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ELECTRONICS AND ELECTRICAL ENGINEERING

No. 25

USSR

EAST EUROPE

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USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS

ELECTRONICS AND ELECTRICAL ENGINEERING

No. 25

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CONTENTS   PAGE

GAVRILOV, A. N., doctor of technical sciences, AGAFONOV, V. V., candidate of
technical sciences and SOLOV'YEV, V. S., engineer

TUNABLE SELECTIVE AMPLIFIER BASED ON INTEGRATED MICROCIRCUITS

[Abstract] The authors are concerned with using rapid correlators to analyze
random signals and find that as a rule it is necessary to have an input
amplifier with a large coefficient of amplification and high input resistance;
this is because the signals taken from the counters have a value on the order
of fractions and units of a millivolt and for the normal operation of the
correlator it is essential usually to have signals on the order of 1 V. The
authors give the frequency characteristics of the amplifier for different
switch positions. The amplifier is used in a two-channel version and
operates in conjunction with the correlator. Figures 3.

1/1

GUSEV, A.V., and RUDENKO, V.N.

CONCERNING THE OPTIMUM STRATEGY FOR MEASURING SMALL DISTURBANCES
OF A GRAVITATIONAL ANTENNA

[Abstract] The paper considers the measurement of small disturbances
of a test body in connection with problems of an increase of sensitiv-
ity of gravitational antennas. The following items are discussed: 1)
Gravitational detector (GD) with passive converter; 2) GD with para-
metric converter; 3) Optimum filtering for GD with parametric sensor
[datchik]; and 4) Antenna with phase detector. It is shown that use
of phase detection for an antenna with a parametric converter makes
it possible to reduce considerably the limiting value of the inten-
sity of the gravitation radiation which is detected. The authors are
sincerely grateful to V.B. Braginskiy, A.A. Belov, A.B. Manukin and
V.I. Panov for stimulating discussions and M.Ye. Gertsenshteyn and
K.K. Likharev for checking the principal formulas. References 30: 20
Russian; 10 Western.

1/1

USSR

PERESLAVTSEV, I. B., Chief of the Kuybyshev ORTPTs [expansion not known]

TELEVISION PROGRAM RECEPTION ON HEIGHT-DIVERSITY RECEIVING ANTENNAS

[Abstract] A brief description of an antenna system with heightwise spacing
between antennas to enhance reception of television broadcasts by the most
remote low-power relay stations. In the proposed system the main antenna
is supplemented by a "wave channel" antenna closer to the ground. The
horizontal spacing between antenna supports is 150 m, the main tower is
75 m high, and the auxiliary support is 16 m high. The details of the
auxiliary antenna are shown in a diagram, and the balancing and matching
unit is described. Installation of such a system at a relay station 110 km
from the main broadcasting studio has resulted in practically uninterrupted
relay transmissions for 80% of the time. Figures 4.

EAST GERMANY

HAUFERT, R., SCHWARZ, J., FOERSTER, TH., WIENER, A., and BETTAC, H. D., High-Voltage Engineering Construction State Enterprise, Karl-Marx-Stadt, and Institute of Electronics, Academy of Sciences of the German Democratic Republic, Neustrelitz Branch

REALIZATION OF AN ANTENNA CONTROL PROBLEM ON THE BASIS OF THE NUMERICAL POINT-DISTANCE CONTROL NC 470

[Abstract] The antenna-control system described and illustrated (with photograph, drawings, block diagrams, and specification charts) consists of the NC 470 control system (developed at the High-Voltage Engineering Construction State Enterprise), an interface unit, a timer system, a measuring system, and a process computer system (PRS-4000). It is suitable for the execution of all antenna-control tasks encountered in a modern ground station. Information may be entered on-line or by perforated tape. The measuring system determines the antenna position. The program system for satellite observations was described. Figures 4; references 10: 3 Western and 7 German.
1/1

USSR   UDC 007:62-192

FINKEL'SHTEYN, YEKHEZKEL' YAZEPOVICH

PARAMETRIC ESTIMATES OF RELIABILITY

Riga PARAMETRICHESKIYE OTSENKI NADEZHNOSTI in Russian, Zinatne, 1975 196 pp

[Excerpts] This monograph is dedicated to one trend in the area of reliability testing of elements. The purpose of the investigation performed is the creation of methods for determination of groups of elements with high reliability based on consideration of the physical peculiarities of the structure of the elements studied before the beginning of their use. Primary attention is given to the construction of inequalities for the probability of failure of elements using a number of numerical constants which are functional distributions of the class of unreliable elements. The book is intended for engineers, graduate students, scientific workers involved in theoretical and applied problems of element reliability testing. The reader must have a familiarity with mathematics up to the level taught at a technical Vuz. 79 figures; 52 references.

1/2

USSR

FINKEL'SHTEYN, YEKHEZKEL' YAZEPOVICH, PARAMETRICHESKIYE OTSENKI NADEZHNOSTI, Zinatne, 1975 196 pp

CONTENTS

2/2

Communications, Data Transmission

USSR

FABIYA, S. A., Deputy Chief of the Simferopol' Intercity Exchange Office
and TERESHCHENKO, N. A., electrician

A UNIT FOR CONNECTING TELEGRAPH EQUIPMENT TO THE TAPE PERFORATOR CONTROLLER
IN AUTOMATIC INTERCITY EXCHANGE OFFICES

[Abstract] The article gives details on the UKP-TA adapter developed by
technicians at the Simferopol' Intercity Exchange Office. The unit is
designed for connecting telegraph equipment to a perforator controller so
that telegraph tape can be used in place of punchcards to keep track of
intercity telephone traffic in automatic exchange offices. This work was
made necessary by the shortage of punchcards and by the unreliable operation
and lack of spare parts for the PD-45-2 automatic keypunch equipment at the
Simferopol' Intercity Exchange Office. In its first year of use the unit
has saved a total of 6338 rubles 50 kopecks. Figures 3.

1/1

USSR

TARNOPOL'SKIY, V. L.: KONIIS [Kiyev Branch of the Central Scientific-Research
Institute of Communications]

TVU-12M TIME-DIVISION MULTIPLEX TELEGRAPH EQUIPMENT

[Abstract] A brief outline of the design and functions of the TVU-12M and
URAL multiplex equipment. The TVU-12M system forms groups of telegraph
connections in a peripheral link (municipal and suburban service). This
equipment works on the time-division multiplex principle with pulse-amplitude
modulation, providing up to 12-channel transmission. Both teletype and
synchronous signals can be handled in any codes at rates up to 200 bauds.
The multiplexed line can be passed in tandem through several exchange offices.
The system includes regenerators for use where the distance between terminal
points is excessive. A diagram is given showing the operation of a TVU-12M
system with two terminal points (sending and receiving). The URAL system
is designed for operation with TVU-12M equipment to enable independent simul-
taneous transmission of discrete data and telephone conversations over
two-conductor subscriber lines without coil-loading or repeater equipment.
Operation is explained and a block diagram and general specifications are
given. Figures 2.

1/1

EAST GERMANY

KUNZMANN, K., Chamber of Technology, Institute of Communications Technology, East Berlin

PLUG-IN CONNECTORS FOR CIRCUIT BOARDS IN TELEPHONE EXCHANGE TECHNOLOGY

[Abstract] The article discusses the selection of plug-in connectors for circuit boards according to economic and reliability criteria, and then presents information about the unified flat-plug-in connector system of the German Democratic Republic [EFS]. This system encompasses direct and indirect connectors for use in ESER [Unified Computer System] units and the EGS [Unified Transmission System] units. Insofar as telephone exchange technology is concerned, the most important units of the system are: multiple-pole indirect circuit-board plug-in connectors as specified in TGL [East-German Standard] 1933/01 for solder and wirewrap (up to 87 poles, 88 by 8.5 by 13.5 mm) and the combination plug-in connectors as specified in TGL 29,331/06 for solder and press connection (up to 27 low-frequency contacts, 88 by 13.5 mm). Figures 3; table 1; references 3: all German.

1/1

EAST GERMANY

ROLLMANN, W., KDT [Chamber of Technology], East Berlin

TELEPHONE STATISTICS (AS OF 1 JANUARY 1975)

[Abstract] Tabulated information is presented about telephones and telephone traffic in 32 countries of Europe, North America, Australia, the Near East, and New Zealand. The information is presented to indicate the status as of 1 January 1975 and to show changes in numbers and in terms of rate from the preceding year. The number of telephones per continent and country, per 100 residents per country, and per area is shown. Data are presented on the number of main and secondary exchanges and on the number of local, domestic long-distance and international long-distance conversations. Romania, with an increase of 21.5 percent in the number of telephones since 1974, showed the highest growth rate, but this country is still the lowest in number of telephones per 100 residents (5.10). Figures 2; tables 1; references 7: 5 German, 1 CEMA, and 1 Western.

1/1   6

EAST GERMANY

SCHIEDEWITZ, WALTER, graduate physicist

CHARACTERISTICS OF MODERN DATA PROCESSING SYSTEMS. PART 1: THIRD-GENERATION ELECTRONIC DATA PROCESSING SYSTEMS

[Abstract] This first part of a series of articles discusses various properties of 3rd-generation data-processing systems, with special emphasis on properties which permit the use of the system for specific applications. The following aspects are covered: multi-programmed processing of data, teleprocessing of data, real-time processing, dialog-type processing, multicomputer systems, and computer networks. While the 3rd-generation systems are much more capable than 2d-generation systems, it is evident that the capabilities of the 3rd-generation systems have characteristics which may be further developed into 4th-generation systems with capabilities which can presently only be guessed. Figures 6; table 1; no references.

1/1

EAST GERMANY

SCHIEDEWITZ, WALTER, graduate physicist

CHARACTERISTICS OF MODERN DATA PROCESSING SYSTEMS. PART 2 (CONCLUDING PART): DEVELOPMENT TRENDS FOR THE FUTURE

[Abstract] The changes between 2d- and 3rd-generation electronic data processing systems, and the characteristic performance and design properties of the 3rd-generation systems indicate the development that is likely to take place in the 4th-generation systems. This article discusses the structure of the typical data-processing system, the operational control, the memory hierarchy, the processors, the addressing, the program control, the formats of data and instructions, and the expected improvements. Among the latter are smaller size, increased switching speed, increased integration degree, increased reliability, reduced costs, higher memory capacity, shorter access times, higher data transmission rates, and lower prices per memory bit. Figures 2; tables 3; references 14: 3 Western and 11 German.

1/1

EAST GERMANY

STUERZ, H., East Berlin

STATUS AND DEVELOPMENT TRENDS OF TELEPHONE EXCHANGE TECHNOLOGY

[Abstract] The subject matter (presented as a lecture in October 1975 at
Ilmenau Technical University) considers the following aspects: structure and
performance of the telephone network, development of traffic needs, perfor-
mance of the supplier industry including the component industry, service qua-
lity of the Postal Service, and economic factors. The telephone statistics
are evaluated, and the status of the exchange-technological system genera-
tion is discussed. Among the selected problems of computer-controlled sys-
tem generation, the author discusses the connection field, the control sys-
tem, and certain third-generation telephone exchange systems. In the DDR,
the tasks ahead include remote control of small exchanges, use of more modern
process computers, and sort out the overlap of digital and analog channels.
Figures 7; tables 6; no references.

1/1

USSR

YELEKOYEVA, E. K. and GRANAT, S. M., Leningrad Branch of the Scientific
Research Institute of Communications

A CIRCUIT CORRECTION FOR THE ATSK-100/2000 CODE TRANSCEIVER

[Abstract] Instructions for modifying the ATSK-100/2000 code transceiver to
correct operation of the hold markers for incoming calls. In the original
circuit design, certain combinations of factors cause false operation of the
markers so that two code transceivers of registers in the transmitting mode
are connected through one another, exchange information, and one or both
connections are broken. Diagrams are given showing connections to be un-
soldered and jumpers to be inserted. In addition, transistors, diodes,
resistors, capacitors and relays are changed and the time parameters of
certain relays are altered. Figures 3.

1/1

USSR   UDC   535-3:621.391.63

KOLOSOV, M. A., POZHIDAYEV, V. N. and FEDOROVA, L. V.

PROPAGATION OF ULTRAVIOLET RADIATION IN THE EARTH'S ATMOSPHERE AND THE
POSSIBILITIES FOR DEVELOPING OPTICAL COMMUNICATION LINES IN THE UV BAND

[Abstract] An evaluation is made of the maximum feasible length of communi-
cation lines in the ultraviolet region of the spectrum with consideration of
the latest advances in laser technology, the latest data on attenuation of
UV emission in the atmosphere and calculations of the background of solar
radiation at the earth's surface. Basic parameters of ultraviolet lasers
and photocathodes are presented. It is shown that UV communication lines
extending several km are feasible. Such lines operating at wavelengths of
2500-2900 Å are independent of receiver orientation relative to the sun or
time of day since there is no background emission in this band. In contrast,
a system operating on 3370 Å has a reduction in effective range by a factor
of 8-10 during daylight hours as compared with dark hours. The parameters of
the receiver and signal-to-noise ratio have some effect on range, but the
attenuation factor has the greatest influence. Figures 3; tables 3;
references 13: 5 Russian, 8 Western.
1/1

LITVAK, IGOR' IOSIFOVICH, LOMOV, BORIS FEDOROVICH, and SOLOVEYCHIK, IL'YA YEVSEYEVICH

PRINCIPLES OF THE CONSTRUCTION OF DISPLAY EQUIPMENT IN AUTOMATED SYSTEMS

[Excerpt] Annotation

The book deals with the principal trends of the development of contemporary systems of information display (SID). Results of the latest research in engineering psychology are set forth, which must be taken into account during selection of the operating regimes and the SIR parameters. Features of the construction of representation facilities for individual use as well as for collective use, and versions of the technical realization of these facilities, are evaluated, including three-dimensional representation devices, as well as systems of information representation based upon the use of new physical principles.

The book is intended for engineers and scientific personnel working on the creation of automated management systems, for specialists in engineering

psychology, for students in higher technical educational institutions and universities while studying the courses "Radio-Engineering Systems," "Automated Management Systems," "Indicator Engineering," etc. The book may also afford interest for a wide circle of readers familiar with the principles of electronics, computer engineering, and television engineering.

Tables 45; figures 279; references 367.

CHAPTER HEADINGS   PAGE

USSR

LITVAK, IGOR' IOSIFOVICH, LOMOV, BORIS FEDOROVICH, and SOLOVEYCHIK, IL'YA
YEVSEYEVICH, OSNOVY POSTROYENIYA APPARATURY OTOBRAZHENIYA V AVTOMATIZIROVANNYKH
SISTEMAKH, "Sovetskoye Radio," 1975 352 pp

3/3

USSR   UDC 621.3.019.3.001.2

LEVIN, A. A., candidate of technical sciences and PERELEKHOV, YU. A., engineer

DETERMINATION OF LOSSES DUE TO FAILURES IN TELEMECHANICS APPARATUS BY
ALLOWING FOR THE CHARACTERISTICS OF TECHNICAL SERVICING

[Abstract] The authors of this article give a model of reliability of the
telemechanic apparatus to be serviced. They provide a graph and a determina-
tion of the probability of the states of the model. They give an expression
for determining the mean losses from nonreliability of the apparatus by
allowing for the real characteristics of the technical servicing system,
thus allowing an evaluation to be made of the effectiveness of the device's
functioning. They give an example of their computation. Figure 1;
references 5: 5 Russian.

1/1

USSR   UDC 621.39:621.376.56

LEVIN, LEONID SEMENOVICH and PLOTKIN, MIKHAIL ABRAMOVICH

PRINCIPLES OF THE CONSTRUCTION OF DIGITAL TRANSMISSION SYSTEMS

Moscow OSNOVY POSTROYENIYA TSIFROVYKH SISTEM PEREDACHI in Russian "Svyaz'"
1975 176 pp

[Excerpt] Annotation

Consideration is given to principles of the digital transmission of various
forms of signals in a communications network. An analysis of digital
modulation methods is conducted, features of the construction and interaction
of higher-order digital systems are investigated. The quality of information
transmission in digital communications systems is evaluated.

The book is designated for engineers specializing in the field of the develop-
ment and operation of digital transmission systems.

CONTENTS   PAGE

USSR

LEVIN, LEONID SEMENOVICH and PLOTKIN, MIKHAIL ABRAMOVICH, OSNOVY POSTROYENIYA
TSIFROVYKH SISTEM PEREDACHI "Svyaz'" 1975 176 pp

3/3

FEDOSEYEVA, YE. G., SKOROSPELOVA, YE. V., FINKEL', E. E. and BRAG-
INSKIY, R. P.

RECOVERY OF PROTECTIVE COATINGS OF COMMUNICATION CABLES WITH THE
AID OF HEAT-SEATING PIPES

[Abstract] The authors of this article cite the results of in-
vestigations on protective coatings of communication cables in
metal shells with a polyethylene hose at the sites of their join-
ing. Recovery of the protective coating is accomplished with the
aid of heat-seating pipes of radiation-modified polyethylene.
Laboratory tests have demonstrated that this method is reliable,
promising, and economical. Economy is achieved by reducing the
cost of materials used and reducing the time consumed in assembly
work. Figures 2; reference 1: 1 Russian.

1/1

USSR   UDC 621.315.758.37

RAZUMOV, L. D.

COMPUTING THE COEFFICIENTS OF PROTECTIVE EFFECT OF CABLE SHELLS
UNDER THE INFLUENCE OF HIGH-VOLTAGE LINES

[Abstract] The author examines the protective effect of metal
coatings of communication cables in the vicinity of high-voltage
lines. He recommends a method of computing the real coefficients
of protective effect of cables in a plastic outer hose and gives
the results of the computations. He also discusses the condi-
tions of grounding involved. Figures 8; table 1; references 4:
4 Russian.

1/1

USSR   UDC 621.391

KHVOROSTENKO, N. P.

EVALUATION OF THE QUALITY OF RADIO COMMUNICATION ALONG CHANNELS
WITH VARIABLE PARAMETERS

[Abstract] The author of this article seeks to evaluate in or-
der of discussion the quality of radio communication with an
average duration of error-free intervals L_n which limit the as-
signed value of n from below. Channels with variable parameters
such as short-wave radio channels and channels with tropospheric
scattering have such a broad range of random changes in their
properties that one usually evaluates their suitability to trans-
mission of information by the reliability of the communication
rather than by the average quality of the radio communication.
References 5: 5 Russian.

1/1

SINITSA, V. N., SPIRIN, V. A. and CHIRKIN, N. M.

MULTITAP ACOUSTIC DELAY SYSTEM AS A CODING AND DECODING DEVICE

[Abstract] The article describes a multitap delay line that shapes a radio
signal in the form of a sequence of pulses for which the initial phase of
the duty cycle frequency corresponds to the law 0, 0, 0, 0, 0, π, π, 0, 0,
π, 0, π, 0 (13-digit Barker code). The delay line is made up of inter-
digital transducers of aluminum film on a lithium niobate backing. When a
pulse of the proper duration is applied to the shaping transducer, phase-
keyed signals with mutually inverted time structure are recovered from the
remaining two transducers, the amplitude pulsations of the signal corre-
sponding to the discrete structure of the shaping electrode. When a phase-
keyed signal is applied to one of the outer electrodes, the decoded signal
can be recovered from the shaping transducer. Figures 2; references 2:
1 Russian, 1 Western.

POSTYUSHKOV, V. P.

OPTIMUM DISTRIBUTION OF ENERGY RESOURCE IN A MULTICHANNEL RADIO LINE

[Abstract] The author considers the problem of effectiveness of a radio
line consisting of N frequency-diversity channels when binary messages are
transmitted to the address of a single recipient. A solution is found for
the problem of minimizing the number of erroneously received symbols. The
optimum power distribution is calculated for a six-channel line, and it is
shown that a considerable gain can be realized by a change from uniform to
optimum power distribution. Figures 3; references 3 Russian.

LUSKINOVICH, P. N. and SKOMOROVSKIY, YU. A.

ON THE POSSIBLE ERRORS IN DETERMINING THE PARAMETERS OF A SIGNAL AT THE
OUTPUT OF A LIGHT CONDUCTOR

[Abstract] The authors demonstrate that by analyzing the shape of an optical
signal propagating in a real light-conductor optical communication line, the
use of the characteristics of the linear circuits may lead to errors because
the circuit modulator -- light conductor -- photodetector is an inertial
nonlinear circuit. References 6: 6 Western.

1/1

GITLITS, M. V., SKALIN, YU. V. and VODNEV, V. A.

COMBINATION NOISES AND DISTORTIONS IN DEVICES OF FM RECORDING

[Abstract] The authors examine questions involved in the forma-
tion of combination noises and distortions in magnetic FM record-
ing apparatus with a low ratio of carrier frequency to upper mod-
ulating frequency of the information signal. The expressions ob-
tained by the authors can be used also for selecting the optimal
parameters of an FM recording system in accordance with the re-
quirements imposed on it. Figures 10; references 8: 8 Russian.

1/1

ARTEM'YEVA, S. YA., MAMATOV, A. I. and STRAKHOV, A. D.

TIME DISTRIBUTION FUNCTIONS FOR THE RECOVERY OF RADIO RELAY LINES

[Abstract] The authors cite statistical data collected on exist-
ing radio relay lines. They give the numerical values of the re-
covery parameters of radio relay line equipment. They conclude
that the recovery functions of real lines are truncated as a con-
sequence of the limitations of the interval in which the possible
values of the recovery time are included. The parameters of these
functions permit judging as to the duration and complexity of re-
covery. Because of the difficulties involved in the computations
on the reliability of the radio relay line equipment, associated
with the use of the truncated form of the law of Weibull-Gnedenko,
it is feasible to convert to the exponential form of the distri-
bution function. Table 1; reference 1: 1 Russian.

1/1

APOROVICH, A. F.

ON THE THEORY OF ELECTROMAGNETIC COMMENSURABILITY

[Abstract] The author of this article briefly examines the
problem and gives statements on the construction of a version
of the general theory of electromagnetic commensurability, which
consists of analyzing the interaction of radio engineering sys-
tems in the process of operation and synthesizing radio engineer-
ing systems by allowing for the requirements imposed for electro-
magnetic commensurability. This article was written for the
purpose of reminding the reader of the extremely acute problems
involved in contemporary radio engineering. References 10: 10
Russian.

1/1

ORLOVSKIY, YE. L. and YEFIMOV, A. S.

REPRODUCTION OF HALF-TONE GRADATIONS IN PHOTOTELEVISION AND PHOTO-
TELEGRAPHY APPARATUS

[Abstract] The authors of this article examine the conditions
of reproduction of half-tone gradations in phototelegraphy and
phototelevision apparatus under the effect of noise. On the ba-
sis of the equation for the visual threshold of sensing distinc-
tions in brightnesses of the noisy image they obtain the optimal
characteristics for analyzing and synthesizing the half-tones.
They find that it is possible to control the contrast sensitivity
of systems of electrical transmission of images by using nonlin-
ear transformations on the transmitting and receiving sides of the
image transmission system. Figures 6; references 8: 8 Russian.

1/1

BARANOVSKIY, G. A., NEMIROVSKIY, A. S., TROITSKIY, V. N. and TSEM-
EKHMAN, V. M.

TELEVISION LINE WITH UTILIZATION OF DIFFRACTION SCATTERING ON THE
CREST OF A MOUNTAIN BARRIER

[Abstract] The authors describe a television line of communica-
tion operating on centimeter waves in mountains, on which the sig-
nal is caused by diffraction scattering of the waves at the peak
of the mountain with an irregular crest. They cite data on the
statistical characteristics of the field and its nature and give
qualitative indicators of transmission along the line. They ob-
served insignificant distortions caused by the multi-ray nature
of the approaching signal. However this distortion is small and
requires no installation of a special apparatus for automatic
correction. Figures 6; reference 1: 1 Russian.

1/1
                              18

POLAND

KLEJMAN, HERMAN [Affiliation not given]

OPTICAL TELECOMMUNICATION LINES

[Abstract] The author deals with the renewal of interest of scientists in
optical telecommunication that is being made possible due to the discovery
of the laser (1960). He examines the problem from a quadruple viewpoint--
optical beams in space, optical beams in the atmosphere, optical beams in
water, and lightguides--and reviews the achievements to-date in this domain.
3 figures; 8 references, including 4 Polish, 2 Russian and 2 English (of
which one is in Russian translation).

1/1

USSR

LEYBMAN, YU. A. and LEVCHENKO, A. F.

EVALUATING THE UTILIZATION FACTOR OF A DATA TRANSMISSION CIRCUIT
BY ALLOWING FOR THE CHARACTERISTICS OF THE MONITORING SYSTEM

[Abstract] Continuous functional monitoring of the efficiency of
the circuit as a whole and its individual elements (communication
channels and data transmission apparatus) is necessary to ensure
the given indicators of reliability of the data transmission cir-
cuit. Such control can be accomplished both with the aid of
structurally autonomous monitoring devices and with the aid of
built-in monitors. Real systems of monitoring the state of a
data transmission circuit may produce a signal concerning the
presence of failure in the circuit when in fact there is none, or
they may erroneously indicate that the circuit is functioning

USSR

when in fact it has failed. Consequently, the readiness of the
circuit to transmit data is practically less than that which an
ideal system of monitoring would ensure. Along with allowing for
the parameters of reliability of the communication channels and
the data transmission apparatus, the monitoring system character-
istics must be taken into account to evaluate the indicators of
reliability of the data transmission circuit. Figures 2; Refer-
ences 3: 3 Russian.

USSR   UDC 621.396.43

BULANDA, G. I., GOLOVIN, E. S. and LITVINOV, B. I.

A SYSTEM FOR SYNCHRONIZATION OF SINGLE-BAND EQUIPMENT FOR PERIPHERAL RADIO
SERVICE

[Abstract] The typical peripheral radio service system has several sub-
scriber stations and a single line station, preventing transmission of group
synchronizing signals in the reverse direction (from the subscriber station
to the line station). A synchronizing system is described in which pilot
signals are transmitted only in the forward direction (from the line station
to subscriber stations). The proposed technique for synchronization was
checked out on single-band equipment for the decimeter wavelength region
with three group stages of SSB signal conversion. Asynchronism was evaluated
by frequency measurement of a test signal at the input of the line station
transmitter and at the output of the line station receiver after passing in
both directions through the system. With master oscillator instability of
10^{-4}-10^{-5} the signal is recovered with frequency error of less than 1 Hz, due
only to residual mismatch between the synchronizing oscillator and the sub-
scriber equipment. Figures 1; references 2 Russian.
1/1

USSR   .   UDC 621.396.61

KAGAN, D. B., KALININ, L. B., PAVLOV, B. A., SOKOLOV, E. P. and CHUYKO, S. I.

RADIO TRANSMISSION EQUIPMENT

[Abstract] The authors describe several pieces of radio broadcasting equipment.
The first is the PSV-5 transmitter manufactured in the USSR designed for high-
quality radio broadcasting in the middle wave range; another is the PKM-1
transmitter operating in the range of 1.5-30 MHz. Another transmitter is one
manufactured in the GDR, KNI-E has an output power of 1 kW. They also describe
an automated television radio station -- the ATRS-5/1 -- with a power of
5/1 kW and designed for operation in the frequency range of 48.5-100 and
174-230 MHz. Another television transmitter -- the NTV10-1 -- is manufactured
in Poland with a power of 10/1 kW. In the transmitter III TV-5 of the radio
station Zona-II, manufactured in Czechoslovakia, modulation is accomplished
on the carrier frequency by shift in the lamp penultimate cascade. Other
non-Soviet block equipment is also described. Figures 12; table 1; references
2: 2 Russian.
1/1

HUNGARY   UDC 621.396.74.029.6:654.195.6.021:65.011.44

CSERNY, LASZLO, Dr, Plant Economy and Organization Department, YMEMF

FACTORS CHARACTERIZING THE EFFECTIVENESS OF BROADCASTING SYSTEMS IN THE
VHF [VERY HIGH FREQUENCY] AND THE UHF [ULTRA HIGH FREQUENCY] BANDS

[Abstract] Studies were made to establish values for the proper characteriza-
tion of the effectiveness of VHF and UHF broadcasting systems. The mathemati-
cal background for the studies was that described by the author in this jour-
nal (Vol 26, 1975, No 8, pp 233-239). The studies indicated that the effecti-
veness can be characterized best by considering not only the area covered
but also the number of residents in the area covered and the service level
(meaning the relationship between population density and residential distance
from the distance from the transmitter). A combined index was developed; it
characterizes both the service area and the quality of the service. Figures 5;
references 8: 2 Hungarian, 1 German, 1 Indian, and 4 Western.

1/1

UDC   621.396.96

OBOLENSKAYA, G. A. and KATIN, S. V.

CHARACTERISTICS OF A SYSTEM OF BINARY DETECTION WITH SEQUENTIAL ANALYSIS

[Abstract] The methods of queueing theory are used to find the character-
istics of detection of binary quantized radio signals in systems with
sequential analysis. The signal and interference from the detector stage of
the receiver are sent to a quantization threshold device with outputs con-
nected to the inputs of two AND gates. The other inputs of the AND gates
are connected respectively to a signal strobe and a control strobe generator,
and the outputs are connected to the inputs of gating circuits that eliminate
pairwise coincidences. The gated pulses are sent to a cumulative reversible
counter with output connected to a decision-making threshold device. A simple
engineering expression is derived for the probability that the counter will
accumulate the decision-making threshold number of pulses by a given time.
An example is given showing calculation of the probabilities of false alarms
and true detection. Figures 5; references 2 Russian.

1/1

UDC   621.397.331.1

OVCHINNIKOV, YU. N. and ROZHKOV, V. M., Novosibirsk Electrical Engineer-
ing Institute of Communications

A CONTROLLABLE MECHANICAL MODULATOR

[Russian abstract provided by the source]

[Text] A mechanical modulator of optical emission is proposed that provides
independent regulation of the duration and recurrence rate of optical pulses
for durations of 1 ms or more and rates of 20 Hz or less. Relations are
found for calculating the shape of the output signal. Figures 1; references
3 Russian.

BORTSOV, DMITRIY VASIL'YEVICH

MAINTENANCE AND REPAIR OF TELEGRAPH APPARATUS ON RAILROAD LINES

[Extract] This book presents problems of the organization of the operation and repair of the ST-2FM, STA-M67, T-63 telegraph apparatus and T-53 transmitter based on the use of norms of time for maintenance and repair of telegraph communications devices over signaling distances and railroad communications approved by the railroad ministry, taking account of the most advanced methods for this work. Principles of operation and areas of application of telegraph transfer devices types UVP-2, UPDTA, T-68 and others are presented. A brief description and practical recommendations for use are presented for the IKI-St, EDIT-1, RETS-1, VO-1, ETI-64, SCHRU-2 and other measurement instruments, increasing the quality of maintenance of communications devices and the reliability of their operation. The book is designed as an aid for engineering and technical telegraph personnel and can be used as a practical guide for telegraph electrical and mechanical technicians to increase their production qualifications.
1/1

ZINCHENKO, B.N., ZINCHENKO, N.S., and KHIZHNYAK, N.A.

NEW PHENOMENA IN UNSTABLE ELECTRON BEAMS

[Abstracts] Some results are presented of investigations of high-perveance beams with Brillouin focusing. The investigations were performed with the aid of a high-verveance electron-optical system, consisting of a 3-electrode gun with longitudinal compression of the charge and focusing by a paraboloid magnetic lens. A continuous cylindrical beam of electrons was formed in the system and a quasi-Brillouin focusing took place outside the gun. At a beam length ($L \simeq 10$ mm) the magnetic field increased slightly. Figures 4; references 10: 6 Russian; 4 Western.
1/1

SEKERESH, B. I., Hungarian Peoples Republic

DEVELOPMENT OF RAPID-INCANDESCENT CRT OF LOW POWER FOR INSTRUMENTS BASED ON TRANSISTORS

[Abstract] The author gives theoretical statements associated with construction and makes a detailed mathematical analysis of the thermal regime of the cathode. He demonstrates that the optimal conditions of a small heating time and thermal stability of the cathode correspond to an approximation equation of losses to heat emission and heat yield of the cathode. Figures 6; table 1; references 6: 1 Hungarian, 5 Western.

1/1

BORODIN, L.F., KIRDYASHEV, K.P., STAKANKIN, YU.P., and CHUKHLANTSEV, A.A.

APPLICATION OF MICROWAVE RADIOMETRY IN INVESTIGATION OF FOREST FIRES

[Abstraction] An evaluation is made of the intensity of electromagnetic radiation in the microwave band of the flame of a forest fire. The effect is considered of a smoke trail and the crown of trees on the spectrum of microwave radiation,and the possibility of detecting the locations of forest fires. Conclusions are drawn from an analysis of the experimental data and a comparison of them with the results of calculations, and with the data from aerial photography in the 0.8 and 3.4 cm wave band. Curves are shown of the following: 1)Spectral dependences of microwave radiation of the flame of a forest fire; 2) Spectral dependences of flame of forest fire with presence of smoke layer; 3)Spectral dependence of absorption of radiation in crown of trees; and 4)Spectral characteristic of radiation of model of lower fires. Figures 6; references 6: 5 Russian; 1 Western.
1/1

ZHELTONOG, K. S. and KOPILOVICH, L. YE.

ON THE FEASIBILITY OF RADIOMETRIC DETERMINATION OF THE ALTITUDE DEPENDENCE
OF THE COEFFICIENT OF ABSORPTION OF THE ATMOSPHERE ON A WAVELENGTH OF 2.53 mm

[Abstract] A theoretical study is done on the feasibility of obtaining information on the altitude profile of the absorption coefficient $\gamma(h)$ in the atmosphere on a wavelength of 2.53 mm by measuring the difference between the zenith brightness temperature and the kinetic temperature of the atmosphere at different altitudes. The mathematical model is based on the assumption that the zenith brightness temperature is measured by a radiometer on 2.53 mm with vertical motion in a laminar atmosphere with standard distributions of temperature and humidity. Curves are plotted for the altitude behavior of temperature difference for various models of $\gamma(h)$. It is shown that variations of the order of 10% in $\gamma(h)$ will be reflected on the altitude behavior of temperature difference if measurements are accurate to 1 kelvin. Estimates show that the error due to reduction of line width with altitude does not exceed 0.1 K from ground level to 20 km for a passband of 100 MHz. Figures 2; references 11: 9 Russian, 2 Western.
1/1

ANDRIANOV, V.A., ARMAN, N.A., KOBARDINA, I.N.

SCATTERING OF RADIO WAVES BY AN UNDERLYING SURFACE WITH VEGETATIVE
COVER

[Abstract] The results are presented of experimental measurements of
the density spectra of the scattering of centimeter radio waves from
three forest sections of birch, alder, and pine with a change of the
wind speed in the 0.8--7 m/sec range. It is shown that the forms of
the spectra of the signal scattered by the forst sections with birch,
alder, and pine correspond qualitatively with one another. The width
of the spectra depends on the wind speed and the type of vegetation,
during which an increase of the mobility of the scatterers leads to
a broadening of the spectrum. With small frequency differences from
the carriers the spectrum is described by an exponential function and
with large frequency differences by a power function. In the case of
scattering of radio waves by vegetation with an increase of the wind
speed, a redistribution of the energy of the energy of the scattered
signal from the low-frequency part to the high-frequency takes place.
Figures 4; references 7 Russian.
1/1

RYBAKOV, V. S.

STATISTICAL CHARACTERISTICS OF THE PHASE DIFFERENCE OF SIGNALS WHEN CENTIMETER
WAVES PROPAGATE BEYOND THE RADIO HORIZON

[Abstract] The article gives the results of calculation of phase-difference
characteristics using the space-time properties of a statistical gaussian
model of the field of ultrashort radio waves as determined from the results
of amplitude measurements. The calculations are done in the 10-cm wave band
for transmission paths from 21 to 103 km long. It is shown that for the case
of reception of centimeter waves beyond the radio horizon, at least in the
diffraction zone, rather than systematizing the statistical characteristics
of the phase difference, one may systematize the parameters of the gaussian
model that permit reliable calculation of these characteristics. Figures 4;
tables 1; references 5 Russian.

1/1   27

TOVARA, K. K.

REFLECTION OF PULSED ELECTROMAGNETIC WAVES FROM HETEROGENEOUS LAYERS

[Abstract] The author investigates the reflection of pulsed electromagnetic waves from layers with one and two variable parameters -- dielectric constant and specific conductivity. The parameters of the layers are determined by the method of synthesis. The basic relationships are derived for the electromagnetic pulse propagating in a heterogeneous layer and the details of the parameters are described. The author also gives equations for synthesizing the electrodynamic parameters. Figures 3; references 2: 2 Russian.

1/1

KOLOSOV, M. A., YAKOVLEV, O. I., TRUSOV, B. P., MOLOTOV, YE. P., ANTSIBOR, N. M., YEFIMOV, A. I., ROZMANOV, V. M., TIMOFEYEVA, T. S., CHUB, YE. V., SHTRYKOV, V. K., and YAKOVLEVA, G. D.

RADIO PENETRATION OF THE ATMOSPHERE OF VENUS BY THE 'VENERA-9' AND 'VENERA-10' PROBES

[Abstract] Until recently the only radio studies of the atmosphere of Venus were those of the Mariner fly-by data. This article gives new experimental data provided by analysis of information from the Venera-9 and Venera-10 satellites transmitted over the period from 26 October to 7 December 1975. Altitude profiles are plotted from observations of radio wave propagation through the atmosphere of Venus for the coefficient of refraction, density, pressure, temperature and electron concentration in the troposphere and ionosphere. It is found that radio observations at altitudes of 35-350 km provide reliable information on the atmosphere of Venus. A comparison with similar studies of the Martian atmosphere shows that radio observations are more effective for Venus due to greater density and electron

concentration. The most difficult zone for research is the region between
36 and 45 km above the surface of the planet, which is close to the level of
critical refraction. A comparison with the results of direct measurements
by Soviet landers showed satisfactory agreement at pressures of 0.2-2
atmospheres. The method of radio penetration is particularly sensitive to
laminar formations in the upper cloud levels. Detailed data on parameters
of the atmosphere for four regions of the planet are to be published in the
journal "Kosmicheskiye issledovaniya" [Space Research]. The authors thank
A. G. Pavel'yev, and L. G. Volkov for assistance in fulfilling this work.
Figures 8; references 6: 3 Russian, 3 Western.

2/2

USSR

PHOTO DETECTORS ON A BASIS OF THE EFFECT OF PHOTON DRAG OF ELECTRONS (FP AND FPU)

[Text] The instruments are a new class of radiation detectors and are designed for measuring power and time characteristics of IR radiation from pulsed lasers. They do not require cooling and possess a high time resolution, broad dynamic range and elevated noise stability in operation. The FP photo detectors have no amplifiers and the FPU types have built-in wide-band amplifiers. The FPU-50 and FPU-100 instruments have a set of replaceable radiation detectors and cover a power range for CO_2 lasers from 10 to $2 \cdot 10^6$ W. An oscillograph or pulsed voltmeter may be used as the registering instrument. Supply of the FPU instruments is accomplished both from batteries built into the instruments and from a 220 V network. An outer view of all types of FP and FPU instruments, as well as the replaceable detectors is shown. The photo detectors were developed at the Physico-Technical Institute imeni A. F. Ioffe of the USSR Academy of Sciences Leningrad K-21, Politekhnicheskay Ul. 26. The developers were P. M. Valov, K. V. Goncharenko, Yu. V. Markov, V. V. Pershin, S. M. Ryvkin and I. D. Yaroshetskiy.

1/3

USSR

Technical Characteristics

Тип прибора 1.	Диаметр входного окна, см 2.	Фоточувствительность, мВ/кВт 3. $R_н=\infty$	$R_н=50$ Ом	Временное разрешение, с 4.	Верхний предел измеряемой мощности, кВт 5.	Эквивалентная мощность шума, Вт 6.
ФП-0,5	0,5	1,6	0,6	$\leqslant 1 \cdot 10^{-9}$	$4 \cdot 10^3$	15
ФП-1	1	0,5	0,3	$\leqslant 1 \cdot 10^{-9}$	$1,6 \cdot 10^4$	30
ФП-2	2	0,13	0,09	$\leqslant 1,5 \cdot 10^{-9}$	$6,4 \cdot 10^4$	50
ФП-3	3	0,06	0,05	$\leqslant 2 \cdot 10^{-9}$	$1,4 \cdot 10^5$	100
ФП-5	5	0,02	0,02	$\leqslant 3 \cdot 10^{-9}$	$4 \cdot 10^5$	250
ФПУ-50	1	—	250	$\leqslant 6 \cdot 10^{-9}$	4,0	6
	1	—	140	$\leqslant 6 \cdot 10^{-9}$	7,0	11
	1	—	50	$\leqslant 6 \cdot 10^{-9}$	20	30
	1	—	10	$\leqslant 6 \cdot 10^{-9}$	10^2	150
	1	—	2,0	$\leqslant 6 \cdot 10^{-9}$	$5 \cdot 10^2$	750
	1	—	0,5	$\leqslant 6 \cdot 10^{-9}$	$2 \cdot 10^3$	$3 \cdot 10^3$
ФПУ-100	1	—	250	$\leqslant 3 \cdot 10^{-9}$	4,0	8
	1	—	140	$\leqslant 3 \cdot 10^{-9}$	7,0	15
	1	—	50	$\leqslant 3 \cdot 10^{-9}$	20	50
	1	—	10	$\leqslant 3 \cdot 10^{-9}$	$1 \cdot 10^2$	200
	1	—	2,0	$\leqslant 3 \cdot 10^{-9}$	$5 \cdot 10^2$	$1,1 \cdot 10^3$
	1	—	0,5	$\leqslant 3 \cdot 10^{-9}$	$2 \cdot 10^3$	$4,5 \cdot 10^3$
ФПУ-100Б	3	—	8,0	$\leqslant 3 \cdot 10^{-9}$	150	$2,5 \cdot 10^2$
ФПУ-250	1	—	40	$\leqslant 1,5 \cdot 10^{-9}$	60	10^2
ФПУ-50	1	—	13	$\leqslant 6 \cdot 10^{-10}$	120	$2,5 \cdot 10^2$

7. { ФП-0,5, ФП-1, ФП-2, ФП-3, ФП-5 }

8. { ФПУ-50, ФПУ-100, ФПУ-100Б, ФПУ-250, ФПУ-50 }

2/3

USSR

Comment: R_H is the load resistance. The photosensitivity of the receivers is indicated for the 10.6-micrometer wavelength.

1. Type of instrument.
2. Diameter of input window, cm.
3. Photosensitivity, mV/kW.
4. Time resolution, seconds.
5. Upper limit of measurable power, kW.
6. Equivalent noise power, W.
7. FP
8. FPU

3/3

EAST GERMANY

HEINZ, MICHAEL, and OTTO, RAINER, graduate engineers

INSTRUMENT GROUP 19: THE AC-RMS DIGITAL VOLTMETERS G-1204.500 AND G-1204.010
FROM ERFURT RADIO WORKS STATE ENTERPRISE. PART 2

[Abstract] This part of the series of articles discussed the users of these
two voltmeters (identical except that the G-1204.500 is a tabletop instrument
and the G-1204.010 is a panel instrument), which include scientific research
institutions, instrument manufacturers, laboratories, and various industries.
It also describes the accessories available, which include connection systems
for multiple units. The instruments comply with the dimensions specified in
East-German Standard TGL 25,064 and with the connections specified in TGL
200-3603. They contain printed circuits, transistors, and integrated circuits.
Common-mode suppression is high because of the guarded construction. The me-
thod of measuring is based on the true effective values with the aid of a
thermocross. Performance and operating specifications will be described in
a subsequent part of this series. Figures 2; no references.
1/1

EAST GERMANY / SOVIET UNION

LUTCHKOV, V. S., RADTSHENKOV, V. F., and BIL'UK, G.YE., Moscow

POWER MEASUREMENT OF OSCILLATIONS IN THE VERY HIGH FREQUENCY SOURCES WITH THE
AID OF FERRITE TRANSDUCERS

[Abstract] This article is the text of the authors' lecture delivered at the
23 to 27 September 1975 IInd International Conference on Microwave Ferrites
held in Suhl. Power measurement of oscillations in very-high frequency sour-
ces may be carried out with the aid of the cross multiplication effect of fer-
rites used in appropriate transducer systems. These systems permit the inertia-
free conversion of the very-high frequency signals in signals of the same amp-
litude which are proportional to the very-high frequency power. The trans-
ducer, of which the design and operation was described and illustrated, also
permits measurement of peak power in pulse-shaped and monochromiatic very-high
frequency signals, and frequency measurement of pulse-shaped very-high frequency
signals. Figures 2; references 3: All Russian.
1/1

EAST GERMANY

SCHILDER, D., Institute for Communications Engineering, Association of State
Enterprises for Communications and Metrology, Radio and Communications Tech-
nology, Berlin

MEASUREMENT OF THE OHMIC RESISTANCE OF DIODE CHIPS IN THE MICROWAVE RANGE

[Abstract] The measurement system described involves the connection of a vari-
able blind resistor in series with the chip and shifting the impedance point
along the effective resistance circuit until the total resistance becomes real.
The test system is designed so that the chip interrupts the internal conductor
of a coaxial cable. The d.c. series resistance is fed to the chip through the
internal conductor. The test system also contains a reactance line. The design
and construction of the test system is illustrated, and the adaptation require-
ments and reactance-line losses are discussed. The measurement procedure is de-
scribed and some results are presented. Figures 4; no references.
1/1

HUNGARY   UDC: 53.084.2:62-525

HELM, Laszlo, Dr, candidate of technical sciences, MTA SZTAKI [Computer Tech-
nology and Automation Research Institute, Hungarian Academy of Sciences]

STATIC CHARACTERIZATION OF FLUIDIC REFLECTION SENSORS

[Abstract] This article reviews the performance parameters of various commer-
cial fluidic reflection sensors (Types RFL-2, RFL-4, RFL-6, and RML-5 made
by Festo; Type PRX-1 made by Howie; Type FAD-593 made by Corning; No. 6080067
made by Pitney Bowes, No. 300490 made by Fluidonics, and Type 4PS-910 made by
Norgren). It also discusses a technique for measuring the characteristic sta-
tic parameters which involves the plotting and analysis of the diagram indi-
cating the relationships between the input and output signals. The diagram ac-
tually plots the p_k/p_t ratio as a function of x (p_k denotes the output pres-
sure, p_t denotes the supply pressure, and x denotes the relative position of
the sensed object from the sensor). The results characterize the performance of
the sensor. Figures 6; tables 3; references 2: one Western and 1 German.
1/1

TIMOFEYEVA, Z. A., doctor of technical sciences and ZHERMUNSKAYA,
L. B., candidate of technical sciences

WIRES OF BERYLLIUM FOR HIGH-FREQUENCY ELECTRICAL MEASURING INSTRU-
MENTS

[Abstract] Products of beryllium have a number of valuable phys-
ico-mechanical properties and are being used with increasing fre-
quency in the various branches of technology, including instrument
construction. Recently in the USSR success has been achieved in
developing a technology for the manufacture of 0.1 mm diameter
wire and 0.1 mm thick foil; today research is being conducted on
the industrial use of these products. The authors give the phys-
ico-mechanical properties of test samples of beryllium wires
manufactured from the selected optimum modes. The use of beryl-
lium wires is quite promising for increasing the frequency range
of measurements and the quality of high-frequency loop and frame
oscillographic galvanometers as well as other high-frequency meas-
uring instruments where the examined characteristics are substan-
tial. Figure 1; tables 2; references 3: 3 Russian.

1/1

KONOVALOV, A. A., LEPORSKAYA, YE. A. and ULICHEV, V. V., Leningrad Institute
of Aviation Instruments

A PROGRAMMABLE TIME RELAY BASED ON ELECTROCHEMICAL DISCRETE HYDROGEN
INTEGRATORS

[Abstract] The article describes a programmable timer with long delays that
uses an electrochemical discrete hydrogen integrator as the master timing
element. The integrator is a hermetically sealed glass vessel that is
divided into two hydrogen-filled chambers by a porous glass disk impregnated
with a sulfuric acid solution. Platinum electrodes that form the input
circuit of the integrator are sealed into both sides of the disk. In the
center of the disk is a capillary opening filled with electrolyte. In this
opening is a fine platinum wire that forms an output circuit with one of the
input electrodes. When an electric current flows through the input circuit,
electrolytic action causes a pressure difference between the anode and
cathode hydrogen chambers. When the pressure difference is sufficient to
displace the electrolyte from the capillary, the electrodes of the output

circuit are separated and this condition is used for the output signal.
Hydrogen flows through the capillary to equalize pressure in the two chambers,
and the capillary is refilled with electrolyte through the action of surface
tension. The range of time delays is $10-10^5$ s. Timer circuits are examined
in which the commutating elements are electromagnetic relays, and also where
a step-by-step switch is used as the commutator, decoder and counter. Figures
2; references 2 Russian.

2/2

GENERAL-PURPOSE DIGITAL VOLTMETER SHCH68001

[Text] The voltmeter is designed in conjunction with inserted
blocks for measuring ac and dc voltages as well as dc resistances.
The ranges of the measured voltages: dc -- from 1 microvolt to
1000 V (with a range of 10, 100 mV, 1, 10, 100, 300 and 1000 V),
ac -- from 100 microvolts to 1000 V (with a range of 1, 10, 100
and 1000 V). The range of measurable resistances is from 0.1 Ohm
to 10 MOhm (with a range of 1, 10, 100 kOhm, 1, 10 MOhm). The
basic error: in measuring a constant voltage no more than $\pm[0.05+
0.02 \ (U_F/U_x-1)]$, in measuring a variable voltage in the frequency
range from 20 Hz to 100 kHz no more than $\pm[0.15+0.05 \ (U_F/U_x-1)]$,
in measuring resistance no more than $\pm[0.1+0.02 \ (R_F/R_x-1)]\%$,
(where U_F and R_F are the final values of the measurement ranges,
U_x and R_x are the current values of the measured quantity). At-
tenuation of noise of normal type is no less than 66, of common
type no less than 160 dB. Output into digital printing is in the
code 8-4-2-1. Supply is from a 220 V ac, 50 Hz. Power required
from the network is no more than 70 V·A. The dimensions are 480
X 120 X 420 mm; the mass is no more than 20 kg. It is made by
the Nevinnomyssk Plant of Electrical Measuring Instruments.

1/1   35

DYATLOV, A. P. and ORLOV, G. N.

METHOD OF AUTOMATIC MONITORING AND CORRECTING THE PARAMETERS OF
RECEIVERS

[Abstract] The authors examine a method of continuous automatic
monitoring and correction of the parameters of spectroanalyzers
and radio receivers in the presence of input effects. They dem-
onstrate the possibility of monitoring the noise factor, the amp-
litude-frequency and phase-frequency characteristics of the chan-
nels and determine the error in monitoring and correcting the
parameters. Figure 1; references 6: 6 Russian.

1/1

YEVLANOV, YU. N., MALINOVSKIY, V. N., FEDOTOV, V. P., candidates
of technical sciences and SHATOKHIN, A. A., engineer

METHOD OF DETERMINING THE NOISE CHARACTERISTICS OF SMALL SIGNAL
AMPLIFIERS

[Abstract] The authors are concerned with planning highly sensi-
tive and precise electronic ways to make measurements; they find
it is essential to have sufficiently complete and precise informa-
tion about the noise characteristics of the elements to be used.
Textbooks and technical specifications do not contain information
about the low-frequency noise component (type 1/f noise) and do
not give any data about the scatter of noise characteristics from
sample to sample. Low-frequency noise is bound from above by the
frequency f_0 and when f is greater than f_0, the thermal noises
with a uniform spectrum predominate over type 1/f noises. Fig-
ure 1; references 2: 2 Russian.

1/1

COMBINED DIGITAL VOLTMETER SHCH68002

[Text] The voltmeter is designed to operate in conjunction with
inserted block-converters for measuring various physical quanti-
ties with output of the measurement result in digital form on a
display panel and in parallel binary-digital code jointly to an
external registering device. The Shch68002-01 instrument is de-
signed for measuring direct and slowly alternating voltages. The
range of measured voltages is from 1 microvolt to 1000 V (with a
range of 100 mV, 1, 10, 100 and 1000 V). Selection of the range
of measurement is manual, automatic and long-range. Measurement
error does not exceed $\pm[0.02+0.05 \ (A_F/A_x-1)]\%$ (where A_F is the
final value of the measurement range, A_x is the current value of
the measured quantity). The input resistance is 1000 (on ranges
of 100 mV and 1 V) and 10 Mθhm (on the other ranges). Speed of
response is 1-4 measurements per second. Suppression of noise of

normal type is no less than 60, of common type no less than 120 dB.
Output onto the digital printer is 8-4-2-1. Supply from the 220 V,
50 Hz ac network. Power required from the network is no more than
60 V·A. Operating conditions: temperature of ambient air 10-35°C,
relative humidity up to 80%. Dimensions 480 X 118 X 420 mm; mass
15 kg. It is produced by the Nevinnomyssk Plant of Electrical
Measuring Instruments.

USSR   UDC 621.398:517.11

SHVINDIN, G. I. and OSTROVSKIY, A. YU., engineers, Aleksandriysk
Electromechanical Plant

A DEVICE FOR DEBUGGING AND TESTING CONTROL BLOCKS ON LOGIC ELEMENTS

[Abstract] The authors of this article propose a test bench for
debugging and checking circuits for automated devices and those
used in telemechanics, constructed on Logic-T elements. They say
that use of this test bench will permit a significant increase in
productivity of the debugging operations and will reduce the
amount of time involved in them. They state that implementation
of this test bench for debugging control stations on logic ele-
ments will give an annual savings of 1700 rubles, whereas the
bench itself costs only 120 rubles. Figure 1.

1/1

USSR   UDC 621.791.382

ELECTRONIC DIGITAL AMPERE-VOLTMETER SHCH68003

[Text] The voltmeter is designed to measure resistances and di-
rect and slowly alternating currents and voltages. The range of
measurable voltages is from 1 microvolt to 1000 V (with a range
of 10, 100 mV, 1, 10, 100 and 1000 V). The range of measurable
currents is from 0.1 nA to 1 A (with a range of 1, 10, 100 micro-
amps, 1, 10, 100 mA and 1 A). The range of measurable resistances
is from 0.1 Ohm to 10 MOhm (with a range of 1, 10, 100 kOhm, 1 and
10 MOhm). The precision class is 0.05/0.02. The input resistance
in the mode of measuring voltage is 1000 (with a range of 10 V)
and 10 MOhm and more (for the remaining ranges). The maximum
speed of response is 25 measurements per second. Suppression of
noise of normal type is 60, of common type 130 dB. Output onto
the digital printer is in code 8-4-2-1. Supply from a network
of 220 V, 50 Hz ac. Required power is 45 V.A. It is made by the
Nevinnomyssk Plant of Electrical Measuring Instruments.

1/1

BONDARCHUK, IVAN YEVSEYEVICH and KHARIN, VLADIMIR IVANOVICH

AVIATION AND RADIOELECTRONIC EQUIPMENT OF THE AN-24 AIRCRAFT

Moscow AVIATSIONNOYE I RADIOELEKTRONNOYE OBORUDOVANIYE SAMOLETA AN-24 in Russian "Transport" 1975, 280 pp. Figures 141; tables 6

[Excerpt] Annotation

In the book are set forth the arrangement, the principle of action, and the features of the flight operation of the electrical equipment: of the electric power sources, of the electrical engine-starting system, the systems of weathercocking the propellers, the fire-extinguishing system, the deicing and heating devices, the lighting equipment; the radio equipment; the radio-navigation equipment, the radars; the instrumentation: the piloting-and-navigation and gyroscopic instruments and automatic pilots, the oxygen equipment.

The book is designated for the flight and technical personnel of civil-aviation operating enterprises. It may be used by auditors at schools of advanced flight training and UTO [expansion unobtainable] and by flight-school students.
1/3

USSR

BONDARCHUK, IVAN YEVSEYEVICH and KHARIN, VLADIMIR IVANOVICH, AVIATSIONNOYE I RADIOELEKTRONNOYE OBORUDOVANIYE SAMOLETA AN-24, "Transport" 1975 280 pp

CHAPTER HEADINGS   PAGE

2/3

USSR

Section III. Instrument equipment

3/3

EAST GERMANY

KUEHN, H., graduate engineer, Carl Zeiss State Enterprise, Jena

STABILIZED HELIUM-NEON GAS LASER

[Abstract] A stabilized helium-neon gas laser with electronic frequency stabilization was described and illustrated with photographs and performance diagrams. Stability is $\Delta\nu/\nu = 1\cdot10^{-7}$ in single-mode operation in the lamb-dip. The running-in performance of the laser is outstanding; it moves through 1 to 10 orders in approximately 30 minutes. Thereafter there is only a slight frequency drift, caused primarily by thermal compensation processes and fluctuations in atmospheric pressure. The control is based on the principle of laser wobbling. Frequency modulation is so low that the coherence length of the laser remains ≥ 40 m. The usefulness of this device for distance measuring is pointed out. The lamb-dip frequency of each individual laser made by Carl Zeiss is compared to that of a calibrated standard laser. Figures 9; reference: 1 German.

1/1

EAST GERMANY/CZECHOSLOVAKIA

PETRU, F., graduate engineer, candidate of sciences, Czechoslovak Academy of Sciences, Instrument Construction Institute, Brno, Czechoslovakia

PROPERTIES OF CZECHOSLOVAK-MADE SINGLE-FREQUENCY LASERS AND LASER INTERFEROMETERS

[Abstract] The characteristics of Czechoslovak-made single-frequency helium-neon lasers, prism interferometers based on these lasers, and separate interferometers are discussed. The uses of these instruments include measurement of distances, velocities, accelerations, oscillations, and the like. The digital output and analog input data permit the use of program-controlled special devices. As an example to illustrate the use of the laser interferometer, the author describes the checking of a dividing machine. The single-frequency lasers come in five wavelengths; the output is 500 mW. Block diagrams are shown for the prism interferometer and the separate interferometer. Figures 11; tables 3; references 10: 3 Czechoslovak, 1 German, and 6 Western.
1/1

AKCHURIN, G. G., BOKOV, V. M. and TUCHIN, V. V.

PARTICULARS OF THE ENERGY CHARACTERISTICS OF A HELIUM-NEON LASER IN THE CASE
OF DISCHARGE CURRENT MODULATION

[Russian abstract provided by the source]

[Text] An experimental study is made of the energy characteristics of a
helium-neon laser in the case of external perturbations of the discharge
current. It is shown that the behavior of the energy characteristic can be
controlled in the case of plasma perturbations on frequencies close to the
frequencies of the normal modes of the discharge. A panoramic method is
proposed for observation of characteristics that enables one to study
characteristics with high resolution with respect to discharge current.
Figures 5; references 7: 6 Russian, 1 Western.

1/1

ZAKHARENKO, YU.G., PRIVALOV, V.YE., FOFANOV, YA.A.

PECULIARITIES OF THE EFFECT OF OSCILLATIONS IN A DISCHARGE ON THE
INTENSITY OF RADIATION OF A GAS LASER

[Abstract] The effect of striations and reactive and local oscillat-
ions on the intensity of radiation of He-Ne lasers is investigated.
It is found that the effect of reactive and local oscillations on
the intensity of radiation of a He-Ne laser amounts to modulation by
them of the discharging current. The cut-off frequency of the modul-
ation characteristics of a He-Ne laser can be determined by the
resonance properties of the discharge-electrical circuit system. In
the case of the presence of traveling striations, modulation of the
intensity of radiation of a laser in which tubes of types LG-56,
OKG-13 and OKG-16 are used, is principally caused by processes co-
phasal along all the length of the tube. This is true in all the re-
gion of operating currents, also including the case when saturation
of the amplitude of traveling striations is observed. The presence of
traveling striations leads to the appearance of a standing wave of
1/2

USSR

the intensity of spontaneous radiation along the discharge (near the cathode branch); the standing-wave ratio strongly differs from unity with X greater than L. Figures 6; references 9: 5 Russian; 1 Western; 3 Japanese.

2/2

Microelectronics and General Circuit
Theory and Information

HUNGARY

CSERNOCH, Janos, graduate physicist, technical and scientific advisor, Main
Microwave Department, Orion Radio and Electrical Enterprise

CALCULATION OF INTERMODULATION NOISES IN MICROWAVE FDM DEVICES. PART I

[Abstract] Intermodulation noises may originate as the result of the charac-
teristics of the non-linear input-output parameter of the quadrupole, the
fluctuation of the group-running time of the quadrupole, improper matching
of the antenna and the feed line system, and multipath propagation. This ar-
ticle discusses the calculation of intermodulation noise and distortion re-
sulting from the first two of these factors. The methods of calculation are
described and illustrated with numerical examples. The example for the first
is the following: Second-order intermodulation noise of P_{d2} = 60 pWo and
third-order intermodulation noise of p_{d3} = 40 pWo are measured in the
f_{12} = 2570 Hz upper channel of the modulator and demodulator (modem short)

1/2

HUNGARY

of a 600-channel device. What are the second-order and third-order lineari-
ties of the connection? The examples for the second are the following: For
a defined antenna feed line system the time fluctuation of the group-running
time, and the minimums or maximums of the group running/frequency diagram
range (in the half period of the ripple) are to be calculated; for a given
antenna/feedline system, the maximum intermodulation noise for a test chan-
nel, the deterioration of the intermodulation noise when the antenna's stan-
ding-wave ratio changes are to be calculated. Figures 4; no references.

2/2

EAST GERMANY

FELDNER, S., Karl-Marx-Stadt

APPROXIMATION OF NETWORKS IN THE TIME RANGE

[Abstract] Relationships between the time and the frequency ranges. Formulation of the approximation task. Solutions of the approximation problem (approximation in the frequency range, approximation in the time range [approximation by superimposition of elementary functions; nonlinear Chebyshev approximation in the time range]). Nonlinear Chebyshev approximation by exponential series. Numerical calculation of nonlinear Chebyshev approximations by exponential series. Results of the approximation of selected weight functions. Figures 6; table 1; no references.

1/1

EAST GERMANY

KRAMBEER, H., Chamber of Technology, Electrical Technology and Electronics Section, Engineering College, Wismar

REVIEW OF SOME THEORETICAL FUNDAMENTALS OF DEFECT LOCALIZATION IN LINEAR ANALOG CIRCUITS AND SYSTEMS

[Abstract] The literature dealing with the following subjects was reviewed briefly: Defect analysis as a discipline of network theory, determination of the network-element value solvability, solution algorithms for the calculation of parameters from test values, effects of random test errors, determination of the parameters outside the tolerance range, defect analysis by digitalization of the defect effects, defect analysis by simulation of the defect effects, defect analysis and parameter determination, selection of test locations in large systems, optimization of the temporal sequence of the testing steps for large systems. References 29: 5 German, 1 Japanese, 5 Russian, and 18 Western.

1/1   45

EAST GERMANY

LANGER, Inge, Chamber of Technology, Electronic Technology and Precision Instrument Technology Section, Dresden Technical University, Area: Electronic Instrument Construction, Dresden

POWER SUPPLY LINES FOR HIGH-SPEED INTEGRATED CIRCUITS ON MULTILAYER BOARDS

[Abstract] The use of potential planes represents the electrically most desirable method of wiring for power supply lines in a high-speed integrated circuit on multilayer board. This provides defined electrical properties to the signal lines, provides electrical shielding and decoupling of the signal lines if the potential planes are properly designed, provides low-impedance power supply for the components on the board, and provides favorable ground line configuration by eliminating the ground wire loops and inductive ground effects. The supply lines are blocked by capacitors to eliminate interference voltage peaks. Examples of wiring based on this principle are presented. Figures 5; references 10: 4 German and 6 Western.
1/1

EAST GERMANY / SOVIET UNION

POLLAK, B. P., HANAMIROV, A. YE., and KORNEYEV, I. V., Moscow Power Institute

MONOCRYSTALLINE AND POLYCRYSTALLINE HEXAGONAL FERRITES AS MATERIALS FOR RESONANCE UNITS IN MICROWAVE TECHNOLOGY

[Abstract] This article is the text of the authors' lecture delivered at the 23 to 27 September 1975 IInd International Conference on Microwave Ferrites held in Suhl. Continuing the discussion reported at the XIVth International Conference of Ilmenau Technical University, 1969, on hexaferrites, the authors discuss monocrystalline hexaferrites (tensor of the magnetic susceptibility, hexagonal ferrite elements in waveguides, resonance directional lines) and polycrystalline hexaferrites (approximation for the ferromagnetic resonance, study of the anisotropy of the ferromagnetic resonance, anisotropy of the resonance field, anisotropy of the resonance susceptibility, and a microwave method for the examination of the texture. Polycrystalline hexaferrites permit the construction of resonance system lines of small dimensions in the millimeter wavelength range. Monocrystalline ferrites may also be used for this purpose in some cases. Figures 8; references 8: 4 German, 3 Russian, and 1 Western.
1/1

TYSHKO, V. A. and POGUDIN, A. I.

A MULTICHANNEL CONTROL SYSTEM BASED ON OPTRON ELEMENTS AND INTEGRATED CIRCUITRY

[Abstract] A simple and economic multichannel synchronous pulse-phase control
system is developed with high reliability and acceptable quality character-
istics. The system is based on type AOU103 optron thyristors and the K1NT251
integrated circuit. Circuit simplicity is achieved by combining the functions
of synchronization and cadence distribution of the output pulses of the phase-
shifting devices of the control channels in a single unit. It is shown how
correcting elements can be introduced to eliminate output pulse asymmetry.
An advantage of the proposed circuit is the absence of coupling between the
null detectors of the control channels and the trigger circuits of the output
pulse shapers, making the operation of the phase-shifting device immune to
interference from the power section of the rectifier. Figures 2; references
4 Russian.

1/1

LITVINENKO, L.N., OSIPOVA, M.M., SAL'NIKOVA, L.P.

CALCULATION OF CHARACTERISTICS OF TEM-WAVES OF CYLINDRICAL MICROSTRIP
LINES

[Abstract] Sections of strip lines are widely used in microwave tech-
nics as transition devices between various types of transmission lines.
The following regular requirements are imposed on such transition de-
vices: insertion into the channel of minimum reflections, wide-band-
ness, mechanical strength, and others. Strip lines, which can be used
in graded coaxial-strip junctions, are of particular interest in con-
nection with them. The present paper -- in an approximation of TEM-
waves -- calculates the characteristics of cylindrical microstrip
lines with infinitesimally thin strips. The lines are filled with a
homogeneous dielectric. In the work the boundary value problem for a
Laplace equation is solved by a rigorous method, making it possible
to obtain the exact distribution of the potential in a cross-section
of the structure. The dependence of the line capacitance, the effect-
ive dielectric constant and the wave impedance on the geometrical
1/2

parameters of the structure and the dielectric constant of the material was calculated with the aid of an electronic computer. The results of the numerical calculations are presented. Figures 2; references 3: 2 Russian, 1 Western.

2/2

LITVINENKO, O.N., LEVCHENKO, YE.G.

MICROSTRIP INHOMOGENEOUS LINES AS OSCILLATORY SYSTEMS

[Abstract] Oscillatory systems in the form of sections of microstrip lines open at the end are considered. A method is discussed for synthesis of open resonators made from sections of heterogeneous lines. The method makes it possible to find, for a specified resonance frequency, a characteristic resistance and a length L to find the principle of change of the wave resistance, and subsequently--making use of known methods-- to calculate the geometrical dimensions of the resonator. The following points are investigated: 1) The spectrum of the resonance frequencies of an open section of line; 2) Wave resistance of a heterogeneous line; 3) Resonance resistance and Q-factor of an oscillatory system; and 4) Calculation of geometrical dimensions. The authors thank Ya.S. Itskokh for fruitful discussion ofthe theme of the work. Figures 7; references 4 Russian.
1/1

MATORA, I.M. and SAVVIN, V.A.

THE THEORY OF PULSE SHAPING BY NONUNIFORM SHAPING LINES AT AN ARBITRARY
LOAD

[Abstract] The theory is presented of shaping voltage or current pulses
with the aid of a nonuniform shaping line (NSL) at a load of arbitrary
type, including parameters variable during the pulse. The following
types of loads are described: 1) Effective resistance R = const.; 2)
Inductive acceleration section of a linear induction accelerator (LIA)
composed of a number of identical inductors; and 3) A pulse transformer
based on an acceleration section of LIA for an electron gun with load-
ing electron current and bias current. A program for solution of the
appropriate systems of differential equations was composed for calcul-
ation of the voltage and current pulse at each of these loads. The
results of a calculation with respect to the theory presented agree
quantitatively with experiment for all loads of importance for which
there are experimental data. The authors thank I.M.Frank for a number
of valuable comments, P.S. Antsupov and R.V.Khar'yuzov for numerous use-
ful discussions, I.I. Shelontsev for assistance in working out a pro-
gram, as well as V.G. Zhitenev and A.I. Arlov for completed measure-
ments. Figures 9; references 10: 9 Russian; 1 Western.
1/1

KRYAZHEVA, O. R. and LANNE, A. A.

ON THE CONDITIONS OF ABSOLUTE STABILITY OF ACTIVE RC CIRCUITS

[Abstract] The authors prove theorems on the absolute stability
of active RC circuits during variation in capacitances. In the
article they examine the theory of active RC circuits and the
relationship between the properties of the circuits and their
structural features. In addition to being of theoretical inter-
est the article is also of interest for developing rational
planning methods. Figures 4; references 4: 1 Russian, 3 West-
ern.

1/1

USSR   UDC   621.375.1

KLICH, S. M. and NIKOLAYEV, A. L.

CALCULATING THE DEGREE OF SUPPRESSION OF DIFFERENCE-FREQUENCY HARMONICS IN
A BALANCED MICROWAVE MIXER

[Abstract] A method is proposed for calculating the degree of suppression
of even-numbered difference-frequency harmonics at the output of a balanced
diode microwave mixer for different input signal levels, including strong
signals. The calculation is based on piecewise-linear approximation of the
current-voltage characteristic and the diode rectification characteristic.
It is shown that the degree of suppression of even harmonics higher than
the first, like the suppression of heterodyne noises, depends on the im-
balance of amplitudes and phases across the diodes of the balanced mixer;
this imbalance (and especially phase imbalance) reduces the suppression of
even harmonics more strongly than suppression of heterodyne noises. The
degree of suppression of a video pulse (zero harmonic) at the balanced mixer
output depends only on the imbalance of amplitudes of the microwave bridge
in the mixer and the spread among the slopes of the rectification curves of

USSR

the diodes used. Factors are distinguished that influence the degree of
suppression of even harmonics and a video pulse in a balanced mixer, and
ways are suggested to improve this suppression, which is of particular
practical importance for AFC radar mixers. Figures 3; references 8 Russian.

KLICH, S. M. and NIKOLAYEV, A. L.

AN EXPERIMENTAL INVESTIGATION OF THE LEVEL OF DIFFERENCE-FREQUENCY HARMONICS
IN MICROWAVE MIXERS IN THE PRESENCE OF A STRONG SIGNAL

[Russian abstract provided by the source]

[Text] The paper gives the results of a comparative experimental study of
the levels of the first four difference-frequency harmonics, including the
zeroth-order harmonic (video pulse) at the output of simple and balanced
diode microwave mixers over a broad range of signal and heterodyne powers.
It is found that even in the case of strong signals a balanced mixer sup-
presses the level of the second (even) harmonic by 12-15 dB, and the zeroth
harmonic still more. The results enable one to evaluate the degree of sup-
pression of an interference signal by a balanced mixer where the frequency
of the second difference-frequency harmonic is equal to the intermediate
frequency, and to choose the optimum working mode of the mixer for AFC radar
systems. The experimental results are compared with calculations. Figures 3;
tables 3; references 3 Russian.
1/1

VALIYEV, KAMIL' AKHMETOVICH, DYAGILEV, VLADIMIR NIKOLAYEVICH, LOBEDEV, VALENTIN
IVANOVICH and LUBASHEVSKIY, ALEKSEY VASIL'YEVICH

MICROPOWER INTEGRATED CIRCUITS

[Excerpt] Annotation

Consideration is given to the circuit-technology and technical features of the
design of micropower integrated circuits, greatest attention being devoted to
logic elements, universal JK and DV triggers, subsystems of counter type,
registers, and adders. Methods are discussed for decreasing the power of
circuits, based on simple engineering calculations, as well as the construction
or selection of such circuit-technology devices which provide for the least
product times lag and the least level of internal noise. Low-level hysteresis
logic circuits of the static and dynamic types are analyzed, as well as ele-
ments of the TTL and STL types, and elements which unite MDP- and bipolar
structures. Questions of the realization of micropower memory circuits are
discussed, results are presented of an investigation of the static, dynamic,
1/3

USSR

VALIYEV, KAMIL' AKHMETOVICH, DYAGILEV, VLADIMIR NIKOLAYEVICH, LOBEDEV, VALENTIN IVANOVICH, and LUBASHEVSKIY, ALEKSEY VASIL'YEVICH, MIKROMOSHCHNYYE INTEGRAL'- NYYE SKHEMY, "Sovetskoye Radio" 1975 256 pp

and noise characteristics of bipolar transistors and circuits in a microregime. Physical and technological features of the development of micropower integrated transistors and integrated circuits are set forth.

The book may be useful for engineers working in the field of radioelectronics, computer engineering and electron engineering for students specializing in the field of microelectronics, systems engineering, and digital automation, as well as by developers of large and medium-scale integrated circuits.

Figures 233; tables 24; references 299.

2/3

3/3

GOLIK, S. M., GROL', V. V. and VIKTOROV, O. V., ,ngineers

A TESTER FOR MONITORING THE FUNCTIONING OF LARGE INTEGRATED CIR-
CUITS WITH A MATRIX STRUCTURE

[Abstract] The authors of this article describe the operating
principles and give a block-schematic of the tester for monitor-
ing the functioning of large integrated circuits with a matrix
structure, developed at the Kiev Polytechnic Institute. They
cite the technical characteristics of the tester. In monitoring
the permanent storage the tester operates in the read mode. The
information written in the memory is compared with information
in the standard memory. Figure 1; references 3: 3 Russian.

1/1

EAST GERMANY

KOMPA, S., graduate engineer, Robotron State Enterprise, ZFT [Research and Engineering Bureau], Area: Instruments, Karl-Marx-Stadt

CALCULATION OF THE SIGNAL VALUES OF PHOTOELECTRIC DETECTORS

[Abstract] The light-technological and the radiation-technological method for calculating the signal values of photoelectric detectors are described. The former method is less accurate and sometimes impracticable. However, it is simpler. In this context, light means visible light and radiation means the entire radiation spectrum including visible light. The basic equation for calculation is $Y = \int E_{e\lambda} F_v(\lambda) S_e(\lambda) d\lambda$, where Y denotes the signal value (in μA), $E_{e\lambda}$ denotes the illumination intensity, $F_v(\lambda)$ denotes the factor of spectral loss, $S_e(\lambda)$ denotes the absolute spectral sensitivity. Examples are presented to illustrate the various methods. Calculation is facilitated if the manufacturers provide meaningful information for their products. Figures 9; no references.

1/1

KOLOSOV, M.A., YAKOVLEV, O.I., PAVEL'YEV, A.G., KAYEVITSER, V.I.,
KALASHNIKOV, I.E., KOZLOV, F.I., KUCHERYAVENKOV, A.I., MATYUGOV,S.S.,
MOLOTOV, YE.P., ROGAL'SKIY, V.I.

BISTATIC RADAR OBSERVATION OF VENUS USING SATELLITES

[Abstract] The results are presented of bistatic radar observation of
the surface of Venus, accomplished with the aid of the "Venera-9" and
"Venera-10" satellites. The effectiveness of this method for investi-
gation of planet topography is shown. The results of investigations
with respect to two tracks with a length of 1200 and 800 km show that
the surface of the planet in the regions indicated is relatively uni-
form with height differentials not exceeding plus or minus 2 km. The
degree of unevenness of the surface, which is characterized by root-
mean-square inclinations of unevenness in an area with a diameter of
approximately 80 km, is approximately the same as for the surface of
the lunar mares. In the case of bistatic radar observation of the sur-
face of Venus, together with a study of the same surface, sounding of
the lower strate of the troposphere results, which makes it possible
1/2

to broaden the potentialities of the conventional method of radio
illumination for investigation of planets with dense atmospheres. The
results presented in this paper give initial information concerning
two regions of the Venus surface. More complete data will be publish-
ed in other papers. The authors thank O.M. Rakitin and L.G. Volkov
for assistance in the makeup of the paper. Figures 6, references 8:
7 Russian; 1 Western.

2/2

LUKOSHKIN, A. P. and PUS', V. V.

SIGNAL DETECTION BY A MULTICHANNEL MONOPULSE RADAR RECEIVER

[Russian abstract provided by the source]

[Text] The distribution of voltage readings is determined at the output of
a multichannel amplitude sum-difference monopulse radar receiver and used as
a basis for examining the problem of signal detection from data of the
amplitude and angle-measurement channels. A detection criterion is proposed
that is invariant to the perturbing parameters of the problem, its optimality
is proved, and the distributions of the statistic of the criterion are found
for the hypothesis and alternative. References 8: 6 Russian, 2 Western.

1/1

DAVYDOV, S. A., VYAZOVTSEV, V. N. and DENNENBURG, N. I.

THE SEZ-32 and SEZ-36 ECHO-OBSTRUCTION APPARATUS

[Abstract] The authors describe the first echo-obstruction appa-
ratus developed in the USSR -- the SEZ-32V and the SEZ-36. They
give the operating principle, the technical and exploitational
characteristics of the echo-obstructor, and a description of the
components. Preliminary articulation measurements give positive
results and indicate that the apparatus may be used on a network
in the version having rigid fastening behind the communication
channels and also in the version with channel commutation. Fig-
ures 7.

1/1

RAL'NIKOV, V. I. and KARCHENKO, I. P.

DECENTRALIZED POWER REGULATION IN A RADAR STATION COLLECTIVE

[Abstract] Criteria of independent power regulation in a radar station
collective are examined. It is assumed that each station in the collective
has its own power regulator that automatically varies the emission power
on the basis of local measurements so as to maintain a given working quality
in accordance with the proposed criteria. It is shown that the a priori
indefiniteness inherent in radar observation can be eliminated by using a
power regulation criterion in the form of the ratio of receiver sensitivity
to transmitter power rather than the conventional signal-to-noise ratio.
An expression is found that relates emission power, threshold level and
probability of false alarms in a given station to the characteristics of
pulse interference due to emissions from other stations. It is shown that
the proposed criteria ensure existence and attainability of an equilibrium
position. The effect of decentralized power regulation on the feasible
working distance between cw and pulse radars in a collective is discussed.
Figures 3; tables; references 5 Russian.
1/1

BARONKIN, V. M.

EFFECTIVENESS OF DISCRETE DETECTORS IN THE CASE OF A WEAK SIGNAL

[Abstract] The author considers the problem of comparing optimum detectors
in radar and communications with digital and discrete processing in the
weak-signal case for long observation time. The optimality criterion is
Pitmann's coefficient of asymptotic effectiveness. The problem is analyzed
within the framework of the theory of tests of statistical hypotheses.
References 7: 4 Russian, 3 Western.

POPOV, D. I.

SYNTHESIS OF ALGORITHMS FOR ANGLE COORDINATE MEASUREMENT FOR THE CASE OF
DISCRETE SCANNING OF AN ANTENNA BEAM

[Abstract] It is shown that measurement of the angle coordinate of a fluctu-
ating target with separate data processing for each position of a discrete-
scanning antenna beam reduces to computation of a statistic that is invariant
with respect to the level of the useful signal and interference. The algo-
rithm for initial data processing is described by an Hermitian form with a
processing matrix formed by the correlation matrices of signal and inter-
ference. A block diagram is given of a measuring instrument that realizes
the proposed algorithms. Figure 1; references 2 Russian.

1/1

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IVANOV, OGEL IVANOV

COOLING OF RADAR APPARATUS

[Extracts] This book studies the influence of temperature on the Norking
capacity of radar apparatus and its elements, as well as the basic physical
processes which occur during cooling, presents a brief description of the
most popular systems for cooling and characteristics of the main elements
included in these systems. The peculiarities of operation of radar cooling
systems are demonstrated. The book is based on materials from the open
domestic and foreign literature. The book is intended for specialists in-
volved in the operation of radar apparatus, as well as readers interested in
problems of cooling of electronic equipment.

CONTENTS   PAGE

1/2

USSR

IVANOV, OGEL IVANOV, OKHLAZHDENIYE APPARATURY RLS, "Voyenizdat" 1975 95 pp

USSR   UDC 621.396.967:629.12(075.3)

SHIROKIKH, IGOR PETROVICH

REPAIR OF SHIPBOARD RADIONAVIGATION INSTRUMENTS

Moscow REMONT SUDOVYKH RADIONAVIGATSIONNYKH PRIBOROV in Russian, "Transport,"
1975 172 pp

[Extracts] This book presents methods of locating defects in radionavigation
devices and repairing them under shipboard conditions. Their technical
operation, regulation and tuning are considered, as well as the testing and
measurement apparatus and tools used for these purposes. The book is intended
as a teaching aid for students in Merchant Marine schools and can be used by
students in courses intended to improve command qualifications, and also as
a practical aid for radio specialists and navigators of the merchant and
fishing fleets.

CONTENTS   PAGE

USSR

SHIROKIKH, IGOR PETROVICH, REMONT SUDOVYKH RADIONAVIGATSIONNYKH PRIBOROV,
Transport," 1975, 172 pp

2/2

SIDOROV, YU. YE.

AN INVARIANT RULE FOR DETERMINATION OF TARGET COORDINATES

[Abstract] A method is proposed for solving the problem of determining
target coordinates that is formulated in terms of the theory of verification
of complex statistical hypotheses. The problem is reduced to sequential
comparison of target "paths" to find the true "path." A uniformly most
powerful invariant rule for verification of hypotheses is derived. This
rule is independent of unknown probability characteristics of the observed
data and gives the highest probability of the right decision in the class of
all invariant rules and in the class of rules with power functions that
depend only on signal-to-noise ratio. The algorithm can be realized with
digital microelectronic hardware. The author thanks L. A. Zhivotovskiy
for valuable advice and for discussion of the work. Figures 2; references
5 Russian.

1/1

GRACHEV, VLADISLAV VASIL'YEVICH, and KEYN, VLADIMIR MIKHAYLOVICH

ELECTRONIC DEVICES FOR CONTROLLING AIR TRAFFIC

Moscow RADIOTEKHNICHESKIYE SREDSTVA UPRAVLENIYA VOZDUSHNYM DVIZHENIYEM in
Russian, "Transport" 1975 344 pp

[Extract] This book presents the theoretical principles, operating principles
and devices used in modern radar stations and combined automated systems used
to control air traffic and the landing of civil aircraft, the principles of
their operation and utilization. Basic information is presented from radar
theory. Primary attention is given to the most important operational char-
acteristics of radar sets which determine their capabilities in practical use.
Radar sets for observing air spaces, radar systems with active response, radar
landing systems, radar systems for observing air fields, weather radar sets
and automated systems intended for the control of air traffic over tracks,
at airfields and intermediate zones are studied. The book is a textbook
for students in civil aviation VUZes under the specialty "operation of
air transport," studying the electronic devices used to control air traffic,
and may also be useful for students in the corresponding specialties of
VUZes, for flying and technical personnel in civil aviation and engineering-
technical workers.
1/1

FROLOV, VLADIMIR SERGEYEVICH

AIRCRAFT NAVIGATION BY MEANS OF INERTIAL NAVIGATION SYSTEMS

Moscow SAMOLETOVOZHDENIYE S POMOSHCH'YU PRIBOROV INERTSIAL'NOY NAVIGATSII
in Russian, "Transport," 1975 184 pp

[Extracts] This book analyzes the physical principles upon which inertial
navigation is based, as well as methods of using inertial devices in order
to increase the accuracy and reliability of aircraft navigation under
difficult weather conditions. The principles of utilization of inertial
instruments during various stages of a flight are presented. It is shown
how inertial instruments during various stages of a flight are presented.
It is shown how inertial navigation instruments can be used to increase
significantly the accuracy of aircraft navigation, particularly in the
polar regions, during flights over terrain without landmarks and at low
altitudes. Combined operation of inertial systems with other aircraft
navigation systems is studied. The book is intended for the navigator,
flight and engineering-technical staff of the Ministry of Civil Aviation,
as well as teachers and students at aviation schools.

1/4

CONTENTS   PAGE

2/4

3/4

USSR

FROLOV, VLADIMIR SERGEYEVICH, SAMOLETOVOZHDENIYE S POMOSHCH'YU PRIBOROV
INERTSIAL'NOY NAVIGATSII, "Transport," 1975 184 pp

4/4

EAST GERMANY

LENK, A., Dresden Technical University, Information Technology Section; Area:
Communication and Test-Value Acquisition, Dresden

DISCRETE AND INTEGRATED SEMICONDUCTOR TRANSDUCERS

[Abstract] This article discusses the properties of modern strain gauges, tem-
perature effects in resistance-based strain gauges, the power transmission fac-
tor as a measure for the error effect of the follower electronic system and
the loading of the test specimen, the power transmission factor of accelera-
tion gauges, and the power transmission factor of piezoresistive pressure
transducers. Leading manufacturers gradually switch from metal transducers
to semiconductor transducers. The advantages of the latter are particularly
pronounced for compression measurement at the present state of the art. Semi-
conductor integrated transducers already predominate in medical uses. Figures
10; tables 2; references 3: 2 German and 1 Western.

1/1

EAST GERMANY

SCHLEGEL [initial(s) not given]

NEW LINEAR INTEGRATED CIRCUITS FROM THE FRANKFURT (ODER) SEMICONDUCTOR FACTORY

[Abstract] The following new monolithic integrated circuits, intended prima-
rily for use in consumer electronic devices, are described and illustrated
with drawings, circuit diagrams, block diagrams, and specification tables:
A 205 (low-frequency amplifier for radio, television, and phono sets, with
an output of 5 W under maximum cooling. Available in versions A 205 D and
A 205 K, differing in the ability of accommodating external cooling system);
A 230 D (RGB [red-yellow-blue] matrix for color television devices for the
direct control of the video terminal stage; a 16-pole unit); AD 240 D (an
integrated ZF [intermediate frequency] amplifier for back-and-white and color
television devices containing a controlled ZF amplifier, picture-delay-
controlled demodulator and a video post amplifier); A 250 D (integrated

1/2

EAST GERMANY

horizontal combination for pulse detachment and line synchronization in television devices with transistorized line terminal stages); A 270 D (an amplifier combination for the video and brightness signal, as well as functional groups for beam-current limitation, black-value scanning, and brightness control); A 295 D (for use in SECAM decoders, consisting of intermediate switch, limiter, and color-channel switch); A 301 D (a combination of stabilizer, amplifier, and threshold-level switch, intended for inductive slot, approximation, and ring initiators primarily, with ability to be modified for a variety of other uses). Figures 19; tables 7; reference 1: German.

2/2

BORZYAK, P.G., KATRICH, G.A., and SAMOYLOV, V.S.

FORMATION OF THE BAND STRUCTURE OF GOLD IN "ULTRATHIN" ISLAND FILMS

[Abstract] Previous works, of which G.A. Katrich was a co-author, studied the energy spectra of photoelectrons emitted by gold films and the optical characteristics of these films in the region of the spectrum with energies of the photons less than 5 ev. Analysis of the results obtained made it possible to determine the energy position of a number of extremal points of the band structure of gold, as well as the energy of some typical optical transitions. It was shown that the energy band structure, typical for massive gold, is retained to a thickness by weight of 10 Å for films of all the range of thicknesses investigated. The present paper extends the above investigation to a study of the changes in the electron states to which a transition to still "thinner" films leads, and the minimum "thicknesses" at which formation begins of the electron band structure of gold in "ultrathin" island films. The energy spectra of photoelectrons emitted by gold films with a work function of 2.1 ev, and a thickness 1/2

by weight from 0.4 to 10 A was studied in the spectral region $h\nu \leqslant 5$ ev. A substrate for the film was developed with sufficient conductivity and which at the same time provided nonphotosensitivity in the region of the spectrum used. The thickness by weight of the films deposited was determined by the piezoquartz resonator method. It is shown that in islands with linear dimensions of 40-50 A, from which the gold film with a thickness by weight of 10 A is made, an energy band structure is formed, characteristics of massive metal. Further "thinning" of the films and the decrease of the island dimensions connected with it leads to a considerable change of the S-band;conversely, the structure of the D-band remains invariable with thinning of the films to a thickness by weight of 1 A. Figures 4; references 4: 2 Russian; 1 Western; 1 Hungarian.

2/2

UDC 621.373.51:621.382.2

PROKHOROV, E. D., SKOROBOGATOVA, S. N. and ZOLOTAREV, YE. S.

EMISSION OF MICROWAVE NOISE BY A GUNN DIODE WITH STATIC CATHODE DOMAIN

[Abstract] An investigation is made of conditions of onset of impact
ionization in static cathode domains. It is shown that impact ionization
may arise at the cathode in Gunn diodes where there is a high-resistance
region with characteristics that differ from the gallium arsenide body of
the diode. Conditions are defined under which this situation can be
experimentally realized. It is hypothesized that a Townsend avalanche
effect may occur in the static cathode domains of Gunn diodes. Emission
of microwave noise is experimentally observed in Gunn diodes with a
strong electric field at the cathode, demonstrating the validity of this
hypothesis. The measured spectral density of noise power in the 8.8-9.8
GHz band emitted by this type of structure is $\sim 10^5 - 10^6$ kT_0. It is
suggested that coherent waveforms could be stimulated by the Townsend
avalanche effect with appropriate gradient doping of the n_0 region in
Gunn diodes. Figures 5; references 16: 7 Russian, 9 Western.
1/1

UDC 621.382.2

KARAKUSHAN, E.I., FATTAKHDINOV, A.U., and KHONYAK, YE.I.

MAGNETODIODE AS A CONTROLLABLE RESISTOR

[Abstract] A comparison is made of a magnetodiode with a magneto-
resistor as a controllable dynamic resistor. A number of advant-
ages of the magnetodiode are discussed. Possible fields of appli-
cation of a magnetodiode as a controllable resistor include: 1)
Attenuators with a variable transmission factor; 2) Amplifiers with
adjustable magnitude of feedback; and 3) Magnetic field sensor
[datchik]. The authors thank V.I. Murygin for reading the manu-
script and discussion of the results obtained. Figures 4; references
5 Russian

1/1

PRYANISHNIKOV, V. A. and ISAYEV, V. T., Leningrad Institute of Precision
Mechanics and Optics

A DEVICE FOR SELECTING MATCHED PAIRS OF FIELD-EFFECT TRANSISTORS

[Abstract] The authors describe a measurement installation for selecting
paired FETs that ensures ratios of initial drain current and transconductance
of at least 0.95. The FET is connected as a common-drain amplifier in the
negative feedback circuit of an opamp, the drain-source voltage and drain
current are obtained from special power supplies, a 1000 Hz signal is applied
to the opamp input, and a variable resistor in series with the drain current
supply is adjusted to give zero opamp output. The transconductance is de-
termined from the value of this resistance, and the drain current to trans-
conductance ratio is determined from the voltage drop across this resistance.
Measurement results are given for type KP103 FETs. Figures 1; tables 2;
references 1 Russian.

1/1

KOROTICH, A. F. and MYZYCHKO, YE. M., engineers

FM-SIGNAL DEMODULATOR BASED ON INTEGRATED CIRCUITS

[Abstract] The authors of this article examine a simple FM-signal
demodulator made on a synchronous phase detector circuit on the basis
of modern integrated microcircuits. They state that the use of integrated
microcircuits in the synchronous phase detector has permitted improving
its parameters such as the holding band and the retention band and
increasing the degree of linearity of the modulation characteristic in
its working part. Figure 1; references 4 Russian.

1/1

AFANASOV, S.G., ASHBEL', I.YA., PETROV,S.G., and CHEREDNIK, V.I.

COMPARATIVE CHARACTERISTICS OF THE OPERATING CONDITIONS OF SINGLE-
TRANSIT RETARDING-FIELD OSCILLATORS FROM THE POINT OF VIEW OF THE
POSSIBILITY OF THEIR MICROMINIATURIZATION, LOWERING OF THE OPERATING
VOLTAGE AND AN INCREASE OF EFFICIENCY

[Abstract] The special features of retarding-field oscillators (RFO),
operating under various conditions are considered from the point of
view of microminiaturization and an increase of efficiency. Available
theoretical and experimental investigations of RFO in a multi-transit
regime do not make it possible at present to draw conclusions con-
cerning their prospects with respect to microminiaturization.
However, it has been experimentally shown in the literature that the
simplicity of construction and the relatively high control of the
movement of electrons in a RFO operating in a single-transit regime
make it possible to a considerable degree for the parameters of real
devices to approach theoretical values. However, in theoretical
1/2

USSR

terms this regime is not completely understood. Consequently, the present paper is limited to a consideration of the special features of RFO in a single-transit regime with various mechanisms for excitation of high-frequency oscillations. The analysis shows that from the viewpoint of economy and the start-up properties of low-voltage RFO with high-perveance beams the most preferable is a "resonance" regime with phase focusing. This was confirmed by experimental investigations which showed that in this regime a RFO can generate microwave oscillations with a reduction of the supply voltages to 1.5--2.5 volts with an efficiency of 2.5--3 percent. The authors thank M.I. Kuznets for discussion of the results and a number of helpful opinions. Figures 7; tables 1; references 17: 14 Russian; 3 Western.

2/2

USSR   UDC   621.373.43

BERMAN, V. R., FROLKIN, V. T., SOLOVEY, M. S. and VOLOSHCHENKO, V. I.

A MAGNETIC SCANNING OSCILLATOR WITH DEFLECTING COIL CONNECTED IN THE COLLECTOR CIRCUIT OF THE FINAL STAGE

[Abstract] An investigation is made of transient processes in a magnetic scanning oscillator with two-cycle and single-cycle deflecting coils connected in the collector circuits of the final push-pull stage. The minimum time of damping of transient processes and the corresponding optimum value of the shunting resistance of the deflecting coil were determined by mathematical modeling on the MN-7 analog computer. The results show that over a wide range of amplification factors the speed of the oscillator and the optimum shunting resistance are practically independent of gain and are determined only by the passband of the preamplifier. On the other hand, the minimum damping time is appreciably dependent on the preamplifier passband: speed improves by a factor of more than 5 with an increase in passband from 15 to 500 kHz. Figures 6; references 4 Russian.

1/1   70

USSR   UDC 624.373.5

PLONSKIY, A. F. and TEARO, V. I.

STABILITY OF THE FREQUENCY OF A QUARTZ AUTOGENERATOR WITH A LINE
SEGMENT

[Abstract] The authors make a theoretical and experimental study
of the autogenerator with quartz resonator excitation through a
segment of coaxial cable. They show the possibility of such ex-
citation for creating highly stable quartz generators and pre-
cision measurements. Although the concept is not entirely new,
experts in the field still do not agree completely in evaluating
the influence exerted on the stability of frequency of generating
oscillations by the line parameters. Figures 4; table 1; refer-
ences 12: 12 Russian.

1/1

EAST GERMANY/SOVIET UNION

WERZ, H. J., Chamber of Technology, East Berlin

IMPROVEMENT AND CLASSIFICATION OF FAST FOURIER TRANSFORMATION

[Abstract] This article is an abbreviated version of the author's dissertation
(prepared under Professor W. A. Taft, Ph. D., Transportation University, Moscow,
31 May 1974). The following tasks are solved for the general case of factorization
of the number of support points of the function to be analyzed or synthesized in
a product of integer factors: Finding of a simple method for the classification
of all fast Fourier transformation algorithms of interest in connection with
practical calculations and minimization of the number of the multiplications to
be performed in the realization of the fast Fourier transformation. The latter
is also useful for error checking in the processing of fast Fourier transforma-
tions. Tables 3; references 6: 2 German, 1 Russian, and 3 Western.

1/1

BILENKO, D.I., ZHARKOVA, E.A., and KHASINA, YE.I.

MODULATION OF REFLECTED RADIATION OF MILLIMETER AND SUBMILLIMETER
WAVELENGTH RANGE ON THE BASIS OF DIODE SEMICONDUCTOR STRUCTURES

[Abstract] In previous works by the authors the possibility was
considered of control of reflected radiation with current injection
in diodes, the plane p-n junction of which is perpendicular to the
direction of propagation of the wave. The calculations made of the
coefficient of reflection from the structures indicated showed a
pronounced dependence of the phase and amplitude of the coefficient
of reflection on the properties of the structure. Choice of the
thickness of the diode base and the current density determines the
form of modulation: amplitude-phase or phase (to 2π) with a small
change of amplitude. The method of control considered can be used
in the infrared, submillimeter and millimeter wavelength range. The
most effective modulation is possible in the submillimeter range
because for control of radiation in this case, e.g., with silicon
structures, excitation is required of actually attainable concen-
trations of charge carriers of $(1-5) \cdot 10^{16}$ cm^{-3} in a thickness of
1/2

layers comparable with the diffusion length in material with high
levels of excitation (80--100 micron). The present short communicat-
ion presents the results of an experimental investigation of control
of reflected radiation of the short part of the millimeter range,
based on diode elements, as a function of the properties of the
structure and the conditions of injection. The control obtained can
find wide applications for control of radiation in wave guide chan-
nels and in free space. Under equal conditions the change of phase
increases in proportion to the increase of frequency. An increase
of the magnitude of the controlled phase shift can be attained by
use of heterostructures and structures with accumulation of charge.
Figures 2; references 3 Russian.

2/2

GERTSENSHTEYN, M.YE. and KOBZEV, V.V.

CONCERNING A THERMAL RECEIVER WITH LASER READING OF TEMPERATURES

[Abstract] The physical aspects are considered of the problem of
creating a thermal receiver in which noise of the temperature read-
ing system is less than the thermodynamic fluctuations of the temp-
erature of the sensing element [datchik] which is heated by the radi-
ation received. In order to increase the sensitivity, the sensing
element must have minimum dimensions and be made from a substance
the index of refraction of which depends on the temperature -- e.g.,
liquid crystals. The sensing element is illuminated by a laser beam,
and the change of phase of reflected or passing waves is registered.
Only a laser system of reading makes it possible to realize maximum
sensitivity of a bolometer. Assuming the sensing element has a di-
ameter of 10 microns and a thickness of 10 microns with a dielectric
constant $\epsilon = 3$, the threshold value with laser readout of the capac-
itance amounts to $\Delta C = 5 \cdot 10^{-14}$ pf. It is extremely difficult to
measure such small values at radio frequencies. References 20: 15
Russian; 4 Western; 1 Russian translation of US patent.
1/1

EAST GERMANY

GEWENIGER, S., and JOERGES, U., Chamber of Technology, Dresden

DAMPING OF GLASS-FIBER WAVEGUIDES WITH A SECOND, LOSSY SHEATH

[Abstract] A DAEMPF program, written in BESM-6-FORTRAN, is now available for
calculating the damping of light waveguides by a second, lossy mantle
There are two limitations to the program: (1) The damping constant (α) is cal-
culated from the expression $\alpha = P_V'/2P$, where P denotes the is the power trans-
mitted by the core (assumed to be loss-free) and the first sheath; (2) the boun-
dary layer between the 1st and 2d sheaths is assumed to be planar. Typical re-
sults, for a waveguide with the following parameters, are presented: core diame-
ter, 35 μm; core refraction, 1.62; sheath refraction coefficient, 1.58; wave-
length, 0.9 μm. The applications of this method for designing of waveguides of
this type are discussed briefly. Figures 2; reference 1: German.

1/1

HUNGARY/WEST GERMANY

RETZ, GUENTHER, marketing director, AMP Deutschland, Langen, West Germany, and
SZALAY, MIKLOS, Dr, technical and economic advisor, Central Research Institute
for Physics, Budapest

DESIGN AND ASSEMBLY TECHNIQUES FOR CONNECTORS BASED ON MODULES

[Abstract] The authors describe briefly the "M" series of modular connectors
offered by the AMP company. This series features versatility and high connec-
ting element density, approximately five per square centimeter. The various
elements and modules were described and illustrated with drawings, photographs,
and specification charts. The two major categories of connectors involved in-
clude (a) connectors for high current transmission or signal transmission, with
twisted or solid wire, and (b) connectors for high-frequency uses and the trans-
mission of high-speed pulses. Information is provided about the contact surfa-
ces, wiring and assembly of the modular connectors and the insulating housing,
and accessories. Figures 15; table 1; no references.
1/1

HUNGARY

Mrs SARKOZY, GEZA, Dr, scientific department head, HIHI [Communications Engineering Industry Research Institute]

TECHNIQUES IN THE MANUFACTURE OF PRINTED CIRCUITS

[Abstract] The proceedings of a symposium held on 22 October 1975 at the Hungarian Chamber of Commerce were briefly described. Two West-German representatives spoke at the symposium. G. Decker, representing Chemcut GmbH in Solingen, spoke about etching, which is an important part of the manufacture of printed circuits. He discussed the classification of the etching devices and outlined their design features. Engineer Dr Tillensen, representing Isola Works in Duren, spoke about the latest achievements in the field of substrate materials for printed circuit boards, and discussed the fundamental aspects of the additive and multilayer technique materials. The speakers featured the products and methods of their respective concerns. Figures 4; tables 2; no references.

1/1

HUNGARY/WEST GERMANY

WEISSKOPF, ROLAND, marketing director, AMP Deutschland, Langen, West Germany, and KOVACS, ERVIN, graduate electrical engineer, technical advisor, Agentura Limited, Budapest

THE TECHNOLOGY OF SOLDERELESS CRIMPED CONNECTIONS

[Abstract] The materials used in solderless crimped joints must be corrosion-resistant, easily formable, and springy. Both twisted and solid wires may be used, most connectors are made of copper. The connecting component, which crimps the wires together must provide large contact area and a gas-tight seal. The major physical characteristics of the connections are the elastic recovery force, the axial recovery force, the cold-welding of the surface peaks, and reliability. Expressions characterizing these were provided. Tools for accomplishing the crimping were described and illustrated. They include the stripper-crimper, the certi-crimp, and the AMP-0-MATOR, all used by the AMP company. Figure 9; no references.
1/1   76

LUGOVOY, V.N., and STREL'TSOV, V.N.; Physics Institute imeni P.N.
Lebedev, Academy of Sciences, USSR, Moscow

ON THE POSSIBILITY OF GENERATION OF FEMTOSECOND PULSES IN THE CASE
OF STIMULATED RAMAN EMISSION IN OPTICAL RESONATORS

[Abstract] The process of stimulated Raman emission (SRE) in an
optical resonator which was discussed in three previous papers by
V.N. Lugovoy and in a number of other works is summarized. Up to
the present regimes of generation of SRE in resonators, with par-
ticipation of anti-Stokes components were not considered, which is
warranted for the case of a sufficient dispersion of the refractive
index of an active medium or for the case of a medium without dis-
persion with sufficiently large losses of the resonator at anti-
Stokes frequencies. In the present paper steady-state generation
of SRE in an optical resonator is considered for the case of a med-
ium without dispersion in the region of anti-Stokes frequencies with
relatively small losses of the resonator in this same region, and
1/3

the special features of the excitation of anti-Stokes components
under these conditions are ascertained. A resonator is postulated,
filled up to the brim by a medium active in the SRE spectrum, and
the mirrors of the resonator reflect well, both at the SRE compon-
ents under consideration and at the frequency of the exterior ex-
citing beam. It is also assumed that the exterior beam is mono-
chromatic and falls on the resonator axis, axciting one of its axial
types of oscillation. As regards the transverse modes, it is assum-
ed that in the resonator their selection is accomplished so that
only the natural oscillations with the minimum transverse index can
be excited, and is characterized only by values of the axial index.
Cases are considered where in the Stokes region only one first Stokes
component is generated and the dispersion of the refractive index of
the medium is practically absent. Excitation of the anti-Stokes com-
ponent of SRE in these conditions is considered. Various cases of
the frequency dependence of the resonator losses are investigated.
Conditions are found in which a large number of anti-Stokes compon-
ents with nearly equal values of intensities are excited when the
2/3

total anti-Stokes output radiation from the resonator constitutes a periodic sequence of ultrashort (femtosecond) pulses with a single pulse at a period. References 11: 10 Russian; 1 Western.

3/3

KOLEDENKO, G. P., MIROSHKIN, V. P., PANOVA, YA. I. and PASYNKOV, V. V.

PERMEABILITY SPECTRA OF MANGANESE-ZINC FERRITES

[Russian abstract provided by the source]

[Text] The authors study the magnetic spectra of grades 1500NM3, 2000NM1, 6000NM and 10000NM ferrites in the frequency range of 0.001-100 MHz. To obtain data close to the spectra of the material, the measurements were done on annular cores of the minimum standard size. Simple approximate curves are proposed for the frequency dependence of μ' and μ'' that agree with experimental data within the limits of rms deviations for the investigated batches of specimens. Figures 2; tables 2; references 7 Russian.

1/1

UDALOV, V. V. and POPOV, V. A.

A POLARIZATION DEVICE FOR THE MILLIMETER AND SUBMILLIMETER BANDS FOR MULTI-
MODE RECTANGULAR WAVEGUIDES

[Abstract] The article gives the results of studies of a polarization device
that can be used as a basis for construction of waveguide attenuators,
couplers, modulators and other elements. An E-polarized input signal enters
an element that rotates the plane of polarization -- a circular waveguide
containing a ferrite rod with an external magnetizing coil -- through a
tapered adapter. The wave is rotated by the Faraday effect when the current
in the magnetizing coil is changed. The arbitrarily polarized output wave
then enters a polarizing element through a tapered adapter. The polarizer
is a rectangular waveguide coupler with periodic structures in the side walls
that utilize anisotropy to couple out the H-polarized component, allowing the
E-polarized component to pass through without losses. When the length of the
coupling section is properly chosen, the H-polarized part of the wave energy
is recovered from two side branches, while the E-component with orthogonal
polarization passes through. Figures 1; references 6 Russian.
1/1

ZOLOTOV, YE.M., KISELEV, V.A., PROKHOROV, A.M., and SHCHERBAKOV,
YE.A.; Physics Institute imeni P.N. Lebedev, Academy of Sciences,
USSR, Moscow

DETERMINATION OF PARAMETERS OF OPTICAL DIFFUSION MICROWAVEGUIDES

[Abstract] Optical waveguides produced by the diffusion of various
elements into glasses and single crystals have recently received
wide application in integral optics. The principal characteristic
of a diffusion waveguide is the distribution of the refractive in-
dex n(x) with respect to its cross section, which determines the
optical properties of the waveguide. The present work proposes a
method of determining the refractive index profile by the measured
values of the effective refractive index n_m^*. This method is suit-
able for both multimode and single-mode waveguides. In particular
the method does not require determination of the parameter $\triangle n$. An
approximation of n(x) is accomplished by a combination of two
functions (parabolic and exponential) which are varied, and
1/2

USSR

conformity to the distribution sought is found with the aid of a
family of universal dispersion curves. In the case of measurements
at one wavelength it is sufficient to determine n_m^* for three modes;
if the waveguide is single-mode it is necessary to measure n_m^* at
three wavelengths. The characteristics of a diffused waveguide in
glass are determined experimentally. The method proposed in the
paper is suitable (with an appropriate choice of the approximating
functions) for determination of the parameters of "submerged"
diffusion waveguides, i.e., waveguides in which the maximum value
of the refractive index $n_1 + \Delta n$ is attained at a considerable dis-
tance from the waveguide surface. Figures 5; tables 1; references
11: 2 Russian; 9 Western.

USSR   UDC 621.372.544

BACHININA, YE.L., GAYDABURA, I.S., and FEL'DSHTEYN, A.L.

HARMONIC FILTER ON A PERIODIC EXPONENTIAL LINE

[Abstract] Until very recently harmonic filters (HF) based on het-
erogeneous lines did not have wide use because of difficulties in
construction of a synthesis theory as well as the technological
complexity of realizing the filters. At present these difficulties
have been overcome by use of computing technics and by the technol-
ogy of printed circuitry. In the process the qualities of the
filters in question become appreciable. The chief of them is the
smoothness of change of the configuration and, consequently, the
low level of parasitic effects caused by nonpropagating higher wave
types. This enables a significant shift of the operating range of a
HF to the side of short wavelengths. A heterogeneous line, fulfill-
ing the function of a HF, must have a periodic structure, because
in this case storage takes place of the reflections at the harmonic
frequencies. The present paper discusses a structure in the form of
1/2

a so-called periodic exponential line (PEL). The parameters, magnitude, the geometries of single units on which a PEL is constructed, and illustrations of a single unit and a HF on a PEL are presented in table form for two HF. It is found that, in accordance with a fixed lemma, a large signal-to-noise ratio, a set of signals which is defined by a twisted cube is optimum. The noise immunity is compared of signals corresponding to a twisted bue and a hexahedron. On the basis of the results obtained it is concluded that a set of signals corresponding to a twisted tube is optimum. Binary signals, possessing in practice the same potential noise immunity can be considered quasi-optimum, but so long as they are considerably simpler to realize, then their use is more preferable. Figures 3; tables 2; references 6: 5 Russian; 1 Western.

BELANOV, A.S., DIANOV, YE.M., YESHOV, G.I., and PROKHOROV, A.M.; Physics Institute imeni P.N. Lebedev, Academy of Sciences, USSR, Moscow

ON THE PROPAGATION OF EIGEN WAVES IN MULTILAYER OPTICAL WAVEGUIDES. II. ENERGY CHARACTERISTICS

[Abstract] This paper is a continuation of a previous paper by the authors [Kvantovaya elektronika, 3, 81 (1976)]. The present work analyzes the energy characteristics of circular laminated waveguides which include a dielectric core of a radius a with a refractive index n_1, an encircling first envelope with an external radius b and a refractive index n_2. The refractive index of the second external envelope is n_3. The investigation was conducted for six types of waveguides with a direct variation of the refractive index of the layers. The following designations are taken for convenient analysis: $\epsilon_1 = n_1^2/n_2^2$, $\epsilon_3 = n_3^2/n_2^2$, c = a/b. In contrast to earlier investigations conducted by the authors, final standard working formulas are obtained which make it possible to calculate the necessary

parameters of laminated dielectric waveguides. Specifically, strict and approximate expressions are derived for the axial energy flow, for powers propagating in waveguide layers and for the eigen waves attenuation factor. To estimate the field area occuped by the wave, an effective diameter of the waveguide cross section is introduced through which 99 percent of the total wave energy flow propagates. Results are presented of calculations of the energy characteristics for five lowest-order modes in the wide range of variations of the waveguide layers parameters. Possible development of a self-filtering waveguide is shown. Figures 13; references 5: 3 Russian; 2 Western.

2/2

ZAV'YALOV, A. S. and PEGOV, A. A.

A WIDE-BAND PHASE SHIFTER ON A CIRCULAR WAVEGUIDE

[Abstract] An approximate method is proposed for calculation of a phase shifter that is a section of circular waveguide with two diametrically opposed thin metal plates, the edges of which are equipped with a decelerating system formed by a series of cuts in the plates to compensate for phase shift dispersion. A distinguishing feature of the design is that the phase-shifting elements have practically no effect on propagation of waves with electric vector perpendicular to the plates. Estimates are made of the ranges of values within which the parameters characterizing the system must be varied (notch depth, height of the plates, period of the structure) for optimum operation. It is found that the cuts should be 1/4-1/6 as wide as the spacing between them, and no deeper than 1/4 of the minimum working wavelength. When the ratio H/R of plate height to waveguide radius is 0.4, the plate length should be (5-6)R, and thickness should be (0.05-0.06)R. The plates are beveled for better matching. Figures 4; references 5 Russian.

1/1

USSR   UDC   621.373

MESHKOV, A. N. and SHISHKO, V. I.

HIGH-POWER NANOSECOND PULSE TRANSFORMERS

[Russian abstract provided by the source]

[Text] An examination is made of the basic particulars of processes in a
pulse transformer when pulse duration is reduced to 1-100 ns at a power
level of hundreds of kW. A procedure for design of a pulse transformer is
presented that accounts for the magnetic viscosity of the core material,
commensurability of magnetic field strength and core magnetization, and the
properties of ferromagnetics in strong magnetic fields. Figures 3;
references 8: 6 Russian, 2 Western.

1/1

USSR   UDC 681.3.06

AL'TSHUL', SEMEN DAVIDOVICH, candidate of technical sciences, GSKB [State
Special Design Office], SKA (Leningrad), GIL'MAN, GENNADIY IVANOVICH,
candidate of technical sciences, GSKB SKA (Leningrad), PEN'KINA, TAT'YANA
VISSARIONOVNE, engineer, GSKB SKA (Leningrad), and RAPOPORT, YEFIM ZELIKOVICH,
engineer, GSKB SKA (Leningrad)

AN ALGORITHM FOR PRINTED CIRCUIT LAYOUT

[Russian abstract provided by the source]

[Text] An algorithm for laying out printed circuits is proposed that is based
on an algorithm of search for the optimum path in an orthogonal grid, and
that minimizes the total length of the corresponding tree in construction of
each alternative circuit. To reduce the number of unrealized connections,
the algorithm provides for uniform distribution of conductors over the plate,
and optimization of separable connections. Figures 2.

1/1

HUNGARY   UDC   621.316.5.017.71

IMRE, LASZLO, Dr, graduate mechanical engineer, candidate of technical sciences,
lecturer, and DANKO, GYORGY, graduate mechanical engineer, assistant professor,
Department of Mechanical Engineering, Faculty of Electrical Engineering, Buda-
pest Technical University

EFFECT OF CAPSULATION DESIGN ON THE WARMING UP OF CAPSULATED ELECTRIC DEVICES

[Abstract] Studies were carried out to establish the effects of geometric de-
sign, capsulating material, surface coating of the housing, and degree of clo-
sure of capsulated electric devices on the warming-up of the device. The tests
reported were carried out on a Type 25 A motor-protecting unit made for the
purposes of the project in a variety of versions. Increasing capsule size and
openness of the design reduced heating-up, and the effects of the capsulating
material depended on the degree of its thermal conductivity. Surface coating
exerts its effect through heat radiation; degree of closure through the amount
of ventilation it permits. Figures 8; tables 5; references 4: all Hungarian.
1/1

USSR

YURASOV, V. S., candidate of technical sciences and BONDARENKO, A. I., engineer

OUTPUT DEVICE FOR SYSTEMS TO CONTROL THE RATE OF MOTION OF A MAGNETIC CARRIER

[Abstract] The authors of this article describe an output device of systems for controlling the rate of motion of a magnetic carrier and give recommendations for selecting the parameters of its elements. This device is used in a system of automatic regulation of the speed of rotation of an electric motor operating on direct current with an indirect drive for the drive shaft of the tape-moving mechanism of the magnetic recording apparatus, as a result of which a high degree of stability is obtained in the rate of motion of the magnetic carrier. Figure 1.

1/1

USSR   UDC 621.315.2.016.2:621.317.333.4

PLATONOV, VASILIY VASIL'YEVICH, and SHAL'IT, GERMAN MIKHAYLOVICH

TESTING AND BURNTHROUGH OF THE INSULATION OF POWER CABLE LINES

Moscow ISPYTANIYE I PROZHIGANIYE IZOLYATSII SILOVYKH KABEL'NYKH LINIY in
Russian, "Energiya," 1975 136 pp

[Extracts] This book presents problems of testing and burnout of insulation.
Methods and norms for testing of insulation of power cable lines, devices for
testing and burnout of insulation of cables are analyzed. The book is
designed for engineering and technical personnel of power systems and in-
dustrial enterprises involved in the operation of repair of cable lines.
It may be useful to workers in planning-design and scientific-research
organizations which utilize or develop devices for the testing or burn-
through of defective cable line insulation.

CONTENTS   PAGE

1/2

USSR

2/2

USSR   UDC 621.315.687.2.004

BRANZBURG, YE.Z., BERMAN. V.I., BELOTSERKOVETS, V.V., ZAKHAROV,A.P.,
KRYLOVA, F.I., and NAMESTNIKOVA, O.A., engineers, All-Union Scientific-
Research Institute of the Cable Industry.

CABLES FOR TERMINATION OF CABLES AT A VOLTAGE UP TO 10kV FOR DAMP
LOCATIONS

[Abstract] The paper is concerned with the development of a reliable
design of a cable terminal for internal installation, especially for
damp and extra damp locations. Comparative tests concerned with a
number of factors were made under conditions close to operational of
the principal forms of end connections in use. Subsequently, a new
Mark KVE_p cable terminal was developed and subjected to tests con-
forming to those given the other cable terminals. In 1972-1973 a
test introduction of the KVE_p was carried out on the active cable
lines of Mosenergo [Moscow Regional Administration Of Power System
Management], Lenenergo, and the Rizhskiy electrical networks, where
the KVE_p units have been in operation up to the present. Figures 1;
tables 1.
1/1

GLUSHCHUK, N. I., DMITRIYEV, V. M. and ONISHCHENKO, V. V.

PARAMETRIC EFFECTS IN THIN SUPERCONDUCTIVE FILMS

[Abstract] A feasibility study is done on using superconductive films as
nonlinear elements in parametric devices, and specifically in regenerative
converter amplifiers. Impedance modulation of superconductive films in rf
fields is analyzed, and pumping conditions that give parametric amplification
are determined. It is shown that the region of parametric amplification for
a regenerative converter amplifier has a lower frequency limit $\omega > \omega_{cr}$ and an
upper frequency limit $\omega \ll (k/\hbar)(T_c - T)$ that is determined by the adiabatic
condition. The gain is calculated for a two-tank regenerative parametric
converter amplifier. The authors thank G. Ye. Churilov for helpful dis-
cussions and V. N. Svetlov for assistance during fulfillment of the work.
Figures 6; tables 1; references 7: 3 Russian, 4 Western.

1/1

DIVIN, YU. YA., ZHUKOV, A. I., NAD', F. YA., RULEV, K. A. and TURYGIN, S. YU.

A DETECTOR RECEIVER OF MILLIMETER AND SUBMILLIMETER EMISSION BASED ON A
SUPERCONDUCTIVE POINT CONTACT

[Abstract] The paper describes a receiver for the millimeter and submilli-
meter wave bands based on the detecting properties of a superconductive point
contact. A helium cryostat is used to hold the temperature at 4.2 K. The
metal cryostat is shielded by a duralumin jacket surounded by two permalloy
shields. Modulated emission is fed to the detector head by a stainless steel
light guide 30 mm in diameter with a tapered tip to 9 mm. A mechanical
device at the input of the light guide modulates the emission at 400 Hz.
Losses amount to 3 dB in the 1.5-2 mm wave band. The electrodes in the de-
tector head were made from niobium wire. The pointed electrode was made
with a tip radius of about 5 μm or less, and the flat electrode was mechani-
cally or chemically polished. Threshold sensitivity on a wavelength of
1.88 mm is $4 \cdot 10^{-14}$ W/Hz$^{\frac{1}{2}}$, which is much better than that of a similar de-
tector based on InSb. The authors thank S. A. Andreyev, Ye. V. Antyukh, and
G. F. Kalashnikov for assistance during preparation of the receiver. Figures
3; references 10: 6 Russian, 4 Western.
1/1

USSR

ARKHIPOV, PAVEL NIKOLAYEVICH

DESIGN AND MAINTENANCE OF THE "ELEKTRONIKA-DD" MACHINE

Moscow KONSTRUKTSIYA I TEKHNICHESKOYE OBSLUZHIVANIYE MASHINY "ELEKTRONIKA-DD"
in Russian, "Statistika," 1975 136 pp

[Extracts] This book contains a description of the operating principle and
design of the electronic and functional circuits of the "Elektronika-DD"
machine. This text is designed for engineers, technicians, operators and
mechanics involved in the operation, maintenance and repair of the
"Elektronika-DD" domestic electronic key-actuated computer at computer
centers, machine accounting stations, machine accounting offices, insti-
tutions and repair plants. The book may also be useful to students of
computer technology.

CONTENTS   PAGE

USSR

USSR

ARKHIPOV, NIKOLAY GRIGOR'YEVICH, BOBOROV, ALEKSANDR GAVRILOVICH, and
TARANENKO, VIKTOR KIRILLOVICH

DESIGN AND MAINTENANCE OF THE TAPE PERFORATOR OF THE "ZOEMTRON-383"
ELECTRONIC COMPUTER

Moscow KONSTRUKTSIYA I TEKHNICHESKOYE OBSLUZHIVANIYE LENTOCHNOGO PERFORATORA
EVM "ZOEMTRON-383" in Russian, "Statistika," 1975 152 pp

[Extracts] The "Zoemtron-383" electronic billing machine consists of the
basic "Zoemtron-382" machine, combined with an S8021 tape perforator.
The main type of work performed by this complex includes problems related
to the output of digital information, characters and symbols onto perforated
tape. The task of the present work is to aid students in technikums and
educational combines of the GUPK [?State Personnel Training Administration]
TsSU [Central Statistical Administration], USSR, students in Vuzes of the
corresponding specialties as well as engineering and technical personnel
of machine accounting bureaus, machine accounting stations and computer
centers.

1/2

USSR

ARKHIPOV, NIKOLAY GRIGOR'YEVICH, BOBOROV, ALEKSANDR GAVRILOVICH, and
TARANENKO, VIKTOR KIRILLOVICH, KONSTRUKTSIYA I TEKHNICHESKOYE OBSLUZHIVANIYE
LENTOCHNOGO PERFORATORA EVM "ZOEMTRON-383," "Statistika," 1975 152 pp

CONTENTS   PAGE

2/2

EAST GERMANY

GREIFF, M., Chamber of Technology, Information Technology Section, Dresden
Technical University

THE BUS STRUCTURE OF THE PROCESSING NETWORKS IN SMALL COMPUTERS

[Abstract] The author describes and compares the various ways in which the in-
ternal bus system is structured. Then, he derives typical application cases
for the major structures of the bus system. The following subjects are covered:
The 3-, 2-, and 1-bus systems; relationships between the data collection paths,
the intermediate registers, and the processing time; and applications for the
3-, 2-, and 1-bus structures. The 3-bus system requires only a single beat for
a combination operation without intermediate register; thus it is suitable for
small and process computers where fast processing is required. Very few uses
appear appropriate for the 2-bus system. The 1-bus system is simple and may
find uses in simple flexible computers, where speed is not vital. Figures 7;
table 1; references 16: 3 Western and 13 German.
1/1

USSR

KORYACHKO, V. P. [Reviewer]

MINICOMPUTERS. PRINCIPLES OF CONSTRUCTION AND DESIGN

[Review of book "Mini-EVM. Printsipy Postroyeniya i Proyektirovaniya" by
Aleksandr Vasil'yevich Palagin, candidate of technical sciences, Cybernetics
Institute, Academy of Sciences, UkrSSR, V. A. Ivanov, A. F. Kurgayev and
V. P. Denisenko, Kiev, "Naukova Dumka," 1975, 200 pp2

[Abstract] The monograph is the first Soviet book to give a systematic
exposition of the fundamentals of minicomputer design. Basic systems
requirements are considered, the influence of hardware on computer structure
is examined, and the evolution of minicomputer development is discussed.
The particulars of organizing command and address systems are analyzed.
Algorithmic, program and microprogram levels of control are described,
and an engineering technique is proposed for design of microprogram
automata. The authors also give their own ideas on software for handling
1/2

USSR

KORYACHKO, V. P., UPRAVLYAYUSHCHIYE SISTEMY I MASHINY No 4(24), Jul/Aug 76
p 140

control of technological processes and on problem-oriented program software.
The use of LSI circuitry in minicomputer design is not considered, but may
be the topic of a separate book.

2/2

POLAND

MOLISZ, WOJCIECH, Institute of Telecommunication, Gdansk Polytechnic

OPTIMIZATION OF MESSAGE ROUTING IN COMPUTER NETWORK WITH A MINIMUM
AVERAGE DELAY TIME

[Abstract] The solution of the optimization of the message routing problem
was attempted by assuming 1) the mutual independence of Poisson information
flows in the channels; 2) the exponential distribution of message lengths;
3) the independence of arrival processes at different computer nodes; 4)
the independence of service time at successive nodes; and that the average
delay of one bit flowing from a source to a terminal was related to the
average flows in the channels. Consequently, the optimal control problem
was conceived as that of finding routes for average flows while minimizing
the average delay and satisfying the known flow requirements. Under the
above assumptions the optimization may be considered as a nonlinear multi-
commodity flow problem. An algorithm is presented and difficulties connected
with the necessary computer storage capacity are discussed. A numerical
example has been computed on an ICL System 4-70 computer. Figures 1;
tables 1; references 5: 3 Polish, 2 Western.
1/1

EAST GERMANY

THOMAS, JUERGEN, graduate engineer, Institute of Communication Technology,
East Berlin

NEW SYMBOLS FOR THE REPRESENTATION OF LOGICALBINARY COMPONENTS

[Abstract] This article describes the symbol system for binary components
specified in the new East-German Standard 16,056/01 to 16,056/06. The standard
covers the principle of the symbol system, the dimensions of the symbols, the
function indicators, the inputs and outputs, logical connection members, trig-
gers, combination components, and special components. All symbols are square
or rectangular; there are no circles, half circles, and the like. One of the
reasons for promulgating the new symbol system was to facilitate computer-
aided documentation preparation. The new symbols are mandatory in documenta-
tion in international operations from 1977 onward; they become mandatory in
domestic operations from 1978 onward. The symbols are illustrated. Figures
14; tables 2; references 6: all to East-German standards.
1/1

AVAYEVA, I.G., LISOVSKIY, F.V., OSIKA, V.A., and SHCHEGLOV, V.I.

FERROMAGNETIC RESONANCE IN EPITAXIAL MIXED FERRITE-GARNET FILMS

[Abstract] In connection with the increase of work on the use of cylindrical magnetic domains (CMD) in computing technology, an investigation of the magnetic parameters of materials with CMD is of interest. From the point of view of CMD-applications, the most promising are epitaxial mixed ferrite-garnet films. The present paper is concerned with an experimental investigation of the ferromagnetic resonance properties of such films at a frequency of approximately 9500 MHz in fields up to 5000 oersted. The angular dependences were calculated of the resonance fields in such films and a comparison made of theoretical conclusions and experimental results. The effect was investigated of residual cubic anistropy and magnetostrictive stress on the resonance properties of the films. A procedure is discussed and the results are presented of measurements of the constant of uniaxial anistropy, saturation magnetization, the constant of magnetostriction and the damping parameter. Figures 8; tables 1, references 10: 3 Russian; 7 Western.
1/1

TYUTIN, ANATOLIY ALEKSEYEVICH, candidate of technical sciences, Cybernetics Institute, Academy of Sciences, UkrSSR (Kiyev); RUSTAMOV, IGOR' ANVEROVICH, graduate student, Cybernetics Institute, Academy of Sciences, UkrSSR (Kiyev); and RESHET'KO, ALEKSANDR IVANOVICH, engineer, Cybernetics Institute, Academy of Sciences (Kiyev)

INFORMATION-ENGINEERING PROVISIONS OF AN AUTOMATED SYSTEM FOR PRINTED CIRCUIT BOARD DESIGN

[Abstract] The paper describes the structure and function of the individual devices, the organization of information storage and processing, the language means of interaction of the user with the system, and some other peculiarities of a system of automated design of multilayer printed circuit boards and hybrid integrated circuits with regular packaging of circuit components, developed at the Cybernetics Institute of the Academy of Sciences, UkrSSR. The principal characteristics are presented of the application program package designed by the authors for a BESM-6 (operational
1/2

USSR

system DUBNA) electronic computer. Block diagrams are shown of the
information-engineering structure of the system of automated design,
and the engineering scheme of the automated design of printed cir-
cuit boards. The design directives (37 in number) are shown in a
table. Figures 2; tables 1, references 3 Russian.

2/2

UDC 62-525:66:681.3:62-501

Mrs BACSO, NANDOR, and MARTON, JOZSEF, Dr, MTA SZTAKI [Computer Technology and Automation Research Institute, Hungarian Academy of Sciences, and HAMPEL, ANTAL, MIKI [Instrument Industry Research Institute]

DATA ACQUISITION SYSTEM USED BY THE CHEMICAL INDUSTRY FOR ELECTRICAL AND PNEUMATIC SIGNALS

[Abstract] The system consists of the MULTIDUCER 32 unit, a 32-channel device with pneumatic channel selector and pneumatic-to-electrical converter (developed at the Pneumatics Department of the SZTAKI for the Cybernetics Institute of Cuba), described in this journal (No 4, 1974), operated in conjunction with the MINIDATA test-data acquisition system, developed at the MIKI. The MINIDATA system is a modular device containing analog signal-source interfaces, test-location selectors, analog-to-digital converters, digital signal processing units, and peripheral devices. It may be operated with microprocessor or programmable tabletop computer. The combined system may be used in various applications. Figures 5; references 4: 1 Hungarian and 3 Western. 1/1

UDC 621.3.004:621.382.82.001.4

BUROVTSEV, VYACHESLAV AFANAS'YEVICH, engineer, Special Design
Office of Scientific Instrument Construction, Siberian Department,
Academy of Sciences, USSR.; IBRAGIMOV, KAMIL SHAYKHULLOVICH,teacher,
Kishinev Polytechnical Institute imeni S. Lazo; and PODZIN, ALEKSEY
YEGOROVICH, candidate of technical sciences, Special Design Office
of Scientific Instrument Construction, Siberian Department, Academy
of Sciences, USSR.

SYSTEM OF HARDWARE-FUNCTIONAL CHECKING AND DIAGNOSTICS OF DIGITAL
CIRCUITS, CONTROLLED BY SMALL COMPUTER

[Abstract] The paper considers problems of organization, design
structures and the mathematical means of a system of checking
and diagnostics of digital units, developed on the basis of the
small "Elektronika-100" electronic computer. A block diagram is
shown of the system of checking and diagnostics developed and real-
ized in the Special Design Office of Scientific Instrument
1/2

Construction, Siberian Department, Academy of Sciences, USSR. The
peculiarities of a specialized language of the dialogue type used
to describe algorithms of checking and diagnostics of various types
of digital circuits are presented. The principal characteristics of
the system are: 1) Number of information outputs of checking unit--
up to 84; 2) Levels of output signals of system--corresponds to sig-
nal levels of elements of series 155; 3) Average time of checking of
circuit containing up to 20 IC, series 155--5 sec; 4) Translator
memory capacity--2.5 K; 5) Program of checking and diagnostics
(symbols)--2500. A test of the system during the course of a year
showed its high efficiency. Figures 1; references 6 Russian.

2/2

USSR   UDC 621.318:681.327.2

RAYEV, V. K., candidate of technical sciences, POTAPOV, V. S. and
SHOTOV, A. YE., engineers

ON THE STORAGE OF INFORMATION IN MEMORIES ON CYLINDRICAL MAGNETIC
DOMAINS DURING SUPPLY SHUT-OFF AND ON

[Abstract] The authors of this article are concerned with the
storage of information in cylindrical magnetic domain (CMD) memo-
ries. They describe the characteristic types of breakdowns in
CMD memories and the causes of them. They give an example of a
simultaneous switching of the control coils to a sinusoidal-shaped
voltage source and the commutation of the control coils with a
one-quarter period shift. The describe the case of a pulsed sup-
ply and the output circuits of the block for controlling the
field. They discuss the influence of an additional plane-parallel
field and state that in certain instances when it is necessary to
clean the memory of external parasite magnetic fields, an effect-
ive way may be transferring the working volume of the memory into
an additional magnetic screen. Figures 4; references 6: 2 Russian,
4 Western.
1/1

USSR   UDC 621.375.826

KUTSENKO, ANDREY VARFOLOMEYEVICH, candidate of technical sciences,
Physics Institute imeni P.N.Lebedev, Academy of Sciences, USSR
(Moscow); POLOS'YANTS, BORIS ARTEMOVICH, engineer, Physics Insti-
tute imeni P.N. Lebedev, Academy of Sciences, USSR; and TEREKHIN,
STANISLAV AL'BERTOVICH, engineer, Physics Institute imeni P.N.
Lebedev, Academy of Sciences, USSR.

MINI-ELECTRONIC COMPUTER IN EXPERIMENTS IN LASER LOCATION OF MOON

[Abstract] Early in 1973 a complex for laser location of the moon
was mounted on the 2.6-meter Shayn reflecting telescope of the
Crimean Astrophysical Observatory. An automation system based on a
mini-electronic computer was introduced into this complex in June
1973, after which regular sessions for location of the lunar re-
flectors began. Later on, the complex underwent some evolution mak-
ing it possible to increase the precision of measurements as well
as the efficiency and convenience of the work. As a whole the
complex is an involved installation, consisting of a laser trans-
mitter, a photodetector, a telescope with an aiming system,
1/2

USSR

receiving-measuring apparatus and an automotive system based on a
mini-electronic computer. The present paper discusses problems and
peculiarities of the minicomputer application in the experiments on
laser location of the moon. The methods, hardware and software of
a developed automated system are described. The principle of accum-
ulation of the reflected signal under conditions of change of the
distance between the earth and moon is illustrated, and a block dia-
gram is presented of the complex for laser location of the moon.
Figures 3; references 3 Russian.

2/2

USSR   UDC 681.325.54/56

GURARIY, MARK MOISEYEVICH, engineer, Scientific-Research Institute of Coal
Industry Control (Mosciw) and RUSAKOV, SERGEY GRIGOR'YEVICH, candidate of
technical sciences, Moscow Institute of Electronic Machinary (Moscow)

A METHOD OF OPTIMUM CALCULATION OF THE PARAMETERS OF LARGE-SCALE INTEGRATED
CIRCUITS WITH HIERARCHICAL REPRESENTATION OF THEIR MATHEMATICAL MODELS

[Russian abstract provided by the source]

[Text] Methods are proposed for machine calculation and optimization of
the electrical characteristics of LSI circuitry that reduce computing costs
by autonomous organization of computing processes for separate subcircuits.
The methods are applicable to calculation of systems of different physical
types. Figures 1; references 9 Russian.

1/1

GOLOVANEVSKIY, E. I., doctor of technical sciences and STOROZHENKO, A. V., engineer

ELECTRO-OPTICAL SYSTEMS OF EXTRACTING INFORMATION FROM A COMPUTER IN GRAPHIC FORM

[Abstract] The authors of this article discuss the advantages of using an electro-optical system for discrete deflection of a laser beam for displaying information from a computer onto a screen in graphic form as compared with the analogous use of cathode ray tubes. They give the experimental results and photographs of the curves computed on the computer and shown on the screen using a system of discrete deflection. Figures 2; references 6: 6 Russian.

1/1

KORABLEV, I. V. and AMANNAZAROV, A., All-Union Correspondence Institute of Light Industry and the Textile Industry

ANALYSIS OF ERRORS OF MEASUREMENT CIRCUITS IN MAGNETO-OPTICAL ANALYZERS

[Russian abstract provided by the source]

[Text] The authors calculate the mean square errors of the principal measurement circuits of magneto-optical analyzers that are caused by instability of circuit parameters and additive interference. The optimum parameters of magneto-optical analyzers are determined that minimize measurement errors, and the accuracies of the investigated analyzers are compared. Figures 1; references 9: 8 Russian, 1 Western.

1/1

USSR   UDC   681.332.3 : 681.335.7

KASHTANOV, YU. V. and UGRYUMOV, YE. P., Leningrad Electrical Engineering
Institute imeni V. I. Ul'yanov (Lenin)

AN INTERFERENCE-RESISTANT INTEGRATOR WITH LONG-TERM ACTION

[Abstract] An integrating circuit with long-term action is described in
which the integrator is a digital counter. A converter changes the analog
input signal to a pulse train with recurrence rate proportional to the signal
information parameter. The integration result (counter code) controls a
code-to-voltage converter with DC voltage output fed to one of the inputs of
a threshold comparison circuit and simultaneously through a normally closed
switch to the input of an analog memory cell. The output of this cell is
connected to the other input of the threshold comparison circuit. The
threshold voltage corresponds to one or two units of the least significant
place of the converter code. If the counter fails when the code differs
from the preceding value by an amount sufficient to operate the threshold com-
parison circuit, the information is recovered when the normally closed switch

1/2

USSR

opens, connecting a high-frequency pulse generator through logic circuits to
the counter input. As a result a rapid linear change in the counter code
takes place until the difference between the output voltages of the memory
cell and the code-to-voltage converter is again less than the threshold value,
at which point the logic circuits return the integrator to the normal working
mode. Expressions are derived for choosing the parameters of the elements
of the integrating circuit. Figures 2; references 2 Russian.

2/2

Certain Aspects of Motion Pictures
and Television

EAST GERMANY

[Unattributed article]

TELEVISION TUNER WITH DIGITAL TUNING AND TRANSMITTER MEMORY

[Abstract] A digital television tuner is described and illustrated with cir-
cuit and block diagram. It tunes digitally, taking the tuning voltage from
a memory and converting it into analog form for the tuning diode. It permits
electronic storage of transmitter settings, maintains the storage content
even with the set turned off, permits pushbutton selection and digital dis-
play of the tuned channel, is capable of being adapted to various tuners with
tuning diodes, input keyboards, display systems, and remote control systems,
is capable of being adapted to various television standards (channel distri-
bution) and cable television, is simple to operate, is compatible with chan-
nel and time display on the picture screen, and is economical to manufacture.
The unit is not yet being manufactured; only a laboratory prototype has been
built so far. Figures 2; reference 1: Western.
1/1

EAST GERMANY

HAASE, C., Central Laboratory for Radio and Television Reception Technology,
Dresden

THE LINE EFFECT IN MATRIX DISPLAY SYSTEMS

[Abstract] The line effect, which is predicated on the finite conductivity of
the electrodes and the capacitive effect of the various luminous components in
flat, matrix-type display systems, leads to very high brightness decrease, es-
pecially in high-resolution (such as TV-resolution) systems of usual screen
sizes. Among the methods discussed for reducing this effect, the most suitable
is the use of strongly non-linear luminous components or by the series-connec-
tion of nonlinear capacities or resistors in the form of thin layers. Elect-
rode-control time extension, which assumes a system with pulse-length modula-
tion, is another potential approach. Figures 8; references 5: 3 German and
2 Western.
1/1
CSO: 1860   - END -