LEVIN, B.I. (Moskva)

Technological progress in the development of transport means. Izv. AN SSSR. Energ. i transp. no.5:595-598 S-O '63.
(MIRA 16:11)

MURAV'YEV, V.I.; LEVIN, B.I., retsenzent; PESKOVA, L.N., red.; USENKO, L.A., tekhn. red.

[Business accounting in the transportation construction] Khoziaistvennyi raschet v transportnom stroitel'stve. Moskva, Transzheldorizdat, 1963. 62 p. (MIRA 17:2)

LEVIN, B.I.

On a great drive. Transp. stroi. 14 no.1:4-5 Ja '64.
(MIRA 17:8)

1. Nachal'nik Tekhnicheskogo upravleniya Gosudarstvennogo proizvodstvennogo komiteta po transportnomu stroitel'stvu SSSR.

LEVIN, B.I.

Increase the tempo of technological progress. Transp. stroi. 14 no.9:1-3 S '64 (MIRA 18:1)

1. Nachal'nik Tekhnicheskogo upravleniya Gosudarstvennogo pro z. vodstvennogo komiteta po transportnomu stroitel'stvu SSSR.

L 09129-67

ACC NR: AP6031994 (A) SOURCE CODE: UR/0230/66/000/007/0005/0008

AUTHOR: Kolokolov, N. M. (Doctor of technical sciences, Professor); Levin, B. I. (Candidate of technical sciences)

8

ORG: None

TITLE: New methods for building roads in marshy regions of the West Siberian Lowlands

SOURCE: Transportnoye stroitel'stvo, no. 7, 1966, 5-8

TOPIC TAGS: civil engineering, highway construction, railway construction, railway bridge, highway bridge

ABSTRACT: The authors discuss new methods used for building railroads and highways through swampy areas. One of the new methods is the use of reinforced concrete trestles instead of roadbeds. This innovation is useful in those areas where sand and pebble conglomerate is hard to procure for firm embankments. Another recent innovation is the use of pile-based prefabricated tre~tle bridges used both for railways and highways. Studies were carried out by the Central Scientific Research Institute of Communications on the cost, service life and labor expenditure involved in building rail lines and highways using the new methods. The studies show that the efficiency of building trestles depends on the design of the pile supports which in turn is determined by marsh depth and load capacity of the mineral bottom. These data show that 40×40 cm prestressed piles may be used in those areas where the base is sandy and where

Card 1/2 UDC: 625.1:627.17

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000929520005-9"

L 09129-67

ACC NR: AP6031994 0

the marsh is not very deep. Where the marsh is deeper than 4 meters, four 60 cm tube-type pile supports must be used. The angles at which various types of piles must be driven are discussed. Tubular piles with closed ends are most efficient in river floodplains since they do not have to be driven very deep. The authors discuss various types of piles with expanding ends designed to increase their load capacity in low-load soil. Bridge spans and various methods for laying roadbeds on them are considered. A study carried out by the Central Scientific Research Institute of Communications shows that rails can be laid on the concrete spans without using ballast beds. The surface of the concrete is covered with epoxy glue which keeps water from seeping in. Such spans are up to 12 m long, 15% lighter than spans using ballast beds and are 20% cheaper. Since Western Siberia has an abundant supply of wood, wooden piles can be used in conjunction with reinforced concrete. The wooden piles can be manufactured near the construction sites which saves money on transportation. The utilization of these methods should make it possible to build roads in very marshy regions of the Western Siberian Lowlands. Orig. art. has: 6 figures.

SUB CODE: 13/ SUBM DATE: None

Card 2/2 nst

KRUPIN, Grigoriy Vasil'yevich, prof.; KHAN, Kharlampy Kharitonovich, inzh. Prinimali uchastiye: RYABIKOV, V.P.; LEVIN, B.K.; DEDYULIN, N.D., retsenzent; GATILIN, N.F., retsenzent; KUZ'MINA, V.S., red.

[Designing enterprises of the dairy industry] Proektirovanie predpriiatii molochnoi promyshlennosti. Moskva, Pishchevaia promyshlennost', 1964. 399 p. (MIRA 18:3)

GESHELIN, M.G. (Moskva); LEVIN, B.M. (Moskva); MAMIKONOV, A.G. (Moskva)

Industrial SRP-3 remote control system. Avtom.i telem. 22 no.7: 950-953 Jl '61. (MIRA 14:6)

(Remote control)

25(5) PHASE I BOOK EXPLOITATION SOV/1879

Levin, Boris Menakhemovich

Ekonomiya chernykh metallov v narodnom khozyaystve SSSR (Conservation of Ferrous Metals in the USSR National Economy) Moscow, Gospolitizdat. 1958. 342 p. 10,000 copies printed.

Eds.: Yu. Lyubovich and V. Podgornova; Tech. Ed.: Yu. Mukhin.

PURPOSE: The book is intended for planners, economists and party workers in ferrous metallurgy establishments, various branches of the machinery-manufacturing industry, railroad transportation, etc. It may also be used as a textbook by vuz students taking a course in industrial economics.

COVERAGE: The book presents a description of the effort to conserve ferrous metal in all stages of processing and use. The significance of metal economy to the economy as a whole and to machinery manufacturing in particular is also discussed. Emphasis is placed on methods of discovering areas where metal conservation would

Card 1/5

bring the most beneficial results. A system of indices which make it possible to compare metal consumption of different establishments within the same industrial branch is included. Chapter II was written jointly with Engineer I.I. Pinegin. There are 67 references, all Soviet.

TABLE OF CONTENTS:

Conservation of Ferrous Metals (Cont.) SOV/1879

AVAILABLE: Library of Congress

JG/bg
9-18-59

Card 5/5

LEVIN, B. M.

Normirovanie i planirovanie tskhovykh raskhodov. Moskva, Mashgiz, 1949. 239 p.

/Standardization and planning of machine-shop expenses./

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

LEVIN, B.M.; TROITSKIY, P.A.

[Shop expenditures; standardization, planning, calculation and analysis of shop expenditures of machine-building plants] TSekhovye raskhody; normirovanie, planirovanie, uchet i analiz tsekhovykh raskhodov mashinostroitel'nogo zavoda. 2., dop.i perer.izd. Moskva, Go.s nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1953. 251 p. (MIRA 6:10)

(Efficiency, Industrial) (Machinery--Construction)

LEVIN, Boris Mikhaylovich

[All-out development of heavy industry is the general line of the CPSU] Vsemernoe razvitie tiazheloi industrii - general'naia liniia KPSS. Moskva, Gos.izd-vo polit.lit-ry, 1956. 109 p. (MIRA 12:3)
(Russia--Economic policy)

VOROZHEYKIN, Dmitriy Ivanovich, inzh.; LIBMAN, Grigoriy Markovich; LEVIN, Boris Mordukhovich; BEKHTEREV, Ivan Andreyevich; CHERNYSHEVICH, Fedor Ignat'yevich; BOVE, Ye.G., kand. tekhn. nauk, retsenzent; TISHCHENKO, A.I., inzh., retsenzent; YAKOVLEV, D.V., inzh., red.; BOBROVA, Ye.N., tekhn. red.

[Operation and maintenance of electric d.c. locomotives] Ekspluatatsiia i obsluzhivanie elektrovozov postoiannogo toka. Moskva, Vses. izdatel'sko-poligr. ob"edinenie M-va putei soobshcheniia, 1961. 341 p. (MIRA 14:8)
(Electric locomotives)

LEVIN, B. M.

Contact measurement method in the microgeometry of surfaces Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. Lit-ry, 1950. 191 p. (52-16728)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000929520005-9"

LEVIN, B. M.

USSR/Physics - Optics, Mirrors

Jan 52

"A New Mirror Multiplier," B. M. Levin

"Zhur Tekh Fiz" Vol XXII, No 1, pp 105-110

Proposes a method which will permit one to enhance and vary the sensitivity of autocollimational measuring and photorecording devices by means of a suitable choice of angles in the familiar mirror multiplier with 2 mirrors without complicating the design. Submitted 23 Mar 51.

206T107

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000929520005-9"

LEVIN, B.M., kandidat tekhnicheskikh nauk (Leningrad)

Optical-mechanical profilographs. [Izd.] LONITOMASH no.34: 244-260 '54. (MIRA 8:10)

(Surfaces (Technology))

GOROKHOVSKIY, Yu.N.; LEVIN, B.M.

Projecter-granulometer for the determination of granularity of photographic blackening. Usp.nauch.fot. no.4:117-124 '55. (Photographic sensitometry) (MIRA 9:4)

LEVIN, B. M.

"New Device for Studying the Pins of Astrometric Instruments," a report presented at the Conference of Commission on Astronomical Instruments Construction of the Astronomical Council, AS USSR, 10-12 Feb 56.

Sum. No. 1047, 31 Aug 56

LEVIN, B.M.; DUKHOPEL, I.I.,

Interferometers for checking planes and plane-parallel plates.
Opt.-mekh.prom. 25 no.6:13-15 Je '58. (MIRA 11:10)
(Interferometer)

LEVIN, B.M.

Automatic control of separator unit. Mash. i neft. obor. no.3:31-34 '64. (MIRA 17:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy i proyektno-konstruktorskiy institut kompleksnoy avtomatizatsii neftyanoy i gazovoy promyshlennosti.

LEVIN, Boris Menakhemovich, dots., kand. ekonom. nauk; LEVIN, Abram Naumovich, doktor tekhn. nauk, prof.; PETRUSHEV, I.M., red.; TER-STEPANYANTS, M.S., red.; GERASIMOVA, Ye.S., tekhn. red.

[Using plastics and saving materials in industry] Primenenie plastmass i ekonomiia materialov v promyshlennosti. Moskva, Ekonomizdat, 1962. 242 p. (MIRA 15:6)
(Plastics)

LEVIN, B.M., knad.tekhn.nauk

Electric power plants on "Sergei Botkin"-type ships. Inform. sbor. TSNIIMF no.69 Tekh. ekspl. mor. flota no.12:57-78 '61. (MIRA 16:3)
(Electricity on ships)

M.

LEVIN, B., kand. tekhn. nauk, starshiy nauchnyy sotrudnik;
YEMEL'YANOV, I.

Standardization and control of marine power plant performances. Mor. flot 23 no.7:25-26 Jl '63. (MIRA 16:8)

1. TSentral'nyy nauchno-issledovatel'skiy institut morskogo flota (for Levin). 2. Nachal'nik otdela teplotekhniki Baltiyskogo parokhodstva (for Yemel'yanov).

GRINBERG, M.I., laureat Stalinskoy premii, doktor tekhnicheskikh nauk, professor; LEVIN, B.M., inzhener; FRENKEL', L.D., inzhener; POLISHCHUK, V.L., inzhener; BEREZYUK, B.F., inzhener.

SVK-150-1 steam turbine made by the Leningrad (Stalin) Metallurgical Plant. Energomashinostroenie no.1:5-16 O '55. (MLRA 9:5)
(Steam turbines)

SOV/124-58-3-3068

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 3, p 75 (USSR)

AUTHOR: Levin, B. M.

TITLE: A Method for Determination of the Localized Entrance Losses in the Suction Pipe of a Hydraulic Dredge (Metodika opredeleniya mestnykh poter' vkhoda vo vsasyvayushcheye ustroystvo zemlesosnogo snaryada)

PERIODICAL: Tr. Mosk. in-ta inzh. zh.-d. transp., 1957, Nr 88/9, pp 52-57

ABSTRACT: In his determination of the entrance-loss coefficient for a hydraulic-dredge suction pipe the author utilizes the law of the conservation of energy. For analytical purposes the author assumes that suction of cohesionless underwater soil is performed through a vertical pipe. In accounting for the horizontal scanning speed of the dredge, the author suggests to reverse the arrangement, i. e., to consider the suction pipe stationary and the soil and water as moving at the speed of scanning.

Card 1/1 N. A. Pritvits

SOV/124-58-3-3067

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 3, p 75 (USSR)

AUTHOR: Levin, B.M.

TITLE: On the Determination of the Suction Flow Rate of a Hydraulic or Suction Dredge (K voprosu ob opredelenii vsasyvayushchey sposobnosti zemlesosnogo snaryada)

PERIODICAL: Tr. Mosk. in-ta inzh. zh.-d. transp., 1957, Nr 88/9, pp 58-67

ABSTRACT: A study is made of that optimal flow rate of hydraulic mixture at which the output of a hydraulic dredge relative to soil mass actually delivered achieves its maximum value. The author asserts that the optimal flow rate is determined solely by the particular properties of the suction pipe of the hydraulic dredge and is at variance with the maximal discharge rate of the total hydraulic mixture. An equation is obtained for the determination of the greatest permissible volumetric density of the hydraulic mixture. The paper contains a reference to a paper by A. N. Klimentov (Gidrotekhn. str-vo, 1951, Nr 12) which is devoted to the same problem.

N. A. Pritvits

Card 1/1

LEVIN, B. M.: Master Tech Sci (diss) -- "Investigation of the operation of a mechanical ship fuel system with stokers". Leningrad, 1958. (Min Maritime Fleet USSR, Leningrad Higher Engineering Maritime School im Admiral S. O. Makarov), 150 copies (KL, No 8, 1959, 136)

MOSTKOV, Mikhail Abramovich [deceased], prof.; MAMRADZE, G.P., kand. tekhn. nauk, red.; LEVIN, B.M., inzh., red.; VERINA, G.P., tekhn. red.

[Hydraulics] Gidravlika. Moskva, Gos. transp. zhel.-dor. izd-vo, 1958. 346 p. (MIRA 11:9)

1. Chlen-korrespondent Akademii nauk Gruzinskoy SSR (for Mostkov). (Hydraulics)

GREBEN', Mikhail Lazarevich; SHCHETININ, Anatoliy Aleksandrovich; LEVIN, B.M., nauchnyy red.; ZHITNIKOVA, O.S., tekhn.red.

[Regulation of steam turbines made by the Leningrad Metal-working Plant; design, testing, and adjusting] Regulirovanie parovykh turbin Leningradskogo Metallicheskogo zavoda; konstruktsiia, ispytanie i naladka. Moskva, Gos.energ.izd-vo, 1959. 181 p. (MIRA 13:3)

(Steam turbines)

YENIN, Vladimir Iosifovich; GERLOVIN, L.I., retsenzent; LEVIN, B.M., otv. red.; SAHDLER, N.V., red.izd-va; KOTLYAKOVA, O.I., tekhn.red.

[Marine boilers; their grouping and design] Kotly morskikh sudov. Komponovka i raschet. Leningrad, Izd-vo "Morskoi transport," 1959. 422 p. (MIRA 13:3)

(Boilers, Marine)

LEVIN, B.M., inzh.

Local entry losses in suction dredging under water. Trudy MIIT no.122:281-312 '59. (MIRA 13:5)
(Dredging)

VINOGRADOV, M.I., dotsent, kand.tekhn.nauk; LEVIN, B.M., assistent

Measuring the discharge of hydraulic mixtures by a full-pressure reversed pipe. Trudy MIIT no.107:24-27 '60.
(MIRA 13:7)

(Hydraulics)

LEVIN, B.M., assistent

Discharge and true characteristics of hydraulic mixtures in the suction pipe of the dredge. Trudy MIIT no.107: 28-32 '60. (MIRA 13:7)

(Hydraulics)

LEVIN, B.M., assistent

Relation between the consistency of the hydraulic mixture and suction parameters. Trudy MIIT no.107:33-46 '60. (MIRA 13:7)

(Hydraulics)

LEVIN, B.M., assistent; MIKHAYLOVA, N.A., kand.fiz.-matem.nauk

Use of Orlov's bathometer in measuring turbidity under laboratory conditions. Trudy MIIT no.107:47-69 '60. (MIRA 13:7)

(Bathometer) (Turbidity)

VALETOV, V.V.; VESNIK, M.I.; GONCHAROV, I.S.; DMITROV, D.V.; LUNEV, A.A.; MOKIN, M.I.; NESTEROV, S.N.; SMIRNOV, V.P.; ALEKSEYEV, S.A., retsenzent; KARKAZOV, A.G., retsenzent; KONDRATOVICH, V.M., retsenzent; LEVIN, B.M., retsenzent; MALIKOV, A.N., retsenzent; SEGALEVICH, S.M., retsenzent; SHPAGIN, A.I., retsenzent; SHTERN, L.T., retsenzent; YAKOBI, A.A., retsenzent; TIKHANOV, A.Ya., tekhn. red.; CHERNOVA, Z.I., tekhn. red.

[Establishing norms for the consumption of materials in machinery manufacture; manual] Normirovanie raskhoda materialov v mashinostroenii; spravochnik. Pod red. V.V.Valetova. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry. Vol.1. 1961. 583 p. (MIRA 15:2)

(Machinery industry)

LEVIN, B.M.

Main characteristics of the power plant on the steamer "Sergei Botkin." Inform. sbor. TSNIIMF no.47. Tekh. ekspl. mor. flota no.3:3-23 '60. (MIRA 15:1)

(Steam navigation)

LEVIN, B.M.; TOMLYANOVICH, D.K.

Certain features of the operation of a parallel fed contact network.
Sbor. nauch. rab. AKKH no.2:26-38 '60. (MIRA 15:5)
(Electric railroads--Wires and wiring)

ROZHDESTVENSKIY, N.A., kand.tekhn.nauk; LEVIN, B.M., kand.tekhn.nauk

Power plant of the steamship "Leninskii Komsomol." Inform.sbor.-TSNIIMF no.52. Tekh.ekspl.mor.flota no.5:19-48 '60. (MIRA 15:2)
(Marine engines)

PROKHOROV, Fedor Nikitovich; BELOKRYLIN, Yu.F., inzh., retsenzent; LEVIN, B.M., inzh., retsenzent; RYAZANTSEVA, Yu.A., retsenzent; KALININ, V.K., inzh., red.; BOBROVA, Ye.N., tekhn. red.

[Electric traction departments and electric power supply of electric railroads]Elektrotiagovoe khoziaistvo i energosnabzhenie elektricheskikh zheleznykh dorog. 2., perer. i dop. izd. Moskva, Transzheldorizdat, 1962. 134 p. (MIRA 16:1)

(Electric railroads--Current supply)
(Electric locomotives)

LEVIN, B.M., kand. tekhn. nauk; PERSHIKOV, L.F.; GOL'DENFON, A.K., kand. tekhn. nauk; AFANAS'YEV, K.A.; STRUMPE, P.I., kand. tekhn. nauk, otv. red.; SUSHKOVA, T.I., red.; KOTLYAKOVA, O.I., tekhn. red.

[Methods of testing thermodynamic processes in marine steam turbine plants] Metodika teplotekhnicheskikh ispytanii sudovykh paroturbinnykh ustanovok. Leningrad, Izd-vo "Morskoi transport," 1962. 118 p. (MIRA 16:9)

1. Leningrad. TSentral'nyy nauchno-issledovatel'skiy institut morskogo flota.

(Steam turbines, Marine)

KALININ, V.K., kand. tekhn. nauk; MIRONOV, K.A., inzh.; LEVIN, B.M., inzh.; LIBMAN, G.M., inzh.; YERSHOV, Ye.F., inzh.; PANCHENKO, P.M., inzh.; BOLYCHEV, N.G., mashinist elektrovoza; ZOLOTAREV, V.N., mashinist instruktor; YANIN, I.A., inzh.; BOVE, Ye.G., kand. tekhn. nauk, red.; USENKO, L.A., tekhn. red.

[Electric networks and maintenance of the equipment of electric locomotives] Elektricheskie skhemy i ukhod za oborudovaniem elektrovozov. [By] V.K.Kalinin i dr. Moskva, Transzheldorizdat, 1963. 279 p. (MIRA 16:7)

(Electric locomotives)

LEVIN, B.M., kand. tekhn. nauk, assistent

Free sedimentation of finely divided particles. Trudy MIIT no.164:173-178 '63. (MIRA 18:3)

LEVIN, B.M., kand. tekhn. nauk; KADYKOV, V.T., inzh.; ZHIVOTOVSKIY, L.S., kand. tekhn. nauk; KARLIN, B.I., kand. tekhn. nauk

Study of the loss of head in hydraulic conveying of microgranular material along horizontal pipes. Trudy MIIT no.176: 53-58 '63. (MIRA 17:6)

LEVIN, B.M., kand. tekhn. nauk

Effect of bend on the reading of a measuring diaphragm. Trudy MIIT no.176:76-85 '63. (MIRA 17:6)

LEVIN, B.M., kand. tekhn. nauk; DROVYANNIKOVA, V.I., inzh.;
KADYKOV, V.T., inzh.

Measuring low velocities of water currents by photography.
Trudy MIIT no.176:86-90 '63. (MIRA 17:6)

[illegible]VIN, B.[illegible], kand. [illegible], [illegible]

Measuring [illegible] rate of hydraulic [illegible].
Trudy [illegible] no.17 [illegible] 96 [illegible].

Optimal intake conditions of suction dredging machinery.
Ibid. [illegible] [illegible]

LEVIN, B.M., kand. tekhn. nauk; DROVYANNIKOVA, V.I., inzh.

Study of the hydrodynamics of flow in horizontal hydraulic sand classifiers. Trudy MIIT no.176:130-143 '63. (MIRA 17:6)

LEVIN, B.M., kand. tekhn. nauk; DROVYANNIKOVA, V.I., inzh.; ZAZHURILO, T.I., inzh.

Study of the process of the precipitation of monodispersed suspensions in small concentrations. Trudy MIIT no.176:144-159 '63. (MIRA 17:6)

LEVIN, B.M., kand.tekhn.nauk

Methods of standardizing fuel consumption for ships of the merchant marine. Inform. sbor. TSNIIMF no.105 Tekh.ekspl. mor. flota. 28:40-55 '64.

(MIRA 18:7)

FD 228

LEVIN, B. R.

USSR/Electronics

Card 1/1

Author : Levin, G. A. and Levin, B. R., Active Members, VNORiE

Title : The passband of a linear system and the reproduction of signals without distortion

Periodical : Radiotekhnika 9, 21-30, Mar/Apr, 1954

Abstract : Considers calculations of signal pulse form distortions during transmission through a minimum-phase linear system if only the frequency characteristic is known. The distortion factor of signal form as a whole and the time lag of the signal are used as quantitative measurements of distortion. Also shows that spreading the characteristics of the standard frequency response passband causes an automatic improvement of the form of its phase response. Six references: 6 USSR.

Institution : All-Union Scientific and Technical Society of Radio Engineering and Electric Communications imeni A. S. Popov (VNORiE)

Submitted : October 31, 1952

LEVIN, B. R.

"Time Characteristics of Impulse Signals Obtained from a Linear Network," Radio Tekh., No 1, 1955

FD-2288

USSR/Electronics - Pulse techniques

Card 1/1 Pub 90-1/12

Author : Levin, G. A. and Levin B. R.

Title : Time Characteristics of signal Pulses Passing Through Linear Systems

Periodical : Radiotekhnika 10, 3-11, Jan 1955

Abstract : Article gives new calculations for delay time, displacement time, and time of rise of the signal front for multi-stage circuits with monotonic and non-monotonic transient characteristics. In a system with identical stages and monotonic transient characteristics, the time of rise of the signal front is equal to difference between the delay time and displacement time. The formulas and graphs in the work can be used in planning multistage systems for reproduction of rectangular pulse signals with given distortion characteristics. Tables, graphs. Four references, 3 USSR.

Institution: --

Submitted : May 28, 1954

Levin, B. R.

KOSHKIN, Valentin Konstantinovich, professor; LEVIN, Boris Ruvimovich; KUTYRIN, Igor' Nikolayevich; BORISOV, Boris Petrovich; PORTNOV, D.A., doktor tekhnicheskikh nauk, retsenzent; LUSHPA, A.I., kandidat tekhnicheskikh nauk, redaktor; UVAROVA, A.F., tekhnicheskiy redaktor

[Free-piston engines in heat power plants] Dvigateli so svobodno dvizhushchimisia porshniami v teplosilovykh ustanovkakh. Pod red. V.K.Koshkina. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1957. 227 p. (MIRA 10:6)

(Gas turbines) (Gas and oil engines) (Pistons)

. LEVIN, B.R. Boris Rubimovich

AUTHOR: Levin, B. R.

TITLE: Theory of Random Processes and its Application in Radio Engineering (Teoriya sluchaynykh protsessov i yeye primeneniye v radiotekhnike)

PUB. DATA: Izdatel'stvo "Sovetskoye Radio" Moscow, 1957, 496 p.p.

ORIG. AGENCY: None given

EDITORS: Ivanushko, N. D.; Tech. Ed: Sveshnikov, A. A.

PURPOSE: The book is intended for radio engineers who wish to learn the methods of the theory of random processes and apply it in their every-day work.

COVERAGE: The book deals with Russian contributions; for references and personalities, see Table of Contents.

TABLE OF CONTENTS

The names of USSR personalities mentioned include Gonorovskiy, I. S., Prof., Drakin, Ye. V., aspirant.

Card 1/17

Levin, B.R.

RELIABILITY SYSTEMS

"Increase of the Reliability of Systems by Providing Spares", by B.R. Levin, Elektrosvyaz', No 11, November 1957, pp 65-72.

The reliability of system consisting of a large number of elements has been studied by many investigators. This article is devoted to methods of increasing reliability of systems by introducing spare elements. One of the fundamental assumptions is that any two elements of the system are independent, i.e., that when one element goes out of order it does not affect the reliability of the second element.

Reference is made to work by Moskowitz and McLean "Some Reliability Aspects of System Design" IRE Transactions, PGRQC-8, September 1956.

Card 1/1

LIPSMAN, ..., tekhnicheskikh nauk; LEVIN, B.R., kandidat tekhnicheskikh nauk.

Radio relay lines, a new trend in communication engineering. Priroda 46 no.7:19-30 Jl '57. (MLRA 10:8)
(Radio relay systems)

LEVIN, B.R.

Average working time of elements the reliability of which changes exponentially. Elektrosviaz' 12 no.8:30-35 Ag '58. (MIRA 11:8)
(Information theory)

SOV/106-58-12-4/13

AUTHOR: Levin, B.R.

TITLE: Reliability Taking into Account the Replacement of Faulty Components (Nadezhnost' s uchetom zamen povrezhdennykh elementov)

PERIODICAL: Elektrosvyaz', 1958, Nr 12, pp 26 - 34 (USSR)

ABSTRACT: A criterion of the different methods of providing a reserve of apparatus for improving the reliability of a system is the probability of the system operating without interruption over a given period of time (Refs 1 - 3). Siforov and Levin (Ref 1 - 3) considered the time interval from the commencement of operation to the instant of the first interruption. The object of this article is to widen the theory of reliability by taking into account the time spent in replacement of faulty components. Initially the simplest case of a single element is considered, subsequently a multi-component system is dealt with. The distribution function of the intervals between successive replacement of a component is first established, assuming that the instant of failure is random and independent of the time when the component is first

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Reliability Taking into Account the Replacement of Faulty Components switched in. The probability of a given number of switching-in operations in a given time is found and also the average number of switching-in operations of the reserve elements. Then the author considers the effect of the time of replacement, assuming (1) instantaneous replacement, (2) constant replacement time, (3) an exponential law of distribution of the replacement time. Finally typical examples are given. There are 3 figures and 6 references (4 Soviet, 1 English and 1 translation)

SUBMITTED: July 17, 1958

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LEVIN, B. R. (Dr.)

"Some Results of Mathematical Reliability Theory." paper presented at the 5th Symposium on Reliability and Quality Control in Electronics, Philadelphia, 12-14 Jan 1959.

The paper presents results on following:

a. Reliability of Systems containing redundant subsystems. In this case, the analysis applies to probability of failure in a fixed period of time.
b. Extension of the above to treat time as a variable.
c. Various statistical quantities applying to conditions in which replacement components are switched into a system.

SOV/4836

PHASE I BOOK EXPLOITATION

Levin, Boris Ruvimovich

Teoriya sluchaynykh protsessov i yeye primeneniye v radiotekhnike (Random Process Theory and Its Use in Radio Engineering) 2d ed., rev. and enl. Moscow, Izd-vo "Sovetskoye radio," 1960. 662 p. Errata slip inserted. No. of copies printed not given.

Ed.: N. D. Ivanushko; Tech. Ed.: A. A. Sveshnikov.

PURPOSE: This book is intended for scientists, technical personnel, and aspirants, and also for teachers and students in advanced courses of the radio-engineering divisions of schools of higher eduction.

COVERAGE: This book attempts to fill a gap in Soviet literature by presenting basic information on the theories of probability and random processes to those people who are concerned with radio-engineering problems. The manual was also designed to be useful to radio engineers, which fact explains the emphasis put on several radio-engineering examples which illustrate the possibility of using theoretical probability methods for solving a variety

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S/024/60/000/02/030/031
E140/E135

AUTHOR: Levin, B.R. (Moscow)

TITLE: The Reliability of an Amplifier with Automatic Gain Control

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1960, Nr 2, pp 208-209 (USSR)

ABSTRACT: The use of feedback improves the reliability of an amplifier but requires a larger number of stages, which in turn reduces the reliability. Analysis shows that under appropriate conditions there exists an optimum number of stages in the presence of feedback for which the reliability is a maximum.
There are 1 figure and 3 Soviet references.

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SUBMITTED: December 21, 1959

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S/109/60/005/04/002/028
E140/E435

6.9000

AUTHOR: Levin, B.R.

TITLE: Optimal Phase Methods of Signal Detection

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 4, pp 537-543 (USSR)

ABSTRACT: The author employs the concepts of statistical decision processes to find optimal methods of processing phase samples of a signal in noise. In place of a sample consisting of n instantaneous values of amplitude, it is possible to process a signal sample consisting of n/2 amplitudes and n/2 phase values. Then in place of the "absolutely optimal" processing of the n samples, it is possible to consider processing of the n/2 amplitude or n/2 phase samples alone. The author knows only the work of Huggins and Middleton (Ref 2) in the previous literature on comparison of phase and amplitude optimal detection methods. From his analysis, the author concludes that the statistical characteristics of detection of a weak determined signal by the optimal phase method are better than for the optimal amplitude method and are close to the absolutely

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LEVIN, B.R.; MAKSIMOV, Yu.P.; MERKADER, L.P.

Crosstalk resulting from simultaneous transmission of television and telephone communications along the same lines. Elektrosviaz' 14 no.4:49-61 Ap '60. (MIRA 13:6)
(Telephone) (Television--Interference)

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S/106/60/000/005/002/009
A055/A133

9.8300
9.3275

AUTHORS: Levin, G. A.; Levin, B. R.; Ayzenberg, V. I.; Rozanov, V. S.

TITLE: Increasing the efficiency of multichannel systems with time division of channels

PERIODICAL: Elektrosvyaz', no. 5, 1960, 10-16

TEXT: Statistical measurements in multichannel systems with time division of channels revealed that a telephone channel is really active only for about 15 minutes per hour at maximum load. The probability law proves that during 99% of the total time the number of active channels does not exceed a value n < N (N being the total number of channels). The present article shows how it is possible to increase the efficiency of these multichannel systems by a proper use of inactive intervals and channels. It also shows that this efficiency can be increased by a more complete utilization of the statistics of the instantaneous values of the transmitted signals: by varying the duration of the channel intervals in accordance with the instantaneous value of the transmitted signal, it is possible to increase the number of channels. To enhance this efficiency, it is necessary to abandon the channel interval of constant duration. Inasmuch as

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Increasing the efficiency of multichannel ...

the time interval between pulses of the preceding and following channels is used as carrier of useful information, the method described by the authors is a variety of pulse-time modulation and can therefore be named "interval pulse-time modulation" or IPTM. There are many possible variants of this new type of modulation system, but all these variants can be divided into definite categories according to: 1) the method used for transmitting the number (n^0) of the channel; 2) the method allowing to take into account the sign of the modulating signal. Let us assume that the voice signal $\xi(t)$ is a stationary random process with probability density w (x), with zero mean value and with dispersion σ^2_ξ. Let us analyze the systems where the information interval is modulated by the absolute value $h|\xi(t)|$ of the signal in a given channel, and where the sign of the signal is coded by an additional pulse. If t_ν is the random duration of the information interval of the ν-th channel, the probability density of t_ν is:

$$W(x) = \frac{2}{h} w\left(\frac{x}{h}\right), \qquad x > 0 \tag{1}$$

where h is the proportionality coefficient(which will be assumed equal to one). The mean value and the dispersion of t_ν are respectively:

$$m_1\{t_\nu\} = \frac{2}{h}\int_0^\infty xw\left(\frac{x}{h}\right)dx = hm_1\{|\xi(t)|\}, \tag{2}$$

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and

$$M_2 \{t_\nu\} = \frac{2}{h} \int_0^\infty x^2 w \left(\frac{x}{h} \right) dx - h^2 m_1^2 \{|\xi(t)|\}. \quad (3)$$

In the case of IPTM where information intervals are modulated by the sum of the instantaneous values of the signal and by its envelope E (t), the mean value of t_ν is:

$$m_1 \{t_\nu\} = m_1 \{\xi (t)\} + m_1 \{E (t)\}. \quad (4)$$

and the dispersion is:

$$M_2 \{t_\nu\} = M_2 \{\xi(t)\} + M_2 \{E (t)\}. \quad (5)$$

To compare the efficiency of several variants of the system using IPTM, the gain procured by any one of these variants (as regards the number of channels and the frequency-band) in respect of the usual pulse-phase modulation systems is to be calculated. In the usual N-channel pulse-phase modulation, interval T_0 is the sum of N + 1 channel-intervals (account taken of the synchronization channel). The duration of one channel-interval is the sum of pulse $\tilde{\tau}$, of the protective time 3τ and of the duration of the information interval $2\alpha_1\sigma$. The magnitude of the peak factor α_1 is derived from the condition that the absolute values do not exceed (with a given probability p_1) $\alpha_1 \sigma$. Thus:

$$T_o = (N + 1)(4\tau + 2\alpha_1 \sigma). \qquad (7)$$

Let us now analyze the time T_i occupied in one period by N_i channels of the IPTM system [Abstracter's note: Subscript i stands for any one of the compared variants of the system.]. If $B_i\tau$ is the duration of the code combination of pulses per channel, T_i is the sum of the time $(B_iS_i + 2)\tau$ occupied by code combinations and marker pulse, and of the total information time equal to the sum of n_i independent, similarly distributed, random magnitudes. S_i is here equal to the number n_i of active channels in the case of a special coding of the number (n^o) of the channel, and to the total number N_i of channels in the case of a simple reading of channels. If the number of active channels is, with a probability near one, not inferior to ten, the total information time can be considered as distributed according to the normal law with the mean and the dispersion respectively equal to $n_i m_1^{(i)}\{t_\nu\}$ and $n_i M_2^{(i)}\{t_\nu\}$. Therefore, T_i is a fortuitous magnitude whose parameters are:

$$m_1\{T_i\} = (B_iS_i + 2)\tau + n_i m_1^{(i)}\{t_\nu\}, \quad M_2\{T_i\} = M_2^{(i)}\{t_\nu\} n_i. \qquad (8)$$

T_i is limited below by magnitude c (minimum duration of all code combinations and

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of marker pulse in one period) and must not exceed, with probability p_2 near one, the duration of period T_0, this to avoid distortions. Taking (8) into account, we obtain:

$$F\left\{\frac{T_0-(B_iS_i+2)\tau-n_im_1^{(i)}\{t_\nu\}}{\sqrt{M_2^{(i)}\{t_\nu\}n_i}}\right\}-F\left\{\frac{\tau-(B_i{}'_i+2)\tau-n_im_1^{(i)}\{t_\nu\}}{\sqrt{M_2^{(i)}\{t_\nu\}n_i}}\right\}=p_2. \quad (9)$$

But it is possible to state that

$$F\{x_2\} = P_2 \quad (10)$$

where

$$x_2 = \frac{T_0 - (B_1S_1 + 2)\tau - n_1m_1^{(i)}\{t_\nu\}}{\sqrt{M_2^{(i)}\{t_\nu\}n_1}}. \quad (11)$$

Equation (10) allows to determine x_2 (for a given probability $1 - p_2$ of the system overload). Using the expression:

$$\tau A_1 = n_1m_1^{(i)}\{t_\nu\} + x_2\sqrt{n_1 M_2^{(i)}\{t_\nu\}}, \quad (12)$$

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we find:

$$T_o = (B_1 S_1 + 2)\tau + \varepsilon \Lambda_1. \quad (13)$$

Substituting into (13) the value of τ extracted from (7), we find the final formula for the possible number of channels N_1, when (the noiseimmunity remaining unaletered) one of the variants of IPTM is used instead of pulse-phase modulation: n_1 being determined as a function of N_1 with the aid of the "activity curve" (activity coefficient k versus N). Equation (14) allows to find function $N_1 = N_1$ (N) at fixed values of T_o and τ, and at given values of p_1 and p_2. If, with IPTM, the number of channels is left equal to N, the time occupied by these N channels will be inferior to T_o. It will be possible, therefore, to increase the pulse duration up to:

$$\tau_1 (N) = \frac{T_o - \Lambda_1 \varepsilon}{B_1 S + 2} \quad (15)$$

The narrowing of the required frequency band, allowed by the passage from pulse-phase modulation to IPTM, will then be characterized by the relation:

$$\Delta_1 = \frac{\tau_1}{\tau} \quad (16)$$

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At the end of the article, the authors, using the above set of formulae, compare the efficiency of the different variants (i) of the IPTM system. They find that the least efficiency corresponds to the coding of the number (n^o) of channels by a uniform binary code. With a non-uniform binary code, the minimum efficiency (1.75-times increase of the number of channels) is yielded by the system with the additional, sign indicating, signal, and the maximum efficiency (1.91-times increase of the number of channels) is yielded by the transmission of the sum (signal + its envelope). The greatest efficiency (4.15-times increase of the number of channels) is obtained with the simple reading of channels and the transmission of the sum (signal + its envelope); this method ensures also the maximum narrowing of the band for the same number of channels. There are 5 figures, 2 tables and 5 references: 2 Soviet-bloc and 3 non-Soviet-bloc. The two references to English-language publications read as follows: Holbrook, Dixon. "Load Rating Theory for Multichannel Amplifiers". BSTY, v. 18, 624, 1939. US-Patent, cl. 179-15. no. 2724017, 15-11-55.

SUBMITTED: February 3, 1960

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6.4600, 9.2400

77504
SOV/108-15-2-9/12

AUTHOR: Levin, B. R.

TITLE: On Some Problems in the Theory of Reliability of Radio-Electronic Equipment (Reported at the October 31, 1958, session of the Reliability Section of the Scientific and Technical Society of Radio Engineering and Electric Communications imeni A. S. Popov.)

PERIODICAL: Radiotekhnika, 1960, Vol 15, Nr 2, pp 67-74 (USSR)

ABSTRACT: The paper discusses general considerations concerning system reliability. The mathematical theory of reliability is based on the statistical definition of reliability of an element or a system, as a probability of failureless work during a certain time interval. The system is represented by a matrix of independent elements $\| A_{ij} \|$. For a fixed time interval T, the element A_{ij} is characterized by the reliability p_{ij}. Thus, a reliability matrix $\| p_{ij} \|$ corresponding to the $\| A_{ij} \|$ matrix is formed. Elements of a matrix row are connected in

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series and the rows are connected in parallel. In the general case when a system is represented by a matrix of the mn order, the standby arrangement may be obtained through series-connected $r \leq n$ matrices of the order $m_k\ s_k$, where $k = 1,2,\ldots,r$. It is obvious that $\sum_{k=1}^{r} s_k = n$. Two methods are considered for connecting standby elements: (1) The so-called hot method, when all elements of the matrix column are connected simultaneously; and (2) the so-called cold method, when each subsequent element of the column is connected only after a failure of the preceeding element. In the latter case the reliability p_{ij} must be known as a function of time. In addition to the exponential law of reliability distribution, assumed until now in most investigations, the Raleigh and the normal distributions must also be considered in many cases. The following basic assumptions are made: (a) A system or an element is either in a condition of functioning or it is out of order; (b) The elements are mutually independent. Based on the above considerations the following three types of reliability problems are considered: (I) Investigation of reliability for a fixed time interval: Here it is assumed that each k-th set is provided with a sensitive element which detects the failure of an element of this set and connects the standby set. The reliability of this sensitive element is p_{ak}.

The reliability P, of the system is then defined by the following expression:

$$P = \prod_{k=1}^{r} \left\{ 1 - \left(1 - \prod_{j=S_{k-1}}^{S_k} p_{1j} \right) \prod_{i=2}^{m_k} \left(1 - p_{ak} \prod_{j=S_{k-1}}^{S_k} p_{ij} \right) \right\}. \qquad (3)$$

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(II) Investigation of reliability as a function of time: Assuming $p_{ii}(t)$ as a continuous function, expressions are given for the probability density, the characteristic function, the distribution moment of order k, the average time of failureless operation, and the variance of time of failureless operation. The above expressions are applied to the following three systems: (1) System of n elements in series; (2) System of m elements in parallel, the elements subject to the same reliability laws (hot method of connection); and (3) System of n elements in series, the system having a single hot standby system. For each system the exponential, the Raleigh, and the normal distribution are considered. From the obtained results it is seen that for the (2) system the largest magnitude of the average failureless operating time is obtained under an assumption of exponential distribution; the smallest magnitude is obtained under

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an assumption of normal distribution. For the (3) system the largest and the smallest magnitudes of failureless operation time are obtained under assumptions of normal and exponential distribution, respectively. (III) Replacing of damaged elements: Two cases are considered: (a) The case of instantaneous connection of the standby element; and (b) the case of a constant failure duration t_3^*. When the number of failures during the time interval (0,t) is given as a random magnitude ν, the probability $P\{\nu \leq n\}$ is that number of failures during the time t does not exceed the number n of elements. Assuming t^* as the average duration of failureless operation, the relationship between $P\{\nu \leq n\}$ and t/t^* is shown on Fig. 4 for $t_3/t^* = 0.3$; $t_3 = 0$, and for various values of n.

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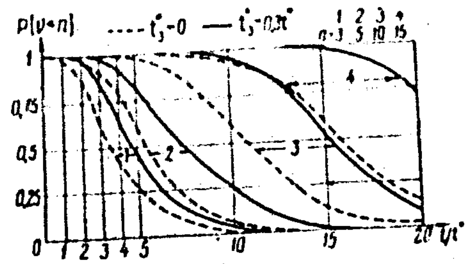

Fig. 4.

Here the exponential law of reliability distribution is assumed. Figure 5 shows the above relationship plotted under assumption of normal distribution of

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element reliability.

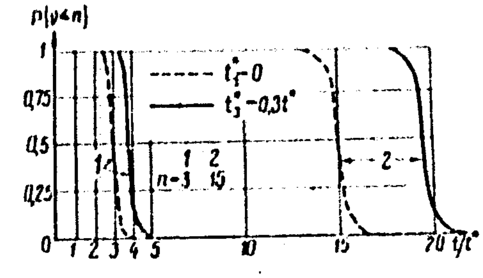

Fig. 5.

No particular conclusions are drawn in the paper.

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There are 5 figures; 2 tables; and 11 references, 7 Soviet, 4 U.S. The U.S. references are: F. Moskowitz, J. B. McLean, Some reliability aspects of systems design, IRE Trans. PGRQC-8, Sept. 1956; G. H. Weiss, On the time-dependent reliability of networks, Proc. Nat. Electronics Conf., 11, Chicago 1956; C. M. Ryerson, Reliability testing theory based on the Poisson distribution, Proc. Fourth Nat. Symp., RQC, Jan. 1958; J. H. K. Kao, Computer methods estimating Weibull parameters in reliability studies, IRE Trans., PGRQC-13, July, 1958.

SUBMITTED: February 17, 1959

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85723

S/108/60/015/006/008/012/XX
B010/B070

16,6100 (also 1344)

AUTHOR: Levin, B. R., Member of the Society

TITLE: Energy Spectrum of the Undetermined Integral of a Steady Random Process

PERIODICAL: Radiotekhnika, 1960, Vol. 15, No. 6, pp. 19-21

TEXT: An expression for the instantaneous energy spectrum of the undetermined integral of a random process is derived, and by taking a time average a relation is obtained which was used in the papers of D. Middleton, I. S. Gonorovskiy, U. R. Bennet, G. Ye. Kertis, and S. O. Rays without proper clarification of its meaning and the assumptions involved in it. In those papers, nonsteady processes of the form

$$\eta_T(t) = \int_{-T}^{t} \xi(t)dt, \text{ where } t \geqslant -T, \text{ and T is an arbitrary fixed instant,}$$

were treated by methods which are valid only for steady random processes, but even then lead to correct results for nonsteady processes. The present

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Energy Spectrum of the Undetermined Integral of a Steady Random Process

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paper shows how these results are to be understood. It is known that the instantaneous energy spectrum $G_{\eta T}(t,\omega)$ of a process $\eta_T(t)$ can be found by starting from the formula $G_{\eta T}(t,\omega) = \frac{\partial}{\partial t} m_1\left\{\left|S_{\eta T}(t,\omega)\right|^2\right\}$, where $S_{\eta T}(t,\omega) = \int_{-T}^{t} \eta_T(t_1)e^{-i\omega t_1}\,dt_1$, and obtaining $G_{\eta T}(t,\omega) = \frac{1}{\omega^2} G_{\xi T}(t,\omega)$ $+ 2\int_{0}^{t+T} B_{\xi}(\tau)\left[1 + \sin\omega(t+T-\tau) + \sin\omega(t+T)\right]d\tau$, where $B_{\xi}(\tau)$ is the correlation function of $\xi(t)$. This function of t and ω describes the instantaneous energy spectrum of the undetermined integral of a random process. The time average of this energy spectrum, $F_{\eta}(\omega)$, is obtained by substituting $G_{\eta T}(t,\omega)$ in $F_{\eta}(\omega) = \lim_{T\to\infty} \frac{1}{2T}\int_{-T}^{T} G_{\eta T}(t,\omega)dt$. The first term gives the contribution $\frac{1}{\omega^2}\lim_{T\to\infty}\frac{1}{2T}\int_{-T}^{T} G_{\xi T}(t,\omega)dt = \frac{1}{\omega^2}\lim_{T\to\infty}\frac{1}{2T}\int_{-T}^{T}\frac{\partial}{\partial t} m_1\left\{\left|S_{\xi T}(t,\omega)\right|^2\right\}$ dt=

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$= \frac{1}{\omega^2} \lim_{T \to \infty} \frac{1}{2T} m_1 \left\{ \left| S_{\xi T}(T,\omega) \right|^2 \right\} = \frac{1}{\omega^2} F_\xi(\omega)$, where $F_\xi(\omega)$ denotes the energy spectrum of the steady random process $\xi(t)$. In order that $\frac{1}{\omega^2} F_\xi(\omega)$ remains finite for $\omega \to 0$, $F_\xi(0)$ must equal 0. $F_\eta(\omega)$ is thus found to be given by $F_\eta(\omega) = \frac{1}{\omega^2} F_\xi(\omega) + \lim_{T \to \infty} \frac{1}{T} \int_0^{2T} B_\xi(\tau) \cdot \left[1 - \frac{\cos\omega(2T-\tau) - 1 + \cos 2\omega T - \cos\omega\tau}{\omega}\right] d\tau$. Since on account of $F_\xi(0) = 0$ $\int_0^\infty B_\xi(\tau) d\tau = \frac{1}{4} F_\xi(0) = 0$, $F_\eta(\omega) = \frac{1}{\omega^2} F_\xi(\omega)$. This formula shows the relationship between the energy spectrum of the steady random process $\xi(t)$ and the average value of the instantaneous energy spectrum of the integral of this random process, taken over a sufficiently long interval of time. The

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6.7110 (1121,1524)

AUTHORS: Levin, B. R. and Rozanov, V.S.

TITLE: Determining the number of channels in multichannel system using spaced pulse-time modulation

PERIODICAL: Elektrosvyaz', 15, no. 6, 1961, 10 - 14

TEXT: In many multichannel communication systems the statistical characteristics of the source of communications are not taken into account when choosing the modulation method. With time division of channels, one of the methods of signal transmission allowing to make use of the statistical characteristics of the source is the spaced pulse-time modulation. The theoretical study of efficiency of this modulation method was already described in a previous article by G. A. Levin, B. R. Levin, V. I. Aysenberg and V. S. Rozanov [Ref. 1: Povysheniye effektivnosti mnogokanal'nykh sistem s vremennym razdeleniyem kanalov (increasing the efficiency of multichannel systems with time division of channels) Elektrosvyaz', 1960, No. 5] where a way was also shown for determining the possible number of channels. In the present article, the authors give a simpler and mathematically more accurate method for determining this number. The general case of

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an N-channel system with time division of channels is considered. It is assumed that $\xi_j(t)$ is the random process describing the modulation law in an individual channel. Account is taken of the channel activity by multiplying $\xi_j(t)$ by the random magnitude η_j which becomes unity with probability p (active channel), and zero with probability q (inactive channel). The modulation function for the N-channel system can then be written as:

$$\zeta(t, N) = \sum_{j=1}^{N} \zeta_j(t) = \sum_{j=1}^{N} f[\xi_j(t)]\,\eta_j, \qquad (1)$$

where f is a functional transformation given in the above-mentioned article. When the absolute magnitude of the signal is transmitted (with an additional pulse for the sign coding), $f(\xi) = |\xi|$; in the case of the summation of the instantaneous signal values and their envelope $f[\xi(t)] = \xi(t)+E(t)$, where $E(t) = \sqrt{\xi^2(t)+\eta^2(t)}$ and where $\eta(t)$ is a process conjugated with $\xi(t)$ according to Guilbert. It is assumed that the communication sources are independent, and that only one-dimensional distribution functions $w_\xi(x)$ of processes $\xi_j(t)$ are used. It is also assumed that the activity and the distribution function of processes $\xi_j(t)$ do not depend on time and are the same for all channels. The integrated distribution func-

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tion of the component $\zeta_j(t)$ of the modulating function is

$$P\{\zeta_j < x\} = \begin{cases} pF_1(x) + q, & x \geq 0 \\ pF_1(x), & x < 0 \end{cases} \quad (2)$$

where

$$F_1(x) = \int_{-\infty}^{x} w_1(x)dx \quad (3)$$

and where $w_1(x)$ is the probability density of $f(\xi_j)$. The probability density of the random function $\zeta_j(t)$ is

$$w(x) = pw_1(x) + q\,\delta(x) \quad (4)$$

Expressing by $\theta_1(w)$ and $\vartheta_1(w)$ the characteristic functions of $f[\xi_j(t)]$ normal and $\zeta_j(t)$, the authors find:

$$\vartheta_1(w) = p\,\theta_1(w) + q \quad (5)$$

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The sources being independent, the characteristic function $\theta(w)$ of the modulating function $\zeta(t, N)$ is:

$$\theta(w) = [\vartheta_1(w)]^N = [p\theta_1(w) + q]^N. \qquad (6)$$

Expressing the moment m_k of a random magnitude by

$$m_k = (-i)^k \theta^{(k)}(0);$$

the mean and the dispersion of the modulating function will be given by

$$m_1\{\zeta(t, N)\} = Npa \qquad (7)$$

and

$$M_2\{\zeta(t, N)\} = Np(\sigma^2 + qa^2), \qquad (8)$$

where a and σ^2 are the mean and the dispersion of the random magnitude $f[\xi_i(t)]$. When N is large, the $\zeta(t, N)$ distribution can be considered as normal with parameters determined by (7) and (8). The total time T occupied in one interval by the multichannel signal consists of the time occupied by code-combinations X

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and marking pulse, and of the total information time equal to ζ (t, N). As shown in the previous article, T is limited (lower limit) by the value t_0 (minimum value of the code-combinations duration of all channels and of the marking pulse) and must not exceed the interval duration T_0. The magnitude $1 - p_2$, called "overload probability", is one of the basic indices of the system. If $N \gg 1$, T is distributed normally and

$$P\{t_0 \leqslant T \leqslant T_0\} = F\left(\frac{T - m_1\{T\}}{\sqrt{M_2\{T\}}}\right) - F\left(\frac{t_0 - m_1\{T\}}{\sqrt{M_2\{T\}}}\right) = p_2 \qquad (9)$$

For practical purposes, the second term in (9) can be neglected, and (9) becomes:

$$F(\alpha_2) = p_2 \qquad (12)$$

where

$$\alpha_2 = \frac{T_0 - m_1\{T\}}{\sqrt{M_2\{T\}}} \qquad (13)$$

or

$$\alpha_2 \sqrt{Np\,(\sigma^2 + qa^2)} = T_0 - 2(N+1)\tau - aNp \qquad (14)$$

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A055/A127

Determining the number of channels ....

for the ordinary coding of the number of the channel, and

$$\alpha_2 \sqrt{Np(\sigma^2 + qa^2)} = T_0 - 2\tau - (B\tau + a)\,Np \qquad (15)$$

when a binary code is used. In these expressions:

$$m_1\{T\} = 2(N + 1)\tau + aNp,\ M_2\{T\} = Np(\sigma^2 + qa^2),\ t_0 = 2(N + 1)\tau, \qquad (10)$$

for ordinary coding, and

$$m_1\{T\} = 2\tau + (a + B\tau)Np,\ M_2\{T\} = Np(\sigma^2 + qa^2),\ t_0 = 2\tau \qquad (11)$$

when a binary code is used, $B\tau$ being the duration of the code-combination of pulses per channel, and 2τ the total duration of the pulse and of the subsequent quiescent interval. For a determined "overload probability", α_2 can be derived from Equation (12); the solution of equation (14) or (15) permits then to determine the number of channels in the multichannel system using spaced pulse time modulation. At the end of the article, the authors apply the obtained formulae to a practical example, i. e., to the determination of the number of channels, in the

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MIDDLTON, D.[Middleton, David]; SMIRENIN, B.A.[translator]; LEVIN, B.R., red.; IVANUSHKO, N.D., red.; SMUROV, B.V., tekhn. red.

[An introduction to statistical communication theory]Vvedenie v statisticheskuiu teoriiu sviazi. Pod red. B.R.Levina. Moskva, Izd-vo "Sovetskoe radio," Vol.1. 1961. 781 p. (MIRA 15:11)

(Information theory) (Telecommunication)

SOV/6371

Transactions of the Sixth Conference (Cont.)

Transactions of the 6th Conf. on Probability Theory and Mathematical Statistics and of the Symposium on Distributions in Infinite-Dimensional Spaces held in Vil'nyus, 5-10 Sep '60. Vil'nyus Gospolitizdat Lit SSR, 1962. 493 p. 2500 copies printed

S/106/63/000/002/001/007
A055/A126

AUTHORS: Levin, B.R., Fomin, Ya.A.

TITLE: Energy spectra of group signals in multichannel pulse systems

PERIODICAL: Elektrosvyaz', no. 2, 1963, 3 - 10

TEXT: The theory of the energy spectra of random pulse processes with a determined cadence interval is applied to sequences of pulse groups. The pulses in the group can be of different kinds. The analysis is limited to pulse group processes where the statistical characteristics of pulse groups are independent of their number (n) in the sequence, and the statistical characteristics of the "ensemble" of pulse groups depend only on their reciprocal position. Using the method evolved by one of them [Levin, Teoriya sluchaynykh protsessov i yeye primeneniye v radiotekhnike (Theory of random processes and its application in radio engineering), second edition, Sovetskoye Radio, 1960], the authors deduce a general expression (consisting of a continuous and a discrete part) for the energy spectrum F (ω) of a random sequence of groups of pulses with a determined cadence interval. They use this expression for the determination of the energy

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spectrum

$$F(\omega) = F_{chan}(\omega) + F_{synchr}(\omega) + F_{chan \times synchr}(\omega) \qquad (8)$$

of the group signal in a synchronous multichannel system with time-separation of channels, under the assumption that the signal consists of m identical channel pulses (n°1 to n°m) and one synchronizing pulse (n°0), the analysis being limited to the case where all the channels have identical statistical and physical characteristics. The authors next deduce three separate formulae giving the group energy spectrum in multichannel systems with pulse-amplitude, pulse-time and pulse-duration modulation, respectively, account taken of both the useful and parasitic modulation of pulses. There are 3 figures.

SUBMITTED: August 29, 1962

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L 9828-63 EDS S/0108/63/018/005/0022/0028
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ACCESSION NR: AP3000432

AUTHOR: Levin, B. R.; Fomin, Ya. A. (Members of the Society)

TITLE: Approximate determination of the function of blip-duration distribution over the envelope of the below-threshold sum of a determined signal and a normal steady-state noise

SOURCE: Radiotekhnika, no. 5, 1963, 22-28

TOPIC TAGS: noise analysis, noise in electrical communication

ABSTRACT: The distribution function is approximated by a first-approximation curve for noise of shorter durations and by an exponential curve for longer durations. The results of this more accurate approximation practically coincide with those obtained by S. O. Rice (BSTJ, vol 37, No 3, 1958) and are in good agreement with the experimental results obtained by V. I. Tikhonov (Uspekhi fizicheskikh nauk, vol 77, No 3, 1962). Orig. art. has: 13 equations and 3 figures

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L 17877-63 EWT(d)/FCC(w)/BDS AFFTC/IJP(C)
ACCESSION NR: AP3004272 S/0106/63/000/007/0021/0032

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AUTHOR: Levin, B. R.

TITLE: Some generalizations in the theory of pulse random processes

SOURCE: Elektrosvyaz', no. 7, 1963, 21-32

TOPIC TAGS: random process

ABSTRACT: The theory of power spectra of pulse processes is extended over the case when random pulse trains appear at determinate intervals. Such pulse random processes occur in multichannel pulse-code-modulation systems, in statistically multiplexed channels, etc. Formulas are developed that describe the following cases: (1) a random number of standard pulses in specified positions; (2) constant-duration pulses at random separations; (3) a clipped signal with determinate periods. Orig. art. has: 6 figures and 38 formulas.

Card 1/1

LEVIN, B.R.

Applicatitn of the theory of random processes in radio engineering. Izv. AN SSSR. Tekh. kib. no.5:103-107 S-O '63. (MIRA 16:12)

LEVIN, B.R.; SEROV, V.V.

Distribution of the periodic function of a random quantity. Radiotekh. i elektron. 9 no.6:1065-1067 Je '64. (MIRA 17:7)