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National Space Science Data Center/
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(NASA-TM-87379) DOCUMENTATION FOR THE N85-12589
MACHINE-READABLE VERSION OF THE ANS
ULTRAVIOLET PHOTOMETRY CATALOGUE OF POINT
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DOCUMENTATION FOR THE MACHINE-READABLE VERSION
OF THE
ANS ULTRAVIOLET PHOTOMETRY CATALOGUE OF POINT SOURCES
(WESSELIUS ET AL. 1982)



AUGUST 1984

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August 1984

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ABSTRACT

The machine-readable version of the catalog is described in detail, with a byte-by-byte format description and characteristics of the data file given. The catalog is a compilation of ultraviolet photometry in five bands, within the wavelength range 155 nm to 330 nm, for 3573 mostly stellar objects. Additional cross reference data (object identifications, *UBV* photometry and MK spectral types) are included in the catalog.

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SECTION I - INTRODUCTION AND SOURCE REFERENCE

The *ANS Ultraviolet Photometry Catalogue of Point Sources* (Wesselius *et al.* 1982) is a compilation of UV photoelectric measurements at 15, 18, 22, 25 and 33 nm for 3573 objects (mostly stars) observed with the Astronomical Netherlands Satellite in the period 1974 October to 1976 April. The reported magnitudes were obtained from mean count rates converted to fluxes using the ANS absolute calibration of Wesselius *et al.* (1980). In addition to the ultraviolet magnitudes, the catalog contains positions taken from the satellite pointing, spectral types and *UBV* data taken from other sources, plus comments on duplicity, variability and miscellaneous notes concerning individual objects. For additional information on the satellite, its instruments, calibration and testing, observational procedures, data reduction, and production of the catalog, the source reference should be consulted.

This document describes the machine-readable version of the ANS catalog and is intended to enable users to read the tape and process the data without problems and guesswork. A copy of this document should be transmitted to any recipient of the machine catalog originating from the Astronomical Data Center.

SOURCE REFERENCE

Wesselius, P. R., van Duinen, R. J., de Jonge, A. R. W., Aalders, J. W. G., Lijnse, W. and Wildeman, K. J. 1982, *ANS ultraviolet photometry, catalogue of point sources*, *Astron. Astrophys. Suppl.* 49, 427.

SECTION 2 - TAPE CONTENTS

A byte-by-byte description of the contents of the machine-readable *ANS Ultraviolet Photometry Catalogue of Point Sources* is given in table 1. A suggested Fortran format specification for reading each data field is included and can be modified depending upon individual programming and processing requirements (Fortran 77 character string-type formats are used); however, caution is advised when substituting format specifications, since some data fields contain character data and others are blank when data are absent. Particular care is required for the photometric data (magnitudes and color indices) where valid zero values can exist, but where fields are blank for nonexistent data and where precision can vary within the same field. It is safest to buffer in records in an unformatted mode or read them with character (A) formats and test for blank data fields before processing with numerical formats for calculation and/or search purposes. For such fields, primary numerical format specifications are given to indicate decimal-point location, while alternate A-type formats are specified in parentheses. Default (null) values are always blanks in data fields for which primary suggested formats are given as A.

Table 1. Tape Contents. *ANS Ultraviolet Photometry Catalogue of Point Sources*

Byte(s)	Units	Suggested Format	Default Value	Remarks
1- 9	---	A9	---	Object identification per the following prioritized order: Henry Draper (HD) number, Durchmusterung (DM) identification, another name for stars; NGC number, IC number, another name for nebular objects.
10	---	1X	---	Blank
11- 12	hours	I2	---	Right ascension, α , equinox 1950, as transmitted to the satellite for the observation. Positional accuracies in α and δ are equal to the precisions reported.
13- 14	min	I2	---	α
15- 16	sec	I2	---	α
17	---	A1	---	Sign of declination, δ , equinox 1950.

Table 1 (continued)

Byte(s)	Units	Suggested Format	Default Value	Remarks
18- 19	°	I2	---	δ
20- 23	'	F4.1	---	δ
24- 33	---	A10	---	Spectral type. MK types are taken from the following: Jaschek (1978), Houk and Cowley (1975), Houk (1978), Buscombe (1977,1980), other sources, in the priority given; or from the HD Catalogue. The format is reasonably uniform in that temperature classes are in byte 24, subclasses in bytes 25-27, and luminosity classes/peculiarities in bytes 28-33; however, there are exceptions with Mount Wilson types and Wolf-Rayet stars where the luminosity classes and W character always begin in byte 24 also, resulting in a right shift of temperature classes and subclasses. Non-temperature classes, such as "P" (for peculiar) are also present, or the field can be entirely blank.
34- 38	mag	F5.2 (A5)	blank	V or m_V taken from Nicolet (1978), from the <i>Catalog of Stellar Identifications</i> (CSI, Ochsenbein, Bischoff and Egret 1981) where m_V is estimated from m_{pg} and HD spectral type, or from other sources. Note that m_V values are reported to lower precision (byte 38 blank) so the A format must be used if the magnitude accuracy is needed.
39	---	1X	---	Blank
40- 44	mag	F5.2 (A5)	blank	$B-V$ taken from Nicolet (1978); signs are always in byte 40.
45	---	1X	---	Blank
46- 50	mag	F5.2 (A5)	blank	$U-B$ taken from Nicolet (1978); signs always in byte 46.

Table 1 (continued)

Byte(s)	Units	Suggested Format	Default Value	Remarks
51	---	A1	---	Descriptive character for 15N magnitude. The character ">" indicates an S/N value < 3, in which case only an upper limit (three times the error) is given.
52- 57	mag	F6.3 (A6)	blank	15N magnitude. Magnitudes are defined as $m_{\lambda} = -2.5 \log f_{\lambda} - 26.10$, where f_{λ} is in $Wm^{-2}nm^{-1}$. Mean count rates are converted to fluxes using the ANS absolute calibration given by Wesselius <i>et al.</i> (1980) and the fluxes used to derive the magnitudes reported. Data of varying precision are given, so bytes 63 and/or 64 may be blank.
58- 62	.001mag	A5 (A1,I3,A1)	---	Error estimate corresponding to σ_{obj} for 15N magnitude (see Section 6.1.3 of source reference for definition) is given between parentheses. Byte 58 always contains "(" and byte 62 ")".
63	---	A1	---	Descriptive character for 15W magnitude (see byte 51).
64- 69	mag	F6.3 (A6)	blank	15W magnitude (see bytes 52-57).
70- 74	.001mag	A5 (A1,I3,A1)	---	Error estimate corresponding to σ_{obj} for 15W magnitude (see bytes 58-62).
75	---	A1	---	Descriptive character for 18 magnitude (see byte 51).
76- 81	mag	F6.3 (A6)	blank	18 magnitude (see bytes 52-57).
82- 86	.001mag	A5 (A1,I3,A1)	---	Error estimate corresponding to σ_{obj} for 18 magnitude (see bytes 58-62).
87	---	A1	---	Descriptive character for 22 magnitude (see byte 51).
88- 93	mag	F6.3 (A6)	blank	22 magnitude (see bytes 52-57).

Table 1 (continued)

Byte(s)	Units	Suggested Format	Default Value	Remarks
94- 98	.001mag	A5 (A1,I3,A1)	---	Error estimate corresponding to σ_{obj} for 22 magnitude (see bytes 58-62).
99	---	A1	---	Descriptive character for 25 magnitude (see byte 51).
100-105	mag	F6.3 (A6)	blank	25 magnitude (see bytes 52-57).
106-110	.001mag	A5 (A1,I3,A1)	---	Error estimate corresponding to σ_{obj} for 25 magnitude (see bytes 51).
111	---	A1	---	Descriptive character for 33 magnitude (see bytes 51).
112-117	mag	F6.3 (A6)	blank	33 magnitude (see bytes 52-57).
118-122	.001mag	A5 (A1,I3,A1)	---	Error estimate corresponding to σ_{obj} for 33 magnitude (see bytes 58-62).
123-125	---	I3	---	Number of observations (separate pointings) in the 25 band; usually the number of observations in the other bands as well; however, at 15N and 15W the number can be smaller because the band was used in either the wide (15 nm) or the narrow (5 nm) mode. Also, the 33 band, and to a lesser degree, the 15 bands were more frequently affected by particle hits than the other three channels, thus resulting in the deletion of data in one or both when the other bands had data of good enough quality to be processed.
126	---	1X	---	Blank
127	---	A1	---	Duplicity code, D, indicating that at least two stars are present within 1' of the pointing position according to the CSI.

Table 1 (concluded)

Byte(s)	Units	Suggested Format	Default Value	Remarks
128	---	A1	---	Variability code, V, denoting that the UV results indicate variability as determined by tests described in Section 7.2.2 of source reference.
129	---	1X	---	Blank
130-131	---	A2	---	Character codes denoting the following: ? : comment(s) in bytes 127 and/or 128 uncertain N : possible contribution from nebular emission SL: spectral type probably later than listed SE: spectral type probably earlier than listed V?: suspected variable; for some of these objects the groundbased information may be erroneously listed in the source catalogs E?: possible anomalous extinction (reddening) law C : cluster star in crowded field, with possible UV data contamination SD: possibly subluminoous D : stars listed as double in source other than CSI D?: hot UV-bright companion probably present; may be a blue field star (field of view is 2.5 x 2.5 arcminutes)

SECTION 3 - TAPE CHARACTERISTICS

The information contained in Table 2 is sufficient for a user to describe the indigenous characteristics of the magnetic tape version of the *ANS Ultraviolet Photometry Catalogue of Point Sources* to a computer. Information which is easily varied from installation to installation, such as block size (physical record length), blocking factor (number of logical records per physical record), total number of blocks, tape density, and coding (EBCDIC, ASCII, etc.) is not included: this information should always be supplied if secondary tape copies of the catalog are transmitted to other users or installations.

Table 2. Tape Characteristics. *ANS Ultraviolet Photometry Catalogue of Point Sources*

NUMBER OF FILES	1
LOGICAL RECORD LENGTH (BYTES)	131
RECORD FORMAT	FB*
TOTAL NUMBER OF LOGICAL RECORDS	3573

* Fixed block length (last block may be short)

SECTION 4 - REMARKS, MODIFICATIONS, ACKNOWLEDGMENT AND REFERENCES

A magnetic tape of the *ANS Ultraviolet Photometry Catalogue of Point Sources* was received for Dr. P. R. Wesselius on 26 March 1984 along with information about the tape parameters (output from the tape creation run) and sample data records. The complete catalog was transferred to disk storage and compared against the published catalog (Wesselius *et al.* 1982). The following modifications were made to the data records to make the format more compatible with other machine catalogs, to affect easier and less ambiguous data processing, and to decrease storage and make single-line listing on standard 132- and 136-column printers possible.

1. The first data record, which contained the header "NO UVX NR", and records 3574 to 3580 (all blank) were deleted.
2. Plus signs were added before the degree fields of all positive declinations.
3. The *B-V* and *U-B* fields were nonuniform, with signs in various bytes and preceding zeros sometimes present and sometimes absent. These fields were homogenized to include uniform sign placement and preceding zeros at all times.
4. The upper limit ultraviolet magnitude descriptive characters (>) were located within the magnitude fields, but their preceding columns were unused (blank). These descriptive characters were moved to the previously blank columns and the numerical data aligned so that all data can be read with numerical format specifications.
5. Bytes 1 and 137 to 140 were always blank, and blanks occurred at various places within each record. The former blanks and certain of the latter ones were removed to decrease the original 140-byte logical record length to 131 bytes, thus allowing single row listing of records on standard line printers.
6. The following errors detected and corrected during the course of the work are listed in Table 3.

Table 3. Errors Corrected in ANS Data

Object	Datum	For	Read	Remarks
HD 65818	MK	B+ V	B1 V	
HD 72108	<i>U-B</i>	+0.79	-0.79	
HD 74146	<i>U-B</i>			data alignment
HD 74455	<i>U-B</i>			data alignment
HD 93250	<i>U-B</i>			data alignment
HD 102509	MK	A+	A Comp	
HD 143018	MK	B+ V	B1 V	
HD 191692	<i>U-B</i>			data alignment
8h19m43s	Name	UGZ CAM	Z CAM	

ACKNOWLEDGMENT

Appreciation is expressed to Dr. Paul R. Wesselius for supplying the ANS catalog on magnetic tape and for kindly reviewing a draft copy of this document prior to its final printing for distribution with magnetic tape copies of the data.

REFERENCES

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- Jaschek, M. 1978, *Catalogue of Selected Spectral Types in the MK System*, *Bull. Inf. Cent. Données Stellaires* No. 15, p. 121.
- Nicolet, B. 1978, *Catalogue of Homogeneous Data in the UBV Photoelectric Photometric System*, *Astron. Astrophys. Suppl.* 34, 1.
- Ochsenbein, F., Bischoff, M. and Egret, D. 1981, *Astron. Astrophys. Suppl.* 43, 259.
- Wesselius, P. R., Van Duinan, R. J., Aalders, J. W. G. and Kester, D. 1980, *Astron. Astrophys.* 85, 221.
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SECTION 5 - SAMPLE LISTING

The sample listing given on the following pages contains logical data records exactly as they are recorded on the tape. Sample records for objects at the beginning and the end of the data file are listed. The beginning of each record and bytes within the record are indicated by the column heading index across the top of each page (digits read vertically). Since each logical record is longer than 115 bytes, the remainder (bytes 116-131) of each is printed on the following row.

L I S T I N G O F R E C O R D S F R O M T A P E F I L E

TAPE FILE NAME: ANS UV Photometry (1982)

RECORDS 3559 TO 3573

TAPE FILE 77

RECORD LENGTH 131 BYTES
INPUT VOLSER ADC002

C O L U M N G 111111112222222233333333334444444444555555555566666666777777777788888888889999999999
 H E A D I N G 1234567890123456789012345678901234567890123456789012345678901234567890123456789012345
 F I N D E X 12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD	3559	166	1661	235501+6716.609	V	8.72	+0.01	-0.20	>11.0	11.199(79)	10.731(42)	12.453(72)	10.549(45)	9.2
		43(64)	4											
RECORD	3560	MGC 7793		235516-3252.1		10.4				10.380(43)	10.409(37)	10.682(26)	10.869(40)	10.8
RECORD	3561	224424		235516+5926.581	IAB	E 0.10	+0.75	-0.21	> 9.4	10.634(54)	10.197(34)	10.943(23)	9.472(20)	8.5
		41(15)	5											
RECORD	3562	224559		235613+4608.184	V	E 6.54	-0.09	-0.61	4.500(9)	4.468(6)	4.629(8)	5.020(7)	5.148(5)	5.6
		87(2)	4											
RECORD	3563	224544		235616+3206.286	IV	E 6.52	-0.11	-0.57		4.432(6)	4.599(4)	4.937(3)	5.165(5)	5.7
		13(12)	1											
RECORD	3564	240464		235618+5959.209	V	9.59	+0.31	-0.61	8.767(40)	8.685(37)	8.718(12)	10.242(16)	9.244(14)	9.0
		35(16)	7											
RECORD	3565	224572		235628+5528.681	V	4.88	-0.07	-0.82	2.357(3)	2.268(2)	2.457(1)	3.188(1)	3.189(1)	3.7
		16(1)	1 D											
RECORD	3566	224599		235642+5944.780.5V		E 9.56	+0.42	-0.52	9.927(168)	9.835(27)	9.696(38)	11.149(33)	9.923(17)	9.4
		75(33)	5											
RECORD	3567	224617		235644+0635.2F3/51V		4.01	+0.42	+0.06		> 9.0	7.673(58)	5.939(6)	6.098(12)	4.6
		65(6)	1											
RECORD	3568	224686		235720-6551.389	IV	4.50	-0.08	-0.28	3.360(5)	3.355(3)	3.436(2)	3.657(1)	3.958(2)	4.2
		14(2)	1											
RECORD	3569	224905		235905+6010.381	V	E 8.47	+0.14	-0.56		7.678(9)	7.657(18)	8.524(9)	7.910(11)	7.8
		68(11)	4											
RECORD	3570	224935		235924-0617.5M3	III	4.41	+1.63	11.83	>11.0	>12.3	>12.0	>12.9	>11.9	9.0
		55(52)	1											
RECORD	3571	166	1675	235936+6707.907		9.06	+1.09	+0.03		>12.0	12.122(212)>13.8	11.393(118)	9.6	
		75(37)	2 D											
RECORD	3572	224999		235946-3000.084	III	5.01	-0.15	-0.55	2.605(2)	2.596(1)	2.837(1)	3.194(1)	3.564(1)	4.1
		55(1)	5 D											
RECORD	3573	162	2353	235948+6236.883	II	9.87	+0.24	-0.60	9.110(86)	8.961(17)	8.983(12)	10.139(10)	9.370(12)	9.3
		35(15)	5											

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