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(Vestnik Svyazi)

No. 12, 1959

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HERALD OF COMMUNICATIONS

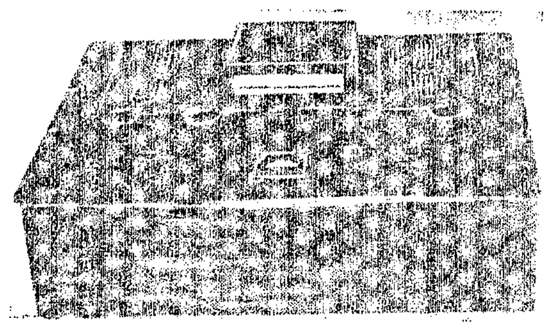
No. 12, 1959

[Following is the complete translation of Vestnik Svyazi (Herald of Communications), issue No. 12 (237). Both covers and the Table of Contents of this Russian-language publication were included in the translation.]

NOTE: In order to expedite its issuance, this publication has been printed directly from the translator's typescript, after a minimum of retouching, cropping and make-up.

INNOVATIONS IN COMMUNICATIONS TECHNOLOGY

Wide-Range Precision Meter, Type PMSShD-1



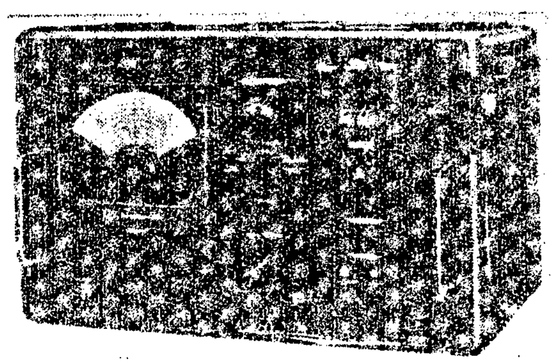
The PMSShD-1 meter is designed for resistance measurements using direct current under laboratory and factory conditions. The basic element of the meter is a single 4-arm high-resistance bridge, which uses an electrometer-type VTVM as an indicating device. The time required to measure any resistance does not exceed 0.5-1 min.

The basic data for the instrument are: 1) measurement range, $10-10^{14}$ ohms; 2) working voltage 10, 90, and 180 v; 3) measurement error does not exceed 0.1% in the $10-10^{10}$ ohm range, and 1% in the $1.001 \cdot 10^{10}-10^{14}$ ohm range; 4) the sensitivity of the electrometer-type VTVM is a constant $2 \cdot 10^{-4}$ v/mm; 5) the input resistance of the volt meter is determined by the magnitude of the grid current, which does not exceed $5 \cdot 10^{-14}$ amp.

The power supply of the instrument consists of four 90-v dry cells (bridge), an 18-v, 60-100 amp-hour storage battery (electrometer-type, VTVM) and a 6-v, 5 amp-hour battery (indicator lighting).

The dimensions of the instrument are: 715 mm × 515 mm × 275 mm; it weighs about 45 kg.

Type GVShD Wide-Range Heterodyne Wave Meter



The type GVShD wave meter is designed to measure the frequency of unattenuated oscillations with a high degree of accuracy over a wide frequency range, and for determining the drift of the measured frequency under the influence of destabilizing factors.

The range of frequencies measured equals 10-3500 Mc. Frequency measurements read directly from the scale of the instrument are accurate to within $2 \cdot 10^{-5}$. The wave meter may also be used for approximate evaluation of instantaneous instabilities of the measured frequency.

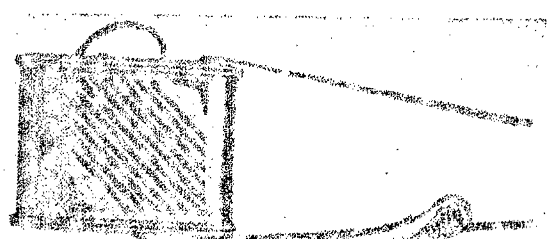
The instrument power supply runs from the 127 or 220 v ac mains; it draws 200 watts of power. The instrument measures 680 mm x 490 mm x 450 mm.

Type 0.5 PEM-1 Megaphone

The radio-engineering industry has developed the portable-type 0.5-PEM-1 electric megaphone. It consists of a microphone, a loudspeaker, an amplifier, and a storage battery. The megaphone is designed for speech amplification in closed rooms in the presence of noise.

The microphone of the electric megaphone is not sensitive to background noise. The megaphone is placed on the chest of the operator; the controls are in the handle of the microphone.

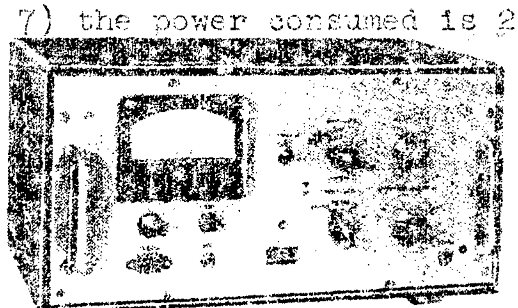
The rated power of the amplifier is 0.5 watts; the dimensions of the electric megaphone are 160 mm x 120 mm x 50 mm.



Type SGSnD Wide-Range Ultra-Short Wave Signal Generator

The instrument is designed to be used in tuning antennas, feeder lines, resonance wave meters, etc. It i distinguished by excellent output-voltage shaping and frequency stability with various types and varying magnitudes of loads.

The basic data for the instrument are: 1) generato band width 30-400 Mc; 2) frequency deviation with variation in the nature and magnitude of the load, for a supply voltage variation of $\pm 10\%$, and over 30 min of continuous operation, does not exceed $5 \cdot 10^{-4}$; 3) the output power of the instrument into a 75-ohm load is not less than 5 watts over the 30-300 Mc frequency band and not less than 2 watts over the 300-400 Mc band; 4) the output voltage of the generator is measured by a peak volt meter; 5) the output voltage of the instrument may be modulated with rectangular pulses, lasting 2-20 μsec, and by 1:1 pulses from a self-contained modulator, as well as by a sinusoidal voltage, and by external pulses; 6) the power supply operates from the 50-cycle ac mains, either 127, or 220 v $\pm 10\%$; 7) the power consumed is 200 watts.



CONTENTS

Proletarians of the World, Unite!

HERALD OF COMMUNICATIONS

A Monthly Industrial-Technical Journal

of the USSR Ministry of Communications

and of the Central Committee of the Trade Union

of Communications, Automotive, and Highway Workers

No. 12 (237)

December 1959

(Nineteenth Year of Publication)

TO DEVELOP AND IMPROVE POSTAL COMMUNICATIONS IN RURAL AREAS

The December plenary session of the CC CPSU will discuss the vital problem of the further development of the rural economy. The communications workers are confronted with the extremely important problem of providing the agricultural workers with communications facilities, and this refers particularly to the largest branch of communications, namely, the post office.

The rural postal communications system plays a lar[ge] and extremely important role in the over-all communication system of the USSR. The rural district branch communicatio[n] offices where approximately one half of all communications workers in our country are employed, have been called upon to provide the public, local party and Soviet organizations, kolkhozes, sovkhozes, and repair-technical stations with communications facilities.

The USSR Ministry of Communications and its local offices, have in recent years done much along the lines of organizing the expansion of the postal communications network in rural areas; communications enterprises have been improved with respect to the quality of service, and they have been staffed with properly trained specialists. Particular attention has been devoted to providing high quality postal services to the sovkhozes, repair-technical stations, and to major kolkhozes. For this purpose, mobile branch communications departments have been added to the system of fixed communications enterprises; these mobile branch communications offices are set up in motor vehicles, and at such points where it might prove inexpedient to set up a special branch communications office; postal agents have been hired from among workers not normally employed by the communications administration. All these steps have served to improve the service provided to rural workers.

At the beginning of this year, more than 45,000 fixed branch communications offices were in operation, there were some 300 mobile branch communications offices, and there were better than 3000 communications agents employed outside of the regular staff of communications workers. Approximately 300,000 mail boxes have been set up in rural populated areas.

Of the various measures that have been put into effect during the past five years, the most significant has been the replacement of uninhabitable and ramshackle buildings housing the various branch communications and major communications offices. During this period, more than 8000 buildings, housing branch communications offices were replaced by renovated or newly constructed buildings.

The interdistrict inspectors play an important part in improving the operations of rural branch communications offices; at the present time, there are some 1100 such inspectors. The interdistrict inspectors, first of all, teach the workers at the branch communications offices how to organize their work schedules in a proper fashion, and in addition, they teach the rural communications enterprises how to provide proper and good service and facilities. The interdistrict inspector has, in effect, become a link between the regional (oblast) administration and the enterprises. Many inspectors have achieved considerable operational improvements from the branch communications offices of their districts by taking advantage of the support and assistance of the party and Soviet organizations. As an example, we might cite the activity of the interdistrict inspector of the Kostroma Communications Administration, F.I. Puchkova.

The measures that have been put into effect by the Ministry of Communications, as well as the locally introduced measures, have made possible, on postal routes, considerable reductions in the number of items of mail that were not delivered; in addition, there has been a decided improvement in the quality of communications services offered to the public. During the months in which the rural workers are busy in the fields, newspapers and mail are very often delivered directly to the field camps and brigades. Much work has been done along the line of setting up model district branch communications and major offices which serve as an example of the quality of service to the public in rural areas, and to the enterprises, institutions, and organizations of these areas; these offices are also centers at which valuable experience can be gained.

Many postal communications enterprises have become genuine cultural institutions in rural areas. Many facts bear this out.

For example, we can cite the Lizums Branch Communications Office of the Latvian SSR. Here, the public is provided with all forms of communications, and the service is excellent. The office always has packing crates and various packaging materials at hand. The supervisor of the office, D.Ya. Kainya, holds regular discussions with customers, and explains the communications services available at the office and how to use them properly. No single populated area, of the many served by this branch communications office, has failed to benefit from a visit by Comrade Kainya.

The collective of the district branch communications office at David-Gorodok, Brest Oblast (office manager, A.I. Glebov) has merited the respect of the population. This office exceeds its assignments under the plan, but what is more important, it carries out its assignments in an excellent manner and provides the citizenry with efficient communications services. It is therefore no accident that the collective of this office has been listed on the regional honor board.

The public receives excellent service from the branch communications office of Gorodeya, Minsk Oblast All conditions have been created here to provide the public with efficient service. As a result of careful, coordinate and attentive work, the communications workers of the offi have been able to eliminate all complaints, and receive only expressions of thanks.

We should not fail to take note of the important initiative taken by a number of communications ministries in the various republics of the Soviet Union with regard to improving the operations of the rural post office.

Thus, at the request of the Ministry of Communications of the Uzbek SSR, the Republic State Administration adopted a resolution on measures to improve the living and cultural conditions of the rural population. These measure referring in particular to the servicing of the public wit all communications facilities, anticipate that in 1959 the Ministry of Communications of the Uzbek SSR will have an additional 365 people, and an appropriate wage fund; the purpose of this increase in manpower is to improve the mai delivery service to the workers and employees at the sovkhozes. For this same purpose, the work plan has also been increased substantially in the Ukrainian, Latvian, and other republics.

The experience gained by many republic communications ministries with respect to setting up mail boxes and auxiliary stations in rural areas should be widely disseminated. Even now, along rural postal routes and in populated areas of the Latvian SSR there are more than 5000 such mail boxes; there are 600 such boxes in the Estonian SSR, and 200 in the Kazakh SSR. This makes it possible to provide a farm worker with the facilities and services of postal communications, and to make better use of the facilities of post office transportation and of the post office personnel.

Where local conditions permit, the mass use of bicycles and motorcycles will promote the more rapid movement of mail to rural areas, and ease the work of rural letter carriers. Rural letter carriers have approximately 45,000 bicycles at their disposal, and the demand for this means of transportation continues to grow.

However, despite the far reaching network of communications enterprises and mail boxes, the over-all state of postal communications in rural areas is still far from adequate to meet all the requirements of the public. Many populated areas are located at considerable distances from the closest communications enterprise and the nearest post office box. Thus, at the beginning of this year, more than 105,000 populated areas, 5000 rural Soviets, 400 sovkhozes, and 12,000 kolkhozes were located at least five kilometers, and even more, from the nearest enterprise; at the same time, these areas were not serviced by mobile branch communications offices, nor by nonstaff communications agents; this situation holds for the entire Soviet Union. More than 64,000 populated areas are completely without any mail boxes, and are at least one kilometer removed from the closest mail box. This situation causes considerable inconvenience for the inhabitants who must walk great distances in order to mail a letter, parcel, or to send a money order. More than half of the postal routes in the country still use horse-drawn vehicles, which obviously cannot provide the rural areas with fast and efficient mail handling.

Many leading communications workers still fail to exhibit the required persistence in effectuating the decisions of the Central Administrative Organizations, decisions which have called upon the local Soviet and party organizations to assist the post office communications enterprises in speeding up the handling of printed matter and mail.

At the Syr-Darya station of the Uzbek SSR there is a interrepublic post office delivery station which receives mail from four districts (rayons) located in the Golodnaya Steppe of Kazakhstan. In inclement weather the streets to the delivery station are impassable for distances of up to one and one half kilometers. The post office truck drivers must therefore carry the mail on their backs and walk through knee-deep mud. Despite the decision of the government of the Uzbek SSR, and despite the requests, made for three years now, to the Ministry of Communications of the Republic, the workers of the Il'ichev communications office of the Kazakh SSR are unable to have the roads put into proper shape.

We hear of many cases in which mail and printed matter are not delivered in a satisfactory manner; this can, for the most part, be attributed to the fact that the kolkhozes do not send out their letter carriers on time, or do not send them out at all, at times, in fact, taking them off the shift and using them for other work.

A large percentage (32%) of rural branch communications offices are without telephone facilities and they are therefore unable to receive telegrams nor to connect interurban telephone conversations. The situation is particularly bad at the Ministry of Communications in the Kirgiz SSR; of the 14 rural branch communications offices opened in 1959 in this republic, not a single office is equipped with telephone facilities.

The 21st Congress of the CPSU assigned grandiose tasks for the continued steep rise and improvement in socialist agriculture. In the light of these assignments, the communications organizations in rural areas must function in a better fashion, and attain new and higher levels. A particular responsibility will be borne by the communicati organizations, and especially by the rural district office and branch communications offices which have been called upon to provide uninterrupted efficient and excellent communications services to all agricultural workers.

The USSR Ministry of Communications, in order to bring about the completion of the assigned tasks, has prepared a plan for the development of postal communications under the current seven-year plan; this plan anticipates the introduction of important measures to bring about the development and improvement of postal communications in rural areas.

It is anticipated that in addition to the existing networks, seven thousand branch communications offices will be opened; further, four thousand mobile branch communications offices, set up on motor vehicles, will be put into operation; in addition, ten thousand nonstaff communicatio agents will be hired to provide the public with postal se vices. In addition, the plan anticipates the installation of mail boxes in all populated areas, where there are 20 . more farms, and which are located more than one kilometer from the closest mail box.

In order to accelerate the movement and delivery of printed matter and mail, all postal routes will be converted to servicing by motor vehicle transport. The kolkhoz and similar nondepartmental letter carriers will be replaced, gradually, by post office letter carriers that work directly for the Ministry of Communications. Bicycles, motorcycles, and motor scooters will also come into widespread use for the delivery of mail to rural areas. In order to bring about practical solutions to these problems, a persistent and daily effort on the part of the republic ministries and regional administrations of communications will be required.

The post office workers must put forth their maximum creative efforts in order to develop the organizational activity designed to seek out all possibilities for best meeting the requirements of the public, enterprises, institutions, and organizations in rural areas, insofar as these pertain to postal services.

From the Collegium of the USSR
Ministry of Communications

TO DEVELOP THE CREATIVE ACTIVITY OF RESEARCHERS AND EFFICIENCY EXPERTS

The Collegium of the USSR Ministry of Communicatic discussed a report by the RSFSR minister of communication: A.V. Cherenkov, which dealt with the mass research and ef ficiency program being carried out at the communications enterprises of the republic; further, the report also dea with the continuing development of this program.

The speaker pointed out that the communications terprises of the Russian Federation, during the first thre quarters of the current year, had more than 13.2 thousand communications workers participating in the efficiency ("rationalization") program — more than 8% in excess of last year. These communications workers introduced approximately 22,000 efficiency suggestions, i.e., more than 14% than had been introduced in 1958.

In recent times, the communications workers of the RSFSR developed a series of valuable suggestions which we adopted by the USSR Ministry of Communications. The sugges tions include, in particular, a suggestion by I.M. Mytary a worker at the Kashir district (rayon) communications office of the Moscow oblast, who proposed a manual post digging machine set up on a cart; in addition, there was the proposal for a method of separating the receiving and transmission of telegrams over automated links that are equipped with ST-35 equipment, a proposal that was developed by the joint team of efficiency experts at the Leningrad telegraph office: this team is made up of G.A. Shchekin, A.V. Pavlov, Ye.M. Drukker, and A.D. Gerkules; the introduction of this method has made it possible, at the telegraph offices, to free a portion of the equipment, and to make additional work space available.

At the same time, and this was noted at the session of the Collegium, the handling of the research and efficiency program by the RSFSR Ministry of Communications, and the status of "rationalization" and "invention" in individual offices is still fraught with serious shortcomings. The ministry has failed to provide for a free exchange of experience directly within the administrations, and at the communications enterprises; moreover, the ministry has failed to provide adequate practical assistance. This year, the ministry failed to prepare a summary plan for the introduction of the most important efficiency suggestions. In certain communications administrations, including

Kaliningrad, Kurgan, Ul'yanovsk, and Kamchatka, in recent months there has been a definite slackening in the efficiency program, and the number of suggestions has definitely declined.

The deputy supervisor of the Technical Administration of the USSR Ministry of Communications, A.N. Tyulyaye addressed the session of the Collegium, as did the chief engineer of the Moscow post office, V.B. Aslanov, the chi engineer of the Moscow regional communications administra tion, V.I. Zasypkin, supervisor of the main Interurban Telephone-Telegraph Communications Administration of the USSR Ministry of Communications, I.S. Ravich, and others; each of the individuals who addressed the session noted the importance of the research and efficiency program in the movement to put into effect the decisions handed down by the June plenary session of the CC CPSU. In this respect, they made specific proposals for the further development of this program.

The Collegium instructed the RSFSR Ministry of Communications to hold more frequent meetings in order to provide a freer exchange of experience in efficiency opera tions, and in order to improve technical information and education programs; these instructions also included such items as improving the control over the status of the eff ciency and research program at the communications administrations and communications enterprises.

The Technical Administration of the USSR Ministry of Communications was advised to publish, in the first half year of 1960, a brochure devoted to the problem of determining the economic feasibility of the inventions and efficiency suggestions that had been put into effect; moreover, the administration was advised to restudy the program of the release, and to accelerate the release, of TEKSO (card index for the exchange of production experience) cards.

IMPROVEMENT OF THE PTS-52 MOBILE TELEVISION STATION

* * *

The article describes the redesigning of the PTS-52 Mobile Television Station which has been carried out at the Riga Television Center.

As a result of the reconstruction, the operational reliability of the equipment has been raised considerably and the working conditions of the operating personnel have been improved.

The redesigning of the PTS-52 Mobile Television Station to be described in this article was carried out by workers at the Riga Television Center at the end of 1958. The result of the reconstruction was the separation of the work stations and improvement of the working conditions of the creative and technical personnel, and an improvement in the operational reliability of the equipment.

Figure 1a shows the previous disposition of the equipment in the bus and Figure 1b shows the present disposition. Here, 1, 2, and 3 are the blocks of the line repeaters of channels I, II, and III; 4, 5, and 9 are the monitoring units of the camera channels; 8 is the control unit for the line repeaters; 6 is the monitoring television set; 7 is the line-repeater block; 10 is a direct line telephone to the studio; 11 is the switching and monitoring block for the transmitters; 12 and 14 are the monitoring units for the synchro generators; 13 is the power-supply block of the synchro generators; 15 and 17 are synchro generators; 18 is the power-supply block for the transmitters; 19 is the monitoring unit for the transmitters; 20 is a direct-line telephone to the receiving apparatus; 21 is the power supply cabinet; 22 are the hinged covers at the consoles; 23 is the director's desk; 24 is a pedestal for the director's desk.

Figures 2a and 2b show the arrangement of the equipment (side view) in the mobile station before and after the redesigning operation.

The following basic changes were introduced into the standard equipment during the reconstruction.

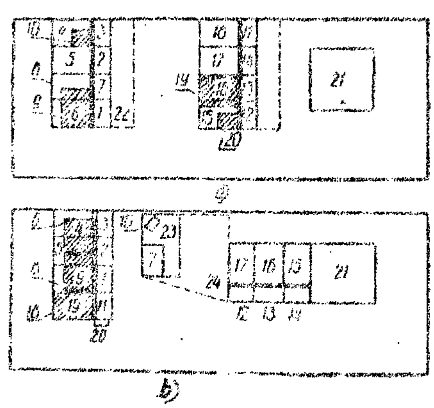


Fig. 1

In the four-section camera-channel desk, the line repeater were removed and transferred to the newly furnished director's desk (at the front on the right in Fig. 3.)

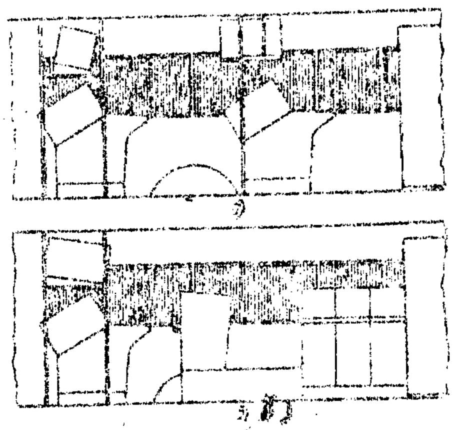


Fig. 2

The first camera channel with the video monitoring unit was transferred into the vacated line repeater section. The reworked transmitter switching block DKKh-77 (describe below) with the KU-10 video monitoring unit (on the left in Fig. 3), which had previously been mounted on a shelf above the synchro generators, was installed in the place of the first camera channel. The following were mounted on a new shelf over the desk: two power supply blocks for the BPKh-53 transmitters, a line-channel video monitoring unit based on a reworked "Rekord" television set, a "Rekord" monitoring television set, and a 1GD-9 command loudspeaker.

A wooden desk was built for the director and mounted on a linoleum covered pedestal, i.e., above the camera-channel desk. Owing to this, technicians sitting at the camera desk did not obscure the screens of the video monitoring units. Two men can work at the director's desk. The desk carries a mixer panel, a command microphone on a rotating stand, a direct-line telephone hand set with a toggle switch for connection to the studio or stage of the theater and lamps for illuminating the desk (the inductor and two telephone bells are inside the desk).

The four-section synchrogenerator console was reworked into three sections; the transmitter-switching and power-supply blocks were removed from it. The desk was placed at a new position in a row with the supply cabinets (Fig. 4). A direct-line telephone to the receiving apparatus was placed at the left of the desk. A D-340 frequency meter was mounted on the side wall of the power supply cabinet.

A "Start" television receiver, which was needed by the director to monitor the program from the ether during transmission, was installed in the auxiliary bus together with the audio monitoring block BKZ. If necessary, the "Start" set with its indoor antenna may be taken out to the commentator's work station instead of the KU-10. Here it is not necessary to run the power and video cables from the busses to the commentator.

The switching and signaling system of the commentator's desk was simplified; the unreliable 14-contuctor cable was replaced by an RPShE 6 x 25 6-conductor screened cable.

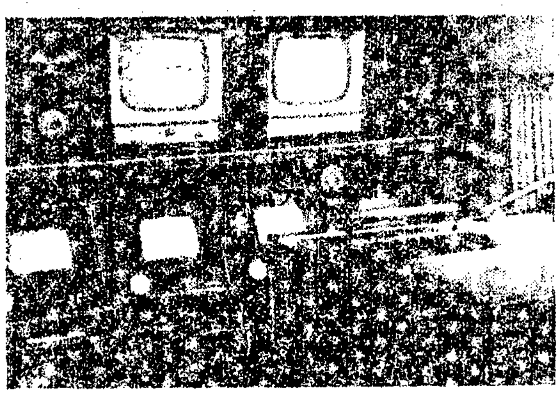


Fig. 3

For loudspeaker communication (broadcasting of the director's commands to the stage during rehersals) we employ an amplifier and an RG-3 radio phonograph loudspeaker which is connected to the reserve 6-contact command communications receptacle nearest to the site of the camera.

The apparatus of the receiving-equipment room was also simplified. The audio line repeaters and the BP-39 power supply block were removed. The line repeaters could

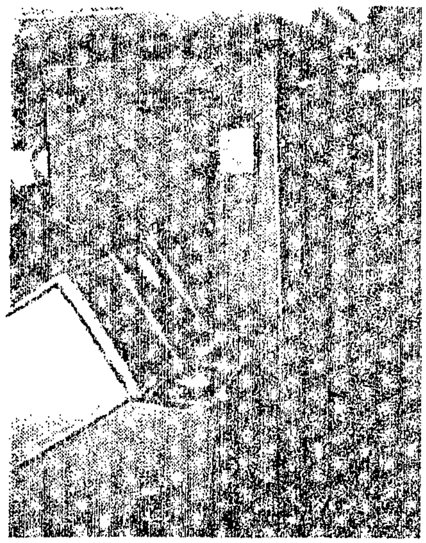


Fig. 4

removed because the sound accompaniment at the Riga television center is fed from the receiving-equipment room to the transmitter through an ASB audio channel.

In order to check all of the channels on a single video monitoring unit, and also to backstop the KU-10, the BKKh-77 switching block was radically reworked. The new circuit and design of the block are characterized by the following unique features. Using a keyboard switching device, it is possible to deliver to the monitoring unit the video signal from any of the three channels, and the video signals from the outputs of the line repeaters and transmitters. The video-signal switching diagram is presented in Fig. 5. The switching apparatus makes use of a somewhat modified 7-key keyboard from a radio receive. Six of the keys serve to feed video signals to the monitoring unit, and the seventh serves as a switch for cutting out the KU directly from the BKKh block (deblocking).

The video and synchro signals are switched by means of 9 type RSM-2 relays. When the "Channel I", "Channel II" or "Channel III" key is pressed, the video signal from the monitoring outputs of the intermediate BUP-2 amplifiers are fed to the relay R_9 through the relay R_1 (or through the relay R_2 or R_3) and thence to the KU. Since the video signal does not contain synchro signals, line and frame synchro pulses are brought in from the reserve output of the BKS-33 block to synchronize the video monitoring unit, these are delivered to the KU through the relays R_7 and R_8. When any of the following buttons are pressed ("BUL output", "Transmitter output"), synchro signals generated by an amplifier-shaper (UF-9) are fed through the relays R_7 and R_8 to the monitoring unit. The video signal is switched in a similar manner by means of the relay R_9; here, the complete video signal is delivered to the input of the UF-9 through the relay R_4 (or R_5 or R_6) and from the output of the UF-9 (lower left in Fig. 5) to the relay R_9. The new switching circuit facilitates tuning of the channe. and makes it possible to detect malfunctions and switch in a reserve KU. The appropriate signal lamps light up when the keys are pressed.

A "chessboard field" signal, which had been delivered earlier through the line repeater to the transmitter input, is used in tuning the radio line. This system is inconvenient, because the line repeater is in use during the entire period in which the line is being tuned. The new circuit of the BKKh provides for the delivery of a chessboard field having a double amplitude of ±5 v directly to the input of the transmitter (through the BPKh-53), i.e., bypassing the line repeater (Fig. 6). Two type RSM-2 relays are used in the circuit. Power is taken from both relays in the position "BUL". In the GSh position (chessboard-field generator), the BUL's output is loaded with an equivalent resistance R.

Since the line repeater section has been removed from the channel desk, the mike for communication with the cameras is connected to the BKKh block; it is here that the button for calling the second machine is mounted. The direct-line telephone for communication to the receiving equipment room is placed in the block.

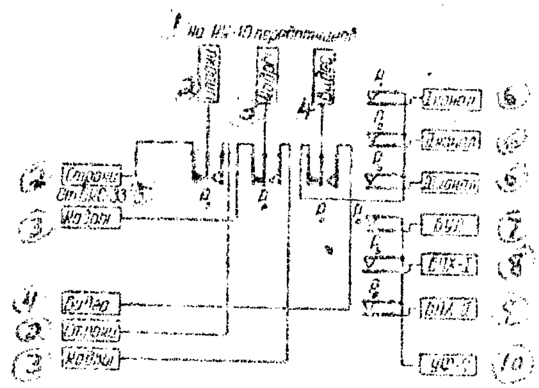


Fig. 5

1) To the transmitter KU-10;
2) Lines;
3) Frames;
4) Video;
5) From BKS-33;
6) Channel;
7) BUL;
8) BPKh-I;
9) BPKh-II;
10) UF-9;
11) P = Relay.

The installation of "audio" and "image" toggle switches in the cathode circuits of the klystrons now makes it possible, when necessary, to transmit image signals from one transmitter and the audio signal from another; this provides for better backing-up of the transmitting apparatus.

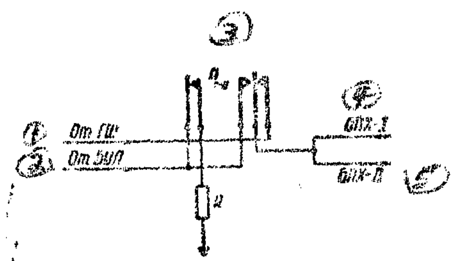


Fig. 6

1) From GSh;
2) From BUL;
3) R_{1--2};
4) BPKh--I;
5) BPKh--II.

One of the chief disadvantages of the line-channel video monitoring unit was the small size of its screen (23LK1B tube). A reworked "Rekord" television set is now being used as a monitoring unit. In place of the loud-speaker, there has been installed a panel which carries the monitoring unit's oscillograph, its controls (brightness, focus, calibration, and oscillogram switch), and the brightness adjustment for the big tube.

Replacement of the monitoring unit by a television set has made it possible to release one half of the BP-39 rectifier, which is now used to supply the chessboard field generator.

The mixer unit, in whose operation many important shortcomings had come to light, was completely reworked. Electronic mixing is now employed in the unit. Here, the new circuit has four mixers: 3 for mixing the channels and 1 for special effects. A push button unit makes it possible to bypass a mixer (three buttons), to switch on the "chessboard field" signal (one button), to cut in the "electric curtain" (one button), and to cut in the mixer (one button). During transmission, the "curtain" and "chessboard" buttons are protected by a special cover which prevents their being accidentally pushed.

Elements of all of the technical adjustments were taken from the mixer unit and mounted on a separate panel (button for switching to reserve amplifier, the transfer signal, and four potentiometers for adjusting the peak-to-peak separation of the video signal and the synchro signals). The result is that the creative and technical personnel do not run into each other during the working periods.

Things are made much more convenient for the director by the placement of the buttons for calling to all of the cameras and the call button for the second vehicle together on one (left) part of the mixer unit. A general view of the mixer panel with the mixer amplifier is presented in Fig. 7.

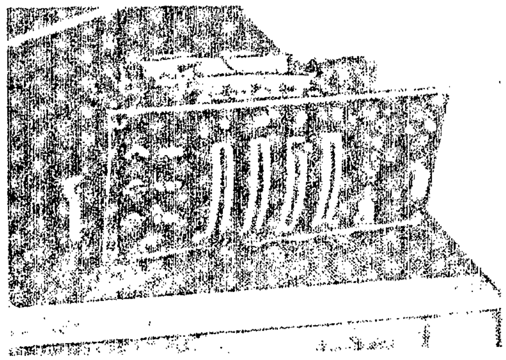


Fig. 7

A toggle switch for switching the monitoring outputs of the line repeaters has been inserted in the line repeater switching circuit (Fig. 8); this permits inspection of image quality on the video monitoring unit and adjustment of the peak-to-peak separations of the synchro and video signals according to the working repeater before the switch is made to the reserve repeater.

The panel is mounted on the front side of the director's desk; access to its controls is obtained through a cut-out in the wall of the desk.

The line-repeater control panel is mounted directly on the line-repeater block.

During the period in which the PTS-52 has been in service we have taken a number of measures with the purpose of making operation of the mobile station easier. More than 30 platforms were constructed to make work atop the structures safer and more convenient. These platforms are constructions made from gas pipes with wooden flooring, on which the tripods with the parabolic antennas and the Kh-7 transmitters are mounted. Platforms with steel-pipe guard rails and booms with block and tackle for raising loads were built at the edges of the roofs. A boardwalk with a guide rope passed along it was laid between the pla forms for the antennas and the platform for the block and tackle. The ends of the power cables and the connecting cables between the busses were sealed into four-contact plugs (A--701), and the receptacles for them (A--700) were mounted on the busses; this simplified connection of the cables considerably.

Boxes with power receptacles and extra fuses were set up at the principal points from which broadcasts are made. The boxes are connected to substations. The power cable from the buses is plugged into these boxes by means of four-contact plug-and-receptacle units (A--701 and A--700). The keys to the boxes are kept in the PTS.

Previously, if the voltage collapsed in one of the phases, an interruption would occur in the operation of the PTS. We have now redistributed the load among the phases in such a way that now, when one of the phases is cut out, transmission may be continued with two camera channels, one transmitter, one synchrogenerator, and one audio channel. Two packaged cut-out switches are mounted in the power-supply cabinet to switch the loads to the working phases.

The BGSh-17 chess-board generator block is placed in the supply cabinet in the place of the BP-38 which was removed.

The BGSh-17 is supplied from one half of the BP-39.

Reliable backstopping was not insured when the two line repeaters were fed from the two halves of a single BP-39 power-supply block. This deficency has now been eliminated by supplying them from different blocks.

A small 400-cycle audio generator, which is used in tuning the radio line, was prepared and installed in the auxiliary bus.

Quenching-pulse distortion had been observed in the KT-6 cameras. This was due to the fact that having been formed in the preamplifier (6N8S and 6A7 tubes), the quenching pulse passed to the tube through the hookup-wire block and the sweep generator (one-half of 6N8S tube), i.e., through many unnecessary circuits and inter-block connections. At the suggestion of Engineer S. P. Zelenoborskiy, the circuit was modified and simplified: a 6N15P tube was used in place of the 6N8S and 6A7 tubes in the preamplifier, and the quenching pulse was delivered directly

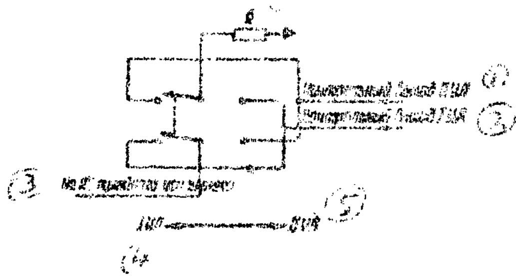


Fig. 8

(1) Monitoring output II of UL;

(2) Monitoring output I of UL;

(3) To KU of line repeater;

(4) I UL;

(5) II UL.

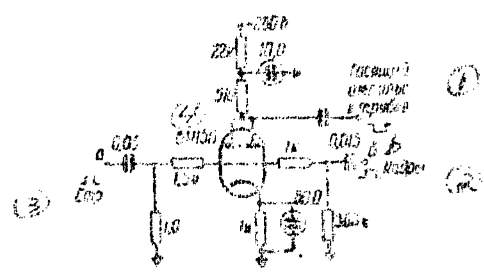


Fig. 9

1) Quenching pulse to tube;

2) Frames;

3) Lines;

4) 6N15P;

[K = kilohms; B = volts]

from it to the tube (Fig. 9). As a result, distortion of the quenching pulse is no longer observed.

At the present time, we make use of a telescoping mast on a fourwheel trailer to lift the parabolic antennas and transmitters; this machine can raise them to a height of over 20 m.

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AN ELECTRONIC GENERATOR FOR STANDARD TELEGRAPH SIGNALS

* * *

We present a description of the circuit of an electronic transmitter producing practically undistorted telegraph signals of types 1:1, 1:6, and 6:1, for transmission at a rate of 50 bauds (the transmission rate may be raised to 300 bauds). A trigger-type counter network with its auxiliary connections is used in the circuit to obtain signals of types 1:6 and 6:1. The generator has tube and relay outputs; this makes it possible to connect it into either a high-resistance or a low-resistance circuit.

In the operation of printing telegraph links through radio channels and through voice frequency telegraphy channels, it is necessary to run periodic checks of the performance of these channels. This inspection should be carried out both during the operation of the links, and when the terminal telegraph apparatus is shut off.

According to the recommendations of the MKKT (International Consultative Committee for Telephony and Telegraphy), the channels should be inspected in the synchrono mode, using an appropriate telegraph-signal generator and a telegraph-signal distortion meter for this purpose.

On startstop telegraph links, where each transmitted symbol contains 7 elementary trains, it is recommended that the channels be checked by transmitting "dots" (alternatin positive and negative elementary trains) and trains of types 1:6 and 6:1 into the channel. In all cases, the duration T_0 of the elementary train is made equal to 20 msec, which correspond s to a transmission rate of 50 bauds. It is necessary that the test signals being fed into the channel not have time distortions. The duration of the positive and negative elementary trains should be equal during the transmission of the "dots"; in transmission of the type 1:6 and 6:1 trains, the repetition rate of the individual trains should be equal to an integral number of elementary trains, i.e., $7\ T_0$.

The standard telegraph-signal generator to be discussed below (Fig. 1) satisfies the requirements set forth above. The generator is assembled from eight 6N3P tubes and consists of an input stage (tube L_1), a repetition-rate scaler (tubes L_2-L_5), a delay multivibrator (tube L_6), a tube-output stage (0.5 of tube L_7), a level-fixing circuit (0.5 of tube L_7) and a relay-output stage (tube L_8 and relay).

The input stage of the generator is a cathode-coupled rheostat trigger circuit, which is tripped by a sinusoidal voltage of 4.5 or more volts. The elements of the repetition-rate scaler are rheostat triggering circuits (triggers) which deliver the positive triggering pulses into the cathode circuit. The pulses which drive the output stages come from the tube L_5 of the divider: from the plates of this tube they proceed to the tube-output stage, and from the grids to the relay-output stage.

Cathode followers are used as output stages. The use of a level fixing circuit permits the attainment of constancy in the amplitudes of the output pulses with respect to the null and reliable cutoff of the output stage regardless of the type of signal being transmitted ("dots" 1:6, 6:1). Due to this the generator works distortion-fre with any load from 5 kilohms up. It is not recommended tha the tube output be used on a load smaller than 5 kilohms, since in this case the output-stage tube is overloaded. The output-signal amplitude may be regulated between 10 and 50 volts by means of a potentiometer connected into the voltage-divider circuit of the fixation circuit.

The two halves of the tube L_8, which works double-ended, are worked into the output stage of the relay output. The relay windings are connected into the cathode circuits of this tube in such a way that the relay can be adjusted to neutrality. An external battery must be connected to the relay contacts to obtain signals from the relay output.

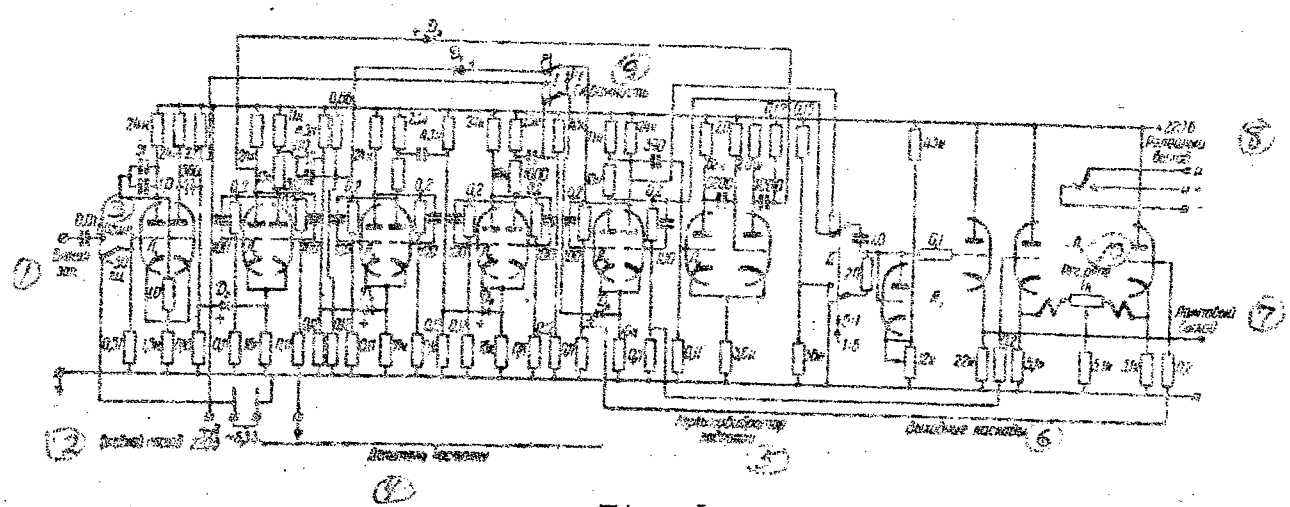


Fig. 1

1) External cutoff;
2) Input stage;
3) EXT.;
4) Repetition-rate scaler;
5) Delay multivibrator;
6) Output stages;
7) Tube output;
8) Relay output;
9) Duty factor;
10) Relay adjustment

Л = tube
К = Kilohms
В = volts
Д = diode
Гц = cycles

Signals which are virtually undistorted as regards their duration arrive at the output of the generator. The duration of the elementary pulse, T_0, is 20 msec in transmission of either "dots" or type 1:6 and 6:1 pulses; here, the pulse repetition rate is exactly 7 T_0. Single-polarity signals are taken from the tube output. The generator's relay output provides for transmission of both single-polarity and double-polarity signals.

When the tube output is used, it is unnecessary to tune the generator; it is ready to transmit signals into the test channel immediately upon connection to the power supply and warmup of the tubes. If, however, the relay output is used, then it is necessary to check the neutrality of the relay with the load connected, and, if necessary, to adjust it by means of the potentimoeter Reg. Rele. The relay is adjusted on the basis of the reading of an external measuring instrument which serves in this case as a distortion meter. Depending on its input circuit, this instrument is connected either in parallel to the load or in series with it. The precision of the generator's pulses will be determined by the precision of the measuring instruments indications.

To obtain "dots", i.e., pulses with the 1:1 relationship, at the generators output, only 3 tubes of the circuit are used: the input stage, the fourth tube of the repetition-rate scaler, and one of the output stages. Selector I is set to the position "1:1". A sinusoidal voltage from the alternation-current main (the tube heater voltage) is delivered to the grid of the left half of the output-stage tube. Positive pulses for triggering the trigger circuit

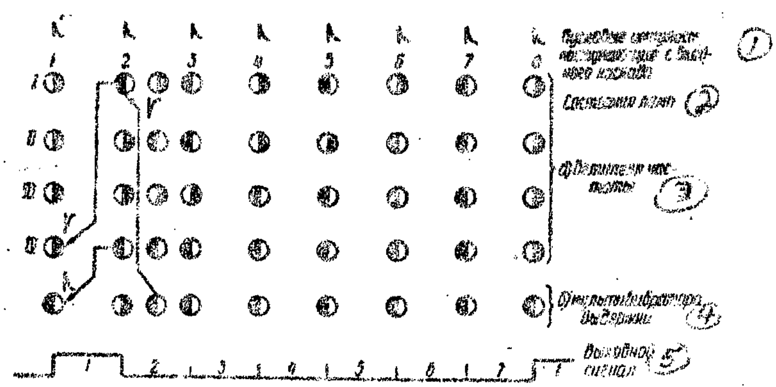


Fig. 2

1) Triggering pulses arriving from input stage;
2) Condition of tubes;
3) a) Repetition-rate scaler;
4) Delay multivibrator;
5) Output signal.

of the fourth stage of the repetition-rate scaler are taken from the plate of the right half of the tube. The signals which drive the output tube stage are taken from one of the plates of the latter's tube, depending on the position of the selector II. The control signals are delivered from the grids of the fourth tube of the scaler to the output stage of the relay output.

All tubes of the circuit are used to obtain signals of types 1:6 and 6:1 at the generator's output. The necessar coupling between stages, as shown in Fig. 1, is obtained by means of the selector I, which is moved to the "duty facto position. In this case, the positive triggering pulses from the input stage arrive at the first stage of the repetition-rate scaler. Additional coupling between the first and fourth scaler stages, which is effected through the semiconductor diodes D_1 and D_2, provides for the delivery of type 1:6 or 6:1 signals to the output of the repetition-rate scaler. The type of signal obtained depends on which half of the fourth-stage tube of the scaler is driving the output tube stage, and is determined by the position of the selector II.

If the relay output is used, the type of signal (1:6 of 6:1) is determined by the relay contacts to which the respective poles of the external battery are connected.

Fig. 2 is a diagram of the operation of the generator's tubes when type 1:6 pulses are being delivered.

A delay multivibrator, which is a trigger circuit with one stable state, is introduced into the generator ircuit to ensure incisive operation. The multivibrator mplifies the pulse proceeding through the feedback from he fourth stage to the first, and shifts it in time. In rinciple, the use of this stage is not mandatory. In ractice, however, stable operation of the generator in he transmission of type 1:6 and 6:1 pulses is attained nly when it is used.

The repetition rate of the signals arriving from the enerator when it is run off the tube heater voltage (6.3 v 0 cycles) is 5 bauds. To obtain signals at another rate rom the generator's output, it can be driven off any exter-al sinusoidal-voltage generator with an output level no ower then 4.5 v. This permits the use of the generator o check channels during telegraphy at a rate as high as 50 to 300 bauds.

Rectangular single-polarity signals whose time dis-ortion does not exceed 0.25% are taken from the tube out-ut of the generator, which is its main output. The ampli-ude of the output-signal voltage is adjustable between 0 and 50 volts with loads of 5 kilohms and more. The enerator operates reliabily with a ± 20% variation in the late voltage.

The generator may be used to check a radio-communi-ations channel as a whole or its individual sections (radi channel and voice-frequency telegraphy channels, at the receiving and transmitting ends of the system), and also to calibrate instruments for measurement of telegraphic distortions having high-resistance inputs (no smaller than 5 kilohms). The relay output provided in the generator make it more versatile, since it makes it possible to check physical cable circuits and intermediate units, such as the telegraph repeater and the SORS bay.

Any telegraphic distortion indicator that can be connected to the output of the tested unit and is designed for the speed with which the signals are being delivered is suitable for measurement of distortions at the output of that unit when the signals are delivered from this generator.

M. G. Kuz'mina, Engineer.

WAYS TO REDUCE THE LABOR COST OF SERVICING ATS (AUTOMATIC TELEPHONE STATIONS)

* * *

The article provides a brief analysis of the present method of operating ATS equipment of the ten-step system (ATS-47) and presents recommendations on ways to recude the labor cost of servicing this equipment.

Telephone stations of the ATS-47 system have been in operation on the urban telephone networks of the Soviet Union for a long time, and have been thoroughly mastered by the station technical personnel. During this period, a great deal of experience has been accumulated in the operation of stations of this system; test apparatus and equipment which simplifies the maintenance of the station plant has been created for them, and automation of the labor consuming processes has been planned and partially carried-out. All this makes it timely to raise the question of improving the methods of operating ATS-47 system equipment with the purpose of reducing the manhours required to service it and the cost of its mantenance.

In 1957, the Scientific-research Institute for Urban and Rural Telephone Communications of the USSR Communications Ministry set out to develop recommendations directed toward improved exploitation of the urban ATS equipment. This applied primarily to the stations of the ten-step system (ATS-47). The investivations which were carried out permitted the conclusion that the labor cost of servicing could be reduced and the productivity of labor raised at the ATS. Among the measures which would make it possible to achieve this are the following: 1) the method of differential repair and checking of the equipment in accordance with the telephone traffic load and the condition of the equipment; 2) conversion of the ATS to part-time operation with simultaneous introduction of improved methods of using the station equipment.

The Method of Differential Repair and Checking of Equipment

In the system of the Communications Ministry, the operation of ATS equipment is administered by the preventive-inspection method. This method consists in the following: with the purpose of preventing breakdowns and attaining high-quality subscriber service, all instrument and station equipment are systematically subjected to thorough checking and repair at rather frequent intervals. Regular preventive measures permit the maintenance of the station equipment in good technical condition in which the number of calls which are not completed as a result of various malfunctions in the station equipment does not exceed fractions of a percent. This insignificant number of failures is practically unnoticed by the subscribers.

Operating experience has shown that in those ATS where frequent breakdowns occur, preventive work, even on a relatively small scale, results in a significant improvement in the quality of communications. If, however, the number of breakdowns is small, a further reduction in the rate of breakdown requires tremendeous effort and still escapes the attention of the subscribers.

As an example of the relationship between the percentage of socalled no-communications states (i.e., connections which are not completed for technical reasons) and expenses for technical maintenance of ATS, we might mention the curves presented in Fig. 1, which have been constructed on the basis of operational data of a number of Swiss ATS.* It is evident from the curves that an extremely large outlay is necessary to reduce the number of failures to below 0.2%; this is clearly inexpedient, since when the number of failures is 0.2%, communications quality is already excellent. The example presented indicates that preventive checks are justified only under certain conditions--namely, when they produce perceptible improve-

*A. Langenberger, Soobrazheniya po voprosu telefonnoy ekspluatatsii (Report on problems of telephone exploitation). "RTT", No. 11, 1956.

ments and when excessively large labor outlays are not necessary for performing them.

For the purpose of working out the most rational system of exploitation, the Scientific-research Institute for Urban and Rural Telephone Communications of the Ministry of Communications of the USSR (NIITS) collaborated wit the administration of the Leningrad Urban Telephone Network to apply a number of special measures to existing ATS by way of an experiment.

Thus, experiments whose purpose included determination of the effectiveness of periodic scheduled repair of the instruments were carried out at two of the Leningrad ATS. 220 instruments for which the schedules repairs we not carried out for seventeen to nineteen months, and 260 instruments which, during the same period, were subjected to scheduled repair in the volume and at the intervals specified by the USSR Communications Ministry were placed under observation. It was found from the observations that the rate of breakdown for the instruments was practically the same for both groups during this period, although the labor outlay for maintenance of the second group was several times that for the maintenance of the first group, with a simultaneous considerable outla of parts. These observations do not, of course, provide a

Table 1

(1) Прибор	(2) Количество занятий (в процентах общего числа занятий)							
	(3) До 50	50—100	100—200	200—300	300—400	400—500	500—600	600—700
IГИ (4)	6,9	15,8	27,7	19,8	21,0	7,8	1,0	—
IIГИ (5)	24,5	18,5	20,4	18,5	11,0	6,7	0,4	—
IVГИ (6)	31,3	14,2	16,5	20,4	10,4	6,2	1,0	—
ЛИ (7)	51,6	6,0	13,0	12,0	9,0	6,0	2,0	0,4
Среднеарифметическое значение (8)	28,9	15,4	19,0	17,8	11,8	6,7	1,3	0,1

1) Instrument
2) Numbers of busyings (as a percentage of the total number of busyings)
3) Less than
4) IGI
5) IIGI
6) IVGI
7) LI
8) Arithmetical mean

basis for abandonment of scheduled repairs, but they nevertheless affirm the expediency of reconsidering the interval at which they are carried out.

ATS instruments operate under different loads; these depend on the inputs of the preceeding selection stage to which they are connected. The Table contains data indicating the number of busyings per day of instruments of various selection stages in the automatic telephone exchange Ye7 of Leningrad (152 IGI, 208 IIGI, 211 IVGI, and 200 LI were placed under observation).

Although the customary interval for running repairs (once per year) is justified for the group of selectors whose load amounts to 300 and more busyings daily. this interval is not required by technical considerations and is economically inexpedient in the case of the instrumen group with a load not exceeding 50 to 100 busyings. Acc- ing to its technical specifications, each DShI (10-step selector) should work for 50,000 cycles without further regulation or replacement of lubricants. The investigatio indicate that on the average, this standard is maintained.

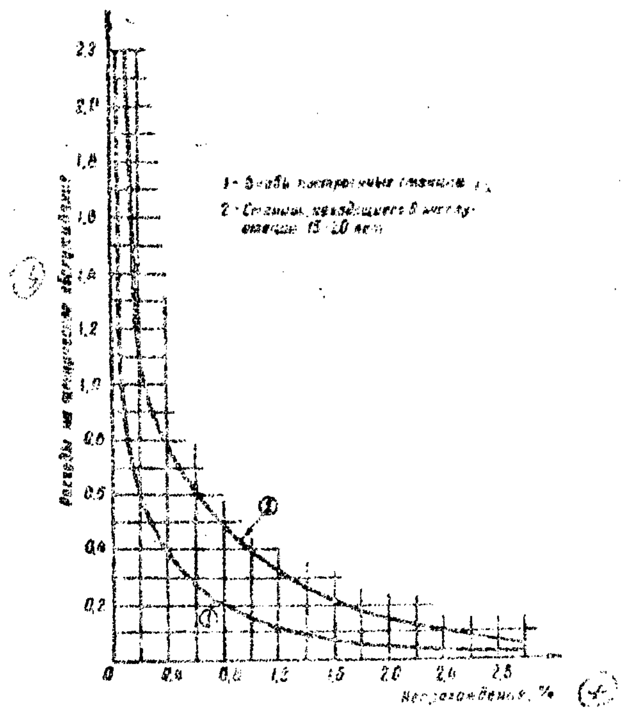


Fig. 1

1) Newly constructed stations;
2) Stations in service for 15 to 20 years;
3) Outlay for technical maintenance;
4) No-communications rate, %

When the number of busyings per day is smaller than 100, the continuous-service period of the instruments amounts to around three years. Consequently, such a group of DShI may be subjected to running inspection once every three years. The repair interval for other groups of instruments may be established in a similar manner.

The above considerations formed the basis of the recommendations worked out by the NIITS on the performance of scheduled repair of the instruments. All the instruments are broken down into three groups in accordance with their daily load: 1) those with fewer than 100 busyings; 2) those with 100 to 300 busyings; 3) those with over 300 busyings. A certain scheduled-repair interval is established for each of these groups: once every three years for the first group, once every two years for the second group and once a year for the third group.

Provision is made for annual replacement of the lubricant and cleaning of the contact banks of the instruments. A definite load-dependent interval is also set forth for scheduled repair of the relays. It is intended to carry out the annual preventive inspection of the preselectors on the scale recommended by the instructions of the USSR Communications Ministry.

The plan for electrical checking of the station equipment was also subjected to analysis. Observations indicated that certain checks are excessive, since they duplicate other checks or do not give the desirable result, although much time is expended in carrying them out. For example, in the course of three months one of the brigades carried out 18 different checks, spent a tot of 534 manhours in the process, and detected only 32 defec here, no defects at all were noted in 12 of the checks.

It should be remembered that in an ATS which is giving poor performance, an increase in the number of checks does not improve the condition of the station equipment, but merely accelerates the process of detection of deficiencies; to bring the equipment into good condition, it is necessary to take a number of unscheduled measures--repair the instruments, exchange line cords, etc.

Experimental operation of the equipment in accordan with the recommendations of the NIITS, which are based on the method of differentiated scheduled repair of the instruments and on electrical checks of the equipment on a convenient scale, was begun in January of last year at Automatic Telephone Exchange Ye7 in Leningrad. The results of the experimental operation for the past year may be regarded as encouraging. While maintaining the same performance indices as those attained in 1957--these were on a par with the average indices for the Leningrad GTS (Urban Telephone Network)—it was possible, on the average, to reduce the labor outlay for the scheduled work by 40%; this reflects a 50% reduction in the adjustment workshop and a 30% reduction in the automatic-equipment room.

The technique proposed for managing repairs and electrical checks of the instruments is only the first step on the road to the development of new improved methods for servicing ATS. As the condition of the station equipment is improved, we shall be able to convert to the more promising statistical method of operation. This method consists essentially in carrying out only "insurance" operations (cleaning the contact banks of the selectors, inspecting the brushes, lubricating the mechanisms, and checking the operation of the signaling equipment) instead of carrying out periodic electrical checks and repair work on the equipment as specified in advance by a plan. Actual scheduled repairs and scheduled checks of the equipment are carried out only in cases where statistical data on malfunctions and spot-check no-communications cases or subscriber complaints indicate that its condition has deteriorated and the performance ceased to meet the established norms. It follows from the above that with this method, the acquisition and processing of statistical data are parts of the operating procedure.

Thus, the statistical method provides for repair and checks of the equipment only in those cases in which it has become necessary. Since the performance indices of

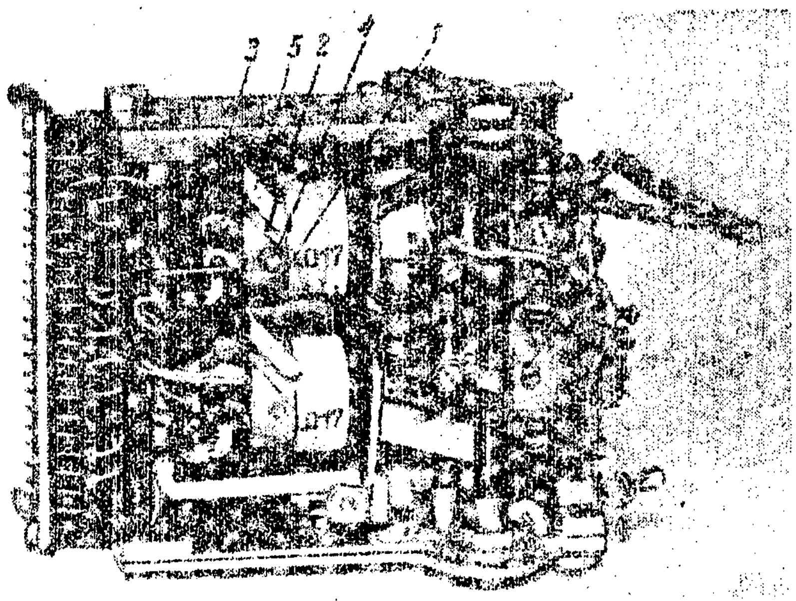


Fig. 2

existing ATS of the ten-step system are gradually being improved, and the technique of maintaining them has been well mastered by the operating personnel, the statistical method may be applied in the future, first to individual ATS and then on a wider scale.

Part-Time Servicing of ATS

Investigations conducted in a 1,000-number ATS (in a districted network) permits the inference that such stations may be serviced on a part-time basis. The volume of scheduled checks and equipment inspections carried out at such stations is not large: according to the plan recommended by the NIITS, it amounts to only 60 manhours per month. It is convenient to perform repairs on the instruments in accordance with the statistical method described above, or even by the breakdown-correction method.

Essentially, the latter method consists in making repairs on only those instruments of the ATS in which breakdowns have occurred. As our observations indicate, all current-maintenance, repair, and electrical checks of the station equipment may be carried out by two technicians in the course of a year. Thus, there is no need to maintain four men for technical servicing of the equipment.

The need for round-the-clock maintenance by technical personnel is basically accounted for by the necessity of constant inspection of the station equipment for fireproofness. The NIITS recommends the following measures for creating conditions for part-time maintenance of small-capacity (fewer than 2,000 numbers) ATS: the installation of a thermoprotector on the electromagnets of the DShI, the series connection of the minus circuit into the two PI (preselectors) through two fuses and a remote alarm device.

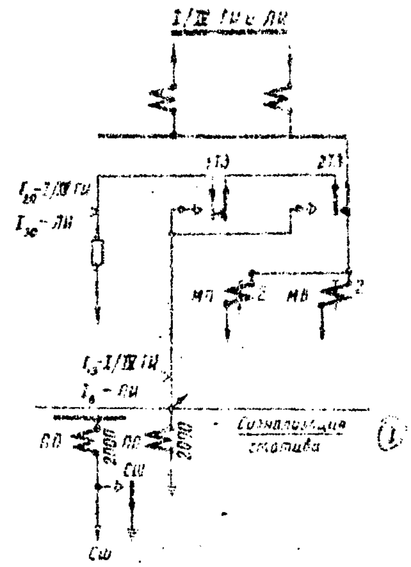


Fig. 3 .

1) Alarm system of bay

ГИ = group selector
ЛИ = line selector

МП = vertical magnet
МВ = rotary magnet
Г = G.

СШ = connecting cord
ТЗ = thermal protector

Figure 2 presents a general view of the thermal tector mounted on the DShI, and Figure 3 shows the circuit diagram of this device and the alarms for I/IVGI and LI.

In this circuit, the TT relays are replaced by two-winding relays and the minus to the mounting plate of the LI relay is delivered over the wire II_8.

The thermal protector of the DShI is a device consisting of the brass heat collector 1, which is wrapped around the electromagnet coil, the conducting elastic spring 2, and the connecting insulation strip 3. The conducting spring is soldered at one end to the heat collector with a low-melting alloy, and the other end is connected to the leadout terminal. The minus to the instrument's electromagnet is delivered serially through the heat collector and the conducting spring. When the electromagnet winding is heated, the heat is picked up by the heat collector, and when the latter has been heated to plus 80°C, an alloy placed on its surface in a special cup 4 fuses. As a result, the conducting spring is released and moves away from the heat collector, breaking the circuit of the electromagnet on the minus side of the battery and closing the alarm circuit with the alarm contact 5.

If current flows for a long period of time through the DShI electromagnet, the time-delay fuse should operate after 20 to 40 sec. If it has not operated after 1.5 to 2 minutes, the thermoprotector works as an auxiliary fusing device. The thermoprotector has already been used successfully in ten-step dial intercommunication systems.

The series connection of two time-delay fuses into the minus circuit of the 2 PI is a reliable protective measure if a short circuit occurs in one of the fuses.

Figure 4 presents a variant of a remote signal system which makes it possible to transmit all signals from the unmanned ATS to a manned ATS. It is necessary to supply the following explanations in connection with this diagram. The relay 1R is mounted on the group signal-syste plate. The relay Z of the group signal system carries an additional spring assembly 53-54, while the relay TS carries a circuit-breaking spring assembly instead of a circuit-closing spring assembly (51-52). The relays 2R and 3R are placed on the battery switchboard BSh. The lamp L_1 duplicates the RS, ZI, and "common fuse blown" signals; the lamp L_2 duplicates the AS, PT, and "thermal fuse blown in distributing frame"; the lamp L_3 duplicates the TS signal. The diagram indicates the connection of all elements to the existing signal system. In working out this circuit, we had in mind the minimum outlay of materials and a minimum amount of modification of the existing signal system. For this purpose, certain signals were combined, although in principle each of them could be transmitted independently to the manned station.

When two signals to the manned ATS arrive simultaneously, only one--the most important--is transmitted. Thus, for example, when the signals PP and PS to the junction ATS appear, only the PS signal is delivered. The circuit provides for monitoring the operativeness of the line wires over which the signals are duplicated. In order to make it possible to determine the reason for lighting of a signal lamp, the plus of the battery is fed through a tone transformer when the relay 1R, 2R, 3R or Z operates.

In March of last year, the 1,000-number ATS V3-9 in Leningrad was experimentally converted to the curtailed-maintenance system: the scheduled night-time maintenance work on this exchange was suspended. The original idea was to determine which signals are delivered to the station at night, which causes give rise to them, and whether it is necessary to maintain maintenance personnel around the clock. The worker at the station concerned himself only with running maintenance of the equipment.

After completion of the work involved in mounting the thermal protectors on all of the DShI, resoldering the minus circuits to the PI, and setting the remote signal system, night-time work at the station, including the running maintenance, was stopped completely.

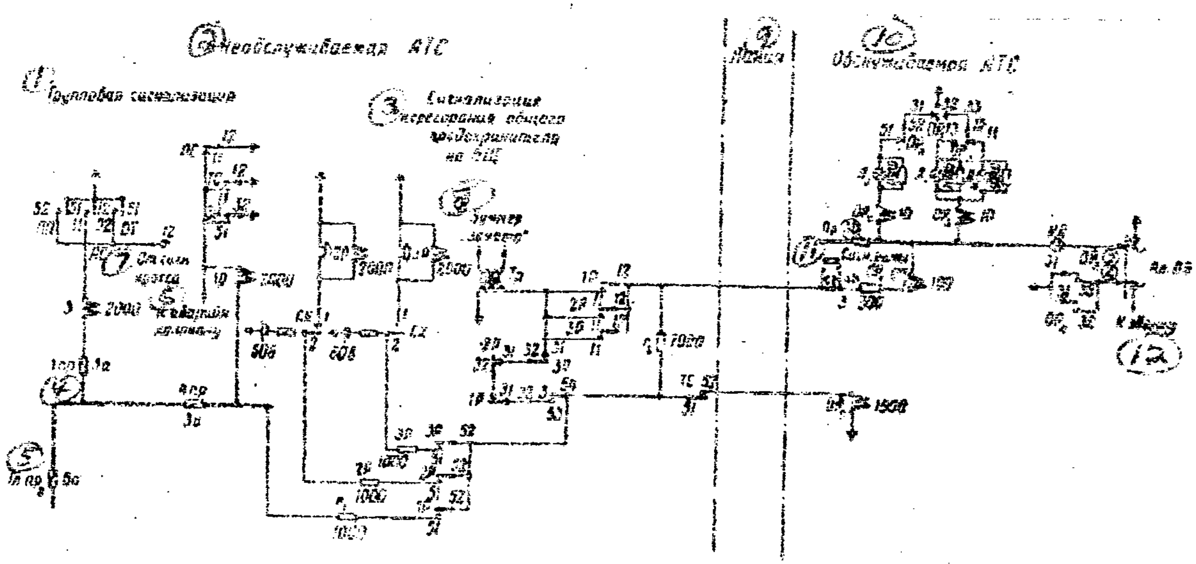


Fig. 4

1) Group signaling;
2) Unmanned ATS;
3) Signal for blown common fuse in BShch
4) Fuse;
5) Main fuse 2;
6) To emergency bell;
7) From distribution-frame signal system;
8) "Busy" tone;
9) Line;
10) Manned ATS
11) Signal Frames;

Л = lamp

Пр = fuse
В = volts

Р = relay
Тр = [illegible]

/Translator's note: Remaining abbreviations not identified in text or in standard references/

No provision was made for running repairs of the instruments at this ATS; only those instruments in which breakdowns occured were repaired. For the remaining instruments, the only work done was to clean the contact banks and lubricate the mechanism once a year.

Operational experience with ATS V3-9 under the maintenance regime described above permits us to draw the following conclusions. Abandonment of the scheduled running repairs of the instruments and a reduction of the scale on which the electrical checks are carried out made possible a sharp reduction of the labor outlay for servicing the station without a sacrifice in communications quality. During the period of experimental operation, there were no breakdowns which would have put the station or part of its equipment out of commission. There were virtually no breakdowns which required the round-the-clock presence of the maintenance personnel.

Thus such stations can be transferred to part-time maintenance without misgivings concerning the quality of communications, when a number of technical and organizational measures recommended by the NIITS have been taken. The remote-alarm system makes it possible to take the necessary measures in case of emergency.

The measures listed above do not exhaust all the possibilities for improving the management of ATS equipment. The implementation of a number of other measures, includin the introduction of fully automatic test equipment for checking the instruments and equipment, improved quality control in the manufacture of the equipment, steady and on-schedule supplying of the station with reserve parts which satisfy technical specifications, etc., will also contribute to this.

The introduction of the recommended maintenance methods on a wider scale will make possible a considerabl reduction of the labor cost of maintaining ATS station equipment and a reduction of the operating staff.

M. U. Rutenburg, Senior Engineer,
NIITS

A DIRECT-CONTROL VOLTAGE STABILIZER

This article describes the operating principle of a voltage stabilizer worked out by the author of the article at the Kuybyshev Division of the NII (Scientific Research Institute) of the USSR Ministry of Communications.

The operating principle is the same for all choke-type electromagnetic stabilizers; basically, they differ only as regards their control circuits. The extensively used ferroresonance voltage stabilizers are simple, but they possess serious shortcomings: a marked dependence of the output voltage U_{out} on the frequency of the supply current, and on the magnitude and nature of the load, plus low efficiency. They are therefore designed for small powers.

Electromagnetic stabilizers with saturable chokes are more complex, but they have higher efficiencies, and U_{out} does not depend on the magnitude of the load within certain limits.

The electromagnetic-stabilizer control circuit with carbon regulator is the most simple. However, the carbon regulator is characterized by inadequate precision of regulation, low reliability, and, as a result of the use of mechanical elements, does not last very long.

Control circuits based on electron tubes represent an improvement. However, the use of these tubes creates certain inconveniences in operation. However, automatic control circuits based on magnetic amplifiers are quite complicated.

A development of a few years ago was an electromagnetic stabilizer with magnetic-amplifier single stage control using a load-current feedback winding on a saturable choke (see "Vestnik Svyazi" No. 12, 1956, page 5). However this scheme is also complex, and high precision of regulation is not necessary in the majority of cases, since it is quite sufficient to maintain the voltage within the limits of ± 1 to 2% of its nominal value.

The following requirements are set forth for commercial stabilizers: maintenance of the output voltage with the required precision, reliability in operation, durability, simplicity of the control circuit, and low cost.

These requirements are adequately met by the alternating-current direct-controlled voltage stabilizer, which, like all electromagnetic stabilizers, consists of an adjustable saturable choke DN, connected in series with the load (Fig. 1).

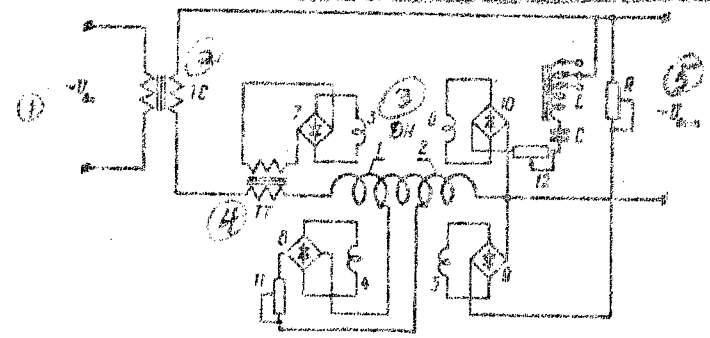


Fig. 1

1) U_{in} (a-c); 2) Power transformer; 3) Saturable choke; 4) Current transformer; 5) U_{out} (a-c).

In addition to the alternating-current windings 1 and 2, the core of the saturable choke carries the load-current feedback winding 3, the feedback winding for the voltage drop across the saturable choke 4, the basic magnetizing winding 5, and the winding of the controllable ferroresonant element 6.

Direct control is effected in this stabilizer without intermediate cascades, directly from reference-voltage elements constructed along the lines proposed by M. A. Rozenblat in the book "Magnetic Amplifiers" (Gosenergoizdat, 1955, page 127). The operation of this circuit is based on the use of the nonlinear dependence of the current I_{dr} flowing through the saturated choke L and the linear dependence of the current I_R flowing through the "active" resistance R on U_{out} (Fig. 2). After rectification, these currents are fed to two different control windings on the saturable choke, the turns of which are opposed to one another. - The magnetic flux of the current I_{dr} demagnetizes the saturable choke, and the magnetic flux of the current I_R magnetizes it. These two fluxes are equal with the nominal voltage at the output of the stabilizer; consequently no signal is delivered to the saturable choke.

In case U_{out} deviates from the nominal value, the currents change, equality of the magnetic fluxes is no longer the case, and a control signal appears at the magnetic amplifier. The magnitude of the signal depends on the slope of the curve of the current I_{dr} flowing through the choke L after it has been saturated (Fig. 2). The signal is insignificantly small for small currents, and it cannot be used without amplification. In the case of a large current, however, considerable power is expended on control, and this reduces the efficiency.

The phenomenon of voltage ferroresonance is used in this stabilizer to amplify the signal with a small current flowing through the saturated control choke. The condenser C is connected in series with the saturated chok L, with the result that the choke's limit of saturation is more sharply resolved, and the necessary slope of the characteristic is obtained even with a small current (Fig. 3).

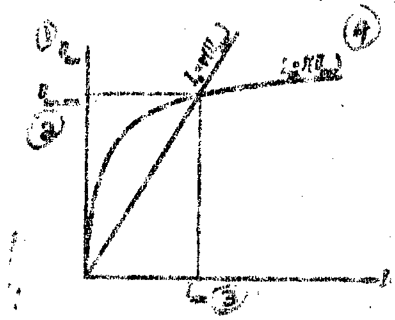


Fig. 2

1) U_{out}; 2) $U_{out\ nom}$; 3) I_{nom}; 4) $I_{dr} = f\ (U_{out})$

Since the capacitive reactance of the condenser is small by comparison with the inductive reactance of the choke, the voltage across the inductance increases by a factor of approximately 1.3. By appropriate selection of the capacitance and the inductance we may arrive at a situation in which the output voltage will not depend within certain limits on variations in frequency. The variable resistor 12, which is connected in series with the saturated choke L and the condenser C, serves to establish the working point on the characteristic during tuning.

A ferroresonant reference-voltage element of this type enables us to obtain a sufficiently large signal. However, this alone is not sufficient to obtain the required degree of stability in U_{out}. Therefore, the stabilizer includes the feedback winding 4 for the voltage drop across the saturable choke DN; the magnetic flux of this winding demagnetizes the basic magnetic flux of the choke. The winding is fed through the rectifier 8, the voltage across which is supplied from a certain number of turns of the a-c windings 1 and 2 of the saturable choke. The voltage drop across the saturable choke depends not only on the degree to which it has been magnetized, but also on the value of the current flowing through it. The operating point of the choke is found on the descending segment of the curve $U_{dr} = f(I_n, I_{podm})$, where I_n is the load current and I_{podm} is the magnetizing current. With the load constant, it moves up or down, in accordance with the value of the input line voltage U_{in}, along one of the curves shown in Fig. 6.3 in the book by Petrov and Piontkovskiy entitled "Voltage and Current Stabilizers" (Svyazizdat, 1952). When the load varies, the curve is displaced almost translationally along the magnetization axis. It is therefore of great importance that the controlling magnetizing force of the reference voltage always lie on the working section of the curve of the corresponding load, i.e., an automatic displacement which varies the magnetization as a function of the load is necessary. The current feedback winding 3 performs such a function. It is fed through the rectifier 7 from the current transformer TT.

Let us consider the operating principle of the stabilizer. With the nominal voltage U_{out} at the output of the power transformer TS, the load current flowing through the current transformer TT induces a voltage in the secondary winding which is rectified by the rectifier 7. A displacement magnetizing flux is created in the current feedback winding 3 as a result. Then a certain drop occurs in the voltage across the saturable choke DN, and the nominal voltage is maintained at the stabilizer output. The currents in the control windings are chosen in such a way that the sum of the resultant magnetic fluxes of the basic magnetizing winding 5, the voltage-drop feedback winding 4, and the control winding of the ferroresonance element 6 will be zero:

$$aw_{pez} = + aw_5 - aw_4 - aw_6 = 0.$$

[aw_{pez} = aw (ampere turns)$_{resultant}$]

The remaining uncompensated displacement flux determines the location of the choke's working point.

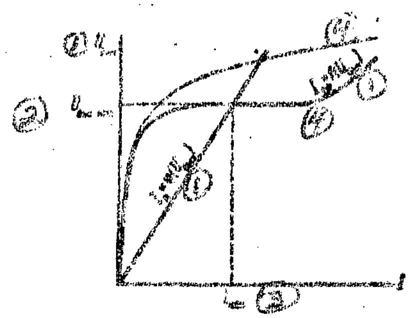


Fig. 3

1) U_{out}; 2) $U_{out\ nom}$; 3) I_{nom}; 4) dr (choke)

Thus, the total resultant flux is equal to the displacement flux of the current-feedback winding 3:

CW общ. рез = 0.5%.

общ. рез = total resultant

When the voltage at the input increases, the voltag at the stabilizer output also increases. Thereupon the current flowing through the saturated choke L, the condenser C, the resistance 12, and the winding 6 increases, as does the demagnetizing magnetic flux of this winding. However, the current flowing through the basic magnetizing winding 5 increases only insignificantly, and its magnetic flux undergoes practically no change.

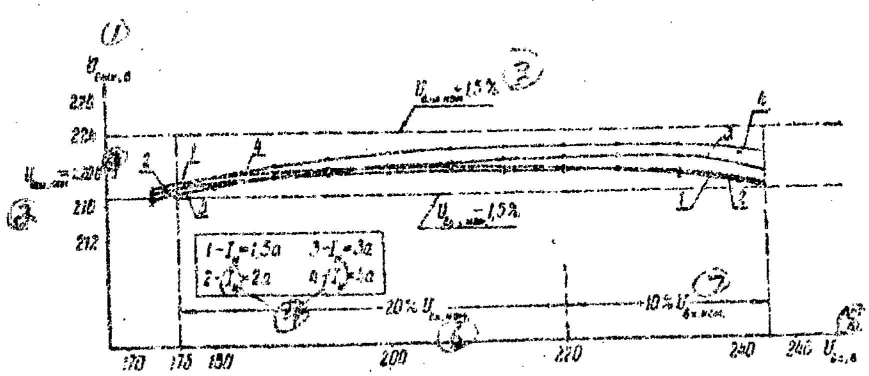


Fig. 4

1) U_{out}, volts; 2) $U_{out\ nom}$; 3) $U_{out\ nom}$ + 1.5%;
4) I_{load}; 5) $U_{out\ nom}$ -1.5%; 6) -20% $U_{in\ nom}$
7) ''10% $U_{in\ nom}$; 8) U_{in}, volts; 9) volts

As a result, the magnetization of the saturable cho... drops and the voltage drop across it increases. This results in an increased current flowing through the voltage drop feedback winding 4, and an increase in its magnetizing flux.

The result is that magnetization declines even further. The voltage drop across the choke DN increases until the voltage U_{out} is equal to the nominal value. Then the current flowing through the winding 6 drops, its magnetizing flux declines, and the increase in the voltage drop across the saturable choke ceases.

When the input voltage decreases, the voltage at the output also decreases, and the current in the winding 6 and its magnetizing flux decline immediately, while the magnetizing flux of the winding 5 remains practically unchanged. The consequence is a drop in the magnetization of the choke and the voltage across it, and, consequently, in the current flowing in the winding 4. The magnetizing flux of this winding begins to decline and this continues until the voltage of the output becomes equal to the nominal value.

The stabilizer designed in accordance with the above description is calculated for a maximum load current of 4 amps; the stabilized output voltage is 220 v; the voltage is maintained within ± 1.5% of $U_{out\ nom}$ with variation of the input voltage from -20 to +10% of $U_{in\ nom}$ and simultaneous variation of the load current from 40 to 100%.

The power expended in control at maximum load does not exceed 100 watts, the efficiency at maximum load is 0.77, and the nonlinearity factor is 15%.

The output voltage of the stabilizer is represented in Fig. 4 as a function of the input voltage.

The control system described above is quite simple in principle and reliable in operation, as well as economical, particularly at high powers.

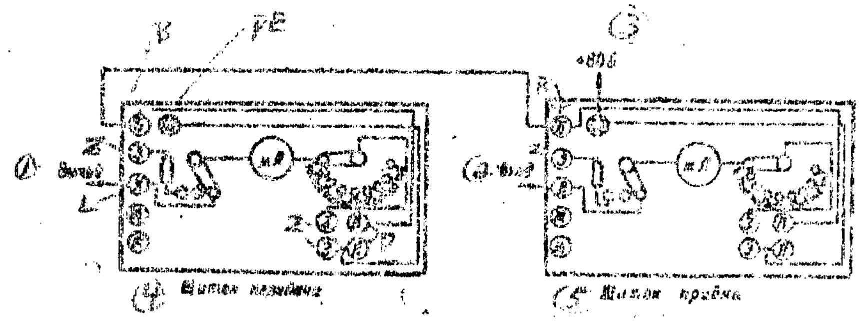
V. P. Soskovets, Engineer

CIRCUIT FOR TRANSITION TO UNMONITORED TRANSMISSION ON TELEGRAPH LINKS EQUIPPED WITH SEMIAUTOMATIC DEVICES

Recently, following the conversion of telegraph trunk lines to semiautomatic operations, telegraph enterprises have been making the transition to unmonitored transmission of through telegrams which are received on perforated tape. In this matter, however, difficulties resulting both from inexperience on the part of the telegraph maintenance personnel and the necessity of making certain modifications in the circuitry at the operators' stations have been encountered.

The author proposes a simple circuit which would permit the organization of phased transition to unmonitored transmission without the introduction of changes in the hookup wires leading to the apparatus. This arrangement if shown in the figure.

The following measures are necessary to convert duplex telegraph transmission to the new operating procedures (without monitoring of the transmission): 1) at the receiving board, the +60 v battery should be disconnected from terminal B and connected to terminal PE, so that the battery is connected in parallel with the



1) Output; 2) Input; 3) Volts; 4) Transmission board; 5) Receiving board

transmitter and with the receiver electromagnet; 2) at the transmission board, the counter battery should be disconnected and the terminal B of the receiving board should be connected to the terminal B of the transmission board. Then, the TT channel will be connected to the circuit: receiving-board terminal L, switch, milliammeter mA, rheostat, receiver electromagnet, +60 v counter battery.

Transmission will be accomplished through the following circuit: +60 v battery, transmitter, terminal B of the receiving board, terminal B of transmission board, transmitter and receiver electromagnet of second telegraph (monitoring telegraph), rheostat, milliammeter mA, switch, terminal L of transmission board, output.

It will be evident from the diagram that unmonitore transmission is effected through the monitoring apparatus; here, after the operator has mastered the appropriate skills, the monitoring apparatus can be shut off (and even removed), after connecting the terminals E and P in the line receptacle with a jumper. In this arrangement, the transmitting and receiving circuits are monitored with the milliammeter.

In the event that a no-communications situation arises and it is necessary to switch to monitored transmission, the jumper is removed from the line plug of the transmission board and monitoring instituted; transmission may be carried on directly from the monitoring telegraph if this is desired.

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Office

COMMUNICATIONS ECONOMICS

THE PLANNING OF ORGANIZATIONAL-TECHNICAL MEASURES

The plan of organizational-technical measures is a vital component of the production-financing plan of independently financed (self-sustaining) enterprises. In the preparation of such a plan, it is necessary to bring to light and make use of existing internal reserves at the enterprises; we have reference here to such items as growth in volume of production, and improving quality of production, increasing labor productivity, reducing production costs, raising economic feasibility, and improving all technical and economic characteristics of production.

If the plan for the organizational and technical measures is sufficiently well thought out, the independently financed enterprises, as a rule, are able to meet their assigned tasks, under the plan, without any difficulties. However, there are enterprises where these plans are improperly prepared, or prepared simply in a formal manner without the necessary preparation; as a matter of fact, some enterprises do not complete their plans until after the completion of the production-financing plan. As a result no calculations are made of the effectiveness of the intended measures, nor is any determination made of whether the expenditures involved in putting these measures into effect are justified; moreover, no deadlines are indicated for putting these measures into effect. In a number of cases, the savings which should result from the introduction of these organizational and technical measures are not reflected in other sections of the production-technical plan (in the estimates for production expenditures, in the labor plan). Some enterprises include measures in their plan, which have been called for in other sections of the production-financing plan (the opening of branch communications offices, renovation and construction of certain sites, etc.).

This article seeks to make certain recommendations on the methods to be used in preparing the plan and in calculating the efficiency of organizational and technical measures to be introduced.

The preparation of the production-financing plan must be started with the preparation of organizational and technical measures.

In order that the organizational-technical plan be properly prepared, a thorough technical-economic analysis of the activities of each operation at the enterprise must be undertaken; this analysis would make it possible to bring to light internal reserves, and to make more efficien use of labor, monetary, and material resources at the enterprise; in addition, the study and utilization of leading opinions at other enterprises is a necessary condition.

The following sequence is recommended for the preparation of the plan. At a meeting of enterprise managers, together with production supervisors, representatives of social organizations, and with the active leaders among th efficiency and research experts, there should be a discussion of those assignments which should serve as the basis for the preparation of the plan. After the meeting has bee held, the measures themselves are planned. At major enterprises, for this purpose, it would be best to set up a com mission (joint team). Subsequently, we must determine the economic efficiency of the measures to be introduced, and we must also determine whether the expenditures involved in the implementation of these measures are justified. The proposed plan must be discussed at production meetings, at which the workers of the enterprise participate. Afterwards, the final draft of the plan may be submitted.

A large number of the workers at the enterprise should be drawn into the preparation of the plan for organizational and technical measures: we have reference her to the engineers, technicians, economists, innovators, and efficiency experts under the general direction of the chief engineer; for district communications offices these above named professional workers will be directed by the deputy supervisor of the office.

The role of the planning-financing workers in the preparation of this plan can be summed up as follows; they instruct the other workers in the proper calculations for the effectiveness of planned measures, they check the computations and provide such assistance as is required for the determination of the measure of efficiency.

The preparation of the plan for organizational and technical measures at communications enterprises should follow, approximately, the following basic courses.

1) The introduction of new and more perfected equipment, the improvement of the organization of production processes, particularly through the introduction of mechanization and automatization (the installation of conveyer belts, automating the transmission of through telegrams, using the no-delay system, and using the semi-automatic connection method on individual links, equipping work stations with various instruments to allow a more rapid completion of a given operation, and to convert transmitters to remote control, etc.).

2) The dissemination of the best organization plans

(combining skills, improving the distribution of work stations based on skills and work load, the preparation of work schedules based on levels of work load, etc.), and by raising the job qualifications of communications workers.

3) The implementation of efficiency recommendations with respect to increasing the utilization of equipment and production space (improving communications circuits, reducing labor-consuming operations, reducing technical interruptions and breakdown), and also the implementation of recommendations with respect to increased volume, increased income, including income from extra services; moreover, efficiency recommendations with respect to improving the service to the public with all communications facilities shou[illegible] also be implemented.

4) The implementation of suggestions which have as their purpose savings in material and power, and the implementation of suggestions designed to achieve a more rapid turnover of enterprise funds.

5) The implementation of measures with respect to improving the organizational structure of the administration, the reduction of administrative expenditures, the strengthening of the independent financing system, and the adjusting of the accounting, control, and planning systems; in addition we should implement measures calling for the

mechanization of bookkeeping and planning operations, for the improvement of warehouse management, and for the introduction of such other measures as will make it possible to eliminate "bottlenecks" in production.

The plan for the organizational and technical measures must be closely tied to the other sections of the production-financing plan; we have particular reference here to: savings by means of implementing certain measures as are accounted for in the work plan, and in the estimate of expenditures for production.

In preparing the plan it is extremely important that we determine accurately the effectiveness of the proposed measures, and the expenditures for their implementation that go hand in hand. The effectiveness of each measure is expressed either in savings of monetary funds or in savings of labor expenditures (which, as a rule, are also calculated in monetary terms), or in improvements in the operational characteristics of the enterprise; the effectiveness of any measure can also be expressed in terms of a combination of such characteristics. Such measures as are particularly important for an enterprise are not subjected to a determination of monetary and labor savings that these measures might produce; we speak here of such measures which are designed to improve labor safety technique, labor protection, and measures intended to raise the cultural and technical level of the workers, and there are similar measures. These measures are independent and should also be included in the plan.

Two indices are used to determine savings: the savings achieved by the end of the plan year, and the conditional annual savings. The first index is a measure of actual savings and can be determined from the moment that a measure is put into effect to the end of the plan year. Specifically, this saving is reflected in the plan for organizational and technical measures and is considered in the labor plan, and in the production expenditure estimate.

The conditional annual saving represents a saving which might have been possible had a measure been implemented from the beginning of the plan year. Thus the conditional plan saving represents the over-all effectiveness of a measure and is used to determine, first of all the time within which the expenditures for the implementation of these measures must pay for themselves, and secondly, to determine the amounts to be awarded to researchers and efficiency experts.

Together with the total savings, we must calculate the total of single expenditures, i.e., expenditures made at one time for the purpose of implementing a measure.

These expenditures are not taken into consideration in determining the extent of the conditional annual savings and the extent of the savings up to the end of the year. However, in computing the savings, it is absolutely necessary that we bear in mind the amortization deductions which must be made from the cost of capital equipment which will be put into operation in order to implement the measures called for in the plan.

The time required in order for the expenditures for the implementation of each measure to pay for themselves depends on the extent of the single expenditures and on the extent of the conditional annual savings; this time period is determined by dividing the total of the single expenditures by the average monthly (average annual) savings. It is very important that we determine these time periods in which the expenditures for the implementation of measures must pay for themselves, since this will make it possible to judge the extent to which the implementation of a certain suggestion is feasible, and it will also make it possible to determine sources from which to cover the expenditures for the implementation of a given measure.

The implementation expenses can be subdivided into capital cutlay necessary for the acquisition of equipment, construction workers, etc., and the estimated production expenses, which include such items as cost of production, conversion of equipment, and new equipment at enterprises.

Capital expenditures are financed by the Prombank (Industrial Bank) on the basis of the established capital investment plan, and these funds are taken from funds made available by the Ministry of Communications, or from funds made available by the enterprise. For measures designed to modernize equipment and introduce new techniques, mechanization, and designed to improve production techniques, method and production-engineering techniques, and to expar production itself (those not included in the plan for capital investment) of independently financed enterprises may be financed through credit from the Gosbank (State Bank) for periods of up to two years, given the condition that the expenditures are completely offset by savings which result from the introduction of the measures. Operational funds may be used to implement measures if these expenditures can be offset by savings obtained in the course of the plan period (year), and if these savings do not involve the acquisition of any new equipment. The expenditures for the measures of this group involve only such sums as the costs of production during the plan year.

The above recommendations will become clearer with a specific example. We must determine the effectiveness of the introduction of combined servicing for a 100-watt radio center and the equipment of a branch communications office (VRS — interurban telephone exchange — and a Morse telegraph instrument) that has been planned for a certain district office located 1.5 km from the radio center. Two workers service this radio center (the center is in operation for 10.5 hours), and the equipment of the branch communications office functions for three hours. It is anticipated that this measure will be introduced by 1 April of the plan year.

In order to combine the servicing of these facilities it will be necessary to construct a "radiofication" line 1.5 km in length, carrying a steel circuit, the radio center will have to be dismantled, and subsequently rebuilt in the building housing the branch communications office.

By organizing this joint servicing of the radio center and the remaining equipment so that only three workers are required, instead of five, it will be possible to release two personnel units, and thus to increase labor productivity, and to reduce the cost of a unit of production. Thus the savings produced from the instant that the combined servicing measure was put into effect until the end of the plan year, and the conditional annual savings, can be determined in the following fashion (see table).

Designation	From instant of introduction to end of year, i.e., nine months	For the entire year
I. Savings in rubles: wages*	490 × 2 × 9 = =8820	490 × 2 × 12 = =11,760
social security (5.3% savings in wage fund)	8820 × 0.053 = =467	11,760 × 0.053 = =623
maintenance expenses for radio center**:		
a) lighting	17.5 × 15 × × 9/12 = 197	17.5 × 15 = =263
b) heating	7 × 50 × 9/12 = =263	7 × 50 = 350
Total	9747	12996
II. Additional expenses in rubles for maintenance of newly built lines (1.5 km):		
for pole maintenance (with a standard of expenditure of 69.3 rubles per 1 km of line per year)	69.3 × 1.5 × × 9/12 = 78	69.3 × 1.5 = =104
for line maintenance (with an expenditure standard of 2.3 rubles per 1 km of wire per year)	2.3 × 3 × × 9/12 = 5	2.3 × 3 = 7
amortization deductions from cost of line construction***	3000 × 0.1 × × 9/12 = 225	3000 × 0.1 = 300
Total	308	411
III. Total savings (savings less additional expenses)	9439	12,585

Footnotes to table:

*As a result of releasing two workers with an average monthly income for each of 490 rubles.

**Housing space: 15 m^2, in area; 50 m^3 in volume. 17.5 rubles are spent for lighting each year for each 1 m^2 of area, and 7 rubles are spent each year for heating each 1 m^3 of volume.

***Cost of poles, wire, installation of poles, and stringing of wires comes to 3000 rubles; the amortization standard for an aerial line is 10%.

Thus the savings to the end of the year come to 9439 rubles, while the conditional annual savings are 12,585 rubles.

At the same time in order to set up the combined servicing, the calculations have shown, that single expenditures of 5000 rubles will be required (for the construction of a feeder line we will require 3000 rubles, and for the disassembling of the radio center and the subsequent reassembly of the radio center we will require 2000 rubles). These one-time expenditures, given conditional annual savings of 12,585 rubles, can be offset with 5000/12,585 = = 0.4 year, i.e., less than five months. It is clear that the less time required to offset such expenditures, the more effective the given measure.

The measures called for in the production-finance plan for a district communications office are calculated i the following manner.

1. In the work plan: the average annual number of workers is reduced by 2 × 9/12 = 1.5 personnel units; the annual wage fund is thus reduced by 8820 rubles; labor productivity (with an average annual staff of 75 workers for the entire enterprise) increases by $(75/75-1.5) - 100\% = 2.04\%$.

2. In the production expenditure estimate: the wage fund for production personnel is reduced by 8820 rubles, and additions to the wage fund are reduced to 467 rubles; expenditures for materials and spare parts increased by 83 rubles; amortization deductions are increased to 225 rubles; general expenses are reduced by 460 rubles.

The total operational expenditures are reduced by 9439 rubles. There is a corresponding reduction in cost pe unit of production.

The plan for organizational and technical measure at an enterprise is formulated on the basis of a table ci in the existing instructions for the formulation of plans at independently financed communications enterprises. V-VII class district communications offices do not prepare their measure planning program in the form of a table, but rather in the form of explanatory notes to the plan.

The Regional Communications Administration must provide assistance to the enterprises in all stages of planning, particularly with respect to measures, the implementation of which require the assistance of other enterprises, or which depend on the Regional Administration alone. It is worthwhile to establish a system under which the Communications Administration, once having approved the production-finance plans of the enterprise, would advise the enterprises which of their planned measures have been approved and taken into consideration in the plan, and which of the measures are regarded as unfeasible, giving complete explanations for such rejection.

The preparation of a plan of organizational-technical measures is only the beginning of the operation. Throughout the entire year we must continue to introduce and implement suggestions which will make it possible to seek out and make use of additional production reserves, and this must be a matter to which the managers of the enterprise devote particular attention.

It is the responsibility of the managers and plan workers of the enterprise to maintain control over the implementation of the plan of organizational and technical measures.

A.I. SORIN and T.S. SHANINA, Junior Scientific Workers at the TsNIIS (Central Scientific-Research Communications Institute)

THE ORGANIZATION AND OPERATION OF COMMUNICATIONS FACILITIES

TRANSFERRING COMMUNICATIONS WORKERS TO THE SEVEN-HOUR WORK DAY AND ADJUSTING WAGE RATES

The decisions of the Central Committee of the CPSU, of the Council of Ministers of the USSR, and of the VTsSPS (All-Union Central Council of Trade Unions), of 19 September 1959, established the deadlines for completing the transition of the workers and employees of all segments of the national economy of our country to the shortened work day, and for the completion of the program to adjust wages. This decision is another indication of the concern shown by the Communist Party and the Soviet Government with respect to improving the well-being of the Soviet people.

For the communications facilities, the above-mentioned decisions established the following deadlines to complete the transition to the shortened work day, and to carry out the adjustment of the wage rates: the transition to the seven-hour work day must be completed in the period from the fourth quarter of 1959 to the third quarter of

1960, i.e., it must be completed by 1 October 1960; the adjustment of the wage rate must be carried out from the second quarter of 1960 to the third quarter of 1961.

The Central Committee of the CPSU, the USSR Council of Ministers, and the VTsSPS have indicated that the transition to the shortened work day and the adjustment of the wage rates must be carried out, for the most, by achieving savings in funds obtained as a result of putting new ideas in technology into effect, by standardizing work norms, by reducing manhour losses, by reducing the number of additional workers, and by further improving the administratio of production, by combining departments, shops, sections, and by introducing a central form of administration at the enterprises, as well as by eliminating excesses in the sy tem of bonus payments, and finally, by halting the practi of giving raises for length of service.

The decision has drawn the attention of the party, Soviet, economic, and trade-union organizations to the necessity of the timely and careful preparation of the enterprises for operations under the conditions of the shortened work day, in order to make certain that the productior plans and assignments with respect to increasing labor productivity are met without fail. What is required here is a daily check on the practical implementation of this requirement directly at each work station. The decision suggested that for each enterprise technical, economic, and organizational measures be prepared and put into effect, and as a result of this action it will become possible to transfer the workers of the given enterprise to the shortened work day.

It should be noted that as a result of the measures that have been put into effect in recent years, it has become possible to obtain definite reserves in production personnel; we have in mind here such measures as the introduction of automation and mechanization facilities, the simplification of the processing operations for postal and telegraph correspondence, the elimination of excesses in the technical servicing of communications facilities, and by organizing more properly various types of control operations at many of the communications enterprises. The utilization of such reserves, together with the development and implementation of important measures, such as have been indicated by the decisions of the CC CPSU, the USSR Council of Ministers, and of the VTsSPS will make it possible to transfer the communications workers to the seven-hour work day within the time period allotted for this purpose; it will be possible, for the most part, to achieve this without any increase in the total number of workers.

In agreement with and after discussing the matter with the Central Committee of the Trade Union, the USSR Ministry of Communications will set specific deadlines for the transition of communications workers at individual communications enterprises — under the administration of the various republics of the Soviet Union — to the shortened work day, and for the introduction of the new pay rates; for the communications enterprises that are controlled by republic and regional administrations, the Councils of Ministers of the various republics of the Soviet Union — in agreement with the appropriate trade union organizations — will set the required deadlines within the limits of deadlines called for in the decisions of the CC CPSU, the Council of Ministers of the USSR, and the VTsSPS, and within the limits of wage funds set aside for this purpose. The work day length remains unchanged for those categories of communications workers for which the shortened work day was put into effect earlier, in view of hazardous production conditions.

The USSR Ministry of Communications, together with the State Committee on problems of labor and wages of the Council of Ministers of the USSR and the VTsSPS, are preparing a presentation to the USSR Council of Ministers which suggests the directions to be taken in the adjustment of wages for communications workers.

The developed suggestions with respect to the adjusting of wage rates for communications workers have as their goal, primarily, the elimination of shortcomings in the existing pay scales for communications workers. The existing pay scales are based on narrow job qualifications, and are characterized by an excessive classification table of skills and rates of pay, varying from five to ten rubles per skill. This system does nothing to stimulate a worker to improve his job rating, to learn related skills, and to move ahead in his work. The existing system of raises for length of service has turned into an obstacle preventing the influx into the communications economy of younger specialists, since the level of starting pay is low and newly hired workers and young specialists refuse to work under such conditions, and they reject the work available in communications organizations.

This project therefore anticipates increases in wages for communications workers, particularly for those communications workers whose pay now is low, i.e., those who receive no length-of-service raises. With the introduction of the new pay scales, length-of-service raises will be eliminated.

It is anticipated that the general-classification skills will be paid identical wages, regardless of where in the Soviet Union a worker happens to be employed; this replaces the existing system of pay rates based on five rate zones. Under the new system, the wages will be based on skill categories (two to three categories per skill).

For the managers and engineer-technical workers, the program anticipates a unified system of wage scales, based on the branch and type of communications facility, but also without any reference to rate zones, and taking into consideration the volume and complexity of operations, and the type and category (class) of enterprise. Together with the new pay rates, new, somewhat higher, enterprise and production shop skill ratings will be issued.

For the line and station communications inspectors, for cable-splicers, for cable layers, for power maintenance men, for battery tenders, for drivers, for diesel truck operators, inspectors of postal railroad cars, and similar skills will be transferred to a six-category pay scale.

In paying workers at communications enterprises situated in the north, in the far east, in eastern Siberia, and in certain areas where natural and climatic conditions are difficult, certain special pay rates will be established to grant these workers a certain advantage over those workers at communications enterprises in the central portions of the country. It is also anticipated that higher pay will be granted to those communications workers who are employed in mountainous regions (above 1500 meters), and also for those communications workers in desert or waterless areas.

As a result of this adjustment in pay scales, the disparity between high paying and low paying communications jobs will be substantially reduced. Moreover, the bonus system is also being overhauled.

For the managers and engineer-technical workers of the communications enterprises, a new bonus system was put into effect as of 1 October 1959; this new system is based on principles established for the entire national economy. The completion and overfulfillment of revenue plans for the completion of the plan for the reduction in costs or exceeding the planned reductions in cost have been established as the basis for the payment of bonuses to managers and engineer-technical personnel. Bonuses will be paid under the conditions that the plan for operational expenditures is not exceeded, and that the basic operational characteristics are maintained, and also that the assigned production volume is met; in addition, the plan for labor productivity must also be completed.

All managers and engineer-technical workers will receive equal percentages of pay as bonuses, regardless of their position. If the above-mentioned conditions are met, the bonus will come to 10-15% plus 3-5% of the monthly pay for each percentage point in excess of the assigned operational characteristics; but in no case will the monthly bonus exceed 0.4% of the monthly pay, in any given month.

The premiums for managers and engineer-technical workers and employees will be paid from the wage fund (instead of setting aside a special 2% fund for bonuses).

The bonus system for general-skill workers will al be adjusted and improved. This system will be put into operation simultaneously with the transition to the new pay scales.

In order to put into effect the new adjusted pay scales, we will require approximately 1.3 billion rubles annually. A certain percentage of this sum will have to be sought directly within the communications economy. It is therefore extremely important that we follow the directives of the CC CPSU, of the USSR Council of Ministers, and of the VTsSPS, which call upon the party, Soviet, trade-union and komsomol organizations, and on the authorities at the ministries, departments, enterprises, organizations, and sections to undertake an explanatory program to encourage the participation of workers, engineer-technical workers, and all employees to participate in the preparation and implementation of measures designed to put into effect the shortened work day, and to bring about the introduction of new pay scales.

The Central Committee of the CPSU, the USSR Council of Ministers and the VTsSPS have called upon all workers, engineer-technical workers and employees to increase their activity and creative efforts in the program to seek out internal production reserves in order that the transition to the shortened work day and the adjustment of wage scales for communications workers would lead, at each enterprise, to increased production, a rise in labor productivity, and thus to a further increase in the material well-being and cultural level of the working people.

It is a matter of honor for Soviet communications workers to respond to the call of the party and the government for the further expansion of the socialist competition, and to complete the assignments under the seven-year plan ahead of schedule.

N.I. BAKHGORSKIY, Supervisor of the Wage and Labor Department of the USSR Ministry of Communications

LETTER CARRIERS REQUIRED FOR DELIVERY OF TELEGRAMS

In order to organize work and service the public properly, the calculation of the number of letter carriers required to deliver telegrams at telegraph communications enterprises takes on particular importance.

It has been decided, for purposes of determining the number of workers required, that three to eight deliveries per hour are possible; specific norms, within these limits, are determined for individual work stations in dependence on the conditions of delivery (radius of delivery zone, population density, municipal transportation facilities, etc.). In other words, the number of letter carriers required to deliver telegrams is determined from an examination of local conditions.

This procedure makes it clear that rigid standards for the delivery of telegrams are required, standards that will make it possible to determine the actual number of letter carriers and communications enterprises that are required, given identical conditions with respect to personnel.

Date of month	Name of letter carrier	Work hours	Number of zones	Number of telegrams	Number of deliveries	Time allotted by standards, in minutes	Departure time	Return time	Time actually spent, in minutes	Additional time, in minutes
1	2	3	4	5	6	7	8	9	10	11
19 May	Polyakova	From 4 P.M.	1	6	6	55	4:21 P.M.	4:55 P.M.	34	–
		to midnight	5	2	2	49	4:56 P.M.	5:43 P.M.	47	–
			4	3	2	31	5:45 P.M.	6:20 P.M.	35	–
			5	4	3	54	6:24 P.M.	7:20 P.M.	56	–
			4	10	8	72	7:22 P.M.	8:36 P.M.	74	24
			5	5	5	70	8:40 P.M.	9:38 P.M.	58	–

Further on we recommend a method for calculating the number of letter carriers required for the delivery of telegrams; this method will meet the requirements. The number of letter carriers, following this method, can be calculated according to time standards for covering the postal zone, and for making the actual delivery; these standards have been established in accordance with instructions received from the communications ministry, relative to working out standards (norms) for telegraph messengers (appendix No. 10 to order No. 960 of the Ministry of Communications, dated 2 December 1954).

In order to determine the personnel required on the basis of the established norms, we must calculate the time allotted under the standards and the time actually spent on delivering telegrams for all letter carriers for a period of one week.

In order to facilitate the calculation, the above table is prepared.

This table includes information for deliveries during an entire week. Subsequently the actual time spent on each delivery is calculated, and the result is recorded in Column 10. Then we look at all trips with a great number of deliveries for which the time standards exceed 60 minutes (Column 7), and if the actual time spent (Column 10) also exceeds 60 minutes, then this trip is reduced to half the deliveries, and subsequently, from a table of standards, the time for each trip with this reduced number of deliveries is obtained. The new times are added, and the standard time is subtracted from the result and entered in Column 7, and the remainder is entered in Column 11 as additional time. Dividing the trips involving many deliveries and time standards above 60 minutes, achieves the purpose of avoiding delays in telegram deliveries, since otherwise the telegrams delivered at the end of these trips would not be delivered on schedule.

Example (see next to last line of table). According to the standards, 72 minutes are required for the trip through the zone for eight deliveries; in fact, 74 minutes are spent. In this case, the trip is divided into two trips, with four deliveries on each trip. The time standard for a single trip in this zone — with four deliveries, comes to 48 minutes; i.e., for two trips 48 + 48 = 96 minutes. From 96 minutes we subtract the time recorded in Column 7, i.e., 72 minutes, and the remainder — 24 minutes — is recorded in Column 11.

In those cases when the standard time exceeds 60 minutes, and the actual time for the trip is less than 60 minutes (last line of table), no additional time is computed.

After finding the additional time, we calculate the following: 1) standard time (Column 7); 2) actual time spent (Column 10); and 3) additional time (Column 11).

In order to determine the required number of letter carriers to handle the deliveries within the time standards the additional time is added to the time standard, and the total is divided by 60 (the number of minutes per hour). The resultant quantity will be the weekly requirement in man-hours which, if divided by seven (the number of days in the week) and multiplied by 30 (the average number of days in a month), we will then have the monthly requirement in man-hours. The result is divided by the monthly letter-carrier work time, and then 4% is added for furloughs.

In its general form the calculation for letter carriers is carried out in the following manner:

$$P = \frac{(t_{st} + t_a) \times 30}{60 \times 7 \times 196} \times \frac{104}{100},$$

where P is the required number of letter carriers, t_{st} is the standard time in minutes per week, t_a is the additional time per week in minutes, 196 hours is the standard letter carrier work time (given an eight-hour work day; given a seven-hour work day, 175 hours per month).

The calculation on the basis of this formula will be final if the standards in the table do not exceed 100%. Otherwise the results obtained in the calculation for the number of letter carriers will have to be reduced by the percentage in excess of the standards.

Below we cite an example of a calculation for the number of letter carriers required to deliver telegrams.

Total standard time (Column 7) — 28,212 minutes.

Additional time (Column 11) — 1624 minutes.

Time actually spent (Column 10) — 25,640 minutes.

This produces the percentage of standard time expended:

$$\frac{28212 \times 100}{25620} = 110\%.$$

The number of letter carriers will be

$$\frac{(28212 + 1624) \times 30}{60 \times 7 \times 196} \times \frac{104}{100} = 11 \text{ units.}$$

If the standards require 110%, the number of personnel calculated will therefore have to be reduced by 10% and in round figures comes out to ten units.

The calculation of personnel on the basis of the suggested method should be carried out for a volume of work over a month in the third quarter, and in case of necessity, for any month except one that has peak-load days (April, November, December).

The table for the calculation of letter carrier personnel should also be used for an analysis of the actual time standards required for delivery zones, and thus to arrive at the necessary correction factors.

The proposed program for the calculation of letter carrier personnel required for the delivery of telegrams was checked at the enterprises of a number of regional communications administrations. Corrections, based on remarks from these enterprises, have been introduced.

The administration of the Interurban Telegraph-Telephone Communications Network of the RSFSR Ministry of Communications feels that the suggested calculation method for the number of letter carrier personnel for the delivery of telegrams makes it possible, more accurately and more correctly, to determine the required personnel, and actually to take operational conditions for delivery into consideration.

I.M. BABASHKIN, Senior Engineer of the Standardization Group at the USSR Central Telegraph Office

LABOR STANDARDIZATION

AT THE LENINGRAD POST OFFICE

The existing system of standardizing work for letter carriers involved in the delivery of telegrams, a system that was introduced many years ago, is extremely complex since it takes no less than a month and a half to two months to complete such a standardization. The complexity of this system can be attributed to the fact that for the purpose of determining time standards — for the delivery of instructions alone — we must observe each delivery zone no less than five times during daylight hours and in the evening; in addition we must observe the time required on each trip through each delivery zone, for the delivery of all numbers of telegrams from one to five, in order to establish extra time standards. All these operations are then summarized into a combined table with a multiplicity of norms (for example, for the branch communications office that is responsible for five delivery zones, there are 30 norms).

The bonus payments under this system are calculated in such a fashion that no single letter carrier can comprehend it.

This obsolete system of standardization is best replaced by a new system. In particular, we must reject standardization for individual delivery zones, and we must eliminate standardization for delivery alone and for the trip alone, with each quantity of telegrams to be delivered This split standardization is completely unnecessary, all the more so since any time standard is not intended to serve as a final goal for each individual trip, but rather as an average of all trips combined, so long as each trip has an identical number of deliveries.

The new method of standardization proposes the following.

The standardization for trips will be carried out in sequence (i.e., independently of the location of the delivery zone), and the trips of both day and night shifts will be examined each and every day for an entire week.

The new method of standardization involves dividin the telegram delivery district into zones, but this system is only maintained for the convenience of sorting telegrams according to delivery routes, wherein we take into consideration the deadlines that have to be met.

Three individual elements are kept under observation: 1) internal operations (receipt of telegrams from the forwarding office, sorting telegrams according to routes, return of undelivered telegrams, and the turning over of the list); 2) the trip through the delivery zone; 3) the actual delivery (from the instant that the letter carrier enters the house, to the exact time that he leaves the house).

Only one standard (norm) is set — the time norm for the delivery of a single telegram, and this becomes the one time standard for the delivery of telegrams throughout the entire district that is served by this branch communications office. This time standard, as an average quantity, is in fact the calculation unit and may be used in order to determine the actual cost of an individual delivery, as well as to be used in the existing system of bonus payments.

It will only take seven days, plus three days to process the observation material, to set the standards under the new system; this is therefore a substantial simplification relative to the old system and requires no compilation of complex tables. The many standards which were derived under the old system are now replaced with a single standard, the standard for the delivery of a single telegram.

The advantages of the new system of standardization may be summarized, in particular, in that they can be applied to the existing system of bonus payments which is based on the familiar principles, with its complex calculations, or it will be possible to establish a piece rate for this work. For example: the time standard for the delivery of a single telegram (including internal operations, the trip, and the actual delivery) is 12.4 minutes for the second category of letter carriers for the delivery of telegrams; if we assume a letter carrier to receive a wage of 400 rubles per month, and if we assume that the average annual man-hour standard comes to 196 hours per month, we can compute the cost of the delivery of a single telegram as follows:

$$\frac{400 \times 100 \text{ kopecks}}{196 \times 60 \text{ minutes}} \times 12.4 = 3.4 \times 12.4 = 42.2 \text{ kopecks.}$$

This individual cost price is increased by 10% and comes to 42.2 + 4.2 = 46.4 kopecks. Thus, any letter carrier delivering telegrams can clearly understand that he receives 46.4 kopecks for the delivery of each and every telegram, and what is more important, he will understand that the more telegrams that he delivers the more his pay will be.

Upon the introduction of the piece work basis, the post office supervisor and the regional trade-union committee authorities released a statement, a document which establishes the following: the manner in which this piece work rate is to be determined; the pay rate for the time spent at work, but not on the actual delivery of telegrams, and this rate will be 100% of the telegram tariff; the pay for idle time will be 50% of the telegram tariff; in the event of breakdown or delay no extras will be paid (i.e., the piece work pay will be based on the telegram tariff) for all days worked during the month, however, reserving the right to earn extras in subsequent days of the month.

While under the existing system of bonus payments the worker is unable to determine personally the amount of his total daily pay, under the piece work system this will involve no difficulties whatsoever. For example: a letter carrier working on a shift for the delivery of telegrams, if he makes 16 trips and delivers 34 telegrams, and if he worked for one hour on work not involving the delivery of telegrams, and if he was idle for one half hour, then his pay will be 46.4 × 34 = 15.78 rubles, for the work not involving the delivery of telegrams, 2.4 rubles, and for the idle time, 51 kopecks. This comes to a total of 15.78 rubles plus 2.4 rubles plus 51 kopecks = 18.33 rubles.

The new system of standardization involving piece work rates was tested, experimentally, for three months at a time; these tests were conducted twice — in 1957 and in 1958 — in Leningrad, at many branch communications offices of the largest communications office, the Dzerzhinsk

Communications Office. The experience gained in establishin labor standards on the basis of the new system revealed th following.

There has been a sharp reduction in the length of time needed to determine the standards for letter carrier delivering telegrams; this time has been cut from a month and a half to two months down to ten days. The seven days of observation to understand the delivery conditions for each day of the week are more than enough to determine the time standards for the delivery of a single telegram, since some 150 to 200 deliveries will take place during this observation period. The subsequent techniques of processing the standardization materials and the techniques of determining the norms have been considerably simplified. The multiplicity of norms has been completely eliminated. The method of determining the piece work rate involves no complexities whatsoever. The calculation of the daily wage rates is absolutely without difficulty, and are within th capabilities and comprehension of each letter carrier.

We have tested the possibility of having the lett carriers deliver telegrams during their idle time, or on their delivery trips with money orders (whether telegraph or postal), on their trips to deliver money order advices, and during their parcel post delivery routes. Piece rates can be determined for these operations, or pay for these operations can be based on the number of hours spent, with the rate to be 100%. Experience has shown the expediency of this type of operation, which in effect makes it possible to use the entire work day fully, and also provides a greater income for the letter carriers. Experience has indicated that this method necessarily produces a rise in labor productivity (average output per hour).

For payroll purposes a table of personal accounts is maintained for each month, and the table contains the following information: 1. Surname, given name, and patronymic. 2. Number of telegrams delivered. 3. Number of idle hours. 4. Number of hours to be paid according to tariff.

For the first half of the month a 50% advance is paid, and on the fourth of the following month a final payment, based on the piece work rate for the month, is made. The time standards and the piece work rates are established for each communications office in the following manner:

Time standard for delivery of single telegram	Piece rate for delivery of single telegram	
	Category 2	Category 3
12.4 minutes	46.4 kopecks	43 kopecks

A test of the piece rate payment basis showed that the expenditures in wages for deliveries of single telegrams is less than under the present bonus payment system.

By introducing the piece work payment basis to the forwarding offices we simplify the accounting procedures, which involve keeping records for each letter carrier on his delivery of telegrams. On the forwarding office file card, the column headed "Time Standard" and "No. of Zone" can be eliminated. The personal records of the letter carriers will be changed as follows: the daily entry in the column "Base Time," "Time Standard," and "Percentage of Time Standard Met" will be eliminated; these columns will only be totaled each half month and each month.

This new system, as was the case for the existing system, is best used in branch communications offices with small work loads, and where three or less letter carriers are required for delivery of telegrams.

The new system of standardization and piece work payments were tested both in Leningrad and in Moscow; these tests proved that we were warranted in approaching the USSR Ministry of Communications with these problems. The release of a special report from the Ministry of Communications, dealing specifically with these problems, is an important necessity, and we are awaiting a final decision in this regard.

M.M. NOVOSELOV, Standardization Engineer.

Research Group of the Leningrad Post Office

INCREASING THE ROLE PLAYED BY PRODUCTION LABORATORIES IN THE TECHNICAL DEVELOPMENT AND IMPROVEMENT OF COMMUNICATIONS FACILITIES

The decisions of the June plenary session of the CC CPSU stress the important role which the production laboratories will have to play in automation and mechanization, in the introduction of new techniques, and in improving equipment and instrumentation.

The letters cited below tell of the work in this direction carried out by the laboratories, and note is taken of the shortcomings and difficulties that are encountered in this work; certain practical suggestions are offered for the improvement of the activities of production laboratories.

The Laboratory of the Leningrad Radiocommunications and Radiobroadcasting Administration, according to senior engineer comrade Stukman, has perfected a process of monitoring the technical facilities of radio links. Equipment has been developed and put into operation, that makes possible remote controlled switching of the equipment at the technical monitoring station into various points of the low-frequency radiotelegraph trunk line.

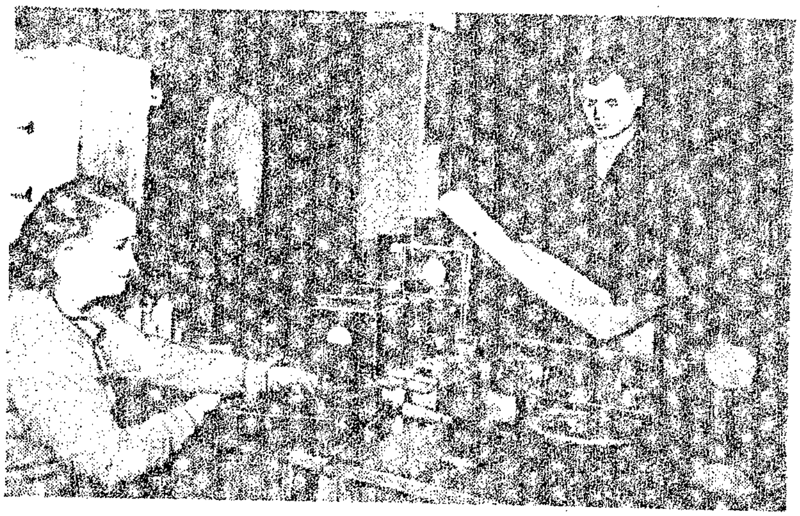
The following method can serve as an additional example of automation in production processes. This method involves monitoring and measuring operational characteristics (frequency characteristics, and the nonlinear distortion factor) of radiobroadcasting stations. Such measurements are carried out, as a rule, with an ADU (remote control equipment) installation which makes it possible to select at long range a series of fixed audiofrequencies with definite levels corresponding to a given percentage modulation. In an ARU (installation) an audio-frequency beat generator (ZG-2A) is used. One of the heterodynes (local oscillators) of the ZG (audio-frequency generator) is retuned by remote control by switching to the appropriate capacitance. The voltage of the fixed level is taken from the remote controlled divider. Thus the operators at the transmission stations can select the required frequency and the appropriate level by means of a dial, thus obtaining low-frequency signals along the line from the central installation in the switching-distributor equipment.

In recent times, the laboratory has done much work along the lines of improving the operational characteristics of the ultrashortwave frequency modulation broadcast transmitters: modernization of exciters, and improving the monitoring-measuring equipment installed in the transmitter room. As a result the ultrashortwave transmission sound quality has shown decided improvement.

The laboratories are devoting particular attention to the problems related to the automation of controls by means of technical facilities. Only the enterprises which have a sufficiently large production base have the capacity to solve the problems related to the automation of standar shortwave transmitters. Therefore the automation of standard shortwave transmitters, in comrade Stukman's opinion, must be accomplished through centralized developments and through the installation of individual unit systems of aut mated control. However, specific problems of automation ar remote control can be solved locally.

The laboratory of the LDRSV (Leningrad Radio Communications and Radiobroadcasting Administration), at the present time, is doing some work on the partial automation of nonstandard shortwave radio communications transmitters. It is anticipated that such operations as the switching on of transmitters, measuring the carrier, and the supply and measurement of modulation will be remote controlled.

In the field of trunk line reception it is anticipated that an automatic signalling device will be put intc operation, a device that will operate on circular radio links under a regime of standby reception. Such a device was developed by the laboratory of the LDRSV and turned over to industry for manufacture.



In the production laboratory of the Central Telegraph Office of the USSR. Engineer V.A. Strakhova and Senior Technician M.V. Vasil'kov are adjusting the equipment for automatic control of voice-frequency telegraph channels.

Photographer: M. Stepanko

However, the lack of an adequate production base at the laboratories of the enterprises may prevent the realization of even a relatively simple project; it would also be necessary to provide qualified mechanics for the production laboratories of radio enterprises, mechanics capable of independently planning and designing automatica... controlled mechanical units and devices.

Comrade Gurvits, supervisor of the production laboratory of the Kiev GTS (city telephone network), discuss in some detail the role played by the production laborato of the major city telephone networks located in those economic areas where there is a lack of industries manufacturing communications equipment and where there are no scientific research institutes for this particular segment of the economy. Under such conditions, the production laboratories must learn to solve comparatively complex problems on their own. It is for this reason that the laboratories must be provided with the required organizational and technical conditions and qualified specialists. During the past two years, the problem of the operations of the production laboratories at major enterprises has repeatedly come up for discussion at the Technical Council of the UkrSSR Ministry of Communications, and this has resulted in some improvement in the operations of the laboratories.

Comrade Gurvits, also discussed in some detail th activities of the laboratory of the Kiev GTS, and mentioned the fact that particular attention is being devoted here to the introduction of new techniques. Considerable work has been done on the installation of two unattended home ATS (automatic telephone exchanges), amplifiers without differential systems, telephone equipment with transistorized amplifiers, signalling cut-off relays, and an economic method of switching holders into the ATS (developed at the laboratory).

In recent times, problems of automation have become particularly important in the work of the laboratory. An automatic method of remote controlled measurement of potentials across the cable circuit have been developed and put into operation; AUD's for checking subscriber substations through district automatic telephone exchanges have also been developed and put into operation, and as a result it has become possible to convert the terminal rooms of the substations to operations without attendant personnel (the above-mentioned AUD's differ from the AUD's developed at the factory "Krasnaya Zarya — Red Dawn," in that the LI-AUD is used for conventional connections, as well as for checking subscriber lines, so that as a result tremendous savings in station equipment become possible).

In view of the fact that the city telephone network operates several automatic telephone exchange systems, the production laboratory is developing intermediate devices that are capable of functioning in all the various automatic telephone exchange systems. We have reference here in particular, to the development, completed in 1959, of a two-wire interstation trunk line capable of handling two different types of automatic telephone exchange systems On the basis of this development a new district automatic telephone exchange in Kiev was planned, and the construction of this particular exchange is being carried out at this time.

In recent times, particular attention has been devoted also to the improvement of preventive maintenance techniques on the cable circuit. Thus, for example, for KP-50 instruments a switching adapter has been developed and put into operation; the utilization of such an adapter speeds up the process of preventive measurements. The met[illegible] of carrying out measurements across the distribution (inte[illegible]mediate) cable circuit has been altered basically, and th[illegible] will make it possible, this year, to complete the plan for preventive measurements on the distribution cable circuit one and a half months earlier than usual.

Comrade Gurvits feels that it would be a good thing to convene an All-Union Conference of Supervisors of Production Laboratories of GTS in 1960 in order to provide a platform for the exchange of experience in operations at various production laboratories. (A similar conference of MTS /interurban telephone network/ was held in 1958, under the auspices of the RSFSR Ministry of Communications.)

Comrade Shenberg, senior laboratory engineer, writes that the subject matter that the production laboratory of the Riga Central Telegraph Office deals with, determines to a considerable degree the circumstance that a direct connection system (SPS) has been introduced and perfected in the Baltic republics.

In the very near future, it is anticipated that the SPS system in the Latvian SSR will be converted to automatic switching. In this connection, the laboratory analyzed the telegraph volume handled in the republic. On the basis of the data obtained, equipment was designed for automatic direct connection stations in the city of Riga.

We know that the SPS system requires a relatively large number of channels in the bunched cables of the interurban lines. However, the high-frequency telephone channels with a range of from 300 to 27,000 cps, set aside for voice-frequency telegraphy, are often not fully utilized. These channels are multiplexed with VT-34 systems, and in view of the fact that channels 13-18 (rack III) are not being used, only channels 1-12, taking up only two thirds of the telephone channel band, are functioning. At the same time, racks I and II, corresponding to channels 1-6 and 7-12, are not being used.

The laboratory has developed, and there is presently in operation, a group frequency converter (GPCh) which make[s] it possible to switch the band of rack I or II into the fre[e] portion of the high-frequency telephone channel band, i.e., into the operating band of rack III. This GPCh is consider ably simpler than the similar device developed by the TsNI[IS] (Central Scientific-Research Communications Institute), described in "Herald of Communications" No. 4, 1958. This c[on]verter operates on three tubes and seven transformers, whi[le] the GPCh using the TsNIIS circuit contains four tubes and thirteen transformers. It has also become possible to eliminate the need for differential transformers. The filter circuits have been simplified. The more economical 12Zh1L tubes are used in the GPCh.

In order to conserve electric power and production space, the power shop of the laboratory developed a circuit for a VT-34 channel receiver operating on 12Zh1L tubes. In comparison with the former TO-3 tubes, the consumption of electric power in the filament circuits is reduced by a factor of 5.6. Negative feedback is used in the receiver, and this increases the stability of the channel parameters At the present time, all VT-34 systems are being converted to 12Zh1L tubes.

A device for signalling frequency deviations in a low-frequency generator has been developed and put into op eration. This device operates on a single small-button glass tube of the 6N3P series.

In addition to carrying out its assignment under the plan, the laboratory also works on renovating and repairing the monitoring-measuring equipment, carries on consultation sessions with efficiency experts, assists the technical personnel of the telegraph office in solving various technical problems, etc.

The laboratory is well equipped with measuring instruments; however, in obtaining the necessary materials and component parts, considerable difficulties are experienced.

The lack of a mechanics section has an adverse effect on the operations of the laboratory. After some circuit has been developed, and after a model has been tested, a hitch develops in that the laboratory has no possibility of constructively planning its further work, and at the same time the laboratory cannot long postpone the introduction of this new device. In order to set up a mechanics section at the laboratory we need machinery, but the telegraph office cannot procure this equipment, since no funds have been allocated for this purpose.

The relations and exchange of information between other laboratories and scientific-research institutes have still not been properly organized. This is a situation which often leads to parallel research. Individual mutual visits alone are not the answer to this problem. It is possible, that there would be some point to publish and disseminate a collection of annual work plans for all laboratories of this particular branch of communications, and each laboratory should have such a handbook at its disposal.

Comrade Fedorov, a laboratory engineer at the Kharkov GTS has offered an interesting suggestion.

One of the functions of the GTS laboratories is to check whether the materials and equipment of the GOST (All-Union State Standard) and VTU (Provisional Technical Specifications) which are sent to the enterprises meet the requirements. However, the conventional equipment at most of the laboratories permits carrying out only an insignificant number of such checks, and it is not always possible to arrive at the correct conclusions.

Since the equipment manufactured at a single factory is sent to various communications enterprises, and since this equipment is tested simultaneously at several enterprises, the degree of completeness of the testing of this equipment depends on the technical equipment availabl at the laboratories. If we take into consideration that there are no inspectors from the Ministry of Communication at the factories, and that these factories are generally located in the same cities in which the communications enterprises are located, we would see that it would be best to use the technical personnel of the laboratories of the communications enterprises to make spot checks on the equipment that is being delivered, directly at the factories, regardless of the type of equipment involved.

In this way we would eliminate the need to maintain costly auxiliary equipment at the laboratories of the communications enterprises, and less time would be spent on all checking operations, and the communications enterprises would be carrying out the necessary check on the production of all factories.

Comrade Netupskiy, supervisor of the production laboratory of the Kiev Interurban Telephone Exchange, discussed the projects carried out at this laboratory. This year, the primary goal of the collective of the laboratory was to ascertain the causes of the frequent burning out of the 390-ohm resistors in the V-12 amplifiers, and to develop a method to prevent damage to these amplifiers.

In order to improve the parameters of the voice-frequency signalling circuits (types TRU-32 and V-12) and to increase their economy, the laboratory has developed more efficient circuits in order to convert these receivers from electronic tubes to transistors.

In order to improve the quality of a link, the lab-oratory is checking to see whether the low-frequency chan-nels and terminal duplex amplifiers are properly matched to the equipment at the station.

The expansion of the switchroom, and at the same time increasing the number of order tables, has brought about the necessity to mechanize the transport of order blanks to the control table. In this connection, the lab-oratory has developed a reliable conveyer system.

In addition to the above-mentioned basic activities the laboratory also carries out such necessary functions a analyzing complex defects, adjusting filters, specialized measurements, departmental inspections of measuring instru-ments, and together with the KONIIS, develops certain oth projects.

Two joint teams have been set up, from among the workers at the laboratory, in order to implement efficiency proposals.

Comrade Netupskiy also mentions a number of diffi-culties which are currently affecting work at the labora-tory. The laboratory lacks an adequate number of engineers. The situation with regard to delivery of such materials as are necessary for experimental developments and measuring techniques is particularly bad. In addition, there is a shortage of space.

In order to improve the operations at the production laboratories, the Ministry of Communications should clearly determine which functions the laboratories ought to perform. Many laboratories are basically only concerned with operational measurements and the installation of equipment. The Ministry of Communications should coordinate the projects of all laboratories, improve the supply of technical materials to the laboratories — particularly with regard to new materials and component parts which are not available from central factories, and which are rarely available on a retail basis. It would also be an excellent idea to establish a classification of standard equipment for production laboratories. It is also necessary that the appropriate organizations begin to check on the quality of the developments of production laboratories, and to see that these developments, which have been approved, are implemented on a mass scale.

There is also need for an adjustment in the use of measuring instruments, and in the checking of these instruments, both at the production laboratories and at the enterprises.

THE EFFECTIVE USE OF MOTOR

VEHICLE TRANSPORTATION IN COMMUNICATIONS

Motor vehicle transportation is widely used in communications for a variety of purposes: to carry mail, print matter, to deliver telegrams, to make the collection rounds of mail boxes, and to empty coin boxes in coin telephones, to service electric communications and radiobroadcasting enterprises, to transport construction materials and materials for line plant repair, to transport the personnel of the emergency-technical repair service on trips to eliminate line damage on the line plant, etc. Motor vehicle transportation is particularly important in postal communications where it performs the most important function — the movement of mail and, consequently, is a necessary component of the production process of postal communications Of the total volume of work handled by the motor vehicle transportation department of the Ministry of Communication, the transportation of mail comes to approximately 50%.

In recent years, the workers of the motor vehicle transportation department of the Ministry of Communications have done much work along the lines of improving the operations, the technical servicing, and repair of the motor pool, and along the lines of increasing the production-technical base of transportation offices; this has had a positive effect on the operational characteristics which indicate the extent to which the facilities of the motor vehicle transportation department are being utilized. In this regard, one of the most important factors is the enlarging of transportation offices and motor pools, and eliminating the small, economically unfeasible, motor vehicle organizations. As of 1 January 1959 approximately 65% of the motor pools under the USSR Ministry of Communications have been combined into independently financed transportation offices, and in certain republics -- Ukraine, Lithuania, and in the Kazakh SSR -- from 86-95% of the motor pools of the ministries of communications have been combined into independently financed transportation offices.

However, the operations of the motor vehicle transportation department still indicate substantial shortcomings. This was clearly shown by the interrepublic joint meetings of motor-vehicle transportation workers that were held under the auspices of the USSR Ministry of Communications in July of this year in Kiev and Alma-Ata; the representatives of all communications ministries of the various republics of the Soviet Union, and representatives from 84 transportation offices participated at these meetings.

Low operational characteristics in the field of motor vehicle transportation can be attributed to serious shortcomings in the organization of its technical operatio In a great many motor vehicle operations, as a result of unsatisfactory preventive maintenance, motor vehicles are frequently idle because of technical failure, the motor vehicles are late in leaving their garage, and they are returned to the garage before their normal tour of duty is completed. And this, for example, in the field of postal communications leads to a disruption of schedules for mail transportation, frequently resulting in the disorganization of the entire operation: delays for letter carriers awaiting the arrival of the mail, an interruption in the normal schedules for the delivery of newspapers and mail, etc.

Because no one checks to see that drivers receive their routes and schedules on time, and also because of serious failings in accounting for gasoline, a fertile soil for the various violations of discipline in transportation, and even misuse of materials results. The use and accounting for motor vehicle tires is also poorly organized despite the fact that all motor vehicle transportation organizatio have vulcanizing equipment; treads are not inspected, and are used until fully worn out; tires are only sent to repair factories in cases of blowouts.

The discipline among the drivers is still quite poor. Some drivers do not take good care of the equipment that has been entrusted to them, they violate labor discipline and the rules of the road, and they come to work drunk. As a result, our motor vehicle transportation organizations are still faced with accidents.

Most transportation offices and motor pools pay absolutely too little attention to efficiency and research programs, mechanization of labor consuming operations, and the study and dissemination of leading labor methods is poorly organized. In recent years, a single brochure dealing with the experience of the transportation offices under the UkrSSR Ministry of Communications has appeared. Nevertheless, there are many leaders among the workers of the transportation department, and there are also many originators of useful measures. In many of the major cities of our country, drivers combine their skill with the trade of a letter carrier, and make the mail box collection rounds. In transporting mail, the motor vehicle driver also fulfills the function of mail escort. In some transportation offices, the drivers also serve as technical inspectors, service telephones, etc. However, information about these remarkable achievements is not being adequately disseminated.

A number of communications ministries and administrations are devoting too little attention to improving th organizational structure of motor vehicle transportation organizations, and to consolidating their material and technical base. One of the most important organizational measures is the consolidation of motor vehicle transportation organizations, a measure that has been implemented throughout the entire national economy, in accordance with the special decisions of the party and Soviet organizations. However, there are communications ministries and administrations which have placed too little value on these measures and have not only failed to put the directives of the USSR Ministry of Communications — dealing with the consolidati of motor vehicle transportation organizations — into effe but are even continuing to set up minor organizations, distributing new motor vehicles to communications enterprise and what is worse, to transfer motor vehicles from transportation offices to communications enterprises.

The work being done to eliminate minor motor vehicle transportation organizations is completely unsatisfactory, as is the work being done to improve the utilization of departmental motor vehicle transportation in the Georgian SSR, where only 23.5% of the motor pools have been consolidated into an independently financed transportation office, while the remaining motor vehicles are scattered over 65 minor motor vehicle transportation organizations; in the Uzbek SSR, only 28.7% of the motor pools have been consolidated, while the remaining motor vehicles have been distributed over 53 motor vehicle transportation organizations; in the Estonian SSR only 36.4% of the motor vehicles have been consolidated, and the remainder have been distributed among 23 enterprises.

Too little attention is being paid to the construction of garages and to consolidating repair stations. Over a number of years, despite the extreme necessity, no garages or transportation offices have been built in the Kirgiz, Uzbek, and the Azerbaydzhan SSR's, and in the Ul'yanovsk, Kemerovo, and Lugansk oblasts. It is for this reason that we have a disparity between the number of motor vehicles and the capacities of the production-technical base set aside for the maintenance, technical servicing, and repair of motor vehicles. The motor pools of the USSR Ministry of Communications have less than half the required number of departmental motor vehicle repair shops set up directly at the garages.

In view of the tremendous task confronting the communications organizations under the seven-year plan, great demand will be made on the workers of the motor vehicle transportation departments. The seven-year plan for the development of communications facilities anticipates a twofold increase in the number of motor pools available for mail transportation. If we take into consideration the specific function of automotive transportation in the field of communications, we will see that we have to set up motor pools primarily by acquiring low tonnage vehicles with go[od] traction and equipped with special bodies.

The USSR Ministry of Communications is persistentl[y] seeking the development and introduction of the productio[n] of automobiles with special bodies. The TsKB (Central Design Bureau) has set up a design unit and an experimental section to develop new designs of special bodies, and a unit for making experimental models.

Simultaneously with the increase in the number of motor pools, there must be an expansion of the production-technical base for maintenance, repair, and technical servicing of automobiles. The communications ministries of the various republics of the Soviet Union must have additional funds at their disposal for the purchase of motor vehicles, in quantities sufficient to meet the planned volume of transportation to be handled, and also for the capital investment required for the construction of garages, and for the purchase of the necessary equipment.

In designing and constructing garages it is impor ant that the latest and most advanced methods of maintenance, technical services, and repair of automobiles be taken into consideration; in other words, we should strive to achieve a situation in which the funds expended on the construction operations should be reduced to the minimum. If there are no garage facilities available, certain open areas, equipped with steam pipes to heat the motor vehicles, should be set aside. This will require very little money and will make it possible to maintain motor vehicles in good running order even in the winter. The Ukrainian SSR Ministry of Communications has had some experience in setting up such garage facilities.

The proper organization of motor vehicle transportation operations is of primary importance for the proper functioning of this service. This improvement in organization is best achieved by consolidation. In accordance with Order No. 570 of the USSR Ministry of Communications, dated 1 September 1959, this consolidation must be completed prior to the beginning of 1960. Nevertheless improvements in technical maintenance and repair must be achieved by all automotive transportation departments.

The decisions of the June plenary session of the CC CPSU have indicated the basic courses to be followed for technical progress in all segments of the national economy, including automotive transportation. In order to implement these decisions, the workers of motor vehicle transportation organizations, party workers, trade-union workers, and the workers of komsomol organizations must concentrate their efforts in the direction of introducing new methods of technical servicing, repair, and storage of automobiles; the implementation of these new methods will make it possible to increase considerably the productive capacity of motor vehicle transportation organizations, and yet reduce expenditures to the minimum, and to maintain the motor pool in good working order.

The technical servicing of cars at the motor vehicle transportation organizations, as a rule, is carried out at the present time in pits, where repair work can also be taken care of at the same time. There are numerous shortcomings to this method; it is for this reason that the major motor vehicle transportation organizations are advised to introduce newer methods for the servicing of cars — a flow line method which will make it possible, by separating the production processes into a number of sequential steps — of the simplest operations — and to provide technical servicing in a complete fashion through effective utilization of equipment, and as a result increase productivity, and improve working conditions.

A combined repair method must be introduced; this method will reduce to the minimum motor vehicle idleness during repair, and will, at the same time, increase the technical preparedness of the motor pool.

Technical servicing and repair of motor vehicles, normally a time consuming operation, are probably best handled by mobile motor vehicle repair workshops.

A necessary condition for the normal operation of motor vehicle transportation is an efficient organization of all forms of technical servicing and repair, the strictest maintenance of schedules for technical servicing, and this latter point must be law for each motor vehicle transportation organization. Eliminating technical servicing, varying the schedule, short cuts in servicing, or ignoring servicing until repair time, should not be resorted to except under extraordinary conditions.

The encouragement of initiative, rationalization, and innovation among the workers of the motor vehicle transportation organizations is a very important point in our struggle for technical progress, widespread mechanization, and the utilization of internal reserves, and improving labor conditions. Each motor vehicle transportation organization should develop a program of efficiency suggestions. In order that the suggested efficiency proposals are kept track of and examined in due time, we must have a special commission, which in addition to the above function, will see to it that those suggestions that are adopted are implemented.

The management of the motor vehicle transportation organizations must devote particular attention to the problems of commercial operation of motor vehicle transport. Since the delivery of mail is the most important function of automotive transportation, serious attention should be devoted to the most efficient utilization of motor vehicles in postal communications, in order that the movement of mail is handled with the utmost rapidity, and that all motor vehicle schedules are maintained.

In order to improve the utilization of vehicles being used to deliver mail, printed matter, and for the delivery of telegrams, the workers of motor vehicle transportation organizations and post office enterprises must treat seriously the matter of preparing schedules for these vehicles, bearing in mind that nonproductive idle time for the vehicles should be reduced to the minimum. In addition, new methods of motor vehicle operation should be introduced into the transportation operation, including the introduction of packing crates, parcel post and printed matter transportation ("container"), the consolidation of postal routes, and the widespread utilization of trailers. The effectiveness of motor vehicle transportation for communications organizations depends in great measure on the selection of the type of vehicle to fit the particular form of transportation. It is for this reason that the independently financed transportation offices should make certain that the motor vehicles at their disposal are suited to the needs of the particular form of transportation, and that their "rolling stock" is equipped with special bodies.

If we take into consideration the shortcomings in motor vehicles available to the communications organizations at the present time, we will see the necessity of expanding the utilization of rented motor vehicle transportation; in this case, the rented vehicle should be used primarily to carry freight, which is the form of transportation best suited to such vehicles.

Increasing labor productivity among the workers of the motor vehicle transportation organizations is an extremely important task. It is for this reason that we must organize and combine the skill of a driver with that of a mail escort, to combine the function of a driver with that of a technician-inspector, and to combine the work of the driver with that of the letter carrier, etc. In addition, electric communications enterprises should see to it that their television repairmen, line inspectors on cable trunk lines, and radio technicians, know how to operate motor vehicles.

The expansion of the Soviet competition at the motor vehicle transportation organizations, improving studies, generalizing and publicizing advanced labor methods, all these will undoubtedly lead to the completion of the assignments confronting these workers collectives of the motor vehicle transportation system under the Communications Ministries. At the same time, the managers of the transportation offices, as well as the party and trade-union organizations, must be instructed to increase the political-educational work among drivers and other workers at the moto vehicle transportation organizations, work directed toward increasing labor and production discipline.

There is no doubt that the workers at the motor vehicle transportation organizations under the Ministry of Communications, as well as the communications workers of our country, will apply all of their efforts to make certain that, in their particular section, the decisions of the 21st Congress of the Party and the decisions of the June plenary session of the CC CPSU are implemented in the shortest period of time.

L.YA. DOBYCHINA, Deputy Supervisor of th

Main Post Office Administration of the USSR Ministry of Communications

A.I. VASIL'YEVA, Deputy Supervisor of the Mail Transportation Department

SOME FEATURES OF THE OPERATIONS

AT THE KAZAN TELEGRAPH OFFICE WITH

SEMI-AUTOMATED RETRANSMISSION OF TELEGRAMS

Beginning with the second half of 1956, the Kazan Telegraph Office began to retransmit telegrams with a semi automated system. Since the link has not been converted to semiautomatic operation simultaneously, but rather on the basis of the arrival of semiautomatic equipment, the init' operation involved the pasting of the monitoring tape onto a telegram blank, and to place the perforated tape into slits cut into this telegraph blank.

When the semiautomatic instruments have been installed on all links with high speed equipment, the necessity for this gluing of the monitoring tape onto the telegram blank was eliminated.

After the perforated tape has passed through the transmitter, at the suggestion of our workers, the tape was again inserted into the cuts in the blank. This method is being used at the present time. The advantages of this method are considerable; in particular, the method is convenient for handling tracers and inquiries. In addition, this method makes it possible to establish more precisely the factors causing the breakdown observed during testing

The collective of the telegraph office became convinced of the advantages of this method after the link had been converted to ST-35 equipment — without any visible transmission monitoring. During the first days, according to the experience gained by the workers of the Leningrad Telegraph Office, both the Kazan Telegraph Office as well as other telegraph offices, the perforated tapes that passed through the transmitter in the course of one hour were collected on special needles-tape holders (the telegraph operators marked the tapes with the number of the telegram, and subsequently the tapes were turned over to the monitoring-information service). A week with this method showed substantial shortcomings and the telegraph operators requested that this method be replaced.

A session of the technical council, with the participation of the telegraph operators, was held. Comrade Yusupov, shift foreman, at this meeting suggested that the perforated tape be returned to the telegram blank, and that the order number of the telegram and the number of the wire over which the telegram had been received — received for transmission over the unmonitored link — be recorded in a register which was formerly used only to record hourly totals. Thus the telegraph operator now had the following additional functions: to record the order number and the wire number, and to place the perforated tape in the blank; however, now the telegraph operator no longer had to recor the order number on the perforated tape, she no longer had to "roll" the tapes that had accumulated in the course of one hour, to spend an hour's work writing, and to place rubber bands around the rolls of tape.

It is quite difficult to use an ordinary pencil to mark the order number on the perforated tape, since normal pressure on the pencil will tear the tape. It is for this reason that it is extremely difficult to locate a tape that is stored in the archives.

We should take note of the fact that during the first days of operation of our telegraph office without any visible monitoring system in which the processed tapes were collected on the needle holders, the adjacent telegraph offices (Leningrad, Saratov, and others) had serious objections about our delayed confirmation of the hourly totals. However as soon as we began to use the journal, recording each series of ten telegrams, this facilitated our arriving at totals considerably, and there were no longer any complaints.

There is no need to dwell in detail on the advantages of this system, since these advantages are obvious to the monitoring service. Some workers, not directly employed at an operative station, assumed that once the perforated tape had been inserted in the slit of the telegram blank after the transmission of the telegram had been completed, and particularly after the entry had been made in the journal, that this phase of the operation was wasted. However, most of the telegraph operators felt that this method was the correct one.

We assume that this method will produce positive results at other telegraph offices.

In addition, we would mention that at the Kazan Telegraph Office, the blanks of transmitted telegrams are not bound but simply tied into bundles. This method is considerably simpler; in addition the twine does not have to be cut, but after the bundle has been turned over to a scrap-paper processing mill, the twine can be reused.

M.I. RAKHIMOV, Supervisor of the Kazan Telegraph Office

S O M E T H I N G   N E W

(From the Experience Gained in the Competition for the Title of "Brigade of Communist Labor.")

The date--7 October 1959--has become a memorable occasion in the life of the workers collective of the radio center. This is the date on which, at a general meeting of the local trade-union committee, attended by leading production workers, representatives of social organizations, and by representatives of the enterprise administration, the results of the competition among the various shifts competing for the right to bear the title of "Brigade of Communist Labor" were summarized.

Speakers at this committee meeting very properly evaluated the manner in which each of the four competing shifts completed their obligation. The work, the trainin, the behavior of each worker in a shift, and the success or failure of each competing collective were subjected to an unprecedented thoughtful, thorough, and complete discussion.

The committee decided against awarding the title to the first shift. It seemed that Comrade Sergeyeva, one of the workers on that shift, had quit her studies and the collective as a whole failed to take any measures to prevent this from happening. The team (brigade) thus bore the full responsibility for an action of an individual member of the collective, and they became acutely aware of their responsibility to raise the level of knowledge of all participants in the competition.

Likewise, the third shift failed to earn the title of "Brigade of Communist Labor" because a firm spirit of friendship had not yet developed in this collective.

The fact that the local committee meeting now discussed requirements which previously had been completely ignored, reflects a remarkable movement spreading throughout the entire country under the slogan "To Work, To Study, and To Live in the Communist Manner."

The local trade-union committee was completely justified and unanimously awarded the title of "Brigade of Communist Labor" to the shifts headed by the Communist Party members, Avvakum Kuz'mich Dubezhinskiy and Aleksandr Petrovich Yelistratov. These two shifts had on many previous occasions shown great production achievements in the socialist competition among the collectives of the radio center. The shift headed by Comrade Avvakum Kuz'mich Dubezhinskiy, once they heard of the nationwide movement of brigades of communist labor, was the first at the center to join this movement.

"Initially there were some doubts" said Avvakum Kuz'mich. "Most of the workers in the shift are older people. Would they be capable of competing for this high honor? After all, not only would it be necessary for them to work hard, but an individual's nature would have to undergo certain changes, and his relationships with other people and his mode of life would also be altered; a man becomes accustomed to the habits that he has acquired over many years. However, Vasili Ivanovich Litvinov, the senoir technician on our shift and one of the oldest workers at the radio center helped to dispel these doubts. He warmly supported the motion to join in the competition; thus at the beginning of February, at a general meeting of the workers of the shift the conditions for the socialist competition for the title of "Brigade of Communist Labor" were accepted."

The brigade headed by A. K. Dubezhinskiy is a small group whose members are qualified radiomen, and the majority of whom have extensive practical experience. Comrade Dubezhinskiy has been working for 25 years at various radio enterprises. He came up through the ranks, starting as an operator, and is now a shift engineer. He is recognized by the collective as a skilled teacher, as a painstaking trainer, and as a specialist imbued with

with the spirit of new ideas; he is continuously striving to develop the methods of organizing the servicing of radio communications facilities.

Senior technician Vasiliy Ivanivcch Litvinov is rightfully regarded as an outstanding specialist in his work. With a great fund of practical knowledge and rich experience at his command, he has done much to improve the work of the shift.

Zinaida Vladimirovna Nagibina, a member of the brigade, began work at the radio center some 15 years ago, after graduating the technical school. She is now the senior technician. She is familiar with the equipment and helps her comrades in becoming acquainted with its operation. Comrade Nagibina participates actively in the social life of the collective, and she is also a member of the local trade-union committee.

Tat'yana Maksimovna Popova, a member of the Communist Party, a worker on this shift, was a telephone operator many years ago. Through persistant study she familiarized herself with the complex radio engineering equipment and became one of the best technicians on the shift. Comrade Popova recently completed a course of specialized studies.

Valentina Kirillovna Nikulenko, a member of the Komsomol, has been employed at the radio center for 7 years.

She is quite familiar with the radio communications facilities, and she is taking correspondence courses at the technical communications school; in addition, she has been elected as a deputy to the village soviet.

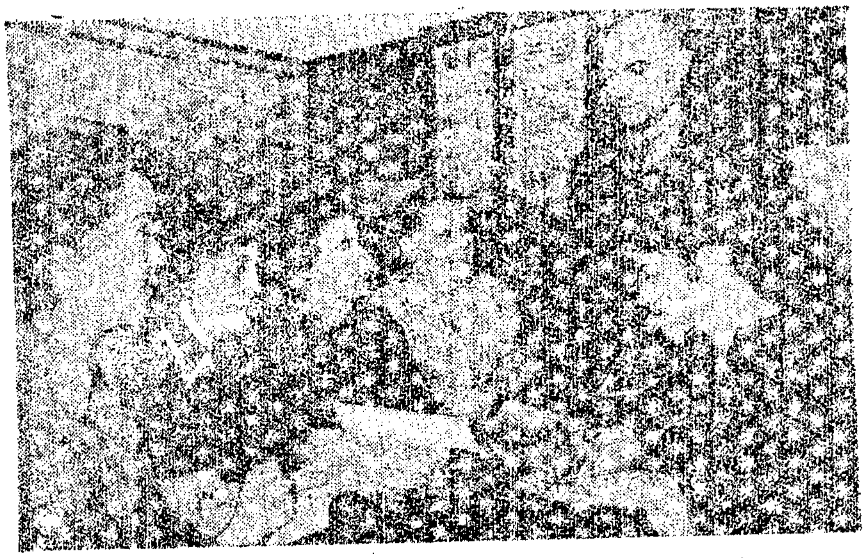
The youngest member of the brigade-- Vera Yefimovna Ivanova, a member of the Komsomol, came to the radio cente after she had graduated the Communications Polytechnicum. Over the past 2½ years she has mastered two jobs and is now learning a third. She is presently the assistant secretary of the Komsomol committee and is the trade union organizer of the shift.

Klavdiya Anadreyevna Fedotova, who replaced her daughter who had recently left to continue her studies, has been a conscientious worker.

The collective of the shift has persevered in its efforts to attain the honored "Brigade of Communist Labor." Over the past eight months, it has regularly fulfilled, and even overfulfilled, the increased obligation that it assumed. The planned work schedule for the second quarter, for example, was exceeded by 2.3%; the schedule of the third quarter was exceeded by 0.3%. An important index is the actual operating time factor (KI)---the actual operating time as a percentage of total time. During the second quarter, the KI factor was 100% relative to a standard of 98%, while in the third quarter--a period that encountered serious difficulties because of adverse broadcasting conditions--the KI factor was 99.3%.

During all of these months there was not a single instance of technical failure that could be attributed to the shift; nor was there a single instance of operational breakdown, despite the fact that it was often necessary to service simultaneously up to 6 auxiliary communications channels of various types. The labor productivity increased by better than 9% relative to the plan.

It was no accident that the operational characteristics of this collective improved. It was rather the fact that from the time that the shift decided to participate in the competition for the title of "Brigade of Communist Labor" a new spirit was in the air. The members of the shift headed by Comrade Dubezhinskiy, in striving to make effective use of each minute of work, began making ever increasing demands on themselves and concentrated exclusively on their work. They continued to familiarize themselves with new equipment, and they continued to put this new equipment into operation; moreover, they are introducing many organizational and operational suggestions that are designed to provide for better servicing of the equipment. They have come to regard the instructions covering proper operating techniques as an inviolate law.

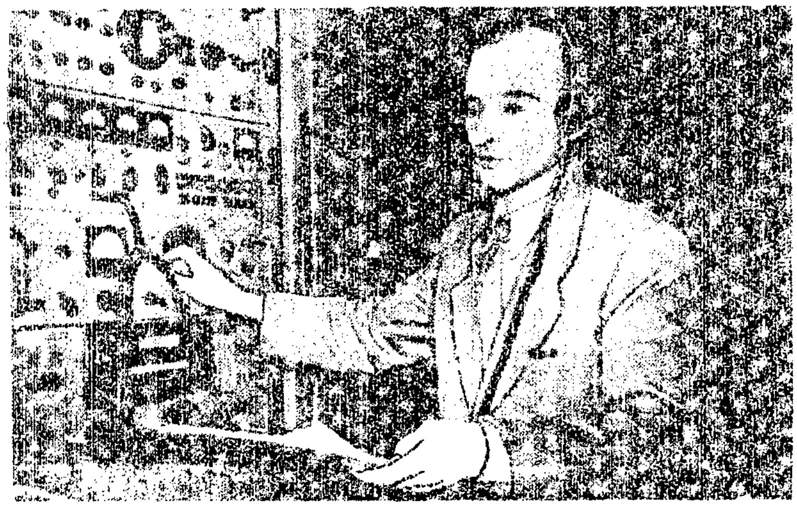


A. K. Dubezhinskiy, leader of the Brigade of Communist Labor, conducts a technical training course for members of the brigade; from left to right: V. Ye. Ivanova, Z. V. Nagibina, T. M. Popova, K. A. Fedotova, A. K. Dubezhinskiy, and V. K. Nikulenko.

According to the norms, the shift headed by Comrade Dubezhinskiy should have 9 people; at the present time, there are but 6. Nevertheless, the shift is successfully servicing a large number of radio links, and a great many stations in excess of the plan. This has been made possible because each member of the brigade has assumed both his own work and the work of his neighbor. And this is no simple matter: a new job involves new stations, new forms of communications, different transmission conditions and one has to work long and hard in order to learn all of the specific features.

Because they have learned to replace one another and to assist each other in a comradely fashion during hours of peak load, the members of the brigade have been successful in accomplishing any task that has been set before them. For example, should the shift be given an urgent assignment--for example, to open a new communications link--the entire staff will participate in this assignment: one person will prepare the receiving equipment, another will select the antennas, and if necessary, a third individual will replace a comrade at his normal job. A smooth operation of this sort makes it possible to install a new link and to put it into operation in short order. Excellent and friendly working relationships have been established with the workers at the radio office, and this cooperation contributes in many ways to the effective operation of the entire shift.

The brigade has assumed the responsibility to give practical assistance to workers on other shifts. Moreover they have put their promises into action. One of the brigade's best radio technicians, V. I. Litvinov, followed the example of Valentina Gaganova and voluntarily transferred to another shift in order to improve the caliber of its work.



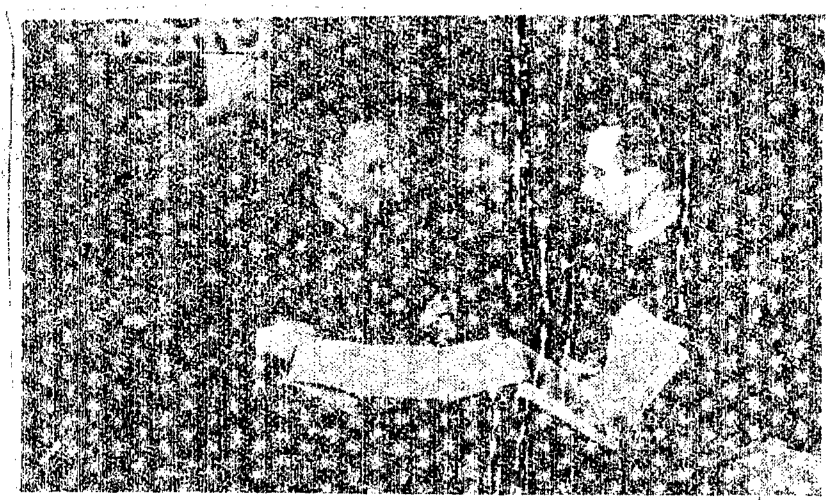
V. I. Litvinov, senior technician at the radio center is preparing the equipment for operations.

The members of the brigade began to devote greater attention to the job of increasing their knowledge. In addition to participating in the technical training course being offered at the radio center--in order to learn new techniques--the members of the brigade also attend additional courses that are conducted for the shift alone; these latter courses are designed to raise the technical competence of the shift. Each member of the team (brigade) has assumed the personal responsibility to prepare a detailed study, during each three month period, on a specific subject that is applicable to his particular job. This study is then presented to the collective of the shift in the form of a report. The foreman of the shift, Comrade

Dubezhinskiy, and the technical engineering personnel of the center are available to assist the workers of the shift in completing their assignments by consulting with them and offering them advice.

The achievements of the brigade are enhanced by their visits to neighboring radio enterprises, where they exchange useful information that has been gathered in practical experience. Thus, for example, at one of the radio centers that the members of the brigade visited, they found that the monitoring operation on a certain radio link was not to their liking. They therefore recommended certain of their own, more efficient, methods. At the same time, the brigade picked up a useful bit of information with respect to equipment repair at another radio enterprise.

The shift headed by Comrade Dubezhinskiy is a friendly, and compact collective; at the center this shift serves as an example to be followed by others, both in their in their work and in their home life. The members of the shift visit theaters, movies, museums, and exhibits together. They participate actively in such social affairs as the planning and programming activity at the village, and in assisting the collective farm (kolkhoz) that is sponsored by the center.



Before start of operations A. P. Yelistratov (at left), foreman of the Brigade of Communist Labor, is assigning work to A. M. Zhukov and A. D. Bobylev.

There are four people in the "Brigade of Communist Labor" headed by A. P. Yelistratov: A. P. Okonechnikov, senior technician, A. D. Bobylev, technician, A. M. Zhukova, supervisor, and P. G. Kamyshentseva, telephone operator. Just as n the case of the shift headed by Comrade Dubezhinskiy, this shift consists of a closely knot group of workers, each of whom is thoroughly acquainted with his trade, who systematically seeks to increase his own knowledge, and who improves working techniques. Each worker is prepared, at any instant, to come to the assistance of a comrade.

The shift headed by Comrade Yelistratov is known at the center for its "quiet" (dependable) work. Selfconfidence, based on thorough knowledge of the job at hand, can serve to explain the quiet atmosphere that prevails on this shift. Regardless of atmospheric conditions, and excellent knowledge of individual working places, particular features of communications facilities, equipment, and antennas will make it possible to find correct solutions promptly, and to set up and maintain communications with all stations.

And although basically there is no similarity between the individuals on these two shifts, much of what has been said about the shift headed by Comrade Dubezhinskiy applies to the shift headed by Conrade Yelistratov. But it is the fact that these two shifts at the enterprise, long before the remaining shifts, changed their attitute toward their work and toward their comrades; they showed their ernest desire, in each of each of their actions, to contribute to their own improvement, and to improve the actions of all people living in our communist society.

However, two brigades represent but the beginning of a remarkable movement. Other shifts and services at the enterprise sensed that at their center a new spirit has arisen and is beginning to develop; this feeling must be spread to the collective of the center in order that the entire enterprise should eventually be awared the honored title "Collective of Communist Labor".

A. V. Kiyashko

and

L. Ya. Yakovlev

TRAINING SCIENTIFIC SPECIALISTS TO MEET NEW PROBLEMS

The problem of training scientific specialists for scientific-research and training institutes in the field of communications, and for communications enterprises is presently of particular importance; the enterprises and organizations to which we refer are the production laboratories and Central Design Bureau (TsKB). This matter should be given the attention it deserves. The level of scientific work and the technical progress in communications facilities depends, in large measure, on the scientific specialists involved.

The June Plenary session of the CC CPSU instructed all of the branch scientific-research institutes and higher educational institutions, as well as all scientists, to regard as their most important task the further development of science and engineering in close contact with the practical aspects of the building of communism. The resolution of the Plenary session speaks of the necessity for scientists to work in friendly cooperation with the workers on the production line, to carry out new theoretical research in behalf of the national economy, to derive conclusion prepare recommendations, and do such research as would accelerate technical progress in all branches and segments of the national economy, thus contributing to the successful completion of the seven-year plan.

In order to complete the goals set by the Plenary session, we must, first of all, have an adequate backlog of well-trained scientific specialists. We have such specialists at our communications facilities; however, their number is totally inadequate. Moreover, too few scientific specialists are being trained to meet our curre requirements.

The USSR Ministry of Communications, at its session during this year, heard reports from all of the directors of scientific-research communications institutes. Each speaker pointed out that a number of important problems remained unresolved, specifically due to the lack of scientifically trained workers, and especially because of a shortage in candidates and doctors of technical sciences. The situation with respect to scientifically trained specialists at our educational institutions is practically the same. As a matter of fact, our production laboratories, the TsKB, and the planning institutes have almost no workers who hold scientific degrees.

For the most part, the scientific specialists for communications facilities, in our country, are trained at educational institutions; relatively few specialists are trained at scientific-research institutions. A check disclosed that the directors of the institutions are almost totally unconcerned with the problems associated with the training of scientific specialists; these problems are relegated to the deputy directors, who, in turn, devote very little attention to this problem. At the faculty meetings of the institutions, there is but a formal discussion of the work of a degree candidate (research worker), and there is no constant check on the work of these workers; in addition, the work of those individuals who are preparing their candidate and doctorial dissertations is totally unsupervised. Moreover, some scientists feel that no such supervision is necessary. Such a standpoint cannot, to any extent, encourage the writers of dissertations to complete their work as quickly as possible. Yet we see, even with the most modest of estimates, that our educational and scientific-research institutions for communications alone, require more than 200 candidates and better than 100 doctors of technical sciences. The following organizations are particularly poorly staffed with scientific specialists: The Kuybyshev and Tashkent Electrical Engineering Communications Institutes, the Kiev branch of the TsNIIS (Central Scientific-Research Institute of Communications) and the Kuybyshev branch of the NII (Scientific-Research Institute) of the USSR Ministry of Communications. The shortage of scientifically trained directors with advanced degrees--degrees of doctors of sciences-- is acutely felt at the TsNIIS (Central Scientifi Research Institute of Communications), NII (Scientific Research Institute), and NIITS (Scientific-Research Institute of Telephone and Telegraph Communications Facilities).

The unsatisfactory situation with respect to providing communications facilities with scientific specialists has made it necessary for the directors of scientific-research and educational institutions--where research work is being carried on--to plan for the maximum utilization of the entire science teaching staff in the program of registering graduate students and the training of scientific specialists.

A well organized and well thought out plan of admittance to graduate work is one of the most important prerequisites for obtaining highly qualified scientific specialists who know their field and are well versed in their specialties, who are capable of resolving new scientific and technical problems in a creative manner. A check has indicated that there are, in many instances, serious shortcomings in this respect. The admittance to graduate work is not widely published, but notices are sent only to enterprise supervisors, and these are not in the least interested in having their best specialists leave to study.

Department chairman and laboratory supervisors fail to stay in contact with the enterprises associated with their work, nor do they remain in contact with their outstanding students, who are now participating in scientific-research work during their studies. The job of selecting candidates for graduate work from among the enterprises is either completely neglected, or conducted in a desultory fashion. As a result, there is, as a rule, no competitive examination for admittance to graduate work.

The basic criteria in deciding whether or not to accept a student for degree work are the evaluations resulting from the admission test. However, the remaining qualifications of a new student, qualifications that have been developed by admissions commissions, are not considered adequately. Thus students who cannot work satisfactorily are admitted to degree candidacy and are subsequently dismissed without having had an oportunity to complete their graduate studies, or without preparing a defense of a dissertation. It is sufficient to note that during the past three years approximately 18% of all graduate students who were dismissed, were so dismissed without adequate cause.

The admission plan for graduate students was completed last year by all of the institutes with the exception of the LEIS (Leningrad Electrical Communications Institute). Moreover, in recent years, the MEIS (Moscow Electrical Communications Institute) and the LEIS had not met their plan.

In recent years, only 49% of the anticipated graduates have been able to complete their work or to defend their dissertations.

The departments and laboratories at which intensive scientific-research work is being conducted exhibit the most effective records of completing their graduating schedules. We have particular reference to the following organizations: MEIS--the departments headed by Professors B. P. Terent'yev, I. Ye. Goron and A. A. Kharkevich; LEIS --the department headed by Professor P. V. Shmakov; NII of the USSR Ministry of Communications--the department headed by Professor G. Z. Ayzenberg.

Graduate dissertations, for the most part, were devoted to the most important technical and economic problems confronting the entire field of communications, and the topics reflected the present level our science. Most of the dissertations dealt with the plans of the scientific research projects of the various departments and laboratories.

For the time being, the working conditions for the research workers at our scientific-research institutes are such that they are not conducive to rapid completion of one's dissertation. A graduate student is often distracted from his scientific work, or even worse, the subject matter of his dissertation is not included in the laboratory program until after he has completed his studies; therefore, he is forced to do work that is not relat to his chosen field. In one of our scientific-research communications institutes there are 59 former degree candidates, the majority of whom are no longer working on their dissertations, and it is doubtful that they will ever defend them. The directors of the NII attribute this situation primarily to the acceptance of such individuals to degree candidacy who have not yet developed their scientific interests and who have not had the require theoretical background for the preparation for a graduate dissertation.

An individual program and the selection of a topic for dissertation are extremely important in successful graduate work. In addition to indicating the scheduled degree tests, this program should also indicate accurately the topics and deadlines for the presentation of outline material, and should also indicate the basic literature pertinent to the study. However, a check has shown that graduate students work without a plan during their first year of study, and study only general subjects. This is a fault directly attributable to the science advisors of the graduate program. Some advisors believe that the program should not be formulated until the second year of study. On the other hand, others regard it as impossible to plan a graduate program for a three-year period. This standpoint is basically inaccurate. The graduate student is left to his own devices and without a goal.

The graduate students will find that they are greatly assisted in their studies if they will prepare abstracts on such scientific material as deals with the topic of their dissertation, if this material is fully discussed at scientific-technical conferences at laboratories and departments, and if these abstracts are published in sufficient time.

However, graduate students submit reports on completed portions of work and abstract presentations on an irregular basis. Many institutes do not observe the rules of graduate work that require the presentation of such reports by the students to the departments and laboratories at least twice a year. The NII of the USSR Ministry of Communications and the TsNIIS are the institutions that we have in mind here.

Where the science advisor program for graduate students has become unsatisfactory, annual scholastic reports have become a pure formality, and the advisors make such standard comments as "continuation of graduate work is indicated" etc.

As an example, we may cite excerpts from a report on one of the graduate students at the LEIS.

Comrade Ryabinin, a graduate student, will complete his work in June of 1960, He has spent two years in graduate work. During this time he passed only two tests, representing the minimum requirement for a candidate--historical and dielectrical materialism, and a foreign language. Lecturer G. K. Serapin, the student's science advisor, writes in the report: "....the student has shown no substantial progress in his dissertation which requires a deeper understanding of many problems that bear directly on this work." The degree committee approved this report and allowed the student to continue his work. Some time later, Comrade Ryabinin, was dismissed from graduate work for failure to keep up with his studies.

The above example clearly shows--that certain graduate student advisors do not devote enough attention to the grading of their students.

The new rules on graduate work stress the responsibility of the science advisor, and they point out the responsibilities of the department head and the head of the institute in so far as their positions affect the training of the graduate student. At the same time, there is a clause in the rules which stipulates that a student may be considered to have completed his graduate work if he has submitted a report setting forth the results of his scientific efforts at a meeting of the Scientific Council and if this report has been approved; unfortunately, this clause has been misinterpreted by many science advisors. Thus at a conference that considered the result of graduate work done at the LEIS, some of the science advisors (Professors Comrades Zeytlyenok, Zelyakh, and others) stated that it was impossible, at the present time to prepare a national program for the graduation of post graduate students. This statement seems to imply a tendency to shirk responsibility in the training of graduate students.

it indicated a preference to follow the principle of "let the results be what they may."

The publication of scientific graduate work in departmental symposia and journals is being handled improperly. In particular, some six to twelve months may elapse before articles prepared by students are published in such journals as "Radiotekhnika" (Radio Engineering), "Elektrosvyaz'" (Electrical Communications), and "Vestuik Svyazi" (Herald of Communications).

Postgraduate training in correspondence schools is poorly organized, at the present time. In recent times, only two degree candidate-correspondence students have completed their course of study and defended their dissertations. The basic shortcoming in the work of correspondence degree candidates can be attributed to the plysical separation of these students from their institutes, departments, and science advisors. In the majority of cases, the correspondence degree candidate has no opportunity to coordinate the topic of his dissertation with the specific nature of his productive work; he has no base from which to conduct the experimental portion of his program, and he is extremely busy with his own production work.

We cannot overlook the training specialists that is accomplished through the degree candidate program. There are 25 to 50 degree candidates at each of our institutes who are workers at these institutes. In addition, many degree candidates from other enterprises and departments are attached to the LEIS and MEIS in order to prepare for examinations in the minimum requirement for a degree candidate and for purposes of working on their dissertation. Most of the degree candidates do not do any work once they have completed their minumum requirements. Most of the candidates find it very difficult to prepare and defend their dissertations because of an inadequate science background or because of a heavy schedule at their jobs.

A substantial percentage of the degree candidates at the NII of the USSR Ministry of Communications are laboritory supervisors and workers who have had experience in scientific-research work. However, during the past 10 years, only 1 candidate (Comrade Yampol'skiy) defended his degree dissertation. The situation is approximately the same at the TsNIIS.

Too few of our scientific workers are preparing their doctoral dissertations. The preparation of these dissertations at all of the institutes is taking place far too slowly, and the deadlines for defending such dissertations are rarely met. Although some doctoral dissertations are 60 to 70% complete, it is extremely difficult to release the authors of these dissertations-- as has been recommended by the NII Administration-- since these degree candidates are at the same time the leading scientific workers of the institute (laboratory supervisor group leaders). There is also considerable difficulty in including the preparation of doctoral dissertations in the laboratory program; moreover, it is very difficult to assign other workers at the institute to assist in the preparation of these doctoral dissertations.

We must admit, however, that the placement of graduates is proceeding in a satisfactory manner. The scientific-research institutes train scientific specialists to cover only their own needs. Educationsl institutes assign only 20% of their graduates to fill their own science teaching staffs, while the remaining graduates are directe to new educationsl institutes (NEIS--Novosibirsk Communications Electrical Engineering Institute; TEIS--Tashkent Communications Electrical Engineering Institute; KEIS-- Kuybyshev Communications Electrical Engineering Institute) and such numbers of students as are requested by the administrations of the NII of the USSR Ministry of Communications and the TsNIIS. In most cases, comments regarding these graduates are good. However, there are instances of inadequately trained graduates. There are instances when these people who have completed their degree candidacy refuse to accept the work assigned to them by the Ministry.

In view of the above we can come to the following conclusions with respect to the training of scientific specialists through the system of degree candidacy.

The degree candidacy program at the educational and scientific-research institutes under the USSR Ministry of Communications is training qualified scientific specialists who are capable of carrying out scientific-teaching and scientific-research assignments at the current level of scientific and technical development. If we take into consideration the scientific specialists that are needed at the educational institutes, at the NII, and at the communications enterprises, we will see that the continued development and organizational strengthening of the degree candidacy program is extremely important. The comments that we have received regarding the graduated students are for the most part positive; many of these students are currently working in responsible and leading scientific-pedagogical and management positions.

However, there are too few scientific specialists being released from the schools; as a matter of fact this number has been sharply reduced in the last two years. On 10 June 1957 instructions were issued with respect to the programing of the work of a degree candidate, the supervision of the completion of his individual plan, and his certification; however, these instructions have frequently been violated by the institutes. The degree candidacy admission program is publicized at all institutes only through the release of advertisements and radio announcements. No explanatory work is conducted on the production line and scientific institutions, among persons who have shown evidence of ability for creative work. Departments at educational institutes fail to maintain contact with their alumni, who have drawn attention to themselves by their scientific work during their studies at the institute. The authorities at the institutes do not grant any special privileges to the persons preparing candidate or doctoral dissertations.

The seven-year plan for the redesign and development of communications, radio broadcasting and television broadcasting facilities requires a substantial improvement in the training of scientific communications specialists both through regular and correspondence courses in graduate work and by attracting communications-production workers with creative abilities to scientific work and to the defense of candidate and doctoral dissertations.

V. N. Lebedev, USSR Deputy Minister of Communications

A HIGHER TECHNICAL EDUCATIONAL INSTITUTION (VTUZ)-ENTERPRISE

The resolutions of the June Plenary session of the CC CPSU indicate that our soviet scientists and educationa institutions are faced with one of the most important problems, namely, the further development of science and technology along creative lines; this development must procee in close contact with the building of communism. As an answer to this problem, our higher technical educational institutions must train highly qualified specialists, and these institutions must also serve as models of the best type of production facilities.

It was decided by the regional Novosibirsk Communications Administration and the Novosibirsk Electrical Engineering Institute of Communications (NEIS) came to the conclusion that in order to put into effect the resolutions of the June Plenary session of the CC CPSU, and in the light of the existing problems before the communications facilities with respect to improving the specialist training programs and raising the level of production standards, it would be necessary to reorganize the NEIS into a VTUZ-enterprise. The NEIS would thus be able to implement the law "on strengthening the ties between school and practice, and on the continuing development of national education in the USSR."

Strengthening the ties between school and actual practice in industry presupposes, first of all, an improvement in the educational process; moreover, the conduct of scientific-research work requires that the staff of the particular higher educational institution involved be thoroughly familiar with the production activity of related enterprises, and with the problems which these enterprises face. This may only be achieved through the direct participation of the professorial and teaching staff, and of the students, in the work of production, planning and scientific-research at enterprises and institutions, etc.

A VTUZ-enterprise creates conditions that contribute to raising the level of instruction, to a fundamental change in teaching methods, and to changes in the subject matter of lectures in different fields of specialization. This is extremely important: until the present time, the professorial and teaching staff, as well as the students, because of existing training conditions, have been voluntarily or otherwise excluded from the area of the productive activity of communications enterprises. The schools were unfamiliar with the needs and prevailing working condition at the enterprises, and the practices followed at these enterprises likewise did nothing to correct the situation. This situation existed partly because, under conditions of rapid technical development, it was impossible to provide modern equipment for laboratories (because of the scarcity and high cost of the latest types of equipment). However, this is not the only reason. It is also true that such equipment, once installed in a school laboratory, could no longer be used for its primary purpose, i.e., as production equipment. It was merely an aid to education.

By reorganizing the institute into a VTUZ-enterpris we will be able to train and retrain specialists with modern equipment, with the latest techniques, at modern enterprises, and in the latest methods for operating these enterprises. The VTUZ will open tremendous possibilities for the development of plans to cover the future expansion of communications facilities, and for determining the required specialization categories and number of specialists.

The NEIS, reorganized as a VTUZ-enterprise, will train highly qualified communications engineers; at the same time, the student body under the direction of the teaching staff will operate the existing communications facilities at the enterprises and sectors assigned to the institute by the Novosibirsk Regional Communications Administration. Industrial educational enterprises and services assigned to the institute for technical servicing, must be prepared to use the latest advances in communications techniques, including modern, progressive operating techniques.

It should be stressed that in establishing a VTUZ-enterprise, it is not our object to have all of the students working at the enterprises that are assigned to the institute. Some of the students at the institutes, of course, will work in other enterprises in the city, as wel as in the scientific-research laboratories of the NEIS. The main task before the teachers and the students of the institute, together with the engineer-technical staff of the Regional Communications Administration, is a thorough and effective study of the most pressing problems relating to the operation of the enterprises attached to the Institute; in particular, they should develop new and progressive methods of labor organization, they must improve the organizational structure of the enterprises, and they must work on setting up model enterprises. A VTUZ-enterprise must become a modern technological laboratory, a point where the facilities and organization of production can be tested, and where the latest and most productive techniques are used, i.e., where the automation of production processes is widespread.

It is expected that the reorganization of the NEIS into a VTUZ-enterprise will be accomplished in the following manner.

With the assistance of the regional administration and with its funds, during the first stage, an automatic telephone exchange (ATS) with a capacity of up to 1,000 numbers and a corresponding network of subscribers will be set up. This ATS will not be a laboratory installation, but will be an operating unit in the city's telephone system, serving the "October" district of the city. The operation of the ATS will be carried out according to existing rules and regulations; however, all of the employees at this exchange will be students of the institute. Working conditions, i.e., length of workday and workweek, salary scales for students and teachers, etc., will be set forth in additional regulations that will be prepared to cover the relationships between the regional Communications Administration and the NEIS. The institute has already started the construction of this automatic telephone exchange. In the future, the institute intends to service and operate the radio retransmission center of the "October" district following the same principles as for the operation of the telephone exchange.

The next stage in the conversion of the institute into a VTUZ-enterprise will be the organization of a regional Communications Branch Office attached to the institute; this office will have individual departments to service the "October" district of Novosibirsk. It is taken for granted that all positions in the newly created regional office, from chief to letter carrier and telegraph messenger, will be filled by students. Fifty 1-st year students are already at work in the branch communications departments of the "October" district.

At the same time, the workshops of the NEIS will set up a repair shop for television and radio receivers; they will also organize groups for the installation of master television antennas. Such a shop must operate on the principle of a typical laboratory, capable of the most complicated repair and maintenance work; the shop must work out standard rules, improve tuning methods, perfect monitoring and measuring equipment, and forward valid complaints to the manufacturing plants.

Thus in the final analysis the institute will provide the public and the enterprises of the "October" district of Novosibirsk with all communications facilities--post office, telegraph office, telephone exchange, wire broadcasting, and in addition, the institute will perform the function of a television studio. It is true that there are no long-line communications enterprises in the "October" district; nor are there any radio and television broadcasting facilities or railroad OPP's (Mail Delivery Departments) there are no district cable trunk lines, no subscriber teletypewriter service, etc. At the same time, it is quit essential that we encourage the schools and students to undertake creative work at such enterprises. With this in mind, the directors of the institute and the directors of the Regional Administration for Communications Facilities are now considering the organization of students into seperate work shifts and brigades for work at such enterprises. Thus conditions are created for combining studies with work at those operational enterprises which, due to their special position, must become model enterprises. Students will thus develop a sense of responsibility for the job assigned to them, they will acquire discipline, and will learn to think and work for themselves.

As a result of the above measures, the NEIS will have acquired the necessary training-production basis that will ensure a high level of training for the communications engineers and science teaching staffs; in addition, the NEI. will be able to do scientific-research work. The regiona Communications administration will have acquired a backlo of good technical the theoretical personnel and the October district of Novosibirsk will then be able to serve as an exemplary communications system--a system that will undoubtedly have a positive effect on raising the cultural and technical level of work for all communications workers in the city and region. The NEIS will, in addition, become the center for the dissemination of scientific and technical information.

The NEIS has developed its study programs on the basis of the newly formulated training programs that have been set up for the communications institutes. We know that for day-students at communications institutes, a year' production work at an enterprise has been ordered; during the first year, work will be combined with study, and after the end of the fourth school year the students will spend an entire year at work.

The enterprises that are assigned to the NEIS by the regional Communications Administration should use first-year students as inspectors, telephone and telegraph operators, postal agents, etc., i.e., as general workers. Fifth-year students will work at these enterprises as engineers and technicians. Correspondence students, and students taking evening courses should be placed in administrative positions and in those sections where the frequent shift-ing of workers cannot be tolerated. Using the above-mentioned enterprises as a base of operations, the students of the intermediate classes could conduct study projects and scientific-technical research work, as well as carry out such laboratory assignments as may properly be undertaken with the existing operational instruments and equipment.

The theorecical studies will proceed along established educational lines and schedules, but instruction methods will be changed substantially for each study year. As general workers on the production line, followed (in their senoir year) with duties as engineers and technicians, students will acquire a very clear picture of the requirements and practical aspects of operating the enterprise. Special lectures in the school auditorium, therefore, will be restricted to the basic theoretical concepts; these concepts will be put into practice at the enterprises, in the course of actual operations. There will be a fundamental change as the student moves from undergraduate to graduate projects, since he will now have every opportunity to support his theoretical conclusions through practical experience.

The study process cannot be divorced from scientific research work. A VTUZ-enterprise provides particularly favorable conditions for useful scientific work. Even now, as we take the first steps in reorganizing the institute, the various departments have planned a series of scientific projects, the successful completion of which is ensured under the new conditions. The departments of the institute now have attached a total of nine scientific-research laboratories whose activity involves matters entering into the sphere of competence of the Ministry of Communications and other departments. A large number of students and instructors work in these laboratories. Under the conditions of a VTUZ-enterprise, scientific-research laboratories will train production personnel. Conditions favorable to an even closer link between science and actual production will have been created.

With the scientific-research laboratories of the NEIS as a base, the scientific-research department even now may be converted into a scientific-research institute. That such a step is expedient is confirmed by the fact that Novosibirsk is an important scientific and industrial center. In this city there is a radio industry, a series of scientific research institutes, and here we find the Siberian Department of the USSR Academy of Sciences. Combining production enterprises and scientific-research work into a VTUZ-enterprise will attract a broad cross-section of specialists and a large student body, thus making it pos-sible for the scientific work of the institute to be raised to a high level.

It is precisely by means of such a combination of scientific-research work and studies that the main objective of the measures being taken to reorganize the NEIS into a VTUZ-enterprise will be attained; we have reference here specifically to the training of highly qualified specialists who are burning with the patriotism of their native land and who have been raised in a spirit of productive labor based on Marxist-Leninist teachings; specialists who are thoroughly familiar with actual practice, and who are capable not only of utilizing modern communications facilities, but who are capable of creating new technique, --the technology of the future.

It is known that with technical progress, production processes, i.e., the technology of operation, change materially. Enterprise structure changes and, with it, the specialists that service these enterprises. It has recently come about therefore that when electric and radio communications facilities are combined, a new specialty arises, i.e., that of "regional communications office technician." Cable trunk lines--purely a wire plant--become cable radio-relay trunk lines as the development of a radio-relay line network proceeds. It is only natural that an entirely new specialization will be required for such combined trunklin Obviously a new specialty, that of "communications channels", will now appear.

Thus the structure of the communications facility will determine the type of specialist that is required; this will be the case even while the structure itself is dictated by the harmonious development of all branches of communications; and this, in the final analysis, can only be determined on the basis of the accomplishment of the general plan, and the meeting of the long-term development schedule for communications facilities. This plan, in its development, requires exact solutions for electric circuit and recommendations must be made with respect to the organization of the technical and general operation of the communication facility; recommendations must also be made with regard to the structure of communications enterprise Through these recommendations we will be able to determine the kind and number of specialists that we require. Undoubtedly the VTUZ-enterprise is capable of resolving this complicated problem. Several departments at the institution, together with the technical engineering personnel of the regional Communications Administration, are starting to work on an over-all plan for the development of communications facilities in Novosibirsk and in the region during the current seven-year plan and for the succeeding period. The achievement of this sizeable task will not, apparently completely resolve this specific practical problem. It will make possible the determination of the general princi ples for planning the further development of communication facilities, it will make possible the development of unif recommendations and methods for planning at communication facilities, and these methods will apply to any oblast, and to the republic as a whole.

What guarantee do we have that the VTUZ-enterprise can successfully work out a general plan for the development of communications facilities? In the initial stage, it is the large number of laboratory experiments that will be conducted during the year. Then there will be the original solutions of particular problems found in the course of undergraduate projects. This will be followed by the development of these solutions, with a certain amount of generalization, and with theoretical and economic justification, in a series of post-graduate projects And finally, during the last stage, there will be a summation of the obtained results, together with a solution of the important national economic problems in the field of communications; these will appear in the form of disserta tions by the instructors at the institute, who will be seeking scientific degrees as candidates and doctors of science. All of this work can be accomplished in two or three years provided that we combine the efforts of the three schools, 25 science departments, joint scientific-research laboratories, the hundreds of students working on their undergraduate or graduate projects and all those working on dissertations. It may be stated with confidence that, for the time being, not a single scientific-research or planning institute has such a large and powerful creative staff at its disposal. Participation in this work will be of enormous educational significance, since hundreds of young people, even during their school years, will be able to participate in the achievement of specific objectives in the building of communism.

Thus the institute, in close and friendly cooperation with the regional Communications Administration, will have to resolve this important problem--the establishment of a VTUZ enterprise and from here to train highly qualif... specialists of the type called for in the long-term plan for the development of communication facilities in our country. At the same time, problems of great national si nificance will be resolved in the light of the objectives set for the higher educational institutions by the 21-st

Congress of the CPSU and by the June Plenary session of the CC CPSU.

N. V. Naumov, Director of the NEIS

N. V. Strelkov, Director of the Novosibirsk Regional Communications Administration

V. G. Bosenko, Deputy Director of the NEIS

I. M. Musatov, Assistant Secretary of the NEIS Communist Party Bureau.

COMMUNICATIONS FACILITIES IN GEORGIA UNDER THE SEVEN-YEAR PLAN

Both the Party and the government are showing great concern about the development and improvement of communications, radio, and television facilities. This is evidence by the great tasks confronting the communications organizations under the seven-year plan with respect to providin the national economy and the population as a whole with first rate and uninterrupted communications facilities, and with respect to satisfying the cultural needs of the Soviet people.

In the current seven-year plan, the Georgian SSR will spend up to 250 million rubles--from all income sources --for the development of communications facilities. This exceeds by a considerable margin all capital investments by the republic for these purposes during the preceding seven years. The communications workers of Georgia are approaching the task of completing the goals of the seven-year plan with great energy and perseverance.

At the present time, many of the cities, especiall Tbilisi, Kutaisi, Batumi, and Sukhumi have not yet provide the conditions necessary to satisfy all the needs of the public, institutions, and enterprises subscribing to the city telephone network. Although the capacity of the city telephone exchanges has increased in recent years, and despite the fact that the city telephone networks have been redesigned and expanded, and further, despite the fact that relative to 1956 there has been an 11% increase in the number of subscribers in the city telephone network (GTS), including a 13% rise in Tbilisi, nevertheless, the city telephone communications network remains backward in comparison to the other segments of the communications industry. Therefore the most important job confronting the communications workers of the Republic is to find a basic solution to the problem of providing the public, the enterprises, and the institutions, with the required telephone communications facilities.

For this purpose, the seven-year plan has allocated considerable capital investments for the construction and development of city telephone exchanges and networks. Thus, for example, in Tbilisi, the capital of the Republic, the plan anticipates the construction of a new high-capacity ATS (automatic telephone exchange); simultaneously, these funds are to be used to expand and redesign the equipment and cable network of the old exchange. New automatic tele phone exchanges will be built in Kutaisi and Batumi with a capacity of up to 4,000 numbers; in Sukhumi and Rustavi new exchanges will be built to handle 3,000 numbers each; a 2,000-number station will be built in Gori, and 900-number stations will be built in Zestafoni, Poti, Samtredia, Tskhaltubo, Borzhomi; 500-number exchanges will be built in Kobuleti, Tskhakaya, Gurdzhaani, Chiature, Telavi, and Makharadze.

Thus the city telephone communications systems, through greater automatization, will develop and increase the total capacity of all exchanges to almost 60,000 numbers including 36,000 numbers for Tbilisi. This rate is considerable faster than any experienced during the preceding seven-year period.

We have also found that the development of the interurban telephone communications network does not satisfy the increasing needs of the public and of the nation economy of the Republic.

At present, only 45 cities and regional centers of the Republic have a direct 24-hour telephone service to Tbilisi. During the current seven-year plan, as a result of putting into effect a number of measures, direct 24-hou telephone service will be established with all the cities and regional centers of Georgia.

The plan anticipates the construction, in Tbilisi, of a new interurban telephone exchange, which will be provided with the latest equipment. This exchange will becom the center of the entire MTS (long-distance communications network) of Transcaucasia.

New high-frequency multiplexed circuits will be pu into operation on many communications routes of the terr-tory of the Republic. Telephone-telegraph communications facilities will begin to operate over the multichannel radio-relay line. All this will make it possible to provide high quality and uninterrupted telephone and telegraph communications services between Tbilisi and with all of the cities and regional centers of Georgia, and with the many cities and populated areas of the other Republics.

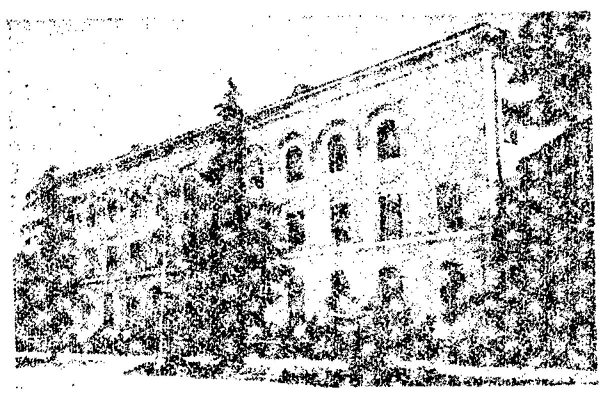
Much work will be concentrated on improving telegraph communications facilities. A semiautomatic telegrap retransmission center has been in operation in Tbilisi since 1955; a similar center has recently been establishe in Sukhumi. In the near future, semiautomatic retransmission centers will be established in Kutaisi and Batumi.

The plan calls for the further expansion of the subscriber teletypewriter network in order to link the central institutions of the city of Tbilisi with the enterprises and organizations of the Republic.

We will soon introduce the method of direct connections, and this will considerably increase labor productivity, improve the quality of processing and accelerate the transmission of telegrams, and in the final analysis, will produce the required economies. A facsimile service between the Tbilisi Central Telegraph Office and the cities of Sukhumi, Batumi, Kutaisi, resorts, and branch communications offices of Tbilisi will be established. In order to put these measures into effect the number of telephone and telegraph channels to many of the telegraph stations of the Republic will be substantially increased.

In recent times, particular attention has been devoted to the extension of telephone and radio broadcasting facilities to rural areas. At the present time, there are more than 1,700 collective farms in Georgia which have telephone facilities; 1,119 collective farms (kolkhozes) have radio facilities at their disposal; however, many of the kolkhozes are still without any telephone or radio facilities.

According to the plans of the Ministry of Communications of the Republic all collective farms will be provided with telephone service by the end of 1960. It is anticipated that many of these kolkhozes will be equipped with telephone intercom facilities. The extension of telephone facilities to rural areas, for the most part, will be accomplished by introducing automatic telephone exchanges and semiautomatic low-capacity installations. In particular, in the period from 1959 to 1965, 100-, 50-, and 20-number automatic telephone exchanges will be set up. To relieve existing telephone networks from the load of telephones connected in parallel, it is planned to rebuild over 600 km of poles and to string 10,000 km of wire along these lines.



The new building housing the ATS and MTS in Sukhumi.

This will make it possible to provide 24-hour service at all rural telephone exchanges, and to improve the quality of service to the public; moreover, favorable conditions will be created under which the Party and soviet organizations will be able to manage the production of the kolkhozes, and it will make it possible to provide an individual circuit, with the closest telephone exchange, for each kolkhoz which has telephone facilities at its disposal. Thus a great many communications workers, operating manual exchanges, will be released for work at other sectors.

During the seven-year plan, the facilities of the radio broadcast extension service will also be more widely developed. The extension of radio broadcast facilities to rural areas must reach a point at which every single family has a radio loudspeaker. It is anticipated that there will be, in Georgia, at least 625,000 such radio loudspeakers by the end of 1965. In order to meet this assignment new radio centers will be constructed, and the existing stations will be rebuilt.

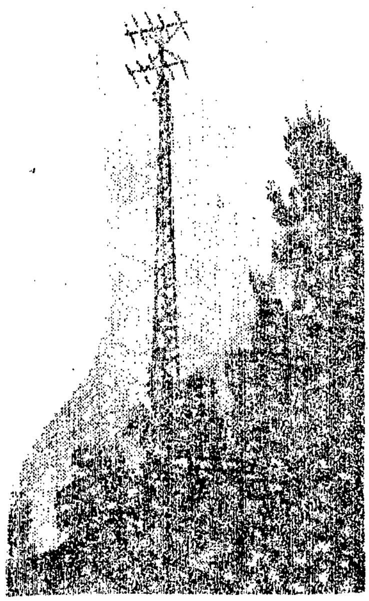
The plan further anticipates the installation of automatic and remote control equipment on the radio retransmission network. This will make it possible to improve considerably the operational characteristics of the operational technical facilities; in addition, it will also be possible to reduce operating expenses.

The largest communications operations--the post office--will undergo further development. Of the 9,500 of postal routes in the Georgian SSR, at the present time, the mail delivery facilities along 7,500 km of these routes are fully mechanized; as a result, all cities and regional centers as well as half the rural branch communications offices are capable of handling printed matter from the Republic centers on the day of issue. In order to transport and deliver mail and printed matter, we intend to use small cars, motorcycles, motorscooters, threewheeled bicycles, and other forms of transportation.

Many of the major communications enterprises anticipate mechanization. Stamping and registry of mail will be handled by machine, we will have bulk-mail packaging equipment, equipment for the loading and unloading of parcel post, and other production operations will also be mechanized. The construction of railroad post offices will be undertaken.

In the next few years, 50,00 cubic meters of space will be built to house operational centers and studios. The purpose of this construction is to provide space for large television studios and modern television equipment. As a result, we will be able to transmit a larger number of programs, and subsequently we will be able to convert to color television. In 1958 and 1959 there were 9 television retransmission stations in operation: in Gori, Staliniri, Telavi, Bolnisi, Gurdzhaani, Sukhumi, Dusheti, Leningori and Akhalitsikhe. In order to continue the expansion of the area covered by the television network, we will construct a radio relay line during the current seven-year plan, and television programs originating in Tbilisi will be carried throughout almost the entire territory of the Republic; in the near future, the people of Georgia in the cities and villages will be able to view programs from Moscow, Leningrad, and other cities of the Soviet Union.

Such are the great objectives before the communications workers of Georgia.



Receiving antenna for the retransmission station in Sukhumi.

The enormous creative enthusiasm with which the communications workers of Georgia, as well as the entire population, greeted the historic decisions of the 21-st Congress of the CPSU and the June Plenary session of the CC CPSU has brought about particularly favorable conditions for the further development and improvement of all communications, radio, and television broadcasting facilities. The communications workers of Georgia are filled with the determination to strive for the early completion of the tasks called for in the seven-year plan, and to achieve a real improvement in the general quality of their work.

G. A. Khristesashvili, Minister
of Communications,
Georgian SSR

FOR THE WORKING PEOPLE OF THE FERGANA VALLEY--A MODEL COMMUNICATIONS SYSTEM

The Fergana valley is one of the most important cotton-producing regions. In addition, industry is here highly developed. It is the honored goal of the communications workers of the Fergana Oblast (region) to provide the cotton workers and laborers of the cities and work villages with effecient and proper communications service

In recent years, there has been considerable development in the communications facilities of the Fergana Oblast. Telephone service is now available at all village soviets, technical repair stations, and all state (sovkhoz and collective (kolkhoz) farms. All the districts (rayons) in the region (oblast) are directly connected, through the interurban telephone network with Fergana--the regional center-- and many districts have two or three channels at their disposal. There has been a marked increase in the number of such channels between Fergana and Tashkent and other district centers; most of these communications links feature the use of efficient modern high-frequency multiplexingequipment.

Prior to 1954, there were only four TsB (common battery) telephone stations in the regional district centers; in 1958, there were 17.

Radio and television broadcasting facilities have been greatly developed in the cities and rural areas. The region now has 120,000 radio loudspeakers. Powerful radio centers are in operation in all cities, district centers, work villages, and on the state and collective farms. An important event in the cultural life of the workers of the region has been the introduction of two television retransmission stations in Fergana and Kokanda; these two stations transmit the programs of the Tashkent Television Center.

In 1958, a radio-relay communications link went into operation; this line provides Tashkent with 12 telephone communications channels.

At the regional telegraph office---in Fergana--an automatic processing center for through telegrams has been set up. Most district and city branch communications offices have had their Morse instruments replaced by ST-35 equipment.

Prior to 1954, the majority of the districts received mail, including newspapers, on an irregular basis, i.e., whenever transportation in a particular direction was available; at the present time, newspapers and mail are delivered to all districts daily, in special motor vehicles. Moreover, 95% of all post-office branch communications offices now receive mail by car on a regular basis.

The workers of the Kuva communications office have exhibited their valuable initiative in organizing the delivery of mail directly to all the collective farms (kolkhozes) of the Kuva district, and this delivery is being made in cars provided by the Ministry of Highway Transportation. By agreement between the district communications office and the collective farms, this delivery method is financed by the collective farms. Mail now reaches the collective farms much more rapidly and it costs less. This measure has released a number of people from the mail delivery operation; in addition, the transport facilities of the collective farms no longer have to be used for the delivery of mail.

Newly created state farms were very quickly provided with communications facilities. In order to improve sharply the services of the VRS (Intradistrict Telephone Communications Service) the plant of this facility was turned over to the administration of the line-servicing center. Line-servicing sections were set up in all districts. The deputy supervisors of the district communications offices were appointed supervisors of these sections.

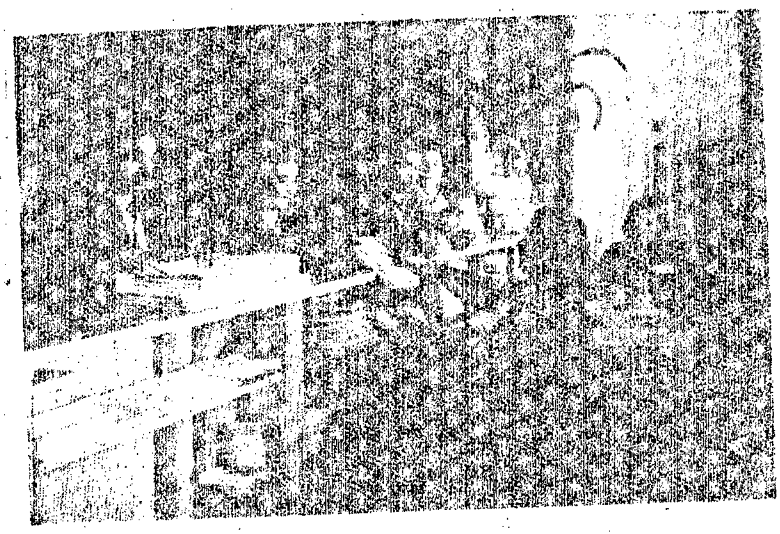
In order to provide for the uninterrupted functionin of these district line servicing sections (RLTU), the sections were provided with the necessary materials, tools and safety devices.

The closely knit and industrious collectives of the RLTU of the Bagdat district (supervisor, Comrade Tuzov of the Frunze district (supervisor, Comrade Kolosov), and of the Kuva district (supervisor, Comrade Tukhtasynov) carried out the plan for capital repairs and maintenance of the intradistrict communications network (VRS) lines in a timely and excellent manner. A tremendeous amount of work has been done in reinforcing telephone pole lines with reinforced concrete supports. Such supports are manufactured in the line servicing centers (LTU), and this will make it possible to reinforce all poles in the near future.

In order to improve the service to the public and to all organizations, new buildings for the district communications offices have been built in rural areas.

As a result of the measures undertaken in recent years, the volume of communications services has increased, so that for 1958 it was possible to fulfill and overfulfil the objectives called for in the plan. Because of an increase in income, nine communications offices and 38 depart-ments were upgraded.

Thirty percent of the income in excess of the plan was allocated for the construction of 5 apartment buildings with 2 apartments each. In addition, state credit was used to finance individual homes. As a result of the activity of the communications enterprises during 1958, 130,000 rubles have been allocated by the superviso of the enterprise to 8 district communications offices.



In the main office of the Frunze district communications office.

The production achievements of the communications workers became possible as a result of the tremendous assistance given by the local party committees and by the soviet organizations. The district and city executiv committees of the Councils of Deputies of Working Men, at their meetings and sessions, are devoting an increasin amount of time to a discussion of the work of communicati organizations. They subject the shortcomings in the work of communications enterprises to a businesslike critique, and make helpful and valuable suggestions for correcting these deficiencies. Only last year, at the suggestion of many district executive committees, 11 DT-20 and DT-24-type tractors were acquired for the district communications offices; these tractors were paid for out of local funds. These tractors were assigned to the district RLTU and are being effectively utilized for the construction of the intradistrict communications network (VRS), as well as for the transport of construction materials for offices and buildings that will house the branch communications offices. In addition, the majority of the district executive committees of the region provided the necessary funds for the purchase of 18 motorcycles with sidecars which were intended for mail delivery and for the use of the maintenance crews on the intradistrict communications network (VRS).

The number of good and technically literate communications workers in the region has increased in recent yea Through their honest efforts they are doing everything possible in order to provide efficient and uninterrupted service on communications facilities. Here we have reference to Yu. S. Sadykov, the supervisor of the Kuva Communications Office, P. Ya. Shakin, senior engineer of the Kokanda Communications Office, Ye. T. Prasol, telephone operator at the Fergana MTS (Interurbal Telephone Communications Network), A. I. Selivanov, inspector at the Kuybyshev Communications Office, A. T. Tursunov, inspecto at the Alta-Aryk Communications Office, G. A. Kosmynin, senior engineer of the Fergana Television Retransmission Station, and many others.

Among the communications workers collectives in the region there are many leaders of production, people who love their work. The working population of the region is particularly grateful to these communications leaders. The modest but important efforts of these individuals is covered in the local press. The following individuals are particularly worthy of this respect: A. L. Romanova, Z. P. Znamenskaya, U. T. Tashmatova, Ye. M. Chulkova and Z. Yu. Yusupova, the rural letter carriers, S. Kh. Khalidova, and M. T. Tairova, and others.

We are particularly proud of the fact that there has been in increase of specialists of local national origin. In 1955, there were 146 communications workers of local national origin, and last year there were 481; this came to 31.2% of the total number of communications workers, relative to 17.1% in 1955.

Last year, a program was initiated to provide for an exchange of experience between the various competing collectives of the communications offices, and between individual communications workers of our region and the Samarkand Oblast, and this program was carried out throug the mutual exchange of visits. The communications worker during such visits, not only exchanged valuable experience, but also assisted in the elimination of various shortcomings.

A meeting of engineer-technical communications workers was held; young communications specialists from our region participated at this meeting, and they invited the engineers and technicians of neighboring regions to the meeting. This meeting had a positive effect on the dissemination of the most advanced production experience.

In order to meet successfully the important objectives which confront our communications workers, the communications administration began to devote greater attention to the operations of district offices and communications enterprises. After the meetings of the council of the Communications Administration, in 1956, at which there was a free exchange of opinions, the solutions to a number of pressing problems in production were put into effect. This management device proved very effective. Members of the Council prepare material for discussion in accordance with the quarterly plans established for the work of the Council. These discussions are attended by the supervisors and workers of the district communications offices. This allows the office managers to improve the service to the public, to eliminate shortcomings in in enterprise operations more rapidly, etc.

Decisions that are arrived at on the basis of a free exchange of opinions among the members of the council are circulated to all communications offices and enterprises for action.

The intensive work effort of the communications workers of the Fergana Oblast has been properly evaluated by the Collegium of the USSR Ministry of Communications and the Central Committee of the Trade Union. On the basis of the results in the All-Union Socialist Competition for the third quarter of 1958, the collective of communications workers in the region was awarded the third prize; this collective received the transferable Red Banner of the USSR Ministry of Communications and the Central Committee of the Trade Union and the first prize for the fourth quarter of 1958 and for the first quarter of 1959.

It would be wrong, however, to assume that there are no shortcomings in the activities of the communications organizations of our region. Three communications offices --Alta-Aryk, Frunze, and Leningrad--last year, and also in the second quarter of this year, failed to meet their assignments under the plan, and failed to improve their operational characteristics.

There are also some operational shortcomings in the interurban telephone communications network. The facilities of the radio broadcasting extension service, of the VRS, and of the postal communications services leave much to be desired. These shortcomings are known to the communications workers collectives of the region, and the collective is working to eliminate them.

The communications workers are working persistently to put into effect the decisions of the 21-st Congress of the CPSU. The communications facilities of the Fergana Oblast will be developed and improved in the current seven-year plan. It is anticipated that there will be a five fold increase in the number of telephone instruments and the plan calls for the construction of a 4,000 number ATS in Fergana; further, it is anticipated that automatic telephone exchanges (ATS), with capacities of

1,500 numbers will be constructed in Kokanda, of 600 numbers in Margelana, and of 200-300 numbers in district centers. The number of interurban communications channels will increase by a factor of 2 as a result of the installation of multiplexing equipment for copper and steel circuits. This will make it possible to put into operation a direct system of city and district center links with Fergana--the regional center--and between Fergana and Tashkent.

A three story building is being built in Fergana in order to house an automatic telephone exchange with a capacity of 4,000 numbers, for an interurban telephone exchange with 120 channels, and for radio relay equipment.

After discussing the decisions of the 21-st Congress of the CPSU, the communications workers of the region undertook the responsibility to complete the seven-year program for the completion of the extension of telephone and radio service to rural areas ahead of schedule--in four to five years.

The plan anticipates the installation of three-program wire broadcasting facilities at the radio centers of the regional centers of Fergana and the city of Kokand. A wirephoto service will also be introduced. Postal communications will also continue to be developed. Mail will be carried from Tashkent, by air, to all districts of the region.

The work schedule is intensive, but realistic. The communications workers will succeed in meeting this schedule well before the anticipated completion date.

V. I. Bezrukov, Supervisor of the
Fergana Oblast Communications
Administration

INFORMATION

LEADERS IN THE SOCALIST COMPETITION

The Communications Workers, together with the entire Soviet people, have actively joined the competition commemorating the 42-nd anniversary of the Great October Socialist Revolution by assuming increased responsibilities.

During the past nine months of the current year, the USSR Ministry of Communications has exceeded, by 10%, their plan for an increase in the number of subscribers to the city telephone networks; the plan for the distribution of printed matter has been exceeded by 2.6%; the revenue plan for the interurban network has been exceeded by 0.7%, and the revenue plan of the radio extension service has been exceeded by 0.1%. However, on the whole the communications segment of the ecomony has produced only 99.4% returns in their revenue plans, including a figure of 98.9% for the third quarter.

Because the socialist competition among the collectives of the communications enterprise is in full swing, we have noted substantial improvements in most basic operational characteristics for the communications organizations during the third quarter of this year.

Following the newly formulated instructions issued by the USSR Ministry of Communications and the Central Committee of the Trade Union, the socialist competition will only be summarized at those communications enterprise and construction organizations that are directly under the administration of the national Ministry. As far as the competition in the various Republics is concerned, the results will summarized by the Communications Ministries of the various republics, and by the trade-union committ

28 collectives have been submitted to the branch administrations as candidates for first place in the competition during the third quarter of this year on the basis of the results of the socialist competition among the collectives of the communications enterprises and construction organizations directly under the administration of the USSR Ministry of Communications.

The Collegium of the USSR Ministry of Communications and the Presidium of the Central Committee of the Trade Union, after examining the results of the competition, recognized the following communications workers collectiv as the victors: the Central Telegraph Office of the USSR (supervisor, Comrade Guzovskiy, chairman of the local committee, Comrade Zakharov), and this collective receive the transferrable Red Banner of the Council of Ministers of the USSR and of the VTsSPS (All-Union Central Council of Trade Unions), and the collective was also awarded first prize. The collective at the Industrial Enterprise Administration of the USSR Ministry of Communications (supervisor, Comrade Gafanovich, chairman of the factory committee, Comrade Popov) and the SMU (Construction-Installation Administration) of the No. 305 "Radiostroy--Radio Construction" Trust (supervisor, Comrade Kuchukov, chairman of the local committee, Comrade Lashin) were awarded the transferrable Red Banners of the USSR Ministry of Communications and of the Central Committee of the Trade Union, and they also received first prizes.

Second prizes were awarded to the following communications workers collectives: the collective of the Moscow Mail Delivery Administration (administration supervisor, Comrade Stas', chairman of the city Trade Union committee, Comrade Churenkov); the collective of the Telephone-Telegraph Cable Trunkline Administration (administration supervisor, Comrade Turovskiy, chairman of the local committee, Comrade Zhukovskiy).

Third prizes were awarded to the communications workers collectives at the radio center of the Kuybyshev Radio Communications and Radio Broadcasting Administration (supervisor, Comrade Vasil'chenok, chairman of the local committee, Comrade Ionova); to the collective at the SMU No. 14 "Mezhgorsvyaz'stroy--State All-Union Trust for Building Structures of Interurban Wire Communications" Trust (supervisor, Comrade Al'tshuler, chairman of the local committee, Comrade Panin).

On the basis of the results obtained in the socialist competition in the various republics, the following collectives have been recognized as victors.

RSFSR

The collective of the Moscow City Radioretransmission Network (administration supervisor, Comrade Asoyan, chairman of the city trade-union committee, Comrade Churenkov), were awarded the transferrable Red Banners of the USSR Council of Ministers and of the VTsSPS, and they received a monetary first prize.

The collectives of the Leningrad City Telephone Network (supervisor, Comrade Lukichev, chairman of the regional trade-union committee, Comrade Basov) and of the Kursk Telegraph Office (supervisor, Comrade Karmadono chairman of the local committee, Comrade Kobyzeva), were awarded the transferrable Red Banners of the USSR Minist of Communications and the Central Committee of the Trade Union that they had held earlier and in addition they received first prizes.

The collectives of the Novosibirsk Interurban Telephone Exchange (supervisor, Comrade Semochkin, chairman of the local committee, Comrade Yakushkin) and of the Ryazan Television Retransmission Station (supervisor, Comrade Smirnov, chairman of the local committee, Comrade Sinitsyna) received the transferrable Red Banners of the USSR Ministry of Communications and of the Central Commit[illegible] of the Trade Union, and they were awarded first prizes also.

The collectives of communications workers in the Ivanovo Oblast (communications administration supervisor, Comrade Nefedov, chairman of the regional trade-union committee, Comrade Smirnov) of the Kuybyshev Post Office (supervisor, Comrade Mazhayev), chairman of the local committee, Comrade Teplyakov), of the Krasnodar SMUR (Construction-Installation District Administration) (supervisor, Comrade Zinger, chairman of the local committee, Comrade Kiozryakov), were awarded third prizes.

UKRAINIAN SSR

The collective of communications workers, Nikolayev oblast ,(communications administration supervisor, Comrade Ishin, chairman of the regional trade-union committee, Comrade Ben') was awared the transferrable Red Banner of the USSR Ministry of Communications and of the Centra[l] Committee of the Trade-Union, and they were awarded first prize.

The collective of the Kiev City Telephone Network (supervisor, Comrade Smarichevskiy, chairman of the regi[onal] trade-union committee, Comrade Kudryaevtseva) were award[ed] the transferrable Red Banner of the USSR Ministry of Communications and the Central Committee of the Trade Union, and they also received first prize.

The second prize was awarded to the collective of communications workers at the Kharkov Oblast (communication administration supervisor, Comrade Linnik, chairman of the regional trade union committee, Comrade Uss).

BELORUSSIAN SSR

The transferrable Red Banner of the USSR Ministry of Communications and of the Central Committee of the Trade Union was awarded to the Minsk Post Office (supervisor, Comrade Mel'nikov, chairman of the local committee, Comrade Guseva), and this collective also received first prize. The second prize was awarded to the Minsk Television Center (supervisor, Comrade Kashel', chairman of the local committee,Comrade Dubrovskiy).

KAZAKH SSR

The collective of the Dzhambul LTU (Line-Service

Center) (supervisor, Comrade Smakov, chairman of the local committee, Comrade Zozulya) received the transferrable Red Banner of the USSR Ministry of Communications and of the Central Committee of the Trade Union, and they also received first prize; the collective of the Alma-Ata City Telephone Network (supervisor, Comrade Denesenko, chairman of the local committee, Comrade Vlasov) received second prize.

GEORGIAN SSR

The transferrable Red Banner of the USSR Ministry of Communications and of the Central Committee of the Trade Union and first prize were awarded to the Tbilisi Central Telegraph Office (supervisor, Comrade Edilashvili, chairman of the local committee, Comrade Davitashvili).

The transferrable Red Banner of the Georgian SSR Ministry of Communications and of the Republic Trade-Union Committee and the first prize were awarded to the collective of workers at the Kutaisi City Communications Office (supervisor, Comrade Gagoshidze, chairman of the local committee, Comrade Chikhladze).

The second prize was awarded to the Kobuleti District Communications Office (supervisor, Comrade Kutateladze, chairman of the local committee, Comrade Seperteladze).

MOLDAVIAN SSR

The transport Communications Office (supervisor, Comrade Krivoshchekov, chairman of the local committee, Comrade Timanov) was awarded the Transferrable Red Banner of the Moldavian SSR Ministry of Communications and of th Republic Trade-Union Committee, and they also received the first prize.

LATVIAN SSR

The collective of the Rezensk ITU (supervisor, Comrade Pribochenok, chairman of the local committee, Comrade Baranov) received the transferrable Red Banner of the Latvian SSR Council of Ministers and of the Republic Trade-Union Council, and the collective also received the first prize.

The collective of communications workers at the Ri District (supervisor of the communications office, Comrade Starchikov, chairman of the local committee, Comrade Drozdova) received the transferrable Red Banner of the Latvian SSR Ministry of Communications and of the Republic Trade-Union Committee, and they also received first prize.

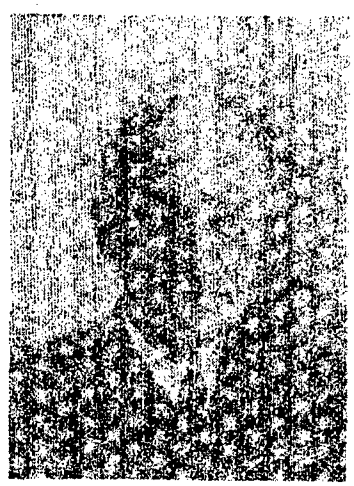
Second monetary prizes were awarded to the Riga OPP (Mail Delivery Department) (supervisor, Comrade Mutselan, Chairman of the local committee, Comrade Malyshevs), to the Bauska District Communications Office (supervisor, Comrade Krastyn', chairman of the local committee, Comrade Zupa), and to the Bauska Line-Servicing Section (supervisor, Comrade Vikse).

* * *

All Ministries of Communications and Trade Union Committees also noted the improvement of the operations of many communications workers collectives.

YEVGENIY VASIL'YEVICH KITAYEV*

On 27 November 1959, Professor Yevgeniy Vasil'yev Kitayev passed away; he was the chairman of the Telephone Department of the Moscow Electrotechnical Communications Institute, an honored scientist and technician of the RSFSR and a doctor of Technical Sciences.



Ye.V. Kitayev was born in St. Petersburg in 1883. Upon completion of the "Real Gymnasium," Yevgeniy Vasil'-yevich entered the St. Petersburg Electrotechnical Instit /now the Leningrad Electrotechnical Institute im. V.I. Ul'yanov (Lenin)/, in 1900, where he studied, while working as an installer; subsequently, he worked as a technician at the St. Petersburg City Telephone Network, and on the con-

*Translator's note: Deceased.

struction of the municipal trolley car system in St. Petersburg. After completing the Electrotechnical Institute, Ye.V. Kitayev took a position, in 1909, at the Kharkov District (Okrug) Post Office-Telegraph Office, as senior mechanic; subsequently he became the senior engineer at the Smolensk District Post Office-Telegraph Office. In 1920, Ye.V. Kitayev was chosen to become a professor at the Smolensk Polytechnic Institute. In 1922, he was transferred to Moscow as the director of the Technical Department of the National Commissariat of Postal and Telegraph Offices. From that time on, Yevgeniy Vasil'yevich worked continuously as a scientist and teacher at the Moscow Electrotechnical Communications Institute, until his final day.

In 1940, Ye.V. Kitayev was awarded the scholarly degree of Doctor of Technical Sciences. During his work at the Institute, Yevgeniy Vasil'yevich wrote more than 25 textbooks on electrical engineering and telephony, becoming well known both in the USSR and abroad.

Ye.V. Kitayev became a member of the technical councils of the USSR Ministry of Communications of the TsNIIS (Central Scientific-Research Communications Institute), of the Discussion Laboratories of the USSR Academy of Sciences, and he became the chairman of the communications section of the Academic Board of the Professional

Education Department of the State Committee of the USSR Council of Ministers, dealing with professional-technical education.

For his outstanding service in the field of science and technology, Ye.V. Kitayev was awarded the honored title of "Honored Scientist and Technician of the RSFSR"; for his many years of faultless work, Yevgeniy Vasil'yevich was awarded the "Order of Lenin."

The bright memory of Yevgeniy Vasil'yevich Kitayev an outstanding teacher and friend — will long be treasured in the hearts of all who knew him.

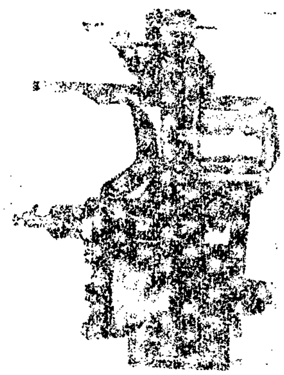
CREATIONS OF RADIO ANALYZERS AND INVENTORS

Mechanical Automatic Stop With Counter

V. N. Kulakov, Senior Technician at the Central Telegraph Office of the USSR, with the active participation of K. T. Timoshkin, an Engineer in the Industrial Laboratory of the Telegraph Office, have constructed a ball-bearing automatic stop, which has been selected for large-scale introduction into the telegraph enterprises of the Soviet Union, in the near future.

The automatic stop is distinguished by simple construction; it is reliable in service. The operating principle of the automatic stop relies upon switching an additional electromagnet into the line circuit by using a ball and a worm-gear. The electric motor of the telegraph device is switched off one minute after service to the instrument has ceased. A counter is mounted on the automatic stop, which computes the period for which the equipment operates.

Automatic stops to the design of Comrad Kulakov are being produced serially by industry.

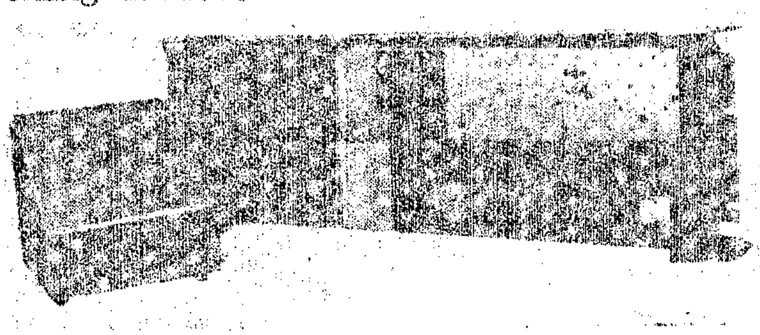


Switching Equipment

Owing to a light load, the high-frequency channels assigned to certain operating facsimile links are often idle.

In order to utilize such channels more completely, S. O. Mel'nik, an engineer at the Central Telegraph Office of the USSR, and E. I. Shishkin, an engineer at the Central Scientific Research Institute for Communications, have developed a special switching device. When there is no traffic over the facsimile links, the high-frequency channel is automatically switched with the aid of this equipment to the long-distance telephone exchange, and may be utilized for long-distance conversations. When a photo-telegram arrives over the facsimile link, and must be transmitted, the operator sends a call signal to the long-distance exchange, and at the end of the next conversation, the high-frequency channel is automatically switched to the facsimile equipment.

The apparatus consists of two ringing instruments and a switching device.

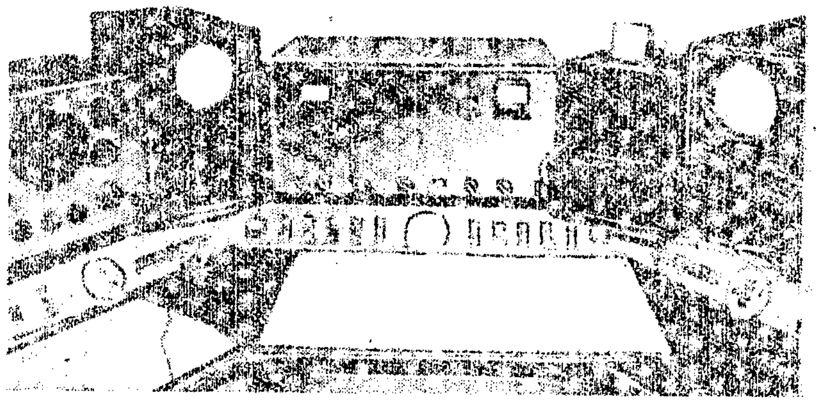


A Working Position for Monitoring the Frequency of Transmitters

At the "October" Transmitting Radio Center, a special operating position has been established for monitoring the frequency of the transmitters. The installation contains receiving equipment with band-spread tuning, an audio-frequency generator, 2 oscillographs, and a 10-kc crystal oscillator with pulse distortion.

Before the frequency of a transmitter is measured, the receiving equipment is calibrated, using a harmonic of the generator close to the frequency of the transmitt[er] to be checked. Where a frequency standard is available, the crystal oscillator may be synchronized with it.

With the equipment of the operating position, it is possible, using standard receiving equipment, to measure the frequency of transmitters with an accuracy completely adequate for service purposes.



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NEW LITERATURE ON PROBLEMS OF COMMUNICATION

Automatic Switching in General-Purpose Telegraph Circuits. Collection of Information. "Communications techniques abroad." Moscow, Svyaz'izdat, 1959, 120 pages. Price, 4 rubles.

The collection is devoted to questions of setting up national telegraph systems, and describes the automatic switching equipment used abroad for telegraph centers.

Az'yan, Yu. M., Berestovskiy, G. N., Kaptsov, L. N., Rzhevkin, K. S., and Senatorov, K. Ya. Semiconductor Triodes in Regenerative Circuits. Edited by Prof. V. V. Migulin. Moscow-Leningrad, Gosenergoizdat, 1959, 312 pages. Price, 10 rubles.

The monograph is devoted to an investigation of the physical processes in regenerative circuits using semiconductor triodes: generators of nearly harmonic oscillations, relaxation oscillators with transformer inverse feedback and reostat-capacitive inverse feedback. The book is intended for scientists and engineers interested in problems of application of semiconductor triodes, and for students in the senior classes.

Geiger, V. A. Magnetic Amplifier Circuits. Translated from English--D. A. Lipman and I. I. Ratgaus. General Editor, I. Ya. Lekhtman. Moscow-Leningrad, Gosenergoizdat, 1959, 400 pages. Price, 13 rubles 60 kopeks.

The authors consider systematically the circuit and operating-technical characteristics of all basic types of magnetic amplifiers and rectifying elements for these circuits. Many uses for magnetic amplifiers are described.

Zin'kovskiy, A. I. Traveling-Wave and Backward-Wave Tubes. Moscow-Leningrad, Gosenergoizdat, 1959, 32 pages. (Popular-Radio Library. Volume 331.) Price, 75 kopeks.

The author describes the physical bases for the operation of traveling-wave and backward-wave tubes, in which protracted interaction of an electromagnetic wave and an electron beam occurs. Information is given on the practical utilization of these tubes in radio equipment in the shf range.

Instructions for Manufacturing Reinforced-Concrete Poles and Supports Under Yard Conditions. Moscow-Svyaz'-izdat, 1959, 100 pages plus 3 inserts. (Ministry of Communications of the USSR. Main administration of long-distance telephone-telegraph communications. Central scientific institute for communications.) Price, 7 rubles 15 kopeks.

The book gives instructions for the manufacture, inspection, testing, transportation, and storage of reinforced-concrete poles and supports.

Instructions to Letter Carriers on the Delivery of Printed Matter and Correspondence in Cities. Moscow-Svyaz'izdat, 1959, 28 pages plus 1 insert. (Ministry of Communications of the USSR, Main postal administration.) Free.

The pamphlet gives the basic principles upon which the delivery of printed matter and correspondence is organized in cities, and considers the duties and responsibilities of letter carriers, as well as the arrangement of their work, and gives brief information on postal dispatches.

Karmazov, M. G., and Yefimov, N. S. Organizing and Planning a Local Telephone System. Moscow -Svyaz'izdat, 1959, 212 pages. Price 5 rubles 50 kopeks.

This book, intended as a textbook for communications schools, is designed to accompany the curriculum for the course, "Organization and Planning of a Telephone System for Engineering-Economic Faculties of Electrical Engineering Communications Institutes." In addition, it may serve as a textbook for students of the telephone-telegraph communications faculties, for studying questions of the organization and planning of a telephone system (urban telephone systems and interrayon telephone systems).

Pocket Handbook for Radio Amateurs and Short-Wave Listeners. Compiled by F. I. Burdeynyy and N. V. Kazanski: Moscow, Printing House of the All Union Voluntary Society for the Promotion of the Army, Aviation, and Navy, 1959, 64 pages. Price 1 ruble 20 kopeks.

The handbook gives the amateur bands, national and territorial letter designations, distribution of the call letters of amateur radio stations in the USSR, and sets forth various other information, required by short-wave and ultrashort wave listeners who follow amateur radio.

Kusov, M. E., Lakhtanov, V. G., Polunichev, N. R. and Luzgin, I. M. Printed Matter--for the Masses. (Experience in distributing printed matter in the Byelorussian SSR.) Moscow, Svyaz'izdat, 1959, 30 pages. (Exchange of progressive experience.) Price 40 kopeks.

The pamphlet describes the distribution of printe matter in the Byelorussian SSR by workers of the rayon bureaus and communications branches, kolkhoz post office public agents for the distribution of printed matter, as well as by news-stand attendants of the publishing union.

Traveling-Wave Tubes. A collection of translated articles. Edited by V. T. Ovcharov. Moscow-Leningrad, Gosenergoizdat, 1959, 152 pages. Price, 4 rubles 35 kopek

Translations of several American articles are published in this book, giving the results of theoretical and experimental studies of the non-linear properties of traveling-wave tubes. The collection is intended for scientific workers, engineering and technical personnel, and students at the technical institutes.

Luzgin, I. M., Transportation and Delivery of Mail Poles's . Rayons. Moscow, Svyaz'izdat, 1959, 15 pages. (Experience of progressive communications workers.) Price, 20 kopeks.

The pamphlet deals with experience in the transportation and delivery of mail in the Gomel Oblast in rural localities as carried out by the leading communications enterprises.

Malinin, R. M. Capacitors and Resistors. Moscow, Boyenizdat, 1959, 175 pages. Price, 4 rubles 30 kopeks.

The author considers the processes which take place in capacitors and resistors; he describes the most common, as well as the newest, types of capacitors and resistors used in the domestic radio industry.

Malov, N. N. Course in Electrical Engineering and Radio Engineering. Fifth edition, revised and expanded. Moscow, Fizmatgiz, 1959, 424 pages. Price, 9 rubles.

The book presents a course in electrical engineering and radio engineering. It is intended to be used as a textbook in the state universities and teacher-training institutes.

Pogorelko, P. A. New Forms of Long-Distance Communications. Moscow, "Soviet Radio" Press, 1959, 86 pages. Price, 2 rubles 25 kopeks.

This is a survey of several foreign studies, shedding light on questions of utilizing the reflection of radio waves from ionized meteor trains for long-distance communication purposes.

Sviridov, V. T. Radio-Relay Communications Lines. Moscow, Fizmatgiz, 1959, 80 pages. (Popular Science Library) Price, 1 ruble 25 kopeks.

A popular description of the installation, operating principles, and utilization of radio-relay communications lines.

Tikhonov, S. N. Fundamentals of Electrical-Radio Engineering. A textbook for courses for radio-technicians and radio-telegraphers. Publishing House of the Voluntary Society for the Army, Navy, and Aviation, 3rd edition, revised and expanded. Moscow, Boyenizdat, 1959, 455 pages Price, 8 rubles 40 kopeks.

The book acquaints the reader with the basic laws and physical phenomena considered in electrical engineering and radio engineering, and prepares him for the study of radio equipment.

Works of the Conference on SHF Electronics. Edited by I. S. Dzhigit and Ye. G. Solov'yev. Moscow-Leningrad, Gosenergoizdat, 1959, 272 pages plus 1 insert. (All Union Scientific Association for Radiophysics and Radio-Engineering of the Acad. Sci. USSR.) Price, 9 rubles 25 kopeks.

These are the published reports on the most pressing problems of SHF electronics, read before the Conference held in Moscow in 1957.

Phase Compensation of Television Transmitters. Collection of translations edited by Ya. I. Efrussi. Moscow, Foreign Literature Press, 1959, 115 pages. Price, 5 rubles 35 kopeks.

The collection includes translations of articles dealing with the properties and methods for design of phase-compensation circuits, as well as experience in their use in Belgian television transmitters and systems. The collection is intended for engineers engaged in the development, construction, and operation of television transmitters, and for students entered in courses and engaged in diploma projects in television technology.

Felistak, Yu. I. Simple Home-Made Radio Parts. Moscow-Leningrad, Gosenergoizdat, 1959, 128 pages. (Popular Radio Library. Volume 336.) Price, 3 rubles.

The book describes home-made radio parts for simple amateur constructions. The simplest calculations are carried out, and practical advice is given respecting fastening, adjusting, and auxiliary instruments.

Yakovlev, B. B. Portable Transistorized Amateur Receivers. Moscow-Leningrad, Gosenergoizdat, 1959, 32 pages. (Popular Radio Library. Volume 335.) Price, 75 kopeks.

The pamphlet describes four build-it-yourself transistorized portable radio receivers, and discusses their construction and methods of alignment.

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