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USSR
ELECTRONIC AND PRECISION EQUIPMENT

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USSR ELECTRONIC AND PRECISION EQUIPMENT

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I. ITEMS OF SPECIAL INTEREST

A. Shortages

P. Yudin, deputy chairman of the Board of Tsentrosoyuz [Central Union of Consumer Cooperatives] states that industrial enterprises are still lax in supplying necessary radio components to the trade network. For example, although 100,000 toggle switches (tumblery) are needed in 1958, Glavradiosbyt [Main Administration for the Sale of Radio Products] has allotted only 5,000 and has absolutely refused to supply DGTs-23 and other germanium diodes.

Some plants supply components in a very unsatisfactory fashion. For example, a plant of the Voronezhskiy Sovnarkhoz [Voronezh Radio Components Plant?] was supposed to have shipped 240,000 KE-1B capacitors; however, it has not shipped any. (Moscow, Radio, Oct 58, p 15)

During August 1958, A. Sergeyev sought in vain from store to store in Moscow for film for his 35-mm camera. Store after store displayed signs reading "No 35-mm film". One store did offer three cartridges of film, but only in a package with developer and developing tank, for 74 rubles and 70 kopecks.

There were 708,000 cameras manufactured in the Soviet Union during the first half of 1958, but what good are they without film? (Moscow, Sovetskoye Foto, Oct 58, pp 83-84)

B. Plants

The Voronezh Electrical Machinery Plant is now subordinate to the Voronezhskiy Sovnarkhoz. (Moscow, Vestnik Mashinostroyeniya, Aug 58, p 69)

[Comment: This plant, a producer of low-power electric motors for automatic and telemechanical systems and sewing machines, is seldom mentioned in published sources.]

The L'vov Electric Bulb Plant is subordinate to the L'vovskiy Sovnarkhoz. (Moscow, Vestnik Mashinostroyeniya, Aug 58, p 71)

A. A. Arutyunov is the director of a plant imeni V. I. Lenin of the Gor'kovskiy Sovnarkhoz. One of this plant's products is surgical scalpels. (Moscow, Vestnik Mashinostroyeniya, Aug 58, p 69)

[Comment: It seems unlikely that this is the Gor'kiy Radio Plant imeni Lenin; the product type appears to be the same as of the Gor'kiy Plant imeni Gor'kiy, a producer of medical instruments.]

II. LOCAL PRODUCTION AND ADMINISTRATION

A. Armenian SSR

In 1958, the output of the enterprises of the Administration of Electrical Engineering Industry and Instrument Making of the Armenian Sovnarkhoz should exceed the 1957 level by 22 percent, with a labor productivity increase of 7 percent.

The capital outlay for 1958 is going according to plan. It is planned that the administration's 1958 capital outlay will amount to 73.4 million rubles.

One of the basic construction projects of the year is the glass-making building of the Yerevan Electric Bulb Plant. The plant now obtains glass bulbs for incandescent lamps and glass tubes for fluorescent lamps from Russia [RSFSR]. During the first half of 1958, the plant will be relieved of the receipt of these inefficient shipments.

The construction at the Kirovakan Avtomatika Plant and the Kirovakan Special Design Bureau; the instrument-making and electrical engineering plants and the Prompribor [Industrial Instrument?] Special Design Bureau in Leninakan; and the Yerevan Electric Machine Building Plant, the Yerevan Cable Plant, and other plants is still continuing. Recently, an enameled wire shop was put into operation at the Cable Plant. In 1958, the first stage of the [Yerevan] Relay Plant should go into operation. A micropower electric motor plant is being planned for Leninakan.

The newly organized Sevan Performing Mechanisms Plant and Yerevan Electrical Metal-Ceramic Products and Semiconductor Plant should go into operation in 1958. The products of these plants will be used for assembling equipment produced by instrument-making plants. Armpromproyekt [Production Planning Administration of the Armenian SSR?] has already begun planning these plants with the aid of specialized planning organizations in Moscow and Leningrad.

A number of plants and shops, which will go into operation in 1959, are also being planned. A glass fiber, glass yarn, and glass textolite plant is being constructed near the village of Tsakhkunk in Sevanskiy rayon. The glass yarn will be used instead of cotton for insulating cable products. This will save a large quantity of valuable raw materials, which can be used for the production of textiles.

A new shop for the assembly of wrist watches is being organized at the Yerevan Timepiece Plant.

A shop for the production of electric ceramic parts is being organized at the refractory materials plant in Tumanyan. The Yerevan Instrument-Making Plant is being moved to new premises and is being considerably expanded.

All these projects are being carried out by the Ministry of Construction. Although the plan for the past months has been exceeded, the existing rates of construction cannot assure the utilization of a great volume of invested capital. Insufficient basic construction materials are supplied to the buildings under construction.

Although the plan for construction is being fulfilled on an overall basis, the danger exists that the basic funded assets will not be put into operation. For instance, in the construction of the relay plant, the plan for construction and installation work has been exceeded in the residential construction sector and underfulfilled in the industrial construction sector. Thus the plans for putting the first stage of the plant into operation during the third quarter of 1958 are imperiled.

Plant directors and managers of trusts of the Ministry of Construction should insist on the fulfillment of scheduled work without any alterations. Whether or not new construction is begun on schedule depends to a great extent on the planning organizations, which are obliged to supply the necessary technical documents to the construction organizations. -- A. Oksuzyan, chief of the Division of Capital Construction of the Administration of Electrical Engineering Industry, Armenian Sovnarkhoz (Yerevan, Kommunist, 8 Jun 58)

B. Georgian SSR

The electrical engineering and instrument-making industries are two of the latest branches of the national economy to become established in the Georgian SSR. The first large enterprises for the production of electrical equipment and instruments appeared in Tbilisi during the postwar 5-year plans. Within a short time, products of plants such as the Tbilisi Elektropuskatel; and Elekrtoavtomat plants have made a name for themselves in the USSR.

To develop the electrical and instrument industries even further in the Georgian SSR, the Georgian Sovnarkhoz has begun organizing a number of new electrical and instrument plants. These plants will be organized on the basis of freed existing production space and the partial reconstruction, expansion, and re-equipment of the premises involved.

In 1958-1959, 20 electrical and instrument plants, capable of satisfying the Georgian SSR's requirements for instruments, equipment, insulation materials, and other equipment, will be organized.

An electric welding equipment plant will be organized on the base of the Tbilisi Machinery and repair plant of the Ministry of Water Resources Georgian SSR.

A plant for the production of crane electric motors is being organized in Tbilisi on the base of the Tbilsel'mash Plant of the Georgian Sovnarkhoz. In this connection, agricultural machine building will be transferred to the Nefteburmash Plant of the Georgian Sovnarkhoz.

Interesting instruments for determining the composition of matter will be produced by a plant which is being created in Tbilisi on Gardabanskoye shosse, on the basis of an artel of the Gruzpromsovet [Georgian Industrial Council?].

Another interesting enterprise is a plant for the production of micropower electric motors, which is expected to be organized on the basis of a building currently under construction for the haberdashery factory of the Administration of Local Industry of the Executive Committee of the Tbilisi City Soviet.

It is expected that an insulation materials plant will be organized in a building currently under construction on Ksanskaya ulitsa [Tbilisi] for the Gareubanskiy Rayon Industrial Combine.

A plant for the production of industrial jewels from agate will be organized on the basis of the "Gruzsamotsvety: (Georgian Gems) Factory of the Administration of Local Industry of the Tbilisi City Soviet. These jewels will be used extensively at enterprises producing various precision instruments.

The production of submersible pump and electric [oil-well] drills is being organized in Kutaisi on the basis of the Gornyak Machine Building Plant.

Three new enterprises of the electrical engineering and instrument-making industry will be organized in Batumi. It is intended to construct a plant for the production of electric carts. Another plant, also under organization in Batumi, will supply electrical equipment for these electric carts. A plant for the production of consumer electrical appliances will also be constructed in Batumi.

A plant for the production of instruments and automation equipment for the light and food industries is being organized in Sukhumi.

The products of two new enterprises under development in the Yugo-Osetinskaya Autonomous Oblast are of great importance. A plant for the production of electrical vibrating machines is being organized on the basis of the Staliniri Machinery Plant. A plant for the production of enameled wire will be organized in the village of Ksuisi, on the base of the Ksuisi Machine Tractor Station.

A plant for the production of electrical shears will be equipped on the premises of the former Akhalsopeli Machine Tractor Station.

It is expected that a plant for the production of instruments and automation and control equipment for the light and food industries will be organized in the city of Gori, on the basis of the machinery plant at present under construction for the Gorpromkombinat [Gori Industrial Combine].

Two enterprises for the production of electrical equipment for tower cranes are being created in Georgia. One of them is being organized in Kaspi on the basis of the former Kaspi Machine Tractor Station; the other is being set up in Poti on the basis of an enterprises currently under construction for the Gorpromkombinat. It has been resolved to construct a plant for the production of electric machine amplifiers in Poti.

It is expected that a cable products plant will be put into operation in Zestafoni; and that a plant for the production of alkali storage batteries and galvanic battery cells will be organized at the Shorapani station.

It is expected that the production of fluorescent lamps will be organized at the glass container plant currently under construction in the Surami area.

To develop models of the most advanced electrical products and to hasten the creative development of the electrical industry in Georgia, it is planned to create a scientific research institute of the electrical engineering industry with a planning and design bureau in Tbilisi. (Tbilisi, Zarya Vostoka, 11 Jun 58)

C. Moldavian SSR

An electrical measuring instrument and oscillograph plant is being founded in Kishinev. It will be the first of its kind in the Moldavian SSR. The basic shops of this plant will be housed in a four-story building. The first group of workers has returned from training in instrument assembly at enterprises in Moscow.

A huge electrical installation equipment plant is being constructed in Tiraspol'. It will produce instruments for the automatic remote control of electric motors, and will also produce control panels and starting devices. A large part of its production will go to the Kishinev Electrical Machinery Plant imeni Kotovskiy, which will specialize in the production of deepwater electric pumps.

Moldavkabel' is the name of a new enterprise being organized on the base of the Bendery Machinery Plant. By the end of the year, this plant should start producing low-voltage and high-voltage cable and wire of various sizes for illumination and power transmission.

Planning institutes in Moscow, Leningrad, and Kiev did much of the work of planning the new enterprises. The Khar'kov Electrical Machinery Plant provided documents and accessories for the production of electric motors. The Lipetsk Pump Plant trained Moldavian specialists in new methods of pump assembly. (Kishinev, Sovetskaya Moldaviya, 15 Jun 58)

D. Moscow Oblast Sovnarkhoz

Each month, the administrative workers of the Moscow Oblast Sovnarkhoz receive a list of the plants which are lagging in their production. The list is not large, and the enterprises change from list to list. The only name which never fails to appear on each of these lists is that of the Lobnya Electrical Engineering Plant.

This plant has not fulfilled its production assignment for 5 months. Its products, electric phonographs, are refused by consumers because of their poor quality.

During 1957, this plant manufactured only 65,000 of the planned 100,000 electric phonographs, yet consumed materials enough for the total planned number. Besides this, the plant had to pay about one million rubles in fines because of complaints against low-quality products.

However, it appears that the officials of the Administration of the Electrical Engineering Industry and Instrument Building of the Moscow Oblast Sovnarkhoz are hardly alarmed by the fate of the Lobnya plant, although the situation and its causes are well known to all. Naydenov, chief engineer of the administration, headed the former All-Union Electrical Engineering Trust, to which the Lobnya plant was subordinate.

In January, the administration dismissed Podol'nev, director of the plant, for unsatisfactory performance of duty. But the situation has hardly improved under Volkov, new director of the plant. True,

a decision was made in March to temporarily terminate production of electric phonographs and to set up the production of magnetic starters, fuses, and other electrical products by 1 June. This deadline has already passed, and the plant is still not ready to start manufacturing the new products.

The possible reasons for this state of affairs were discussed at a meeting convened late in April by Yeremenko, chief of the administration, and it was determined precisely what must be done for manufacturing the new products in Lobnya.

Pertsov, deputy chief of the administration, was authorized to visit one of the Moscow plants and see to it that the proper materials were supplied to the Lobnya plant. This has not yet been done. Levin, chief of the technical division [of the administration?], was to guarantee the plant [thread] rolling machines, but there is no trace of them as yet.

Terminating the production of phonographs left the plant with a backlog of 900,000 rubles' worth of materials and semifinished products which are no longer needed. Kuznetsov, chief of the Material and Technical Supply Division of the administration, was authorized in April to take the necessary measures [for disposing of the materials?], but nothing has yet been done.

The production qualifications of many of the Lobnya plant workers are low. The plant does not have a single experienced engineer who could be a real production organizer. The Moscow Oblast Sovnarkhoz assigned Rodionov as chief engineer of the plant, but he is a specialist on the textile industry with little knowledge of the electrical engineering industry. Rodionov has not solved a single difficult technical problem in the 9 months he has worked at the plant.

The Lobnya plant does not receive the necessary assistance from the Administration of Capital Construction and Equipment of the Sovnarkhoz (Kossov is deputy chief). SMU-5 [Construction and Installation Administration No 5], which is subordinate to the Moscow Oblast Sovnarkhoz, chronically fails to equip production areas. The plant lacks the most necessary technical and auxiliary services such as boiler facilities laboratories, a tool shop, and storage facilities.

The Krasno-Polyanskiy Rayon, where the Lobnya plant is located, is a significant industrial center of the Moscow area, but the rayon organization fails to assign several experienced engineers, designers, technicians, and other experienced workers to help the lagging plant. (Moscow, Leninskoye Znamya, 24 Jun 58)

III. PHOTOGRAPHIC EQUIPMENT

The [Leningrad] GOMZ [State Optical Machinery Plant] is the producer of the KPT-1 motion-picture projector. (Moscow, Kinomekhanik, Nov 58, p 24)

The Samarkand Kinap Plant has been producing the 10-UDS-1 and 10-UDS-2 motion-picture sound reproduction apparatus since 1955. Recently, it modernized these units and renamed them the 10-UDS-3 and the 10-UDS-4, which it will start mass-producing in 1959.

(Full details on this sound reproduction apparatus are given in the source). (Moscow, Kinomekhanik, Nov 58, pp 29-35)

The Moscow Photographic Accessories Plant, of which Zabegalin is director and Goroshkov is chief engineer, floods the trade network with poor-quality products, yet the Administration of the Metal Processing Industry of the Moscow City Executive Committee, to which it is subordinate, fails even to reprimand the plant. (Moscow, Vechernyaya Moskva, 16 Jun 58)

The Moscow Phonograph Plant has made experimental models of a Lyubitel' 8-mm motion-picture projector and of a 16-mm sound film projector. (Moscow, Tekhnika Molodezhi, May 58, p 24)

The Moscow Phonograph Plant has developed and produced its first group of [163KPL-3] sound motion-picture projectors. These projectors have a two-tube amplifier which uses miniature tubes, and two speakers. (Moscow, Vechernyaya Moskva, 8 Sep 58)

The following prices were quoted in an official prize list for the second 1958 state lottery of the Ukrainian SSR:

Prize	Price in Rubles
Kiev-3a camera	2,200
Zorkiy-2S camera	700
Smena-2 camera	180

(Kiev, Pravda Ukrainy, 10 Sep 58)

IV. RADIO INDUSTRY

A. General

An all-union scientific and technical conference was opened in Moscow on 16 June 1958. This conference will discuss further improvement in the models and production technology of broadcast receivers, television sets, and sound recording and reproducing devices.

The conference, which had 500 participants, was organized by the State Committee for Radioelectronics of the Council of Ministers USSR and the All-Union Industrial Exposition. (Moscow, Pravda, 17 Jun 58)

The Scientific and Technical Society of the Instrument Making Industry held a conference on mechanically controlled electron and ion tubes, at which 220 representatives from various USSR cities were present and 19 lectures and reports were read. Most of the reports concerned mechanically controlled tubes designed for various control and measuring instruments.

Formerly, the radio engineering industry was regarded primarily as a potential supplier of mechanically controlled tubes and apparatus for other branches of the national economy; however, during the course of the conference it was shown that such tubes and apparatus are of importance for use in the radio industry itself.

Mechanically controlled tubes can be used for gauging the linear dimensions of certain parts, such as mica and other dielectric capacitor plates; for the mechanical testing of individual apparatus and instruments produced by the radio industry; for checking the physical properties of materials, especially in the vacuum tube industry; and for many other purposes.

However, the radio industry was criticized at the conference for delaying the experimental and small-series production of several types of mechanically controlled tubes developed by higher educational institutions and scientific laboratories of the USSR. This in turn is delaying the development of this branch of applied electronics.

Participants in the conference thought it wise to ask the Committee for Radioelectronics [of the Council of Ministers USSR] to give concrete support to the development of USSR mechanically controlled tubes.

The conference considered that the most urgent primary measure that should be taken is the organization of the experimental and small-series production of mechanically controlled tubes at one of the Moscow vacuum tube plants. Priority should be given to those tubes developed in the USSR. (Moscow, Radiotekhnika, Sep 58, p 70)

Recently, the development of telephotographic apparatus with open recording and flat scanning for both transmission and receiving has been undertaken in the USSR and in foreign countries.

The FTAP telephotographic apparatus is the first series-produced apparatus of this type. It was developed by the TsNIIS [Central Scientific Research Institute of Communications] in collaboration with the Scientific Research Institute of the Radio Engineering Industry. It has successfully undergone tests in intracity, intraoblast, and main-line communications, and the industry has begun its series production. (Moscow, Vestnik Svyazi, Oct 58, pp 3-4)

B. Prices

The Rostov-na-Donu Base of Posyltorg [All-Union Mail Order Office] of the Ministry of Trade RSFSR will mail the following goods on order from purchasers:

Goods	Price in Rubles
Ural-57 radio phonograph, powered from AC source of 110, 127, or 220 volts	1,064.00
Rekord radio receiver, powered from AC source of 110, 127, or 220 volts	351.00
Strela radio receiver, powered from AC source of 110, 127, or 220 volts	267.00
Rodina-52 radio receiver, complete with batteries and outdoor antenna kit	583.90
Electric meters, 220 volts, 5 amperes	187.00

Prices stated above include packing and shipping costs. -- Advertisement (Yerevan, Kommunist, 9 Sep 58)

The following prices are quoted in an official prize list for the second 1958 state lottery of the Ukrainian SSR:

Prize	Price in Rubles
Start television set	1,950
Avrora radio phonograph	1,100

Prize	Price in Rubles
Daugava radio phonograph	1,100
Rekord radio phonograph	495

(Kiev, Pravda Ukrainy, 10 Sep 58)

The following prices were quoted in an official prize list for the second 1958 state lottery of the Azerbaydzhan SSR:

Prize	Price in Rubles
Temp-3 television set	2,600
Znamya television set	2,500
Rekord television set	1,750

(Baku, Bakinskiy Rabochiy, 11 Sep 58)

The following prices were quoted in an official prize list for the second 1958 state lottery of the Belorussian SSR:

Prize	Price in Rubles
Druzhba radio phonograph	2,300
Minsk-58 radio phonograph	1,300
Rekord radio phonograph	495
Belarus'-4 television set	2,600
Znamya television set	2,500
Temp-3 television set	2,600
Rubin television set	2,800
Rekord television set in varnished cabinet	1,750
Belarus'-57 radio receiver	1,350
Rodina battery radio receiver	405

(Minsk, Sovetskaya Belorussiya, 14 Sep 58)

C. Television

A tubeless television receiver is much smaller than an ordinary set and weighs only 6 kg. The small dimensions and light weight are possible because there is not a single tube in the set except the picture tube. The others have been replaced by transistors. The power input of this set totals 12 watts, as compared with 100 watts for the ordinary set, and it is more dependable in operation, since transistors last considerably longer than tubes.

This new set also has another decided advantage. It is powered by a standard 12-volt battery of the kind used in Volga and Moskvich passenger cars.

A model of this new transistor television receiver was developed by the Moscow Television Laboratory. The diameter of the screen of the picture tube is 180 mm, the same as that of the type KVN television set. Engineers and technicians of the laboratory are currently working on development of a transistor television receiver with a large picture size. (Moscow, Vechernyaya Moskva, 20 Jun 58)

Construction has started in Vil'nyus on a plant for the production of television equipment and television sets. This plant will be the largest of its kind in the Baltic area. The first story of the main production building, with an area of 7,000 square meters, is almost completely equipped. The plant will begin production in the first half of 1959 and will manufacture its first 100,000 television units.

All basic production processes in the manufacture of television units and parts will be fully automated at this plant. When it starts to operate at full capacity in 1965, it will be producing 40,000 [sic] television sets and more than one million various television units per year. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 27 Jun 58)

A standard medium-power television and ultrashort-wave radio station developed in the USSR in 1951-1953 required a total floor space of 110 sq m, of which the space occupied by the equipment amounted to 20.5 sq m. The total frontage of all cabinets and units was 20.5 meters; the total operational efficiency of the video transmitter for the transmission of a solid black field amounted to about 11 percent.

A station of the same power just developed by USSR industry requires only 30 sq m of floor space, of which the equipment occupies 6 sq m; the total frontage of the equipment is 7 meters, and the industrial efficiency is 16-17 percent. (Moscow, Elektrosvyaz, Oct 58, p 36)

The USSR vacuum tube industry has developed new television transmitting tubes, the, LI101 and LI202, which are superior to the currently used LI7 and LI17 tubes.

The LI101 tube (1) will be used for studio broadcasts. It has more even background light and requires less studio lighting than the currently employed L17 tube.

The LI201 tube (2) is designed for extrastudio broadcasts of standard television centers and studio and extrastudio broadcasts of small television stations. In addition, it will be used for color television broadcasting.

(Source gives additional information on these two tubes.) (Moscow, Vestnik Svyazi, Oct 58, p 5)

(1) Photo available in source, p 5, bottom.

(2) Photo available in source, p 5, top.

D. Color Television

Addressing the 11th research commission of the International Consultative Committee for Radio (MKKR), recently convened in Moscow, S. V. Novakovskiy, a leader in the development of color television, reported that early in 1959, after the first color television sets have been manufactured, experimental broadcasts from a new color television studio will begin. He added that after enough data have been gathered technical standards will be established and extensive use of color television will begin. (Moscow, Sovetskaya Rossiya, 12 Jun 58)

The average Moscow television viewer is no longer entirely satisfied with the black-and-while image produced by his set. He is looking forward to television broadcasts in color, such as are already available to viewers in the US.

But they are also available to us. Yesterday we witnessed a color television broadcast in the Scientific Research Institute of the Ministry of Communications USSR. It consisted of a public review of the work of the institute in color.

It was given in the conference hall where there were two projection screens 1200x900 mm in size. The screens were illuminated with the colors red, blue, and green. Color slides, excerpts from motion-picture film on the Youth Festival, and views of artists from the laboratory studio were shown.

According to A. D. Fortushenko, chief of the institute, a number of scientific research organizations, plant laboratories, and design bureaus are working on various problems of the technology of color television and are designing the necessary equipment. His own institute has worked out several variants of color television systems. In all of these, the color broadcasts can be received on ordinary sets, but only in black and white, of course.

Laboratories of the institute have designed a studio camera with four lenses, a device with a scanning beam for transmitting slides and motion pictures, video channel equipment, projection-type color units, and special measuring equipment.

The technical problems of color television have already been solved and it is now up to industry to start production of the necessary equipment. The manufacture of this equipment is still a very complex problem.

When asked when color television broadcasts could be expected in Moscow, S. V. Novakovskiy, chief of the television laboratory, replied that experimental broadcasts would start from a central studio at the beginning of the new year. The broadcasting equipment is being developed in Leningrad and the receiving equipment will be made in Moscow. Laboratory studios of the institute are already putting on color television broadcasts. (Moscow, Moskovskaya Pravda, 12 Jun 58)

Workers of the All-Union Scientific Research Institute of Television in Leningrad have for several years studied the various possible systems for color television. They have developed and tested a laboratory model and are currently engaged in the design and manufacture of one of the first color television centers.

Yesterday, the institute demonstrated a full complement of television equipment to the Leningrad Scientific and Technical Society. This equipment included transmitting devices which permit color transmission of the same full programs as those currently broadcast in black and white, such as full-sized [35-mm ?] motion pictures, [live] shows, stationary color images, transparencies, and drawings on opaque bases.

Also demonstrated were models of television receivers made on an experimental basis by the institute. These were made entirely of domestically manufactured components.

The production of an experimental model of a color television center was started on 1 July. It will be set up in Moscow at the end of 1958 and will go into operation early in 1959.

The Moscow Electric Bulb Plant and the Leningrad Plant imeni Kozitskiy will soon begin series production of color television receivers. (Leningrad, Leningradskaya Pravda, 27 Jul 58)

E. Radios and Combination Sets

The Rodina-58 battery-powered radio has 3 crystal diodes, 5 transistors, and 3 miniature tubes. Input power has been reduced from 1.4 watts for the previous model (Rodina-52) to 0.7-0.9 watt for the Rodina-58.

The tubes are used for radio-frequency amplification. The audio circuit is based on four transistors; two of these (type P6V) serve as first amplifier, and the other two (type P6G) serve as final amplifier. A type D2Ye diode serves as a detector. The tube anode circuits are fed through a voltage converter which has a transistor and two crystal diodes.

The power supply for the tube filament circuits comes from two 1,ZNVMTs-150 battery cells hooked up in parallel. Four more of these cells, hooked up in series, supply the power for the anode circuits of the tubes and semiconductors. This set of two batteries is good for 1,200 hours of operation (the older set of batteries lasted only 1,000 hours despite its greater weight). The new set costs 50 rubles, whereas the older set cost 80 rubles.

There is no high-voltage battery required to feed the anode circuits of the Rodina-58.

The first group of Rodina-58 battery radios will be produced in 1958. The tentative price is 475 rubles. (Moscow, Novyye Tovary No 10, 1958, p 4)

The Oktava-58 radio and the Oktava-58 radio-phonograph both have five wavebands, internal directional magnetic antennas for the long and medium wavebands, internal antennas for the ultrashort wave band, keyboard tuning, tuning eyes, automatic volume control, and dual tone controls.

Both sets have four speakers. Two of these are type 2-GD-3 wideband speakers mounted on the front wall of the cabinet, and the other two are type 1-GD-9 high-frequency elliptical speakers mounted on the sides of the cabinet. The universal record player of the radio-phonograph has two speeds (33 1/3 and 78 rpm) with semiautomatic starting and automatic stopping.

The piezoceramic pickup arm of the record player has two interchangeable permanent sapphire needles for playing both standard and long-playing records.

These two sets are distinguished from previous models by the use of printed circuits for the intermediate and audio-frequency systems, by supplying a constant voltage to the filaments of the 6Kh2P and 6N2P tubes to reduce the noise level of the entire circuit, by a separate control for the intermediate-frequency circuit, and by improved designs of the magnetic antenna cutout and other units.

These changes have improved the electrical and acoustical parameters of the radio receiver [of both sets], which are now 1.5-2 times as great as the established technical specifications for radio receivers of this class.

The tentative price of the radio receiver is 900 rubles, and of the radio-phonograph, 1,500 rubles. (Moscow, Novyye Tovary No 10, 1958, p 2)

The Riga VEF Electrical Engineering Plant has developed the new 14-tube Topaz radio-phonograph. The radio of this set will receive broadcasts in the long, medium, short, and ultrashort wavebands. The short waveband is divided into four spreadbands.

The set has a two-channel audio amplifier with a lower-frequency channel output power of 6 watts and a higher-frequency channel output power of 3 watts. The nondirectional acoustical system has six speakers.

The main control functions of the Topaz can be performed by remote control.

The radio receiver has an input power of 210 watts, and the phonograph has an input power of 230 watts. (Moscow, Vestnik Svyazi, Oct 58, inside front cover)

The first group of new Kristall-104 combination television-radio-phonograph-tape recorders has recently been produced. This combination set receives broadcasts in the long, medium, short, and ultrashort wavebands.

The screen area of the 53LK2B picture tube of the Rubin-102 television set measures 34 x 45 cm and is located in the left side of the Kristall-104 cabinet. A Lyuks radio receiver, an El'fa-10 double-track tape recorder, and a universal record player are in the right side of the cabinet.

The acoustical system of the Kristall-104 consists of a powerful two-channel amplifier and nine speakers, two of which are removable. The set has 36 tubes and 18 semiconductor diodes. It can be powered from any AC source of 110, 127, or 220 volts. The input power for the tape recorder is 140 watts; for the television set, 230 watts; for the radio or phonograph, 160 watts; for the television and tape recorder together, 290 watts; and for the radio and tape recorder together, 200 watts.

The television is equipped with remote control of image brightness and sound.

The Kristall-104 weighs 130 kg and measures 1,120 x 935 x 575 mm. The price is 13,000 rubles. (Moscow, Novyye Tovary, No 10, 1958, p 3)

The radio engineering industry has developed a compact TU-100M wired radio amplifier. This amplifier, which uses miniature tubes, includes a Class 1 radio receiver and a universal record player.

It is intended for use in settled areas, parks, stadiums, trains, ships, etc.

Output power of the TU-100M is 100 watts. It may be powered from any AC source of 110, 127, or 220 volts. Input power is 0.5 kw. (Moscow, Vestnik Svyazi, Oct 58, inside front cover)

New economical, remotely controlled and automated apparatus is needed for rural radiofication. However, certain sovnarkhozes and radio engineering enterprises are delaying the production of this badly needed equipment. For example, the Riga VEF Plant of the Latvian Sovnarkhoz refuses to organize the production of the SVR-ADU remote-control equipment for rural wired-radio units, although it developed this equipment itself. For 2 years the Riga Diesel Plant has failed to begin the development of automatically-controlled diesels for power supply systems used in radiofication. Neither the proper administrations of Gosplan USSR nor those of the gosplans of union republics are giving any real help to communications organs in placing orders for radiofication equipment at industrial enterprises.

The State Committee for Radioelectronics also bypasses these vital questions, although it is supposed to be in charge of implementing new technology. Despite numerous requests from the Ministry of Communications, the committee has not organized the development of a low-cost economical transistor radio receiver, which is needed in remote and mountainous areas where wired-radio installation is not feasible. (Moscow, Radio, Oct 58, p 8)

V. INSTRUMENTS

A. General

The matter of standardization and unification in instrument-making enterprises, which were formerly under the Ministry of Instrument Making and Automation Equipment, is chaotic. The designer is free to select the design elements of instruments, which gives rise to an unwarranted diversity of instrument sizes and designs and necessitates a large number of tools for instrument production.

Electronic recording instruments produced by the [Moscow] Komega Plant and the [Moscow] Energopribor Plant are designed differently and have a different cost. However, they have the same purpose and identical technical specifications. They differ because one was designed and produced by a plant under the Ministry of Electric Power Stations USSR and the other by a plant under the former Ministry of Heavy Machine Building.

The Moscow Manometr Plant produces type EMD electronic bridges. The Chelyabinsk Metallurgical Plant produces the same type of bridges. They have the same technical specifications, but are quite different in shape and size. This complicates installation and the production of control panels.

Various type-sizes of resistance thermometers and thermocouples are used extensively in Soviet industry. Many of them are installed with the aid of connecting pipes. However, there is no uniformity in the types of threads that are used and as a result installation is made needlessly difficult.

The [Leningrad] Elektropul't Plant, the [Tallin] Il'marine Plant, and the Ufa Low Voltage Electrical Equipment Plant have produced types KF, KV, and UP control keys. They vary in shape and size, but perform the same functions. It will be possible to reduce electrical keys to two designs after unification.

The Tomsk Manometr Plant has designed and produced level relays (35,000 units per year) with specifications at variance with those prescribed by GOST [State All-Union Standard]. Hence the consumer must produce his own nonstandard flanges to assemble the relays.

The above examples attest to the fact that the instrument-making industry is below the level of unification and standardization attained by other branches of industry.

The absence of a single blueprinting system for instrument-making plants frustrates the development of specialized production and the efforts of enterprises to exchange experience. Sometimes a plant spends several months reworking blueprints for a new type of instrument so that they will conform to the plant's system.

SKBSN (Special Design Bureau of Standardization and Normalization) for the production of instruments was established in February 1957. It is engaged now in the selection, classification, and analysis of various plants' standards. SKBSN plans to give special attention to the unification of potentiometers, bridges, gas analyzers, regulators, and actuating mechanisms.

Obviously, unification and standardization demand a great deal of effort. Within 2-3 years, it will be necessary to develop approximately 1,500 departmental standards (normal'), 800 design guide, and 100-150 standards. Hence SKBSN must be assured qualified personnel and a production-experimental base. The following organizations will also play an important part in departmental standardization: OBOSN (basic branch divisions of standardization and normalization), NIISchetmash [Scientific Research Institute of Computor Machine Building], NIITeplopribor [Scientific Research Institute of Thermal Power Engineering Instrument Building], VNITIPribor [All-Union Scientific Research Technological Institute of Instrument Making], and TsNIIKA [Central Scientific Research Institute of Over-All Automation]. (Moscow, Priborostroyeniye, Dec 57)

A unified multicomponent pneumatic system (AUS) of instruments and regulators based on the unit-type principle was developed in 1952-53 by NIITeplopribor [Scientific Research Institute of Thermal Power Engineering Instrument Building] in conjunction with IAT (Institute of Automatics and Telemechanics) of the Academy of Sciences USSR.

The [Moscow] Tizpribor Plant of the Moscow City Sovnarkhoz has begun the series production of all 22 modifications of instruments and units of the system.

In addition, IAT, on the basis of a regulator of the system, has developed a ratio regulator with a wide range of settings of rated ratio value. The rated ratio value can be changed or corrected to a third value by remote control.

ResearchbyNIITeplopribor in the field of pneumatic automation equipment has led to the production of secondary recording, indicator, and registering instruments and small-sized regulators. The group of small pneumatic instruments and regulators developed by NIITeplopribor includes 13 types of instruments and units. Included in this group are the following:

1. Three modifications of secondary recording instruments.

2. Two modifications of secondary indicator instruments.

3. A secondary indicator instrument for totaling the flow of liquids, steam, and gases.

4. A regulator and preliminary unit.

5. Two modifications of programming devices.

6. Mathematical devices for totaling the relay and correlation relay.

7. An alarm relay. (Moscow, Priborostroyeniye, Dec 57, p 1)

The UIM-21 universal microscope produced by a Leningrad plant and the large BP projector produced by a Novosibirsk Plant are well-designed instruments that are handy to use. The series production of these instruments shows how highly proficient the workers of the two plants are. Nevertheless, both have defects which are detrimental to their working accuracy.

(Source lists defects in the instruments and suggests changes that can be made.) (Moscow, Izmeritel'naya Tekhnika, No 4, Jul-Aug 58, pp 93-94)

B. Research and Development

There is too much of a gap between the time new instruments are developed and the time that they are put into series production. In recent years, experimental models of a number of instruments for measuring pressure and rarefaction, level, density, and thickness; and instruments based on the utilization of radioactive isotopes and ultrasonics, which have the advantage of measuring parameters without touching the measured object with the measuring element, have been developed and produced. However, practically none of these instruments has been put into series production.

Many instruments and much automation equipment necessary for the automation of industrial processes have not been put into production by the instrument-making industry. These include instruments for measuring high vacuums; instruments for measuring combustible and aggressive viscous substances; compensation instruments for measuring pressure and pressure difference; long-submersion thermocouples for measuring the temperature of molten steel; instruments for the measurement and automatic regulation of the concentration of hydrogen ions (pH meters) with a precision from 0.01 to 0.05 pH; and concentration meters for the measurement and automatic regulation of the concentrations of multicomponent solutions, salts, acids, and alkalis. The series production of miniature secondary registering and regulating instruments has not been organized.

There should be better coordination between the many design bureaus and scientific research institutes in order to cut down the time elapsing between the creation of an experimental model of an instrument and the initiation of its series production.

Three organizations, NIITeplopribor [Scientific Research Institute of Thermal Power Engineering Instrument Making], the Khar'kov KIP [Control and Measuring Instrument] Plant, and the [Moscow] Tizpribor Plant are developing new designs of compensation-type differential manometers. This work is not coordinated by anyone, although the KIP Plant has surpassed the other organizations in the development of more advanced differential manometers with temperature and pressure correction. If the efforts of these three organizations were joined, industry could receive compensation-type differential manometers in a much shorter time.

The instrument-making industry should pay particular attention to the quality and reliability of control and measuring instruments. Checks made by the Committee for Standards, Measures, and Measuring Instruments have disclosed that some poor-quality instruments have been produced. A large part of the manometers produced in recent years by the Tomsk Manometer Plant go out of operation after 3 months of operation, although they are supposed to operate at least 3-5 years. Panel electrical measuring instruments made by the Krasnodar ZIP Plant are not suitable for operation where even slightly aggressive substances are present and quickly disintegrate in operation at chemical enterprises and galvanizing shops.

One reason for poor-quality instruments is the low quality of materials used for making them, especially those materials used for the sensitive elements. The low capacity of special design bureaus engaged in the development of instruments is another reason. The quality of the materials used for making instruments, such as precision alloys and high-purity alloys and metals, are extremely important for the quality of the instruments themselves. (Moscow, Izmeritel'naya Tekhnika, No 4, Jul-Aug 58, pp 3-4)

The USSR production of instruments in 1957 was 5.2 times as great as in 1950. This figure does no include special branches of instrument making. Despite this sharp growth, the USSR instrument making industry fails to fully satisfy the growing needs of the national economy. The 20th Congress of the CPSU forecast that the production of instruments would be 3.5 times as great as at present, and that 32 new instrument plants would be built [by 1965?].

The most important tasks of the instrument-making industry in the coming years are the development and production of standard sets of transmitters with standard output signals, the expansion of the products list and ranges of measured quantities, and an increase in the reliability and accuracy of measurements.

In the automation of many industrial processes, precision control and regulation of flow and quantity of liquid and gaseous substances are necessary. For automating blast-furnace operations, transmitters for regulating the blast rate with corrections for temperature and pressure are needed. In open-hearth production, the flow of resins, generator gas, and hydrogen must be controlled. The chemical, petroleum, and food industries need precision instruments for measuring amounts of liquid.

The instrument-making industry is being given the task of producing standard sets of rotameters (variable-area flowmeters), volume meters, and high-precision differential manometers for various operating conditions, both for giving readings and for transmitting signals for regulation purposes.

The range and accuracy (to 0.2-0.5 percent) of instruments for measuring pressure and vacuum have to be raised. The production of instruments for measuring extra-high pressures up to 100,000 kg/sq cm and vacuums up to 10^{-9} mm of the mercury column must be undertaken. The development and production of standard sets of instruments for measuring pressure, vacuum, and flow, based on compensation methods of measurement should be undertaken to increase accuracy.

To automate oil refineries and synthetic fatty acid plants currently under construction, new instruments are already needed in 1958. These include volume flowmeters with flow pipe diameters of 80, 150, and 250 mm. At present, the instrument-making industry is producing such instruments with pipe diameters of only 40 mm.

Instruments for measuring temperature are produced in very few modifications in the USSR, and sometimes have insufficient range and accuracy. Thus, they cannot be used for controlling the temperature of certain industrial processes with the proper reliability and accuracy. For example, in the automation of smelthing operations, transmitters for the continuous measurement of furnace bonnet, flame, combustion products, and molten metal temperatures are needed.

In the next few years, the instrument-making industry is faced with the task of developing and producing a number of instruments based on various measuring methods for measuring temperatures ranging from minus 200 to plus 6,000 degrees centigrade. The accuracy and range of thermocouples, resistance thermometers, and manometric thermometers should be increased. Thermocouples for prolonged and frequent submersion in the measurement of the temperature of molten metal should be developed and put into production.

To solve these problems, metallurgical enterprises should supply new high-quality thermoelectrode materials and materials for protective cases to the instrument-making industry. Scientific research and design organizations are obliged to develop new principles of measuring high temperatures, such as the use of semiconductor elements and the employment of radioactive, ultrasonic, and other radiation.

Analytical instruments for determining the composition and properties of substances are very important in the automation of industrial processes. Recently, there has been an increasing trend away from controlling production processes by indirect parameters such as temperature, pressure, and flow, to the automatic conduct of processes to the most economically feasible operating schedules through the direct use of data on the composition and properties of the finished product. Thus, analytic instruments are most useful in the chemical, petroleum, hydrolysis, coke-chemical, and other branches of industry.

However, at present the USSR does not have the necessary equipment for measuring the composition and properties of substances. For this reason, in chemical enterprises alone, more than 20,000 laboratory workers are engaged in taking samples and making analyses manually.

Consequently, the instrument industry has the task of developing large-scale scientific research and experimental design work in developing a wide range of types of instruments for the analysis of the composition of both gaseous and liquid substances, based on methods already used in industry, such as thermoconductivity, thermal effect of combustion, optical-acoustical, thermochemical, magnetic, and other methods. At the same time, work should be done on the development of industrial instruments for the automatic analysis of the composition of substances based on known laboratory analysis methods: photocolorimetry, refractometry, mass spectrometry, chromatography, and the use of magnetic nuclear resonance.

During the coming Seven-Year Plan, the instrument-making industry should master the production of industrial and laboratory instruments and transmitters for checking salinity, the concentration of solutions, the viscosity and density of substances, the moisture content of various gases, and solid and friable bodies for many varied industrial conditions. It is necessary to expand the range and accuracy of instruments for determining the concentration of hydrogen ions and to develop simple instruments for determining soil acidity.

In the USSR, as well as in the rest of the world, instrument-making and automation equipment development is following the trend of designing of standard units and components.

The SKTB-BFA (Independent Design And Technological Bureau for Biophysiological Apparatus) and the Scientific Research Institute of Computer Machine Building are working successfully on the development of an installation for the automatic group registration of measurements in an automatic system which signals when any value deviates from the norm. This installation should be finished as soon as possible, and the enterprises of the Moscow City Sovnarkhoz should begin its production.

In the next few years, it is necessary to develop and produce standard sets of electrical, pneumatic, and hydraulic performing mechanisms. The Special Design Bureau for Automatics in Kirovakan, Armenian SSR, should accelerate the development of standard sets of electrical performing mechanisms. The Chuvashskiy Sovnarkhoz should accelerate the organization of the production of these mechanisms at the Cheboksary Peforming Mechanisms Plant.

It is estimated that the production of telemechanization equipment will be increased to 10-12 times the present level by 1965. This will entail a considerable amount of research and experimental design work in the development of basic products list for telemechanical equipment. It is important that all efforts in this direction be coordinated, preferably by the Central Scientific Research Institute of Over-All Automation.

The instrument-making industry should pay more attention to improving the quality and reliability of the instruments it produces. For example, the Tomsk Manometer Plant and the Kazan' Teplokontrol' Plant produce manometers, manometric thermometers, and direct action regulators having service lives of 6-10 months.

(Source gives details on several aspects of USSR instrument making and some information on computer development). (Moscow, Planovoye Khozyaystvo, Aug 58, pp 29-39)

C. Electrical Instruments

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

NKF-110-57 single-phase oil-filled voltage transformer produced by the Moscow Transformer Plant, Moscow City Sovnarkhoz.

R6 multirange shunt for the R2/1 potentiometer, N375 moving-coil panel recorder DC ammeters and voltmeters; N376 ferrodynamic panel recorder AC ammeters and voltmeters; N377 panel ferrodynamic recorder AC wattmeters, and N378 panel detector recorder frequency meters -- all produced by the Krasnodar ZIP Plant of the Krasnodarskiy Sovnarkhoz.

MSR-55 decade resistance box, produced by the L'vov Teplokontrol' Plant.

SP-7 thermometers for checking the temperature of meat, produced by the Klin Thermometer Plant.

DM-6 diaphragm differential manometer with an" epid" differential transformer secondary instrument, produced by the Moscow Manometr Plant.

N360 portable recorder AC/DC voltamperemeter, N360A portable recorder DC voltamperemeter, and D346 single-phase panel phase meters -- all produced by the Krasnodar ZIP Plant.

A-10 truck scales produced by the [Armavir] Armalit Plant of the Krasnodarskiy Sovnarkhoz.

VPG-2M mobile weight-type platform scales, produced by the Armalit Plant.

R330 low-ohm, two-range, DC potientometer; and N382 panel single-phase recorder phase meter, produced by the Krasnodar ZIP Plant. (Moscow, Izmeritel'naya Tekhnika, No 5, 1958, p 95)

Much work on the improvement of existing electric meters and the development of new meters is going on in the USSR.

The SO meter and the later SO-1 meter were very simple to manufacture, but were deficient in many respects and low in quality.

The type SO-2 meter, which was put into production in 1956 and is still in production, was an improvement over the SO-1, but still has certain deficiencies.

The type SO-42, which was developed by the Mytishchi Electric Meter Plant, recently passed state testing. Most of the deficiencies of the SO-2 have been eliminated.

(Source gives further details on USSR and foreign-made electric meters). (Moscow, Izmeritel'naya Tekhnika, No 5, Sep-Oct 58, pp 86-90)

The Ts-21 ampere-volt-ohmmeter (3), which has been prepared for production, is designed for measuring AC and DC voltage and DC wattage, and resistance. A type M-494 microammeter is used as a measuring device in this instrument. The wide measuring ranges of the instrument are achieved by the use of shunts and supplementary resistors installed in its case. A copper-oxide valve rectifier is used for converting AC into DC.

The instrument has three scales: for resistance, for AC voltage, and for DC wattage and voltage. A rheostat is used for zero-setting. The power sources of the instrument are in a special compartment of the case. It operates in a horizontal position, measures 208 x 118 x 75 mm, and weighs about 1.3 kg. (Moscow, Novyye Tovary, No 7, 1958, p 9)

(3) Photo available in source, p 9, top.

The Leningrad Analytical Instrument Plant recently began the production of mass spectrometers. Very high precision is required to manufacture these instruments. Here one must deal with currents down to trillionths [of an ampere?].

One such mass spectrometer (4) made by the plant consists of more than 2,000 parts assembled in 22 units. About 200 vacuum tubes are used in it. It can determine the isotopic content of matter, whether liquid, solid, or gaseous, for various research purposes in nuclear and atomic physics, analytical chemistry, and geochemistry.

Several such instruments are adjusted simultaneously in the plant's assembly shop. Once they are adjusted, they are ready for shipment. Some will be sent to China, Czechoslovakia, Rumania, the United Arab Republic, and Poland. Others will be sent to scientific research institutes of the Academy of Sciences USSR.

Some time ago, the plant mastered the production of the 1301 mass spectrometer for determining the isotopic content of gases: a year later, it began assemblying a new universal instrument for the isotopic analysis of gases, liquids, and solids. The plant's design bureau is developing a mass spectrometer for the chemical analysis of matter. An extra-high precision gas analyzer capable of trapping microconcentrations of oxygen in ethylene is being developed specially for the Leningrad Okhta Chemical Combine. Another new instrument will be used in the production of synthetic rubber.

M. D. Shutov is chief engineer of the plant design bureau. (Leningrad, Leningradskaya Pravda, 13 Jun 58)

(4) Photo available in source, p 4, left.

The Riga Gidrometpribor Plant has started series production of a new device for measuring the moisture content of soils in the field. This device consists of a set of transmitters and a megohmmeter. The transmitters consist of two carbon plates to which a wire has been soldered, and these are lowered into the soil to depths of 10-100 cm.

The first of these devices have been sent to scientific research institutions in Moscow, Kiev, Minsk, Alma-Ata, and other cities. (Vil'nyus, Sovetskaya Litva, 18 Jun 58)

The Leningrad Geofizika Plant is the producer of the OT-24-51 oscillograph. (Moscow Izmeritel'naya Tekhnika, Apr 58, p 32)

D. Industrial Instruments

The Tallin Measuring Instrument Plant has developed a heat measuring instrument utilizing a dilatometric differential thermometer. It is designed for measuring the amount of heat in water heating systems. It is superior to similar instruments produced abroad. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 13 Jun 58)

A microsecond meter for testing concrete has been developed by Leningrad engineers A. S. Durasov and N. A. Krylov. This meter has a special sound wave receiver and a complex acoustical impulse emitter. The emitter and receiver are placed tight against the concrete, and within 30-40 seconds a full characteristic curve of its stability and uniformity are received.

Production tests of this new device have indicated that it is considerably superior to ultrasonic and impulse-type devices used in other fields of industry in the USSR and abroad. (Riga, Sovetskaya Latviya, 24 Jun 58)

B. V. Bochkarev is director of the Leningrad Lenpribor Plant.

Under the direction of M. B. Ioffe, chief designer, the plant has developed and manufactured a UGN-1 "revolution counter" (schetchik oborotov) instrument for determining the depth at which samples are taken in oil-well drilling operations. This instrument can also be used to measure the depth of oceans and determining the profile of the bottom. It is also used in the textile industry to compute the amount of finished cloth. By adding an electric pulse mechanism to it, this instrument may also be used for counting sheets of paper in the publishing business.

With several modifications, which result in its being called a "cable counter" (schetchik kabelya), this instrument can be used to advantage in the winding of coils.

The Lenpribor plant recently was the first in the USSR to manufacture a fluid meter for measuring the amount of alkali in the processing of synthetic fibers.

The P-1 productivity meter automatically measures the clearance between the rollers of a rolling mill and keeps close track of the thickness of the metal being rolled. (Leningrad, Leningradskaya Pravda, 27 Jun 58)

I am writing to inform the editors that the measures described in an article entitled "Set up Production of Radioactive Instruments" which was published in Sovetskaya Latviya [date of publication not

given] are being carried out. A special commission of the Latvian Sovnarkhoz is currently examining plants where it is possible to use radioactive isotopes in installations for automating production processes.

The commission will soon finish its work and the Technical and Economic Council of the sovnarkhoz will announce the results. The question of organizing small-series production of radioactive instruments at one of the enterprises of the Latvian Sovnarkhoz will also be reviewed.

A design group organized at the Riga Avtoelektropribor Plant in 1958 has already developed several designs of apparatus for automating production processes with the aid of radioactive isotopes, and some of these have been introduced into production.

It is planned to increase the number of workers in the design group. -- N. Pukhal'skiy, chief of the Production and Technical Division, Latvian Sovnarkhoz (Riga, Sovetskaya Latviya, 27 Jun 58)

The Institute of Automatics of Gosplan Ukrainian SSR has developed an experimental model of a small-sized neutron generator for controlling the chemical composition of complex substances during industrial processing.

It is planned to start production in 1959 of an experimental group of neutron generators for scientific institutions and industrial enterprises. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 27 Jun 58)

The Moscow Kalibr Plant has produced the Model KPR-4B automatic (5) for checking pistons of ZIL vehicles. It has increased the productivity of checking operations to 4-5 times the formed amount. Partial specifications are as follows:

Work cycle	3.6 seconds
Productivity	1,000 units/hr
Weight of automatic	1,700 kg

(Moscow, Mashinostroitel', Oct 58, pp 40-41)

(5) Photo available in source, p 40, right.

The Moscow Kalibr Plant has produced the Model ASR-3 automatic (6) for checking and sorting tapered bearing rollers. The diameter and taper of the bearing rollers are measured simultaneously. Its productivity is 3,600 units per hour. Partial specifications are as follows:

Diameter of workpiece	10-20 mm
Length of workpiece	15-42 mm
Weight of automatic	1,200 kg

(Moscow, Mashinostroitel', Oct 58, p 40)

(6) Photo available in source, p 40, left.

The [Moscow] Frezer Plant has produced a feeler-type profilograph-profilometer (7), which is a stationary, highly sensitive, inductive instrument. This instrument has greater vertical magnification than analogous foreign models. It is also more precise than similar instruments manufactured outside the USSR. Partial specifications are as follows:

Range of measurement (classes of finish in accordance with GOST 2789-51)	
Registering on tape	5-14
Indicating instrument	6-12
% of error	
Indicating instrument	Plus or minus 10
Vertical magnification	Plus or minus 4
Tracing speeds	
Registering on tape	0.1, 0.2, 0.4, 0.8 mm/min
Visual reading	0.5 mm/sec
Magnification [times]	
Vertical direction	2,000-120,000
Horizontal direction	60-4,200

(Moscow, Mashinostroitel', Oct 58, p 41)

(7) Photo available in source, p 41, left.

The group for the control of dimensions and quality of rolled metal of the Central Laboratory of Automatics has developed a device (8) for measuring the thickness of rolled steel. The introduction of this device at the Leningrad Steel-Rolling Plant alone will save more than 700,000 rubles per year. (Moscow, Komsomol'skaya Pravda, 14 Jun 58)

(8) Photo showing part of the measuring device available in source, p 2, top.

E. Scales

The following table gives an approximate idea of the number of weighing devices used in agriculture:

Scales	No	Cost in Rubles	
		Each	Total
Truck	30,000	1,000	30,000,000
Freight	280,000	100	28,000,000
Livestock	15,000	400	6,000,000
Table	280,000	40	11,200,000
Industrial	60,000	80	4,800,000
Other	6,000	300	1,800,000
Weights	7,000,000	2	14,000,000
Total		--	95,800,000

The enterprises of certain sovnarkhozes should give aid to the repair brigades of RTS [Equipment Repair Stations] in providing model instruments and spare parts for the repair of scales. For example, the Stavropol' Scales Repair Plant could supply Class 3 scales and weights to RTS. The Odessa Plant imeni P. Starostin could produce Class 2 scales with capacities up to one ton, and Class 3 weights of up to 500 kg for RTS. The L'vov Motor Vehicle Plant could produce a series of lift trucks based on the ZIL-151 developed by the All-Union Scientific Research Institute of the Committee for Standards, Measures, and Measuring Instruments. These trucks would be used for transporting weights. The Kokchetav and Armavir scales plants should supply spare parts for truck and freight scales to RTS. The Moscow and Chelyabinsk scales plants should supply parts for table scales to RTS.

Two or three trade schools for teaching the repair of scales should be organized, preferably in Armavir and Kokchetav, where there are large scales plants producing truck and freight scales used in agriculture. (Moscow, Izmeritel'naya Tekhnika, No 4, Jul-Aug 58, pp 8-9)

The Leningrad Gosmetr Plant has produced analytical microscales for weighing precious metals with a precision to one hundreth of a milligram. The new scales are equipped with semiautomatic and mechanical devices. Formerly it took 2 minutes to take a reading while weighing metal; now it takes only 20-25 seconds. After weighing, the scales stop and give the necessary reading. Adjustment, removal of miniature weights, and other operations are performed mechanically. (Moscow, Komsomol'skaya Pravda, 13 Jun 58)

The Leningrad Gosmetr Plant is the producer of the type VA-200 Balanced arm analytic scales. (Moscow, Izmeritel'naya Tekhnika, No 5, Sep-Oct 58, p 24)

F. Industrial Exposition

The following instruments were among those displayed at the 1958 All-Union Industrial Exposition in Moscow:

4RB-32A regulating unit; BP-28V lead unit; PS-37A signal relay; BS-34A summing relay; RS-33A ratio relay; TSD-35A and TSD-36A programers; SP-1 signal indicator; PPE-6 electropneumatic converter; and types 1RL-29; 2RL-29B, 3RL-29V, 1MP-30A, and 2MP-30V secondary recorder and indicator instruments -- all components of new regulating apparatus produced by the Moscow Tizpribor Plant.

BRU-11 and BRU-21 contactless regulating units, produced by the Chelyabinsk Teplopribor Plant.

EPP and EMP series-produced instruments utilizing the type SIP-01 pulse cutout for expanding their range of use in regulating systems.

The DTV-018 temperature transmitter used for the contact measurement of smooth rotating rollers.

TPP-2Zh spring type pneumatic thermometers, produced by the [Kazan'] Teplokontrol' Plant of the Tatarskiy Sovnarkhoz.

MPShchPl-54 pyrometric millivoltmeter and MPP-254 portable pyrometric millivoltmeter, produced by the Yerevan Instrument Plant of the Armenian Sovnarkhoz.

EMDS-26 automatic electronic multipoint indicating and signaling bridge, produced by the Moscow Manometr Plant in place of the EMDS-23 bridge.

Type MTI Class 0.5 manometers for high-precision measurements and other instruments, made by the Moscow Manometr Plant.

Self-recording electronic bridges and potentiometers with tape diaphragms and single and multiple point indicating instruments with rotating scales produced by the L'vov Instrument Plant have replaced the same types of instruments made by the GSOKB [State All-Union Special Design Bureau].

Electronic boiler-regulating units, produced by the [Moscow] Komega Plant.

A set of automatic regulators for the boiler shop of a Thermal Electric Power Station, produced by the [Moscow] Energopribor Plant.

(Source gives further information on these and other instruments displayed at the exposition, along with illustrations). (Moscow, Priborostroyeniye, Sep 58, pp 24-27)

The new ZRT-454 telescope is on display in the optical equipment division of the Machine Building Pavilion of the All-Union Industrial Exposition. This instrument is for viewing objects no closer than 35 meters from the viewer, and can also be used for astronomical studies, viewing sports events, etc. The telescope has interchangeable eyepieces which permit 25-, 50-, and 100-power viewing. (Moscow, Vechernyaya Moskva, 16 Jun 58)

VI. ELECTRICAL PRODUCTS

A. General

The Serpukhov [Kondensator] Plant produces power capacitors, which are in great demand in the electrical and power engineering industries. The plant is doing all it can to increase production and improve quality, but it faces many vital problems, a number of which are connected with the work of the chemical industry.

Although chlorinated diphenyl is used abroad for impregnating paper capcitors because of its high dielectric permeability, it is used very little in the USSR. The reason for this is that the USSR chemical industry produces the basic material, biphenyl, as a plasticizer only, and this biphenyl is of a low quality. The Serpukhov plant, which has an order for 100 tons of biphenyl in 1958, has to process this chemical further on its own. The chemical industry is capable of producing higher-quality biphenyl, because occasionally some plants send such biphenyl to the Serpukhov plant.

The Serpukhov plant is waiting for bakelite cylinders from the chemical industry.

Metalized insulators are needed for improving the quality and reliability of capacitors. Silver and platinum are used for this purpose, and the process is complicated and long, since it must be repeated several times; in addition, silver and platinum are expensive. However, metalizing with iron has been done successfully. It is true that the equipment for this process is more complicated: a furnace for baking in a hydrogen medium is needed to prevent rusting. However, the metal layer amounts to 50 microns and the costs are recovered.

The Gzhel' Insulator Plant should perform metalizing operations. The Administration of Electrical Engineering Industry and Instrument Making of the Moscow Oblast Sovnarkhoz should organize the metalizing of products with iron paste at the Gzhel' plant, where all the necessary conditions for such work exist. It is also hoped that the management of the Gzhel' plant will take active part in initiating the production of metalized insulators.

At present, the method of deep drawing is being introduced in the series production of capacitor housings. The first capacitors in the new housings have been produced. However, their further production is being delayed because the plant's equipment for deep drawing housings is being used for filling the orders of other enterprises.

The most vital part of the plant is the vacuum-impregnating section, where all the moisture and air is eliminated from capacitors. The process of moisture removal, full degassing, and impregnating and drying takes 6-14 days and accounts for 80 percent of the total industrial cycle for producing capacitors.

Unfortunately, this vital sector does not meet modern requirements. The area where the large vacuum boilers are installed has a low ceiling; it is cluttered with equipment, and has oil-soaked floors. The plant needs the help of the sovnarkhoz to clean up and modernize this section.

Giproenergoprom [State Planning Institute of the Power Engineering Industry] is compiling a plan for the general reconstruction of the Serpukhov plant. The basic technical projects have been concurred with and supported by the sovnarkhoz. However, certain leaders of the Administration of Electrical Engineering Industry and Instrument Making are in error. They insist that small series of capacitors be produced in the plant's laboratory building. The laboratory is designed for scientific experimental work for the further development of USSR capacitor manufacture, and should not be directed to other purposes. -- M. Morozov, director of the Serpukhov Kondensator Plant (Moscow, Leninskoye Znamya, 17 Jun 58)

The Moscow Elektrosvet Plant produces light fixtures, including explosion-proof types, for the chemical industry and always fills its orders on time. It makes seven types of light fixtures for the chemical industry.

While the chemical industry is satisfied with the plant, the plant is not too satisfied with the chemical industry. According to B. I. Lyubetskiy, plant director, the industry is not mass-producing plexiglass, which is needed for lamp shades. The plant needs synthetic materials for shades, high-quality white enamels, and many other chemical products. Ganna Fedoseyevna Rublinskaya is deputy chief engineer of the plant. (Moscow, Moskovskaya Pravda, 13 Jun 58)

Model Ts-75 gas case-hardening furnaces produced by the Biysk Electric Furnace Plant have been installed in the Krivoy Rog Kommunist Plant. (Moscow, Mashinostroitel', Aug 58, p 20)

The Moscow Izolit Plant has designed and manufactured a device for determining the electrical stability and dielectric loss of various insulation materials. This installation has been used at the plant to test micanite. (Moscow, Vechernyaya Moskva, 27 Jun 58)

B. Voltage Regulators and Transformers

The Moscow Transformer Plant has developed and begun production of a compact relatively inexpensive voltage regulator (9), which weighs about 5 kg and can be used in a 127- or 220-volt circuit. It maintains a voltage of 127 volts with a network supply variation from 85 to 140 volts; it maintains 220 volts with a network supply variation from 140 to 250 volts. (Moscow, Tekhnika Molodezhi, No 5, 1958, p 16)

(9) Photo available in source, p 16, middle of first column.

In February 1958, the consumer-goods shop of the Moscow Transformer Plant began the production of type ARN-250 voltage regulators (10). These regulators are much better than the previously produced type RAT-200 autotransformers. They measure 150 x 232 x 164 mm, weigh 5.3 kg, and sell for 140 rubles. (Moscow, Novyye Tovary, No 7, 1958, p 8)

(10) Photo available in source, p 8, bottom.

[Comment: It appears that both articles concern the same voltage regulator.]

The AOSB-0.3 combination autotransformer, which is used for changing 127-volt AC current to 220-volt AC current and vice versa, sells for a retail price of 48 rubles. This transformer has a rated power of 300 watts and is designed to supply power to household appliances. (Moscow, Byulleten' Roznichnykh Tsen, No 29, Oct 58, p 40).

The RAT-200M autotransformer, which is used for stabilizing AC voltage in 220-volt lines for supplying radio apparatus, sells for a retail price of 48 rubles. It has a rated power of 200 watts and handles variations ranging from 180 to 240 volts. (Moscow, Byulleten' Roznichnykh Tsen, No 29, Oct 58, p 41)

The Zaporozh'ye Transformer Plant produces a voltage stabilizer (11) which has neither voltmeter nor regulating control, since it maintains the voltage automatically. Its output current is 220 volts and it weighs 16 kg. (Moscow, Tekhnika Molodezhi, No 5, 1958, p 16)

(11) Photo available in source, p 16, top of second column.

C. Cable

The Khar'kob Yuzhkabel' Plant is making extensive use of synthetic materials in the manufacture of signal, control, and power cable and of heatproof and winding wire. The use of polyvinyl chloride in the manufacture of cables permitted a saving of 820 tons of lead in 1957 alone, and the replacement of natural silk with capron brought a saving of 250,000 rubles during the same period.

Polyethylene insulation is being used in the manufacture of signal cables.

The plant laboratories are very helpful in these matters. The rubber products laboratory is working on new high-quality rubber for hoses, and the lacquer laboratory is studying the uses of new synthetic lacquers. (Kiev, Pravda Ukrainy, 8 Jun 58)

In 1958, the Leningrad Sevkabel' Plant and the branch of the Scientific Research Institute of the Cable Industry pledge to produce an experimental structural length of 220-kv medium-pressure oil-filled cable a month ahead of schedule, and to develop and produce an experimental structural length of small-diameter camera cable for color television purposes.

To conserve polyethylene, the plant and branch also pledge to develop a method for manufacturing coaxial cable with wider spacing between disks by 7 November 1958. (Leningrad, Leningradskaya Pravda, 11 Jun 58)

The Leningrad Sevkabel' Plant has manufactured a cable rated for 500,000 volts. This cable is currently undergoing thorough testing in the high-voltage laboratory of the plant. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 22 Jun 58)

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