JPRS L/10300

3 February 1982

Worldwide Report

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

(FOUO 2/82)

FBIS FOREIGN BROADCAST INFORMATION SERVICE

APPROVED FOR RELEASE: 2007/02/09: CIA-RDP82-00850R000500030008-5

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

APPROVED FOR RELEASE: 2007/02/09: CIA-RDP82-00850R000500030008-5

JPRS L/10300

3 February 1982

WORLDWIDE REPORT

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

(FOUO 2/82)

CONTENTS

PAN-EUROPEAN SATELLITE BROADCASTING PLANNED

PM181607 London THE TIME in English 18 Jan 82 p 3

[Report by Kenneth Golsing: "European Satellite TV Trial To Start in Spring"]

[Text] The first Pan-European experiment to prepare for direct broadcasting by satellite is likely to begin this spring, when Britain, Austria, West Germany and Italy, will in turn present a week's programmes, the best of their output, on closed-circuit television.

An assessment of the experiment will follow; but experts believe that there is an extremely strong chance of success. Many difficulties have to be solved but a full service could be possible by the end of the decade.

Representatives of the four countries will meet in Geneva on Thursday and Friday to make arrangements. The first week of the experiment will probably be in the spring, the second in the summer and the others in the autumn and winter.

Five other countries are interested in providing programmes for the service: Holland, the Irish Republic, Portugal, Switzerland and Belgium (Flemish). Those interested in receiving the service are Malta, Tunisia, Spain, Algeria and Belgium (French).

The first of many conferences on broadcasting by satellite was held in Dublin five years ago. In 1980 European broadcasting union representatives met in Venice to discuss an offer from the European Space Agency of free use for television experiments of the two broadcasting channels planned for their L-SAT (large satellite) project.

The meeting resulted in the formation of a group of experts from the broadcasting organizations of Britain (Independent Broadcasting Authority/Independent Television Companies Association), France (TF1), Germany (ARD), Italy, Austria, Holland, Portugal and Sweden.

The L-SAT project is planned to begin in 1986. The British Government has announced that it will subscribe one-third of the cost (77m pounds); the other big partner is Italy, also one-third, and participants include Canada, Holland, Switzerland, Austria, Belgium, Spain and Denmark. This year's experiment will attempt to come to terms with such difficulties as copyright, and the provision of a multi-sound signal allowing viewers in different countries to tune to their own language.

CSO: 5500/2087

LDP PLANS TO LAUNCH 'SECURITY SATELLITE'

OW051131 Tokyo SANKEI SHIMBUN in Japanese 1 Jan 82 morning edition p 1

[Article by Saneyuki Kodachi]

[Excerpts] Now that the mounting international tension in connection with the Polish and other developments has made it necessary for Japan to build up its defense potential, the LDP, in cooperation with the Defense Agency's uniformed officers, has decided to begin working out plans from the outset of the new year to launch a Japanese security satellite.

The decision was born from the notion that Japan, whose national policy is to defend itself exclusively for the purpose of self-defense, must have a satellite to promptly monitor military developments in the far eastern region of the Soviet Union, a potential threat to Japan, by taking photographs and to have at its disposal the "rabbit's long ears" to monitor world developments without a moment's delay.

The LDP Security Affairs Research Council, headed by Chairman Asao Mihara, is soon to begin a study on the plan and in February, Taro Nakayama, former director general of the prime minister's office and chairman-designate of the LDP special committee on space development, is scheduled to visit Washington to feel out the United States about its cooperation.

If this plan materializes, Japan will become the third country to have a security satellite, after the United States and the Soviet Union, and hence it may create an international stir.

Presently, whenever Japan wants to know something about Soviet military developments such as the deployment of troops on the four northern islands, Japan asks the United States for information. However, as a Defense Agency official said, "The United States makes information available to us only when it thinks that doing so is all right; it seldom provides us with photographs."

A civilian official of the Defense Agency said, "Although no commitment has been made between Japan and the United States on providing information to each other, we believe that, in case of an emergency directly affecting Japan's security, the U.S. side will provide us with information." However, uniformed members of the agency believe that "now that the situation changes from moment to moment,

we cannot meet our objectives by only relying on the United States for information." Against this background, the talk of launching a Japanese security satellite has gained momentum.

In connection with these moves, Makoto Genda, chairman of the LDP Defense Affairs Council, is eager to promote the satellite launching plan in earnest. He said: "To possess a security satellite means to prevent war. With its science and technology, Japan can develop by itself both the satellite and the rocket necessary for its launching. This is a matter of political decision."

Asao Mihara, chairman of the Security Affairs Research Council, made it clear that his council should begin studying the plan immediately. He said: "Since other members of the research council have made similar recommendations and since I believe that this is an important idea, I would like to put the matter to a study, with the Foreign Ministry also participating in it."

Whether Japan should develop the security satellite domestically, ask the United States for technical cooperation or purchase the necessary rocket and even the satellite itself from the United States remains a question.

Regarding the rocket necessary for the launching, this requirement can be met by using the N-II type rocket used by the National Space Development Agency to launch the meteorological satellite "Himawari-II" to an altitude of 36,000 km last August. However, this rocket contains only 56 percent of domestically produced parts; the balance is either purchased from the United States or produced under a licensed production system.

As a result, it appears to be the quickest and simplest way to seek technical cooperation from the United States; this will also be a way of reducing Japan's trade surplus vis-a-vis the United States.

Former prime minister's office Director General Nakayama plans to visit the United States in mid-February and meet congressional leaders in the scientific, foreign relations and defense areas--including his friend, Don Fuqua, chairman of the House Science and Technology Committee--and officials of the National Aeronautics and Space Administration. He will try to find out what the U.S. side thinks about the plan and also seek the understanding of the U.S. side in the interpretation of the notes exchanged (in 1969) on cooperation between Japan and the United States in space development.

After seeing the U.S. reaction, the Defense Agency, the Science and Technology Agency and other pertinent government agencies will establish a committee for the study of the security satellite to formally start the necessary survey and research work. Thus, the LDP wants to make the security satellite one of the pillars of Japan's security in the period of the post-1981 mid-term defense estimate.

Stressing the significance of the satellite, Nakayama said: "The AWAC's which the Defense Agency purchases cost 12 billion yen a piece but a security satellite can be launched at a cost of 20 billion yen. So, it will lessen the defense burden of the nation. Besides, if and when Japan possesses a satellite, the Soviet Union will not easily carry out any rash actions."

CSO: 5500/2073

APPROVED FOR RELEASE: 2007/02/09: CIA-RDP82-00850R000500030008-5

FOREIGN MINISTRY CALLS FOR REVISION OF RADIO WAVES LAW

Tokyo NIHON KEIZAI SHIMBUN in Japanese 15 Dec 81 p 2

[Text] In the midst of a situation whereby the Polish situation is becoming tenser, the problem of revising Article 5 of the Radio Waves Law, which article prohibits the governments of foreign countries from establishing radio-telegraph stations within Japan, has come to the surface, once again. The reason for this is that after the issuance of a state-of-emergency declaration in Poland this time, communication with that area has been interrupted temporarily, because the Foreign Ministry was unable to install radio-telegraph equipment in the embassy in that country, from the standpoint of diplomatic mutualism. The sudden change in the Polish situation seems to have disclosed the problematical points in regard to overseas information-gathering networks of Japan.

In accordance with article 5 of the Radio Waves Law, no licenses concerning radio-telegraph stations will be granted to the "governments of foreign countries or representatives thereof" or the "corporations or organizations of foreign countries." Therefore, foreign embassies' requests for the establishment of radio-telegraph stations have so far been rejected, apart from the United States, special exception measures toward which are approved partly on the basis of the Japan-U.S. Security Treaty. At the same time, the Japanese side has also not installed radio-telegraph equipment in the embassies in other countries, from the viewpoint of the principles of mutualism.

The communications contact networks as to Poland were suspended due to the issuance of a state-of-emergency declaration in that country, and the Foreign Ministry was unable to contact the Japanese Embassy in Warsaw for about 9 hours. For this reason, the ministry says, "In order to provide against any unforeseen situation, it is necessary to revise the Radio Waves Law." Thus, it intends to work upon the Postal Services Ministry to revise the Radio Waves Law, from now. From the standpoint of radio-wave control, however, the Postal Services Ministry has even from before been expressing disapproval toward the proposed revision of the law. Therefore, it will probably take time to carry out coordination.

In this connection, a Foreign Ministry leader revealed on the afternoon of the 14th that the ministry communicates with the embassy in Poland as occasion demands, through third countries, though it is still impossible to establish telephone or telex contacts with the embassy.

CSO: 5500/4532

USE OF OPTIC FIBER IN TELECOMMUNICATION NETWORK UNDER STUDY

Tokyo NIKKEI ELECTRONICS in Japanese 9 Nov 81 pp 245-252

[Text] Abstract: The Telegraph and Telephone Public Corporation (TTPC) has begun investigation of the technical feasibility of introducing optic fiber to the subscriber system. It is conceivable that in the future, in addition to nontelephone services such as data, facsimile and captain, the subscriber system will be able to have other services such as ultra-high-speed data, ultra-high-speed facsimile, ITV, TV conference, image information, TV lecture, and TV telephone. Technological preparations have been started to meet these challenges. The first onsite experiment has been completed in the Yokosuka area in Kanagawa Prefecture. Moreover, as a link in the drive to popularize the information network system, a model experiment is soon to be carried out in the Musashino and Mitaka areas of the city of Tokyo. This experiment will be centered around digital communications technology, but optic fiber is expected to be involved also.

Investigation into the application of optic fiber communication to the subscriber line has begun. The Yokosuka Electric Communications Research Center of the TTPC has already completed the first onsite experiment. On the other hand, under the powerful leadership of Vice President Yasusada Kitahara, investigation of the information network system (INS) has also begun. A model experiment using optic fiber scheduled to begin in 1983 is to be carried out in the Musashino and Mitaka areas of the city of Tokyo. For this project and the construction cost of the fourth electric communications research center which is under consideration, the TTPC has decided to increase its 1982 investigation and research expenditures by 12 percent over the previous year, to 90 billion yen (approximate figure requested). This amounts to approximately 2.2 percent of the business income, exceeding the 2-percent level which is considered a standard for investigation and research expenditure.

Figure 1 shows those services that are expected to be introduced to the subscriber system in the future.[1] There are a number of nontelephone services having an information volume comparable to that of telephone service, such as data, facsimile, and captain. Moreover, broad band services in the range of 1-4 MHz such as ultra-high-speed data, ultra-high-speed facsimile, ITV [industrial TV], TV conference,

image information, TV lecture and TV telephone, or high grade TV service in the range of 3 MHz may also be contemplated.

Introduction of optic fiber has special significance for the economics of broad band transmission routes.[2] Furthermore, flexibility and expansibility are necessary in order to be able to cope with the movement of new services. For this purpose, investigation of wavelength-splitting multiplex bilateral transmission[3] has been carried out. It is highly desirable that the subscriber system be of a nonrelay type from the viewpoint of economy and maintainability. At present, the nationwide average distance of the subscriber lines is 2 km, with 95 percent of the lines less than 5 km in length. When nonrelay transmission distance can be extended to 5-7 km through the use of optic fiber, almost all subscribers will be able to be connected without relay.

An outline of the experiments carried out in the Yokosuka area is summarized in Table 1. The trial system can be divided roughly into four groups. The primary group transmission system is one in which the application of PBX multiplex office lines and high-speed data to the subscriber line is investigated. The broad band subscriber system is suitable for big subscribers such as business offices containing PBX multiplex office lines, ultra-high-speed facsimile, ultra-high-speed data, and TV conference. The general subscriber system is aimed at the household application of 4 MHz TV in addition to providing services of the digital primary including facsimile, captain and data. The CATV system was introduced to ascertain the basic technology related to multiplex transmission of VHF band TV and high-grade TV transmission. The longest experiment section is 8.5 km long with a turn, and the shortest is 1.2 km. The experiment sections consist of various types of subsections, including pipe line section, overhead section and tunnel section.[4]

Multiplexing is accomplished by means of wavelength splitting using two waves in the primary group transmission system as shown in Figure 2(a); four waves in the broad band subscriber system as shown in Figure 2(b); five waves (with one wave for either high grade TV or UHF TV) for the general subscriber system as shown in Figure 3(a); and two waves in the CATV system[5] as shown in Figure 3(b).

Taking into consideration the initial deviation, thermal variation, and changes due to aging of the elements, the wavelength intervals chosen were 30 nm (semiconductor laser) for the short wavelength band and 150 nm (light emitting diode) for the long wavelength band. Three types of wave mixers and separators were prepared in accordance with the number of multiplexing. The insertion loss was 3.5-4.3 dB for the two wavelengths multiplexing (interference film filter). It was less than 10 dB for the four wavelengths multiplexing (concave diffraction grid), and it was less than 11.7 dB for the five wavelengths multiplexing (a combination between interference film filter and plain diffraction grid).

When direct analog modulation format involving semiconductor laser was used, the interference between the propagation modes was found to take place within the fiber due to the nature of laser, and speckle noise (modal noise) was generated. As a result, deterioration of the wave form and a reduction in S/N were experienced. The high frequency superposed modulation method[6] was used as the main measure for solving this problem. The optical feedback method[7] was also experimented with in the high grade TV transmission.[8]

The station equipment was all accommodated in subracks. Equipment for the general subscriber system and the broad band subscriber system was packed two subscribers per subrack. The CATV system was packed with four high grade TV systems or four VHF TV systems per subrack, while the primary group transmission system was packed with an active system and a standby system per subrack. Each rack contained three subracks (four subracks in case of the primary group transmission system).

Taking into consideration its application in the subscriber system, a new type of optical connector consisting of an all-ceramic plug core was developed with a view to economy and simplicity.[9] The average connection loss (of 180 terminals) assembled onsite was found to be 0.74 dB, with a standard deviation of 0.16 dB.[10]

Table 2 summarizes the major experimental results obtained from the tests carried out on the optic fiber transmission system. The minimum light reception power of the 7 km analog channel was -36 dBm when the S/N was 42 dB. The differential gain was 4.1 percent for the 860 nm band and 3.5 percent (the standard is less than 5 percent) for the 890 nm band. The differential phases were, respectively, 2.4 degrees and 1 degree (ditto, less than 3 degrees); the frame slopes were, respectively, less than $\pm$ 2 percent and less than $\pm$ 2 percent (ditto, less than 10 percent); and the line slopes were, respectively, less than $\pm$ 1 percent and less than $\pm$ 1 percent (ditto, less than 5 percent). The standard for the image transmission was also satisfied, and no significant deterioration in the image quality was detected even after it was transmitted by an overhead cable over a distance of 5.6 km.

The average light reception power corresponding to a signal error rate of 10^{-9} was found to be -45 dBm in the case of digital transmission. It was found through this experiment that the actual loss due to optic fiber was less than the design standard. Therefore, nonrelay transmission over a distance of 7 km could be accomplished even when system margins of 2 dB for the analog channel and 3 dB for the digital channel were used. The themes for future study should include practical application of the power supply method, supervisory control method using optical transmission line, and testing method for the wavelength multiplexing system. Apart from the general household applications, the broad band services for the big subscribers such as business offices can be expected to be realized fairly soon.

The INS model experiment will be carried out in 1982 in the Musashino and Mitaka areas of the city of Tokyo.

The INS idea concerns digitization of the conventional analog telephone network (including digitalization of subscriber lines) and then utilizing this digital network for various services.[11] In addition, the transmission charge for all services is said to be computed on the basis of the bit number (quantity of information) (a charging format based on the quantity of information). In this way there will be no contradictions as far as charges are concerned even if different types of services are intermixed. For example, the telephone service charge will be computed on the basis of 64 kbits/second multiplied by the duration of conversation. Telephone services using a compressed band of 32 kbits/second can also be contemplated.

The TTPC has firmly drawn up a plan to carry out a series of model experiments in the Musashino and Mitaka areas of the city of Tokyo starting in 1982. Approximately 10,000 general subscriber telephones, approximately 250 digital telephone terminals and approximately 750 nontelephone terminals will be installed free of charge in homes and offices in the designated area in order to carry out the experiments. Figure 4 shows the block diagram of this model system.

The services that will be provided include: 1) those services in which the digital effects are most significant (such as digital facsimile, digital still picture, compound PBX, document communication and processing, and multimedia services); 2) those services introduced mainly for the purpose of confirming the technological feasibility of digitization (such as digital telephone and digital scanned image communication service); 3) those services introduced for the purpose of confirming the effectiveness of optic fiber utilization (such as ultra-high-speed facsimile and image circuit service); and 4) those services introduced mainly for the purpose of confirming the technology related to the unification of the digital networks (such as digital data exchange and facsimile communications network).

However, matters related to budgeting are not yet quite settled. The estimated request for the 1982 budget includes 90 billion yen for investigation and research expenditures, which amounts to an increase of 12 percent over the previous year. This significant increase in the budget is considered to be due in part to a desire to realize the INS idea. However, on the other hand, President Tsune Shindo declared that he would apply a brake to the annual 1.7 trillion equipment investment (construction investment) at present because of uneasiness over a trend of declining business income. It appears, therefore, that some operational adjustment will have to be made even on such items as investment in new business activities.

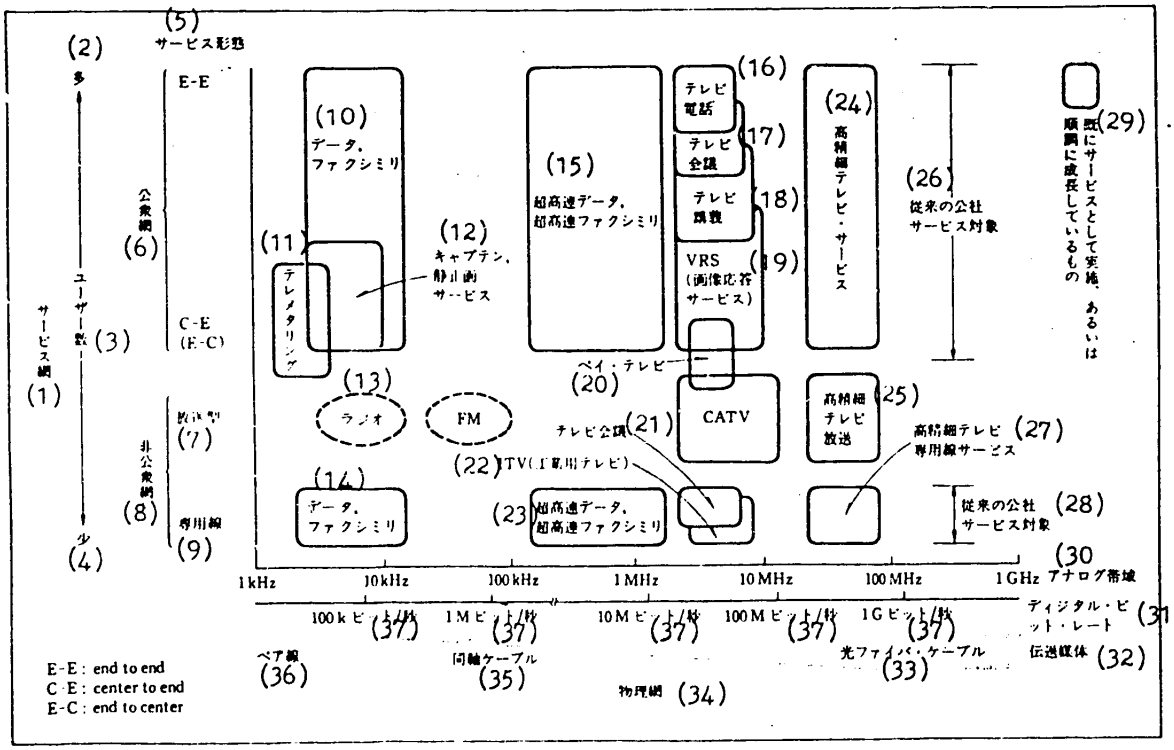

図1 将来，加入者系へ導入が予想されるサービス[1]

Figure 1. Services expected to be introduced to the subscriber system in the future.[1]

Key: (1) Service network (2) More (3) User number (4) Less (5) Service format (6) Public network (7) Broadcast type (8) Nonpublic network (9) Special line (10) Data, facsimile (11) Telemetering (12) Captain, still image service (13) Radio (14) Data, facsimile (15) Ultra-high-speed data, ultra-high-speed facsimile (16) TV telephone (17) TV conference (18) TV lecture (19) VSR (video response service) (20) Pay TV (21) TV conference (22) ITV (industrial TV) (23) Ultra-high-speed data, ultra-high-speed facsimile (24) High grade TV service (25) High grade TV broadcast (26) Objects of the public corporation's conventional services (27) High grade TV special line service (28)=(26) (29) Those services already implemented or growing smoothly (30) Analog band (31) Digital bit rate (32) Transmission medium (33) Optic fiber cable (34) Physical network (35) Coaxial cable (36) Pair line

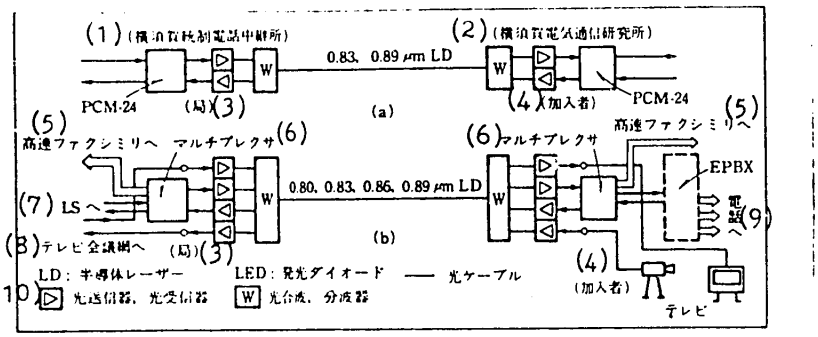

図2 (a)1次群伝送システムの構成と，(b)広帯域加入者システムの構成

Figure 2. (a) Construction of primary group transmission system.
(b) Construction of broad band subscriber system.

Key: (1) Yokosuka controlled telephone relay station (2) Yokosuka Electric Communications Research Center (3) Station (4) Subscriber (5) High-speed facsimile (6) Multiplexer (7) To LS (8) To TV conference network (9) To telephone (10) LD: Semiconductor laser, LED: Light emitting diode, ——: Optic cable, ▷: Optic transmitter, optic receiver, W: Optic mixer, optic separator

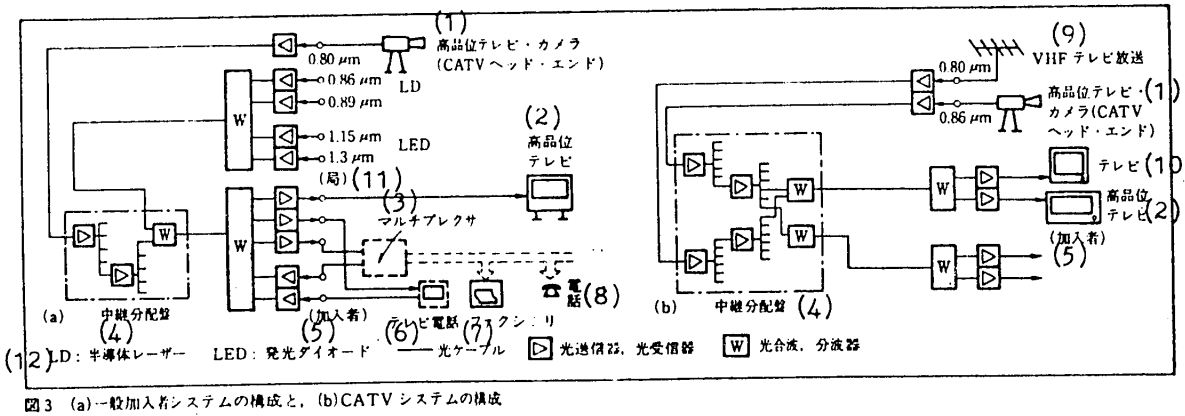

図3 (a)一般加入者システムの構成と，(b)CATV システムの構成

Figure 3. (a) Construction of general subscriber system.
(b) Construction of CATV system.

Key: (1) High grade TV camera (CATV headend) (2) High grade TV (3) Multiplexer (4) Relay distributer board (5) Subscriber (6) TV telephone (7) Facsimile (8) Telephone (9) VHF TV broadcast (10) TV (11) Station (12) LD: Semiconductor laser, LED: Light emitting diode, ——: Optic cable, ▷: Optic transmitter, optic receiver, W: Optic mixer, optic separator

Table 1. Outline of optic fiber transmission experimental system in Yokosuka area.

表1 横須賀地区での光ファイバ伝送実験システムの概要

	1次群 (A) 伝送システム	(B) 広帯域加入者システム			(C) 一般加入者システム				(D) CATVシステム	
(1) 伝送信号	ディジタル 1次群	ディジタル 2次群 (E)		カラー・テレビ信号…1ch 音声信号……1ch (F)	ディジタル 1次群 (G)		カラー・テレビ信号…1ch 音声信号……1ch (H)		高品位カラー・テレビ信号 (I)	VHF帯 カラー・テレビ信号 (J)
(2) 適用距離(目標値)	12km	7km			5km				5km	2km
適用光ケーブル(3)	グレーデッド・インデックス型マルチモード光ファイバ									
(4) 伝送路符号(信号)	CMI	CMI		アナログ・ベース・バンド	CMI		アナログ・ベース・バンド		アナログ・ベース・バンド	アナログ直接輝度変調 (IM)
光源 (5)	GaAlAs LD	GaAlAs LD			GaAlAs LD	InGaAsP LED	GaAlAs LD	InGaAsP LED	GaAlAs LD	
波長(μm)(6)	下り 0.83	上り 0.89	下り 0.80	上り 0.83	下り 0.86 ~	上り 0.89	下り 0.89	上り 1.15	下り 0.86	上り 1.3	0.86(0.80)	0.80
受光素子 (7)	Si APD	Si pin PD		Si APD	Si APD	Ge APD	Si APD	Ge APD	Si APD	
サービス例 (8)	PBX 超高速データ	PBX 超高速ファクシミリ 超高速データ		4MHzテレビ (テレビ会議用)	ファクシミリ キャプテン データ		4MHzテレビ (映像情報サービス用)		高品位テレビ	VHFテレビ放送

注) LD: 半導体レーザー LED: 発光ダイオード APD: なだれフォトダイオード
(9) PD: pin型フォトダイオード CMI: Coded Mark Inversion

Key: (A) Primary group transmission group (B) Broad band subscriber system (C) General subscriber system (D) CATV system (1) Transmitted signal (2) Applicable distance (target value) (3) Applicable optic cable (4) Transmitted code (signal) (5) Light source (6) Wavelength (μm) (7) Light receiving element (8) Example of service (9) Note: LD: Semiconductor laser, LED: Light emitting diode, APD: Avalanche photodiode PD: pin-type photodiode (A1) Digital primary group (A3) Graded index type multimode optic fiber (A6) Down 0.83, Up 0.89 (A8) PBX, ultra-high-speed data (E1) Digital secondary group (E3)=(A3) (E6) Down 0.8, Up 0.83 (E8) PBX, ultra-high-speed facsimile, ultra-high-speed data (F1) Color TV signal...1 ch, Audio signal...1 ch (F3)=(A3) (F4) Analog base band (F6) Down 0.86, Up 0.89 (F8) 4 MHz TV (TV conference) (G1) Digital primary group (G3)=(A3) (G6) Down 0.89, Up 1.15 (G8) Facsimile, Captain, Data (H1) Color TV signal...1 ch, Audio signal...1 ch (H3)=(A3) (H4) Analog base band (H6) Down 0.86, Up 1.3 (H8) 4 MHz TV (image information service) (I1) High grade color TV signal (I3)=(A3) (I4) Analog base band (I8) High grade TV (J1) VHF band color TV signal (J4) Analog direct brightness modulation (IM) (J8) VHF TV broadcast

Table 2. Major test results of trial facilities for optical transmission system.

表2 試作装置の光伝送系主要実験結果

(A)	チャネル	1	2	3	4
(B)	伝送信号	6.3Mビット/秒(下り)	6.3Mビット/秒(上り)	4MHzカラー・テレビ(下り)	4MHzカラー・テレビ(上り)
(C)	変調形式	PCM-1M		直接1M	
(D)	光源	GaAlAs半導体レーザー			
(E)	中心波長	789nm	829nm	861nm	888nm
(F)	ファイバ内光出力	−3.6dBm	−3.5dBm	−7.3dBm	−7.1dBm
(G)	受光素子	Si pin型フォトダイオード		Siなだれフォトダイオード	
(H)	最小受光電力(注)	−46.8dBm	−45.6dBm	−38.5dBm	−37.6dBm
(I)	合波分波損失(含むバンド・パス・フィルタ)	12dB (5.5 / 6.5)	10.7dB (5.2 / 5.5)	10.6dB (5.6 / 5.0)	11.6dB (5.9 / 5.7)
(J)	コネクタ損失	1dB			
(K)	許容線路損失	30.2dB	30.4dB	19.6dB	17.9dB
(L)	光ケーブル損失(含むスプライス)	3.1dB/km	2.6dB/km	2.5dB/km	2.2dB/km
(M)	マージン	8.5dB	12.2dB	2.1dB	2.5dB
(N)	無中継伝送距離	7km			

(O) 注) ディジタル・チャネルは誤り率10^{-9}
アナログ・チャネルは S/N 42dB

Key: (A) Channel (B) Transmitted signal (C) Modulation format (D) Light source (E) Central wavelength (F) Light output power inside fiber (G) Light receiving element (H) Minimum light reception power (see note) (I) Mixing/separation loss (including bandpass filter) (J) Connector loss (K) Allowable line loss (L) Optic cable loss (including splice) (M) Margin (N) Nonrelay transmission distance (O) Note: Digital channel error rate 10^{-9}, Analog channel S/N = 42 dB (1B) 6.3M bit/sec (down) (1D) GaAlAs semiconductor laser (1G) Si pin-type photodiode (2B) 6.3M bit/sec (up) (2D)=(1D) (2G)=(1G) (3B) 4 MHz color TV (down) (3C) Direct IM (3G) Avalanche photodiode (4B) 4 MHz color TV (up) (4C)=(3C) (4G)=(3G)

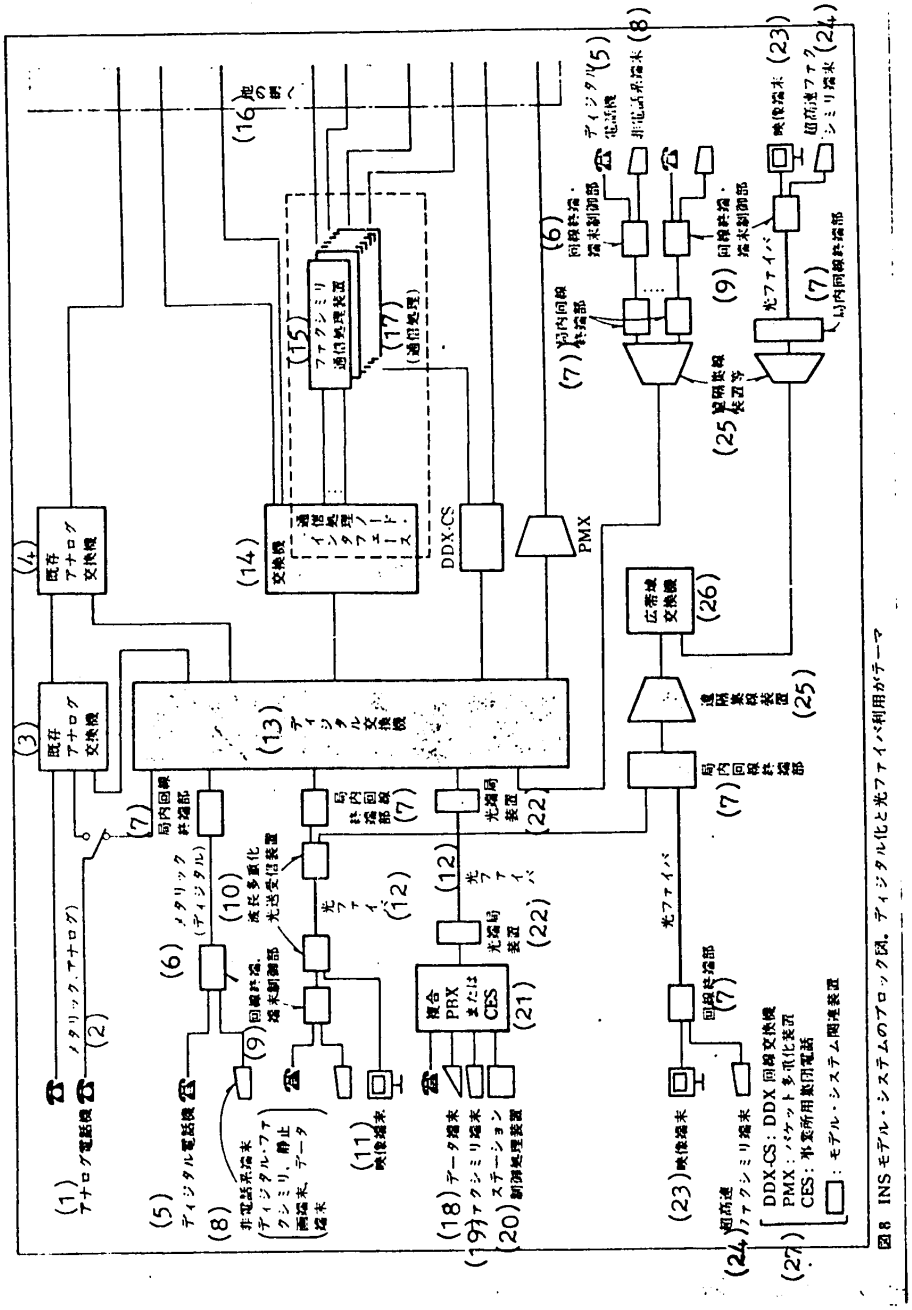

Figure 4. Block diagram of INS model system--digitalization and optic fiber application the main theme.

[Key on following page]

Key: (1) Analog telephone (2) Metallic (analog) (3) Existing analog exchange (4)=(3) (5) Digital telephone (6) Metallic (digital) (7) Circuit terminal at station (8) Nontelephone terminals (digital facsimile, still image terminals, data terminal) (9) Circuit terminal, terminal control (10) Wavelength multiplexing optic transceiver equipment (11) Image terminal (12) Optic fiber (13) Digital exchange (14) Exchange, communication processing mode interface (15) Facsimile communication processing equipment (16) To other network (17) Communication processing (18) Data terminal (19) Facsimile terminal (20) Station-controlled processing equipment (21) Compound PBX or CES (22) Optic terminal station equipment (23) Image terminal (24) Ultra-high-speed facsimile terminal (25) Remote junction equipment (26) Broad band exchange (27) DDX-CS: DDX circuit exchange, PMX: Packet multiplex equipment, CES: Group telephone for business offices, [ ]: Equipment related to the model system

FOOTNOTES

1. Asaya, Nosu, Matsumoto: "Construction and Characteristics of Optic Subscriber System in Yokosuka Area," Technical Report (Communication Format) of Electronic Communications Society, CS81-62, July 1981.

2. Nikei, Yamaguchi, Kajima, Hatano: "Construction and Characteristics of Optic Subscriber Experimental line," ibid, CS81-63, July 1981.

3. Miki: "Optic Fiber Multiplex Transmission Using Wavelength Splitting," NIKKEI ELECTRONICS, 28 May 1979 issue, No 213, pp 118-151.

4. Watanabe, Asaya, Onishi, Sato, Nosu, Fujiyama, Nishimura: "The Characteristics of Experimental Broad Band Subscriber Optic Transmission Facilities in Yokosuka Area," ibid, CS81-111, August 1981.

5. Asaya, Onishi, Watanabe, Sato, Mochida, Futoda: "Investigation of Optic Subscriber Transmission System With Consideration to Include Broadcast Image Service," ibid, CS81-109, August 1981.

6. Sato, Asaya, Watanabe, Hayashida, Suzuki, Hamano, Fukugawara: "Overhead Optic Cable Transmission Experiment of High Grade TV and VHF Band TV Signals," ibid, CS81-110, August 1981.

7. Asaya, Sato, Hayashida: "Characteristics of High Grade TV Transmission Equipment Using Direct IM Modulation of LD," ibid, CS81-81, July 1981.

8. Arai: "High Grade TV System Having A Variety of Practical Applications," NIKKEI ELECTRONICS, 28 September 1981 issue, No 274, pp 226-232.

9. Suzuki, Matsumoto, Sugawara, Masuko: "Trial Construction of Simple Optical Connectors," ibid, CS81-107, August 1981.

10. Suzuki, Matsumoto, Atogawa, Sugawara: "High Density Mounted Optical Connectors," ibid, 270, October 1981.

11. Kitahara: "A Road To INS," Proceedings of Advanced Information Communications System Lecture Series, TTPC of Japan, August 1981.

9113
CSO: 4106/22

SUDAN

BRIEFS

PROGRAM POSTPONED--The Sudanese Government has informed the companies concerned of its decision to postpone for a year implementation of the Sudanese telecommunications development program. This year will be used to launch a crash program aimed at rehabilitating various existing equipment and at setting up an adequate technical infrastructure within the telecommunications corporation. [Excerpts] [Paris MARCHES TROPICAUX ET MEDITERRANEENS in French No 1882, 4 Dec 81 p 32] [COPYRIGHT: Rene Moreux et Cie Paris 1981]

CSO: 5500/5004

END