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USSR
ELECTRONIC AND PRECISION EQUIPMENT

Number 14

13 October 1959

Prepared by

Foreign Documents Division
CENTRAL INTELLIGENCE AGENCY
2430 E. St., N. W., Washington 25, D.C.

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USSR ELECTRONIC AND PRECISION EQUIPMENT

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I. ITEMS OF SPECIAL INTEREST

A. Status of USSR Automation

Many difficulties in the introduction of automation have yet to be eliminated in the USSR. Both in the organization of all-around scientific research and in the production of automation equipment we still lag behind the US, only because the conditions necessary for automation (the production facilities, the development of science, and the personnel) were developed later in our country. It will take some time yet to overcome this lag. However, in a planned economy with a continuous rapid growth of our personnel and the level of our science, we possess in reality unlimited capabilities for solving any kind of technical problem. An example of this is the launching of artificial satellites and the development of intercontinental rockets, where extremely complex automatic equipment and instruments have played a considerable part. (Moscow, Kommunist, No 9, Jun 59, p 17)

B. Production of Industrial Equipment at Institute

Instruments with the producer's designation "LPI" are not made in any factory or plant, but rather, in the L'vov Polytechnic Institute. Many automatic units made by the Chair of Machine Building Technology, Machine Tools, and Tools of the L'vov Polytechnic Institute are used in the shops of the [L'vov] Tool Plant.

A group of scientific associates of the institute are designing an automatic line for assembling the electro-optical systems of television picture tubes, which will be installed at the L'vov Electric Bulb Plant. (Moscow, Trud, 18 Jul 59)

C. Shortages and Deficiencies

In Leningrad, a large center of the instrument-making industry, no enterprises manufacture square parts for instruments. (Leningradskaya Pravda, 7 Jul 59)

To fulfill the new tasks of the June Plenum of the Central Committee CPSU, the Kiev Tochelektropribor Plant needs to expand its shops and laboratories, which are provided with obsolete equipment and occupy crowded premises. The plant considers that now is the time to expand its laboratories and hire new personnel in order to create a branch of the Scientific Research Institute of Instrument Making. Much help in this task could be obtained from the Electrical Engineering Faculty of the Kiev Polytechnic Institute and the Institute of Electrical Engineering of the Academy of Sciences Ukrainian SSR, which have been aiding the plant for a long time.

Nobody can deny that new high-quality materials are needed for new instruments. However, it is difficult to obtain modern magnetic alleys and insulation materials for making experimental models; also there is a shortage of polyvinyl chloride, nylon, and phenol powders. It is the duty of the Kiyevskiy Sovnarkhoz to help the plant meet its goals. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 29 Jul 59)

A complaint might be registered against instrument making plants. Sugar refineries do not have such instruments as density meters, lime milk, syrup, and molasses flow meters. It is time to develop and manufacture them. (Kiev, Pravda Ukrainy, 29 May 59)

What motivates Rosglavelektrosnabsbyt [Main Administration for the Supply and Sale of Electrical Products of the RSFSR?] in its method of distributing products? This question was brought up in a letter from Desyaterik, chief of the Supply Division of the Mednogorsk Uralelektromotor Plant of the Orenburgskiy Sovnarkhoz.

When the plant needed PELBO wire .7-1.0 mm in gauge, Rosglavelektrosnabsbyt selected the Kuybyshev Cable Plant for Order No 1-59-768 the Leningrad Sevkabel' Plant for Order No 1-59-801, and the Rybinsk Cable Plant for Order No 19-59-788.

The Mednogorsk Plant received the first order without too much trouble, since Kuybyshev is not too far away. But it experienced difficulty with the other two orders, since both Rybinsk and Leningrad are about 2,000 km from Mednogorsk.

The Mednogorsk plant had been receiving PM cable from the Berdyansk Cable Plant. However, according to order No 29-57-29, it was to begin procuring this cable from Khabarovsk. The plant had to hire a plane to fly in the cable in order to meet the production plan. Thus 5,983 rubles had to be spent to bring in cable worth only 2,647 rubles.

Mednogorsk plant personnel would not be surprised if one of these days cable plants turned up on Vrangel' Island or on the Kamchatka Peninsula. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 15 Jul 59)

A letter from Firsov, chief of the Production Division of the Administration of Radio and Electrical Engineering and Metalworking Industry, Latvian Sovnarkhoz, was published in the 17 May 1959 issue of Promyshlenno-Ekonomicheskaya Gazeta. He indicated in the letter that the output of Festival' high-class radio receivers at the Riga Radio Plant imeni Popov was being disrupted because the Podol'skkabel' plant had failed to supply 18-conductor cable for quite a long time, although the latter plant had received an order for such cable.

According to D. Chernichkin, a member of Gosplan USSR, the Division of Electrical Engineering and Instrument Making Industry of Gosplan USSR has studied Firsov's letter. "Soyuzglavelektro" of Gosplan USSR has therefore allotted 117 km of 18-conductor cable for the Riga Radio Plant during 1959. Of the 117 km, 48 km will come from the Podol'skkabel' Plant and the rest from other cable industry enterprises. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 12 Jul 59)

D. New Plants

The Tallin Radio Engineering Plant imeni Kh. Pegel'man (Tallinskiy radiotekhnicheskiy zavod imeni Kh. Pegel'mana) has the following articles on sale on credit: types FS-K0, FS-K1, FS-K2, FS-A0, FS-A1, and FS-A4 photoresistors; also nonlinear semiconductor resistors rated for 5, 20, or 50, volts; from .7 to 30 milliamperes plus or minus 20 percent; and for nonlinear factors from 1.5 to 4.5.

Send enquiries to the plant at Pyarnuskoye Shosse 142, Tallin, Estonian SSR. -- Advertisement (Moscow, Vechernyaya Moskva, 10 Jul 59)

The Izhevsk Radio Plant (Izhevskiy radiozavod) is one of the newest enterprises of the Udmurtskaya ASSR. It produces Volna radio receivers and has begun the development of small radio-phonographs based on printed circuits. Engineers and production workers are doing extensive work in the utilization of plastics and in the mechanization and automation of production processes. About 80 percent of the workers and other employes are graduates of secondary schools and special educational institutions. (Moscow, Pravda, 4 Aug 59)

The Mozyr' Cable Plant (Mozyrskiy kabel'nyy zavod), which is subordinate to the Administration of Electrical Engineering Industry and Instrument Making of the Belorussian Sovnarkhoz, is a new enterprise and has not yet begun operation. However, the administration is having this plant equipped with old machinery, such as extrusion presses and annealing furnaces. It stands to reason that an enterprise equipped with museum pieces will not satisfy the needs of its consumers.

Borushko is chief of the Administration of Electrical Engineering Industry and Instrument Making. (Moscow, Izvestiya, 7 Aug 59)

The Purmanskiy Electrical Machinery Plant in Pyl'tsama, Estonian SSR, which was organized in the buildings of a former MTS, will soon be ready for operation. Soon this new enterprise will begin the production of high-voltage 6- and 10-kv disconnecting switches, which are badly needed for the electrification of agriculture in the republic.

The creation of this new enterprise is an example of the efficient use of existing production space. In a few months, the Risti Metal Products Plant, also organized on the basis of a former MTS, will turn out its first products. (Moscow, Pravda, 18 Aug 59)

E. Personalities

P. B. Borodin is deputy chairman of the State Committee for Automation and Machine Building of the Council of Ministers USSR. (Moscow, Sovetskaya Pechat', Jul 59, p 1)

B. Grigor'yev is chief engineer of the Scientific Research Institute of Aircraft Technology. (Moscow, Izobretatel' i Ratsionalizator, Jul 59, p 2)

II. LOCAL PRODUCTION AND ORGANIZATION

A. RSFSR

1. General

During the first half of 1959, enterprises of the RSFSR produced 1,900 large electric machines, 6,600 electric motors over 100 kw in power, 624,000 electric motors up to 100 kw in power 51.9 million vacuum tubes, and power transformers with a total power of 8.3 million kva. (Moscow, Sovetskaya Rossiya, 15 Jul 59)

2. Moskovskaya Oblast

During the first half of 1959, enterprises of Moskovskaya Oblast produced 663,000 electric meters and 225,300 cameras. (Moscow, Leninskoye Znamya, 23 Jul 59)

3. Leningrad

During the first half of 1959, enterprises of Leningrad and Leningradskaya Oblast produced 12,200 power circuit breakers, power transformers with a total power of 113,000-kw, 4,064 electric welding machines, 703 X-ray units, 2,863 km of armored cable, 3,868 km of marine cable, 359,600 cameras, and 758,000 timepieces. (Leningradskaya Pravda, 21 Jul 59)

B. Ukrainian SSR

During the first half of 1959, enterprises of the Ukrainian SSR produced 1,393 large electric machines, 1,001 electric motors over 100 kw in power, 291,000 electric motors under 100 kw in power, 14,200 tape recorders, 111,000 radio receivers, 15,100 television sets, and 145,000 cameras.

The above figures represent moderate percentage increases over the first half of 1958, except for a 30-percent decrease in the production of radios and a more than tripled output of television sets. (Kiev, Pravda Ukrainy, 19 Jul 59)

C. Belorussian SSR

During the Seven-Year Plan, construction will be completed of the Minsk Timepiece Plant, the Borisov Motor Vehicle and Tractor Electrical Equipment Plant, the Gomel' Instrument Making Plant, the Lida Electrical Installation Equipment Plant, and the Gomel' and Mozyr' aluminum and steel-aluminum electric wire plants. The output of the Minsk Electrical Engineering Plant will be expanded considerably. (Minsk, Kommunist Belorussii, No 4, Apr 59, p 33)

D. Lithuanian SSR

In 1958, 3.9 million radio receivers and one million television sets were produced by USSR industry. USSR radio receivers and television sets are of as good quality as the best models made in the capitalist countries of Europe and in the US.

During the years of Soviet rule, a highly developed radio industry was re-established in the Lithuanian SSR. In 1958, Lithuanian industry produced 1,700 radio receivers. By the end of 1965, the production of radio receivers will reach 50,000. During this same time, the production of tape recorders will rise from 15,600 to 70,000.

A television equipment plant with a capacity of 100,000 television sets per year will be constructed in Vil'nyus. (Vil'nyus, Sovetskaya Litva, 5 Aug 59)

During the first half of 1959, enterprises of the Lithuanian SSR have produced 5,100 electric welding units, 8,200 electric welding transformers, 345,600 electric motors under one kw in power, 3,900 electric motors from one to 100 kw in power, and 976,400 electric meters.

The above figures represent small or moderate increases over the first half of 1958, except for a 52-percent increase in the production of electric motors under one kw in power. (Vil'nyus, Sovetskaya Litva, 19 Jul 59)

E. Latvian SSR

During the first half of 1959, enterprises of the Latvian SSR produced 1,300 sets of train lighting equipment, 108 sets of electrical equipment for motor cars of electrified railroads, 3,700 sets of electrical equipment for lift trucks automatic telephone equipment with a capacity of 74,000 numbers, 255,000 telephone sets, and 260,000 radio receivers. (Riga, Sovetskaya Latviya, 25 Jul 59)

F. Estonian SSR

The Tallin Vol'ta Plant, the Tallin Eesti Kaabel' Plant, the Tallin Punane RET Plant, the Tallin Radio Engineering Plant imeni Kh. Pegel'man (Tallinskiy radiotekhnicheskiy zavod imeni Kh. Pegel'mana), and the Tartu Instrument Making Plant are all subordinate to the Administration of Machine Building of the Estonian Sovnarkhoz.

During the first half of 1959, enterprises of the Estonian SSR produced 7.6 million rubles' worth of illumination engineering equipment; 5.1 million rubles' worth of electrical installation equipment; 12.5 km of installation wire; 55 million rubles' worth of instruments, automation equipment, and spare parts for them; and 7,400 radio-phonographs.

During the first half of 1959, the Tallin Eesti Kaabel' Plant mastered the production of rubber-insulated cable with polyvinyl chloride covering, and aluminum conductors; the Punane RET Plant began the production of high-class radio-phonographs with two extension loud-speakers; the Tallin Radio Engineering Plant imeni Kh. Pegel'man began the production of new semiconductor devices; and the Tallin Experimental Control and Measuring Equipment Plant began the production of automatic radioactive positioning level gauges.

At the same time, the Tartu Instrument Making Plant failed to begin the production of modernized TRK-57 thermal relays and RDK-57 pressure relays. The Tallin Experimental Control and Measuring Instrument Plant failed to begin the production of contactless weight meters for the textile industry and instruments for measuring the thickness of cold-rolled metal. (Tallin, Sovetskaya Estoniya, 25 Jul 59)

G. Azerbaydzhan SSR

During the first half of 1959, enterprises of the Azerbaydzhan SSR produced 56,800 electric motors up to 100 kw in power; 12 million rubles' worth of instruments, automation equipment, and instrument spare parts; and 21,100 radio receivers and television sets.

The production of electric motors was 26 percent over the first-half of 1958; that of instruments, automation equipment, and spare parts was 78 percent over the first half of 1958; that of radios and television sets was 48 percent over the first half of 1958.

The Baku Electrical Machine Building Plant and the Kazan-Bulag Electrical Equipment Plant [Kazanbulagskiy elektroapparatnyy zavod] of the Administration of Machine Building, Azerbaydzhan Sovnarkhoz, failed to fulfill their gross production plans, as did the Electrical Machinery Plant [Elektromekhanicheskiy zavod] of the Ministry of Local Industry Azerbaydzhan SSR. (Baku, Bakinskiy Rabochiy, 29 Jul 59)

H. Armenian SSR

During the first half of 1959, enterprises of the Armenian SSR produced 13,908 generators up to 100 kw in power, 95,652 electric motors up to 100 kw in power, 8,125 mobile generating units, power transformers with

a total power of 1,333,000 kva, 18,016 electric light bulbs, 8,794 km of lighting cord, 39,129 km of installation wire, bare wire made from 3,103 tons of copper, and 646,000 alarm clocks.

The above figures represent slight increases over the first half of 1958, except for small reductions in the production of mobile generating units and alarm clocks and a 138-percent gain over 1958 in the production of bare copper wire. (Yerevan, Kommunist, 28 Jul 59)

I. Tadzhik SSR

Workers of the Tadzhik SSR have made the following pledges for the Seven-Year Plan: to organize in the republic, beginning in 1959, without additional capital investment over the Seven-Year Plan level, the production of new electrical products, namely, power transformers, cable products, light bulbs, installation products, glass insulators, electrical porcelain, low- and high-voltage switchgear, washing machines, electrical trade equipment, metal products for electrical equipment, and irons. In 1965, 350 million rubles' worth of these products will be manufactured. (Stalinabad, Kommunist Tadzhikistana, 23 Jul 59)

[Comment: As far as is known, the present production of electrical products in the Tadzhik SSR is negligible.]

J. Kirgiz SSR

During the first half of 1959, enterprises of the Kirgiz SSR produced 193,000 magnetic starters. (Frunze, Sovetskaya Kirgiziya, 22 Jul 59)

III. ELECTRONIC EQUIPMENT

A. Tubes

For 13 years, a radio station of the Ministry of Communication has been operating successfully with high-power dismountable tubes in its output stage. This practice has lowered the station's operating costs. If it had utilized regular sealed tubes, it would have used up at last four hundred 100-kw radio tubes during those 13 years. The cost of these tubes, including transportation expenses, would have amounted to about one million rubles.

Three types of dismountable tubes are used in the USSR: the RG-500, the 20-S-300, and the RGM-500. Dismountable tubes can operate for 20-30 years in a transmitter circuit. The tubes are usually electronic units which have to be exhausted continuously while in operation.

Despit the obvious economic superiority of dismountable tubes, they are not widely used because neither the Main Radio Administration of the Ministry of Communications USSR nor the State Committee for Radioelectronics of the Council of Ministers USSR pays sufficient attention to the development, production, and utilization of such tubes. The existing situation should be remedied in the next year or two. (Moscow, Vestnik Svyazi, Jun 59, pp 9-10)

A type 53IK4Ts color television picture tube (1) has been developed in the color picture tube laboratory of the Moscow Electric Bulb Plant. (Moscow, Vechernyaya Moskva, 5 Aug 59)

(1) Photo showing the screen of the new picture tube after testing available in source, p 2, center

B. Components

Capacitors, resistors, switches, tubes, semiconductors, and relays are needed in almost any branch of industry. Therefore, much attention is being paid to increased output and to the mechnization and automation of the production of these radio components.

Design and design-technological bureaus or divisions have been organized at many plants for working out the over-all mechanization of components production. Although these plants have not been operating thus for very long, they have achieved notable successes. For example, a radio parts plant of the Moscow Oblast Sovnarkhoz [Pavlovskiy Posed Radio Components Plant] has fully mechanized lines for the production of mica, glass-enamel, and plastic-film capacitors.

Over-all mechanization and automation of the production of radio components significantly raise the basic technical and economic indexes of shops and enterprises. For example, constant-flow mechanized lines for the production of type MLT resistors have increased their output 46 percent; lines for making metal and paper capacitors have more than tripled their output per square meter of production space.

However, this advanced technology is being introduced into production very slowly. Sometimes, machines take years and years to develop. The trouble stems from the fact that the machine-tool and tool industry does not develop industrial equipment for mass and large-series production of radio components.

Workers of radio plants themselves must develop such machines, although they lack know-how, equipment, and facilities. Various small designs groups and divisions operating independently have arisen at radio component manufacturing plants. For example, mechanization of the production of resistors is handled in Moscow, Leningrad, Gor'kiy, and Voronezh; and mechanization of the production of electrolytic capacitors takes place in Leningrad, Voronezh, and Novosibirsk. This work is dispersed within individual economic regions and amounts to a waste of manpower and equipment.

Over-all mechanization and automation of the production of various radio components, especially the development of automatic lines, should be handled by the design groups of leading machine tools plants. It is much easire to standardize machine parts in large design bureaus, which would also be able to produce experimental models and even small-series products. Design bureaus at radio component plants should specialize in the development of individual processes, such as electrical measuring, heat-treatment, vacuum, assembly, and welding processes. All of this would help to unify the designs of radio components and to utilize mechanization and automation know-how more advantageously.

It is highly important that material and technical supply be improved for organizations engaged in automation and mechanization of radio component production.

It would be best to organize stores and warehouses for the sale of standardized machine units, automatic systems components, and other parts such as reducers, control knobs, regulating valves, small electric motors, and pneumatic and hydraulic drive systems in such large industrial centers as Moscow, Leningrad, and Novosibirsk. Planning organs could obtain what they need from such stores. Since special laboratory equipment is used for a fixed period and than becomes of little or no use, it would be wise to develop equipment leasing bases in large cities, where for example, ultrasonic generators, soldering irons, and machine tools could be leased.

Operations of the special design bureaus are being hampered because they are subject to too many masters. On one hand, they are subordinate directly to the directors of the plants where they are located, who often use them for purposes other than those the bureaus should fulfill. On the other, they are subject to the administrations of radio engineering industry of the sovnarkhozes where they are located. In addition, they are "under the care of" the State Committee for Radioelectronics. Project plans (tematicheckiy plan) have to be coordinated with all of these organizations. Often, the opinions of these leading organs are divergent. For this reason, for example, a design bureau serving the radio industry of Leningrad did not have its 1959 project plan approved until May 1959. -- Engr N. Kashin, Leningrad (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 28 Jun 59)

On 28 June 1959, an article by Engr N. Kashin of Leningrad about the laggard introduction of constant-flow mechanized lines and automatic lines in the production of radio components by the radio industry was published in Promyshlenno-Ekonomicheskaya Gazeta.

In answer to this article, K. Martyushov, chief of the Seventh Administration of the State Committee for Radioelectronics of the Council of Ministers USSR, informed the editorial board that the committee has worked out a single plan for 2-3 years, wherein each special design bureau and plant is given a specified amount of work in the planning and implementation of the plans for mechanization and automation equipment.

Recently a resolution was adopted concerning the establishment of plants specializing in the production of nonstandard industrial instruments for the radio industry, especially for enterprises engaged in the production of radio components. Individual types of equipment and lines will be built according to existing designs and according to new developments. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 29 Jul 59)

At present, selenium rectifier wafers 15 mm or over in size are produced in only square or rectangular shapes. The production of round types was terminated as of 1 January 1959.

Only two diameters of selenium rectifier wafers are produced in round shapes: 5 and 7.2 mm. (Moscow, Radio, Jun 59, p 59)

The Novosibirsk Radio Components Plant mass-produces a large variety of products, including type PM fuses and type KE capacitors. (Moscow, Partiynaya Zhizn', No 13, Jul 59, pp 37-38)

C. Television

The Electrical Engineering Institute of Communications imeni M. A. Bonch-Bruyevich is participating directly in the further development of television. Its laboratory of industrial television has created a unit for power stations, which allows a dispatcher continuously to observe boiler operations. The unit consists of three television cameras and a receiver unit, which the dispatcher uses to control the operations of the boilers.

The laboratory has also developed an experimental television unit for studying oil wells, which is undergoing testing in oil fields of the Tatarskaya ASSR and has thus far operated successfully.

The Vorkutugol' Combine asked the institute to make equipment for studying coal beds in the northern coal fields. The institute developed a television unit which can be used for this purpose.

The institute's laboratories are developing color and three-dimensional television systems. This work was begun 10 years ago. The first experimental unit was used to demonstrate the particularities of three-dimensional television reception. A unit for industrial purposes was built on the basis of these experiments.

It is important at present to cut down the width of the transmitted frequency band. Usually a certain spectrum of frequencies must be used for transmitting television video. Since three-dimensional television requires that information be transmitted twice at the same time, the spectrum has to be doubled. At present, a special camera is being developed for the transmission of three-dimensional video. A three-dimensional color television receiver is also being developed.

Scientists are thinking of automating the operations of television centers and of developing a system of automatic controls for these operations.

Ultrasonic television is an interesting field of radioelectronics. It can be used to see where the human eye has hitherto been unable to penetrate.

The electrical engineering institute and the Leningrad Institute of Motion-Picture Engineers have collaborated in the development of a television system for making motion-picture films by an electronic method. The idea consists in using a television camera to take the shots and using the screen of a special iconoscope to record the images directly on film. -- P. Shmakov, Honored Worker of Science and Technology, Professor, Doctor of Technical Sciences (Leningradskaya Pravda, 25 Jul 59)

The Chair of Television headed by P. V. Shmakov of the Leningrad Electrical Engineering Institute of Communications has developed an industrial dispatcher television unit for the remote observation of instrument readings at power stations. This unit was developed in collaboration with workers of Hydroelectric Power Station No 2 of Lenenergo [Leningrad Regional Electric Power Administration].

The television unit utilizes four transmitter cameras using Molot-1 tubes; an intermediate stand with an auxiliary screen; and a receiver unit.

Recently, the Chair of Television developed the equipment of a studio camera which operates on the scanning beam principle. This equipment is designed for small color television studios and can also be used successfully for black-and-white transmission from small studios. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 29 Jul 59)

The Sputnik-2 all-transistor television set, which was developed in a Moscow institute, can be powered by a 12-volt storage battery. The set's input is only 13.2 watts, as compared with 105 watts for the most economical series-produced television set. The Sputnik-2 weighs a little over 7 kg, as compared with the 16-kg weight of the lightest mass-produced television set.

The new television set has a 200-x-150-mm screen and has the same sensitivity as an ordinary set. (Kishinev, Sovetskaya Moldaviya, 12 Jul 59)

The 12-channel Znamya-59 television set, which has a screen measuring 340 x 255 mm and is mounted in a table-model varnished wood cabinet, sells for 2,600 rubles. This price includes spare parts provided for in the specifications.

The 12-channel Topaz projection-type television set retails for 8,000 rubles. This price includes accessories and spare parts provided for in the specifications. (Moscow, Byulleten' Roznichnykh Tsen, No 20, Jul 59, p 36)

D. Radios and Combination Sets

The design bureau of the Voronezh Radio Plant (Voronezhskiy radiozavod) has developed the Rodina-59 Class-2 superheterodyne radio receiver, which is designed mainly for operation in rural areas and can be powered by batteries or by AC current. The set has both semiconductors and tubes.

The frequency converter and heterodyne stage of the Rodina-59 are based on one type P-29 battery triode-heptode tube. The two intermediate-frequency stages use 1K2P tubes. The detector stage utilizes a D2Ye germanium diode. The other stages use type P13 semiconductors. Two of them are used in the first audio amplifier circuit and two in the second audio amplifier circuit. A P13A triode is used in the voltage converter unit.

The set receives stations in the long-, medium-, and short-wave bands. Its intermediate frequency is 465 kc. It can be powered from a conventional set of batteries with voltages of 1.2, 6, or 60 volts; from low-power dry cells or storage batteries with voltages of 1.2 or 6 volts; or from an AC circuit with voltages of 220 or 127 volts. (Moscow, Radio, Jun 59, p 5)

A group of engineers of the Riga VEF Plant under the leadership of Robert Fridrikhson have finished developing the new Latviya radio-phonograph, which will replace the Akkord. The new set will have a superior sound system and will employ a rotating ferrite antenna for its long- and medium-wave bands. An internal dipole antenna will serve to bring in local FM ultrashort-wave stations. The set will have keyboard controls and will play 33-, 45-, and 78-rpm records.

In contrast to currently produced radios, the Latviya will employ a unit system for its chassis. The units will have printed circuits and all the components can be soldered simultaneously to the circuits by the dip soldering method. Therefore, the plant's new technology shop is getting ready to put into operation an automatic line for making printed circuits. The completely new design of the Latviya will make it possible to mechanize many assembly operations. It is expected that the series production of this radio-phonograph will begin in 1960.

Besides developing the above-named models, the plant expects to replace the Lyuks-2 radio-phonograph with a better model. The new model will be of a console type, with a four-speed record player, which can also be used for playing stereophonic records.

In the future, plant designers will work on radio equipment using semiconductors and designed for semiautomatic production. The increased consumer demand for television sets has made plant designers think about developing combination sets with television receivers. -- B. Kostanyants, Chief Designer, Riga VEF Plant (Riga, Sovetskaya Latviya, 10 Jul 59)

The Minsk Radio Plant is being aided by the IRPA (Scientific Research Institute of Radiobroadcast Reception and Acoustics) in the development of a radio receiver for rural areas, which will soon be finished. This receiver will have long- and medium-wave bands. Its output power will be about .4-.5 watts, but its input power will be only .85-.9 watts. Type Saturn flashlight batteries will power the set.

The use of good audio frequency circuits and a two-speaker sound system enhances the set's audio quality.

Plant designers are also developing the Belarus'-5 television combination set. Although they have not finished their current projects, they are already planning new developments, including television sets utilizing picture tubes with deflection angles of 110 degrees, console television sets with tape-recorder attachments, and new radio-phonographs. -- V. Pumpyanskiy, Chief Engineer, Minsk Radio Plant (Moscow, Radio, Jun 59, p 5)

The Minsk Radio Plant has already begun series production of Belarus'-5 combination television-radio-phonographs. (Minsk, Sovetskaya Belorussiya, 19 Jul 59)

The Minsk Radio Plant has begun series production of the new Belarus'-5 combination television-radio-phonograph. The first consignment of these sets has been turned over to the trade network.

The Belarus'-5 sets are produced in the television shop (2) of the plant. (Stalinabad, Kommunist Tadzhikstana, 6 Aug 59)

(2) Photo showing the Belarus'-5 sets on a warm-up conveyer available in source, p 4

The Rostov Mail Order Base of the Ministry of Trade RSFSR has the following radio-phonographs on sale: Oktava, 1,296 rubles; Ural-57, 945 rubles; and Muromets, 995 rubles.

The above prices including packing and shipping costs. -- Advertisement (Yerevan, Kommunist, 9 Jul 59)

The Dayna Radio-Phonograph is produced within the Administration of Instrument Making of the Lithuanian Sovnarkhoz. (Moscow, Knizhnaya Letopis', No 33, 1959, p 46)

Enterprises of the Lithuanian Sovnarkhoz have produced the first models of combination radio-tape recorders. These combinations have seven-tube receivers with keyboard controls and four loud-speakers, which produce a stereophonic effect. The tape recorder is mounted at the top, where the record turntable is usually located on a radio-phonograph. Recordings can be made through a microphone or directly from the radio receiver.

It is expected that the series production of the radio-tape recorder combinations will begin in August 1959. (Moscow, Sovetskaya Torgovlya, 11 Jul 59)

E. Telephone Equipment

At present, the Riga VEF Plant produces step-by-step automatic telephone exchanges, which utilize complex electromechanical devices. However, designers of the plant, in collaboration with the Leningrad Scientific Research Institute of Communications Equipment (Leningradskiy nauchno-issledovatel'skiy institut tekhniki svyazi), are to begin the development and production of new types of crossbar automatic telephone exchanges during the Seven-Year Plan.

The new exchanges are being developed in two variants: the ATS-K 40/80, for rural communications and the UATS-K 100/2000 for industrial enterprises and institutions. The exchanges are being designed so that they can be utilized as extension city substations.

The new exchanges will utilize modern contactless connections, based on the use of ferrites and semiconductors.

It is expected that the production of the crossbar exchanges will begin in 1963.

In preparing for the production of crossbar exchanges, we should also develop high-capacity city telephone exchanges of the table type [stolovoy tip] with automated intrastation connections. Such equipment will make it possible to carry on uninterrupted telephone communications between different cities. The table-type station is being developed by a design group headed by Vasiliy Poletayenko. Designers promise to finish the work in time to organize the production of these stations in 1962.

Besides the above, the plant is to begin the production of other modern equipment, including automatic telegraph relay equipment, which has already been developed and should be put into production by the end of 1959.

The plant is hampered in its production of telephone handsets because it does not have the special pressure casting machines needed for making plastic parts.. This is the fault of the Latvian Sovnarkhoz, which failed to supply the necessary equipment on time.

Another impediment is the Permskiy Sovnarkhoz, which supplies poor-quality telephone and microphone capsules, and in meager quantities at that. The Odessa Cable Plant, which has developed good stretch-cord for telephones, is not bothering to produce it.

Although a Faculty of Electrical Communications exists at the Riga Polytechnic Institute, its first specialists will not graduate for 3 years. The sovnarkhoz must see about supplying the personnel needed by the Riga VEF Plant in the meantime. -- V. Kostanyants, Chief Engineer, Riga VEF Plant (Riga, Sovetskaya Latviya, 10 Jul 59)

F. Tape Recorders

The Vil'nyus El'fa Electrical Engineering Plant has developed and is now producing the new El'fa-10 (Spalis) tape recorder for individual use. It is designed for types 2 or SN tapes. Its tape speed is 190.5 mm/sec, and it is intended for work with reels having a capacity of 360 meters.

The Spalis utilizes the two-track recording method. Switching from one track to the other is accomplished by transferring the full reel from the right to the left side. The recorder measures 410 x 300 x 175 mm, is powered from a 127- or 220-volt circuit, and requires no more than 75 watts input for any type of operation.

(Source gives detailed information about the El'fa-10 recorder.) (Moscow, Radio, Jun 59, p 27)

IV. COMPUTERS

A completely automatic traffic light controlled by an electronic analog computer unit has been installed on one of the intersections of Nevskiy Prospekt in Leningrad. This is the first time cybernetic machinery has been put into use for traffic regulation purposes in the USSR.

Electronic machines are being used on an ever-increasing scale in the USSR. Recently, the Leningrad Institute of Precision Mechanics and Optics developed a machine for making complex calculations involved in the computation of various optical systems. An analog computer developed at the Electrical Engineering Institute of Communications imeni M. A. Bonch-Bruyevich adds trigonometric tables in several minutes and computes complex problems in the field of radio communications and electrical engineering. The Scientific Research Institute of Urban and Rural Telephone Communications has devised a machine for computing and designing several hundreds of connection circuits needed in the development of automatic telephone exchanges. (Minsk, Sovetskaya Belorussiya, 17 Jul 59)

The TsNIIKA (Central Scientific Research Institute of Over-All Automation) has begun the development of a control computer for the over-all automation of a boiler-turbogenerator unit.

The TsNIIKA is developing equipment based on control computers for complete automation of units at the Zmeyevskaya GRES [State Regional Electric Power Station] of Khar'kovenergo [Khar'kov Regional Electric Power Administration?]. (Moscow, Kommunist, No 9, Jun 59, p 21)

In 1958, an original digital machine for automatic registration and signaling, the MARS-300, was produced. This machine was developed by the Design Bureau for Biophysical Apparatus. It can control temperature, flow vacuum, and a number of other parameters simultaneously at 300 points. The information comes out in digital form on a special tape and also in the form of signals on a simulation diagram. (Moscow, Kommunist, No 9, Jun 59, p 20)

A group of Soviet engineers headed by Yu. N. Belikov of a scientific research institute have developed an electronic interpolator called the Stanok. This machine can make computations for the machining of parts with complex three-dimensional configurations at very high speeds in accordance with blueprints. The computation results are recorded on magnetic or punched tape that shows which part and what configuration three-dimensional milling machine is supposed to machine. The machine tool in turn has a small input unit in which the tape is inserted to provide a program for the automatic machining of the part.

The interpolator and input unit have been successfully tested and approved by a technical conference of representatives of leading USSR scientific research institutes working in the field of electronics and by a state interdepartmental commission, and it has been recommended that they be produced for industrial use. (Baku, Bakinskiy Rabochiy, 8 Jul 59)

The first USSR system for the digital programed control of a heavy lathe has been developed by designers at the Khar'kov Electrical Machinery Plant. These designers, in collaboration with the Khar'kov Polytechnic Institute, have already made the necessary laboratory studies. (kiev, Pravda Ukrainy, 9 Jul 59)

Moscow scientists headed by V. A. Trapeznikov, Corresponding Member of the Academy of Sciences USSR, and B. Ya. Kogan, Candidate of Technical Sciences, have developed the EMU-8 electronic analog unit, a high-precision machine intended for use by scientists in checking out new automation systems.

Because of the great volume of automation activity in metallurgy, machine building, power engineering, and construction, the industrial series-production of the EMU-8 analog unit has been started. (Baku, Bakinskiy Rabochiy, 1 Aug 59)

Viktor Semenovich Petrov is the director of the Moscow Computing and Analyzing Machine Plant (zavod schetno-analiticheskikh mashin). The largest shop in the plant is the tabulator shop. Recently, a semiconductor shop was organized at the plant. (Moscow, Moskovskaya Pravda, 11 Jul 59)

The Kursk Schetmash Plant is subordinate to the Kurskiy Sovnarkhoz. Kormilitsya is chief mechanic of the plant. (Moscow, Pravda, 7 Aug 59)

A computing center has been organized at the Tartu State University. A Ural electronic computer is being acquired by the center, which will do work for scientific institutes and plants located in Tartu.

Utilization of the new computer will help promote research work in mathematics, especially in cybernetics and computer mathematics. (Tallin, Sovetskaya Estoniya, 5 Jul 59)

Recently, the personnel of the Computing Center of the Institute of Mechanics and Mathematics of the Academy of Sciences Azerbaydzhan SSR finished assembling and adjusting a continuous electronic computer (3). Azerbaydzhan scholars learned how to put such a machine into operation at the Computing Center of the Academy of Sciences Ukrainian SSR. This machine can solve the future current distribution in the Azenergo [Azerbaydzhan SSR Regional Electric Power Administration?], one of the largest power systems in the USSR. It can also solve problems connected with determining wave resistance against bodies submerged in liquids.

This analog can also be used as an automatic computer or integrator for determining differential and algebraic equations up to the 16th degree inclusively, and it solves such equations very rapidly.

The machine is highly practical. All variables and their derivatives are observed visually and are registered by pointer instruments, which are connected to the appropriate output circuits. The graphic solution is photographed on an oscillograph. -- F. Nagiyeva, Senior Engineer, Computing Center of the Institute of Mechanics and Mathematics, Academy of Sciences Azerbaydzhan SSR (Baku, Bakinskiy Rabochiy, 29 Jul 59)

(3) Photo available in source, p 4

The machine computing station of the Statistical Administration of the Armenian SSR was founded about 2 years ago, but began operations only recently. The station, which is headed by S. Tamazyan, is equipped with high-capacity card punches, verifiers, sorters, and tabulators.

The new station has mechanized all of the work of the Armenian SSR Statistical Administration and part of the computing and calculating activities of the Streetcar and Trolley Bus Administration, Shoe Factory No 1, a planning institute, and other enterprises. At present, workers of the station have begun mechanizing the greater part of the computing work of the Yerevan Silk Combine imeni V. I. Lenin, and the "Armzhilgrazhdanproyekt" Planning Institute [for Civilian Housing of the Armenian SSR?] During the first half of 1959, the station has performed about 8 million additions, 1.2 million calculations, and many other operations and has cut computing costs to a fraction of their former size. (Yerevan, Kommunist, 2 Aug 59)

V. INSTRUMENTS

A. General

The following measures and measuring instruments have been approved by the Committee on Standards, Measures, and Measuring Instruments, on the basis of state tests, for use in the USSR:

MSR-58 lever-type resistance box produced in the L'vovskiy Sovnarkhoz.

M-216 panel microammeter produced in the Omskiy Sovnarkhoz.

M-220 panel microammeter produced in the Omskiy Sovnarkhoz.

F-505 portable electronic voltmeter produced in the Kiyevskiy Sovnarkhoz.

TSh-2 ball-type hardness tester produced in the Ivanovskiy Sovnarkhoz.

TP-10 thermometers for oil separators produced in the Moscow Oblast Sovnarkhoz.

P-316 single DC bridge produced in the Krasnodarskiy Sovnarkhoz.

P114 and P114/1 portable calibrated shunts produced in the Leningradskiy Sovnarkhoz.

V80 and V81 miniature oscillator frequency meter produced in the Belorussian Sovnarkhoz.

TK-2 hardness tester produced in the Ivanovskiy Sovnarkhoz.

DR-0 and DR-0.5 Class-III prototype expansion dynamometers produced in the Latvian Sovnarkhoz.

IZV-21 vertical optical range finder produced in the Leningradskiy Sovnarkhoz.

DO-2 dioptrimeter produced in the Moscow Oblast Sovnarkhoz.

FEK-N-57 Photoelectric colorimeter-nephelometer produced in the Moscow Oblast Sovnarkhoz.

R-517 nonreactive resistance box produced in the Kiyevskiy Sovnarkhoz.

VM-20 semimicroanalytic scales produced in the Leningradskiy Sovnarkhoz. (Moscow, Izmeritel'naya Tekhnika, Jun 59, p 76)

B. Industrial Controls

S. V. Andreyev, Candidate of Technical Sciences, and A. N. Trushinskiy, a young engineer, both of the laboratory of Biophysics of the All-Union Institute for Plant Care, have successfully developed two new semiconductor instruments: a temperature regulator and a humidity regulator. The new instruments are designed for regulating and maintaining artificial climate in special rooms, and also for production purposes. (Leningradskaya Pravda, 17 Jul 59)

O. P. Nikotin and D. L. Leshchinskiy, scientific associates of the Leningrad Technological Institute imeni Lensovet, have developed gamma-ionization instrument for measuring the thickness of strips of rolled plate glass. The instrument transmitter has a special cooling device, which enables it to be installed directly in the rolling area. Formerly,, the glass was measured in a solidified form at least 130 meters from the furnace. The new instrument automatically determines the thickness of the hot glass and records this information.

The new instrument has already been installed on the conveyer of the Gus' Khrustal'nyy Glass Plant imeni Dzerzhinskiy. In the near future, such instruments will be installed in all polished-glass plants. (Leningradskaya Pravda, 19 Jul 59)

The Moscow Fizpribor Plant is the producer of the type IU-1 level indicator, which is designed for measuring the variation of the level of current-conducting liquids within the limits of 2 meters. Transmitters with vinyl plastic insulation are used for temperatures up to 60 degrees centigrade; for higher temperatures up to 80 degrees centigrade, polyethylene has to be used. The maximum pressure under which the instrument can work is 25 atmospheres.

A type M-340 secondary indicating instrument installed on the control panel is included with the IU-1. (Yerevan, Kommunist, 5 Jul 59)

Designers at the Khar'kov Teploavtomat Plant have developed a new electronic-hydraulic system for regulating the pressure and flow of liquids and gases at enterprises of various branches of industry. The plant is getting ready to series-produce the equipment of this system. (Kiev, Pravda Ukrainy, 9 Jul 59)

The Special Design Bureau for Analytic Instrument Making of the Academy of Sciences USSR develops instruments for controlling complex chemical processes.

A new model of a mass spectrometer, which has been developed for oil refineries, gives information continuously and automatically on the composition of the gases obtained during the refining process. Formerly it took several hours to carry out such an analysis. The first two instruments of this type will be installed at the Moscow Oil Refinery in July 1959.

The bureau has developed the first Soviet gas analyzer, which will be used to control the amount of oxygen utilized in the chemical process of making polyethlene plastic. This instrument was tested recently at the Leningrad Okhta Chemical Combine. (Leningradskaya Pravda, 16 Jul 59)

The Tallin Experimental Control and Measuring Instrument Plant has developed a new instrument, the ITU-495 universal thickness gauge, which is used for measuring the thickness of sheet metal without coming into contact with the measured object. This instrument is based on radioactive isotopes and can measure sheet steel from .05 to one mm and from .03 to .8 mm in thickness. Therefore, it is now possible to measure the thinnest sheets and bands of high-grade steel by the constant-flow method. (Tallin, Sovetskaya Estoniya, 30 Jul 59)

The Moscow Tizpribor Plant, in collaboration with NIITeplopribor [Scientific Research Institute of Thermal Power Engineering Instrument Making] and the Institute of Automatics and Telemechanics of the Academy of Sciences, has begun the development of automation equipment which would provide for the construction of many automatic plants.

Pavel Pavlovich Benediktov is director of the Tizpribor Plant where he has worked for 12 years. K. P. Tyutnev is chief engineer, M. I. Zhutovskiy is chief designer, V. V. Poverennyy is chief of production, and V. G. Nazarov is chief technologist. (Moscow, Izvestiya, 2 Aug 59)

Although the buildings of the Kazan' Teplokontrol' Plant were erected not long ago, they are full of dirt, and parts are piled up on the floors. There is a mad-rush atmosphere throughout the shops, where one continuously hears quarreling, cursing, and swearing. This external lack of order is merely a symptom of more serious internal shortcomings.

The plant, which was constructed 10 years ago, produces apportioning measuring, and control instruments designed for chemical plants, petroleum refineries, oil fields, and thermal electric power stations. However, the instruments it produces fail to meet the level of modern technology.

The policy of the Teplokontrol' Plant's management is well illustrated by the history of the TG-410 and TG-610 recorder manometric thermometers and the DPES differential manometers. These instruments are primitive in design, do not give stable readings, and often break down.

The Committee on Standards, Measures, and Measuring Instruments of the Council of Ministers USSR forbade their production as of 1 July 1957. Lukin, former Deputy Minister of Instrument Making [and Automation Equipment] USSR, agreed with the committee's decision. It looked as though the plant would have to radically improve these instruments. Quite the opposite was the case.

The plant management felt that if they took time to make improvements, they would have to lower their production of instruments for a certain time. Consequently, they got permission to continue the production of old instruments until 1 January 1958, and for some reason, the committee agreed to lift its ban.

At the end of 1958, Ryumin, deputy chairman of the Tatarskiy Sovnarkhoz, and Solov'yev, director of the Teplokontrol' Plant, submitted a new request to continue the production of the obsolete instruments until 1 January 1959. At the same time, they promised that the instruments would be improved, so the officials of the committee gave their consent again.

Now, the same people have obtained permission to produce obsolete instruments until 1 July 1960. The plant management is selling out-and-out rejects to its consumers. In 1957 and 1958, 33.2 percent of all tested type DP instruments were rejected. During the past 6 months, the rejects among these instruments have climbed to 61.3 percent.

Not along ago, the Tatar State Control Laboratory for Measuring Equipment forbade the Teplokontrol' plant to ship type 04-DP-410 differential manometer-flow meters, No 732 through 737, to the Omsk Synthetic Materials Plant. These instruments were of poor quality; however, despite the ban, they were sent on to the Omsk plant.

The control laboratory then informed the Tatarskiy Sovnarkhoz that the management of the Teplokontrol' plant chronically shipped poor-quality, partially-equipped, and below-standard instruments. Ryumin, deputy chairman of the sovnarkhoz, answered that the sovnarkhoz could not agree with the laboratory's unfounded and purposeless decisions on the state testing of the differential manometers produced at the Teplokontrol' plant, and recommended that the laboratory limit itself to control tests only.

Plant Director Solov'yev, Chief Engineer Makhon'ko, and Deputy Chief Engineer Yegorov, are not interested in improving production, but only in fulfilling the quantitative aspects of the plan. Consequently, most shops and work positions do not have blueprints and some parts are produced by memory or by eye. The director has closed down the experimental shop and has converted it to the production of obsolete instruments. -- Kh. Bayleyev, Chief, Control Laboratory for Measuring Equipment; I. Parpura, Engineer (Moscow, Izvestiya, 2 Aug 59)

The Tallin Measuring Instrument Plant (Tallinskiy Zavod izmeritel'nykh priborov) was organized in 1957 as a result of the merger of three small enterprises. The plant was then producing a large variety of products, including scales, water meters, iron drums, and central heating boilers, and for this reason it had great difficulties. For a long time, it failed to fulfill the state plan and was a technically backward enterprise.

The situation did not bother the former Ministry of Local and Shale-Chemical Industry Estonian SSR, to which the plant was subordinate. The plant's production structure was expanded even further, to include the production of such articles as children's bicycles, large-size toy automobiles, and insecticide spray guns.

After the reorganization of industry and the creation of the Estonian Sovnarkhoz, the plant was made subordinate to the Administration of Machine Building, which helped it to overcome its technical backwardness and to gradually free itself from the manufacture of extraneous products.

The plant has improved considerably in the last few years, but its production space is not being used fully and it works on only one shift.

According to the plan, the plant produces mainly water meters, heating gauges, and control equipment for checking automobile ignition systems. However, there is insufficient demand for such equipment. Some of the products are obsolete, such as the water meters, which had been produced in Estonia at the former Khelios Plant in their present form.

The plant makes obsolete control apparatus for automobiles, which was formerly made by the Tartu AGE Plant.

Gosplan Estonian SSR and the Estonian Sovnarkhoz do not have to sell the plant's products. The plant itself must write to all the sovnarkhozes in the country and look for purchasers. It cannot figure out to whom it will sell ignition instruments in August.

This is all well known to the Administration of Machine Building of the Estionian Sovnarkhoz. Plant workers would like to produce something more necessary to the national economy. Plant designers have developed an improved heating gauge, but this alone does not solve all the problems.

At one time, the Administration of Machine Building had decided that the plant would produce thermal valves, which are needed by the national economy; however, these will soon be produced by a plant in Tartu

In the fall of 1958, the plant and the Tallin Polytechnic Institute began the development of a universal high-temperature chromatograph. It was thought that at long last the plant would start specializing in the production of analytical equipment for the chemical industry. However, the plant was informed in May 1959 that by 1960 it was to begin the production of ultrasonic cleaning apparatus. Technical documents were ordered, but nothing further has been done. For reasons beyond its control, the problem of specialization of the plant remains unsolved. -- A. Sork, Chief Technologist Tallin Measuring Instrument Plant; E. Erin, Deputy Secretary of the Plant's Primary Plant Organization; Yu. Olivson, Chairman of the Plant Trade Union Committee (Tallin, Sovetskaya Estoniya, 9 Jul 59)

C. Electrical and Electronic Instruments

The Vil'nyus Electric Meter Plant is one of the most important electrical instrument making plants in the USSR. In 1950 it produced 20,000 electric meters, and in 1958, 1.7 million meters. In 1959 it will make more than 1.9 million meters. (Vil'nyus, Sovetskaya Litva, 7 Jul 59)

The type SO-OM electric meters, which are rated for either 5 or 10 amp and 127 or 220 volts AC and have a precision class of 2.0, retail for 170 rubles apiece. (Moscow, Byulleten' Roznichnykh Tsen, No 2, Jul 59, p 39)

During the Seven-Year Plan, the Tallin Punane RET Plant will install two conveyers for assembling instruments and radio receivers, and five belt conveyers. It will also put four belt conveyers into operation for intersection transport and will install two conveyer drying lines and a universal press line for producing small-series parts.

By the end of 1964, it will develop and produce at least 30 new improved electronic measuring instruments, which are badly needed for the automation of production processes in various branches of the national economy. (Tallin, Sovetskaya Estoniya, 10 Jul 59)

The [Moscow] Energopribor Plant is the producer of the ER-III-54 (E-III-54) electronic regulating instrument and the PV-53L-T electrical second meter. (Moscow, Knizhnaya Letopis', No 20, 1959, pp 38, 49)

D. Geophysical Equipment

A new original electrical prospecting instrument has been developed at the Institute of Automatics and Electrometry of the Siberian Branch of the Academy of Sciences USSR, Novosibirsk. This new light instrument weighs 1.5 kg together with its power source. It is more accurate and sensitive than older, heavier types. It can be used for locating coal, ores, water, and other underground materials. (Riga, Sovetskaya Latviya, 5 Jul 59)

The Moscow Neftepribor Plant has begun the series production of a new type of bus-mounted seismic research station; it records signals on magnetic tape, which can then be transcribed onto paper bands. Earlier stations had equipment that recorded signals on photographic paper.

Experimental models of the new stations have been tested successfully in Saratovskaya and Penzenskaya oblasts. Today [31 July 1959?] a new seismic research station was shipped to the Tyumen Geological Administration. (Moscow, Vechernyaya Moskva, 31 Jul 59)

The Mosneftekip Plant is located in the settlement of Kapotnya in the city of Lyubertsy, Moskovskaya Oblast. --Advertisement (Moscow, Moskovskaya Pravda, 9 Jul 59)

E. Instrument Repair

The Riga Etalon Experimental Measuring Instrument Plant (Rizhskiy eksperimental'nyy zavod izmeritel'nykh priborov "Etalon") is accepting the following instruments for repair: manometers; manometric vacuum meters; vacuum meters; manometric thermometers up to 120 degrees contigrade; Rockwell, Brinell, and Vickers hardness testers; disruptive testing machines; and refractometers.

Applications should be made at ulitsa Skarnyu 8, Riga. -- Advertisement (Riga, Sovetskaya Latviya, 31 Jul 59)

[Comment: The address of this plant was formerly given as ulitsa Shkyunu 8, Riga.]

VI. PRECISION EQUIPMENT

A. Cameras and Lenses

The Yupiter-6 f:2.8/180-mm lens for Zenit and Start cameras is designed primarily for portrait work. The size of the image it produces is 3.6 times that produced by a normal [50-mm] lens. It focuses from 2 meters to infinity and has a depth-of-field scale, a present diaphragm stop, and a tripod socket.

The Telemar-22 f:5.6/200-mm lens for Zenit and Start cameras also has a preset diaphragm stop and produces a negative image which is four times the size of one produced by a normal lens. It focuses from 2.5 meters to infinity.

The Tair-11 f:2.8/133-mm lens for FED and Zorkiy cameras focuses from 1.5 meters to infinity. (Moscow, Novyye Tovary, No 8, 1959, p 5)

The full measurements of the Kiyev-Vega 16-mm camera are 83 x 43.5 x 24.5 mm [as compared with 77 x 30 x 20 mm for the Japanese Minolta-16 of which it is a copy]. The shutter speeds of the Kiyev-Vega are 1/30, 1/60, and 1/200 sec. The lens is an Industar-M f:3.5/23-mm, which has a resolving power of 50-55 lines per mm at a focusing range of 4-7 meters. The exposure counter of this camera automatically indicates the number of exposures remaining after each picture is taken. (Moscow, Novyye Tovary, No 7, 1959, p 6)

[Comment: None of the available sources describing this camera have yet made any mention of synchronization for flash, yet every illustration shows clearly that the Kiyev-Vega camera has the same flash contact as the Minolta-16.]

Whereas in 1955 the offices of Posyltorg [All-Union Mail Order Office] shipped out only 31 types of photographic equipment, including only five types of cameras, they shipped out 95 types of equipment, including 11 types of cameras, in 1958.

During 1959, Posyltorg is expected to sell 13. 8 million rubles' worth of photographic equipment, as compared with 6. 6 million rubles' worth in 1955. (Moscow, Sovetskoye Foto, Jul 59, p 73)

N. Chesnokov, member of Gosplan USSR, has informed the editors that materials published in Sovetskoye Foto, Moscow, December 1958, [see USSR Electronic and Precision Equipment, No 7, 20 March 1959, pp 8-9] have been reviewed in Gosplan USSR, which has recommended to Gosplan RSFSR and Gosplan Ukrainian SSR that they take measures to increase the production of photographic accessories with the aim of satisfying popular demand. (Moscow, Sovetskoya Foto, Jul 59, p 73)

During recent years, the Krasnogorsk Machinery Plant has displayed its cameras and lenses at 21 different international fairs and exhibitions, including those in London, Sofia, New York, Paris, Tokyo, Brussels, and Milan. Among the countries to which this plant exports its products are China, Burma, Switzerland, Czechoslovakia, India, and Malaya.

The plant has manufactured an experimental model of the new Yunkor camera, which will soon go into series production. This camera has a plastic body and will give 12 exposures of the 6 x 6 size or 16 exposures of the 4.5 x 6 size per roll of film. It will be a good camera for beginners, since it is very inexpensive.

Photography enthusiasts will also be very pleased with the new Zorkiy-7 [35-mm] camera, which will have a Yupiter-8 lens interchangeable with a variety of other lenses, combined range-viewfinder window with bright-line projected field frame, self-timer, and hinged back. It will take up to three exposures per second.

Among the new cameras which will appear for sale during the Seven-Year Plan are the Zorkiy-6, Moskva-6, Nartsiss, Start-2, Mir, and Zenit-3.

The plant will also increase its output of lenses. During 1958, it produced 60,000 more lenses than during 1957. Labor productivity has been increased 25 percent. (Moscow, Leninskoye Znamya, 2 Jun 59)

During 1959, the Krasnogorsk Machinery Plant will produce such new cameras as the Zorkiy-6, the Mir, and the Drug.

Among the dozens of new types of cameras to be produced by this plant during the Seven-Year Plan will be one with a fully automatic exposure process. (Moscow, Leninskoye Znamya, 19 Jul 59)

The Krasnogorsk Machinery Plant will produce the well-made but inexpensive Mir camera, which is a simplified model of the Zorkiy-type camera.

The Mir is a 35-mm camera with a focal-plane shutter calibrated in speeds of 1/30, 1/60, 1/125, 1/250, 1/500, and B. It is equipped with either an Industar-26M F:2.8/50-mm lens or an inexpensive Industar-50 f: 3.5/50-mm lens. The combined range-viewfinder has a base of 39 mm and plus-or minus 2.5 diopters compensation. The image as seen through the viewfinder is 1.15 times natural size. This camera will accept either standard cassettes or the double cylinder disassembling type. It is also equipped with a self timer and a synchrocontact. It will accept lenses made for the Zorkiy cameras. (Moscow, Novyye Tovary, No 8, 1959, p 4)

B. Scales

According to Al'bitskiy, director of the Orekhovo-Zuyevo Pribordetal' Plant, his enterprise has been producing type LT conveyer scales for 5 years. At the end of 1958, the plant received newly designed type LTM automatic mechanized conveyer scales, which were developed by the NIKIMP [Scientific Research and Design Institute for Testing Machines, Instruments, and Equipment for Measuring Mass]. The new model is better than the old; it weighs at a higher speed and has a wider conveyer belt. It also has a remote reading apparatus. In addition 250 kg less metal is required to manufacture it.

The plant expects to produce experimental models of the scales in August 1959. During the first half of 1960, the plant will make all the industrial accessories, and thus finish all preparations for series-producing the scales. In June 1960, it will stop production of the old model and begin mass production of the new LTM conveyer scales.

This means that it will take the plant a whole year to begin series production of the new model, after making an experimental model. According to Al'bitskiy, the conversion to production of the new scales does not entail any great difficulties; all that is needed is that accessories be designed and manufacturing methods be worked out. These tasks have been entrusted to the VNIITIPribor [All-Union Scientific Research Technological Institute of Instrument Making] -- so says Al'bitskiy.

Sokolovskiy, director of the VNIITIPribor, says that he has no knowledge of being entrusted with any such tasks and that the institute cannot help out the Pribordetal' Plant because it is overloaded with urgent work.

It appears that the plant has postponed the production of industrial accessories until the first half of 1960. However, it could finish its preparatory work in time to get the new model into series production at the beginning of 1960.

The Administration of Electrical Engineering Industry and Instrument Making of the Moscow Oblast Sovnarkhoz has a strange attitude toward this matter. It was not until 4 July 1959, a delay of 6 months, that Blagushin chief engineer of the administration, began to look for a planning institute to plan the industrial accessories for the new conveyer scales.

The Pribordetal' Plant is not hurrying. Only two machinists are working on the experimental model of the new product. Can one expect it to go into production soon? -- Moscow, Leninskoye Znamya, 1 Aug 59

C. Hearing Aids

Designers at the Moscow Hearing Apparatus Plant have developed original hearing aids installed in eyeglass frames. About 20,000 of these will be produced in 1959. The plant has also begun series production of hearing aids installed in ladies' hair ornaments. This kind of hearing aid, along with power sources weighs only about 55 grams.

The new hearing aids have been put on sale in the specialized store of "Soyuzmedinstrumenttorg" at Frunzenskaya Naberezhnaya, No 4, Moscow. (Moscow, Vechernyaya Moskva, 6 Jul 59)

D. Theater Sound Equipment

The Central Design Bureau of the Ministry of Culture RSFSR has finished the laboratory testing of two new sets of sound equipment for wide-screen theaters. The Leningrad Kinap Plant has begun to make production models of this equipment.

The new sound equipment is smaller than earlier-produced types and uses only half as much electric power. It is also much cheaper to manufacture. It is assembled according to the unit principle, which makes mass production possible. (Leningradskaya Pravda, 9 Jul 59)

VII. ELECTRICAL PRODUCTS

A. Rotating Machinery

Armenian plants have begun to produce small high-precision machine tools and miniature electric motors.

The Leninakan Mikroelektrodvigatel' Plant has produced the first series of micropower electric motors equipped with built-in reduction units and having powers up to 10 watts and a speed of 10 rpm. These motors will be used extensively in thermal regulation equipment, in cybernetic devices, in automatic constant-flow lines, in instrument making, and for various other industrial purposes. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 29 May 59)

The Khar'kov Elektrostanok Plant has been producing type TMG-30P modernized DC tachometric generators since the middle of 1959. These generators, which have permanent magnets, are designed for use as speed transmitters in circuits where wide ranges of speed regulation are needed. The generators have outputs of 20 kw, voltages of 250 volts, armature currents of .087 amp, speeds of 4,000 rpm, and load reactances of 2,650 ohms.

The plant also produces type TMG-30 tachometric generators rated for 30 kw, 460 volts, 4,000 rpm, and 8,333 ohms, which have independent 110-volt excitation systems. (Moscow, Promyshlennaya Energetika, Jul 59, p 57)

B. Switches and Other Line Apparatus

The Yerevan Electrical Equipment Plant (Elektroapparatnyy zavod) is producing multiple circuit breaker switches for 220 volts, 25 amp in two- and three-pole versions; multiple throwover switches: and type PK-113 voltmeter and pushbutton starters. (Moscow, Promyshlennaya Energetika, Jul 59 p 57)

The Yerevan Electrical Equipment Plant has a conveyer for the assembly of type PV 3-25 multiple switches (4). (Yerevan, Kommunist, 30 Jul 59)

(4) Photo available in source, p 3, bottom, left

The Cheboksary Electrical Equipment plant began the production of types BPT-100 and BPN-100 feeder units in 1959. These units are designed for supplying power to protective and automatic equipment operating on DC, rated for 110 volts, and used in AC circuits. (Moscow, Promyshlennaya Energetika, Jul 59, p 57)

The Ufa Electrical Equipment Plant of the Bashkirskiy Sovnarkhoz began the series production of series VU static suppressor units in 1959. These units are designed to suppress radio static caused by elevator electrical equipment. (Moscow, Promyshlennaya Energetika, Jul 59, p 62)

C. Mercury Rectifiers

It is planned that in 1959 the Tallin Mercury Rectifier Plant will begin the production of mercury rectifiers in units along with electrical equipment for electric locomotives. (Moscow, Promyshlennaya Energetika, Jul 59, p 57)

The Tallin Mercury Rectifier Plant, which was founded in 1959 on the basis of the Railroad Car Repair Plant imeni M. I. Kalinin, is having new equipment installed in its old buildings. A new mercury rectifier shop has been built and an engineering building is under construction. The plant will make rectifiers for main-line electric locomotives. (Tallin, Sovetskaya Estoniya, 21 Jul 59)

On 21 July 1959, the Tallin Mercury Rectifier Plant imeni M. I. Kalinin produced its first consignment of ignitron valves for mercury rectifiers. (Tallin, Sovetskaya Estoniya, 23 Jul 59)

D. Power Capacitors

The Ust'-Kamenogorsk Capacitor Plant is the No 2 plant in the Soviet Union (after the Serpukhov plant) responsible for the production of industrial stationary capacitors. Its products are very important in the USSR national economy. Cosine capacitors used for increasing power efficiency are of great significance.

The plant's annual production of capacitors will be sufficient for all the large power stations several thousands of kw in capacity that will go into operation. The cost of the capacitors is only a fraction of the cost of generators of equivalent power.

The Ust'-Kamenogorsk plant will also produce communications capacitors, which will make it possible to have high-frequency communications circuits on electric power transmission lines.

Special pulse capacitors are used in scientific research institutes. A number of capacitors are used in units for working metals.

The plant is being constructed by the most modern methods possible and is highly efficient in appearance. It will have air conditioning wherever needed for storing materials or for processes. The area occupied by control and measuring installations amounts to almost half of the plant's production area. Its first products will be manufactured in 1959. (Alma-Ata, Narodnoye Khozyaystwo Kazakhstana, May 59, p 95)

E. Wire and Cable

The Scientific Research Institute of the Cable Industry has developed power cables which are filled with very heavy oil and can be laid on vertical routes with unlimited variations in level. Production of these cables, which are rated for 6 and 10 kv, has been started at that Moscow Moskabel' Plant. (Moscow, Promyshlennaya Energetika, Jul 59, p 62)

The Tallin Eesti Kaabel' Plant pledges to put a new production building equipped with high-production machinery into operation in 1960. During the Seven-Year Plan, it will begin production of installation and lighting wire with plastic insulation, enameled wire with high-durability PEM enamel, and enameled aluminum wire. (Tallin, Sovetskaya Estoniya, 10 Jul 59)

While the Panevezhis Litkabel' Plant was still under construction, orders were sent to plants in Penza, Saratov, Alma-Ata, Kiev, and other USSR cities for machinery for drawing and enameling large- and medium-gauge wires. When the plant finally went into production, it turned out its first products, 100 kg of enameled copper wire.

The enterprise operates on a shopless system, which is the most economical way, according to Petrauskas, plant director.

In 1959, the Litkabel' Plant will supply 300 tons of enameled wire to the radio and electrical industries of the Lithuanian SSR. By the end of the Seven-Year Plan, its production space will cover 18,000 sq m. It will have 12 large sections equipped with hundreds of various automatic and semiautomatic machines. About 200 engineers and technicians will be employed there.

During the Seven-Year Plan, in addition to several hundred type-designations of enameled wire, the plant will begin the production of electric cord and plastic wire. It will produce enough for the Lithuanian SSR and for certain other republics.

The Plant has an enameled wire shop (5). (Vil'nyus, Sovetskaya Litva, 5 Aug 59)

(5) Photo available in source, p 3, top

F. Batteries

During the first half of 1959, the Klaypeda Sirius Plant's production was quadruple that of the first half of 1958. It has put the production of KB flashlight batteries on a single conveyer and has begun installing two similar types of lines for the production of other types of batteries.

Plant personnel have built a semiautomatic machine for producing Saturn search-light cells, a semiautomatic for welding covers onto flashlight cells, five new semiautomatics for binding anodes of cells, and an automatic labeling machines.

Prior to the June Plenum of the Central Committee CPSU, a scientific and technical conference concerning the over-all mechanization and automation of the production of chemical power sources was held in Klaypeda. Participants included representatives of the Academy of Sciences Lithuanian SSR, headed by its president, Matulis; representatives of the Vil'nyus State University imeni Kapsukas, Gosplan USSR, Gosplan RSFSR, and various scientific research institutes; and guests from China.

At the conference, 22 lectures on urgent problems of over-all mechanization and automation and advanced manufacturing methods for chemical power sources were given. A number of lectures concerned the study and analysis of new systems of chemical power sources.

The holding of this conference in Klaypeda, where a very large dry cell and storage battery plant will be developed during the Seven-Year Plan, is very significant. Workers of the Sirius Plant heard much valuable advice and added to their scientific and technical knowledge.

Not long after the conference, the Sirius Plant received six units of industrial equipment from other Soviet republics, including two units developed by an experimental plant of the All-Union Scientific Research Institute of Chemical Power Sources for the production of Saturn and Kristall dry cells. Representatives of institutes and enterprises of other Soviet republics promised to produce 17 additional units of industrial equipment for the Sirius Plant from 1958 to 1960. Six of these units will be automatics.

Although the plant has been aided by other Soviet republics, it has misgivings about the Lithuanian Sovnarkhoz, which is to blame for delaying the preparation of technical documents for the construction and remodeling of production buildings. This delay can seriously hold up the introduction and utilization of modern equipment. -- I. Fabiyonavichyus, Chief Engineer, Klaypeda Sirius Plant (Vil'nyus, Sovetskaya Litva, 24 Jul 59)

A set of Smena 64-6VTs43/VTs88-7 batteries consisting of an 86-volt anode battery, a 1.2-volt filament battery, and a 7.8-volt grid battery (the batteries are air-zinc types utilizing alkaline electrolytes) retails for 86 rubles.

The operating life of the set is at least 665 hours, utilizing the continuous charge method of operation. (Mosoow, Byulleten' Roznichnykh Tsen, No 20, Jul 59 p 37)

G. Insulation

In recent years, the Khot'kovo Elektroizolit Plant has begun the production of many new modern insulation materials. Its products can compete with similar materials produced by the best capitalist enterprises. The dielectric strength of its commutator mica strip is 18 kv/mm, as compared with 15.9 kv/mm in the US.

The dielectric strength perpendicular to the layers of its textolite is 5 kv/mm, as compared with 3.2 kv/mm in England. Likewise, dielectric strength parallel to the layers is .65 kv/mm, as compared with 1.5 kv/mm in England.

The plant has raised the dielectric strength of its LKh-0.20 cotton varnished fabric to 36 kv/mm, or 6 kv/mm higher than fabric made by the best foreign (French) firms.

However, the "getinaks" of various types made by the plant has higher dielectric losses and lower dielectric strength than that made by the most famous English firms. Our textolite has lower puncture strength than that made in England. Our commutator micanite varies more in thickness than the best types of materials of this type made in the US.

During the next 2-3 years, the plant pledges to increase the average dielectric strength of its cotton varnished fabric to 40 kv/mm and of silk varnished fabric to 55 kv/mm, and to significantly increase the elasticity of these materials.

It also intends to increase the resistivity (after drying) of organosilicon varnished fabric to 10^{14} instead of 10^{13}; to increase the puncture strength of silk varnished fabric to 7 kg/cm instead of 6 kg/cm; and to lower the average tolerance for thickness of commutator micanite to .025 instead of .03 and at certain points to .05 instead of .07.

The plant expects to raise the puncture strength of textolite to 700 kg/sq cm, which will make it possible to lower the sizes and cross-section areas of panels used in electrical machine building and thereby to save 10 million rubles' worth of textolite per year.

In 1960 the plant is to begin the series production of "getinaks" with tangential dielectric loss not greater than .02 and dielectric strength along the layers of not less than 60 kv/mm with a distance of 50 mm between electrodes. This will make it possible to use "getinaks" in apparatuses operating at high frequencies and to cut the sizes of these apparatuses by 20 percent.

The plant asks the Orekhovo-Zuyevo and Ivanovo textile combines to improve the singeing and calendering of EI fabric and B percale, to develop methods for the high-quality finishing of EI fabric, and to organize the output of diagonal-weave fabrics for making insulation of extra-high elasticity.

The Gus' Khrustal'nyy, Merefa, Polotsk, and Berdyansk glass plants should improve the quality of the oils used in the production of glass fabrics and should eliminate fuzziness and sagging in the filler fabric. Chemical plants should improve the quality of their organosilicon varnishes.

Lebedev is director of the Khot'kovo plant and V. V. Kudryavtsev is chief engineer. The plant's activities have been praised by M. P. Ivanov, deputy chairman of the Moscow Oblast Sovnarkhoz; M. F. Kostrov, director of the All-Union Electrical Engineering Institute; and V. N. Novikov, First Deputy Chairman of the Council of Ministers RSFSR, Chairman of Gosplan RSFSR.

A mechanized constant-flow line for the production of commutator micanite is being set up at the plant (6). (Moscow, Leninskoye Znamya 4 Aug 59)

(6) Photo showing a group of men working on the new line available in source, p 2, bottom, right

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