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Reference Aid
The Co-Inventors' Network of V.V. Borisov
for Fast Oscilloscope Technology

H.D. Burton

June 1990

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Technology Information Systems Program
Lawrence Livermore National Laboratory

June, 1990

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THE CO-INVENTORS' NETWORK
OF V.V. BORISOV
FOR FAST OSCILLOSCOPE TECHNOLOGY

FOREWORD

As part of the United States-Soviet Union Joint Verification Experiment (JVE) in 1988, the Soviets debuted to the West a fast-oscilloscope, single-signal recorder (SRG-7). Messrs Borisov, Zbritsky, Kudryakov, Golyshev, Zotov, and Mikhailov were participants in the JVE.

This collection of Soviet patents, then, is derived from a computerized association of inventors. It is an example of a reference aid for analysts observing technologies which can be created using presently available computer technology to electronically access and analyze unclassified information. The association process starts with a known inventor (in this case Vladimir V. Borisov), identifies co-inventors in the patent literature, and finally compiles the technologies of the group. The intention is to place an inventor's publications into a group perspective and to identify the group and institutional affiliation. The following pages contain about 60 Soviet patents and nearly 70 co-inventors who were associated by this process.

As background, the Soviet patent laws of 1924 as modified in 1931 granted the state exclusive right to an invention. The law was revised in 1989 to grant exclusive right for 20 years to the patent holder. Between 1931 and 1989 patent invention practice often includes the inventor's enterprise managers (and others as required) as an offering to get needed enterprise development funds for an idea. The new law offers inventors more compensation for ideas, establishes a development funding system independent of the enterprise and gives many "perks" for foreign use of the inventions.

The association process is strongest in groups where the practice of adding enterprise names to the list of inventors is commonplace. This appears to be the case presented here.

The approach used to compile this body of information could be used to study any discipline for which relevant databases exist and could be carried out in bibliographic databases as well as patent files. The wealth of information available on-line increases daily and the software used in the project provides the means to tap into it and extract meaningful and useful subsets.

Introduction

The following reference aid was developed using commercially available on-line databases from which information was retrieved using sets of names as the retrieval keys. The retrieved information was then further processed and analyzed using software developed by LLNL's Technology Information Systems Program. The software supports three kinds of functions - format conversion and translation, information analysis, and report generation.¹

The data retrieval was done iteratively to increase the relevance of the retrieval results. Schematically, the retrieval process is shown in figure 1. The original search, or starting point, was a list of inventors' names developed from manual co-inventor pairing. After all patents by these individuals were retrieved, a subset of information was produced by computer program that selected those patents with any pair of names from the original list. The assumption was that if two individuals collaborated on a patent then the work might be more relevant. From this subset of the records, a new master list of all inventors was produced. The original starting list names were removed and the remaining names became the retrieval list for the second iteration. Software was created to identify the paired-inventor subsets and derive the follow-up name lists. The process was continued through four iterations at which point no new names were retrieved and closure of the set occurred.

Once the final retrieval set was compiled, various electronic sorting analyses were done. Of major use in this project were the frequency distribution, cross correlation, and concordance. These programs are described below.

Frequency Distributions

This program produces a list of unique number of occurrences for the inventors' name and for the institutional affiliation field. Because of the lack of standardization across databases and inconsistency even within databases, the alphabetical list can be very useful in bringing together

1

Burton, H. D. Bibliographic Post-Processing with the TIS Intelligent Gateway: Analytical and Communication Capabilities. Lawrence Livermore National Laboratory, Livermore, CA UCID-20529 (September 1985).

Burton, H. D. "Use of a Virtual Information System for Bibliometric Analysis." Information Processing & Management 24(1):39-44. 1988.

FIGURE 1

inconsistency even within databases, the alphabetical list can be very useful in bringing together and identifying variants such as multiple forms of the same name. Subsequently, we manually edited the data file to eliminate some of these inconsistencies. The existence of spelling inconsistencies is a significant problem when dealing with foreign names and institutions.

Cross-Correlation

Included in the reference aid is a co-inventor cross correlation which provides an alphabetical listing with frequency of occurrence for all individuals who have co-invented any given work in the retrieval set. Other correlations can be performed on subsets within a field or across combinations of fields. Examples are a co-authorship correlation done within the authors field while subject trends over time is a correlation done between fields (indexing terms vs. date of publication).

Concordance

Because large numbers of co-inventors occur, this index brings together all entries for a given inventor. In general, the concordance program indexes any user-specified field in the file. It will produce an alphabetical list of the items occurring in that field with a reference to their location for further look-up.

Construction of this reference aid

This reference aid is made up of patents with English abstracts and figures. The English abstract and citation information were obtained from different on-line computerized information services. A computer program was used to merge the two files. The figures are from microfilm copies of the original patents that were optically scanned and digitized and combined with text. The file was sorted and formatted using the LLNL Process software.

Since the on-line patent files include coverage only as far back as 1968, earlier patents are not included.

The Patents

This section contains the V.V. Borisov associated Soviet patents in numerical order. The country code SU (Soviet Union) represents the country in which the patent was issued. The 6 or 7 digit patent number is assigned by the patent office. The suffix letter denotes the type of patent, i.e., T = follow-up to earlier patent; U = original patent citation. The data YY.MM.DD is the date of issue of the patent, not the inventor's date of claim.

1. SU 281657-T 78.02.28

Berkovskij, Arkadij G.

PHOTOMULTIPLIER WITH SEVERAL APERTURED ELECTRODES - HAS SUPPLEMENTARY ELECTRODES AT NEGATIVE POTENTIAL TO ENSURE LOGARITHMIC CHARACTERISTIC. 68.01.17 SU 1210990/68-A [68SU-210990]. (SU-281657) Multiplier, suitable for multi-stage multiplying systems, has an advantage that the operational amplitude characteristic has a logarithmic law. This is obtained by making holes in certain emitters (1). Behind the holes supplementary emitters (2) are located and have a negative potential (10 - 20 volts). The secondary electrons which leave the secondary emitters and which pass the grid, arrive at the subsequent stage. Log characteristic can be obtained by careful choice of the emitter voltages.

2. SU 297329-T -80.10.07

Berkovskij, Arkadij G.

VACUUM PHOTOCELL FLATE ASSEMBLY - HAS TRIANGULAR RECESSES IN PHOTOCATHODE BACKING, WITH ANODE PLATES LYING IN BISECTING PLANES OF RECESSES. 69.10.20 SU 1368650/69-A [69SU-368650]. (SU-297329) Distortion of output signals is reduced by making triangular recesses in the photocathode (1) metal backing (2). The anode plates (3) lie in the bisecting planes of the above recesses. Making the anodes in the form of plates (3) reduces the number of photoelectrons bombarding the glass (1), but does not suppress them completely. They are further reduced by the recesses in the photocathode (1) and by placing the anode plates (3) as above. Bul. 37/7.10.80.

3. SU 334918-T 81.03.31

Guselnikov, V.G.; Berkovskij, Arkadij G.; Tsygankova, I.I.

HEAVY CURRENT PULSE PHOTOCCELL - HAS ADDITIONAL GRID BETWEEN ANODE AND GLASS ENVELOPE TO PREVENT SELF-EXCITATION. 70.08.13 SU 1466209/70-A [70SU-466209]. (SU-334918) The photocell delivers high output currents. Its self- excitation is eliminated and output pulses accurately reproduce the input signals by placing a highly transparent metal grid (4) between the anode grid (2) and envelope (3) close to the latter. The additional grid (4) is at the anode potential and is connected to the anode grid (2). Bul. 12/30.3.81.

4. SU 341370-T 76.03.25

Shkunov, V.I.

**HIGH SENSITIVITY CATHODE RAY TUBE - ADDITIONAL MAGNETIC LENS
GIVES INCREASED SENSITIVITY OF BOTH DEFLECTION SYSTEMS. 71.04.29 SU
1651745/71-A [71SU-651754]. ABSTRACT field unavailable.**

5. SU 392572-T 76.07.25

Pavlov, Sergej I.

STORAGE ELECTRON BEAM TUBE LINE NON PARALLELISM CORRECTION - SINGLE SIDE WRITE AND READ GUNS CORRECTED BY VARYING BEAM VOLTAGES AND MAGNETIC DEFLECTION. 71.12.31 SU 1731814/71-A [71SU-731814]. ABSTRACT field unavailable.

6. SU 392834-T 76.07.25

Berkovskij, Arkadij G.

PHOTOELECTRONIC HIGH RESPONSE MULTIPLIER DESIGN - HAS ACCELERATING GRIDS COAXIAL WITH EMITTERS WITH CONCENTRIC RADII OF CURVATURE OF ALL STAGES. 71.12.31 SU 1731935/71-A [71SU-731935]. (SU-392834) The photoelectronic multiplier contains photocathode (1), emitters (2), acceleration grids (3), screens (4) and anode (5). All the components have a curvilinear surface e.g., part of a cylindrical section which makes the photomultiplier self-focussing. This is because the electron flux emitted by any part of the emitters (2) always accelerates towards the center of the grids (3) which ensures high coefficient of trapping of the primary and secondary electrons. Additionally the electrons trajectory and radial drift are relatively small which ensures high response of the system.

7. SU 464030-T 75.03.15

Berkovskij, Arkadij G.

SINGLE LIGHT SIGNAL CHRONOGRAPH RECORDING - BY COLLECTING SECONDARY ELECTRONS ON SECOND POTENTIAL CARRIER AND SHAPING A CHARGE IMAGE. 73.07.05 SU 1939217/73-A [73SU-939217]. (SU-464030) When fast-moving physical processes which are accompanied by light radiation are to be investigated by chronography of the light signals, an electronic image is created on a potential carrier by means of a stream of photoelectrons. The charge image is reproduced in a luminescent screen by a read beam, directed on the surface. The sensitivity threshold can be improved, and also the accuracy, if the secondary electrons, which are emitted by the surface of the potential carrier when a charge image is applied, are collected on the surface of a second potential carrier. A charge image of the same shape as on the first potential carrier, but with an opposite sign, is produced on it. The information can be read by an electron beam, produced by a thermoelectric gun of the oscillographic type which is arranged at an angle to the photoelectric gun.

8. SU 530311-T 76.09.30

Predein, Boris A.

MULTI-CHANNEL TIME INTERVALS. METER - HAS TIME PULSE COUNTER CONNECTED TO MEMORY FOR SEPARATE READOUT FROM CHANNELS. 74.07.22 SU 2048928/74-A [74SU-048928]. (SU-530311) Multi-channel recorder of time intervals for experimental physics, specifically in particle accelerators and radar systems consists of time counter, whose output is connected through memory to output register. To reduce the size, the equipment includes address decoder and address shift registers. Incoming time pulses pass through AND gates (5) to address decoder (4). Clock pulses are supplied from counter (1) to memory (2). Control pulses to address register (6) initiate simultaneous switching of addresses of input channels. The successive time intervals are recorded in memory for new addresses. The equipment registers input pulses in the order of their arrival storing the pulses in memory (2) and including simultaneous pulses from all channels. Control signal to address register (6) are provided in time intervals which are shorter than the appearance of pulses in the channels. Readout of information is controlled by address registers (6 and 7) and output register (8).

9. SU 536595-T 76.11.25

Arkhipov, Valentin K.; Vygovskij, V.V.; Stefankov, Viktor F.

TIME SCALE PULSE CONVERTER - HAS X AND Y COORDINATE FORMING UNITS WITH SIGNAL CORRECTION ALONG SEGMENTS. 75.08.22 SU 2167156/75-A [75SU-167156]. (SU-536595) Converter is suitable for fast single pulse measurement eqpt. where micro- and nano-second time ranges are necessary. It has an advantage of high accuracy which is achieved by the introduction of X and Y co-ordinate forming units, signal correction along the segments, commutation field decoder direct code converter. Circuit consists of record scan generator (1), sub-lighting pulse generator (2), starter (3), memorizing cathode ray tube (4), readout raster generator (5), calibration unit (6), readout unit (7), automation unit (8), magnetic memory (9), indicator unit (10), digital converter (11) X co-ordinate forming unit (12), Y co-ordinate forming unit (13), correction signal unit (14), correction factor sign determining unit (15), summator (16), commutator (17), encoder (18), and direct code to supplementary code converter (19).

10. SU 551723-T 77.03.25

Pavlov, Sergej I.

**DEFLECTING SYSTEM OF THE TRAVELING WAVE TYPE FOR A CATHODE RAY
TUBE. 75.01.06 2093572/75-A [75SU-093572]. Abstract not available.**

11. SU 573088-A1 81.03.30

Berkovskij, Arkadij G.; Kostin, A.B.

LOGARITHMIC AMPLITUDE CHARACTERISTIC PHOTOELECTRONIC DEVICE - HAS PHOTOCATHODES BETWEEN SCREENS AND ENTRY WINDOW, IN PLACE OF SCREENS FOR SMALL FLUX HANDLING. 75.10.03 SU 2178193/75-A [75SU-178193]. (SU-573088) The device is intended for wide range detectors of ionizing radiations, and directly for registration of light fluxes whose amplitude varies in a wide range. The device dynamic range is widened towards small light fluxes by placing cathode plates (5) in the place of the screens (3), between them and the entry window. A photoemissive layer is applied on both sides of these plates (5). Owing to non-uniform accelerating gradient at the photocathode (5) emissive surface and the ribbed electrode (1), limiting of the emission current by the electrode space charge takes place at different densities of the emission currents. Provision of a multiplying stage widens the dynamic range towards small light fluxes by about a number of times equal to the coefficient of secondary emission of the emissive layer on the ribbed electrode (1). At a cathode sensitivity of some 30 micro A/lumen and coefficient of secondary emission of the ribbed electrode (1) of about 10, the device operates in a range of light flux between 10 to the fifth and 10 to the eight lumen. Maximum output current is more than 10A. Bul. 12/30.3.81.

12. SU 578661-T 77.10.30

Petrov, Igor A.; Yavor, Stella-Ya.

FOCUSSING ASSEMBLY OF TELERECORDING ELECTRON BEAM TUBE - HAS LINEAR FOCUSSING ELECTRODE FITTED WITH RECTANGULAR GAP FOR BETTER RESOLUTION. 75.04.04 SU 2125278/75-A [75SU-125278]. (SU-578661)
Multicolored electron beam tube is used for telerecording and for better resolution along the axis of the cathode, the electron gun is supplied with focusing electrode with rectangular gap of length greater than distance between peripheral electron beams. Tube contains two-part electron gun (1), splitting diaphragm (2), multi-channel modulator (3), linear focusing electrodes (4), crosswise focusing electrode (5) and information receiving block (6).

13. SU 597088-U 78.03.05

Stefankov, Viktor F.; Arkhipov, Valentin K.; Rybak, Vyacheslav V.; Saratovskij, Evgenij N.

PULSE ENGINEERING TIME SCALE CONVERTER - HAS READ SIGNAL FORMER CONNECTED BETWEEN READ-OUT UNIT AND MEMORY AND ANGULAR CORRECTION COEFFT. FORMER WITH ADDER AT OUTPUT. 76.05.17 SU 2363292/76-A [76SU-363292]. (SU-597088) Time scale converter measures single, short-lived processes lasting for micro-and nanoseconds. The present model is an improved version of the converter patented under No. 536595. The prototype contains recording scanning generator (1), illumination pulse generator (2), starter (3), memory CRT (4), readout raster generator (5), calibrating unit (6), readout unit (7), automatic control unit (8), memory (9), indicator (10), digital converter (11), X and Y coordinate formers (12 and 13), correction signal extractor (14), sign discriminator (15), adder (16), commutator board (17), encoder (18), and simple code to complementary inverse code converter (19). The disadvantage of the prototype consists in its systematic amplitude error of 2 - 3% and a dynamic error, whose size is determined by the slope of the input signal, and can reach 5 - 10%. To increase the accuracy of conversion, the modified converter contains readout signal former (20) and angular correction coefft. former (21) in extruding and packing.

14. SU 600709-T 78.03.30

Golovkov, Viktor P.; Fominoŭ, Viktor A.

PULSE ENGINEERING AMPLITUDE DISCRIMINATOR - HAS CONTROL UNIT, INTEGRATOR AND DELAY LINE WITH CONTROL UNIT ACTING AS PHASE INVERTER WHEN INTEGRATOR IS USING VARICAP DIODE. 75.12.03 SU 2195008/75-A [75SU-195008]. (SU-600709) Discriminator can be used in devices for measurement of parameters of electric signals, time intervals etc. and accuracy is increased by provision of a control unit (4) and of series connected integrator (5) and amplitude discriminator (6). The control unit (4) is inserted between delay line (2) input and one of the integrator (5) inputs. The integrator's other input is connected to a comparator (3) output. Signals A and B with a maximum and minimum amplitude are applied. When the maximum and minimum amplitude signal (A) is selected, a pulse (v) appears at the comparator (3) output. When the minimum amplitude signal is selected, comparator (3) delivers a pulse (g). Both pulses have the same amplitude. The former pulse appears before the latter, and their spacing (Δt) determines the instability of "tying-in" time.

15. SU 615828-A1 81.03.30

Berkovskij, Arkadij G.; Kostin, A.B.

ELECTRON VACUUM TUBE ELECTRONS MULTIPLIER SYSTEM - HAS ACCELERATING GRIDS LOCATED ECCENTRICALLY WITH RESPECT TO ANODES WITH CURVATURE RELATED TO PRECEDING ANODE. 76.10.22 SU 2414593/76-A [76SU-414593]. (SU-615828) System is suitable for high vacuum techniques and for tubes with high time resolution. It has advantages of fast action, achieved by the location of accelerating grids, eccentrically w.r.t. the corresponding dynodes, so that in each pair of dynode-accelerating grids, the center of curvature of the grid is displaced w.r.t. the center of curvature of the dynode in the direction towards the preceding part of electron beam by the distance 0.45 - 0.55 of the line dimension of the dynode. Dynodes (1) have curvilinear surfaces in the form of a part of a cylindrical surface and the accelerating grids (2) have identical form to the dynode at the center of curvatures and are oriented at a distance approximately equal to the half of the width of the dynode. The width of the gap between the adjacent dynodes and the grid is not the same. Where there are ten stages, the time of the path consists of 0.3 nano-seconds. Bul. 12/30.3.81.

16. SU 624245-T 78.09.15

Smirnyj, Mikhail F.

NON-STANDARD CARRIER READ-OUT UNIT FOR AUTOMATIC CONTROL - WITH UNITY OUTPUT OF TRIGGER CONNECTED TO INPUT OF FIRST AND-GATE AND READ-OUT FROM E.G., MAGNETIC DATA CONDUCTOR RAILS. 76.09.13 SU 2403695/76-A [76SU-403695]. (SU-624245) This data readout unit is useful in automatic control. It can be used for readout from non-standard data media, e.g., conductor rails on which magnetic recordings are made. The advantage is the greater reliability and simplicity. As the carriage of the readout unit proceeds, any pulse signals from the readout units which are supra-threshold, switch the triggers in the sequence determined by the topography of the marks read from the rails. Any considerable fluctuation of the heads after trigger operation no longer changes the state of the triggers, and so eliminates malfunctioning in playback. The AND-gates produce "1" or "0" according to the readout marks. To increase efficiency, the inlet channel (5) is provided with sprung splitters (12) which can be rotated. Additional atomizers (11) are placed along the directing sleeves between the slide valves. Receiving bunkers (13) are placed opposite each slide valve (10).

17. SU 629506-T 78.10.25

Zotov, Vadim V.; Mikhajlov, Viktor N.; Predein, Boris A.; Selivanova, Emma G.; Chernikov, Vladimir I.

RECORDING SINGLE ELECTRIC SIGNALS SHAPE - BY CONSECUTIVE INTEGRATION AT GIVEN MOMENT AND MEMORIZING SIGNAL INTEGRAL VALUES AND THEIR CODES. 77.01.03 SU 2437823/77-A [77SU-437823]. (SU-629506) Earlier method consists in selecting discrete values of a signal, storage, conversion into digital code and then shape restitution by these values. For more accurate recording, the input signal is integrated consecutively at the moment $t_i = i\Delta t$, where $i = 1, 2, 3, \dots, n$; Δt - digitization interval, and the integral values of the signal and their codes are memorized. Described method for recording the shape of single electric signals is useful in investigating signals down to the nanosecond width range. Accuracy is increased because the signal band is narrowed on integration and short pulses can be formed to reduce dynamic error and error due to stroboscopic signals. Error is within 1 - 2% for 100 digitization points.

18. SU 630738-T 78.10.30

Borisov, Vladimir V.; Zyuzin, Lev N.; Yakovenkov, Leonid R.

ELECTRON-OPTICAL SCAN CALIBRATION SYSTEM FOR PHOTO-REGISTERS - WITH LIGHT PULSE TRAIN FORMER HAVING UNEQUAL LENGTH LIGHT CONDUCTORS FOR NANOSECOND AND PICOSECOND RANGE CALIBRATION ACCURACY. 77.06.13 SU 2498562/77-A [77SU-498562]. (SU-630738) An electro-optical scan calibration system for photo-registers has a former of a light pulse train, which has unequal length light conductors. The conductors are connected to the light source output and the driving generator produces single pulses, which are in the nano- and piezo-second range. The synchronizing block (4) signal is simultaneously applied to start a driving generator (5) and to start an electro-optical converter (1) timing scan. The generator (5) single pulse excites the light signal source (6), which is applied to the former (7). This signal is converted into a light pulse train by the delay action of the light conductors. The objective (2) is for the transmission of the tested process and the objective (3) is for the transmission of the calibrated pulses.

фиг. 2

19. SU 640245-T 78.12.30

Arkhangelskij, Igor A.; Zabolotnyj, Nikolaj; Golovkov, Viktor P.; Shikhmanov Sergej S.

NANOSECOND TIME INTERVALS METER - HAS MAIN AND AUXILIARY COUNTERS, AND SERIES-CONNECTED ADDER DECODER AND REGISTER. 77.07.27 SU 2514088/77-A [77SU-514088]. (SU-640245) High speed time interval meter in nanosecond range has gates (7 - 11) main binary-decimal counter (6) and auxiliary counters (1 - 5). Incoming signal T is applied to input of gates (7 - 11) second input of which is connected to a sequence of time pulses shifted by dT . Initially all gates are closed and counters (1 - 6) are set to zero. During measurement of time interval T switches (7 - 11) open consecutively and transmit counting pulses to triggers (2 - 5) of auxiliary counters and to counter (1) through subtraction circuit (12) and OR-gate (13). Subtraction circuit (12) deletes one pulse from counter (1). Correcting circuit (14) transmits signal to OR-gate (13) when recorded number of pulses in counters (1 - 5) differ by more than two units. Adder (15) registers sum of pulses of auxiliary counters. The sum is encoded in circuit (16) and transmitted to register (17).

20. SU 647643-T 79.02.15

Arkhangelskij, Igor A.; Zabolotnyj, Nikolaj; Chernikov, Vladimir I.

BRIEF TIME INTERVALS METER - HAS MEASUREMENT CHANNEL CONNECTED VIA GATE AND TRIGGER TO SECOND CHANNEL. 77.02.23 SU 2456269/77-A [77SU-456269]. (SU-647643) Meter of short time intervals for radar computer, automation systems and experimental physics has a counter (1) connected through memory (2) to address decoder (3). To extend range of application measuring channel is connected by gate (4) and trigger (6) to a second similar channel. Initially counters (1) are in home position. After a start pulse counter (1) registers strobe pulses. Stop pulse passes through open gate (4) to coincidence circuit (5) with second input from trigger (6). Stop pulse is transmitted to address decoder (3) of first channel. Each time interval is entered into memory (2) in binary code. When the memory of first channel is filled, pulse is applied to trigger (6) of first channel and to the start lead of second channel. Operation of trigger (6) cuts off coincidence gate (5).

Fig. 1

21. SU 669427-T 79.06.25

Berkovskij, Arkadij G.; Gubanov, Yuriy; Pavlov, Sergej I.

MFG. METHOD FOR MULTI-COMPARTMENT IMAGE-CONVERTER TUBE - BY INVERTING INTERMEDIATE PHOTOCATHODE AFTER PHOTOCATHODE PROCESSING, AND USING HT FOR AGEING WITH PUMP EVACUATION. 78.01.02 SU 2562931/78-A [78SU-562931]. (SU-669427) Conversion coefft. is increased and the noise level is decreased by having the photocathodes of two adjacent compartments processed simultaneously on a gas-evacuating stand. After processing, the intermediate photocathode is turned over. Then the image-converter is aged by a high voltage, while continuously evacuating it by a pump. The photocathode of the luminescent screen substrata is kept by a wire, which is later burned-out. The photocathode is turned over by a magnet with following fixing. The ageing and the evacuation remove particles of alkaline metals.

22. SU 674117-T 79.07.15

Petrov, Igor A.; Yavor, Stella Ya.

CHARGED PARTICLE ELECTRON-OPTICAL FOCUSING SYSTEM - HAS CORRECTOR HAVING FOUR PLANES OF SYMMETRY, SET PERPENDICULAR TO OPTICAL AXIS, IMPROVING IMAGE. 76.04.12 SU 2345114/76-A [76SU-345114]. (SU-674117) Improved image from the optoelectronic unit (1), as well as easier adjustment and simplified design are due to the spherical aberration corrector having an electrode with a hole and has four symmetry planes, its location being perpendicular to the optical axis which passes through the center of the hole. The beam of electrons is focussed by the optoelectronic unit (1) the lenses of which exhibit a positive spherical aberration. This deflects the electrons from the optical axis, the beam interacting with the electrostatic field of corrector (2). The octupole component of the field deflects the beam reducing spherical aberration.

23. SU 693481-T 79.10.25

Arkhipov, Valentin K.; Sapezhko, Arkadij Ya.

SINGLE ELECTRIC SIGNAL SCALE-TIME CONVERSION - BY PREPN. OF CRT DIELECTRIC TARGET BY MULTIPLE RASTER SCANNING USING ELECTRON BEAM. 76.01.04 SU 2307976/76-A [76SU-307976]. (SU-693481) Method is suitable for radioelectronics and automation. It has advantage of fast recording, achieved by use of a multiple raster scan by electron beam, whose current during the preparation is equal to the beam current during readout. The preparation is done automatically after the "start" button is pressed. This starts trigger (1), valve (2) passes pulses from master generator (3) via OR-gate to the raster scan-forming circuit (5), memory CRT (6), and to counter (7). The output signal from counter (7) resets trigger which stops the incoming pulses. The number of stages in the counter is equal to the raster cycles. The recording is done automatically after the signal has arrived. The output signal starts the time scan forming circuit (8) and via delay unit (9) is passed through the tube (6).

24. SU 701427-A1 81.07.30

Voronov, B.F.; Kozhunov, Y.U.I.; Predein, Boris A.

IONIZED RADIATION SEMICONDUCTIVE DETECTOR - USES SEMICONDUCTIVE SENSOR CABLE LINE AND SHORT-CIRCUITING CABLE LINE SECTION TO INCREASE SENSITIVITY AND TIME RESOLUTION. 78.03.20 SU 2592035/78-A [78SU-592035]. (SU-701427) Semiconductive detector (ionized radiation) uses semiconductive sensor connected to the cable line. Also capacitor is parallel connected to the sensor output and to the cable line output a short-circuiting cable section is connected. The capacitor capacitance C and the short-circuiting cable section length l and the sensor thickness d are expressed by mathematical relations- t_i is significantly smaller than ρC and significantly greater than $2l/v_k$ also d/v is significantly smaller than t_i ; where t_i is the radiation pulse length, ρ is cable line wave resistivity, v_k is field velocity in the cable line v is travel speed of non-equilibrium carriers. This allows increase in the time resolution and detector sensitivity. The radiation induced in sensor (1) is the current pulse which charges the summary capacitance. As a result into the cable line input passes pulse voltage $F(t)$ expressed by mathematical expression. The voltage pulse $F(t)$ along the cable line (2) passes to the short-circuiting cable section (4). The signal $F(t)$ has narrow band frequency as compared with the examined pulse $I(t)$ therefore passing along the cable line it will be less distorted. At the branching point in (4) signal divides and one half reflects from the short-circuited cable end changing polarity without amplitude change and returns with delay $\Delta t = 2l/v_k$ to the branch point. As a result the signal $W(t)$ passed to output is defined by mathematical expression and its form will repeat the radiation pulse form. Bul. 28/30.7.81 (5 pp. Dwg. No. 1).

Фиг. 1

Фиг. 2

Фиг. 3

Фиг. 4

25. SU 714543-T 80.02.05

Shkunov, Vladimir A.; Borisov, Vladimir V.

TWIN-BEAM OSCILLOGRAPH - HAS TIME-BASE OSCILLATOR WITH SEPARATOR OF AUXILIARY BEAM FOR SEMICONDUCTOR TARGET. 77.08.22 SU 2549160/77-A [77SU-549160]. (SU-714543) Faster scan of oscillograph is achieved by reducing the output capacitance of the time base oscillator as well as of the assembly. The oscillator has a unit for separating and forming an auxiliary beam while the semi-conductor target 16 is intersected by the latter. Reduced distortion of image and enhanced focusing are achieved with two oscillators of time base. Oscillator 1 feeds pulses between cathode 5 and control electrode 6 of the electron gun forming the main beam by the action of anode 7, focusing electrode 8 and separating diaphragm 9. In the absence of the beam there is only a small leakage current and the negligible capacitance between the target and time base 12 allows speed of scanning to be high.

26. SU 714635-T 80.02.05

Arkhipov, Valentin K.; Saratovskij, Evgenij N.; Rybak, Vyacheslav V.; Stefankov, Viktor F.; Zbritskij, Igor E.

PULSE RECORDING TIME SCALE CONVERTER - HAS CRT CHARGE STORAGE DUTY CONTROL FOR CONVERSION OF INPUT SIGNAL FREQUENCY SPECTRUM TO OBTAIN DIGITAL DATA. 76.12.29 SU 2435335/76-A [76SU-435335]. (SU-714635) Known circuitry contains the input signal delay circuit (1), recording sweep generator (2), storage cathode-ray tube (3), frame sweep generator (5), brightening pulse (6) and line sweep (7) pulses, calibrator (8), control unit (9) with control signal input, readout amplifier (10), digital converter (12), magnetic memory (19), strip perforator (20), and indicator (21). The invention is related to pulse technology, esp. recording appts. for single microsecond and nanosecond pulse. It serves for more accurate determination of the scale of the converted signal in units of real time. The underlying principle is conversion of the frequency spectrum of the signal to be recorded by means of a CRT storage device on charge storage duty and effecting time-scale conversion of the signal being recorded. A systematic 2% error is reduced.

27. SU 717801-T 80.02.25

Arkhipov, Valentin K.; Aniskin, Fedor F.; Volgin, Aleksandr N.; Vygovskij, Anatolij V.

VISUAL DISPLAY UNIT WITH AUTOMATIC SCALE SELECTION - HAS SHIFT REGISTER OUTPUTS TAKEN TO COMMUTATOR AND COMPARATOR WITH OUTPUT TAKEN TO IDENTITY UNIT. 77.10.17 SU 2534876/77-A [77SU-534876]. (SU-717801) Manual scale selection is replaced by automatic selection and increase in speed of operations achieved by adding a shift register, comparator, identity unit and commutator to prototype design. To set a 1-1 scale, an external signal is applied to the shift register, which produces a code of an n-digit binary number representing the number of individual locations on the matrix panel along the ordinate. In accordance with this code the commutator connects a decoder to the lower digit outputs of the memory unit.

Arkhipov, Valentin K.; Aniskin, Fedor F.; Volgin, Aleksandr N.; Vygovskij, Anatolij V.

ADJUSTABLE IMAGE DATA DISPLAY APPTS. - HAS PULSE GENERATOR OPERATING AT EXTERNALLY VARIABLE FREQUENCY INTO COINCIDENCE GATE CONNECTED TO COUNTER. 77.11.28 SU 2547319/77-A [77SU-547319]. (SU-739583) Data display appts. for control and computing has greater accuracy by provision for attaining an image size such that the vertical dimension of the screen is fully occupied. The memory (1) receives code correspondence to the ordinates of the investigated signal. Associated parts in rendition of the recordings on the matrix screen (3) are the decoders (2 and 4), counter (5), pulse generator (6), and comparator (7). The pulse generator operates at the frequency f_1 . Now another pulse generator (13) operates at frequency f_2 along with counters (8 and 9), register (10), coincidence gates (11 and 12), divider (14), and delay circuit (15). Since the rendition process is periodical, the frequency f_2 can be varied by external adjustments while viewing the signal on the screen. When the code of the third counter equals that of the second counter, the code of the ordinate of the investigated signal is changed by a factor of f_1/f_2 . When the image fully occupies the screen, its scale is $1-f_1/f_2$. Bul. 21/5.6.80.

29. SU 752401-T 80.07.30

Golovkov, Viktor P.; Zabolotnyj, Nikolaj; Shikhmanov, Sergej S.

NANOSECOND RANGE PULSE REGISTRATION - USING SIGNAL FED FROM OR-GATES TO ANALOG SWITCHES, ENABLING INCREASE OF MEMORY CAPACITY.
74.12.20 SU 2085916/74-A [74SU-085916]. (SU-752401) To increase precision of registration, the device has a unit to functionally convert the discrete signal levels and to store them. At the input of the functional network, is switched an analogue switch (1), connecting via the time line (2), with the storage units (3 - 8). Each of the latter consists of series connected precision resistors and storage capacitors. The storage unit can be mfd. in two separate elements, to maintain a memory and scanning of the delay line. The storage units (3 - 8), via the analogue switches (9 - 14) are switched to the null potential bus. Control of the analogue switches (9 - 14) is carried out by signals from the outputs of the correspondence two pulse logical OR elements, connected in the logical unit (15). Sum singular inputs of the logical OR elements of unit (15), are switched to the controlling inputs of the analogue switches (1 and 16). Other inputs of the logical element of unit (15) are switched to the pulse distribution units (17). The starting input of the pulse distribution unit (17) and the controlling inputs of the analogue switches (1 and 16) are switched to the output of the threshold element (18). Bul. 28/30.7.80.

Физ 1

Фиг. 2

30. SU 758949-A1 81.09.07

Arkhipov, Valentin K.

TIME SCALE SIGNAL CONVERSION - BY USING READ AND WRITE ELECTRON BEAMS OF SPECIFIED ENERGY RATIO. 79.01.08 SU 2712230/79-A [79SU-712230]. (SU-758949) A time scale conversion method of electric signals, for use in radio electronics and automation to match the rate of change of the signals to the rate of data input in the processor, is based on recording them as a potential relief on a dielectric target without a barrier grid of the memory cathode-ray tube, using a first electron beam for reading. The signal is recorded by a second beam with electrons accelerated to an energy of the max. secondary emission factor. To shorten the time required for the signal conversion, the electrons of the first beam are accelerated to an energy which is less than that of the second beam by an amount corresponding to a first critical potential. The energy of the electrons of both beams are then reduced by the same amount so that the energy of the electrons of the first beam is less than the amount of the first critical potential. The target is continuously scanned by the first beam. Bul. 33/7.9.81 (3 pp.).

31. SU 767657-T 80.09.30

Dubov, Aleksandr A.; Kudryakov, Nikolaj K.; Kulakov, Gennadij V.; Chernikov Vladimir I.

SINGLE SIGNALS OSCILLOGRAPHIC REGISTRATION - USING CALIBRATION MARKS FORMED FROM MULTIPLE FREQUENCY MEANDER SIGNALS TO PROVIDE OSCILLOGRAPH ALIGNMENT. 77.01.03 SU 2440044/77-A [77SU-440044]. (SU-767657) Unambiguous sequencing of several oscillographs of a single event e.g., nuclear reaction is attained using calibration marks obtained from a multiple frequencies involute. The arrangement allows time scale expansion for a single event obtained by a different oscillograph. In an example three oscillographs are superimposed and interconnected at indicated points. Correct sequencing is afforded using the shape of multiple frequencies meanders. Number of points is limited only by oscillograph field and resolution. The control circuit used for embodiment contains a reference frequency generator, computing unit, adder and amplifier. Bul. 36/30.9.80.

Фиг. 2

Фиг. 3

32. SU 782148-T 80.11.23

Elkin, Igor; Zbritskij, Igor E.; Rybak, Vyacheslav V.; Sapezhko, Arkadij Ya.; Saratovskij, Evgenij N.

TIME SCALE CONVERTER - WITH HIGH VOLTAGE PULSE GENERATOR INPUT CONNECTED TO STARTING UNIT, OUTPUT TAKEN TO STORAGE TUBE COLLECTOR. 79.01.08 SU 2709454/79-A [79SU-709454]. (SU-782148) Prototype contains starting unit (1), delay lines (2 and 3), write sweep generator (4), brightening pulse generator (5), storage tube (7), calibration unit (8), readout raster generator (9), collector mode selector (10), former-amplifier (12), digital converter (13), indicator (14), and recorder (15). To achieve a higher conversion factor than that obtainable with the prototype by reducing to a minimum the period of time during which high voltage is present across the collector of the storage tube, modified converter contains high-voltage pulse generator (6), which generates rectangular pulses whose amplitude reaches several KV with steep leading and trailing edges and last approximately as long as the writing sweep. The generator is started directly by the input pulse. The resultant longer readout time gives a longer charge retention period and a larger conversion factor, which allows the data output speed to be matched to the final recorder input speed without the need for an intermediate memory. The converter may be used in recording single or infrequently recurring signals in the microsecond and nanosecond range. Bul. 43/23.11.80 (4 pp. Dwg. No. 1).

33. SU 790172-T 80.12.23

Golovkov, Viktor P.; Golyshev, Aleksey I.; Fominov, Viktor A.

PEAK TRANSITION TIME RECORDING - BY CLIPPING INPUT SIGNAL FROM BELOW TO AMPLITUDE RATIO OF PEAK AND CLIPPED SIGNALS IS CONSTANT. 75.01.06 SU 2093587/75-A [75SU-093587]. (SU-790172) Recording the moment of transition of an input single pulse signal through maximum by lagging the signal, and comparing the input signal with the lagged one, measuring the time between a fixed reference point and the moment when the two signals are equal, and subtracting one-half of the lag from the measured interval is made more accurate for signals which do not have a flat top e.g., triangular signals. By firstly clipping the input signal from below so that that amplitude ratio of the input signal and clipped signal is constant throughout the amplitude range of the input signal and then amplifying it by a set factor, e.g., to its original amplitude, allowance is made for the descent time. The input signal (B_x) is fed to a delay line and to a controlled threshold. The latter sets an appropriate threshold in the clipper to hold a constant B_x /clipped signal ratio at its output, presented to amplifier where the gain equals this ratio. The resulting signal is fed directly and via the delay circuit to a comparator for the output unit. Bul. 47/23.12.80 (4 pp.).

Фиг. 2

Фиг. 3

34. SU 798600-T 81.01.23

Arkhangelskij, Igor A.; Borisov, Vladimir V.; Zyuzin, Lev N.

OSCILLOGRAPH MEASUREMENT OF SINGLE SIGNAL PARAMETERS - TIME BASE VOLTAGE IS MODULATED BY SINUSOIDAL VOLTAGE SERVING AS TIME MARKS. 75.05.16 SU 2133907/75-A [75SU-133907]. (SU-798600) Single pulses are displayed on the oscilloscope screen, and slope and duration of edges of sub-nanosecond pulses can be measured. Accuracy of measurement of slope of pulse edges of short duration is increased by applying on the signal trace of time marks produced by modulation of the time base voltage by a sinusoidal voltage. The method does not require new technical means. The accuracy of measurement is greater the shorter the pulse edge. Signal image on the CRO screen makes possible accurate measurements of the duration and slope of separate sections of the edge. The use of the proposed method eliminates the need for high speed linear time bases, reducing the requirements for high accuracy of delay lines, makes possible measurements of slopes of following each other pulses. Uncertainty of the appearance of the second and following pulses is of little importance, since the time base covers the whole time interval in which the pulses appear. Bul. 3/23.1.81 (2 pp.) inner surface of cooling body and condenses on its capillary structure. The condensate is then returned to the exciter surface through connectors (5). Bul. 26/15.7.81 (4 pp. Dwg. No. 1).

35. SU 824230-A1 81.04.23

Mikhajlov, Viktor N.; Predein, Boris A.; Selivanova, Emma G.; Chernikov, Vladimir I.

EXPONENTIAL FUNCTION INDEX CALCULATOR - HAS ONE DATA AND TWO REFERENCE VOLTAGE INPUTS TAKEN TO THRESHOLD ELEMENTS AND SUBTRACTOR. 79.06.25 SU 2787815/79-A [79SU-787815]. (SU-824230) Calculator can be used in research in physics and chemistry for e.g., combined reactions or radioactive decay of the described exponential function. It is made more accurate by use of an integrator, subtractor and codes divider. When the input signal reaches a min. threshold level A1, threshold element (1) operates and flips flip-flop (4), marking the start of the integration interval t_1 , with the end set by t_2 and A2. The input signal is integrated over a period T, when the connected signal V5 is passed to codes divider (7). The difference $A_2 - A_1$ passes to divider (7) to produce the index. Bul. 15/23.4.81 (3 pp. Dwg. No. 1).

36. SU 858074-A1 81.08.23

Borisov, Vladimir V.; Zyuzin, Lev N.; Yakovenkov, Leonid R.

SCALE SHAPER FOR CRT SCREEN - HAS EXTRA TRIGGER BETWEEN FREQUENCY DIVIDER OUTPUT AND COMMUTATOR, WHICH IS CONNECTED TO COUNTERS VIA DECODER. 79.10.26 SU 2849799/79-A [79SU-849799]. (SU-858074) Scale shaper for CRT screen is used to produce a scale with unequal intervals, and with greater accuracy since, in addition to trigger (1), signal generator (2), frequency divider (3), commutator (5), counters (6 and 7), AND-gate (9), and D-A converters (10 and 11), it also has extra trigger (4), decoder (8), and OR-gate (12). Counters (6 and 7) are initially set to '1'. First signal from generator (2) via divider (3) and trigger (4) illuminates first point on scale. Subsequent signals, from trigger (4) and generator (2) alternately, via commutator (5), are summed in counter (6), whose contents represents horizontal line of scale, and is fed to D-A converter (10). When counter (6) overflows, counter (7), contents increases by one, and is fed to D-A converter (11), which controls vertical line. Unequal intervals depend on previous setting of decoder (8), operating commutator (5). When complete scale is formed, counters (6,7) via AND (9) reset trigger (1), switching off generator (2). Bul. 31/23.8.81 (5 pp. Dwg. No. 1).

37. SU 862181-A1 81.09.07

Borisov, Vladimir V.; Zyuzin, Lev N.; Maksimov, Gennadij P.

COMPUTING SIGNALS OSCILLOGRAPHIC SCALE FORMING APPTS. - HAS PULSE GENERATOR CONNECTED TO COUNTER WHERE COUNT OF ONE IS DECODED AS SIX FOR VERTICAL SHIFT OF CRT BEAM BY ONE COARSE SCALE DIVISION. 79.12.28 SU 2863863/79-A [79SU-863863]. (SU-862181) Appts. for forming a scale on a CRT screen and contg. generator, commutator, counters with different scaling factors, and X-co-ordinate and Y-co-ordinate D/A converters has greater accuracy by a simpler design for oscillographic measurement of signal parameters in computer engineering. A decoder and another commutator are introduced. The scaling coeffs. are 51, 11 and 36 respectively for a scale with 10 large horizontal divisions, six large vertical divisions and five subdivisions between lattice nodes. The scale is formed by consecutively forming identical horizontal and identical lines. Each generated pulse forms a luminous point on the scale. As the pulses pass e.g., to the first counter, each new number is converted into a correspondence voltage applied to the horizontal deflecting plates to form a screen horizontal line with as many luminous points as pulses. At the 52-nd pulse, a 1-level in the next counter is decoded as the number 6 which is switched to the Y-co-ordinate converter to shift the beam vertically by one large division. Bul. 33/7.9.81 (4 pp.).

38. SU 883854-A2 81.11.23

Brunov, Mikhail V.; Golovkov, Viktor P.; Golyshev, Aleksey I.

PULSE TIME POSITION LOCATION APPTS. - USES TRIGGER WITH DATA INPUT CONNECTED TO UPPER LEVEL DISCRIMINATOR AND SET INPUT CONNECTED TO APPTS. OUTPUT. 80.03.20 SU 2894941/80-A [80SU-894941]. (SU-883854) Appts. is used for measuring the time intervals between pulses having different rising edge slope and a large dynamic amplitude range, as per the Parent Spec. To improve noise rejection over a wide dynamic range of input pulses, it has a trigger, with its data input connected to the output of the upper level discriminator, and its 'set' input connected to the output of the appts. When the sawtooth voltage generator pulse change rate (leading edge) attains $V/2$, where V is the generator frequency; the output discriminator threshold is reached and the latter fires to pass a pulse of the standard pulse shaper to reset the trigger and thus switch off the sawtooth generator. The time interval between the standard pulse shaper pulses is equal to the time interval between the starts of the rising edges of the useful signals. Thus, the trigger blocks the output discriminator until the input signal reaches the discriminator triggering threshold and thus eliminates any pulses at the standard pulse shaper output in the presence of an input pulse of amplitude U_m for an interval $Unop1$ is less than U_m is less than $Unop3$, where $Unop1,3$ designate the threshold levels of the two discriminators, low level and upper level, respectively. Since the noise signal amplitude approximates to $2Unop1$ then the noise rejection is doubled. Bul. 43/23.11.81 (3 pp.).

39. SU 905850-A1 82.02.15

Aniskin, Fedor F.; Volgin, Aleksandr N.; Vygovskij, Anatolij V.

SIGNAL CHARACTERISTICS DISPLAY UNIT - WITH COMPARATORS, REGISTERS, CODE CONVERTER AND ADDERS TO GENERATE LARGE DISPLAY AND REDUCE RESOLUTION ERRORS. 80.06.25 SU 2944822/80-A [80SU-944822]. (SU-905850) Equipment for displaying the variable components of individual and periodic signals and for recording them photographically, comprises a matrix display panel (3), whose X and Y buses are served by decoders (2 and 4), pulse scalars (5 and 10), pulse generator (6), switch (10), registers (9 and 13), AND gate (8), comparator (7) and memory (1). Accuracy is improved by the introduction of a second and third comparator (11 and 12), a second and third register (13 and 14), code converter (15) and adders (16 and 17). The maximum scale for the ordinates of the signal being displayed is selected from the difference between the maximum and minimum values of the ordinate, the display being generated relative to minimum code value of the ordinate. Since the resolution of the matrix is constant, this leads to an increase in accuracy. Bul. 6/15.2.82 (5 pp. Dwg. No. 1/1).

40. SU 934537-A1 82.06.07

Borisov, Vladimir V.; Golovteev, Aleksandr V.; Zyuzin, Lev N.; Maksimov, Gennadij P.

SCALE FORMER ON CRT SCREEN - HAS FIRST COUNTER OUTPUT CONNECTED TO COMMUTATOR AND DECODER TO A-D CONVERTER. 80.10.03 SU 2993193/80-A [80SU-993193]. (SU-934537) CRT screen scale former has a first counter's second output connected to a commutator to increase operational speed by avoiding a time loss for 77 node points formation which takes approximately 12% of total screen forming time. Each counter digit is converted into a scale point potential forming the base line consisting of 51 points. A commutator is actuated after a line is formed changing vertically lines positioned by one step. Lines only are formed on a CRT screen having 10 horizontal, 6 vertical, and 5 small divisions between a grid node. Bul. 21/7.6.82 (4 pp.).

Фиг. 1

Фиг. 2

41. SU 943586-A1 82.07.15

Borisov, Vladimir V.; Zyuzin, Lev N.; Ryzhakov, Vladimir M.; Shuvalov, Viktor M.

CALIBRATION OF SCAN PERIOD NON-LINEARITY - BY HAVING SIGNAL RECORDED AND REPRODUCED AND NON-LINEARITY DETERMINED FROM RATIO OF REFLECTED FIXED TIME INTERVALS. 80.12.02 SU 3009840/80-A [80SU-009840]. (SU-943586) Method to calibrate non-linearity of the scan period of a cathode-ray tube, has extended frequency range of calibration voltages, achieved by setting the period length of the calibration signal at equal or less than two-thirds the scan period length. An image of the calibration signal is reproduced, at least ten times, synchronized with the scanning. The reproductions are recorded and the repeated fixed time intervals of the calibration signal, which are formed by a shift of similar phases of the signal, are separated and are uniformly positioned, according to time, in the test section of the scanning. Bul. 26/15.7.82 (3 pp.).

42. SU 943917-A1 82.07.15

Petrov, Igor A.; Shkunov, Vladimir A.; Yavor, Stella Ya.

MEMORY ELECTRON BEAM DATA STORAGE UNIT - HAS QUADRIPOlar FIELD TO FORM ELECTRON TRAJECTORY VIA MULTI-CHANNEL LENS AT LARGE AXIS TO CHANNEL OPTICAL AXIS. 80.07.03 SU 2951207/80-A [80SU-951207]. (SU-943917) Electron beam storage unit, e.g., for memory units for data storage and reproduction, has the multi-channel lens in the form of four electrodes with the first, second and fourth having a set of dotted mutually parallel orifices, so as to improve the resolving power. The parallel electron beams from the electron protector (1) are deflected by the coarse addressing system (2) into one of the multi-channel lens channels. Due to interaction in the lens channel, the electron beam has low spherical aberration. The quadrupolar components of the field form the electron trajectory so that it leaves the multi-channel lens at a large angle to the optical axis of the channel. Then the beam of electrons is scanned by the first and second matrix systems (7 and 8) in the fine addressing system w.r.t. the mini raster axis X and Y. Bul. 26/15.7.82 (4 pp. Dwg. No. 1/1).

43. SU 962821-A1 82.09.30

Zotov, Vadim V.; Markov, Yuriy A.; Pavlyuchenkov, Oleg G.; Saprykin, Boris P.

DIGITAL IMPULSE SIGNALS FORM INDICATOR - HAS PULSE COMPARATOR AND COMPARED UNIT SIGNALS ARE GIVEN IDENTIFYING CHARGE AND RECORDED. 80.07.07 SU 2953223/80-A [80SU-953223]. (SU-962821) The digital signal form indicator has has increased information capacity, due to the inclusion of strobe shaper, three AND-gates two OR-gate, control trigger and address codes commutator. The test signal is converted and passed to two registers, so that one register holds current impulse and the other hold the previous impulse. Each new information impulse is compared with the preceding and is recorded in the next cell of the memory unit, with an identifying charge, indicating equality or inequality between successive impulses. The charges allow the information to be reproduced as the actual curve of the test signal. Bul. 36/30.9.82 (5 pp.).

Saprykin, Boris P.; Lukin, Mikhail M.; Khudyakov, Yuriy K.

TESTING MAGNETIC RECORDING APPTS. - HAS TAPE CIRCUITRY CONNECTED TO DATA-BLOCK AND ZONE DETECTOR PRESENTING ZONE DATA. 81.02.23 SU 3294421/81-A [81SU-294421]. (SU-970444) Magnetic recording appts. conrg. a clock pulse generator, gates, a recording pulse shaper and memory in series at one input to a tape transport and an A/D converter in series with a control sync. at the other input has greater accuracy for use as instrumentation. It can be used for data recording on a magnetic carrier mainly in appts. for service purposes, esp. in tests. Introduction of a data-block and zone detector (4) (for information without position designation) enables required data to be detected more accurately in playback and marked more accurately in recording. The tape transport itself and all the circuitry can be used just when necessary and this saves energy and is more convenient in service. The test object is connected to the control sync. and valves. Bul. 40/30.10.82 (3 pp. Dwg. No. 1/1).

45. SU 974455-A1 82.11.15

Zbritskij, Igor E.; Saratovskij, Evgenij N.; Sapezhko, Arkadij Ya.

TIME-SCALING CONVERTER STORAGE CRT - HAS OUTSIDE RING ELECTRODE NEAR COLLECTOR FACE ON SIDE OF SIGNAL PLATE. 80.12.09 SU 3214079/80-A [80SU-214079]. (SU-974455) Improved reliability of time scaling converter of the storage CRT is ensured by fixing the potential of the envelope surface. The envelope holds the signal plate and the collector with a lead, while the ring electrode outside the envelope is placed near the end face of the collector on the side of the signal plate. The width of the electrode is selected to be equal to 0.2 of the space between the collector and the signal plate to minimize disturbance of the field distribution in the storage CRT. The field in the space between the lead (3) of the ring collector (2) and the outside ring electrode (5) drops to zero eliminating parasitic charge in the space between the collector and the target (4). The electrode is made of copper foil 0.035 mm thick and 5 - 10 mm wide preventing field distortion. Bul. 42/15.11.82 (3 pp. Dwg. No. 2/2).

46. SU 982483-A1 86.07.07

Zbritskij, Igor E.; Panin, V.N.

RESEARCH STORAGE CRT SINGLE SIGNALS SCALE-TIME CONVERSION - BY ELECTRON BEAM READ-OUT AT LOWER READ-OUT CURRENT AND DIFFERENT GAIN IN CHANNELS WITH AND WITHOUT RECORDED INFORMATION. 81.05.29 SU 3293618/81-A [81SU-293618]. (SU-982483) Scale-time conversion of single electric signals on a storage CRT by a time scan in time-amplitude-coordinates for recording on a microchannel plate (3), amplification of the recording electron beam, its transmission through the microchannel plate under conditions of satn. and max. amplification, amplified beam collection and readout by raster scanning of the beam over a prescribed period of time, is performed by readout by an electron beam under conditions of microchannel plate amplification on the same side as the recording. The plate-amplified readout beam is recorded for the presence of information on the part of the microchannel plate in question to be ascertained from the decrease of the beam. The readout time satisfies the condition that the readout time plus the time between the end of recording and the start of readout is no greater than RC , where R and C are the resistive and capacitive components of the channel wall of the microchannel plate. The positive charge on the channel walls distorts the electric field within the channel and this leads to a decrease of the readout beam gain. USE/ADVANTAGE - In studying once-for-all or rarely recurring rapid processes, conversion error is reduced. The converted information is visualized during recording and readout for operative processing. Bul. 25/7.7.86 (4 pp. Dwg. No. 1).

Фиг. 1

47. SU 1039024-A1 83.08.30

Kunets, Grigorij A.; Prokopenko, Ernest A.; Rybak, Vladislav V.; Shobotenko, Nikolaj S.

PULSE SERIES FAULTS DISCRIMINATOR - HAS TWO COMMUTATORS ADDITIONAL PULSE SHAPER AND COUNTER IN INPUT COUPLED TO NAND-GATES. 81.10.09 SU 3347263/81-A [81SU-347263]. (SU1039024) Commutators, additional pulse former and a counter are used in a pulse series faults discriminator to sense pulse losses, spurious pulses presence and increase the frequency range. The former is coupled to a first commutator control input and an input trigger. The counter is connected to commutator and NAND-gate. Checked sequence is applied to a trigger forming control signals for two error detecting channels formed by commutators, formers and reversing counters. If the sequence is correct the number of counter pulses in a positive half cycle exceeds the negative half cycle pulses. Pulse loss is discriminated by an interval formation on an input trigger registered by counters. The regular intervals registered by counters also indicate the spurious pulse presence. Bul. 32/30.8.83 (4 pp. Dwg. No. 0/2).

Фиг. 2

48. SU 1052127-A1 85.06.30

Arkhipov, Valentin K.; Rybak, V.V.; Saratovskij, Evgenij N.

INSTRUMENTATION SCALING-TIME DIMENSION CONVERTER - FEEDS STROBE PULSE GENERATOR OUTPUTS TO LINEAR TRANSIT STAGE CONNECTED TO STORAGE CRT DEFLECTION UNIT. 82.04.01 SU 3417886/82-A [82SU-417886]. (SU1052127) External start signal, fed from the 'start' terminal to the strobe pulse generator (9), produces a rectangular pulse. Generator (9) output also passes to the linear transit stage (10), which enables the passage of the recorded signal (under test) to the vertical deflection system of the storage CRT SCRT. The recorded signal is then set across the SCRT target. On reading the trailing edge of the strobe pulse, produced by generator (9), the controller (7) is started-up and produces a series of pulses to time synchronize the operation of the converter. USE/ADVANTAGE - For instrumentation, partic. for converting one-off (or each of a series of rarely occurring pulses in a train) pulse into a digital code. The pulses lie in the micro- to nano-second range. Improves speed of response. Bul. 24/30.6.85 (6 pp. Dwg. No. 1/5).

49. SU 1061191-A1 83.12.15

Pavlyuchenkov, Oleg G.; Sapezhko, Arkadij Ya.

COUNTING MODE CORRECTION IN CRT MEMORY - BY REGULATING UNTIL PULSE AMPLITUDES ARE EQUAL FOR EACH COUNTING LINE. 82.04.14 SU 3420316/82-A [82SU-420316]. (SU1061191) In this method, counting mode correction is done considering the conditions of recording (values fed in during relief potential recording) and counting (reading) conditions. To set the optimal reading mode, the target is prepared for recording and the zero lines are recorded and read by a rectangular cross-sectional raster, and the reading is measured by any means, e.g., oscillograph with amplitude calibration. The amplitude of pedestal pulse I_{cn} is measured on the oscillograph amplitude scale, and the read amplitude I_{cn} is measured by regulating the voltage between the target and the collector during repeat cycle preparations of write-read process when their amplitudes are equalized. USE/ADVANTAGE - For time-scale conversion of unitary fast-decaying electric signals. It enables faster setting of optimal modes enabling max. amplitude of undistorted readable signals which increases the S/N ratio. Bul. 46/15.12.83 (3 pp. Dwg. No. 1/2).

50. SU 1075402-A1 84.02.23

Zotov, Vadim V.; Predein, Boris A.; Ryazhskij, Vladimir N.; Chernikov, Vladimir I.

CONVERTER OF VOLTAGE INTO DIGITAL CODE - HAS AND-GATES OUTPUTS COUPLED TO TRIGGERS INPUTS IN COUNTER. 78.06.28 SU 2502974/78-A [78SU-502974]. (SU1075402) Initially, the switches (81.8n-1) are closed, the condensers (6) of the uneven numbered charging units (3) discharged, with a voltage equal to the bias of the bias source (9). The input signal passes through linear gate (2) to the charging unit (31) and amplifier (4), the diode (5) charging up capacitors (6) to the maximum amplitude of the input signal. At time t_1 , the control unit (1) closes the linear gate (2), opens switch (81) and AND-gate (121), giving a command to discharging generator (10) to start discharging capacitor (6) of charging unit (31), all synchronized by control unit (1) with the frequency of generator (13). Pulses from this generator go through open AND-gate (121) to the input of the higher orders of the trigger (141) of counter (15), which counts the number of pulses in the first degree of the conversion. Then the voltage on the output of charging unit (31) starts to decrease linearly. When the voltages on the additional outputs of charging devices (31 and 32) are equal the comparator (111) activates at time t_2 and gives a signal to the control unit (1), which synchronizes the activation with the generator (13) and gives a command for a discharging current to switch from charging unit (31) to charging unit (32), to discharge capacitor (6) of this unit, supplied by discharging generator (10). As before the counter (15) counts the pulses from generator (13) in the second degree of the conversion. When the voltages on the additional outputs of the charging units (32 and 33) are equal, the comparator (112) activates and the codifying process described is repeated. The count in the odd-numbered triggers is used to complement the count in the even-numbered through special connections. USE/ADVANTAGE - The innovation concerns computing and pulse techniques and is designed for codifying the amplitude of pulses and of voltmeter currents. The aim has been to improve the accuracy while retaining speed of response. Bul. 7/23.2.84 (5 pp. Dwg. No. 1/2).

Фиг. 2

51. SU 1101072-A1 86.03.30

Arkhipov, Valentin K.; Mirkin, E.L.; Saratovskij, Evgenij N.; Stefankov, Viktor F.

SINGLE ELECTRICAL SIGNALS TIME-SCALE CONVERSION - BY RECORDING AND REPLAY USING TWO CRT CONTINUALLY SCANNING TARGET. 83.01.26 SU 3544162/83-A [83SU-544162]. (SU1101072) Single electrical signals are converted using at least two CRTs for recording/replay to increase conversion accuracy and reliability. Tubes targeters are continuously scanned by a recording beam along a closed line generated by a time scan. The tubes have identical scan period shifted in respect to each other by working periods differentials which can be sequential or overlapping. Interconnected tubes are synchronized by a single generator coupled through delay lines to deflection plates. Additional decoupling capacitors are used for shifting the phase forming cyclic ellipsoidal closed curves from which signal parameters are determined. Processes could be effected manually or by a computer. USE - In pulse techniques for pico- and nano-second range. Signals registration/conversion. Bul. 12/30.3.86 (6 pp. Dwq. No. 0/5).

$\Phi U 2.1$

$\varphi_{112.2}$

$\varphi_{112.3}$

φ_{u2.4}

$\phi_{U2.5}$

52. SU 1108880-A1 86.06.15

Borisov, Vladimir V.; Zbitskij, Igor E.; Zyuzin, Lev N.; Mikhajlov, Viktor N; Rybak, V.V.

OSCILLOGRAPHIC REGISTER OF SINGLE ELECTRIC IMPULSES - HAS MEMORY TO RECORD CODES OF COORDINATES OF ELECTRONIC IMAGE AND USES SCANNER TO READ-OUT CODES DURING REPRODUCTION. 82.07.16 SU 3476540/82-A [82SU-476540]. (SU1108880) When the test signal passes along signal input (16), it is recorded on the current-conducting screen (3) of cathode ray tube (1), when commutator (10) passes a signal to the X deflection system (5) from recording unit (8). Micro-channel plate (2) draws the form of the test signal on screen (3) in amplitude-time coordinates. After recording of the signal, unit (8) passes a signal to control unit (12), which closes the shutter of camera (7). During output of information, unit (12) passes a signal to digital scanning unit (13), commutator (10) and memory unit (15). During scanning of plate (2), an impulse current is formed when the beam reaches a read-out line of the electronic image on screen (3). This current allows the code of the Y-coordinate to be recorded from unit (13) in memory unit (15), according to the address corresponding to the X-coordinate of the same element of the image. The information recorded in unit (15) is then reproduced on tube (1) by passing the converted information to Y-deflection system (4). USE - Testing of single or rarely-repeated physical processes, i.e., atomic reactions. Bul. 22/15.6.86 (7 pp. Dwg. No. 1/2).

Фиг. 1

Фиг.2

53. SU 1109746-A1 84.08.23

Borisov, Eduard V.; Zotov, Vladimir V.

RANDOM PULSE GENERATOR WITH ERLANG PULSE DISTRIBUTION - HAS AND-GATE WITH INPUTS FROM PULSE SHAPER AND COUNTER OVERFLOW OUTPUT, OUTPUT TAKEN TO SWITCH CONTROL INPUT. 83.04.07 SU 3573472/83-A [83SU-573472]. (SU1109746) New circuit components, counter (6), AND-gate (7) and switch (8), are used in the following way. The counter counts the constant-amplitude Poisson pulse train produced by the existing generator (1), converter (2), exponential voltage generator (9), comparator (3), pulse width limiter (4) and pulse shaper (5). When the counter overflows, it is reset, and AND-gate (7) passes the shaper pulse to switch (8), which opens, transferring to the output the analog signal formed by converter (2). USE/ADVANTAGE - Ability to generator both Poisson pulse trains with constant pulse amplitude, and Erlang pulse trains with random pulse amplitude distinguishes the generator from its prototype and makes it suitable for modelling impulse noise in data communication channels. Bul. 31/23.8.84 (3 pp. Dwg. No. 1/1).

54. SU 1109790-A1 84.08.23

Golubev, Boris A.; Lukin, Mikhail M.; Pavlyuchenkov, Oleg G.; Saprykin, Boris P.; Khudyakov, Yuriy K.

MAGNETIC RECORDER FOR DIGITAL DATA - HAS TWO REGISTERS AND EXCLUSIVE OR-GATES INPUTS CONNECTED TO REGISTER OUTPUTS. 83.06.10 SU 3605547/83-A [83SU-605547]. (SU1109790) Control signal from rail (12) permits the passage of cycle pulses from generator (8) via diodes unit (7) to the input synchronizer (6). The latter forms the signal for the start of the record-reproduction unit (3) and the signal for the beginning of the data accumulation. This is applied to the memory (5). The data from transmitters (13) is applied to the input of shaper (2) via D-A converter (1). Simultaneously the data from the output of A-D converter is applied to register (9). From the output of the latter signals are applied to the input of register (10) and through one of the inputs of XOR-gate (11). On coincidence of signals at the input of XOR-gate (11) the re-recording of signals from register (9) to register (10) is carried out and again the recorded data is compared with the one which was recorded earlier. USE/ADVANTAGE - For recording digital data, reduction of the duplication of signals is achieved during recording of slowly varying processes achieved. Bul. 31/23.8.84 (3 pp. Dwg. No. 1/1).

55. SU 1114237-A2 85.06.30

Pavlov, Sergej I.; Panin, V.N.; Saratovskij, Evgenij N.; Arkhipov, Valentin K.

RAPID DATA STORING CRT - HAS DIELECTRIC LAYER POSITIONED ON OUTPUT PARTS OF MICRO-CHANNEL PLATE CHANNELS. 83.04.08 SU 3574314/83-A [83SU-574314]. (SU1114237) The glass envelope contains recording and read-out projectors, micro-channel plate (4) with channels (5), dielectric layer (6), signalling electrode and luminescence screen. The dielectric layer (6) is deposited on output parts of the plate (4) channels (5), i.e., on the side facing the signalling electrode. The ratio of the dielectric layer thickness (δ) to the channel diameter (d) of the micro-channel plate (4) is larger or equal to 10 to minus 2 or smaller or equal to 10 to minus 1. During the signal recording, the charge pattern is produced on the output parts of the memory element. This pattern corresponds to the tested signal image. The presence of the dielectric layer (6) produces the layer of electrical carries, which is characterized by a raised resistance for the current conductivity. This prevents the charge pattern from being erased. USE/ADVANTAGE - For time-scaling conversion of unit-step signal containing amplifying micro-channel plate. Storage tube increases the information authenticity during conduction of physical measurements by increasing the time-scaling conversion coefficient of this information. The information storage time is raised by 2 times in comparison with a known tube, therefore the read-out time is increased by the same amount. Bul. 24/30.6.85 (6 pp. Dwg. No. 2/3).

Фиг. 2

Фиг. 3

Korzh, Vadim I.; Subbotin, Valerij T.; Chernikov, Vladimir I.

LIGHT BURSTS IMAGE RECORDER - HAS CCD MATRIX AND TEST SIGNAL GENERATOR WITH OUTPUTS TO CCD-UNIT AND SECOND OR-GATE. 82.12.29 SU 3529302/82-A [82SU-529302]. (SU1117859) The appts. additionally includes a test signal generator whose controlling input is connected to the 'Test' input of the video-processor, whose first data input is connected to the output of the sync. oscillator. In each anodes of appts. working the CCD matrix is charged by a background electric charge 10% less than the max. In the mode of test frame feeding and recording, besides a DC voltage, the matrix is fed by a test signal e.g., chess-board field. On Back-ground signal the storage time counter (5) is started on a logic '1' from the start unit (4) enabled by OR-gate (6). During storage time signal from the first output of the counter arrives at the storage input of unit (1) and via third OR-gate (11) goes to the locking input of time pulses of the sync. oscillator (2). The input register of the CCD-unit (1) works in the mode of back-ground charge transferring while an output register leads out the cells charges. USE/ADVANTAGE - For physical processes analysis which include light burst, increases dynamic range of the registered images. Reduces h.f. distortion. Bul. 37/7.10.84 (7 pp. Dwg. No. 1/2).

Фиг. 2

57. SU 1124792-A1 85.06.30

Arkhipov, Valentin K.; Berkovskij, Arkadij G.; Panin, V.N.; Saratovskij, Evgenij N.; Mirkin, E.L.; Mikhajlov, Viktor N.; Pavlov, Sergej I.

UNIT-STEP FUNCTION SIGNAL TIME-SCALE CONVERSION - USING COMBINED CURRENTS OF MICRO-CHANNEL PLATE ELECTRODES AND MICRO-PLATE OUTPUT CURRENT TO OBTAIN DATA READ-OUT SIGNAL. 83.08.10 SU 3633992/83-A [83SU-633992]. (SU1124792) The null potential is set on the micro-channel plate (MCP) (2) input electrode (1) and a constant potential (1KV) is applied to the MCP (2) output electrode (4). A constant potential (2-3kV) is applied to the signalling electrode (5). The tested signal is recorded by a recording beam (6), which irradiates the (MCP) (2) input surface. The secondary electrons are taken away from the MCP channel walls, when the beam passes through, and the positive charge pattern is shaped in the MCP corresponding to the signal image. The stored charges are in an unsaturated condition in the channels (3). The read-out is slower and the beam (7) is used, being modulated by the recorded charge pattern, which decreases the MCP output current. This is fed to the signalling electrode (5) and the load. ADVANTAGE - The method expands the conversion signal dynamic range by 3 to 5 times due to the raised max. recording speed. Bul. 24/30.6.85 (6 pp. Dwg. No. 1/2).

58. SU 1173446-A1 85.08.15

Berestov, Sergej I.; Sazhin, Sergej A.; Subbotin, Valerij T.

MEMORY FOR DIGITAL MEASURING TECHNIQUES - HAS ADDRESS COUNTERS PER SECTION OF ACCUMULATOR AND COUNTERS ARE COUPLED TO ACCUMULATOR SECTIONS. 83.06.30 SU 3613395/83-A [83SU-613395]. (SU1173446) The recording signal via OR-gate (6) and AND-gates (3.1 and 4.1) converts to the recording and memory section signals which pass to the input of section (1 and 1.1) and carry out the recording of data set on the data inputs (9) of the unit. During the read out of data the external signal for read out via OR-gate (6) passes to the input for the selection of the memory unit. Thus in the result of the recording of the data word directly into the accumulator the address is taken inside the unit in relation to the 'record' or 'read out' signals and the recording in the other memory unit attains the limiting fast action. USE/ADVANTAGE - For computers and digital measurements can be used in measuring systems which require fast recording of measured information. Bul. 30/15.8.85 (3 pp. Dwg. No. 1/1).

59. SU 1177847-A1 85.09.07

Saprykin, Boris P.; Lukin Mikhail M.; Pavlyuchenkov, Oleg G.

RESEARCH MAGNETIC CARRIER DATA RECORDING APPTS. - HAS A-D CONVERTER CYCLICALLY PRESENTING ONE MEASUREMENT TO REGISTER TO ERASE PREVIOUS ONE. 82.03.16 SU 3411397/82-A [82SU-411397]. (SU1177847)
The magnetic carrier data recording appts. contg. an A/D converter for the signals to be recorded, two valve units with outputs to corresponding memories connected via a third memory in series with a pulse shaper one input of the tape transport and a clock generator connected to a control sync., has an output from the A/D converter to the valve unit (11) and register register (13) along with the valve unit (12), register (14), time mark forming circuit (15) and arithmetical unit (16). USE/ADVANTAGE - As instrumentation for digital data measuring technique, e.g., in experimental investigation of physical fields which vary non-uniformly over a comparatively long period of time, less magnetic tape is consumed in recording slowly varying parameters by redn. of the vol. of information recorded. Measurements differing from previous measurements are memorized within definite limits cyclically. Bul. 33/7.9.85 (3 pp. Dwg. No. 1/1).

60. SU 1177863-A1 85.09.07

Shkunov, Vladimir A.; Grigorev, Aleksandr S.; Leontev, Viktor V.; Soozar, Oleg N.

FLAT MULTIPLE-ELECTRON BEAM SIGNAL-SIGNAL CONVERTER - HAS PLATES IN TWO PARALLEL PLANES AND EMITTERS SHIFTED IN OPPOSITE DIRECTIONS. 84.01.05 SU 3687490/84-A [84SU-687490]. (SU1177863) Converter plates are located in two parallel planes directly opposite, the emitters being shifted in opposite directions. The distance between plates located in different planes is not more than 0.1 of minimal lateral thermocathode dimension. The instrument consists of a thermocathode (1), plates (2 - 5), emitters (6), control (7), focussing (8), deflecting (9), and the target electrodes (10). The thermocathode is made in the form of strips (2 and 3) and (4 and 5). One side of plates (2 - 5) has emitters (6) all electrodes being coaxial to the electrode units. The plates (2 and 3) and (4 and 5) of thermocathode (1) are located in two parallel planes one opposite the other with the emitters turned in the opposite direction. The distance d between the plates (2 and 5) and (3 and 4) is not more than 0.1 of minimal cathode (1) cross-section dimension. The electron beam (11) is focused by the electrodes (8) with a pair of openings (13) and enters the deflecting cell (14) being further directed by the electrodes (9). USE/ADVANTAGE - Converter can be used for conversion, registering and storage of information. Its energy efficiency is improved without an impairment of other parameters as a result of power dissipation. Bul. 33/7.9.85 (3 pp. Dwg. No. 1/2).

Фиг. 1

Pavlov, Sergej I.

MONITORING AND CONTROL DEVICE COMMUTATOR - HAS REVERSE WINDING OFF REMOTE SWITCH CONNECTED TO FIRST LEAD FOR POWER SUPPLY CONNECTED VIA NO CONTACT OR FIRST BUTTON. 84.08.21 SU 3783157/84-A [84SU-783157]. (SU1201902) The electromagnetic relay's second closing (n.o.) contact's second lead is connected to the first lead for connecting the power source via opening (n.c.) contacts of the first electromagnetic relay. The other lead of the first signal lamp is linked to the first electromagnetic relay coil lead, and the other lead of the second lamp goes to the outlet of the second electromagnetic relay coil. The lamps are so connected that when any button is pressed, one of them (lamps) comes on, otherwise the circuit is malfunctioning. ADVANTAGE - Connection of lamps parallel to relay coils enables instant diagnosing of circuit and relay operation. Bul. 48/30.12.85 (3 pp. Dwg. No. 0/1).

62. SU 1219987-A1 86.03.23

Kunets, Grigorij A.; Prokopenko Ernest A.; Rybak, Vladislav V.; Shobotenko, Nikolaj S.

INSPECTION TOOL FOR ELECTRICAL CONNECTIONS - HAS THIRD AND FOURTH OUTPUTS OF CONTROL UNIT CONNECTED TO SECOND AND THIRD INPUTS OF OUTPUT UNIT. 84.07.31 SU 3775232/84-A [84SU-775232]. (SU1219987) Object of test (1) is connected up to source (9) of excitation signals under control of priority device (7). Control center (2) orders the working procedure according to an internal set of logic codes, and sets in inputs to input unit (3) for transmission through decoder (5) to analysis unit (6), an assembly of triggers and logic gates storing the signal inputs (9) and priority details from unit (7), also repeated via encoder (8) to the output display and/or print-out (4). The control unit contains a multiplexer, synchro generator and logic units organizing the full range of command functions. Logging of logic results from each test of each connection in the test item enables analysis unit (6) to provide output unit (4) with the required list of faults occurring. USE/ADVANTAGE - For checking multiple electrical connections; developed for speed and esp. a capability of determining the numbers of contacts showing either shorting or open circuit. Bul. 11/23.3.86 (10 pp. Dwg. No. 1).

Фиг. 2

Фиг. 3

63. SU 1259360-A1 86.09.23

Pavlov, Sergej I.

COMMUTATION DEVICE FOR REMOTE CONTROLS - HAS THIRD RELAY WITH TWO CLOSING CONTACTS AND FOURTH RELAY WITH CLOSING AND OPENING CONTACTS. 85.02.05 SU 3851475/85-A [85SU-851475]. (SU1259360) Pressing button (5) energizes relay (4.1) opening contacts (4.2), closing contact (4.3), this action energizes relay (1.1), which is held in energized state by its self-holding contact (1.2) and its contact (1.3) also becomes closed. Releasing the button (5) de-energizes the relay (4.1) opening contact (4.3) and closing contact (4.2). The relay (2.1) is then energized with contact (2.2) opened and contact (2.3) closed. The relay (3.1) is energized via closed contact (2.3) and diode (7) and is then held due to closed contact (3.2) and at the same time its contact (3.3) also closes. The circuit is prepared for breaking the relay (1.1). Therefore one circuit can control two remote switches and timing relay contacts. USE - In remote control systems. Bul. 35/23.9.86 (2 pp. Dwg. No. 1/1).

Appendix A

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SU 674117-T 79.07.15
SU 943917-A1 82.07.15

ZABOLOTNYJ NIKOLAJ

SU 640245-T 78.12.30
SU 647643-T 79.02.15
SU 752401-T 80.07.30

ZBRITSKIJ IGOR E

SU 1108880-A1 86.06.15
SU 714635-T 80.02.05
SU 782148-T 80.11.23
SU 974455-A1 82.11.15
SU 982483-A1 86.07.07

ZOTOV VADIM V

SU 1075402-A1 84.02.23
SU 629506-T 78.10.25
SU 962821-A1 82.09.30

ZOTOV VLADIMIR V

SU 1109746-A1 84.08.23

ZYUZIN LEV N

SU 1108880-A1 86.06.15
SU 630738-T 78.10.30
SU 798600-T 81.01.23
SU 858074-A1 81.08.23
SU 862181-A1 81.09.07
SU 934537-A1 82.06.07
SU 943586-A1 82.07.15

Appendix B

Index of Co-Inventors

Mon Jun 4 11:05:29 PDT 1990

Using CROSS

Option(s): author author; counts+totals

Input file: borism

Output file: bauau

ANISKIN FEDOR F

3* ANISKIN FEDOR F
2 ARKHIPOV VALENTIN K
3 VOLGIN ALEKSANDR N
3 VYGOVSKIJ ANATOLIJ V

11 TOTAL

ARKHANGELSKIJ IGOR A

3* ARKHANGELSKIJ IGOR A
1 BORISOV VLADIMIR V
1 CHERNIKOV VLADIMIR I
1 GOLOVKOV VIKTOR P
1 SHIKHMANOV SERGEJ S
2 ZABOLOTNYJ NIKOLAJ
1 ZYUZIN LEV N

10 TOTAL

ARKHIPOV VALENTIN K

2 ANISKIN FEDOR F
11* ARKHIPOV VALENTIN K
1 BERKOVSKIJ ARKADIJ G
1 MIKHAJLOV VIKTOR N
2 MIRKIN E L
2 PANIN V N
2 PAVLOV SERGEJ I
1 RYBAK V V
2 RYBAK VYACHESLAV V
1 SAPEZHKO ARKADIJ YA
6 SARATOVSKIJ EVGENIJ N
4 STEFANKOV VIKTOR F
2 VOLGIN ALEKSANDR N
2 VYGOVSKIJ ANATOLIJ V
1 VYGOVSKIJ V V
1 ZBRITSKIJ IGOR E

41 TOTAL

BERESTOV SERGEJ I

1* BERESTOV SERGEJ I
1 SAZHIN SERGEJ A
1 SUBBOTIN VALERIJ T

3 TOTAL

BERKOVSKIJ ARKADIJ G

1 ARKHIPOV VALENTIN K
9* BERKOVSKIJ ARKADIJ G
1 GUBANOV YURIJ
1 GUSELNIKOV V G
2 KOSTIN A B
1 MIKHAJLOV VIKTOR N
1 MIRKIN E L
1 PANIN V N
2 PAVLOV SERGEJ I
1 SARATOVSKIJ EVGENIJ N
1 TSYGANKOVA I I

21 TOTAL

BORISOV EDUARD V

1* BORISOV EDUARD V
1 ZOTOV VLADIMIR V

BORISOV VLADIMIR V

2 TOTAL

1 ARKHANGELSKIY IGOR A
8* BORISOV VLADIMIR V
1 GOLOVTEEV ALEKSANDR V
2 MAKSIMOV GENNADIY P
1 MIKHAJLOV VIKTOR N
1 RYBAK V V
1 RYZHAKOV VLADIMIR M
1 SHKUNOV VLADIMIR A
1 SHUVALOV VIKTOR M
2 YAKOVENKOV LEONID R
1 ZBRITSKIY IGOR E
7 ZYUZIN LEV N

27 TOTAL

BRUNOV MIKHAIL V

1* BRUNOV MIKHAIL V
1 GOLOVKOV VIKTOR P
1 GOLYSHEV ALEKSEJ I

3 TOTAL

CHERNIKOV VLADIMIR I

1 ARKHANGELSKIY IGOR A
6* CHERNIKOV VLADIMIR I
1 DUBOV ALEKSANDR A
1 KORZH VADIM I
1 KUDRYAKOV NIKOLAJ K
1 KULAKOV GENNADIY V
2 MIKHAJLOV VIKTOR N
3 PREDEIN BORIS A
1 RYAZHSKIY VLADIMIR N
2 SELIVANOVA EMMA G
1 SUBBOTIN VALERIY T
1 ZABOLOTNYJ NIKOLAJ
2 ZOTOV VADIM V

23 TOTAL

DUBOV ALEKSANDR A

1 CHERNIKOV VLADIMIR I
1* DUBOV ALEKSANDR A
1 KUDRYAKOV NIKOLAJ K
1 KULAKOV GENNADIY V

4 TOTAL

ELKIN IGOR

1* ELKIN IGOR
1 RYBAK VYACHESLAV V
1 SAPEZHKO ARKADIY YA
1 SARATOVSKIY EVGENIY N
1 ZBRITSKIY IGOR E

5 TOTAL

FOMINOV VIKTOR A

2* FOMINOV VIKTOR A
2 GOLOVKOV VIKTOR P
1 GOLYSHEV ALEKSEJ I

5 TOTAL

GOLOVKOV VIKTOR P

1 ARKHANGELSKIY IGOR A
1 BRUNOV MIKHAIL V
2 FOMINOV VIKTOR A
5* GOLOVKOV VIKTOR P
2 GOLYSHEV ALEKSEJ I
2 SHIKHMANOV SERGEJ S

	2	ZABOLOTNYJ NIKOLAJ

	15	TOTAL
GOLOVTEEV ALEKSANDR V	1	BORISOV VLADIMIR V
	1*	GOLOVTEEV ALEKSANDR V
	1	MAKSIMOV GENNADIJ P
	1	ZYUZIN LEV N

	4	TOTAL
GOLUBEV BORIS A	1*	GOLUBEV BORIS A
	1	KHUDYAKOV YURIJ K
	1	LUKIN MIKHAIL M
	1	PAVLYUCHENKOV OLEG G
	1	SAPRYKIN BORIS P

	5	TOTAL
GOLYSHEV ALEKSEJ I	1	BRUNOV MIKHAIL V
	1	FOMINOV VIKTOR A
	2	GOLOVKOV VIKTOR P
	2*	GOLYSHEV ALEKSEJ I

	6	TOTAL
GRIGOREV ALEKSANDR S	1*	GRIGOREV ALEKSANDR S
	1	LEONTEV VIKTOR V
	1	SHKUNOV VLADIMIR A
	1	SOOZAR OLEG N

	4	TOTAL
GUBANOV YURIJ	1	BERKOVSKIJ ARKADIJ G
	1*	GUBANOV YURIJ
	1	PAVLOV SERGEJ I

	3	TOTAL
GUSELNIKOV V G	1	BERKOVSKIJ ARKADIJ G
	1*	GUSELNIKOV V G
	1	TSYGANKOVA I I

	3	TOTAL
KHUDYAKOV YURIJ K	1	GOLUBEV BORIS A
	2*	KHUDYAKOV YURIJ K
	2	LUKIN MIKHAIL M
	1	PAVLYUCHENKOV OLEG G
	2	SAPRYKIN BORIS P

	8	TOTAL
KORZH VADIM I	1	CHERNIKOV VLADIMIR I
	1*	KORZH VADIM I
	1	SUBBOTIN VALERIJ T

	3	TOTAL
KOSTIN A B	2	BERKOVSKIJ ARKADIJ G
	2*	KOSTIN A B

	4	TOTAL
KOZHUNOV Y U I	1*	KOZHUNOV Y U I
	1	PREDEIN BORIS A

	1	VORONOV B F

	3	TOTAL
KUDRYAKOV NIKOLAJ K	1	CHERNIKOV VLADIMIR I
	1	DUBOV ALEKSANDR A
	1*	KUDRYAKOV NIKOLAJ K
	1	KULAKOV GENNADIJ V

	4	TOTAL
KULAKOV GENNADIJ V	1	CHERNIKOV VLADIMIR I
	1	DUBOV ALEKSANDR A
	1	KUDRYAKOV NIKOLAJ K
	1*	KULAKOV GENNADIJ V

	4	TOTAL
KUNETS GRIGORIJ A	2*	KUNETS GRIGORIJ A
	2	PROKOPENKO ERNEST A
	2	RYBAK VLADISLAV V
	2	SHOBOTENKO NIKOLAJ S

	8	TOTAL
LEONTEV VIKTOR V	1	GRIGOREV ALEKSANDR S
	1*	LEONTEV VIKTOR V
	1	SHKUNOV VLADIMIR A
	1	SOOZAR OLEG N

	4	TOTAL
LUKIN MIKHAIL M	1	GOLUBEV BORIS A
	2	KHUDYAKOV YURIJ K
	3*	LUKIN MIKHAIL M
	2	PAVLYUCHENKOV OLEG G
	3	SAPRYKIN BORIS P

	11	TOTAL
MAKSIMOV GENNADIJ P	2	BORISOV VLADIMIR V
	1	GOLOVTEEV ALEKSANDR V
	2*	MAKSIMOV GENNADIJ P
	2	ZYUZIN LEV N

	7	TOTAL
MARKOV YURIJ A	1*	MARKOV YURIJ A
	1	PAVLYUCHENKOV OLEG G
	1	SAPRYKIN BORIS P
	1	ZOTOV VADIM V

	4	TOTAL
MIKHAJLOV VIKTOR N	1	ARKHIPOV VALENTIN K
	1	BERKOVSKIJ ARKADIJ G
	1	BORISOV VLADIMIR V
	2	CHERNIKOV VLADIMIR I
	4*	MIKHAJLOV VIKTOR N
	1	MIRKIN E L
	1	PANIN V N
	1	PAVLOV SERGEJ I
	2	PREDEIN BORIS A
	1	RYBAK V V
	1	SARATOVSKIJ EVGENIJ N
	2	SELIVANOVA EMMA G

	1	ZBRITSKIJ IGOR E
	1	ZOTOV VADIM V
	1	ZYUZIN LEV N

	21	TOTAL
MIRKIN E L	2	ARKHIPOV VALENTIN K
	1	BERKOVSKIJ ARKADIJ G
	1	MIKHAJLOV VIKTOR N
	2*	MIRKIN E L
	1	PANIN V N
	1	PAVLOV SERGEJ I
	2	SARATOVSKIJ EVGENIJ N
	1	STEFANKOV VIKTOR F

	11	TOTAL
PANIN V N	2	ARKHIPOV VALENTIN K
	1	BERKOVSKIJ ARKADIJ G
	1	MIKHAJLOV VIKTOR N
	1	MIRKIN E L
	3*	PANIN V N
	2	PAVLOV SERGEJ I
	2	SARATOVSKIJ EVGENIJ N
	1	ZBRITSKIJ IGOR E

	13	TOTAL
PAVLOV SERGEJ I	2	ARKHIPOV VALENTIN K
	2	BERKOVSKIJ ARKADIJ G
	1	GUBANOV YURIJ
	1	MIKHAJLOV VIKTOR N
	1	MIRKIN E L
	2	PANIN V N
	7*	PAVLOV SERGEJ I
	2	SARATOVSKIJ EVGENIJ N

	18	TOTAL
PAVLYUCHENKOV OLEG G	1	GOLUBEV BORIS A
	1	KHUDYAKOV YURIJ K
	2	LUKIN MIKHAIL M
	1	MARKOV YURIJ A
	4*	PAVLYUCHENKOV OLEG G
	1	SAPEZHKO ARKADIJ YA
	3	SAPRYKIN BORIS P
	1	ZOTOV VADIM V

	14	TOTAL
PETROV IGOR A	3*	PETROV IGOR A
	1	SHKUNOV VLADIMIR A
	3	YAVOR STELLA YA

	7	TOTAL
PREDEIN BORIS A	3	CHERNIKOV VLADIMIR I
	1	KOZHUNOV Y U I
	2	MIKHAJLOV VIKTOR N
	5*	PREDEIN BORIS A
	1	RYAZHSKIJ VLADIMIR N
	2	SELIVANOVA EMMA G
	1	VORONOV B F
	2	ZOTOV VADIM V

	17	TOTAL

PROKOPENKO ERNEST A

2 KUNETS GRIGORIJ A
2* PROKOPENKO ERNEST A
2 RYBAK VLADISLAV V
2 SHOBOTENKO NIKOLAJ S

8 TOTAL

RYAZHSKIJ VLADIMIR N

1 CHERNIKOV VLADIMIR I
1 PREDEIN BORIS A
1* RYAZHSKIJ VLADIMIR N
1 ZOTOV VADIM V

4 TOTAL

RYBAK V V

1 ARKHIPOV VALENTIN K
1 BORISOV VLADIMIR V
1 MIKHAILOV VIKTOR N
2* RYBAK V V
1 SARATOVSKIJ EVGENIJ N
1 ZBRITSKIJ IGOR E
1 ZYUZIN LEV N

8 TOTAL

RYBAK VLADISLAV V

2 KUNETS GRIGORIJ A
2 PROKOPENKO ERNEST A
2* RYBAK VLADISLAV V
2 SHOBOTENKO NIKOLAJ S

8 TOTAL

RYBAK VYACHESLAV V

2 ARKHIPOV VALENTIN K
1 ELKIN IGOR
3* RYBAK VYACHESLAV V
1 SAPEZHKO ARKADIJ YA
3 SARATOVSKIJ EVGENIJ N
2 STEFANKOV VIKTOR F
2 ZBRITSKIJ IGOR E

14 TOTAL

RYZHAKOV VLADIMIR M

1 BORISOV VLADIMIR V
1* RYZHAKOV VLADIMIR M
1 SHUVALOV VIKTOR M
1 ZYUZIN LEV N

4 TOTAL

SAPEZHKO ARKADIJ YA

1 ARKHIPOV VALENTIN K
1 ELKIN IGOR
1 PAVLYUCHENKOV OLEG G
1 RYBAK VYACHESLAV V
4* SAPEZHKO ARKADIJ YA
2 SARATOVSKIJ EVGENIJ N
2 ZBRITSKIJ IGOR E

12 TOTAL

SAPRYKIN BORIS P

1 GOLUBEV BORIS A
2 KHUDYAKOV YURIJ K
3 LUKIN MIKHAIL M
1 MARKOV YURIJ A
3 PAVLYUCHENKOV OLEG G
4* SAPRYKIN BORIS P
1 ZOTOV VADIM V

	---	15	TOTAL
SARATOVSKIJ EVGENIJ N	6	ARKHIPOV VALENTIN K	
	1	BERKOVSKIJ ARKADIJ G	
	1	ELKIN IGOR	
	1	MJKHAJLOV VIKTOR N	
	2	MIRKIN E L	
	2	PANIN V N	
	2	PAVLOV SERGEJ I	
	1	RYBAK V V	
	3	RYBAK VYACHESLAV V	
	2	SAPEZHKO ARKADIJ YA	
	8*	SARATOVSKIJ EVGENIJ N	
	3	STEFANKOV VIKTOR F	
	3	ZBRITSKIJ IGOR E	
	---	35	TOTAL
SAZHIN SERGEJ A	1	BERESTOV SERGEJ I	
	1*	SAZHIN SERGEJ A	
	1	SUBBOTIN VALERIJ T	
	---	3	TOTAL
SELIVANOVA EMMA G	2	CHERNIKOV VLADIMIR I	
	2	MIKHAJLOV VIKTOR N	
	2	PREDEIN BORIS A	
	2*	SELIVANOVA EMMA G	
	1	ZOTOV VADIM V	
	---	9	TOTAL
SHIKHMANOV SERGEJ S	1	ARKHANGELSKIJ IGOR A	
	2	GOLOVKOV VIKTOR P	
	2*	SHIKHMANOV SERGEJ S	
	2	ZABOLOTNYJ NIKOLAJ	
	---	7	TOTAL
SHKUNOV V I	1*	SHKUNOV V I	
	---	1	TOTAL
SHKUNOV VLADIMIR A	1	BORISOV VLADIMIR V	
	1	GRIGOREV ALEKSANDR S	
	1	LEONTEV VIKTOR V	
	1	PETROV IGOR A	
	3*	SHKUNOV VLADIMIR A	
	1	SOOZAR OLEG N	
	1	YAVOR STELLA YA	
	---	9	TOTAL
SHOBOTENKO NIKOLAJ S	2	KUNETS GRIGORIJ A	
	2	PROKOPENKO ERNEST A	
	2	RYBAK VLADISLAV V	
	2*	SHOBOTENKO NIKOLAJ S	
	---	8	TOTAL
SHUVALOV VIKTOR M	1	BORISOV VLADIMIR V	
	1	RYZHAKOV VLADIMIR M	
	1*	SHUVALOV VIKTOR M	
	1	ZYUZIN LEV N	

	4	TOTAL
SMIRNYJ MIKHAIL F	1*	SMIRNYJ MIKHAIL F

	1	TOTAL
SOOZAR OLEG N	1	GRIGOREV ALEKSANDR S
	1	LEONTEV VIKTOR V
	1	SHKUNOV VLADIMIR A
	1*	SOOZAR OLEG N

	4	TOTAL
STEFANKOV VIKTOR F	4	ARKHIPOV VALENTIN K
	1	MIRKIN E L
	2	RYBAK VYACHESLAV V
	3	SARATOVSKIY EVGENIY N
	4*	STEFANKOV VIKTOR F
	1	VYGOVSKIY V V
	1	ZBRITSKIY IGOR E

	16	TOTAL
SUBBOTIN VALERIY T	1	BERESTOV SERGEY I
	1	CHERNIKOV VLADIMIR I
	1	KORZH VADIM I
	1	SAZHIN SERGEY A
	2*	SUBBOTIN VALERIY T

	6	TOTAL
TSYGANKOVA I I	1	BERKOVSKIY ARKADIY G
	1	GUSELNIKOV V G
	1*	TSYGANKOVA I I

	3	TOTAL
VOLGIN ALEKSANDR N	3	ANISKIN FEDOR F
	2	ARKHIPOV VALENTIN K
	3*	VOLGIN ALEKSANDR N
	3	VYGOVSKIY ANATOLIY V

	11	TOTAL
VORONOV B F	1	KOZHUNOV Y U I
	1	PREDEIN BORIS A
	1*	VORONOV B F

	3	TOTAL
VYGOVSKIY ANATOLIY V	3	ANISKIN FEDOR F
	2	ARKHIPOV VALENTIN K
	3	VOLGIN ALEKSANDR N
	3*	VYGOVSKIY ANATOLIY V

	11	TOTAL
VYGOVSKIY V V	1	ARKHIPOV VALENTIN K
	1	STEFANKOV VIKTOR F
	1*	VYGOVSKIY V V

	3	TOTAL
YAKOVENKOV LEONID R	2	BORISOV VLADIMIR V
	2*	YAKOVENKOV LEONID R
	2	ZYUZIN LEV N

	---	6	TOTAL
YAVOR STELLA YA		3	PETROV IGOR A
		1	SHKUNOV VLADIMIR A
		3*	YAVOR STELLA YA
	---	7	TOTAL
ZABOLOTNYJ NIKOLAJ		2	ARKHANGELSKIJ IGOR A
		1	CHERNIKOV VLADIMIR I
		2	GOLOVKOV VIKTOR P
		2	SHIKHMANOV SERGEJ S
		3*	ZABOLOTNYJ NIKOLAJ
	---	10	TOTAL
ZBRITSKIJ IGOR E		1	ARKHIPOV VALENTIN K
		1	BORISOV VLADIMIR V
		1	ELKIN IGOR
		1	MIKHAJLOV VIKTOR N
		1	PANIN V N
		1	RYBAK V V
		2	RYBAK VYACHESLAV V
		2	SAPEZHKO ARKADIJ YA
		3	SARATOVSKIJ EVGENIJ N
		1	STEFANKOV VIKTOR F
		5*	ZBRITSKIJ IGOR E
		1	ZYUZIN LEV N
	---	20	TOTAL
ZOTOV VADIM V		2	CHERNIKOV VLADIMIR I
		1	MARKOV YURIJ A
		1	MIKHAJLOV VIKTOR N
		1	PAVLYUCHENKOV OLEG G
		2	PREDEIN BORIS A
		1	RYAZHSKIJ VLADIMIR N
		1	SAPRYKIN BORIS P
		1	SELIVANOVA EMMA G
		3*	ZOTOV VADIM V
	---	13	TOTAL
ZOTOV VLADIMIR V		1	BORISOV EDUARD V
		1*	ZOTOV VLADIMIR V
	---	2	TOTAL
ZYUZIN LEV N		1	ARKHANGELSKIJ IGOR A
		7	BORISOV VLADIMIR V
		1	GOLOVTEEV ALEKSANDR V
		2	MAKSIMOV GENNADIJ P
		1	MIKHAJLOV VIKTOR N
		1	RYBAK V V
		1	RYZHAKOV VLADIMIR M
		1	SHUVALOV VIKTOR M
		2	YAKOVENKOV LEONID R
		1	ZBRITSKIJ IGOR E
		7*	ZYUZIN LEV N
	---	25	TOTAL

Appendix C

Inventor Frequency Distribution
- by frequency,

and

Inventor Frequency Distribution
- by name alphabetically

Alphabetical List of Inventors with Patent Totals

3 ANISKIN FEDOR F
3 ARKHANGELSKIY IGOR A
11 ARKHIPOV VALENTIN K
1 BERESTOV SERGEY I
9 BERKOVSKIY ARKADIY G
1 BORISOV EDUARD V
8 BORISOV VLADIMIR V
1 BRUNOV MIKHAIL V
6 CHERNIKOV VLADIMIR I
1 DUBOV ALEKSANDR A
1 ELKIN IGOR
2 FOMINOV VIKTOR A
5 GOLOVKOV VIKTOR P
1 GOLOVTEEV ALEKSANDR V
1 GOLUBEV BORIS A
2 GOLYSHEV ALEKSEY I
1 GRIGOREV ALEKSANDR S
1 GUBANOV YURIY
1 GUSELNIKOV V G
2 KHUDYAKOV YURIY K
1 KORZH VADIM I
2 KOSTIN A B
1 KOZHUNOV Y U I
1 KUDRYAKOV NIKOLAJ K
1 KULAKOV GENNADIY V
2 KUNETS GRIGORIY A
1 LEONTEV VIKTOR V
3 LUKIN MIKHAIL M
2 MAKSIMOV GENNADIY P
1 MARKOV YURIY A
4 MIKHAYLOV VIKTOR N
2 MIRKIN E L
3 PANIN V N
7 PAVLOV SERGEY I
4 PAVLYUCHENKOV OLEG G
3 PETROV IGOR A
5 PREDEIN BORIS A
2 PROKOPENKO ERNEST A
1 RYAZHSKIY VLADIMIR N
2 RYBAK V V
2 RYBAK VLADISLAV V
3 RYBAK VYACHESLAV V
1 RYZHAKOV VLADIMIR M
4 SAPEZHKO ARKADIY YA
4 SAPRYKIN BORIS P
8 SARATOVSKIY EVGENIY N
1 SAZHIN SERGEY A
2 SELIVANOVA EMMA G
2 SHIKHMANOV SERGEY S
1 SHKUNOV V I
3 SHKUNOV VLADIMIR A

2 SHOBOTENKO NIKOLAJ S
1 SHUVALOV VIKTOR M
1 SMIRNYJ MIKHAIL F
1 SOOZAR OLEG N
4 STEFANKOV VIKTOR F
2 SUBBOTIN VALERIJ T
1 TSYGANKOVA I I
3 VOLGIN ALEKSANDR N
1 VORONOV B F
3 VYGOVSKIJ ANATOLIJ V
1 VYGOVSKIJ V V
2 YAKOVENKOV LEONID R
3 YAVOR STELLA YA
3 ZABOLOTNYJ NIKOLAJ
5 ZBRITSKIJ IGOR E
3 ZOTOV VADIM V
1 ZOTOV VLADIMIR V
7 ZYUZIN LEV N

List of Inventors by Patent Frequency

11 ARKHIPOV VALENTIN K
9 BERKOVSKIY ARKADIY G
8 BORISOV VLADIMIR V
8 SARATOVSKIY EVGENIY N
7 PAVLOV SERGEY I
7 ZYUZIN LEV N
6 CHERNIKOV VLADIMIR I
5 GOLOVKOV VIKTOR P
5 PREDEIN BORIS A
5 ZBRITSKIY IGOR E
4 MIKHAJLOV VIKTOR N
4 PAVLYUCHENKOV OLEG G
4 SAPEZHKO ARKADIY YA
4 SAPRYKIN BORIS P
4 STEFANKOV VIKTOR F
3 ANISKIN FEDOR F
3 ARKHANGELSKIY IGOR A
3 LUKIN MIKHAIL M
3 PANIN V N
3 PETROV IGOR A
3 RYBAK VYACHESLAV V
3 SHKUNOV VLADIMIR A
3 VOLGIN ALEKSANDR N
3 VYGOVSKIY ANATOLIY V
3 YAVOR STELLA YA
3 ZABOLOTNYIY NIKOLAJ
3 ZOTOV VADIM V
2 FOMINOV VIKTOR A
2 GOLYSHEV ALEKSEY I
2 KHUDYAKOV YURIY K
2 KOSTIN A B
2 KUNETS GRIGORIY A
2 MAKSIMOV GENNADIY P
2 MIRKIN E L
2 PROKOPENKO ERNEST A
2 RYBAK V V
2 RYBAK VLADISLAV V
2 SELIVANOVA EMMA G
2 SHIKHMANOV SERGEY S
2 SHOBOTENKO NIKOLAJ S
2 SUBBOTIN VALERIY T
2 YAKOVENKOV LEONID R
1 BERESTOV SERGEY I
1 BORISOV EDUARD V
1 BRUNOV MIKHAIL V
1 DUBOV ALEKSANDR A
1 ELKIN IGOR
1 GOLOVTEEV ALEKSANDR V
1 GOLUBEV BORIS A
1 GRIGOREV ALEKSANDR S

1 GUBANOV YURIJ
1 GUSELNIKOV V G
1 KORZH VADIM I
1 KOZHUNOV Y U I
1 KUDRYAKOV NIKOLAJ K
1 KULAKOV GENNADIJ V
1 LEONTEV VIKTOR V
1 MARKOV YURIJ A
1 RYAZHSKIJ VLADIMIR N
1 RYZHAKOV VLADIMIR M
1 SAZHIN SERGEJ A
1 SHKUNOV V I
1 SHUVALOV VIKTOR M
1 SMIRNYJ MIKHAIL F
1 SOOZAR OLEG N
1 TSYGANKOVA I I
1 VORONOV B F
1 VYGOVSKIJ V V
1 ZOTOV VLADIMIR V

184 TOTAL

END

**DATE
FILMED**

12/11/191