JPRS L/10019

29 September 1981

Worldwide Report

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

(FOUO 14/81)

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APPROVED FOR RELEASE: 2007/02/09: CIA-RDP82-00850R000400050069-7

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CONTENTS

BRIEFS

'MTI,' 'ANA' BILATERAL AGREEMENT--Budapest, 29 Aug (PL)--The news agencies of Hungary, MTI, and of the People's Democratic Republic of Yemen, ANA, today signed an agreement for bilateral cooperation. The document was signed by ANA director general (Nageeb Mohammed Ibrahim) and MTI first deputy general Erno Lakatos following several days of talks and exchange of opinions. During his stay in Hungary the ANA director general met with Imre Gyori [as received; bureau files list Miklos Ovari], chairman of the agitation and political propaganda committee of the Hungarian Socialist Workers' Party; and with Robert Garai, Hungarian deputy minister of foreign affairs. [Text] [PA021345 Havana PRELA in Spanish 1935 GMT 29 Aug 81]

JAPAN, UK TELECOMMUNICATIONS TALKS--Tokyo, Sept. 17 (JIJI PRESS)--Japan and Britain Thursday agreed to hold regular meetings to explore ways of promoting cooperation in the field of telecommunications. The accord came when Posts and Telecommunications Minister Ichiro Yamanouchi conferred here with former British industry minister Keith Joseph, who was transferred to the post of education and science minister in Monday's reshuffle of the cabinet of Prime Minister Margaret Thatcher. They decided to call the first meeting in London in the middle of next year and continue to hold such sessions alternately in Tokyo and London to discuss telecommunications policies, technology and systems. It was also agreed that the governmental Nippon Telegraph and Telephone Public Corp. (NTT) and Kokusai Denshin Denwa Co. (KDD), Japan's international communications monopoly, will exchange views with British Telecommunications (BT) on technological development. [Text] [OW171545 Tokyo JIJI in English 1415 GMT 17 Sep 81]

CSO: 5500/2313

LIBYA

BRIEFS

CONTRACT FOR COASTAL LINE--The British company, Brush Power Equipment, a subsidiary of Hawker Siddeley Company, is going to provide telecommunications equipment to Libya for 4 million pounds sterling ($8 million). This equipment, according to the British company, is destined for the telecommunications line which is to be built along the Libyan coast over a distance of about 2,000 km. [Text] [Paris MARCHES TROPICAUX ET MEDITERRANEENS in French No 1864, 31 Jul 81 p 1990] [COPYRIGHT: Rene Moreux et Cie Paris 1981] 9516

CSO: 5500/4728

IVORY COAST

BRIEFS

'FRATERNITE MATIN'VIA FACSIMILE--At the conclusion of an insert on facsimile transmission/printing of newspapers within a special section "Telecom 1981," JEUNE AFRIQUE notes that "facsimile may soon be adopted in Africa by the Ivory Coast FRATERNITE MATIN as a way of printing its Bouake edition." [Editorial report] [Paris JEUNE AFRIQUE in French Nos. 1076-1077, 19 and 26 Aug 81 p 75] [COPYRIGHT: Jeune Afrique GRUPJIA 1981]

CSO: 5500/5070

USSR

UDC 621.395.74

DEVELOPMENTAL TRENDS OF MUNICIPAL TELEPHONE NETWORKS

Moscow ELEKTROSVYAZ' in Russian No 7, Jul 81 (manuscript received 29 Dec 80) pp 1-7

[Article by Yuriy Ivanovich Yemel'yanov, Deputy Director of the Main Administration for Telephone Networks of the USSR Ministry of Communications]

[Text] The deputy director of the Main Administration of Telephone Networks of the USSR Ministry of Communications, Yuriy Ivanovich Yemel'yanov, discusses the urgent problems confronting municipal telephone network specialists in light of the resolutions of the 26th CPSU Congress and which are related to a fast path of development, the necessity of improving the subsector profitability, a growth in labor productivity as well as the quality of service to clients.

Questions of centralization and automation of the servicing of GTS [municipal telephone network] equipment, the monitoring and control of the network, the implementation of signaling system No. 7, handling subscriber accounts and optimizing network planning are treated in other articles of this topical selection.

Our nation has well developed electrical communications networks: municipal, rural, intrazonal, long distance, international and institutional telephone networks; telegraph networks including facsimile communications and data transmission facilities; satellite communications, television and broadcasting systems as well as radio networks; a postal network which does not age and with the introduction of "electronic mail" will enjoy a second birth, as well as a widescale printed material dissemination network.

The telephone was and will remain for the foreseeable future the most popular, accessible and rapid means of communication by people over distances. The nation's populace, organizations, enterprises and institutions are interested in the expansion of local, especially municipal telephone service. This is responsible for the constant attention given to municipal telephone networks, which is manifest by party, management and planning organs.

The 1976 decree of the USSR Council of Ministers concerning the acceleration of the development of the nation's telephone service was a program document for the activity of all communications workers of municipal telephone networks. This decree became the basis for the resolution of many questions in the expansion of GTS's: the construction of ATS [automatic telephone exchange] buildings, the financing of the installation of the production process equipment, the development and introduction of new GTS hardware, the development of equipment for the time metering of the cost of local telephone conversations and its introduction on the networks, as well as the sale of telephones through the commercial network and a number of other questions.

The plan assignments for the development of the GTS in the 10th Five-Year Plan have been overfulfilled. Automatic telephone exchanges with an overall capacity amounting to about half of what was done over the preceding nine five-year plans have been placed in service; the installed capacity of crossbar ATS's has more than doubled, the number of telephones people have has almost doubled and the number of pay phones has increased by a factor of 1.3, something which is especially important given the rapid growth of residential construction. Simultaneously with the expansion of the network, work has gotten underway on its automation, which has reached 99.1 percent over these years.

The tasks of the 26th CPSU Congress of increasing the number of telephones by a factor of 1.3, including those installed for the populace by a factor of 1.4 times, require a significant increase in the volumes of planning, installation and construction, start-up and alignment work as well as the production and delivery of a large volume of GTS equipment.

The main tasks of the subsector remain: the mastery of new GTS equipment, boosting its operational efficiency, improving operation and improving the quality of service [1, 2].

Modern GTS's are complex technical engineering complexes, which include: civilian facilities (ATS buildings and junction centers); sanitary engineering facilities which provide for the requisite temperature and humidity conditions (air conditioners, refrigerators, ventilation equipment, etc.); ATS switching equipment and the switching equipment of junction centers; the equipment for intercenter and interexchange service, including physical and multiplex communications links and channels; line equipment shops with the transmission system equipment; alternating and direct current electrical power supplies; line and cable facilities, repair and restoration services and a number of auxiliary services.

At least three conditions must be met in order to support the operation of all of this complex equipment in interacting together and make good quality service available: reliable units and equipment; skilled servicing personnel with staffing in accordance with servicing norms; technical standards and instruction materials on the operation of the units and equipment.

New kinds of equipment, cables, instruments, etc. have arrived over the years of the 10th Five-Year Plan for municipal telephone networks. Primarily crossbar and ten-step ATS's are being used as the switching equipment on municipal telephone

networks. Crossbar and ten-step systems are used to build both the ATS's directly and the incoming, outgoing and long distance traffic centers, as well as the reference-information and special services centers.

The main switching equipment is an ATSK [crossbar automatic telephone exchange] of domestic design, which is produced by plants in the USSR, GDR and CSSR. During the years of the 10th Five-Year Plan, work was done to improve the ATSK equipment. In 1980, series production of the ATSK-U was started: an improved type of crossbar ATS.

The improvements involved approximately 65 percent of the ATSK equipment and new kinds of instruments and control panels appeared in the equipment complement, which were designed to improve the operation of telephone exchanges [3]. The modernization was expressed in the refinement of the subscriber set (AK), the coder equipment, the information transmitting and receiving devices, as well as check and test equipment, power supply circuitry and electronic equipment appeared in the equipment complement of exchanges. The improvements were directed towards increasing the reliability, reducing the requirements for production process areas and curtailing the installation and operational costs. On the whole, the space requirements of the automatic switch room of a 10,000 number ATS with seven-place numeration were reduced by 15 percent through the elimination of 50 subscriber set racks and 15 dial-pulse coder equipment racks.

The second major type of GTS switching equipment continues to be the ten-step system ATS's: the ATS-54A. The third type, which has appeared recently, is a crossbar of the ATS "Pentakonta-1000S" system, which is produced in Polish Peoples Republic under French license [4, 5] and which is adapted for operation on the municipal telephone networks of the USSR.

Moreover, there are ATS's of other systems in various amounts on municipal telephone networks: mechanical, different variants of ten-step and crossbar type ATSK-100/2000 (rural type) offices. Of course, it would be better to have the same type of equipment on the networks. This is more advantageous from the viewpoint of production, installation, operation, spare parts as well as personnel training. However, the pace of municipal telephone network development is such that there is not enough equipment of the same type and it is necessary to use different kinds.

The introduction of new switching systems will begin in the 11th Five-Year Plan on local networks. It will be necessary at the same time to introduce systems of different types: the quasi-electronic ATS's - "Kvarts" (municipal telephone network), "Kvant" and "Istok" (rural and possible municipal telephone exchanges), as well as the electronic offices - MT-25 and DKh-100 (municipal telephone exchanges). Primarily crossbar equipment (ATSK-U) will be used, as before, as the switching centers for municipal telephone networks, while ten-step equipment will be used in small amounts. Moreover, it is possible that other types of ATS's will appear on the networks in limited amounts, in particular, the crossbar KMK-20T (Finland), the mechanical-electronic ARE-11 (Yugoslavia) and other ATS's.

Such a motley picture creates considerable difficulties, in particular, in setting up the interaction of exchanges in a network, in providing them with spare parts

and in training personnel. A fixed condition for the introduction of imported ATS's is their adaptability to the existing network: it is necessary to retrofit an exchange, but not to supplement the existing network with too much equipment and to introduce supplemental intermediate equipment which encumbers it. It is obligatory that the strategy of bringing the indicated ATS's on line be changed, accomplishing this by means of creating regions of equipment of the same type.

Type MT-25 municipal electronic ATS's will be produced in the USSR under license of the "Tompson" company (France); DKh-100 exchanges should be delivered by the "Telefenno" company (Finland); quasi-electronic "Kvarts" ATS's are a development of the Leningrad "Krasnaya Zarya" scientific production association. The indicated ATS's are exchanges with control based on a recorded program. Either electronic or reed switch (quasi-electronic) matrices are used as the switching fields in them. Concentration switches (subexchanges) are provided as part of the ATS's, where these can be brought out at points remote from the reference ATS where there is a sharp demand for telephone. A savings in communications links and channels is achieved in this way. True, transmission system hardware appears on the indicated routes (line channel, terminal equipment), which requires servicing, even if a minimal amount, but the main thing is that rooms are needed for the concentration switches (subexchanges), electrical power supplies for them and the transmission system. This must be kept in mind when planning branch offices and in the overall engineering and economic substantiation for exchange construction.

The municipal telephone networks in our nation were among the first in the world which started to use circuit multiplexing. At the start of the 1960's, the KRR transmission system appeared on GTS's, which was modernized and introduced as the KRR-M. After that, KAMA equipment arrived at the network: a transistorized variant of the KRR-M. This analog equipment makes it possible to obtain 30 telephone channels via a physical pair in a high frequency MKSG cable.

In recent years, the widescale introduction of IKM-30 digital transmission systems [6] has started on interexchange links, where these systems use pulse-code modulation at a rate of 2.048 Mbit/sec, which makes it possible to set up 30 telephone channels via two pairs of conventional low frequency cable using at least one additional physical pair for remote signaling and monitoring.

The IKM-30 transmission system is an equipment complex which includes the matching devices and the line channel with the unattended repeater stations, spaced 1.2 to 1.7 km apart. And the system can be put in service only by providing for the complete delivery of both the main and the intermediate equipment.

The IKM-30 is electronic equipment which is technologically suited to manufacture; it is anticipated that in the near future it will be produced in rather large volumes, as a result of which, it will become possible to curtail the use of KAMA equipment which employs scarce trunk communications MKSG cable. THE IKM-30 equipment will find widescale applications on municipal telephone networks given the condition that it will be modernized and the plant will assure high quality of its manufacture.

The secondary IKM-120 system [7] has been designed around the IKM-30 for a zonal network. Following its testing under GTS conditions, it will possibly appear where high capacity bundles of junction lines are needed.

One of the important components of GTS's is the line and cable facilities. These include the following: the telephone ductwork, its inspection devices, commutators, cable and open wire lines (including, inter-office, inter-center, trunk and subscriber lines), cable pressurizing equipment, cable entrance houses as well as cable terminal and subscriber sets.

Telephone conduits have undergone slight changes with time: asbestos cement pipes are layed instead of concrete blocks, and the inspection devices have become large in volume. Polyethylene pipes have not as yet found widescale application on the networks.

The increase in the volume of inspection points is dictated both by the creation of more comfortable conditions for working in them and by the appearance of new types of cables with an increased bend radius: type TPP polyethylene jacketed cable and TSShp corrugated steel cable.

The major type of GTS trunk cables is TPP cable of various capacities of up to 1,200 pairs with a current conducting core having diameters of 0.4 and 0.5 mm. Recently, TPP type cable has appeared on the network, which has a core of 0.32 mm with the same pair capacity. Its deliveries amount up to 10 percent of the overall volume of cable deliveries and will increase in the future. The same TPP cable, but with up to 2,400 pairs, is undergoing trial operation and is being prepared for series production.

The lead jacketed TG cable, as before, remains the most reliable, i.e., is the least subject to faulting, but is used primarily for inter-center (MUS) and inter-office (MSS) communications. Type TPP cable is likewise finding application here where a backup route is available, which has been set up for TG cable. With the introduction of the IKM-30 transmission systems, TG cable has come to be widely used to multiplex the indicated systems. For MUS and MSS municipal telephone networks, type MKS high frequency cable is also used, which is run where it is necessary to set up channels based on the KAMA (or KRR-M) analog transmission system.

Imported cables are used in small amounts on the networks, and their parameters are either close or identical to the parameters of domestic cables.

Experimental fiber optic communications lines have been created on a number of GTS's. The introduction of factory models of optical cable is anticipated in the 11th Five-Year Plan, which as part of a complex with digital transmission systems will provide for the organization of high fidelity communications channels. It is necessary to determine those sections of the Unified Automatic Communications System based on a technical and economic analysis where it is most advantageous to use fiber optic communications systems, taking into account the cost of the lines, the multichannel capacity and the distance of the exchange spacings.

The pressurization of a cable is of great importance for preserving the cable, and consequently, for communications reliability; this is accomplished by type K[illegible]M compressor and signaling installations for 30 and 60 cable. A KDV-10 unit has been designed, which is intended for the connection of 100 cables. Its introduction will assist in reducing the technological areas required for the housing of compressor installations and provide a constant air pressure for a greater number of cables from a single installation.

It should be noted that with the overall considerable technical progress in municipal telephone networks, such important network components as the terminal units (distributing frames, boxes, and to a certain extent, distribution boxes) have remained practically the same as they were at the dawn of the development of communications: cumbersome, requiring a large metal consumption and with a traditional "screwed down" connection. The demand of the sector for the development of modern compact and highly reliable cable terminal devices has not yet been satisfied over a period of several years now.

The starting and terminal component of a municipal telephone network, just as for the entire Unified Automated Communications System, is the telephone set. In becoming the property of a subscriber, it has remained an important component of the telephone network, having an impact in many respects on the quality of service. For this reason, the observation of the regulations for its operation and good maintenance are important now as never before.

Various types of telephones are used in the terminal subscriber units, including sets produced by CEMA member nations. Telephones of an improved design and with better electrical acoustic parameters are being developed ("Gamma", "Gaysma", TAN-80, etc.). The ATM-69/2 pay telephone has been designed and a table-top pay phone is being developed.

Telephones with push button dialers, using both battery and frequency transmission methods, telephone accessories of various types ("Viza-32", "Trel'-1", "Trel-2", with built-in calculators, electronic clocks, timers, etc.), which are intended for automating number dialing and increasing the subscriber to equipment ratio in the institutional sector, will find widescale applications in the future.

As far as the civilian facilities of municipal telephone networks are concerned, they are built in accordance with standard project plans. The construction of ATS buildings of a municipal construction style with a large glass covered area has finally passed, something which has a negative impact on equipment operation. Modern standard ATS buildings (automatic switch rooms) have the minimum requisite illumination via narrow window openings.

The introduction of quasi-electronic and electronic switching systems on the network requires additional study of the design principles of municipal telephone networks. This question needs to be thoroughly worked through by scientific and planning organizations, but a general trend can be seen which has developed during the process of network expansion.

Following the ten-step ATS's, crossbar type ATS's begin to appear on the telephone networks, which had a number of advantages (a high speed multifrequency code, remote control of a connection, the existence of a pressure contact in the electrical circuit, etc.). In order to preserve them, crossbar ATS's were introduced so that an ATSK subscriber was connected to the subscriber of another ATSK through a purely "crossbar" telephone line, while the subscribers of ten-step ATS's were connected through a "ten-step" line. Only one transition is permitted when connecting a crossbar ATS subscriber to a ten-step subscriber: at the point where a transition is provided by means of supplemental equipment from one type of signaling to another.

Such a network construction is dictated by the design of the incoming and outgoing traffic centers of the different types: the ten-step and crossbar. Considering the fact that they are tied together and to the ATS's by different trunk groups of junction lines, it can be said that the crossbar ATS's were introduced and are being introduced by means of creating a parallel network ("segregated", "superimposed").

From the viewpoint of network design, the introduction of quasi-electronic ATS's should not cause any difficulties, since the signalling system and its capabilities are similar to the system of crossbar ATS's and the signal switching takes place in analog form, i.e., quasi-electronic ATS's can be inserted in the existing crossbar centers without additional equipment. A quasi-electronic center variant design is possible where crossbar ATS's can be tied into them. The governing factor here is a specific project plan and the requisite volumes of the various types of equipment.

Signal switching is accomplished in digital form in electronic ATS's. The conversion of the signal from analog to digital form is an expensive operation. It is necessary to make an effort to see that there is a minimum number of such transitions on a network, and even better, there is only one (similar to the situation with battery and frequency codes in the case of mechanical ATS). For this reason, the possibility of creating a "superimposed" electronic communications network is being examined, in which both the ATS's and the centers as well as the transmission system (a PCM system) operate with a signal in digital form and the transition to the analog network is made only once.

Considerable work has been done over the years of the 10th Five-Year Plan to improve the operational level of GTS facilities and improve the service quality. Electronic automatic number identification equipment, electronic pulse pairs, electronic dial-pulse registers and matching devices are being installed in municipal ATS's; new types of connector relays are being introduced (RSLP, RSLU-M and RSLI-G). The networks are being outfitted with new monitor and test equipment: the PRSL-2, AL, UNE, POV, PKU, PKNP-AON and others, as well as the INIR, IIV and PKP-4 and other meters. All of the indicated equipment and instruments have been designed for one purpose: to improve the operation and increase the labor productivity of servicing personnel.

A great of work has been done to improve the quality of service on AMTS--GTS----UATS [automatic long distance component exchanges--municipal telephone

exchanges--agency automatic telephone exchanges] sections. The fact is that by using long distance automation and in this case, occupying the expensive facilities of through-working centers and channels, a subscriber in some cases is not able to "break-through" to the subscribers of agency telephone exchanges because of the lack of junction lines on the section between the reference automatic telephone exchange and the agency ATS. Work has been organized to bring the number of junction lines into an agency ATS up to standards. However, not everywhere. There are objective reasons for this, for example, the lack of the requisite equipment on the part of departments. In this case, it is necessary to limit the capacity of the agency ATS which has an output to the municipal telephone network. But there are still networks whose workers have not realized the importance of the work to be done and it has not been organized as the situation requires.

There are so-called hard to dial numbers (in the case of long distance service) on some networks. In this case, the municipal networks are obligated to work with the subscribers and ascertain the necessity for installing additional telephones for them, which are to be used for incoming traffic. This will also promote an improvement in the quality of long distance service.

Very special attention is now being devoted to the area of toll order junction lines and the junction lines between automatic long distance exchanges and municipal telephone exchanges. It has remained practically without any good monitor and test equipment. The measures, which were planned in conjunction with the specialists of long distance telephone exchanges, local networks and designers, will make it possible to solve this problem in the immediate future. Quality control of the equipment being produced has been set up at the supply firms by specialists of the USSR Ministry of Communications. The analysis of exchange operation has been organized with the presentation of annual reports on equipment defects to the manufacturing plants and foriegn companies, for the purpose of improving production technology.

The existence of a complex set of equipment on a network requires a high degree of professionalism and a constant increase in skill levels. Courses have been set up on an annual basis for municipal telephone network workers: for the training of brigade workers of the adjusting brigades for ten-step system ATS's; for the study of crossbar ATS's, the "Pentokonta" system, automatic number identification equipment, new types of cables and their pressurization, new equipment on the line facilities of municipal telephone networks as well as new methods of operating them; for improving the skills of engineering and technical workers and engineers separately in production electrical measurements laboratories as well as the study of new equipment and improving the skills of directors and chief engineers of municipal telephone networks. Thus, by taking a break from production work, the skills of about 3,000 engineering and technical workers of municipal telephone networks are being improved annually.

Constant attention is being devoted to the study, dissemination and introduction of advanced methods of labor by means of publishing descriptions in journals, in express-information as well as publishing special placards and making films.

Individual advanced methods of labor for municipal telephone networks were discussed at a staff meeting of the USSR Ministry of Communications: the work experience of subscriber line shop brigades; cable worker and splicer brigades as well as the brigades for servicing pay telephones.

The brigade method of servicing the facilities of municipal networks has been introduced on an experimental basis in the Leningrad, Chelyabinsk, Kiev and a number of other municipal telephone networks.

Motion picture films are being made on the following topics: servicing pay telephones; checking the operation of pay telephones from monitor consoles (SKTA); servicing the IKM-30 equipment; cable facilities; and a cartoon "Take Care of the Pay Telephone". These films are sent out for motion picture release in each republic, oblast and kray center.

All-union conferences of municipal telephone network workers are held regularly once every three to four years to exchange experience with the operation of municipal telephone network facilities. The last conference was held in October of 1980 in Tashkent (see ELEKTROSVYAZ', 1981, No. 4).

Comprehensive communications quality control systems (KSUKS) are being introduced. To instruct the municipal telephone network workers in the introduction of KSUK's, a brochure has been prepared as well as procedural instructions on this problem [8].

The operational efficiency of municipal telephone networks depends in many respects on the operational organization of the entire complex municipal telephone network equipment. Designs are still encountered where operational questions are either given a secondary role or they are completely forgotten about. In this case, new equipment appears which has not been provided with monitor and test or specialized measurement equipment. And without it, or without it being implemented based on computers with program software, correct and proper operation is impossible, and consequently, a high service quality cannot be guaranteed.

It is planned that future ATS's will be equipped with diagnostic and faulty unit localization instruments, and the servicing of ATS's will practically consist of replacing the damaged functional modules, and their restoration (repair) will be accomplished at special repair centers, which are yet to be created, or if agreed upon, at the manufacturing plants. A consequence of this should be a sharp reduction in the staff of operating personnel in the automatic switch room, but it will also become necessary to have highly skilled specialists for the servicing of the SUVK's [expansion unknown], who possess the requisite amount of knowledge of mathematics, programming, electronics and communications. Work is underway now on the specialization of students in the final courses as well as the creation of a new specialty in the higher educational institutes and communications technical schools.

Until recently, the major method of operating the exchange facilities of the municipal telephone networks was preventive maintenance. The essence of the method consists in planned inspections and monitoring of equipment operability

and the elimination of the defects which were found. Naturally, with this technique, labor expenditures for operation are high. Given the conditions of a shortfall of labor resources and the necessity of improving the efficiency of telephone network operation, the question has come up concerning the implementation of new, more progressive servicing methods.

The first such attempt was the method of curtailed preventive maintenance. However, with a certain real reduction in labor expenditures, the danger of degradation of communications quality arose, since faults, especially in mechanical ATS's, will as before continue to occur, but they will not be detected and eliminated in an operationally timely manner.

The most promising servicing system is the monitor and correct method of operation (KKM) [9]. The essence of it consists, first of all, in setting norms for the communications quality indicators, i.e., establishing their threshold values, and secondly, having servicing personnel interfere in exchange operation only when these values are exceded.

A preparatory period should precede the transition to the monitor and correct method of servicing telephone exchanges and centers. This period is different in different networks and exchanges and is determined by the amount of time needed for the following: the performance of a complete one-time preventive check of the equipment; making those corrections which have not yet been made in the switching equipment itself as well as the monitor and test equipment for the purpose of expanding its diagnostic capabilities, and the remote fire alarm signaling devices in an exchange and checking their operability in a facility which is attended around the clock; and finally, to study the instructions on KKM and train specialists in working using the indicated technique.

An ever greater number of networks is operating every year using the monitor and correct method operation. It is true that its introduction is complicated by the lack of automated equipment to monitor the quality of the servicing (for example, to monitor the threshold values of failures to make connections). However, the method has been adopted for widescale implementation, since even in the case of manual monitoring of communications quality indicators (call servicing), a perceptible reduction is achieved in labor expenditures. Instructions have been worked out for the implemntation of KKM in servicing crossbar systems and the same instructions are being prepared for ten-step ATS's.

The widescale implementation of the monitor and correct method is opening up prospects for the centralization of network operation. If constant servicing of an exchange or center is not provided, the skilled operating personnel of several ATS's can be concentrated either at one of the ATS's or at a center, and since interference in the operation of an exchange will take place only in cases where the communications quality indicators fall below the threshold values, the number of servicing personnel can be significantly reduced.

Centralization of the staff of servicing personnel, equipping the staff with the technical hardware for observing communications quality, for data display

and intervening in ATS operation will make it possible to create highly organized technical operation centers (TsTE). Prior to the development and deliveries of the new technical hardware, the existing equipment must be used for the technical operation centers, as has been done on the Moscow, Leningrad, Tashkent municipal telephone networks, as well as a number of other networks, where technical operation centers are right now being created. An invariable condition for the introduction of technical operation centers should be the actual reduction of staffs; it is impermissible that in the rush to follow the style of the day (the utilization of computers, computer centers, etc.) instead of each installer which is eliminated it would be necessary to have to add a highly skilled engineer to the staff to service the computers and specialized complexes. The further development and refinement of the centralization of technical operations will be seen in the creation of automated control systems for municipal telephone networks.

Automated centralized operation should be the basis for the automated control system for municipal telephone networks (ASU-GTS), and become its major technological subsystem along with the other governmental plan subsystems.

The correct operational organization of municipal telephone network facilities depends in many respects on the implementation of instructions and production process schedules for operational servicing of all kinds of GTS facilities, which are being developed, published and sent out to the sites on a regular basis.

The listing of the main documents which the municipal telephone networks are obligated to utilize in municipal telephone network operation are: instructions and production process charts for servicing ten-step ATS's (of the ATS-47/54 type); instructions for the operation of municipal crossbar ATS's of the ATSK type (ATSK-U); for the set-up and operational acceptance of municipal type ATS's; for the installation and alignment of automatic number identification equipment; for the operation of automatic number identification equipment; for servicing electrical power supplies; for the construction of the line facilities of municipal telephone networks; for laying cable in permafrost regions; for installing type TPF, TPPZ and other cables; for the alignment and operation of KAMA equipment; temporary standards for the consumption of spare parts and materials for the current maintenance and repair of line and exchange facilities of municipal telephone networks; temporary instructions for the measurements and operation of IKM-30 equipment; the following olbigations apply to management: those for establishing data sheets for line facilities of municipal telephone networks; for the electrical measurements of line installations; for the design and corrosion protection of underground metal communications structures; written instructions for servicing compressor and signaling installations as well as an entire series of other management materials.

The communications ministries of the union republics and the production and engineering administrations for communications should get these documents to the network workers.

In conclusion, one can formulate certain problems which confront municipal telephone networks specialists during the 11th Five-Year Plan in light of the overall task of increasing production efficiency:

--The fastest possible mastery of new municipal telephone network equipment: its study, introduction and utilization at maximum possible capacity for the purpose of bringing the percentage of installed municipal telephone network capacity in service up to 92 to 93 percent, as well as accelerating the recovery of funds extended for construction;

--Selecting optimal, thoroughly worked out project plan solutions, which take into account future equipment; it could be that under conditions of large electronic ATS's (up to 50,000 - 60,000 numbers) using high capacity trunk groups of junction lines, optical cables and digital transmission systems, it will prove expedient to dispense with traditional junction center formation; this and other questions of the design of the networks of the future require serious engineering and economic substantiation work;

--The development of the network of junction lines to agency ATS's, something which will allow for not only high quality service with long distance automation, but also improve the quality of local service for enterprises and organizations having agency ATS's;

--Improving the operation of municipal telephone networks by means of further automating them while simultaneously or subsequently centralizing the networks; correctly utilizing the monitor and test equipment; all possible support of the initiatives of specialists for the design of new automation equipment;

--For the purpose of reducing the load on municipal telephone networks, install time metering equipment for the cost of local conversations, APUS, with a uniform system of rendering subscriber accounts.

The work of specialists and managers of municipal telephone network enterprises in the indicated directions will make it possible to improve the quality of telephone service for the populace and boost labor productivity in the subsector.

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USSR

INTERNATIONAL 'SVYAZ'-81' EXHIBITION

Moscow ELEKTROSVYAZ' in Russian No 7, Jul 81 pp 52-53

[Article in the "Information" section: "The International 'Communications 81' Exhibition"]

[Text] The International Specialized Exhibition "Communications Equipment and Systems - 'Svyaz'-81'" will take place in Moscow under the slogan "Communications Equipment in the Service of Man and Society" in the Sokol'niki Park of Culture and Relaxation. For the third time, our nation will make exhibition spaces available to the companies of more than 20 nations, which produce communications gear: such an exhibition was held for the first time in Moscow in 1975.

The Ministry of the Communications Equipment Industry designated the organization responsible for the preparation and conduct of the exhibit; the USSR Ministry of Communications is one of the major participants in the exhibition. Moreover, their number includes the Ministry of the Electronics Industry, the Ministry of the Radio Industry, Ministry of Instruments, Ministry of the Electrical Equipment Industry, the Central Committee of the Voluntary Society for Cooperation with the Armed Forces, the USSR Academy of Sciences and other ministries and departments. The exhibition is being organized with cooperation of the USSR Chamber of Commerce and Industry and the USSR Exhibition of National Economic Achievements.

The total exhibition display area will be more than 20,000 square meters.

The subject areas of the exhibition displays are: satellite communications; radio communications; terminal communications equipment; communications networks and channels, television and radio broadcasting; measurement equipment, including computers for communications network control; radioelectronic components and materials for communications equipment; postal communications; amateur radio; philately; scientific and engineering literature; home entertainment radioelectronics equipment.

The Soviet exhibit will occupy 6,000 square meters of pavilion floor space and 2,000 square meters of the open areas. Exhibitions of more than 3,000 designations will be displayed.

Equipment both for the overall state communications network of the nation and for various departmental networks will be demonstrated. The exhibits will make it possible to gain a rather clear-cut understanding of the work of Soviet scientists, engineers and workers, as well as to estimate the ever increasing importance of communications equipment in the life of society and trace its developmental trends, especially, the trends in the use of integrated circuits, lasers, computers and other achievements of science and engineering, as well as the increase in reliability and longevity of communications systems, the rise in the carrying capacity of communications channels, the speed of various switching devices, the reduction in electrical power consumption, etc.

The exposition should also reflect the contribution of domestic scientists to the development of worldwide communications engineering, for which it is planned that the materials of the Central Communications Museum imeni A.S. Popov and the Polytechnical Museum will be used.

Various forms of international cooperation and developmental efforts in conjunction with socialist nations in the field of switching equipment, radio communications, terminal equipment and acoustical equipment will be reflected.

Audio-visual demonstration slide shows, television monitors, etc. will be widely used in the exposition.

The Soviet exposition will open up with a section which will acquaint visitors to the exhibition with the development of communications technology in the Soviet Union. A panel will be presented which is devoted to cooperation within the framework of the "Intersputnik" system, as well as models of communications satellites and samples of the equipment being used. A panel is being prepared which reflects the network of transceiving stations in the "Orbita-2" satellite communications system; the receiving station of the "Moskva" satellite communications system will be demonstrated as well as the "Orbita-RV" equipment and the "Ekran-ChM" direct TV broadcasting complex.

A slide film is being prepared which is devoted to the nation's Unified Automated Communications Network.

Considerable space is being set aside in the exposition for television and radio broadcasting equipment. Communications gear designed and built for the purpose of broadcasting the events of the 22nd Olympic Games will be shown. Also intended for display are transceivers, studio equipment and monitor and measurment instruments. The following will be shown: an electronic video and audio TV signal switcher; the "Magnoliya" mobile color TV station; the PVS-4 mobile video recorder; the "ASL-Tsifra" set of equipment for cable color TV junction lines; the standardized unattended "Rutan-1" repeater; tolerance monitoring equipment; the FTU-A television motion picture equipment for recording black and white pictures; the "Parallaks-1" stereotelevision set; equipment for monitoring and measuring the parameters of TV channels, etc.

The largest section of the Soviet exhibit is "Terminal Equipment, Communications Channels and Networks". The main hardware with which the Unified Automated Communications Network is constructed will be shown here: the switching equipment - the

"Kvant" quasi-electronic telephone exchange; electronic equipment for subscriber number identification - the AON; units for testing quasi-electronic ATS's [automatic telephone exchanges]; analog and digital transmission systems - the K-3600, K-1920P, K-1020R, K-1020S, IKM-1920, IKM-480, IKM-120, IKM-30S, the "Zona-120", the "Elektronika-Svyaz'-11Ts" radio relay equipment, the "Elektronika-Svyaz'-2", etc.; the equipment of fiber optics communications lines for various purposes; a digital test set for locating faults and aligning the TSIKLON digital signal processing equipment; a technical operating center of a municipal telephone network for 300,000 to 500,000 numbers; equipment for the centralized monitoring of pay telephones on municipal networks; the "Otel'" equipment of the system for metering telephone conversations from hotels; the APUS time metering equipment for conversation costs; the ASV time service equipment; the D-AZU time multiplexed equipment with delta modulation for the subscriber lines of municipal telephone networks; the "Fonemofon" speech synthesizer; various telephone sets, including an electronic one; telephone concentrator switches; automatic dialing accessories; long distance pay telephones.

Telegraph and facsimile communications as well as data transmission equipment will be widely represented; the following are planned to be exhibited: the DUMKA duplex all-purpose multichannel channel generating set; the KIT pulse-code telegraphy set; various models; the OTsKST operator's work position of the terminal station of a traffic switching center; the PTTs-TsKS-100 telegraph circular transmission console; display type telegraph terminals; the RTA-80 five-element code, electronic automated telegraph page printer; the "Izotop" and TsFTA-Ts (digital) color facsimile sets; the "Interval" equipment for the automatic processing and correction of the quality of telegraph messages, etc.

The following equipment will be demonstrated: trunk and low level radio communications hardware; antennas; instrumentation complexes; monitoring meters for various purposes; electrical power supplies; generators and amplifiers; cable products.

A symposium will be held during the working period of the "Svyaz'-81" exhibition on urgent issues of communications development.

A special postage stamp and envelope are being prepared which are devoted to the exhibition and there will be a special cancellation for the stamp.

The "Svyaz'-81" international exhibition will certainly make abundant information available to specialists, enrich them with new technical ideas and also promote the strengthening of business contacts.

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END