"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, Valentin, dr.

Computing machines and controlling devices in the service of science and technology. Przegl techn no.44:5 2 N '60.

1. Dyrektor Naukowo-Badawczego Instytutu Budowy Maszyn Liczacych.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.

Farm buildings built of vibrated rolled elements. Sel'.stroi. 15 no.5:11 My '60. (MIRA 13:8)

1. Glavnyy konstruktor eksperimental'no-konstruktorskogo byuro Akademii stroitel'stva i arkhitektury SSSR.
(Precast concrete construction)
(Farm buildings)

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MIKOYAN, A.; IGNATOV, N.; KOROVUSHKIN, A.; GARBUZOV, V.; KABKOV, Ya.; KUDRYAVTSEV, A.; BORYCHEV, I; VOROB'YEV, V.; SVESHNIKOV, M.; USHAKOV, V.; MIROSHNICHENKO, B.; ZENCHENKO, N.; BABUSHKIN, V.; NIKITKIN, N.; PODSHIVALENKO, P.; ZOTOV, M.; VOSKRESENSKIY, A.; KAZANTSEV, A.; KORDYUKOV, A.; NOSKO, P.; PLESHAKOV, S.; VERSOV, A.; ROMASHOV, A.

I.N. Kazakov; obituray. Den. i kred. 19 no.3:95 Mr '61. (MIRA 14:3)

(Kazakov, Ivan Nikolaevich, 1907-1961)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

Ushakov, V.

THE STUDY OF THE DEPENDENCE OF COSMIC RAY μ^+ -MESON POLARIZATION AT SEA LEVEL UPON THEIR ENERGIES

B. Dolgoshein, B. Luchkov, V. Ushakov

A hodoscope system of counters operating with a high voltage pulse supply was used to measure the degree of polarization of μ^+ -meson flux at sea level for different μ-meson energies. The μ-meson energy range was 300 Mev - 1.5 Bev.

Report presented at the International Cosmic Ray Conference, Moscow, 6-11 July 1959

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S/056/62/042/004/004/037
B102/B104

3 2400
24.6700

AUTHORS: Dolgoshein, B., Luchkov, B., Ushakov, V.

TITLE: Low-energy cosmic muon polarization at sea level

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 4, 1962, 949-955

TEXT: The polarization of cosmic positive muons of 0.2-1.55 Bev was measured at sea level with a copper absorber ($700 \cdot 1400 \cdot 20$ mm^3) surrounded by several layers of gas-discharge counters. The μ^--mesons decayed before recording (lifetime $\sim 10^{-7}$ sec). The background of the μ^+-e^+ decays recorded could be due to rather improbable events (the muon is stopped in the layers and another particle passes through the positron detector; the muon and positron trajectories intersect within the absorber; the muons are stopped or decay in the glass walls of the counters nearest to the absorber plate). The ratio between background and effect was of the order of 10^{-2}-10^{-3}. During 1500 hrs operation more than $3 \cdot 10^4$ μ^+-e^+ events were recorded. From the time distribution of the decay positrons the μ^+

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lifetime was obtained as 2.18 ± 0.04 μsec. The asymmetry of the positron angular distribution was measured, the asymmetry factors R were determined:

Absorber	Cu	Cu	Cu	Fe
E, Bev	0.2	0.55	1.40	0.55
R	1.13 ± 0.025	1.135 ± 0.020	1.195 ± 0.030	1.020 ± 0.023

The polarization of the muon flux was calculated from R, taking account of the geometry, the angular and energy distributions and the range-energy ratio of the decay positrons. The numerical results are given in Table 2; for Fe polarization was, as expected, equal to zero. The possible contribution of $K_{\mu 2}$ decays to the polarization is estimated: $\eta(E_\mu \approx 1.5$ Bev) = 0.375 ± 0.035. From this a value $K^+/\pi^+ = 0.22 \pm 0.18$ is obtained for the ratio of K^+ and π^+ mesons produced in the atmosphere. Professor A. I. Alikhanyan is thanked for interest and V. Berezinskiy for discussions. There are 5 figures and 2 tables.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Engineering Physics Institute)

SUBMITTED: November 1, 1961

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

Low-energy cosmic muon polarization ... S/056/62/042/004/004/037
B102/B104

E_{μ^+}, Bev	Number of decays	Polarization exp.	Polarization theor.
0,20	6663	0,24±0,045	0,23
0,30	1415	0,29±0,08	0,25
0,55	11066	0,25±0,035	0,28
1,05	1485	0,40±0,08	0,33
1,40	5701	0,35±0,05	0,335
1,55	4900	0,40±0,05	0,335

Table 2

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.

State Bank financing and long-term credit to agricultural and municipal enterprises. Den. i kred. 17 no.8:11-20 Ag '59. (MIRA 12:11)
(Credit)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.

A strong Soviet ruble. Sov.torg. 33 no.8:3-8 Ag '60. (MIRA 13:8)

1. Zamestitel' predsedatelya pravleniya Gosbanka SSSR. (Money) (Russia—Commerce)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.

State Bank tasks in connection with the decisions of the January Plenum of the Central Committee of the CPSU. Den. i kred. 19 no.3:3-13 Mr '61. (MIRA 14:3)
(Agricultural credit) (Construction industry--Finance)
(Banks and banking)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.

Technical specification is not a trifle. NTO 3 no.12:54 D '61. (MIRA 15:1)

1. Zamestitel' predsedatelya oblastnogo pravleniya nauchno-tekhnicheskikh obshchestv stroitel'noy industrii.
(Voronezh--Building--Contracts and specifications)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.

State Bank tasks in developing agriculture. Den. i kred. 20 no.4:3-12 Ap '62. (MIRA 15:4)
(Banks and banking) (Agriculture)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.

Spend economically and produce more. Den. i kred. 21 no.5:3-12 My '63. (MIRA 16:5)
(Agriculture—Finance) (Banks and banking)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.

Give more attention to the problems of financing capital construction. Den. i kred. 21 no.8:8-16 Ag '63. (MIRA 16:9)
(Banks and banking) (Construction industry--Finance)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V., polkovnik

Perfect the methodology of training subordinates. Komm. Vooruzh. Sil 46 no.20:39-43 O '65. (MIRA 18:12)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

SOV/5041

PHASE I BOOK EXPLOITATION

Ushakov, Viktor

Rakety steregut sovetskoye nebo; reportazh (Rockets Guard the Soviet Sky; Report) Moscow, Izd-vo "Izvestiya", 1960. 73 p. 50,000 copies printed. (Series: Biblioteka "Izvestiy", no. 9)

Ed.: V. Kitain; Tech. Ed.: V. Vlasova.

PURPOSE: This popular-type booklet is intended for the general reader.

COVERAGE: The author describes the role of the Soviet anti-aircraft defense forces in the Lockheed U-2 incident. He reports on his interviews with the Commander-in-Chief of Air Defense, Marshal of the Soviet Union S. Biryuzov, and with military personnel at antiaircraft guided-missile units. The intercepting and downing of the U-2 plane is described, including the actual firing of the fatal missile by missile-guidance officer Senior Lieutenant Eduard

Card 1/3

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Fel'dblyum. A photograph captioned "That is all that remained of Power's plane after explosion of the missile" is presented. The name of Vasiliy Polyakov, the Air Defense pilot who downed the RB-47 plane, is mentioned. There are no references.

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, Viktor; KITAIN, V., red.; VLASOVA, V., tekhn.red.

[Rockets watch over the Soviet sky; report] Rakety steregut sovetskoe nebo; reportazh. Moskva, Izd-vo "Izvestiia," 1960. 73 p. (Biblioteka "Izvestii," no.9) (MIRA 14:3)

(Guided missiles) (Rockets (Aeronautics))

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V., mayor; GALAK, N., mayor; SHCHERBOKOV, N., starshiy leytenant

Tank platton in separate reconnaissance patrols. Voen. vest. 39 no. 1:43-48 Ja '60. (MIRA 14:2)

(Military reconnaissance)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, Viktor

Terrible weapons are in their hands. Voen.znan. 37 no.5:7-8 My '61. (MIRA 14:4)

(Russia--Armed forces)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

[illegible]SNICHENKO, G., polkovnik; USHAKOV, V., polkovnik

Organization work of a staff officer. Komm. Vooruzh. Sil 4 no.1:32-35 Ja '64. (MIRA 17:9)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.A., kandidat tekhnicheskikh nauk; KARAGODIN, V.A., inzhener; MORO, A.I., inzhener; KHAZANOV, B.E., inzhener; FEDOROV, B.S., inzhener; MALITSKIY, S.I., inzhener.

Design and building of large size storm sewers. Gor.khoz. Mosk. 27 no.6: 26-30 Je '53. (MLRA 6:6)

(Moscow--Drainage)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.A.

Seminar and lecture with motion pictures for workers in the construction industry. Opyt rab. po tekhn. inform. i prop. no.4:33 '63. (MIRA 17:1)

1. Nachal'nik otdela TSentral'nogo byuro tekhnicheskoy informatsii TSentral'no-Chernozemnogo soveta narodnogo khozyaystva.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V. A.

Milk

Increasing butterfat production in cows of the Stalin Collective Farms. Sots. zhiv., 14, No. 2, 1952.

9. Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V. A.

Calves

Keeping calves in summer quarters. Sots. zhiv. 14 no. 7, 1952.

9. Monthly List of Russian Accessions, Library of Congress, December 1953/52, Uncl.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

1. USHAKOV, V.A.

2. USSR (600)

4. Cows

7. Problem of the age of heifers at first breeding, Sov.zootekh. 8 no. 3, 1953.

9. Monthly List of Russian Accessions, Library of Congress, APRIL 1953, Uncl.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

1. USHAKOV, V. A.

2. USSR (600)

4. Insemination, Artificial

7. Work of aritificial insemination stations for cattle in the area of the Kholmogory State Breeding Farm, Sots, zhiv., 15, no. 4, 1953.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

OSNAKOV, V. A.

33361. Pis'mo V redaktsiyo. (O Vliyanii Kachestva Semini c. -x. Zhivotnykh Na Kachestvo Ariploida). Sov. Zotekhniya, 1949, No. 6, c. 91-92.

SO. Letopis' Zhurnal'nykh Statey, Vol. 45, Moskva, 1949

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

38236. USHAKOV, V. A.

Lagernoye soderzhaniye telyat v kolkho ze "Kollektivnyy trud". (Kholmogor. rayon Arkhang. obl.) Sov. zootekhniya, 1949, No 3, s. 37-39

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V. A.

USHAKOV, V. A. -- "Investigation of Magnetic Telephone Systems." Sub 19 Apr 52, Moscow Electrical Engineering Inst of Communications. (Dissertation for the Degree of Candidate in Technical Sciences.

SO: VECHERNAYA MOSKVA, January-December 1952

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

SOV/112-57-5-11619

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1957, Nr 5, p 303 (USSR)

AUTHOR: Ushakov, V. A.

TITLE: Distribution of Permanent Magnetic Flux in a Telephone (Paspredeleniye postoyannogo magnitnogo potoka v telefone)

PERIODICAL: Sb. nauch. rabot Vses. zaoch. elektrotekhn. in-ta svyazi, 1956, Nr 1, pp 74-82

ABSTRACT: Application of general magnet-designing principles to the design of magnetic systems for telephones is considered. A design of a TK-4 magnetic circuit is made, and experimental data on the distribution of permanent magnetic flux in the telephone is presented. From author's summary.

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

KHARKEVICH, Anatoliy Dem'yanovich; USHAKOV, V.A., otv. red.; ROZHDESTVENSKAYA, V.A., red.

[Principle schematics of the basic devices for the 47 automatic telephone exchange] Printsipial'nye skhemy osnovnykh priborov ATC-47. Moskva, Redaktsionno-izdatel'skii otdel VZEIS, 1962. 39 p. (MIRA 16:12)
(Telephone stations--Equipment and supplies)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, Vyacheslav Andreyevich; KHACHIROV, L.I., otv. red.; ROZHDESTVENSKAYA, V.A., red.

[Diagrams of telephone apparatus with transistor amplifiers; manual for students of the fourth course in telegraph and telephone communication] Skhemy telefonnykh apparatov s usiliteliami na transzistorakh; uchebnoe posobie dlia studentov IV kursa telegrafnoi i telefonnoi sviazi. Moskva, Redaktsionno-izdatel'skii otdel VZEIS, 1963. 33 p. (MIRA 17:5)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

POKRASS, M.P.; USHAKOV, V.A., otv. red.; VRONSKAYA, I.S., red.

[Automatic and remote control system units. Memory elements; lectures in a course on "Principles of automatic and remote control in communications" for students of telephone and telegraph communication departments] Uzly ustroistv avtomatiki i telemekhaniki sviazi. Elementy pamiati; lektsii po kursu "Osnovy avtomatiki i telemekhaniki sviazi" dlia studentov fakul'teta telefonno-telegrafnoi sviazi. Moskva, Red.-izd. otdel VZEIS, 1963. 60 p.
(MIRA 17:11)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

POKRASS, M.P., kand. tekhn. nauk; USHAKOV, V.A., otv. red.

[Elements of automatic control and remote control systems; lectures in the course on "Principles of automatic and remote control" for students of telephone and telegraph communication departments] Elementy ustroistv avtomatiki i telemekhaniki; lektsii po kursu "Osnovy avtomatiki i telemekhaniki sviazi" dlia studentov fakul'teta telefonno-telegrafnoi sviazi. Moskva, Red.-izd. otdel VZEIS, 1963. 110 p. (MIRA 17:11)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, Vyacheslav Andreyevich; POKRASS, M.P., otv. red.; ROZHDESTVENSKAYA, V.A., red.

[Telephony; manual for students of the Engineering Economics Department of the All-Union Correspondence Institute of Electrical Communication] Telefoniia; uchebnoe posobie dlia studentov inzhenerno-ekonomicheskogo fakul'teta VZEIS. Moskva, Red.-izd. otdel VZEIS, Pt.1. 1963. 152 p. (MIRA 19:1)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USLAKOV, V.B.

Accommodation capacity of tonic and atonic muscles and of individual muscular fibers in the frog. TSitologiia 1 no.3: 280-284 My-Je '59. (MIRA 12:10)

1. Laboratoriya evolyutsionnoy fiziologii Fiziologicheskogo instituta pri Leningradskom universitete.
(MUSCLE)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.B.

Using the method of vital staining in estimating the functional state of resting tonic and tetanic muscles of a frog. TSitologiia 3 no.3:272-280 My-Je '61. (MIRA 14:6)

1. Laboratoriya evolyutsionnoy fiziologii Fiziologicheskogo instituta pri Leningradskom universiteta.
(MUSCLE) (ADSORPTION (PHYSIOLOGY))

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.B.

Comparing the heat resistance of the protein substrate in tonic and atonic skeletal muscle fibers. TSitologiia 3 no.4:418-425 Jl-Ag '61. (MIRA 14:8)

1. Laboratoriya sravnitel'noy fiziologii Fiziologicheskogo instituta pri Leningradskom universiteta.
(HEAT--PHYSIOLOGICAL EFFECT) (MUSCLE)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.B.

Protein substrate of tonic and tetanic skeletal muscles of a frog. Vest.LGU 16 no.9:123-134 '61. (MIRA 14:5)
(MUSCLE) (MYOSIN)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.B.

Resistance of tonic and atonic muscle fibers to the action of a series of chemical agents. Dokl.AN SSSR 138 no.2:485-487 My '61. (MIRA 14:5)

1. Leningradskiy gosudarstvennyy universitet im. A.A.Zhdanova. Predstavleno akademikom V.N.Chernigovskim.
(CHEMICALS—PHYSIOLOGICAL EFFECT) (MUSCLE)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.B.

Some specific features of the biochemical composition of tonic and atonic skeletal muscles. Dokl. AN SSSR 141 no.5:1232-1235 D '61. (MIRA 14:12)

1. Leningradskiy gosudarstvennyy universitet im. A.A. Zhdanova. Predstavleno akademikom V.N. Chernigovskim.
([redacted]) (MYOSIN)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

ACCESSION NR: AP4034546 S/0020/64/155/005/1178/1181

AUTHOR: Ushakov, V. B.

TITLE: On the question of the reason for thermal death of cold blooded animals' skeletal muscles

SOURCE: AN SSSR. Doklady*, v. 155, no. 5, 1964, 1178-1181

TOPIC TAGS: muscle tissue dye absorption, protein fraction, fibrin fraction, actomyosin, frog, muscle, thermal death, glycerination

ABSTRACT: This study aimed at further elucidation of the assumption that the earlier observed stepwise increase of dye absorption by this muscle tissue upon heat exposure is contingent upon structural changes in the variously heat-resistant protein fractions of muscle fiber protoplasm. Another aim was to find the protein fraction, thermal injury of which would cause destruction of muscle fibers.

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

ACCESSION NR: AP4034546

The tests are briefly described. They were conducted on the isolated sartorius muscle of the frog, kept in Ringer's solution which was heated to the desired experimental temperature, maintained there for 15 minutes, then dyed with neutral red, and the dye absorption determined quantitatively. The muscle was then treated with glycerin which was subsequently removed. Altogether 322 tests with dye were conducted between 34 and 47 C. Results are graphed and show 2 stepwise increases of dye absorption at 36 and 41C; these are assumed to correspond to coagulation of the water soluble protein fraction and that of actomyosin respectively. To verify this assumption, the same tests were repeated with glycerinated muscle which retains only myofibrillar proteins (the soluble fraction having been removed by the glycerin). These showed absence of the first dye-absorption step, thus confirming that its earlier appearance was caused by changes in the water soluble proteins. Contractability of these muscles pointed towards retention of the actomyosin properties. It is concluded that destruction of the water soluble protein fractions is responsible for the thermal death of muscle tissue. (Another study on light penetrability of muscle upon exposure to heat will be published separately). Irreversible death occurred at 37C. Orig. art. has: 3 figures.

Card 2/3

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

ACCESSION NR: AP4034546

ASSOCIATION: Institut evolyutsionnoy fiziologii im. I. M. Sechenova Akademii nauk SSSR (Institute of Evolutionary Physiology, Academy of Sciences, SSSR)

SUBMITTED: 12Sep63 ATD PRESS: 13054 ENCL: 00

SUB CODE: LS NO REF SOV: 007 OTHER: 005

Card 3/3

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.N.

Analysis of the causes of the thermal death of skeletal [illegible].
Fiziol.zhur. 51 no.3:388-394 Mr 1965.

(M [illegible])

1. Institut evolyutsionnoy fiziologii i biokhimii imeni [illegible]
AN SSSR, Leningrad.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.B.

Thermostability of excitable and contractile systems of a muscle fiber. Sbor.rab. Inst. tsit. no.8:55-60 '65. (MIRA 18:12)

1. Laboratoriya evolyutsii dvigatel'noy deyatel'nosti Instituta evolyutsionnoy fiziologii i biokhimii imeni I.M.Sechenova AN SSSR, Leningrad.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

[illegible]KOV, V.[illegible].

Thermostability of the choline receptor system of [illegible] tonic and tetanic frog muscles. Sbor.rab. [illegible] [illegible] '65. (MIRA 18:12)

1. Laboratoriya evolyutsii dvigatel'noy deyatel'nosti instituta evolyutsionnoy fiziologii i biokhimii imeni I.M.Sachenova AN SSSR, Leningrad.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

L 25824-66

ACC NR: AP6015936 SOURCE CODE: UR/0239/65/051/003/0388/0394

AUTHOR: Ushakov, V. B.

ORG: Institute of Evolutionary Physiology and Biochemistry, im. I. M. Sechenov, AN SSSR, Leningrad (Institut evolyutsionnoy fiziologii i biokhimii AN SSSR)

TITLE: Investigation of the causes of thermal death of skeletal muscles

SOURCE: Fiziologicheskiy zhurnal SSSR, v. 51, no. 3, 1965, 388-394

TOPIC TAGS: mouse, rat, experiment animal, myology, cytology, protein

ABSTRACT: The effect of heating in Ringer's solution on skeletal muscles of frogs, toads, mice, rats, and chicks was studied by determining the absorption by the muscles of neutral red. The technique described by the author in Tsitologiya, Vol 3, No 4, 418, 1961, was used. The absorption of neutral red in relation to the temperature at which the muscles were heated could be described in every case by a curve with two steps (plateaus). The temperature at which the first plateau began corresponded to the thermal death of the muscles, as indicated by the loss of the capacity to contract upon action of an electric current. The thermal death of the muscles took place at 37° for frogs and 39° for toads. The skeletal muscles of warm-blooded animals were more resistant: the temperature of thermal death was 43° for

Card 1/2

UDC: 614.742+612.5

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L 25824-66

ACC NR: AP6015936

rats. The skeletal muscles of young, sexually immature mice were more resistant than those of adult mice: their thermal death occurred at 45°. The temperature of thermal death for the skeletal muscles of chicks was 48°. The increase in the absorption of neutral red in the stage immediately following thermal death of the muscles (that after the first plateau on the curve) was within the same range for all animals investigated. This indicated that thermal damage to the same protein or to the same protein complex was involved in every case. The author thanks Ye. K. Zhukov for his critical remarks made as a result of reading the manuscript. Orig. art. has: 3 figures and 1 table. [JPRS]

SUB CODE: 06 / SUBM DATE: 23Nov63 / ORIG REF: 019 / OTH REF: 009

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APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.B.

Editor of "Description of Analog Computer MPT-9", Sbornik NII MPSS, 1952 -- AiT 2/56/35
Co-author with A. A. Fel'dbaum of "Linear Analog Computers, Nauch-Tekh Sbor NII MPSS, 12, 1951 --Prib 4/56/11.

Scientific Research Institute, Ministry of Communications Equipment Industry
(NII Ministerstvo Promyshlennosti Sredstv Svyazi)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

FEL'DRAUM, A. A.

Coauthor with V. B. Ushakov of "Linear Analog Computers, Nauch-Tekh Sbor NII MPSS, 12, 1951 --Prib 4/56/11.

Scientific Research Institute, Ministry of Communications Equipment Industry.
(NII Ministerstvo Promyshlennosti Sredstv Svyazi)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V. B., ed.

Berlin. Fachausschuss fur Regelungstechnik. Strukturnye kharakteristiki sistem avtomaticheskogo regulirovaniia (Regelungstechnik) Moskva, Gos. energ. izd-vo, 1948. 94 p. (52-36640)

TA165.V415

1. Automatic control..I. Ushakov, V. B., ed.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V. B.

Apr 49

USSR/Engineering
Literature
Electricity

"Recent Gosenergoizdat Publications" 1 p

"Vest Elektro-Prom" No 4

Books published recently by Gosenergoizdat (State Power Publishers) include "Gas Turbines," by V. P. Blyudov, "UHF Techniques," by Brainerd - translation, "Alphabet of Radio Engineering," by S. Kin, 3d supplement and revised edition, "Power Engineering in Manufacturing Plants," edited by V. V. Luknitskiy, and "Structural Characteristics of Automatic Regulation Systems," edited by V. B. Ushakov

57/49T42

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V. B.

112-3-6419

Translation from: Referativnyy Zhurnal, Elektrotekhnika, 1957, Nr 3, p. 188 (USSR)

AUTHOR: Ushakov, V.B.

TITLE: Very-Low-Frequency Apparatus for Obtaining Dynamic Characteristics of Automatic Control Systems (Infranizkochastotnaya apparatura dlya snyatiya dinamicheskikh kharakteristik sistem avtomaticheskogo regulirovaniya)

PERIODICAL: Tr. 2-go Vses. soveshchaniya po teorii avtomat. regulirovaniya, III, Moscow - Leningrad, 1955, pp. 147-162. Vystupleniya, pp. 163-164

ABSTRACT: The following apparatus of the Computing and Analytical Machine Plant in Penza is described: 1. The НГ -2 generator for producing pure sine waves in a frequency range of 0.01 to 100 cps. 2. The НФ -1М very-low-frequency phase and frequency meter for measuring: the phase angle between two voltage oscillations of the same frequency in

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112-3-6419

Very-Low-Frequency Apparatus for Obtaining Dynamic Characteristics of Automatic Control Systems (Cont.)

of 0.1 to 100 cps, with the possibility of obtaining single rectangular oscillations and sawtooth oscillation in phase with them, which is necessary for obtaining transient characteristics. 5. The КВ -2 compensation rectifier for highly stable compensation of the constant component in the limits of 0.50 v. 6. The ЗСВ-1М electron-stabilized rectifier for supplying the remaining instruments of the unit. Skeleton diagrams of the instruments and their connections for obtaining various characteristics are included. M.P.S.

Card 3/3

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V. B

Nr: AF 1150117

AUTHOR: Not given

TITLE: Electronic Mathematical Machines. Instruments of Infra-low Frequency. Concise Catalog. (Elektronnyye matematicheskiye mashiny. Pribory infranizkoy chastoty. Kratkiy katalog.)

PUB. DATA: Tsentral'noye byuro tekhnicheskoy informatsii, Moscow, 1956, 61 pp., 3,000 copies.

ORIG. AGENCY: Ministerstvo Priborostroyeniya i Sredstv Avtomatizatsii SSSR

EDITOR: Ushakov, V.B., Tech. Ed.: Kirzhner, Ts. Ya.

PURPOSE: This is an illustrated catalog with specifications and a short text on the structure of mathematical machines.

COVERAGE: The mathematical machines and instruments presented in this catalog are divided into these groups:

I Mathematical machines (electric analyzers) and analog computers: a) general use; b) special use;

II Supplementary equipment expanding the potentialities of the analyzers;

III Recording devices and indicators;

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

Nr: AF 1150117

Electronic Mathematical Machines. Instruments of Infra-low Frequency. Concise Catalog. (Cont.)

МН -1 type electron computer 17

МН -7 miniature type electron computer 15

МН -8 type electron computer 17

ЭИ -12 type electric integrator 19

Special Use Analog Computer

АТР-1 type automatic traction computer 21

Supplementary Equipment Expanding the Potentialities of the Analyzers

A set of nonlinear units for the КНБ type electric analyzers 23

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APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

Nr: AF 1150117

Electronic Mathematical Machines. Instruments of Infra-low Frequency. Concise Catalog. (Cont.)

КНБ type electric analyzers

ЭДБ-1 type single-stage electro-mechanical dynamic unit 25

БПЭ-1 type permanent delay unit 27

Recording Devices and Indicators

И-4 type cathode-ray indicator 29

И-5 type cathode-ray indicator 31

ЭРУ-1 type recording cathode-ray apparatus 33

ФП-2 type photo-attachment 35

ФП-3 type photo-attachment 37

ВЛ-2 type vacuum-tube voltmeter 39

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APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

Nr: AF 1150117

Electronic Mathematical Machines. Instruments of Infra-low Frequency.
Concise Catalog (Cont.)

Infra-low Frequency Instruments

НФ-2 type infra-low-frequency phasometer and frequency meter 41

НГПК-2 type infra-low-frequency generator of periodic oscillations 43

ДПВ-1М type double peak voltmeter 45

КВ-2 type balancing rectifier 47

ЭСВ-1М type electron-regulated rectifier 49

Universal Digital Computers.
Universal digital computer "Ural" 51

Machines and Instruments in Early Stages of Adaptation for Production

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APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

Nr: AF 1150117

Electronic Mathematical Machines. Instruments of Infra-low Frequency. Concise Catalog (Cont.)

МЛ—2 type electric analyzer 53

БРВ – type recording and function -reproduction unit 55

ЭЛМ-type cathode-ray minimizer 57

ЭЦВП-type electron digital printing voltmeter 59

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APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V. B. (Cand. Tech. Sci.)

"Basic Methods of Construction of Modelling Apparatus in SKB-245 MPSA,"

paper read at the Session of the Acad. Sci. USSR, on Scientific Problems of Automatic Production, 15-20 October 1956.
Avtomatika i telemekhanika, no. 2, p. 182-192, 1957.

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APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.B.

119-11-5/7

AUTHOR Ushakov, V. B.

TITLE "On Mathematical Machines of Continuous Function". (O matematicheskikh mashinakh nepreryvnogo deystviya)

PERIODICAL Priborostroveniye, 1957, Nr 11, pp. 17-25 (USSR)

ABSTRACT One of the most widely used groups of these machines are the socalled mathematical machines with continuous function (they are also called anologous-mathematical machines or mathematical modelling plants). The mathematical basic operations-integrating, differentiating, addition, multiplication, division a.o.-are carried out in the these machines by means of continuous methods. The quick functioning of these machines makes it possible to investigate processes which take place not only in the course of whole seconds but also of small fractions of seconds, as well as slow transition processes which extend over 10.000 seconds. The analogous mathematical machines are divided into two main groups:

1.- machines for the solution of problems which are characterized by simple differential equations.
2.- machines for the solution of problems which are characterized by differential equations in quotient deductions.

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"On Mathematical Machines of Continuous Function."

The first group of these machines is used in cases where one has to deal with the motion of various bodies and mechanisms in a space with the transition of the substances within various spaces a.o. The second group serves for the solution of problems which are in connection with the spatial distribution of heat, liquids, electromagnetic fields with mechanic stress in various parts of the working medium a.o.
The field of use of this group of machines is very wide. A difference is still made between machines of general use and specialized machines, modelling plants for general use are provided for such cases where the problems to be solved are characterized by steady systems of ordinary differential equations with constant or variable coefficients of kind,

$$\frac{dx_i}{dt} = F_1 (x_1, x_2 \ldots\ldots x_i, t), \text{ where } i = 1,2 \ldots n,$$

as well as with systems of algebraic and transcendental equations.
The analogous mathematical machines with extra devices

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"On Mathematical Machines of Continuous Function."

are also suitable for the solution of integral equations of the second Fredholm type or according to Wolther. The general technical data of the machines produced in series are mentioned in table 1. The specialized analogous mathematical machines are used in such cases where it is necessary to solve a certain problem only in the course of a longer period, the problem being connected with a separate system or a group of problems which differ from one another by the data of coefficients to be supplied to the machine or by initial conditions in the case of an unchanged system of equations. The specialized analogous mathematical machines can again be divided into four groups:

1.- Modelling plants for a certain process or a certain object. To this group belong electric models of atom plants, energy systems, electric and radio sets, models of different power machines, rolling-mills or metal working factories and plants, chemical aggregates, hydro systems and even such of biological organs (heart, thyroid gland) a.o.

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"On Mathematical Machines of Continuous Function."

2.- Calculation machines for training devices (trainers)
Specialized linear modelling plants are a main part of "complex trainers" by means of which the operational training under difficult conditions is carried out e.g. the crews of modern airplanes, the staff of future atom power plants, a.o.

3.- Calculators of "regime" (of the data of technological processes) or complex parameters.
To this group belong various instruments for the determination of regime in the machining of materials, airport-calculators for the determination of data connected with the preparation of an airoplane for flight, apparatuses for the determination of train-motion parameters (power-drag calculators) as well as of the operation of their aggregates (e.g. power machines for electric locomotives a.o.). Also such apparatuses belong to this group which can calculate some new complex magnitudes after single operation parameters, the new magnitudes characterizing more completely the course of the production process or the work of the corresponding aggregate. To this type of apparatuses belong for example

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119-11-5/7

"On Mathematical Machines of Continuous Function."

mathematical instruments which continuously register the capacity of a blast furnace as well as the productivity of the process taking place within it; apparatuses which register static operation characteristics and carry out the calculations of complex parameters in chemical enterprises in the case of processes of oil working, a.o. Usually these are smaller apparatuses designed for use in factories.

4.- Controlling calculation mechanisms.

These mechanisms represent one of the main parts of complex control plants (automatic controls) for the control of processes or objects.

(There are 5 illustrations and 3 comprehensive tables with technical data)

ASSOCIATION: None given.

AVAILABLE: Library of Congress.

CARD 5/5

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

RADZIVILOV, Ye.N. Prinimal uchastiye ANTONOV, V.S. USHAKOV, V.B., kand.tekhn.nauk, red.; KIRZHNER, TS.Ya., tekhn.red.

[Computers. Very low frequency range devices] Elektronnye matematicheskie machiny. Pribory infranizkogo diapazona chastot. Katalog. [n.p.] TSentr.biuro tekhn.informatsii priborostroeniia i sredstv avtomatizatsii, 1958. 70 p. (MIRA 14:1)

1. Moscow. Nauchno-issledovatel'skiy institut schetnogo mashinostroyeniya.
(Electronic calculating machines) (Electric meters)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V. B

SOV/144-58-9-18/18

AUTHOR: Gikis, A. F., Candidate of Technical Sciences, Docent

TITLE: Inter-University Scientific Conference on Electric Measuring Instruments and Technical Means of Autoxation (Mezhvuzovskaya nauchnaya konferentsiya po elektroizmeritel'nym priborom i tekhnicheskim sredstvam avtomatiki)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Elektromekhanika, 1958, Nr 9, pp 130-135 (USSR)

ABSTRACT: The conference was held at the Leningradskiy elektrotekhnicheskiy institut imeni V. I. Ul'yanova (Lenina) (Leningrad Electro-technical Institute imeni V. I. Ul'yanov (Lenin)) on November 11-15, 1958. The representatives of eleven higher teaching establishments and three research institutes participated and a large number of specialists of various industrial undertakings were present.

Docent B. M. Smolov (Leningrad Electro-Technical Institute) read the paper "Non-linear electronic voltage transformers with a numerical output", in which he considered two methods of transforming voltages into a numerical code.

Card 5/13 V. P. Skuridin (Ural Polytechnical Institute imeni S. M. Kirov) presented the paper "New counters based on polarized relays". These do not suffer from the disadvantage of existing counters, namely, that the results are lost if the current supply is accidentally interrupted.

Professor A. V. Fremke and Docent Ye. M. Dushin (Leningrad Electro-Technical Institute) presented the paper "Metering transducers for automatic instruments with discrete types of recording".

Candidate of Technical Sciences V. B. Ushakov and P. N. Kopay-Gora (Scientific Research Institute for Computers) presented the paper "Computing equipment for automatic centralized control of production parameters".

Candidate of Technical Sciences V. B. Ushakov presented the paper "Certain trends in the development of analogue computers and of computing devices intended for use in industry".

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

28(2) PHASE I BOOK EXPLOITATION SOV/2675

Moscow. Dom nauchno-tekhnicheskoy propagandy im. F. E. Dzerzhinskogo

Vychislitel'naya tekhnika i yeye primeneniye (Computation Technique and Its Application) Moscow, Gosenergoizdat, 1959. 391 p. (Series: Obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy RSFSR) 5,000 copies printed.

Ed. (Title page): S. A. Lebedev, Academician; Ed. (Inside book): V.I. Savel'yev; Tech. Ed.: G. I. Matveyev.

PURPOSE: This collection of articles is intended for scientific, engineering and technical personnel engaged in research, design and operation of digital and analog computers. It may also be used by students of vuzes specializing in computers.

COVERAGE: The authors present fundamentals of digital computers, their elements and units such as arithmetic units, internal and external memory and control devices. They discuss the possibility of constructing computers using semiconductor elements and consider the fundamentals in the theory of logical circuits. They also discuss problems of programming and explain the operation of analog computers and their elements. Brief discussion of mathematical instruments is also presented. The articles were presented at a computer seminar arranged by Moskovskiy dom nauchno-tekhnicheskoy propagandy imeni F. E. Dzerzhinskiy (Moscow Center for Scientific and Technical Propaganda imeni F. D. Dzerzhinskiy) in 1957. No personalities are mentioned. References appear at the end of some articles.

Zimarev, A. N., Engineer. Construction of High-speed Computers Using Semiconductor Elements 185

The author discusses the possibility of using transistors in computer circuits and describes the operation of the following transistor circuits: amplifiers, pulse forming circuits, triggers and direct-coupled transistors. There are 4 references: 1 Soviet and 3 English.

Nesluzhovskiy, K. S. Devices of Series Computing Machines. 201

The author discusses component elements of series computing machines such as dynamic triggers, circuits for transforming codes, adding and subtracting circuits and circuits for determining coincidence of two codes. He also describes the operation of a series-type memory unit. There are no references.

Nikolov, V. P., Candidate of Technical Sciences. Electronic Analog Computers for Solving Differential Equations 269

The author presents a general discussion of analog computers and considers fields of their application. He presents a table of Soviet computers, giving specifications, year of manufacture and the developing organization. There are 11 references, all Soviet (including 1 translation).

Vitenberg, I. M., Candidate of Technical Sciences. Operational Units of Analog Computers 297

The author discusses the operation of various units in a computer such as adders, integrators, differentiators, operational amplifiers, multipliers and functional converters and analyses their circuits. There are 13 references, all Soviet (including 1 translation).

Glusberg, E. A., Engineer. Use of Analog Computers in Engineering and Scientific Analysis 327

The author discusses the use of analog computers for analyzing performance of various industrial machinery such as rolling machines, dynamoelectric amplifiers, hydraulic motors, etc. Use of analog computers for solving hydraulic equations is also discussed. There are 8 references, all Soviet (including 2 translations).

Glusberg, E. A., Engineer. Methods of Setting up Problems for Analog Computers and Checking Accuracy of Solutions 340

The author discusses the procedure of reducing problems to a form suitable for analog computers and describes methods of connecting various computer units. He explains methods of determining proper scale factors and transfer coefficients and presents numerical examples. He also discusses methods of solving nonlinear functions and considers computer accuracy. There are no references.

Yasmanov, V. V., Candidate of Technical Sciences. Modern Small Mathematical Instruments 366

The author discusses the construction and operation of mathematical instruments such as integrators, integraphs and planimeters. He also describes harmonic analyzers developed by Mader, Coradi and Henrici and explains the operation of instruments for analyzing random functions. There are 14 references, 7 Soviet (including 4 translations) and 7 English.

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

28(2)

AUTHORS: Petrov, G. M., Ushakov, V. B., Candidates of Technical Sciences

SOV/119-59-1-8/20

TITLE: Small Size Mathematical Analogy Computers MN -10 With Semiconductors (Malogabaritnaya analogovaya matematicheskaya mashina MN -10 na poluprovodnikakh)

PERIODICAL: Priborostroyeniye, 1959, Nr 1, pp 10-14 (USSR)

ABSTRACT: A computer is described which was constructed in December 1957 by NIISchetmash and provided with 653 semiconductor diodes and triodes. The main parts are (N. B. Lakunin, V. A. Popov, V. S. Stepin and I. T. Trepakov contributed in the finishing process): 24 operational amplifiers, 6 of which serve for integration, 6 for summation, 6 for the change of signs and 6 in the schemes of the non-linear blocks. Apart from this the machine features:

1. 36 changeable resistances at the input of the operational amplifiers.
2. 8 non-linear blocks which perform 4 multiplications or 4 non-linear functions depending on one single unknown quantity.

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

3. 6 non-linear diode cells which are used for the reproduction of a non-linear dependence, e.g. in form of a hysteresis.
4. 2 special potentiometers which permit a variation of the constant quantities in the example to be solved.
5. 1 decimal divider of two standard voltages and pointer instruments which secure the regulation of the operational amplifiers and non-linear blocks.
6. Potentiometer, throw-over switch, and resistances in order to be able to find the initial conditions and to correct periodically the zero position of the operational amplifiers.
7. Generator and a timing device.
8. Switching field.
9. Relay, throw-over switch, button switch, signal lamps.
10. A stabilized direct-current supply for charging the operational amplifiers and a non-stabilized direct-current part for the supply of the relays.

The operation of the computer takes place in three main stages, e. g. :

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Small Size Mathematical Analogy Computers MN -10 SOV/119-59-1-8/20

With Semiconductors

1. Zero control of the direct-current amplifiers.
2. Adjusting of the transmission coefficients for the operational amplifiers and of the functional dependence at the non-linear blocks.
3. Integration.

During the process of integration the solutions of an example are recorded by a cathode-ray oscillograph or a loop oscillograph.

The amplifier of the type UPT-20 of the computer MN -10 has the following characteristic features:

Total amplification coefficient for direct current	500,000
Drift at the output in the case of an operational amplification coefficient 1 in mV/°C	1 - 5
Drift at the output during the process of integration with R being equal to 1 MΩ and C being equal to 1 μF in mV/sec	1
Maximum load current at an output voltage of 30 V in mA	3

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Small Size Mathematical Analogy Computers MN-10 SOV/119-59-1-8/20
With Semiconductors

Amplification coefficient at 100 kilocycles in db	74
Noise level in mV	7
Necessary capacity of an amplifier in mV	~900

The amplifier UPT-20 is charged by a rectifier part of semiconductors. This part supplies three stabilized voltages of -60 V, +60 V and +40 V. The -60 V source can be loaded up to 270 mA and the two others up to 360 mA. This block contains furthermore a direct current tapping source of 26 V and 1 A, a generator for a square-wave voltage of 20 V at 1 kilocycle with a maximum load of 10 mA. The entire block ESV -10 is charged with 220 V, 50 cycles alternating current. The charging capacity is 100 VA. The non-linear blocks are also called potentially grounded as the diodes are always maintained on a potential which is close to zero. Basic circuit diagrams of the non-linear generator, and the non-linear multiplication block are enclosed. The construction of the computer MN -10 was carried out by G. V. Grigoriyev. The device consists of 2 main blocks, e.g. the summation device, and the current supply block. The summation device consists of several easily exchangeable

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subassemblies. Photographs of them were taken. The reliability of the computer MN -10 was experimentally tested by the solution of 20 different examples which are also solvable in a different way. The deviation of the computer with respect to the maximum value was not more than 3-5% and with respect to the average quadratic error 1-2%. When the computer was tested with respect to errors the voltage was 30 V. The application of semiconductors instead of valves to mathematical analogy computers proved to be of advantage. It is therefore to be expected that also larger analogy computers will be converted to the semiconductor principle. There are 8 figures.

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AKULINICHEV, I.T.; BABSKIY, Ye.B.; GEL'SHTEYN, G.G.; PETROV, G.M.; SKACHKOVA, A.I.; UTEY, N.I.; USHAKOV, V.B.

Electronic modeling of the electricactivity of the heart. Biofizika, 4 no.3:354-360 '59. (MIRA 12:7)

1. Nauchno-issledovatel'skiy institut schetnogo mashinostroyeniya, Institut grudnoy khirurgii AMN SSSR, Moskva i Institut normal'noy i patologicheskoy fiziologii AMN SSSR, Moskva.

(ELECTROCARDIOGRAPHY,
electronic model of electric activity of heart (Rus))

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

AKULINICHEV, I.T.; BABSKIY, Ye.B.; GEL'SHTEYN, G.G.; LAKUNIN, N.B.; MOSKALENKO, G.V.; PETROV, G.M.; USHAKOV, V.B.

Cardiocyclography. Biofizika 4 no. 4:490-495 '59. (MIRA 14:4)

1. Nauchno-issledovatel'skiy institut schetnogo mashinostroyeniya, Institut grudnoy Khirurgii AMN SSSR i Institut normal'noy i patologicheskoy fiziologii AMN SSSR, Moskva.
(ELECTROCARDIOGRAPHY)

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

AKULINICHEV, I.T.; BABSKIY, Ye.B.; GEL'SHTEYN, G.G.; PETROV, G.M.; SKACHKOVA, A.I.; UTEY, N.I.; USHAKOV, V.B.

Reproduction of the electrocardiogram by an electronic model system. Biofizika 4 no.5:589-594 '59. (MIRA 14:6)

1. Iz otdela elektromodelirovaniya Nauchno-issledovatel'skogo instituta schetnogo mashinostroyeniya, Instituta grudnoy khirurgii AMN SSSR i laboratorii klinicheskoy fiziologii Instituta normal'noy i patologicheskoy fiziologii AMN SSSR, Moskva.
(ELECTROCARDIOGRAPHY)

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

Ushakov, V.B.

8(2), 9(6) SOV/119-59-3-13/15

AUTHOR: Anisimov, V. I., Engineer

TITLE: The Inter-university Scientific Conference on Electrical Measuring Instruments and on the Technical Means of Automation (Mezhvuzovskaya nauchnaya konferentsiya po elektroizmeritel'nym priborom i tekhnicheskim sredstvam avtomatiki)

PERIODICAL: Priborostroyeniye, 1959, Nr 3, pp 30-31 (USSR)

ABSTRACT: This Conference was held at the Leningradskiy elektrotekhnicheskiy institut im. V. I. Ul'yanova (Lenina) (Leningrad Institute of Electrical Engineering imeni V. I. Ul'yanov (Lenin)) in November 1958. It was attended by more than 500 representatives of universities, scientific research institutes, of the OKB, the SKB (Special Design Office), of industries and other organizations. More than 30 lectures were delivered in the meetings of this Conference. In opening the conference N. P. Boroditskiy underlined the outstanding importance of automation and of measuring technique for the development of national economy. N. N. Shumilovskiy in his lecture reported on "The Trends in the Development of Methods of Radioactive Control of Production Data" and outlined the extensive

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possibilities of using radioactive methods in such control. Ye. G. Shrameko and S. A. Spektor reported on a new method of measuring heavy direct currents with the help of the nuclear magnetic resonance. M. A. Rozenblat investigated problems of the application of magnetic amplifiers in automation and in measuring technique. A. V. Fateyev reported on the present-day state on the prospects of automatic control technique. Ye. Z. Tayptin investigated some peculiar features of and the prospects offered by automatic pulse systems. The lecture by N. G. Boldyrev dealt with problems of stability of discrete automatic systems. V. B. Ushakov discussed the main trends in the development of mathematical analog computers and of computers designed for industrial use. The report by V. S. Kyabyshkin deals with an electronic analog correlator for the calculation of correlation functions in the investigation of winds in the ionosphere. M. I. Turgenson reported on the most important methods, which guarantee both an active and passive freedom from disturbances in

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discrete selective systems. Ya. V. Kovsel'tsev discussed problems of averaging, differentiation, and balancing of time-dependent functions which can be represented by electric signals. V. P. Skuridin investigated new computing devices with polarized relays. A. V. Frenke and Ye. M. Bushin reported on instrument transformers for automatic instruments with automatic recording. V. B. Ushakov and S. N. Kopay-Gora reported on a computer for the automatic centralized control of production specifications. M. M. Petisov discussed fundamental problems of the theory of automatic measuring instruments with an inverse conversion for the measurement of non-electric quantities. Ye. I. Tenyakov dealt with problems of the construction of automatic d. c. potentiometers with high accuracy. D. I. Malev discussed a high-precision automatic d. c. bridge for digital computations. The participants in the Congress listed below discussed the following subjects (which, however, are not given by the exact wording of the titles): V. A. Ivanisov: The planning of measuring elements for

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The Inter-university Scientific Conference on Electrical Measuring Instruments and on the Technical Means of Automation

accurate automatic quotient-type meters in digital computations. B. N. Kharchenko: Methods of determining the dynamic errors of a magnetic oscilloscope by simulation. P. P. Ornatskiy: Problems in measuring electric quantities at extremely low frequencies by electrical indicating instruments of various systems. L. F. Kulikovskiy: Novel types of a. c. compensators. A. S. Borenkrants: Automatic bridges and a. c. compensators suited for the control of the parameters of condensers in series production. L. I. Stolov: Some characteristics of midget induction motors which can be used in measuring technique and automation. D. A. Borodayev: Ultrasonic pressure- and liquid level gages. Yu. A. Skripnik: The circuitry of a phase-sensitive commutation indicator for a. c. semi-equilibrium bridges. N. F. Suvid: The application of instruments with magnetic bridges, which permit a considerable simplification of the design of the apparatus and the circuitry used in the measurement of non-electric quantities. V. A. Ferents: Method of increasing the sensitivity of oxygen gas analyzers. P. V. Novitskiy: Design of apparatus for measuring vibration quantities. V. V. Pasynkov: Main types of non-linear semiconductor resistors and possibilities of their application to circuitry in automation and measuring technique. S. N. Novopashennyy: Development of measuring amplifiers with semiconductor triodes. Ya. V. Novosel'tsev, N. A. Smirnov, Ye. Ye. Afanas'yev, Ye. P. Ugryumov: Precision semiconductor frequency meter operating according to the pulse-counting principle. P. G. Nikitin and A. Berukladnikov: Methods of measuring the magnetic field strength by means of bismuth resistors and transducers operating on the Hall effect principle. A resolution was adopted by the closing plenary meeting of the Conference, which indicates ways of improving and coordinating scientific research work in the field of automation, electric measuring- and computing technique.

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SOLODOVNIKOV, V.V., prof., doktor tekhn.nauk, red.; BOGOLYUBOV, N.N., akademik, red.; ISHLINSKIY, A.Yu., akademik, red.; KAZAKEVICH, V.V., prof., doktor tekhn.nauk, red.; LYAPUNOV, A.A., prof., doktor fiz.-mat.nauk, red.; PETROV, B.N., red.; POPOV, Ye.P., prof., doktor tekhn.nauk, red.; POSPELOV, G.S., prof., doktor tekhn.nauk, red.; RYABOV, B.A., prof., doktor tekhn.nauk, red.; ANISIMOV, B.V., dotsent, kand.tekhn.nauk, red.; PETROV, V.V., dotsent, doktor tekhn.nauk, red.; PLOTNIKOV, V.N., dotsent, kand.tekhn.nauk, red.; USHAKOV, V.B., doktor tekhn.nauk, red.; POLYAKOV, G.F., red.izd-va; SOKOLOVA, T.F., tekhn.red.

[Automatic control and computer engineering] Avtomaticheskoe upravlenie i vychislitel'naia tekhnika. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry. No.3. 1960. 489 p. (MIRA 13:7)

1. Chlen-korrespondent AN SSSR (for B.N.Petrov).
(Automatic control) (Electronic calculating machines)

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

S/621/61/000/000/008/014
D234/D303

AUTHORS: Ushakov, V.B., Kopay-Gora, P.N., and Grinya, Ya.I.

TITLE: An electronic logical device with digital recording of the parameters

SOURCE: Nauchno-tekhnicheskoye obshchestvo priborostroitel'noy promyshlennosti. Primeneniye vychislitel'noy tekhniki dlya avtomatizatsii proizvodstva. Trudy soveshchaniya, provedennogo v oktyabre 1959 g. Ed. by V.V. Solodovnikov. Moscow, Mashgiz, 1961, 342 - 357

TEXT: The authors deal with two variants of an electronic logical recording device designed at the department of electric simulation of NIISchetmash, for automatic measurement and digital recording (on a special chart) of industrial parameters and for signalling when the parameters are outside a given operating range. The first variant is described in detail; its technical characteristics were determined by the requirements of chemical synthesis of NH_3, but the possibility of its use in other circumstances with similar cha-

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racteristics is foreseen. The capacity is 52 parameters; the values of the parameters are printed successively in one line of the chart, each value with 3 digits; values that are outside a given range are printed in red. The device contains approximately 50 electron tubes and 50 relays; a special property is that it can be connected directly with primary transmitters or with transmitters of parametric type. Results of tests of the device are quoted: Some properties of the second variant are mentioned, such as taking into account the non-linearity of the transmitters, possibility of graphical recording of some parameters etc.; it is stated that the device contains only 4 electron tubes and some tens of electromechanical relays. There are 3 tables and 10 figures.

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V.B.

BERG, A.I., glav. red.; TRAPEZNIKOV, V.A., glav. red.; BERKOVICH, D.M., zam. glav. red.; LEBEDEV, A.Ya., doktor tekhn. nauk, prof., zam. glav. red.; AVEN, O.I., red.; AGEYKIN, D.I., red.; kand. tekhn. nauk, dots., red.; AYZERMAN, M.A., red.; VENIKOV, V.A., doktor tekhn. nauk, prof., red.; VORONOV, A.A., doktor tekhn. nauk, prof., red.; GAVRILOV, M.A., doktor tekhn. nauk, prof., red.; ZERNOV, D.V., red.; IL'IN, V.A., doktor tekhn. nauk, prof., red.; KITOV, A.I., kand. tekhn. nauk, red.; KOGAN, B.YA., doktor tekhn. nauk, red.; KOSTOUSOV, A.I., red.; KRINITSKIY, N.A., kand. fiz.-mat. nauk red.; LEVIN, G.A., prof. red.; LOZINSKIY, M.G., doktor tekhn. nauk, red.; MOSGIYEVSKIY, V.L., red.; MAKSAREV, Yu.Ye., red.; MASLOV, A.A., dots., red.; POPKOV, A.A., red.; RAKOVSKIY, M.Ye., red.; ROZENBERG, L.D., doktor tekhn. nauk, prof., red.; SOTSKOV, B.S., red.; TIMOFEYEV, P.V., red.; USHAKOV, V.B., doktor tekhn. nauk, red.; FEL'DBAUM, A.A., doktor tekhn. nauk, prof., red.; FROLOV, V.S., red.; KHARKEVICH, A.A., red.; KHRAMOY, A.V., kand. tekhn. nauk, red.; TSYPKIN, Ya.Z., doktor tekhn. nauk, prof., red.; CHELYUSTKIN, A.B., kand. tekhn. nauk, red.; SHREYDER, Yu.A., kand. fiz.-mat. nauk, dots., red.; BOCHAROVA, M.D., kand. tekhn. nauk, starshiy nauchnyy red.; DELONE, N.N., inzh., nauchnyy red.; BARANOV, V.I., nauchnyy red.; PAVLOVA, T.I., tekhn. red.

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BERG, A.I.--- (continued). Card 2.

[Industrial electronics and automation of production processes]Avtomatizatsiia proizvodstva i promyshlennaia elektronika. Glav. red. A.I.Berg i V.A.Trapeznikov. Moskva, Gos.nauchn. izd-vo "Sovetskaia Entsiklopediia." Vol.1. A - I. 1962. 524 p. (MIRA 15:10)

1. Chlen-korrespondent Akademii nauk SSSR (for Sotskov, Kharkevich, Zernov, Timofeyev, Popkov).
(Automatic control) (Electronic control)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

LYUSTERNIK, L.A., red.; KLIMOV, G.P., red.; TSYGANKIN, A.P., red.; USHAKOV, V.B., doktor tekhn. nauk, red.; BARANOVA, Z.S., inzh., red.izd-va; GORDEYEVA, L.P., tekhn. red.

[Computer mathematics and computer engineering] Voprosy vychislitel'noi matematiki i vychislitel'noi tekhniki. Moskva, Mashgiz, 1963. 431 p. (MIRA 16:6)

1. Chlen-korrespondent Akademii nauk SSSR (for Lyusternik).
(Electronic computers)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

S/2967/63/000/000/0264/0275

ACCESSION NR: AT3012141

AUTHORS: Ushakov, V. B.; Petrov, G. M.

TITLE: Analog mathematical machine MN-14 with input and output information in digital form

SOURCE: Voprosy* vy*chislitel'noy matematiki i vy*chislitel'noy tekhniki. Moscow, 1963, 264-275

TOPIC TAGS: analog computer, digital input, digital output, high stability, constant current amplifier, stabilized zero, nonlinear differential equations

ABSTRACT: The authors describe the MN-14 analog computer in some detail. The machine is extremely stable due to the constant current amplifiers with stabilized zeros. The mathematical and logical operations of which the machine is capable are designed for solution of systems of ordinary nonlinear differential equations containing a large quantity of various nonlinear dependencies. The setup of blocks in the MN-14 makes it possible to solve complicated systems of nonlinear ordinary differential equations of up to 30th order. With two such machines working in parallel, still more complicated problems can be solved. The basic machine

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operations are summation, multiplication by a constant coefficient, integration, multiplication of two dependent variables, reproduction of a nonlinear function of one variable, and use of the logical operation of conditional jump. The machine has provision for introducing low-frequency random inputs and for oscillograph viewing of the output. Some pertinent data are given:

Number of removable type blocks (including 178 matched constant current amplifiers)	372
Number of vacuum tubes	3 100
Number of semiconducting diodes (germanium and silicon)	7 800
Number of semiconducting triodes	120
Number of resistors	about 33 000
Number of condensors	7 020
Length of wiring, in meters	about 45 000
Electrical capacity, required of a three-phase network of 220 v, 50 cps, in kva	12
General area occupied by machine, in m^2	10

In comparing the MN-14 with the best American machines, the authors claim that the MN-14 yields nothing to the others. Orig. art. has: 2 figures, 1 table and 1 formula.

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

AFANAS'YEV, G.D.; USHAKOV, V.B.

Ways of improving the power indices of crushing machinery for fine and medium crushing. Izv. vys. uchob. zav.; tsvet. met. 8 no.1:28-33 '65. (MIRA 18:6)

1. Severokavkazskiy gornometallurgicheskiy institut, kafedra elektrooborudovaniya i avtomatiki.

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

USHAKOV, V. B.

"Low frequency analog statistical analyzer."

report submitted for 4th Intl Conf, Intl Assn for Analog Computation, Brighton, 14-18 Sep 64.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

BERG,A.I.,glav.red.; TRAPEZNIKOV,V.A.,glav.red.; TSYPKIN, Ya.Z., doktor tekhn.nauk,prof.,red.; VORONOV,A.A., doktor tekhn.nauk,prof.,red.; SOTSKOV,B.S., doktor tekhn.nauk,red.; AGEYKIN,D.I., doktor tekhn. nauk, red.; GAVRILOV,M.A., red.; VENIKOV,V.A., doktor tekhn.nauk, prof.,red.; CHELYUSTKIN,A.B., doktor tekhn. nauk,red.; PROKOF'YEV, V.N., doktor tekhn.nauk,prof.,red.; IL'IN,V.A., doktor tekhn.nauk, prof.,red.; KITOV,A.I.,doktor tekhn.nauk,red.; KRINITSKIY, N.A., kand. fiz.-matem.nauk,red.; KOGAN,B.Ya., doktor tekhn.nauk, red.; USHAKOV,V.B., doktor tekhn.nauk,red.; LERNER,Yu.A., doktor tekhn. nauk,prof., red.; FEL'DBAUM, A.A.,prof., doktor tekhn.nauk,red.; SHREYDER,Yu.A., kand. fiz.-mat. nauk,dots.,red.; KHARKEVICH,A.A., akad., red.;TIMOFEYEV,P.V., red.; MASLOV,A.A.,dots.,red.; LEVIN, G.A., prof.,red.; LOZINSKIY,M.G., doktor tekhn.nauk,red.; NETUSHIL, A.V., doktor tekhn.nauk,prof.,red.; POPKOV,V.I.,red.; ROZENBERG, L.D.,doktor tekhn.nauk,prof.,red.; LIVSHITS,A.L.,kand.tekhn.nauk,red.

[Automation of production and industrial electronics] Avtomatizatsiia proizvodstva i promyshlennaia elektronika; entsiklopediia sovremennoi tekhniki. Moskva, Sovetskaia Entsiklopediia. Vol.3. Pogreshnost' resheniia - Teleizmeritel'naia sistema chastotnaia. 1964. 487 p. (MIRA 17:10)

1. Chlen-korrespondent AN SSSR (for Sotskov, Gavrilov, Timofeyev, Popkov).

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120009-7

L 26418-66 EWT(d)/EWP(1) IJP(c) GS/BS

ACC NR: AM5017155 Monograph UR/

Ushakov, V. B.; Petrov, G. M.; Rasov, Ye. P.; Popov, V. A.; Lakunin, N. B.; Moskalenko, G. V.; Sabayev, G. N.

The MN-14 electronic nonlinear analog computer (Elektronnaya nelineynaya analogovaya vychislitel'naya mashina MN-14) Moscow, Izd-vo "Mashinostroyeniye," 1965. 232 p. illus., biblio. 3300 copies printed.

TOPIC TAGS: analog computer, analog computer system, computer control system, computer component/MN-14 analog computer

PURPOSE AND COVERAGE: This book is intended for engineers, technicians, and scientists concerned with the problems of development and practical application of analog computers. It may also be useful to students in this field at schools of higher education. The MN-14 nonlinear electronic analog computer, developed at the Scientific Research Institute of Computer Machine Building, is described. It is used to model dynamic systems described by common nonlinear differential equations up to the 30th order with a large number of nonlinear relationships. The MN-14 computer may also be used to solve engineering construction problems as well as for scientific investigations in various fields of the national economy. The principles of the computer's design and its circuit characteristics are discussed. Basic units and structural assemblies are described and the methods used in the preparation of the problems solved by the computer are covered. Considerable attention is paid to the problems of increasing the computer's practical application by means of introduction of additional equipment into its system. The names of

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ACC NR: AM5017155

Ushakov V. B., Doctor of Technical Sciences, and G. M. Petrov are listed as the leaders.

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BERG, A.I., glav. red.; TRAPEZNIKOV, V.A., glav. red.; TSYPKIN, Ya.Z., doktor tekhn. nauk, prof., red.; VORONOV, A.A., prof., red.; AGEYKIN, D.I., doktor tekhn. nauk red.; GAVRILOV, M.A., red.; VENIKOV, V.A., doktor tekhn. nauk, prof., red.; SOTSKOV, B.S., red.; CHELYUSTKIN, A.B., doktor tekhn. nauk, red.; PROKOF'YEV, V.N., doktor tekhn. nauk, prof., red.; IL'IN, V.A., doktor tekhn. nauk, prof., red.; KITOV, A.I., doktor tekhn. nauk, red.; KRINITSKIY, N.A., kand. fiz.-mat. nauk, red.; KOGAN, B.Ya., doktor tekhn. nauk, red.; USHAKOV, V.B., doktor tekhn. nauk, red.; LERNER, A.Ya., doktor tekhn. nauk, prof., red.; FEL'DBAUM, A.A., doktor tekhn. nauk, prof., red.; SHREYDER, Yu.A., kand. fiz.-mat. nauk, red.; KHARKEVICH, A.A., akademik, red. [deceased]; TIMOFEYEV, P.V., red.; MASLOV, A.A., dots., red.; TRUTKO, A.F., inzh., red.; LEVIN, G.A., prof., red.; LOZINSKIY, M.G., doktor tekhn. nauk, red.; NETUSHIL, A.V., doktor tekhn. nauk, prof., red.; POPKOV, V.I., red.; ROZENBERG, L.D., doktor tekhn. nauk, prof., red.; LIFSHITS, A.L., kand. tekhn. nauk, red.; AVEN, O.I., kand. tekhn. nauk, red.; BLANN, O.M. [Blunn, O.M.], red.; BROYDA, V., inzh., prof., red.; BREKKL', L [Brockl, L.] inzh., knad. nauk, red.; VAYKHARDT, Kh. [Weichardt, H.], inzh., red.; BOCHAROVA, M.D., kand. tekhn. nauk, st. nauchn. red.

[Automation of production processes and industrial electronics] Avtomatizatsiia proizvodstva i promyshlennaia elektronika; entsiklopediia sovremennoi tekhniki. Moskva, Sovetskaia entsiklopediia. Vol.4. 1965. 543 p. (MIRA 18:6)

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AUTHORS: Ushakov, V. D., Mezhirova, L. P., Galata, L. A., Kostyuk, A. G., Khusnutdinova, Z. S., Medvedev, S. S., Abkin, A. D., Khomikovskiy, P. M.

TITLE: Polymerization of styrene and butadiene with styrene in emulsions under the action of initiating redox systems. I. Effect of the nature of peroxide compounds on the rate of polymerization

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 11, 1961, 1716-1722

TEXT: Aim of the present work was the determination of the most active initiating redox systems for the polymerization of butadiene with styrene in emulsions, and especially of the effect of the nature of peroxides on the rate of polymerization. Nekal with 20 % of Na_2SO_4 and NaCl and mersolate (mixture of Na salts of sulfonic acids of the aliphatic series $C_{15}H_{31}SO_3Na$) with $\leq$ 5 % of NaCl served as emulsifiers. Peroxides were used

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Polymerization of styrene and...

as oxidants (Table). Potassium ferrocyanide and ferrous pyrophosphate complex (IV) served as reducing agents. The rate of polymerization was determined either dilatometrically or from the yield of polymer (in ampuls). Polymerization took place at 5°C with an excess of butadiene, styrene with peroxides dissolved in it (10 % solution), and the calculated amount of emulsifier solution. A suspension of the ferrous pyrophosphate complex was added at a certain temperature by means of medical syringes. Substances used: (1) mersolate (3 % by weight added to water, ratio monomer : emulsifier 1 : 3); (2) potassium ferrocyanide. The temperature was varied between 0 and 50°C. Seven peroxides were investigated in amounts equivalent to 0.02 and 0.1 % by weight of isopropyl benzene hydroperoxide. $K_4Fe(CN)_6$ was used in concentrations equimolecular to hydroperoxide. p-tert-butyl isopropyl benzene hydroperoxide (I) had the optimum rate of polymerization; that of ethyl isopropyl benzene peroxide, isopropyl benzene (II), and ethyl benzene hydroperoxide was lower, that of dibenzyl hydroperoxide still lower, and that of benzoyl peroxide the lowest. Polymerization with H_2O_2 proceeds fast at the beginning, then it decreases strongly, since H_2O_2 and the reducing agent are readily soluble in water. With 0.2-0.5 % by weight

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of II, only the initial rate increases. The total yield is lower than with 0.1 % by weight of II. Between 0.75 and 1 % by weight of II, initial rates and total yield are much lower. With 0.02-0.2 % by weight of I, initial rates increase. Since the total rate decreases at 0.2 % by weight, the dependence of the reaction rate on the hydroperoxide concentration is probably linked with the inhibiting effect of the decomposition products of hydroperoxide. With 0.1 % by weight of I and an equimolecular amount of $K_4Fe(CN)_6$, both total yield and initial rate increased with increasing temperature. The activation energies were determined according to the Arrhenius equation and found to be: E = 8.6 kcal/mole for II and E = 5.7 kcal/mole for I. Reduction of E by 3 kcal/mole at $\sim 0^oC$ corresponds to a 200-fold increase of the reaction rate. Since the rate is twice as high at 0^oC, the pre-exponential factor in the Arrhenius equation increases by 10^2 times with decreasing activation energy of I. For the copolymerization of butadiene with styrene (ratio 70 : 30) at 5^oC, the following was used: Nekal (2.8 and 1.4 % by weight added to water). 0.44 % by weight of ferropyrophosphate (related to iron sulfate) of the monomer. The ratio organic phase : aqueous phase was 1 : 4 (by weight). In the case of 0.34 %

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by weight of hydroperoxide of II (equimolar ratio to the monomer) optimum rate was achieved with IV. The highest yield was achieved with aryl-alkyl hydroperoxides (I and 1,1-diphenyl ethane hydroperoxide (III)) (Table). With an emulsifier concentration of 2.8 %, maximum conversion (70-75 %) was achieved after 2 hr with 0.2 % by weight of I and with 0.3 % by weight of III. With 0.34 % by weight of II, optimum conversion (~30 %) was achieved after 2 hr. Polymerization of I and IV with 1.4 or 2.8 % by weight of emulsifier was constant up to 30 % conversion, then the rate dropped. With 1.4 % by weight, the initial rate was lower and the decrease more distinct. With an addition of 0.1 % by weight of hydroperoxide + 0.26 % by weight of IV (after 1 hr new addition of 0.1 % by weight of hydroperoxide and 0.18 % by weight of IV), constant polymerization took place up to 60 % conversion. Thus, the consumption of the initiating system causes a decrease in rate. The efficiency of redox systems and initiators depends on the reactivity of the radical as well as on the solubility of the peroxide compounds in the aqueous phase and in the monomers. The lower the solubility in water, the lower the loss and the stronger the initiating action. I + IV cause a higher rate of reaction than II + IV due to lower activation energy and lower solubility in water. For II + IV, the redox reaction occurs at the

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phase boundary, for I + IV also in the aqueous phase. The existence of a maximum of the rate of polymerization for I and butyl isopropyl hydroperoxide is caused by polymerization inhibition due to the decomposition products of the hydroperoxides. The authors thank A. G. Pod"yapol'ska for help with experiments and T. I. Yurzhenko (L'vovskiy industrial'nyy institut (L'vov Industrial Institute)) for supplying some hydroperoxides There are 5 figures, 1 table, and 7 references: 4 Soviet and 3 non-Soviet. The two references to English-language publications read as follows: F. A. Bovey, I. M. Kolthoff, Emulsion Polymerization, New York, 1955; C. F. Fryling, Industr. and Engng. Chem., 41, 986, 1949.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-chemical Institute imeni L. Ya. Karpov)

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AUTHORS: Ushakov, V. D., Mezhirova, L. P., Galata, L. A., Khusnutdinova, Z. S., Sheynker, A. P., Medvedev, S. S., Abkin, A. D., Khomikovskiy, P. M.

TITLE: Polymerization of styrene and butadiene with styrene in emulsions under the action of initiating redox systems. II. Effect of the nature of the reducing agent on the rate of polymerization

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 11, 1961, 1723-1729

TEXT: The effect of the reducing component of initiating systems and of the addition of a second reducing agent on the rate of polymerization is studied. Used were systems of hydroperoxides (HP) of isopropyl benzene (I) or p-tert-butyl isopropyl benzene (II) with ferropyrophosphate complex (III), potassium ferrocyanide (IV), ferrous sulfate with o-phenanthroline, or of complexes of α,α-dipyridyl with ferrous oxalate. Sodium bisulfite and the bisulfite compound of acetone served as reducing

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