Acoustics, Signal Processing

Optimization of Parameters of Correlation Devices for Detection of Signals
[V.V. Bessonov; RADIOTEKHNIKA, Mar 87] .................................................. 1

Reception of Phase-Keyed Signals by Acoustooptic Convolver in Presence of Background Interference
A.S. Gurevich, G.S. Nakhmanson; RADIOTEKHNIKA, Jan 87 .......................... 1

Digital Demodulation of Frequency-Modulated Signal [A.M. Movshovich; RADIOTEKHNIKA, Jan 87] .... 1

Correlational Sine-Cosine Processing of Signals in Real Receiver
[I.V. Gindler, V.G. Petnikov; RADIOTEKHNIKA, Jan 87] ................................ 1

Effectiveness of Target Detection by Radar with Synthesized Aperture
[L.G. Dorosinsky, A.A. Kurov; RADIOTEKHNIKA, Jan 87] ............................... 2

Signal Frequency Filtration Using Input Devices with Charge Coupling
[Yu. R. Vinetskiy; RADIOTEKHNIKA I ELEKTRNIKA, Dec 86] ....................... 2

Digital Demodulation of Frequency-Modulated Signal [A.M. Movshovich; RADIOTEKHNIKA, Jan 87] .... 2

Broadcasting, Consumer Electronics

Multidimensional Spatial Digitization of Television Images
[A.A. Borodyanskiy; RADIOTEKHNIKA, Mar 87] ............................................ 3

Studio Tape Recorder for Duplicating Synchronized Sound Tracks
[V.M. Lukoyanychev, O.M. Sidamonidze; TEKHNIKA KINO I TELEVIDENIYA, Oct 86] ................................................................. 3

Electric Drive with Quartz Frequency Stabilization for Kinor Film Camera
[A.Y. Vorobyev; TEKHNIKA KINO I TELEVIDENIYA, Oct 86] .......................... 3

Use of Panel-Type Sound Absorbers in Television Studios
[M.Yu. Lane; TEKHNIKA KINO I TELEVIDENIYA, Oct 86] ............................. 3

Research on Dynamic Range of Vidicons in Pulse Mode Operation
[V.P. Klimashin, L.F. Lysyuk, I.A. Preobrazhenskiy; TEKHNIKA KINO I TELEVIDENIYA, Oct 86] .................. 3

Mathematical Description of Space-Time of Television Image
[d.V. Golayzen, A.V. Mindel; RADIOTEKHNIKA, Jan 87] ................................. 4

Television Projectors with Oil Medium
[Yu.P. Gushcho; TEKHNIKA KINO I TELEVIDENIYA, Oct 86] .......................... 4

Memory-Based System of Automatic Silver-Zinc Storage Battery Charging and Discharging
[V.S. Vasilyev, O.N. Tsymbulsky; TEKHNIKA KINO I TELEVIDENIYA, Feb 87] .......................... 4

New Television Lens with Variable Focal Length
[L.I. Samsonova, I.A. Blyumina; TEKHNIKA KINO I TELEVIDENIYA, Feb 87] .......................... 4

Differential Distortions in Video Tape Recorders
[A.V. Goncharov, M.I. Khartonov; TEKHNIKA KINO I TELEVIDENIYA, Feb 87] .......................... 5

Improvement of Balanced Inputs to Electroacoustic Devices
[V.M. Potapova, E.P. Tarasov; TEKHNIKA KINO I TELEVIDENIYA, Feb 87] .......................... 5

Method for Evaluation of Quality Indices of Cinema Equipment
[L.V. Brykin, N.M. Prokofyeva, A.V. Sokolov, TEKHNIKA KINO I TELEVIDENIYA, Feb 87] .......................... 5

Antennas, Propagation

Design of Noncoaxial Homogeneous Shields [S.M. Apollonskiy; RADIOTEKHNIKA, Jan 87] ..................... 6

Comparative Performance Evaluation of Integral Equations and Basis Functions Used for Numerical Solution of Problems Concerning Thin Curvilinear Wire Radiators and Specifically Their Current Distribution and Input Impedance [I.A. Dokukov; RADIOTEKHNIKA, Jan 87] .......................... 6

Use of Multiple Compensation in Short-Wave Antenna Arrays
[V.B. Braude, A.Z. Fradin; RADIOTEKHNIKA, Jan 87] .................................. 6

Effect of Finiteness of Substrate Dimensions on Radiation Pattern of Microstrip Antenna
[A.F. Chaplin, Ye.M. Yashchishin; RADIOTEKHNIKA, Jan 87] .......................... 6

Limit of Noncoherent Storage in Telescopic Radar with Synthetic Aperture
[V.P. Sedyakin; RADIOTEKHNIKA, Dec 86] .................................................. 7
Comparison of Potential Characteristics of Detection in Radar Systems
[A.K. Cheremisov; RADIOTEKHNIKA, Mar 87] .................................................. 7

Circuits, Systems

Theoretical Basis of Oscillations of Piezoelectric Resonators Operating with Contour-Shift Modes
[V.S. Samoylov, I.I. Postinkov, M.V. Mironova; RADIOTEKHNIKA, Mar 87] .................. 8
Use of Logic Gates in Functional Modules of Receiver System
[O.A. Khandzyan; RADIOTEKHNIKA, Jan 87] .................................................. 8
Problem of Solvability of Automatic Synthesis of Designs of Television Equipment
[Ye.K. Chigarov; TEKHNIKA KINO I TELEVIDENIYA, Feb 87] ................................. 8

Transportation

Method for Selection of an Electromagnetic Suspension System
[IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA, Jan 87] ............... 9

Aerospace, Electronic Systems

Measuring Characteristics of Sea Ripple with Ship Radar
Two-Gyroscope Compass
[L.I. Kargy, Ye.G. Kizlov, V.I. Rybakov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY PRIBOROSTROIENIYE, Jan 87] .................................................. 10
Error from Inertial forces of Plotting Device of Stellar System of Coordinates in Astronavigation System
[V.I. Yushchenko, M.A. Sergeev, V.A. Levanenko, T.N. Rysakova; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY PRIBOROSTROIENIYE, Jan 87] .................. 10

Instrumentation

Digital Measurement of Amplitude of Pulses of Electric Field With Automatic Calibration of Sensitivity
[IZMERITELNAYA TEKHNIKA, Feb 87] .................................................. 11
Procedure for Data Processing in Logarithmic Time Scale  [RADIOTEKHNIKA, Mar 87] .................. 11
Evaluation of Temperature Characteristics of Slot Radiators  [IZMERITELNAYA TEKHNIKA, Feb 87] .................. 11
Evaluation of Error in Determining Chromaticity Coordinates of Objects
[IZMERITELNAYA TEKHNIKA, Feb 87] .................................................. 11
Construction Principles of One Class of Analog-to-Digital Converter of Spatial Position
[IZMERITELNAYA TEKHNIKA, Feb 87] .................................................. 11
Modernization of Method for Determining Interval Estimates of Error of Digital Instruments
[IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROIENIYE, Jan 87] .................. 12
Position-sensitive X-radiation Transducers  [PRIBORY I SISTEMY UPRAVLENIYA, Jan 87] .................. 12
Small Instrument System  [PRIBORY I SISTEMY UPRAVLENIYA, Jan 87] .................. 12
New Instrument for Geophysical Sampling of Ferrous Metal Ores, the RSK-102
[PRIBORY I SISTEMY UPRAVLENIYA, Jan 87] .................................................. 12
Miniature Pickup of All-round Pressure  [PRIBORY I SISTEMY UPRAVLENIYA, Jan 87] .................. 12
Application of Special Use Microcircuits in Scales Equipment
[PRIBORY I SISTEMY UPRAVLENIYA, Jan 87] .................................................. 12
Electrodynamics Braking of Mine Electric Locomotive
[IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA, Jan 87] .................. 13
Combined Flaw Detector for Inspection of Surface of Cylindrical Articles
[IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA, Jan 87] .................. 13
Optimization of Structure of Distributed Control Computer Systems
[IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROIENIYE, Jan 87] .................. 13
TEM1 Series of Electronic-mechanical Heat Counters
[PRIBORY I SISTEMY UPRAVLENIYA, Jan 87] .................................................. 13
Transducer of Angular Rotations  [PRIBORY I SISTEMY UPRAVLENIYA, Jan 87] .................. 13
Photodetection Device for Infrared Remote Control System
[PRIBORY I SISTEMY UPRAVLENIYA, Jan 87] .................................................. 14
Algorithmization of Control of Electric Motor Drive of Sirena-1 Self-propelled Flaw Detector

Crane Strain-measurement Scales With Data Processing by a Microprocessor

Minimization of the Permanent Memory Capacity of Microprogram Control Device Through Vertilization of Flow Chart Algorithm

Electron Devices

Comparative Analysis of Three Methods of tuning Two-Inductive Superconducting Quantum Interferometers

Optimization of Selection of Linear Decisive Limit in Two-channel Optoelectronic Detection Devices

Digital Processing of Signals at Photodetector Output

Dark Current and Noise of “Solar-Blind” Photomultipliers

Imitator of Visual Situation with Variable Contrast

Microprocessor Installation for Measuring Parameters and Characteristics of Matrix Screens

Computers

Design of Asynchronous JK-Flip Flop Based On the And-Not Logical Elements

Mathematical Models of Buffer Stores with Group Access

Microwave Theory, Techniques

Controlling Shape of Radiation Pattern in Energy Transmission Channel by Means of Microwave Beam

Integrated-Circuit Version of Balanced Twin Wideband Microwave Mixer on Two-Conductor Transmission Lines

Communications

Method of Block Synchronization of Alphabetical Codes for Digital Transmission Systems

Sampling and Storage Integrator with Large Dynamic Range

Noncoordinate Method for Determining Transmittance in Satellite Television Channels

Interference Immunity of Two-Link Communication System with Elimination of Narrow-Bank Interference in Radio Relay

Sonics, Ultrasonics

Signal-to-Noise Ratio at Output of Acoustooptical Device for Forming Interferograms
Electromagnetic Compatibility

Electromagnetic Compatibility in Model of Electronic System

[B.Kh. Kharlov, N.D. Kombakov; RADIOTEKHNIKA, Jan 87] ................................................................. 21

Power Engineering

Mechanical Characteristics of Electromagnetic Brake With a Cylindrical Ferro-Magnetic Copper-Plated Rotor  [IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA, Jan 87] ......................... 22


Magnetics

Linear Displacement Sensor Based on the Hall Effect and Phi-shaped Magnetic Lens

[IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROYENIYE, Jan 87] ......................... 23

Quantum Electronics, Electro-Optics

Use of Functional Iterations for Analysis of Oscillatory Processes in Fiber-Optical Self-excited Oscillator

[RADIOTEKHNIKA, Mar 87] ......................................................................................................................... 24

Signal-to-Noise Ratio in Optical Spectrum Analyzer With Time Integration

[RADIOTEKHNIKA, Jan 87] ......................................................................................................................... 24

Concerning Optimum Choice of Parameters of the Receiver-Transmitter of Laser Scanning System

[RADIOTEKHNIKA I ELEKTRONIKA Nov 87] ............................................................................................ 24

Solid State Circuits

Structural Transformations in Amorphous SiO₂ Films Bombarded by Medium-energy Ions

[MIKROELEKTRONIKA, Jan 87] .................................................................................................................. 25

Limiting Values of Basic Parameters Characterizing High-speed Superlarge-scale Integration with Field Effect Transistors  [MIKROELEKTRONIKA, Jan 87] .................................................. 25

Lens-screen Modules for Organization of Optical Interconnections in Superlarge-scale Integration Systems

[MIKROELEKTRONIKA, Jan 87] .................................................................................................................. 25
Optimization of Parameters of Correlation Devices for Detection of Signals
18600179a Moscow RADIOTEKHNIKA in Russian
No 3, Mar 87 (manuscript received after revision 15 Jul 86) pp 18-21
[Article by V.V. Bessonov]

[Abstract] The article considers two simple methods of separating the basic lobe of a correlation function from the lateral lobe for signals, the spectrum envelope of which is close to a rectangular form. The first uses gating and the second two additional correlation channels for nonlinear signal processing. The methods can be used in a correlation detector for which a block diagram is shown. Figures 4; references 6: 5 Russian, 1 Western (in Russian translation).

1645/12232

Reception of Phase-Keyed Signals by Acoustooptic Convolver in Presence of Background Interference
18600139a Moscow RADIOTEKHNIKA in Russian
No 1, Jan 87 (manuscript received 4 Apr 86) pp 78-82
[Article by A.S. Gurevich and G.S. Nakhmanson]

[Abstract] Reception of phase-keyed binary signals through an acoustooptic convolver in the presence of stationary normal background interference n(t) is analyzed, this interference assumed to have a zero mean value and a correlation function n(t) n(t_2) = K(t_1 - t_2). The convolver consisting of two identical ultrasonic light modulators, one behind the other, is followed by an integrating lens and then a photodetector in the focal plane of the later. The photodetector feeds electric output signals through a selective amplifier to a synchronous detector. The convolver is assumed to operate in the Bragg diffraction mode, a plane light wave entering the first modulator and a reference signal entering the second one. The signal-to-noise ratio at the receiver output is calculated on this basis, first analytically for an ideal amplifier with a rectangular frequency characteristic and a synchronous detector with two channels in phase quadrature. It is then calculated numerically for signals with Barker code or random code keying. The results indicate that the maximum signal-to-noise ratio depends on the ratio of optical signal recording time to light pulse duration. Figures 4; references 6: 5 Russian, 1 Western (in Russian translation).

2415/12232

Correlational Sine-Cosine Processing of Signals in Real Receiver
18600139a Moscow RADIOTEKHNIKA in Russian
No 1, Jan 87 (manuscript received after revision 5 Aug 86) pp 20-22
[Article by I.V. Gindler and V.G. Petnikov]

[Abstract] Correlational sine-cosine detection and extraction of signals with unknown initial phase is analyzed, considering that a real receiver for this purpose has a finite interference immunity. As performance criterion for such a sine-cosine receiver serves the peak output signal-to-noise ration, which indicates how much interference immunity is lost, assuming that only linear distortions of a signal occur in the channel. Figures 1; references 2: 1 Russian, 1 Western.
Effectiveness of Target Detection by Radar with Synthesized Aperture

18600139b Moscow RADIOTEKHNIKA in Russian No 1, Jan 87 pp 23-24

Article by L.G. Dorosinskiy, A.R. Kurov

Abstract] The effectiveness of target detection by a radar in the presence of external interference sources is characterized by the signal-to-interference ratio at the output of the signal processing channel. This parameter is calculated for a radar with synthesized aperture on the basis of relevant system characteristics, the system consisting of transmitter and receiver radar as well as target and interference sources. This parameter, essentially constituting a performance improvement coefficient, depends on the effective scattering surface area of the target but not on the energy characteristics of radar transmitter-receiver set and of interference sources. It therefore is a universal radar effectiveness characteristic which accounts for the degree of correlation between interference signals, the form of weighting function in the signal-processing channel, and the form of radiation pattern of not only transmitter and receiver antennas but also of interference sources.

Digital Demodulation of Frequency-Modulated Signal

18600139 Moscow RADIOTEKHNIKA in Russian No 1, Jan 87 (manuscript received after revision 23 Jul 86) pp 54-57

Article by A.M. Movshovich

Abstract] Digital demodulation of FM signals by way of discrete Hilbert transformation is considered, under conditions of not necessarily constant amplitude and small frequency deviation of the Kotelnikov theorem not necessarily applicable. The demodulator consists of three stages, with a computer between the input analog-to-digital converter and the output digital-to-analog converter. The algorithm of demodulation involves summation of an infinite number of terms and its accuracy therefore depends on the number of terms retained as well as on the computer precision. In the case of an input signal with the constant instantaneous frequency and without amplitude modulation the error caused by truncation of the infinite sum depends on the subcarrier phase, which fluctuates, at the time of signal reading t=kT (T-discretization interval in the analog-to-digital converter). For a specific application such as demodulation of the color subcarrier in the SECAM television system, or any other specific case, this algorithm cannot be sued as is but must be optimized with respect to accuracy. This is achieved by use of a "time window" (Hemming, Henning, Bartlett, Blackman). Figures 4; references 6: 1 Russian, 5 Western (2 in russian translation).
Multidimensional Spatial Digitization of Television Images

UDC 621.391:621.837:621.397.2.037.372

Multidimensional Spatial Digitization of Television Images
18600174b Moscow RADIOTEKNIKA in Russian No 3, Mar 87 (manuscript received after revision 11 Jul 86) pp 6-9

[Article by A.A. Borodyanskiy]

[Abstract] The article investigates the problem of hyper-trigonal digitization of an image as an essentially multidimensional function of space-time coordinates and also of the intensity and chrominance coordinates. The characteristics are obtained of n-dimensional interpolating filters, which regenerate an image according to its readings. The approach proposed represents a reliable theoretical base for optimizing the process of discrete representation of images. References 8: 7 Russian, 1 Western.

UDC 778.534.48

Studio Tape Recorder for Duplicating Synchronized Sound Tracks
18600152e Moscow TEKHNIKA KINO I TELEVIDENIYA in Russian No 10, Oct 86 p 59

[Article by V.M. Lukoyanychev and O.M. Sidamonidze, Georgian Republic Radio and Television Center]

[Abstract] The R7/a cassette tape recorder produced in Hungary is widely and successfully used for synchronized audio recording with mobile film cameras for field reporting work. However this tape recorder does not have facilities for copying the tape and attempts made at several radio and television centers to fabricate adequate copying devices have not been successful. A studio tape recorder for duplicating tapes based on the R7 tape recorder was developed at the Georgian Republic Radio and Television Center. A block diagram is given and described. Figure 1.

12497/12232

UDC 778.533.6-83

Electric Drive with Quartz Frequency Stabilization for Kinor Film Camera
18600152d Moscow TEKHNIKA KINO I TELEVIDENIYA in Russian No 10, Oct 86 pp 57-58

[Article by A.Ye. Vorobyev, Moldavian Republic Radio and Television Center]

[Abstract] At the Moldavian Republic Radio and Television Center, the 16-mm Kinor film camera is used with the Reporter-6 tape recorder which are connected by a 5 - 10 m cable for pilot signal transmission and frequency stabilization is required. However series produced quartz stabilized electric drives are not always available or are not of the required quality. A block diagram for a quartz frequency stabilization electric drive designed for the Kinor is shown and discussed and performance data are given. The design is simple, reliable because of digital processing of the control signals and utilizes the series produced 29EPSS electric drive. The unit was successfully tested on 32 Kinor cameras for 3 months. Figure 1; reference: 1 Russian.

UDC 681.8.534:621.397.618

Use of Panel-Type Sound Absorbers in Television Studios
18600152c Moscow TEKHNIKA KINO I TELEVIDENIYA in Russian No 10, Oct 86 pp 43-44

[Article by M.Yu. Lane, All-Union Television and Radiobroadcasting Scientific Research Institute]

[Abstract] Television studios are now generally soundproofed by installing acoustically prepared wood facings on wooden framing (with a surface of 90-300 m²) on walls and ceilings. New studios built for color television utilize more powerful lighting equipment and because of fire hazards the room framing is metallic and wood acoustic facing is no longer used. Soundproofing of the ceiling is especially difficult and the article describes the use of stiff sound absorbent panels covered with glass cloth suspended from the ceiling. The recommended design shown consists of 11 rows of paneling 1.05 m apart, the rows are made of 1000 x 1000 x 100 mm modules and each module consists of two panels fitted together and covered with glass cloth. The modules are suspended 700 mm from the ceiling. The design is light and easily installed. Its efficiency was demonstrated by the reconstruction of the S-300 TV studio of the Irkutsk Radio and Television Center and reverberation frequency characteristics are given for the studio. The suspended panel method was found to be satisfactory in practice for studios although the results did not conform to the reverberation time frequency characteristic standard. Tests were performed by the Scientific Research Institute for Construction Physics, USSR State Committee for Construction Affairs. Figures 2; references: 3 Russian.

12497/12232

UDC 621.385.832.564.4

Research on Dynamic Range of Vidicons in Pulse Mode Operation
18600152b Moscow TEKHNIKA KINO I TELEVIDENIYA in Russian No 10, Oct 86 pp 40-42

[Article by V.P. Klimashin, L.F. Lysyuk and I.A. Preobrazhenskiy, All-Union Motion Picture and Photography Scientific Research Institute]

[Abstract] Image distortions due to the nonlinearity of camera tube responses are especially undesirable in measurement systems using TV technology. The signal/noise ratio at the camera output is the decisive factor in
Mathematical Description of Space-Time of Television Image

18600139k Moscow RADIOTEKNIKA in Russian No 1, Jan 87 (manuscript received after revision 23 Jun 86) pp 17-20

[Article by O.V. Gofayzen and A.V. Mindel]

[Abstract] The raster formation process and the resulting space-time structure of a television image consisting of horizontal lines in a digital television system is described in a rigorous mathematical form applicable particularly to a system with solid-state signal transducers. The description is based on horizontal motion of an oblique point array and includes the scanning process. The description is obtained with the aid of a discretization function, using also the Fourier transform of the space-time pulse response of an image-synthesizing element and the frequency characteristic of the electrical channel. Figures 2; references: 1 russian.

2415/12232

UDC 681.397

Television Projectors with Oil Medium

18600152a Moscow TEKNIKA KINO I TELEVIDENIYA in Russian No 10, Oct 86 pp 31.39

[Article by Yu.P. Gushtcho, Moscow Institute of Radio Engineering, Electronics and Automation]

[Abstract] At the present time commercially viable large-screen television systems are of two types. The first utilizes a lens system to enlarge the image on the luminescent screen of the picture tube with a 7-15 cm diagonal so as to project an image of up to 2 m². However physical limitations preclude further enlargement. The second, or Eidophor type, is discussed which uses a deformable oil medium screen whose principle was invented by Fischer. The oil medium screen replaces the luminescent screen of the CRT by a deformable oil medium light valve which can retain a signal for a period of one frame which is located before a lens system and projection screen. The Eidophor principle is used for black and white and color large screen projectors (1 - 240 m²) and also for space-time light modulators in coherent processors where it be used to generate relief-phase rather than the less effective amplitude transcriptions while data input is handled at television speeds. The large-screen projectors can be used for auditoriums, control of industrial processes, remote sensing of small-scale or inaccessible events and for simulation equipment. Currently available equipment is reviewed (4 Western units and the USSR Ariston). The principle of the system, characteristics of the light deformable medium and relief imaging characteristics and generation are discussed. The circuit of the US PJ-5000 unit is described. Figures 7; references 12: 6 Russian, 6 Western (2 in Russian translation).

12497/12232

UDC 621.355.84:621.354.322.078

Memory-Based System of Automatic Silver-Zinc Storage Battery Charging and Discharging

18600113c Moscow TEKHNIKA KINO I TELEVIDENIYA in Russian No 2, Feb 87 pp 48-49

[Article by V.S. Vasilyev and O.N. Tsybulskiy, Sochiiskiy Radio and Television Center]

[Abstract] A system of automatic charge and discharge of silver-zinc (SZ) storage batteries was developed and put into operation at the Sochinsky Radio and Television Center. The system makes it possible to charge and discharge SZ storage batteries with control of the duration of charge and discharge, as well as their capacities, which made it possible to complete a battery of storage batteries with identical capacitance. Operational tests of the system showed its high reliability, and assured operation of the SZ storage batteries during filmings. At a competition of innovator proposals this development obtained third prize and a recommendation of the State Professional-Technical Academy, State Committee of the Council of Ministers of the USSR concerned with Television and Radio Broadcasting. Figures 1; references: 4 Russian.

6415/12232

UDC 681.7.067.252.6:621.397.13

New Television Lens with Variable Focal Length

18600113c Moscow TEKNIKA KINO I TELEVIDENIYA in Russian No 2, Feb 87 pp 22-25

[Article by L.I. Samsonova and I.A. Blyumina, All-Union Scientific Research of Television and Radio Broadcasting]
[Abstract] The article considers the overall and aberration parameters of the new television variable lens OTsT 10 x 10 M with a 10x focal range. Technical data are presented on the OTsT 10 x 10 M, as well as on the transmission coefficient of modulation of the lens for a frequency of 30 line/mm.

UDC 621.397.61 VM

Differential Distortions in Video Tape Recorders
18600113d Moscow TEKHNIKA KINO I TELEVIDENIYA in Russian No 2, Feb 87 pp 25-29

[Article by A.V. Goncharov and M.I. Kharitonov, All-Union Scientific Research Institute of Television and Radio Broadcasting]

[Abstract] This article describes the major reasons for differential distortions in video tape recorders. Methods for their compensation and measurement are considered. Video tape recorders which record composite color signals are used for the most part in television broadcasting. Joint transmission in one channel of brightness and chromaticity signals considerably increase the requirements on the characteristics of such a channel, and particularly to those of them which determine television crosstalk distortions of brightness/chrominance, subdivided into differential gain (DG) and differential phase. Differential distortions appreciably affect the quality of the reduced image of SECAM: e.g., DG can worsen the signal-to-noise ration in the chromaticity channel. In combination with other forms of distortions and noise they can lead to the appearance of flares on an image. Figures 5; references: 5 Russian.

6415/12232

UDC 534.86+621.395.61

Improvement of Balanced Inputs to Electroacoustic Devices
18600113b Moscow TEKHNIKA KINO I TELEVIDENIYA in Russian No 2, Feb 87 pp 12-16

[Article by V.M. Potapova and E.P. Tarasov, Central Design Bureau, Ekran Scientific Production Association]

[Abstract] Improvements are considered for balanced inputs which, with the use of transformer, make it possible to decrease considerably the dimensions and cost of the latter and at the same to increase the quality of the electroacoustic device. With galvanic decoupling, the organization of linear and mixer inputs assures a very high overload capacity with respect to input and a very small distortion over a wide range of frequencies. The development of microphone amplifiers with a new circuit diagram of the input transformer demonstrated that it is possible to obtain a low noise level with the use of conventional integrated operational amplifiers by means of an increase in the transformation ratio. Figures 6; references 4: 2 Russian, 2 Western.

6415/12232

UDC 778.53.002.658.562

Method for Evaluation of Quality Indices of Cinema Equipment
18600113a Moscow TEKHNIKA KINO I TELEVIDENIYA in Russia No 2, Feb 87 pp 8-12

[Article by L.V. Brykin, N.M. Prokofyeva, and A.V. Sokolov, Leningrad Institute of Cinema Engineers]

[Abstract] The article proposes a method for determining the quality indices of cinema systems such as resolution, nonlinear distortion, instability, film speed variation, film skipping which makes it possible qualitatively and quantitatively to reveal the effect of each of perturbation factors. On the basis of this method it is possible to determine the weight of each of the perturbation factors, and already at the stage of designing to draft a way of providing for the required quality indices of cinema equipment. Figures 1; references: 7 Russian.

6415/12232
**Design of Noncoaxial Homogeneous Shields**

18600139 Moscow RADIOTEKHNIKA in Russian
No 1, Jan 87 pp 77-78 [Annotation of article no 937-sv deposited at Central Scientific and Technical Institute 'Informsvyaz,' 13— with 3 figures and 9 biological references]

[Article by S.M. Apollonskiy]

[Abstract] A design method is proposed for multilayer shielding shells made of homogenous material with layers not exactly coaxial or concentric because of technological imprecision. Such shells, in the Rayleigh approximation, are bounded by coordinate surfaces which satisfy the conditions \( h_x = 1 \) and \( \frac{gd_x}{gd_y} = \frac{h_x}{h_y} = 0 \) (Lame coefficients, \( gb = e, l, k \) - sequence of indices). The method involves solving the Laplace equation for the magnetic scalar potential by reduction to a canonical infinite system of algebraic equations. The method is applicable to physical arrays of layers one inside another with generally not coinciding axes or centers in a homogeneous isotropic medium with magnetic permeability \( \mu_0 = 4\pi \times 10^{-7} \) H/m and electrical conductivity \( \sigma_0 = 5\times 10^5 \) S/m. It is demonstrated on the design of a spherical shielding shell. Presence of a metallic inclusion inside the shell cavity must be taken into account.

2415/12232

UDEC 621.396.670

**Use of Multiple Compensation in Short-Wave Antenna Arrays**

18600139g Moscow RADIOTEKHNIKA in Russian
No 1, Jan 87 (manuscript received after revision 30 Jun 86) pp 73-76

[Article by V.B. Braude and A.Z. Fradin]

[Abstract] Multiple compensation of reflections in cophased horizontal wideband short-wave antenna arrays is examined, its purpose being to increase the traveling-wave coefficient in the main feeder and better matching of wire dipoles with feeder lines. Appropriate linear dephasing of dipole groups is considered in preference to insertion of special transformers. Accordingly, such an antenna array consisting of \( N-2^k \) (k- integer) dephased vertical sections is designed with symmetric feed of each and parallel feed of all, dephasing of horizontal sections have been considered by other authors. The basic dimensions correspond to those of an SGD 4/8 antenna array and the calculated performance characteristics indicate the feasibility of multiple compensation by this method. Figures 4; references: 6 Russian.

2415/12232

UDEC 621.396.67

**Effect of Finiteness of Substrate Dimensions on Radiation Pattern of Microstrip Antenna**

18600139f Moscow RADIOTEKHNIKA in Russian
No 1, Jan 87 (manuscript received after revision 30 Jun 86) pp 63-67

[Article by A.F. Chaplin and Ye.M. Yashchishin]

[Abstract] The radiation pattern of microstrip antenna on a dielectric substrate is calculated, taking into account the edge effect due to finiteness of the substrate dimensions. Exact boundary conditions at the dielectric surface are replaced with impedance conditions, the model of an antenna in the approximation being an infinitely large plane with isotropic surface impedance above the substrate and zero impedance beyond it. Calculations are made for a two dimensional impedance model of such an antenna excited by surface waves. An exact analytical solution to the excitation problem for an impedance strip is not known, diffraction of surface waves by the strip edges being evidently significant enough to be included. An approximate numerical solution has been obtained with the aid of a computer, the results agreeing closely with experimental data. Figures 5; references: 4 Russian.

2415/12232

UDEC 621.371.32:538.552.2001.24
Limit of Noncoherent Storage in Telescopic Radar with Synthetic Aperture  
18600100a Moscow RADIOTEKHNIKA in Russian  
No 12, Dec 86 (manuscript received after revision 30 Jun 86) pp 13-16  

[Article by V.P. Sedyakin]  

[Abstract] A telescopically scanning radar with synthetic aperture is considered, continuous antenna position control for continuous coverage of one target surface area ensuring high-quality surveillance. Noncoherent storage of radio images for a smoother pattern evolution can yield a high signal-to-noise ratio not attainable by coherent storage. For a design and performance analysis, with superposition and summation of images included in the signal processing algorithm, the limit attainable by noncoherent storage is determined on the basis of standard relations in the approximation of plane scanning. Depending on the radar-target geometry and the radar aperture characteristics, a gain of 2-10 in the signal-to-noise ratio is found to be feasible by noncoherent image storage \( N_{\text{pairs}} \) of stored images \( 0.2 \times 2.0 \) km length of synthetic aperture, \( h = 100 \) km flight altitude, \( P = 20 \) km minimum distance on target surface from projection of radar platform trajectory to surveyed area. Figures 2; references 6: 5 Russian, 1 Western (in Russian translation).

18600139j Moscow RADIOTEKHNIKA in Russian  
No 1, Jan 87 pp 84-85 [Annotation of article No 951-sv deposited at Central Scientific and Technical Institute 'Informsvyaz,' 5 pp with 5 bibliographical references]  

[Article by V.P. Kostin]  

[Abstract] The necessary boost of the energy potential in a laser radar facility for compensation of modulating atmospheric interference, to ensure reliable detection of optical signals, is estimated relative to the intrinsic energy potential as reference level. The estimate is based on an exponential dependence of the necessary boost on the dispersion of the logarithm of signal energy and on the probability integral. With a maximum dispersion \( \text{gd}^2 = 0.64 \) in sufficiently long near-surface channels, a 0.9 or higher probability of detection should be attainable if the energy potential of the ground communication channel is boosted to a more than 3.9 times higher one.
Circuits, Systems

Theoretical Basis of Oscillations of Piezoelectric Resonators Operating with Contour-Shift Modes

UDC 621.372.412
18600174c Moscow RADIOTEKHNIKA in Russian No 3, Mar 87, pp 37-39

[Article by V.S. Samoylov, I.I. Postinkov, and M.V. Mironova]

[Abstract] The article considers the basis of the theory of oscillations of quartz resonators, the piezoelectric elements of which perform contour-shift oscillations. Such piezoelectric resonators are widely used in generators and filters operating over a large interval of temperature variations with high requirements for frequency stability. Figures 3.

Use of Logic Gates in Functional Modules of Receiver System

UDC 621.376.62
186001391 Moscow RADIOTEKHNIKA in Russian No 1, Jan 87 (manuscript received after revision 14 May 86) pp 13-17

[Article by O.A. Khandzyan]

[Abstract] The circuit design of several digital functional modules with logic gates for a receiver system is analyzed and their mode of operation is described. One such module is a wideband amplifier consisting of two AND inverter stages and a transformer either in series between them or in parallel across the first one. Another such module is a comb filter consisting of several stages with AND gates and a shifting circuit with delay lines, no capacitors and inductors. Logic conversion at each quantization level is effected here by an AND-OR inverter pair, delay lines being also replaceable by AND and OR gates. Demodulation of an FM signal without conversion to AM is demonstrated, the demodulator consisting of a frequency-division counter with a reference-pulse generator, two AND coincidence circuits, a trigger, a pulse counter with a reference-pulse generator, and a register. Extraction of the envelope and amplification of this low-frequency signal can be effected by means of a conventional decoder and additional logic gates. All these modules can be designed for large-scale integration and for operation alone or with classical modules. Figures 7; tables 1; references 8: 7 Russian, 1 Western.

Problem of Solvability of Automatic Synthesis of Designs of Television Equipment

UDC 621.397.6.001.66
18600113f Moscow TEKHNIKA KINO I TELEVIDENIYA in Russian No 2, Feb 87 pp 17-22

[Article by Ye.K. Chigarov, All-Union Scientific Research Institute of Television]

[Abstract] The article considers the conditions for computer-aided design of television equipment which can be fabricated by programmable controlled production equipment. Object characteristics must be expressible in an appropriate formal language. Description in terms of genotype predicates must be possible by means of finite sets. Synthesis functions must be reducible to partially recursive functions. Possible value for fabrication must be possible predicates of the genotype nucleus. Contradictions appearing during automated design indicate the existence of local expressions describing structural elements. References: 10 Russian.

6415/12232

6415/12232
Method for Selection of an Electromagnetic Suspension System

The article presents a procedure for selection of an electromagnetic suspension system based on a general optimized one-stage procedure for adaptation of a solution. The procedure is demonstrated on variations of autonomous systems of electromagnetic suspension with gp-shaped electromagnets. The nonlinear programming optimization problem is solved numerically by an algorithm of variable tolerance. Figures 1; references: 4 Russian.

06415/06662
Measuring Characteristics of Sea Ripple with Ship Radar

18600139e Moscow RADIOTEKHNika in Russian No 1, Jan 87 (manuscript received 14 Apr 86 pp 8-10

[Article by I.Ye. Ushakov, L.V. Yevtseyeva, S.A. Kachinskiy, and A.F. Kulikov

[Abstract] Two parameters of sea ripple, mean wave crest height and mean surface slope angle, were measured with a Mius navigational radar on a ship moving at speeds of 0-12 knots while the sea ripple varied over the 1-4 points range on the roughness scale. The instrumentation for such a contactless measurement included, in addition to the radar transceiver, an antenna-waveguide system with transfer switch and a lock-in device, a single-channel generator of probing pulses, a generator of standard microwave signals, a ferrite circulator with absorbing load, two envelope detectors, a two-channel generator of measuring pulses, a magnetic sound recorder, and a Pierce computer-aided data processing system. Probing pulses of 0.3 us duration were used for the measurements, echo signals arriving at 3° and 1.5° angles after reflection by water surface segments respectively 300 m and 600 m away from the ship being picked up for processing. The results indicate that the ripple parameters are determined with minimum error when fluctuation frequencies of echo signals are measured over the most likely time interval between two successive average-level crossovers by the envelope rather than when its mean fluctuation frequency is measured. Figures 2; references: 4 Russian.

Two-Gyroscope Compass

Leningrad IZVESTIYa VYSSHIKH UCHEBNYKH ZAVEDENIY PRIBOROSTROYENIYE in Russian Vol 30, No 1, Jan 87 (manuscript received 8 Jan 1986) pp 40-44

[Article by L.I. Kargy, Ye.G. Kizlov, and V.I. Rybakov, Leningrad]

[Abstract] A theoretical and experimental investigation is made of the scheme of a gyrocompass constructed on the basis of the two angular velocity pickups with direct reduction of a platform into the plane of a meridian. It is shown that a two-gyroscope compass, built with gyroscopes, the technical characteristics of which are approximately identical, or differ by less than 50 percent, have a higher speed of response and precision as compared with one-gyroscope schemes for gyrocompasses. Figures 2; references 5: 4 Russian, 1 Western (in Russian translation).

Error from Inertial forces of Plotting Device of Stellar System of Coordinates in Astronavigation System

18600118b Leningrad IZVESTIYa VYSSHIKH UCHEBNYKH ZAVEDENIY PRIBOROSTROYENIYE in Russian Vol 30, No 1, Jan 87 (manuscript received 3 Mar 86) pp 44-50

[Article by V.I. Yushchenko, M.A. Sergeyev, V.A. Levashenko, and T.N. Rysakova, Leningrad Institute of Precision Mechanics and Optics]

[Abstract] Algorithms are presented with which a standard program is composed for a computer which calculates the mean-square error of the plotting device for a stellar system of coordinates (SSC) from inertial forces during the steady-state movement of an object. It is shown that the mean-square error of the SSC employed for determination of the angular coordinates of an object is substantially smaller than an analogous error in pilot instruments with pendulum-correctors. The article is recommended by the Department of Onboard Control Instruments. Figures 3; references: 5 Russian.
Digital Measurement of Amplitude of Pulses of Electric Field With Automatic Calibration of Sensitivity

UDC 621.317.726.089.52:681.7.068.621.39

Instrumentation

18600146c Moscow IZMERITELNAYA TEKNIKA in Russian No 2, Feb 87 pp 44-45

[Article by V.B. Buber, Yu.A. Pivovarov, and A.A. Sokolov]

[Abstract] The article describes a self-calibrating measurer of the pulses of an electrical field which was developed with the object of decreasing errors of measurement. Together with this decrease, a reduction is achieved of the build up time of the device's transient response to 50 nanosecond. The device consists of a measurement transducer, an optical fiber link and a recorder. A block diagram of the device is shown. Figures 1; references: 2 Russian.

06415/06662

UDC 621.372

Evaluation of Error in Determining Chromaticity Coordinates of Objects

18600146c Moscow IZMERITELNAYA TEKNIKA in Russian No 2, Feb 87 pp 27-29

[Article by V.I. Lagutin]

[Abstract] Formulas are proposed for calculation of the systematic and random components of the errors of indirect measurements of the chromaticity coordinates of objects. It is shown that the component errors of such measurement are individual to each measured object and in the general case cannot be used as standardized characteristics of light-measuring instruments. References: 2 Russian.

06415/06662

UDC 535.6.088.2:001.8

Evaluation of Temperature Characteristics of Slot Radiators

18600146a Moscow IZMERITELNAYA TEKNIKA in Russian No 2, Feb 87 pp 39-40

[Article by V.I. Matveyev]

[Abstract] The article considers the temperature characteristics of a slot radiator consisting of a temperature wedge and a linearly moving slot placed before it which is used as a calibrator during certification and tests of scanning infrared systems. During conducting of thermovisual measurements employing a temperature wedge and a slot radiator it is recommended that a temperature wedge be used with a small temperature gradient with respect to the working surface, and that a slot be used with a small width and to place it in the area of a more elevated temperature of the wedge. Figures 2; references: 2 Russian.

06415/06662

UDC 681.2.088
Modernization of Method for Determining Interval Estimates of Error of Digital Instruments

Modernization of Method for Determining Interval Estimates of Error of Digital Instruments

[Abstract] The article considers a method for increasing the precision of an experimental evaluation of the limits of random errors of digital measuring instruments (DMI) whose total error includes quantization, systematic as well as random components. This method makes it possible, without change of the experimental procedure or with small changes, to increase considerably determination of the interval values of the error of DMI during their testing. The article is recommended by the Department of Information Measurement Technology. Figures 1; references: 5 Russian.

06415/06662
UDC 681.586:621.386

Position-sensitive X-radiation Transducers

[Abstract] The article presents the basic technical characteristics of the RKD-1 type position-sensitive x-radiation transducer which uses a NAV-1 resistance filament anode. Position-sensitive X-radiation transducers and instruments developed on their basis have applications in geology, scientific research, criminology and silicon and germanium crystal testing. Figures 1; references: 4 Russian.

06415/06662
UDC 621.757.008:658.82.011.56

Small Instrument System

[Abstract] The article describes the prototype of a specialized microcomputer system designed for realization of portable measuring instruments of low and medium complexity. Figures 2; references: 4 Russian.

06415/06662
UDC 550.834

Miniature Pickup of All-round Pressure

[Abstract] The article describes a small pickup using a silicon crystal whisker as a primary converter. It is used for measurements of the all-round pressure of liquid and gaseous media in the 0-10^5 pascal range. It can also be used for operational control of the blood pressure of the human body. Figures 1; references: 3 Russian.

06415/06662
UDC 681.26:681.325.5-181.4

Application of Special Use Microcircuits in Scales Equipment

[Abstract] The article is concerned with the problem of creating electromechanical scales which have the same precision (or better) than mechanical scales, but free from their deficiencies. The steps taken in the creation of...
a scale with high-speed, output into an automatic control system and equal with respect to cost to mechanical devices are described. References: 2 Russian.

06415/06662

UDC 622.625.28-83

Electrodynamic Braking of Mine Electric Locomotive
Novocherkassk IZVESTIYA VYSSHIKH UCHEBYNYKH ZAVEDENIY: ELEKTROMEKHANIKA in Russian No 1, Jan 87 (manuscript received after revision 24 Aug 87) pp 107-110

[Article by Mark Vasilyevich Chashko, candidate of technical sciences, scientific worker, Donetsk Polytechnical Institute]

[Abstract] An experimental check is performed on the drive of a mine electric locomotive in a dynamic braking regime, and a source of proneness to accident is shown. A circuit with cutoff is proposed, and the results are presented of an experimental and theoretical investigation of this circuit. The circuits are shown of electrodynamic braking with feedback and with cutoff. Figures 2; references: 2 Russian.

06415/06662

UDC 621.039.546.3

Combined Flaw Detector for Inspection of Surface of Cylindrical Articles
18600120b Novocherkassk IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA in Russian No 1, Jan 87 (manuscript received after revision 6 May 85) pp 82-86

[Article by Nikolay Fedorovich Nikitenko, candidate of technical sciences, senior scientific worker, Novocherkassk Polytechnical Institute, Nikolay Nikolayevich Luska, senior scientific worker, head of division, Novocherkassk Polytechnical Institute, Anatolii Leonyevich Shmal, post-graduate student, Novocherkassk Polytechnical Institute, and Pavel Grigoryevich Vinichenko, engineer, Novocherkassk Polytechnical Institute]

[Abstract] The article considers the block diagram of a flaw detector, equipped with eddy current and photoelectric transducer whose characteristics were obtained on specimens with artificial defects. Results are given of tests of the flaw detector on samples of satisfactory and defective articles. Figures 3; references 2: 1 Russian, 1 Western.

06415/06662

UDC 536.6

TEM1 Series of Electronic-mechanical Heat Counters
18600112e Moscow PRIBORIY ISISTEMY UPRAVLENIYA in Russian No 1, Jan 87 pp 32-33

[Article by Engineers R.Z. Aloyev, G.s. Ter-Israyelov, and B.G. Brodskiy]

[Abstract] The article considers the TEM1 parametric series of electronic-mechanical heat counters developed by the Special Design Office for Petroleum Technical Instruments, Baku, and intended for measurement of the total amount of thermal energy and the heat carrier on the individual, group, or central inputs of closed (without removal of heat carriers) networks for the water supply of urban and rural residential and public buildings. The principles of operation of the IPKT1 standard converter which enters into the make-up of the TEM1 are described and the technical characteristics of the TEM1 are given. Figures 2.

06415/06662

UDC 531.74.084.2

Transducer of Angular Rotations
18600112d Moscow PRIBORIY I SISTEMY UPRAVLENIYA in Russian No 1, Jan 87 p 29

[Article by M.V. Lakomkin, engineer]

[Abstract] The article describes a transducer of angular rotations developed at the Kubyshev Aviation Plant, with the linear characteristic of the angle-voltage in the plus or minus 60 degree range, an error not exceeding 0.4
percent, and a resolution of plus or minus 2°. The external dimensions of the unit are 40 x 40 mm. This transducer is recommended for use in various devices used in automatics, telemechanics, and measuring techniques. Figures 1.

06415/06662
UDC 621.384.3

Photodetection Device for Infrared Remote Control System
18600112c Moscow PŘIBORY 1 SISTEMY
UPRAVLÉNIYA in Russian No 1, Jan 87 p 32

[Article by Engineers V.A. Kononov and V.S. Alekhin]

[Abstract] The article discusses a photodetection device for an infrared remote control system. A block diagram is shown for a spark-safe photodetector for environments with explosion hazards. The technical characteristics of the device are given. Tests showed that for a photodetector device with a power of 180 mW the maximum operating distance was 25 m, operation was possible in buildings of volumes up to 200 m³ because of signal reflection while under underground conditions the range was 3-5 m.

06415/06662
UDC 620.179.1:620.165.29

Algorithmization of Control of Electric Motor Drive of Sirena-1 Self-propelled Flaw Detector
18600112b Moscow PŘIBORY 1 SISTEMY
UPRAVLÉNIYA in Russian No 1, Jan 87 pp 24-26

[Article by L.N. Lozovoy, candidate of technical sciences]

[Abstract] The article describes one of the most optimum algorithms of control of the electric motor drive of the Sirena-1 self-propelled flaw detector, based on a developed system of commands. Block diagrams of the algorithms are presented of the start and stop of the equipment in a prescribed position, switching on of X-ray radiation and analysis of the environmental parameters, as well as a description of the functional circuit of an assembly of detectors and the principal of decoding the command. Operation of the proposed algorithm is considered. Series production of the “Sirena-1” started at the Burevëctnik Scientific Production Association (Leningrad). The equipment is the first robotics complex in the USSR for control of the quality of the welded seams of main pipelines during their construction. Figures 3; references 3: 2 Russian, 1 Western.

06415/06662
UDC 681.327

Minimization of the Permanent Memory Capacity of Microprogram Control Device Through Vertilization of Flow Chart Algorithm
18600118] Leningrad IzVESTIYA VYSSHIKH UČEBNYKH ZAVEDENIJ; PRIBOROSTROYENIYE in Russian Vol 30, No 1, Jan 87 (manuscript received 27 Jan 86) pp 23-27

[Article by A.a. Barkalov, Z.O. Dzhaliashvili, and V.N. Strunlin, Donetsk Polytechnical Institute]

[Abstract] The article proposes a method for optimizing the permanent memory capacity of a microprogram control device, based on “splitting” of the operational vertices of the interpreted flow chart of an algorithm. In this way, compatibility is obtained of all the microoperations, and the problem of optimum encoding of the operational part of the microcommand is simplified. An analytical evaluation is made of the proposed method and the method of encoding the combined microoperation fields, and the area of effective use of the proposed method is determined. The increase in the time for fulfillment of the algorithm is small. The article is recommended by the Department of Electronic Computing Machines. Figures 3; references 5: 4 Russian, 1 Western.

06415/06662
**Comparative Analysis of Three Methods of tuning Two-Inductive Superconducting Quantum Interferometers**

UDC 537.312.62:621.396.6

Comparative Analysis of Three Methods of tuning Two-Inductive Superconducting Quantum Interferometers

18600118e Leningrad Izvestiya Vysshikh Uchebnikh Zavedeniy: Priborostroyeniye in Russian
Vol 30, No 1, Jan 87 (manuscript received 25 Nov 85 pp 51-54

[Article by S.V. Arkhremenko, A.Yu. Petrov, and A.V. Filimonov, Novosibirsk Electrical Engineering Institute]

[Abstract] The article considers three methods of tuning two-inductance superconducting quantum interferometers (SQVI) at room temperature, which are distinguished by the design of the coil of the oscillatory circuit, inductively coupled with the SQVI. A comparative analysis is made of the sensitivity of these methods. The experimental results agree well with theoretical calculations. The article is recommended by the Department of Information Measuring Techniques. Figures 2; references: 4: 3 Russian, 1 Western.

6415/12232

UDC 621.384.31

**Optimization of Selection of Linear Decisive Limit in Two-channel Optoelectronic Detection Devices**

UDC 621.383.292.029.75

Optimization of Selection of Linear Decisive Limit in Two-channel Optoelectronic Detection Devices

18600118h Leningrad Izvestiya Vysshikh Uchebnikh Zavedeniy: Priborostroyeniye in Russian
Vol 30, No 1, Jan 87 (manuscript received 27 Sep 85 pp 69-73

[Article by D.S. Kozarev and G.I. Leshev, Leningrad Institute of Precision Mechanics and Optics]

[Abstract] The article evaluates a method for selection of the decisive limit in two-channel optoelectronic detection device (TODD) and a method is presented for selection of the optimum linear threshold limit. The method is applicable in the design of TODD with built-in microprocessors for data processing and analysis. The article is recommended by the Department Faculty (Kafedra) on Optoelectronic Devices. Figures 4; references: 3 Russian.

6415/12232

UDC 681.32

**Digital Processing of Signals at Photodetector Output**

UDC 531.8

Digital Processing of Signals at Photodetector Output

18600118g Leningrad Izvestiya Vysshikh Uchebnikh Zavedeniy: Priborostroyeniye in Russian
Vol 30, No 1, Jan 87 (manuscript received 4 Oct 85 pp 73-80

[Article by V.I. Kalinchuk, Leningrad]

[Abstract] The article considers an algorithm for digital processing of signals at the photodetector output with the signals presented by a precise non-uniform filtered Poisson input. For known signal, noise and input circuit parameters the procedure can be realized by series-produced analogue/digital converter microprocessors or single-chip microcomputers. Figures 5; references: 3 Russian.

6415/12232

UDC 621.383.292.029.75

**Dark Current and Noise of “Solar-Blind” Photomultipliers**

UDC 531.8

Dark Current and Noise of “Solar-Blind” Photomultipliers

18600118h Leningrad Izvestiya Vysshikh Uchebnikh Zavedeniy: Priborostroyeniye in Russian
Vol 30, No 1, Jan 87 (manuscript received 16 May 86 pp 81-85

[Article by V.A. Usachev, Kazan]

[Abstract] The article considers the basic components of dark current and the nature of anode current noise. A criterion for selection of photodetectors is proposed and the construction for fastening the FEU [photoelectric multiplier]-142 in an optoelectronic device for detection of vacuum ultraviolet is illustrated. A comparison of the experimental and calculated values of the anode current noise of the FEU-142 is also illustrated. Figures 4; references: 2 Russian.

6415/12232

UDC 531.8

**Imitator of Visual Situation with Variable Contrast**

UDC 531.8

Imitator of Visual Situation with Variable Contrast

18600118h Leningrad Izvestiya Vysshikh Uchebnikh Zavedeniy: Priborostroyeniye in Russian
Vol 30, No 1, Jan 87 (manuscript received 11 Mar 86 pp 86-89

[Article by N.F. Gusarova, A.V. Demin, and G.V. Polshchikov, Leningrad Institute of Precision Mechanics and Optics]

[Abstract] Imitators of a visual situation (IVS) are actively used during production and tests of optical and optoelectronic devices and device complexes, as well as during training of operators for their exploitation. A number of problems in contemporary complexes have stimulated the development of new IVS which assure imitation of a large number of the parameters of the visual situation and have improved precision. The present article proposes a scheme for construction of an imitator of visual situation with the possibility of a smooth change of the contrast of the image observed up to its conversion in an IVS. The article is recommended by the Department for Special Optical Devices. Figures 1; references: 9 Russian.
Microprocessor Installation for Measuring Parameters and Characteristics of Matrix Screens

This materially improves the quality of devices and the area of their application. Specific data are presented with respect to an installation used for investigation of modulation characteristics. A block diagram of the device is shown and the flow chart of the measurement algorithm is given. Figures 4; references: 2 Russian.

[Article by U.Yu. Usmonov and F.M. Yablonskiy]
Design of Asynchronous JK-Flip Flop Based On the And-Not Logical Elements
Leningrad IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROYENIYA in Russian Vol 30, No 1, Jan 87 pp 32-36

[Article by M.V. Luchko, Lvov Trade and Economics Institute]

[Abstract] Functioning of an asynchronous JK-flip-flop as an asynchronous finite automation is described by normal transfer tables and yields, and the design of its asynchronous sequence of circuits based on And-Not elements is presented. The article is recommended by the Department of Technology for Processing Economic Information. References: 10 Russian.

6415/12232
681.142.6

Mathematical Models of Buffer Stores with Group Access
18600118a Leningrad IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROYENIYE in Russian Vol 30, No 1, Jan 87 (manuscript received 21 Mar 86 pp 36-39

[Article by V.A. Popov, Leningrad Institute of Aviation instrument Engineering]

[Abstract] The article proposes and analyzes the organization of buffer stores using the group access method. Previously buffer stores delivered a single record but with access handling all messages accumulated in the store to this moment are accessed, i.e., it is completely cleared. The analysis uses a model which takes into account both the external parameters which characterize the flows of single record accessing and access handling, and the interior time parameters—the expenditure of time on recording and readout of one message which characterize memory reaction time. The article is recommended by the Department of Automated Control Systems. Figures 2; references: 3 Russian.

6415/12232
Controlling Shape of Radiation Pattern in Energy Transmission Channel by Means of Microwave Beam

UDC 621.396.67.001.24

[Article by V.A. Vanke, S.K. Lesota, and A.V. Rachnikov]

[Abstract] The possibility of controlling the radiation pattern in the energy transmission channel of a solar space power system is examined, specifically controlling the direction of maximum radiation intensity, also in the case of a fixed wave parameter \( \frac{g_1 R_1 R_2}{\lambda D} \) (\( R_1 \) - radius of transmitter antenna, \( R_2 \) - radius of receiver antenna, \( D \) - distance between antennas, \( \lambda \) - radiation wavelength). For an analysis of the problem are determined variants of such a channel with maximum efficiency of energy transmission from the aperture of one antenna to that of the other by a microwave beam with a constant ratio of maximum power density within its cross-section to power density at its edge. The power density distribution in the plane of the receiver antenna is treated as a function of the radial coordinate, with the maximum power density not necessarily at the center. Another important control optimization criterion are two surface utilization factors characterizing the transmitter antenna and the receiver antenna respectively. On this basis, it appears to be feasible to suppress the side lobes of the microwave radiation field to below the USSR medical standard safety limit of 10 gmW/cm² in a more than 90 efficient energy transmission channel, with an up to 58 antenna surface utilization factor on the receiver side. Figures 3; references: 2 Russian.

02415/06662

UDC 621.396.621

Integrated-Circuit Version of Balanced Twin Wideband Microwave Mixer on Two-Conductor Transmission Lines

UDC 621.396.65

[Article by B.Ye. Pustovarov, V.A. Lukyanchuk, and O.N. Chesnokov]

[Abstract] An integrated version of a balanced twin microwave mixer with a bandwidth exceeding two octaves is described which includes compensated exponentially nonlinear transitions on two-conductor transmission lines matching the four-diode lattice. The chip topology and the equivalent circuit are shown, the latter including not only the input impedance of the transitions but also the series resistances of the diodes and the output inductance. Two-conductor transmission lines are preferable to coaxial microstrip lines, because they provide matching over a wider frequency range and they allow a higher degree of integration. Figures 2; references: 5 Russian.

02415/06662
Method of Block Synchronization of Alphabetical Codes for Digital Transmission Systems

UDC 621.394.662

Article by G.S. Markaryan, G.G. Khachatryan, and L.G. Khachatryan

Abstract: A method of block synchronization for digital transmission systems is proposed which makes it possible to use all the synchronizing capacity of an alphabetical code. A synchronization protocol is described using to full synchronization capacity of the code and a realization of the block synchronization system is described and illustrated into a block diagram. The parameter for code synchronization is used as a criterion and a procedure for parameter evaluation is described allowing comparison of codes. An evaluation is given for the currently used 6V-4T code. Figures 2; references: 6 Russian, 4 Western (1 in Russian translation).

Sampling and Storage Integrator with Large Dynamic Range

UDC 621.396.62

Article by Ye.S. Poberezhskiy, M.V. Zarubinskiy and V.D. Zhenaton

Abstract: In connection with digital radio receiving devices, results are presented of an experimental investigation of the dynamic range of a sample sampling and storage integrator realized by means of series-produced microcircuits and intended for digitization of narrow-band oscillations. A block diagram of the integrator is shown and described. An evaluation is given of the factors affecting the dynamic range of these devices. The circuit used for measuring the dynamic range is shown. Figures 4; references: 5 Russian.

Noncoordinate Method for Determining Transmission Time for Satellite Television Channels

UDC 621.397.23.092.2.08:629.783

Article by Yu.A. Fedorov, Yu.D. Ivanova, and A.I. Savelev

Abstract: A method is considered for determining the transmission time for satellite television channels which does not require knowledge of the earth satellite coordinates. According to the values of the transmission time measured at the check point the time of distribution as far as the reception point is determined with an error of 1-23 microseconds. An analysis is made of the error connection with long-duration measurements of the location of the earth satellite. Figures 2; references: 3 Russian.
UDC 621.391

Signal-to-Noise Ratio at Output of Acoustooptical Device for Forming Interferograms
18600174h Moscow RADIOTEKHNIKA in Russian No 3, Mar 87 (manuscript received after revision 29 Mar 1986) pp 79-82

[Article by V.A. Golub]

[Abstract] The recording of amplitude-phase spectra in real time by holographic methods presents problems and the interferogram method is considered an alternative. The article demonstrates that during processing of the radio signal of an acousto-optical device for forming interferograms, the presence of additive noise leads to the appearance at its output of nonstationary optical background noise, the mean value of which contains a component oscillating with a frequency equal to the difference of the frequencies of the controlling oscillations of the deflectors. The analytical ratios obtained make it possible to evaluate the background noise level, and to determine the signal-to-noise level at the output of the acousto-optical device for forming interferograms.

References: 5 Russian.

06415/06662
Electromagnetic Compatibility in Model of Electronic System

[Abstract] A multilevel model of an electronic system is constructed by the hierarchical procedure, taking into account its complexity and the totality of all elements including control devices. It is then represented as a standard black box with a set of input signal, a set of control signals, and two sets of output signals related through a real vector in the space of states as functions of time. On the basis of this model is established the EMC space for system elements, for analysis and synthesis of the system. The steps to ensure electromagnetic compatibility are accordingly structuration of the system and simulation of interactions of elements with analysis of their frequency distribution at the lowest level. This is followed by conversion of signals, for determination of the state of each element at a fixed instant of time, then construction of the EMC space of input-output signals for each system element and scanning for the condition of orthogonality. Next follow construction of the EMC space of converted input signals, calculation of the EMC factor for the system, and, after the system has been checked for orthogonality, determination of other incidental EMC estimates. Figures 3: references: 4 Russian.
Mechanical Characteristics of Electromagnetic Brake With a Cylindrical Ferro-Magnetic Copper-Plated Rotor

UDC 62-592.35.001.24

[Article by Leonid Alekseyevich Potapov, candidate of technical sciences, assistant professor, Bryansk Institute of Transportation Machine Construction]

[Abstract] The analytical dependence of the moment of an electromechanical brake with a cylindrical ferromagnetic copper-plated rotor versus the frequency of rotation, the geometrical dimensions, and other constructional factors is obtained on the basis of electromagnetic field theory. As a special case of this dependence, formulas are obtained for the moments of an electromagnetic brake with massive and hysteresis rotors. These formulas were checked by comparing the calculated mechanical characteristics with the experimental. The good correspondence of the experiments and calculations bear witness to the accuracy of the equations and the advisability of their use in engineering practice. Figures 5; references: 6 Russian.

Grid Model of Periodic Processes of Generalized Static Electromagnetic Energy Converter With Bar Magnetic Circuit

UDC 621.3.01

[Article by Roman Vladimirovich Filts, doctor of technical sciences, senior scientific research worker, Institute of Applied Problems of Mechanics and Mathematics, USSR Academy of Sciences, and Orest Vladimirovich Semchishin, senior engineer, Institute of Applied Problems of Mechanics and Mathematics, USSR Academy of Sciences]

[Abstract] Modelling of a generalized static energy converter is required for design purposes. The article proposes an algorithm for calculation of the periodic processes in a device consisting of a bar magnetic circuit with an arbitrary scheme of a magnetic circuit and a set of windings connected to an arbitrary electrical circuit. The algorithm was realized in FORTRAN-IV for a Yes-1060 computer. Reference: 6 Russian.
UDC 621.318.538.26

Linear Displacement Sensor Based on the Hall Effect and Phi-shaped Magnetic Lens
186001181 Leningrad IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROYENIYE in Russian Vol. 30, No 1, Jan 87 (manuscript received 2 Jan 85) pp 55-58

[Article by V.I. Prokoshin and V.G. Shepelevich, Belorussian State University imeni V.I. Lenin]

[Abstract] The article considers the design of a linear displacement sensor based on the Hall effect and a phi-shaped magnetic lens made up of a magnetic circuit in the form of a ring, and permanent magnets, in which a moving rod consisting of alternating ferromagnetic and nonferromagnetic disks causes a periodic change of the induction of the magnetic field close to the surface of the permanent magnets. The effect of the lateral displacements of the moving rod and the external magnetic fields on the change of the components of the magnetic induction in the gap of the linear-displacement transducer is investigated. The article is recommended by the Department of the Physics of Solids. Figures 3; reference: 1 Russian.

06415/06662
Use of Functional Iterations for Analysis of Oscillatory Processes in Fiber-Optical Self-excited Oscillator

[Abstract] The article considers the use of modified functional iteration equipment for analysis of the oscillatory processes in self-excited oscillators, which makes it possible by simple methods to model a regime of stochastic oscillations. The apparatus consisted of a photodiode, amplifier, laser, spectrum analyzer, oscillograph and light guide. Modelling of the chaotic oscillation made is useful for investigation of the structure of a strange attractor in a self-excited oscillator and for determination of stochastic regimes, which are undesirable during practical employment of a self-excited oscillator. Figures 4; references: 10 Russian

Signal-to-Noise Ratio in Optical Spectrum Analyzer With Time Integration

[Abstract] The noise in an optical spectrum analyzer with time integration of the light intensity distribution is evaluated, such an analyzer having a much better resolution than one with space integration of the light intensity distribution. Processing of an optical signal diffracted in the first order involves its transfer from the acousto-optic modulator to the photosensitive surface of a charge-coupled device, onto which is also projected a reference light wave with rotating phase front. The signal-to-noise ratio here is calculated by the energy method, assuming a finite frequency band of the optical signal and a very short transit time for an acoustical wavefront through the modulator relative to the optical signal recording time so that noise charge constitutes the principal interference. An expression is obtained as a result which indicates that the signal-to-noise ratio can be maximized by adjustment of the “exposure ratio” (amplitude of optical signal wave squared to amplitude of reference wave squared) according to the power within the envelope of the analyzed optical signal. Figures 3; references 4: 1 Russian, 3 Western.

Concerning Optimum Choice of Parameters of the Receiver-Transmitter of Laser Scanning System

[Abstract] On the basis of a spatial-frequency analysis, the errors are considered of measurement of the heights of surface irregularities by a laser scanning system (LSS) measuring distance by the phase method, it is shown that for a surface with known statistical characteristics, parameters of a LSS can be selected, with which errors of measurements, depending both on the effect of spatial filtering and on the precision of evaluation of the phase of the intelligence signal during Gaussian noise, are minimal. A block diagram of the LSS is presented. Figures 2; references: 10 Russian.
Limiting Values of Basic Parameters
Characterizing High-speed Superlarge-scale
Integration with Field Effect Transistors
18600138b Moscow MIKROELEKTRONIKA in
Russian Vol 16, No 1, Jan 87 (manuscript received 28
Mar 86) pp 3-14

[Abstract] Design and performance of superlarge-scale
integration on the basis of field-effect transistor gates are
examined from the standpoint of physical characteristics
and engineering criteria. Three types of field-effect trans-
sistors for circuit integration are compared, namely
silicon MOSFETs, Schottky-barrier FETs, and selective-
dy-doped heterostructure FETs. Their basic physical
characteristics are channel length and channel width,
threshold voltage determining the reliability, breakdown
current limiting the supply voltage, switching work, and
effective drift velocity of charge carriers. The engineer-
ing criteria for their integration are packing density and
mean length of coupling lines. An analysis of applicable
theoretical relations and available numerical data indicates
ways to increase the switching speed and the
attainable limits in terms of circuit dimensions and
layout for necessary charge carrier transfer and heat
dissipation. Tables 3; references 38: 20 Russian, 18
Western (2 in Russian translation).