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Worldwide Report

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

(FOUO 2/80)

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THAILAND

BRIEFS

SATELLITE TV EQUIPMENT--The Nippon Electric Company [NEC] of Tokyo on 17 October announced that it had received an order from the Bangkok Television Broadcasting Company (BBTV) of Thailand for satellite communications earth stations and television broadcasting equipment totaling 1.5 billion yen. The Thai Government plans to expand its television network nationwide using the communications satellite (Parapa), owned by the Indonesian Government, which orbits above the Indian Ocean. Thailand now has only four privately-owned TV stations in Bangkok which serve only Bangkok and its suburbs. The order includes 11 satellite communications earth stations for transmitting and receiving TV waves to and from the satellite (Parapa) and TV broadcasting equipment for nine stations including one at Chiang Mai. The earth stations and TV broadcasting equipment are scheduled to be delivered in September, next year. [OW250347 Tokyo MAINICHI SHIMBUN in Japanese 18 Oct 79 Morning Edition p 6]

CSO: 5500

USSR

REMOTE CONTROL OPERATION OF REDIFFUSION BROADCAST STATIONS

Moscow VESTNIK SVYAZI in Russian No 10, 1979 pp 26-28

[Article by M. L. Fel'dman, engineer at the Leningrad City Radio Relay Network: "An Equipment Complex for the Control and Management of Rediffusion Broadcast Stations: The Effect of Automation"]

[Text] A new complex for the direction and control of rediffusion broadcast (PV) stations has been in operation for the last few years at the Leningrad City Radio Relay Network (LGRS). To begin with, this apparatus was installed in the suburbs, which, despite the considerable remoteness of the network's equipment, allows for the absence of a permanent staff and insures a quality presentation of all three programs and the efficient direction and control of the net's operation in the suburbs.

As far back as 1971, engineers at the LGRS production laboratory suggested using the City Radio Relay Network's KRR-M (cable radio relay) high-frequency channel as a remote control/remote signaling (TU-TS) channel. Since the new apparatus for rediffusion broadcast utilizes the frequency compression principle, the application of the City Radio Relay Network's high-frequency channel has made possible the precise control of the status of any reference repeater station (OUS), even those considerably removed from the central rediffusion broadcast station (TsSPV). As a result, a completely automated rediffusion broadcast network with its own central repeater station (TsUS) has been constructed at the present time in the operating suburb. The central repeater station does not have permanent-duty personnel, since all control and direction is accomplished from the central rediffusion broadcast station. Apart from the utilization of the high-frequency channel in conjunction with the new equipment complex, we are also adopting a UMT-3 bridge amplifier on the remote control/remote signaling lines. With its help, for example, reference repeater stations are being directed and controlled in the farthest removed regions of new construction, where the length of the connecting line (SL) exceeds 30 km.

In building this equipment, workers at the Central Design Bureau of the USSR Ministry of Communication (its developers) took into account principles that were used earlier at the LGRS. For example, the changeover to a radial-node scheme using intermediate amplifiers; the control over threshold values for parameters of the distributing mains--feeder line direction and control (UKFL); the coupling of the automatic outdoor speaker engagement (AVUD) and UKFL systems; and the presence of a system for the automatic control of transformer substations (AKTP), etc.

The operational personnel at the LGRS are trying to realize all the virtues that are built into the complex of direction and control equipment. The information carrying capacity of the City Radio Relay Network has essentially been expanded, thanks to the adoption of both time and frequency compression. At present it is possible to transmit up to 30 commands and receive up to 30 reference repeater station status replies along a single connecting line. At the same time, it is possible to control the amplifiers, transmitters and the radio receiver at the reference repeater station on one remote control/remote signaling channel. The receiver can be connected to any amplifier channel or transmitter; the reserve audio line can be connected at a distance; the transformer substation can be switched from one reference repeater station to another, which previously was not possible. We simultaneously receive status replies on the amplifiers and transmitters at the reference repeater station, on the intruder alarm, the fire alarm signal response, the disengagement of the power-exchange mains, etc. However, under our conditions, the information-carrying capacity of the remote control/remote signaling system is still not exhausted.

The possibility of evaluating along a single connecting line the feedback control from both amplifiers of the reference repeater station and, as we have already put into practice, from the power-exchange mains allows us to increase the efficiency of service and the quality of the net's performance. It is also possible along this single line to evaluate the feedback control from the transmitters (with the aid of automatic comparators in the control and correction unit rack, the operation of which is very reliable).

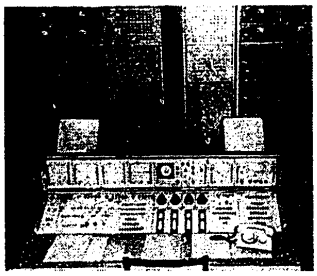
The operation of the TU-0.4 repeater amplifiers which go into the complex at the central rediffusion broadcast station insures the possibility of raising the quality and reliability of the equipment's operation with little loss of time and labor. These amplifiers, possessing considerable output power, also have very good electrical characteristics (a wide passband, a low coefficient of non-linear distortion and low levels of integral noise). They have simple construction and, consequently, great

ease of repair. The small number of electromechanical relays, on the whole, has increased the reliability of the automated equipment system.

A modernized TU-0.4x2M amplifier has been made to higher standards with high-quality assembly work. Its single drawback is the absence of an "input-output" comparator circuit, widely used at present in rediffusion broadcast equipment.

At the same time, operation of the complex of new rediffusion broadcast equipment has exposed certain of its shortcomings which lower its efficiency of operation. Our collective is constantly working to eliminate the errors in the equipment. For example, there had been no acoustic unit in the amplifier station control panel (PUUS) nor the technical requirements for it. For an amplifier we adopted the standard PS-ATS [further expansion not provided] amplifier, developed at the LGRS for program broadcast lines. Room for the amplifier was found inside the panel (+60V power supply), while the cores stand atop the upper panel. Everything, however, is still not done. The interference of the acoustic control circuits on the readings of the sampling pulse meter has not been eliminated. It would be desirable to provide for the remote engagement and disengagement of the TU-0.4 rebroadcast amplifier. Furthermore, power supply circuits for the rebroadcast amplifier's output relays are not separate. When one of them is damaged, there is a risk of losing the program at the output busbars. When measuring or tuning the remote control/remote signaling channel, provisions should be made for the continuous sending of commands or of a separate frequency through some reference repeater station.

At our enterprise we have developed and introduced a system for the TUS-K [further expansion not provided] rack by which, when there is a line emergency in the remote control/remote signaling system, the racks' common acoustic emergency signal goes off. This layout significantly speeds up locating the malfunction. We have equipped the panel with a cord and plug for observing the shape of the signal on the oscillograph panel. This is very convenient, since during the tuning and measuring processes one may effectively control the "filter entry" point of the TUS-K rack. We have also made an acoustic device to signal telephone calls from the reference repeater station's duty man on the reserve remote control/remote signaling line. When the TUS-K rack was installed, strong interference was noted in the racks' control circuits. After decoupling elements were installed in these circuits, the effect ceased. Such finishing work has allowed us to improve the TUS-K rack's service while at the same time increasing its operating efficiency.



Control and Correction Unit racks, TUS-K and Amplifier Station Control Panel installed at the Central Rediffusion Broadcast Station

The peculiarities, virtues and shortcomings of the output switching and control rack have been studied in detail. For example, when operating in the "local measurement" mode on the output switching and control rack, we noticed that the "emergency release" button did not work when the racks' common "program emergency" signal goes off. We managed to eliminate this shortcoming by introducing decoupling diodes in each of the BKK's (control and correction units). While connecting the second output switching and control rack we also exposed interference in the control circuits from the panel. The installation of decoupling elements in the control and direction circuits in both output switching and control racks has made it possible to remove this negative factor.

While operating the TUS-I rack we likewise improved certain circuits. For example, it turned out that the bypass mechanism possessed low reliablitiy. It required a detailed selection of 124 transistors in counter stages and a precise selection of the grid bias. In the LGRS production laboratory another simpler and more reliable bypass mechanism was suggested which is now successfully undergoing experimental operation. The TUS-I rack's switching mechanism possesses low interference immunity. As a result, there are frequent "dropouts" (especially at distant reference repeater stations) in the operation of the switches when transient impulse noise of significant amplitude (more than 30 B) appears. A partial way out of the situation was found--a matching of the dividers in the switching mechanisms' shapers. However, this is not always effective.

Some of the manufacturing plant's unfinished work was discovered in the process of servicing the apparatus. Inaccuracies in

the documentation and differences between the diagrams and the actual installation hamper the work. The equipment's execution is low-quality: all the racks we have received which make up the complex have required further adjustment. This is a consequence of the fact that the manufacturers do not tune each type of apparatus in the complex; only separate units and assemblies are subject to adjustment. At the LGRS, practice has shown that all shortcomings can be eliminated. However, this further improvement requires an additional outlay of labor and lowers the effectiveness of the new equipment. One wants to hope that the manufacturing enterprises will take the operational notes into consideration and will undertake measures that contribute to eliminating the defects.

At the present time, the experimental section of the central rediffusion broadcast station and more than 30 percent of the Leningrad city and suburb reference repeater stations are covered by the equipment in the complex. In summing up the experience accumulated at the LGRS in the process of operating the new equipment, one might say that its introduction contributes to raising the technical level of the network for all three programs and, in the end, contributes to improving the quality of the programs broadcast to the subscriber. The new system makes it possible to consolidate the equipment at the central rediffusion broadcast stations, and to move up to a new qualitative step in the operation of three-program rediffusion broadcasting in major cities. The positive experience of operating the station equipment will allow the LGRS in the future to actively introduce the new complex's equipment for the direction and control of rediffusion broadcast stations.
[8-9512]

9512
CSO: 5500

USSR

MULTIPLE SIGNAL TRANSMISSION ON 'ORBITA' SYSTEM

Moscow VESTNIK SVYAZI in Russian No 10, 1979 pp 32-33

[Article by E. Ya. Chekhovskiy, laboratory chief at the Scientific Research Institute of Broadcasting: "Compression Equipment for the Transmission of Newspaper-Column Images and Radio Broadcast Programs on the 'Orbita' System"]

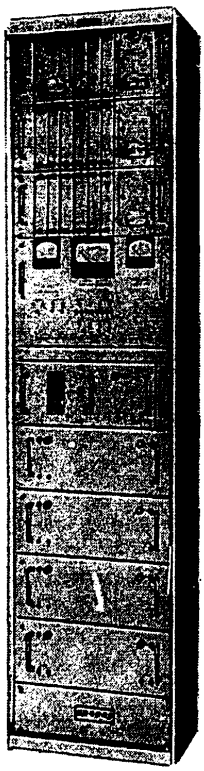
[Text] A broad network of land-based "Orbita" receiver stations has been created for the broadcast of Central Television programs by means of satellite communications. With the help of these stations, the television programs are transmitted with the necessary time shift to the distant and little-accessible regions of the Far North and the Far East. The network of "Orbita" stations is the basis also for the reception of other forms of information, in particular, newspaper-column phototelegraphy and radio broadcast programs.

The network of "Orbita" receiving stations encompasses the administrative centers where at present decentralized printing points for the central newspapers already exist or will be started up. In connection with this, the network of "Orbita" stations may also serve as the basis for the creation of a satellite system for the reception of the central newspapers.

No less pressing is the task of conveying radio broadcast programs.

It is already possible to utilize the existing systems for these ends. Owing to the fact that the traffic capacity of one radio broadcast program channel or a channel for the transmission of newspapers (by phototelegraphy) is many times smaller than the traffic capacity of a television (TV) channel, the channel may be packed with these types of information, that is, they may be transmitted along with television.

The main problem which is to be solved during development of equipment for the transmission of radio broadcasts and newspaper-column images together with television is the search for the best method of compressing the signals--best from the point of view of minimal noise from the additional signals in the television transmission. The possible methods of signal compression in a common transmission channel (N. V. Talyzin, L. Ya. Kantor, et al. "Transmission of Newspaper Columns on the 'Orbita' System," ELEKTOSVYAZ', No 5, 1969) are divided into two large groups--time and frequency compression methods. Frequency compression methods were chosen for the transmission of radio broadcasts and the central newspapers, since additional compression of the "Orbita" system's TV trunk by the time method is not possible.



Equipment rack for the transmission of central newspapers and one radio broadcast program along with television

In the output mode the TV signal spectrum occupies the frequency range from 50 Hz to 6 MHz; the newspaper image signal spectrum is from 312 kHz to 552 kHz; and the radio broadcast signal spectrum is from 50 Hz to 10 kHz. In order to consolidate such signals in a common broadcast channel, subcarrier frequencies were chosen which are frequency modulated by the radio broadcast and column image output signals and which carry them into a region of frequencies exceeding 6 MHz.

On the receiving side, this makes it possible to separate the television signal from the frequency modulated subcarrier signals of the radio broadcast and newspaper column channels with the aid of filters. The subcarrier frequencies are subsequently demodulated and, thus, the original radio broadcast and phototelegraphy signals are separated out.

The method indicated for combining the signals is the simplest in its technical realization and has still more advantages. For example, the combination of the signals is already taking place upon input to the satellite channel and, therefore, the transmission of radio broadcasts and newspaper images does not require the installation of separate transmitters and receivers. The apparatus for separating out the radio broadcasts and the newspaper columns is set up only at those stations at which the indicated signal is received. At the remaining network television stations it is not necessary to install additional equipment. This simplifies the organization of the radio broadcast channels and the transmission of newspaper columns, and makes it possible to build up the network of such channels as much as is necessary.

According to the given principle of TV channel compression, equipment for the transmission of the central newspapers and one channel of radio broadcast along with television has also been developed at present and produced commercially.

The apparatus is designed and built as one standard rack (fig 1).

The basic technical parameters of the radio broadcast transmission channel are the following: a transmitted frequency bandwidth of 50-10,000 Hz; frequency response ±1 dB; output signal immunity from psophometric interference >57 dB; nonlinear distortion <2%. The newspaper column transmission channel possesses such figures as: transmitted frequency bandwidth of 12-252 kHz; output channel frequency response <±1 dB; immunity of the output channel signal to integral noise >26 dB.

The equipment makes it possible to transmit within the television trunk of the satellite communication line one radio

broadcast program with performance figures that correspond to those required of a first-class channel along with the central newspapers, with the use of the "Gazeta-2" high-speed photo-telegraphy equipment. At the same time, the transmission of the additional types of information indicated leads to an increase in the television output channel noise level of approximately 1 dB. Other deterioration of the television transmission has not been observed.
[8-9512]

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INTERNATIONAL AFFAIRS

FRANCO-GERMAN TV BROADCAST GROUP CREATED

Paris AIR & COSMOS in French 1 Dec 79 p 40

[Article by Pierre Langereux: "Creation of a New Franco-German Industrial Group for Direct Satellite Telecasting"]

[Text] Messerschmitt-Bolkow-Blohm (MBB) and AEG-Telefunken of West Germany have joined forces with Thomson-CSF and Aerospatiale of France to form the "principal European industrial group" for construction of satellites for direct telecasting. This new group will undertake "the development and placing in operation of direct TV satellites," such construction having been authorized on 2 October by the French and German governments (cf. AIR & COSMOS No 781), and to "promote present and successor satellites on the international market."

This decision, which follows the "complete agreement in principle" reached last week by the four firms, was announced 26 November by Mr Philippe Giscard d'Estaing, associate director of Thomson-CSF and director of its international group.

This new group, which will be created within a very short time--the signing of the articles is scheduled to occur within 2 or 3 months--will take the form of a de facto German company, probably of the GIE (Economic Interest Group) type or its equivalent, according to Philippe Giscard d'Estaing.

"Business will be divided equally between the French and German firms throughout the whole project, except for the pre-operational satellites, in which the French firms will have a 46 percent share and the Germans a 54 percent share. Coordination of the sale of these pre-operational satellites will be managed by MBB in concert with Aerospatiale, and coordination of production costs by Thomson-CSF with AEG-Telefunken," according to the Thomson-CSF communique published for the occasion.

The make-up of the industrial group comes as no surprise (cf. AIR & COSMOS No 783). Nevertheless, we note that the choice of Aerospatiale has not yet been officially announced by the French services which conjointly examined the applications of Matra and Aerospatiale. But this announcement should be imminent, and was expected this week.

The detailed allocation of responsibilities for production of the first direct French (TDF 1) and German (TV-SAT) TV satellites has not been established, says Thomson-CSF, noting however that "the components and sub-systems will be developed in Germany and France in such a way as to permit maximum interchangeability and to demonstrate a unique coordinated conception."

But the activity of this new group, whose structure will not be in place until the beginning of 1980, will for the present be to work on the international markets, Thomson-CSF announced. To an extent this is already in progress, as certain members of the group have already made contact with potential foreign users--notably MBB in China and, with Aerospatiale, in the Scandinavian countries (Project "Nordsat"). The composition of the group is also subject to change and the possible integration of other industrial concerns, depending on the vagaries of the market.

Thomson-CSF considers that there is actually an important market for direct TV satellites, following recent studies of the French and German market. According to Philippe Giscard d'Estaing, the French share of the world market should run up to around Fr 17 billion over a 20-year period, this being one-third (36 percent, to be precise) of the global market (satellites, launchers, control stations, broadcasting stations). The principal competitors will obviously be U.S. and Japanese concerns.

For Thomson-CSF it is vital to get a share of this market, explained Philippe Giscard d'Estaing, because it is the sole means of reconverting a large part of its work force in the wireless beams and TV transmitter divisions, where employment prospects are threatened.

9516
CSO: 5500

FRANCE

FIRST 'AEROSOLAR' TV BROADCAST RELAY INAUGURATED

Paris AIR & COSMOS in French 1 Dec 79 p 40

[Article by Pierre Langereux: "Inauguration of France's First Aerosolar Relay"]

[Text] Telediffusion de France (TDF) inaugurated on 15 November 1979 its first air and solar powered television relay station, installed at Saint-Guilhem-le-Desert, near Montpellier (Herault).

This experimental station, which cost close to Fr 350,000, was financed jointly by TDF, the CEA (Atomic Energy Commission), and the director's office of the Department of Agriculture. The relay station will insure regional broadcast coverage, and will also permit TDF to study the (complex) functioning of a station powered by wind and solar generators, in order to extend their usage to other installations. The first relay powered by solar energy was installed in FRANCE in June 1978 at Peypin (Bouches-du-Rhone). But the first application of a solar generator to power a TV relay was in operation in 1977 at Tillabery in Niger (Africa), where since 1968 receiving stations powered by photocells had been providing educational TV programming for isolated villages. In the last 10 years, TDF points out, more than 1,500 photocell modules representing an installed power of 17 Kw (peak load) have been put in service in various installations.

The aerosolar station at Saint-Guilhem, installed on a protected site, supplies mW [expansion unknown] (under 20-22 volts): it is of sufficient size to function for 95 hours per week. In January, the least favorable month (2,760 Wh/m^2 (watt-hours per meter-squared) of sunshine as against 5,500 in July), the solar generator can furnish 7,200 Wh per week and the aerogenerator 9,000 Wh per week, whereas the station consumes 8,200 Wh per week. The RTC [expansion unknown] solar generator has a peak power of 600 watts and consists of 60 Type BPX 47A modules, each one having 34 silicon photocells 57 mm in diameter. It was installed by CGE-Alsthom on a structure inclined at a 65-degree angle and oriented toward the south. The Aerowatt wind-power generator, type 150 EP 7G, has a peak power of 120 watts and is situated at the top of a 9-meter pole. It is equipped with blades 2 meters in diameter with variable settings and a speed governor which enable it to function in winds anywhere from 3 to 60 meters per second. The assembly is coupled to CIPEL lead batteries of Hydra VS 200 type with a capacity of 1,050 Ah (ampere hours).