USSR
ELECTRONIC AND PRECISION EQUIPMENT

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I. ITEMS OF SPECIAL INTEREST

A. Chronographs for Tracking Earth Satellites

A representative of the Astronomical Council of the Academy of Sciences USSR visited the Leningrad Electric Timepiece Plant and awarded certificates and badges of honor to a group of its workers and specialists who had taken active part in the organization of stations for the observation of artificial earth satellites.

The plant produced a large consignment of printer chronographs for various USSR laboratories. These instruments make it possible to count time with a precision up to five thousandths of a second. During the flight of the satellites, the chronographs record the time of their passage from one point of the horizon to another in various observation areas.

The chronographs consist of a printing unit, a quartz oscillator, and a control panel. Tests have shown them to be of exceptionally high accuracy. The plant has received an order for the production of a new consignment of these instruments. (Leningradskaya Pravda, 17 May 58)

B. Semiconductors in Sputnik III

Semiconductors are used on a wide scale in the third Soviet earth satellite. The satellite's programing unit is completely transistorized. New semiconductor components were used in all of the measuring, scientific, and radio instruments. Several thousand semiconductor components are installed in the satellite.

Radio, atomic technology, and power engineering can no longer get along without semiconductor devices and units. -- Engr G. Petrov (Moscow, Trud, 22 May 58)

C. Plants

In recent years, a number of large plants of all-union importance went into operation in the Mordovskaya ASSR. These include the Saransk Cable Plant, and the Saransk Electric Bulb Plant. The Saransk Elektrovypryamitel' Plant, which produces germanium dry rectifiers, is undergoing reconstruction.

At present, a number of new large enterprises are being constructed in the Mordovskaya ASSR. When these enterprises go into operation, it will be a boost to the chemical machine building industry and the electrical engineering industry, and the production of electric power will increase. (Moscow, Sovetskaya Rossiya, 7 Jun 58)

The Gor'kiy Plant imeni Ul'yanov (zavod imeni Ul'yanova, g. Gorkiy) of the Gor'kiy Sovnarkhoz is one of the producers of a single-burner hot plate which sells for 50 rubles. [Comment: No previous mention of this plant has been noted in the Soviet press.] (Moscow, Novyye Tovary, No 6, 1958, p 17)

Since the beginning of 1958, the Moskovskiy Metallist Plant has produced more than 2,000 electric hair clippers, which are driven by miniature electric motors.

The Moscow Electrical Products Plant No 6 (shestoy zavod elektroizdeliy) is getting ready to produce a new electric fan. [Comment: These appear to be new plants.] (Moscow, Vechernyaya Moskva, 7 Jun 58)

The Moscow "Muzreminstrument" [Musical Instrument Repair] Plant [apparently a new plant] is selling components for television sets and radio receivers and other radio materials to organizations and enterprises.

Applications should be made at ulitsa Karla Marksa No 12, Moscow. -- Advertisement (Moscow, Moskovskaya Pravda, 6 Jun 58)

D. Thermoelectric Generators

Recently the problem of economical power sources for rural radiofication was solved by the industrial production of thermoelectric generators.

The manufacturing process for thermoelements was developed on the basis of a number of inventions by the NIITS (Leningrad Scientific Research Institute of Urban and Rural Telephone Communications) of the Ministry of Communications USSR, and thermoelectric generators were designed at the Leningrad experimental workshops. The work was conducted with the collaboration of the Leningrad Physicotechnical Institute of the Academy of Sciences USSR. The series production of 11-12-watt generators has already been organized. A 16-18-watt thermoelectric generator has been developed. This new generator consumes 120-130 grams of kerosene per hour. Several variants utilize benzine.

The main purpose of thermoelectric generators is to supply power to rural wired-radio units. A radio unit supplied from such a source can serve more than 200 loud-speakers. A great advantage of the thermoelectric generators is the simplicity of putting them into operation. This makes it unnecessary to have skilled workers for servicing them.

Thermoelectric generators can be used for other purposes than rural radiofication. For example, the NIITS is developing a 12-watt thermoelectric generator with a gas burner by request of the administration of the Dashava-Kiev gas pipeline. It will be used primarily for supplying power to stations for the cathodic anticorrosion protection of main gas pipelines. In the future, thermoelectric generators equipped with gas cylinders may be used for rural radiofication also. -- V. Daniyel'-Bek, Candidate of Technical Sciences; N. Roginskaya, Senior Engineer (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 8 Jun 58)

E. Defective Nickel Tubing

The Revda [Sverdlovskaya Oblast] Plant for the Processing of Nonferrous Metals supplies nickel tubing for radio tube cathodes. However, the inside of this tubing is covered with metallic dust or scale that cannot be removed even by ultrasonic methods.

When vacuum tube plants complained, Taubkin, director of the Revda plant, stopped deliveries. Dozens of complaints are sent into Revda daily, but the answer of the plant management is always: "You'd better take what we give you or you won't get anything at all." And so the plant continues to turn out poor products. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 23 May 58)

F. Consumer Goods Shortages

Despite the greater opportunities created by the reorganization of industry, many enterprises, sovnarkhozes, and oblast executive committees are not giving sufficient attention to the production of consumer goods.

In October 1956, the Council of Experts of the All-Union Chamber of Commerce approved a model of the Start camera for production. The Krasnogorsk plant, which was to have started its production in 1957, failed to do so and the Moscow Oblast Sovnarkhoz did nothing to make the plant fulfill its obligation.

The production of many items is delayed to an excess, as has been the case with the Melodiya tape recorder. A Novosibirsk plant was supposed to have sent the first consignment of these tape recorders to the trade networks a year ago. Another example is the Zarya television set, an inexpensive set designed for mass use, which was developed by the Leningrad Plant imeni Kozitskiy. Two other enterprises were to have begun mass production of several hundred thousand of these sets long ago: however, they are still merely considering their production, and have cut down the 1958 production plan to 10,000 sets. -- S. Trifonov, Deputy Minister of Trade USSR (Moscow, Novyye Tovary, No 5, 1958, p 3)

A number of plants of the Leningradskiy Sovnarkhoz have ceased production of many consumer items. For example, the consumer goods shop of the Kirov Plant, which produced cooking pots with plastic handles and other household goods, has been abolished. Steam irons with heat controls, and cast carbon steel hatchets are no longer on sale in Leningrad because their production has been halted. Self-generating electric flashlights, SM-1.5 washing machines, Elektrosila vacuum cleaners, Progress electric razors, hide-away beds, and other goods have been taken out of production. The Lengazapparat Plant has stopped producing steel enameled ware, which is in great demand by consumers. It is intended to stop producing the Raketa children's automobile and children's sleds, although these articles were only recently put into production.

In view of this situation, enterprises of the sovnarkhozes should be given assignments for the production of consumer goods which could not be revoked without the agreement of the republic Ministry of Trade or of the administrations of trade of [city] executive committees.

The Leningradskiy Sovnarkhoz should exercise stricter control over enterprises assigned to undertake the production of consumer goods.
-- D. Reypol'skiy, Director, Leningrad Branch of the Pavilion of the All-Union Chamber of Commerce (Moscow, Novyye Tovary, No 7, 1958, p 2)

Nearly a year has passed since Trifonov, Deputy Minister of Trade USSR, promised an immediate increase in the availability of photographic materials through Posyltorg [All-Union Mail Order Office], yet the price catalog for 1958 remains the same as before and Posyltorg agrees to ship only orders for what is available in the local stores.

A large part of the radio components for time relays and electronic flash units cannot be ordered through Posyltorg. For example, they do not have PEL-0.8 and PEL-0.15 wires, 800-microfarad 300-volt capacitors, pulse transformers, neon tubes, or type IKF-120 tubes. (Moscow, Sovetskoye Foto, Sep 58, p 84)

The city of Nizhniy Tagil is very poorly supplied with photographic materials. Film appears very seldom in the stores here, and when it does, the variety is extremely limited. Furthermore, the trade network sells film which is already long past development deadlines. The improvements promised by Trifonov, Deputy Minister of Trade USSR, in Sovetskoye Foto, September 1957, have not yet been made evident to the photography enthusiasts of Nizhniy Tagil. (Moscow, Sovetskoye Foto, Aug 58, p 84)

A factor which limits the number of motion-picture-making enthusiasts in the Soviet Union is the unavailability of such items as film, tripods, panheads, interchangeable lenses, filters, illuminating equipment, developing tanks with reels for 15- and 30-meter lengths of film, collapsible drying containers, simple but dependable copying apparatus, rewinds, splicers, portable screens, editing devices, and projectors for both sound and silent film. (Moscow, Komsomol'skaya Pravda, 14 Aug 58)

Cultural and sporting goods stores of Andizhan are often out of films, do not know when more will be available, and do not even recognize a request for certain types of photographic papers. They have no accessories such as interchangeable lenses, and do not even have metol or hydroquinone. Materials for color photography are simply unheard of. (Moscow, Sovetskoye Foto, Sep 58, p 82)

From time to time the periodical Sovetskoye Foto publishes articles describing the use of the 8-mm AK-8 movie camera and also explaining how to process reversible film.

These articles convinced me, an amateur photographer, to try my luck at motion-picture photography.

However, I have spent 2 months running from store to store vainly searching all over Leningrad for a movie camera. There are plenty of 16-mm cameras available, but no projectors for this size film are or have been available. On the other hand, there are 8-mm projectors available, but I cannot find a single 8-mm camera. -- V. Pariy (Moscow, Sovetskoye Foto, Sep 58, pp 83-84)

II. LOCAL PRODUCTION AND ADMINISTRATION

Most favorable circumstances exist for the development of instrument making in the Moscow City Sovnarkhoz, where the leading scientific research institutes and a number of design and planning bureaus and plants are located. Products of plants such as the Manometr, Tizpribor, and Komega plants are very well known.

The Tizpribor Plant produces the type AUS preliminary control system. The Energopribor and Komega Plants develop and produce electronic regulation systems for small and medium power engineering installations.

A Moscow design bureau has developed and produced the first model of a high-speed electronic computer for controlling hundreds of measured quantities.

The Moscow Manometr plant designs and produces many types of instrument transmitters. It was the first USSR plant to begin the production of diaphragm differential manometers, which are used mainly for measuring the amount of liquids or gases traveling in pipelines. The production of these manometers has permitted a sharp cutback in the production of mercury float-type manometers, which required an enormous expenditure of scarce mercury. The Manometr Plant also produces many other electrical and pneumatic instrument transmitters, and secondary electronic instruments for measuring temperature, flow, and level.

The Moscow Fizpribor Plant has produced a number of new, interesting products.

Moscow enterprises produce all basic components for automation. However, the capabilities of Moscow in the development of instrument making and automation equipment are not being utilized fully.

The insufficient capacity of instrument plants and design bureaus does not enable them to put into production effectively and rapidly the instruments developed by some of the largest scientific research institutes of the Academy of Sciences USSR and Gosplan USSR. -- P. Adamov, Deputy Chief, Administration of Radio Engineering Industry and Instrument Making, Moscow City Sovnarkhoz (Moscow, Moskovskaya Pravda, 20 May 58)

Enterprises of the Administration of Electrical Engineering Industry and Instrument Making of the Moscow Oblast Sovnarkhoz produce heavy-current capacitors, X-ray and Gamma-ray apparatus, motor vehicle and tractor storage batteries, electric wire and cable, all types of thermometers, various instruments, and electrical insulation materials.

In 1958, the enterprises of the administration are to increase their production 9.5 percent over 1957. Results of the first few months of 1958 show that this task is on its way to being fulfilled.

Enterprises have fulfilled the new technology plan for the first quarter of 1958 and have developed and built models of new products and materials, including capacitors for 100-kv transmission lines, steatite insulators for traction equipment, VTs.P.25 dial scales, various thermometers, thermal contactors, and other equipment.

Much work in large-scale mechanization has been done at the Klin Thermometer Plant, which previously had been operating at a loss. Now it fulfills and exceeds its plan and has become a profitable enterprise.

However, the administration has its laggards, such as the Lobnya Electrical Engineering Plant, which does not fulfill its plan. It produces the UPM-1 record player, which is obsolete and falls short of GOST requirements.

Besides the Lobnya plant, three others -- the [Khot'kovo] Elektroizolit Plant, the Mytishchi Instrument Making Plant, and the Savvino Electrical Machinery Plant -- did not fulfill their first-quarter 1958 plans for raising labor productivity. The [Serpukhov] Kondensator Plant, the [Podol'sk] Mikroprovod Plant, the [Gzhel'] Elektroizolyator Plant, and the [Khot'kovo] Elektroizolit Plant failed to lower production costs during the first quarter.

Various reasons for these failures exist, but in the main they are the result of poor organization of production. The Elektroizolit Plant has more workers than specified by the plan and uses more expensive materials than it should.

The Mytishchi Instrument Making Plant and the Savvino Electrical Machinery Plant did not fulfill their assignments for labor productivity because most of their shop operations are carried out by obsolete methods.

Supply deficiencies cause great difficulties. This is particularly true with electrical component units, such as selsyns, selenium elements, and relays. Because of supply gaps, the Elektroizolit Plant, the Podol'skkabel' [Podol'sk Cable] Plant, and the [Teplyy Stan] Mosrentgen Plant did not fulfill their first-quarter 1958 products-list plans. The supply of hot rolled metal to the enterprises is absolutely unsatisfactory.

Despite these deficiencies, the electrical and instrument making industries of the sovnarkhoz are gathering speed and the existing problems can be solved very soon.

Between 1959 and 1965, plastics will replace metal in many of the products made in the Moscow Oblast Sovnarkhoz. It will be necessary to develop and put into industrial production more than 25 types of new materials; about 125 type-sizes of new wire and cable; more than 200 type-designations of machines, equipment, and instruments; and about 150 type-sizes of new electric carbons and insulators.

To realize the plans for the Moscow Oblast Sovnarkhoz, several problems now delaying the future development of the electrical and instrument industries must be solved. The most important problem is the absence of fully developed scientific research institutes, technological bureaus, laboratories, and tool plants in the economic region.

The Scientific Research Design and Technological Bureau for Glass Medical Instruments and the branch of the Scientific Research Storage Battery Institute do not have the proper equipment, premises, and specialists for carrying out work successfully. The Moscow Oblast Sovnarkhoz has very few other institutes, design bureaus, and laboratories. It is impossible to depend on the large institutes and bureaus subordinate to other sovnarkhozes, Gosplan USSR, and Gosplan RSFSR. Gosplan RSFSR has accepted only one quarter of the more than 100 projects submitted by the Moscow Oblast Sovnarkhoz. The design and technological organizations transferred to the Moscow Oblast Sovnarkhoz are unable to satisfy the needs of the electrical industry. They could only accept five out of 25 projects submitted.

It is hoped that the problem of research and development in the Moscow Oblast Sovnarkhoz will soon be solved, and that institutes and other organizations under the jurisdiction of Gosplan USSR will be transferred to the Administration of Electrical Engineering Industry and Instrument Making of the sovnarkhoz. This is especially true with regard to the Special Design Bureau of the Cable Industry of Glavniiproyekt [Main Administration of Scientific Research Institutes and Planning Organizations] of Gosplan, which is located in Mytishchi; the branch of a scientific research institute of Gosplan USSR, which is located at the [Kudinovo] Elektrougli Plant; and a laboratory of the Scientific Research Institute for Plastics of the Ministry of Chemical Industry, which was created on the base of the Podol'sk Storage Battery Plant. -- M. Blagushin, Deputy Chief Engineer, Administration of Electrical Engineering Industry and Instrument Making, Moscow Oblast Sovnarkhoz (Moscow, Leninskoye Znamya, 27 May 58)

The Administration of Electrical Engineering Industry and Instrument Making of the Armenian Sovnarkhoz needs engineers specializing in electronics, instrument making, relay manufacture, fiberglass manufacture, glass insulating materials manufacture, and precision industrial jewel manufacture to fill the positions of chief technologists, chief designers, chief mechanics, shop foremen and chiefs, and laboratory chiefs in newly organized plants.

Applications should be made to the Administration of Electrical Engineering Industry and Instrument Making at ulitsa Amiryana, 6, Yerevan. -- Advertisement (Yerevan, Kommunist, 16 May 58)

At a recent conference devoted to the development of instruments and automation equipment in the Estonian SSR, it was noted that more than 30 new instruments, including some based on radioactive isotopes, were put into production in Estonia during the past year. High precision electronic instruments, taximeters, and automatic equipment for refrigerators are being produced. Programed regulators produced for air-conditioning equipment can regulate temperature and humidity for 12 days running.

In 1958, the output of electrical and radio measuring equipment in the Estonian SSR will be tripled. According to the long-range 7-year plan, the present volume of production of instrument-making plants will be tripled. It is intended to construct several new plants. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 28 May 58)

III. ELECTRONIC EQUIPMENT

A. Bulbs and Tubes

The Moscow Electric Bulb Plant is producing a new type of high-pressure mercury lamp (1). Such lamps are designed for illuminating large shops. (Moscow, Izvestiya, 9 Jul 58)

(1) Photo showing the new mercury lamps being tested available in source, p 3, top

The mass production of fluorescent lamp starters and fixtures should be started in the Armenian SSR as soon as possible. The Yerevan Electric Bulb Plant is capable of sharply increasing its output of fluorescent lamps. For this purpose, the Armenian Sovnarkhoz need provide only a certain amount of supplementary materials. The large-scale use of fluorescent lamps instead of incandescent lamps will provide better lighting efficiency and will save power. -- M. Tsaturyan, Director, Yerevan Electric Bulb Plant (Yerevan, Kommunist, 30 May 58)

R. Amiryan is chief engineer of the Yerevan Electric Bulb Plant. (Yerevan, Kommunist, 7 Jun 58)

The Ryazan' Electric Bulb Plant has a special automatic cutoff machine for trimming the tubular bulbs of lamps and radio tubes. This machine processes an average of 86,000 bulbs per shift. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 4 Jun 58)

The application of luminescent coating to television picture tubes is done automatically at the L'vov Electric Bulb Plant. A special automatic pouring frame for this purpose has been installed on the conveyer (2). (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 21 May 58)

(2) Photo available in source, p 1, top

B. Transmitters

While the widely used USSR-made 50-kw broadcast transmitters are up to modern standards in general, they have one essential defect: unreliability in operation, owing to the employment of low-quality components and to certain design and circuit deficiencies.

One serious deficiency in the high-frequency part of the transmitter is overheating of circuit coils and movable slip rings. In one case, the slip rings went out of order after several days of operation. Another deficiency, the occurrence of breakdowns in the output feeder, was eliminated by removing the porcelain centering lugs.

A year's operation disclosed serious deficiencies in the design of the flanges which carry water to the tanks of the tubes and coils. Because of bad corrosion in these flanges, water begins to leak through after 8-10 months and the transmitter has to be shut down for a long time for repairs.

The design of the circuit units of the two final stages of the transmitter is very inconvenient. It is very difficult to change tubes in these stages, and there is no norm covering the time spent in this work. The units are often damaged because the polyethylene washers used in them melt.

The TR1-15/15 thyratrons used by the plant have not proved satisfactory in operation. Frequent flash backs cause damage in the circuits. The lower power TR1-6/15 thyratron is incomparably better in operation.

Shutdowns have often occurred because the absorption resistors on the plates of the generator and modulator tubes burn out. Frequent interphase sparkover in the automatic contactor which feeds the small rectifier made it necessary to replace this contactor with another type.

The low quality of the wound components should be noted. Transformers, particularly filament transformers, often broke down; after they were rewound, breakdowns stopped occurring.

The radio industry should give serious attention to these and other defects in 50-kw transmitters and should take steps to correct them. (Moscow, Vestnik Svyazi, Aug 58, p 27)

C. Prices

The following prices were quoted in an official prize list of the state lottery for the Ukrainian SSR (in rubles):

Vostok-57 radio-phonograph in polished cabinet	1,200
Dnepr-9 tape recorder	1,650
Rekord radio-phonograph	495

(Kiev, Pravda Ukrainy, 27 May 58)

The following prices were quoted in an official prize list of the state lottery for the Tadzhik SSR (in rubles):

EG-2 electric phonograph	450
Irtysh radio-phonograph	1,100
Lyuks or Druzhba radio-phonograph	2,300
Tape recorder [unidentified]	1,500

(Stalinabad, Kommunist Tadzhikistana, 27 May 58)

The [Moscow] Central Trade Base of Posyltorg [All-Union Mail Order Office] has received a consignment of radio receivers which will be shipped on order to prospective purchasers. The prices are as follows (in rubles):

Voronezh battery radio receiver with five tubes and two wave bands, keyboard in plastic cabinet, with antenna controls,	256
Voronezh radio receiver complete with batteries and antenna	381
Voronezh radio receiver complete with thermoelectric generator and antenna	533

Orders for radio receivers will be accepted until 1 July 1958. The prices quoted include all shipping costs to the Belorussian SSR. -- Advertisement (Minsk, Sovetskaya Belorussiya, 28 May 58)

D. Radios

A Leningrad scientific research institute has developed the Festival all-transistor pocket radio, which has the shape and size of a small book. (Moscow, Trud, 22 May 58)

The Voronezh Elektrosignal Plant has designed the new Strela portable radio receiver, which weighs 800 grams and has keyboard band switches. (Moscow, Izvestiya, 29 May 58)

The new Volna three-tube radio receivers have appeared in the stores of the Udmurtskaya ASSR. These sets have keyboard band switches and horizontal tuning dials.

The Ural, Moskvich, and Kama radio receivers and radio-phonographs are produced in Udmurtskaya ASSR. In 1958, the Sarapul' Plant imeni Ordzhonikidze mastered the production of the Kometa radio-phonograph, which differs from ordinary sets in that it has an ultrashort-wave band. (Moscow, Komsomol'skaya Pravda, 20 May 58)

The Moscow Krasnyy Oktyabr' Plant will start production of the first Zarya radio sets and make them available to the trade network by the end of 1958.

Masal'skiy is director of the plant. (Moscow, Vechernyaya Moskva, 5 Aug 58)

The new Zarya radio receiver is housed in a plastic cabinet. It has two knobs and four keys for control and tuning to stations operating in the long- or medium-wave bands. Its great sensitivity permits reception of a large number of stations.

The volume of the Zarya's sound is sufficient for an average-size room. It has a type 1-GD-9 oval speaker and special elements in its system for pleasant sound reproduction. Rated output power is 0.5 watt, the audio band width is 150-3,500 cycles, and sound pressure is 3.5 bars. It can also be used with any record player.

The Zarya has three miniature tubes (two type 6I1P and one type 6P14P) and three germanium diodes (one type DG-Ts4 and two type DG-Ts27).

This receiver may be plugged into any AC source of 127 or 220 volts. Input power is 30 watts. The set measures 290 x 210 x 160 mm and weighs 4 kg.

Production of the Zarya will begin during the second half of 1958. The tentative price is 250 rubles. (Moscow, Novyye Tovary, No 8, 1958, p 3)

The new Dnipro-58 radio receiver, designed by the Dnepropetrovsk Radio Plant (DRZ), is a superheterodyne set using three miniature tubes. It receives stations in the long-, medium-, and short-wave bands. Its sensitivity is at least 300 microvolts in the long- and medium-wave bands and 500 microvolts in the short-wave band. With an output power of 0.5 volt-ampere and a sound pressure of 4.5 bars, the type 1-GD-9 loud-speaker reproduces a sound-frequency band width from 150 to 3,500 cycles. The receiver has keyboard controls consisting of five keys. Three of these are for switching wave bands, the fourth for connecting a record player, and the fifth for on-off switching. The right side of the set has a knob for tuning, and the left side has a double knob, the larger for tone control and the smaller for volume. The set is powered by AC through a selenium rectifier and has an input of no more than 35 watts. The imitation fine wood cabinet measures 430 x 230 x 280 mm. The set costs 350 rubles.

The new Dnipro-58 radio-phonograph, designed by the same plant, has a universal record player located in the top of the set above the radio. The record player consists of a two-speed induction motor and a piezoceramic pickup arm with two sapphire needles, for both standard and long-playing records. For phonograph operation, the set reproduces a sound-frequency band width from 150 to 5,000 cycles at an input of no more than 50 watts. The imitation fine wood cabinet measures 435 x 285 x 315 mm. The set costs 650 rubles.

The Dnepropetrovsk Radio Plant will produce an experimental consignment of Dnipro-58 radio receivers and radio-phonographs during 1958. (Moscow, Novyye Tovary, No 7, 1958, p 7)

The new Sverdlovsk portable radio receiver is an eight-transistor set powered by three flashlight batteries connected in series. It has a power input of 23 milliamperes. This set, which uses small-size parts and units, employs a 1-GD-9 oval speaker and a printed circuit. A type P6G triode performs the functions of frequency converter and heterodyne. The intermediate frequency amplifier has two stages using type P6V triodes. The detector is based on a type DGTs8 diode. The first audio amplifier and output stage are based on a push-pull circuit and operate on type P6V triodes. To improve the quality of sound of the receiver, the audio amplifier system uses negative feedback. The set also has a "broad-range" (glubokiy) automatic gain control.

The Sverdlovsk receives stations operating in the long- and medium-wave bands. It has an internal magnetic antenna.

Mass production of these sets will be started early in 1959. (Moscow, Novyye Tovary, No 7, 1958, p 7)

During development of the new Lyuks-2 radio-phonograph (an improved model of the Lyuks radio-phonograph) at the Riga VEF Plant, particular attention was devoted to improving the reliability of the receiver and electric parameters.

The Lyuks-2 has 11 miniature tubes, a selenium rectifier, and 6 wave bands. The set is equipped with an internal rotating magnetic antenna for reception on the long- and medium-wave bands, and provision is made for attaching an external antenna for short-wave reception. A special internal antenna (dipole) is for the reception of ultrashort-wave broadcasting. Also, the set has dual tone controls and a wide-band nondirectional acoustical system.

The audio band width in the long-, medium-, and short-wave bands is 60-6,500 cycles; in the ultrashort-wave band, 60-12,000 cycles; and for the record player, 60-7,000 cycles. The rated output power is 6 watts and sound pressure is 20 bars. Sensitivity in the long-, medium-, and short-wave bands is at least 50 microvolts, and in the ultrashort-wave band, 10 microvolts. The sensitivity at the phonograph jack at rated output is at least 0.2 volt.

The Lyuks-2 may be hooked up to a phonograph pickup, a tape recorder, or a portable speaker, and provision has been made for a ground wire and an ultrashort-wave antenna.

The set can be powered from any ordinary power network of 110, 127, or 220 volts. Power input for the radio receiver is no more than 85 watts, and for the record player, about 100 watts. The set weighs 27 kg and measures 625 x 450 x 365 mm. The price is 2,300 rubles. (Moscow, Novyye Tovary, No 9, 1958, p 2)

The new Khar'kov radio-phonograph is a five-tube superheterodyne radio receiver with a universal record player. It receives stations in the long-, medium-, short-, and ultrashort-wave bands. Its sensitivity on the long-, medium-, and short-wave bands is at least 200 microvolts, and on the ultrashort-wave band, at least 20 microvolts. It has an output of 2 volt-amperes, two type 2GD-3 loud-speakers, and dual tone controls. The universal record player has a crystal pickup and a two-speed motor.

The set does not use more than 55 watts input for radio reception or more than 70 watts for record playing. (Moscow, Novyye Tovary, No 6, 1958, p 3)

E. Television

1. Industrial Television

The PTU-OM1 television unit is the most simple and inexpensive of all present-day types of transmitting television equipment. It is designed for large-scale use in various branches of the national economy.

The PTU-OM1 consists of two units: a television camera with a vidicon-type transmitting tube and a video receiver with a 35LK2B picture tube. The camera can be installed up to 150 meters from the video receiver and provides a picture with 300 lines at 50 frames per second.

The PTU-2M television unit is compact, simple, and inexpensive. It receives pictures with high definition, and is rated for large-scale use in various branches of the national economy.

The PTU-2M consists of a television camera with a vidicon-type transmitting tube, a channel unit, and a video receiver. The camera can be equipped with a lens head to permit the interchange of two lenses, the selection of an aperature, and the focusing of lenses, by remote control. The camera can be installed up to 1,000 meters from the rest of the equipment. The channel unit consists of a video amplifier, an ultrashort-wave oscillator, a sweep oscillator, a power pack, and a synchro-generator. The channel unit is based on transistors, and provides interlaced scanning with 625 lines at 25 frames per second.

This unit is adaptable for the hookup of five regular television receivers, which can be installed 500-800 meters from the channel unit.

The PTU-2M can be provided with a special switchboard and a special channel unit, in which case it is called the PTU-4.

The PTU-5 television unit is basically designed for underwater observation. It consists of a television camera with an LI-17 transmitting tube, which can be installed in a special air-tight housing; a channel unit consisting of a miniature video control device; a power pack containing a synchro-generator and scanners, which provide interlaced scanning with 625 lines at 25 frames per second; and a special extension video control unit using a 35LK2B picture tube. The camera can be extended up to 500 meters from the rest of the unit.

(Source contains illustrations of the units described.) (Moscow, Tekhnika Kino i Televideniya, Aug 58, pp 27-29)

Production at the Magnitogorsk Metallurgical Combine is being managed with the aid of television. The screen is permanently located before the chief dispatcher of the combine. Television cameras are located throughout the various shops and work areas of the combine, where they aid in the proper performance of various operations. Installation of even more cameras is being undertaken. (Moscow, Izvestiya, 29 May 58)

2. Home Television Sets

No true "mass" television set, which means a set that everyone can own, has been produced in the USSR. The nearest thing available is the small-screen KVN-49 television set, which is currently the most popular set in the USSR, just as it was 9 years ago.

Two years ago, the Leningrad Plant imeni Kozitskiy, the oldest radio engineering enterprise in the USSR, began developing a mass-type television set, and in 1957, developed the Zarya television set with a screen measuring 5 cm along its diagonals. This set can at first partially satisfy the need for a mass-type model, but its circuit and design peculiarities make it difficult to mechanize its production, to use advanced manufacturing methods, to repair the set, and to modernize it.

The development of a mass-type television receiver is a complex and specific task, and one cannot expect a single enterprise to find the best solution alone.

The radio engineering industry has substantial experience in combining the creative forces of plants and institutes for solving complicated problems. This was the case with the development of the unified Lyuks, Oktava, and Baykal radio receivers, which USSR industry is mass-producing now. Why could not the same know-how be applied to the development of a mass-type television receiver? Leningrad has a substantial number of highly qualified engineers specializing in television, who could solve the problem of a mass-type television set in a short time. It is hoped that the Leningrad Television Institute, the leading organization in the USSR, will not stand idly by.

The Leningrad Planning and Design Bureau [not further identified] has conducted substantial work in studying and comparing various methods of designing and building modern radioelectronic apparatus. The functional assembly system, whereby a set is composed of independent assemblies, has proved to be the most promising. However, this system has not been adopted sufficiently in the development of radioelectronic equipment.

The experimental Komsomolets television set, which consists of five independent assemblies, was developed to demonstrate the feasibility of the functional assembly system. This set utilizes printed circuits

made by etching foil-covered "getinaks" (laminated plastic). The Komsomolets has a rectangular picture tube with a screen measuring 35 cm along the diagonals. It utilizes a little more than 100 watts of electric power, and according to its electrical parameters, it qualifies as a mass-type receiver.

The functional assemblies used for making the Komsomolets can also be used in sets with larger picture tubes.

There is a substantial gap between the laboratory table and the plant conveyer; development of a television model in a laboratory does not mean that all problems have been solved. At present, an average of 2 1/2 years passes from the time that a television model is developed to the time it is put into industrial production. By then, it is already obsolete and no longer meets consumer requirements. Thus, a plant's operations have to be disrupted and it must start anew.

Despite the most earnest efforts of plants producing television sets, they have thus far failed to reduce the gap between advanced technical ideas and the embodiment of these ideas in production.

Functional assemblies could solve these problems. It would be unnecessary to start from scratch in designing each new receiver. The assemblies could be produced centrally at specialized enterprises. The assembly system could make it possible to automate the production of television receivers.

It seems strange that in Leningrad, the city of advanced technology, the KVN-49, the most primitive television set in the USSR, is being produced. It is true that intense efforts are being made in preparing for the production of the Zarya television set. However, the Zarya can be considered only a temporary model. It is therefore necessary to prepare for the production of a better mass-type television set. -- K. Runov and A. Sorin, Engineers (Leningradskaya Pravda, 7 Jun 58)

A plant of the radio industry of the Leningradskiy Sovnarkhoz is getting ready for the production of Zarya television sets. This set has a screen measuring 28 x 21 cm, which is twice the size of the screen of the KVN-49 television set.

Experimental models of the Zarya are being assembled on conveyers. The Zarya weighs only 15 kg, and will use only half the power needed for the KVN-49. It will be made available to purchasers in 1958; the first consignment of the set will go on sale in October.

The plant is developing a new television set, the Zarya-59. It is based entirely on printed circuits, which are produced by the galvanic [probably hot zinc spray or print] method. This process was developed by the plant and the Scientific Research Technological Institute of the Leningradskiy Sovnarkhoz.

The plant will produce 10,000 of the new television sets during the last quarter of 1958. Beginning in January 1959, 10,000 such sets will be supplied to the stores monthly. (Leningradskaya Pravda, 17 May 58)

The modernized Znamya-58 televison set has been developed by a plant of the Leningradskiy Sovnarkhoz. It is designed for receiving 12 television channels, which makes it adaptable for use in any city in the USSR where there is a television station.

The Znamya-58 utilizes miniature tubes, and has semiconductors in its rectifier unit. It utilizes a type 1GD-9 oval loud-speaker on the front panel and a round 2GD-3 loud-speaker on the side panel.

The set reproduces sound in a frequency band of 100-60,000 cycles, with a sound pressure of 4 bars. Sensitivity on all 12 channels is 200 microvolts. Resolution capacity is 450-500 lines. Input power is 140 watts.

The production of Znamya-58 televison sets is slated for the third quarter of 1958. A total of 60,000 of these sets will be produced in 1958. They will sell for 2,500 rubles apiece. (Moscow, Novyye Tovary, No 6, 1958, p 4)

The Krasnoyarsk Television Plant has shipped more than 20,000 Avangard television sets to the trade network. The plant has developed the new Yenisey television set, a striking improvement over the Avangard-55. It will have lower weight and input power and a larger screen, and will receive 12 channels. It will be put into production during the second half of 1958. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 6 Jun 58)

The Moscow Television Equipment Plant is getting ready for the mass production of the new Almaz-102 and Rubin-102 television sets. The first experimental models of these sets, which were produced before May 1958, have already undergone successful testing.

Both sets have FM ultrashort-wave bands. Both are rectangular-screen 19-tube table models, capable of receiving 12 television channels. The Almaz 102 has a screen measuring 340 x 450 mm; the Rubin-102 has a screen measuring 270 x 360 mm.

The plant has produced an experimental model of the Kristall-104 combination radio-television set. This set consists of an Almaz television receiver, a Lyuks Class-1 all-wave radio receiver, and a tape recorder. (Moscow, Vechernyaya Moskva, 2 Jun 58)

The Moscow [Television Equipment] Plant has developed the new Rubin-102, Rubin-201, and Rubin 202 television sets, which are equal in quality to those produced by foreign firms and are superior in image definition. Either 43LK2B metal-glass picture tubes or 43LK3B all-glass picture tubes can be used in these sets. They have a screen size of 270 x 360 mm and can receive FM broadcasts in the ultrashort-wave band.

Each set has 19 tubes and semiconductor diodes. The acoustical system of the Rubin-102 table-model television set consists of two 1-GD-9 oval speakers located on the front. The Rubin 201 and 202 console models use two 1-GD-9 oval speakers, two 2-GD-3 round speakers, and 1 VGD-1 "tweeter" apiece. They are supplied from 110-, 127-, or 220-volt circuits. The Rubin 102 measures 495 x 480 x 435 mm; the Rubin-201, 950 x 490 x 450 mm; and the Rubin 202, 1,045 x 490 x 460 mm.

The table below gives comparative specifications of the new sets and the old Rubin television set:

	Rubin-102, 201, and 202	Rubin
Input power (watts)		
For television	150	180
For FM reception	60	90
Resolution capacity (number of clearly distinguishable lines)	550	500
Number of channels	12	5
Sensitivity (microvolts)		
For FM reception	50	200
For audio and video	100	200
Minimum number of brightness gradations	8	7
Audio band width (cycles)	80-8,000 [102] 60-8,000 [201-202]	80-6,000

	Rubin-102, 201, and 202	Rubin
Sound pressure (bars)	8	6
Maximum nonlinear distortion (%)		
Horizontal	10	12
Vertical	7	10

The production of these television sets is planned for the end of 1958 or the beginning of 1959. (Moscow, Novyye Tovary, No 7, 1958, pp 4-5)

The new L'viv television set has been developed on the base of the well-known Rekord television set. The new receiver utilizes only miniature tubes and has an automatic line-frequency trimmer. Its screen measures 360 x 270 mm, the maximum size for type 43LK2B picture tubes.

The L'viv is equipped with the unified PTP-1 attachment, which enables it to operate in five television channels and three ultrashort-wave FM channels. Its controls are located on the side and back of the cabinet.

The two-stage low-frequency amplifier of the set is based on a 6I1P triode and a 6P14P pentode. It has a nondistorted audio output of 2 watts and a coefficient of nonlinear distortion of 7 percent in the sound track. Types 2GD3 and 1GD9 loud-speakers are installed under the screen on the front of the set.

The L'viv measures 525 x 495 x 480 mm, weighs 29 kg, and sells for 2,600 rubles. It has 16 tubes, an input of 145 watts for broadcast reception, a sensitivity of 100 microvolts for the audio and video channels, and a frequency band width of 80-8,000 cycles. (Moscow, Novyye Tovary, No 5, 1958, p 5)

The Voronezh table-model television set has 13 miniature tubes, an octal base tube, semiconductor diodes, and a type 43LK2B (metal-glass) or type 43LK3B (glass) cathode-ray tube. This set also has a standard 12-channel selector switch. A type 1-GD-9 speaker is mounted on the right side of the cabinet.

Sensitivity on each channel is at least 200 microvolts. Image resolution is at least 500 lines in the center of the screen, and there are eight discernable contrast gradations. The audio frequency band width is 160-6,000 cycles and sound pressure is 2 bars. Input power does not exceed 150 watts. The tentative price of the set is 1,900 rubles.

The following table compares the Voronezh with the Rekord set:

	Voronezh	Rekord
No of channels	12	5
Ultrashort-wave and FM	None	Yes
Screen size (mm)	270 x 360	210 x 280
In % of total front panel area	62	31
Dimensions of cabinet (mm)	445 x 385 x 580	485 x 425 x 420
No of tubes	14	16
Input power (watts)	150	165

(Moscow, Novyye Tovary, No 9, 1958, p 4)

F. Tape Recorders

The Kiev Radio Equipment Plant has developed the new improved Dnepr-10 tape recorder. Testing of this recorder by the Scientific Research Institute of Sound Recording has shown it to be superior to the earlier Dnepr-9 tape recorder.

The Dnepr-10 does double-track recording on a standard type-2, 7.35-mm tape from a microphone, a wired-radio network, phonograph records, and radio receivers and television sets having outlets for extra speakers. Playback is effected with two built-in speakers, or with external speakers or amplifiers.

The tape moves at a speed of 19.05 cm per second; recording duration is 2 x 30 minutes [i.e., 30 minutes per track].

The frequency characteristic band width is 50-10,000 cycles. With a normal output of 2.5 watts, nonlinear distortion is less than 5 percent. Two 6N8S and one 6P6S tubes are used in the record-playback amplifier, a 6Ts5S tube is used in the rectifier, and 6F5S tube is used as a recording amplitude indicator.

The Dnepr-10 is supplied from a 110-, 127-, or 220-volt, 50-cycle AC circuit, and its maximum input power does not exceed 80 watts. The unit measures 350 x 510 x 320 mm and weighs 21 kg. It will go on sale during the second quarter of 1958 and will sell for 1,600 rubles. (Moscow, Novyye Tovary, No 5, 1958, p 4)

USSR industry has started series production of the Akkord portable tape recorder. It will record either speech or music through a microphone, from a wired-radio network, from a radio receiver, from a television set, and also from a record player. It does double-track recording for more economical use of the tape.

Playback is effected through an internal amplifier and two type 1-GD-9 speakers, or through external amplifiers or radio receivers. The tape recorder is controlled by means of two knobs, one for selecting the type of operation to be performed and the other for selecting rewind speeds. The set has a dial-type count indicater to facilitate finding any part of a recording on a roll. New recording automatically erases previous recording. The tape comes out of the recording head during rewinding.

The Akkord is smaller and more attractive than previous models because of extensive use of plastics and the use of small components such as miniature magnetic heads and an electric motor with an external rotor.

The tape moves at a speed of 9.53 cm/sec. Recording on one track of a 250-meter spool (one full reel) takes 45 minutes. The rated output capacity of the set's amplifier is 1.5 watts. Nonlinear distortion does not exceed 5 percent. The frequency characteristic band width is 50-6,000 cycles. Volume and tone control cover a wide range. The amplifier uses only miniature tubes and a selenium rectifier. The set receives its power from an AC source of 110, 127, 200, or 220 volts. The maximum input power for both recording and playback is no more than 75 watts, and for rewind, no more than 110 watts. The set weighs 13.5 kg and its dimensions are 365 x 295 x 200 mm. It will become available for purchase during the second half of 1958. (Moscow, Novyye Tovary, No 8, 1958, p 2)

G. Communications Equipment

The Scientific Research Institute of the Radio Engineering Industry and the Installation Administration of Mezhgorsvyazstroy [State All-Union Trust for the Construction of Intercity Wire Communications Installations] have developed transistorized auxiliary amplifiers for K-24 high-frequency line-adding systems. These amplifiers have been given the conventional designation, VKUS-24.

The type VKUS-24 amplifiers measure 145 x 40 mm, are highly economical, and provide amplification of 4.7 nepers for 108-kc currents.

A set of type VKUS-24 amplifiers has already been installed on a trunkline. (Moscow, Vestnik Svyazi, Aug 58, inside front cover)

The Leningrad Krasnaya Zarya Plant is the producer of the UATS-50/100 agency dial telephone station [PBX], which is on display at the 1958 Industrial Exposition in Moscow. (Moscow, Vestnik Svyazi, Aug 58, p 14)

The type FTA-M2 telephotographic apparatus, which uses a drum-type scanning system, is designed mainly for the transmission of semitone pictures, but can also be used for black-and-white pictures, sketches, and texts. It is also capable of transmitting color pictures, which are received as black-and-white pictures.

The FTA-M2 apparatus will operate on wire, cable, and radio-relay lines in the channels of line-adding apparatus with effectively transmitted frequency bands of 300-2,700 and 300-3,400 cycles. It is supplied from a 127- or 220-volt, 50-cycle AC line. It consists of two independent portable units: a transmitter (3) and a receiver (4), each of which measures 600 mm x 395 mm x 285 mm and weights 42 kg.

(Source gives detailed descriptions of the FTA-M2.) (Moscow, Vestnik Svyazi, Aug 58, pp 2-5)

(3) Photo available in source, p 4

(4) Photo available in source, p 3

H. Institute and Plant Information

The Scientific Research Institute of the Radio Engineering Industry has designed a standard suspension-type cableway conveyer for intraplant transport of blanks, semifinished products, and finished products. This conveyer consists of standardized parts and components. A monorail holding a carriage with hangers is installed along the cableway. It is controlled from a main panel and from emergency signal posts installed along the conveyer route. The use of a three-speed drive unit (2-10 meters/min) makes it possible to use the conveyer under various production conditions. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 8 Jun 58)

Construction of the Minsk Radio Plant began in 1951, and within 4 years, it was operating at its planned capacity. In 1951, one of its shops began the production of the Minsk-R-7-51 Class-2 radio receiver. Within a year, the plant produced the Belarus'-52 Class-1 radio receiver. Since then, it has developed 11 original designs of radio receivers, radio-phonographs, and television sets. Most of the models accepted for mass production received high ratings from the Council of Experts of the Pavilion of the Best Models of Consumer Goods.

The Council of experts awarded 25,000 rubles to the best workers of the plant for mastering the production of the new Belarus'-57 Class-1 radio receiver in 1957. This new receiver incorporates many of the latest achievements of radio engineering, including the use of miniature tubes and semiconductor components.

The Belarus'-3, the first combination radio-phonograph-television set ever produced in the USSR, which recently appeared in the stores of the Belorussian SSR, is now in great demand.

In April 1958, the plant began the mass production of the new Minsk-58 radio-phonograph, which replaces the earlier-produced Minsk-R-7. This set consists of a six-tube superheterodyne receiver and a universal record player, and uses many semiconductor components. It has an ultrashort-wave band, a rotating internal antenna, and dual tone controls.

The plant is now developing new 12-channel large-screen television sets with improved audio systems.

The plant fulfills or exceeds its plan each month. Yudelevich is plant director; Pumpyanskiy is chief engineer. (Moscow, Novyye Tovary, No 7, 1958, p 3)

[Comment: If the above article is accurate, the Minsk Radio Plant, formerly subordinate to the Ministry of Local and Fuel Industry Belorussian SSR, is not the same as the Minsk Radio Plant imeni Molotov, which was producing radio receivers as early as 1947.

The existence of two radio plants in Minsk was previously indicated by a reference to an unidentified Minsk plant of the Ministry of Radio Engineering Industry USSR in Izvestiya, 8 September 1954. If a new Minsk Radio Plant of local subordination went into operation in 1951, it is possible that the former Plant imeni Molotov was the unidentified all-union plant and that it stopped its civilian production after the new plant went into operation.

This may be a situation similar to the transfer of civilian radio production from the Moscow Order of Lenin Radio Plant to the Moscow Krasnyy Oktyabr' Radio Plant.]

The Riga Radio Plant imeni A. S. Popov went into operation in 1946, and at first produced only the T-689 and T-755 receivers. In 1952, it began to produce the Riga-10 radio receiver, and later the Riga-51 radio-phonograph. In 1956, it began the production of the Daugava radio receiver and radio-phonograph.

The Daugava, which is now called the Sakta and has a different external design, is popular in all parts of the USSR. The Daugava model radio-phonograph is now produced by three other plants under the names Iset', Irtysh, and Avrora.

The Plant imeni Popov regularly fulfills its plan for the production of radio equipment. It produces almost all of its own components and subassemblies, with the exception of tubes and certain magnetic materials. It produces components at a cost much lower than other plants, which supply them to enterprises of the radio engineering industry.

The Festival' radio receiver, which was developed by the plant and approved for mass production, is the best radio receiver in the USSR. (Moscow, Novyye Tovary, No 5, 1958, p 2)

A recent conference on supply at the Riga Radio Plant imeni Popov has netted favorable results. Buzdin, chief of the Latsnabsbyt [Administration of Supply and Sales of the Latvian SSR?] has changed his attitude toward the needs of the plant for special working clothes and has allotted the number required by the plant. Bragilevskiy, chief of the base of Khimreaktiv [Administration for the Sale of Chemical Reagents?] has seen to it that the plant receives the chemical reagents that it needs badly.

However, Shelyganov, chief of Glavlesobumsnabsbyt [Main Administration for the Sale of Wood and Paper], who was present at the conference, paid no attention to the desires of the participants at the conference. The plant has not yet received knife-blade veneer or high-quality plywood from his administration.

Pavlovskiy is chief technologist of the Plant imeni Popov. (Riga, Sovetskaya Latviya, 17 May 58)

IV. COMPUTERS

The series production of reliable control and computing machines can occur only with the use of series-produced radio components with long service lives and special parameters for electronic pulse circuits.

At present, unfortunately, each of the 20 or so organizations engaged in the research and development of computing machines has to design and build its own magnetic and semiconductor components. This causes waste and delays the series production of machines.

It is time to solve the problem of organizing the development and series production of standard radio components, semiconductors, and pulse-measuring apparatus for electronic mathematical and control machines by the radio engineering industry. A scientific research institute specializing in magnetic radio components for mathematical and control machines and automation equipment should be organized.

The long time (up to 2-3 years) required for the development and production of new experimental models of electronic computers is a serious deficiency. The main cause of this situation is usually the unsatisfactory facilities for experimental production provided for experimental design and scientific research work. An example of this is the Moscow SAM [Computing and Analyzing Machine] Plant, which produces models of newly developed electronic computers. This plant is slow in carrying out experimental operations because it is overloaded with series production assignments.

A qualified efficient experimental production base for newly developed electronic computers is a need that cannot be shunted aside. Such a base could cut the development-production time in half. -- Yu. Ya. Bazilevskiy, Deputy Chief of a Special Design Bureau (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 17 May 58)

The Moscow Computing and Analyzing Machine Plant produces storage units (5) for mathematical machines. (Moscow, Komsomol'skaya Pravda, 27 May 58)

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

The Moscow Computing and Analyzing Machine Plant is producing T-5-M tabulators with IP-80 card punch machines, which will be equipped with a special electronic attachment. These machines will be installed in the mechanical computation factory, where the data on the USSR census will be processed.

N. F. Fedotov is chief of the tabulator shop of the Moscow Computing and Analyzing Machine Plant. (Tbilisi, Zarya Vostoka, 10 Jun 58)

The Moscow Scientific Research Institute of Computer Machine Building has designed the MN-10 computer, (6), the first analog computer with a fully transistorized circuit. It is designed for the study of various automatic regulation systems up to the sixth order utilizing electrical analogy for solving problems. (Moscow, Moskovskaya Pravda, 5 Jun 58)

(6) Photo showing an MN-10 being set up for operation available in source, p 3, right

NIIschetmash (Scientific Research Institute of Computer Machine Building) has developed the VPRR-2 instrument for determining cutting conditions for turning, milling, and drilling. It can also be used for technical norm setting and for research work in cutting laboratories.

The VPRR-2 is based on the electrical compensation principle, with the use of potentiometers. Its specifications are as follows:

Number of variables	23
Accuracy of calculations	Plus or minus 5 percent
Input power	120 watts
Input voltage	220/127/36 volts, 50 cycles
Dimensions	640 x 280 x 430 mm
Weight	25 kg

The instrument is very reliable and simple to operate. It was tested successfully by NIIschetmash, and Gosplan USSR has recommended it for production.

(Source gives additional descriptive matter and a circuit diagram.) (Moscow, Byulleten' Tekhniko-Ekonomicheskoy Informatsii, No 8, 1958, pp 39-40)

Penza instrument makers [of the Penza Computing and Analyzing Machine Plant] have begun the production of the S-45-6 special sorting and calculating machines on order for the Central Statistical Administration

of the Council of Ministers USSR. The S-45-6 machines are designed for processing the materials of the all-union census. Such a machine will process the data for 250 persons in one minute.

Experimental models of the new machines have been successfully tested and have been sent to the Central Statistical Administration. The Penza workers will finish the total order by October 1958. (Yerevan, Kommunist, 20 May 58)

The Kursk Computing Machine Plant has developed the new Kursk adding machine, which is better than the Feliks adding machine. (Moscow, Izvestiya, 4 Jun 58)

A new Ural automatic digital computer (7) has been installed and put into operation at the computing center of the Academy of Sciences USSR. This machine is small enough to be used in design bureaus of industrial enterprises for carrying out complex mathematical computations in designing machine tools, subassemblies, and machine parts. (Moscow, Vechernyaya Moskva,, 22 May 58)

(7) Photo available in source, p 1, bottom

A Ural computer, the first universal automatic computer in the computing center of the Institute of Mathematics and Mechanics imeni Romanovskiy, Academy of Sciences Uzbek SSR, is now being set up for operation. (Tashkent, Pravda Vostoka, 21 May 58)

A special EI-S electrical integrator (8) is in operation at the All-Union Oil and Gas Research and Development Institute. It is the world's first automatic machine for determining the optimum operational routines for oil and gas fields. It was developed by Soviet scientists and specialists.

The EI-S is a machine that can study the processes occurring underground and can predict the extraction of oil in areas thousands of kilometers from Moscow. It can also make predictions for 5-6 years in advance. (Moscow, Komsomol'skaya Pravda, 22 May 58)

(8) Photo available in source, p 1, top

V. INSTRUMENTS

A. General Information

Instruments and automation are important factors augmenting the defense capabilities of the USSR. Precision instruments are essential for modern armament. Success in the field of atomic physics, in testing intercontinental ballistic missiles, and in launching earth satellites evidences the competence of the instrument making industry.

The growing importance of the leading scientific research institutes and design bureaus of Gosplan USSR has become manifest, especially the State All-Union Central Scientific Research Institute of Over-all Automation, the Scientific Research Institute of Thermal Power Engineering Instrument Making, the Scientific Research Institute of Computer Machine Building, the All-Union Scientific Research Technological Institute of Instrument Making, and the All-Union Scientific Research Institute of Electrical Measuring Instruments. These institutes must direct the work of their counterparts on the republic level.

In an effort to meet the increasing demand for instruments and automation equipment, it has been decided to construct 26 new instrument building plants and to reconstruct 17 others during the Sixth Five-Year Plan. However, this will by no means satisfy the demand for instruments, especially in agriculture.

Design bureaus, scientific research institutes, and planning institutes for automating various branches of industry were organized in 1956 in Azerbaydzhan, Armenia, Georgia, and the Ukraine. As a result, the importance of these republics from an industrial viewpoint has increased considerably. (Moscow, Priborostroyeniye, Nov 57, pp 1-2)

During the Fifth Five-Year Plan instrument production increased to three times that of 1950. The production of instruments for the automatic checking and control of manufacturing processes was increased to 2.8 times; of mathematical computers, to 7.4 times; and of instruments for determining the composition of gases, to 3 times the former amount. About 200 plants are now engaged in the production of instruments.

An experimental model of an ultrasonic flow gauge for contactless measurement of liquids has been developed. An experimental model of an electromagnetic flow gauge for measuring conductive liquids also has been developed.

A radioactive level gauge has been developed for use in the automation of various manufacturing processes. An ultrashort-wave gauge for measuring, registering, and regulating the level of both conductive liquids and liquids with a high dielectric constant also has been developed.

A total of 500,000 manometers were produced in the USSR in 1956, including the following: manographs, vacuum manometers, vacuum gauges, and manometers for measuring extra-high pressures. A radioactive ionization manometer with scale measuring limits of from 10^{-3} to 10 mm of the mercury column and manometers for measuring pressures up to 10,000 kg/sq cm have been developed in the last few years. Research is now being conducted on developing manometers for measuring pressures up to 25,000 kg/sq cm.

There has been inadequate development of instruments for analyzing the composition of gases. Such instruments are needed for checking and controlling various manufacturing processes in the metallurgical, chemical, petroleum, and power industries. More than 120 types of instruments for analyzing gases and gaseous compounds are needed during the Sixth Five-Year Plan. However, only 41 types are now in series production.

As a result of a decision of the Council of Ministers USSR in 1949, the State All-Union Design Bureau of Analytical Instrument Making, the Analytical Instrument Plant, and the Experimental Design Bureau for Automation of the Ministry of Chemical Industry were instituted. They have played an important part in developing the production of instruments for determining the composition and properties of substances. The following instruments are indicative of the advances made: magnetic gas analyzers, optical-acoustical gas analyzers, analytical gas analyzers, mobile gas analyzers, stationary automatic photocolorimetric gas analyzers, and mass spectrometers.

The following types of pH meters have been developed and produced: a mobile pH meter and a self-recording pH meter for measuring from a pH of 1.5 to 12, with a precision of plus or minus 0.1 at 50 degrees centigrade; a laboratory pH meter with a measuring range of 0 to 14, with a precision of plus or minus 0.1; an automatic self-recording and regulating pH meter with a range of from 0 to 8 at temperatures up to 60 degrees centigrade and from 0 to 14 at temperatures up to 100 degrees centigrade.

The model Engler laboratory viscosimeter and the model VIMS [All-Union Scientific Research Institute for Mineral Raw Materials] torsion viscosimeter with measuring ranges of up to 1,000 centipoises have been produced for use in the food and petroleum industries.

A radioactive fluid density meter with a measuring range of from 0.5 to 2.5 grams/cu cm and a precision of plus or minus 2 percent has been developed by the instrument making industry for general industrial use. A stationary fluid density meter with a measuring range of from 0.04 to 0.66 gram/cu cm and a precision of plus or minus 4 percent has been developed by the chemical industry.

The chromatographic method of analyzing light hydrocarbon compounds, especially gases, has been applied quite extensively. The following instruments have been developed for this purpose: an experimental model of a laboratory chromatograph for determining the composition of gaseous compounds, with a precision of plus or minus 5 percent and a sensitivity of 1.1 percent; a chromatograph for determining the amount of saturated and unsaturated hydrocarbon in a complex gaseous compound, with an absolute accuracy for heavy hydrocarbons of plus or minus 0.05 percent; a chromatograph for analyzing low-boiling gases and pyrolysis gases up to and including butylene, with a precision of plus or minus 0.3 percent; a chromatograph for determining the presence of hydrogen in a compound of carbon monoxide, methane, ethane, propane, isobutane, and butane, with a precision of plus or minus 0.05 percent and a sensitivity of 5 percent; a chromatograph unit for continuous measurement of the composition of methane, ethane, propane, butane, pentane, hexane, and air compounds in mines, with a sensitivity of from one to 10^{-4} percent for heavy hydrocarbons and 0.05 percent for methane and ethane; a universal chromatograph unit for analyzing complex compounds of saturated and unsaturated hydrocarbons, with a sensitivity of from 1 to 10^{-4} percent and a relative error of 3 percent.

Several types of laboratory and stationary hygrometers have been developed and produced recently.

The instrument making industry now produces a large number of thermocouples, resistance thermometers, liquid-in-glass and manometric thermometers, and optical, photoelectric, and radiation pyrometers. However, even more highly refined thermometric instruments are needed. Efforts are being made to develop thermocouples for protracted temperature measurements of molten steel. Series-produced pyrometers with ranges of 800-1,400 and 1,200-2,000 degrees centigrade have been redesigned for measurements up to 4,500 degrees centigrade. Photoelectric and color pyrometers are also being successfully developed.

The Soviet instrument making industry produces a large number of secondary instruments, especially indicator, recording, and regulating types of pyrometric millivoltmeters, and single and multiple point types of automatic electronic potentiometers and bridges. (Moscow, Priborostroyeniye, Nov 57, pp 3-7)

B. Industrial Instrumentation

The Scientific Research Institute of Thermal Power Engineering Instrument Making needs experienced electrical engineers and engineers specializing in electronics, who desire to do design work. These engineers are needed for work as leaders of scientific research and design groups. The institute also needs senior engineers.

Applications should be made at Ol'khovskaya Ulitsa 27, Moscow B-66. -- Advertisement (Moscow, Vechernyaya Moskva, 2 Jun 58)

The production of instruments in small series increases their costs. The MN-5106 gas analyzer unit produced by the Kiev Instrument Plant (Kiyevskiy zavod priborov) costs 29,000 rubles, which precludes its use for the automation of small industrial facilities.

The Moscow Tizpribor Plant, the Kazan' Teplokontrol' Plant, and others produce obsolete gas analyzers, mercury differential manometers, thermocouples, thermometers, resistors, membrane draft gauges, recorder millivoltmeters, and other instruments. Some of them, such as the GEUK-21 carbon dioxide gas analyzer, were developed more than 20 years ago and have never been modernized. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 16 May 58)

The Moscow Control and Measuring Instruments Plant is producing new improved apparatus for the control, regulation, and automation of industrial processes in the chemical and petroleum industries.

It produces the complex TsIATIM-51-U and TsIATIM-52-U apparatus, which are used in oil cracking processes. They make it possible to use the cracking equipment more efficiently and to obtain more high-quality chemical end-products.

The plant has developed the AChR-56 apparatus for regulating industrial processes in the chemical industry.

Soon the plant will finish testing the original BCh-2 apparatus for determining and analyzing hydrocarbon gases. The BCh-2 can do in 45 minutes a job which required 4-5 hours by the old methods. (Moscow, Vechernyaya Moskva, 7 Jun 58)

The Leningrad Lenteplopribor Plant will produce more than 3,000 electronic potentiometers (9), and other instruments during 1958. The plant's products are very important in production automation in the petroleum, chemical, and other branches of industry. (Leningradskaya Pravda, 11 Jun 58)

(9) Photo showing the assembly of an electronic potentiometer for the chemical industry available in source, p 1

The Moscow Fizpribor Plant has produced new precision instruments designed for the control and regulation of industrial processes in chemistry, rare-metals metallurgy, and radio parts production. One of the instruments is the ESU electronic level control (10). A large number of these instruments are already being used in the chemical industry. (Moscow, Vechernyaya Moskva, 2 Jun 58)

(10) Photo showing the assembly of ESU instruments available in source, p 2, top

The Moscow Fizpribor Plant has the following instruments for sale by contract:

Type SVK-1 stabilized rectifier, which is designed for stabilizing voltages from 0 to 300 volts. This is a two-channel rectifier and the voltage on the output of each channel is regulated from 0 to 255 volts and from 75 to 300 volts. The current for each channel is 50 milliamperes. The SVK-1 measures 200 x 195 x 230 mm and weighs 8 kg. It is very suitable for laboratory work and for research on various radio circuits.

Type BK-3 radiometric scaler, which is designed for studying various types of radioactivity and for work with tracer atoms. It uses a decimal counting system. Its coefficient of scaling is 1:100 and 1:2. The instrument measures 180 x 185 x 320 mm and weighs 7 kg. It comes equipped with a type SB-1M mechanical meter.

The type ESU-1 electronic capacitance level control, which is designed for signaling the deviation of the level of a medium from a given value. The instrument can be used for signalizing the level of liquid or of friable bodies with various physical characteristics, electrical conductivity, viscosity, and temperature.

Orders should be sent to the plant at Bakuninskaya, 14, Moscow, B-5. -- Advertisement (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 28 May 58)

In 1958, the Kiev Control and Measuring Instrument Plant began the production of type SA automatic saccharimeters for the automatic measurement of the quantity of sugars in certain substances and solutions.

At the end of 1957, the plant produced the type RA automatic photoelectric refractometer, which is designed for solving very important problems in the automation of industrial processes in a number of branches of the food industry.

The Moscow Control and Measuring Instrument Plant has produced an automatic polarization colorimeter for measuring the concentrations of substances according to their color intensity. In particular, this instrument is used for determining sugar traces in condensates.

(Source gives further information on these instruments and illustrations) (Moscow, Byulleten' Tekhniko-Ekonomicheskoy Informatsii, No 8, 1958, pp 55-57)

The Instrument Making Shop of the Production Laboratory of the Scientific Research Institute of the Silk Industry. Gosplan RSFSR, has designed a new stroboscopic tachometer, the EST-4. This instrument has a measuring range of 3,500-18,000 rpm. Instrument error is plus or minus one percent. The EST-4 is supplied by a 220-volt 50-cycle AC line. It measures 190 x 100 x 200 mm with its handle and weighs 1.3 kg.

The institute has begun series production of the EST-4. (Source gives detailed information and an illustration of the EST-4.) (Moscow, Byulleten' Tekhniko-Ekonomicheskoy Informatsii, No 8, 1958, pp 52-53)

The personnel office of the Tallin Control and Measuring Instrument Plant is located at Merepuyyestee 15, third floor, Tallin.

The Estelektroradiosnabsbyt [Administration for the Sale and Supply of Electrical and Radio Products?] is located in Room 110, ulitsa Lomonosova 49, Tallin. (Tallin, Sovetskaya Estoniya, 6 Jun 58)

The Moscow Komega Plant produces apparatus for the automatic regulation of high-power boiler units. In 1958, it will produce dozens of sets of new electronic regulators. (Moscow, Komsomol'skaya Pravda, 24 May 58)

The Moscow Kalibr Plant has begun series production of electronic instruments (11) for checking and sorting track rollers. One of the new instruments is on display at the All-Union Industrial Exposition in Moscow. (Moscow, Vechernyaya Moskva, 2 Jun 58)

(11) Photo available in source, p 1

C. Electrical Instruments

In 1955, the production of general-purpose electrical measuring instruments was 27 times as high as in 1946; the 1955 products list of such instruments was 214 as compared with 33 in 1946. Nevertheless, the demand for these instruments is met only 50-55 percent; for certain types of precision laboratory instruments, the demand is met only 5-10 percent.

This is caused mainly by the plants' inability to add capacity fast enough to meet the demand. For instance, the Kiev Tochelektropribor Plant, one of the leading enterprises in this field, is supposed to double its output of instruments in the near future. However, conditions in the plant do not favor such an increase in output. Almost all the plant's production is concentrated in a single building, which was put into operation in 1946. The construction of a second building has been dragging on for several years.

In actuality, the building of a number of new structures has not even started. The archway between the two buildings, which would give additional room to shops that need separate premises, has not been built.

The expansion of instrument production at the plant is being held back not merely by lack of production space, but also by the inability to expand the design bureau and laboratories. Construction workers are still occupying a part of the plant's facilities.

We expect that Gosplan Ukrainian SSR and the Kievskiy Sovnarkhoz will take timely measures to finish the reconstruction of the Tochelektropribor Plant and to sharply increase its products list. All construction work should be finished no later than 1958-1959.

The Kiev Tochelektropribor Plant produces units for measuring high DC current. Its work on magnetometry is of great use to the metallurgical industry, which produces magnetic steels, materials, and alloys. Its heavy-current DC instruments are badly needed in the aluminum industry and other branches of industry. -- V. Kulebakin, Active Member, Academy of Sciences USSR; A. Nesterenko, Corresponding Member, Academy of Sciences Ukrainian SSR. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 1 Jun 58)

In 1956, the Vil'nyus Electric Meter Plant failed to fulfill its plan. Shteyn, chief of the Production Planning Division of the plant, managed to cover up for the plant's failures. When Fruma Mikhaylovna Berman reported this to the party organization of the plant management, Shteyn, along with Pidlisnyy, chief engineer of the plant, began a campaign of persecution against her.

Fruma Berman is not the only one who has suffered at the hands of the dishonest plant management. In 1957, Malyshev, chief technologist, and Oblonskiy, chief technologist before him, left their jobs voluntarily. Working conditions were made impossible for Bugrov, former engineer of the Bureau of Innovations and Inventions.

An order No 56, dated 12 February 1958, shows that a large number of persons who had nothing to do with such activities were rewarded for implementing new technology.

Pidlisnyy has thrown the plant into an uproar by not permitting it to adopt a new method of making meter dial drums, which had been used at the Leningrad Electrical Machinery Plant. Instead, he has been wasting money and manpower developing a method of his own.

It is time the party organization of the Electric Meter Plant do something about the nefarious deeds of Shteyn and Pidlisnyy. Moreover, it should evaluate the unprincipled actions of Afanas'yev, secretary of the plant party bureau.

(Source contains a detailed description of the strife at the Electric Meter Plant.) (Vil'nyus, Sovetskaya Litva, 28 May 58)

The Leningrad Vibrator Plant of the Administration of Instrument Making, Leningradskiy Sovnarkhoz, is the producer of the type D-128 portable voltmeter. (Moscow, Knizhnaya Letopis', No 35, 1958, p 31)

The [Moscow] Energopribor Plant is the producer of the type MS-08T ground meter. (Moscow, Knizhnaya Letopis', No 37, 1958, p 32)

D. Electronic Instruments

At a conference dedicated to the 40th anniversary of the Nizhni-Novgorod Radio Laboratory imeni V. I. Lenin, which was held in Gor'kiy from 22 to 24 May 1958, a number of lectures concerning the USSR radio industry were given.

One of the speakers, V. L. Lebedev, reviewed the work being done in the field of radio measurements and dwelt on the history of the Scientific Research Institute of Measurement (nauchno-issledovatel'skiy institut izmeritel'noy tekhniki).

During the past 8 years, the institute has been engaged mainly in the development of electronic radio measuring instruments, has completed ten scientific research projects, and has developed about 100 general-purpose instruments, not including auxiliary or special-purpose instruments. Sixty-nine instruments were put into series production or produced in experimental consignments. Since it is impossible to list all instruments produced and all scientific research projects carried out, only a few sets of instruments will be noted.

The institute produces the following groups of instruments:

1). Instruments for general measurements (voltmeters, pulse voltmeters, inductance meters, conductivity meters, quality factor meters, nonlinear distortion meters, and other instruments).

2). Instruments for measurements in the 30 mc band (frequency meters from 10 cycles to 100 mc, modulation meters from one to 100 percent, oscillators from 50 cycles to 140 mc, and other instruments).

3). Instruments for measurements in the metric wave band (frequency meters from 10 kc to 800 mc, impedance meters, oscillators in the 16-2,000 mc band, attenuators, and other instruments).

4). Instruments for measurements in the decimetric wave band (wattmeters from one milliwatt to 5,000 watts, impedance meters for a 500-3,500 mc band, oscillators from 2,000 to 3,800 mc).

5). Instruments for measurements in the centimetric wave band (impedance meters for wave bands up to 10,000 mc, oscillators from 3,450 to 7,500 mc, attenuators for attenuation to 120 decibels, and other instruments). (Moscow, Radiotekhnika, Aug 58, p 76)

The type ITS-2 instrument (12) is designed for measuring the distortion of telegraph signals. It is powered from a 127- or 220-volt AC circuit. The instrument itself weighs 21 kg; its power supply weighs 19 kg. It is being produced by one of the industrial enterprises of the Kiyevskiy Sovnarkhoz. (Moscow, Vestnik Svyazi, Aug 58, inside front cover)

(12) Photo available in source, inside front cover, right, middle

E. Geophysical Equipment

The products of the Barnaul Geophysical Apparatus Plant are necessary for making use of the natural wealth of Altayskiy Kray and other areas of the USSR. The plant makes three types of core-sampling stations, which are used for studying exploratory wells up to 750 meters in depth; radiometric instruments; seismic receivers; and other equipment.

The plant has been in operation a little over 3 years. During this time, its output has increased to five times the initial figure. Several months ago it began the production of RP-1 radiometers. It is preparing to manufacture RM-2 and SG-42 radiometers, which are designed for detecting radioactive ores. These instruments are much more accurate than foreign-made types, and are equal to them in technical parameters.

A special plastics shop for supplying the needs of the entire Altayskiy Sovnarkhoz has been organized at the Barnaul Geophysical Apparatus Plant.

The special design bureau of the Leningrad Geologorazvedka Plant designs new equipment for the Barnaul plant. Although the bureau designs modern instruments, they are already outdated by the time they get into series production.

The Barnaul plant is now producing the ES-36 pulser, which was slightly modernized by plant specialists. However, it should have been replaced long ago by the type PKR relay pulser, which weighs only one fourth as much as the ES-36 and is more reliable in operation. However, the Barnaul plant cannot produce it because it does not have any type KDR-1 coding relays, which are produced by the Khar'kov Transsvyaz Plant.

At the beginning of 1957, the design bureau of the Barnaul Geophysical Apparatus Plant developed a selsyn drive for the registers of core-sampling stations. This type of drive is more reliable and more accurate, and costs only one tenth as much as a mechanical drive. However, the supply of selsyns (type S-401 synchronous motors) was postponed until 1958; consequently the production of the new instrument has been delayed.

Interruptions in the supply of component units have an adverse effect on the plant's production rate. The Gor'kovskiy Sovnarkhoz often delays the shipment of capacitors, motor vehicle glass, and driveshafts. The Moscow [Oblast?] Sovnarkhoz delays shipments of STS-8 meters. The Tashkentskiy Sovnarkhoz delays the shipment of KTO-2 cable. -- N. Tutevol', chief of a shop of Barnaul Geophysical Apparatus Plant (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 25 May 58)

The [Leningrad] Geologorazvedka Plant is the producer of the ASG-25 gamma-ray automatic core-sampling station which was developed by A. D. Fursov and E. P. Morozov. The new station makes it possible to determine the nature of the radioactivity of various ores, and has almost double the sensitivity (now 3 microns/hr) of the "Ritsa" core-sampling station. (Moscow, Priborostroyeniye, Oct 58, p 28)

The Leningrad Design Bureau of the Ministry of Geology and Mineral Conservation USSR has designed a new RVS-1 instrument called a helicopter radiometer for use in detecting the radioactivity of an area from an airplane or helicopter. Leading designers A. S. Kudryashev and V. P. Porfirov are chiefly responsible for the development of this instrument. It has been used in both the Mi-1 and the Ka-15 small helicopters and consists of a sensitive transmitting unit, an amplifying and metering unit, a two-channel recorder, and a control panel. A unique electronic circuit automatically ensures stability of operation of this instrument, which weighs 60 kg. During flight, this instrument continuously measures and records gamma radiation intensity. The first of these instruments has already passed tests, and the Leningrad Geologorazvedka Plant has started series production of them.

The RVS-1, which is 2.5 times as sensitive as the older model, is powered through the helicopter's own power system. (Moscow, Sovetskaya Aviatsiya, 29 Aug 58)

Soviet oceanographic expeditions making shipboard measurements of depth, temperature, and salinity of ocean water will now receive a new instrument utilizing electronics and semiconductors for making all of these measurements simultaneously with high accuracy and speed.

The new instrument resembles a small telescope. Its control panel and registering unit are installed on board ship, while the remote transmitter is lowered into the sea. The instrument has a self-balancing electronic bridge utilizing a sequential system based on low-value capacitors and special motors. Semiconductor thermistors are used for measuring water temperature. A manometric tube acts as the sensitive element

for the capacitance depth transmitter, which is connected electrically with the rest of the instrument. The temperature is measured to an accuracy of 0.1 degree centigrade in the range of from minus 2 to plus 30 degrees centigrade. Salinity and depth are measured to a high accuracy.

The inventors of this instrument are V. M. Shubert, Chief Designer for Planning of the Leningrad Design Bureau of the Ministry of Geology and Mineral Conservation, and N. B. Dokukin, an engineer.

The Leningrad Geologorazvedka Plant has built series-production models of these instruments. Experimental models of these instruments have already been tested successfully on ships. (Baku, Bakinskiy Rabochiy, 29 May 58)

The Institute of Physics of the Academy of Sciences Ukrainian SSR has designed semiconductor bolometers which perform the function of infrared radiation receivers in the same way as metal bolometers. The Experimental Production Division of the Institute of Physics has undertaken the small-series production of these instruments to satisfy the needs of various organizations.

(Source gives detailed information on these bolometers.) (Moscow, Byulleten' Tekhniko-Ekonomicheskoy Informatsii, No 8, 1958, pp 40-41)

VI. PRECISION EQUIPMENT

A. Microscopes

A new microscope developed by the chair of optical instruments under the leadership of Prof M. M. Rusinov can be seen at the Institute of Precision Mechanics and Optics.

The new microscope has a field of view that is 2.5 times that of existing microscopes, and its image quality is high. In addition, it is simpler than existing types and will be cheaper than currently produced types when it is put into series production.

This microscope is designed mainly for studying biological compounds with magnification power up to 350.

The Leningrad Optical Machinery Plant [of the Russkiye Samotsvety Trust] will produce this microscope. (Leningradskaya Pravda, 5 Jun 58)

The Leningrad Optical Machinery Plant has started manufacturing an experimental series of microscopes for biological studies designed under the direction of Prof M. M. Rusinov. These new microscopes have a field of view which is 2.5 times that of an ordinary microscope. (Moscow, Izvestiya, 8 Jun 58)

B. Photographic Equipment

The photo journalist must often take pictures under the most exacting circumstances, requiring the most dependable equipment, yet our photographic industry hardly considers the needs of photo journalists, and there is not a single press camera made in the USSR today.

Despite the high quality and dependability of such Soviet cameras as the Kiev, they are designed primarily for the amateur and do not necessarily always satisfy the requirements of the professional, particularly of the photo journalist.

There are three roll-film cameras series produced in the USSR today. These are the beginners' Lyubitel'-2 camera, which takes 6-x-6-cm negatives, and the Moskva-4 and Moskva-5 medium-class cameras, which take 6-x-6 or 6-x-9-cm negatives. The major fault of these cameras is that focusing is accomplished by moving only the front elements of the lens, limiting its use for close-up photography.

The most popular USSR-produced 35-mm camera among photo journalists is the Kiev. Production of the new Kiev-4 and Kiev-4a models is just beginning, and of these the Kiev-4 (without built-in exposure meter) will be used most extensively for photo journalism. (Moscow, Sovetskoye Foto, Sep 58, p 47)

The Leningrad State Optical Machinery Plant has manufactured an experimental group of new Neva twin-lens-reflex cameras. (Moscow, Sovetskaya Torgovlya, 23 Aug 58)

The new 35-mm Yunost' camera is priced at 450 rubles. (Moscow, Novyye Tovary No 9, 1958, p 3)

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

Moskva-5 camera	520 rubles
Smena-2 camera	180 rubles
Zorkiy-2S camera	700 rubles

(Kiev, Pravda Ukrainy, 27 May 58)

The Leningrad exposure meter is produced in a shop of the Leningrad Vibrator Plant, under conditions of very high cleanliness. The shop's current assignment for the production of these exposure meters is 10,000 per month. A year ago, only about half that number were being produced. The shop uses ultrasonic vibration for cleaning parts and for other purposes.

Plant designers have developed a new exposure meter model, which will be useful even in darkening twilight. (Leningradskaya Pravda, 6 Jun 58)

The Latvian Sovnarkhoz has ordered a number of Riga enterprises to set up production of various photographic accessories.

The Riga Electrical Machinery Plant will produce electrical glazing machines (elektrofotoglyantsevatel'); the Riga Electric Bulb Plant will produce both electronic and single-shot flash tubes and bulbs, flood lamps, and enlarger bulbs; and the Riga Etalon Plant will produce scales for weighing chemicals. (Moscow, Sovetskoye Foto, Aug 58, p 85)

C. Motion-Picture Equipment

The Kiev Kinodetal' Plant was organized in 1943 on the base of a motion-picture equipment repair workshop. At that time there were only a few machine tools and 20 workers in the plant. By 1945 the plant's gross production amounted to 100,000 rubles; it is expected to amount to 10.5 million rubles according to the 1958 plan. There are currently 350 workers at the plant.

This plant produces more than 30 type designations of spare parts and units for motion-picture projectors; special film storage cabinets, carrying cases, and reels for 16-mm film; fireproof screens of light material; assembled units and complete sets of parts for 35-mm cameras; and spare parts for 16-mm cameras.

In 1955, the plant, in collaboration with NIKFI (Scientific Research Motion-Picture Photography Institute) organized the series production of the KShS-1 projector, based on the KPT-1 camera, for showing wide-screen stereophonic films. The plant produced 20 of these apparatuses in 1955 and 225 of them in 1957; the production of 400 sets is planned for 1958.

In 1956, the plant, together with NIKFI, started manufacturing projectors for panoramic motion pictures, and at present the plant produces the improved Kiev panoramic motion-picture projector.

Again in cooperation with NIKFI, the plant expects during 1958 to start manufacturing experimental models of equipment for 70-mm film. -- B. Yagodzinskiy, Director, Kiev Kinodetal' Plant (Moscow, Kinomekhanik, Oct 58, p 35)

The Odessa Kinap Plant is now subordinate to the Odesskiy Sovnarkhoz. (Moscow, Tekhnika Kino i Televideniya, Aug 58, p 93)

D. Watchmaking Industry

According to G. S. Starodubtsev, director of the Scientific Research Institute of the Timepiece Industry, the USSR timepiece industry now produces 24.5 million consumer timepieces annually, including up to 13.2 million wrist watches. At present, 49 types of consumer timepieces are being produced, including wrist watches, alarm clocks, wall clocks, and table clocks. In 1958, 11 new varieties will go into production, including the Volga women's wrist watch, which will be made by the Uglich Timepiece Plant.

Soon Soviet people will be able to have table clocks which tell the hour, day, week, month, and day of the month.

Recently, a conference of workers of the timepiece industry was held. This conference was important because it dealt with the broader implementation of timepiece programing devices in the metallurgical, chemical, food, and other industries, for the purpose of automating various production processes. (Moscow, Vechernyaya Moskva, 29 May 58)

More than 4,000 women are employed at the Moscow First Timepiece Plant (pervyy chasovoy zavod). -- I. Krivosheyev, Deputy Director of the Plant (Moscow, Moskovskaya Pravda, 7 Jun 58)

The Serdobsk State Timepiece Plant in Penzenskaya Oblast has sent its first consignment of new 11-jewel 7-day table and wall clocks to trade organizations. The clockwork is enclosed in a plastic case. In 1958, the plant will produce 205,000 of these clocks. (Moscow, Leninskoye Znamya, 8 Jun 58)

E. Firearms

The Izhevsk [Firearms] Plant is starting production of an improved model of the IZh-54 shotgun. A new model developed during 1958 has an over-and-under double barrel arrangement with interchangeable barrels of varying lengths.

The plant has also developed a unique new model in the IZh-56-3 Belka combination shotgun and rifle with over-and-under arrangement of the barrels. The lower barrel is smooth-bore 28 or 32 caliber for either shot or slugs, and the upper barrel is for 5.6-mm cartridges. The barrels are mounted in such a fashion that the heat expansion of one will not affect the other. (Moscow, Sovetskaya Aviatsiya, 27 Jul 58)

Experimental models of the new 16- and 20-gauge IZh-57 double-barreled shotgun, one model for mass production and the other for custom production, have successfully passed tests. The price of the mass-produced model of the IZH-57 is 1,200 rubles. (Moscow, Novyye Tovary, No 9, 1958, p 11)

VII. ELECTRICAL PRODUCTS

A. Control and Switching Equipment

Until recently, control panels were produced only at plants of the Ministry of Electric Power Stations and at small nonspecialized plants and shops. Their production was more or less on an individual-order basis; very little standardization of types was employed.

Although the Leningrad Elektropul't Plant with its large volume of production was able to employ modern manufacturing methods, the individual-order nature of its products hampered the initiation of large-series production.

The TsKB Elektroprivod (Central Design Bureau for Electric Drive and Automatics) of the Scientific Research Institute of the Electrical Industry, in collaboration with the Minsk Electrical Engineering Plant and the Novosibirsk Turbogenerator Plant, has developed a series of standard package control and protection panels consisting of 21 type-designations of parts. A series of low-voltage standard power distribution boards, consisting of 24 type-designations, has been developed and put into production.

Two new specialized enterprises of the electrical engineering industry, the Minsk Electrical Engineering Plant and the Novosibirsk Turbogenerator Plant, have been given the assignment of producing standard control and protection units, and power distribution boards. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 6 Jun 58)

The Dnepropetrovsk Selenium Rectifier Plant produces gamma-electronic relays, which operate on the principle of utilizing the radioactive decomposition of a cobalt isotope and are designed for two-portion contactless control in the automatic installations of the ore-mining industry. The relays are produced in three modifications: The RGE-1, which is based on semiconductors; the RGE-2, which is a simplified version supplied completely by AC current; and the RGE-3, which is a high-speed relay with a photoelectron multiplier. These instruments can be used for counting mine cars traveling at high speeds.

The first consignment of the new relays has undergone industrial testing at the Chelyabinskugol' Combine, where their reliability was proved. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 4 Jun 58)

The [Tartu] Termoavtomat Plant is the producer of the type RD-7-T pressure relay. (Moscow, Knizhnaya Letopis', No 35, 1958, p 34)

The Leningrad Elektrooborudovaniye Electric Heating Devices Plant [Leningradskiy zavod elektronagrevatel'nykh priborov "Elektrooborudovaniye" -- apparently a new plant, or an old plant or artel which has been renamed] produces type PM-2 magnetic starters out of materials supplied by the consignee. Type PM-magnetic starters are used for the remote starting of electric motors up to 20 kw in power.

Orders should be sent to the Elektrooborudavaniye Plant at Sredniy Okhtenskiy prospekt d. 33/15, Leningrad K-176. -- Advertisement (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 28 May 58)

New power station remote control equipment utilizing semiconductors and magnetic equipment is series-produced by the Leningrad Elektropul't Plant. (Moscow, Komsomol'skaya Pravda, 1 Jun 58)

The [Leningrad] Elektropul't Plant is the producer of the types K-20, K-23, and K-03 universal push-button switches and the type KSM-2 electromagnetic push-button switch. (Moscow, Knizhnaya Letopis', No 35, 1958, p 32)

The Elektropul't Plant is the producer of the type PPT-10 fuses. (Moscow, Knizhnaya Letopis', No 35, 1958, p 33)

In 1958, rectifiers for converting AC into DC made by the Saransk Elektrovypryamitel' Plant have been shipped to China, Bulgaria, Rumania, India, and other countries. (Moscow, Sovetskaya Rossiya, 7 Jun 58)

B. Batteries

Synthetic ferric oxide is used in the manufacture of alkali storage batteries. A number of scientific research institutes and enterprises have devised a way to replace 80 percent of the ferric oxide with Krivorog "Sin'ka" ore, which is concentrated up to 67 percent. A ton of synthetic ferric oxide costs 8,000 rubles, while a ton of Krivorog ore costs only 38 rubles. According to preliminary figures, the new method will save more than 15 million rubles per year.

However, Rudosbyt [Administration for the Sale of Ore?] refuses to supply ore with the proper iron content, offering ore with harmful impurities instead. The Dnepropetrovskiy Sovnarkhoz should see that the ore has an iron content no less than 66-67 percent. When 66-67 percent iron ore is used, only 9,000-10,000 tons per year are required: when 64-percent iron ore is used, 16,000-18,000 tons are needed.

Ore-dressing operations should be organized at one of the mines of the Krivorog Basin. -- M. Slobodskoy, Chief Engineer, Leningrad Leninskaya Iskra Storage Battery Plant, and V. Gaintsev, Chief Engineer, Kursk Akkumulyator Plant (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 11 Jun 58)

Silver-zinc storage batteries developed by the VNIIT (All-Union Scientific Research Institute of Current Sources) are on exhibit at the All-Union Industrial Exposition. Such batteries are from three to six times as powerful as acid batteries. (Moscow, Komsomol'skaya Pravda, 1 Jun 58)

C. Wire and Cable

In recent years, the USSR cable industry has succeeded in using aluminum instead of copper for making cable cores, and aluminum and plastics instead of copper for sheathing cable. In 1955, aluminum cable products constituted 55 percent of the total USSR production of cable products. More than 60 percent of the total cable products were sheathed with lead substitutes. During the past 7 years, more than 200,000 tons of copper and lead have been saved.

However, all capabilities for substituting aluminum for copper in the production of cable products and electrical equipment are far from exhausted. Aluminum marine cable, communications cable, control cable, flexible cable, and flexible installation wire have not been developed or produced.

The plan for the production of aluminum winding wire and enameled wire is not being fulfilled. The replacement of copper windings in electric motors, transformers, magnetic separators, and other types of electrical equipment by aluminum windings is being delayed intolerably.

Most of the cable plants have failed to master the processes of drawing thin and medium-size aluminum wire. In 1957, the [Moscow] Moskabel' Plant, the [Kuybyshev] Kuybyshevkabel' Plant, the [Khar'kov] Yuzhkabel' Plant, and the [Tashkent] Tashkentkabel' Plant did not fulfill their plans for the production of cables with substitutes for lead sheathing. As a result, more than 3,000 tons of lead were overexpended.

During the first quarter of 1958, the Yuzhkabel' Plant fulfilled its plan for the production of aluminum installation wire 48 percent and its plan for copper installation wire 330 percent. Instead of producing aluminum power cable in aluminum sheathing, the Yuzhkabel' Plant produced copper power cable in lead sheathing. Not only did the Khar'kovskiy Sovnarkhoz fail to demand that the plant fulfill its products-list plan; it went even further: it relieved the plant of the production of aluminum winding wire, although the sovnarkhoz's own enterprises needed this wire.

There has not been much success in providing cable plants with equipment for processing aluminum. USSR industry has not mastered the production of machines for drawing aluminum wire smaller than 1.6 mm in diameter, or of hydraulic presses up to 5,000 tons in capacity for applying aluminum sheathing on cable and wire. The quality and quantity of production of worm machines for applying plastic insulation on cable and wires leave much to be desired.

Problems of economizing on copper and lead are accorded a secondary degree of importance in the project schedule of the NIIKP (Scientific Research Institute of the Cable Industry), which is supposed to head the work on introducing substitutes for nonferrous metals. This institute gives insufficient aid to enterprises in developing new aluminum products and in devising manufacturing methods for them. It did not draw up technical documents for aluminum winding wire and enameled wire, although the production of such wire has been planned for many years. Only recently did the institute draw up technical documents for aluminum wire which is designed for installation under plaster.

Insufficient aid from the NIIKP and the negligence of the sovnarkhozes lead the plants to forget about utilizing substitutes and to overexpend thousands of tons of expensive metal.

A conference on saving copper and lead in the USSR was held at the end of May 1958. At this meeting, the main steps toward saving and replacing lead and copper in the electrical industry were outlined.

Sovnarkhozes, cable plants, and electrical machine building enterprises should pay attention to economizing on nonferrous metals and the use of substitute materials on a constant day-to-day basis. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 6 Jun 58)

The Scientific Research Institute of the Cable Industry has developed a new type of wire with a high-quality polyurethane coating. This wire is tested on experimental stators in the institute's electric insulation laboratory. (Moscow, Moskovskaya Pravda, 1 Jun 58)

Within a comparatively short time, the Scientific Research Institute of the Cable Industry and the Tashkentkabel' Plant have developed nine continuous vulcanizing units, which have consolidated several processes and saved equipment and material at the plant.

Andreyev is director of the [Tashkent Branch of the] Scientific Research Institute of the Cable Industry.

Safonov is director of the Tashkentkabel' Plant; Makarov is chief engineer. (Tashkent, Pravda Vostoka, 6 Jun 58)

A new enameled wire shop (13) has been constructed at the Yerevan Cable Plant. The new shop is equipped with complex machinery and produces enameled winding wire from .05 to 3 mm in gauge.

The plant has also organized the production of APPR flat aluminum wire with rubber insulation and two or three parallel conductors. This is the first wire of this type to be produced in the USSR; it is designed for closed wiring in residential and other buildings.

New USSR-made wire-drawing units are being installed at the plant. They will be used for drawing copper and aluminum wire. (Yerevan, Kommunist, 29 May 58)

(13) Photo showing the large-gauge wire department of the new enameled wire shop available in source, p 3, left

D. Insulation

The utilization of epoxy resins and MBK compositions based on methacrylic resins in the electrical and radio industries brings about high technical and economical results. These compositions have high electrical insulation properties and are waterproof and highly adhesive. Submersible electric motors with this type of insulation can operate for several years. Current transformers with cast resin insulation are only one half to one third the size of those with porcelain insulation. Motors with this insulation can freeze and thaw out without becoming damaged. The use of cast resins in the electrical and radio industries will bring about a saving of 25,000 tons of copper and 160,000 tons of ferrous metal between 1959 and 1965.

However, these modern materials are being put into use very slowly. During the past 4 years, with the help of the NIIEP (Scientific Research Institute of the Electrical Industry) and the VEI (All-Union Electrical Engineering Industry), the mass production of electrical equipment with cast insulation was introduced at only two small plants: the Moscow Electrical Machinery Plant [probably Dzerzhinskiy Rayon] and the Sverdlovsk Current Transformer Plant.

The large-scale use of cast insulation is also being delayed by the chemical industry, which produces poor-quality epoxy resins and MBK compositions in insufficient quantities. Many complaints are being directed toward the Kineshma Chemical Plant, which produces the raw material for cast resins -- diphenylolpropane with a high amount of impurities and moisture. The cost of epoxy resins and MBK compositions is much too high. Current transformers made with the new insulation cost just as much as any other current transformer.

Because of the shortage of these resins, some radio and electrical plants try to make their own.

For several years, many large scientific research institutes of the chemical and electrical industries, the Okhta Chemical Combine, the [Moscow] Izolit Plant, and other enterprises have been mastering the production of cast resins and MBK compounds, but they have not coordinated their efforts. In addition, there is no exchange of production and technical know-how, and production facilities have hardly been expanded. The large chemical enterprises do not participate enough in the development of new materials. For example, the Gor'kiy Sovnarkhoz, despite the orders of Gosplan RSFSR, does not organize the production of MBK compounds at its own enterprises.

Special industrial equipment is needed for producing electrical and radio products with cast resins. This equipment has to be made by the plant itself, usually in an expensive primitive fashion. For example, the Moscow Electrical Machinery plant had to spend more than 40,000 rubles for making accessories for simple products.

Planning and scientific research organs should solve the problem of the centralized design and production of basic types of industrial equipment for the manufacture of products using cast resins.

Small plants were the first to begin using new insulating materials; now the large electrical and radio plants should begin using them, especially the [Leningrad] Elektrosila Plant, the [Leningrad] Elektroapparat Plant, the Moscow Transformer Plant, and the Moscow Dinamo Plant.

The status of the production and utilization of cast insulation was recently discussed at an All-Union Conference organized by the Central Bureau of Technical Information of the Electrical Industry by order of Gosplan USSR and Gosplan RSFSR. Representatives of the chemical, electrical, and radio industries participated at this conference, and requested Gosplan USSR and Gosplan RSFSR and the sovnarkhozes to take measures toward expanding the production and utilization of cast insulation. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 25 May 58)

The VEI (All-Union Electrical Engineering Institute imeni V. I. Lenin), in collaboration with the [Khot'kovo] Elektroizolit Plant, has developed and put into production an effective method for the group heat treatment of electric insulation products for winding purposes. These products are heated with high-frequency currents on special single and double-spindle machines. In 3-5 minutes, the material heats up to 165-170 degrees. The entire heat-treatment process requires 10-30 minutes, a fraction of the time required by conventional methods. -- V. Degtev, Scientific Worker of VEI (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 11 Jun 58)

A mechanized constant-flow line for the production of large 220,000-400,000-volt bushings has been developed, installed, and put into operation at the Moscow Izolyator Plant. (Moscow, Moskovskaya Pravda, 7 Jun 58)

E. Carbon Products

The [Kudinovo] Ekektrougli Plant is one of the largest USSR producers of electrocarbon products. It produces tiny carbon plates and brushes, without which no electric motor could operate. Its production is complex and highly important.

It may seem strange that this plant, a supplier to the most advanced branches of modern industry, has more manual operations than machine operations. Coke is crushed by hand; carbon compound is mixed by hand; semi-finished products are pushed around on primitive carts; ancient Mannheim furnaces and the few high-production automatic furnaces are loaded and unloaded manually.

This large, important enterprise does not have a single production process that is fully mechanized from beginning to end. Chemical powders are not kept in special sealed containers, but in dusty paper sacks. The proper hermetic tightness necessary for chemical production is absent in the plant. Plant engineers can only dream about stabilizing the quality of each type of electric brush and electrocarbon semifinished product.

"Unfortunately," states Volzhenskiy, plant director, "the problem [of quality stabilization] cannot be solved by a single enterprise. This problem, along with the mechanization and hermetic seal of our products, can be solved only in cooperation with learned personnel equipped with a good experimental base. The plant's numerous efforts to solve these problems on its own have ended in failure."

A large scientific research group working on developmental problems of electrocarbon production is located on the plant's grounds. This is the branch of a Moscow institute [Scientific Research Battery Cell and Electrocarbon Institute]. Its divisions occupy the same buildings as the plant shops.

The Elektrougli Plant is now under the jurisdiction of the Moscow Oblast Sovnarkhoz. The institute is subordinate to Gosplan USSR. Despite their physical proximity, the plant and institute are alienated by departmentalization. The branch of the institute operates at an even, quiet pace. Plant problems never penetrate its spacious and comfortable offices. No one at the institute feels personal responsibility for production. It is true that every year the institute concludes a traditional "friendship pact" with the plant and promises it all-around aid. However, production workers, hardened by sad experience, tend to regard this pact with skepticism.

Only two successful innovations have resulted from the institute's work in the automation of the electrocarbon industry: the development of automatics for pressing electric brushes in finished sizes along with the simultaneous pressing of pieces of cables into them; and the development of continuous furnaces for baking lead-graphite products.

The institute also tried to mechanize other sector of production, but it left off half-way in all cases. For example, the institute recommended that vibrating mills for the simultaneous grinding and mixing of carbon materials with the use of coal tar as a high-temperature binder be installed in Shop No 1. This step seemed extremely promising. It would have brought about a uniformity in semifinished products, less chemical precipitation, and an increased capacity of the baking furnaces. However, the valuable proposal was never worked out. When the vibrating mills, which were produced according to the designs of the institute, were tested in the shop, their screens and bolts fell out and the shield plates broke off. It was impossible to control the degree of grinding of coke powder and coal tar in them. After suffering with the vibrating mills for several months, the plant rejected them and went back to using sledge-hammers.

The new furnaces with regulated resistances which were recommended by the institute also failed to prove themselves. Their loading capacity turned out to be extremely small. Cracks appeared on the products. Plant innovators increased the furnace capacities 30 percent, but were unable to prevent cracks. It then became necessary to adopt a different design of furnace, as recommended by plant workers. This furnace had nonregulated resistance, but had a higher load capacity and no mechanical defects.

Often the institute recommends new types of products for production before they have been tested sufficiently and before a process has been worked out for them. This results in the mass-production of rejects.

A. S. Fialkov, chief engineer of the branch of the institute, was asked, "What is the explanation for the paltry aid rendered to the plant by the institute?"

He answered: "First of all, we must regard production problems as secondary, and not primary, tasks. These problems do not in any way constitute the main projects in our scientific plans. Moreover, our experimental capacity is very limited. We are not capable of testing every little process or design from beginning to end."

To back up his statement, Fialkov demonstrated the branch's experimental shop. It is surprising that the entire manufacturing cycle of electrocarbon production can fit there. Granulating, mixing, pressing, baking, graphite coating, and machining, the most important production stages, are represented in a most abridged form. There is no electronic microscope for studying the structure of products. There is no room for installing new experimental equipment. There is no mechanical base, where the institute could build new mechanisms and develop designs. This is why the institute recommends unprofitable brushes and untested designs to the plant.

"Sometimes we have to set up an experiment in the plant," say the scientific workers of the institute. "However, the shops are occupied in fulfilling their plans. We are strangers there. And so we have to walk around for weeks in the series-production shops, begging for a machine tool for experimentation purposes.

The alienation of the plant from the institute disrupts the fruitful activity of both production workers and scientists. However, no one wants to be brave enough to end this unsavory situation. The voice of reason inquires: "Would it not be better to transfer the branch of the institute to the subordination of the Moscow Oblast Sovnarkhoz, since it is located under the same roof as the Elektrougli Plant?" The sovnarkhoz is more capable than any other master of coordinating the activity of this branch with the needs of production. Then, the Elektrougli Plant could become the leading USSR enterprise in technology and working conditions. (Moscow, Leninskoye Znamya, 4 Jun 58)

F. Electric Furnaces

The Leningrad High-Frequency Installations Plant has produced a 1,000-watt unit for heating dielectrics and plastic powder in an electrical field (14). It will be exhibited at the International Exposition in Damascus, United Arab Republic. (Leningradskaya Pravda, 17 Jun 58)

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

The Moscow Platinopribor Plant is the producer of the TVV-2 vacuum furnace. (Moscow, Zavodskaya Laboratoriya, No 9, 1958)

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