURES 210 CM IN DIAMETER AND 430 CM IN LENGTH, INCLUDING THE APORT STRUCTURE IN THE PRIMARY STRUCTURAL MEMBERS ARE AN EQUIPMENT PLATFORM AND A CENTRAL TUBE. THE RADIOMETER TOLESCOFE IS MOUNTED ON THE EQUIPMENT PLATFORA AND VIENS THE EARTH THROUGH A SPECIAL *PERTURE IN THE SPACECRAFT'S SIDE, A SUPPORT STRUCTURE EXTENDS MADIALY OUT FROM THE CUTREN WALLS OF THE SPACECRAFT AND PANELS, WHICH FORM THE OUTER WALLS OF THE SPACECRAFT AND PANELS, SHAPED SPACE BETWEEN THE CENTRAL TUBE AND SPECIAL *PERTURE IN THE SPACECRAFT AND ACTIVATED BY GROUND COMMAND. THE SPACECRAFT AND ACTIVATED BY GROUND COMMAND. THE SPACECRAFT AND ACTIVATED BY GROUND COMMAND. THE SPACECRAFT AND ACTIVATED BY GROUND COMMAND. THE SPACECRAFT AND ACTIVATED BY GROUND COMMAND. THE SPACECRAFT AND ACTIVATED BY GROUND COMMAND. THE SPACECRAFT AND COMMAND BURSYSTEM ONCE THE SPACECRAFT AND BATTERY SAD COMMAND BURSYSTEM ONCE THE SPACECRAFT AND SPACECRAFT AND COMMAND BURSYSTEM ONCE THE SPACECRAFT AND PANELS PROPER SPACECRAFT AND ACTIVATED BY GROUND COMMAND. THE SPACECRAFT AND COMMAND BURSYSTEM ONCE THE SPACECRAFT AND SPACECRAFT AND COMMAND BURSYSTEM ONCE THE SPACECRAFT AND PROVIDES TELEMETRY AND COMMAND BURSYSTEM ONCE THE SP

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-- RETEOSAT- 1 ESA STAFF--

INVESTIGATION NAME- IMAGING RADIOMETER

NSSDC ID-	MET05-8-01	INVESTIGATIVE PROGRAM Applications		

INVESTIGATION DISCIPLINE(S) Meteorology

PERSONNEL ESA STAFF

ESA-ESTEC

Section 2

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BRIEF DESCRIPTION THE VISIBLE-IR RADIOMETER FLOWN ON METEOSAT-B IS CAPABLE OF PROVIDING DAY/NIGHT OBSERVATIONS OF CLOUDCOVER AND EARTH/CLOUD RADIANCE TEMPERATURE MEASUREMENTS FROM A SYNCHRONOUS, SPIN-STADILIZED SATELLITE FOR USE IN (1) OPERATIONAL WEATHER ANALYSIS AND FORECASTING AND, (2) FOR SUPPORT TO GARP. THE FIVE-CHANNEL INSTMMENT IS ABLE TO TAKE FULL PICTURES OF THE EARTH'S DISK. THE THREE IR CHANNELS (TWO IN THC '5.5- TO 12-5-MICROMETER REGION AND ONE IN THE 5.7- TO C.3-MICROMETER REGION.) AND THE TWO VISIBLE CHANNELS (0.5- TO O.9-MICROMETER NUSE A COMMON OPTICS SYSTEM. INCOMING RADIATION IS RECEIVED BY A SCAN MIRROR AND COLLECTED BY AN OPTICAL SYSTEM. THE SCAN MIRROR IS SET AT A MOMINAL ANGLE OF AS DEG TO THE RADIOMETER OPTICAL AXIS, WHICH IS ALIGNED PARALLEL TO THE SPIN AXIS OF THE SPACECRAFT. THE SPINNING MOTION OF THE SPACECRAFT (APPROXIMATELY 100 RPM) PROVIDES A WEST-EAST SCAN MOTION WHEN THE SEAUNTIALLY TILTING THE SCANNING MIRROR AT THE COMPLETEND OF SEQUENTIALLY TILTING THE SCANNING MIRROR AT THE COMPLETION OF EACH SPIN.

--- METEOSAT-B, ESA STAFF-----

INVESTIGATION NAME- DATA COLLECTION PLATFORM (DCP)

INVESTIGATIVE PROGRAM COMMUNICATIONS NSSOC ID- METOS-8-02

> INVESTIGATION DISCIPLINE(\$) COMPUNICATIONS

PERSONNEL ESA STAFF

ESA-ESTEC

BRIEF DESCRIPTION THE DATA COLLECTION PLATFORM IS DESIGNED TO (1) DISSEMINATE IMAGE DATA TO USER STATIONS, (2) COLLECT DATA FROM VARIOUS EARTH-BASED PLATFORNS, AND (3) PROVIDE FOR A SPACE-IO-SPACE RELAY FOR DATA FROM POLAR ORBITING SATELLITES. THIS EXPERIMENT IS SIMILAR TO THE METEOROLOGICAL DATA COLLECTION AND TRANSMISSION SYSTEM (WEFAX) FLOWN ON SMS 1-, SMS 2, AND GOES SERIES SPACECRAFT. THIS EXPERIMENT DFERATES ON S-DAND FREQUENCIES FOR WEFAX TYPE TRANSMISSIONS AND UHF FOR DATA COLLECTION PLATFORM REPORT AND INTERROGATION.

SPACECRAFT COMMON NAME- NIMBUS-G Alternate Names-

NSSDC ID- NIMBS-G

WEIGHT- 832. KG LAUNCH DATE- 10/00/78 Launch Site- Vändenberg AFB, United States Launch Vehicle- Delta

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-0A

LANNED ORBIT PARAMÈTERS Orbit type- geocentric Orbit period- 104.03 min Periapsis- 955. Kn	INCLINATION- 99. DEG Apdapsis- 955. KM
ERSONNEL Mg - H. Mannheimer Sc - M. Tepper PM - R.K. Browning PS - W.R. Bandeen	NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSFC NASA-GSFC

PS - W.R. BANDEEN NASA-GSFC BRIEF DESCRIPTION THE NINBUS-G RESEARCH AND DEVELOPMENT SATELLITE SERVES AS A STADILIZED, EARTH-ORIENTED PLATFORM FOR THE TESTING OF ADVANCED SYSTEMS FOR SENSING AND COLLECTING METEOROLUGICAL DATA ON A GLOBAL SCALE. THE POLAR-ORBITING SPACECART CONSISTS OF THREE MAJOR STRUCTURES -- (1) A HOLLON TORUS-SNAPED SENSOR MOUNT, (2) SOLAR PADDLES, AND (3) A CONTROL HOUSING UMIT THAT IS CONNECTED TO THE SENSOR MOUNT BY A TRIPOD TRUSS STRUCTURE. CONFIGURED SOMEWHAT LIKE AN OCEAN BUOY, NIMBUS-G IS NEARLY 3.7 N TALL, 1.5 M IN DIARTER AT THE BASE, AND ABOUT THAT FORMS THE SATELLITE BASE HOUSES THE ELECTRONICS EQUIPHENT AND BATTERY MODULES. THE LOWER SURFACE OF THE TORUS PROVIDES MOUNTING SPACE FOR SENSORS AND ANTENNAS. A BOX-BEAM STRUCTURE ROUNTING SENSOR EXPERIMENTS. MOUNTED ON THE CONTROL HOUSING UNIT, MIICH IS CLOATED ON TOP OF THE SPACECARFT, ARE SUN SENSORS, HOP;TUT-SCANNERS, AND A COMMAND ANTENNA. AN ADVANCED ATTITUDE CONTROL SYSTEM PERMITS THE SPACECRAFT'S ORIENTATION TO BE CONTROLLED TO WITHIN PLUS OR MINUS 1 DEG IN ALL THREE AXES (PITCH, ROLL, AND

YAW). EIGHT EXPERIMENTS HAVE BEEN SELECTED. THEY ARE (1) -LIND INFRARED MOMITORING OF THE STRATOSPHERE LIMS, (2) -STRATOSPHERIE AND MESOSPHERIC SOUNDER SAMS, (3) - COASTAL ZONE COLOR SCANNER (ZCS, (4) - STRATOSPHERIC AEROSOL MEASUREMENT 11 SAMS II, (5) - EARTH RADIATION BUDGET ERB, (6) - SCANNIN ULITICANNEL MICROMAVE RADIOMETER SMNR, (7) - SOLAR BACKSCATTER UW AND TOTAL OZOME MAPPING SPECTROMETER SBUY/TOMS, AND (8) -TEMPERATURE-HUMIDITY INFRARED RADIOMETER THIS. THIS COMPLEMENT OF SENSORS ARE CAPABLE OF OBSERVING SEVERAL PARAMETERS OF IMPORTANCE AT AND BELOW THE NESOSPHERIC LEVELS. A NEW CAPABILITY OF IMPORTANCE IS DIRECTED TOWARD OBSERVATION OF ATMOSPHERIC AND OCEAN POLLUTANTS. SUFFICIENT RUNTIME IS PLANNED FOR STUDY.

- NIMBUS-G, ALLISON-----------

INVESTIGATION NAME+ TEMPERATURE/HUMIDITY INFRARED RADIOMETER (Thir)

NSSDC ID- NIMBS-G-10

INVESTIGATIVE PROGRAM CODE ERN

INVESTIGATION DISCIPLINE(5) Meteorology

PERSONNEL PI - L.J. ALLISON

NASA-GSFC

----- NIMBUS-G, GLOERSEN------------

INVESTIGATION NAME- SCANNING MULTISPECTRAL MICROWAVE

RADIOMETER (SMMR) INVESTIGATIVE PROGRAM NSSDC ID- NIMBS-G-08 CODE ERN

INVESTIGATION DISCIPLINE(S) METEOROLOGY ATMOSPHERIC PHYSICS

PERSONNEL		1
TU - P.	GLDERSEN	NASA-GSFC
TN - R.O.	RANSEIR	ENVIRONMENT CANADA
TM - D.H.	STAELIN	MASS INST OF TECH
TH + 9.J.	CAMPBELL	US GEOLOGICAL SURVEY
TH - D.B.	ROSS	NOAA-ERL
TH - P.	GUDMANSEN	TECH U OF DENMARK

OCEANOGRAPHY

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BRIEF DESCRIPTION THE PRIMARY PURPOSE OF THE SCANNING MULTICHANNEL MICROWAVE RADIOMETER (SMMR) IS TO OBTAIN AND USE OCEAN MOMENTUM AND ENERGY-TRANSFER PARAMETERS ON A NEARLY ALL-WEATHER OPERATIONAL BASIS. WINDS, WATER VAPOR, LIQUID WATER CONTENT, AND MEAN CLOUD DROPLET SIZE, ALL AT LOW ALTITUDES, ARE DETERMINED. MICROWAVE BRIGHTMESS TEMPERATURES ARE OBSERVED WITH A 10 CHANNEL (FIVE FREQUENCY DUAL POLARIZED) SCANNING MATELER OPERATION AT 0.8-, 1.4-, 1.7-, 2.8-, AND 4.6-CM WAVELENGTHS (37, 21, 18, 10.69, 6.633 GHZ. THE ANTENNA IS A PARAMETER OPERATION STEFT FROM MADIR BY 0.73 RAD. MOTION OF THE ANTENNA REFLECTOR OFFSET FROM MADIR BY 0.73 RAD. MOTION OF THE ANTENNA REFLECTOR PROVIDES OBSERVATIONS FROM WITHIN CONICAL VOLUME ALONG THE GROUND TRACK OF THE SPACECRAFT. THE SAME INSTRUMENT IS ON SÉASAT-A AND SEASAT-B.

--- NIMBUS-G, HEATH

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INVESTIGATION NAME- SOLAR AND BACKSCATTER ULTRAVIOLET/TOTAL Ozone mapping system (Sbuv/toms)

NSSDC 10- NIMBS-G-09	INVESTIGATIVE PROGRAM Code Ern
	INVESTIGATION DISCIPLINE(S) Atmospheric Physics Solar Physics
PERSONNEL TL - D.F. HEATH TM - C.L. MATEER TM - A.D. BELMONT TM - A.J. MILLER TM - A.F.S.GREEN TM - D.M. CUNNOLD TM - W.L. IMHOF	NASA-GSFC Environment Canada Control Data Corp Noaa-Mus U of Florida Mass Inst of tech Lockheed Palo Alto

IN - W.L. IMHOF DRIEF DESCRIPTION THE OBJECTIVES OF THE SBUV/TOMS ARE TO DETERMINE THE WERTICAL DISTRIBUTION OF OZONE, MAP THE TOTAL OZOME AND 200-MB HEIGHT FIELDS, AND MOHITOR THE INCIDENT SOLAR ULTRAVIOLET (UV) IRRADIANCE AND ULTRAVIOLET RADIATION BACKSCATTERED FROM THE EARTH, THE SBUV SPECTROMETER MEASURES SOLAR UV THAT IS BETWEEN 2500 AND 3300 ANGSTROMS WITH A SPECTRAL BAND PASS OF 10 ANGSTROMS. THE INSTRUMENT FOV OF 0.20 RAD IS DIRECTED AT THE NADIR. A PARALLEL PHOTOMETER CHANNEL AT 3400 ANGSTROMS MEASURES THE REFLECTIVITY OF THE ATMOSPHERE'S LOWER BOUNDARY IN THE SAME 0.21-RAD FOV. BOTH CHANNELS ALSO VIEW THE ELENT SHORTEST WAVELENGTHS ARE CENTERED AT LEVELS BANGING FROM ST THE TERMINATOR. THE CONTRIBUTION FUNCTIONS FOR THE ELENT HORDEST WAVELENGTHS ARE CENTERED AT LEVELS RANGING FROM ST THE SAME 0.21-RAD FOV. BOTH CHANNELS ALSO VIEW THE ELENT HORDEST WAVELENGTHS ARE CENTERED AT LEVELS RANGING FROM ST THE TERMINATOR. THE CONTRIBUTION FUNCTIONS FOR THE ELENT HORDEST WAVELENGTHS ARE CENTERED AT LEVELS RANGING FROM ST THE SBUW SPECTROMETER HAS A SECOND MODE OF OPERATION THAT ALLOWS A CONTINUOUS SPECTRAL SCAN FROM IGOO TO 4000 ANGSTROMS AND THEIR TEMPORAL VANIATION OF THE EXTRATERRESTRIAL SOLAR SPECTRUM ADD THEIR TEMPORAL VANIATION OF THE EXTRATERRESTRIAL SOLAR SPECTRUM THE OBSITAL TRACK WITH AN FDV OF APPROXIMATELY 0.052 RAD. AT EACH SCAN POSITION THE EARTH RADIANCE IS MONITORED AT SIX MOND THEIR TEMPORAL VANIATION STEP SCANS SCROSS A 105-DEG FOW NORMAL TO THE ORBITAL TRACK WITH AN FDV OF APPROXIMATELY 0.052 RAD. AT EACH SCAN POSITION THE EARTH RADIANCE IS MONITORED AT SIX MONOCHROMETER, WHICH IS EQUIPPED WITH A SPATIAL SCAM MECHANIES MONOCHROMETER, WHICH IS EQUIPPED WITH A SPATIAL SCAM MECHANIES MONOCHROMETER, WHICH IS EQUIPPED WITH A SPATIAL SCAM MECHANIES MONOCHROMETER, WHICH IS EQUIPPED WITH A SPATIAL SCAM MECHANIES MONOCHROMETER, WHICH IS EQUIPPED WITH A SPATIAL SCAM MECHANIES MONOCHROMETER, WHICH IS EQUIPPED WITH A SPATIAL SCAM MECHANIES MONOCHROMETER, WHICH IS EQUIPPE

--- NIRBUS-G, HOUGHTON----

INVESTIGATION NAME- STRATOSPHERIC AND MESOSPHERIC SOUNDER (SAMS)

NSSOC ID- NIMBS-G-02

INVESTIGATIVE PROGRAM CODE ERN

INVESTIGATION DISCIPLINE(S) Atmospheric physics Meteorology

PERSONNEL PI - J.T. HOUGHTON OI - W.L. BARNES OI - K. DAVIES	OXFORD U NASA-GSFC WDC-A, Solar-Terr Phys
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DI - W.L. BARNES DI - K. DAVIES NASA-GSFC WDC-A, SOLAR-TERR PHYS BRIEF DESCRIPTION THE OBJECTIVE OF SAMS IS TO OBSERVE EMISSION FROM THE THE OBJECTIVE OF SAMS IS TO OBSERVE EMISSION FROM THE RADIOMETERS AND TO DETERMINE TEMPERATURE AND VERTICAL CONCENTRATIONS OF HC20G, NC20G, CNC40, CO, AND NO IN THE STRATOSPHERE AND MESOSPHERE TO APPROXIMATELY 90 KM. MEASUMEENTS OF LONAL WIND IN THIS REGION ARE BEING ATTEMPTED BY OBSERVING THE DOPPLER SHIFT OF ATMOSPHERE LS INCIDENT ON A REASUMEENTS OF SONAL WIND IN THIS REGION ARE BEING ATTEMPTED BY OBSERVING THE DOPPLER SHIFT OF ATMOSPHERE LS INCIDENT ON A REASUMEENTS OF YEW. EACH 28 BY 2.8 MRAD (CORRESPONDING TO 100 KM BY 16 KM AT THE LIMB, VIEW SPACE FOR CALIBRATION, AND VIEW THE ATMOSPHERE OBLIQUELY TO OBTAIN VERTICAL PROFILES. THREE ADJACENT FIELDS OF VIEW. EACH 28 BY 2.8 MRAD (CORRESPONDING TO 100 KM BY 16 KM AT THE LIMB, FOCUS ONTO A FIELD-SPLITING MIRROR WHICH DIRECTS RADIATION TO SIX DETECTORS. THE REMAINING DIVISION INTO CHANNELS IS ACCOMPLISHED HAROUGH DICHROIC BEAM SPLITTERS. THERE ARE SEVEN PRESSURE MODULATOR CELLS (PHC). THO CONTAIN CO(20), THE REMAINDER N(20)O, GN CA(4), CO, AND A(20)O. PRESSURE IN THE CILLS MAY BE VARIED ON, COMMAND BY CHANGING THE TEMPERATURE OF A SNALL CONTAINER OF MOLEGULAR SIEVE HATERIAL ATTACHED TO EACH PMC. THE SPECTRAL PARAMETERS FOR THE HC2DO CHANNEL ARE 2.7 MICROMETERS AND 25 TO 100 MICROMETERS. ALL OTHER CHANNELS LIE WITHIN THE RANGE OF 4.3 TO 15 MICROMETERS. SIGMALS PERMITS ELIMINATING EMISSION FROM ALL DETECTORS, ONE A SIGMALS PERMITS ELIMINATING EMISSION FROM HITEFERING GASES WITHIN THE TELESCOPE A CHOPPER THE PARATURE CAN BE INTENDOUCH FOR A SMALL BLACK DODY AT KNOWN TEMPERATURE CAN BE INTENDUCED FOR CALIBRATION. ACCUMATE MEADY LOW THE ATMOSPHERIC PRESSURE AT THE LEVEL BELMINATING EMISSION FROM THE TWO SIGMALS FROM CALIBRATION. ACCUMATE MEADY AND MEADY AT MOSPHERIC PRESSURE AT THE LEVEL BELMINATING EMISSION FROM THE TWO SIGMALS FROM ONE CO72 LANNON.

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-- NIMBUS-G, MCCORMICK-----

INVESTEGATION NAKE- STRATOSPHERIC AEROSOL MEASUREMENT-II (SAM-11)

NSSDC IN- NIMBS-G-06

INVESTIGATION DISCIPLINE(S) UPPER ATMOSPHERE RESEARCH METEOROLOGY

INVESTIGATIVE PROGRAM Code ERN

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SPECIAL

PFRSONNEL TL - M_P. TH - T.J. TM - G.W. TM - B.M. TM - P.B. NASA-LARC U of Wyoning Natl CTR for Atmos Res U of Arizona NCCORMICK Pepin Grans Hernan Rússell STANFORD RES INST

- NIMBUS-G, RUSSELL, 3RD----

INVESTIGATION NAME- LOWER ATMOSPHERIC COMPOSITION AND Temperature experiment (lacate)

INVESTIGATIVE PROGRAM NSSDC ID- NIMBS-G-01

INVESTIGATION DISCIPLINE(S) UPPER ATMOSPHERE RESEARCH Meteorology

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TL - J.M. TL - J.C.		NASA-LARC Natl CTR for Atmos Res Drexel U
TH - F.B. TH - E.E. TH - C.D. TH - S.R.	REMSBERG LOEVY	NASA-LARC U of Washington U of Michigan
	FISCHER Planet	U OF MUNICH Noaa-Ness

TH - W.G. PLANET BRIEF DESCRIPTION THE OBJECTIVE OF THE LIMB INFRARED MONITOR OF THE STRATOSPHERE (LIMS) EXPERIMENT IS TO MAP THE VERTICAL PROFILES OF TEMPERATURE AND THE CONCENTRATION OF OZONE, WATER VAPOR, NITROGEN DIOXIDE, AND NITRIC ACID IN THE LOWER TO MIDDLE STRATOSPHERE RANGE, WITH EXTENSION TO THE STRATOPAUSE FOR MATER VAPOR AND INTO THE LOWER MESOSPHERE FOR THEPERATURE AND OZONE. THE INSTRUMENT HAS A SIM-CHANNEL INFRARED (IR) RADIOMETER THAT INCORPORATES HG-CD-TE DETECTORS COOLED BY A TWO-STAGE SOLID CRYDGEN COOLER, THE RADIOMETER MAPS VERTICAL PROFILES OF THERMAL IR EMISSION COMING FROM THE MORIZON IN SIX BANDS (6.2-9.5, 11.3, 14.9, AMD 51.2 RICRORETERS) OF THE ATMOSPHERIC CONSTITUENTS OF INTEREST. TWO OF THE CHANNELS ARE USED TO DETERMINE RADIANCE PROFILES OF EMISSION BY CO2. THESE PROFILES PRESSURE. THE INFERED TEMPERATURE PROFILE, TOGETHER USED THERE ANDIANCE PROFILES IN THE OTHER SPECTRAL BANDS, ARE THEN USED TO INFER THE VERTICAL DISTRIBUTION OF TRACE CONSTITUENTS. THE TEMPERATURE IS DETERMINED WITH AN ACCURACY OF ABOUT 2D PERCENT, WITH THE EXCEPTION OF NAC WHICH IS DETERMINED TO WITHIN ABOUT, SO PERCENT. INSTANTANEOUS VERTICAL FIELD-OF-VIEW AT THE HORIZON IS 2 KM FOR THE NOZ AND WATER VAPOR CHANNELS.

SPACECRAFT CONNON NAME-ALTERNATE NAMES-

163

INVESTIGATION NAME- COASTAL ZONE DOCAN COLOR SCANNER

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-- NIMBUS-G, HOVIS-------

INVESTIGATIVE PROGRAM INVESTIGATION DISCIPLINE(S) EARTH RESOURCES SURVEY

PERSONNEL TL - W.A. HOVIS TM - N.L. RICHARD TR - C.S. YENTSCH TM - D. CLARK TM - J.R. APEL TM - S.Z. EL-SAYED TM - H.R. GLADN TM - R.C. WRIGLEY	NOAA-NESS NASA-GSFC Bigelow Lab Dcean SCI Noaa-Ess Noaa-erl Texas A&M U U of Miami Nasa-Arc
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NSSDC ID- NIMBS-G-03

TH - R.C. WRIGLEY NASA-ARC DRIEF PESCRIPTION THE COASTAL 20ME COLOR SCANNER EXPERIMENT IS DESIGNED TO MAP CHLOROPHYLL CONCENTRATIONS IN WATER, SEDIMENT DISTRIBUTION, GEUBSIOFFE CONCENTRATIONS AS A SALINITY INDICATOR, AND TEMPERATURE OF COASTAL WATERS AND DECAN CURRENTS, REFLECTED SOLAR ENERGY IS MEASURED IN SIX CHANNELS TO SENSE COLOR CAUSED BY ABSORPTION DUE TO CHLOROPHYLL, SEDIMENTS, AND GELBSTOFFE IN COASTAL WATERS, SPECTRAL BARKS, AT 443 AND G7O NANOMETERS CENTER ON THE MOST INTENSE ABSORPTION. RATIOS OF CHLOROPHYLL, WHILE THE BAND AT 550 NANDMETERS CENTERS ON THE "HINGE POINT?" HE WAVELENGTH OF MINIMUM ABSORPTION. RATIOS OF MEASURED SUBFACE CHLOROPHYLL CONCENTRATIONS, DATA FROM THE SCANNING RADIOMETER IS PROCESSED, WITH ALGORITHNS BEVELOPED FROM THE SIGEACE CHLOROPHYLL CONCENTRATIONS, DATA FROM THE SCANNING RADIOMETER IS PROCESSED, WITH ALGORITHNS DEVELOPED FROM THE FIELD EXPERIMENT DATA, TO PRODUCE MAPS OF CHLOROPHYLL ABSORPTION, THE TEMFLRATURE OF COASTAL WATERS THIS COMENTAL BANDS, THE FIRST AT 520 "ANDMETERS FOR CHLOROPHYLL CORRELATIONS AND 750 RANOMETERS FOR SUFFACE OF CHLOROPHYLL CORRELATIONS AND TO SO HANDMETERS FOR SUFFACE VEGETATION. TO AVOID SUN GLINT, THE SCANNER MINROR CAN BE TILTED ABOUT THE SENSOR PITCH AXIS ON AND TOSO HANDMETERS FOR SUFFACE VEGETATION. TO AVOID SUN GLINT, THE SCANNER MINROR CAN BE TILTED ABOUT THE SENSOR PITCH AXIS ON COMMAND SO THAT THE LINE OF SIGHT OF THE SENSOR PITCH AXIS ON COMMAND SO THAT THE LINE OF SIGHT OF THE SENSOR PITCH ON ADDIR. OR MINUS D.35 RAD IN STEPS OF D.035 RAD WITH RESPECT TO NADIR.

----- 'INBUS-G, JACOBOWITZ-----

INVESTIGATION NAME- EASTH RADIATION BUDGET (ERB)

INVESTIGATIVE PROGRAM NSSDC ID- NIMBS-G-07

CODE ERN INVESTIGATION DISCIPLINE(S) Planetary Athospheres Meteorology

ERSONNEL		
ŤĽ + H.	JACOBOW172	NOAK-NESS
TN - T.H. TN - F.B. TN - K.L.		COLORADO STATE U Drexel u u of calif, davis
TM - J.R. TM - L.L.	HICKEY	EPPLEY LAB, INC NGAA-NESS
TF - A.P. TH - G.L.		CALIF INST OF TECH NASA-LARC

TH - A.P. INGERSOL TH - G.L. SMITH BF JEF DC3CFIPTION THE OBJECTIVE OF THE EARTH RADIATION BUDGET (ERB) EXPERIMENT, A CONTINUATION OF MIMBUS-FERB, IS TO DETERTINE, OVER A PERIOD OF A YEAR, THE EARTH RADIATION BUDGET ON BOTH SYMOPTIC AND PLANETARY SCALES BY SIMULTAMENUS MEASURENT OF INFORING TOLAR RADIATION AND OUTGOING EARTH REFLECTED (SHORTMARE) AND EMITTED (LÖNGWARE) RADIATION. BOTH FIXED WIDE-ANGLE SAMPLING OF TERESTRIAL FLUXES AT THE SATELLITE ALTITUDE AND SCANNED NARROW-ANGLE SAMPLING OF THE RADIANCE (OMPONENTS DEFENDENT ON ANGLE ARE USED TO DETERMINE OUTGOING RADIATICH (REFLECTED AND EMITTED). THE ERB SUBSYSTEM CONSISTS ST A 22-CHANNEL RADIOMETER CONTAINING SEPARATE SUBASSEMBLIES TO DEFINA THE REQUIRED SOLAR, EARTH-FLUX (WIDE ANGLE), AND SCANNED EARTH, RADIATED SOLAR, EARTH-FLUX (WIDE ANGLE), AND SCANNED EARTH, RADIANCE, SAMPLING OF THE RADIANCE UNEODLED IMERMAL DETECTORS, THERMOPILE DETECTORS IN THE SOLAR NON FIXED-EARTH-FLUX CHANNELS, AND PYROELECTIC DETECTORS IN THE SCANNING CHANNELS. THE TO SOLAR CHANNELS VIEW IN FRONT OF THE OBSERVATORY IN THE X-Y PLANE. THE SOLAR CHANNELS OBTAIN USABLE SOLAR DATA ONLY DURING A PERIOD OF ABOUT 3 MIN IN EACH ORBIT WHEN THE SPACECARFT IS OVER THE ANTACTIC REGION. THER SOLAR CHANNEL SUBASSEMBLY CAN BE PIVOTED PLUS OM MINUS D.35 RAD IN THE K-Y PLANE TO COMPENSATE FOR SUM ANGLES AND INS LASS AND IN THE K-Y PLANE TO COMPENSATE FOR SUM ANGLE CONTINUOUSLY SACHLED AT FOUR EARTH-FLUX CHANNELS ARE MOUNTED.S INTHE SOLAR CONTINUOUSLY VIEW THE TOTAL EARTH DISK AND ARE CONTINUOUSLY SACHLED AT FOUR PERIOS OF AT LEAST 38.5. THERE ARE EIGHT INTEGRATED FOR PERIODS OF AT LEAST 38.5. THERE ARE EIGHT INTEGRATED FOR PERIODS OF AT LEAST 38.5. THERE ARE EIGHT INTEGRATED FOR PERIODS OF AT LEAST 38.5. THERE ARE EIGHT INTEGRATED FOR PERIODS OF AT LEAST 38.5. THERE ARE EIGHT INTEGRATED FOR PERIODS OF AT LEAST 38.5. THERE ARE EIGHT INTEGRATED FOR PERIODS OF AT LEAST 38.5. THERE ARE EIGHT INTEGRATED AT FOUR PERIOS ARE NOT CONTIGUOUSLY SACHLED AT FOUR PERIOS ARE

NSSDC ID- NOAA-A

18.87

LAUNCH DATE- 1978 Launch Site- Vandenberg Af8, United States Launch Vehicle- Atlas F WEIGHT- 588.9 KG

SPONSORING COUNTRY/AGENCY United States NOAA-NESS

PLANNED ORBIT PARAMETERS Orbit type- geocentric Orbit period- 101.5 min Periapsis- 833. km

PERSONNEL

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- MG M.L. GARBACI PM G.A. BRANCHFLOWER PS A. ARKING

PS - A. ARKING NASA-GSFC BRIEF DESCRIPTION NOAA-A, A TIROS-N TYPE SPACECRAFT,15 THE FIRST IN A SCRIES OF THIRD-GENERATION, OPERATIONAL METEGROGOGICAL SATELLITES FOR USE IN THE NATIONAL OPERATIONAL ENVIRONMENTAL SATELLITE SUBSYSTEM (MOESS) AND TO SUPPORT THE GLOBAL ATNOSPHERIC RESEARCH PROGRAM (GARP) DURING 1978-84. THE SATELLITE DESIGN PROVIDES AN ECONORICAL AND STABLE SUM-STWCHROMOUS PLATFORM FOR ADVANCED OPERATIONAL INSTRUMENTS TO MEASUME THE EARTH'S ATNOSPHERE, ITS SUFACE AND GLOUD COVER, AND THE NEAR-SPACE ENVIRONMENT. PRIMARY SENSORS INCLUDE AN ADVANCED VERY HIGH RESOLUTION RADIONCTER (AVHRR) FOR OBSERVING DAYTIME AND NIGHTIME GLOBAL CLOUD COVER AND AN OPERATIONAL VERTICAL SOUNDER FCR OBTAINING TEMPERATURE AND WATER VAPOR PROFILES THROUGH THE EARTH'S ATMOSPHERE, SECOMDARY EXPERIMENTS TOM STATUTE OF A SPACE ENVIRONMENT MONITOR (SER), WHICH MESURES THE PROTON AND ELECTRON FLUX NEAR THE EARTH. AND A DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DCS), WHICH PROCESSES THE DROTON AND PLATFORM LOTAGUISITIONS THE VARIOUS NETLAYS TO CENTRAL DATA ACQUISITION STATIONS THE VARIOUS NETLOROLOGICAL DATA RECEIVED FROM FREE-FLOATING BALLOONS AND OCEAM SUOYS DISTRIBUTED AROUND THE GLOBE. THE SATELITE IS BASED UPON THE BLOCK SD SPACECTAFT BUS DEVELOPED FOR THE US AIR FORCE, AND IS CAPABLE OF MAINTAINING AN EARTH-POINTING ACCURACY OF BEFTER THAN PLUS OR MINUS 0.1 DEG WITH A MOTION RATE OF LESS THAN 0.335 DEG/S.

----- NOAA-A, BOSTRON-----

INVESTIGATION NAME- SPACE ENVIRONMENT MONITOR

NSSDC ID- NOAA-A -04

INVESTIGATIVE PROGRAM Operational weather observations INVESTIGATION DISCIPLINE(S) METEOROLOGY

BRIEF DESCRIPTION

PERSONNEL PI - C.O. BOSTROM

APPLIED PHYSICS LAR

INCLINETION- 98.7 DEG APOAPSIS- 833. KM

NASA HEADQUARTERS

NASA-GSEC

BRIEF DESCRIPTION THIS EXPERIMENT IS AN EXTENSION OF THE SOLAR PROTON MONITORING EXPERIMENT FLOWN ON THE ITOS SPAGECRAFT SERIES. THE EXPERIMENT PACKAGE CONSISTS OF FOUR DETECTOR SYSTEMS AND A DATA PROCESSING UNIT. THE LOW-ENERGY PROTON ALPHA TELESCOPE (LEPAT) SEPRARTELY MEASURES IN FIVE ENERGY RANGES BOTH PROTONS BETWEEN TSO KEV AND 40 MEV AND ALPHA PARTICLES BETWEEN 150 KEV/A AND 25 ANTI-EARTH DIRECTIONS WITH GUDEG VIEWING IN THE ANTI-SUN AND GMHIDIRECTIONAL DETECTOR (PDD) MEASURES PROTONS ABOVE 10, 30, AND 60 MEV, ELECTRONS ABOVE 140 KEV, AND PROTONS AND ELECTRONS (INSEPARABLE) ABOVE 750 KEV. THE HIGH-ENERGY PROTON ALPHA RELESCOPE (HEPAT) HAS A 50-DEG VIEWING COME, VIEW IN THE ANTI-EARTH DIRECTION, AND IT MEASURES PROTONS ABOVE 400 MEV AND FOTONS AND ALPHA PARTICLES ABOVE 000 AND 1000 MEV/N. THE TOTAL ENERGY DETECTOR (TED) MEASURE TOTAL ENERGY ABOVE 1 KEV.

---- NOAA-A, NESS STAFF------

INVESTIGATION NAME- ADVANCED VERY HIGH RESOLUTION RADIOMETER (AVHRR)

NSSDC ID- NOAA-A -DT

INVESTIGATIVE PROGRAM Operational weather observations

INVESTIGATION DISCIPLINE (5) HETEOROLOGY

PERSONNEL

NOAA-NESS

BRIEF DESCRIPTION

NESS STAFF

BRIEF DESCRIPTION THE NOAA-A ADVANCED VERY HIGH RESOLUTION PADIOMETER (AVHRRY IS A FOUR-CHANNEL SCANNING RADIOMETER CAPABLE OF PROVIDING GLOBAL DAYTIME AND NIGHTIME SEA SURFACE TEMPERATURE, ICE, SNOW, AND CLOUD INFORMATION. THESE DATA ARE OBTAINED ON A DAILY BASIS FOR USE IN WEATHER HANALTSIS AND FORECASTING, THE MULTISPECTRAL RADIOMETER OPERATES IN THE SCANNING MODE AND REASURES EMITTED AND REFLECTED RADIATION IN THE FOLLOWING SPECTRAL INTERVALS -- CHANNEL 1 (VISIBLE), D.55 TO D.9 GUT OFF AROUND 1.3 MICROMETERS, CHANNEL 3 (IR WINDOW), 10.5 TO 11.5 MICROMETERS, AND CHANNEL 4 (IR WINDOW), 3.55 TO 3.93 MICROMETERS, CHANNEL 4.4 (IR WINDOW), 3.55 TO 3.93 MICROMETERS, AND THE THO IR WINDOW CHANNELS HAVE A THERMAL MICROMETERS, AND THE THO IR WINDOW CHANNELS HAVE A THERMAL MICROMETERS, AND THE THO IR WINDOW CHANNELS HAVE A THERMAL

DIRECT READOUT DATA ARE TRANSMITTED TO GROUND STATIONS BOTH AT LOW (4 KM) RESOLUTION VIA AUTOMATIC PICTURE TRANSMISSION (APT) AND AT HIGH (1 KM) RESOLUTION VIA HIGH RESOLUTION PICTURE TRANSMISSIOM (MRPT). DATA RECORDED ON BOARD ARE AVAILABLE FOR CENTRAL PROCESSING. THEY INCLUDE GLOBAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF 4 KM, AND LOCAL AREA COVERAGE (LAC) DATA, WHICH CONTAINS DATA FROM SELECTED PORTIONS OF EACH ORDIT WITH A 1 KM RESOLUTION. IDENTICAL EXPERIMENTS ARE FLOWN ON THE OTHER SPACECRAFT IN THE TIROS-N/NDAA SER:E?.

----- NDAA-A, NESS STAFF------

INVESTIGATION NAME- OPERATIONAL VERTICAL SOUNDER

NSSOC ID- NOAA-A -02

NESS STAFF

INVESTIGATIVE PROGRAM Operational weather observations

NOAA-NESS

INVESTIGATION DISCIPLINE(S) Meteorology

PERSONNEL P1 -

PI- NESS STAFF NOAA-NESS BRIEF DESCRIPTION THE NOAA-A OPERATIONAL SOUNDER CONSISTS OF THREE INSTRUMENTS DESIGNED TO DETERMINE RADIANCES NEEDED TO CALCULATE INSTRUMENTS DESIGNED TO DETERMINE RADIANCES NEEDED TO CALCULATE EMPERATURE AND HUMIDITY PROFILES OF THE ATMOSPHERE FROM THE SURFACE TO THE STRATOSPHERE (APPROXIMATELY 1 MB). THE FIRST INSTRUMENT, THE BASIC SOUNDING UNIT (BSU), HAS 14 CHANNELS AND MAKES MEASUREMENTS IN THE FOLLOWING SPECTRAL INTERVALS --CHANNEL 1 - THE 3.7-MICROMETER WINDOW REGION, CHANNEL 2 - THE SURFACE TO THE STRATOSPHERE (CD BANDS (13.3, 13.6, 13.6, 13.7, 4.3, 14.5, 14.75, AND 15.0), AND CHANNELS 12 THROUGH 14 - THE B-MICROMETER CO2 BAND, CHANNELS 12 THROUGH 14, 1THE B-MICROMETER CO2 BAND, CHANNELS 12 THROUGH 14, 1THE B-MICROMETER CO3 DERATING AT 14.97 MICROMETER USING THROUGH 11 - THE SO TO AD GHZ OXYGEN (50.3, 53.7, 55.0, AND 57.9) TO OBTATH TEMPEDATURE PROFILES WHICH ARE FREE OF LOOUN INSTRUMENT, THE SIG TO AD GHZ OXYGEN (50.3, 53.7, 55.0, AND S7.9) TO OBTATH TEMPEDATURE PROFILES WHICH ARE FREE OF LOOUN INSTRUMENT, THE SIG TO AD GHZ OXYGEN (50.3, 53.7, 55.0, AND DEVICES UTILIZING A STEP TO PROVIDE A TRAVERSE SCANNING IN THE DEFAIL NOTION OF THE SATEDITE PROVIDES SCANNING IN THE ORBATI MOTION OF THE SATEDITE PROVIDES SCANNING IN THE ORBATI MOTION OF SATED TO PROVIDES TAVERSE SCANNING IN THE ORBATI MOTION OF SATED SATE TO PROVIDE A TRAVERSE SCANNING IN THE ORBATI MOTION OF THE SATEDITE PROVIDES SCANNING IN THE ORBATI IN THE TIROS-N/NOAA SERIES.

INVESTIGATION NAME- DATA COLLECTION SYSTEM

NSSDC ID- NOAA-A -O3

INVESTIGATIVE PROGRAM Operational weather observations

NOAA~NESS

INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL

PI -NESS STAFF

PI- NESS STAFT BRIEF DESCRIPTION THE DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DCS) ON NOAA-A IS DESIGNED TO MEET THE METGOROLOGICAL DATA NEEDS OF THE UNITED STATES AND TO SUPPORT THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM (GARP). THE SYSTEM RECEIVES LOW DUTY CYCLE ITAMSMISSIONS OF METGOROLOGICAL ODSERVATIONS FROM FREE-FLOATING BALLOONS, OCEAN BUOYS, OTHER SATELLITES, AND FIXED GROUND-BASED SENSOR PLATFORMS DISTRIBUTED A ROUND THE GLOBE. THESE OBSERVATIONS ARE ORGANIZED ON BOARD THE SPACECRAFT AND RETRANSMITTED WHEN THE SPALECRAFT COMES IN RANGE OF A COMMAND AND DATA ACQUISITION (CAD) STATION. FOR FREE-MOVING BALLOONS, THE DOPPLER FREQUENCY SHIFT OF THE TRANSMITTED SIGNAL IS BASERVED TO CALCULATE THE LOCATION OF THE BALLOONS. THE DCS IS EXPECTED, FOR A MOVING SENSOR PLATFORM, TO HAVE A LOCATION ACCURACY OF 5 TO 8 KM RRS, AND A VELOCITY ACCURACY OF 1 TO T.6 MS. THIS SYSTEM HAS THE CAPABILITY OF ACQUIRING DATA FROM UP TO 2000 PLATFORMS PER DAT. IDENTICAL EXPERIMENTS ARE FLOWN ON OTHER SPACECRAFT IN THE TIROS-N/NOAA SERIES.

SPACECRAFT COMMON NAME- NOAA-B Alternate Names-

NSSOC ID- NOAA-B

LAUNCH DATE- 1979 Launch Site- Vandenberg Afb, United States Launch Vehicle- Atlas F WEIGHT- 588.9 KG

SPONSORING COUNTRY/AGENCY United States NOAA-NESS

PLANNED ORBIT PARAMETERS Orbit type- geocentric Orbit period- 94.5 min Periapsis- 500. KM

INCLINATION- 98.7 DEG APOAPSIS- 500. KM

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PERSONNEL

-	M.L. G.A. A.	GARBACZ Branchflower Arking

BRIEF DESCRIPTION

BRIEF DESCRIPTION NOAA-B IS THE SECOND IN A SERIES OF THIRD-GENERATION, OPERATIONAL METEDROLOGICAL SATELLITES FOR USE IN THE NATIONAL OPERATIONAL ENVIRONMENTAL SATELLITE SUBSYSTEM (NOESS) AND TO SUPPORT THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM (GARP) DURING 1978-84. THE SATELLITE DESIGN PROVIDES AN ECONOMICAL AND STABLE SUN-SYNCHRONOUS PLATFORM FOR ADVANCED OPERATIONAL INSTRUMENTS TO MEASURE THE EARTH'S ATMOSPHERE, ITS SURFACE AND CLOUD COVER, AND THE NEAR-SPACE ENVIRONMENT. PRIMARY SENSORS INCLUDE AN ADVANCED VERY HIGH RESOLUTION RADIOMETER (AVHER) FOR OBS.RVING DAYTIME AND NIGHTIME GLOBAL CLOUD COVER AND AN OPERATIONAL VERTICAL SOUNDER FOR ÓBTAINING TEMPERATURE AND WATER VAPOR PROFILES THROUGH THE EARTH'S ATMOSPHERE. SECONDARY EXPERIMENTS CONSISTS OF A SPACE ENVIRONMENT MONITOR (SEM). MHICH MEASURES THE PROTON AND ELECTRON FLUX MEAR THE EARTH, AND A DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DES). WHICH PROCESSES AND RELAYS TO CENTRAL DATA. JUISITION STATIONS THE SATELLITE IS BASED UPON THE MLOCK SD SPACECRAFT BUS DEVELOPED FOR THE US AIR FORCE, AND IS CAPABLE OF MAINTAINING AN EARTH-POINTING ACCURACY OF BETTER THAN PLUS OF MAINTAINING AN INTH A MOTION RATE OF LESS THAN 0.035 DEG/S. ----- NOAA~B, BOSTRON------

INVESTIGATION NAME- SPACE ENVIRONMENT MONITOR

NSSDC ID- NOAA-8 -04

INVESTIGATIVE PROGRAM Operational weather observations

INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL PI - C.O. BOSTROM

APPLIED PHYSICS LAB

NASA HEADQUARTERS NASA-GSFC NASA-GSFC

BRIEF DESCRIPTION THIS EXPERIMENT IS AN EXTENSION OF THE SOLAR PROTON MONITORING EXPERIMENT FLOWN ON THE IIDS SPACECRAFT SERIES. THE EXPERIMENT PACKAGE CONSISTS OF FOUR OFFECTOR SYSTEMS AND A DATA PROCESSING UNIT. THE LOW-ENERGY PROTON ALPHA TELESCOPE (LEPAT) SEPARATELY MEASURES IN FIVE ENERGY RANGES BOTH POTONS DETWEEN TSO KEV AND 4D MEV AND ALPHA PARTICLES DETWEEN 150 KEV/N AND 25 MEV/N. THERE ARE TWO LEPATS VIEWING IN THE ANTI-SUN AND ONNIDIRECTIONAL DETECTOR (FOD) MEASURES PROTONS ABOVE 10, 3U, AND 60 MEV, ELECTRONS ABOVE 140 KEV, AND PROTONS ABOVE 10, 3U, AND 60 MEV, ELECTRONS ABOVE 140 KV, AND PROTONS ABOVE 10, 3U, AND 60 MEV, ELECTRONS ABOVE 140 KV, AND PROTONS ABOVE 10, 3U, AND 60 MEV, ELECTRONS ABOVE 140 KV, AND PROTONS ABOVE 400 MEV (INSEPARABLE) ABOVE 750 KEV. THE HIGH-ENERGY PROTON ALPHA ANTI-EARTH DIRECTION, AND IT MEASURES PROTONS ABOVE 400 MEV AND FROTONS AND ALPHA PARTICLES ABOVE 60D AND 100G MEV/N. THE TOTAL ENERGY DETECTOR (TED) MEASURES TOTAL ENERGY ABOVE 1 KEV. BRIEF DESCRIPTION

----- NOAA-B, NESS STAFF----------

INVESTIGATION NAME- ADVANCED VERY HIGH RESOLUTION RADIOMETER

NSSDC ID- NOAA-8 +01

INVESTIGATIVE PROGRAM Operational weather observations

INTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL

NESS STAFF NOAA-NESS

PI- NESS STAFF NOAA-NESS BRIEF DESCRIPTION THE NOAA-B ADVANCED VERY HIGH RESOLUTION RADIOMETER (AVWRRN) IS A FOUR-CHANNEL SCANNING RADIOMETER CAPABLE OF PROVIDING GLOBAL DATIME AND NIGHTIME SEA SURFACE TEMPERATURE. ICE. SNOW, AND CLOUD INFORMATION. THESE DATA ARE OBTAINED ON A DAILY BASIS FOR USE IN VERTHER ANALYSIS AND FORECASTING. THE MULTISPECTRAL RADIOMETER OPERATES IN THE SCANNING MODE AND SPECTRAL INTERVALS -- CHANNEL 1 (VISIBLE). O.55 TO 0.9 MICROMETERS, CHANNEL 2 (NEAR IR), 0.725 MICROMETER TO DETECTOR UT OF A ROUND 1.3 MICROMETERS, CHANNEL 3 (IR WINDOW), 3.55 TO 3.93 MICROMETERS. ALL FOUR CHANNELS 4 (IR WINDOW), 3.55 TO 3.93 MICROMETERS, AND CHANNEL 4 (IR WINDOW), 3.55 TO 3.93 MICROMETERS, AND CHANNEL 4 (IR WINDOW), 3.55 TO 3.93 MICROMETERS, ALL FOUR CHANNELS 4 AVE A THERMAL RESOLUTION 0- 0.42 K AT 300 K. THE AWHRR IS CAPABLE OF OFRAFING IN BOTH REAL-TIME OR RECORDED MODES. REAL-TIME OR DIRECT. READOUT DATA ARE TRANSMITED TO GROUND STATIONS BOTH AT LOW (6 KM) RESOLUTION VIA AUTOMATIC PICTURE TRANSMISSION (APT) AND AT HIGH (1 KM) RESOLUTION VIA HIGH RESOLUTION PICTURE TRANSMISSION (HRPT). DATA RECORDED ON BOARD ARE AVAILABLE FOR DATA, HAVE A RESOLUTION OF 4 KM. AND LOCAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF A KM. AND LOCAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF A KM. AND LOCAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF A KM. AND LOCAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF A KM. AND LOCAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF A KM. AND LOCAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF A KM. AND LOCAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF A KM. AND LOCAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF A KM. AND LOCAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF A KM. AND LOCAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION I THEY INCLUE CHORDED ARE AVAILABLE FOR DATA, HAVE A RESOLUTION OF A KM. AND LOCAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF A KM. AND LOCAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF A KM. AND

-- NOAA-B, NESS STAFF------INVESTIGATION NAME- OPERATIONAL VERTICAL SOUNDER

NSSDC ID- NOAA-B -DZ

INVESTIGATIVE PROGRAM Operational weather observations

INVESTIGATION DISCIPLINE(S) METEOROLOGY

NDAA-NESS

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BRIEF DESCRIPTION

PERSONNEL

BRIEF DESCRIPTION THE NOAA-B OPERATIONAL SOUNDER CONSISTS OF THREE INSTRUMENTS DESIGNED TO DETERMINE RADIANCES NEEDED TO CALCULATE TEMPERATURE AND HUMIDITY PROFILES OF THE ATNOSPHERE FROM THE SURFACE TO THE STRATOSPHERE (APPROXIMATELY 1 MC). THE FIRST INSTRUMENT, THE BASIC SOUNDING UNIT (BSU), HAS 14 CHANNELS AND MAKES REASURREMENTS IN THE FOLLOWING SPECTRAL INTERVALS --CHANNEL 1 - THE 3.7-MICROMETER WINDOW REGION, CHANNEL 2 - THE 84.3-MICROMETER CO2 BAND, CHANNEL 3 - THE 9.7-MICROMETER ZOUNE BAND, CHANNEL 4 - THE 11.1-MICROMETER WINDOW REGION, CHANNEL 5 THROUGH 11 - THE 15-MICROMETER VINDOW REGION, CHANNEL 5 THROUGH 11 - THE 15-MICROMETER VADOR BANDS (18.8, 23.15, AND 29.4). THE SECOND INSTRUMENT, THE STRATOSPHERIC SOUNGING UNIT, HAS THREE CHANNELS OPERATING AT 14.97 MICROMETERS USING SELECTIVE ABSORPTION BY PASSING THE INCOMING RADIATION THROUGH INTERFERNCE. THE SIGNOMY SOUNDING UNIT, HAS FOUR CHANNELS 57.9) TO OBTAIN TEMPERATURE PROFILES WHICH ARE FREE OF CLOUD INSTRUMENT, THE SIGNAWE SOUNDING UNIT, HAS FOUR CHANNELS 57.9) TO OBTAIN TEMPERATURE PROFILES WHICH ARE FREE OF CLOUD INTERFERRECCE. THE INSTRUMENTS ARE CROSS-COURSE SCANNING DEVICES UTILIZING A STEP TO PROVIDE A TRAVERSE SCAN WHILE THE ORBITAL MOTION OF THE SATELLITE PROVIDES SCANNING IN THE CORTHOGORAL DIRECTION. SIMILAR EXPERIMENTS ARE FLOWN ON OTHER SFACECRAFT IN THE THROS-M/NOAA SERIES.

-- NDAA-B, NESS STAFF----

INVESTIGATION NAME- DATA COLLECTION SYSTEM (DCS)

NSSOC 10- NOAA-B -03

INVESTIGATIVE PROGRAM Operational weather observations

INVESTIGATION DISCIPLINE(5) METEOROLOGY

NECS STAFE

NOAA-NESS

BRIEF DESCRIPTION

PERSONNEL

BRIEF DESCRIPTION THE DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DCS) ON NOAA-B IS DESIGNED TO MEET THE METEOROLOGICAL DATA NEEDS OF THE UNLIED STATES AND TO SUPPORT THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM (GARP). THE SYSTEM RECEIVES LOW DUTY CYCLE TRANSMISSIONS OF METEOROLOGICAL OBSERVAI.ONS FROM FREE-FLUATING BALLOONS, OCEAN BUDYS, OTHER SATELLITES, AND FIXED GROUND-BASED SENSOR PLATFORMS DISTRIBUTED AROUND THE GLOBE. THESE OBSERVATIONS ARE ORGANIZED ON BOARD THE SPACECRAFT AND ACTRANSMITTED WHEN THE SPACECRAFT COMES IN RANGE OF A COMMAND DATA ACQUISITION (CAA) STATION, FOR FREE-MOVING BALLOONS, THE DOPPLER FREQUENCY SHIFT OF THE TRANSMITTED SIGNAL IS OBSERVATORS TO 8 AMOVING SENSOR PLATFORM, TO HAVE A LOCATION ACCURACY OF S TO 8 KM RMS, AND A VELOCITY ACCURACY OF ITO 1.0 MS. THIS SYSTEM HAS THE CAPABILITY OF ACQUIRING DATA FROM UP TO 2000 PLATFORMS PER DAY. IDENTICAL EXPERIMENTS ARE FLOWN ON OTHER SPACECRAFT IN THE TIRDS-N/NOAA SERIES.

SPACECRAFT COMMON NAME- NOAA-C Alternate Names-

NSSDC ID- NGAA-C

LAUNCH DATE- 1980 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- ATLAS F

SPONSORING COUNTRY/AGENCY UNITED STATES NOAA-NESS

PLANNED DRBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 94.5 min Periapsis- 500. km	INCLINATION- 98.7 DEG Apõapsis- 500, km	
PERSONNEL		
MG — MIL. GARBACZ PM — G.A. Branchflower PS — A. Arking	NASA HEADQUARTERS NASA-GSFC NASA-GSFC	

BRIEF DISCRIPTION NOAA-C IS THE THIRD IN A SERIES OF THIND-GENERATION, OPERATIONAL METEOROLOGICAL SATELLITES FOR USE IN THE MATIONAL DPERATIONAL ENVIRONMENTAL SATELLITE SUBSTIM (NOESS) AND SUPPORT THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM (GARP) DURING 1978-84. THE SATELLITE DESIGN PROVIDES AN ECONOMICAL AND STABLE SUN-SYNCHRONOUS PLATFORM FOR ADVANCED OPERATIONSL INSTRUMENTS TO MEASURE THE EARTH'S ATMOSPHERE, ITS SURFACE AND

INVESTIGATION DISCIPLINE(S) NESS STAFF

PERSONNEL P1 -

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NOAA-NESS

---- NAAA-C. NESS STAFF-----INVESTIGATION NAME-NSSBC ID- NOAA-C -D2 INVESTIGATIVE PROGRAM OPERATIONAL WEATHER COSTRVATIONS

PERSONNEL PI -NESS STAFF BRIEF DESCRIPTION

INVESTIGATION DISCIPLINE(5) METEOROLOGY NOAA-NESS SPACECRAFT COMMON NAME- NOAA-D Alternate Names-

BRIEF DESCRIPTION THE DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DCS) ON NOAA-C IS DESIGNED TO MEET THE METEOROLOGICAL DATA NEEDS OF THE UNITED STATES AND TO SUPPORT THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM (GARP). THE SYSTEM RECEIVES LOW OUT CYCLE RANSMISSIONS OF METEOROLOGICAL DOSERVATIONS FROM FREE-FLOATING GALLOONS, OCEAN BUOYS, OTHER SATELLITES, AND FIXED GROUND-RASED SENSOR PLATFORMS DISTRIBUTED A ROUND THE GLOBE. THESE OBSERVATIONS ARE ORGANIZED ON GOARD THE SPACECRAFT AND RETRANSMITTED WHEN THE SPACECRAFT COMES IN RANGE OF A COMMAND AND DATA ACQUISITION (COA) STATION. FOR FREE-MOUNING GALLDONS, THE DOPPLER FREQUENCY SHIFT OF THE TRANSMITTED SIGNAL IS DOSERVED TO CALCULATE THE LOCATION OF THE BALLOONS. THE DCS IS EXPECTED, FOR A MOVING SENSOR PLATFORM, TO HAVE A LOCATION ACCURACY OF 5 TO 8 KM RRS, AND A VEDOCITY ACCURACY OF 1 TO 1.6 MS. THIS SYSTEM HAS THE CAPABLILITY OF ACQUIFING DATA FOOM UP TO 2000 PLATFORMS PER DAY. IDENTICAL EXPERIMENTS ARE FLOWN ON OTHER SPACECRAFT IN THE TIROS-N/NOAA SERILS. BRIEF DESCRIPTION INVESTIGATION NAME- ADVANCED VERY HIGH RESOLUTION RADIONETER (AVHRR) INVESTIGATIVE PROGRAM Operational weather observations

NSSDC ID- NOAA-D

PERSONNEL

SPONSORING COUNTRY/AGENCY UNITED STATES

PLANNED ORBIT PARAMETERS Orbit type- geocentric orbit period- 94.5 min periapsis- 500. km

MG + M.L. GARBACZ PM - G.A. BRANCHFLOWER PS - A. ARKING

BRIEF DESCRIPTION THIS EXPERIMENT IS AN EXTENSION OF THE SOLAR PROTON MONITORING EXPERIMENT FLOWN ON THE ITOS SPACECRAFT SERIES. THE EXPERIMENT PACKAGE CONSISTS OF FOUN DETECTOR SYSTEMS AND A DATA PROCESSING UNIT. THE LOW-ENERGY PROTON ALPHA TELESCOPE (LEPAT) SEPARATELY MEASURES IN FIVE ENERGY RANGES BOTH PROTONS BETWEEN 150 KEV AND 40 MEV AND ALPHA PARTICLES BETWEEN 150 KEV/N AND 25 MEV/N. THERE ARE TWO LEPATS VIEWING IN THE ANTI-SUM AND ANTI-EARTH DIRECTIONS WITH 60-DEG VIEWING CONES. THE PROTON ONNIDIRECTIONAL DETECTOR (POD) MEASURES PROTONS ABOVE 10, 30, AND 60 MEV, ELECTRONS ABOVE 100 KEV, AND PROTONS AND ELECTRONS (INSEPARABLE) ABOVE 750 XEV. THE HIGH-ENERGY PROTON ALPHA ANTI-EARTH DIRECTION, AND IT MEASURES PROTONS ABOVE 400 MEV AND FELESCOPE (HEPAT) HAS A 50-DEG VIEWING COME, VIEW IN THE ANTI-EARTH DIRECTION, AND IT MEASURES PROTONS ABOVE 400 MEV AND PROTONS AND ALPHA PARTICLES ABOVE 600 AND 1000 MEV/N. THE TOTAL ENERGY DETECTOR (TED) MEASURES TOTAL ENERGY ABOVE 1 KEV. BRIEF DESCRIPTION

PERSONNEL PI - C.O. BOSTROM

APPLIED PHYSICS LAB

INVESTIGATION DISCIPLINE(S) NETEOROLOGY

INVESTIGATIVE PROGRAM Operational weather observations

NSSDC ID- NDAA-C -04

----- NOAA-C, NESS STAFF------

HSSDC ID- NOAA-C -01

---- NOAA-C, BOSTROM------INVESTIGATION NAME- SPACE ENVIRONMENT MONITOR

CLOUD COVER, AND THE NE, SPACE ENVIRONMENT. PRIMARY SEMSORS INCLUDE AN ADVANCED VERY HIGH RESOLUTION RADIOMETER (AVMRC) FOR OBSERVING DAYTIME AND NIGHTIME GLOBAL CLOUD COVER AND AN OPERATIONAL VERTICAL SOUNDER FOR OBTAINING TEMPERATURE AND MATER VAPOR PROFILES THROUGH THE EARTH'S ATMOSPHERE. SECONDARY EXPERIMENTS CONSIST OF A SPACE ENVIRONMENT MONITOR (SEM), WHICH REASURES THE PROTON AND ELECTRON FLUX NEAR THE EARTH'S AND A DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DCS), WHICH PROCESSES AND RELAYS TO CENTRAL DATA ACQUISITION STATIONS THE BALLOONS AND DECAN BUOYS DISTRIBUTED AROUND THE GLOBE. THE SATELLITE IS GASED UPON THE BLOCK SD SPACECRAFT BUS DEVELOPED FOR THE US AIR FORCE, AND IS CAPABLE OF MININAG AN EARTH-FOINTING ACCURACY OF BETTER THAN PLUS OR MINUS G.1 DEG WITH A MOTION RATE OF LESS THAM 0.035 DEG/S.

BRIEF DESCRIPTION THE NGRA-C OPERATIONAL SOUNDER WILL CONSIST OF THREE INSTRUMENTS DESIGNED TO DETERNING RADIANCES MEEDED TO CALCULATE EMPERATURE AND HUMIDITY PROFILES OF THE ATMOSPHERE FROM THE SUBFACE TO THE STRATOSPHERE (APPROXIMATELY 1 MB). THE FIRST INSTRUMENT, THE BASIC SOUNDING UNIT (GSU), WILL HAVE 14 CHANNELS AND WILL MAKE MEASUREMENTS IN THE FOLLOWING SPECTRAL INTERVALS -- CHANNEL 1 - THE 3.7 MICROMETER WINDOW REGION, CHANNEL 2 - THE 4.3 MICROMETER CARBON DIOXIDE BAND, CHANNEL 3 -THE 9.7 MICROMETER 020NE BAND, CHANNEL 4 - THE 11.1 MICROMETER CARBON DIOXIDE BAND (13.3), 13.6, 14.0, 14.3, 14.5, 14.75, AND 15.0), AND CHANNELS THROUGH 14 - THE 15 MICROMETER ROTATIONAL WATER VAPOR BANDS (18.6, 23.15, AND 29.4). THE SECOND DIOXIDE BANDS (13.6, THE INCOMING CARDING UNIT, WILL HAVE THREE CHANNELS OPERATING AT 14.97 MICROMETER NOTATIONAL WATER WAPOR BANDS (18.6, 23.15, AND 29.4). THE SECOND INSTRUMENT, THE STRATOSPHERIC SOUNDING UNIT, WILL HAVE THREE CHANNELS OPERATING AT 14.97 MICROMETER UNITY STRUE THREE CHANNELS OPERATING AT 14.97 MICROMETER UNITY STRUE THREE CHANNELS OPERATING AT 14.97 MICROMETER UNITY STRUE THREE CHANNELS OPERATING AT 14.97 MICROMETER USING 5.2ECTIVE ABSORPTION BY PASSING THE INCOMING RADIATION THAOUGH THREE PRESSURE MODULATED CELLS CONTAINING CARBON DIOXIDE. THE THIRD INSTRUMENT, THE MICROMAVE SOUNDING UNIT, WILL HAVE FOUR INSTRUMENT, THE MICROMAVE SOUNDING UNIT, WILL HAVE FOUR INSTRUMENT, THE MICROMAVE SOUNDING UNIT, WILL HAVE FOUR INSTRUMENT, THE MICROMAVE SOUNDING UNIT, WILL HAVE FOUR INSTRUMENT, THE MICROMAVE SOUNDING UNIT, WILL HAVE FOUR INSTRUMENT, THE MICROMAVE SOUNDING UNIT, WILL HAVE FOUR INSTRUMENT, THE MICROMAVE SOUNDING UNIT, WILL HAVE FOUR INSTRUMENT, THE MICROMAVE SOUNDING UNIT, WILL HAVE FOUR INSTRUMENT, THE MICROMAVE SOUNDING UNIT, WILL HAVE FOUR INSTRUMENT, THE MICROMAVE SOUNDING UNIT, WILL HAVE FOUR INSTRUMENT, THE MICROMAVE SOUNDING UNIT, WILL HAVE FOUR INSTRUMENT, THE MICROMAVE ATAVERSE INTERVERSE OPERATING IN THE ORBITAL MOTION OF -- NOAA-C> NESS STAFF----

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INVESTIGATION DISCIPLINE(S) METEOROLOGY

NSSDC 1D- NOAA-C -03

INVESTIGATION NAME- DATA COLLECTION SYSTEM (DCS)

LAUNCH DATÉ- 1981 LAUNCH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- ATLAS F

UNITER VAPOR PROFILES THE POTON AND PLATFORM DIGATE AND PLATE THE ADVANCED VERVICE AND PLATE ADVANCED VERVILLA SUBJECTION FOR THE AND AND PLATE ADVANCED VERVILLA SUBJECTION FOR ADVANCED VERVILLA SUBJECT OF ADVANCED AND THE SUBJECT OF ADVANCED AND THE SUBJECT OF ADVANCED AND THE SUBJECT OF ADVANCED AND THE SUBJECT OF ADVANCED AND THE SUBJECT OF ADVANCED AND THE SUBJECT OF ADVANCED AND THE SUBJECT OF ADVANCED AND THE SUBJECT OF ADVANCED AND THE SUBJECT OF ADVANCED AND THE SUBJECT OF ADVANCED AND THE SUBJECT OF ADVANCED AND THE SUBJECT OF ADVANCED AND THE SUBJECT OF A STADLE CAUGADANCED AND AND THE SUBJECT ON FLUX NEAR THE CAUGADANCED AND AND THE SUBJECT ON FLUX NEAR THE CAUGADANCED AND AND SUBJECT OF A STADLE CAUGADANCE AND AND ATTER VAPOR PROFILES THE POTON AND ELECTRON FLUX NEAR THE CAUGADANCED AND AND PLATFORM LOCAT DA SISTE OF A STADLE ADVANCED AND AND ANTER SUBJECT OF AND AND CAUSTION STATIONS THE VARIOUS HETEOROLOGICAL AND PLATFORM LOCAT DA SISTEM (DES), WHICH MEASURES THE POTON AND PLATFORM LOCAT DA SISTEM (DES), WHICH SUBJECTION AND RELEVENDES AND RELAYS TO CENTRAL DATA ACQUISITION STATIONS THE VARIOUS AND ADVANCED VERVIED FOR ADVANCED FROM FREEFLOATING SATELLITE IS BASED UPON THE BLOCK SO SPACECRAFT BUS DEVELOPED

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INCLINATION- 98.7 DEG APOAPSIS- 500. KN

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NASA HEADQUARTERS NASA-GSFC NASA-GSFC

FOR THE US AIR FORCE, AND IS CAPABLE OF MAINTAINING AN EARTH-POINTING ACCURACY OF BETTER THAN PLUS OR MINUS D.1 DEG WITH A MOTION RATE OF LESS THAN 0.035 HEG/S.

AA-D. BOSTRON-----

INVESTIGATION NAME- SPACE ENVIRONMENT MONITOR

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER ODSERVATIONS

---- NOAA-D, NESS STAFF-----

APPLIED PHYSICS LAR

PI-C.O. BUSIRUM PI-C.O. BUSIRUM BRIEF DESCRIPTION THIS EXPERIMENT IS AN EXTENSION OF THE SOLAR PROTON MUNITORING EXPERIMENT FLOWN ON THE ITOS SPACECRAFT SERIES, THE EXPERIMENT PACKAGE CONSISTS OF FOUR DETECTOR SYSTEMS AND A DATA PROCESSING UNIT. THE LOW-ENERGY RANGES BOTH PROTONS BETWEEN 150 KEV AND 40 MEV AND ALPHA PARTICLES BETWEEN 150 KEV/N AMD 25 REV/N. THERE ARE TWO LEPATS VIEWING IN THE ANTI-SUN AND ANTI-EARTH DIRECTIONS WITH 60-DEG VIEWING CONES. THE PROTON AND 60 MEV, ELECTRONS ABOVE 1400 KEV, AND PROTONS AND ELECTRONS (INSEPARABLE) ABOVE 750 KEV. THE HIGH-ENERGY FROTON ALPHA TELESCOPE (HEPAT) HAS A SO-DEG VIEWING CONE, VIEW IN THE ANTI-EARTH DIRECTION, AND IT MEASURES PROTONS ABOVE 400 MEV AND AND 60 MEV, ELECTRONS ABOVE 1400 KEV, AND PROTONS ABOVE 400 MEV AND AND 60 MEV, ELECTRONS ABOVE 140 KEV, AND 1000 MEV/N. THE MATH-EARTH DIRECTION, AND IT MEASURES PROTONS ABOVE 400 MEV AND TELESCOPE (HEPAT) HAS A SO-DEG VIEWING CONEY. VIEW IN THE ANTI-EARTH DIRECTION, AND IT MEASURES PROTONS ABOVE 400 MEV AND TELESCOPE (HEPAT) HAS A SO-DEG VIEWING CONEY VIEW IN THE ANTI-EARTH DIRECTION, AND IT MEASURES PROTONS ABOVE 400 MEV AND THE ANTI-EARTH DIRECTIOR, AND IT MEASURES TOTAL ENERGY ABOVE 1 KEV.

INVESTIGATION NAME- ADVANCED VERY HIGH RESOLUTION RADIOMETER

NSSDC 10- NOAA-D -04

INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL PI - C.O. BOSTROM

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INVESTIGATION NAME- DATA COLLECTION SYSTEM (DCS)

- NOAA-D, NESS STAFF----

THREE PRESSURE MODULATED CELLS CONTAINING CO2. THE THIRD INSTRUMENT, THE MICROWAVE SDUNDING UNIT, HAS FOUR CHANNELS OPERATING IN THE 50 TO 60 GHZ OXYGEN (50.3, 53.7, 55.0, AND 57.9) TO GBTAIN TEMPERATURE PROFILES WHICH ARE FREE OF CLOUD INTERFERENCE. THE INSTRUMENTS ARE CROSS-COURSE SCANNING DEVICES UTILIZING A STEP TO PROVIDE A TRAVERSE SCAN WHILE THE ORBITAL MOTION OF THE SATELLITE PROVIDES SCANNING IN THE ORBITAL DIRECTION. SIMILAR EXPERIMENTS ARE FLOWN ON OTHER SPACECRAFT IN THE TIRDS-N/NOAA SERIES.

NSSDC ID- NOAA-D -03 INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

INVESTIGATION DISCIPLINE(S) METEOROLOGY

NOAA-NESS

PERSONNEL NESS STAFF

SPACECRAFT COMMON NAME- NOAA-E Alternate Names-

PI - NESS STAFF NUAA-NESS BRIEF DESCRIPTION THE DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DCS) ON NOAA-D IS DESIGNED TO MEET THE METEOROLOGICAL DATA NEEDS OF THE UNITED STATES AND TO SUPPORT THE GLUBAL ATMOSPHERIC RESEARCH PROGRAM (GARP). THE SYSTEM RECEIVES LOW DUTY CYCLE TAANSMISSIONS OF METEOROLOGICAL OBSERVATIONS FROM FREE-FLOATING GALLOONS, OCEAN BUDYS, OTHER SATELLITES, AND FIXED GROUND-BASED SENSOR PLATFORMS DISTRIBUTED AROUND THE GLOBE. THESE OBSERVATIONS ARE ORGANIZED ON BOARD THE SPACECRAFT AND ATTA ACQUISITION (CDA) STATION. FOR FREE-MOVING BALLOONS. THE DOPPLER FREQUENCY SHIFT OF THE TAANSMITTED SIGNAL IS EXPECTED, FOR A MOVING SENSOR PLATFORM, TO HAVE A LOCATION ACCUMARY OF 5 TO 8 KM RMS, AND A VELOCITY ACCURACY OF TO 150 MS. THIS SYSTEM HAS THE CAPABILITY OF ACQUIRING DATA FROM UP TO 2000 PLATFORMS PR DAY. IDENTICAL EXPERIMENTS ARE FLOWN ON OTHER SPACECRAFT IN THE TIROS-M/MOAA SERIES.

NSSDC ID- NDAA-D -01

(AVHRR)

INVESTIGATIVE PROGRAM Operational weather observations

INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL P1 -NESS STAFE

NOAA-NESS

P1 - VESS STAFF NOAA-NESS BRIEF DESCRIPTION THE NOAA-D ADVANCED VERY HIGH RESOLUTION RADIOMETER (AVHRR) IS A FOUR-CHANNEL SCANNING RADIOMETER CAPABLE OF PROVIDING GLOBAL DAVIME AND NIGHTTIME SEA SURFAGE TEMPEDATURE. ICE, SNOW, AND CLOUD INFORMATION. THESE DATA ARE OBTAINED ON A DAILY BASIS FOR USE IN WEATHER ANALYSIS AND FOPECASTING. IHE MULTISPECTRAL RADIOMETER OPERATES IN THE SCANNING MODE AND MEASURES EMITTED AND REFLECTED RADIATION IN THE FOLLOWING SPECTRAL INTERVALS -- CHANNEL 1 (VISIBLE), D.55 TO 0.9 MIGROMETER, CHANEL 2 (IREAR IR), 0.725 MIGROMETER TO DETECTOR CUT OFF AROUND 1.3 MIGROMETERS, WHANNEL 3 (IR WINDOW), 3.55 TO 3.93 MIGROMETERS, ALL FOUR CHANNEL 4 (IR WINDOW), 3.55 TO 3.93 MIGROMETERS, ALL FOUR CHANNEL 4 (IR WINDOW), 3.55 TO 3.93 MIGROMETERS, ALL FOUR CHANNEL 5 HAVE A THERMAL RESOLUTION OF 0.12 K AT 300 K. THE AVHRR IS CAPABLE OF OPERATING IN BOTH REAL-TIME OR RECORDED MODES. REAL-TIME OR DIRECT READOUT DATA ARE TRANSMITTED TO GROUND SIATIONS BOTH AT LOW (4 KM) RESOLUTION VIA AUTOMATIC PICTURE TRANSMISSION (APT) AND AT HIGH (1 KM) RESOLUTION VIA HIGH RESOLUTION PICTURE TANSMISSION (HRPT). DATA RECORDED ON BOARD ARE AVAILABLE FOR CENTRAL PROCESSING. THEY INCLUDE GLOBAL AREA COVERAGE (GAC) DATA. HIGH CONTAINS DATA FROM SELECTED PORTIONS OF EACH ORDIT WITH A1 KM RESOLUTION F4 KM, AND LOGAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION F4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION F4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION F4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION F4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION F4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION F4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION F4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION F4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION OF F4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION DATA FROM SELECTED PORTIONS OF EACH ORDIT WITH A1 KM RESOLUTION DATA FROM SELECTED PORTION

----- NDAA-D, NESS STAFF----

INVESTIGATION NAME- OPERATIONAL VERTICAL SOUNDER

NSSDC 10- NDAA-D -02

INVESTIGATIVE FROGRAM Operational Weather Observations INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL PI -NESS STAFF

NDAA-NESS

GRIEF DESCRIPTION THE NOAA-O OPERATIONAL SOUNDER CONSISTS OF THREE INSTRUMENTS DESIGNED TO DETERMINE RADIANCES NEEDED TO CALCULATE TEMPERATURE AND HUMIDITY PROFILES OF THE ATMOSPHERE FROM THE SURFACE TO THE STRATOSPHERE (APPROXIMATELY 1 MO). THE FIRST INSTRUMENT, THE BASIC SOUNDING UNIT (GSU), HAS 14 CHANNELS AND MAKES MEASUREMENTS IN THE FOLLOWING SPECTRAL INTERVALS --CHANNEL 1 - THE 3.7-MICROMETER WINDOW REGION, CHANNEL 2 - THE BAND, CHANNEL 4 - THE 11.1-MICROMETER WINDOW REGION, CHANNEL 5 -THROUGH 17 - THE 15-MICROMETER CO2 BAND (13.3, 14.0, 14.35, 14.55, 14.75, AND 15.0), AND CHANNELS 12 THROUGH 14 - THE 18-MICROMETER ROTATIONAL WATER VAPOR BANDS (18.8, 23.15, AND 29.4). THE SECONS INSTRUMENT, THE STRATOSPHERIC SOUNDING UNIT, HAS THREE CHANNELS OPERATING AT 14.97 MICROMETERS USING SELECTIVE ADSORPTION BY PASSING THE INCOMING RADIATION THROUGH BRIEF DESCRIPTION

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LAUNCH DATE- 1982 LAUNCH SITE- VANDENBERG ASB, UNITED STATES LAUNCH VEHICLE- ATLAS F SPONSORING COUNTRY/AGENCY UNITED STATES

NOAA-NESS PLANNED ORBIT PARAMETERS Orbit type- geocentric Orbit period- 94.5 min Periapsis- 500. km INCLINATION- 98.7 APOAPSIS- 500. KM 98.7 DEG

PERSONNEL MG - R.L. GARBACZ PM - G.A. BRANCHFLOWER PS - A. ARKING NASA HEADQUARTERS NASA-GSFC NASA-GSFC

NSSDC ID- NOAA-E -04

NSSOC ID- NOAA-F

PS - A. ARKING NASA-GSFC BRIEF DESCRIPTION NOAA-E IS THE FIFTH IN A SERIES OF THIRD-GENERATION, OFERATIONAL METEOROLOGICAL SATELLITES FOR USE IN THE MATIONAL OPERATIONAL ENVIRONMENTAL SATELLITES SUBJECT (NOESS) AND TO SUPPORT THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM (GARP) DURING STABLE SUM-SYNCHRONOUS PLATFORM FOR ADVANCED OPERATIONAL INSTRUMENTS TO MEASURE THE EARTH'S ATMOSPHERE, ITS SURFACE AND CLOUD COVER, AND THE NEAR-SPACE ENVIRONMENT, PRIMARY SENSORS INCLUDE AN ADVANCED VERY HIGH RESOLUTION RADIOMETER (AVHRR) FOR OBSERVING DAYTIME AND NIGHTINE GLOBAL CLOUE COVER AND AN OPERATIONAL VERTICAL SOUNDER FOR DETAINING TEMPERATURE AND WATER VAPOR PROTILES THROUGH THE CARTH'S ATMOSPHERE, SECONDART EXPERIMENTS CONSIST OF A SPACE ENVIRONMENT MONITOR (SEM), WHICH MEASURES THE PROTON AND ELECTRON FLUX NEAR THE CARTH, AND A DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DCS), WHICH VARIOUS METEOROLOGICAL DATA RECEIVED FOR MEE-FLOATINGS BALLOONS AND 3CEAN BUDYS DISTRIBUTED AROUND THE GLOBE. THE SATELLITE IS BASED UPON THE HICK SD FAREE-FLOATINGS BALLOONS AND 3CEAN BUDYS DISTRIBUTED FOR HIS SUBJECT. FOR THE US AIR FORCE, AND IS CAPABLE OF MAINTAINING AN BALLOONS AND SECOND THE GLOCK SD SPACECRAFT BUS DEVELOPED FOR THE US AIR FORCE, AND IS CAPABLE OF MAINTAINING AN HITH A NOTION RATE OF LESS THAN G.0335 DEG/S.

-- NOAA-E, BOSTRON-----

INVESTIGATION NAME- SPACE ENVIRONMENT MONITOR

INVESTIGATIVE PROGRAM Operational weather observations

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INVESTIGATION DISCIPLINE'S) METEOROLOGY

PERSONNEL P1 - C.O. BOSTROM

APPLIED PHYSICS LAB

BRIEF DESCRIPTION THIS EXPERIMENT IS AN EXTENSION OF THE SOLAR PROTON MONITORING EXPERIMENT FLOWN ON THE LTOS SPACECRAFT SERIES. THE EXPERIMENT PACKAGE CONSISTS OF FOUR DETECTOR SYSTEMS AND A DATA PROCESSING UNIL. THE LOW-ENERGY PROTON ALPHA TELESCOPE (LEPAT) SEPARATELY MEASURES IN FIVE ENERGY RANGES BOTH PROTONS DETWENN 150 KEV AND 40 MEV AND ALPHAP PARTICLES BETWEEN 150 KEV/N AND ANTI-4RATH DIRECTIONS WITH 60-DEG VIEWING COMES. THE PROTON ORNIDIRECTIONAL DETECTOR (POD) MEASURES PROTONS ABOVE 10, 30, AND 60 MEV, ELECTRONS ABOVE 140 KEV, AND PROTONS AND ELECTRONS (INSEPARABLE) ABOVE 750 KEV, THE HIGH-ENERGY PROTON ALPHA TELESCOPE (HEPAT) WAS A 50-DEG VIEWING COME, VIEW THE ANTI-4RATH DIRECTION, AND IT MEASURES PROTONS ABOVE 400 MEV AND PROTONS AND ALPHA PARTICLES ABOVE 600 AND 1000 MEV/N. THE TOTAL ENERGY DETECTOR (TED) MEASURES TOTAL ENERGY ABOVE 1 KEV.

-- NOAA-E, NESS STAFF-----

INVESTIGATION NAME- ADVANCED VERY HIGH RESOLUTION RADIOMETER (AVHRR)

NSSDE LD- NOAA-E -01

INVESTIGATIVE PROGRAM Operational weather deservations INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL PI -

NOAA-NESS

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INVESTIGATION NAME- OPERATIONAL VERTICAL SOUNDER

INVESTIGATIVE PROGRAM Operational weather observations NSSDC ID- NOAA-E -02

INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL PI -

BRIEF DESCRIPTION

NOAA-NESS

BRIEF DESCRIPTION THE NORA-E OPERATIONAL SOUNDER CONSISTS OF THREE INSTRUMENTS DESIGNED TO DETERNINE RADIANCES MEEDED TO CALCULATE INSTRUMENTS DESIGNED TO DETERNINE RADIANCES MEEDED TO CALCULATE SUBFACE ID THE STRATOSPHERE (APPROXIMATELY 1 MB). THE FIRST INSTRUMENT, THE BASIC SOUNDING UNIT (BSU), HAS 14 CHANNELS AND MAKES MEASUREMENTS IN THE FOLLOWING SPECTRAL INTERMALS --CHANNEL 1 - THE 3.7-MICROMETER WINDOW REGION, CHANNEL 2 - THE 4.3-MICROMETER CO2 BAND, GHANNEL 3 - THE 9.7-MICROMETER OZONE BAND, CHANNEL 4 - THE 11.1-MICROMETER WINDOW REGION, CHANNEL 2 - THE 4.3-MICROMETER CO2 BAND, GHANNEL 3 - THE 9.7-MICROMETER OZONE BAND, CHANNEL 4 - THE 15.1-MICROMETER WINDOW REGION, CHANNEL 5 THROUGH 11 - THE 15-MICROMETER WINDOW REGION, CHANNEL 5 HAROUGH 11 - THE 15-MICROMETER VAPOR BANDS (18.8, 23.15, AND 29.4). THE SECOND INSTRUMENT, THE STRATOSPHERIC SOUNDING UNIT, HAS THREE CHANNELS OPERATING AT 14.97 MICROMETERS USING SELECTIVE ABSORPTION OF PASSING THE INCOMING KADIATION THROUGH THREE PRESSURE MODULATED CELLS CONTAINING CO2. THE THIRD INSTRUMENT, THE MICROWAC SOUNDING UNIT, HAS FOUR CHANNELS 0PERATING IN THE 50 TO 60 GHZ OXYGEN (5D.3, 53.7, 55.0, AND 57.9) TO OBTAIN TEMPERATURE PROFILES WILCH ARE FREE OF CLOUD INTERFERENCE. THE INSTRUMENTS ARE CROSS-COURSE SCANNING DEVICES UTILIZING A STEP TO PROVIDE A TRAVERSE SCANNING IN THE ORBITAL MOTION OF THE SATELLIFE PROVIDES SCANNING IN THE ORBITAL MOTION OF THE SATELLIFE PROVIDES SCANNING IN THE ORBITAL MOTION OF THE SATELLIFE PROVIDES SCANNING IN THE ORBITAL MOTION OF THE SATELLIFE PROVIDES SCANNING IN THE ORBITAL MOTION OF THE SATELLIFE PROVIDES SCANNING IN THE ORBITAL MOTION OF THE SATELLIFE PROVIDES SCANNING IN THE ORBITAL MOTION OF THE SATELLIFE PROVIDES SCANNING IN THE ORBITAL MOTION OF THE SATELLIFE PROVIDES SCANNING IN THE ORBITAL MOTION OF THE SATELLIFE PROVIDES ARE FLOWN ON OTHER SPACECRAFT IN THE TIROS-M/MOAA SERIES.

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----- NOAA-E, NESS STAFF------

INVESTIGATION NAME- DATA COLLECTION SYSTEM (DCS) NSSDC ID- NOAA-E -03

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL NESS STAFF

NOAA-NESS

PI - NESS STAFF NUMA-NESS BRIEF DESCRIPTION THE DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DCS) ON NOA-E IS DESIGNED TO MEET THE METEOROLOGICAL DATA NEEDS OF THE UNITED STATES AND TO SUPPORT THE GLOBAL ATMOSPHERIC RESEARCH PROVAM (GARP). THE SYSTEM RECEIVES LOW DUTY CYCLE TRANSNISSIONS OF METEOROLOGICAL OBSERVATIONS FROM FREE-FLOATING BALLOONS, OCEAN BUDYS, OTHER SATELLITES, AND FIXED GROUND-BASED SENSOR PLATFORMS DISTRIBUTED AROUND THE GLOBE. THESE OBSERVATIONS ARE ORGANIZED ON BOARD THE SPACECRAFT AND RETRAMSAITED WHEN THE SPACECRAFT COMES IN RANGE OF A COMMAND AND DATA ACQUISITION (COA) STATION. FOR FREE-MOVING BALLOONS. THE DOPPLER FREQUENCY SHIFT OF THE TRANSMITTED SIGNAL IS OBSERVED TO CALCULATE THE LOCATION OF THE BALLOONS. THE DCS IS EXPECTED, FOR A MOVING SENSOR PLATFORM, TO HAVE A LOCATION ACCURACY OF 5 TO 8 KM RMS, AND A VELOCITY ACCURACY OF 1 TO 1.6 MS. THIS SYSTEM HAS THE CAPABILITY OF ACQUIRING DATA FROM UP TO 2000 PLATFORMS PER DAY. IDENTICAL EXPERIMENTS ARE FLOWN ON OTHER SPACECRAFT IN THE TIROS-N/NDAA SERIES.

SPACECRAFT COMMON NAME- NOAA-F Alternate Names-

NSSDC ID- NOAA-F

LAUNCH DATE- 1983 Launch Site- Vandenberg AFB, United States Launch Vehicle- Atlas F WEIGHT~ 588.9 KG

SPONSORING COUNTRY/AGENCY UNITED STATES NOAA-NESS

PLANNED ORÐIT PARAMETERS Orbit Type- geocentric Orbit period- 94.5 min Periapsis- 500. km	INCLINATION~ 98.7 DEG Apõapsis- 500, km	
PERSONNEL		
MG - N.L. GARBACZ	NASA HEADWUARTERS	
PN - G.A. BRANCHFLOWER	NASA-GSFC	
PS - A. ARKING	NASA-65FC	

PS - A. ARKING NASA-GSFC BRIEF DESCRIPTION NOAA-F IS THE SIXTH IN A SERIES OF THIRD-GENERATION, PREATIONAL METEOROLOGICAL SATELLITES FOR USE IN THE NATIONAL OPERATIONAL ENVIRONMENTAL SATELLITE SUBSYSTEM (NOESS) AND TO SUPPORT THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM (GARP) DURING 1978-84. THE SATELLITE DESIGN PROVIDES AN ECONOMICAL AND S'ABLE SUM-SYNCHRÖNDUS PLATFORM FOR ADVANCED OPENATIONAL INSTRUMENTS TO MEASURE THE EARTH'S ATMOSPHERE, ITS SUBFACE AND CLOUD COVER, AND THE NEAR-SPACE ENVIRO MENT. PRIMARY SENSORS INCLUDE AN ADVANCED VERY HIGH RESOLUTION RENT. PRIMARY SENSORS INCLUDE AN ADVANCED VERY HIGH RESOLUTION REDIT. PRIMARY SENSORS INCLUDE AN ADVANCED VERY HIGH RESOLUTION THALIOMETER (AVWAR) FOR OBSERVING DAYTIME AND NIGHTIME GLOBAL CLOUD COVER AND AN OPERATIONAL VERTICAL SOUNDER FOR OBTAINING TEMPERATURE AND VATER VAPOR PROFILES THROUGH THE EARTH'S ATMOSPHERE, SECONDARY EXPERIMENTS CONSIST OF A SPACE ENVIRONMENT MONITOR (SEM), WHICH MEASURES THE PROTON AND ELECTON FLUX NEAR THE EARTH, AND A DATA COLLECTION AND PLATFORM LOCATION SYSTEM (OCS), WHICH PROCESSES AND RELAYS TO CENTRAL DATA ACQUISITION STATIONS THE VARIOUS METEOROLOGICAL DATA RECEIVED FROM FREE-FLOATING BALLOONS AND DCEAN BUGYS DISTRIBUTED ARQUND THE GLOBE, THE SATELLITE IS GASED UPON THE BLOKS SD SFCERAFT BUS DEVELOPED FOR THE US AIR FORCE, AND IS CAPABLE OF MAINTAINING AN EARTH-POINTING ACCURACY OF BETTER THAN PLUS OR MINUS O.T DEG WITH A NOTION RATE OF LESS THAN 0.DS5 DEG/S.

-- NOAA-F. BOSTROM----

INVESTIGATION NAME- SPACE ENVIRONMENT MONITOR

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVA(IONS

INVESTIGATION DISCIPLINE(5) NETEOROLOGY

PERSONNEL PI - C.O. BOSTROM

NSSDC 10- NOAA-F -04

APPLIED PHYSICS LAB

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT IS AN EXTENSION OF THE SOLAR PROTON MONITORING EXPERIMENT IS AN EXTENSION OF THE SOLAR PROTON EXPERIMENT PACKAGE CONSISTS OF FOUR DETECTOR SYSTEMS AND A DATA PROCESSING UNIT. THE LOW-ENERGY PROTON ALPHA TELESCOPE (LEPAT) SEPARATELY MEASURES IN FIVE ENERGY RANGES BOTH PROTONS BETWEEN 150 KEV AND 4D MEV AND ALPHAP PARTICLES BETWEEN 150 KEVAN AND ANTI-EARTH DIRECTIONS WITH 60-DEG VIEWING CONES. THE ANTI-SUN AND ANTI-EARTH DIRECTIONS WITH 60-DEG VIEWING CONES. THE PROTON OMNIDIPSCTIONAL DETECTOR (POD) MEASURES PROTONS ABOVE 10-30.

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AND 6D MEV, ELECTRONS ABOVE 143 KEV, AND PROTONS AND ELECTRONS (INSEPARABLE) ABOVE 750 KEV. THE HIGH-ENERGY PROTON ALPHA TELESCOPE (HEPAT) HAS A 30-DEG VIEWING CONE, VIEW IN THE ANTI-EARTH DIRECTION, AND IT MEASURES PROTONS ABOVE 400 MEV AND PROTONS AND ALPHA PARTICLES ABOVE 600 AND 1000 MEV/N. THE TOTAL ENERGY DETECTOR (TEO) MEASURES YOTAL ENERGY ABOVE 1 KEV.

--- NOAA-F, NESS STAFF------

INVESTIGATION NAME- ADVANCED VERY HIGH RESOLUTION RADIONETER (AVHRR)

NSSDC 10- NOAA-F -D1

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INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS INVESTIGATION DISCIPLINE(S) METEOROLOGY

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NESS STAFF NOAA-NESS

PI - NESS STAFF NOAA-NESS BRIEF DESCRIPTION THE NOAA-F ADVANCED VERY HIGH RESOLUTION RADIOMETER (AWHRR) IS A FOUR-CHANNEL SCANNING RADIOMETER CAPABLE OF PROVIDING GLOGAL DAVINE AND NIGHTIME SEA SURFACE TEMPERATURE, ICE, SNOW, AND CLOUD INFORMATION. THESE DATA ARE OBTAINED ON A DAILY BASIS FOR USE IN WEATHER ANALYSIS AND FORECASTING. THE WULTISPECTRAL RADIOMETER OPERATES IN THE SCANNING MODE AND REASURES EMITTED AND REFLECTED RADIATION IN THE FOLLOWING SPECTRAL INTERVALS -- CHANNEL 1 (VISIBLE), D.55 TO D.9 MICROMETER, CHANNEL 2 (NEWAR IR), D.725 MICROMETER TO DETECTOR CUT OFF AROUND 1.3 MICROMETERS, CHANNEL 3 (IR WINDOW), 1D,5 TO 11.5 MICROMETERS, AND CHANNEL 4 (IR WINDOW), 3.55 TO 3.93 MICROMETERS, AND THE TWO IR WINDOW CHANNELS HAVE A THEMAL RESOLUTION OF D.12 K AT 3DG K. THE AVHRR IS CAPABLE OF OPERATING IN BOTH REAL-TIME OR RECORDED MODES. REAL-TIME OR DIRECT READOUT DATA ARE TRANSMITTED TO GROUND STATIONS BOTH AT LOW (4 KM) RESOLUTION VIA AUTOMATIC PICTURE TRANSMISSION (APT) AND AT HIGH (1 KM) RESOLUTION VIA HIGH RESOLUTION OF CHANNELS HAVE A ANDLAR ECOND ALLARE COVERAGE (GAC) DATA. HAVE A RESOLUTION OF 4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION OF 4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION OF 4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION OF 4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION OF 4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION OF 4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION OF 4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION OF 4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION OF 4 KM, AND LOCAL AREA COVERAGE (GAC) DATA. HAVE A RESOLUTION I DENTICAL EXPERIMENTS ARE FLOWN ON THE OTHER JPACECRAFT IN THE TINGS-M/NOAA SERIES.

NOAA-F, NESS STAFF-----

INVESTIGATION NAME- OPERATIONAL VERTICAL SOUNDER

NESS STAFF

NSSDC ID- NOAA-F -02

INVESTIGATIVE PROGRAM Operational weather observations

INVESTIGATION DISCIPLINE(S) METEOROLOGY

PERSONNEL PI -

NOAA-NESS

BRIEF DESCRIPTION THE NOAA-F OPERATIONAL SOUNDER CONSISTS OF THREE INSTRUMENTS DESIGNED TO DETERMINE RADIANCES NEEDED TO CALCULATE ENPERATURE AND HUMIDITY PROFILES OF THE ATMOSPHERE FROM THE SURFACE TO THE STRATOSPHERE CAPPROXIMATELY 1 MB). THE FIRST INSTRUMENT, THE BASIC SOUNDING UNIT (BSU), HAS 14 CHANNELS AND MAKES MEASUREMENTS IN THE FOLLOWING SPECTRAL INTERVALS -CHANNEL 1 - THE 3.7-MICROMETER WINDOW REGION, CHANNEL 5 THROUGH II - THE 1.7-MICROMETER WINDOW REGION, CHANNEL 5 THROUGH II - THE 1.7-MICROMETER VINDOW REGION, CHANNEL 5 THROUGH II - THE 1.7-MICROMETER VINDOW REGION, CHANNEL 5 THROUGH II - THE 1.7-MICROMETER VINDOW REGION, CHANNEL 5 THROUGH II - THE 1.7-MICROMETER VINDOW REGION, CHANNEL 5 THROUGH II - THE 15-MICROMETER VINDOW REGION, CHANNEL 5 14.05, CHANNEL 4 - THE 11.1-MICROMETER CO2 BAND (13.3, 13.6, 14.0, 14.3, 14.5, 14.75, AND 15.0), AND CHANNELS 12 THROUGH 14 - THE 18-M'TROMETER ROTATIONAL WATER VAPOR BANDS (18.8, 23.15, AND 29.4). THE SECOND INSTRUMENT, THE STRATOSPHERIC SOUNDING UNIT, HAS IHREE CHANNELS OPERATING AT 14.97 MICROMETERS USING SELECTIVE ABSORPTION BY PASSING THE INCOMING RADIATION THROUGH THREE PRESSURE MODULATED CELLS CONTAINING CO2. THE THIRD INSTRUMENT, THE MICROWAVE SOUNDING UNIT, HAS FCUR CHANNELS OPERATING IN THE 50 TO 60 GNZ OXYGEN (50.3, 53.7, 55.0, AND 57.9) TO BATAIL TEMPERATURE PROFILES WICH ARE FE OF CLOUD INTERVENT. THE INSTRUMENTS THE CROSS-COURSE SCANNING DEVICES UTILIZING A STEP TO PROVIDE TRAVERSES SCAN WHILE THE ORBITAL MOTION OF THE SATELLITE PROVIDES SCANNING IN THE GRINGGONAL DIRECTION. SIMILAR EXPERIMENTS ARE FLOWN ON OTHER SPACECRAFT IN THE TIRDS-N/NDAA SERIES. BRIEF DESCRIPTION

----- NOAA-F, NESS STAFF----

INVESTIGATION NAME- DATA COLLECTION SYSTEM (DCS)

NSSDC ID- NOAA-F -03 INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

INVESTIGATION DISCIPLINE(S) Meteorology

PERSONNEL NESS STAFF PI -

NOAA-NESS

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DCS) ON NOAA-F IS DESIGNED TO MEET THE METEOROLOGICAL DATA NEEDS OF THE UNITED STATES AND TO SUPPORT THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM (GARP). THE SYSTEM RECEIVES LOW DUTY CYCLE TRANSMISSIONS OF NETEOROLOGICAL DOSERVATIONS FROM FREE-FLOATING BALLOONS, DCEAN BUOYS, OTHER SATELLITES, AND FIXED GRÖUND-BASED SENSOR PLATFORMS DISTRIBUTED AROUND THE GLOBE. THESE OBSERVATIONS ARE ORGANIZED ON BOARD THE SPACECRAFT AND RETRANSMITTED WHEN THE SPACECRAFT COMES IN RANGE OF A COMMAND AND DATA ACQUISITION (COA) STATION, FOR FREE-MOVING BALLGONS, THE DOPPLER FREQUENCY SHIFT OF THE TRANSMITTED SIGNAL IS FXPECTED, FOR A MOVING SENSOR PLATFORM, TO HAVE A LOCATION ACGURACY OF S TO 8 KM RMS, AND A VELOCITY ACCURACY OF TO 1.4 MS. THIS SYSTEM HAS THE CAPABILITY OF ACQUIRING DATA FROM UP TO 200D PLATFORMS PER DAY. IDENTICAL EXPERIMENTS ARE FLOWN ON OTHER SPACECRAFT IN THE IJROS-N/NDAA SERIES.

SPACECRAFT COMMON NAME- NOAA-G Alternate Names-

NSSDC ID- NGAA-G

LAUNCH DATE- 1984 Launch Site- Vandenberg Afb, United States Launch Vehicle- Atlas F WEIGHT- 588.9 KG

SPONSORING COUNTRY/AGENCY UNITED STATES NOAA-NESS

PF

PERSONNEL		
86 - X.L.	GARBACZ	NASA HEADQUARTERS
PM - G.A.	BRANCHFLOWER	NASA-GSFC
PS - A.	ARKING	NASA-GSFC

PS - A. ARKING NASA-GSFC BRIEF DESCRIPTION NOAA-G WILL BE THE SEVENTH IN A SERIES OF THIRD-GENERATION, OPERATIONAL METEOROLOGICAL SATELLITES USE IN THE NATIONAL OPERATIONAL ENVIRONMENTAL SATELLITE SUBSYSTEM (MOESS) AND TO SUPPORT THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM (GARP) DURING 1978-84. THE SATELLITE DESIEN WILL PROVIDE AM ECONOMICAL AND STABLE SUN-SYNCHRONOUS PLATFORM FOR ADVANCED OPERATIONAL INSTRUMENTS TO MEASURE THE EARTH'S ATMOSPHERE. ITS SUFFACE AND CLOUD COVEN, AND THE NEAR-SPACE ENVIRONMENT. PRIMARY SENSORS WILL INCLUDE AN ADVANCED VERY HIGH RESOLUTION RADIOMETER (AVWRR) FOR OBSERVING DAYTIME AND NIGHTIME GLOBAL CLOUD COVER AND AN OPFRATIONAL VERTICAL SOUNDER FOR OBTAINING TEMPERATURE AND WATER VAPOR PROFILES THROUGH THE EARTH'S ATMOSPHERE. SECONDARY EXPERIMENTS WILL CONSISTS OF A SPACE ENVIRONMENT MONITOR (SEM), WHICH WILL MEASURE THE PROTON AND ELECTRON FLUX NEAR THE EARTH. AND A DATA COLLECTION AND ELECTRON FLUX NEAR THE EARTH. AND A DATA COLLECTION AND ELECTRON FLUX NEAR THE ELOATING BALLOONS AND OCEAN BUDYS DISTRIBUTED AROUND THE GLOBE. THE SATELLITE WILL BE GASED UPON THE BLOCK SD SPACECRAFT BUS DEVELOPED FOR THE US AIR FORCE, AND WILL BE CAPABLE OF MAINTAINING AN EARTH-POINTING ACCURACY OF BETTER THAN PLUS OR NIMUS 0.1 DEG WITH A NOTION RATE OF LESS THAN 0.035 DEG/SEC.

- NOAA-G, BOSTROM-----

INVESTIGATION NAME- SPACE ENVIRONMENT MONITOR

NSSDC ID- NOAA-6 ±04

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS

- ale

PERSONNEL PI - C.O. BOSTROM BRIEF DESCRIPTION

APPLIED PHYSICS LAB

BRIEF DESCRIPTION THIS EXPERIMENT IS AN EXTENSION OF THE SOLAR PROTON MONITORING EXPERIMENT FLOWN ON THE ITDS SPACECRAFT SERIES. THE EXPERIMENT PACKAGE CONSISTS OF FOUR DETECTOR SYSTEMS AND A DATA PROCESSING UNIT. THE LOW-ENERGY PROTON ALPHA TELESCAPE (LEPAT) SEPARATELY HEASURES IN FIVE ENERGY RANGES 90TH PROTONS BETWEEN ISO KEV AND 40 MEV AND ALPHA PARTICLES BETWEEN 150 KEV/N AND 25 MEV/N. THERE ARE TWO LEPATS VIEWING IN THE ANTI-SUN AND ANTI-EARTH DIRECTIONS WITH 60-DEG VIEWING CONES. THE PROTON ONNIDIRECTIONAL DETECTOR (POD) MEASURES PROTONS ADDVE 10, 30, AND. 60 MEV, ELECTRONS ABOVE 140 KEV, AND PROTONS AND ELECTRONS LINSEPARABLE) ABOVE 750 KEV. THE HIGH-ENERGY PROTON ALPHA ANTI-EARTH DIRECTION, AND IT MEASURES PROTONS ABOVE 10 MIN THE ANTI-FARTH DIRECTION, AND IT MEASURES PROTONS ABOVE 00 MEV AND PROTONS AND ALPHA PARTICLES BEVING COME, VIEW IN THE TOTAL ENERGY DITECTOR (TED) MEASURES TOTAL ENERGY ABOVE 1 KEV.

- NOAA-G, NESS STAFF-------

INVESTIGATION NAME- ADVANCED VERY HIGH RESOLUTION RADIOMETER (AVHRR)

NSSDC ID- NOAA-G -01

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS INVESTIGATION DISCIPLINE(S)

PERSONNEL PI -NESS STAFF

NOAA-NESS

BRIEF DESCRIPTION THE NORA-G ADVANCED VERY HIGH RESOLUTION RADIOMETER (AVHRR) WILL BE A FOUR CHANNEL SCANNING RADIOMETER CAPABLE OF PROVIDING GLOBAL DAYITME AND NIGHTIME SCANNING RADIOMETER CAPABLE OF PROVIDING GLOBAL DAYITME AND NIGHTIME SCANNING RADIOMETER CAPABLE OF PROVIDING GLOBAL DAYITME AND NIGHTIME SCANNING RADE ON A DAILY BASIS FOR USE IN WEATHER ANALYSIS AND FORECASTING. THE MULTISPECTRAL RADIOMETER WILL OPERATE IN THE SCANNING RODE AND WILL MEASURE EMITTED AND REFLECTED RADIATION IN THE FOLLOWING SPECTRAL INTERVALS — CHANNEL 1 (VISIBLE), 0.555 TO 0.9 MICROMETER, CHANNEL 2 (MEAR 1R), 0.725 MICROMETER TO DETECTOR CUT OFF AROUND 1.3 MICROMETER, CHANNEL 3 (IR WINDOW), 10.5 TO 11.5 MICROMETER, AND CHANNELS WILL HAVE A SPATIAL RESOLUTION OF 1.1 KM, AND THE TWO IR WINDOW CHANNELS WILL HAVE A THERMAL RESOLUTION OF 0.12 DEG K AT 3DD DEG K. THE AVHRW WILL BE CAPABLE OF OPERATING IN BOTH REAL-TIME OR RECORDED HODES. REAL-TIME OR DIRECT READOUT DATA WILL BE TRANSMISSION (AFT) AND AT HIGH (1 KM) RESOLUTION VIA HIGH RESOLUTION PICTURE TRANSMISSION (HRPT). DATA RECORDED ON HODRS UNLL DIAVISION (AFT) AND AT HIGH (1 KM) RESOLUTION VIA HIGH RESOLUTION PICTURE TRANSMISSION (HRPT). DATA RECORDED ON HODRS UNLL BE AVAILABLE FOR CENTRAL PROCESSING. THEY INCLUDE GLOBAL AREA COVERAGE (GAC) DATA, WILL HAVE A RESOLUTION VIA HIGH RESOLUTION PICTURE TRANSMISSION (HRPT). DATA RECORDED ON HORN WILL BE CAPABLE FOR OFFRAL PORCESSING. THEY INCLUDE GLOBAL AREA COVERAGE (GAC) DATA, WILL HAVE A RESOLUTION OF A KM, AND LOCAL AREA COVERAGE (GAC) DATA, WILCH WILL CONTAIN DATA FROM SELECTED PORTIONS OF EACH ORBIT WITH A 1 KM RESOLUTION. IDENTICAL EXPERIMENTS WILL BE FLOWN ON THE OTHER SPACEGRAFT IN THE TIRDS-M/NOAM SERIES.

-- NOAA-G, NESS STAFF------

INVESTIGATION NAME-

NSSDC ID- NOAA-G -02

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

INVESTIGATION DISCIPLINE(5)

PERSONNEL NOAA-NESS NESS STAFF

-- NDAA-G, NESS STAFF------

INVESTIGATION NAME- DATA COLLECTION SYSTEM (DCS)

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS NSSOC ID- NDAA-G -03

INVESTIGATION DISCIPLINE(S) HETEOROLOGY

PERSONNEL NESS STAFE

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NOAA-NESS

PI - RESS STAFF RUMATHESS BRIEF DESCRIPTION THE DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DCS) ON NOAA-G WILL DE DESIGNED TO MEET THE METEOROLOGICAL DATA NEEDS OF THE UNITED STATES AND TO SUPPORT THE GLOBAL ATROSPHERIC RESEARCH PROGRAM (GARP). THE SYSTEM WILL RECEIVE LOW-DUTY CYCLE TRANSMISSIONS OF METEOROLOGICAL OBSERVATIONS FROM FREE-FLOATING BALLOONS, OCEAN BUOYS, OTHER SATELLITES, AND FIXED GROUND-BASED SENSOR PLATFORMS DISTRIBUTED AROUND THE GLOBE. THESE OBSERVATIONS WILL BE ORGANIZED AROUND THE GLOBE. THESE OBSERVATIONS WILL BE ORGANIZED AN AND THE SPACECRAFT AND RETRANSMITTED WHEN THE SPACECRAFT COMES IN RANGE OF A COMMAND AND DATA ACQUISITION (CDA) STATION, FOR TREE-MOUND BALLOOMS, THE DOPPLER FREQUENCY SNIFT OF THE TRANSMITTED SIGNAL WILL BE OBSERVED TO CALCULATE THE LOCATION OF THE BALLOONS, THE DOPS IS EXPECTED, FOR A MOVING SHASOR PLATFORM, TO NAVE A LOCATION ACCURACY OF S TO 8 KM RMS. AND A VELOCITY ACCURACY OF 1 TO 1.6 MSEC, THIS SYSTEM WILL HAVE THE CAPABILITY OF ACQUIRING DATA FROM UP TO 2000 PLATFORMS PER DAY.

IDENTICAL EXPERIMENTS WILL BE FLOWN ON OTHER SPACECRAFT IN THE TIROS-N/NOAA SERIES.

SPACECRAFT CONNON NAME- ONE METER UV TELESCOPE Alternate Names- Spacelab Astronomy MISS, Spacelab IM UV Telesc

NSSDC ID- OMUVTEL

LAUNCH DATE- 1982 Launch Site- Capé Canaveral, United States Launch Vehicle- Shuttle WEIGHT- KG

SCONSORING COUNTRY/AGENCY UNITED STATES NA54-055

DUANNES ADDIT PARAMETERS

ORBIT TYPE	GEOCENTRIC		
ORBIT PERI		INCLINATION-	DEG
PERIAPSIS-	KB	APOAPS15-	КМ
PERSONNEL			
MG -	UNKNOWN	UNKNOWN	
SC - J.D.	ROSENDHAL	NASA HEADQUAR	TERS
PN - 0.5.	LECKRONE	NASA-GSFC	
PS -	UNKNOWN	UNKNOWN	

BRIEF DESCRIPTION DURNOTH THAN SA WILL USE THE SPACE SHUTTLE AS ITS PRIMARY TRANSPORTATION SYSTEM FOR CARRYING INSTRUMENTATION INTO NEAR-EARTH ORBIT. UNDER THE SPACELAB PROGRAM THE SHUTTLE'S PATLOAD BAY IS BEING CONFIGURED AND EQUIPPED TO ACT AS A GENERALIZED IN-ORBIT LABORATORY. ONE PROPOSED SPACECRAFT MISSION IS TO FLY A 1-METER GENERAL PURPOSE TELESCOPE CAPABLE OF PERFORMING NON-SOLAR ASTRONOMICAL OBSERVATIONS FROM THE VACUUM-UV THROUGH THE VISIBLE-WAVELENGTH RANGE. THE INITIAL DEFINITION OF THE REQUIREMENTS FOR THIS 1-M UV-OPTICAL SPACELAB TELESCOPE AND RELATED SUPPORT SYSTEMS BEGAN IN DECEMBER 1974. THE ORGANIZATION AND INFLEMENTATION OF THE UV-OPTICAL TELESCOPE STUDY WILL BE CARRIED OUT BY AN INSTRUMENT DEFINITION TEAM (107) WHOSE MEMBERS HAVE BEEN CHOSEN FROM SCIENTISTS THROUGHOUT THE WORLD ON THE GASIS OF SUBMITTED PROPOSALS. THIS IDT WILL INTERACT WITH NASA THROUGH A NASA STUDY SCIENTIST APPOINTED BY GSFC.

- ONE METER UV TELESCOPE, HENIZE-----

INVESTIGATION NAME+ INSTRUMENT DEFINITION TEAP

INVESTIGATIVE PROGRAM NSSDC 1D- OMBVTEL-01

CODE SA

INVESTIGATION DISCIPLINE(5) ASTRONOMY

PE

RSONNEL		
TL - X.C.	HENIZE	NASA-JSC
TH - A.H.	SMITH	NASA-GSFC
TH - C.H.		U OF WISCONSIN
TH - R.W.	O'CONNELL	U OF VIRGINIA
TH - E.B.	JENKINS	PRINCETON U

THE F.G. JERKINS FRAMEWONU BRIEF DESCRIPTION THE SPECIFIC GOAL OF THE INSTRUMENT DEFINITION TEAM (IDT) IS TO ESTABLISH THE SCIENTIFIC MERIT AND APPROVE PRELIMINARY CONCEPTUAL DESIGN OF A LIXIBLE, GENERAL PURPOSE, 1-M CLASS UV-OPTICAL FACILITY TELESCOPE FOR SPACELAB ASTRONONY MISSIONS; THE END PRODUCTS OF THE DEFINITION STUDY INCLUDE -- (1) A DELIMENTION OF BROAD SCIENTIFIC GOALS AND THE DEFINITION OF REPRESENTATIVE OBSERVING PROGRAMS, (2) A THOROUGH STATEMENT OF REQUIREMENTS FOR TELESCOPE AND SUPPORT SYSTEMS PERFORMANCE MECESSARY TO THE FACILITY SCIENTIFIC OBJECTIVES, (3) PRELIMINARY DESCRIPTIONS OF SEVERAL ILLUSTRATIVE FOCAL PLANE INSTRUMENTS, AND (4). A WELL-DEVELOPED CONCEPT OF THE TOTAL OPERATING TELESCOPE FACILITY, INCLUDING COMMAND AND CONTROL MECHANISMS, DATA HANDLING, GROUND OPERATIONS, USER INVOLVEMENT, ETC.

SPACECRAFT COMMON NAME- PIONEER VENUS ORBITER Alternate Names- Pioneer Venus 1978 Orbit

NSSDC 10- P107808

LAUNCH DATE- 05/22/78 Launch Site- cape canaveral, united states Launch vehicle- atlas WEIGHT- 517. KG

NASA-055

SPONSORING COUNTRY/AGENCY UNITED STATES

PLANNED ORBIT PARAMETERS ORBIT TYPE~ VENUSCENTRIC ORBIT PERIOD- 1440. MIN PERIAPSIS- 200. KM

INCLINATION-105. DEG APOAPSIS-66614 κĦ

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PERSONNEL

5C 戶料	- F.D. - M.A. - C.F. - L.	NASA HEADQUARTERS NASA HEADQUARTERS NASA-ARC NASA-ARC

BRIEF DESCRIPTION THE PIONEER VENUS ORBITER IS PLANNED TO BE A SINGLE, SPIN-STABILIZED SPACECRAFT IN A HIGHLY ELLIPTICAL ORBIT ABOUT VENUS. THE NONINAL OPERATIONAL LIFETIME IS 1 VENUS SIDEREAL YEAR (225 DAYS), WHICH PERMITS INTENSIVE STUDIES OF THE PLANET'S ATMOSPHERE AND ITS RESPONSES TO THE SUM, THE PATLOAD HAS BEEN SELECTED TO OPTIMIZE CORRELATIVE STUDIES SETWEEN THE LONG-LIVED ORBITER AND THE ENTRY PROBES. THE ORBITAL INVESTIGATIONS INCLUDE STUDIES OF THE UPPER ATMOSPHERE, IONOSPHERE, AND THE INTERACTIONS OF THE SOLAR WIND WITH THE VENUSIAN ATMOSPHERE. REMOTE SENSING TECHNIQUES EXAMINE THE LOWER ATMOSPHERE. REMOTE SENSING TECHNIQUES EXAMINE THE LOWER ATMOSPHERE. AND THE INTERACTIONS OF THE SOLAR UNAXIES AND TEMPORAL PHENOMENA OF BOTH SHORT- AND LONG-TERM DURATION. THE CONGEVITY OF THE ORBITE AND THE CAMPLETION OF A LARGE NUMBER OF MONITORED ORBITS SHOLLD PERMIT A DETERMINATION OF THE GRAVITATIONAL FIELD HARMONICS. IN AN EFFORT TO MINIMIZE COST AND OFTIMIZE DESIGN CAPABILITY. THE ORBITER SPACECRAFT AND THE PROBE BUS FOR THE MULTIPROBE MISSION ARE OF COMMON ORIGIN. BRIEF DESCRIPTION THE PIONEER SPIN-STABILIZED SE

--- PIONEER VENUS ORDITER, BRACE-----

INVESTIGATION NAME- LANGMUIR PROBE

NSSDC ID- PIO7808-01

INVESTIGATIVE PROGRAM CODE SE

INVESTIGATION DISCIPLINE(S) Planetary atmospheres Planetary idnospheres

PERSONNEL

PI ~ L.H. OI ~ M.B. OI - A. OI - A.F. OI - T.M.	MCELROY Pedersen Nagy	NASA-GSFC Harvard u Esa-Estec U of Michigan U of Michigan
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GRIEF DESCRIPTION U OF RICHIGAN BRIEF DESCRIPTION THIS EXPERIMENT CONSISTS OF A PAIR OF CYCLINDRICAL LANGMUIR PROBES OF THE TYPE BEING USED ON AE. TWO PROBES ARE REQUIRED, SO THAT ONE IS ALWAYS OUT OF THE WAKE OF THE SPACEGRAFT. IN FLIGHT ANALYSIS, SO MEASUREMENTS TAKEN AT A RATE OF OWE PER SECOND PROVIDE HIGH SPATIAL RESOLUTION FOR THE REASUREMENTS OF NE AND TE. THE RESULTS OF THESE HIGH RESOLUTION MEASUREMENTS ARE USED BOTH TO STUDY THE UPPER ATMOSPHERE AND IONOSPHERE AND TO INVESTIGATE THE INTERACTION OF THE SOLAR WIND WITH THE VENUSIAN IONOSPHERE. THIS EXPERIMENT PROVIDES MEASUREMENTS DUER THE WHOLE REGION TRAVERSED BY THE ORBITER. COVERING A LARGE RANGE OF SOLAR ASPECT ANGLES, TO TIELD A MORE COMPLETE CONFIGURATION OF THE PHYSICAL PROPERTIES DF THE IONOPAUSE REGION.

-- PIONEER VENUS ORBITER, BROWN------INVESTIGATION NAME- RADAR ALTIMETER NSSDC ID- PI0780R-02

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Geodesy and Cartography Planetology

PERSONNEL		
PI - W.E. OI - G. OI - W.M. OI - D.H.	PETTENGILL	NASA-JPL Mass Inst of Tech U of Calif, La Mass Inst of Tech

BRIEF DESCRIPTION

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BRIEF DESCRIPTION A RADAR ALTIMETER IS USED TO OBTAIN INFORMATION ON THE ORBITER ALTITUDE, PLANETARY SURFACE TEMPERATURE, AND RADAR SCATTERING PROPERTIES IN ORDER TO INFER THE SURFACE TOPOGRAPHY, GEOLOGY, AND THE THERMAL AND MECHANICAL PRUPERTIES OF THE INTERIOR OF VENUS. THE WEIGHT OF THE INSTRUMENT IS 9.0 KG (20 LB), AND THE POWER CONSUMPTION IS 25 W.

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- PLONEER VENUS ORBITER, CROFT----

INVESTIGATION NAME- RADIO SCIENCE TEAM NSSOC 10- PI0780R-03

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Geodesy and Cartography Planetary Ionospheres Planetary Atmospheres

PERSONNEL		
TL - T.A. TH - G.H. TM - A.J. TM - R. TM - I.I.	CROFT KEATING KLIORE PHILLIPS Shapiro	
TM - R	¥00	

ASA-LARC	u .	· ·	•
ASA-JPL			
ASA-JPL			
ASS INST	ÓF	TECH	
ASA-JPL			

BRIEF	DESCRIPTION

BRIEF DESCRIPTION THE RADIO SCIENCE TEAM HAS THE RESPONSIBILITY FOR PLANNING, COORDINATING, AND RECOMMENDING SCIENTIFIL USES OF RADIO SIGNALS, EXECUTING APPROVED EXPERIMENTS, AND CONDUCTING THE DATA ANALYSIS REGUIRED. MAJOR FIELDS OF INTEREST INCLUDE THE GRAVITY FIELD OF VEMUS, VERTICAL STRUCTURE OF THE DAYTIME AND NIGHTTIME IONOSPHERES, NEUTRAL ATMOSPHERE TEMPERATURE, PRESSURE AND DENSITY, HORIZONTAL GRADIENTS OF ATMOSPHERE PROPERTIES, AND SMALL SCALE TURBULENCE IN THE ATMOSPHERE.

- PIONEER VENUS ORBITER, DONAHUE-----

INVESTIGATION NAME- PARTICIPATING THEORIST DONAHUE

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) AERONOMY **IONOSPHEVES** PLANET AT ATNOSPHERES

U OF NICHIGAN

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ALL REAL PROPERTY AND

PERSONNEL PI - T.M. DONAHUE

NSSDC ID- PIO780R-04

GRIEF DESCRIPTION THIS EXPERIMENT COMBINES RESULTS OBTAINED FROM THE ORBITER MISSION WITH RESULTS FROM THE MULTIPROBE MISSION TO OBTAIN A UNIFIED PICTURE OF THE ATMOSPHERIC AND IONDSPHERIC CHEMISTRY AND TRANSPORT PROCESSES OCCURING IN THE ATMOSPHERE OF VENUS

- PIONEER VENUS ORBITER, EVANS------

INVESTIGATION NAME- TRANSIENT GAMMA-RAY SOURCES

NSSDC 10- PIO7BOR-05 INVESTIGATIVE PROGRAM

CODE SL

INVESTIGATION DISCIPLINE(S) GAMMA-RAY ASTRONOMY

PERSONNEL		
PI - W.D. OI - J.P. DI - P.R. OI - R.M. OI - R.M. OI - I.B. OI - R.E.	CONNER HIGBIE Klebesadel Olson Strong	LOS ALAMOS SCI LAB LDS ALAMOS SCI LAB LOS ALAMOS SCI LAB LOS ALAMOS SCI LAB LOS ALAMOS SCI LAB LOS ALAMOS SCI LAB SANDIA LABORATORIES

BRIEF DESCRIPTION AN OMNIDIRECTIONAL GAMMA-RAY DETECTOR EMPLOYING TWO PHOSWICH SCINTILLATION SPECTROMETERS SENSITIVE TO PROTONS FROM 0.2 TO 2.0 MEV ARE USED WITH LOGIC CIRCUIRY TO DETECT THE BEGINNING OF A GAMMA EVENT AND TO INITIATE A PERIOD OF RAPID DATA COLLECTION. DATA IS STORED IN A MEMORY UNIT FOR SUBSEQUENT TRANSMISSION TO EARTH. CONFIRMATION THAT A TRUE GAMMA EVENT MAS OCCURED IS OBTAINED BY COMPARISON WITH RESULTS FROM OTHER EXPERIMENTS IN EARTH SATELLITES. THIS EXPERIMENT CALCULATING ACCURATE SOURCE LOCATIONS.

-- PIONEER VENUS ORBITER, HANSEN------

INVESTIGATION NAME- CLOUD PHOTOPOLARIMETER

NSSDC ID- PIO7808-06

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Planetary Atmospheres

PERSONNEL		
PI - J.W. OI - P. OI - A.A. OI - D.L. OI - L.	STONE	U OF ARIZONA NASA-GISS Computer Sciences Corp NASA-GISS Computer Sciences Corp

BRIEF DESCRIPTION THIS EXPERIMENT USES A SIMPLIFIED VERSION OF THE IMAGING PHOTOPOLARIMETER FLOWN ON PIONEER 10 AND 11 TO PROVIDE LOW-RESOLUTION, FOUR-COLOR MAPS OF THE VENUSIAN CLOUD COVER WITH A HIGH-RESOLUTION IMAGING CAPABILITY NEAR APOCENTER, THE PRINCIPAL OBJECTIVE OF THIS INVESTIGATION IS TO DETERMINE THE PROPERTIES OF THE CLOUDS AND HAZE, INCLUDING THE VENTICAL AND HORIZONTAL DISTRIBUTION OF THE PARTICLES, CLOUD PARTICLE SIZE AND REFRACTIVE INDEX, THE CLOUD-TOP HEIGHT, AND THE NUMBER DENSITY OF PARTICLES.

PIONEER VENUS DRBITER, KNUDSEN-----

INVESTIGATION NAME- RETARDING POTENTIAL ANALYZER NSSDC ID- P10780R-07

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(5) Planetary Atmospheres Planetary Ionospheres

PERSONNEL PI - W.C. KNUDSEN OI - K. Spenner OI - R.C. WHITTEN

LOCKHEED PALO ALTO INST FUR PHYS WELTRAUM NASA-ARC OI - R.C. WHITTEN NASA-ARC BRIEF DESCRIPTION THE INSTRUMENT PROPOSED FOR THIS EXPERIMENT IS A LANGMUIR PROBE, RETARDING POTENTIAL ANALYZER, DESIGNED TO MEASURE ELECTRON CONCENTRATION AND TEMPERATURES, MAJOR ION CONCENTRATIONS AND TEMPERATURES, ION DRIFT VELOCITIES, AND THE ENERGY DISTRIBUTION FUNCTION OF AMBIENT PHOTOLECTRONS. IT IS AN ADAPTATION OF THE INSTRUMENT FLOWN ON THE GERMAN AEROS SATELLITE IN 1972. EITHER ONE OF TWO SENSOR HEADS MAY BE USED, EACH CONSISTING OF A MULTIGRID CUP AND ELECTRONETER, WHICH CAN OPERATE IN ELECTRON, ION, OR PHOTOLELECTRON HOES, INITIATED BY SPACECRAFT ROLL PULSES. THE MEASUREMENTS TAKEN WHEN THE SENSOR AXIS IS CLOSEST TO THE PLASMA FLOW VELOCITY VECTOR ARE TRANSMITTED. THE AIMS OF THE INVESTIGATION ARE TO IMPROVE KNOWLEDGE OF THE IMPORTANT IONIC REACTIONS IN THE VENUSIAN IONOSPHERE, TO STUDY THE PLASMA TRANSPORT PROCESSES AT THE SOLAR WIND-IONOSPHERE BOUNDARY, AND TO STUDY SIMILAR AIMS CONCERNING THE AMBIENT ELECTRON POPULATION. PIONEER VENUS ORDITER, NIEMANN-----

CODE SL

INVESTIGATION NAME- NEUTRAL PARTICLE MASS SPECTROMETER

INVESTIGATIVE PROSRAM NSSDC 10- PI07808-11

> INVESTIGATION DISCIPLINE(5) AERONOMY Planetary Atmospheres

PERSONNEL NIEMANN Carignan Hartle PI - H.B. OI - G.R. OI - R.E. OI - N.W. SPENCER

NASA-GSFC U OF MICHIGAN NASA-GSFC NASA-GSEC

BRIEF DESCRIPTION THE EXPERIMENT USES A QUADRUPQLE MASS SPE_TROMETER WITH THE EXPERIMENT USES A QUADRUPQLE MASS SPE_TROMETER WITH THEE ION SOURCE OPERATING MODES AND THREE MASS SCANNING MODES. THE ION SOURCE CAN BE OPERATED ALTERNATELY IN OPEN AND CLOSED CONFIGURATIONS TO INCREASE ACCURACY. AN ADAPTIVE MASS SCAN IS USED TO REDUCE THE BIT RATE REQUIRED FOR A GIVEN INFORMATION RETURN RATE. THE RESOLUTION IS 1_E-4 FOR ADJACENT MASSES, AND THE MASS RANGE IS 1 TO 45 U. VERTICAL AND HORIZONTAL DENSITY VARIATIONS OF THE MAJOR NEUTRAL CONSTITUENTS OF THE UPPER ATMOSPHERE OF VENUS ARE DETECTED AND MEASURED TO DETINE THE DYNAMIC, CHEMICAL, AND THERMAL STATES OF THE UPPER ATMOSPHEME. IMPORTANT CONSTITUENTS TO BE MEASURED ARE ME.O. Q(2), CO, CO(2) AND/OR N(2), AND A, IT MAY ALSO BE POSSIBLE TO STUDY H, D AND/OR H(2), C, AND NO.

-- PIONEER VENUS ORBITER, RUSSELL-----

INVESTIGATION NAME- TRIAXIAL FLUXGATE MAGNETOMETER

INVESTIGATIVE PROGRAM NSSDC 10- P107808-12 CODE SL

> INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS Particles and fields

PERSONNEL PI - C.T. RUSSELL 01 - P.J. COLEMAN, JR. 01 - F.V. CORONITI 01 - C.F. KENNEL 01 + R.L. MCPHERRON 01 - G.L. SISCOE	U OF CALIF, LA U DF CALIF, LA U OF CALIF, LA U OF CALIF, LA U OF CALIF, LA U OF CALIF, LA
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BRIEF DESCRIPTION THIS EXPERIMENT USES A TRIAXIAL FLUXGATE MAGNETOMETER WITH TWO RING CORE SENSORS AT THE END OF A MAGNETOMETER BOOM AND ONE RING CORE SENSORS AT THE END OF A MAGNETOMETER BOOM AND ONE RING CORE SENSORS, AT 45 DEG TO THE SPIN AXIS, HALFWAY DOWN THE BOOM. THE DRIVE AND ELECTRONICS DESIGN HAS BEEN USED ON THE APOLLO 15 AND 16 SUBSATELLITES. THE ODJETIVES ARE TO DETERMINE ANY DLANETARY AND REMANENT MAGNETIC FIELDS, TO DEDUCE THE LOCATION AND STREMGTH OF IONOSPHERIC CURRENT SYSTEM, TO DETERMINE THE ENERGY AND MA'S BALANCE IN THE UPPER ATMOSPHERE OF VENUS, TO DETERMINE THE NATURE OF THE SOLAR WIND INTERCTION WITH VENUS, AND TO STUDY THE NEAR-WAKE REGION OF VENUS AND INE STRUCTURE OF THE VENETIAN BOW SHOCK. INTERPLANETARY OBJECTIVES ARE TO DETERMINE THE PROPERTIES OF THE AVERAGE FIELD AT D.7 AND 1.0 AU. THE INSTRUMENT IS INTENDED TO, IN THE WORST CASE OF LOW-BIT AND LOW-SAMPLE RATES, MEASURE ONE VECTOR PER 32 S. WHILE IM VENUS ORBIT. WHEN THE SPACECRAFT IS COASTING THROUGH THE INTERPLANETARY REGION IN THE APOAPSIS MODE, THE SAMPLE RATE IS PLANNED TO BE ONE VECTOR PER 8 SEC. WHILE THE SPACECRAFT IS PASSING THROUGH THE VENUSIAN IONOSPHERE IN THE PERIAPSIS MODE, THE SAMPLE RATE IS PLANNED TO BE ONE VECTOR PER 8 SEC. WHILE THE SPACECRAFT IS PASSING THROUGH THE VENUSIAN IONOSPHERE IN THE PERIAPSIS MODE, THE SAMPLE RATE IS PLANNED TO BE FOUR VECTORS PER S.

- PIONEER VENUS ORBITER, SCARF---

INVESTIGATION NAME- ELECTRIC FIELD DETECTOR

INVESTIGATIVE PROGRAM NSSDC ID- PI0780R-13 CODE SL

INVESTIGATION DISCIPLINE(S) Particles and fields Space plasmas

TRW SYSTEMS GROUP TRN SYSTEMS GROUP

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12276

PERSONNEL PI - F.L. SCARF

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTS OF A MODIFIED VERSION OF THE PIONEER 8 AND PIONEER 9 EXPERIMENTS TO MEASURE THE ELECTRIC FIELD COMPONENTS IN FOUR 30 PERCENT NARROW BAND CHANNELS CENTERED AT 100, 730, 7350, AND 30,000 HZ. THE AINS OF THE INVESTIGATION ARE TO PERFORM THE FIRST ANALYSIS OF VLF ELECTRIC FIELDS AT VENUS TO ELUCIDATE THE PLASMA INTERACTIONS BETWEEN THE SOLAR WIND AND THE IONOSPHERIC OR EXOSPHERIC PLASMA. THE ROLE OF PLASMA INSTABILITIES IN MODIFYING THE HEATFLUX FROM THE SOLAR WIND AND IN THERMALIZING NEWLY BORN IONS FROM VENUS ARE ALSO STUDIED. A SELF-CONTAINED BALANCED V-TYPE ANTENNA WITH A DIFFERENTIAL PREAMPLIFIER IS EMPLOYED TO MAKE THE MEASUREMENTS. AT THE 512-BII-PER-S SATELLITE MODE, ONE FREQUENCY SCAN PER S IS OBTAINED.

PERSONNEL PI - H. MASURSKY

NSSDC ID- PI07BOR-08

US GEOLOGICAL SURVEY

PI-H. TASURSKT US GEULUGICAL SURVET BRIEF DESCRIPTION SURFACE PROFILE, ROUGHNESS, AND ELECTRICAL PROPERTIES DATA FROM THE PIONEER VENUS RADAR ALTIMETER ARE ANALYZED IN CONJUNCTION WITH SPACECRAFT-DERIVED GRAVITY INFORMATION AND EARTH-BASED RADAR BACKSCATTER DATA TO PRODUCE A SERIES OF CARTOGRAPHIC AND GEOLOGIC MAPS. THE INITIAL MAPS INCLUDE GEOMETRIC ARRAYS OF RADAR PROFILES AND TOPOGRAPHIC CONTOUR DATA. THESE ARE THEN UTLIZED TO PRODUCE A SHADED RELIEF CARTOGRAPHIC MAP, SCALE 1 TO 25 MILLION, WITH SUPERIMPOSED CONTOUR INFORMATION. PRELIMINARY VENUSIAN GEOLOGIC INFORMATION, INFERRED FROM ALL AVAILABLE SPACECRAFT AND EARTH-BASED RADAR DATA SOURCES, WILL SUBSEQUENTLY DE ADDED TO THE CARTOGRAPHIC MAP BASE TO PRODUCE GOLOGIC CAP5. IT IS ANTICIPATED THAT ONE TO THREE LARGER SCALE (1 TO 5 MILLION) CARTOGRAPHIC AND GEOLOGIC MAPS OF SCIENTIFICALLY INTERESTING VENUS SURFACE FEATURES ALSO WILL BE PRODUCED.

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(5) Geodesy and Cartography Planetology

CODE SL

- PIONEER VENUS ORBITER, MCGILL-

INVESTIGATION NAME- PARTICIPATING THEORIST MCGILL

INVESTIGATIVE PROGRAM NSSOC ID- PI0780R-09 CODE SL

CONCERNING THE AMBIENT ELECTRON POPULATION. ----- PIONEER VENUS ORBITER, MASURSKY-----INVESTIGATION NAME- PARTICIPATING THEORIST MASURSKY

INVESTIGATION DISCIPLINE(S) PLANETOLOGY

PERSONNEL

U OF MASSACHUSETTS

BRIEF DESCRIPTION INVESTIGATIONS OF THE TOPOGRAPHY AND GEOLOGY OF VENUS ARE UNDERTAKEN TO ASSURE CORRECT RECOGNITION OF TOPOGRAPHIC AND MATERIAL CHARACTERISTICS OF THE PLANET AND TO ARRIVE AT THE GEOLOGICAL AND GEOPHYSICAL INTERPRETATION OF THESE GEOLOGICAL AND CHARACTERISTICS.

----- PIONEER VENUS ORBITER, NAGY------

INVESTIGATION NAME- PARTICIPATING THEORIST NAGY

INVESTIGATIVE PROGRAM NSSDC ID- PI07808-10 CODE SL

INVESTIGATION DISCIPLINE(5) AERDNOMY PLANETARY IONDSPHERES PLANETARY ATMOSPHERES

U OF MICHIGAN

PERSONNEL PI - A.F. NAGY

BRIEF DESCRIPTION INVESTIGATIONS OF THE IONOSPHERE OF VENUS ARE OPTIMIZED BY EXTENDING CURRENT MODELS AND FORMULATING A MISSION PLAN BEST SUITED TO ADDRESS. TOPICS INCLUDING THE PHYSICS OF THE SOLAR WIND-ION3SPHERE INTERACTION, ENERGETICS OF THE UPPER ATMOSPHERE, ION CHEMISTRY, AND THE PROCESSES RESPONSIBLE FOR ATHOREMAL STRUCTURE OF THE IONOSPHERE, INCLUDING MECHANISMS RESPONSIBLE FOR THE MAINTENANCE OF THE NIGHTTIME IONOSPHERE. BRIEF DESCRIPTION

PI - G.E. MCGILL

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----- PIONEER VENUS ORBITER, SCHUBERT------

INVESTIGATION NAME- PARTICIPATING THEORIST SCHUBERT

NSSOC	10-	P10780R-14	INVESTIGATIVE	PROGRA
			CODE SL	

INVESTIGATION DISCIPLINE(S) 10NOSPHERES MAGNETOSPHERIC PHYSICS PLANETARY ATMOSPHERES PLANETOLOGY

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PERSONNEL PI - G. SCHUBERT

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U OF CALIF, LA

BRIEF DESCRIPTION BRIEF DESCRIPTION WEASUREMENTS OF PLASMA TEMPERATURES, MAGNETIC FIELDS, COMPOSITION, AND OTHER DATA ARE USED TO DEVELOP AND TEST THEORIES OF ATMOSPHERIC CIRCULATION AND SOLAR WIND-IONOSPHERE INTERACTIONS. IN THE CASE OF THE TOPOGRAPHY AND GRAVITY, THE DATA (ALTIMETRY AND TRACKING) ARE USED BOTH IN DESCRIPTIVE FASHION, TO SIMPLY CHARACTERIZE THE SUBFACE OF VENUS AND ITS GRAVITATIONAL FIELD, AND IN A MORE QUANTITATIVE WAY TO MODEL THE INTERNAL STRUCTURE OF THE PLANET.

- PIONEER VENUS ORBITER, STEWART------

INVESTIGATION NAME- PROGRAMMABLE ULTRAVIOLET SPECTROMETER

NSSDC ID- PIO780R-15 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(5) Planetäry Atmöspheres Aerondmy Ionospheres

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PI - A.I. 01 - C.A. 01 - C.W.	BARTH Hord	U 0F U 0F	COLORADO COLORADO COLORADO
01 - G.E.			COLORADO
ot - o*	ANDERSON	U OF	COLORADO

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS INVESTIGATION USES A 125-MM CASSEGRAIN TELESCOPE ON A 125-MM EDERT-FASTIE SPECTROMETER WITH A PROGRAMMABLE GRATING DRIVE, AIRGLOW, SCATTERED SUNLIGHT, AND HYDROGEN LYMAN ALPHA EMISSIONS ARE DETECTED IN THE THERMOSPHERE, MESOPHERE, ALSO EXOSPHERE OF VENUS, THESE MEASUREMENTS ARE USED TO ESTABLISH AND MAP THE COMPOSITION, TEMPERATURE, AND PHOTOCHEMISTRY OF THE THERMOSPHERE AND IDNOSPHERE, TO DETERMINE THE PRESSURE AT AND ABOVE THE VISIBLE CLOUD TOPS, AND TO ESTABLISH THE DISTRIBUTION AND ESCAPE RATE OF ATOMIC HYDROGEN. THE INSTRUMENT OPERATES IN THE 11DD-3400 A REGION.

--- PIONEER VENUS ORBITER, TAYLOR----

INVESTIGATION NAME- RADIOMETRIC TEMPERATURE-SOUNDING EXPERIMENT

NSSDC ID-	P10780R-16	INVESTIGATIVE CODE SL	PROGRAM
		Thurse treation	

INE(S) VESTIGATION DISCIPLIN Planetary atmospheres

PERSONNEL		
PI - F.W.	TAYLOR	NASA-JPL
01 - H.H.	AUMANN	NASA-JPL
01 - M.T.	CHAHINE	NASA-JPL
01 - C.B.	FARMER	NASA-JPL
01 - J.V.	MARTONCHIK	NASA-JPL
01 - A.P.	INGERSOL	CALLE INST OF TECH
01 - J.T.	HOUGHTON	OXFORD U
01 - G.D.		CLARENDON LAB
01 + (.D.		ÖXFORD U
	WILLIAMSON	CLARENDON LAB
	DICKINSON	NATL CTR FOR ATMOS RES
0I - J.C.	GILLE	NATL CTR FOR ATMOS RES

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BRIEF DESCRIPTION THIS INVESTIGATION USES AN 8-CHANNEL RADIOMETER FOR VERTICAL TEMPERATURE SOUNDING OF THE ATMOSPHERE FROM THE CLOUD TOPS (60 KM) TO 150 KM AND FOR INVESTIGATIONS DF CLOUD MORPHOLOGY. INCLUDING THE IDENTIFICATION OF POSSIBLE MULTIPLE LAYERS AND WATER VAPOR MAPPING. THE INSTRUMENT IS BASED ON THE SELECTIVE CHOPPER RADIOMETER AND THE PRESSURE MODULATOR RADIONETER DESIGNS FLOWN ON NIMBUS SATELLITES.

INVESTIGATION NAME- ION MASS SPECTROMETER

NSSDC 10- P10780R-17

INVESTIGATION DISCIPLINE(S) PLANETARY IONOSPHERES PLANETARY ATMOSPHERES

INVESTIGATIVE PROGRAM

PERSO	NNEL						
P1	- H.A.	TAYLOR, J	R.	N	ASA-	-65 F C	
01	- S.J.	BAUER		N	A5A-	-GSFC	
01	- R.E.	HARTLE		N	ASA-	GSFC	
01	- н.с.	BRINTON		N	ASA-	-GSFC	
10	- J.R.	HERMAN		N	ASA-	GSFC	
01	— T_M_	DONAHUE		Ų	0 F	MICHIGAN	
01	- P.A.	CLOUTIER		R	ICE	U	
01	- F.C.	MICHEL		R	ICE	u	
BRIEF	DESCRIP	TION					
	THE CO	POSITION	AND CON	CENTRATION	01	THERMAL	POSITI
IONS	IN THE	IONDSPHERE	OF VENUS	ARE DETER	NINE	D AND INT	ERPRET

IONS IN THE IONDSPHERE OF VENUS ARE DETERMINED AND INTERPRETED IN TEAMS OF VERTICAL AND HORIZONTAL COMPONENTS. THE INSTRUMENT USED IS A BENNETT RADID-FREQUENCY MASS SPECTROMETER BASED ON THE DESIGN OF THOSE FLOWN ON OGO AND ATMOSPHERIC EXPLORER SATELLITES, A MASS RANGE OF 1 TO 60 U IS COVERED WITH A VARIETY OF AUTOMATIC SCAN-SEARCH MODES AVAILABLE.

----- PIONEER VENUS ORBITER, WOLFE------

INVESTIGATION NAME- SOLAR WIND PLASMA DETECTOR NSSDC 10- P107808-18

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) SPACE PLASMAS PARTICLES AND FIELDS

PERSONNEL		
PI - J.∦.	WOLFE	NASA-ARC
01 - A.	BARNES	NASA-ARC
01 - H.R.	COLLARD	NASA-ARC
0I - D.D.		NASA-ARC
01 - J.D.		NASA-ARC
01 - R.C.		NASA-ARC
0I - 0.S.	INTRILIGATOR	U OF SOUTHERN CALIF

BRIEF DESCRIPTION

GRIEF DESCRIPTION THE INSTRUMENT FOR THIS EXPERIMENT IS A QUADRISPHERICAL THE INSTRUMENT, WITH FOR THIS EXPERIMENT IS A QUADRISPHERICAL INSTRUMENT, WITH FIVE CURRENT COLLECTORS AND ELECTROMETERS. INTE ENERGY/CHARGE RANGE IS 50-8000 (10MS) IN 32 STEPS AND 1-500 (ELECTRONS) IN 16 STEPS. THE ANGULAR RANGE COVERED IS PLUS OR FILL D OF VIEW IS 15 DEG TIMES 25 DEG ATIMUTH, AND THE DETECTOR FIELD OF VIEW IS 15 DEG TIMES 25 DEG ATIMUTH, AND THE DETECTOR FIELD OF VIEW IS 15 DEG TIMES 25 DEG AT 15 DEG TIMES 45 DEG, DEPENDING ON POSITION. THE LOGIC DESIGN IS ESSENTIALLY THAT USED ON FIONEER BAND 9. THE OBJECTIVES ARE TO NEASURE SOLAR WIND CONDITIONS OUTSIDE THE VENETIAN BOW SHOCK, INSIDE THE MAGNETOSHEATH FLOW FIELD, AND TO STUDY THE IONOPAUSE STRUCTURE. SOLAR WIND MEASUREMENTS ARE MADE DURING THE TRANSIT TO VENUS, PARTICULARLY TO STUDY MACROSCALE PROBLEMS AND TO DETERMINE AVERAGE GRADIENTS. THE NEAR-PLANET WAKE REGION IS ALSO AVAILABLE FOR STUDY.

SPACECRAFT COMMON NAME+ PIONEER VENUS PROBE BUS ALTERNATE NAMES+ PIONEER VENUS 1978

NSSDC ID- PIOZRPA

LAUNCH DATE- 08/00/78 VEIGHT- 380, KG LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- ATLAS

SPONSORING COUNTRY/AGENCY

UNITED STATES NASA-055

PLANNED ORBIT PARAMETERS ORBIT TYPE- VENUS PROBE

PERSONNEL		
	KOCHENDORFER	NASA HEADQUARTER
SC - H.A.	MITZ	NASA HEADQUARTER
PM - C.F.	HALL	NASA-ARC
PS - L.	COLIN	NASA-ARC

NASA HEADQUARTERS

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No. of

L. WEINER STREET

PS - L. COLIN NASA-ARC BRIEF DESCRIPTION THIS SPACECRAFT IS THE BUS PORTION OF THE PIDNEER VENUS MULTIPROBE MISSION. ON THIS MISSION FOUR INSTRUMENTED ATMOSPHERIC ENTRY PROBES ARE CARRIED BY THIS BUS TO THE VICINITY OF VENUS AND RELEASED FOR DESCENT THROUGH THE ATMOSPHERE TO THE PLANETARY SURFACE. TWO SMALL PROBES ENTER ON THE NIGHTSIDE, AND ONE SMALL PROBE AND DNE LARGE PROBE ENTER ON THE DAYSIDE OF THE PLANETARY SURFACE. TWO SMALL PROBES SEPARATE FROM THE DAYSIDE OF THE PLANETARY SURFACE. TWO SMALL PROBES SEPARATE FROM THE DAYSIDE OF THE PLANET. THE SPACECRAFT IS SFI'N STABILIZED. THE TRIP TO VENUS TAKES 125 DAYS. THE FOUNPROBES SEPARATE FROM THE BUS ABOUT 10 TO 20 DAYS DEFORE ENTRY. THE LARGE PROBE TAKES 1-1/2 H TO DESCEND THROUGH THE ATMOSPHERE, WILE THE THRE SMALLER PROBES REACH THE SURFACE OF THE PLANET 'S MIN AFTER THE VENUSTAN ATMOSPHERE AT A SHALLOW ENTRY ANGLE AND OF ATMOSPHERIC FRICTION DURING ITS DESCENT. INVEST, GAIJONS OF ATMOSPHERE, AND TO THE SURFACE, THE NATURE AND COMPOSI'ION OF THE ATMOSPHERE DOWN TO THE SURFACE, THE NATURE AND COMPOSI'ION OF THE ATMOSPHERE, AND LOCAL INFORMATION ON THE ATMOSPHERE INFORMERE, AND LOCAL INFORMATION ON THE ATMOSPHERE CUDES, THE RADIATION FIELD AND ENERGY EXCHANGE IN THE LOWER ATMOSPHERE, AN SISTER MISSION, PIONEER VENUS ORBITER, IS SCHUDS PATTERN. A SISTER MISSION, PIONEER VENUS ORBITER IS SCHUCHATION PATTERN. A SISTER MISSION, PIONEER VENUS ORBITER IS SCHUCHASIE THE PROBES CAN ATMOSPHERE AND COMPOSITION OF THE ATMOSPHERE DOWN TO THE SURFACE. THE NATURE AND COMPOSITION OF INFORMATION ON THE ATMOSPHERE, AND INFORMATION ON THE ATMOSPHERE INFORMATION TO THE SURFACE. THE NATURE AND COMPOSITION OF INE ATMOSPHERE, AND LOCAL INFORMATION ON THE ATMOSPHERE INFORMATION PATTERN. A SISTER MISSION, PIONEER VENUS ORBITER; IS SCHUCHAS, THE RADIATION SEARCE ANT AROUNT VENUS Z WEEKS BEFORE THE PROBES ARE RELEASED. SIMULTANEOUS

inde:

MEASUREMENTS BY THE PROBES AND ORBITER PERMIT RELATING SPECIFIC Local measurements to the general state of the planet and its Environment as observed from orbit.

PIONEER VENUS PROBE BUS. BAUER------

INVESTIGATION NAME- PARTICIPATING THEORIST BAUER

INVESTIGATIVE PROGRAM NSSDC 10- P1078PA-08

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES AERONOMY Interplanetary physics Ionospheres

MASA-GSEC

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PERSONNEL P1 - S.J. BAUER

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BRIEF DESCRIPTION A NUMBER OF THEORISTS HAVE BEEN SELECTED TO PARTICIPATE AS MEMBERS OF THE SCIENCE STEERING GROUP IN DEFINING THE SCIENTIFIC OBJECTIVES, STRATEGY, AND PLANNING FOR THE MISSION, IN LOORDINATING THE EXPERIMENTS, AND IN THE ANALYSIS OF FLIGHT EXPERIMENT DATA. EACH THEORIST HAS AN AREA OF MAJOR RESPONSIBILITY THAT INCLUDES ANALYSIS AND INTERPRETATION OF THE INSITU ION COMPOSITION MEASUREMENTS TO PRODUCE A SELF-CONSITENT MODEL OF THE DATSIDE UPPER ATMOSPHERE AND IONOSPHERE OF VENUS, INCLUDING THE ROLE OF CHEMICAL AND TRANSPORT PROCESSES, AS WELL AS AN UNDERSTANDING OF THE TYPE OF INTERACTION BETWEEN THE SOLAR WIND AND THE VENUS IONOSPHERE. BRIEF DESCRIPTION

- PIONEER VENUS PROBE BUS, COUNSELMAN-----

INVESTIGATION NAME- DIFFERENTIAL VERY-LONG-BASELINE Interferometric tracking

NSSDC 10+ P1078PA-06

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(5) PLANETARY ATMOSPHERES METEOROLOGY LANETOLOGY

PERSONNEL					
PT - C.C.	COUNSELMAN	MASS	INST	U†	1 ECR
01 - 1.1.	SHAPIRO	MASS			
01 - R.	PRINN	HASS			
01 - J.	CHARNEY	MASS			
01 - G.H.	PETTENGILL	MASS	1857	0F	TECH

BRIEF DESCRIPTION THIS EXPERIMENT INVOLVES APPLYING DIFFERENTIAL VERY-LONG-BASELINE INTERFEROMETRY TECHNIQUES TO THE RADIO SIGNALS FROM THE ENTRY PROBE AND BUS (ORBITING SPACEGRAFT) IN ORDER TO INFER OR PLACE UPPER LIMITS ON WIND SPEEDS IN THE LOWER ATMOSPHERE. THESE RESULTS ARE USED IN MODELING THE CIRCULATION PATTERNS OF VENUS' ATMOSPHERE. DATA TAKEN PRIOR TO PROBE ENTRY ARE USED, IF FEASIBLE, TO INFER CHARACTERISTICS OF VENUS' GRAVITY FIELD FOR USE WITH PROBE ENTRY OPERATIONS AS WELL AS IN LATER SCIENTIFIC EVALUATION. BRIEF DESCRIPTION

- PIONEER VENUS PROBE BUS, DONAHUE---

INVESTIGATION NAME- PARTICIPATING THEORIST DONAHUE

INVESTIGATIVE PROGRAM NSSDC 10- P1078PA-09 CODE SL

> INVESTIGATION DISCIPLINE(S) PLANETARY ATHOSPHERES AERONOMY

PERSONNEL PI + T.N. DONÁHUE

Mary Sec.

U OF HICHIGAN

BRIEF DESCRIPTION NUMBER OF THEORISTS HAVE BEEN SELECTED TO PARTICIPATE NUMBERS OF THE SCIENCE STEERING GROUP IN DEFINING THE SCIENTIFIC OBJECTIVES. STRATEGY. AND PLANNING FOR THE MISSION-IN COORDINATING THE EXPERIMENTS, AND IN THE ANALYSIS OF FLIGHT EXPERIMENT DATA. EACH THEORIST HAS AN AREA OF MAJOR RESPONSIBILIT THAT INCLUDES THE INTERDISCIPLINARY ASPECTS OF ATMOSPHERIC CHEMISTRY AND RADIATIVE TRANSPORT THEORY TO ARRIVE AT AN UNDERSTANDING OF THE ARENONY OF THE ATMOSPHERE OF VENUS.

---- PIONEER VENUS PROBE BUS, GOODY-----

INVESTIGATION NAME- PARTICIPATING THEORIST GOODY

INVESTIGATIVE PROGRAM NSSDC ID- PI078PA-10 CODE SL

> INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES AERONONY METEOROLOGY

PERSONNEL P1 - R.M. GOODY

DRIEF DESCRIPTION A NUMBER OF THEORISTS HAVE BEEN SELECTED TO PARTICIPATE AS MEMBERS OF THE SCIENCE STEERING GROUP IN DEFINING THE SCIENTIFIC OBJECTIVES, STRATEGY, AND PLANNING FOR THE HISSION, IN CORDINATING THE EXPERIMENTS, AND IN THE ANALYSIS OF FLIGHT EXPERIMENT DATA. EACH THEORIST HAS AN AREA OF MAJOR RESPONSIBILITY THAT INCLUDES THE THEORY OF THE CIRCULATION OF THE LOWER ATMOSPHERE AND THE RECOMBINATION OF THE PRODUCTS OF PHOTOLYSIS.

-- PIONEER VENUS PROBE BUS, HUNTEN------

INVESTIGATION NAME- PARTICIPATING THEORIST HUNTON

INVESTIGATIVE PROGRAM CODE SL

> INVESTIGATION DISCIPLINE(S) Planetary atmospheres Aeronomy METEOROLOGY

> > KITT PEAK NATE OBS

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HARVARD U

PERSONNEL PI - D.M. HUNTEN

NSSDC ID- PIO78PA-11

BRIEF DESCRIPTION A NUMBER OF THEORISTS HAVE BEEN SELECTED TO PARTICIPATE AS MEMBERS OF THE SCIENCE STEERING GROUP IN DEFINING THE SCIENTIFIC OBJECTIVES, STRATEGY, AND PLANKING FOR THE MISSION, IN COORDINATING THE EXPERIMENTS, AND IN THE ANALYSIS OF FLIGHT EXPERIMINT DATA. EACH THEORIST HAS AN AREA OF MAJOR RESPONSIBLLITY THAT INCLUDES A DETAILED DESCRIPTION OF THE CLOUDS AND THE HEAT BALANCE OF THE ATMOSPHERE AND SURFACE OF YEMNS AND A DETERMINATION OF THE DYNAMICS AND AERONOMY OF THE DYNERD ATMOSPHERE UPPER ATMOSPHERE.

- PIONEER VENUS PROBE BUS, PETTENGILL-----

INVESTIGATION NAME- RADIO SCIENCE TEAM

INVESTIGATIVE PROGRAM NSSDC 10- P1078PA-07 CÓDE 5L

> INVESTIGATION DISCIPLINE(S) PLANETARY #TMOSPHERES AERONOMY METEOR'LOGY PLANELARY LONOSPHERES

PERSONNEL TL - G. TM - T.A. TM - A.J.	KLIORE	 MASS INST OF TECH Stanford U NASA-JPL
TH - R.	W00	NASA-JPL

BRIEF DESCRIPTION THE RADIO SCIENCE TEAM HAS THE RESPONSIBILITY FOR THE RADIO SCIENCE TEAM HAS THE RESPONSIBILITY FOR PLANNING, COORDINATING, AND RECOMMENDING SCIENTIFIC USES OF RADIO SIGNALS FOR THE MISSION, AND OF EXECUTING APPROVED EXPERIMENTS AND CONDUCTING THE DATA ANALYSIS REQUIRED. THE MAJOR AREAS OF RESPONSIBILITY ARE IN THE USE OF S-BAND TELEMETRY SIGNALS TO BOTAIN PRECISE TRAJECTORY AND DESCENT DATA OF THE ENTRY PROBES FOR DETERMINATION OF ATMOSPHERIC MOTIONS, WINDS, AND TURBULENCE. ALSO, THE TEAM IS RESPONSIBLE FOR THE DEVELOPMENT AND ANALYSIS OF RECOMMENDATIONS PERTAINING TO THE APPLICATIONS OF VERY LONG BASELINE INTERFEROMETRY TECHNIQUES TO THE MISSION. THE MISSION.

-- PIONEER VENUS PROBE BUS, POLLACK-----

INVESTIGATION NAME- PARTICIPATING THEORIST POLLACK

NESDE 10- P1078PA-12

INVESTIGATION DISCIPLINE(S) YVESTIGATION DISCIPLINE PLANETARY ATMOSPHERES AERONOMY GEODESY AND CARTOGRAPHY

PERSONNEL PI - J.B. POLLACK

CODE SL

BRIEF DESCRIPTION A NUMBER OF THEORISTS HAVE BEEN SELECTED TO PARTICIPATE A MUMBER OF THE SCIENCE STEERING GROUP IN DEFINING THE SCIENTIFIC OBJECTIVES, STRATEGY, AND PLANNING FOR THE MISSION, IN COORDINATING THE EXPERIMENTS, AND IN THE ANALYSIS OF FLIGHT EXPERIMENT DATA. EACH THEORIST HAS AN AREA OF MAJOR RESPONSIBILITY THAT INCLUDES THE DETERMINATION OF IMPORTANT SOURCES OF THERMAL OPACITY. THE SCATTERING CHARACTERISTICS OF THE CLOUDS, AND SOLAR ENERGY DEPOSITION PROFILE, AND THE THEORY AND EVOLUTION OF THE ATMOSPHERE AND LITHOSPHERE OF VENUS. BRIEF DESCRIPTION

-- PLONEER VENUS PROBE BUS. SPENCER-

INVESTIGATION NAME- PARTICIPATING THEORIST SPENCER

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INVESTIGATIVE PROGRAM

NASA-ARC

staile.

NSSDC ID- PI078PA-13

INVESTIGATION DISCIPLINE(S) Planetary atmospheres Aeronomy

PERSONNEL PI - N.H. SPENCER

NASA-GSEC

BRIEF DESCRIPTION

BRIEF DESCRIPTION A NUMBER OF THEORISTS KAVE BEEN SELECTED TO PARTICIPATE A NUMBERS OF THE SCIENCE STEERING GROUP IN DEFINING THE SCIENTIFIC OBJECTIVES, STRATEGY, AND PLANNING FOR THE MISSION, IN COORDINATING THE EXPERIMENTS, AND IN THE ANALYSIS OF FLICHT EXPERIMENT DATA. EACH THEORIST HAS AN AREA OF MAJOR RESPONSIBILITY THAT INCLUDES THE INTERDISCIPLINARY ASPECTS OF THE NATURE OF THE COMPOSITION OF THE ATMOSPHERE OF VENUS, THE DRIVING FORCES OR ENERGY INPUTS AFFECTING THE BEHAVIOR OF THE ATMOSPHERE AND CLOUDS AND CHANGES THAT TAKE PLACE.

PIONEER VENUS PROBE BUS, TAYLOR, JR.

INVESTIGATION NAME- ION-MASS SPECTROMETER

NSSDC ID- PIO78PA-02 INVESTIGATIVE PROGRAM CODE SL

> INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES PLANETARY IONOSPHERES AERONOMY

PERSONNEL

PI - H.A.	TAYLOR JR	
01	DATE OR JR.	NASA-G5FC
01 - 5.J.		NASA-GSFC
01 - T.M.	DONAHUE	U OF MICHIGAN
01 - P.A.	CI OUT I CO	
		RICE U
01 - R.E.		NASA-GSFC
0I - H.C.	BRINTON	NASA-GSFC
01 - F.C.		HASA-GSPL

BRIEF DESCRIPTION THIS ION MEASUREMENTS WHICH BRIEF DESCRIPTION THIS ION MASS SPECTROMETER EXPERIMENT OBTAINS MEASUREMENTS WHICH PROVIDE INFORMATION ON THE SOLAR WIND INTERACTION WITH VENUS, UPPER ATMOSPHERE PHOTOCHEMISTRY, AND THE MASS AND HEAT TRANSPORT CHARACTERISTICS OF THE ATMOSPHERE A BENNETT ION SPECTROMETER, SIMILAR TO UNITS FLOWN ON MANY EARTH SATELLITES AND ROCKETS, MEASURES VENUS' UPPER ATMOSPHERE ION CONCENTRATIONS IN THE MASS RANGE FROM T TO 60 ATOMIC MASS BURNUP, FROM THE TIME OF CROSSING VENUS' BOWSHOCK TO BUS BURNUP. BURNUP.

----- PIONEER VENUS PROBE BUS, VON ZAHN------

INVESTIGATION NAME- NEUTRAL PARTICLE MASS SPECTROMETER

NSSDE 10- PI078PA-03 INVESTIGATIVE PROGRAM CODE SL INVESTIGATION DISCIPLINE(S) Planetary atmospheres Aeronomy

VON ZAHN	U OF BONN
C.NIER	U OF MINNESOTA
HUNTEN	KITT PEAK NATL OBS

PERSONNEL PI - U. 01 - A.O. 01 - D.M.

BRIEF DESCRIPTION THIS NEUTRAL PARTICLE MASS SPECTROMETER EXPERIMENT WILL OBTAINS MEASUREMENTS WHICH PROVIDE INFORMATION ON THE ORIGIN AND EVOLUTION OF VENUS' ATMOSPHERE, THE PRESENT EMERGY BALANCE AND DYNAMICS OF THE UPPER ATMOSPHERE, AND THE INTERACTION OF THE UPPER ATMOSPHERE WITH SOLAR RADIATION AND THE INTERPLANETARY MEDIUM. A MAGNETIC DEFLECTION, DUBLE-FOCUSING, MASS SPECTROMETER WILL BE FLOWN TO MEASURE THE UPPER ATMOSPHERE NEUTRAL NOLECULES IN THE MASS RANGE 1 TO 46 ATOMIC MASS UNITS.

******************************* PIONEER VENUS PROBE LRG************

SPACEGRAFT COMMON NAME- PIONEER VENUS PROBE LRG Algephate Names- Pioneer venus 1978

NSSDC ID- PLO78PB

LAUNCH DATE- D8/00/78 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- ATLAS WEIGHT- 300. KG

SPONSORING COUNTRY/AGENCY UNITED STATES

NASA-OSS

PLANNED ORBIT PARAMETERS ORBIT TYPE- VENUS PROBE

教師家

PERSONNEL		
NG - F.D.	KOCHENDORFER	
SC - NLA.	HITZ .	
PH - C.F.	HALL	
PS - L.	COLIN	

BRIEF DESCRIPTION

NSSDC 1D- P1078PB-05

BRIEF DESCRIPTION THIS SPACECRAFT IS THE LARGE PROBE PORTION OF THE PIONEER-VENUS MULTIPROBE MISSION ON THIS MISSION FOUR INSTRUMENTED ATMOSPHERIC ENTRY PROBES APE CARRIED BY A SPACECRAFT BUS TO THE VICINITY OF VENUS AND RELEASED FOR DESCENT THROUGH THE AIROSPHERE TO THE PLANETARY SURFACE. TWO SMALL PROBES ENTER ON THE NIGHTSIDE AND A SMALL PROBE AND THIS LARGE PROBE ENTER ON THE DAYSIDE OF THE PLANET. THE SPACECRAFT SUS ENTERS THE ATMOSPHERE AND OBTAINS ATMOSPHERIC COMPOSITION DATA UNTIL BURNUP. INVESTIGATIONS EMPHASIZE THE STUDY OF THE SURVETURE AND COMPOSITION OF THE AIMOSPHERE DOWN TO THE SURFACE, THE NATURE AND COMPOSITION OF THE CLOUDS, THE AND LOCAL INFORMATION ON THE ATMOSPHERIC CIRCULATION PATTERN. A SISTER MISSION, PIONEER-VENUS ORBITER, IS SCHEDULED TO PLACE AND CLOCAL INFORMATION ON THE ATMOSPHERIS. SURFACES, STHULTANEOUS MEASUREMENTS BY THE PROBES ARE RELEASED, SIMULTANEOUS MEASUREMENTS BY THE PROBES AND ORBITER PERMIT RELATING SPECIFIC LOCAL MEASUREMENTS TO THE GENERAL STATE OF THE PLANET AND ITS ENVIRONMENT AS OBSERVED FROM ORBIT.

PIONEER VENUS PROBE LRG, BOESE------

INVESTIGATION NAME- INFRARED RADIOMETER

INVESTIGATIVE PROGRAM CODE SL

> INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES AERONOMY

NASA HEADQUARTERS NASA HEADQUARTERS

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PERSONNEL		
PI ~ R.H. 0I - J.B. 0I - J.H. 0I - L.P.	POLLACK Miller	NASA-ARC NASA-ARC NASA-ARC NASA-ARC

BRIEF DESCRIPTION THE OBJECTIVES OF THIS EXPERIMENT ARE TO MEASURE THE ATMOSPHERE THERMAL FLUX PROFILE, DETECT CLOUD LAYERS AND INFER THEIR COMPOSITION, AND ESTIMATE THE ATMOSPHERIC WATER VAPOR CONTENT. THIS EXPERIMENT USES A 4-CHANNEL INFRARED RADIOMETER LOOKING DOWN FROM THE PROBE. TWO INTERNAL BLACKBODIES ARE USED TO ALLOW ABSOLUTE MEASUREMENTS OF THE FLUX IN EACH CHANNEL. THE INSTRUMENT WEIGHS ABOUT 2 KG AND USES ABOUT 3 W OF POWER.

--- PIONEER VENUS PROBE LRG, COUNSELMAN------

INVESTIGATION NAME- DIFFERENTIAL VERY LONG-BASELINE Interferometric tracking

NSSOC ID- PI078PB-09

2	INVESTIGATIVE	PROGRAM
	CODE SI	

INVESTIGATION DISCIPLINE(PLANETARY ATMOSPHERES	5)
METEOROLOGY	
PLANETOLOGY	

PERSONNEL			
PL - C.C.	MASS Mass Mass	INST O INST O INST O	F TECH F TECH F TECH F TECH
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BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT INVOLVES APPLYING DIFFERENTIAL VERT-LONG-BASELINE INTERFEROMETRY IECHNIQUES TO THE RADIO SIGMALS FROM THE ENTRY PROBE AND BUS (ORBITING SPACECRAFT) IN ORDER TO INFER OR PLACE UPPER LIMITS ON WIND SPEEDS IN THE LOWER ATMOSPHERE. THESE RESULTS ARE USED IN MODELING THE CIRCULATION PATTERNS OF VENUS' ATMOSPHERE. DATA TAKEN PRIOR TO PROBE ENTRY ARE USED, IF FEASIBLE, TO INFER CHARACTERISTICS OF VENUS' GRAVITY FIELD FOR USE WITH PROBE ENTRY OPERATIONS AS WELL AS IN LATER SCIENTIFIC EVALUATION.

--- PIONEER VENUS PROBE LRG, HOFFMAN-----

INVESTIGATION NAME- NEUTRAL PARTICLE MASS SPECTROMETER

NSSDC ID- PIOTAPB-06

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Planetary Atmospheres Aepunomy

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PI - J.H. DI - R.R.	HODGES, JA. Kolpin	U OF TEXAS, DALLAS U OF TEXAS, DALLAS TRW SYSTEMS GROUP Harvard U
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175

PERS a BRIEF DESCRIPTION THE OBJECTIVE OF THIS INVESTIGATION IS TO MEASURE THE COMPOSITION OF THE LOWER ATMOSPHERE OF VENUS. THIS INVESTIGATION USES A CERAMIC MICRO LEAK GAS INLET AND A DOUBLE-FOCUSING MAGNETIC DEFLECTION MASS SPECTROMETER. ABUT 50 ANALYSES OF THE VENUSIAN ATMOSPHERE ATE PLANNED DURING THE PROBE DECENT. A SEPARATE SAMPLE OF THE ATMOSPHERE IS ANALYZED FOR RARE GASSES. THE ANALYZEN HAS A MASS RANGE OF 1 TO 212 U AND A DYNAMIC RANGE OF 1.E7. THE INSTRUMENT IS BASED ON A DESIGN FLOWN PREVIOUSLY.

-- PIONEER VENUS PROBE LRG, KNOLLENBERG------

INVESTIGATION NAME- CLOUD PARTICLE SIZE SPECTROMETER

INVESTIGATIVE PROGRAM NSSBC 10- PID78P8-03 CODE SL

INVESTIGATION DISCIPLINE(S) Planetary atmospheres Aeronomy

PERSONNEL

U OF CHICAGO Kitt Peak Natl Obs KNOLLENBERG Hunten

PI - R. 01 - D.M. BRIEF DESCRIPTION

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BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT IS TO MEASURE VENUS' CLOUD PARTICLE SIZES AND CONCENTRATIONS. A LASER IS USED TO ILLUMINATE CLOUD PARTICLES, OPTICAL LENSES WILL IMAGE THE PARTICLE SHADOWS ON ARRAYS OF DETECTORS. THE PARTICLE SHADOWS ARE USED TO DETERMINE PARTICLE SIZE AND CONCENTRATION. THE FLIGHT SENSOR IS SIMILAR TO THOSE FLOWN IN AIRCRAFT AND BALLOONS.

---- PIONEER VENUS PROBE LRG, OYAMA-----

INVESTIGATION NAME- GAS CHROMATOGRAPH

NSSDC 10- P1078P8-04 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES AERONOMY

PERSONNEL		
P1 - V.1.	AMAYO	NASA-ARC
01 - J.S.	POLLACK	NA5A-ARC
01 - 6.	CARLE	NASA-ARC
01 - F.	NOELLER	NASA-ARC

BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT IS TO DETERMINE THE COMPOSITION OF VENUS' LOWER ATMOSPHERE. FROM THESE MEASUREMENTS, DEDUCTIONS ARE MADE OF THE GASEOUS SOURCES OF INFRARED OPACITY, THE DEGREE OF DIFFERNITATION OF VENUS' INTERIOR, THE DEGREF OF SIMILARITY BETWEEN THE SOLID BODIES OF EARTH AND VENUS, AND EVOLUTION OF VENUS' ATMOSPHERE. TWO GAS CHROMATOGRAPH COLUMNS ARE USED TO ANALYZE SAMPLES OF THE ATMOSPHERE DURING PROBE DESCENT, THREE OR FOUR SAMPLES WILL BE AMALYZED. BRIEF DESCRIPTION THE OBJECTIVE ANALYZED.

--- PIONEER VENUS PROBE LRG, RAGENT-----____

INVESTIGATION NAME- CLOUD EXTENT, STRUCTURE, AND

DISTRIBUTION

N550C ID- P1078P8-02 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Planetary Atmospheres Aeronomy METEOROLOGY

NASA-ARC CNRS-LPSP

PERSONNEL PI - B. RAGENT PI - J.E. BLANONT

URIEF DESCRIPTION THIS EXPERIMENT CONSISTS OF A NEPHELOMETER TO MEASURE THE ENERGY BACKSCATTERED FROM CLOUD PARTICLES. IT USES A PULSED GALLIUM ARSENIDE LASER DIODE TO ILLUMINATE THE CLOUDS. THE ALTITUDE HISTORY OF THE BACKSCATTERED SIGMAL INDICATES THE PRESENCE AND VERTICAL EXTENT OF CLOUDS ALONG THE TRAJECTORIES. COMPARISONS WITH THE MEASUREMENTS FROM THE SMALL PROBES INDICATES THE SPATIAL VARIABILITY OF THE CLOUD STRUCTURE. THE LASER OPERATES AT ABOUT 9000 A. THE EXPERIMENT WEIGHS ABOUT 0.5 KG AND USES ABOUT 1.3 W OF POWER.

--- PIONEER VENUS PROBE LRG, SEIFF-----

INVESTIGATION NAME- ATHOSPHERE STRUCTURE

NSSDC ID- PIO78PB-OT

INVESTIGATIVE PROGRAM

CODE SL

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES

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Ċ.	PI	-	Ä.	SELFF	NASA-ARC.
	01	-	s.	SOMMER	NASA-ARC
				BLANCHARD	NASA-LARC
			D.B.	KIRK	NASA-ARC
			R.	YOUNG	U OF CALIE, LA
				DERR	US GEOLOGICAL SURVEY

BRIEF DESCRIPTION THE INSTRUMENTS FOR THIS EXPERIMENT INCLUDE A THREE-AXIS ACCELEROMETER, PRESSURE SENSORS, AND TEMPERATURE SENSORS. THEY ARE ASSED ON THE TECHNOLOGY DEMONSTRATED BY THE PAET VEHICLE (PLANETARY ATMOSPHERE EXPERIMENT TEST R7106-2001). THE MEASUREMENTS ARE USED TO CONSTRUCT A PROFILE OF ATMOSPHERE STATE PROPERTIES FOR THE LARGE PROBE TRAJECTORY FROM THE SURFACE TO APPROXIMATELY 140 KM ALTITUDE. THEY ARE ALSO USED TO DETERMINE VEHICLE. BY COMPARING ATMOSPHERE CONDITIONS ALONG THE LARGE PROBE TRAJECTORY WITH THOSE MEASURED BY THE SMALL PROBES, CIRCULATION EDDELS OF THE ATMOSPHERE ARE DETERMINED. THE INSTRUMENTS WEIGH ABOUT 2.5 KG AND CONSUME ABOUT 4.7 W DF POWER. POWER.

-- PIONEER VENUS PROBE LRG, TOMASKO------

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(5) - Planetary Atmospheres Aeronomy

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INVESTIGATION NAME- SOLAR ENERGY PENETRATION INTO THE ATMOSPHERE

NSSDC 10- PI078P8-07

PERSONNEL PÍ – M.G. TOMASKO DI – W. WOLFE DI – A. CLEMENTS WOLFE CLEMENTS

BRIEF DESCRIPTION

URIEF DESCRIPTION THE OBJECTIVE OF THIS INVESTIGATION IS TO DETERMINE THE REGIONS IN VENUS' ATMOSPHERE WHERE SOLAR ENERGY IS DEPOSITED. SIX NARROW-FIELD-OF-VIEW DETECTORS ARE USED TO MEASURE THE INTENSITY OF SCATTERED SOLAR LIGHT. AS THE PROBE DESCENDS THROUGH THE ATMOSPHERE, THE DIFFERENCE BETWEEN UPWARD-LOOKING AND DOWNWARD-LOOKING DETECTORS WILL INDICATE THE NET DOWNWARD ELUX.

************************** PIONEER VENUS PROBE SM***************

SPACECRAFT COMMON NAME- PIONEER VENUS PROBE SM Alternate names- pioneer venus 1978

N550C 10- P1078PC

LAUNCH PATE- 08/00/78 Launch Site- Cape Canaveral, United States Launch Vehicle- Atlas WEIGHT- 75. KG

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-055

PLANNED ORBIT PARAMETERS Orbit type- venus probe

KOCHENDORFER	NASA HEADQUARTERS
FELLOWS	NASA HEADQUARTERS
HALL	NASA-ARC
COLIN	NASA-ARC
	HALL

PS - L. CULIN ANSA-ARC BRIEF DESCRIPTION THIS SPACECRAFT IS THE FIRST SMALL PROBE OF THE PIONEER-VENUS MULTIPROBE MISSION. ON THIS MISSION FOUR INSTRUMENTED ATMOSPHERIC ENTRY PROBES ARE CARRIED BY A SPACECRAFT BUS TO THE VICINITY OF VENUS FOR DESCENT THROUGH THE ATMOSPHERE TO THE PLANETARY SURFACE. TWO SMALL PROBES ENTER ON THE WIGHTSIDE, AND ONE SMALL PROBE AND ONE LARGE PROBE ENTER ON THE MIGHTSIDE, AND ONE SMALL PROBE AND ONE LARGE PROBE ENTER ON THE MIGHTSIDE, AND ONE SMALL PROBE AND ONE LARGE PROBE ENTER ON THE MIGHTSIDE, AND ONE STALL BURNUP. INVESTIGATIONS EMPHASIZE THE STUDY OF THE STRUCTURE COMPOSITION AND NATURE OF THE ATMOSPHERE DOWN TO THE SURFACE. AND OF THE CLOUDS, THE RADIATION FIELD AND ENERGY EXCHANGE IN THE LOWER ATMOSPHERE, AND LOCAL INFORMATION ON THE ATMOSPHERE, IS SCHELDULED TO PLACE AN ORBITING SPACECRAFT ARGUND VENUS 2 WEEKS BEFORE THE PROBES AND ORBITICR STATE OF THE PLANET ATO UNERS MEASUREMENTS BY THE PROBES AND ORBITER PERMIT RELATING SPECIFIC LOCAL MEASUREMENTS TO THE GENERAL STATE OF THE PLANET AND INS ENVERONMENT AS OBSERVED FROM ORBIT. ENVIRONMENT AS GESERVED FROM ORBIT.

- PIONEER VENUS PROBE SM# COUNSELMAN-

INVESTIGATION NAME- DIFFERENTIAL VERY LONG BASELINE INTERFEROMETRIC TRACKING

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N55DC 10- P1078PC-03 INVESTIGATIVE PROGRAM PERSONNEL ISONNEL PI - V.E. 01 - J. 01 - L.A. 01 - A. 01 - G. 01 - M. INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES METEOROLOGY PLANETOLOGY PERSONNEL RSONNEL PI – C.C. COUNSELMAN OI – I.I. SHAPIRO OI – R. PRINN OI – J. CHARNEY OI – G.H. PETTENGILL MASS INST OF TECH MASS INST OF TECH MASS INST OF TECH MASS INST OF TECH MASS INST OF TECH BRIEF DESCRIPTION BRIEF DESCRIPTION THIS EXPERIMENT INVOLVES APPLYING DIFFERENTIAL VERY-LONG-BASILINE INTERFEROMETRY TECHNIQUES TO THE RADIO SIGNALS FROM THE ENTRY PROBE AND BUS (DRBITING SPACECRAFT) IN ORDER TO INFER OR PLACE UPPER LIMITS ON WIND SPEEDS IN THE LOWER ATMOSPHERE. THESE RESULTS ARE USED IN MODELING THE CIRCULATION PATTERNS OF VENUS' ATMOSPHERE. DATA TAKEN PRIOR TO PROBE ENTRY ARE USED. IF FEASIBLE, TO INFER CHARACTERISTICS OF VENUS' GRAVITY FIELD FOR USE WITH PROBE ENTRY OPERATIONS AS WELL AS IN LATER SCIENTIFIC EVALUATION. --- PIONEER VENUS PROBE SM, RAGENT------INVESTIGATION NAME- CLOUD EXTENT, STRUCTURE, AND **DISTRIBUTION** NSSDC ID- PLO78PC-02 INVESTIGATIVE PROGRAM CODE 51 INVESTIGATION DISCIPLINE(S) Planetary atmospheres Aeronomy Heteorology PERSONNEL PI - 8. RAGENT PI - J.E. BLAMONT NASA-ARC CNRS-LPSP BRIEF DESCRIPTION THIS EXPERIMENT CONSISTS OF A NEPHELOMETER TO MEASURE THE ENERGY BACKSCATTERED FROM CLOUD PARTICLES. IT USES A PULSED GALLIUM ARSENIDE LASER DIODE TO ILLUMINATE THE CLOUDS. THE ALIIUDE HISTORY OF THE BACKSCATTERED SIGNAL INDICATES THE PRESENCE AND VERTICAL EXTENT OF CLOUDS ALONG THE TRAJECTORIES. COMPARISONS WITH THE MEASUREMENTS FROM THE SMALL PROBES INDICATES THE SPATIAL VARIABILITY OF THE CLOUD STRUCTURE. THE LASER OPERATES AT ABOUT 900D A. THE EXPERIMENT WEIGHS ABOUT G.6 KG AND USES ABOUT 1.3 W OF POWER. -- PIONEER VENUS PROBE SM, SEIFF------INVESTIGATION NAME- ATMOSPHERE STRUCTURE NSSDC 10- P1078PC-01 INVESTIGATIVE PROGRAM CODE SL INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES PERSONNEL SEIFF Sommer Kirk Blanchard Young PI - A. QI - S. QI - D.8. QI - R.C. QI - R.C. QI - R. NASA-ARC NASA-ARC NASA-ARC NASA-LARC U OF CALIF, LA NSSDO DERR US GEOLOGICAL SURVEY

N550C ID- PI078PC-04

BRIEF DESCRIPTION THE INSTRUMENTS FOR THIS EXPERIMENT INCLUDE A SINGLE-AXIS ACCELEMONETER, PRESSURE SENSORS, AND TEMPERATURE SENSORS. THEY ARE BASED ON THE TECHNOLOGY DEMONSTRATED BY THE PAET VEHICLE (PLANETARY ATMOSPHERE EXPERIMENT TEST R7106-2001). THE MEASUREMENTS ARE USED TO CONSTRUCT A PROFILE OF ATMOSPHERE STATE PROPERTIES FOR THE LARGE PROBE TRAJECTORY FROM THE SURFACE TO APPROXIMATELY 140 KM ALTITUDE. THEY ARE ALSO USED TO DETERMINE VERTICAL WIND VELOCITY, HORIZONTAL WIND VELOCITY, AND TURBULENCE. BY COMPARING ATMOSPHERE CONDITIONS ALONG THE LARGE PROBE TRAJECTORY WITH THOSE MEASURED BY THE SMALL PROBES, CIRCULATION MODELS OF THE ATMOSPHERE ARE DETERMINED. THE INSTRUMENTS WEIGH ABOUT 1.2 KG AND CONSUME ABOUT 4.8 W OF POWER.

--- PIONEER VENUS PROBE SM, SUOMI----

INVESTIGATION NAME- INFRARED RADIOMETER

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) Planetary Atmospheres Aergnony

BRIEF DESCRIPTION THE OBJECTIVES ARE TO LOCATE REGIONS OF RADIATIVE CONVERGENCE AND DIVERGENCE AS A FUNCTION OF ALTITUDE AND TO INDICATE THE HEIGHT AT WHICH SOLAR EMERGY IS ABSORUED BY THE ATMOSPHERE. THIS EXPERIMENT USES A SMALL NET FLUX RADIOMETER ON THE PROBE TARGETED TO THE DAYSIDE OF VERUS TO MEASURE THE NET SOLAR FLUX IN THE D.2- TO 4-MICROMETER REGION. THE TWO PROBES TARGETED TO THE NIGHTSIDE OF THE PLANET CARRY NET INFRARED FLUX SENSORS COVERING THE 1- TO 25-MICROMETER REGION. THE INSTRUMENT WEIGHS ABOUT 0.4 KG AND USES 2.2 W OF POWER. ************************* PIONEER VUNUS PROBE SM2************* SPACECRAFT COMMON NAME- PIONEER VENUS PRODE SM2 Auternate Names- Pioneer Venus 1978 NSSOC 10- PI078PD LAUNCH DATE- 08/00/78 Launch Site- cape canaveral, united states Launch vehicle- atlas WEIGHT- 75. KG SPONSORING COUNTRY/AGENCY UNITED STATES NASA-OSS PLANNED GRBIT PARAMETERS Orbit type- venus probe PERSONNEL MG - F.D. KOCHENDORFER SC - M.A. MITZ PM - C.F. HALL PS - L. COLIN NASA HEADQUARTERS NASA HEADQUARTERS NASA-ARC PS - L. COLIN NASA-ARC BRIEF DESCRIPTION THIS SPACECRAFT IS THE SECOND SNALL PROBE OF THE PIONEER-VENUS NULTIPROBE MISSION. ON THIS MISSION FOUG INSTRUMENTED ATMOSPHERIC ENTRY PROBES ARE CARRIED BY A SPACECRAFT BUS TO THE VICINITY OF VENUS FOR DESCENT THROUGH THE ATMOSPHERE TO THE PLANETARY SURFACE. TWO SMALL PROBES ENTER ON THE NIGHTSIDE, AND ONE SMALL PROBE AND ONE LARGE PROBE ENTER ON THE NIGHTSIDE, AND ONE SMALL PROBE AND ONE LARGE PROBE ENTER ON THE NIGHTSIDE, AND ONE SMALL PROBE AND ONE LARGE PROBE ENTER ON THE NIGHTSIDE, AND ONE SMALL PROBE AND ONE LARGE PROBE ENTER ON THE NIGHTSIDE, AND ONE SMALL PROBE AND ONE LARGE PROBE ATMOSPHERE AND OBTAINS ATMOSPHERIC COMPOSITION DATA UNTIL OUPOSITION AND NATURE OF THE ATMOSPHERE DOWN TO THE SIGNIFARE. AND OF THE CLOUDS, THE RADIATION FILLD AND EMERGY EXCHANGE IN THE LOVER ATMOSPHERE, AND LOCAL INFORMATION ON THE ATMOSPHERIC CIRCULATION PATTERN. A SISTER MISSION, PIONEER-VENUS ORBITER, IS SCHELDULED TO PLACE AN ORDITAN FORMATION DATHE ATMOSPHERIC CIRCULATION PATTERN. A SISTER MISSION, PIONEER-VENUS ORBITER, IS SCHELDULED TO PLACE AN ORDITAN FORMATION DATHE ATMOSPHERIC CORPOSE THE PROBES ARE RELEASED, SIMULTANEOUS MEASUREMENTS BY THE PROBES AND CORFITEN PERMIT RELATING SPECIFIC LOCAL MEASUREMENTS TO THE GENERAL STATE OF THE PLANET AND ITS ENVIRONMENT AS OBSERVED FROM ORDIT. NASA-ARC

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NASA-JPE

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-- PIONEER VENUS PROBE SM2, COUNSELMAN------

INVESTIGATION NAME- DIFFERENTIAL VERY-LONG-BASELINE Interferometric tracking

C 10-	PI078PD-03	INVESTIGATIVE PROGRAM Code SL
		INVESTIGATION DISCIPLINE(S) Planetary Atmospheres

METEOROLOGY PERSONNEL PI - C.C. COUNSELMAN OI - I.I. SHAPIRO OI - R. PRINN OI - J. CHARNEY MASS INST OF TECH MASS INST OF TECH MASS INST OF TECH MASS INST OF TECH MASS INST OF TECH 01 - G.H. PETTENGILL

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS. EXPERIMENT INVOLVES APPLYING DIFFERENTIAL VERY-LONG-BASELINE INTERFEROMETRY TECHNIQUES TO THE RADIO SIGMALS FROM THE ENTRY PROBE AND BUS (ORBITING SPACECRAFT) IN DROER TO INFER OR PLACE UPPER LIMITS ON WIND SPEEDS IN THE LOWER ATMOSPHERE. THESE RESULTS ARE USED IN MODELING THE CIRCULATION PATTERNS OF VENUS' ATMOSPHERE. DATA TAKEN PRIOR TO PROBE ENTRY ARE USED, IF FEASIBLE, TO INFER CHARACTERISTICS OF VENUS' GRAVITY FIELD FOR USE WITH PROBE ENTRY OPERATIONS AS WELL AS IN LATER SCIENTIFIC EVALUATION.

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-- PIONEER VENUS PROBE SM2, RAGENT--------

INVESTIGATION NAME- CLOUD EXTENT; STRUCTURE; AND DISTRIBUTION

NSSDC 10- PI078P0-02

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INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES AERONOMY METEOROLOGY

NASA-ARC CNRS-LPSP

PERSONNEL RAGENT PI - B. RAGENT PI - J.E. BLAMONT

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTS OF A NEPHELOMETER TO MEASURE THE ENERGY DACKSCATTERED FROM CLOUD PARTICLES. IT USES A PULSED GALLIUM ARSENIDE LASER DIODE TO ILLUMINATE THE CLOUDS. THE ALTITUDE HISTORY OF THE BACKSCATTERED SIGNAL INDICATES THE PRESENCE AND VERTICAL EXTENT OF CLOUDS ALONG THE TRAJECTORIES. COMPANISONS WITH THE NEASUREMENTS FROM THE SMALL PROBES INDICATES THE SPATIAL VARIABILITY OF THE CLOUD STRUCTURE. THE LASER OPERATES AT ABOUT 9000 A. THE EXPERIMENT WEIGHS ABOUT D.6 KG AND USES ABOUT 1.2 W OF POWER.

--- PIONEER VENUS PROBE SH2, SEIFF------

INVESTIGATION NAME- ATMOSPHERE STRUCTURE

ACCESS STATES

NSSDC ID- PIO78PD-01 INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES

PERSONNEL		
PI - A.	SEIFF	NASA-ARC
01 - 5.	SOMMER	NASA-ARC
01 - 0.8.	KIRK	NASA-ARC
01 - R.C.	BLANCHARD	NASA-LARC
01 - R.	TOUNG	U ÖF CALIF, LA
01 + J.	DERR	US GEOLOGICAL SURVEY

BRIEF DESCRIPTIÓN THE INSTRUMENTS FOR THIS EXPERIMENT INCLUDE A THREE-AXIS ACCELEROMETER, PRESSURE SENSORS, AND TEMPERATURE SENSORS. THEY ARE BASED ON THE TECHNOLOGY GEMONSTRATED BY THE PAET VEHICLE (PLANETARY ATMOSPHERE EXPERIMENT TEST R7106-2001). THE MEASUREMENTS ARE USED TO CONSTRUCT A PROFILE OF ATMOSPHERE STATE PROPERTIES FOR THE LARGE PROBE TRAJECTORY FROM THE SUFFACE TO APPROXIMATELY 140 KM ALTITUDE. THEY ARE ALSO USED TO DETERMINE VERTICAL WIND VELOCITY, HORIZONTAL WIND VELOCITY, AND TURBULENCE. BY COMPARING ATMOSPHERE CONDITIONS ALONG THE LARGE PROBE TRAJECTORY WITH THOSE MEASURED BY THE SMALL PROBES, CIRCULATION MODELS OF THE ATMOSPHERE ARE DETERMINED, THE INSTRUMENTS WEIGH ABOUT 1.2 KG AND CONSUME ABOUT 3.4 W OF POWER. BRIEF DESCRIPTION POWER

- PIONEER VENUS PROBE SM2, SUOMI---------

INVESTIGATION NAME- INFRARED RADIOMETER

INVESTIGATIVE PROGRAM CODE SL NSSDC 10+ P1078P0+04

> INVESTIGATION DISCIPLINE(5) PLANETARY ATMOSPHERES AERONOMY

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PERSONNEL		
PI - V.E.	SUCHI	U OF WISCONSIN
OI - J.	LENDBLE	U OF LILLE
01 - L.A.	SRONOVSKY	U OF WISCONSIN
01 - A.	FYNAT	NASA-JPL
01 - G.	DANIELSON	NASA-JPL
01 - M.	HERMAN	U OF LILLE

BRIEF DESCRIPTION THE OBJELTIVES ARE TO LOCATE REGIONS OF RADIATIVE COVERGENCE AND DIVERGENCE AS A FUNCTION OF ALTITUDE AND TO INDICATE THE HEIGHT AT WHICH SOLAR ENERGY IS ABSORBED BY THE ATMOSPHERE. THIS EXPERIMENT USES A SMALL NET FLUX RADIOMETER ON THE PROBE TARGETED TO THE DAYSIDE OF VENUS TO MEASURE THE NET SOLAR FLUX IN THE 0.2 TO 4 MICROMETER REGION. THE TWO PROBES TARGETED TO THE NIGHTSIDE OF THE PLANET CARRY NET INFRARED FLUX SENSORS COVERING THE 1 TO 25 MICROMETER REGION. THE INSTRUMENT WEIGHS ABOUT 0.4 KG AND USES 2.2 W OF POWER.

SPACECRAFT COMMON NAME- PIONEER VENUS PROBE SM3 Alternate names- Pioneer Venus 1978

NSSDC 10- PI078PE

WEIGHT- 75. KG LAUNCH DATE- 08/00/78 Launch Site- cape canaveral, united states Launch vehicle- atlas

SPONSORING COUNTRY/AGENCY United States NASA-055 PLANNED ÖRBIT PARAMETERS ORBIT TYPE- VENUS PROBE PERSONNEL MG - F.D. SC - M.A. PM - C.F. KOCHENDORFER HITZ PS - L. COLIN

BRIEF DESCRIPTION THIS SPACECRAFT IS THE THIRD SMALL PROBE OF THE PIONEER-VENUS MULTIPROBE MISSION. ON THIS MISSION FOUR INSTRUMENTED ATHOSPHERIC ENTRY PROBES ARE CARRIED BY A SPACECRAFT BUS TO THE VICINITY OF VENUS FOR DESCENT THROUGH THE ATMOSPHERE TO THE PLANETARY SURFACE. TWO SMALL PROBES ENTER ON THE NIGHTSIDE, AND DNE SMALL PROBE AND DNE LARGE PROBE ENTER ON THE NIGHTSIDE, AND DNE SMALL PROBE AND DNE LARGE PROBE ENTER ON THE NIGHTSIDE, AND DNE SMALL PROBE AND DNE LARGE PROBE ENTER ON THE NIGHTSIDE, AND DNE SMALL PROBE AND DNE LARGE PROBE ENTER ON THE DAYSIDE OF THE PLANET. THE SPACECRAFT BUS ENTERS THE ATMOSPHERE AND DOTAINS ATMOSPHERIC COMPOSITION DATA UNTIL BURNUP. INVESTIGATIONS EMPHASIZE THE STUDY OF THE STRUCTURE COMPOSITIEN AND NATURE OF THE ATMOSPHERE DOWN TO THE SURFACE, AND OF THE CLOUDS, THE RADIATION FIELD AND ENERGY EXCHANGE IN THE LOWER ATMOSPHERE, AND LOCAL INFORMATION ON THE ATMOSPHERING CIRCULATION PATTERN. A SISTER MISSION, FIONEER-VENUS ORBITER, IS SCHELDULED TO PLACE AN DRBITING SPACECRAFT AROUND VENUS Z WEEKS BEFORE THE PROBES AND ROBISTER PERMIT RELATING SPECIFIC LOCAL MEASUREMENTS TO THE GENERAL STATE OF THE PLANET AND ITS ENVIRONMENT AS OBSERVED FROM ORBIT. BRIEF DESCRIPTION

NASA HEADQUARTERS NASA HEADQUARTERS NASA-ARC

NASA-488

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- PIONEER VENUS PROBE SM3, COUNSELMAN----------

INVESTIGATION NAME- DIFFERTIAL VERY-LONG-BASELINE Interometric tracking

NSSDC ID-	P1078PE-03	INVESTIGATIVE PROGRAM
		INVESTIGATION DISCIPLINE(5) PLANETARY ATMOSPHERES
		METEOROLOGY
		PLANETOLOGY
PERSONNEL		N

CKSAUKEL				
₽Ï − Č.C.	COUNSELMAN	MASS INST		
01 - 1.1.	SHAPIRO	MASS INST		
01 - R.	PRINN	MASS INST	OF TECH	1
01 - J.	CHARNEY	MASS INST	OF TECH	1
01 - G.H.	PETTENGILL	MASS INST	OF TECH	1

BRIEF DESCRIPTION THIS EXPERIMENT INVOLVES APPLYING DIFFERENTIAL VERY-LONG-DASELIME INTERFEROMETRY TECHNIQUES TO THE RADIO SIGMALS FROM THE ENTRY PROBE AND BUS (ORBITING SPACECRAFT) IN ORDER TO INFER OR PLACE UPPER LIMITS ON WIND SPEEDS IN THE LOWER AT MOSPHERE. THESE RESULTS ARE USED IN MOSELING THE CIRCULATION PATTERNS OF VENUS' ATMOSPHERE. DATA TAKEN PRIOR TO PROBE ENTRY ARE USED, IF FEASIBLE, TO INFER CHARACTERISTICS OF VENUS' GRAVITY FIELD FOR USE WITH PROBE ENTRY OPERATIONS AS WELL AS IN LATER SCIENTIFIC EVALUATION.

----- PIONEER VENUS PROBE SM3, RAGENT-----

INVESTIGATION NAME- CLOUD EXTENT, STRUCTURE, AND DISTRIBUTION

NSSDC 10- PIO78PE-02

CODE SL INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES AERONDRY METEORDLOGY

NASA-ARC CNRS-LPSP

INVESTIGATIVE PROGRAM

PERSONNEL RAGENT PI - B. RAGENT PI - J.E. BLAMONT

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT CONSISTS OF A NEPHELOMETER TO MEASURE THE ENERGY BACKSCATTERED FROM CLOUD PARTICLES. IT USES A PULSED GALLIUM ARSENIDE LASER DIODE TO ILLUMINATE THE CLOUDS. THE ALTITUDE HISTORY OF THE BACKSCATTERED SIGNAL INDICATES THE PRESENCE AND VERTICAL EXTENT OF CLOUDS ALONG THE TRAJECTORIES. COMPARISONS WITH THE NEASUREMENTS FROM THE SMALL PROBES INDICATES THE SPATIAL VARIABILITY OF THE CLOUD STRUCTURE. THE LASER OPERATES AT ABOUT 9000 A. THE EXPERIMENT WEIGHS ABOUT 0.6 KG AND USES ABOUT 1.3 W OF POWER.

- PIONEER VENUS PROBE 5M3, SELFF------

INVESTIGATION NAME- ATMOSPHERE STRUCTURE

NS50C ID- P1078PE-01

INVESTIGATIVE PROGRAM CODE SL

INVESTIGATION DISCIPLINE(5) PLANETARY ATMOSPHERES

ERSO	INE	il.	
PI	-	A .	SEIFF
01	-	s.	SOMMER
01	-	Ruda.	BLANCHARD
01	-	D.8.	KIRK
01	-	R.	YOUNG
01	-	J .	DERR

- 11	SA-	ARC		
- N/	SA-	LARC		
N	ASA-	ARC		
U	0.F	CALI	Fr LA	1
0	S GE	OLDG	ICAL	SURVEY

BRIEF DESCRIPTION THE INSTRUMENTS FOR THIS EXPERIMENT INCLUDE A THREE-AXIS ACCELENOMETER, PRESSURE SENSORS, AND TEMPERATURE SENSORS, THEY ARE DASED ON THE TECHNOLOGY DEMONSTRATED BY THE PACT VEHICLE (PLANETARY ATMOSPHERE EXPERIMENT TEST R7106-2001). THE MEASUREMENTS ARE USED TO CONSTRUCT A PROFILE OF ATMOSPHERE STATE PROPERTIES FOR THE LARGE PROBE TRAJECTORY FROM THE SURFACE TO APPROXIMATELY 140 KM ALTITUDE. THEY ARE ALSO USED TO DETERMINE VERT (CAL VIND VELOCITY, HORIZONTAL WIND VELOCITY, AND TURBULENCE. BY COMPARING ATMOSPHERE CONDITIONS ALONG THE LARGE PROBE TRAJECTORY WITH THOSE MEASURED BY THE SMALL PROBES, CIRCULATION MODELS OF THE ATMOSPHERE ARE DETERMINED. THE INSTRUMENTS WEIGH ABOUT 1.2 KG AND CONSUME ABOUT 3.4 W OF POWER. POWER.

-- PIONEER VENUS PROBE SH3, SUDMI------

INVESTIGATION NAME- INFRARED RADIOMETER

NESDE 10- P1078PE-04

CODE SL INVESTIGATION DISCIPLINE(S) PLANETARY ATMOSPHERES AFRONOMY

INVESTIGATIVE PROGRAM

PERSONNEL		
PI - V.E.	SUONI	U OF WISCONSIN
01 - J.	. ENOBLE	U OF LILLE
	FYMAT	NASA-JPL
	SROMOVSKY	U OF WISCONSIN
01 - G.	DANIELSON	NASA-JPL
01 - N.	HERMAN	U OF LILLE

BRIEF DESCRIPTION THE DBJECTIVES ARE TO LOCATE REGIONS OF RADIATIVE CONVERGENCE AND DIVERGENCE AS A FUNCTION OF ALTINDE AND TO INDICATE THE HEIGHT AT WHICH SOLAR ENERGY IS ABSORDED BY THE ATMOSPHERE, THIS EXPERIMENT USES A SMALL NET FLUX RADIOMETER ON THE PROBT. TARGETED TO THE DAYSIDE OF VENUS TO MEASURG THE SOLAR FLUX IN THE 0.2-TO 4-MICROWETER REGION. THE TWO PROBES TARGETED TO THE NIGHTSIDE OF THE PLANET CARY NET INFRARED FLUX SEORS COVERING THE 1- TO 25 MICRUMETLR REGION. THE INSTRUMENT WEIGHS ABOUT 0.4 KG AND USES 2.2 W OF POWER.

SPACECRAFT COMMON J.ME- SAFE Alternate NAMES- AEM-B, Strat Aero and Gas exp Appl expl mission B, Sagm

NSSDC ID- AEM-8

LAUNCH DATE- 07/01.79 HEIGHT- 22. KG LAUNCH SITE- WALLOPS FLIGHT CENTER, UNITED STATES LAUNCH VEHICLE- SCOLT-F

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-0A

PLANNED ORBIT PARAMETERS Orbit type- geocentric Orbit period- 96.6 min Periapsis- 600. km	INCLINATION- 50. DEG Apoapsis- 600. XM
PERSONNEL MG – D.S. DILLER SC - M. TEPPER PM – C.L. WAGNER- JR. PS – R.S. FRASER	NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSFC 1 isa-gsfc

BRIEF DESCRIPTION THE STRATOSPHERIC ALGOOL AND GAS EXPERIMENT (SAGE) SPACECRAFT SERVES AS A SMALL, VERSATILE, LOW- OST PLATFORM CARRYING A SINGLE EXPERIMENT DESIGNED TO DETERMINE THE SPATIAL DISTRIBUTION OF STRATOSCHERIC AEROSOLS AND DZONE ON A GLOBAL SCALE. THE SAGE OBTAINS AEROSOL AND DZONE INFORMATION BY MEASURING THE ATTENUATION OF SOLAR RADIATION BY THE EARTH'S ATMOSPHERE AT FOUR SEPARATE WAVELENGTH'S. THE SPACEFRAFT IS LAUCHED INTO A 600-KM CIRCULAR, SO-DEG INCLINED ORBIT BY A

SCOUT-F. -- SAGE, NFTORMICK-----

INVESTIGATION NAME- STRATOSPHERIC AEROSOL AND GAS EXPERIMENT (SAGE)

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NSSDC ID- AEM-8 -01

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INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(5) UPPER ATMOSPHERE RESEARCH Meteorology

PERSONNEL PI - M.P. MCCORNICK

A CONTRACTOR OF A CONTRACTOR O

PI - M.P. RECORNICK NASA-LARC BRIEF DESCRIPTION THE OBJECTIVES OF THE SYRATOSPHERIC AEROSOL (MS) GAS EXPERIMENT (SAGE) ARE TO DETERMINE THE SPATIAL DISTRIBUTION OF STRATOSPHERIC AEROSOLS AND OZONE ON A GLOBAL SCALE. SPECIFIC OBJECTIVES ARE -- (1) TO LEVELOP A SATELLITE-GASED REMOTE SENSING TECHNIQUE FOR STRATOSPHERIC AEROSOLS AND OZONE (2) TO MAP AEROSOL AND OZONE CONCENTRATIONS ON A TIME SCALE SHORTER THAN MAJOR STRATOSPHERIC CHANGES, (3) TO LOCATE STRATOSPHERIC AEGOSOL AND DZONE CONCENTRATIONS ON A TIME SCALE SHORTER AND TRANSFER PHENOMENA. (5) TO DOSERVE HEMISPHERE DIFFERENCES, AND (6) TO INVESTIGATE THE OPTICAL PROPERTIES OF AEROSOLS AND HASSESS THEIR EFFECTS ON GLOBAL CLIMATE, THE SAGE INSTRUMENT CONSISTS OF A GREGOZIAN TELESCOPE AND A DETECTOR SUBASSEMBLY WHICH MEASURES THE ATTENNISTION OF SOLAR RADIATION AT FOUR NAVELENGTHS (.35, .46, .6, AND 1.0 MICROMETERS) DUMING SOLAR OCCULTATION. AS THE SPACECRAFT EMCRESS FROM THE EARTH'S SNADOW. THE SENSOR SCANS THE EARTH'S ATMOSPHERE FROM THE HORIZON UP, WHICH MEASURES THE ATTENNATION OF SOLAR RADIATION BY DIFFERENT ATMOSPHERIC LAYERS. THIS PROCEDURE IS REPEATED DURING SPACECRAFT SUNSEL. TWO VERTICAL SCANNINGS ARE OBTAINED DURING SACH ORBIT, VITH EACH SCAN REOURING APPROXIMATELY 1 MIN OF TIME TO COVER THE ATHOSPHERE ABOVE THE TROPOSPHERE. THE INSTRUMENT HAS A FIELD OF VIEW OF APPROXIMATELY 1 MIN OF ARC WHICH WILL RESULT IN A VERTICAL RESOLUTION OF LESS THAT 1 %M.

SPACECRAFT COMMON NAMES SAN MARCO-D/L Alternate Names-

NSSOC ID- SM-DL

LAUNCH DATE- 02/00/80 WEIGHT- 200. KG LAUNCH SITE- SAN MARCO PLATFORM, OFF COAST OF KENYA LAUNCH VEHICLE- SCOUT

SPONSORING COUNTRY/AGENCY TTALY CRA NASA-DSS UNITED STATES

PLANNED GRUIT PARAMETERS Gruit Type- Geocentric Gruit Penidd- 95. M Periapsis- 227. Km INCLINATION- 3. DEG APOAPSIS- BOD. KM 95. MIN PERIAPSIS-PERSONNEL NASA HEADQUARTERS NASA HEADQUARTERS NASA-GSFC NASA-GSFC LOGAN SCHMERLING

MG - W. SC - E. PN - A.J. PS - `.W. CAPORALE SPENCES

PS - .W. SPENCER NASA-GSFC BRIEF DESCRIPTION THIS SATELLITE IS A 96.5-CM DIAMETER SPHERE WITH FOUR-THIS SATELLITE IS A 96.5-CM DIAMETER SPHERE WITH FOURA-PAIRS OF ELECTRIC FIELD PROBE SENSORS (OME PAIR ORIENTED ALDNG THE SPACECRAFT SPIN AXIS). AN INTERNAL STRUCTURAL CYLINDER (26-CM DIAM) EXTENDS SLIGHTLY THROUGH THE SPHERE AND IS COINCIDENT WITH THE SATELLITE SPIN AXIS. A 30-CM WIDE BELT AROUND THE SATELLITE EQUATOR, IS DOVENED WITH 1792 SOLAR CELLS THAT, WITH 2 RECHARGABLE BATTERIES, COMPRISES THE POWER SOURCE. THE SATELLITE EMPLOYS PASSIVE THERMAL CONTROL. ATTITUGE DATA ARE PROVIDED BY A SUN SENSOR AND A HAGNETOMETER. A MAGNETI TORQUING SYSTEM IS USED TO CONTROL SPIN RATE AND SPACECRAFT ALTITUDE. A SO-AIN CAPACITY TAPE RECORDER IS DN BOARD, ALONG WITH FIVE EXPERIMENTS, -- (1) DRAG BALANCE, (2) AIRGLON SPECTROMETER, (3) ION VELOCITY, (4) ELECTRIC FIELD METER, AND (5) WIND AND TEMPERATURE. THIS SPACECRAFT IS TO STUDY RELATIONSHIPS BETWEEN SOLAR ACTIVITY AND METEOROLOGICAL PHENOMENA AND TO LOOK FOR LINKS BETWEEN TROPOSPHERIC AND THERMOSPHERIC PROCESSES.

-- SAN MARCO-0/L, BROGLIG------

INVESTIGATION NAME DRAG BALANCE AND AIR DENSITY

NSSOC ID- SH-DL -01

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Atmospheric physics

PERSONNEL PI - L. BROGLIO

NATE RES COUNC ITALY

MARY VERILE STATES

BRIEF DESCRIPTION THE DRAG BALANCE INSTRUMENT, WHICH IS AN INTEGRAL PART OF THE SATELLITE, CONSISTS OF AN INNER MASS, AN ELASTIC ELEMENT, AND AN OUTER SHELL. THE DRAG BALANCE IS THE CONNECTING ELASTIC ELEMENT BETWEEN THE OUTER LIGHT SHELL AND THE INNER HEAVY BODT. THE CENTER OF THE BALANCE IS LOCATED AT THE SATELLITE GEOMETRIC CENTER, OR THAT POINT WHICH IS THE GEOMETRIC CENTER BOTH OF THE INNER BODT AND THE SHELL. THIS INSTRUMENT MEASURES THE RELATIVE TRANSLATIONS BETWEEN THE SHELL AND THE INNER BODT ALONG THREE MUTUALLY ORTHOGONAL AXES. THESE THRE AXES ARF FIXED "D THE BODY, ONE OF THEM BEING COINCIDENT WITH THE POLAR SYMMETRY AXIS OF THE SATELLITE. BEING FIXED TO THE SATELLITE, THE AXIS ROTATES WITH IT IN THE FREE-PRECESSION MOTION AROUND THE CENTER OF GRAVITY. THE BALANCE IS DESIGNED IN SUCH A WAY

THAT THE MAXIMUM TRANSLATION BETWEEN THE SHELL AND THE DRUM IS GENERALLY OF THE GROER OF 0.01 MM. IN MOST CASES THE DRAG FORCE AT THE DRBIT APOGEE IS NEGLIGIBLE. AS A CONSEQUENCE, THE Apogee data are used. To get an in-flight calibration of the Balance. TRUS, the translation of the elastic system is charged into voltages that are amplified and demodulated to obtain CS signals

-- SAN MARCO-07L, HANSON-------

INVESTIGATION NAME- IVI-ION VELOCITY INSTRUMENT (PLANA® Retarding Potential Analyzer)

NSSDC JD- SM-DL -03

Mr. Second

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Particles and fields Ionospheres

PERSONNEL PI - W.B. HANSON

U OF TEXAS, DALLAS

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT IS A PLANAR RETARDING POTENTIAL ANALYZER, DESIGNED TO OBTAIN MEASUREMENTS OF RELATIVE THERMAL-ION VELOCITY, PLASMA DENSITY, AND ION TEMPERATURE. THE ION ANGLE-OF-ARRIVAL CAN DE DETERMINED HT USE IN THE INSTRUMENT DESIGN OF A SQUARE APERTURE COLLIMATOR AND A SPLIT COLLECTOR. TOGETHER WITH KNOWLEDGE OF SPACECRAFT NOTION, THIS ALLOWS COMPUTATION OF THE THREE-DIMENSIONAL THERMAL-ION NOTION ALLOWS THE ORDITAL PATH. PLASMA DENSITY AND TEMPERATURE IS CALCULATED BY INTERPERATION OF THE VOLTAGE-AMPERAGE PROFILE PRODUCED BY THE INSTRUMENT FOR A GIVEN IMPRESSED VOLTAGE PATTERN ON THE ERIOS AND COLLECTOR. ION VELOCITY MEASUMEMENT IS PLANNED ONCE FACH SPACECRAFT SPIN PERIOD (TD S), FURTHER EXPERIMENT DETAILS MAY BE FOUND IN THE SAN MARCO-D PROJECT PLAN.

-- SAN MARCO-D/L, MAYNARD------

INVESTIGATION NAME- 3-AXIS ELECTRIC FIELD

NSSBC ID- SM-DL -05 INVESTIGATIVE PROGRAM CODE 51/CO-0P

INVESTIGATION DISCIPLINE(S) Particles and fields Ionospheres

PERSONNEL PI - N.C. MAYNARD DI - J.P. HEPPNER

NASA-GSFC NASA-GSFC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS FXPERIMENT IS DESIGNED TO OBSERVE THE THREE COMPONENTS F AMBIENT ELECTRIC FIELD OVER THE SATELLITE TRAJECTORY. THREE PAIRS, A PAIR FOR EACH COMPONENTS OF CVLINDRICAL PROBES ARE USED. A BOOY IN A PLASMA ESTABLISHES A POTENTIAL RELATIVE TO THE PLASMA THAT MAINTAINS A CURRENT GALANCE. IF NO CURRENT IS DRAWN FROM THE BODY, ITS POTENTIAL DSPENDS ON THE POTENTIAL DIFFERENCES WITHIN THE PLASMA. FOR EACH COMPONENT, THE FLOATING POTENTIAL (OF EACH OF THE TWO SYMMATRICALLY PLACED PROBES WITH RESPECT 16 THE SPACEERAFT) IS MEASURED. FROM THESE OBSERVATICAS, THE ELECTRIC FIELD CAN BE GEOMETRY. AND MAGNETIC FIELD. TWO PAIRS OF PROBES EXTEND FROM ALS. MORE DETAILS OF THIS EXPERIMENT ARE FOUND IN THE 'SAN MARCO-D PROJECT PLAN.'

--- SAN MARCO-D/L, SCHMIDTKE-----

INVESTIGATION NAME- AIRGLOW-SOLAR SPECTROMETER

NSSDC 10- SM-DL -02 INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Solar Physics Aeronomy ATMOSPHERIC PHYSICS

INST FUR PHYS WELTRAUM

PI -	G.	SCHMIDTKE	INST	FUR	PHYS	WELTRAUM
- 10		FISCHER	INST	FUR	PHYS	WELTRAUM
- 10		KNOTHE	INST	FUR	PHYS	WELTRAUN
- 01 -		MASCHEK	INST	FUR	PHYS	HELTRAUM
- 10	c.	MUNTHER	INST	FUR	PHYS	WELTRAUM

BRIEF DESCRIPTION

PERSONNEL

ALL ACTOR

BRIEF DESCRIPTION THE SENSOR MEASURES THE EQUATORIAL DAY AND NIGHT AIRGLOW, THE SOLAR RADIATION REFLECTED FROM THE SURFACE AND CLOUDS, THE SOLAR RADIATION, AND THE RADIATION OF INTRAPLANETARY AND INTERGALACTIC ORIGIN REACHING THE SATELLITE IN THE SPECTRAL RANGE FROM 7DU TO 20 NM WITH A SPECTRAL RESOLUTION OF 0.7-4 NM. FOUR SPECTROMETERS, 4 GRATINGS, AND 17 BULTIPLIERS ARE USED.

- SAN MARCO-D/L, SPENCER-------

INVESTIGATION NAME- WIND AND TEMPERATURE (NATE)

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Meteorology Planetary Atmospheres ATMOSPHERIC PHYSICS

NASA-GSFC U OF MICHIGAN

PERSONNEL PI - N.W. SPENCER DI - G.R. CARIGNAN

NSSDC ID- SM-DL -D4

DI - G.R. CARIGNAN U OF MICHIGAN BRIEF DESCRIPTION THE OBJECTIVE OF THIS INVESTIGATION IS TO MEASURE THE IM SITU NEUTRAL WINDS, NEUTRAL PARTICLE TEMPERATURES, AND THE CONCENTRATION OF SELECTED GASES. THREE COMPONENTS OF THE WINDS ONE NORMAL TO THE SATELLITE CIRECTION ARE MEASURED. TWO SCANNING BAFFLES, ONE MOVING VERTICALLY IN FRONT OF THE SENSOR. AS NOW BEING EMPLOYED ON SATELLITE ATMOSPHERE EXPLORENCE (AE-CJ, NEUTRAL ATMOSPHERE TARPERATURE EXPERIMENT (NATE), AND ONE NOVING HORIZONTALLY MYAR.Y IDENTICAL IN CONCEPT TO THE VERTICALLY SCANNING BAFFLE AND INCORPATED ON THE NATE FOR AE-D AND -E, UISED. THE WIND NORMAL TO THE SATECRAFT VELOCITY VECTOR ARE COMPUTED FROM MEASURENENTS OF THE ANOULAR RELATIONSHIP BETWEEN THE MEUTRAL PARTICLE STREAM VAND THE SATELLITE DIRECTION IS MEASURED DIRECTIVE BY THE RETARDING MEDIAPONENTS. THE MEUTRAL PARTICLE STREAM VAND THE SATELLITE DIRECTION IS MEASURED DIRECTIVE BY THE RETARDING MEASUREMENTS THE WIND NORMAL TO THE FRANCING THE REQUIRED RETARDING POTENTIAL. FROM THESE QUANTITATIVE MEASUREMENTS THE WIND VECTOR IS COMPUTED. THE TEMPERATURE EMPRASIZED THAT THE WIND AND THESE QUANTITATIVE MEASUREMENTS THE WIND AND THE SATE ANS SPECT THE REQUIRED RETARDING POTENTIAL. FROM THESE MAINING OF THE REQUIRED NETARDING POTENTIAL. FROM THESE QUANTITATIVE MEASUREMENTS THE WIND AND THE TEMPERATURE MASSING AND THE SATELLITE DIRECTION IS MASSING DIRECTIVES THE BASIS FOR THE TEMPERATURE MEASUREMENTS FOR THIS MISSION. IT SHOULD BE TEMPERATURE MEASUREMENTS FOR THIS MISSION. IS SHOULD BE PERFORMED IN THE SAME OPERATING MODE. FOR COMPOSITION MEASUREMENTS. THE ROM ANS SPECTNOMETER IS USED IN A SEPARATE OPERATING MODE DESIGNED FOR THIS PURPOSE.

SPACECRAFT COMMON NAME- SAN MARCO-D/M Alternate Names-

NSSDC ID- SM-DM

PL.

LAUNCH DATE- 09/00/79 WEIGHT-Launch Site- San Marco Platform, off coast of lenya Launch Vehicle- Scout KG

SPONSORING	COUNTRY/AGENCY	
UNITED	STATES	NA 5A-055
ITALY		CRA

.ANNED ORBIT PARAMETERS Drbit type- geocentric Drbit period- 480. Min Periapsis- 420. Km	INCLINATION- 3. DEG Apoapsis- 27000. Km	

PERSONNEL PM - A.J. CAPORALE

BRIEF DESCRIPTION THIS IS A SMALL SPACECRAFT BUILT AROUND A SINGLE EXPERIMENT. ITS GEMERAL APPEARANCE IS THAT OF TWO CYLINDERS WITH A COMMON AXIS, ONE WITH DIAMETER OF 70 CM AND HEIGHT OF 40 CM, WITH THE SECOND CYLINDER EXTENDING FROM THE END OF THE FIRST FOR AN ADDITIONAL 42-CM AND WITH A DIAMETER OF ADDUT 32 CM. THE SURFACE OF THE LARGER CYLINDER IS COVERED WITH 1296 SOLAR CELLS THAT FEED 2 RECHARGABLE BATTERY PACKS. THE SPACECRAFT IS SPIN STABILIZED ALONG THE AXIS OF ITS CYLINDICAL STRUCTURE, AND SCANNING OPERATION FOR THE INSTRUMENT IS DEPENDLAT UPON THE SATELLITE SPIN. THE PURPOSE OF THIS SPACECRAFT IS TO MONITOR CLOUD COVER AND 020NE CONTENT. WITH ONE-THIRD THE PERIOD OF AN EARTH-SYNCHRONOUS, OR STATIONARY, SATELLITE, OBSERVATIONS MAY BE REPEATED THREE TIMES PER DAY. FURTHER DETAILS ON THIS SPACECRAFT CAN BE FOUND IN THE 'SAN MARCO D PROJECT PLAN.'

--- SAN MARCO-D/N, BUONGLORNO-----

INVESTIGATION NAME- IR RADIOMETER FOR MONITORING CLOUD COVER AND DZONE CONTENT

NSSOC 10- SM-DM -01

INVESTIGATIVE PROGRAM Earth observations

INVESTIGATION DISCIPLINE(S) METEOROLOGY Atmospheric physics

PERSONNEL BUONGIORNO PI

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NASA-GSEC

BRIEF DESCRIPTION THIS RADIOMETER EXPERIMENT IS DESIGNED TO MONITOR CLOUD COVER AND 020NE CONTENT FROM A NEAR-EQUATORIAL ORBIT. A HIGH-RESOLUTION (25-KM INSTANTANEOUS FIELD OF VIEW IFOV) AND LOW-RESOLUTION (200-KM IFOV) MODE ARE BOTH AVAILABLE. EITHER MODE IS OPERATED THROUGH A COMMON TELESCOPE, FILTER-WHEEL, AND SCAN-MIRROR SYSTEM. THERE ARE THREE HG, CD, TE DETECTORS. THE BAND, THE LOW-RESOLUTION (LR) MULTISPECTRAL MAPPING OPERATES BAND, THE LOW-RESOLUTION LL? MULTISPECTRAL MAPPING OPERATES IN THE SAME BAND (CHANNEL 3) PLUS SIX OTHER BANDS BETWEEN 8.85 AND 15.01 MICROMETERS, BANDWIDTH FOR EACH OF THESE SIX BANDS SIS LESS THAM. 35 MICROMETERS, AND THE LOW EDGE OF THE BANDS UITHS ARE AT 8.85, 9.59 (020ME), 13.81, 14.14 (CO2), 14.59 (CO2) AND 14.90 (CO2) MICROMETERS, IN THE LR MODE, TWO CHANNELS ARE SELECTED FOR SIMULTANEOUS DESERVING. SCANNING IS ACCOMPLISHED BY SPACEGRAFT SPIN PLUS MIRORS STEPING ONCE EACH REVOLUTION. ONE FRAME REQUIRES 6.5 (IMAGERY) TO 7.5 MIN (SOUNDING, AND CALIBRATION OCCURS ONCE EACH MARIG-D.'

SPACECRAFT COMMON NAME- SCATHA Alternate Names- Sesp P78-2a, P78-2 Stp P78-2

NSSDC ID- SCATHA

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LAUNCH DATE- 01/00/79 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- DELTA WEIGHT- 343. KG

SPONSORING COUNTRY/AGENCY UNITED STATES UNITED STATES UNITED STATES	DOD-USAF NASA-OSS DOD-NAVY	
PLANNED ORBIT PARAMETERS		

ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 1440. MIN PERIAPSIS- 27850. KM Z.50 DEG INCLINATION- 2.50 APDAPSIS- 4278D. KM PERSONNEL

NONE ASSIGNED None Assigned Durrett None Assigned NG -SC -PM - 3. USAF-SAMSO PS

THE AND FOR THE AND FOR AND PARAMETERS AND FOR

- SCATHA, AGGSON--

INVESTIGATION NAME- ELECTRIC FIELD DETECTOR

INVESTIGATIVE PROGRAM NSSDC ID- SCATHA -05 CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Particles and fields IONOSPHERES

PERSONNEL PI - T.L. AGGSON

NASA-GSFC

BRIEF DESCRIPTION THIS EXPERIMENT (SC 10 USAF NO.) MEASURES THE ADSOLUTE POTENTIAL BETWEEN THE SATELLITE AND THE PLASMA USING A 100-M IP-TO-TIP DIFOLE ANTENNA. THE ANTENNA BLEMENTS ARE COPPER-BERYLLIUM STEM EXTENDABLE ANTENNAS AND ARE 0.64 CM TUBES WHEN EXTENDED. THE ANTENNA ALEMENTS ARE INSULATED EXCEPT FOR A WHEN EXTENDED. THE ANTENNA ALEMENTS ARE INSULATED EXCEPT FOR AND RETRY AT THE END. THUS FOR AMBIENT PLASMA CONDITIONS, THE CONDUCTING SEGMENTS OF THE ANTENNA ARE POSITIONED OUTSIDE THE SWEATH REGION. DC ELECTRIC FIELDS FROM 0.1 TO 20 MU/M ARE MEASURED AND AC FIELDS IN THE FREQUENCY RANGE FROM 3 TO 200 HZ ARE MEASURED FROM 1 TO 10D MICROVOLTS/M.

CODE ST

12

-- SCATHA, BLAKE-INVESTIGATION NAME- ENERGETIC PROTON DETECTOR

INVESTIGATIVE PROGRAM NSSDE ID- SCATHA -14

INVESTIGATION DISCIPLINE(S) PARTICLES AND EIELDS

PERSONNEL PI - J.O. BLAKE AFROSPACE CORP

BRIEF DESCRIPTION THIS EXPERIEMNT (PART OF SC2) MEASURES THE PROTON FLUX IN THE ENERGY RANGE FROM 20 TO 1000 KEV IN DIFFERENTIAL CHANNEL PLUS AN INTEGRAL FLUX IN THE RANGE FROM 1 TO 2 MEV. THE EXPERIMENT IS FUNDED DT SAMSO.

-- SCATHAF CHAPPELL-----

INVESTIGATION NAME- LIGHT ION MASS SPECTROMETER

INVESTIGATIVE PROGRAM NSSDC ID- SCATHA -09

INVESTIGATION DISCIPLINE(5) Particles and fields Space plasmas

CODE ST/CO-OP

PERSONNEL PI - C.R. CHAPPELL 01 - D.L. REASONER

NASÀ-MSFC Nasa-Msfc

BRIEF DESCRIPTION THIS EXPERIMENT (SC 7) MEASURES THE ION DENSITY, TEMPERATURE, AND DRIFT. THE LIGHT ION SPECTROMETER IS BASICALLY THE SAME INSTRUMENT FLOWN ON OGO 5, EXCEPT THAT ONE ADDITIONAL SENSOR IS ADDED, AND RETARDING POTENTIAL GRIDS ARE INCORPORATED SO THAT PLASMA DRIFT CAN BE MEASURED.

INVESTIGATION NAME- ELECTRON GUN-ION GUN

INVESTIGATIVE PROGRAM NSSDC ID- SCATHA -07

CODE ST

INVESTIGATION DISCIPLINE(S) Magnetospheric Physics

PERSONNEL PI - H.A. COHEN

USAF GEOPHYS LAB

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--- SCATHA, DEFOREST-----

INVESTIGATION NAME- SAN DIEGO PARTICLE DETECTOR

INVESTIGATIVE PROGRAM CODE ST/ONR

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS SPACE PLASMAS

PERSONNEL DEFOREST S.E.

NSSDE ID- SCATHA -11

U OF CALIF, SAN DIEGO

Attorner

BRIEF DESCRIPTION THIS EXPERIMENT (SC 9) MEASURES THE ELECTRON AND ION DIFFERENTIAL FLUX, ENERGY, AND ANGLE RESOLUTION. THIS PARTICLE DETECTOR MEASURES ENERGY SPECTRA IN 64 STEPS BETWEEN I AND 70,000 EV. THE ACCEPTANCE ANGLE OF THE TELESCOPE IS 5 DEG HALF-ANGLE. THIS SAME TYPE INSTRUMENT FLEW ON THE ATS 5 AND ATS 6 SPACECRAFT. THE EXPERIMENT IS FUNDED BY ONR.

-- SCATHA, FENNELL-----

INVESTIGATION NAME- SPACECRAFT SHEATH FIELDS DETECTOR

NSSDC ID- SCATHA -D6 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

PERSONNEL PI - J.F. FENNELL BRIEF DESCRIPTION

AEROSPACE CORP

BRIEF DESCRIPTION THE EXPERIMENT (PART OF SC2) CONTAINS THREE ELECTROSTATIC ANALYZERS -- TWO ARE MOUNTED 180 DEG APART ON BOOMS, AND THE THIRD IS MOUNTED ON THE SPACECRAFT BODY. THE THREE SENSORS HAVE THE SAME LOOK DIRECTION, SO THAT IF THERE WERE NO ELECTRIC FIELDS ADOUT THE SATELLITE, ALL THREE SENSORS MOULD MEASURE THE SAME FLUX, SPECTRUM, AND ANGULAR DISTRIGUTION OF ELECTRONS AND PROTONS IN THE ENERGY RANGE 1 TO TUDO EV. AN OFTICAL BATA TRANSMISSION SYSTEM IS USED TO TELENETER DIGITAL DATA FROM THE ANALYZERS TO THE SATELLITE DATA PROCESSING SYSTEM TO MAINTAIN ELECTRICAL ISDLATION AT THE ANALYZERS. THE FOTENTIAL OF THE SPHERES TRELATIVE TO THE SATELLITE REFERENCE POINTIAL OF THE SPHERES. POTENTIAL MEASUREMENTS AT THREE POINTIONS IN THE PLASMA SHEATH ARE OBTAINED. THE EXPERIMENT IS FUNDED BY SAMSO.

-- SCATHA, JOHNSON-----

INVESTIGATION NAME- ENERGETIC IGN SPECTROMETER

NSSOC ID- SCATHA -13 INVESTIGATIVE PROGRAM

> INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS SPACE PLASMAS

PERSONNEL PI - R.L. JOHNSON

LOCKHEED PALO ALTO

BRIEF DESCRIPTION THIS EXPERIMENT MEASURES THE FLUX OF IONS, WITH MASS RANGE 1 TO 150 U, IN THE ENERGY RANGE FROM 100 TO 20,000 EV. THE SENSOP IS AN ENERGETIC ION SPECTROMETER.

CODE ST

-- CATHAZ KOONS--

INVESTIGATION NAME- SPACECRAFT SURFACE POTENTIAL MONITOR

NSSDC ID- SCATHA -01 INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) MAGNETOSPHERIC PHYSICS

PERSONNEL PI - H.C. KOONS

AEROSPACE CORP

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE FLIGHT INSTRUMENT (PART OF SCI) MEASURES THE SURFACE POTENTIAL OF 20 DIFFERENT TYPES OF MATERIALS RELATIVE TO SOME COMMON REFERENCE POINT ON THE SATELLITE. THE SAMPLE IS MOUNTED ON ONE SURFACE OF A DIELECTRIC SLAB, AND A CONDUCTING PLATE IS MOUNTED ON THE OTHER SURFACE. THE CAPACITANCE OF THIS CONFIGURATION IS ABOUT 250 MICRO-MICRO-FARADS. THE CONOUTING PLATE IS ATTACHEC TO THE REFERENCE POINT THROUGH A 0.25-MICRO-FARAD CAPACITOR. THE TWO CAPACITORS CONSTITUTE A 1000 TO 1 VOLIAGE DIVIDER BETWEEN THE SENSOR SURFACE AND THE REFERENCE POINT. SOME OF THE MATERIALS USED ARE -- SILICON AND CARBON CLOTH FABRIC WITH AND WITHOUT INTERNOVEN CONDUCTING MIRES SVER MULTILAYER INSULATION, SOLAR CELL COVER GLASSES, TWO BLACK PAINTS WITH DIFFERENT CONDUCTIVITY, DNE STANDARD WHITE PAINT AND ONE CONDUCTING WHITE PAINT, GOLD CREFERENCE, GUARZZ, ALUMINUM-TWO SURFACE FINISHES, AND MYLAR MULTILAYER. INSULATION, SITYTEEN OF THE SAMPLES ARE PLACED ON THE SIDES OF THE SATELLIFE AND RATED IN AND OUT OF SUNLIGHT. TWO SAMPLES EACH ARE LOCATED AT THE ENDS IN THE SHADOWS, THIS EXPERIMENT IS FUNDED BY SAMSD.

--- SCATHA, KOONS-------

INVESTIGATION NAME- CHARGING ELECTRICAL EFFECTS ANALYZER

NSSDC ID- SCATHA -02

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

INVESTIGATIVE PROGRAM CODE ST

PERSONNEL PI - H.C. KOONS

BRIEF DESCRIPTION

AEROSPACE CORP

n na sa sa ƙwalar ƙa

BRIEF DESCRIPTION THE FLIGHT EXPERIMENT (PART OF SCI) MEASURES ELECTROMAGNETIC INTERFERENCE IN THE RANGE 100 TO 1.67 M2. THREE SEPARATE INSTRUMENTS WILL BE USED. THE FREQUENCY RANGE FROM 0.1 to 10 MHZ IS MEASURED WITH A SWEPT FREQUENCY ANALYZER. THE FREQUENCY BAND 10D TO 5D KH2 IS MONITORED BY A 10-CHANNEL, FIXED-FREQUENCY ANALYZER. THE CAPABILITY ALSO EXISTS TO TELEMETER BRANDBAND, UNDETECTED SIGNALS FROM SENSORS IN THE FREQUENCY BAND 10D TO 5000 MZ. THE ANALYZER SAMPLES SIGNALS FROM A. VARIETY OF SENSORS, INCLUDING SOLAR ARRAY BUS, POWER LINE BUS, TYPICAL COMMAND LINE, EXTERNAL SHORT DIPOLE, AND SAMSO.

nan<mark>ta</mark>nan Markati

- SCATHA, LEDLEY-----

INVESTIGATION NAME- MAGNETIC FIELD MONITOR

NSSOC ID- SCATHA -08 INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

NASA-GSEC

USAF MATERIALS LAB Aerospace corp

PERSONNEL PT - B.G. LEDLEY

BRIEN DESCRIPTION THIS EXPER

BRIE! DESCRIPTION THIS EXPERIMENT (SC 11) OBTAINS TRIAXIAL "EASUREMENTS OF THE GEOMAGNETIC FIELD. A BGOM-MOUNTED (ON A 7-M BOOM) FLUXGATE Magnetometer is used. Time resolution is four vector per S. Field Resolution is 0.4 knotessla for a dynamic range of +500 Nangtessla per axis. Sensor response is from 0C to 70 Hz.

INVESTIGATION NAME- QUARTZ CRYSTAL MICROBALANCES IN Retarding potential analyzers

NSSDC ID- SCATHA -03 INVESTIGATIVE PROGRAM

CODE ST INVESTIGATION DISCIPLINE(S) Atmospheric physics

PERSONNEL PI - W_L. LEHN DI - D.F. HALL

BRIEF DESCRIPTION

BRIEF DESCRIPTION IN THIS EXPERIMENT (ML12) TWO QUART2 CRYSTAL MICROBALANCES ARE PLACED IN RETARDING POTENTIAL ANALYZERS, WITH ONE MICROBALANCE-ANALYZER SET NOUNTED ON THE SATELLIFE SIDE, AND THE OTHER SET PLACED ON A SPACECRAFT END MAINTAINA IS CONTINUOUS SHADOW. THE RETARDING POTENTIAL ANALYZER IS USED TO EXCLUDE IONS FROM THE MICROBALANCE AND TO MAINTAIN A ZERO ELECTRIC FIELD CONDITION AT THE SENSOR. TO DETERMINE THE DEPENDENCE OF CONTAXINATION RATE UPON SURFACE CHARGE, MEASUREMENTS ARE MADE WITH AND WITHOUT THE RETARDING POTENTIAL BIAS. THE QUARTZ SENSORS HAVE AN ACTIVE TEMPERATURES FROM -60 TO 100 DEG C.

- SCATHA, LEHN---------

INVESTIGATION NAME- THERMAL CONTROL SAMPLE MONITOR

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) PLANETARY PHYSICS

PERSONNEL PI - W.L. LEHN

BRIEF DESCRIPTION

NSSDC ID- SCATHA -04

US AIR FORCE

BRIEF DESCRIPTION THIS EXPERIMENT EVALUATES THE PERFORMANCE OF THERMAL CONTROL MATERIALS AS A FUNCTION OF ORB.T CONTAMINATION CONDITIONS. THE SENSOR MEASURES THE FACKFACE TEMPERATURE OF EIGHT THERMAL CONTROL MATERIAL SAMPLES. THE INSTRUMENTS ARE POSITIONED CONTIGUOUS WITH THE QUARIZ CRYSTAL MONITORS. IT IS POSSIBLE TO HEAT THE SAMPLES AND TO PURGE CONTAMINANTS WHICH FREEZE OUT ON THE YEST SURFACE.

- SCATHA, PAVEL-----

INVESTIGATION NAME- RAPID SCAN PARTICLE DETECTOR

NSSDC ID- SCATHA -12

CODE ST

PARTICLES AND FIELDS

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INVESTIGATIVE PROGRAM

PERSONNEL PI - A. PAVEL

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USAF GEOPHYS LAB

BRIEF DESCRIPTION THIS EXPERIMENT (SCS) EMPLOYS ELECTROSTATIC ANALYZERS AND SOLID STATE SPECTROMETERS TO MEASURE THE ELECTRON AND ION DIFFERENTIAL FLUX. FOR ELECTRON AND PROTOM FLUXES, THIS RAPID SCAN PARTICLE DETECTOR PROVIDES FAST THE RESOLUTION, POSSIBLY WITHIN 1 MS. TO OBTAIN SUFFICIENT COUNTING RATES, THE INSTRUMENT HAS A 15-DEG HALF-COME ANGLE ACCEPTANCE, AND THE ENERGY SPECTRUM IS MEASURED IN ONLY FOUR STEPS.

-- SCATHA, REAGAN------

INVESTIGATION NAME- HIGH-ENERGY PARTICLE DETECTOR

INVESTIGATIVE PROGRAM NSSDC ID- SCATHA -15

CODE ST/ONR INVESTIGATION DISCIPLINE(S) High Energy Astrophysics

PERSONNEL PI - J.B. REAGAN LOCKHEED PALO ALTO

BRIEF DESCRIPTION THIS EXPERIMENT (SC 3) MEASURES THE ELECTRON FLUX IN THE D.3 TO 2.1 MEV RANGE AND THE PROTON FLUX IN THE 1 TO 10D MEV RANGE AND ALPHA PARTICLES FROM 6 TO 6D MEV. A HIGH-ENERGY PARTICLE SPECTROMETER IS USED TO DETERMINE FLUX AND PITCH ANGLE DISTRIBUTIONS.

----- SCATHA, SAGALYN-----

INVESTIGATION NAM' - PLASMA PROBE

INVESTIGATIVE PROGRAM Code \$t NSSDC TD- SCATHA -10

- R.C. SAGALYN

INVESTIGATION DISCIPLINE(S) Particles and fields

USAF GEOPHYS LAB

BRIEF DESCRIPTION THE PLASMA PROBE EXPERIMENT (SC6) MEASURES THE ELECTRON DENSITY IN THE RANGE 1.0E-1 TO 1.0E+4 PER CM CUBED AND TEMPERATURE FOR ELECTRONS IN THE RANGE 0 TO 100 EV. THE SENSOR INCLUDES TWO GRIDDED PROBES, ONE MOUNTED ON A 3-M. INSULATED BOOM AND THE OTHER BODY MOUNTED ON A CONDUCTING SURFACE.

SPACECRAFT COMMON NAME- SEASAT-A Alternate Names- Ocean Dynamics Sat-A, sea Satellite-A

NSSOE ID- SEAST-A

PERSONNEL

WEIGHT- 1800. Ku LAUNCH DATE- 05/17/78 Launch Site- Vändenberg AFB, united States Launch Vehicle- Atlas

SPONSORING COUNTRY/AGENCY NASA-0A UNITED STATES

PLANNED ORBIT PARAMETERS Orbit type- geocentric Druit period- 100.2 Min Periapsis- 775. Km 108. DEG INCLINATION-APOAPSIS-775. KH PERSONNEL NG - S.W. MCCANDLESS, JR. PM - W.L. GIBERSON PS - J.A. DUNNE NASA HEADQUARTERS NASA-JPL NASA-JPL

NSSOC ID- SEAST-A-04

BRIEF DESCRIPTION THE OCEAN. DYNAMICS SATELLITE (SEASAT-A) IS DESIGNED TO PROVIDE MEASUREMENTS OF WAVE HEIGHT AND DIRECTION SPECTRUM, SURFACE WIND SPEED AND DIRECTION SEA SURFACE TOPOGRAPHY AND HIGH RESOLUTION RADAR AND INFRARED IMAGERY OF SELECTED AREAS OF THE OCEAN. THE INSTRUMENT PAYLOAD BEING CONSIDERED CONSISTS COMPRESSED PULSE RADAR ALTIMETER, COMERED STATHETIC APERTURE IMAGING RADAR, MICROWAVE WIND SCATTEROMÉTER, SCANNING MULTIFREQUENCY MICROWAVE RADIOMETER, AND INFRARED RADIOMETER, SOME OF THE ACCURACIES EXPECTED ARE DISTANCE DETWEEN SPACECRAFT AND OCEAN SURFACE TO 10 CH, WIND SPEEDS TO 6.6 FPS, AND SURFACE TEMPERATURES TO 1 DEG C.

-- SEASAT-A, MCLAIN-----

INVESTIGATION NAME+ SCANNING VISUAL/INFRARED RADIOMETER

INVESTIGATIVE PROGRAM CODE ESE

INVESTIGATION DISCIPLINE(S) Meteorology Oceanography

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11	-		BERNSTEIN
TH	-	0.K.	HUH
TM	•	W.L.	BARNES
TM	-	F.H.	ANKOAICH
TH	-	X.D.	FELLERMAN

NOAA-NESS SCRIPPS INST OCEANOGR Louisiana State U NASA-GSFC Research Triangle Inst NASA-GSEC

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BRIEF DESCRIPTION THE SCANNING VISIBLE-IR RADIJMETER (SR) EXPERIMENT (1) OBTAINS IMAGES OF VISIBLE AND THERMAL TR EMISSION FROM DCEAN, COASTAL, AND ATMOSPHERIC FEATURE: IN SUPPORT OF THE OTHER EXPERIMENTS AND (2) IDENTIFIES CURRENTS AND STORMS. THIS SENSOR, ORIGINALLY FLOWN ON THE ITOS SERIES SPACECRAFT, CONSISTS OF TWO SCANNING RADIOMETERS, A DUAL SR PROCESSOR AND TWO SR RECORDERS. THE RADIOMETER MEASURES REFLECTED RADIATION FROM THE EARTH/ATMOSPHERE SYSTEM IN THE 0.52- AND 0.73-MICROMETER BAND DURING THE DAY AND EMITTED RADIATION FROM THE EARTH ANL ITS ATMOSPHERE IN THE 10.5- TO 12.5-MICROMETER REGION DURING THE DAY AND NIGHT.

- SEASAT-A, PIERSON-

INVESTIGATION NAME- HICROWAVE WIND SCATTEROMETER

INVESTIGATIVE PROGRAM NSSOC ID- SEAST-A-03 CODE ESE

INVESTIGATION DISCIPLINE(%) Meteorology

	CUNY INST MAR+ATMOS SC
PIERSON	
5PANTHAM	NASA-LARC
	NOAA-NWS
	NDAA
BAER	
HALBERSTAN	NASA-JPL
	NASA-LARC
	U OF KANSAS
MOORE	D OF KANSAS
	PIERSON GRANTHAM FLITTNER Baer Halberstam Jones, JR. Moore

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BRIEF DESCRIPTION THE MICROWAVE WIND SCATTEROMETER EXPERIMENT IS DESIGNED TO USE AN ACTIVE RADAR SYSTEM TO MEASURE WIND SPEED AND DIRECTION. THE INSTRUMENT, DEVELOPED FROM THE SKYLAB EXPERIMENTAL SCATTEROMETER, DETERMINES WIND DIRECTION WITHIN 20 DEG AND WIND SPEED FROM LESS THAN 4 METERS/S TO GREATER THAN 26 METERS/S WITH AN ACCURACY OF 2 METERS/S. THE SCATTEROMETER TAKES MEASUREMENTS OVER TWO 460 KM-UDE SWATHS EQUALLY DISPLACED ABOUT THE NADIR OF 235 KM. A HIGH WIND SWATH ADDS AN ADDITIONAL 260 KM TO EACH SIDE.

-- SEASAT-A, ROSS---

INVESTIGATION NAME- SCANNING MULTICHANNEL MICROWAVE Radiometer (SMMR)

NSSDC ID- SEAST-A-OS

INVESTIGATIVE PROGRAM

INVESTIGAT IN DISCIPLINE(S) OCEAN/

PERSONNEL TL - D.8.	2055	NGAA-ERL
TM -	REINHARDT	NOAA
	SHERMAN, III	NGAA-NESS Nasa-JPL
TM - F.T. TM - J.	BARATH Vaters	NASA-JPL
	HOLLINGER	US NAVAL RESEARCH LAB

- J. - J.P. - T.T. - N. - C.T. - W.J. WILBEIT, JR. NASA-GSF NASA-WFC HUANG SWIFT CAMPBELL TM TM TM NASA-LARC US GEOLOGICAL SURVEY CUNY INST MAR+ATMOS SC CARDONE BRIEF DESCRIPTION THE PRIMARY PURPOSE OF THE SCANNING MULTICHANNEL THE PRIMARY PURPOSE OF THE SCANNING MULTICHANNEL THE PRIMARY PURPOSE OF THE SCANNING MULTICHANNEL MICROWAVE RADIOMETER EXPERIMENT IS TO OBTAIN AND USE OCEAN MOMENTUM AND ENERGY-TRANSFER PARAMETERS ON A NEARLY ALL-WEATHER OPERAYIONAL BASIS. WINOS, WATER VAPOR, LIQUID WATER CONTENT, AND MEAN CLOUD DROPLET SLIZE, ALL AT LOW ALTITUDES, ARE PARAMETERS WHICH ARE DERIGHTNESS TEMPERATURES ARE OBSERVED DETERMINED. MICROWAVE BRIGHTNESS TEMPERATURES ARE OBSERVED MITH A 10-CHANNEL (FIVE-FREQUENCY OUAL POLARIZED) SCANNING RADIOMETER OPERATION AT 0.8-, 1.4-, 1.7-, 2.8-, AND 4.6-CH MAVELENGTHS (37, 21, 18, 10.60, AND 6.633 GHZ). THE ANTENNA IS A PARABOLIC REFLECTOR OFFSET FROM NADIR BY 0.73 RAD. MOTION OF THE ANTENNA REFLECTOR FOULDES OBSERVATIONS FROM WITHIN CONTCAL VOLUME ALONG THE GROUND TRACK OF THE SPACECRAFT. THIS SAME EXPERIMENT IS ON NIRBUS-G.

- SEASAT-A, SMITH, III------

INVESTIGATION NAME- COMPRESSED PULSE RADAR ALTIMETER (RA)

NSSDC ID- SEAST-A-01

CODE ESE INVESTIGATION DISCIPLINE(S)

NAVIGATION METEOROLOGY

INVESTIGATIVE PROGRAM

TM - B.H. TM - TM - J.J. TM - TM - E.M.	SMITH, III Chovitz Townsend McGoogan Byrne Gaposchkin Leonibus Yapleë Comen	USN SURF WEAPONS CNTR Noaa-Nos Nasa-WFC Noaa Sao US Naval Research Lab US Naval Research Lab US Naval Research Lab
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BRIEF DESCRIPTION THE COMPRESSED PULSE RADAR ALTIMETER EXPERIMENT (1) THE COMPRESSED PULSE RADAR ALTIMETER EXPERIMENT (1) MEASURES THE ALTITUDE BETWEEN THE SPACECRAFT AND THE OCEAN SURFACE AND (2) MEASURES WAVE HEIGHT. THE ALTIMETER, EXPERIMENT S-193 (NSSDC 73-027A-20), AND IS SIMILAR TO THE ALTIMETER FER ACCURATE VERSION OF THE SKYLAB RATAS ALTIMETER, EXPERIMENT S-193 (NSSDC 73-027A-20), AND IS SIMILAR TO THE ALTIMETER THAT FLEW ON GEOS-C. THE ALTIMETER PRECISION OF PLUS OR MINUS 10 CM ALLOWS TIME VARYING FEATURES SUCH AS TIDES, WIND PILE-UP, AND STORN SURGES TO BE SENSED AND IDENTIFIED. IT IS ALSO CAPABLE OF LOCATING ANG MAPPING OCEAN SURFACE CURRENTS WITH SPEEDS OF SO TO 50 CM/S OR GREATER, BECAUSE THE SLOPE OF THE SURFACE IS PROPORTIONAL TO THE SURFACE SPEED. THE MEASUREMENT OF WAVE HEIGHT, WHICH IS REQUIRED TO OBTAIN A TO-CM PRECISION IN ALTITUDE, CAN BE COMBINED WITH SURFACE WIND MEASUREMENTS TO DETERMINE SEA STATE.

----- SEASAT-A, TELEKI------

INVESTIGATION NAME- COHERENT SYNTHEILC APERTURE IMAGING Radar (SAR)

INVESTIGATIVE PROGRAM Earth observations NSSDC ID- SEAST-A-02

INVESTIGATION DISCIPLINE(S) NAVIGATION RETEOROLOGY

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TL - P.G.	TELEKI	US GEOLOGICAL SURVEY
TM - D.B.	ROSS	NOAA-ERL
		US GEOLOGICAL SURVEY
TM ← ¥.J.		
TH - A.	100M15	NASA-JPL
		NA5A-JPL
TM - W.E.		NASA-JPI.
- 18 - F.T.	BARATH	
TM -	RODGERS	NASA-JPL
	RIFENACH	NOAA-ERL
78 - C.L.		NOAA-NESS
TM - J.W.	SHERMAN, III	
	LTEWART	SCRIPPS INST OCEANOGR
TM - R.		ENVIRON RES INST OF MI
TM - J.	LELENKA	
TH -	SHEMDIN	NASA-JPL
17 -	SHEREIN	

BRIEF DESCRIPTION. THE IOHERENT, SYNTHETIC APERTURE, IMAGING RADAR FXPERIVENT IS DESIGNED TO USE WAVE PATTERN AND DYNAMIC BEHAVIOR INFORMATION TO OBTAIN IMAGES OF THE OCEAN. THE INSTRUMENT, FLOWN ON APOLLO 17 AS THE APOLLO LUNAR SOUNDER, YIELDS IMAGES OF WAVES WINDSE WAVE LENGTH IS IN THE RANGE OF 50 TO 1000 METERS AND CAN DETERMINE WAVE DIRECTION WITHIN 20 DEG WITH THE POSSIBILITY DF A 180 DEG AMBIGUITY FOR ONE-SIDE IMAGES. WAVE HEIGHT CAN ALSO BE DETERMINED FROM THE DATA FOR FULLY DEVELOPED SEAS. THE IMAGING RADAR CAN FUNCTION THROUGH CLOUDS AND HOMINAL RAIN TO PROVIDE WAVE PATTERNS NEAR SHORELINE AND HIGH-RESOLUTION PICTURES OF ICE, OIL SPILLS, CURRENT PATTERNS, AND SIMILAR FEATURES.

SPACECRAFT COMMON NAME- SEASAT-B Alternate Names- gcean dynamics sat-b, sea satellite-b

NSSDC ID- SEAST-B

WEIGHT- KG LAUNGH DATE- 1981 LAUNGH SITE- VANDENBERG AFB, UNITED STATES LAUNCH VEHICLE- ATLAS

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-0A

PLANNED ORBIT PARAMETERS Orbit Type- Geocentric Orbit Period- 100,3 min Periapsis- 775. km	INCLINATION- 108. DEG Apoapsi5- 775. KM
PERSONNEL MG - S.W. MCCANDLESS, JR. PM - W.E. GIBERSON PS - J.A. DUNNE	NASA HEADQUARTERS NASA-JPU NASA-JPL

BRIEF DESCRIPTION

THE OCEAN DYNAMICS SATELLITE IS DESIGNED TO PROVIDE MEASUREMENTS OF WAVE HEIGHTS AND DIRECTION SPECTRUM, SURFACE TOPOGRAPHY, AND HIGH RESOLUTION RADAR AND INFRARED IMAGENY OF SELECTED AREAS OF THE OCEAN. THE INSTRUMENT PAYLOAD CONSISTS OF X-BAND COMPRESSED PULSE RADAR ALTIMETER, COMERCH SYNTHETIC APERTURE IMAGING RADAR, MICROWAVE WIND SCATTEROPHER, SCANNING MULTIFREQUENCY MICROWAVE RADIONETER, AND INFRARED ALTIMETER, ACCURACIES ARE RAPECTED FOR THE SPACECRAFT TO OCEAN SURFACE DISTANCES TO 10 CM, WIND SPEEDS TO 6.6 FPS, AND SURFACE TEMPERATURES TO 1 LEG C.

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--- SEASAT-B, RCLAIN----

INVESTIGATION NAME+ SCANNING VISUAL/INFRARED RADIOMETER

NSSDC	ID÷	SEAST-8-04	INVESTIGATIVE PROGRAM Code ESE
			INVESTIGATION DISCIPLINE(5) "Meteorology Oceanography

PERSONNEL TL - E.P. TM - TM - 0.K. TM - W.L. TM - F.M. TM - K.D.	BERNSTEIN Huh Barnes Vukovich	NDAA-NESS Scripps inst Oceanogr Louistina State U Nasa-GSFC Research Triangle inst Nasa-GSFC
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BRIEF DESCRIPTION THE SCANNING VISIBLE-IR RADIOMETER (SR) EXPERIMENT (1) OBTAINS IMAGES OF VISIBLE AND THERMAL IR EMISSION FOR OCEAN-COASTAL, AND ATMOSPHERIC FEATURES IS SUPPORT OF THE OTHER EXPERIMENTS AND (2) IDENTIFIES CURRENTS AND STORMS. THIS SENSOR, ORIGINALLY FLOWN ON THE ITOS SERIES SPACECRAFT, CONSISTS OF TWO SCANNING RADIOMETERS, A DUAL SR PROCESSON AND THO SR RECORDERS. THE RADIOMETER MEASURES REFLECTED RADIATION FROM THE EARTH/ATMOSPHERE SYSTEM IN THE 0.52- AND OURISF MICROMETER BAND DURING THE DAY AND EMITTED RADIATION FROM THE EARTH AND ITS ATMOSPHERE IN THE 10.55- TO 12.5- MICROMETER REGION DURING THE DAY AND NIGHT.

-- SEASAT-8, PIERSON------

INVESTIGATION NAME- MICROWAVE WIND SCATTEROMETER

INVESTIGATIVE PROGRAM NSSOC ID- SEAST-8-03 CODE ESE

INVESTIGATION DISCIPLINE(5) METEOROLOGY

TH - W.L. TH - TH - TH - TH -	PIERSON GRANTHAM FLITTNER Baer Halberstam Jones, Jr. Moore	CUNY INST MAR+ATMOS SC NASA-LARC NOAA-NWS NOAA NASA-JPL MASA-LARC U OF KANSAS
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BRIEF DESCRIPTION THE MICROWAVE WIND SCATTEROMETER EXPERIMENT IS DESIGNED TO USE AN ACTIVE RADAR SYSTEM TO MEASURE WIND SPEED AND DIRECTION. THE INSTRUMENT, DEVELOPED FROM THE SKYLAB EXPERIMENTAL SCATTEROMETER, DETERMINES WIND DIRECTION WITHIN 20 DEG AND WIND SPEED FROM LESS THAN 4 METERS/S. THE SCATTEROMETER TAKES MEASUREMENTS OVER TWO 460 KM-UDE SWATHS EQUALS DISPLACED ABOUT THE NADIR BY 235 KM. A HIGH WIND SWATH ADDS AN ADDITIONAL 260 KM TO EACH SIDE.

- SEASAT-B, ROSS----------

INVESTIGATION NAME- SCANNING MULTI-CHANNEL MICROWAVE RADIOMETER (SMMR)

	10-	SEAST-8-85
NSSDC	10-	25731-0-07

INVESTIGATIVE PROGRAM CODE ESE

INVESTIGATION DISCIPLINE(S) METEOROLOGY OCEANOGRAPHY

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ERSONNEL		
TL - Dawn R	055	NDAA-ERL
•••	EINHARDT	NOAA
	HERMAN, III	NGAA-NESS
		NASA-JPL
	IARATH	
7M ~ J. W	ATERS	NASA-JPL
TH - J.P		US NAVAL RESEARCH LAD
1M - T.T. 1	TANETT ID	NASA-GSFC
		NASA-WFC
TM - N. 3	LUANG	
TH - C.T. S	SWIFT	NASA-LARC
	AMPBELL	US GEOLOGICAL SURVEY
		CUNY INST MAR+ATMOS SC
T M	TAR DONE .	COM1 THOT ORNALIZE CO

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BRIEF DESCRIPTION THE DEEAN DYNAMICS SATELLITE (SEASTA1-B) IS DESIGNED TO PROVIDE MEASUREMENTS OF WAVE HEIGHT AND DIRECTION SPECTRUM, SURFACE WIND SPEED AND DIRECTION, SEA SURFACE TOPOGRAPHY, AND HIGH-RESOLUTION RADAR AND INFRARED IMAGERY OF SELECTED AREAS OF THE OCEAN. THE INSTRUMENT PAYLOAD BEING CONSIDERED OF X-BAND COMPRESSED PULSE RADAR ALTIMETER, COMERENT SYNTHETIC APERTURE IMAGING RADAR, MICROWAVE WIND SCATTEROMETER, SCANNING MULTIFREQUENCY MICROWAVE RADIOMETER, AND INFRARED RADIOMETER, SOME OF THE ACCURACIES EXPECTED ARE DISTANCE BETWEEN SPACECRAFT AND OCEAN SURFACE TO 10 CM, WIND SPEED TO 6.6 BPS, AND SURFACE TEMPERATURES TO 1 DEG C.

---- SEASAT-B, SMITH, III-----

INVESTIGATION NAME- COMPRESSED PULSE RADAR ALTIMETER (RA) NSSDC ID- SEAST-8-01

INVESTIGATIVE PROGRAM Earth observations

NOAA~NDS NASA-HEC

SÃO

USN SURF WEAPONS CNTR

US NAVAL ELSEARCH LAB

INVESTIGATION DISCIPLINE(S) OCEANOGRAPHY GEODESY

PERSONNEL

STATEL					
ΤL	-	\$.L.	SMITH, III		
TR	-	8.H.	CHOV11Z		
TH	~	J.T.	MCGODGAN		
TĦ	-	в.	YAPLEE		
TM	-	E.M.	GAPOSCHKIN		

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE COMPRESSED PULSE RADAR ALTIMETER EXPERIMENT (7) MEASURES THE ALTITUDE BETWEEN THE SPACECRAFT AND THE OCEAN SURFACE AND (2) MEASURES #AVE HEIGHT. THE ALTIMETER IS A MORE ACCURATE VERSION OF THE SKYLAB RADAR ALTIMETER, ÉXPERIMENT 5-193 (NSSOC 73-027A-20), AND IS SIMILAR TO THE ALTIMETER THAT TLEW ON GEDS-C. THE ALTIMETER PRECISION OF PLUS OR MINUS 10 CM ALLOW TIME VARYING FEATURES SUCH AS TIDES, WIND PILE-UP, AND STORM SURGES TO BE SENSED AND IDENTIFIED. IT IS ALSO CAPABLE OF LOCATING AND MAPPING OCEAN SURFACE CURRENTS WITH SPEEDS OF PROPORTIONAL TO THE SURFACE SPEED. THE MEASUREME \ OF WAVE HEIGHT, WHICH IS REQUIRED TO OBTAIN A 10-CM PRECISION IN ALTITUDE, CAN BE COMBINED WITH SURFACE WIND MEASUREMENTS TO DETERMINE SEA STATE.

- SEASAT-B> TELEKI--

INVESTIGATION NAME- COHERENT SYNETHIC APERTURE IMAGING RADAR (SAR)

INVESTIGATIVE PROGRAM CODE ESE NSSDC 1D- SEAST-B-02

> INVESTIGATION DISCIPLINE(5) OCEANOGRAPHY

PERSONNE

TL - P.G.	1 EL ÉK I	US JEOLOGICAL SURVEY
TM - Þ.8.	ROSS	NOAA-ERL
TM - W.J.	CAMPBELL	US GEOLOGICAL SURVEY
TN - A.	LOOMIS	NASA-JPL
TH - W.E.	EROWN, JR.	NASA-JPL
TH - F.T.	BARATH	NASA-JPL
TM -	RODGERS	NASA-JPL
TŘ - C.L.	RUFENACH	NOAA-ERL
TM - J.W.	SHERMAN, III	NOAA-NESS
TM - R.	STEWART	SCRIPPS INST OCEANOGR
TM - J.	ZELĖNKA	ENVIRON RES INST OF MI
TN -	SHEMDIN	NASA-JPL

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE COHERENT, SYNTHETIC APERTURE, IMAGING RADAR EXPERIVENT IS DESIGNED TO USE WAVE PATTERN AND DYNAMIC BEHAVIOR INFORMATION TO OBTAIN IMAGES OF THE OCEAN, THE INSTRUMENT, FLOWN ON APOLLO 17 AS THE APOLLO LUWAR SOUNDER, YIELDS IMAGES OF WAVES WHOSE LENGTH IS IN THE RANGE OF 50 TO 1000 METERS AND CAN DETERNINE WAVE DIRECTION WITHIN 20 DEG WITH THE POSSIBILITY OF A 180-DEG AMDIGUITY FOR ONE-SIDE IMAGES. WAVE HEIGHT CAN ALSO BE DETERNINED FROM THE DATA FOR FULLY DEVELOPED SEAS. THE IMAGING RADAR CAN FUNCTION THROUGH CLOUDS AND MOMINAL RAIN TO PROVIDE WAVE PATTERNS NEAR SHORELINE AND HIGH-RESOLUTION PICTURES OF ICE, OIL SPILLS, CURRENT PATTERNS, AND SIMILAR FEATURES. FFATURES.

SPACECRAFT COMMON NAME- SOLAR MAXIMUM MISSION ALTERNATE NAMES- SMM

NSSDC 10- SMM

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NAME OF COMPANY

SCENE:

LAUNCH DATE- 10/00/79 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES WEIGHT- 1610. KG LAUNCH VEHICLE- SHUTTLE

SPONSORING COUNTRY/AGENCY UNITED STATES NASA-055

PLANNED ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC Orbit Period- 96.2 Min Periapsis- 575. KM INCLINATION-33. DEG 575. KN PERSONNE

۱G	- M.E.	MCDONALD	NASA HEADQUARTERS
5 C	- J.D.	BOHLIN	NASA-GSFC
Ň	- P.T.	BURR	NASA-GSFC
P S	- x.J.	FRUST	NASA-GSFC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE SOLAR MAXIMUM MISSION (SMM) IS DEDICATED TO COORDINATED OBSERVATIONS OF SPECIFIC SOLAR ACTIVITY AND SOLAR FLARE PROBLEMS. THE SPACECRAFT IS ORIENTED TOWARD THE SUN DURING THE DAYLIGHT PORTION OF THE ORBIT. THE SPACECRAFT ITSELF DOES NOT RASTER OVER THE SOLAR DISK. ALTHOUGH INDIVIOUAL INSTRUMENTS HAVE THIS CAPABILITY. THE SMM SPACECRAFT IS DESIGNED SO THAT IT CAN BE RETRIEVED BY AN EARLY SHUTTLE FLIGHT, RETURNED TO EARTH, REFURBISHED AND FITTED WITH AN UPDATE PAYLOAD, AND RETUR'ET TO ORBIT FOR ANOTHER SOLAR-ORIENTED MISSION. SOLAR-DRIENTED MISSION.

- SOLAR MAXIMUM MISSION, ACTON------

INVESTIGATION NAME- SOFT X-RAY POLYCHROMATOR

NSSDC 1D- SMM -04 INVESTIGATIVE PROGRAM

CODE ST INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

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ERSONNEL		
PI L.W.	ACTON	LOCKHEED PALO ALTO
Р1 ⁶⁶ — А.Н.	GABRIEL	APPLETON LAB
PI - J.L.	CULHANE	U COLLEGE LONDON
01 - R.C.	CATURA	LOCKREED PALO ALTO
01 - J.H.	PARKINSON	U COLLEGE LONDON
01 - C.G.	RAPLEY	U COLLEGE LONDON
01 - B.B.	JONES	APPLETON LAB.
01 - C.	JORDAN	OXFORD U
DI - C.J.	WOLFSON	LOCKHEED PALO ALTO
01 - 0.C.	FANCETT	APPLETON LAB

P

BRIEF DESCRIPTION THIS EXPERIMENT USES X-RAY EMISSION LINES IN THE 0.4-NM TO 2.24-NM SPECTRAL REGION AS DIAGNOSTIC TOOLS TO INVESTIGATE ASPECTS OF SOLAR ACTIVITY LEADING TO PLASMA TEMPERATURES IN THF 1.5 TO 50 MILLION K RANGE. THE INSTRUMENTATION INCLUDES TWO SYSTEMS, A FLAT CRYSTAL SPECTROMETER AND A BENT CRYSTAL SPECTROMETER, THE FLAT CRYSTAL SPECTROMETER COVERS FROM 1.4 TO 22.44 A IN 7 RANGES, HAS A FIELD DF VIEW OF 10 BY 10 ARC S, AND CAN RASTER OVER A 7 BY 7 ARC MIN AREA. ITS BEST TIME RESOLUTION IS 0.25 S. THE BENT CRYSTAL SPECTROMETER CONSISTS OF A SET OF BENT CRYSTALS COVERING SEVEN IRON LINES (BETWEEN 1.769 AND 1.945 A) AND THE CALCIUM XIX LINE BETWEEN 3.165 TO 3.231 A. THIS INSTRUMENT HAS A FIELD OF VIEW OF 6 BY 6 ARC MIN. IS NOT RASPERED AND HAS A MAXIMUM TIME RESOLUTION OF D.1 5. 0F A 1.769 3.231

-- SOLAR MAXIMUM MISSION, CHUPP-----

INVESTIGATION NAME- GAMMA RAY EXPERIMENT

NSSDC ID- SMM -67 INVESTIGATIVE PROGRAM CODE ST

INVESTIGATION DISCIPLINE(5) Solar Physics

PERSONNEL

PI -	E+L+	сниер	U OF NEW HAMPSHIRE
01 -	D.J.	FORREST	U OF NEW HAMPSHIRE
01 -	к.	PINAU	MP1-EXTRATERR PHYS
01 -	C.	REPPIN	MPI-EXTRATERR PHYS
- 01 -	ε.	RIÉGÉR	MPI-EXTRATERR PHYS
01 -	W_N_	JOHNSON	US NAVAL RESEARCH LAD
0I -	Rala	KINZER	US NAVAL RESEARCH LAB
01 -	J.Ď.	KURFESS	US NAVAL RESEARCH LAB
- 10	G_H_	SHARE	US NAVAL RESEARCH LAB
01 -	A.S.	JACOBSÓN	NASA-JPL

BRIEF DESCRIPTION

SMM

NSSDC 1D-

BRIEF DESCRIPTION THE PRIMARY SCIENTIFIC GOAL OF THIS EXPERIMENT IS THE STUDY OF GAMMA-RAT EMISSIONS FROM THE SUN BEFORE AND DURING SOLAR FLARES. THE MAIN DETECTOR IS A SET OF SEVEN 7.6- BY 7.6-CM SODIUM IDDIDE SCINTILLATORS COVERING THE ENERGY RANGE FROM D.3 TO 17 MEW WITH AN ENERGY RESOLUTION OF BETTER THAN 7 PERCENT AT 0.662 MEW AND TEMPORAL RESOLUTIONS RANGING FROM 16 S (FULL ENERGY RANGE) TO 15 (SELECTED ENERGY INTERVAL) TO D.D64 S. A HIGH-ENERGY METECTOR CONSISTS OF THE SODIUM IODIDE ARRAY AND A CESIUM IDDIDE SCINTILLATOR COVERING FROM 15 TO 16D MEW WITH A TEMPORAL RESOLUTION OF THOS FOR HIGH-ENERGY NEUTRONS AND GAMMA RAYS. TWO ADDITIONAL SODIUM IODIDE SCINTILLATORS FORM AN X-RAY DETECTOR SENSITIVE BETWEEN 10 AND 160 KEW WITH FOUR CHANNELS OF ENERGY RESOLUTION AND A TEMPORAL RESOLUTION CF 1 S. 1 5.

- SOLAR MAXIMUM MISSION, DE JAGER---

INVESTIGATION NAME- HARD X-RAY IMAGING SPECTROMETER

INVESTIGATIVE PROGRAM EDDE ST -05

> INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL

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PI - C. DE JAGER OI - H.F. VAN BEEK DI - A.P. WILLMORE

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BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT IS TO MEASURE THE POSITION, STRUCTURE, AND THERMODYMANIC PROPERTIES OF HOT THERMAL AND NONTHERMAL SOURCES IN ACTIVE REGIONS AND FLARES. THIS INSTRUMENT PRODUCES IWJ-DIAMENSIONAL IMAGES WITH 8-ARC S RESOLUTION OVER A CIRCULAR AREA 3 MIN 44 S IN DIAMETER, OR 32 ARC 5 RESOLUTION OVER AN 8 MIN 32 S BY 7 MIN 28 S AREA, OR TWO ONE-DIAMENSIONAL IMAGES CONSISTING OF TWELVE 4-ARC MIN BY 16-ARC S FAN BEAMS IN X AND 12 FAN BEAMS OF 16 ARC S BY 4 ARC MIN 1N Y. THESE IMAGES ARC OBSERVED IN SIX ENERGY CHANNELS BETWEEN 3.5 AND 30 KEV, AND WITH A TEMPORAL RESOLUTION OF AT LEAST 1.5 S. A HIGH-ENERGY MONITOR OBSERVES THE ENTIRE SUM AT ENERGIES UP TO 40 KEV. BRIEF DESCRIPTION UP TO 40 KEV.

-- SOLAR MAXINUM MISSION; FROST------

INVESTIGATION NAME- X-RAY SPECTROMETER

INVESTIGATIVE PROGRAM NSSOC LD- SHM -06 CODE ST

INVESTIGATION DISCIPLINE(5) Solar Physics

ERSONNEL		
P1 - K.J.	FROST	NASA-GSFC
01 - L.E.	DRWIG	NASA-GSFC Hasa-gsfc
01 - 6.8.	DENNIS	
DI - T-LA	CLINE	NASA-GSFC
· 01 - U.D.	DESAI	NASA-GSFC

BRIEF DESCRIPTION

BRIEF DESCRIPTION THIS EXPERIMENT MEASURES FLARE X-RAY EMISSION WITH 16 CHANNEL EMERGY ANALYSIS AND D.1-S TIME RESOLUTION IN THE EMERGY RANGE OF 20 TO 300 KEV. A SEARCH FOR TEMPORAL STRUCTURE IN THE X-RAY "MISSION WITH A TIME RESOLUTION OF 1 MILLISECOND IS CONDUCTED USING ONE CHANNEL DETWEEN 20 AND 300 KEV.

----- SOLAR MAXINUM MISSION, MACQUEEN-----

INVESTIGATION NAME- CORONAGRAPH/POLARIMETER

INVESTIGATIVE PROGRAM -01 NSSDC 10- SMM CODE ST

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL		
P1 ~ R.M.	NACQUEEN	HIGH ALTITUDE OBS
0I - L.L.	HOUSE	HIGH ALTITUDE OBS
01 - W.J.	WAGNER	HIGH ALTITUDE OBS
01 - E.G.	HILDNER	HIGH ALTITUDE OBS
01 - G.A.	DULK	U OF COLORADO
01 - R.J.	HANSEN	HIGH ALTITUDE OBS
01 - R.	KOPP	LOS ALAMOS SCI LAB
01 - 6.9.	PNEUMAN	HIGH ALTITUDE OBS
DI - C.W.	QUERFELD	HIGH ALTITUDE DBS
01 - H.U.		MPI-EXTRATERS PHYS
01 - K.V.		CSIRO, DIV OF RADIOPHYS

F

----- SOLAR MAXINUM MISSION, REEVES------

CODE ST

INVESTIGATION NAME- XUV SPECTROHELIGHETER

NSSOC ID- SHM -03

INVESTIGATION DISCIPLINE(5) Solar Physics

INVESTIGATIVE PROGRAM

PERSONNEL PI - E.M. DI - R.W. DI - G.L. REEVES Noves Withbroe Timothy OI - J.G. TINOTHY DI - M.V. ZONBECK

HARVARD COLLEGE OBS Harvard College OBS Harvard College OBS Harvard College OBS Harvard College OBS

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OI - M.V. ZONBECK HARVARD COLLEGE OBS BRIEF DESCRIPTION THE SCIENTIFIC OBJECTIVES OF THIS EXPERIMENT INCLUDE THE DETERMINATION OF THE THREE-DIMENSIONAL STRUCTURE OF THE SOLAR PLASMA IN ACTIVE REGIONS ASSOCIATED WITH SOLAR FLARES, THE STRUCTURE AND EVOLUTION OF ACTIVE REGION LOOPS AND CORONAL HOLES. AND MICROSCOPIC AND MACROSCOPIC VELOCITIES FOR ACTIVE REGIONS AND FLARES, TO ACHIEVE THESE OBJECTIVES, THIS EXPERIMENT WILL MEASURE ELECTRON TEMPERATURES FROM INTENSITY RATIOS OF A PAIR OF LINES OF DERYLLIUM- AND LITMIUM-LIKE IONS, ELECTRON DENSITIES FROM EMISSION LINE INTENSITY RATIOS AND FLARES, THE TELESCOPE SECTION OF THE INSTRUMENT CONSISTS OF A SINGLE OFF-AXIS PARABOLOID AND MACNETIC FIELD CONFIGURATIONS FROM CONSISTS OF A GRAZING-INCIDENCE ROWLAND MOUNTING WITH A FIXED ARRAY OF DETECTORS ON A CARRIAGE THAT CAN BE DRIVEN ALONG THE FORMATION FOR A CARRIAGE THAT CAN BE DRIVEN ALONG THE FORMATION IS 4 BY 4 ARC SOVER A RASTER SIZE VARIABLE FROM Z ARC 5 TO 46 BY 46 ARC MIN. THE SPECTRAL RANGE OF COVERED IS 20 TO 716 A AND 929 TO 1332 A WITH A RESOLUTION OF O.1 A FWMM.

1222

---- SOLAR MAXIMUM MISSION, TANDBERG-HANSSEN-----

INVESTIGATION NAME- ULTRAVIOLET SPECTROMETER AND POLARIMETER

INVESTIGATIVE PROGRAM NSSDC ID- SMM -02 CODE ST

INVESTIGATION DISCIPLINE(5) SOLAR PHYSICS

South a second

PERSONNEL FI - E. TANDBERG-HANSSEN 0I - R.G. ATHAY 0I - J.M. BECKERS 0I - J.C. BRANDT 0I - R.C. BRANDT 0I - R.C. BRANDT 0I - R.D. CHAPMAN 0I - C.L. HYDER 0I - D.E. BOOGATE	NASA-MSFC HIGH ALTITUDE ODS Sacremento peak obs Nasa-GSFC Lockheed palo Alto Nasa-GSFC Nasa-GSFC Nasa-GSFC
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OI - B.E. WOODGATE NASA-GORC BRIEF DESCRIPTION THE OBJECTIVES OF THIS EXPERIMENT ARE TO STUDY SOLAR ULTRAVIOLET RADIATIONS FROM ACTIVE REGIONS, FLARES, AND THE CORONA IN ORDER TO DETERMINE THE PHYSICAL PARAMETERS OF TEMPERATURE, DENSITY, VELOCITY, AND MAGNETIC FIELD IN THE SUN'S ATMOSPHERE, AND TO CONDUCT AN AERONDMY PROGRAM TO MEASURE VARIOUS CONSTITUENTS IN THE EARTH'S ATMOSPHERE BY MEASURING THE ATMOSPHERIC EXTINCTION OF SUNLIGHT AT SPACECRAFT DUSK AND DAWN. THIS INSTRUMENT IS A MODIFIED VERSION OF THE SOLAR DESERVATORY (050 S). THE INSTRUMENT COVERS THE 10D TO SOLAR DESERVATORY (050 S). THE INSTRUMENT COVERS THE 10D TO SOLAR DESERVATORY (050 S). THE SPACECRAFT DUSK AND 30 BY FUHM, AND OBSERVES AN AREA OF TO 4 BY 4 ARC MIN IN SIZE AT A SPATIAL RESOLUTION COMMANDABLE BETWEEN 1 BY TARCS AND 30 BY 30 ARC S. POLARIZATION IS MEASURED USING A ROTATING GUARTER-WAVE PLATE INSERTED IN THE LIGHT PATH SO ALL FOUR STOKES PARAMETERS CAN BE DETERMINED. IT IS POSSIBLE TO SELECT ANY OF SIX PAIRS OF LIMES FOR POLARITERY AND ANY OF THREE SETS DF FOUR LINES FOR SPECTROSCOPY TO ALLOW SIMULTANEOUS ANALYSIS AT DIFFERENT HEIGHTS IN THE SOLAR ATMOSPHERE.

- SOLAR MAXIMUM MISSION, WILLSON----

INVESTIGATION NAME- ACTIVE CAVITY RADIOMETER IRRADIANCE MONITOR

NSSDC	10-	SMM	-08	INVESTIGATIVE Physics And	
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INVESTIGATION DISCIPLINE(S) Solar Physics

PERSONNEL .PI - R.C. WILLSON

186

NASA-JPU

Alexidee

BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT IS THE MEASUREMENT OF THE TOTAL SOLAR IRRADIANCE WITH STATE-OF-THE-ART ACCURACY AND PRECISION. THE TOTAL SOLAR IRRADIANCE FROM THE FAR-ULTRAVIALL THROUGH THE FAR-INFRARED WAVELENGTHS IS MEASURED BY THREE ACTIVE CAVITY RADIOMETER (TYPE IV) DETECTORS. THESE DETECTORS ARE ELECTRICALLY SELF-CALIBRATED. CAVITY PYRELIOMETERS AND ARE EACH CAPABLE OF DEFINING THE ABSOLUTE RADIATION SCALE WITH AN UNCERTAINTY OF 0.1 PERCENT IN THE INTERNATIONAL SYSTEM OF UNITS. UNITS.

SPACECRAFT COMMON NAME- SPACELAB 1 Alternate Names-

NSSNC ID- SPALABI

1

ALC: NO

WEIGHT- 14500, KG LAUNCH DATE- 11/00/80 Launch Site- Cape Canaveral, United States Launch Vehicle- Shuttle

SPONSORING COUNTRY/AGENCY International United States	ESA Nasa-dMSF
PLANNED ORDIT PARAMETERS Orbit Type- Geocentric Orbit Peridd- Min Periapsis- KM	INCLINATION- DEG Apoapsis- km
PERSONNEL Mg - R. Noblitt SC - W. Taylor PS - C.R. Chappell	NASA HEADQUARTERS NASA HEADQUARTERS NASA-MSFC

SC - W. TAYLOR NASA HEADQUARTERS PS - C.R. CHAPPELL NASA-MSFC BRIEF DESCRIPTION THE FIRST SPACELAB MISSION IS A JOINT NASA AND EUROPEAN PRESSURIZED COMPARTMENT (MODULE) FOR HOUSING EQUIPMENT AND FLIGHT PERSONNEL AND A SPACE EXPOSED PLATFORM TO ACCOMDATE INSTRUMENTS. THE COMPARTMENT NAD PLATFORM ARE FLOUN INTO SPACE AND RETURNED INSIDE THE PAYLOAD COMPARTMENT OF THE SPACE SHUTTLE ORBITER. THE MISSION IS PLANNED TO LAST 7 DAYS, AND WHILE IN SPACE, THE ORBITER PAYLOAD COMPARTMENT OF THE SPACE. SHUTTLE ORBITER. THE MISSION IS PLANNED TO LAST 7 DAYS, AND WHILE IN SPACE, THE ORBITER PAYLOAD COMPARTMENT DOORS ARE OPENED TO ALLOW VIEWING OF THE EARTH, SUN, AND DEEP SPACE. AN PRESSURIZED COMPARTMENT COMPARTMENT OF THE SPACE. SHUTTLE ORBITER. THE MISSION IS PLANNED TO LAST 7 DAYS, AND MHILE IN SPACE, THE ORBITER PAYLOAD COMPARTMENT DOORS ARE OPENED TO ALLOW VIEWING OF THE EARTH, SUN, AND DEEP SPACE. AN PARTICLE ACCELERATORS, STUDIES OF THE IONOZATION STATES OF FAUST INSTRUMENT, HZE PARTICLE DOSIMETRY, NUTATION STATES OF FAUST INSTRUMENT, HZE PARTICLE DOSIMETRY, NUTATION OF HELIANTHUS ANNUUS, VESTIBULAR EXPERIMENTS, INFLUENCE OF SPACE FLIGHT ON EXTTHROKINETICS IN MAN, CHARACTERIZIOS OF ACCE FLIGHT ON EXTRINGUENTION STUDIES OF FAUSTIBULO-SPINAL REFLEX MECHANISMS, EFFECTS ON PROLOMED WEIGHTLESSNESS, GEOPHYSICAL MECHANISMS, EFFECTS ON PROLOMED WEIGHTLESSNESS, GEOPHYSICAL FULD HUBIRCANTS IN A ZERO GRAVITY ENVIROMENT, RIBIOLOGICAL STUDIES OF FLUID LUBIRCATES JOURNAL BEARINGS, ACTIVE CAVITY RADIONETER SOLAR IRRADIANCE MONITOR, ATMOSPHERIC TRACE MOLECULES OBSERVED BY SPECTROSCOPY, GRILLE SPECTROMETER, WAYS IN THE OH EMISSIVE LAYER, TENTERATURE-WIND IN MESOSPHERE-THERMOSPHERES, HAND LYMAN ALPHAA, SOLAR SPECTRUM FROM 1900 A TO 4 MICROMETERS, LOW-ENERGY ELECTROMETER, WAYS IN THE OH EMISSIVE LAYER, TENTERATURE-WIND IN MESOSPHERE-THERMOSPHERES, HAND LYMAN ALPHAA, SOLAR SPECTRUM FROM 1900 A TO 4 MICROMETERS, LOW-ENERGY ELECTROMETER, MAYES IN THE OH EMISSIVE LAYER, SLED SLED EXPERIMENTS, HEAVY COSMIC

-- SPACELAB 1, BEGHIN----

INVESTIGATION NAME- PHENOMENA INDUCED BY CHARGED PARTICLE

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS IONOSPHERES

PERSONVEL PI - C. 01 - Y. 01 - M. 01 - M. 01 - J.J. 01 - J.J. 01 - J.J. 01 - J.J.	BEGHIN ARNAL HAMELIN HENRY PIRRE DERTHELIER LAUERENAT MAEHLUM TADIM DACHEII	CNRS, CTR FOR SPECTROM CNRS CNRS CNRS CNRS CNRS CNRS CNRS NDRE NDRE SSA-ESTEC
01 - J. 01 - R. 01 - A. 01 - T.	TROIM BOSWELL Gonfalone Sanderson	

NSSDC ID- SPALAB1-25

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO USE AN ELECTRON AND ION DEAM GUN (UP TO 10 KEV), AN ASSOCIATED WAVE RECEIVER (UP TO 100 MH2).ELECTRON TEMPERATURE PROBE, AND THREE PARTICLE DETECTORS TO -- (1) STUDY IONOSPHERIC NEUTRALIZATION PROCESSES TO -- (1) STUDY IONOSPHERIC NEUTRALIZATION PROCESSES WITH RESPECT TO THE PLASMA. (2) STUDY PLASMA INSTABLLITIES BY MEASURING FIECTRICAL (UP TO 100 MH2) AND MAGNETIC (200 HZ UP TO 20 MH2).WAVE COMPONENTS, (3) USE THE SHUTTLE MOTION TO PERFORM ION BOUNCE EXPERIMENTS, (4) STUDY THE SECONDARY ELECTRON FLUX. THE EQUIPMENT CONSISTS ^* AN ACTIVE PACKAGE CONSISTING OF AN ELECTRON GUN, AN ION CM (DEUTERIUM AND XENON), A PARTICLE DETECTOR, AND A PASSIVE PACKAGE CONTAINING AN ELECTRIC

ANTENNA, MAGNETIC ANTENNA, AND TWO PARTICLE DETECTORS.

----- SPACELAB 1, BENTON-----

INVESTIGAT	ION NAME- HZE-P/	ARTICLE DOSIMETERY
NSSDC ID-	SPALAB1-11	INVESTIGATIVE PROGRAM Code 58

INVESTIGATION DISCIPLINE(S) Particles and fields Space Biology

PERSONNEL PI - E.V. BENTON DI - D.D. PETERSON DI - R.M. CASSUU U OF CALIF, SAN FRANC. U OF CALIF, SAN FRANC. U OF CALIF, SAN FRANC.

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BRIEF DESCRIPTION THE OBJECTIVES OF THIS EXPERIMENT ARE TO PROVIDE BASELINE DATA FOR EVALUATION OF RADIATION RISK TO MAN FROM HZE PARTICLES ON THIS AND FUTURE SPACELAR MISSIONS, AND TO CONTINUE A PROGRAM OF DOCUMENTATION OF HZE - PARTICLE RADIATION INSIDE MANNED SPACERAFT WHICH HAS INCLUDED APOLLO, SKYLAB, AND ASTP MISSIONS. THE EGUIPMENT CONSISTS OF -- (1) A PASSIVE DOSIMETER PACKET (POP) CONTAINING PLASTIC NUCLEAR TRACK DETECTORS, AN AGC1 CRYSTAL DETECTOR (CD), AND THERMOLUMINESCENCE DETELTOR (TLD) CHIPS, AND (2) A THICK PLASTIC STACK (TPS) CONSISTING OF A STACK OF 20D LEXAN POLYCARBONATE PLASTIC FILMS.

- SPACELAB 1, BERTAUX------

INVESTIGATION NAME- INVESTIGATION ON ATMOSPHERIC H AND D Through the measurement of Lyman-Alpha

INVESTIGATIVE PROGRAM NSSDC ID- SPALAB1-22 CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS Atmospheric Physics

CNRS-SA IAS0

PERSONNEL PI - J.L. BERTAUX DI - G. KOCKARTS

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE -- TO USE A LYMAN-ALPHA PHOTONETER EQUIPPED WITH H AND D ABSORPTION CELLS TO REASURE DEUTERIUM EMISSION. TO OBSERVE PROTON PRELIPITATION IN THE AURORAL AND EQUATORIAL ZONES. TO USE A HYDROGEN ABSORPTION CELL AS A TECHNIQUE TO ELIMINATE THE INTERPLANETARY LYMAN-ALPHA BACKGROUND. TO OBSERVE THE SEPAC PROTON GUN INTERACTIO WITH THE STS/SPACELAB ENVIRONMENT, AND TO AITEMPT TO M. SURE ATMOSPHERIC HYDROGEN LYMAN-ALPHA EMISSIONS. THE EQUIPMENT CONSISTS OF A PHOTOMETER WITH AN ATOMIC HYDROGEN ABSORPTION CELL AND AM ATOMIC DEUTERIUM ABSORPTION CELL, AND A SOLAR BLIND PHOTOMULTIPLIER FOR DETECTOR.

----- SPACELAB 1, BISWAS-

INVESTIGATION NAME- IONIZATION STATES OF SOLAR AND GALACTIC COSNIC RAY HEAVY NUCLEI STUDIES

INVESTIGATIVE PROGRAM CODE ST/CO-OP NSSOC ID- SPALABI-06

INVESTIGATION	DISCIPLINE(S)
PARTICLES A	ND FIELDS
COSMIC RAYS	

PERSONNEL PI - S. PI - D. OI - R. OI - N. OI - V. OI - S.	BISWAS LAL Cowsik Durgaprasad Venkatavaradan Sarkar	TATA INST OF FUND RES PHYSICAL RESEARCH LAB TATA INST OF FUND RES TATA INST OF FUND RES TATA INST OF FUND RES TATA INST OF FUND RES
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BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO MEASURE THE IONIZATION STATES OF HEAVY ELEMENTS (O TO FE) IN SOLAR COSMIC RAYS AND THE LOW-FIRENGY GALACTIC COSMIC-RAY IONIZATION STATES. THE DETECTOR MODULE CONSISTS OF A THIN UPPER STACK OF KODAK CELLULOSE NITRATE (CN) PLASTIC SHEETS, A LOWER STACK OF KODAK CELLULOSE NITRATE (CN) PLASTIC SHEETS, A LOWER STACK OF KODAK CELLULOS NITRATE (CN) WITH LEXAN POLYCARBONATE SHEETS AT THE BOTTOM, AND AN ELECTRONIC DRIVE SYSTEM.

-- SPACFLAB 1. BOELLA---

INVESTIGATION NAME- ASTRONOMICAL X-RAY SPECTROSCOPY USING A GAS Scintillation proportional counter

NSSDC ID- SPALAB1-28

INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

PERSONNEL

	- G.	BOELLA	U COLLEGE LONDON
10	~ R.	L.F.BOYD	U COLLEGE LONDON
01	- 6.	BROWLIE	MULLARD SPACE SCI LAB
01	- 1.	L. CULHANE	MULLARD SPACE SCI LAB
01	- J.	IVES	MULLARD SPACE SCI LAB
	- P.		MULLARD SPACE SCI LAB
01	- R.	D. ANDRESEN	ESA-ELIEC
	- A.	PEACOCK	ESA-ESTEC
	- B.		ESA-ESTEC
01	- 5.	SALENI	CNR, COSMIC PHYSICS LAB
01	- 1.	SCAR51	CNR, COSMIC PHYSICS LAB
01	- G.	VILLA	CNR, COSMIC PHYSICS LAB

GRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE -- (1) TO USE A GAS SCINTILLATION PROPORTIONAL COUNTER (1,5-50 KEV, 5-DEG, FIELD OF VIEW, LESS THAN 10 PERCENT RESOLUTION AT 6 KEV) TO MEASURE SPECTRAL FEATURES OF GALACTIC X-RAY SOURCES, THE DIFFUSE X-RAY BACKGROUND, CLUSTERS OF GALACTIC X-RAY SOURCES, THE DIFFUSE X-RAY BACKGROUND, CLUSTERS OF GALACTIC X-RAY SOURCES, THE DIFFUSE X-RAY BACKGROUND, CLUSTERS OF GALACTIC X-RAY SOURCES, THE DIFFUSE X-RAY BACKGROUND, CLUSTERS OF GALACTIC X-RAY SOURCES, THE DABILITY TO REJECT CHARGED PARTICLE BACKGROUND RADIATION WHOSE ENERGY IS NEAR THAT OF WEAK X-RAY SOURCES. THE EQUIPMENT IS A GAS SCINTILLATION COUNTER HAVING A 25-100 MICROMETER BERVLLIUM UNDOW, XENON CHAMBER, PHOTOMULTIPLIER DETECTOR, AND A PULSE HEIGHT ANALYZER.

- SPACELAB 1, BOWYER----

INVESTIGATION NAME- FAR UV OBSERVATIONS USING THE FAUST INSTRUMENT

NSSDC ID- SPALAB1+07	INVESTIGATIVE PROGRAM Code SA
	INVESTIGATION DISCIPLINE(S) ASTRONOMY
PERSONNEL	
PI - C.S. BOWYER	U OF CALIF, BERKELEY
DI - G.C. COURTES	CNRS-LAS
OI - J.M. DEHARVENG	LAS
DI – R., MALINA	U OF CALIF, BERKFIFY

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE IS TO PERFORM UV (110D-3500 A) BROADBAND INAGING BEARING AND LOW RESOLUTION (20-200 A) Spectroscopy of -- Globular (LUSTERS, GALACTIC CLUSTERS, QUASI-STELLAR OBJECTS, NEARBY GALAXIES, UV STARS, ENTENDED SOURCES, GEOCORONA, AND SPACELAB 1 CONTAMINANTS. THE EQUIPMENT CONSISTS OF A FAR ULTRAVIOLET SPACE TELESCOPE (FAUST) AND AN ELECTRONIC INTERFACE NODULE.

----- SPACELAB 1, BROWN------

INVESTIGATION NAME- NUTATION OF HELIANTHUS ANNUUS

NSSDE 10- SPALAB1-12 INVESTIGATIVE PROGRAM CODE SB

> INVESTIGATION DISCIPLINE(S) SPACE BIOLOGY

PERSONNEL		
PI - A.H.		U OF PENNSYLVANIA
01 - A.O.		U OF PENNSYLVANIA
01 - D.K.	CHAPMAN	U OF PENNSYLVANIA

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO -- (1) DETERMINE GUANTITATIVELY WHETHER THE CONDITION OF SUSTAINED WEIGHLESSNESS PRODUCES THE SAME DAMPING OR INHIBITING EFFECT ON PLANT NUTATION AS DOES ROTATION ON A HORIZONTAL CLINOSTAT ON EARTH, (2) MEASURE THE PERIOD AND AMPLITUDE OF ANY NUTATIONL OSCILLATIONS OF SUSTAINED WEIGHLESSNESS, AND (3) GAIN EXPERIENCE IN THE CONDUCT OF A PLANT PHYSIOLOGICAL EXPERIENCE IN THE CONDUCT OF A PLANT PHYSIOLOGICAL EXPERIENCE AND HIGH FOUR TEST PLANTS ILLUMINATED BY IMFARAED LIGHT ARE LOGATED IN THE FIELD OF VIEW OF A VIDEO CAMERA, ROTON COMPARTNENTS, PLANT NODULES, BATTERY PACK, WIDEO TAPE DATA RECORDER, CONTROL ELECTRONICS, AND A CARRY-ON MODULE CONTAINER OF 28 PLANT MODULES.

-- SPACELAB 1. BUCKER-------

INVESTIGATION NAME- ADVANCED BIDSTACK EXPERIMENT

INVESTIGATIVE PROGRAM CODE SB

INVESTIGATION DISCIPLINE(S) SPACE BIOLOGY

P1 - H. BUCKER

PERSONNEL

NSSDC ID- SPALAB1-32

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U OF FRANKFURT

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO INCREASE THE KNOWLEDGE OF HZE PARTICLES EFFECT ON BIOLOGICAL SPECTMENS, TO ASSESS GUANTIATIVELY THE INTERFERENCE OF HZE PARTICLES WITH OTHER BIOLOGICAL STUDIES IN SPACE, TO DETERMINE THE DISTRIBUTION OF HZE PARTICLES AT DIFFERENT LOCATIONS IN THE MODULE AND ON THE PALLET, AND ESTABLISH RADIATION PROTECTION GUIDELINES FOR MAN AND BIOLOGICAL EXPERIMENTS IN FUTIPE SPACE FLIGHTS. THE EQUIPMENT CONSISTS OF FOUR CYLINGERS WITH LAYERS OF DIFFERENT BIOLOGICAL OBJECTS BETWEEN DIFFERENT TRACK DETECTORS. INTEGRATING DOSIMETERS, AND SPECIALLY SELECTED TRACK DETECTORS.

----- SPACELAB 1, COGOLI------

INVESTIGATION NAME- LYNPHOCYTE PROLIFERATION IN WEIGHTLESSNESS

NSSDC ID- SPALAB1-36

INVESTIGATIVE PROGRAM CODE SB/CO-OP

INVESTIGATION DISCIPLINE(S) SPACE BIOLOGY

U OF ZURICH

PERSONNEL PI - A. COGOLI

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE IS TO GAIN FURTHER INFORMATION ON THE TRIGGERING OF THE IMMUNGRESPONSE AND ON THE MECHANISM OF EUCARYOTIC CELL DIFFERENTIATION DURING LONG-DURATION SPACEFLIGHTS. THE EQUIPMENT CONSISTS OF AN INCUMIDATOP, FOUR FLASKS OF HUMAN BLOOD, AND A VESSEL FOR LIQUID AIR.

- SPACELAB 1, COURTES-----

INVESTIGATION NAME- VERY WIDE FIELD GALACTIC CAMERA

INVESTIGATIVE PROGRAM CODE SA/CO-OP

INVESTIGATION DISCIPLINE(S) ASTRONOMY

ΡE

ERSONNEL		
P1 - GC	COURTES	CNRS-LAS
01 - M.	VITON	CNRS-LAS
01 - J.P.	SIVAN	CNRS-LAS
01 - H.L.	ATKINS	NASA-MSFC

NSSDC ID- SPALAB1-27

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE IS TO STUDY ZODIACAL LIGHT AND GEGENSCHEIN. LXTENDED GALACTIC OBJECTS, SKY BACKGROUND, CONTINUUM LIGHT AND EMISSION LINES IN HII REGIONS, EXTENSION OF GALACTIC AND EXTRAGALACTIC MATERIAL. STARS AND STAR-LIKE OBJECTS, BRIGHT UV OBJECTS, DUST CONTAMINATION AROUND SFARELAD, AND EMISSION AND MORPHOLOGY STUDIES OF ATMOSPHERIC CONSTITUENTS, WITH WIDE FIELD (SO DEG) ULTRAVIOLET (130 TO 300 NM) AND SPECTROGRAPHIC PHOTOGRAPHY. THE EQUIPMENT CONSISTS OF A WIDE-FIELD CANGHA CONSISTING OF A HYPERBOLIC COLLECTOR, INTERCHANGEABLE SCHMID? CHAMBERS (INCLUDING PRISM, FLAT MIRRORS AND FILTERS), RENOVA - PROXINITY FOCUSED INTENSIFIER UTILIZING A CHANNEL ELECTRON MUL 'IPLIER ARRAY (CEMA) DETECTOR SYSTEM WITH A 100 FRAME FILM PACKAGE.

- SPACELAB 1. CROMMELYNCK-

INVESTIGATION NAME- ABSOLUTE MEASUREMENT OF THE SOLAR Constant

NSSDC ID- SPALAB1-26

PERSONNEL

INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE -- (1) TO USE A SELF-CALIBRATING RADIONETER TO MEASURE THE ABSOLUTE VALUE OF THE SOLAR CONSTANT AND TO MEASURE ANT LONG-TEAM VARIATIONS IN THE SOLAR CONSTANT, AND (2) TO USE SUFFACES OF FUSED SILICA AND METAL EXPOSED TO PALLET CONDITIONS TO DETERTINE THE AMOUNT OF DEGREDATION OF OPTICAL SUFFACES DUE TO CONDITIONS ON THE SPACELAB PALLET. THE EQUIPMENT CONSISTS OF AN ABSOLUTE RADIOMETER WITH AN INBUILT STABILITY CHECK.

-- SPACELAB 1, DEMORENT -----

INVESTIGATION NAME+ TRIBIOL>,ICAL STUDIES OF FLUID LUBRICANT Journal

NSSDC ID- SPALAB1-TO INVESTIGATIVE PROGRAM APPLICATIONS

INVESTIGATION DISCIPLINE(S) INTERPLANETARY PHYSICS TECHNOLOGY

PERSONNEL PI → K.E. PI → Å.F.	

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URLEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO -- DETERMINE THE EFFECT THE EXPERIMENT OBJECTIVES ARE TO -- DETERMINE THE EFFECT OF ZERO GRAVITY ON THE DPERATION OF FLUID LUGRICATED JOURNAL BEARINGS, (2) OBSERVE FLUID FLOW-SURFACE WETTING AND HYDRODYNAMIC FLUID FORMATION IN JOURNAL BEARINGS OPENING IM ZERO GRAVITY, (3) OBSERVE AND MEASURE DYNAMIC INSTABILITIES IN HYDRODYNAMIC BEARINGS IN ZERO GRAVITY, (4) EVALUATE THE USE OF MAGNETIC FIELDS AND FERROLUBRICANTS FOR PREVENTING OWNAMIC INSTABILITY IN JOURNAL BEARINGS OPERATING IN ZERO GRAVITY, AND (5) EVALUATE THE USE OF MAGNETIC FIELDS FOR CONTROLLING FEROFLUIDS IN ZERO GRAVITY. EQUIPMENT CONSISTS OF -- TYPICAL JOURNAL BEARING AND LUBRICANT, FEROFLUD LUGRICATED MAGNETIC JOURNAL, TPANSPARENT BEARINGS FACILITATE PHOTOGRAPHY AND OBSERVATION, AND A CAMERA.

--- SPACELAB 1. ENGE-

INVESTIGATION NAME- ISOTOPE STACK

INVESTIGATIVE PROGRAM NSSDC ID- SPALAB1-29 CODE SA

INVESTIGATION DISCIPLINE(S) COSMIC RAYS

NASA-HSFC HASA-HSFC

PERSONNEL PI - W. DI - R.	ENGE Beaujean	INST PHA NUCLEAR PHYS Inst Pha Nuclear Phys
01 - 8.	SIEGMON	INST P+A NUCLEAR PHYS

192

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE IS TO USE A STACK OF PLASTIC SHEETS TO MEASURE HEAVY COSMIC-RAY NUCLEI (CHARGE \mathcal{L} = 3, 50 MEV PER NUCLEON TO 2 GEV PER NUCLEON), AND TO DETERMINE THE SOURCE, ACCELERATION, PROPAGATION, AND AGE OF COSMIC RAYS. THE EGULPMENT CONSISTS OF A STACK OF LAYERS OF PLASTIC VISUAL TRACK DETECTORS HOUSED IN A SEALED ALUMINUM CONTAINER.

--- SPACELAB 1, ESA STAFF----

INVESTIGATION NAME- METRIC CAMERA FACILITY

INVESTIGATIVE PROGRAM NSSDC ID- SPALAB1-38

CODE ER/COOP

INVESTIGATION DISCIPLINE(S) EARTH RESOURCES SURVEY

ESA-ESTEC

PERSONNEL ESA STAFF P1 -

BRIEF DESCRIPTION THE METRIL CAMERA FACILITY HAS A ZEISS RMK A 30/23 AERIAL SURVEY (AMERA AND A SKYLAB OPTICAL WINDOW, WITH THE FOLLOWING MAIN CHARACTERISTICS -- F = 305 MM, F-STOPS AVAILABLE - F/5.6, F/8, F/11, SHUTTER SPEEDS - 1/100 AND 1/1000 S, NEGATIVE SIZE -23 X 23 CM (LENGTH FOR 450 PHOTOS PER MAGAZINE), ANGLE OF FIELD 15 56 DEG, AND A RESOLVING POWER OF 40 PER MM, BLACK AND WHITE, COLOR, AND COLOR IR FILMS CAN BE USED. THE MAIN TOPICS FOR THE PROPOSED MEASUREMENTS ARE -- ANALYTICAL MEASUREMENTS FOR CONTROL EXTENSION, TOPOGRAPHIC MAPPING, ORTHOPHOTOMAPPING, RESOLUTION EXPERIMENT, AND THERMAILC MAPPING AND INTERPRETATION. INTERPRETATION.

--- SPACELAB 1, ESA STAFF-----

INVESTIGATION NAME- MICROWAVE FACILITY

INVESTIGATIVE PROGRAM Code Er/Coop NSSDC ID- SPALAB1-39

INVESTIGATION DISCIPLINE(S)

METEOROLOGY

PERSONNEL ESA STAFF PI -

A CARLES

10000

ESA-ESTEC

BRIEF DESCRIPTION THE DEJECTIVES OF THE MICRONAVE FACILITY IS DEVELOPMENT OF ALL-WEATHER REMOTE SENSING METHODS, STUDY SENSOR-OBJECT INTERACTION BY MEASUREMENT OF OCEAN SUBFACE WAVE SPECTRA WITH A DUAL-FREQUENCY SCATTERONMETER AND VERIFY SYNTHETIC APERATURE RADAR BEHAVIDE. THE GUIPMENT CONSISTS OF (1) AN ANTENNA-PARABOLIC DISK WITH DIRECT HORN FEEDING. ACTUAL APERATURE TOB. EFFECTIVE APERATURE ABOUT 2 M AZIMUTH AND 1 H ELEVATION, BEAMWIDTH OF 3 DEG, AND EFFICIENCY OF APPROXIMATELY 66 PERCENT, (2) A RECEIVER - COHERENT PULSE RECEIVER WITH FIXED HUMBER OF RANGE GATES. COHERENT PULSE RECEIVER AND A BROADBAND RADIOMETER, AND (3) HF ELECTRONICS - OPERATING FREQUENCY TBD. CARRIER FREQUENCY 8.50 MHZ, AND AVERAGE RF POWER OF ABOUT 25 V.

SPACELAB TA ESA STAFF

INVESTIGATION NAME- SPACE SLED FACILITY

NSSDC 10- SPALAB1-40

INVESTIGATIVE PROGRAM CODE SB/CO-OP

INVESTIGATION DISCIPLINE(S) SPACE BIOLOGY

PERSONNEL ESA STAFF PI

ESA-ESTEC

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BRIEF DESCRIPTION THE SPACE SLED FACILITY IS PROVIDED FOR VESTIBULAR RESEARCH ON HUMAN AND ANIMAL TEST SUBJECTS. VARIOUS ACCELERATION PROFILES ARE AVAILABLE, INCLUDING OSCILLATION AT A RATE OF 0.02 TO 1 HI IN THE RANGE OF 0.1-0.5 G, WITH SINUSOIDAL. AND CONSTANT ACCELERATION. POSITIONING IS AVAILABLE 360 DEG ARQUND THE UPRIGHT AXIS, AND PLUS OR MINUS 90 DEG ARQUND THE LATERAL AXIS.

--- SPACELAB 1, ESA STAFF-----

INVESTIGATION NAME- SPACE PROCESSING LABORATORY

INVESTIGATIVE PROGRAM CODE ES NSSDC ID- SPALAB1-42

ESA STAFF

INVESTIGATION DISCIPLINE(S) TECHNOLOGY

ESA-ESTEC

UNLET DESCRIPTION THE SPACE PROCESSING LABORATORY CONSISTS OF THREE CATEGORIES --- SYSTEM EQUIPMENT, RATERIAL SCIENCES INSTRUMENTATION, AND MATERIAL SCIENCES EXPERIMENTS. THE CONCEPTUAL DESIGN OF THE GRADIENT HEATING FACILITY FOR HIGH TEMPERATURE IS ORIENTED TOWARDS TYPICAL METALLURGICAL, CRYSTAL GROWTH, AND GLASS EXPERIMENTS.

-- SPACELAB 1. FARMER----

INVESTIGATION NAME- ATMOSPHERIC TRACE MOLECULES OBSERVED BY Spectroscopy

NSSDC 10- SPALAB1-05

PERSONNEL PI -

INVESTIGATIVE PROGRAM EARTH DESERVATIONS

INVESTIGATION DISCIPLINE(S) ATMOSPHERIC PHYSICS

PERSONNEL		
P1 - C.8	FARMER	NASA-JPL
	BEER	NASA-JPL
01 - R.	BRECKINRIDGE	NASA-JPL
01 - J.		NASA-JPL
01 - R.	NORTON	NASA-JPL
QI — 0.	RAPIER	
01 - R.	SCHINDLER	NASA-JPL
01 - F.	TAYLOR	NASA-JPL
01 - R.	TOTH	NASA-JPL
	ZANDER	U OF LIEGE
01 - R.		OHIO STATE U
01 — J.	SHAW	NASA-GISS
01 - J.	SUSK1ND	NASA-LARC
01 - J.	RUSSELL	NASAFLARG

01 - J. RUSSELL NASA-LARC BRIEF DESCRIPTION THE OBJECTIVE OF THIS EXPERIMENT IS TO USE THE OBJECTIVE OF THIS EXPERIMENT IS TO USE HIGH-RESOLUTION. BOARDBAND (2-16 MICROMETERS) INFRARED ABSORPTION SPECTRA TO --- (1) DETERMINE THE VARIABILITY OF MINOR AND TRACE CONSTITUENTS OF THE UPPER ATMOSPHERE O. A GLOBAL SCALE, ART TO STUDY CHARACTERISTIC RESIDENCE TIMES FOR THESE CONSTITUENTS, THE MAGNITUDE OF THEIR SOURCE AND SINKS, AND THEIR EFFECTS ON THE STABLILTY OF THE ATMOSPHERE, AND (2) PROVIDE A CALIBRATED SPECTRAL BACKGROUND ATLAS ESSENTIAL FOR THE DESIGN OF ADVANCED INSTRUMENTATION TO BE USED FOK GLOBAL MONITORING OF CRITICAL ATMOSPHERIC SPECIES. THE EQUIPMENT CONSISTS OF A RAPID-SCAN, FOURIER-INTERFERENCE, SPECTROMETER SYSTEM CONTAINING -- (1) AN OPTICAL SYSTEM CONSISTING OF THE BASIC INTERFEROMETER, FOREOPTICS, DETECTOR OPTICS, SUNTACKER, PHOTO CAMERA, CRYOSTAT AND FILTER WHEEL (2) A CONTINUOUS-SCAN SERVO SYSTEM, (3) AN IR SIGNAL HANDLING SYSTEM, (4) A DATA-HANDLING SYSTEM AND PRESSURIZATION SYSTEM.

- SPACELAB 1. GAUER---

INVESTIGATION NAME- HEASUREMENT OF (CENTRAL) VENOUS PRESSURE by puncturing an arm vein

NSSDC 1	b-	SPALAB1-31	INVESTIGATIVE PROGRAM Code Sb/CO-OP

INVESTIGATION DISCIPLINE(S) SPACE BIOLOGY

ERSONNEL PI - 0.H. 01 - 01 -	GAUEP Koch Rocker	Ū U	OF BERLIN OF BERLIN OF BERLIN OF BERLIN
01 -	KIRSCH		

BRIEF DESCRIPTION BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE IS TO PROCURE ABSOLUTE DATA THAT THE ADAPTION OF MINERAL AND WATER METADOLISM TO THE WEIGHTLESS CONDITION IS INITIATED BY THE ENGORGEMENT OF THE CEPHALAD CIRCULATION. THE EQUIPMENT CONTAINS A STRAIN GAGE NANDMETER, TAPE RECORDER, AND BATTERIES. - SPACELAB 1, GAUER-INVESTIGATION NAME- COLLECTION BLOOD SAMPLES FOR DETERMINING A.D.H., ALDOSTERONE, AND OTHER HORMONES NSSDC ID- SPALAB1-37 INVESTIGATIVE PROGRAM CODE SB/CO-OP

INVESTIGATION DISCIPLINE(S) SPACE BIOLOGY

PERSONNEL		
P1 - 0.H.	GAUER	U OF BERLIN
01 -	KIRGCH	U OF BERLIN
01 -	KOCH	U OF BERLIN
01 -	ROCKER	U OF BERLIN
01 -	STOBOY	U OF BERLIN

GRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE IS THE CONFIRMATION AND COMPLETION OF SIMILAR WORK IN THE SKYLAB FLIGHTS, AND ATTEMPT TO FIND A CONMECTION WITH CIRCULATORY PARAMETERS. THE EQUIPMENT IS A CENTRIFUGE AND A STORAGE CONTAINER AT MINUS 20 DEG.

- SPACELAB 1, GIRARD-----

INVESTIGATION NAME- GRILLE SPECTROMETER

NSSDC 10- SPALAB1-18	INVESTIGATIVE PROGRAM Earth observations
	INVESTIGATION DISCIPLINE(S) Atmospheric physics

PERSONNEL		
P1 - A.	GIRARD	ONERA
01 - D.	FRIMONT	BIRA
01 - N.	ACKERMAN	BIRA

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE -- (1) TO DETERMINE THE VERTICAL DISTRIBUTION PROFILES OF TRACE CONSTITUENTS IN THE STRATOSPHERE, MESOSPHERE, AND THERMOSPHERE IN ORDER TO STUDY THE CHENICAL AND DYNAMICAL ATMOSPHERIC PROCESSES, AND (2) TO MONITOR, ON A LONG-TERN BASIS, MAN-MADE AND NATURAL ALTERATIONS OF THE NEAR-EARTH ENVIRONMENT. THE EQUIPMENT CONTAINS AM INFRARED SPECTROMETER WITH A TELESCOPE AND A COOLED INFRARED DETECTOR. DETECTOR.

- SPACELAB 1, GREEN------

INVESTIGATION NAME- ELECTRD-PHYSIOLOGICAL TAPE RECORDER

NSSOC ID- SPALAB1-35 INVESTIGATIVE PROGRAM BIOSCIENCE

INVESTIGATION DISCIPLINE(S) SPACE BIOLOGY

PERSONNEL				
PI - H.L.	GREEN	CLINICAL	RES	CENTER
01 - F.D.	STOTT	CLINI CAL	RES	CENTER
01 - H.S.	WOIFF	CLINICAL	RES	CENTER

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE IS TO STUDY ACCLIMATISATION OF ASTRONAUTS TO ZERO GRAVITY BY MEANS OF AN ELECTROCARDIOGRAPH (ECG). ELICTROCEPHALOGRAM (EEG) ELECTRO-OCULOGRAM (EOG). AND POSSIBLY ELECTROMYOGRAM (EMG) ON A CONTINUOUS DASIS BY A MINIATURE TAPE RECORDER ATTACHED TO THE CREW MEMBER. THE EQUIPMENT CONSISTS OF ECG. EEG. AND EOG ELECTRODES. PREAMPLIFIER, TAPE RECORDER, AND BATTERIES.

CODE SA

-- SPACELAB 1, HART------

INVESTIGATION NAME- GEOPHYSICAL FLUID FLOW INVESTIGATIVE PROGRAM

NSSDC ID- SPALAB1-08

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INVESTIGATION DISCIPLINE(5) SOLAR PHYSICS ASTRONOMY

U OF COLORADO U OF COLORADO HIGH ALTITUDE OBS

NASA-NSFC

PERSONNEL	
P1 - J.E.	HART
01 - J.	TOOMRE
01 - P.	GILMAN
01 - 5.	FICHTL

BRIEF DESCRIPTION THERE ARE TWO EXPERIMENT OBJECTIVES. ONE OBJECTIVE OF THIS EXPERIMENT IS TO UNDERSTAND THE CONVECTION OF STARS AND THE SUN BY -- (1) STUDYING THE ONSET OF CONVECTION BETWEEN DIFFERENCES AND ROTATION, (2) STUDYING THE SHAPES OF THE CONCENTRIC SPHERES AS A FUNCTION OF IMPOSED TEMPERATURE DIFFERENCES AND ROTATION, (2) STUDYING THE SHAPES OF THE CONVECTION CELLS AT THE ONSET OF CONVECTION AND ITS EVOLUTION, (3) STUDYING THE INTERACTIVE MOTIONS SUCH AS MEAN AZIMUTHAL FLONS OBSERVED ON THE SOLAR EQUATORIAL REGION. THE OTHER DEPERIMENTS TO ACT AS THE FORENUMER OF A SERIES OF PROPOSED EXPERIMENTS TO STUDY THE BAROCLINIC PROPERTIES OF THE EARTH'S ATMOSPHERE AND THE GENERAL CIRCULATION OF THE EARTH'S OCEAN BASINS. THE EQUIPMENT CONSISTS OF AN ELECTROCONVECTION CELL, CONTROLLERS, AND A CAMERA. CONTROLLERS, AND & CAMERA.

- SPACELAB 1, HERSE------

INVESTIGATION NAME- WAVES IN THE OH EMISSIVE LAYER

INVESTIGATIVE PROGRAM CODE ER/COOP NSSDC ID- SPALAB1-19

INVESTIGATION DISCIPLINE(S) METEOROLOGY ATMOSPHERIC PHYSICS

PERSONNEL PI - M. 01 - G. HERSE CHRS-SA CHRS-SA MOREELS

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO STUDY THE LARGE SCALE STRUCTURE OF THE ATMOSPHEBIC OH EMISSION, AND TO IMVESTIGATE POSSIDLE RELATIONS DETWEEN THE OH EMISSION STRUCTURE AND OROGRAPHY OR METEOROLOGICAL PHENOMENA. THE EQUIPMENT CONTAINS AN IMAGE INTENSIFIER WITH A CAMERA, FILTER, AND 16-MM 40VIE CAMERA WITH A 25-MM F 0.95 LENS.

-- SPACELAB 1, HONECK

INVESTIGATION NAME- MICRO-ORGANISMS AND BIOMOLECULES IN THE SPACE ENVIRONMENT

INVESTIGATIVE PROGRAM CODE S8/CO-OP NSSDC 10- SPALAB1-34

INVESTIGATION DISCIPLINE(S) SPACE BIOLOGY

PERSONNEL		
P1 - S.	HONECK	U OF FRANKFURT
0I - C.	THOMAS-GORFIAS	U OF FRANKFURT
01 - G.	REITZ	U OF FRANKFURT

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO --- (1) MEASURE QUANTITATIVELY THE EFFECTS OF SPACE PARAMETERS (VACUUM, SOLAR UV-RADIATION) ON MICROBIAL BACTERIAL SPORES, BACTERIAL VEGETATIVE CELLS, BACTERIOPHAGES AND ENZYMES, AND TO UNDERSTAND THE EFFECTS ON THESE SAMPLES, (2) EVALUATE THE CONSEQUENCES OF GENETIC AND RESPONSE ALTERATIONS, AND (3) COMPARE THE RESULTS WITH SIMULATION EXPERIMENTS PERFORMED IN THE LABORATORY. THE EQUIPMENT IS A BOX ACCOMMUDATING 100 TO 200 BIOLOGICAL SAMPLES.

----- SPACELAB 1, KIMZEY-----

INVESTIGATION NAME- INFLUENCE OF SPACEFLIGHT ON Erythrokinetics in Man

NSSDC 10- SPALAB1-14

INVESTIGATIVE PROGRAM CODE SB

INVESTIGATION DISCIPLINE(S) SPACE BIOLOGY

PERSONNEL		
PI - S.L.	KIMZEY	NASA-JSC
01 - W.H.	CROSOV	SCRIPPS C+R FOUNDATION
01 - MEHD1	TAVASSOLI	SCRIPPS C+R FOUNDATION
01 - P.C.	LOHNSON	BAYLOR U
01 - J.P.	CHEN	U OF TENNESSEE
01 ~ C.D.A	_DUNN	U OF TENNESSEE
01 - R.D.	LANGE	U OF TENNESSEE
01 - E.C.	LARKIN	VETERANS ADMIN HOSP

NSSDC ID- SPALA01-03

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE 15 TO OBTAIN NEW AND SPECIFIC INFORMATION PERTAINING TO THE MECHANISM AND SITE OF ACTION Relative to the Red Blood Cell M/SS and Plasma volume changes DBSERVED DURING SPACE FLIGHT. THE EQUIPMENT CONSISTS OF AN IN-FLIGHT BLOOD COLLECTION SYSTEM IND A REFRIGERATOR.

SPACELAB 1, MENDE------

INVESTIGATION NAME- ATHOSPHERIC EMISSION PHOTOMETRIC IMAGING

INVESTIGATIVE PROGRAM C. DE ST

INVESTIGATION DISCIPLINE(S) Atmospheric physics

1.90

ERSONNEL		
PI - S.B	. MENDE	
01 - R.H		
01 - R.J		
01 - D.L		
01 - G.R		
01 - 8.J		
ot - 5.	CLIFTON	

The Real Property in the Prope

OI - S. CLIFTON BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO -- (1) INVESTIGATE THE UPPER ATMOSPHERIC TRANSPORT PROCESSES THROUGH THE MEASUREMENT UPPER ATMOSPHERIC TRANSPORT PROCESSES THROUGH THE MEASUREMENT OF RESONANT SCATTERED EMISSIONS FROM POSITIVE MG IONS, (2) OF RESONANT SCATTERED EMISSIONS FROM POSITIVE MG IONS, (2) OF RESONANT SCATTERED EMISSIONS FROM POSITIVE MG ONS, (2) OF RESONANT SCATTERED EMISSIONS FROM POSITIVE MG ONS, (2) OF RESONANT SCATTERED EMISSIONS FROM POSITIVE MG MASKED ENISTIONS (3) INVESTIGATE ATMOSPHERIC COMPOSITION RESULTING EMISSIONS, (3) INVESTIGATE ATMOSPHERIC COMPOSITION AND ENERGY BUDGET THROUGH OBSERVATIONS OF NATURAL AURORA, (4) OBSERVE LARGE- AND IMALL-SCALE AURORAL MORPHOLOGY AND COMPARE ULTRAVIOLET AND VISIBLE AURORAL FEATURES, (5) SUPPORT THE ULTRAVIOLET AND VISIBLE AURORAL FEATURES, (5) SUPPORT THE ULTRAVIOLET AND VISIBLE AURORAL FEATURES, (5) SUPPORT THE EQUIPMENT CONSISTS OF -- (1) A DUALCHANNEL VIDES SYSTEM WITH ASSOCIATED OPTICS AND DATA HANDLING ELECTRONICS NOUNTED ON A ASSOCIATED OPTICS AND DATA HANDLING ELECTRONICS NOUNTED ON FOR MIGH SENSITIVITY. HIGH-RESOLUTION OFERATION, (3) A FOR MIGH SENSITIVITY. HIGH-RESOLUTION OFERATION, (3) A FOR MIGH SENSITIVITY. HIGH-RESOLUTION OFERATION, (3) A FOR MIGH SENSITIVITY. HIGHARESOLUTION OFERATION, (3) A AND SCALED OPTICS AND (4) CDM5 AND ONBOARD RECORDERS UTILIZED FOR DATA DISPLAY AND RECORDING

- SPACELAB 1, OBAYASHI------

"NVESTIGATION NAME- SPACE EXPERIMENTS WITH PARTICLE Accelerators (Sepac)

INVESTIGATIVE PROGRAM CODE ST/CO-OP LSSDC ID- SPALAB1-02

> INVESTIGATION DISCIPLINE(S) ARTICLES AND FIELDS

LOCKHEED PALO ALTO LOCKHEED FALG BOSTON COLLEGE NASA-MSFC NASA-MSFC NASA-MSFC

NACA-MSEC NASA-MSFC

ERSONNEL		U 0F T (KYO
01 - J.M.	OBAYASHI Sellen	TRW SISTEMS GROUP U of texasisan antonio
01 - J.L. 01 - C.R. 01 - W.T.	CHAPPELL	NASA-MSFC NASA-MSFC

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO USE AN ELECTRON BEAM THE EXPERIMENT OBJECTIVES ARE TO USE AN ELECTRON BEAM ACCELERATOR AND A MAGNETO PLASMA DYNAMIC ARCJET TO STUDY -- (1) AURORAL PRODUCTION IN THE UPPER ATMOSPHERE, (2) IONOSPHERE AURORAL PRODUCTION IN THE UPPER ATMOSPHERE, (2) IONOSPHERE PROCESS, ELECTRIC AND MAGNETIC FIELD MORPHOLOGY, VEHICLE CHARGE PROCESS, ELECTRIC AND MAGNETIC FIELD MORPHOLOGY, VEHICLE CHARGE PROCESS, ELECTRIC AND MAGNETIC FIELD MORPHOLOGY, VEHICLE CHARGE PROCESS, ELECTRIC AND MAGNETIC FIELD MORPHOLOGY, VEHICLE CHARGE PROTECT AND AND MAGNETIC FIELD MORPHOLOGY, VEHICLE CHARGE PROTECT AND AND MAGNETIC PLOTENT AND SETMEN THE BEAM/ NEUTRAL PLUME INTERACTION, THE COUPLING BETWEEN THE BEAM/ NEUTRAL PLUME INTERACTION, THE COUPLING BETWEEN THE PARTICLE INTERACTIONS ON ATMOSPHERIC DYNAMICS, THE EQUIPMENT CONSISTS OF AN ELECTRON BEAM ACCELERATOR, MAGNETO PLASMA DYNAMIC ARCJET, BATTENY/CAPACITOR BANK TO PROVIDE HIGH DISCHARGE CURRENT, MONITOR AND DIAGNOSIC DEVICES, AND CONTROL, DISPLAY, AND DATA MANAGEMENT SYSTEMS.

- SPACELAB 1, PAN---

INVESTIGATION NAME- BEARING LUBRICANT WETTING, SPREAUING AND OPER'ING CHARACTERISTICS IN O-G

INVESTIGATIVE PROGRAM

NSSDE 1 - SPALAB1-09

INVESTIGATION DISCIPLINE(S) Interplanetary physics Technology

PERSONNEL PI - C.H.T.PAN SHAKER RESEARCH CORP

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO -- (1) DETERMINE THE EXTENT TO WHICH SELECTED COMMERCIAL LUBRICANT METTABLLITY IS AFFECTED BY A ZERO-GRAVITY ENVIRONMENT, (2) DETERMINE HOW BEAPING TORQUE, BEARING LUBRICANT FECDING, AND BEARING OPERATING TORQUE, BEARING LUBRICANT RESEARCH OF COMMERCIAL COMPARE RESULTS WITH LABORATORY RESEARCH OF COMMERCIAL APPLICATIONS, AND (4) PROVIDE DATA FOR APPLICATIONS IN SPACE ARDUARE. THE GUIPPENT CONSISTS OF PLATES FOR LUBRICANT WETTING AND SPREADING TESTS, HYDRODYNAMIC JOURNAL BEARING, AND AN AVAILABLE FLIGHT CAMERA.

- SPACELAB 1, RESCHKE-----

INVESTIGATION NAME- VESTIBULO-SPINAL REFLEX MECHANISMS

NSSDC ID- SPALAB1-16

CODE SB

INVESTIGATIVE PROGRAM

INVESTIGATION DISCIPLINE(S) Space Biology

PERSONNEL	
PI = M.F.	RESCHKE
0I - J.L.	HOMICK
01 - D.J.	ANDERSON

JZL-AZAN NASA-JSC U OF MICHIGAN

DRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO USE THE ESA SLED TO THE EXPERIMENT OBJECTIVES ARE TO USE THE ESA SLED TO DETERMINE IF THE VESTIBULO-SPINAL REFLEX MEASUREMENT TECHNIQUE (H-REFLEX) IS SUITABLE AS AN EFFECTIVE PREDICTOR OF SUSCEPTIBILITY TO SPACE MOTION SICKNESS, AND TO STUDY THE RELATIONSHIP BETWEEN MOTION SICKNESS SENSITIVITY ON THE EARTH RELATIONSHIP BETWEEN MOTION SICKNESS SENSITIVITY ON THE FARTH EQUIPMENT CONSISTS OF A SLED FACILITY, POWER MODULE CONTAINING PULSE GENERATOR-OS TILOSCOPE DIFFERENTIAL AMPLIFIER AND MICROPROCESSOR, PREAMPLIFIER, STIMULOUS ISOLATION UNIT, AND MICROPROCESSOR. PULSE GENERATO Microprocessor, Electrode Kit-

--- SPACELAB 1, ROSS----

INVESTIGATION NAME- MASS DISCRIMINATION DURING Weightlessness

NSSDC ID- SPALAB1-30

INVESTIGATION DISCIPLINE(S) Space biology

INVESTIGATIVE PROGRAM CODE SB/CO-OP

PERSONNEL ROSS PI - H.

IL OF STIRLING

11 OF ROME

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE IS TO COMPARE MASS DISCRIMINATION WHEN BOTH THE OBSERVER AND THE TEST OBJECTS ARE WEIGHTLESS, WITH WEIGHT DISCRIPTINATION UNDER NORMAL GRAVITY. THE EQUIPMENT IS A BOX CONTAINING WEIGHTED TINS, A BLINDFOLD, INSTRUCTIONS, AND RECORD CARDS.

-- SPACELAB 1, SCANO------

INVESTIGATION NAME- BALLISTOCARDIOGRAPHIC RESEARCH IN Weightlessness

INVESTIGATIVE PROGRAM Code Sb/CD-OP NSSDC 10- SPALAB1-33

INVESTIGATION DISCIPLINE(S) SPACE BIGLOGY

PERSONNEL PI - A. SCANO

BFIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO RECORD A THREE-DIMENSIONAL BALLISTOCARDIDGRAM IN RESTING WEIGHTLESS MAN AND COMPARE IT WITH SIMILAR TRACINGS RECORDED ON THE SAME SUBJECT IN GROUND CONDITIONS, POSSIBLY TO FIND BCG MODIFICATION: IN RELATION TO CARDIOVASCULAR ALAPTATIONS TO MEIGHTLESSNELS, AND TO RECORD OTHER BODY ACCELERATIONS IN WEIGHTLESSNELS, AND TO RECORD OTHER BODY ACCELERATION, AND COUGH. THE EQUIPMENT CONSISTS OF THREE SERVO-ACCELEROMETERS AND ONE ECG RECORDER WITH FOUR CHANNELS.

--- SPACELAB 1, SULZMAN------INVESTIGATION NAME- CHARACTERIZATION OF PERSISTING CIRCADIAN RHYTHMS

NSSDC ID- SPALABI-15

INVESTIGATION DISCIPLINE(S)

PERSONNEL SULZMAN PI - F.M. SULZH 01 - M.C. MOORE

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO -- TEST IF CIRCADIAN RHYTHNS PERSIST OUTSIDE THE EARTH'S ENVIRONMENT, AND TO DETERMIJE IF THE CIRCADIAN TIMING SYSTEM IS EXOGENOUS OR ENDOGENUS, AND (2) EXAMINE THE INFLUENCE OF THE SPACE ENVIRONMENT, UN THE CIRCADIAN ORGANIZATION. THE EQUIPMENT CONSLITS OF A LIGHT TIGHT BOX CONTAINING 24 GROWTH TUBES.

INVESTIGATION NAME- OC AND LOW FREQUENCY VECTOR MAGNETOMETER

SPALAB1-23 NSSDC 10INVESTIGATIVE PROGRAM CODE ST/CO-OP

INVESTIGATION DISCIPLINE(S) Magnetospheric Physics Particles and fields

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and the second s

191

INVESTIGATIVE PROGRAM

CODE SB

SPACE BIOLOGY

HARVARD U Harvard U

- SPACELAB 1. THEILE-----

PERSONNEL P1 - 8. THEILE

BRIEF DESCRIPTION THE EXPERIMENT DØJECTIVES ARE TO USE A THREE-AXIS FLUKGATE MAGNETOMETER TO STUDY --- (1) NAGMETIC FIELDS OF THE IDNOSPHERIC POLAR ELECTROJET AND ITS RETURN CURRENT, EGUATORTAL ELECTROJET, AND THE SOLAR QUIET CURRENT, (2) THE VECTOR MAGNETIC FIELD BACKGROUND. THE EQUIPMENT CONSISTS OF TWO SEPARATE THREE-AXIS FLUKGATE SENSORS.

--- SPACELAB 1, THUILLIER------

INVESTIGATION NAME- TEMPERATURE AND WIND MEASUREMENTS IN THE Mesosphere and thermosphere

NSSDC ID-	SPALAB1-20	INVESTIGATIVE PROGRAM Code Er/Coop
		CODE EN/COOP

INVESTIGATION DISCIPLINE(S) METEOROLOGY PLANETARY ATMOSPHERES

PERSONNEL P1 - G. THUILLI 01 - J.E. BLANONT 01 - M.L. DUBOIN 01 - P. CONNES	ER CNRS-SA CNRS-SA CNRS-SA Paris Observatory
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BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE TO USE A MICHELSON THE EXPERIMENT OBJECTIVES ARE TO USE A MICHELSON INTERFEROMETER TO --- (1) DETERMINE THE TEMPERATURE AND WIND PROFILES FROM THE TOP OF THE MESOSPHERE TO THE THERMOSPHERE BY ANALYSIS OF THE LINE WIDTHS AND DOPPLER SHIFTS OF NATURAL EMISSION OF DAVELOW NORSHTGLOW CONSTITUENTS, AND (2) TO USE THIS EXPERIMENT AS A DEMONSTRATION FOR MORE SOPMISTICATED INSTRUMENTS TO BE FLOUN ON FUTURE MISSIONS. THE EQUIPMENT INSTRUMENTS OF THREE FIELD-COMPENSATE. MICHELSON INTERFEROMETERS, A HIGH-RESOLUTION INSTRUMENT, AND A USSEGRAIN TELESOPE.

----- SPACELAB 1, THUILLIER-----

INVESTIGATION NAME- MEASUREMENT OF THE SOLAR SPECTRUM FROM 190NM TO 4000NM

INVESTIGATIVE PROGRAM Code St NSSDC ID- SPALAD1-21

INVESTIGATION DISCIPLINE(S) SOLAR PHYSICS

PERSONNEL PI - G. PI - P- 01 - J. 01 - R.	THUILLIER Simon Blamont Pastiels	ENRS+SA IASP ENRS-5A IASP LANDESSTEDNWARTÉ
01 - R. 01 - D.	LABS	LANDESSTERNWARTE

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE IS TO MEASURE THE SOLAR SPECTRAL IRRADIANCE WITH AN ACCURACY OF 0.1 PERCENT IN ORDER TO DETERMINE SOLAR CONSTANT, VARIATIONS IN SOLAR CONSTANT WITH SOLAR CYCLE USING SPACELAR/STS FLIGHTS OVER A 10-VEAR PERIODA AND VARIATIONS OF IRRADIANCE WITHIN EACH SPECTRAL REGION. THE EQUIPMENT CONSISTS OF THREE GRATING SPECTROHETERS COVERING --EQUIPMENT CONSISTS OF THREE GRATING SPECTROHETERS COVERING --EQUIPMENT CONSISTS, AND IR - 1000 TO 4000 NM (10 NM BANDFASS).

----- SPACELAB 1, TORR--

INVESTIGATION NAME- AN IMAGING SPECTROMETRIC OBSERVATORY

INVESTIGATIVE PROGRAM NSSDC TO- SPALAB1-01 CODE ST

INVESTIGATION DISCIPLINE(S) ATMOSPHERIC PHYSICS

PER

RSONNEL	U OF MICHIGAN
PI - H.R. TORR	KITT PEAK NATL OBS
OI - A.L. BROADFOOT	KITT PEAK NATL 085
OI - D.E. SHEMANSKY	KITI PEAK NATE ODS
01 - B.R. SANDEL	KITT PEAK NATE DBS
01 - S.K. ATREYA	U OF MICHIGAN
Q1 - G.R. CARIGNAN	U OF MICHIGAN
	ARECIBO OBS
01 - J.C.F.WALKER	U OF MICHIGAN
OI - D.G. TORR	U OF MICHIGAN
OT - T N. DONAHUE	

GRIEF DESCRIPTION THE OBJECTIVES OF THIS EXPERIMENT ARE -- (1) TO PRODUCE THE DAYTIME SPECTRUM (200-12,000 A, 3=6 A RESOLUTION) THE FIRST DAYTIME SPECTRUM (200-12,000 A, 3=6 A RESOLUTION) EMISSIONS OF ATMOSPHERIC METASTABLE SPECIES, ATMOSPHERIC MOLECULAR NITROGEN SYSTEMS, NESOSPHERE AND LOWER THERMOSPHERE TRACE CONSTITUENTS, ATMOSPHERIC HELIUM AND HYDROGEN, (2) TO THE SHUTTLE INDUCED CONTAMINATION, AND (3) TO SERVE AS THE PRECURSOR FOR FUTURE SHUTTLE DESERVING PROGRAMS USING THIS DOSERVATORY. THE EQUIPMENT CONSISTS OF (1) A BROADBAND INSTRUMENT DESIGNED FOR HIGH-SPEED OPERATION, (2) AM INSTRUMENT COMPOSED OF FIVE CO-ALLENED DEMICAL SPECTRORTERS, EACH RESTRICTED TO A GIVEN SPECTRAL RANGE WITHIN THE SELECTED FIELD OF VIEW, AND (3) A MIRROR ON THE COVER USED FOR IMAGE

STABILIZING, HEIGHT SCANNING OR TRACKING.

--- SPACELAB 1, VON BAUNGARTEN----

INVESTIGATION NAME- HUMAN VESTIBULAR REACTIONS AND SENSATION In space (sled experiments)

INVESTIGATIVE PROGRAM NSSDC ID- SPALAB1-41 CODE 58

INVESTIGATION DISCIPLINE(S) Space biology

PERSONNEL PI - R. VON BAUMGARTEN DI - J. Dichgans OI - T. Brandt DI - H. Scherer	U OF MAINZ U OF FREIBERG Krupp kranken-Angstaln U of Munich
--	--

BRIEF DESCRIPTION THE EXPERIMEN' CDJECTIVE IS TO USE THE SLED TO STUDY THE THE EXPERIMEN' COORDINATION AND OF THE INTEGRATION OF MULTISENSORY STIMULA WITHIN THE ORIENTATION CENTERS OF THE BRAIN BY SUBJECTING THE SUBJECT TO SHORT PERIODS OF LINEAR ACCELERATION IN CONJUNCTION WITH OPTOKINETIC STIMULATION AND CALORIC STIMULATION. IN ADDITION TO THE SPACE SLED, THE CAUPMENT CONTAINS AN OPTAKINETIC STIMULATION DISPLAY. A CALORIC STIMULATION SYSTEM, AN OPTICAL TARGET SETTING SYSTEM, AN ELECTROBERT RECORDER, AN ELECTROMYDORAPHIC RECORDING SYSTEM, AN ELECTROMYSTAGHOGRAPHIC RECORDING SYSTEM, ELECTROCARDIOGRAPHIC RECORDING SYSTEM, AND A MOTION PERCEPTION INDICATOR. INDICATOR .

----- SPACELAB 1, VOSS, JR.-----

INVESTIGATION NAME- EFFECTS OF PROLONGED WEIGTLESSNESS ON The Humoral Immune Response in Humans

INVESTIGATIVE PROGRAM NSSDC ID- SPALAB1-17

CODE SB

INVESTIGATION DISCIPLINE(S) Space Biology

PERSONNEL PI - E.W. VOSS/ JR.

U OF ILLINOIS

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVES ARE AN EVALUATION OF PROLONGED WEIGHTLESSNESS AS A STRESS FACTOR EFFECT ON THE IMMUNE RESPONSE OF HUMANS, AND TO ESTABLISH THE CAPABILITY OF HUMANS TO RESPOND IMMUNOLOGICALLY TO POTENTIAL FOREIGN PATHOGENS DURING FUTURE SUSTAINED SPACE FLIGHT. THE EQUIPMENT INCLUDES A CONTAINER FOR STORING BLOOD SAMPLES, STERILE SYRINGES, NEEDLES, AND TEST TURES. TUBES .

--- SPACELAB 1, WILHELM------

INVESTIGATION NAME- STUDY OF LOW-ENERGY ELECTRON FLUX AND Its reaction to active experimentation

NSSDC ID- SPALAB1-24

INVESTIGATION DISCIPLINE(S) PARTICLES AND FIELDS

MPI-AERONOMY MPI-AERONOMY Tech u of graz

INVESTIGATIVE PROGRAM

CODE ST/CO-OP

PERSONNEL PI - K. 01 - W. 01 - W. NTURELM STUDEMENN

BRIEF DESCRIPTION THE EXPERIMENT DBJECTIVES ARE TO FLY A 2-PI FIELD OF VIEW THE EXPERIMENT DBJECTIVES ARE TO FLY A 2-PI FIELD OF VIEW ELECTROSTATIC ANALYZER TO MEASURE -- NATURAL ELECTRON FLUXES IN THE 0.5- TO 12.2.0-KEV RANGE TO STUDY PRECIPITATION PROCESS IN AURORAL EMISSION, EFFECTS OF THE ELECTRON ACCELERATOR (SEPACI OPERATIONS ON THE NATURAL ELECTRON FLUXES, THE INFLUENCE OF THE SHUTTLE/SPACELAB GENERATED ATMOSPHERE ON THE NATURAL ELECTRON FLUX, AND TO STUDY NATURAL ELECTRON FLUXES AS A SENSITIVE PROBE FLUX, AND TO STUDY NATURAL ELECTRON FLUXES, THE ENJIPHENT OF THE SURFACE CHARGE ON THE STS/SPACELAB, THE EQUIPENT CONSISTS OF AN ELECTROSTATIC DEFLECTION DEVICE WITH A REMISPHERIC FIELD OF VIEW AND WITH AZIMUTH AND PITCH-ANGLE RESOLUTION, AND EIGHT CONTINUOUS CHANNEL ELECTRON MULTIPLIERS FOR DEFECTORS. RESOLUTION, A FOR DETECTORS.

INVESTIGATION NAME- ACTIVE CAVITY RADIGHETER SOLAR Irradiance: Monitor

INVESTIGATIVE PROGRAM CODE ST NSSDC 10+ SPALAB1-04

INVESTIGATION DISCIPLINE(5) Solar Physics Particles and fields

4 - CARE

PERSONNEL		
P1 + 8.C.	VILLSON	NASA-JPL
01 - R.	BEER	NASA-JPL
01 - H.		CALIF INST OF TECH
	KENDALL, SR.	CALLE INST OF TECH
BRIEF DESCRIP	110N	
THE EX	PERIMENT OBJECTIVES ARE TO	MEASURE THE TOTAL SOLAR
IRRADIANCÉ,	TO MEASURE THE MAGNETUDE A	ND DIRECTION CHANGES IN
THE TOTAL 5	OLAR IRRADIANCE, AND PROVID	E LONG TERM CORRELATION
AND CALIBRAT	ION WITH SATELLITE ROCKE	T AND FUTURE SHUTTLE
ELIGHTS. THE	EQUIPMENT CONSISTS OF AN A	CTIVE CAVITY RADIOMETER
THE TH (CEL	FCALIBRATING PYRHELIOMETER)	. A POWER CONVERTER, AN
ELECTRONIC UN	IT, AND SUPPORT STRUCTURE.	

----- SPACELAR 1, YOUNG----

NSSOC TO+ SPALAB1-13

PERSONNEL

RSONNEL PI - L.R. DI - G.M. DI - R.E. DI - K.E. DI - C.M.

NSSOC ID- LST

SPONSORING COUNTRY/AGENCY UNITED STATES

PERSONNEL MG - M.J. AUCREMANNE SC - N.G. ROMAN PS - C.R. O'DELL

PLANNED ORBIT PARAMETERS ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 94.5 MIN PERIAPSIS- 500. KM

INVESTIGATION NAME- VESTIBULAR STUDIES

YOUNG JONES MALCOLM Money Oman NASS INST OF TECH MCGILL U D+C INST OF ENVIRN MED D+C INST OF ENVIRN MED

WEIGHT- 9525. KG

INCLINATION- 28.8 APÖAPSIS- 500. KN

NASA HEADQUARTERS NASA HEADQUARTERS

NASA-RSEC

28.8 bEG

MASS INST OF TECH

INVESTIGATIVE FROGRAM

INVESTIGATION DISCIPLINE(\$) Space Biology

CODE 55

BRIEF DESCRIPTION THE EXPERIMENT OBJECTIVE IS TO DETERMINE IF OTOLITH SENSITIVITY CHANGES ARE INVOLVED IN SPACE GOTION SICKNESS AND POSTFLIGHT POSTURAL DISTURGANCES. EQUIPMENT CONSISTS OF --SLED FACILITY, MOTOR-DRIVEN ROTATING FIELD, YO-MP MOVIE CAMERA, CALIBRATION LIGHT ARRAY, STATION FOR HUPPING TEST, AND TAPE

NASA-OSS

PS - C.R. 0'DELL NASA-RSFC BRIEF DESCRIPTION THE PROPOSED LARGE SPACE TELESCOPE (LST) IS A SPACERORNE, DIFFRACTION-LIMITED TELESCOPE WITH A PLANNED EFFECTIVE AF-ESTURE OF APPROXIMATELY 3 M. THE INITIAL LAUNCH OF THE LST INTO EARTH ORBIT IS EXPECTED IN LATE 1980. THE SPACE SHUTTLE IS USED FOR INITIAL LAUNCH, IN-ORBIT SERVICING, AND FOR RETURN OF THE LST TO THE GROUND FOR MAINTEHANCE. THE AMTICIPATED MINIMUM OFERATIONAL LIFFTIME, EXCLUDING DOWNTIME FOR PERIODIC MAITOMAL ASTRONOMICAL SPACE OBSERVATORY FACILITY. THE USE OF THE ONBOARD INSTRUMENTATION IS OPEN TO SCIENTISTS OF ALL COUNTRIES. THUS, ITS DESIGN IS MOST FLEXIBLE TO ALLOW FOR THE REFLACEMENT OF SCIENTIFIC INSTRUMENTATION WHEN NECESSARY. TO INCORPORATE TECHNOLOGICAL ADVANCES, AND TO SATISFY CHANGES IN THE OSERVATIONAL INTERSTO OF THE ASTROMOMICAL COMMUNITY. INSTRUMENTATION UPDATING, REPAIR, OP REPLACEMENT ARE ACCOMPLISHED AY EITHER RETURN OF THE ASTROMOMICAL COMMUNITY. INSTRUMENTS AS FOLLOWS -- (1) A HIGH-RESOLUTION CA'ERA TO COVER THE SPECTRAL RANGE FROM T20 TO TO DION, (2) A HIGH-RESOLUTION SPECTROGRAPH, OF RESOLUTION MAPROXIMATELY 1.ES, FOR THE 120-TO-310 NM REGION, (3) A FAINT OBJECT SPECTROGRAPH FOR WORK IN THE 90- TO 1100-MR REGION, (4) AM ASTROMERIC PAKAESE FOR INGING WORK ON DOUBLE STARS, POPER NOTIONS, PARALLAXES, ETC., (5) AN INFRARED PHOTOMETER MAY/OR SPECTROGRAPH TO COVER THE WAVELENGTH INFRARED PHOTOMETER TANDON STRUMENTER TO COVER THE WAVELENGTH INFRARED PHOTOMETER TANDON STRUMENTER TO COVER THE WAVELENGTH INFRARED PHOTOMETER TO TOON PARALLAXES, ETC., (5) AN INFRARED PHOTOMETER TANDON STRUMETER TO COVER THE WAVELENGTH INFRARED PHOTOMETER TO TOON PARALLAXES, ETC., (5) AN INFRARED PHOTOMETER TANDON MICROMETERS.

INVESTIGATION NAME- SCIENTIFIC INSTRUMENT PACKAGE UNIT NO. 1 - High-Resolution Camera

SPACECRAFT COMMON NAME- ST Alternate Names- large space telescope, space telescope

LAUNCH DATE- 11/00/23 LAUNCH SITE- CAPE CANAVERAL, UNITED STATES LAUNCH VEHICLE- SHUTTLE

NSSDC 10-L\$7 -01 INVESTIGATIVE PROGRAM CODE SA

INVESTIGATION DISCIPLINE(5) ASTRONOMY

UNKNOWN

PERSONNEL UNKNOWN PI -

BRIEF DESCRIPTION THE HIGH-RESOLUTION CAMERA UNIT IS BEING DESIGNED TO A PHASE B LEVEL. THE UNIT IS COMPOSED OF TWO DISTINCT CAMERAS. ONE IS A F/24 FILLO CAMERA WITH A 3 ARC-MIN FIELD OF VIEW, AND USING A ≤ 0 -MM SEC ORTHICON DETECTOR. THE OTHER CAMERA IS A BIFOCAL-LINGTY JASTRUMENT, F/48 OR F/96, WITH LIMITS FIELDS OF VIEW AS ≤ 1 is is the total fields of COMPOSED IN THE DESIGN STUDY IS A 400 by 400 CCD ARRAY.

- ST, UNKNOWN-

INVESTIGATION NAME- SCIENTIFIC INSTRUMENT PACKAGE UNIT NO. 2 - HIGH-RESOLUTION SPECTROGRAPH

INVESTIGATIVE PROGRAM CODE SA NSSOC ID- LST -02

INVESTIGATION DISCIPLINE(S) ASTRONOMY

UNKNOWN

PERSONNEL UNKNOWN PI -

BRIEF DESCRIPTION THE HIGH-RESOLUTION SPECTROGRAPH UNIT IS BEING DESIGNED TO A PHASE B LEVEL. THE PRINCIPAL OPERATING MODE IS AS AN ECHELLE SPECTROGRAPH WITH SPECTRAL RESOLUTIONS OF 3.E4 TO 1.2E5 OVER THE WAVELENGTH INTERVAL FROM 115 TO 410 NN. TWO LARGE SEC ORTHIC'N CAMERAS ARE USED AS THE DETECTORS.

ST. UNKNOWN----

INVESTIGATION NAME- SCIENTIFIC INSTRUMENT PACKAGE UNIT NO. 3 - FAINT-OBJECT SPECTROGRAPH

N220C 10-	LST	~03	INVESTIGATIVE CODE SF	PROGRAM
			INVESTIGATION ASTRONOMY	DISCIPLINE(S)

PERSONNEL PI -UNKNOWN

LINKNOWN

BRIEF DESCRIPTION

UNIEF PESCRIPTION THE FAINT-OBJECT SPECTROGRAPH UNIT IS BEING DESIGNED TO A PHASE B LEVEL. THE DESIGN IS OF THE WADSWORTH TYPE ALLOWING RESOLUTIONS OF 1.E2 TO 1.E4 OVER THE WAVELENGTH INTERVAL FROM 90 TO BOO NM. THE DETECTORS USED IN THE DESIGN ARE PHOTONCOUNTERS. THEREBY ALLOWING OBSERVATIONS TO THE FAINTEST POSSIBLE MAGNITUDE.

-- ST/ UNKNOWN-------

INVESTIGATION NAME- SCIENTI,IC INSTRUMENT PACKAGE UNIT NO. 4 - INFRARED PHOTOMETER

INVESTIGATIVE PROGRAM NSSOC ID- LST -04

CODE SA

INVESTIGATION DISCIPLINE(S)

UNKNOWN

PERSONNEL PI -UNKNOWN

BRIEF DESCRIPTION

BRIEF DESCRIPTION THE INFRARED PHOTOMETER UNIT IS BEING DESIGNED TO A PHASE B LEVEL. THE BASIC COMPONENT IN THE DESIGN IS A LARGE, SUPERFLUID-HELIUM DEWAR THAT WILL HOLD. TWO DEFECTORS COME PHOTOCONDUCTOR, ONE BOLOMETER) AT 2 DEG KELVIN, OR LESS, FOR 1 YEAR. THE COOLED DEFECTORS ALLON NEAR BACKGROUND LIMITED PERFORMANCE TO BE OBTAINED OVER THE WAVELENGTH INTERVAL FROM 1 RICROMETER TO 1 MILLIMETER.

ST UNKNOWN-----

INVESTIGATIC NAME- SCIENTIFIC INSTRUMENT PACKAGE UNIT NO. 5 - ASTROMETRIC INSTRUMENT

INVESTIGATIVE PROGRAM CODE SA -05 NSSDC ID- LST

INVESTIGATION DISCIPLINE(S) ASTRONOMY

金支援

PERSONNEL PI -UNKNOWN

PERSONNEL PI - C.O. BOSTROM

NSSDC ID- TIROS-N-04

APPLIED PHYSICS LAB

INVESTIGATION DISCIPLINE(S) METEOROLOGY

INVESTIGATIVE PROGRAM Operational weather observations

BRIEF DESCRIPTION THIS EXPERIMENT IS AN EXTENSION OF THE SOLAR PROTON MONITORING EXPERIMENT FLOWN ON THE ITOS SPACECRAFT "EXILS. THE EXPERIMENT PACKAGE CONSISTS OF FOUR DETECTOR SYSTEM, AND A DATA PROCESSING UNIT. THE LJW-ENERGY PROTON ALPHA TELESCOPE (LEPAT) SEPARATELY MEASURES IN FIVE ENERGY RANGES BOTH PROTONS BETWEEN 150 KEV AND 40 MEV AND ALPHA PARTICLES BETWEEN 150 KEV/N AND 25

SPONSORING COUNTRY/AGENCY United states NOAA-NESS/NASA-QA . Min

PLANNED ORÐIT PARAMETERS Orðit type- geocentric Orbit period- 94.5 mi Periapsis- 500. Km

NSSDC 10- LST

BRIEF DESCRIPTION

PERSONNEL PI -

-06

UNKNOWN

ERSONNEL			
MG - H.L.	GARBACZ	NASA HEADQUARTE	ÞS
PM - G.A.	BRANCHFLOWER	NASA-GSFC	
PS - A.	ARKING	NASA-GSFC	

BRIEF DESCRIPTION TIROS-W IS AN OPERATIGNAL METEOROLDGICAL SATELLITE FOR USE IN THE NATIONAL OPERATIONAL ENVIRONMENTAL SATELLITE SUBSYSTEM (NOESS) AND TO SUPPRAT THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM (GARP) DURING 1978-84. THE SATELLITE DESIGN PROVIDES AN ECONOMICAL AND STABLE SUM-SYNCHRONOUS PLATFORM FOR AVANCED OPERATIONAL INSTRUMENTS TO MEASURE THE EARTH'S ATMOSPHERE, ITS SURFACE AND CLOUD COVER, AND THE NEAR-SPACE ENVIRONMENT. PRIMARY SENSORS INCLUDE AN ADVANCED V'RY HIGH RESOLUTION RADIOMETER (AVHRR) FOR OBSERVING DAYTIME AND NIGHTIME GLOBAL CLOUD COVER AND AN OPERATIONAL VERTICAL SOUNDER FOR OBTAINING TEMPERATURE AND WATER VAPOR PROFILES THROUGH THE EARTH'S ATMOSPHERE. SECONDARY EXPERIMENTS CONSIST OF A SPACE ENVIRONMENT MONITOR (SEN), WHICH MEDESS THE PROTON AND ELECTRON FLUX NEAR THE EARTH, AND A DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DES), WHICH MEDESS THE PROTON AND ELECTRON FLUX NEAR THE EARTH, AND A DATA COLLECTION AND PLATFORM LOCATION SYSTEM (DES), WHICH PROESSES AND RELAYS TO CENTRAL DATA ACQUISITION STATIONS THE VARIOUS METEOROLOGICAL DATA RECEIVED FROM FREE-FLOATING BALLOONS AND OCEN BUTT DISTRIBUTED ARDUND THE GLOBE. THE SATELLITE IS BASED UPON THE BLOCK SD SPACECRAFT BUS DEVELOPED FOR THE US AIR FORCE, AND IS CAPADE OF MAINTAINING AN CARTH-POINTING ACCURACY OF BETTER THAN PLUS OR "INUS D.1 DEG WITH A MOTION RATE OF LESS THAN OLOSIBLE

-- TIROS-N, BOSTROM------INVESTIGATION NAME- SPACE ENVIRONMENT MONITOR

INCLINATION- 98.7 DEG Apgapsis- 500. Km NASA-GSEC ARXING

SPACECRAFT COMMON NAME- TIROS-N Alternate names-

NGSDC ID- TIROS~N

WEIGHT- 588.9 KG

LAUNCH DATE- 05/00/78 Launch Site- Vandenberg Afb, United States Launch Vehicle- Atlas

BRIEF DESCRIPTION THE HIGH-SPEED POINT/AREA PHOTUMETER UNIT IS BEING DESIGNED TO A PHASE B LEVEL. THROUGH USE OF BOTH POINT AND AREA PHOTON-COUNTING DETECTORS, HIGH-SPEED FILTER PHOTOMETRY CAN BE PERFORMED OVER THE WAVELENGTH INTERVAL FROM 115 TO 650 NM. THE FIELDS OF VIEW ARE VARIABLE FROM NEAR-DIFFRACTION LIMITED SIZE, ORDER OF 0.2 ARC-S, TO A FEW ARC-S.

---- STA UNKNOWN------INVESTIGATION NAME- SCIENTIFIC PACKAGE UNIT NO. 6 - High speed point/area photometer

ASTRONOMY

INVESTIGATIVE PROGRAM CODE SA

INVESTIGATION DISCIPLINE(S)

URKNOWN

BRIEF DESCRIPTION THE ASTROMETRIC INSTRUMENT UNIT IS BEING DESIGNED TO A PHASE BLEVEL. TWO DIFFERENT CONCEPTS HAVE BEEN ADVANCED, ONE IS TO USE A KOTATING CODED WHEEL TO MODULATE THE LIGHT INTENSITY AT THE FOCAL PLANE OVER A S ARC-MIN FIELD, AND LATRLE THE RESULTANT SIGNAL FROM A PHOTOMULTIPLIER AT A VERY HIGH RATE. SUBSEQUENT ANALYSIS OF THE SIGNAL ALLOWS DETERMINATION OF THE POSITIONS AND COLORS OF ALL STARS PRESENT IN THE FIELD OF VIEW. THE SECOND CONCEPT IS TO MODIFY THE ST'S FINE GUIDANCE SYSTEM SO THAT IT CAN SPECIFY THE LOCATION OF INSIVIOUAL STARS TO THE MEEDED ASTROMETRIC PRECISION (ORDER OF 0.008 ARC-S). BRIEF DESCRIPTION

WE J/N. THERE ARE TWO LEPATS VIEWING IN THE ANTI-SUM AND ANTI-EARTH DIRECTIONS WITH 60-DEG VIEWING COMES. THE PROTON OMNIDIRECTIONAL DETECTOR (POD) MEASURES PROTONS ABOVE 10, 30, AND 60 MEV, ELECTRONS ABOVE 140 KEV, AND PROTONS AND ELECTRONS (INSEPARABLE) ABOVE 750 KEV, THE HIGH-ENERGY PROTON ALPHA TELESCOPE (HEPAT) HAS A 50-DEG VIEWING COME, VIEW IN THE ANTI-EARTH DIRECTION, AND IT MEASURES PROTONS ABOVE 400 MEV AND 'ROTONS AND ALPHA PARTICLES ABOVE 600 AND 1000 TEV/N. THE TOTAL ENERGY DETECTOR (YED) MEASURES TOTAL ENERGY ABOVE 1 KEV.

-- TIROS-N, NESS STAFF-----INVESTIGATION NAME- ADVANCED VERY HIGH RESOLUTION RADIOMETER (AVHOR)

NSSDC ID- TIROS-N-01

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

NOAA-NESS

INVESTIGATION DISCIPLINE(S) NETEOROLOGY

PERSONNEL NESS STAFF

P1

P1 - NESS STAFF NOAA-NESS BRIEF DESCRIPTION THE TIROS-M ADVANCED VENY HIGH RESCLUTION RADIOMETER (AVHRB) IS A FOUR-CHANNEL SCANNING RADIOMETER CAPABLE OF PROVIDING GLOBAL DAYTIME AND NIGHTIME SEA SURFACE TEMPERATURE, ICE, SNOW, AND CLOUD INFORMATION. THESE DATA ARE OBTAINED ON A DAILY BASIS FOR USE IN WEATHER ANALYSIS AND FORCASTING. THE HULTISPECTRAL RADIOMETER OPERATES IN THE SCANNING MODE AND REASURES EMITTED AND REFLECTED RADIATION IN THE FOLLOWING SPECTRAL INTERVALS -- CHANNEL 1 \ ISIBLE), 0.55 TO 0.9 MICROMETER, CHANNEL 2 (IREAN IN), 0.725 MICROMETER TO DETECTOR CUT OFF AROUND 1.3 MICROMETERS, CHANNEL 3 (IR WINDOW), 10.5 TO 11.5 MICROMETERS, AND CHANNEL 4 (IR WINDOW), 3.55 TO 3.93 MICROMETER, CHANNEL 2 (IREAN IN), 0.725 MICROMETERS IN JECTOR CUT OFF AROUND 1.3 MICROMETERS, CHANNEL 3 (IR WINDOW), 10.5 TO 1.1 KM, AND THE 1WC IR WINDOW CHANNELS HAVE A THERMAL RESOLUTION: OF 0.12 K AT 300 K. THE AVHRE IS CAPABLE OF OPERATING IN BOTH REAL-TIME OR RECORDED MODES. REAL-TIME OR DIRECT READOUT DATA ARE TRANSMITTED TO GROUND STATIONS BOTH AT LOM (/ KW) RESOLUTION VIA AUTOMATIC PICTURE TRANSMISSION (APT) AND A/ MIGHTI. DATA RECORDED ON BORD ARE AVAILABLE FOR CENTRAL PROCESSING. THEY INCLUDE GLOBAL AREA COVERAGE (GAC) DATA, HAVE A RESOLUTION OF 4 KM, AND LOCAL AREA COVERAGE (GAC) DATA, WHICH CONTAINS DATA FREM SELECTED PORTIONS OF EACH ORBIT WITH A1 KM RESOLUTION. IDENTICAL EXPERIMENTS ARE FLOWN ON THE OTHER SPACECRAFT IN THE TIRDS-MOARS SERIES.

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

NOAA-NESS

INVESTIGATION DISCIPLINE(S) Meteorology

PERSONNEL NESS STAFF PI -

P1 - NESS STAFF NOAA-NESS SRIEF DESCRIPTION THE TIROS-N OPERATIONAL SOUNDER CONSISTS OF THREE INSTRUMENTS DESIGNED TO DETERMINE RADIANCES NEEDED TO CALCULATE TEMPERATURE AND HUMIDITY PROFILES OF THE ATMOSPHERE FROM THE SURFACE TO THE STRATOSPHERE (APPROXIMATELY 1 MB). THE FIRST INSTRUMENT, THE DASIC SOUNDING UNIT (BGU), HAS 14 CHANNELS AND MAKES MEASUREMENTS IN THE FOLLOWING SPECTRAL INTERVALS --CHANNEL 1 - THE 3.7-BICROMETER WINDOW REGION, CHANNEL 2 - THE 4.3-MICROMETER CO2 BAND, CHANNEL 3 - THE 9.7-MICROMETER OZDNE BAND, CHANNEL 4 - THE 11.1-MICROMETER WINDOW REGION, CHANNELS S THROUGH 11 - THE 15-MICROMETER WINDOW REGION, CHANNELS S THROUGH 11 - THE 15-MICROMETER WINDOW REGION, CHANNELS S THROUGH 11 - THE SCAND. CHANNEL 3 - THE 9.7-MICROMETER OZDNE BAND, CHANNEL 4 - THE 11.4-MICROMETER WINDOW REGION, CHANNELS S THROUGH 11 - THE SCAND. SOLON AND CHANNELS 12 THROUGH 14 - THE BAND, CHANNEL 3 OFFRATING AT 14.97 MICROMETERS USING SELECTIVE ABSORPTION BY PASSING THE INCOMING RADIATION THROUGH HAS THREE CHANNELS OF PERATING AT 14.97 MICROMETERS USING SELECTIVE ABSORPTION BY PASSING THE INCOMING RADIATION THROUGH INTERE MODULATED CELLS CONTAING CO2. THE THIRD INSTRUMENT, THE MICROWAVE SOUNDING UNIT, HAS FOUR CHANNELS OFFRATING IN THE 50 TO 60 CH2 OXYGEN (50.3, 53.7, 55.0. AND INTERFERENCE. THE INSTRUMENTS ARE CROSS-COURSE SCANNING INTERFERENCE. THE INSTRUMENTS ARE CROSS-COURSE SCANNING INTERFERENCE. THE INSTRUMENTS ARE CROSS-COURSE SCANNING IN THE ORBITAL MOTION OF THE SATELLITE PROVIDES SCANNING IN THE ORBITAL MOTION OF THE SATELLITE PROVIDES SCANNING IN THE ORBITAL MOTION OF THE SATELLITE PROVIDES SCANNING IN THE ORBITAL MOTION OF THE SATELLITE PROVIDES SCANNING IN THE ORBITAL MOTION OF THE SATELLITE PREMEMENTS ARE FLOWN OK OTHER SPACEGRAFJ IN THE TIROS-N/NOAA SERIES.

--- TIROS-NA NESS STAFF-----

INVESTIGATION NAME- DATA COLLECTION SYSTEM (DOS)

INVESTIGATIVE PROGRAM OPERATIONAL WEATHER OBSERVATIONS

INVESTIGATION DISCIPLINE(S) METEOROLOGY

NSSDC JD- TIROS-N-03

--- TIROS-NA NESS STAFF-----

INVESTIGATION NAME- OPERATIJNAL VERTICAL SOUNDER

NSSDC ID- TIROS-N-02

PERSONNEL NOAA-NESS NESS STAFF PI -

PI - NESS STAFF BRIEF DESCRIPTION THE DATA COLLECTION AND PLATFORM LDCATION SYSTEM (DCS) ON TIROS-N IS DESIGNED TO MEET THE METEOROLOGICAL DATA MEEDS OF THE UNITED STATES AND TO SUPPORT THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM (GARP). THE SYSTEM RECEIVES LOW DUTY CYCLE TRANSMISSIONS OF METEOROLOGICAL OBSERVATIONS FROM FREE-FLOATING BALLOONS, OCEAN BUOYS, OTHER SATELLITES, AND FIXED GROUMD-BASED SENSOR PLATFORMS DISTRIBUTED AROUND THE GLOBE. THESE OBSERVATIONS ARE ORGANIZED ON BOARD THE SPACECRAFT AND RETRANSMITTED WHEN THE SPACECRAFT COMES IN RANGE OF A COMMAND AND DATA ACQUISITION (COA) STATION, FOR FREE-MOVING BALLOONS. THE DOPPLER FREQUENCY SHIFT OF THE TRANSMITTED SIGNAL IS OBSERVED TO CALCULATE THE LOCATION OF THE BALLOONS. THE DCS IS REYOCITED, FOR A MOVING SENSOR PLATFORM, TO HAVE A LOCATION ACCURACY OF S TO 8 KM RPMS, AND A VELOCITY ACCURACY OF 1 TO 1.0 MS. THIS SYSTEM MAS THE CAPABILITY OF ACQUIRING DATA FROM UP TO 2000 PLATFORMS PER DAY. IDENTICAL EXPERIMENTS ARE FLOWN ON OTHER SPACECRAFT IN THE TIRDS-MINGA SERIES.

SPACECRAFT COMMON NAME- UK 6 Alternate Names- United Kingdom-6

NSSDC 10- UK-6

LAUNCH DATE- 07/27/78 LAUNCH SITE- WALLOPS FLIGHT CENTER, UNITED STATES LAUNCH VEHICLE- SCOUT WEIGHT- 133.8 KG

SPONSORING COUNTRY/AGENCY UNITED KINGDOM ser

ORBIT TY ORBIT PE	IT PARAMETERS PE- GEOCENTRIC RIOD- 95.6 MIN S- 550. KM	INCLINATION- Apoapsis-	55. DEG 550. KM
∴ERSONNEL Mg -	NONE ASSIGNED		

NG - SC - PM - J.E. PS - J.L.	NONE ASSIGNED FOSTER CULHANE	APPLETON Imperial	

BRIEF DESCRIPTION THE OBJECTIVE OF THIS SPACECRAFT IS TO UNDERTAKE STUDIES IN HIGH-ENERGY ASTROPHYSICS. TWO K-RAY EXPERIMENTS, ONE COSMIC-RAY EXPERIMENT, AND THREE TECHNOLOGY EXPERIMENTS ARE CARRIED. THE SPACECRAFT IS SPIN STABILIZED, WITH THE SPIN MAIS COMMANDED INTO A SEQUENCE OF ORIENTATIONS TO ACCOMODATE THE X-RAY EXPERIMENTS REQUIREMENTS. THE INTENDED ORBIT IS CIRCULAR, 550 KM IN ALTITUDE, AND 55 DEG IN INCLINATION.

--- UK 6, UNKNOWN-----

INVESTIGATION NAME- COSMIC RAY

NSSDC ID-	UK - 5	-01	INVESTIGATIVE PROGRAM Code Sa/Co-OP
			INVESTIGATION DISCIPLINE(S) COSNIC RAYS

PERSONNEL UNKNOWN PI -

BRIEF DESCRIPTION THIS EXPERIMENT IS INTENDED TO MEASURE THE CHARGE AND ENERGY SPECTRA DF THE ULTRA-HEAVY COMPONENT OF THE COSMIC RADIATION WITH PARTICULAR EMPHASIS ON THE CHARGE REGION Z.GT. 30.

-- UK 6, UNKNOWN-----

INVESTIGATION NAME- LEICESTER X-RAY

INVESTIGATIVE PROGRAM NSSDC 19- UK-6 -02 CODE SA/CO-OP

INVESTIGATION DISCIPLINE(5) X-RAY ASTRONOMY

PERSONNEL P1 -UNKNOWN

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BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO INVESTIGATE THE PERIODIC AND APERIDDIC FLUCTUATIONS IN EMISSIONS FROM A WIDE RANGE OF X-RAY SOURCES DOWN TO SUBMILLISECOND TIME SCALES.

--- UK 6, UNKNOWN------

INVESTIGATION NAME- MSSL/B X-RAY

NSSDC ID~ UK-6 -03

INVESTIGATIVE PROGRAM Code Sa/Co-op INVESTIGATION DISCIPLINE(S) X-RAY ASTRONOMY

U COLLEGE LONDON

TERRICO, DANG

CONTRACTOR OF THE OWNER OF

assisted with

PERSONNEL 91 -Pl -UNKNOWN UNKNOWN

BRIEF DESCRIPTION THIS EXPERIMENT IS DESIGNED TO STUDY DISCRETE SOURCES AND THIS EXPERIMENT IS DESIGNED TO STUDY DISCRETE SOURCES AND EXTENDED FEATURES OF THE LOW-ENERGY, X-RAY SKY IN THE RANGE 0.1 EXTENDED FEATURES OF THE LOW-ENERGY. AND SHORT-TERM VARIABILITY TO 2.0 KEV. IN ADDITION, BOTH LONG- AND SHORT-TERM VARIABILITY OF INDIVIDUAL SOURCES ARE STUDIED IN CONJUNCTION WITH THE LEICESTER EXPERIMENT. THIS EXPERIMENT IS PROVIDED JOINTLY BY THE UNIVERSITY COLLEGE, LONDON/MULLARD SPACE LABORATORY, AND DIRMINGHAM UNIVERSITY.

INDEX OF ACTIVE AND PLANNED SPACECRAFT AND EXPERIMENTS

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4. INDEX OF ACTIVE AND PLANNED SPACECRAFT AND EXPERIMENTS

This index contains the names of all spacecraft and experiments that were either active sometime between January 1, 1975, and June 30, 1977, or planned as of June 30, 1977. The spacecraft are listed alphabetically by both common name and alternate names. The alternate names are printed with a reference to the NSSDC spacecraft common name. Next to the NSSDC spacecraft common name are printed the sponsoring country and agency, launch date, orbit type, NSSDC ID code, and the current state. The current state includes the epoch date, status, and data rate of all launched spacecraft and experiments. For prelaunch spacecraft, only the status is shown; there is no information shown for prelaunch spacecraft experiments. The status and data rate, for the most part, reflect the state as of June 30, 1977, that became effective on the listed epoch date. However, a few changes subsequent to this date may appear. An explanation of the terms used in these columns may be found in Appendix C. The experiments are listed following the associated spacecraft common name and are ordered alphabetically by the principal investigator's or team leader's last name. The experiment name, NSSDC ID code, and current state are also given for each experiment. Finally, each name is followed by a page number referencing the description of the spacecraft or experiment found in this report.

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INDEX OF ACTIVE AND PLANNED SPACECRAFT AND EXPERIMENTS by spacecraft names and principal investigator

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		LAUNCH		cu	RRENT STATUS		
		COUNTRY AND AGENCY DATE ORBIT TYPE		EPOCH MMDD¥¥		DATA Rate	PAGE NO.
AD-A	JACCHIA Keating	UNITED STATES NASA-OSS 12/19/63 GEOCENTRIC Norsystematic changes of Air Density Systematic changes of Air Density	63-053A 63-053A-01 63-053A-02	12/19/63 12/19/63 12/19/63	NORMAL	5085 5085 5085	11 11 11
4 D - C	JACCHIA KEATING	UNITED STATES NASA-OSS DB/OI/68 GEOCENTRIC Nonsystematic changes of AIR Density Systematic changes of AIR density	68-066A 68-066A-01 68-066A-02	3/05/76	NORMAL	5085 5085 5085	11 11 11
AE 5		SEE AE-E					
AE-C	BARTH BRACE BRINTON Champion Doering Hanson	RETARDING PUTENTAL ANALIZEATURET HETCH	73-101A 73-101A-13 73-101A-01 73-101A-01 73-101A-02 73-101A-03 73-101A-04	2/28/76 2/28/76 2/28/76 2/28/76 2/28/76	NORMAL Normal Normal	STND STND STND STND STND STND STND	11 12 12 13 13 13
	HAYS Heath Hinteregger Hoffman Hoffman Nier	(RPA) VISIBLE AIRGLOW PHOTOMETER (VAE) Extreme Solar UW Monitor (ESUM) Solar EUV Spectrophotometer (EUVS) Magnetic Ion-Mass Spectrometer (Mins) Low-Energy Electroms (LEE) Open-Source Neutral Mass Spectrometer	73-101A-14 73-101A-05 73-101A-06 73-101A-10 73-101A-12 73-101A-07	5/28/75 3/10/75 1 HLF 77 2/28/76	NORMAL INDPERABLE Partial Partial Normal Indperacle	STND Stnd Stnd Zerq	13 14 14 14 14 14
	RICE Rice Spencer	(OSS) Cold Cathode Ion Gauge Capacitance Manometer Neutral Atmosphere Temperature (Nate)	73-101A-15 73-101A-16 73-101A-09	12/16/73	NORMAL Normal Partial	STND STND STND	15 15 15
AE-D	BARTH BRACE Champion Dgering Hanson	INITED STATES NASA-OSS 10/06/75 GEOCENTRIC ULTRAVIOLET NITRIC-OXIDE EXPERIMENT Cylindrical Electrostatic probe (CCEP) Atmospheric Density Accelerometer (MeSA) Photoelectrom Spectrometer (PES) Retarding Potential Analyzer/Drift Meter	75-096A 75-096A-11 75-096A-01 75-096A-02 75-096A-03 75-096A-04	1/29/70 1/29/70 1/29/70 1/29/70	INOPERABLE INOPERABLE INOPERABLE INOPERABLE INOPERABLE INOPERABLE	ZERO Zero Zero Zero	15 16 16 16 16 17
	HAYS Hedin Hinteregger Hoffman	(RPA) VISIBLE AIRGLOW PHOTOMETER (VAE) Neutral Atmosphere composition (NACE) Solar Euv Spectrophotometer (Euvs) Magnetic Ion-MASS Spectrometer (MIMS)	75-0968-13 75-0968-08 75-0968-06 75-0968-10	1/29/7	5 INDPERABLE 5 INOPERABLE 5 INOPERABLE 6 INOPERABLE	ZERO Zero	18
	HOFFMAN Nier	LOW-ENERGY ELECTRONS (LEE) Open-source neutral mass spectrometer (OSS)	75-096A-12 75-096A-07	1/29/7	6 INOPERABLE 6 INOPERABLE	ZERO	18
	RICE Rice Spencer	CAPALITANCE MANONETER Cold Cathode Ion Gauge Neutral Atmosphere temperature (NATE)	75-0968-14 75-0968-15 75-0968-09	1/29/7	6 INOPERABLE 6 INOPERABLE 6 INOPERABLE	1 680	19
AE-E	BRACE BRINTON Champion Doering Hanson	UNITED STATES NASA-OSS 11/20/75 GEOCENTRIC Cylindrical Electrostatic Probe (CEP) Ion Composition and Concentration Atmospheric Density Accelerometer (Mesa) Photoelectron Spectrometer Retarding Potential Analyzer/Drift Meter	75-107A 75-107A-01 75-107A-10 75-107A-10 75-107A-02 75-107A-03 75-107A-04	12/00/7 12/11/7 12/04/7 12/00/7	5 NORMAL 5 Normal 5 Normal	STND Stnd Stnd Stnd Stnd Stnd	19 19 20 20
	HAYS HEATH HEATH HÉDIN HINTEREGGER NIER	(RPA) VISIBLE AIRGLOW PHOTOMETER (VAE) Extreme Solar UV Monitor (ESUN) Backscatter UV Spectrometer (BUV) Neutral Atmosphere Composition (Nace) Solar EUV Spectrophotometer (EUVS) Open-Source Neutral Mass Spectrometer		5/20/7 3/18/7 12/11/7 12/00/7 12/11/7		ZEPO Stnd Stnd Stnd	21 21 21 21 21 21
	RICE RIC e Spencer	(OSS) Capacitance Manometer Cold Cathode Ion Gauge Neutral Atmosphere Temperature (Nate)	75-107A-13 75-107A-13 75-107A-0	2 12/04/7 3 12/04/7 9 12/11/7	'S NORMAL 'S NORMAL 'S NORMAL	STNI Stni Stni	> 22
AEM	-A	SEE HOMM					
AEM	-B	SEE SAGE					
AEP	i-C	SEE MAGSAT					
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AEROS	SZ KRANKOWSKY Neske Roemer Schmidtke Spenker Spenner	FEDERAL REPUBLIC OF GE GFW 07/16/74 GEOCENTRIC UNITED STATES NASA-OSS MASS SPÉCTROMETER (MS) ELECTRON CONCENTRATION IN THE IONOSPHERE ATMOSPHERIC DRAG ANALYSIS SOLAR EUV RADIATION NEUTRAL ATMOSPHERE TEMPERATURE ENERGY DISTRIBUTION OF IONS AND	74-055A 74-055A-0 74-055A-0 74-055A-0 74-055A-0 74-055A-0 74-055A-0 74-055A-0	1 9/25/ 3 9/25/ 6 9/25/ 4 9/25/ 5 9/25/	75 INOPERABL 75 INOPERABL 75 INOPERABL 75 INOPERABL 75 INOPERABL 75 INOPERABL 75 INOPERABL	Ë ZER ë Zer e Zer e Zer e Zer e Zer	0 22 0 23 0 23 0 23 0 23

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	COUNTRY AND A	**********	DATE ORBIT TYPE	* *** NSSDC ID				
*PRINC.INVEST.NA	ME EXPERIMENT N	IAME	· · · · · · · · · · · · · · · · · · ·	* *	EPOCH MMDDYY	STATUS	DATA RATE	PAG
	ELECTRONS							
AEROS-B	SEE AEROS 2							
ALQUETTE 2	CANADA UNITED STATES	NASA-OSS	11/29/65 GEOCENTRIC	65-098A	11/29/75			
BELROSE	UNITED STATES VLF RECEIVER	NASA-OSS		65-098A-02			ZERO	2
BRACE Hartz	CYLINDRICAL ELECT COSMIC RADIO NOIS	ROSTATIC PRO	ÐE	65-098A-05	11/29/75 11/29/75	NORMAL	ZERO Zero	2
MCDIARMID Whitteker	ENERGETIC PARTICL Sweep Frequency S	E DETECTORS		65-098A-03 65-098A-04	11/29/75 11/29/75 (ZERO Zero	2
ALQUETTE-8				65-098A-01	11/29/75		ZERO	2
ALSEP 12	SEE ALQUETT							
ALSEP 14	SEE APOLLD							
	SEE APOLLO	14 LM/ALSEP						
ALSEP 15	SEE APOLLO	15 LM/ALSEP						
ALSEP 16	SEE APOLLO	16 LM/ALSEP						
ALSEP 17	SEE APOLLO	17 LM/ALSEP						
ANS	NETHERLANDS	NIVR	08/30/74 GEOCENTRIC	74-070A	7/30/76 N			
SEINKMAN	UNITED STATES Low-Energy X-Ray e	NASA-OSS Experiment		74-070A-02			ZERO	2
GURSKY	HIGH ANGULAR AND S Observations of C	PECTRAL RES	DEUTION	74-070A-03	7/30/76 N 7/30/76 N	IORMAL IORMAL	ZERQ Zero	2
VANDUINEN	UV TELESCOPE			74-070A-01	7/30/76 N	DRMAL	ZERO	25
APOLLO 11 LM	SEE APOLLO 1	1 LM/EASEP						-
POLLO 11 LH/EASEP Alley	UNITED STATES LASER RANGING RETR	NASA-OMSF Oreflector	07/16/69 LUNAR LANDER	69-059C 69-059C-04	12/14/69 1		ZERO	Z
POLLO 12 LH/ALSEP	UNITED STATES	NASA-OMSF	11/14/69 LUNAR LANDER		7/20/69 N		STND	25
FREEMAN	UNITED STATES Suprathermal ion d	NA5A-055	CONTRACT CONTRACT	69-099c	10/01/77 I		ZERO	25
LATHAM Snyder	PASSIVE SEISMLC (P Solar wind spectro	5E)		69-0996-05 69-0996-03 69-0996-02	5/03/76 I 10/01/77 I 1/15/77 I	NOPERABLE	ZERO Zero	26 26
APOLLO 12C	SEE APOLLO 1	2 LM/ALSEP				NOF ERABLE	ZERO	26
POLLO 14 LM/ALSEP	UNITED STATES	NASA-DHSF	01/31/71 LUNAR LANDER	71-008C	10/01/22 **			_
FALLER	UNITED STATES LASER RANGING RETR	NASA-OSS			10/01/77 P.		ZERO	26
KOVACH Latham	ACTIVE SEISMIC Passive seismic (p.			71-008c-09 71-008c-05	2/05/71 Ni 10/01/77 Pi		STND Zero	26
O * BRIEN	CHARGED PARTICLE L	UNAR ENVIRON	MENT	71~008c-04 71-008c-08	10/01/77 NO 10/01/77 P/	DRMAL	ZERO ZERO	27
APOLLO 14C	SEE APOLLO 1	4 LM/ALSEP					2.EKU	27
OLLD 15 LM/ALSEP	UNITED STATES	NASA-ONSF	07/26/71 LUNAR LANDER	71-063C	10/04/77 -			
BATES	UNITED STATES LUNAR DUST DETECTOR	NASA-OSS			10/01/77 P/		ZERO	27
FALLER Freeman	LASER RANGING RETRO	OREFLECTOR		71-063C-09 71-063C-08	10/01/77 NG 7/30/71 NG	RHAL	ZERO	27
JOHNSON	SUPRATHERMAL IDN DI Cold Cathode Ion G	ETECTOR		71-063c-05	3/12/77 IN	OPERABLE	STND Zero	27 27
LANGSETH Latham	HEAT FLOW			71-063c-07 71-063c-06	7/18/75 IN	OPERABLE	ZERD	28
APOLLO 15C	PASSIVE SEISMIC			71-063C-01	1/13/77 IN 10/01/77 NG	RMAL	ZERO Zero	28 28
	SEE APOLLO 15	5 LM/ALSEP						
OLLO 16 LM/ALSEP	UNITED STATES	NASA-DSS NASA-OHSF	04/16/72 LUNAR LANDER	72-031c	10/01/77 PA	RTIAL	ZERO	28
OYAL. Kovach	LUNAR SURFACE MAGNE	TOMETER		72-0310-03	10/01/77 PA	07 J & I	2500	
LATHAM	ACTIVE SEISNIC Passive Seisnic (PS	(E)		72-0310-02 72-0310-01	12/07/73 No	RMAL	ZERO Zero	28 29
APÓLLO 16C	SEE APOLLO 16	LM/ALSEP			10/01/77 NO	NTAL	ZERO	29
DLLO 17 LM/ALSEP	UNITED STATES	NASA-OMSF	2/07/72 LUNAR LANDER	72-096C	10/01/27 54			
BERG	UNITED STATES LUNAR EJECTA AND ME	NASA-OSS			10/01/77 PA	REIAL	ZERO	29
KOVACH	LUNAR SEISMIC PROFI	LING EXPERIM	ENT	72-096C-05 72-096C-06	8/15/76 PA	RTIAL	ZERQ	29
LANGSETH Weber	HEAT FLOW			72-0966-08	10/01/77 NO 10/01/77 NO		ZERO Zero	29
	LUNAR SURFACE GRAVI	NEILK		72-0966-09	10/01/77 PA		ZERD	30 30
APOLLO 17C	SEE APOLLO 17	LM/ALSEP						
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APPL EXPL MISSION B SEE HCMM	NSSDC 10	EPOCH MMDDYY	RRENT STATU! STATUS	DATA Rate	PAGE NG.
SPACECRAFT NAME COUNTRY AND AGENCY PRINC.INVEST.NAME EXPERIMENT NAME APPL EXPL MISSION & SEE HCMM			314103	RATE	ND.
APPL EXPL MISSION B SEE HCMM					
APPL EXPL MISSION B SEE HCMM					
SEE ARYABHATA					
ARIABAT SEE UK 5					
ARIEL 3 DEVICE ARIEL 3	75-033A	9/23/76	INOPERABLE INOPERABLE	ZERO Zero	30 30
REYABHATA INDIA ING GAMMA RAYS	75-033A-02 75-033A-03	4/19/75	INDPERABLE	LERO	30
DBATACH IDNOSPHERIC ELECTRON IRAP AND DT	75-0334-01	9/23/75	INOPERABLE	ZERO	31
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		TRI-DIRECTIONAL, MEDIUM-ENERGY PARTIC Detector	LE 69-069A-	D4 3/10/75	NORMAL	SUBS	
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APPENDIXES

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APPENDIX A - OTHER RELEVANT SPACECRAFT

Spacecraft relevant to the purpose of this report and not included elsewhere are listed in this Appendix. The spacecraft include those that have previously been published in earlier reports of this series and now have a status of cancelled, failed at launch, or mission being rescoped. Some missions that are under study are also included if these seem likely to be approved in the near future. The investigators for these missions have not yet been chosen. The spacecraft are listed alphabetically by the NSSDC spacecraft common name. Listed with each spacecraft are the sponsoring country and agency, the actual or planned launch date, the type of orbit, the NSSDC ID code, and the status. A definition of the terms used in the current status column can be found in Appendix C.

Spacecraft Name	Sponsoring Country and Agency		Launch Date	NSSDC ID	Current Starus	
AMPS	United States	NASA-OSS	Under Study	AMPS	Under Study	
Corsa	Japan	ISAS	02/06/76	CORSA	Failed Mission	
DADE-A	United States	NASA-OSS	12/05/75	DADE-A	Failed Mission	
DADE-B	United States	NASA-OSS	12/05/75	DADE-B	Failed Mission	
Diapo	France	Unknown	Canceled	DIAPO	Canceled Mission	
Dual-A	U.S.S.R.	Unknown	Canceled	DUAL-A	Canceled Mission	
Dual-41	U.S.S.R.	Unknown	Canceled	DUAL-A1	Canceled Mission	
Dynamics Explorer	United States	NASA-OSS	00/00/80	DE	Under Study	
Egret	United States	NASA-OSS	00/00/79	EGRET	Mission Being Rescoped	
Electrodynamics Explorer	United States	NASA-OSS	00/00/79	EE	Mission Being Rescoped	
EOS-A	United States	NASA-OA	Canceled	EOS-A	Canceled Mission	
GP-A	United States	NASA-OSS	06/17/76	GRAVR-A	Rocket 7606-1701	
Intercosmos 10	U.S.S.R.	Unknown	10/30/73	73+082A	Inoperable Prior to 1975	
ITOS-E2	United States United States	NOAA-NESS NASA-OA	Canceled	ITOS-E2	Canceled Mission	
ITOS-I	United States United States	NOAA-NESS NASA-OA	Canceled	ITOS-I	Canceled Mission	
ITOS-J	United States United States	NASA-OA NOAA-NESS	Canceled	ITOS-J	Canceled Mission	
Jupiter Orbiter Probe	United States	NASA-OSS	01/00/82	JOP	Approved Mission (See Appendix B4.)	
Landsat-E	United States	NASA-OA	00/00/83	LAND-E	Under Study	
Lunar Polar Orb-Daughter	United States	NASA-OSS	Canceled	LPO-D	Canceled Mission	
Lunar Polar Orb-Mother	United States	NASA-OSS	Canceled	LPO-M	Canceled Mission	
0S0-J	United States	NASA-OSS	Canceled	050-J	Canceled Mission	
RM 20	United States	DOD-USAF	04/12/75	RM20	Failed Mission	
Sari	France	Unknown	Canceled	SARI	Canceled Mission	
Space Shuttle LDEF	United States	NASA~OAST	07/00/79	SSLDEF	Under Study	

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APPENDIX B - SPECIAL INVESTIGATORS

B1. IUE Guest Investigators

The International Ultraviolet Explorer (IUE) has a facility class payload that will be utilized for a number of different investigations. This spacecraft does not have individual principal investigators or team leaders associated with each experiment. Listed are the names of the guest investigator with his affiliation and the title of the investigation.

B2. Joint IRAS Science Working Group

The Infrared Astronomy Satellite (IRAS), like IUE, does not have individual principal investigators or team leaders associated with each experiment. Operation of the spacecraft is by the Joint IRAS Science Working Group. Members of this Working Group and their affiliations are listed.

B3. The Caravane Collaboration (COS-B)

The gamma-ray astronomy satellite, COS-B, was initially conceived and implemented by five university and research groups. The members of these groups and their affiliations are listed. Other individuals who joined this effort are included in the list.

B4. Jupiter Orbiter Probe Investigators

The investigators and investigations for the Jupiter Orbiter Probe to be launched in early 1982 were recently selected. The investigators with their affiliations are listed for each of the probe and orbiter investigations. The Principal Investigators are indicated by an asterisk. The Orbiter Imaging and Radio Science team members with their affiliations are listed separately. Team Leaders are indicated. Scientists with their affiliations who are making interdisciplinary studies are also listed.

B1. International Ultraviolet Explorer (IUE) Guest Investigators

Guest Investigators and Investigations

Barth - University of Colorado The Determination of the Seasonal Dynamics of Mars from Observed Ozone and Atmospheric Dust Variations

Black - Harvard College Observatory Investigation of Interstellar Carbon Investigations of Stellar Chromospheres and Coronas Ultraviolet Investigations of Stellar X-Ray Sources

Boggess - NASA-GSFC Observations of Planetary Nebulae and of Galactic H II Regions Ultraviolet Observations of Quasi-Stellar Objects

Bohm-Vitense - University of Washington Ultraviolet Observations of A and F Stars

Castor - University of Colorado Spectroscopic Observations of 0, Of, and Wolf-Rayet Stars

Conti - University of Colorado Spectroscopic Observations of O, Of, and Wolf-Rayet Stars

Crampton - Dominion Astrophysical Observatory, Canada Circumstellar Matter in Close Binaries Evidence for Mass Loss in the Ultraviolet Spectra of Early-Type Supergiants

Dalgarno - Harvard College Observatory Investigation of Interstellar Carbon

Daltabuit - Instituto of Astronomia, Universidad Nacional Autonoma de Mexico Ultraviolet Photoelectric Photometry of Emission Line Objects

Delsemme - University of Toledo Observation of Comet Encke and Other Comets

Doherty - Washburn Observatory, University of Wisconsin Observations of Stellar MG II 2800 A Lines in Main-Sequence F-G Stars

Guest Investigators and Investigations

Donn - NASA-GSFC The Search for Spectra of Interstellar Molecules Against Hot Stars Ultraviolet Cometary Observations

Dupree - Harvard College Observatory

Investigation of Interstellar Carbon Investigations of Stellar Chromospheres and Coronas Ultraviolet Investigations of Stellar X-Ray Sources

Estabrook - NASA-JPL

Ultraviolet Observations of Quasistellar Objects and the Intergalactic Medium

Fiebelman - NASA-GSFC Observations of Planetary Nebulae and of Galactic H II Regions

Gehrels - University of Arizona Spectrophotometry of Planets

Greenstein - California Institute of Technology Observations of Faint, High-Latitude Blue Stars

Gursky - Center for Astrophysics, SAO Study of the Ultraviolet Spectra of Selected Galactic X-Ray Sources

Hackney - Western Kentucky University Observations of the Ultraviolet Spectra of the Peculiar Radio Source OJ 287 and Related Objects

Heap - NASA-GSFC Hot Subluminous Stars

Hilditch - Dominion Astrophysical Observatory, Canada Circumstellar Matter in Close Binaries

Hill - Dominion Astrophysical Observatory, Canada Circumstellar Matter in Close Binaries Evidence for Mass Loss in the Ultraviolet Spectra of Early-Type Supergiants

Hummer - University of Colorado Spectroscopic Observations of O, Of, and Wolf-Rayet Stars

Hutchings - Dominion Astrophysical Observatory, Canada Circumstellar Matter in Close Binaries Evidence of Mass Loss in the Ultraviolet Spectra of Early-Type Supergiants

Guest Investigators and Investigations

Imhoff - Ohio State University Ultraviolet Spectra of T Tauri Stars

Jackson - NASA-GSFC Ultraviolet Cometary Observations

Jenkins - Princeton University The Study of Interstellar Absorption Lines

Johnson - Lockheed Palo Alto Research Laboratory Investigations of Circumstellar Matter

Jugaku - Tokyo Astronomical Observatory Ultraviolet Spectroscopy of Selected B and A Stars

Kellogg - Center for Astrophysics, SAO Study of the Ultraviolet Spectra of Selected Galactic X-Ray Sources

Kleinmann - SAO Lyman and Photometry of H II Region

Klinglesmith - NASA-GSFC Ultraviolet Studies of the Star A Centauri

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Leckrone - NASA-GSFC Spectroscopy of the Bp, Ap, and Magnetic Variable Stars at Ultraviolet Wavelengths Ultraviolet Spectroscopy of Dwarf and Giant B and A Stars

Liller - Harvard College Observatory Ultraviolet Investigations of Stellar X-Ray Sources

Lillia - Laboratory for Atmospheric & Space Physics Spectroscopic Observations of O, Of, and Wolf-Rayet Stars

Linsky - University of Colorado Observations of Chromospheric Emission Lines from F-M Dwarfs and Giants

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Sapar - W. Struve Astrophysical Observatory of Tartu, U.S.S.R. Ultraviolet Observations of Early-Type Stars and Galaxies Guest Investigators and Investigations

Savage - University of Wisconsin, Madison Interstellar Lyman-Alpha Observations Schild - SAO Lyman and Photometry of H II Region Schmidt - California Institute of Technology Ultraviolet Observations of Quasistellar Objects and the Intergalactic Medium Smith - NASA-GSFC The Search for Spectra of Interstellar Molecules Against Hot Stars Ultraviolet Emission Line Spectra in Bright Galaxies Snyder - University of Virginia The Search for Spectra of Interstellar Molecules Against Hot Stars Sobieski - NASA-GSFC Ultraviolet Spectroscopy of Peculiar Eclipsing Binary Stars Spitzer - Princeton University The Study of Interstellar Absorption Lines Ultraviolet Spectroscopy of Stellar and Extragalactic Objects Stecher - NASA-GSFC The Physical State and the Distribution of Gas in Our Galaxy Steif - NASA-GSFC The Search for Spectra of Interstellar Molecules Against Hot Stars Timothy - Harvard College Observatory Investigations of Stellar Chromospheres and Coronas Tomasko - University of Arizona Spectrophotometry of Planets Torres-Peimbert - Instituto of Astronomia, Universidad Nacional Autonoma de Mexico Ultraviolet Photoelectric Photometry of Emission Line Objects Underhill - NASA-GSFC Study of the Ultraviolet Spectra of Early-Type Supergiants Vandenbout - University of Texas, Austin Observations of Interstellar Molecules The Interstellar Abundance of Light Elements Ultraviolet Spectroscopy of X-Ray Emitting Binary Systems

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Williams - University of Manchester, UK The Physical State and the Distribution of Gas in Our Galaxy

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Young, R. E.	MADA TANG

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Orbiter Investigations

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Magnetometer

National State

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APPENDIX C - DEFINITIONS

Several words and phrases are used in this report in a precise and specific sense. These terms are defined here to clarify the intended meaning to the reader.

Active -

 $(x,y) \in \mathcal{A}_{A}^{(n)}(x)$

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As applied to a spacecraft mission or one of its experiments pertinent to this report, a general status-of-operation term that means the spacecraft or experiment has been launched and was reported to NSSDC to be in either a "normal" or "partial" status.

Apoapsis - The distance from the surface of the reference body to the furthest orbit point. This distance is expressed as astronomical units (AU) for heliocentric orbits, including planetary system flybys that became escape trajectories from the solar system; e.g., Pioneers 10 and 11. The units are kilometers (km) of altitude for all other orbits.

Approved Mission - A planned spacecraft mission status term that means the spacecraft mission has been approved, and funding is or will be available to perform the mission.

Brief

Description - As applied to a spacecraft, a description containing a concise summary of the spacecraft mission, specifically outlining the overall objectives of the mission and the scientific studies being performed. As applied to an experiment, a description containing a concise summary of the experiment purpose and instrument characteristics, emphasizing those relevant to the scientific use of the resulting data.

Canceled Mission - As applied to a spacecraft mission, a status term that means the mission was canceled and no funds are expected to become available to carry out the project. Failed Mission - As applied to a spacecraft mission, a status term that means the spacecraft failed to achieve a suitable orbit, or the experiments failed to function after achieving orbit.

Inclination - The angle (in degrees) between the satellite orbital plane and the equatorial plane of the primary gravitational body. For satellites with heliocentric orbits, the ecliptic plane is used in lieu of the equatorial plane.

As applied to a spacecraft, a status-of-operation Inoperable term that means the spacecraft is no longer capable of producing any useful scientific data because of malfunction or failure of the spacecraft system, completion of the phase of the spacecraft trajectory in which useful measurements could be performed, or network support (tracking, command, and telemetry) has been discontinued, etc. As applied to an experiment, a status-of-operation term that means the experiment is no longer capable of producing any useful scientific data because of a malfunction or failure of the experiment system or critical parts of the spacecraft system, or the completion of the phase of the spacecraft trajectory in which useful measurements could be performed.

Mission Being Rescoped -

Normal -

As applied to a spacecraft mission, a status term that means the mission has been redefined to an extent that the original mission plan and experiments are no longer valid and a new mission plan and experiments are under study.

As applied to an active spacecraft, a status-ofoperation term that means the spacecraft and other required systems are capable of working so that the data would be suitable for all of the scientific studies planned for the spacecraft when the spacecraft is turned on and the data are recorded. As applied to an active experiment, a status-ofoperation term that means all experiment and spacecraft systems are working so that the data would be suitable for all of the scientific studies originally planned for the experiment.

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NSSDC ID Code -

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An identification code used in the NSSDC information system. In this system, each successfully launched spacecraft and experiment is assigned a code based on the launch sequence of the spacecraft. Subsequent to 1962, this code (e.g., 72-012A for the spacecraft Pioneer 10) corresponds to the COSPAR international designation. The experiment codes are based on the spacecraft code. For example, the experiments carried aboard the spacecraft 73-019A (Pioneer 11) are numbered 73-019A-01, 73-019A-02, etc. Each prelaunch spacecraft and experiment is also assigned an NSSDC ID code based on the name of the spacecraft. For example, the proposed NASA launch, Solar Maximum Mission, would be coded SMM. The experiments to be carried aboard this spacecraft would -02, etc. Once a -01, SMM be coded SMM spacecraft is launched, its prelaunch designation is changed to a postlaunch designation; e.g., Pioneer-G, which was launched on April 6, 1973, was given the NSSDC ID code of 73-019A, corresponding to the launch spacecraft common name, Pioneer 11.

Orbit Type - A word or phrase indicating the most important phase of the trajectory of a given spacecraft mission. The orbit type may be any one of the following: geocentric, selenocentric, heliocentric, Venuscentric, Marscentric, lunar lander, Venus lander, Mars lander, Jupiter lander, lunar flyby, Venus flyby, Mars flyby, Mercury flyby, and Jupiter flyby.

Partial - As applied to a spacecraft, a status-of-operation term that means the spacecraft and other required systems are working, but not all systems are working as well as the design required. If the spacecraft were turned on and the data recorded, the data would be suitable for only a portion of the scientific studies planned for the spacecraft. As applied to an experiment, a status-of-operation term defined similarly to that for a spacecraft.

Periapsis - The distance from the surface of the reference body to the nearest orbit point. This distance is expressed as astronomical units (AU) for heliocentric orbits, including planetary system flybys that became escape trajectories from the solar system; e.g., Pioneers 10 and 11. The units are kilometers (km) of altitude for all other orbits.

Planned - As applied to a spacecraft mission pertinent to this report, a general status term that means the spacecraft mission was last reported to NSSD(as either "approved" or "proposed." As applied to an experiment, a term that indicates an experiment is expected to fly on a planned spacecraft mission.

Proposed Mission - A planned mission status term that means the spacecraft design and the experiments have been selected; however, no funds have been approved to perform this mission.

Standard - As applied to a spacecraft or experiment data acquisition rate, a term that means the data that can be processed and made available to the experimenters are being acquired at the rate or percentage of coverage required to accomplish the planned scientific studies.

Substandard - As applied to a spacecraft or experiment data acquisition rate, a term that means the data that can be processed and made available to the experimenters are <u>not</u> being acquired at the rate or percentage of coverage required to continue all the planned scientific studies.

Unknown - As a general term, indicates information either unknown or unavailable at NSSDC.

Zero -

As applied to a data acquisition rate, a term that means the spacecraft or experiment has been turned off except for state of health measurements and is in a standby condition capable of being returned to its previous status.

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APPENDIX D - ABBREVIATIONS AND ACRONYMS

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A	ungstrom	CAL	calorie
ABMA ACAD	A.my Ballistic Missile Agency Academy	CAL TECH CALSPHERE	California Institute of Technology calibration sphere
ACIE	Accompatical Chart and Information Center	CAN	Canada
	(now Defense Mapping Agency Aerospace	CAS	Cooperative Applications Satellite
	Center)		(France-NASA)
ACS	attitude control system	CAV	composite analog video
AD	Dual Air Density Explorer (satellite, NASA)	CDA	command and data acquisition (station)
x/D	analog to digital	CDC	Control Data Corporation
AE AEC	Atmosphere Explorer (satellite, NASA)	CDS CENS	cadmium sulfide Centre d'Etudos Nucleaires de Saclay
AEROPROPUL	Atomic Energy Commission aeropropulsion	cuno.	(France)
AEROSAT	Aeropautical Satellite (NASA-ESA)	CHEM	chemical
AEROSP	aerospace	CM	command module; centimeter
AFB	Air Force Base	CMD	command
AFCRL	Air Force Cambridge Research Laboratories	CNES	Centre National d'Etudes Spatiales
	(now US Air Force Geophysics Laboratory)	du	(France)
AFGL AFO	Air Force Geophysics Laboratory Announcements of Flight Opportunities	CNET	Centre National d'Etudes des Telecommuni- cations (France)
AFSC	Air Force Systems Command	CNRS	Centre National de la Recherche Scienti-
AGC	automatic goin control		fique (France)
AGCY	agency	CO:84	connission
AIMP	Anchored Interplanetary Monitoring	COMSAT	Communications Satellite Corporation
	Platform (satellite, NASA)	CONTE	Comision Nacional de Investigacion del
ALOSYN	Alouette topside sounder synoptic (data)	COUCA	Espacio (Spain) Connie Deu Samplite (James)
ALPO	Apollo Lunar Polar Orbiter (satellite, NASA); Association of Lunar and Planetary	CORSA COS	Cosmic-Ray Satellite (Japan) Cosmic-Ray Satellite (ESA); cosmic
	Observers	COSPAR	Committee on Space Research
ALSEP	Apollo Lunar Surface Experiments Package	COUNC	council
	(NASA)	CPS	cycles per second
ALT	altitude	CPU	central processing unit
AM	amplitude modulation	CRC	Communications Research Centre (Canada)
ASIP	ampere	CRPL	Central Padio Propagation Laboratories
AMPS	Atmosphere, Magnetosphere, and Plasmas in		(later ITSA; formerly part of ESSA; now NOAA/ERL)
AMS	Space (satellite, NASA) Army Map Service (now Defense Mapping	CRREL	Coid Region Research & Engineering
A.C.	Agency Topographic Center)	GINEL	Laboratories
ANSAT	Radio Amateur Satellite Corporation	CRS	Commission for Space Research (Italy)
AMU	atomic mass unit; astronaut maneuvering unit	CRT	cathode ray tube
ANIK	Canadian Telecommunications Satellite; also	CS1	cesium iodide
	referred to as TELESAT	CSN	command service module
ANNA	Army, Navy, NASA, Air Force (geodetic	CTR	centor
1115	satellite) Astronomical Netherlands Satellite	CTS CZCS	Canadian Telecommunications Satellite coastal zone ocean color scanner
ANS	(Notherlands-NASA)	6263	coastat cone been coror scamer
A050	Advanced Orbiting Solar Observatory		
AP	magnetic activity index Ap	D	day
APL	Applied Physics Laboratory of Johns Hopkins	DAC	data acquisition camera
	University	DADE	Dual Air Bonsity Explorer (satellite, NASA)
APPL	application	DAN	Danish
APT	automatic picture transmission	DAPP	Defense Acquisition and Processing Program (DOD)
A/R ARC	acquisition/reference Ames Research Center (NASA)	DASA	Defense Atomic Support Agency
ARC-NEN	arc-minute	DATS	Despun Antenna Test Satellite (DOD)
ARC-S	arc-second	DB	decibel
ARDC	Air Research and Development Command	DCP	data collection platform
	(now AFSC)	PCS	direct couple system; data collection
ARPA	Advanced Research Projects Agency	BFP	system
ARSP	Aerospace Research Support Program (USAF)	DEF DEG	defense degree
AS+E ASOS	American Science & Engineering, Inc. antimony-sulfide oxy-sulfide	DENPA	Density Phenomenn (satellite, Japon)
ASTP	Apolio-Soyuz Test Project (USSR-NASA)	DEV	development
ASTROPHYS	astrophysics	DFVLR	Deutsche Forschungs-und Versuchsanstalt
AT	atomie		für Luft-und Raumfahrt; English transla-
ATCOS	Atmospheric Composition Satellite (NASA)		tion, Research Laboratory for Aeronautics
ATDA	Alternate Target Docking Adapter	DIAL MILES	and Astronautics, Fed Rep of Germany
ATFE	advanced thermal control flight experiment	DIAL/NIKA	Diament Allemande/Mini Kapsol (satellite, Fed Rep of Germany-France)
ATM ATS	Apollo Telescope Mount; atmosphere Applications Technology Satellite (NASA)	DIAL/WIKA	Diament Allemande/Wissenschaftliche
AT+T	American Telephone & Telegraph Corp.		Kapsel (satellite, Fed Rep of Germany-
AU	astronomical unit		France)
AUST	Australia	DIAN	diameter
AVCS	advanced vidicon camera system	DIAPO	Diapason (satellite, France)
AVG	average	DIT	Brexel Institute of Technology
AVIIRR	advitced very high resolution radiometer	DMAAC	Befense Mapping Agency Aerospace Center
AWRE	Atomic Wapons Research Establishment	DMATC DME	Defense Mapping Agency Topographic Center Direct Measurements Explorer (satellite.
	(Australia)		NASA)
		DNSP	Defense Military Satellite Program (DOD)
BCD	binary coded decimal	DOD	Department of Defense
BE	Beacon Explorer (satellite, NASA);	DODGE	Department of Defense Gravity Experiment
	beryllium		(satellite, DOD)
BEV	billion electron volts	DRID	direct readout image dissector (camera
BIC	barium iodide cloud	DRIR	system) direct readout infrared radiometer
BIOS BPÍ	Biological Satellite (NASA) bits per inch	DRTE	Defence Research Telecommunications
BPS	bits per second		Establishment (now CRC)
BTL	Bell Telephone Laboratories	DSAP	Defense System Applications Program (DOB)
BUV	backscatter ultraviolet	USCS	Defense Satellite Communications System (DOD)
BV	billion volts	DSIR	Department of Science and Industrial
B/N	bláck and white Bundessisters für Missenschaftliche	065	Research (England)
BWF	Bundesminister für Wissenschaftliche Forschung (Fed Rep of Germany)	DSN DV	Deep Space Network digital video
	torsecond (the web of dermany)	DYN	dynamic
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E	energy	GRAVR	Gravitational Redshift Space Probe (NASA)
EASEP	Early Apollo Scientific Experiment Package	GRE	ground reconstruction equipment; ground
ECS	Experimental Communications Satellite (NASA)	GREB	reconstruction electronics Galactic Radiation Experiment Background
EDS L-30	Environmental Data Service (NOAA) Eccentric (Orbiting) Geophysical Observatory	OUTR	(satellite, USN)
	(satellite, NASA)	GRI	Groupe de Recherche Ionospherique (France)
ECAS	Engineers Satellite (DOD) effective isotropic radiative power	GROC	Netherlands Committee for Geophysics and Space Research
EIRP EL	electric (data camera carried on Apollo)	GAS	German Research Satellite (NASA-Fed Rep
ELDO	European Launch Development Organization		of Germany}
C1 CC	(ESA)	GSD GSE	Grid Sphere Drag (satellite, £60) geocentric solar ecliptic (coordinate
ELEC ELECTR	electric electronics	uae:	system)
ELMS	Earth Limb Measurement Satellite (NASA-USAF)	GSFC	Goddard Space Flight Center (NASA)
EME	environmental measurement experiment	GSM	geocentric solar magnetospheric (cuordinate system)
EMR ENVIRON	Electromechanical Research (Company, England) environment; environmental	.GT.	greater than
EOF	end of file	GUGNS	Glavnoye Upravleniye Gidrometeorologicheskoi
EOGO	Eccentric Orbiting Geophysical Observatory		Sluzhby (Main Administration of the Hydrometeorological Service, USSR)
EOS	(satellite, NASA) Earth Observation Satellite (NASA)	GV	gigavolt
EPE	Energetic Particle Explorer (satellite,	GVIFAR	geosynchronous very high resolution
* 10	NASA)		radiometer
E/Q ERB	energy per unit charge Earth radiation budget (experiment)		
ERDC	Earth Resources Bata Center	II	hour
ERGS	Earth Geodetic Satellite (USAF)	HAD HCM21	High Altitude Observatory Heat Capacity Map Mission (satullite,
ERL EROS	Environmental Research Laboratory (NOAA) Earth Resources Observation System	110121	NASA)
ERS	Environmental Research Satcilite (USAF)	HCMR	Heat Capacity Mapping Radiometer
ERT	extended range telescope	HCO HDRSS	Harvard College Observatory high data rate storage system
EPTS ESA	Earth Resources Technology Satellite (NASA) European Space Agency	HE	helium
ESMR	electrically scanning microwave radiometer	HEAO	High-Energy Astrophysical Observatory
ESOC	European Space Operations Centre (ESA)	HEOS	(NASA) High-Eccentricity Earth-Orbiting
ESRO ESSA	European Space Research Organization (now ESA) Environmental Science Services Adminis-	11203	Satellite (ESA)
	tration (now NOAA)	HET	health, education, telecommunications
ESTABL	establishment	HETS HEW	high-energy telescope system health, education, and welfare
ESTEC	European Space Technology Center (ESA) Eastern Test Range (also referred to as	HFE	heat-flow experiment; heat-flow electronics
	Cape Canaveral)	HR	high resolution
1ETS	Engineering Test Satellite	HRIR HRIRS	high-resolution infrared radiometer high-resolution infrared radiometer sounder
EUV EV	extreme ultraviolet electron volt	H.S.	high school
EVA	extravehicular activity	K/DROMET	hydrometeorological
EVM	Earth viewing (equipment) module	HZ	hertz (cycles per second)
EXOS EXOSAT	Exispheric Satellite (Japan) European X-ray Observation Satellite (ESA)		
EXTRATERR	extraterrestrial	IVb	Institute of Atmospheric Physics (USSR)
		I BH I CBM	International Pusiness Machines (Corp) intercontinenta, ballistic missile
FARO	Flare-Activated Radiobiological Observately	ICSU	International Council of Scientific Unions
	(satellite, COD)	ID	identification
FED	Federal	IDC IDCS	image dissector camera image dissector camera system
FLT-SAT FM	Fleet Satellite (LSN) frequency modulation	IDCSP	Initial (or Interim) Defense Communica-
FMRT	final meteorological radiation tape		tion Satellite Program (or Project) (DOD)
FOUND	foundation field of view	IDSCS	Initial Defense Satellite Communication System (DOD)
FOV FPR	flat plate radiometer	IDT	instrument definition team
FR	French Research (satellite, France)	IE	Ionospheric Explorer (satellite, NASA-NBS)
FRC	Flight Research Center (NASA)	i fov I grf	instrument field of view International Geomagnetic Reference Field
FSC FSK	FLEETSATCOM (satellite, USN-USAF) frequency shift key	IGY	International Geophysical Year
FWEM	full width at half maximum	IME	International Magnetosph wie Explorer
FWS	filter wedge spectrometer	IMP	(satellite, NASA-ESA) Interplanetary Monitoring Platform
			(satellite, NASA)
GARP	Global Atmospheric Research Program	IMS	International Magnetospheric Study
GCA GE	Geophysics Corporation of America General Electric (Company)	INDASAT INOP	Indian Scientific Satellite (ISRO-USSR) inoperable
.GE.	greater than or equal to	INSAT	Indian National Socillite (ISRO-USSR)
GEMS	Geostationary European Meteorological	INST	institute
GEOPHYS	Satellite (ESA) geophysical	INTA	Instituto Nacional de Tecnica Aeroespacial (Spain); the National Institute of
GEOS	Geodetic Barth-Orbiting Satellite (NASA);		Aerospace Spience
	Geostationary Earth-Orbiting Satellite	INTASAT	satellite (INTA, Spain)
	(ESA) Gesellschaft für Weltraumforschung (Center	INTELSAT	International Telecommunications Satellite (NASA-COMSAT)
GES FUR WELTRAUM-	for Space Research, Fed Rep of Germany)	ION COMP	Ionospheric Corposition (satellitesee
FORSCH	-		DIAPO)
G.E.T.	ground elapsed time	IPA	Institute for Physics of the Atmosphere (SAS)
GEX GGSE	gas exchange gravity gradient stabilization experiment	1051	International Quiet Sun Year
GHZ	gigahertz	IR	infrared
		IRAS	Infrared Astronomy Satellite
GISS	Goddard Institute for Space Studios (NASA)		
GISS GM	Goddard Institute for Space Studios (NAS.) Geiger-Hueller; gram	IRBN IRIG	intermediate range ballistic missile Inter-Range Instrumentation Group
GISS GM GMS	Goddard Institute for Space Studies (NASA) Goiger-Hueller; gram Geostationary Meteorological Satellite (Japan)	IRBM	intermediate range ballistic missile Inter-Range Instrumentation Group Infrared-interforometer spectrometer;
GISS GM GMS GMT	Goddard Institute for Spnce Studies (NASI) Geiger-Nueller; gram Geostationary Meteoroicgical Satellito (Japan) Greenwich mean time	IRBM IRIG	intermediate range ballistic missile Inter-Range Instrumentation Group infrared-interferometer spectrometer; International Radiation Investigation
GISS GM GMS	Goddard Institute for Space Studies (NASA) Geiger-Hueller; gram Geestationary Meteoloicgical Satellite (Japan) Greenwich mean time Geesynchronous Operational Environmental	IRBM IRIG	intermediate range ballistic missile Inter-Range Instrumentation Group Infrared-interforometer spectrometer;
GISS GM GMS GMT	Goddard Institute for Spnce Studies (NASI) Geiger-Nueller; gram Geostationary Meteoroicgical Satellito (Japan) Greenwich mean time	IRBM IRÍG IRIS	intermediate runge ballistic missile Inter-Range Instrumentation Group infrared-Interferometer spectrometer; International Radiation Investigation Satellite (NASA-ESA)

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IRR	infrared radiometry	1.47	
IRTRN	infrared transmission	MIT NJS	Massachusetts Institute of Technology
ISAS	Institute of Space & Aeronautical Science	MM	Mariner Jupiter/Saturn (spacecraft, NASA) millimeter
ISEE	(Japan) International Sun-Earth Explorer (satellite,	MMM	millimeter wave
	NASA-ESAJ	80L 8-P	Hanned Orbiting Laboratory (satellite, DOD) minus-plus
1515	International Satellite for Ionospheric	MPI	Max-Planck-Institut (Fed Rop of Germany)
ISRO	Studies (NASA-Canada) Indian Epace Research Organization	MR	medium resolution
ISS	Ionospheric Sounding Satellite (Japan)	MRIR MS	medium-resolution infrared radiometer microsocond; millisocond
ITCZ ITOS	intercropical convergence zone	MSC	Manned Spacecraft Center (now Johnson Space
ITPR	Improved TINOS Operational Satellite (NOAA) infrared temperature profile radiometer	here	Center)
ITR	incremental tape recorder	MSFC MSN	Marshali Space Flight Center (NASA) mission
ITSA	Institute for Telecommunication of Sciences	MSS	Magnetic Storm Satellite (NASA-AFCRL);
	and Aeronomy (formerly a subdivision of ESSA; now NGAA-ERL)	MSSCC	multispectral scanner
IU	instrument unit	MTS	multicolor spin-scan cloudcover camera Netcoroid Technology Sateilite (NASA)
IUE	International Ultraviolet Explorer (satellite, NASA-UK-ESA)	MUSE	monitor of ultraviolet solar energy
TUWDS	International URSIGRAM and World Days Service	1974 1977	milliwatt
IZMIRAN	Institute of Torrestrial Magnetism and		
	Aeronomy of the Academy of Sciences (USSR)	NA	not applicable; Nora Alice (satellite, DOD)
		NACE NADUC	neutral atmosphere composition experiment Nimbus/ATS Data Utilization Center
JHU JPL	Johns Hopkins University	NASA	National Aeronauties and Space Adminis-
JSC	Jot Propulsion Laboratory (NASA) Johnson Space Center (NASA)	NA Det	tration (Washington, D.C., Headquarters)
	Sound of the conter (Mok)	NASC NASDA	National Aeronautics and Space Council National Space Development Agency (Japan)
KBS	litelies was seen t	NATL.	national
KEV	kilobits per second kiloelectron volt	NATO	North Atlantic Treaty Organization
KG	kilogram	NBS NCAR	National Bureau of Standards National Center for Atmospheric Research
KHZ. KM	kilohortz	NCC	National Climatic Center (NOAA)
KP	kilometer magnetic activity index Kp	NDRE NEMS	Norwegian Defence Research Establishment
KPNO	Kitt Peak National Observatory	neno	Nimbus-E microwave spectrometer: Near- Earth Magnetospheric Satellite (ESA)
KSC	Kennedy Space Center (NASA)	NESC	National Environmental Satellite Center
		NESS	(now NESS)
LA	Los Angeles	11233	National Environmental Satellite Service (NOAA)
LAB LACATE	faboratory	NGSP	National Geodetic Satellite Program
LAGEOS	lower atmosphere composition and temperature Laser Geodetic Earth-Orbiting Satellite	NHC NH	National Hurricane Center
1.04	(NASA)	NMC	National Institutes of Health National Meteorological Center
LARC LAS	Langley Research Center (NASA)	NMRT	Nimbus meteoro.ogical radiation tape
LASL	Large Astronomical Satellite (ESA) Los Alamos Scientific Laboratory	NNN NNSS	No mational name
LCS	Lincoln Calibration Sphere	NOAA	Navy Navigation_1 Satellite System National Genanic and Atmospheric Adminis-
.LE. LEM	less than or equal to lunar excursion module		tration (formerly ESSA)
LEPEDEA	low-energy proton and electron differential	NOMSS	National Operational Meteorological
LERC	energy analyzer	NORAD	Satellite System North American Air Defense Command
LES	Lewis Research Center (NASA) Lincoln Experimental Satellite (DOD)	NORW	Norwegian
LETS	low-energy telescope system	NOS NOTS	National Ocean Survey (NOAA) Naval Ordnance Test Station
61. LN	Lincoln Laboratory (MIT)	NRC	National Research Council
LMD	lunar module Laboratory of Meteorological Dynamics	NRL	Naval Research Laboratory
LOFTI	Low-Frequency Trans-Ionospheric (satellite,	NSA NSF	National Security Agency National Science Foundation
LOGACS	USN-NRL)	NSSDC	National Space Science Data Center
000/100	Low-G Accelerometer Calibration System (USAF)	NUCL NWL	nuclear
LPSP	Laboratoire de Physique Stellaire et	SWRC	Naval Weapons Laboratory National Weather Records Center (presently
LR	Planetaire (CNRS)		NCC)
LRIR	labuled release limb radiance inversion radiometer; low-		
	resolution infrared radiometer	0A	Office of Applications (NASA)
LRL LRV	Lunar Receiving Laboratory (JSC)	OVD	Orbiting Astronomical Observatory (satellite,
LST	lunar roving vehicle Large Space Telescope (satellite, NASA)	OAK	NASA)
.LT.	less than	OART	Office of Aerospace Research (USAF-AFSC) Office of Advanced Research and Technology
LTV	Ling-Tenco-Vought (Company)		(NASA)
		OAST	Office of Aeronautics and Space Technology (NASA)
м Ма	meter, milli- (prefix)	085	observatory
MAPS	Mercury Atlas	OCC	OPLE Command Center
MARENTS	measurement of air pollution from satellite Modified Advanced Research Environmental	(IFO	Orbiting Frog Otolith (NASA experimental spacecraft)
HAS	Test Satellite (USAF)	020	Orbiting Geophysical Observatory
HASC	Ministry of Aviation Supply (UK) magnetic attitude spin coil		(satellite, NASA)
MASS	hassachusetts	OI OUNI	other investigator
MATER NB	material		low-resolution ammidirectional radiometer (on Explorer 7)
MC	millibar Regacycle	OMSF	Office of Manned Space Flight (NASA)
MED	medicine; medical	ONR OPEP	Office of Naval Research orbital-plane experiment package
METEC	Meteoroid Technology (satellite, NASA)	OPLE	Omega position and location experiment
METEOSAT NEV	Moteorological Satellite (ESA) million electron volts	OP OFF ORBIS	operational off
MG	milligram	URB15	Orbiling Radio Bencon Ionospheric Satellite (NASA)
MIZ MIDAS	Megahertz	DRS	Octahedral Research Satellite (NASA);
NIN	Missile Defense Alarm System (USAF) minute	OSCAR	Orbiting Research Satellite (DOD)
		0002 II.	Orbiting Satellite Carrying Amateur Radio

050	Orbiting Solar Observatory (satellite,		SC
055	NASA) Office of Space Science (NASA)		SCANS SCEL
OSSA	Office of Space Science and Applications		SCIL
	(NASA; now two separate offices)		SC1
OT OTDA	Operational TIROS (satellite, NASA) Office of Tracking and Data Acquisition		SCMR SCORE
VIDA	(NASA)		SCORE
OV	Orbiting Vehicle (satellite, USAF)		SCR
OVT	organic vapor trap		SD SE
			SEASAT
PAC	Packaged Attitude Control (satellite, NASA)		SEC
PAET PAGEOS	Planetary Atmosphere Experiment Test Passive Geodotic Earth-Orbiting Satellito		SECOR
	(NASA)		
PAM	pulse amplitude modulation		SEN
PD	pulse coded modulation project director		JERI
PE	Planetary Explorer		SESP
PEP PFM	platform electronic package pulse frequency modulation		SESPO
PHASR	Personnel Hazards Associated with Space		SIBS
	Radiation (satellite, USAF)		SIDS
PHYS PI	physics principal investigator		SIM
PIXEL	picture element		SIRS
PL PLACE	prelaunch		SM
PLACE	position location and aircraft communica- tion experiment		SMM
PH	pulse modulation; photomuitiplier		SMMR
PMR	pressure modulation radiometer; Pacific		SMS
PMF	Missile Range photomultiplier tube		SNAP
P-N	positive-negative (junction)		SOEP
POGO	Polar Orbiting Geophysical Observatory		SOLRAD SPADES
PPS	(satellite, HASA) pulses per second		arauca
PR	pyrolytic release		SPHINX
PROT	protection		SPM
PSE	pressure sensor passive selsmograph experiment		SR
PTL	Photographic Technology Laboratory (JSC)		
			SRATS
QONIAC	quarter-orbit magnetic attitude control	~	SRC
	(system)		0.01
			SR1 SRT
RA	Ranger (spacecraft, NASA)		SSC
RAD RADCAT	radium; radiation Baian Calibertian Tanuat (sotallite (1984)		SSCC SSD
RADOSE	Radar Calibration Target (satellite, ARPA) Radiation Dosimeter (satellite, DOD)		555
RAE	Radio Astronomy Explorer (satellite, NASA)		S51
RAM RBV	random access memory (system) return beam vidizon (camera)		STADAN
RC	resistance capacitor		STARAD
RCA	Radio Corporation of America		STD
R+D REP	research and development republic		STDN STER
RES	research		STL
REXS	Radio Exploration Satellite (Japan)		STN
RF RF1	radio frequency radio frequency interference		STP
RM	Radiation Meteoroid (satellite, NASA);		
DUC	Radiometric Measurement (satellite, DOB) root mean square; Radiation Moteoroid		STRATOS STUD
RMS	Satellite (NASA); Radiometric Measurement		รบเ
	Satellite (DOD)		
RPA RPM	retarding potential analyzer revolutions per minute		SURCAL SVC
RPS	revolutions per second		SIT
RRL	Radio Research Laboratorics (Japan)		SNRF
RSRS RTD	Radio and Space Research Station (England) Research Technology Division (USAF)		SYNCOM
RTG	radioisotope thermoelectric generator		
RTIS	real-time transmission system		TAC
			TACONSAT
s	second		TATS
SAM SAMOS	stratospheric aerosol measurement Satellite Mission Observation System		TATSACON
3/0403	(satellite, USAF)		TD
SAMS	stratospheric and mesospheric sounder		TD
SANSO	Space and Missile Systems Organization (USAF)		TDP
SAO	Smithsonian Astrophysical Observatory		T+DR
SAPPSAC	spacecraft attitude precision pointing		TDRSS
SAS	and slowing adaptive control Small Astronomy Satellite (NASA); Soviet		TEC
	Academy of Sciences		TEI
SATAR SATELL	Satellite for Aerospace Research (NASA) satellite		TELESAT
SATELL	Satellite Antenna Test System (NASA)		TEMP
SBRC	Santa Barbara Research Center		TET

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project scientist Scanning microwave spectrometer Signal Corps Engineering Laboratories school **SCIENCE** Selective composition mapping radiomuter Signal Communication by Orbiting Relay Equipment (satellite, DOD) selective chopper radiometer Senetice San Diego Solar Explorer (satellite, NASA) Deean Dynamic Satellite (NASA) secondary electron conduction (vidicon tube) Sequential Collation of Range (satellite, USAF) space environment monitor Spinning Satellite for Electric Rocket Tost (NASA) Space Experiment Support Program Space Environmental Support Project Office Saviat Hydromotorological Service Saik Institute for Biolog cal Studies Space Investigations Documentation System (NASA) tube) Space investigations bocumentation System (NASA) scientific instrument module satellite infrared spectromotor; System for Information Retrieval and Storage (NSSBC) San Marco (satellite, NASA-Italy) solar maximum mission scanning multispectral microwave radiometer Synchronous Meteorological Satellite (NASA) Synchronous Sectorological sateritie (NASA) systems for nuclear auxiliary power solar-oriented experiment package Solar Radiation (satellite, NASA-DOD) Solar Perturbation and Atmospheric Density Measuresent Satellite (DOD) Space Plasma High Voltage Interactive Experiment (satellite, NASA) solar proton monitor Solar Radiation (satellite, NASA); sconning rudiometer; sounding rocket Solar Radiation in Thermospheric Structure (satellite, Japan) Space Research Council; Science Research Council [NASA] Council Stanford Research Institute Stanford Research Institute supporting research and technology Satellite Situation Center spin-scan cloudcover camera Space Science Rivision (JPL) Small Scientific Satellite (NASA) satellite-to-satellite tracking Spacecraft Tracking and Data Acquisition Network (now STDN) Starfish Radiation (satellite, NASA) standard Storfish Radiation (satellite, NASA) standard Spaceflight Tracking and Data Network (NASA) storadian Space Teelmology Laboratories (now TRW Systems Group) station Solar Terrestrial Probe (satellite, NASA); Solar Terrestrial Physics stratosphere studies studies State University of Iowa (now University of Iowa) Surveillance Calibration (satellite, DOD) service Southwest Sine Wave Response Filter (program) Synchronous Communication (satellite, NASA) system Technology Application Center Tactical Communications Satellite (DOD) Test and Training Satellite (MASA) Tacti al Satellite Communications (program, DOD) technical director technical director Thor-Delta (satellite, ESA); launch vehicle (NASA-USAF) Tracking Data Processor (program) tracking data relay tracking and data relay satellite system telemetry and command; transearth coast technical; technology transearth injection atellite, Ganada (also referred to xANE) fc. oral; temerature

te: oral; temperature tel. copo and electron telescope

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TETR THIR	Test and Training (satellite, NASA) temperature-humidity infrared radiometer	USN USSR	United States Navy Union of Soviet Socialist Republics
	Thor Augmented Delta Agena (launch vehicle)	UT	universal time
THORAD-AGE		UV UV	ultraviolet
TIMATION	Time Location System (USN)		
TIP	Tracking Impact Prediction (sutellite, DOD)	UVKO	ultraviolet nitric-oxide experiment
TIROS	Television and Infrared Observation Satellite (NASA)	uvs	ultraviolet spectrometer
TL	team leader		
TLI	translumar injection	v	volt
TN	tean neaber	VAR	variation
TOMS	total come mapping system	VHF	very high frequency
1000		VHRR	very high resolution radiometer
	topographic	VISSR	visible infrared spin-scan radiometer
TOPS	Thermal Noise Optical Optimization	VLF	very low frequency
	Communication System (NASA)		
TOPSI	topside (sounder) (satellite, NASA)	VTPR	vertical temperature profile radiometer
TOS	THROS Operational Satellite (or System) (NASA)		
TOVS	TIROS operational vertical sounder	W	watt
TRAAC	Transit Research and Attitude Control	WEVTR	wideband video tape recorder
	(satellite, USN)	WDC	World Data Center
TRANET	Doppler Tracking Network (USN)	WDC-A-R&S	World Data Center A for Rockets and
TRANSP	transportation		Satellites
TRS	Tetrahedral Research Satellite (USAF)	WEFAX	weather facsimile
TRUST	television relay using small terminals	WFC	Wallops Flight Conter (SASA)
	Thompson, Ramo, Wooldridge, Inc	WGSPR	Working Group for Space Physics Research
TRW		W140	Korld Meteorological Organization
TTS	Test and Training Satellite (NASA) (also	WPH	words per minute
	called TATS, TETR)		Keapons Research Establishment Satellite
THERLE	tropical wind energy conversion and reference level experiment	WRESAT	(Australia)
	•	W5	Wallops Station (NASA; now Wallops Flight Center)
U	university	WSMR	White Sands Missile Range
UCLA	University of California at Los Angeles	WTR	Western Test Range (also referred to as
			Vandenberg AFB)
UHF	ultrahigh frequency	billin .	World Weather Watch
UK	United Kingdom	11111	noris neacher nasen
US	United States		
USA	United States Army; United States of America	_	· · · · · · · · · · · · · · · · · · ·
USAF	United States Air Force	z	atomic number