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USSR
ELECTRONIC AND PRECISION EQUIPMENT

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I. ITEMS OF SPECIAL INTEREST

A. Electronic Equipment Production

From 1948 to 1957, the industrial output of the Soviet Union was more than quadrupled. The production of radioelectronic equipment, however, was increased more than 18-fold during this period. -- V. I. Siforov (Moscow, Nauchnyye Doklady Vysshey Shkoly: Radiotekhnika i Elektronika, No 1, 1959, p 8)

B. Thermoelectric Generator

Workers of the Leningrad Scientific Research Institute of Urban and Rural Telephone Communications have designed a thermoelectric generator which burns ordinary "Saratov"-type gas derived from oil shale (kerogaz). The experimental model of the thermoelectric generator consists of two independently operating sections of 18 watts' power each, which are heated separately by two burners. This is the first time such a power has been achieved.

The new type of heat transfer reduces heat losses and considerably increases the efficiency of the generator. (Riga, Sovetskaya Latviya, 8 Aug 59)

C. New Plants

The Yoshkar-Ola Electroautomatics Plant (Yoshkar-Olinskiy zavod elektroavtomatiki) has joined the ranks of operating enterprises. The plant has mastered the series production of a new automatic potentiometer for use in metallurgical, chemical, and other branches of industry. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 16 Aug 59)

Two new plants have been put into operation in the Georgian SSR. These are an electrical engineering plant [in Shorapani] which is producing batteries and the Kaspi Electrical Equipment Plant. (Minsk, Sovetskaya Belorussiya, 7 Aug 59)

D. Shortages

The batteries for Turist portable radios are rated for 22 hours of operation, but usually have a much shorter life. After they have been expended, it is more difficult to obtain replacement batteries than it is to win a Volga or Moskvich passenger car in a lottery.

The batteries go so quickly because they are made in Yelets, are sent to the Voronezh cultural goods base, and then to Riga, where they are installed in the receivers. Then the radios are sent all over the USSR, and by the time they reach the purchaser, the batteries are worn down.

The Moscow Mosmuzradio Plant claims to repair Turist radios, but does not provide batteries for them.

The leaders of the trade organization should come to an agreement with industry and arrange for the production of sufficient quantities of batteries. (Moscow, Krokodil, 30 Aug 59, p 11)

The Samarkand Kinap Plant produces an insufficient quantity of selenium rectifiers. Only 20 percent of the requirements of new movie theaters for rectifiers was met in 1958, and only 30 percent is being met in 1959.

The Samarkand and Moscow sovnarkhozes, which are in charge of plants producing selenium rectifiers, selenium discs, 4-volt 3-watt reading lamps, and xenon lamps, should try to effect a considerable increase in the output of these products so as to satisfy the needs of the motion-picture networks in 1959 at least. (Moscow, Kinomekhanik, Aug 59, p 36)

E. Corrupt Practices

One of the plants [unidentified] subordinate to the Leningradskiy Sovnarkhoz began the production of new Zarya television sets. For a long time, the products of Leningrad industry had enjoyed a good reputation, and people began buying the new television sets with confidence. Soon the customers discovered that the sets were of poor quality. A group of Moscow specialists believed that the Zarya should be taken out of production.

A special inspection team of the chairman of the Leningradskiy Sovnarkhoz conducted an investigation and found poor production organization, willful violations of technological methods, and a lack of proper quality control. However, the Zarya had one quality not usual for electronic equipment: it could disappear from the finished products storeroom without leaving a trace in the plant's till.

If a leading personality of the radio engineering administration of the sovnarkhoz came to the plant, he would be given a good television set as a bribe. If the person wavered, he would be told: "Even Comrade Grigor'yev, the chief of your administration, has given permission to do this."

Another plant [Leningrad Plant imeni Kozitskiy], the producer of the more expensive and better Znamya-58 television set, adopted the same "TV giveaway" habit. The free television sets earned great popularity among officials of the Administration of Radio Engineering Industry, such as Murashenko, Fedorov, and Rautsen, and leading personnel of other administrations, such as Labut, Pavlova, Laptev, and Kirillyuk. Larin, chief accountant of the sovnarkhoz, also acquired a Znamya-58 television set at the same time that he was enforcing financial discipline at plants.

Other persons obtained two or three sets apiece, such as Neshchadimov, chief technologist of an administration, and Zholdakov and Vismont, both deputy chiefs of administrations.

Workers of the inspection team calculated that 150,000 rubles in state funds had been purloined in this manner. In a few months of 1959 alone, 85,000 rubles' worth of Znamya-58 television sets were given away.

It is not known what would have been the consequences of the investigation had the Commission of Soviet Control of the Council of Ministers USSR not become interested in the "TV giveaway" affair. A housecleaning resulted, and a special order from Afanas'yev, chairman of the Leningradskiy Sovnarkhoz, was issued. Although the plant directors promised to make amends, nothing was said about correcting the dishonest, immoral atmosphere of the entire dealings. -- M. Lanskoy (Moscow, Krokodil, 10 Sep 59, pp 8-9)

II. ELECTRONIC EQUIPMENT

A. Printed Circuits; Automation

In improving the production of electronic components, Soviet scientists and engineers have progressed from conventional three-dimensional assembly of apparatus to the so-called "printed circuitry" method.

The use of printed circuits in the Start television set makes it possible to solder 300 points in 8 seconds. In conventional three-dimensional assembly, it takes 8 seconds to solder one point. In the production of Kristall radio receivers, 450 connections are soldered in a few seconds.

The old conventionally assembled Luch television set measured 640 x 435 x 440 mm and weighed 38 kg. Its present-day equivalent, the Start, measures 380 x 410 x 390 mm and weighs 21 kg. It takes 6 man-hours less to produce a Start than it did to make a Luch.

New models of radio receivers based on printed circuits have been developed, including the Volna, Dorozhnyy, and Moskvich. Printed circuit plates for Kristall receivers, which were exhibited at the Brussels Fair, are being produced.

Use of the new printed circuit methods has made it possible to cut labor consumption by 36 percent in the annual production of 400,000 Moskvich radio receivers. In addition, industry has been freed from the production of 3.6 million resistors, 1.2 million tube panels, and 800,000 contact blocks.

It has been possible to develop flat chokes for the intermediate frequency filters of television sets in place of bulky and unreliable three-dimensional chokes. Printed flat wave guides can replace cumbersome expensive wave-guide designs and can bring about a 50-percent weight reduction, with a production cost amounting to only one percent of the cost of producing a three-dimensional wave guide. -- Engr T. Dmitriyeva (Moscow, Lesnaya Promyshlennost', 18 Jul 59)

Considerable work in automation and mechanization has been done at a number of leading enterprises of the Moscow Oblast Sovnarkhoz. For example, the printed circuit assembly method has been used on a wide scale in the USSR for the first time at one of the plants of our economic region which produces Start television sets. This has made it possible to mechanize and, in some operations, to automate production.

Printed circuit assembly has a great advantage over regular three-dimensional circuitry, since it provides high mechanical strength and vibration resistance in the equipment, eliminates assembly mistakes in mass or large series production, simplifies assembly operations, and cuts production costs. Because of this, the plant in a short time has mastered the production of printed circuits and has created a new television set based on these circuits. This set has already received recognition from television viewers.

The new Start-2 television set, which has a 220- x 290-mm screen, and is based on printed circuits, weighs only 20 kg. On the other hand, the Luch television set formerly produced by the plant, with a 180- x 240-mm screen, weighed 40 kg. The new set has an input of 130 watts, as compared to 210 watts of the old set.

The Start-2 television set consists of three plates: the horizontal sweep plate; the vertical sweep plate; and the intermediate frequency amplifier, low-frequency amplifier, and video amplifier plate. The plates are made of K21-22 plastic powder on a mechanized constant-flow line developed by plant workers. The conductive layer is applied on the plate with a special chemical-electroplating unit. The plant also developed a unit for applying insulating paint, and has developed and put into use a semiautomatic horizontal furnace for relieving internal stresses in the plates, a unit for photoprinting circuits, and an automatic for mounting components on the plate. The plant uses dip-soldering to fasten components onto the plate.

The Pavloskiy Posad Electrical Machinery Plant (Pavlovo-Posadskiy elektromekhanicheskiy zavod), another Moskovskaya Oblast plant, is striving to organize the mass production of capacitors. It has developed, produced, and put into operation a special automatic for inspecting capacitors according to three capacitance ratings.

During the past 3 years, the Pavlovskiy Posad plant has developed about 100 types of new automatics, semiautomatics, and machines and has produced more than 500 pieces of equipment. The plant has developed constant-flow mechanized lines for the production of mica and paper capacitors.

By 1961, the plant expects to develop four automatic lines for performing all production and checking operations in the manufacture of mica, glass-enamel, and plastic film capacitors. The productivity of the automatic glass-enamel capacitor line will be 300,000 capacitors per shift. It will be 33 meters long and will be controlled from a central panel. Three workers per shift will be needed to operate it.

In instrument making, and in automatic control and regulation circuits, semiconductors are being used on an ever-increasing scale. They will be used for many purposes in electric drive circuits, in the manufacture of machinery and electric motors, in changing units, in electrolytic and electroplating processes, and for other purposes. Power semiconductors rated for 10-15 kw and over have been designed and are being produced in the USSR. Such a device measures 55 x 300 mm without terminals. Semiconductor devices with powers of 50-60 kw will soon be put into production.

At one of the plants [unidentified] of the Moscow Oblast Sovnarkhoz where semiconductor diodes are mass-produced, automatic units, lines, and sections are being developed on a large scale. The plant will thereby increase its output of diodes and raise their quality.

Workers of the enterprises of the radioelectronics industry of the Moscow Oblast Sovnarkhoz will do their best to fulfill the resolution of the June Plenum of the Central Committee CPSU. -- N. Pokrovskiy, Deputy Chief, Technical Administration, Moscow Oblast Sovnarkhoz (Moscow, Radio, Aug 59, pp 5-6)

B. Transistorization

During the past year, the mass production of high-frequency transistors, including P-402 and P-403 transistors, was begun in the USSR. The P-402 and P-403 transistors operate well on high frequencies up to the ultrashort-wave band. Many radio plants have utilized the new transistors to develop a number of models of radio receivers for series production. An attempt to organize the mass production of transistor radios has been made at one of the plants of the Saratovskiy Sovnarkhoz.

Despite these achievements, the general situation with transistorized receivers is unsatisfactory. Usually, small plants or plants without sufficient experience in the production of radiobroadcast receivers strive to master the production of new transistorized radio equipment. As far as such leading USSR plants as the [Riga] VEF Plant and the Voronezh and Murom radio plants are concerned, none of them has ventured to take the first step. Of course, it is always easier for them to make vacuum tube receivers. But how many more of these receivers and amplifiers, which are representative of the radio engineering of yesteryear, are going to be produced?

Automobile radios are a good example. Multitube A-8 and A-12 radios made by the Murom Radio Plant are still being installed in the popular Moskvich and Volga passenger cars. These radios are equipped with cumbersome, unreliable, vibrator converters. The Murom plant could have begun producing new auto radios long ago which, if not fully transistorized, could have had semiconductor audio-frequency amplifiers and voltage converters.

However, the management of the Murom Radio Plant, very much like the management of other plants engaged in the production of battery radios, is in no hurry to transistorize its products, but rather continues to turn out obsolete vacuum tube equipment.

It is silly to try to explain away this situation by saying that series-produced transistors have unstable parameters. If a small enterprise such as the Moscow Hearing-Aid Equipment Plant has been able to produce several thousand transistorized hearing aids per month for more than 2 years already, what is keeping large enterprises of the radio industry from using transistors?

For some reason, the State Committee for Radioelectronics of the Council of Ministers USSR, which is occupied in earnest with the development of new transistors, maintains a puzzling passivity with regard to their utilization in radio equipment for the populace. (Moscow, Radio, Aug 59, p 6)

C. Components

USSR industry produces a large variety of ferrite cores of various shapes. Ferrite of barium, which is a highly coercive material, is used for making permanent magnets. Low-coercivity ferrites are used mainly for making cores used in alternating-current circuits. The latter are divided into the following groups:

Nickel-zinc ferrites with magnetic permeability from 20 gauss/oersted to 2,000 gauss/oersted.

Manganese-zinc ferrites with permeability from 1,000 gauss/oersted to 3,000 gauss/oersted.

Ferrites with rectangular hysteresis loops, which are used in electronic computers.

Ferrites for superhigh frequencies.

Nickel-zinc ferrites and, in part, manganese-zinc ferrites have mainly been put in use in radio apparatus for the populace.

(Source gives information on the properties of several kinds of ferrite cores.) (Moscow, Radio, Aug 59, p 55)

D. Prices

The Central Trade Base of Posyltorg [All-Union Mail Order Office] will ship the following goods on order to private citizens:

Goods	Price (rubles)
Rekord radio receiver	339
Kazan'-57 radio-phonograph	574
Ural-57 radio-phonograph	945
Muromets radio-phonograph	945
Yauza tape recorder	1,843
One reel (180 meters) of tape for Yauza recorder	24
One reel (350 meters) of tape for El'fa recorder	38
Yubileynyy electric phonograph	367

The prices shown include shipping costs. Orders should be addressed to Moscow, Ye-126, Aviamotornaya ulitsa, 50. -- Advertisement (Kiev, Pravda Ukrainy, 14 Aug 59)

A 4P1L oscillator tube retails for 20 rubles; a 6F1P triode-pentode tube retails for 21 rubles. (Moscow, Byulleten' Roznichnykh Tsen, No 22, Aug 59, p 21)

E. Television

Radio engineering enterprises of the Leningradskiy Sovnarkhoz have started series production of mobile television stations for use at television centers. Semiconductor devices, miniature tubes and parts, and printed circuits are used in these stations. A new domestically produced camera tube of improved quality is being installed in the cameras for the first time. Portable equipment permits simultaneous transmission from six microphones. A special camera can be used at distances up to 300 meters. All equipment of the mobile station is installed in ZIL-158 bus.

The mobile television station ensures high-quality transmission of both sound and image. (Riga, Sovetskaya Latviya, 14 Aug 59)

The Leningradskiy Sovnarkhoz has developed the new Komsomolets television set for mass production in 1960. This 12-channel 14-tube receiver has a type 35LK2B picture tube with a 285- x 215-mm screen. The set consists of six easily dismountable functional units which have printed circuits formed by etching foil-covered "getinaks" laminated plastic. These printed units are fastened to a vertical chassis and are securely interconnected.

The Komsomolets is the first domestically produced television receiver to consist of functional units which can be manufactured and adjusted independently. Units with standardized electrical and structural characteristics are fully interchangeable. This use of functional units not only results in improved production and quality of the sets, but also simplifies repair and maintenance.

The acoustical system of this set consists of a type 1-GD-9 speaker placed face down in the bottom of the cabinet. The sound is then directed to the viewer via a sound cone with the opening facing the front of the set. This arrangement provides sound frequencies from 200 to 8,000 cycles per second and a sound pressure of 2.5 bars at a rated power of one watt. Sensitivity of the set is at least 200 microvolts; horizontal resolution is 450 lines at the center and 350 lines at the edges and verticle resolution is 400 lines at the center and 350 lines at the edges.

The two knobs for brightness control and on-off volume control are at the front corners of the cabinet, and the remainder of the controls are on the side panels. A special brightness-control circuit (ARYa) ensures constant image brightness during contrast adjustment. Other novel circuits ensure stable synchronization, adequate protection against interference, and well interlaced scanning. The horizontal and vertical sweep circuits employ standard units.

The Komsomolets can operate from any 110-, 127-, or 220-volt 50-cycle circuit. Input power is 120 watts. The small size (500 x 335 x 385 mm) and light weight (17 kg) of the set are made possible by the use of miniature tubes, semiconductor diodes, small parts, and printed circuits. (Moscow, Novyye Tovary, No 7, 1959, p 3)

One of the plants of the Krasnoyarskiy Sovnarkhoz [Krasnoyarsk Television Plant?] is producing the 12-channel Yenisey-2 television set, which utilizes 16 tubes, 8 semiconductor diodes, and a 35LK2B 280- x 210-mm picture tube. The set's sensitivity is at least 200 microvolts; selectivity with regard to the adjacent channel is at least 20 decibles. Image definition is 400/350 lines horizontally and 450/350 lines vertically.

The Yenisey-2 is supplied from a 127- or 220-volt AC circuit and uses not more than 150 watts of power. Its cabinet measures 525 x 450 x 415 mm, and the set's weight is not over 24 kg.

(Source gives detailed information on the Yenisey-2.) (Moscow, Radio, Aug 59, p 42

K. I. Samoylikov, a radio designer and skilled radio fan from Noginsk, has designed the new Malyutka pocket television set (1). It weighs one seventh as much as the Start television set, which weighs 21 kg and is one of the lightest television set in the USSR. The Malyutka measures 130 x 180 x 210 mm; it has about one thirteenth the volume of the Start.

The Malyutka utilizes six semiconductors and nine midget tubes, and can be supplied from any electrical circuit or from a 6-volt battery. It consumes 45 watts. The screen is about the same size as a matchbox.

Besides working on the circuitry of his new television set, Samoylikov made the chassis of duralumin and a cabinet of a sheet of polyvinyl plastic banded with two stainless steel strips.

Samoylikov is a prominent amateur and specialist in his field. His original tape recorder, field television receiver, measuring instruments, and other equipment have been exhibited many times at all-union radio-amateur exhibitions. -- V. Moiseyev (Moscow, Leninskoye Znamya, 16 Aug 59)

(1) Photo available in source, p 4, middle, left

F. Radios

The Sarapul Radio Plant imeni Ordzhonikidze is producing the Ural-57 table-model radio-phonograph consisting of a six-tube AM superheterodyne receiver and a record player for regular and LP records.

The receiver is designed for operation in the 150-415-kc, 520-1,600-kc, 3.95-7.5 mc, and 9.7-12.0-mc wave bands. Its sensitivity in the long- and medium-wave bands is at least 150 microvolts, and in the short-wave bands, at least 250 microvolts, with an output of 50 milliwatts and a signal-noise ratio of 20 decibels. Sensitivity on the phonograph socket is 160-180 millivolts. Adjacent channel selectivity with 10 kc of detuning is more than 26 decibels in the long- and short-wave bands.

(Source gives additional information on this set.) (Moscow, Radio, Jul 59, pp 20-21)

In recent times, USSR industry has produced a number of miniature radio receivers, but their owners know how difficult it is at times to obtain spare power sources for them.

The TsS is a new transistor receiver (2). Its first models have been produced by a cultural goods factory of the Central Union of Consumer Cooperatives. This small, light, and cheap radio can be powered continuously for 30 hours by an ordinary flashlight battery. (Moscow, Ogonek, No 36, Aug 59, p 20)

(2) Photo available in source, p 20, top, left

G. Recording Equipment

The Leningrad Kinap Plant has produced the new KZM-7 four-channel magnetic sound recording unit, which is built up of standard blocks. The blocks were developed by the plant in collaboration with the Central Design Bureau of the Ministry of Culture USSR.

The new recorder has a tape speed of 456 mm/sec and a type-2 tape with a maximum roll length of 320 meters.

(Source gives additional information on and photographs of this recording unit.) (Moscow, Tekhnika Kino i Televideniya, Aug 59, p 17)

III. COMPUTERS

V. Ivanov and A. Chelyuskin, workers of the Institute of Automatics of the Academy of Sciences USSR, and R. Golovkin, head of the laboratory of the Moscow Pipe Plant, have developed an electronic computer which has fully automated the regulation of the process of pipe welding with respect to variations in the thickness of the metal strip and temperature of the weld seam.

As the metal strip enters the tube forming mill, its thickness is constantly measured by a device using X rays. Any irregularity is recorded in the memory unit of the computer. As the irregularity approaches the welding unit, a thermocouple feeds data on the temperature of the seam into the computer. The computer instantaneously processes the data received from both sources, computes the appropriate change in operating regime, and transmits the new regime to the welding unit, thus maintaining a uniform quality of weld over the entire length of the pipe.

This apparatus has been installed in the Moscow Pipe Plant and will soon be put into industrial operation. Similar automatic devices are being installed in the Dnepropetrovsk Pipe Plant imeni Lenin. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 16 Aug 59)

Workers of the Stal'proyekt Institute [State All-Union Institute for Planning Units of Steel Foundry and Rolling Equipment] and the Penza Institute of Computing and Analyzing Machines, together with engineers of the Magnitogorsk Metallurgical Combine, have developed an experimental model of a computer to be used on Blooming Mill No 450 in Magnitogorsk for instantaneously determining the length of blooms and controlling the shears for cutting them accurately without stopping the movement of the metal. (Kiev, Pravda Ukrainy, 16 Aug 59)

According to I. S. Bruk, Corresponding Member of the Academy of Sciences USSR and director of the Institute of Electronic Control Machinery of the Academy of Sciences USSR, the institute has already recommended extensive utilization of electronics in economic planning and industrial management, and is currently specializing in the development of high-speed digital computers for these purposes.

The institute has already gained considerable experience in the application of high-speed electronic machines to planning. A method has been devised for formulating plans for supplying coal, cement, and other industrial materials to distant parts of the country while taking transportation costs into account. This type of analysis has been applied in particular to the supply of coal to Siberia.

Until now, all calculations connected with the solution of individual planning problems have been performed on the Soviet M-2 machines, but the institute is currently prepared to develop machines especially adapted to planning. Such a machine is being designed and will be produced domestically.

The introduction of semiconductors and other techinical innovations permits the development of smaller and more compact computers with greater operating speeds. Backed by Gosplan USSR, the institute is devoting considerable attention to the introduction of such digital computers into the various branches of the national economy. Many planning and construction organizations and metallurgists have expressed interest in them, and they are in particular demand for automation of the management and maintenance of the economic schedules in the production and distribution of electric power, which will save several hundred million rubles per year. This is substantiated by experience. For example, the use of computers in planning the platform supports of the Bratskaya GES (Hydroelectric Power Station) resulted in saving many tons of metal. (Moscow, Moskovskaya Pravda, 7 Aug 59)

Under the direction of Prof T. N. Sokolov, scientists of the Chair of Mathematical and Computing Devices and Installations of the Leningrad Polytechnic Institute imeni Kalinin have developed a constant-action cybernetic computer which will replace several dozen calculating machines. This new machine will be used for research in the fields of aerodynamics and hydrodynamics.

The computer almost instantaneously performs the operations of integration and differentiation and multiplication by a constant coefficient, solves nonlinear relations of the trigonometric function type, and performs other functions.

The new design of this electromechanical computer is distinguished from currently used similar computing devices in that it can perform a considerably greater number of operations. (Tashkent, Pravda Vostoka, 16 Aug 59)

Certain experimental operations have shown that electronic computers designed for solving mathematical problems encountered in scientific research and engineering calculations, such as the Ural, Strela, and M-3, are not suitable for the mechanization of many economic calculations. Their utility value drops considerably when they are used for the overall mechanization of accounting and planning at industrial enterprises, in banking systems, in solving central supply problems, and other such applications.

It takes more than 30 hours to assess 15,000 work orders on the Ural computer and more than 100 hours on the M-3. Hundreds of hours of continuous operation are required for these machines to make all computations connected with labor and wage accounting in a large industrial enterprise. The Strela computer is much better for such operations, which it performs at a speed of 2,000 additions per second. Even in this case, the necessary speed for accounting calculations is not achieved.

The poor results of automating accounting and planning calculations by using so-called universal high-speed computers are determined by the specifics of the data-processing operations in such calculations. To design high-speed computers capable of effectively mechanizing accounting and planning calculations, it is necessary to analyze standard computation operations for accounting and planning and to make requirements for the specifications of such machines based on this analysis. (Moscow, Voprosy Ekonomiki, Jul 59, p 36)

The Kursk Schetmash Plant is organizing production of two-counter VMM-2 automatic multikey calculating machines and VMP-2 semiautomatic calculating machines, both of which perform all four arithmetical functions and combinations of functions. The machines are 17-column types.

However, although the national economy is in sore need of such machines, the plant has produced very few of them during 1959. The high technical and cultural standards essential to series production of calculating machines are not observed at the Schetmash plant, where the production process is disrupted, there is no definite system of accounting and checking, imperfect parts often reach the assembly stage, and cleanliness is not observed.

During 1960, the plant must increase its output of calculating machines to several times the present level, but is not yet prepared to do this. Of 5,000 units of equipment (osnastka) needed, only 3,000 have been designed and manufactured.

The plant has not yet recieved authorization for acquiring the precision automatic lathes, grinding and milling machines, and presses for increasing the production of new calculating machines in 1959 and establishing the required reserve of parts. As a rule, the plant is not supplied with the materials called for in design and manufacturing specifications.

NIISchetmash [Scientific Research Institute of Computer Machine Building], the main branch institute which has aided the plant in the past, has discontinued all work connected with calculating machines of this class, and there are no other organizations concerned with design and technological developments in this field. This has given rise to the necessity of establishing a special design and technological bureau at the Kursk Schetmash Plant.

Construction is going badly on the second industrial building of the plant, where the new production of calculating machines is to be located.

The plant management and director Korchevskiy in particular do not display the proper urgency in the solution of pertinent problems, nor do they seek the active assistance of higher organs. Thus, the series production of calculating machines has not been established. The Schetmash plant stands in sore need of immediate assistance from the Kursk Sovnarkhoz and Gosplan RSFSR. -- B. Romanov, Chief Designer, Kursk Schetmash Plant, and Others (Moscow, Izvestiya, 28 Aug 59)

The T-5M tabulator is produced within the Administration of Radio Engineering Industry and Instrument Making of the Moscow City Sovnarkhoz. (Moscow, Knizhnaya Letopis', No 37, 1959, p 50)

The Leningradskiy Sovnarkhoz already has in operation 135 machine accounting stations and bureaus serving 162 enterprises. (Leningradskaya Pravda, 13 Aug 59)

IV. INSTRUMENTS

A. General

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

IM-13 modulation meter, made in the Gor'kovskiy Sovnarkhoz.

28 IM metering amplifier, made in the Vil'nyusskiy [Lithuanian?] Sovnarkhoz.

RTs-1 disruptive testing machine for testing standard samples of cement, made in the Kemerovskiy Sovnarkhoz.

R-512 variable capacitor, made in the Kiyevskiy Sovnarkhoz.

D-539 portable wattmeter, made in the Kiyevskiy Sovnarkhoz.

M-309 panel voltmeters and ammeters, made in the Krasnodarskiy Sovnarkhoz.

E-309 panel voltmeters and ammeters, made in the Krasnodarskiy Sovnarkhoz.

TPOL-10 through-type single-wound current transformer with cast insulation, made in the Sverdlovskiy Sovnarkhoz.

Karagach-2 battery-supplied roentgen meter for measuring doses of gamma radiation, made in the Moscow City Sovnarkhoz.

U520 unit for testing magnetically permeable materials, made in the Kiyevskiy Sovnarkhoz.

SP-27 mercury-filled glass thermometers, made in the Moscow Oblast Sovnarkhoz.

DR-10 working dynamometers made in the Moscow City Sovnarkhoz have been consolidated with the DR-3 and DR-8 dynamometers also made in the Moscow City Sovnarkhoz. (Moscow, Izmeritel'naya Tekhnika, Aug 59, p 64)

B. Electrical Instruments

The Kiev Tochelektropribor Plant is the producer of the D533 portable ammeters, voltmeters, and wattmeters. (Moscow, Knizhnaya Letopis', No 37, 1959, p 35)

The Leningrad Vibrator Plant is the producer of the K-16 electrical remote tachometer. (Moscow, Knizhnaya Letopis', No 37, 1959, p 50

The Vil'nyus Electric Meter Plant has a main assembly and adjustment conveyer (3). (Moscow, Pravda, 11 Sep 59)

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

C. Industrial Controls

Soviet scholars and engineers of the Central Scientific Research Institute of Ferrous Metallurgy, in close cooperation with Tallin Experimental Control and Measuring Instruments Plant, have developed the MU-32 multichannel level gauge for measuring the level of molten metal in closed blast furnaces with the aid of radioactive isotopes. Previously produced instruments of this type were all two-channel devices and would thus permit measurement at only two points. The new MU-32 instrument operates on 32 channels and will thus permit automatic measurement and control of the level of blast-furnace charges.

According to preliminary calculations published by the Main Administration on Uses of Atomic Energy under the Council of Ministers USSR, the MU-32 instrument used together with other automatic devices will permit a 2-percent increase in the productivity of blast furnaces. On a country-wide scale, this would amount to about one million additional tons of cast iron per year and a saving of about one billion rubles. (Tallin, Sovetskaya Estoniya, 7 Aug 59)

Workers of the Central Laboratory of Automatics of the Ministry of Construction RSFSR have developed the new PVTs-5256 instrument for determining the acidity and alkalinity of solutions during the process of producing substances in the chemical and food industries, where it is being used extensively in the automation of production. (Moscow, Leninskoye Znamya, 15 Aug 59)

D. Test Instruments

Utilizing the fact that each product with a flaw in it has its own specific wave pattern, academician N. Akulov of the Academy of Sciences Belorussian SSR and a group of scholars have developed a new vibrational flaw detector, the basic units of which are a small hammer, a transmitter with vibrator attached, and a measuring instrument.

The hammer sets up local wave patterns within the test product and these are picked up by the piezoelectric transmitter, which then creates a voltage in the measuring instrument. A time relay and frequency filter prevent unwanted initial vibrations from registering on the instrument.

This new dectector may be used for testing the quality of porcelain and ceramic products, for measuring fluid levels in closed containers, and for detecting corrosion in metal tanks, reservoirs, seagoing vessels, etc.

Tests have shown the device to be highly effective and dependable in operation. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 14 Aug 59)

The Khar'kov Transsvyaz' Plant is the producer of the URD-58 ultrasonic flaw detector, which was exhibited at the All-Union Exposition of the Achievements of the National Economy. This instrument was developed by the Flaw Detection Department of the All-Union Scientific Research Institute of Railroad Transport.

The type URD-52M ultrasonic flaw detector, which was formerly produced by the Transsvyaz' Plant, was designed for finding flaws only in the butt ends of rails. The URD-58 checks whole rails thoroughly.

(Source gives additional information on ultrasonic flaw detectors.) (Moscow, Put' i Putevoye Khozyaystvo, Aug 59, p 7)

The Ivanovo Testing Instrument Plant [Ivanovskiy zavod ispytatel'nykh priborov] has the following instruments on sale: the TSh-2 Brinell hardness tester, K-2 twist-tester, and MK-05 pendulum impact testing machine.

Orders are to be sent to the Administration of Material and Technical Supply, with copies to the plant at Lezhnevskoye Shosse, Ivanovo, Oblastnoye. (Moscow, Izmeritel'naya Tekhnika, Aug 59, p 26)

E. Radioactivity Measuring Devices

The process of calculating radioactivity has not yet been automated at existing industrial installations, which has resulted in great loss of time and excessive harmful exposure of those working with radioactive materials.

Models of automatic instruments for calculating radioactivity have been developed in the Soil Institute of the Moldavian Branch of the Academy of Sciences USSR. V. V. Kotelev, head of the division of soil biology, and L. A. Shakun, a technician, have designed a new automatic which fully mechanizes this complex process and virtually eliminates the danger of radiation. This instrument differs from previous models in its simplicity of design, dependability of operation, and precision of measurement. It will perform 50 types of calculations in a single setting and record the results on paper tape. On completion of the calculation, the instrument automatically stops and turns off the power.

The instrument was recently submitted to a special commission in Moscow for examination. A resolution has been adopted for the manufacture of ten experimental models and for turning the instrument over for industrial production.

The commission concluded that this is the first automatic of its type in the Soviet Union. The instrument is currently on display at the All-Union Exposition of the Achievements of the National Economy.

The X-ray workshops of the Ministry of Health Moldavian SSR, together with workers of the Moldavian Branch of the Academy of Sciences USSR, have started manufacturing experimental models of the new automatic instrument. (Kishinev, Sovetskaya Moldaviya, 7 Aug 59)

F. Optical Equipment

The Soviet photographic industry is expected to produce 1,670,000 cameras during 1959, which is ten times the number produced in 1940.

The Start single-lens reflex camera, produced by the Krasnogorsk Machinery Plant, was discovered to have serious defects only after the first consignment had been released to the trade network, whereupon the plant was obliged to recall all unsold cameras for exchange and to guarantee exchange of all defective cameras already bought by consumers. The Start camera consists of 550 optical and mechanical parts, of which 250 make up the focal-plane shutter.

A technical conference of representatives of photographic equipment plants was convened in Krasnogorsk in May 1959. Participants in this conference resolved to produce in 1959 nine new camera models, to develop and manufacture experimental models of 11 new camera models and 12 new types of photographic accessories, and to organize the production of eight new lenses.

In view of the several advantages and apparently increasing popularity of the between-the-lens or behind-the-lens leaf-type shutters, it is deemed that the development of a good shutter of this type, probably at some one of the timepiece plants, is essential to the proper development of the Soviet photographic equipment industry.

Plastics are expected to play an ever-increasing role in the manufacture of lenses, since the advantages of their application tend to outweigh the several disadvantages. In fact, the Salyut camera already incorporates two parts made of plexiglass.

Although domestically produced cameras are the least expensive in the world, members of the trade organizations complain of the large numbers of them left unsold in the stores. This is considered to be, at least in part, the fault of the tradespeople themselves, for they could be doing much more than at present to increase the popularity of cameras among potential consumers. However, part of the reason is also the limited availability of necessary or desirable materials and accessories.

(Source contains further information and illustrations of manufacturing and testing processes.) (Moscow, Sovetskoye Foto, Aug 59, pp 38-46)

Assembly of the largest Soviet telescope, manufactured by Leningrad optical machinery enterprises, has been completed. With respect to mirror diameter, which is 2.6 meters, this is the third largest reflector in the world. This giant astronomical instrument was developed by a group of designers under the direction of B. K. Ioannisiani, Lenin Prize winner. Focusing, tracking, and other operations are performed automatically on this telescope, and the reflector is maintained at a constant temperature which prevents distortion of the image received. The telescope is designed for galactic and extragalactic observations.

After adjustment, this telescope will be shipped to the Crimean Astrophysical Observatory of the Academy of Sciences USSR. (Minsk, Sovetskaya Belorussiya, 16 Aug 59)

V. ELECTRICAL PRODUCTS

The machine builders of Frunze have manufactured their first consignment of PMI-2 small magnetic starters, which are superior in design to those previously produced in the Kirgiz SSR. Only half as much plastic and a third as much rolled brass go into the manufacture of the PMI-2 starters, while their service life is 15 times greater under load.

A new branch of industrial production, electrical engineering, is under development in Kirgizia. Enterprises of the republic are already producing new types of electric motors, electric telphers, automatic air circuit breakers, fuses, and electronic level measuring devices.

It is planned to organize the production of electrical instruments in the city of Osh in 1960. The production of electric shears and heavy-duty electric telphers at machine building plants of the republic is also planned, and the first cable plant is being founded.

By the end of the Seven-Year Plan, the republic's output of electrical engineering products will be triple that of 1959. (Frunze, Sovetskaya Kirgiziya, 14 Aug 59)

Although the Tiraspol' Electrical Equipment Plant is still under construction and new equipment is still being installed, production has already been started. During the first half of 1959, the plant produced 276 above-plan starting units for submersible pumps. The plant recently mastered and has already produced 2,180 automatic switches.

The plant now is faced with the task of more quickly completing the installation of the necessary production machinery and setting up series production of electrical equipment. So far, the assembly of automatic switches has been performed on an individual basis by 30 men, but when the conveyer is put into operation, the number of workers will be reduced by half while actual output will increase. The installation of equipment has already been started in the galvanizing division. The latest automatic equipment will be installed for high-frequency heat treatment of parts. Many machine tools already in operation perform five or six operations either simultaneously or sequentially, and these machines are operated for the most part by young people with secondary school education. -- Ye. D'yachenko, Director, Tiraspol' Electrical Equipment Plant (Kishinev, Sovetskaya Moldaviya, 13 Aug 59)

The Tallin Mercury Rectifier Plant imeni Kalinin has produced its first group of ignitrons for its first rectifier unit, and has thereby started series production of such equipment for Novocherkassk main-line electric locomotives operating on alternating current. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 14 Aug 59)

Designers and technologists of the Novoutkinsk Iskra Plant are working on the design of a seam and spot welding unit, which performs both types of welding operations simultaneously.

This is the first plant in the USSR to organize the production of self-propelled high-powered welding automatics and transformers, for arc and spot welding, which have aluminum windings instead of copper.

The Iskra plant will triple its production of welding machines during the Seven-Year Plan. (Moscow, Sovetskaya Rossiya,, 12 Aug 59)

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