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12 October 1977

TRANSLATIONS ON TELECOMMUNICATIONS POLICY,  
RESEARCH AND DEVELOPMENT

No. 16

**WORLD**

**WIDE**

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## INTERNATIONAL

### INTERCOSMOS COUNCIL CHAIRMAN INTERVIEWED ON SPACE COOPERATION

LD161858Y Moscow TASS in English 1533 GMT 16 Sep 77 LD

["Socialist Countries" Cooperation in Space"--TASS headline]

[Text] Moscow, September 16 TASS--The scope of the "Intercosmos" programme is widening with every year. There were many important events in the recent times, chairman of the "Intercosmos" Council, academician Boris Petrov, told a TASS correspondent.

Taking part in the "Intercosmos" programme are Bulgaria, Hungary, GDR, Cuba, the Mongolian People's Republic, Poland, Romania, USSR, and Czechoslovakia. There were 16 launchings of "Intercosmos" satellites, and five high-altitude research rockets and dozens of meteorological rockets were launched since 1969. Moreover, some Soviet craft carried instruments created by scientists of other socialist countries.

The first automatic general-purpose orbital station was launched last year. This set the beginning to the new stage in exploration on the "Intercosmos" programme. The single telemetric system made for receiving information from "Intercosmos" satellites on the territory of countries participating in the programme was tested successfully on board the automatic general-purpose orbital station "Intercosmos"-15.

During last year's talks in Moscow, the delegations of the socialist countries accepted the Soviet Union's proposal on participation of Bulgaria, Hungary, the GDR, Cuba, Mongolia, Poland, Romania and Czechoslovakia in manned flights on board Soviet spaceships and stations. The first group of candidates for cosmonauts from the GDR, Poland and Czechoslovakia is trained in the Yuriy Gagarin cosmonauts' training center.

The Soviet Union is cooperating in space exploration with capitalist countries, too. France was the first country with which the Soviet Union concluded an agreement on such cooperation eleven years ago.

The first Indian earth's satellite "Aryabhata" was launched with the use of a Soviet booster over two years ago. The Soviet-Swedish cooperation is developing successfully.

Of great importance was the first international USSR-USA joint space flight. The Soviet-American agreements on joint work in space biology, medicine, meteorology, in the studies of environment, the moon and planets are being successfully implemented.

CSO: 5500

## INTER-ASIAN AFFAIRS

### BRIEFS

MICROWAVE PROJECT--The construction of the India-Sri Lanka microwave project is being expedited. India will provide modern equipment necessary for the project worth around 30 million rupees, while Sri Lanka will spend nearly 20 million rupees for civil work. The project will provide Sri Lanka with efficient and high capacity trunk circuit not only to India but also within the country. [Colombo International Service in English 1045 GMT 19 Sep 77 BK]

CSO: 5500

INDIA

COMMITMENT TO NONALINED NEWS POOL REITERATED

Delhi ISI in English 1441 GMT 22 Sep 77 BK

[Text] India's commitment to the Nonalined News Agencies Pool was reiterated by a spokesman of the Ministry of External Affairs in New Delhi 21 September.

Denying a local press report that India has severed its links with the pool, the spokesman said "India is very much participating in it."

He said the government of India was now considering the nomination of its representative on the coordinating committee of the pool in place of Mohammed Yunus. A decision would be taken on this in the next few days. The next meeting of the coordinating committee is likely to be held in Jakarta some time in December this year or January next year, he said.

The spokesman also said that there was a proposal to set up a pool of broadcasting organisations of the nonalined countries will be held in Sarajevo in Yugoslavia next month. [sentence as received] Several working groups are now working on the various aspects of the proposal. One of these groups is now in session at Dubrovnik in Yugoslavia. India is preparing a paper for the conference and is also helping in preparing other documents, the spokesman said.

CSO: 5500

INDIA

SAMACHAR DENIES SPLIT WITH NONALINED NEWS POOL

BK211441Y Hong Kong AFP in English 0818 GMT 21 Sep 77 BK

[Text] New Delhi, Sept 21 (AFP)--A spokesman for the Indian news agency SAMACHAR today denied a report that the agency had severed its links with the non-aligned news agencies pool. The spokesman was commenting on a report in the English-language daily, INDIAN EXPRESS, that SAMACHAR was no longer attached to the pool and that its service to other members had been suspended since Tuesday. The paper also said that the Post and Telegraph Department had cut the telex service of SAMACHAR because of non-payment of 800,000 rupees (about \$98,000) in telex bills.

While admitting that the telex lines had been cut for non-payment of bills, the SAMACHAR spokesman said the services would be restored on payment, expected in 2 or 3 days.

The non-aligned pool, under which 17 agencies from Europe, Africa, Asia and Latin America are exchanging news, was set up in July last year at the non-aligned information ministers' conference held here.

CSO: 5500

TELEPHONE CIRCUIT NETWORK CONTROL UNIT

Tokyo NIPPON DENKI GIHO in Japanese No 116, May 76 pp 69-76

[Article by: Kunji Maeda, assistant chief of Machinery Inspection Section, Materials Bureau, Nippon Telegraph and Telephone Public Corporation (NTT) (former researcher, Technology Bureau); Yoshio Bessho, chief of Communication Network Section, Circuit Section, Planning Bureau, NTT (former member Technology Bureau); Tetsuo Kobayashi, member of 3rd Division, Switching Systems Main Division, Switchboard Business Division, Nippon Electric Company, LTD. (NEC) (formerly with Systems Technology Division); Akira Ichimura, member of Systems Technology Division, Switchboard Business Division, NEC; and, Susumu Enokito, member of Systems Technology Division, Switchboard Business Division, NEC]

[Text] 1. "Gist"

The public telephone network has been released for data communications and it has become possible to conduct data communication easily through the telephone network. For conducting data communication through the telephone exchange network, Nippon Telegraph and Telephone Public Corporation (NTT) has established technical standards to be followed, relative to interferences with and controls needed for using the telephone network. NTT has also developed the device necessary for controlling the telephone exchange network from the data terminal equipment (DTE). The device is the network control unit (NCU) which is introduced herewith.

The technical standards for the interface between this NCU and the DTE and for control procedures are in conformity with CCITT (Consultative Committee on International Telegraph and Telephone) recommendations V24 and V25.

2. "Preface"

With the revision of the Public Telecommunications Law, the use of the public network was liberalized and the subscribing telephone network was institutionalized for use in data communication (to be gradually carried out by central offices as they begin to implement the "wide-area time-rated system," established 12 Nov 72). [Change in city call rate from no time limit to charge by time, but calling areas expanded without rate increases.] In data

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communication utilizing telephone circuits, a device becomes necessary for installation between the DTE and telephone office facilities to perform the functions of connecting and controlling the subscriber's network. This device is the telephone circuit NCU which was just developed. Like other telephone terminal equipment, this device has the capabilities of activating the switching equipment, restoring, transmitting selective signals, detecting calling signals, etc.

### 3. "Outline"

In data communication utilizing telephone circuits, various modes of operations can be conceived and therefore, various types of NCU interface blocks, suitable for these modes of operations, were devised.

Since manual as well as automatic controls can be used in transmitting and receiving operations, the following types have been developed: manual transmitting and manual receiving; manual transmitting and automatic receiving; and automatic transmitting and automatic receiving connections. A simple "KANI"-type NCU, which can be used with existing telephone sets and does not utilize control interface with other equipment, has also been developed. The foregoing NCU's are for installation on the terminal side, for data communication using a single [HF] channel, but NCU's which can simultaneously handle multichannels (capable of increasing in increments of 2-channel units, up to a maximum of 20 channels) have been developed for installation at the central office. Types of NCU's are shown in Table 1.

Table 1. Kinds of NCU

Type Equipment	Explanations
"KANI" NCU	Switch to be used in combination with telephone
MM-1 NCU (Note 1)	Manual transmitting/receiving connection MM-1 has level compensation circuit
MM-2 NCU (Note 1)	MM-2 does not have level compensation circuit
MA-NCU (Note 1)	Manual transmitting/automatic receiving connection
AA-NCU (Note 2)	Automatic transmitting/receiving connection
CA20-NCU (Note 2)	For multichannel (maximum 20 channels)--install in central office
2-channel transmitting/receiving trunk for CA20 NCU	2-channel transmitting/receiving trunks to mount on CA20-NCU
Testing equipment for telephone circuit NCU	Portable testing equipment for maintenance purposes

NOTES:

1. Depending on selective signals sent, there are: (D1) 10 PPS; (D2) 20 PPS; (P) PB signal use.
2. Depending on selective signals sent, there are: (D) DP signal use (10/20 PPS dual use); (P) PB signal use.
3. "M", "A" and "C" used in designating types of NCU stand for "manual," "automatic" and "center," respectively.

The interconnection schematic chart between these NCU's, and the MODEM and DTE, are shown in Figure 1.

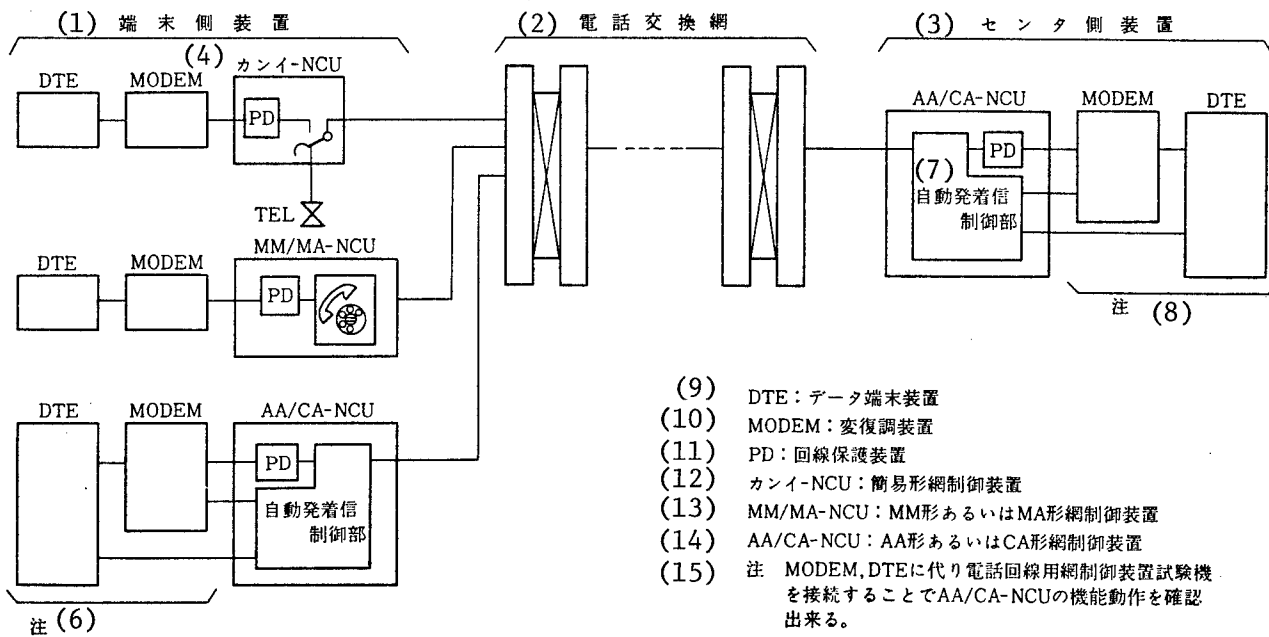


Figure 1. Interconnection of data systems with NCU

KEY:

- |  |  |
|--|--|
| 1. Data terminal equipment                     | 14. AA/CA-NCU: AA- or CA-type NCU  |
| 2. Telephone switching network                 | 15. NOTE: By connecting the telephone circuit NCU test equipment, in place of the MODEM/DTE, the functional operations of the AA/CA-NCU can be tested. |
| 3. Center equipment                            |  |
| 4. "KANI" NCU                                  |  |
| 5. Automatic transmitter/receiver control unit |  |
| 6. NOTE  |  |
| 7. Automatic transmitter/receiver control unit |  |
| 8. NOTE  |  |
| 9. DTE: Data terminal equipment                |  |
| 10. MODEM: Modulator-demodulator               |  |
| 11. PD: Circuit protective device              |  |
| 12. "KANI" NCU: "KANI"-type NCU                |  |
| 13. MM/MA-NCU: MM- or MA-type NCU              |  |

In the interfaces with the MODEM and DTE, CCITT recommendations V24 were followed where interfaces were specified and for those not specified, the simplest possible interface was devised. CCITT recommendation V25 was also followed for connection and control procedures.

Also, the NCU's have a built-in protective device (PD), which is needed in protecting the telephone facilities during data communication.

4. "Specifications"

a. "Operational Range"

The operational range is shown in Table 2.

Table 2. Operational Range

Item		Operational range	Remarks
Power input	Commercial power voltage and cycles	100 ± 10 V 50 Hz or 60 Hz	
	DC loop Impedance	A, H type center C, D type center	Below 1000 Ω Below 1500 Ω
Line	Insulation Impedance	Below(?) 40KΩ	Includes C <sub>1</sub> , C <sub>2</sub> type center
Temperature Humidity	Temperature	5 - 35° C	
	Humidity (relative humidity)	45 - 85%	

b. "Electrical Specifications"

(1) Where 600-type telephone equipment/parts are used, specifications applicable to them will be used.

(2) Transmission attenuation level: The transmission attenuation level of this unit's data communication channel will be measured under the condition that the PD has been short-circuited and the signal frequency will be below 1.5 dB at 300 Hz and below 0.5 dB at 1500 Hz.

(3) Crosstalk attenuation level: As for the crosstalk attenuation level of the CA20 NCU, the signal frequency must be over [-] 75 dB at 1500 Hz, with the CA20-use 2-channel transmitting/receiving trunk line mounted.

(4) Specifications for the dial pulse and minimum break: The dial pulse and minimum break for the type AA and type CA20 NCU's are as shown in Table 3.

Table 3. Specifications of Dials

Type	Items	Specifications	Remarks	
Dial Pulse Signals	Average speed	10PPS 20PPS	Measure with the spark suppressor circuit removed	
	Average make rate	10PPS 20PPS		
	Minimum break rate	10PPS 20PPS		
Pulse Bandwidth Signals	Contact Point Resistance	Below 0.5 $\Omega$	Resistance between terminals of two contact springs	
	Signal Frequency	1. Low frequency 852 Hz +0.40 -0.50% 2. High frequency 1336 Hz +0.40 -0.50%	1. Measurement is to be carried out when digit "8" is transmitted. 2. Measurement will be made at the 600 terminals by providing -48V DC through the telephone transmitter circuit.	
	Signal level	1. Level of low frequency -9.5 + 2.0 dBm 2. Level of high frequency -8.5 + 2.0 dBm		
	Signal Distortion	1. When 1209, 1336, 1477 Hz are all eliminated and when the distortion level of the low frequency is measured, there is over -23 dB. 2. When 697, 770, 852, 941Hz are all eliminated and the distortion level of the high frequency is measured, there is over -23 dB. To eliminate, means to provide an attenuation of over -40 dB to the component frequency (within + 1.5%).		
	Minimum transmission time of signal	Over 50 ms	Signal cycle is 120ms	
	Minimum break	Over 30 ms	Must be over	

(5) Interface: The control interface between the NCU and the MODEM or DTE are shown in Tables 4 and 5. The electrical specifications are given in Table 7. [Table 6 is also given below since it is referred to in Table 5.]

Table 4. General interface of NCU-MODEM

(1) インタフェース名称	(2) 記号	(3) 方向		(4) 機能	(5) ピン番号
		NCU	MOD		
(6) 保安用接地	FG		(7)	装置のフレーム接地用接地	1
(8) 接続完了	DSC	→	(9)	相手が応答したことを示す ON: 相手が応答した OFF: 相手が応答していない	2
(10) 回線接続指令	CML	←	(11)	回線の切替接続を指令する ON: 回線をNCU側からDTE側へ切り替える OFF: 回線をDTE側からNCU側へ切り替える	3
(12) 呼出表示	CI	→	(13)	呼出信号を検出したかどうかを表示する ON: NCUが呼出信号を検出した OFF: NCUは呼出信号を検出していない	4
(14) 通信用接地	SG		(15)	FG以外のすべてのインタフェースに対する基準電位を与える	7

注 分界点は9ピンの小形コネクタによる  
(16)

KEY:

- |  |  |
|--|--|
| 1. Interface name                            | 11. Controls the switching/connection of circuit   |
| 2. Symbol                                    | ON: Switches the circuit from NCU to DTE   |
| 3. Direction                                 | OFF: Switches the circuit from DTE to NCU  |
| 4. Functions                                 | 12. Call indicator (CI)  |
| 5. Pin number                                | 13. Indicates whether the call signal has been detected  |
| 6. Safety grounding                          | ON: NCU has detected the call signal   |
| 7. Frame grounding of apparatus (FG)         | OFF: NCU has not yet detected the call signal  |
| 8. Completion of Contact (DSC)               | 14. Signal grounding (SG)  |
| 9. Indicates the response of the other party | 15. With the exception of FG, provides the fundamental electric potential for all the other interfaces |
| ON: Other party has responded                | 16. NOTE: The small 9-pin connector provides the demarcation point                                     |
| OFF: Other party has not yet responded       |  |
| 10. Circuit connection control (CML)         |  |

Table 5. General Explanation of NCU-DTE Interface

(1) インタフェース 名	(2) 記号	(3) CCITT V24 回路番号	(4) 方向		(5) 機能	(6) ピン 番号
			NCU	DTE		
(7)	保安用接地	FG	212	←	(8) 装置のフレーム接地用接地	1
(9)	呼出要求	CQR	200	←	(10) 自動呼出回路部 (ACU) に対して呼出動作の開始を要求する ON: ACU に対して復旧を指示する呼出動作の開始を要求する OFF: ACU に対して復旧を指示する	4
(11)	回線使用中表示	DLO	203	→	(12) 回線 (または ACU) の使用中を表示する ON: 回線 (または ACU) が使用中である OFF: 回線 (または ACU) があきである	22
(13)	次番号要求	PND	210	→	(14) DTE に番号情報の送出を要求する ON: 次の番号情報の送出を要求する OFF: 番号情報を受信する体制ができていない	5
(15)	番号情報 (2 <sup>0</sup> )	DS 1	206	←	(19) 番号情報および終り符号 (EON) を 4 桁の 2 進符号で表示する (番号情報と 2 進符号の組合せは表 6 のとおり)	14
(16)	番号情報 (2 <sup>1</sup> )	DS 2	207			15
(17)	番号情報 (2 <sup>2</sup> )	DS 4	208			16
(18)	番号情報 (2 <sup>3</sup> )	DS 8	209			16
(20)	番号表示	DPR	211	←	(21) 番号情報を送出中であることを表示する ON: 番号情報を送出中である OFF: 番号情報を送出中でない	2
(22)	接続完了	DSC	204	→	(23) 相手が応答したことを示す ON: 相手が応答した OFF: 相手が応答していない	13
(24)	呼放棄	ACL	205	→	(25) 呼出動作の異常を DTE に知らせる ON: 呼出動作に異常が生じた OFF: 呼出動作に異常は生じていない	3
(26)	電源表示	PI	213	→	(27) NCU の電源が有効であるかどうかを示す ON: NCU の電源は有効である OFF: NCU の電源は有効でない	6
(28)	通信用接地	SG	201	←	(29) FG 以外のすべてのインタフェースに対す基準電圧を与える	7

KEY:

- |  |   |
|--|---|
| 1. Interface name  | 12. Indicates the circuit (or ACU) is in use  |
| 2. Symbol  | ON: Circuit (or ACU) is busy  |
| 3. CCITT V24 circuit number  | OFF: Circuit (or ACU) is open   |
| 4. Direction   | 13. Next-digit-request (PND)  |
| 5. Functions   | 14. Request DTE to send digit code  |
| 6. Pin number  | 15. Digit code (2 <sup>0</sup> ) (DS 1)   |
| 7. Safety Grounding (FG)   | 16. Digit code (2 <sup>1</sup> ) (DS 2)   |
| 8. Frame grounding of apparatus                                      | 17. Digit code (2 <sup>2</sup> ) (DS 4)   |
| 9. Call request (CQR)  | 18. Digit code (2 <sup>3</sup> ) (DS 8)   |
| 10. Request the automatic calling unit (ACU to start call operations | 19. Indicates the digit code and ending code number (EON) in binary codes of 4 bits (refer to Table 6 for "Code of Digits in Binary") |
| ON: Directs restoral and requests start of call operations to ACU    | 20. Digit indicator (DPR)   |
| OFF: Directs restoral to ACU   | 21. Indicates that digit code is being sent   |
| 11. Circuit-in-use indicator (DLO)                                   | ON: Digit code is being sent  |
|  | OFF: Digit code is not being sent   |

[Key continued on following page]

- 22. Connection completed (DSC)
- 23. Indicates that the other party has responded  
ON: Other party has responded  
OFF: Other party has not yet responded
- 24. Abandoned call (ACL)
- 25. Notifies the DTE of trouble in the calling operation  
ON: Trouble has occurred in calling operation  
OFF: No trouble has occurred in calling operation
- 26. Power indicator (PI)
- 27. Indicates whether the power source for NCU is available  
ON: Power source for NCU is available  
OFF: Power source for NCU is not available
- 28. Signal grounding (SG)
- 29. Provides fundamental voltage for all interfaces, except FG

Table 6. Code of Digits in Binary

Information	Column Values			
	DS 8	DS 4	DS 2	DS 1
Digit 0	0	0	0	0
" 1	0	0	0	1
" 2	0	0	1	0
" 3	0	0	1	1
" 4	0	1	0	0
" 5	0	1	0	1
" 6	0	1	1	0
" 7	0	1	1	1
" 8	1	0	0	0
" 9	1	0	0	1
* (star)	1	0	1	0
# (square)	1	0	1	1
ECON	1	1	0	0

Table 7. Electrical Specifications of the Interface between NCU and DTE

Items	Specifications	Remarks
Load impedance	3 - 7	Impressed voltage of 3 - 15V
Effective parallel capacity	Below 1,100 PE	
Open circuit voltage	Below 2 V	Positive or negative
Open circuit current	Below 25 V	Positive or negative
Short circuit current	Below 0.5 A	
Signaling voltage	5 - 15 V	Positive or negative For load impedance of 3-7K
Switching transient time	Within 1 ms	
Maximum instantaneous speed during switching	Below 30V/us	Positive or negative

(6) Timing: Timing pulses for the AA and CA20 NCU's are shown in Table 8.

Table 8. Specifications of Timing Pulses

Items	Specifications	Remarks
Prepause	Over 3 seconds	
Dial pulse monitor failure	DP 25 - 35 seconds	The elapsed time from start of NCU to completion of transmitting selective signaling (only AA-NCU)
	PB 7 - 13 seconds	
Response monitor	40 - 50 seconds	The elapsed time from transmitting selective signals to response by other party
Overall timing	Approximately 70 seconds	The elapsed time from start of NCU to restoral (only CA20-NCU)
Restoral time-out period	Over 2.2 seconds	

5. "Functional Outline"

The functional characteristics of the various NCU's are given in Table 9.

The NCU's are shown in Photos 1 - 5.

Table 9. Comparison of Functions of NCU's

Type		KANI	MM-1	MM-2	MA	AA	CA20
Features		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
Outward appearance	Length	170	225	225	225	120	450
	Width	110	155	155	155	270	660
	Height	80	234	234	234	380	1,300
	Weight	Apprx. 0.7 kg	Apprx. 1.6 kg	Apprx. 1.5 kg	Apprx. 1.4 kg	Apprx. 9.5 kg	Apprx. 175 kg
	Body color	Warm Gray	Warm Gray	Warm Gray	Warm Gray	Cream	Blue
Type of Installation		Desk-top (with telephone)	Desk-top	Desk-top	Desk-top	Wall and/or desk	Upright body
Interface connector			9-pin connector (DEM-9S)	9-pin connector (DEM-9S)	9-pin connector (DEM-9S)	9-pin connector (DEM-9S) 25-pin connector (DBM-25S0001)	
Power consumption (AC 100V)			5 VA	4 VA	5 VA	30 VA	
Mode of use	Transmitter	Manual	Manual	Manual	Manual	Manual	
	Receiver	Manual	Manual	Manual	Manual	Automatic	
Circuit accommodated		1	1	1	1	1	
Supplemental			Auxiliary telephone auto-dial	Auxiliary telephone auto-dial	Auxiliary telephone auto-dial	Test telephone	
Center downtime							Transmits 1,650 Hz/120 INT
Connecting data terminals (company products) (examples)		Telemetry facsimile	KANI data terminal (50,100, 200 baud)	Telemetry facsimile	Data terminal (100,200 1,200 baud)	Data terminal electronic calculator (few circuits)	Electronic calculator

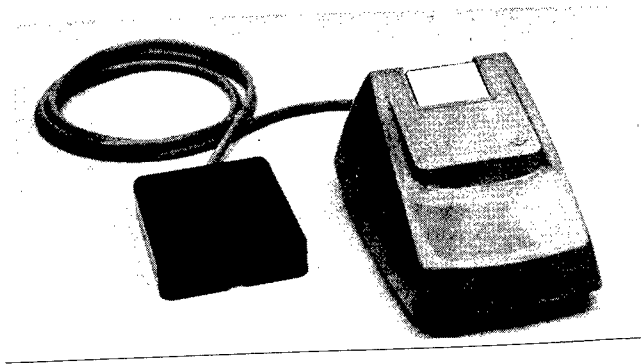


Photo 1. "KANI" NCU



Photo 2. MM-1 (MM-2) NCU (D type)



Photo 3. MA-NCU (P type)

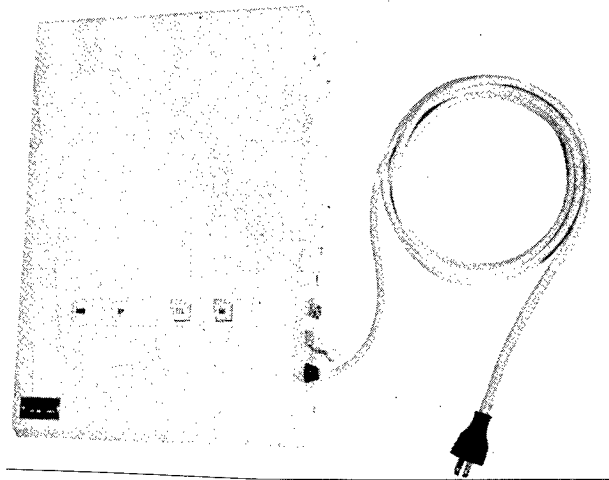


Photo 4. AA-NCU (D and P type)

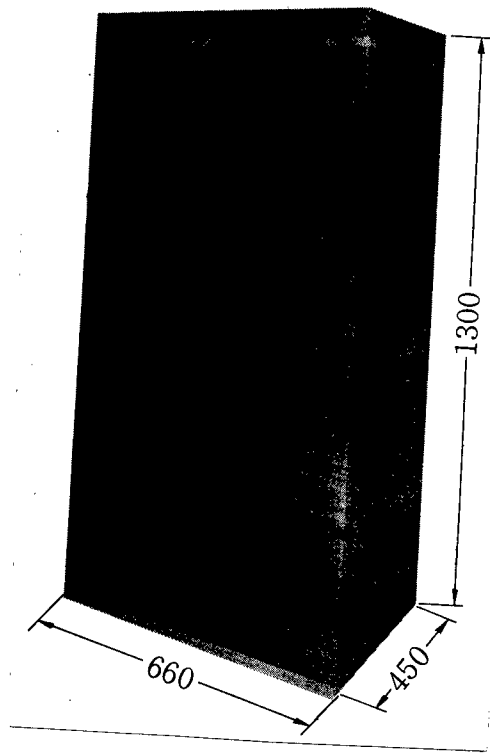


Photo 5. CA20-NCU (D and P type)

## 6. "Operational procedures"

The operational procedures of the NCU's will be explained with the AA-type NCU as the model. Refer to Figure 2 for the circuit diagram and Figure 3 for the time chart.

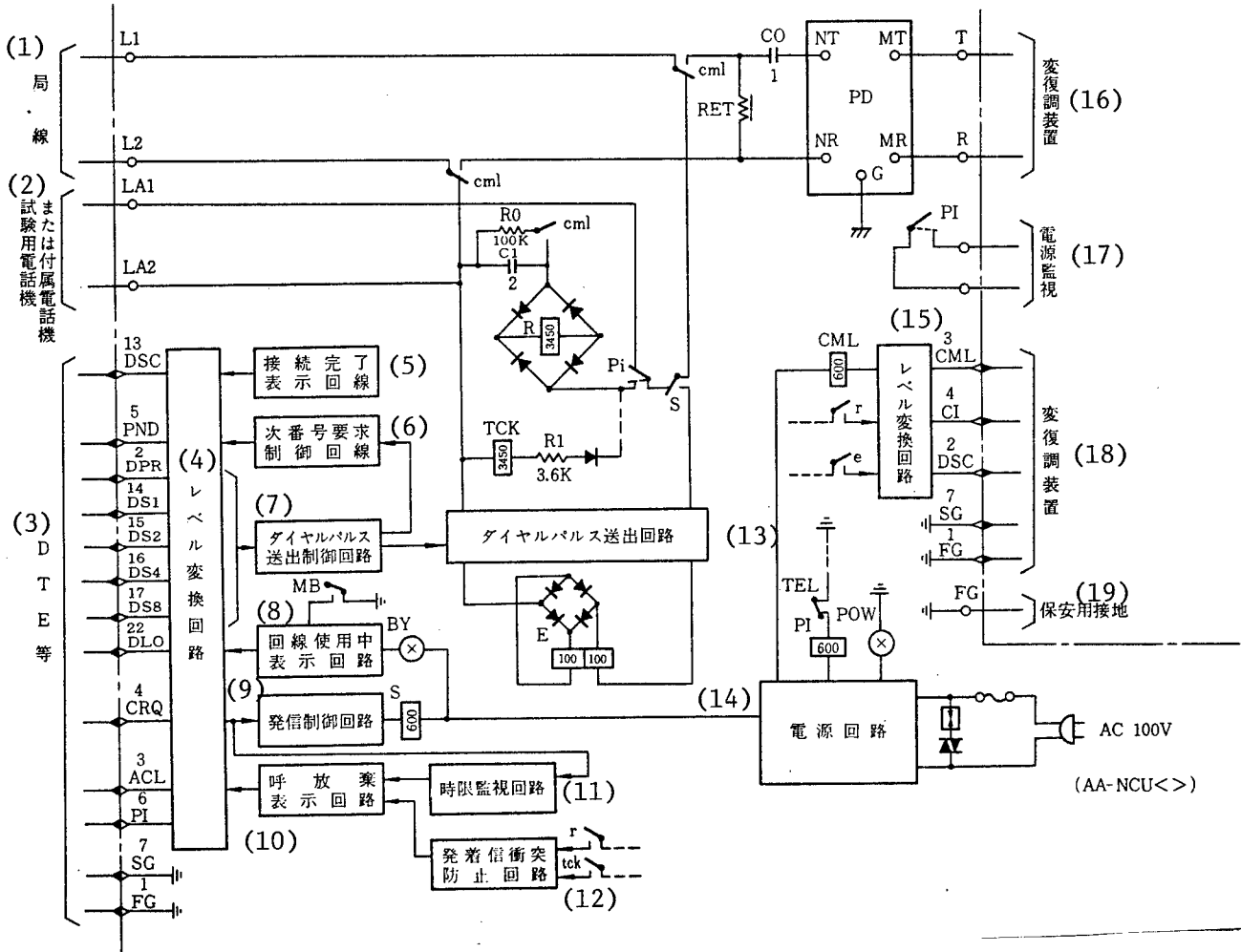


Figure 2. Circuit diagram of AA-type NCU

[Key on following page]

KEY (Figure 2):

1. Channels
2. Or, auxiliary telephone/testing telephone
3. Data terminal equipment, etc.
4. Level compensation circuit
5. Connection-completed indicator circuit
6. Next-digit-request control circuit
7. Dial pulse transmission control circuit
8. Circuit-in-use indicator
9. Transmission control circuit
10. Call abandoned indicator circuit
11. Time monitoring circuit
12. Transmitting/receiving collision prevention circuit
13. Dial pulse transmission circuit
14. Electric power circuit
15. Level compensation circuit
16. MODEM
17. Electric power monitor
18. MODEM
19. Safety grounding

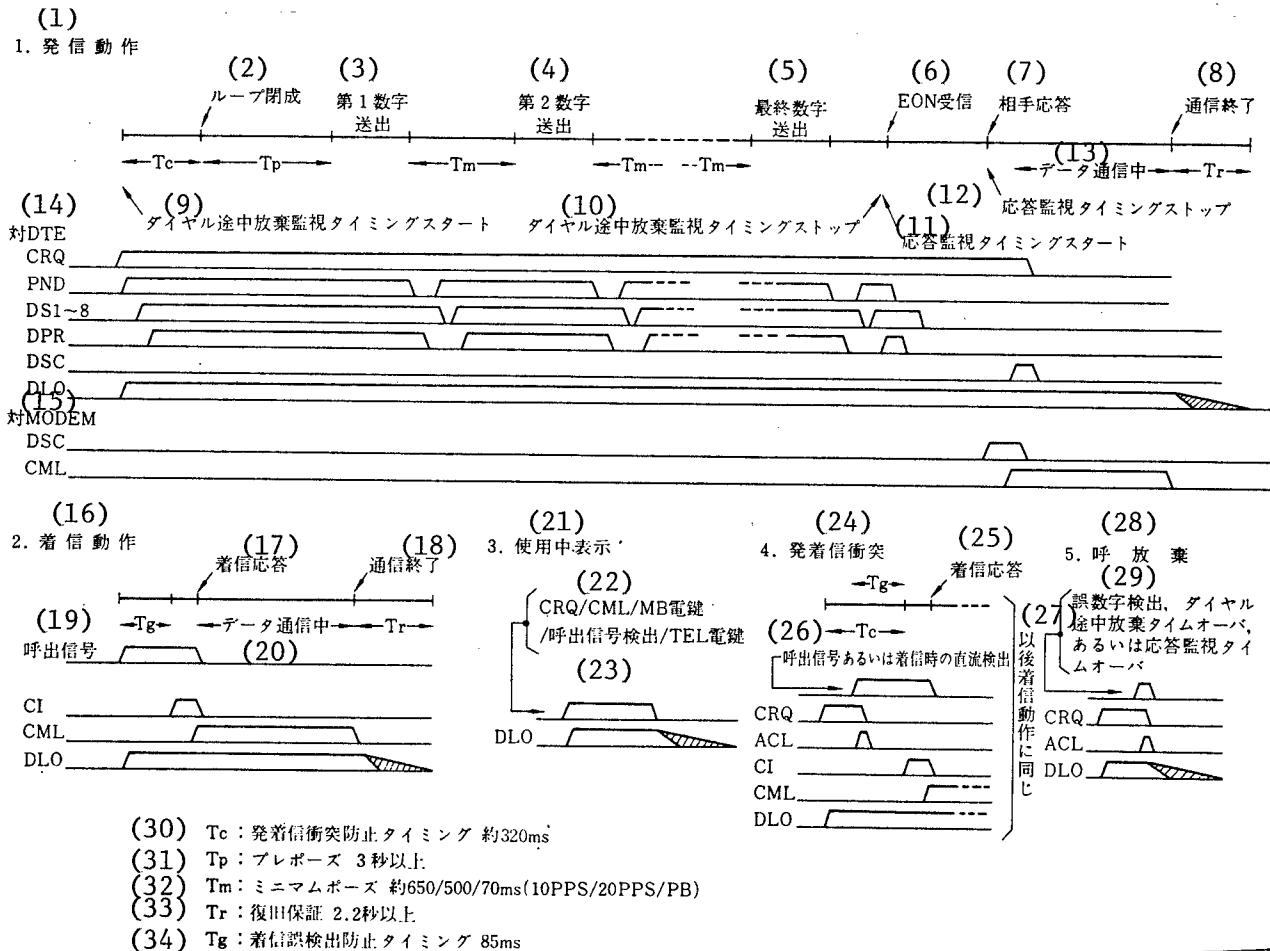


Figure 3. Control sequence of AA-type NCU  
 [Key continued on following page]

KEY:

1. Sequence 1. Transmission operations
  2. Closed loop
  3. Transmit 1st digit
  4. Transmit 2nd digit
  5. Transmit last digit
  6. Receive EON
  7. Response of other party
  8. Completion of communication
  9. Monitor for abandonment of dialing/timing start
  10. Monitor for abandonment of dialing/timing stop
  11. Response monitor/timing start
  12. Response monitor/timing stop
  13. Data being transmitted
  14. For
  15. For
  16. Sequence 2. Receiving operations
  17. Receiving response
  18. Completion of communication
  19. Call signal
  20. Data being transmitted
  21. Sequence 3. In-use indicator
  22. CRZ/CML/MB key/
  23. Calling signal detection/TEL key
  24. Sequence 4. Transmitting/receiving collision
  25. Receiving response
  26. Detection for DC at time of calling signal or receiving
  27. Remainder same as for receiving operations
  28. Sequence 5. Call abandonment
  29. Detection for wrong number, dialing abandonment time-over or response monitoring time-over
  30. Tc: Transmitting/receiving collision prevention, timing apprx. 320 ms
  31. Tp: Pre-pause over 3 seconds
  32. Tm: Minimum pause, apprx. 650/500/70 ms (10 PPS/20 PPS/PB)
  33. Tr: Restoral time-out period, over 2.2 seconds
  34. Tg: Prevention of erroneous detection in receiving, timing 85 ms
- a. "Transmission Operations": Refer to sequence 1, "Transmission Operations," [Key #1] of Figure 3.
- (1) DTE confirms whether PI is ON and PND, ACL, DSC and DLO are OFF.
  - (2) If above conditions are met, the DTE turns the CRQ to ON and actuates the NCU. As soon as CRQ is ON, the NCU actuates the time monitoring circuit, measures the timing until the EON mentioned in item (13) below is received, and monitors for dialing abandonment. If, before receiving EON, should the specified timing ( $30+5s/DP$ ,  $10+s/PB$ ) elapse, the NCU will use the call abandoned indicator circuit to turn ACL to ON and indicate the time-over to the DTE (refer to sequence 5, "Call Abandonment," [Key #28] of Figure 3).

(3) With the CRQ on ON position, the circuit-in-use indicator of the NCU turns the DLO to ON and notifies the DTE (refer to sequence 3, "In-use Indicator," [Key #21] of Figure 3).

(4) Through the next-digit-request control circuit, the dial pulse transmission control circuit turns the PND to ON.

(5) The DTE sends to the NCU, the first digit of the subscriber number to be dialed in binary code of DS 1 - 8, and then, turns the DPR to ON. The code of DS 1 - 8 and relation to digits are shown in Table 6.

(6) The transmission control circuit of the NCU actuates the "S" relay and forms a loop of the circuit via the dial pulse transmitter control circuit. Before the activation of the "S" relay, the transmitting/receiving collision prevention circuit confirms that the circuit is not receiving (TCK relay on "R" relay is operating). If it detects that the circuit is receiving during this period (monitoring time is approximately 320 ms), the ACL is turned to ON by the call abandoned indicator circuit (refer to sequence 4, "Transmitting/receiving collision," [Key #24] of Figure 3).

(7) After closing of the loop, the transmission control circuit breaks (over 3 seconds). Then, the dial pulse transmitter control circuit, which had earlier received the subscriber's number, converts the first digit of the number to dial pulse through the dial pulse transmitter circuit and sends it into the circuit. When the first digit is sent out, the PND is turned to OFF.

(8) When the PND is OFF, the DTE turns the DPR to OFF.

(9) When the DPR is turned to OFF, the NCU again turns the PND to ON and requests the DTE for the next digit.

(10) When the PND is again turned ON, the DTE sends out the next digit in the DS 1 - 8 code, and then, turns the DPR to ON.

(11) With the DPR on ON and the passing of dial pulses, the NCU completes transmission by sending out these pulses to the circuit and turns the PND to OFF.

(12) Subsequently, the NCU and DPR repeat the operations of aforementioned (8), (9), (10) and (11).

(13) When the PND is ON and the sending of the subscriber's number is fully completed, the DTE changes DS 4 and DS 8 to "1", indicates the symbol of the final number (EON) and turns the DPR to ON. (From the time of the operation described above in item (1) till now, the DTE has the terminal equipment ready (ER) of the MODEM circuit turned to ON.) When the EON symbol is received, the time monitoring circuit is actuated. The dial abandoned monitoring timing which had started earlier is stopped and simultaneously, the response monitor timing is started to await the response of the other party through the "E" relay operation described in item (14) below. If, after re-

ceiving the EON signal, the response of the other party cannot be detected within 40 - 50 seconds, the call abandoned indicator circuit turns the ACL to ON and indicates the time-over (refer to sequence 5, "Call Abandonment," [Key #28] of Figure 3).

(14) When the subscribing party receives the signal through the telephone network and makes a response, the polarity of the channel reverses and this puts the response detector "E" relay into operation. At this time, to indicate to the MODEM that the connection has been completed, the DSC is turned to ON.

(15) The MODEM takes the ER, which was earlier received from DTE, and the logical product from the DSC of NCU, and turns the circuit connection control (CML) to ON.

(16) With the CML on ON position, the NCU activates the CML relay and through the CML contact point, switches the circuit to the MODEM.

(17) Through the CML relay operation, the connection-completed indicator circuit turns the connection-completed DSC to ON and notifies the DTE.

(18) With the DSC on ON, the DTE turns the CRQ to OFF and completes the calling operation.

(19) With the completion of data communication, the DTE turns the ER to MODEM to OFF position.

(20) With the ER on OFF, the MODEM restores the CML relay and opens the direct current loop of the circuit. Simultaneously, after the restoral timing of 2.2 seconds, turns the DLO to OFF.

NOTE: When the ACL is ON, the DTE turns the CRQ to OFF to abandon transmitting operations and stops the activation of MODEM circuit (refer to sequence 4, "Transmitting/Receiving Collision," [Key #24], and sequence 5, "Call Abandonment," [Key #28] of Figure 3).

#### b. "Receiving Operations"

For this operation, refer to the time chart of sequence 2, "Receiving Operations," [Key #16] of Figure 3.

(1) When a signal is received from the telephone network, a call signal of 16 Hz comes through the circuit. Through the bridge circuit of the rectifier, there is full-wave rectification and the receiver detection relay "R", which operates with the calling signal current, keeps repeating the operations of receiving and restoring.

(2) With the "R" relay in operation and through the contact point operation, the level compensation circuit takes the "R" relay operational error prevention timing (85 ms), after which the call indicator (CI) is sent to the MODEM.

- (3) Through the terminal equipment ready (ER) and the "AND" circuit of the IC, the MODEM turns the circuit connection control (CML) to ON.
- (4) With the CML on ON, the NCU activates the CML relay and through the CML contact point, switches the circuit to Data Mode.
- (5) With completion of data communication, the DTE turns the ER to MODEM to OFF.
- (6) With ER on OFF, the MODEM turns the CML to OFF.
- (7) With CML on OFF, the NCU restores the CML relay and opens the direct current loop of the circuit. At the same time, after the restoral timing of 2.2 seconds, the DLO is turned to OFF.

c. "Other Functional Characteristics"

- (1) In-use Indicator Circuit: During transmission, receiving, data communication, and operation of the MB electrical key or the TEL electrical key, this apparatus shows the in-use indicator to the DTE and illuminates the BY lamp of this equipment (refer to sequence 3, "In-use Indicator," [Key #21] of Figure 3).
- (2) Power Indicator: With the POW lamp, indicates that the power is coming in. With the power monitor relay PI, power is automatically switched to the auxiliary telephone. For external equipment, a monitoring circuit is set up to enable monitoring of power with the contact loop disconnected. (ON<sub>0</sub>, ON<sub>1</sub> terminals).
- (3) Switch to Test or Auxiliary Telephones: Through operation of the TEL electrical key, the circuit can be switched to the telephones.
- (4) Closing: To stop transmission operation from the DTE, this piece of equipment can be closed by manipulating the MB electrical key.
- (5) Changing Dial Pulse: Through order specification, the speed of transmitter dial pulse can be changed to 10 PPS or 20 PPS.

d. "Differences from Type CA20"

The foregoing concerned the operations of AA-type NCU. In operational procedures for connections, the CA20 NCU differs from the AA type on the following points.

Since there are 20 channels for the transmitting/receiving trunk (BWT) of the circuit, but only 2 channels for the automatic calling unit (ACU), a connector is needed between the BWT and ACU. This permits dual use of the ACU and is an economy measure.

In transmission connection, as explained for AA type, a designated circuit, or BWT, must be selected before transmitting the subscriber's number. The CA20 NCU differs in that the BWT number is 2-digit (10-unit and 1-unit number) and must be received from the DTE like the subscriber's number. When the CA20 NCU receives the BWT number from the ACU, a connector is used between the ACU and the designated BWT. At this point, it is conceivable that the designated BWT was just used for a prior connection and the line has not been fully restored. Therefore, for type AA, a restoral timing (approximately 4 seconds) was taken at the time of final restoral but for type CA20, the timing istaken prior to the connection. After the restoral timing, in order to activate the circuit, the "S" relay is actuated and the exchange network loop is closed. Subsequent operational sequences are practically the same as for AA-type NCU. One other point of difference is that while for type AA, there is monitoring for dial abandonment, for type CA20, the overall timing (approximately 70 seconds) is monitored from ACU activation to restoral.

#### 7. "Test Equipment for Telephone Circuit Network Control Unit"

This piece of equipment is used to test the functional operations of both the AA and CA20 NCU's. As shown in Photo 6 below, it is a portable apparatus, measuring 300 mm in height, 470 mm in width and 230 mm in depth. It weighs approximately 20 kg. Operational parts of this apparatus include the circuit converter, lamp and electrical key. By manipulating the circuit converter and the electrical key, simulated connections of the DTE control interface, etc. can be performed. The lamp can test network control and functional performances of the subscribing telephone network.

Refer to Figure 1 for the interconnection system.

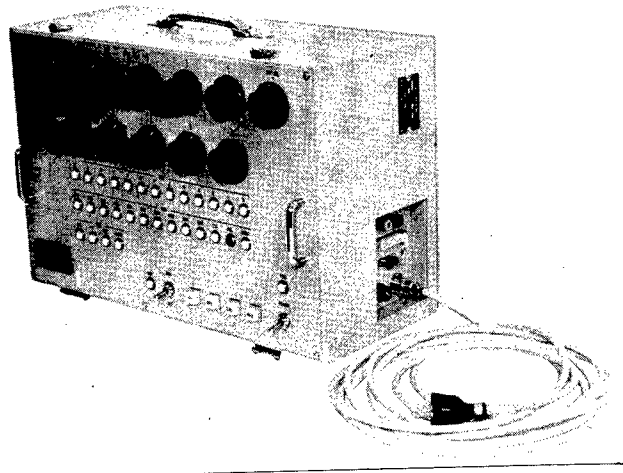


Photo 6. TEL-NCU TST-E (Testing Equipment)

## 8. "Conclusions"

The outline of the network control unit was given above. With use of the public telephone network liberalized, this apparatus can be used for various types of data communications, facsimile, etc. In the diversifying field of data communications of the future, it is expected to be widely used. In conclusion, deep appreciation is expressed to those who provided guidance that made this unit one of practical use.

## 9. "Reference"

Yamato, Madake and four others--Network Control Unit--"SHISETSU" Vol 25, No 3.

9134

CSO: 5500

LAOS

POSTAL-TELECOMMUNICATIONS DELEGATION LEAVES FOR USSR, GDR

BK191046Y Vientiane Domestic Service in Lao 0000 GMT 19 Sep 77 BK

[Text] On the afternoon of 17 September a delegation of the Lao Ministry of Posts and Telecommunications, headed by Khampheng Boupha, minister of posts and telecommunications, left Vientiane for Moscow for a friendly visit to the USSR at the invitation of the Communications Ministry of the USSR.

Seeing the delegation off at the Wattai Airport were directors and deputy directors of various departments and a large number of cadres of the Ministry of Posts and Telecommunications, Soviet Charge d'Affaires (Oleg Dusinin), and GDR Ambassador Dieter Jarok.

It was reported that following its visit to the USSR, the delegation will visit the GDR at the invitation of the GDR Ministry of Posts and Telecommunications.

CSO: 5500

PEOPLE'S REPUBLIC OF CHINA

SZECHWAN DEVELOPS RURAL BROADCASTING, TELEVISION

HK170435Y Chengtu Szechwan Provincial Service in Mandarin 2140 GMT 16 Sep 77 HK

[Summary] Szechwan Province has scored new successes in developing broadcasting and related scientific research. The rural broadcasting network is now basically complete, with 460,000 production teams connected to the system and a total of 11 million loud-speakers installed.

Medium and short-wave broadcasting, television and frequency modulation broadcasting have also developed greatly since the Cultural Revolution. There are now more than 10,000 television reception points in the urban and rural areas.

The province's 8 local broadcasting equipment factories now produce more than 20 products, including large-screen projection television sets, precision television equipment, amplifiers and so on.

Since the provincial CCP committee held a broadcast mobilization rally on science and technology, the staff and workers on the province's broadcasting front have worked hard to implement its spirit. Broadcasting bureaus throughout the province have strengthened leadership over research work and the provincial Broadcasting Bureau has held two forums to look into the modernization of broadcasting. Broadcasting departments have now summed up experiences with more than 10 research projects, including the automation of equipment in broadcasting stations, the use of methane gas to generate electricity for broadcasting, the prevention of rust on broadcasting and television wires, long-distance meteorological broadcasting wires, the use of bamboo as a substitute for reinforced concrete poles, projection television, reinforced concrete television frequency modulation transmitting towers and measures to avoid lightning strikes on mountain stations.

"Large-screen projection television is one of the major fruits of research in the province's broadcasting industry. The use of large-screen projection television receivers for watching programs collectively is not only a major measure for achieving greater, faster, better and more economical results in popularizing television broadcasting, but is also effective for cultivating people's collectivist ideology." With the help of the Chinese Optics Research Center and other units, the Szechwan broadcasting equipment plant has overcome various difficulties such as shortages of raw materials and achieved a new breakthrough in improving the quality of the Type-401 large-screen monochrome projection television receiver. It was highly evaluated at the national symposium on projection television held in Wuhsi in January. The screen of this television set is 60 times larger than that of a 14-inch table model and can be watched by 1,000 people at one time.

CSO: 5500

VIETNAM

BRIEFS

WIRED BROADCASTS--Since early this year, An Giang Province has consolidated and built 80 wired radio stations with more than 300 loudspeakers in various districts and villages. A network of loudspeakers has now been installed in almost all cities and towns in the province and wired radio stations have been set up in nearly all villages in major rice growing areas. These wired radio stations have provided regular guidance for local peasants in applying science and technology to agricultural production. [Hanoi Domestic Service in Vietnamese 1300 GMT 19 Sep 77 BK] Tien Giang Province has built a provincial wired radio station, four wired radio substations in districts and 25 others in villages with more than 223 public loudspeakers. The province is striving to improve the radio network at the district level and set up more wired radio substations in villages and train professional cadres to promptly serve people in the province. [Hanoi Domestic Service in Vietnamese 1300 GMT 29 Sep 77 BK]

CSO: 5500

INTERNATIONAL AFFAIRS

KURTOVIC RECEIVES CUBAN PRESS AGENCY DIRECTOR GENERAL

Belgrade TANJUG in English 1744 GMT 21 Sep 77 LD

["Pool" item]

[Text] Belgrade, 21 Sep (TANJUG)--Todo Kurtovic, secretary in the Executive Committee of the League of Communists of Yugoslavia (LCY), today received Gustavo Robrenho, director general of the Cuban news agency PRENSA LATINA, and had with him a cordial talk of some length on matters relating to political, information and other relations between Cuba and Yugoslavia. TANJUG's director general, Pero Ivacic, accompanied the Cuban news agency's director general.

Cooperation between TANJUG and PRENSA LATINA, especially within the pool of the news agencies of the nonlined countries, and preparations for the 6th conference of the nonaligned countries' chiefs of state or government to be held in Havana in 1979 were discussed on this occasion.

Earlier, the Cuban news agency's director general, Robrenho, and his assistant, Berauld Nieves, were received by Muhamed Berberovic, member of the Yugoslav Government and chairman of the Federal Committee for Information.

The Cuban news agency PRENSA LATINA's director general also talked with Yugoslav representatives on current preparations for the first conference of the Nonaligned Countries' Broadcasting Organizations to be held in Sarajevo, central Yugoslavia, next month with Cuba participating.

CSO: 5500

BULGARIA

POOR STATE OF TELEPHONE EQUIPMENT, COMMUNICATIONS OUTLINED

Sofia POGLED in Bulgarian 25 Jul 77 pp 2

[Article by Yana Konstantinova, Ministry of Communications press secretary:  
"Who Is Confusing the Reader?"

[Text] The charges leveled against telephone communications personnel, carried in issue No 20 of 16 June 1977 on padding telephone charges with a view to the fulfillment of quarterly or annual plan and for earning bonuses are groundless. However, we are convinced that the editors have received letters complaining of telephone conversation charges. We, too, receive such letters. Investigations have established that a large percentage of them are groundless. It turns out that those who complain have dialed directly other okrug cities or else that their set was used by friends or neighbors who dialed other settlements without the knowledge and permission of the subscriber. Breakdowns of the individual readers are not excluded. However, these are isolated cases. Should they occur the quarterly charges are amended. We answer the questions of the newspaper as follows:

1. What is the "secret" of impeccable telephone communications?

The quality of telephone communications depends on a number of factors and, above all, of the technical equipment.

Our national telephone circuit has mostly obsolete equipment which is unable to provide high quality use. We are undertaking the insulation of newer equipment which will improve the condition of telephone communications in Sofia and throughout the country. Unfortunately, the Ministry of Electronics and Electrical Engineering has still not supplied us with the necessary quasielectronic settlement equipment.

Disturbances in telephone conversations arise also because of the current reconstruction and modernization of telephone circuits without breaking existing communications. However, we are trying to recircuit communications mainly at night, when the traffic is at its lowest.

Disturbances appear also as a result of breakdowns in the cables, sub-standard construction and faults in the equipment produced by our industry.

In 1976 alone the construction and installation organizations broke 1,376 cables and put out of order some 30,000 telephone sets for periods ranging from 3 to 15 days. The process is continuing.

The quality of the circuits using plastic cables is also not always on the necessary level.

For the past 2 years the dialing and relay sets supplied by the radio-electronic industry have shown poor quality indicators. A large percentage of them are either totally defective or unreliable.

Use and maintenance calls, and cadre turnover and level of skills also influence the quality of telephone conversations. As we may see, this is a question of an entire set of objective and subjective reasons which affect the quality of telephone communications.

2. Could most office officials "help" automatic telephone counters?

The individual counters of every subscriber are sealed and all interference is excluded. Therefore, the communications personnel cannot "assist" the automated telephone counters.

In local calls the equipment counts as a call any number dialing regardless of time. There are two ways for charging long-distance calls: person to person with the assistance of the operator, and direct dialing in which case they are recorded by individual counter of the subscriber.

The country is divided into four zones and the recording of telephone calls along automatic dial lines is accomplished by the individual counters through pulses fed each 12, 8, 6 and 5 seconds, depending on the zone of the other subscriber. Thus, for example, if a subscriber in Sofia is calling a subscriber in Varna or any other okrug center in zone 4, immediately after contact has been made the individual counter of the Sofia subscriber begins to record and send each 5 seconds one pulse. In other words, it will record in 1 minute 12 local calls (chargeable units). We consider groundless the complaints by citizens of padded number of telephone calls. Suffice it to point out that in only 27 out of 286,000 subscribers in Sofia a wrong count was established as a result of faulty individual counters.

3. What is the pleasing news for our readers for this year and the Seventh Five-Year Plan?

This year about 30,000 telephone sets will be installed and opened and about 17,000 will be distributed in the areas of the ATTs-44 [Direct Dial-Exchange-44] "Oborishte," the ATTs-52 "Cherven Krust," ATTs-Ovcha Kupel,"

and ATTs-76 Gara Iskur. ATTs will be installed in new areas, as follows: Studentsko Gradzhe and "Cherevena Zvezda," about 1800 sets mainly for official communications, with an additional 15 coin operated sets, and another 20 coin operated sets at the Druzhba railway district. Telephone services in the Iliyantsi industrial zone will be improved with the addition of another 400 telephone sets by the ATTs-38, and so on.

In the Seventh Five-Year Plan priority is being given to the development of telephone communications in Sofia. A special program is being implemented to this effect. It calls for the installation of capacities for 111,000 new telephone sets, as follows: Mladost ATTs, 18,700; Lyulin ATTs, 18,700; Druzhba ATTs, 9,600, and an additional 6,000 telephone sets by the Cherven Krust ATTs.

We should bear in mind, however, that time is necessary before major changes have been made and felt by the citizens, mainly because of the complexity of communications construction.

The management of the ministry is working on steadily upgrading the level of services. It supervises strictly the observance of deadlines for newly built capacities and for reaching the full capacity of existing exchanges and stations.

5003

CSO: 5500

## BULGARIA

### MISUSE OF TELEPHONES CRITICIZED

Sofia RABOTNICHESKO DELO in Bulgarian 8 Aug 77 p 2

[Article by Kipra Dobрева: "Rejoinder -- How Much is a Telephone Call Worth?"]

[Text] How many different things do we mean when we say "time"? The time in which we live, the era during which the years of our life pass by. The time included in that segment of the day during which we labor -- working time. The time during which we rest -- our leisure time. We say, "I have no time," and we do not understand how mistaken we are. We say, "I have wasted time," and do not understand how right we are. A folk proverb teaches us, "Lost time is never found again."

Can we safeguard this priceless capital against all those useless things that cram it with idleness and inanity? We should mention here first the phenomenon which has become common in our day -- overindulgence in words, the most frightful time-killer. We Bulgarians are talkative people. Even if the zero effect of the time-equivalent of words cannot always be measured precisely, there is one area where idle talk is amenable to being reckoned . . . telephone calls.

In the developed countries of the world a local telephone call lasts an average of two minutes; in our country they last six minutes. The figures are quite eloquent, but we could make them even more telling . . . with the help of arithmetic. If we assume that in a working day a person makes five telephone calls, each of six instead of two minutes, the result is 20 minutes wasted in empty talk. Now to be sure, they are not always empty talk. We may also call them unessential. But either way, they are superfluous: no more than two or three minutes are required for a business call. Thus it follows that 100 minutes are wasted per week on the telephone, or 85 hours during the working days of the year. . .

In 85 hours in our country about 7225 radio receivers, 5610 TV sets come off the conveyor, nearly 1,615,000 meters of woolen fabrics are woven, 860,625 pairs of shoes are manufactured. . . But let us not overdo figures.

All the more so since we could not accuse the creators of those figures of directly frittering away the conjectural 85 hours. There are no telephone sets alongside lathes or looms, but in offices. But nonetheless this irretrievably lost time could be turned to account.

If we continue with our arithmetic, we encounter almost astronomical figures. In the capital city's private branch exchanges alone there are 96,000 numbers. If each of these stations squanders 20 minutes every day, the innocent expenditure of time on PBX's would amount to 8,160,000 hours in a year. We would not undertake to specify in this event how many things could be produced in this time. But what might not get done in these millions of hours?!

The ruthless exploitation of the telephone in our country is also illustrated by other figures. According to international rating, one station should generate from 800 to 1200 calls a year. Here, too, we are "over the world level." We go as high as 16,000-17,000 calls -- a number that cannot help affecting quality. This inconceivable number of calls impedes the operation of telephone exchanges. The latter are calculated for a certain number of connections, just as a bridge is calculated for loads of limited tonnage.

Let nobody erroneously interpret our words as a kind of justification of the telephone communications in our country. No, we are far from such a position and we would prove this at once -- again with figures. In the developed countries 70 out of 100 local calls are completed with conversation. Subscriber errors come to 10-12 percent. In our country barely 30-40 calls (out of 100) are completed with conversation. For Sofia this figure is 45-50 to 55. At the end of the five-year plan with the reconstruction and modernization of the Sofia telephone network, it is expected that 60 calls (out of 100) will be completed with conversation. In international communications, 12-20 calls are successful instead of 65. Here we will already have a little difficulty in speaking of a world level. And inevitably we will have to use the words "effectiveness" and "quality" which have become so popular during the five-year plan. But with a minus sign in front. A primary concern of the Ministry of Communications is to make this sign a plus by increasing the carrying capacity of the entire communications system.

Let us get back to what we were saying. And that was the matter of economizing. Economizing on the time which slips away imperceptibly on the telephone and which we could convert into material form.

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## BULGARIA

### BULGARIA'S CONTRIBUTION TO STUDY OF RADIO COMMUNICATIONS

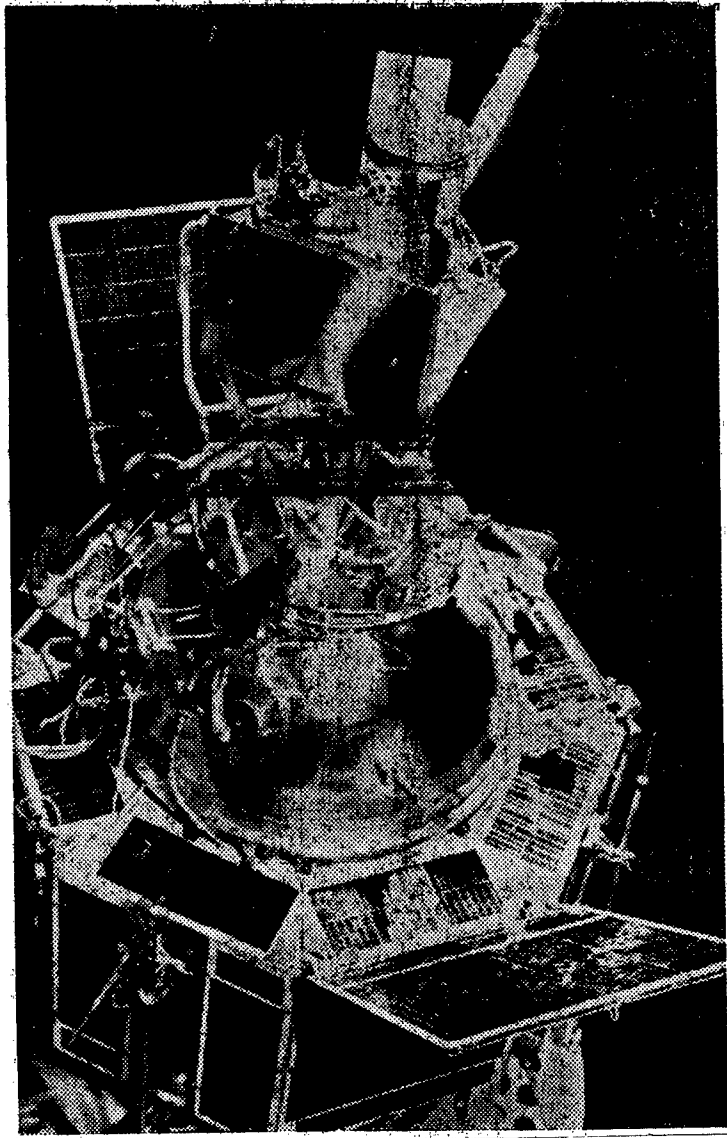
Sofia VECHERNI NOVINI in Bulgarian 3 Sep 77 p 6

[Article by Prof. Dr Kiril Serafimov, corresponding member of the International Academy of Astronautics: "Space and Radio Forecasting -- Correction Made by Bulgarian Scientists; Our Achievements of Great Significance for Study of Ionosphere; Research of High Scientific and Practical Value"]

[Text] Everyday a powerful radio transmitter broadcasts radiowave-propagation forecasts for the next 24-hour period. Every month our specialized journals publish data on radiowave propagation and forecasts of future short-wave communication conditions for monthly periods. For various needs plans are in preparation for radio networks and a radio path for long-range future time intervals. Thus in our country, too, use is made of data on the circumterrestrial electrified space, the ionosphere, in order to compile radiowave propagation forecasts.

The Geophysics Institute and the Central Space Research Laboratory of the Bulgarian Academy of Sciences make such radio forecasts of various long-range conditions -- from daily to yearly forecasts. In addition, intensive research activity is conducted, the aim of which is to elevate forecasting accuracy, encompass more, hitherto unforecast conditions in the prediction process, and coordinate the obtained results dynamically with newly arising practical needs.

The principal basis of our radio forecasts is the data obtained at two vertical ionosphere sounding stations near Sofia and Michurin. In addition, data from our ionospheric observatories at Sofia and Vitosha are used, as well as information from the Zurich Solar Activity Observatory. Recently, for specific cases (for example, for communications with space objects), forecasting also includes data from ionospheric measurements by specialized Interkosmos-2, 8, 12 and 14 and OGO-4 and 6 satellites. This modernizes and improves the bases of radio forecasts.



Interkosmos-12 artificial earth satellite. Operating successfully on board is Bulgarian space equipment, by which valuable scientific results have been obtained by direct investigations of structural parameters of ionospheric plasma.

## Optimum Operating Frequency and Maximum Useable Frequency

Of special interest are the new results we have obtained in our country in the area of forecasting regarding relations between so-called optimum operating frequency and maximum useable frequency. The latter is the highest radio frequency (i.e., the shortest wave) that can be used along a given radio path or in a desired radio network. But the use of this maximum frequency involves certain risks because of random variations of ionospheric parameters. Heretofore it was assumed that ionospheric values in their random variations conform to the so-called normal (Gaussian) distribution. But a number of Bulgarian investigations prove that there are significant deviations from the normal distribution. If this is true, the best (optimum) radio-communication frequency is about 15 percent lower than that most often used. Given deviations from the normal distribution, the ratio between optimum and maximum frequency varies. The new changed ratio was the object of our investigations. It was found that the relationship between optimum and maximum frequency has daily, seasonal and sun-cycle variations. These variations have been studied in our country on the basis of data from a number of European and Bulgarian ionospheric stations, and dependences and corresponding formulas for determination of optimum operating frequency under all kinds of conditions have been derived.

It is especially interesting that, given high solar activity, the optimum operating frequencies are not only 15-percent lower, but sometimes as much as 21-percent lower values than the maximum frequencies.

## Correction of Radio Communication Conditions

As can be seen, this significantly corrects radio communication conditions and creates opportunities for more accurate and dynamic allowance for the ionosphere's real reflectivity

For further sharp improvement of radio forecasts and radio-path planning, we must study the relations between the portion of the ionosphere probed by the ionospheric stations and the higher unprobed ionosphere (which is investigated for the most part by satellite rockets). In this area our specialists are striving, according to satellite and ground-based data, to create fairly accurate ionospheric models, which will be the foundation for a qualitative improvement of radio forecasting.

Satellite ionospheric data can be obtained by vertical sounding with flying, orbiting ionospheric stations or through measurements of electron and ion concentrations at the point of the satellite's flight. Ionospheric sounding by satellite now solves almost all applied problems, but it is very expensive and therefore is employed on a very limited scale. Satellite measurements of local electron and ion concentrations are more practical, but give only individual points of the complex ionospheric structure. Since we conduct such satellite measurements, much work is under way

in our country to combine them successfully and rationally with information from the ionospheric stations and with night-sky luminescence measurements in order to obtain the structure of the outermost ionosphere, which is not probed from earth. Ionospheric models will thus be improved, and more accurate data for radio forecasting will be obtained.

With these theoretical and experimental studies, our science is helping to improve the quality of radio communications and radio traffic and at the same time is participating in the world process of multifaceted and extensive utilization of information about circumterrestrial space for practical purposes.

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HUNGARY

LONG DISTANCE TELEPHONE NETWORK TO BE EXPANDED

Budapest NEPSZABADSAG in Hungarian 28 Aug 77 p 1

[Text] At a press conference on Saturday at the Mihaly Pollack Technical College--within the scope of the 9th National Postal Conference--Dezso Horn, deputy minister and Postal Service managing director, reviewed the most important tasks facing the Postal Service. Arpad Pullai, minister of transportation and postal affairs, was also present. Among other things he said that by 1981, they will open 3 telephone zone exchange centers and another one by 1982. The new automatic letter sorting equipment will probably be placed in operation by next year at Post Office #78. The final organization of the construction area of the Postal Service Center is continuing as well as the approval of the development goal.

The deputy minister said that the most important tasks lie in the long distance communication lines. Presently, there are 1,100,000 installed instruments in Hungary and that this is too few is shown among other things by the fact that the postal service maintains a list of 200,000 requesters for telephones. They will not be able to create a balance between the demands and the possibilities for a long time. The Post, however, wants to make sure that the population accomplishes its most important telephone conversations. So in addition to the proposed development of the exchange centers, they will speed up the expansion of the public telephone network. Within the time frame of the plan, in addition to the development of the exchange centers in Budapest, they will expand and update telephone exchange centers in 12 additional cities. Up to now, 144 cities and more significant settlements have been connected to the national long distance network. Long distance communication has been established for subscribers with 24 countries. In the coming years both services will be expanded. One more interesting item from the press conference: the number of TV subscribers now equals that of the number of radio subscribers, in fact, it even exceeds [the latter] in some counties.

CSO: 2500

ARGENTINA

CONSTRUCTION BEGINS ON ELECTRONICS EQUIPMENT PLANT

Buenos Aires LA OPINION in Spanish 2 Sep 77 p XIV

[Text] In the presence of the secretary of state for communications, Brig Gen Alberto Vicente Nieto (ret), the administrator general of ENTEL [National Telecommunications Company], Brig Gen Eduardo Oscar Corrado, the director of the Superior Technical School of the Army, Brig Gen Jorge Horacio Croce, Italian Ambassador Dr Enrico Carrara and national, municipal and business leaders, the first portion of the Telettra Argentina SAIC factory [expansion unknown] was opened in Campana, Buenos Aires Province. The factory is a foreign investment for the production of communications equipment.

It is a model establishment which brings to the country the original technology of Telettra of Italy, a company of the Fiat group, whose home office is in Milan.

The investment program for the coming years amounts to approximately \$2 million, basically in an industrial plant of 8,600 square meters, of which 1,000 square meters have been fitted out with electronic equipment, initially for the production of multiplex telephonic or frequency modulation equipment.

The multiplex equipment permits the simultaneous transmission of up to 960 voice channels (telephonic) by microwave in radio linkage systems. For example, this equipment will be used for interurban telephone communications through radio links between Buenos Aires-Rosario and Cordoba-Campo Duran.

Also planned is the production of PCM telephone mutiplex equipment, a new technique that permits the transmission of up to 30 channels (communications) along a single pair of wires, that is, 30 simultaneous communications where only one can be handled at present, without the need for installing additional cables.

At the ceremony in Campana the president of Telettra Argentina, Juan Rossi, pointed out the significance of the investment because of the incorporation of advanced technology for the plans of ENTEL and for the large domestic companies that require communications by means of radio links.

The director-general of Telettra of Italy, Dr Mario Zanfi, said that this is one more demonstration of confidence in the future of Argentina.

For his part the secretary of communications, General Alberto Vicente Nieto, emphasized the great importance assumed by Telettra since the beginning of its operations in 1946 in the field of communications on a worldwide scale and said that its participation in the national communications program was an auspicious sign.

After the blessing of the new factory, which was in charge of the bishop of Zarate and Campana, Alfredo Mario Esposito Castro, the authorities and special guests toured the installations and heard descriptions of the functioning of the modern equipment.

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CSO: 5500

BRAZIL

PROTECTIONISM AND MINICOMPUTER MANUFACTURING DISCUSSED

Maintenance of Protectionist Policy

Rio de Janeiro JORNAL DO BRASIL in Portuguese 1 Sep 77 p 21

[Text] Brasilia--The president of the Brazilian Computer Corporation S.A. [DIGIBRAS] and the executive secretary of the Electronic Data Processing Activities Coordinating Commission [CAPRE], Messers Wando Borges and Ricardo Saur, respectively, in a deposition to the Commission on Science and Technology of the Chamber of Deputies, that lasted almost 3 hours, yesterday defended the maintenance "for a long time," of a policy of protection of the national computer industry, the only means they consider practical for confronting the "dumping" capability of the multinationals in that field.

"A careful analysis would show the pseudocompetitiveness of the market if the government were to allow great international corporations to operate side by side under conditions of laissez-faire with the small Brazilian companies engaged in the effort of developing national technology," said Ricardo Saur, for whom the support of Congress and public opinion to the present policy of the government for the area of computers "minimizes the danger of it being aborted."

Lack of Interest

The CAPRE executive secretary, who spoke after the testimony by Wando Borges, said that when the commission was created and when the first studies were developed by the Ministries of Planning and the Navy, identifying the area of minicomputers as the most suitable for a national effort in the field of data processing (1972/1973), "the multinationals installed here, including IBM, the largest of them, declared themselves not interested in participating in this effort, when consulted on the subject."

The president of DIGIBRAS had revealed that the growth of the Brazilian computer installations has only been exceeded by that of Japan and the prospects of an average annual growth of between 20 and 30 percent up to 1980, permits one to foresee that by that date there will be more than 15,000 computer center installations in the country. "Brazil will begin the decade of 1980 as one of the main world markets for data processing and that explains all the activity today by the multinationals in their attempts to participate more actively in this market," explained Ricardo Saur.

#### Support

To a question by Deputy Getulio Dias (Brazilian Democratic Movement-Rio Grande do Sul) on whether there is the danger that all of the government policy on data processing could be changed, the CAPRE executive secretary, as well as the president of DIGIBRAS, replied affirmatively. "It is basic, therefore, that the mechanisms for the protection of national industry remain for a long time until it acquires sufficient maturity to confront the competition of the multinationals with great competitive power and ability to practice 'dumping'," emphasized Wando Borges.

Ricardo Saur then added that the support by Congress and public opinion for this policy is basic for minimizing the danger that it will be aborted. "This support does not depend on party lines and government decrees because it is a matter of a national interest," he said.

The Rio Grande do Sul legislator then asked whether the decision by IBM of halting production of data processing tapes in Campinas (Sao Paulo), is not in the form of a reprisal because of the difficulties posed by the Brazilian government to its entry into the minicomputer market.

Wando Borges said he believes that such decision is due to purely business reasons but Ricardo Saur reported that deactivation of the IBM tape activity--whose exports, according to him, were made almost internally, that is, to its subsidiaries in other countries--is causing them to renege on some contracts in the country. IBM is now facing difficulties in importing them," he said.

#### Multinationals Have Little Chance

Brasilia CORREIO BRAZILIENSE in Portuguese 10 Sep 77 p 7

[Text] The multinational corporations which are bidding alone for one of the two vacancies for the manufacture of minicomputers in Brazil, have little chance of obtaining them, it was revealed yesterday in Brasilia by a source of CAPRE. "It would be naive to believe that the government would deliver the national minicomputer market to a foreign company gratuitously," indicated the informant.

Next Tuesday, CAPRE President Elcio Costa Cauto will hold a meeting with the other representatives of the organization for a preliminary examination of the 16 plans presented. "However," according to the source, "some of the plans are so incomplete that they will not withstand that preliminary examination." One thing is definitively certain, according to the federal official: the plans which do not foresee research activity in the area of minicomputers will be automatically eliminated.

#### Own Technology

The reason for this is that it is the government's intention that if two national companies are selected, they will contract for foreign technology only once, then going on to develop their equipment with their own technology. The member of CAPRE cites the case of COBRA, the state company in the field, as an example to be followed by the other companies that may be selected. The contract for providing technology which it has with the Japanese corporation Saiko, will not be renewed because Cobra became skilled in developing similar equipment in its laboratories.

The statements made by the CAPRE informant give to understand that the best plans with the greatest chances of being selected are those of Maico (a partnership of the Nogueira Garcez Group with the Basic Four) and that of Edisa (a partnership of small and medium Rio Grande do Sul companies with participation of the state government), which in addition to capital, have the conditions for developing their own technology.

"However," said the CAPRE informant, "we are going to make "on the spot" examinations of all the statements made in the plans to check on the veracity of the information provided. One of the plans, which will be carefully examined, will be the one presented by Hidroservice in partnership with J.C. Mello, which reports that it has already developed a completely national technology in the manufacture of minicomputers."

#### Criteria For Selection in Bidding

Rio de Janeiro O GLOBO in Portuguese 14 Sep 77 p 22

[Text]Brasilia (O GLOBO)--"Any plan, regardless of who controls the capital, has the chance of being selected." This is one of the points of the official note published yesterday by the president of CAPRE, Elcio Costa Couto, after the meeting for the first analysis of the 16 plans competing for the two vacancies opened by the government for the manufacture of minicomputers in the country.

#### Note

This is the text of the CAPRE official note:

1. As it was already revealed last Thursday, 8 September, in response to the invitation made by the government through CAPRE, 16 companies interested in manufacturing minicomputers in the country presented plans.

The attached list indicates the name of the company, the nature of its share holdings and the source of the technology proposed in the plan.

2. The appropriateness of the government policy in opening the possibility of participation in the market for two more companies (in addition to Cobra--Brazilian Computers Inc of national capital and control), through a type of competition among those interested can be seen because:

A. The proliferation of companies in the field is avoided and the danger of predatory competition is eliminated;

B. The interest and the possibility of national businessmen entering the field is obvious;

C. The possibility that other companies, including foreign companies, could produce minicomputers in the country is maintained;

D. The various technological alternatives now existing will allow the country a selection which is more adequate for the national interests (mainly in terms of transference of technology).

3. CAPRE intends to analyze the plans and proposes to name the best by the end of the year. It has already formed a permanent task force for analyzing them which consists of persons from CAPRE (coordinator) of DIGIBRAS and the National Patent Institute [INPI].

4. In terms of requirements, the basic orientation will be selection of the "two best plans," which means that the basic criterion will be the intrinsic value of the plan, keeping in mind its technological adaptation, its financial status, quality of the product, conditions of the transfer of technology, ability to compete in the market (cost of production, quality of the product, final price, technical assistance to the user and so forth).

Under those circumstances, any plan regardless of who controls the capital, has the chance of being selected.

5. The criteria described in Resolution No 5 of the Economic Development Council [CDE] (national control, better technological availability, solvency in foreign credits, greater percentage of national manufacture, share in the market) shall be observed and will weigh heavily in the final decision, benefitting the plan which in addition to its intrinsic value, adheres to them in a greater degree.

Plans presented to CAPRE on 08/09/77 for the manufacturing of minicomputers:

Foreign Companies

Source of Technology

Hewlett Packard	Mother Company
Olivetti	" "
Four Phase	" "
NCR	" "
Burroughs	" "
IBM	" "
TRW	" "

Partnerships

Maico Ltd--Foreign minority partner (Basic Four).  
National Companies  
Protodata/ISDRA--Purchase contract (Philips).  
Sharp/Inepar/Dataserv--Purchase contract (Logabax).  
Edisa S.A.--Purchase contract (Fujitsu).  
Elebra S.A.--Purchase contract (Honeywell--CII).  
Ifema S.A.--Own development.  
Hidroservice/J.C. Mello--Own development.  
Docas de Santos--Purchase contract (NEC).  
Labo Eletronica Ltda--Purchase contract (Nixdorf).

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## JAMAICA

### SEAGA STATEMENT SCORES PLAN TO STRANGLE FREE SPEECH

FL091550Y Kingston DAILY GLEANER in English 7 Sep 77 pp 1, 13 FL

[Excerpts] Opposition leader Edward Seaga charged yesterday that the government's decision to appoint a government-nominated directorate for Radio Jamaica, was the "critical move in a four-part master plan by government to strangle its critics and assassinate free expression in Jamaica."

Following is the text of the statement:

The decision of the government to appoint a government-nominated board of directors for Radio Jamaica for a "one year period in the first instance" is the critical move in a four-part master plan by government to strangle its critics and assassinate free expression in Jamaica.

The four-point PNP master plan was revealed by me in a statement published in the DAILY GLEANER on July 30, 1975, over two years ago. This master plan is the standard communist strategy to seize control of the free press and was first mooted in the PNP just after the official visit to Cuba in July 1975. It calls for four steps to be taken, as revealed in my statement of July 1975, and as re-stated here:

- (1) Acquisition of control of RJR;
- (2) Withdrawal of government economic support for the DAILY GLEANER;
- (3) Transformation of JBC into a propaganda mouthpiece of the government;
- (4) Establishment of a government newspaper.

In regard to these four steps, the public should note that in addition to the announced establishment of a government board to run RJR as made by the prime minister on Sunday night, the opportunity was also used by the prime minister to openly confirm the government's decision to starve the DAILY GLEANER of all economic support on the grounds that it is against democratic socialism.

The public is already aware of the transformation of JBC into a propaganda arm of the government's API.

All that remains to completely fulfill this four-part master plan on which I warned two years ago is the establishment of a government newspaper, signs of which are beginning to emerge for those who are carefully following other developments with the daily press.

The acquisition of foreign-owned shares of RJR is not a point of contention with the opposition since this succeeds in bringing RJR into Jamaican ownership and the opposition Jamaica Labour Party was the author of the policy of the Jamaicanisation of foreign interests commencing 8 years ago.

What is totally unacceptable to the opposition is the running of RJR by a government-appointed board, and no formula which provides for direct or indirect political control of RJR by any political party will be acceptable to the opposition and should ever be acceptable to the people of Jamaica.

The government must be required by the nation to move immediately to set up a national committee reflecting all interests which will work out within 30 days a formula for public ownership and control of RJR which will completely prevent any direct or indirect political influence in the operation of the station.

If this is not done then the nation must be prepared to confront the government in a manner which will positively demonstrate without any doubt whatsoever that freedom of speech in a non-negotiable article of life in this country and on no account and by no means will the nation accept government control of the free broadcasting medium and strangulation of the free press.

A free RJR is vital to the survival of a free Jamaica. It is the ears of the multitude of workers, farmers and all who comprise the great majority of this country who get their news by radio rather than the press.

A government-controlled RJR will ensure that the multitude of Jamaicans will hear only the news which the government allows the people to hear. A government-controlled RJR will allow a suitable climate of hostility to be created to effectively strangle the DAILY GLEANER, and complete the demise of the half-strangled DAILY NEWS.

It is worth repeating here my warning of July 1975, that the result of these moves if the people of Jamaica allow them to be implemented, is that the only news which will reach the public is news which the government wants the people to hear or read. Under such circumstances no one will ever know of failures, mismanagement, corruption, dictatorship or brutality which may occur in the country.

Not even the most addicted supporter of the PNP could tolerate life in a country in which death, corruption, brutality, mismanagement could be effectively hidden from the people, because there would be no need for a government to fear or respect anyone if it had the power to commit any act and successfully hide it from the people.

No opposition could function in such a society, whether it be political opposition or those who voice their dislike of any act of government. Under such circumstances a political party could entrench itself in power for all times by stifling the voice of all opposition and by propagandising at will.

We have already seen the handiwork of the PNP government in this respect in malicious propaganda exercises using parliament, JBC, and API, to understand that we are dealing with a government which if given the chance will mercilessly control and shackle freedom of speech to the point where it can vengefully deal with anyone and everyone who is not in total support of its policies, giving gruesome effect to the dictum of the PNP that if you are not a supporter then you are an enemy.

Under such circumstances every Jamaican would be forced to revalue his future and the future of the country and make desperate decisions in the interests of survival.

EXPANDING COMMUNICATION SERVICES DISCUSSED BY MINISTER OF POST

Jiddah 'UKAZ in Arabic 4 Sep 77 p 3

[Interview with 'Alawi Darwish Kayyal, the Minister of Post, Telephone and Telegraph, by 'Abd-al-'Aziz al-Sharif; Ten Artificial Satellite Stations in Kingdom to Facilitate Telephone Communications; Mobile Telephone Centrals, Each with a Capacity of 1,000 Lines To Handle Increased Contacts by Pilgrims from Holy Places"]

[Excerpts] His Excellency Dr 'Alawi Darwish Kayyal, the minister of post, telephone and telegraph, has talked to 'UKAZ about the ministry's projects in the various fields. His Excellency said that telephone, telegraph and telex communications in the kingdom have become among the most important mainstays of the kingdom's development operation. His Excellency also spoke about the automatic telephone, the telex and the artificial satellite projects which seek to serve the citizens and to enhance domestic and international communications and also to serve the pilgrims and the visitors to the holy Ka'bah. Following is the text of the interview:

[Question] Your ministry has made vast strides in various important projects in the kingdom's different provinces. What are the ministry's most important projects that are being implemented this year to offer better services to the citizens?

[Answer] Forgive me, but we don't say that they are vast strides. We say that they are modest strides and we implore God to give us success in exerting greater efforts for more projects to realize the country's prosperity and the citizen's welfare, considering that telephone, telegraph and telex communications have come to be among the most important fundamental mainstays in the development operation.

All the projects being implemented by the ministry seek to facilitate and improve the communications service and to spread this service at the broadest level in order to meet the needs of all the citizens. In view of the fact that the element of speed in this respect is of extreme importance, attention is being devoted to the speedy performance of services.

We now have several projects to achieve this objective:

First, the project to expand the current networks and to increase the number of telephone lines. A total of 72,200 additional lines are being currently installed in 23 towns throughout the kingdom. The expansion projects provide for increasing the number of telephone lines in the kingdom by 470,000 lines that are to be completed before the end of the current five-year plan. The envelopes [containing the tenders] for this enormous expansion will be opened on 27 September 1977, God willing.

Second, the mobile centrals project. We have concluded contracts providing for the supply of 28 mobile centrals, each with a capacity of 1,000 lines. The distinguishing feature of these centrals is that they can meet any urgent demand in any place. They are like first aid and rescue units at emergency times. In pilgrimage seasons, these centrals can have extremely important effect in handling the constantly increasing [communications load] and in meeting the pilgrims' urgent needs in the holy places and shrines.

Third, the artificial satellite stations project. We now have four artificial satellite stations and preparations are underway to build 10 satellite stations in the kingdom. It is probably important for me here to point out with pride what the kingdom, along with its Arab sisters, has achieved within the framework of the Arab League in regard to setting up the Arab Space Communications Organization and in selecting Riyadh as the headquarters of this organization. The main control station of the organization's artificial satellites is also in the kingdom.

Fourth, the most important project at present--after the pivotal cable project which linked the cities in the western, central and eastern provinces with each other through the automatic telephone system--is the project to link all the kingdom's cities and villages with each other automatically through the microwave project. This project will include 100 percent of the kingdom's cities and 95 percent of its villages. It will be implemented within 2.5 years and the first two connections between Riyadh and al-Qasim and between Abha and al-Ta'if will be received and put into operation in 16 months. This project is important for developing communications in the kingdom because it will enable 10,000 people to use the lines simultaneously, without finding any of the lines busy.

With the completion of these projects, with the use of the latest equipment and apparatuses and with the sincere efforts of the workers, better services that are satisfactory to the citizens will be realized.

Fifth, we also have the project to expand and increase the telex lines so that they may reach 5,600 lines by the end of 1398 of the hejira. The increase and expansion will continue until the number of lines reaches 15,000 by the end of the development plan.

In respect to the post, postal services are being expanded and developed. A project to establish three main postal centers in Riyadh, Jiddah and al-Dammam, which are the centers of weight insofar as these services are concerned, will be shortly submitted for an international bid in order to handle the postal services automatically and to surmount the problems of the shortage of labor and to offer better and quicker services to the citizens.

#### Cooperation with Morocco

[Question] Your Excellency has visited the fraternal Morocco. Could you please give us a clear idea about the most important results of this visit?

[Answer] I did actually pay an official visit to the fraternal Kingdom of Morocco in the month of Rajab at the invitation of the Moroccan minister of telecommunications. The most important results of this visit are probably the strengthening of the relations of fraternity and friendship and bolstering the bonds of cooperation between the two kingdoms and their peoples generally and between the telecommunications administrations of the two countries. A joint statement was issued on the results by both sides. Moreover, [agreement was reached on] the operation of a direct line between Morocco and the Kingdom, on the exchange of expertise and on the formation of a joint Saudi-Moroccan committee which will meet annually in Riyadh or Rabat to define the work program.

#### Expansion of Telex

[Question] May I ask Your Excellency about your ministry's plan to spread the use of the telex in all areas of the kingdom? When does Your Excellency expect this coverage to be completed and what line capacity will the telex [system] have when it is actually ready for operation?

[Answer] Automatic telex centrals have been set up in Riyadh, al-Dammam, al-Khubar, Jiddah, al-Ta'if and Medina. Work to set up telex centrals in Mecca and Yanbu' is about to be completed. We currently have 1,100 telex lines which will amount to 5,600 lines in 1398 of the hejira. The ministry seeks to increase the telex centrals so that they may be able to absorb 15,000 lines by the end of the current development plan. Thus, this service will spread in all parts of the kingdom, God willing, and will meet the needs of all the citizens and of all the cities and villages, if necessary.

#### Decentralization of the Services

[Question] Does your ministry's plan provide for giving broad powers to the undersecretaries and to the directors of the automatic telephone service in the provinces and in the various cities of the kingdom and do you think that these services will perform the required duties?

[Answer] The ministry adopts the system of decentralized services and this is why it gives broad powers to the undersecretaries and to the provincial directors of telephone, telegraph and postal services so as to achieve

flexibility in handling the work. There is no doubt that the delegation of these powers to the officials in charge in the cases permitted by the regulations achieves the desired objective of making quick decisions and of meeting the work requirements.

[Question] The postal services are currently engulfed by some vagueness. This is evident in the deteriorating postal services and in the delay in mail delivery. When, God willing, will best services be provided and is it the intention of the ministry to use modern equipment to improve the postal services?

#### No Delay in Mail Delivery

[Answer] Regarding the deteriorating postal services and the delay in mail delivery in recent months, the matter was beyond the post's control and was due to several inevitable factors, the most important probably being the shortage of national manpower, the numerous vacancies in the job of mailmen and mail sorters in particular and the inability of the service to handle the big increase and the enormous flow of mail from all parts of the world. Though the work continued day and night, the volume of the mail was still much bigger than the effort exerted and this is why some mail accumulated and why there was delay in its delivery. Neither I nor the postal service succumbed to or were content with the situation. A quick solution had to be found for the problem. The approval of the Civil Service Commission had to be obtained to bring in contract workers for the job of mailmen and mail sorters because it was not permitted at the time to bring in contract workers to fill the vacant positions. In view of the need, the commission agreed and contract workers were brought from the fraternal Egypt, Sudan and Jordan. These workers arrived last month to make up for the shortage and to handle the situation in the three major centers that constitute the main points for receiving mail from abroad--namely Riyadh, Jiddah and al-Dammam. It has thus been possible, God be praised, to control the situation and to eliminate the delay.

I can now say on the basis of the reports I have and on the basis of my visits to the work sites that the postal service has overcome the tribulation and has risen above the problem. The phenomenon of delay in mail delivery has come to an end, God be thanked, and I am no longer receiving complaints about delays. I hope that with the efforts, alertness and cooperation of all the postal officials and workers, what has happened will not recur so that the interests of the citizens may be safeguarded and the reputation of the postal service and of its workers may be preserved.

#### Surprise Visits to Postal Centers

I have given my instructions to his excellency the post's director general, to the Inspection Directorate, to the provincial directors and to the postal centers to follow up the progress of work constantly to make sure that the mail is delivered as quickly as possible and that the post's plan of delivering

mail between the cities within 24 hours is reinstated. I will personally pay surprise visits to the postal centers to familiarize myself with the progress of work on the spot. The citizens have probably already felt an improvement and will still feel greater improvement and will realize that the delay problem has ended. I welcome any complaint about delay, should there be any. The envelope containing the delayed letter should be attached to the complaint so that the proper investigation may be conducted.

#### Increasing Telephone Lines

[Question] Concerning the automatic telephone, what is Your Excellency's opinion on the ministry's recent announcement about increasing the telephone lines and about extending the initial work period? Is the ministry inclined to find a quick solution to this problem in the major cities?

[Answer] I believe that the answer to your first question also covered the answer to this question. It should not be forgotten that the ministry is exerting maximum efforts to find solutions to all the problems of services through studies and planning. However, studying and planning the solutions is one thing and implementing the solutions is something else that requires time, capabilities, budgetary allocations and the cooperation of the companies selected in implementing the operations on schedule and so forth. We hope that our problems will end with the implementation of the plan's projects on schedule.

#### Artificial Satellite Stations

As for the latest decisions of the ministry regarding the use of artificial satellites for telephone communications, I have already told you that we now have four artificial satellite stations in Riyadh, al-Ta'if, Buraydah and Abha. The ministry is exerting efforts currently to build 10 more stations in various parts of the kingdom. The kingdom is a member in the International Artificial Satellites Organization (INTELSAT).

However, the great accomplishment of which the Arabs are proud is that they have founded the Arab Space Communications Organization, whose headquarters is in Riyadh, to use space networks for communications through the Arab artificial satellites. It has been decided that the kingdom will be the main headquarter for the central station controlling these Arab satellites. The kingdom is the biggest founder and beneficiary from the services of this organization which will bear fruit in the field of communications as soon as its foundation is completed, its projects implemented and its satellites launched.

#### Direct Contact With Arab Countries

[Question] There are extremely important projects, such as the project for direct contacts with the Arab countries and other countries. What are your ministry's most important projects in this regard?

[Answer] Direct contact has become a necessity required by the importance and the development of communications in societies. This is why the projects to set up direct communications with the Arab countries and other countries are important and necessary. We have already initiated direct communications with Kuwait via the al-Dammam-Kuwait pivotal cable. The kingdom has also been connected with Bahrain via the microwave network through which telephone traffic is transferred to the fraternal and neighboring Gulf countries. As for setting up this direct contact through pivotal marine cables, the studies have again turned toward more economic solutions. It has become evident from studies that the most convenient means for establishing direct communications is through the use of the microwave networks. This is insofar as the Arab countries are concerned. As for direct contacts with the European and American countries, the matter requires, as I have already said, the conclusion of bilateral agreements and technical preparations to insure implementation on a sound basis. A committee has been formed under the chairmanship of his excellency the ministry's undersecretary for telephone affairs to go to London in a few days to conclude a preparatory agreement for direct contacts by participants from the kingdom.

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CSO: 5500

## REVIEW OF 'ORBITA' SATELLITE COMMUNICATION SYSTEM

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, 1977 Inside Front Cover, p 40

[Text] The space telecommunication system 'Orbita' has been in operation in the Soviet Union for almost 10 years. When it was commissioned in October 1967, our press noted that the communication satellite, which can "see" and beam on a third of the earth's surface, can become the only required intermediate station for effecting communication between any two however distant points, including the whole territory of our country.... It is when relaying to almost inaccessible regions, over natural obstacles--oceans, mountains and the taiga--that the economic effect is especially great.

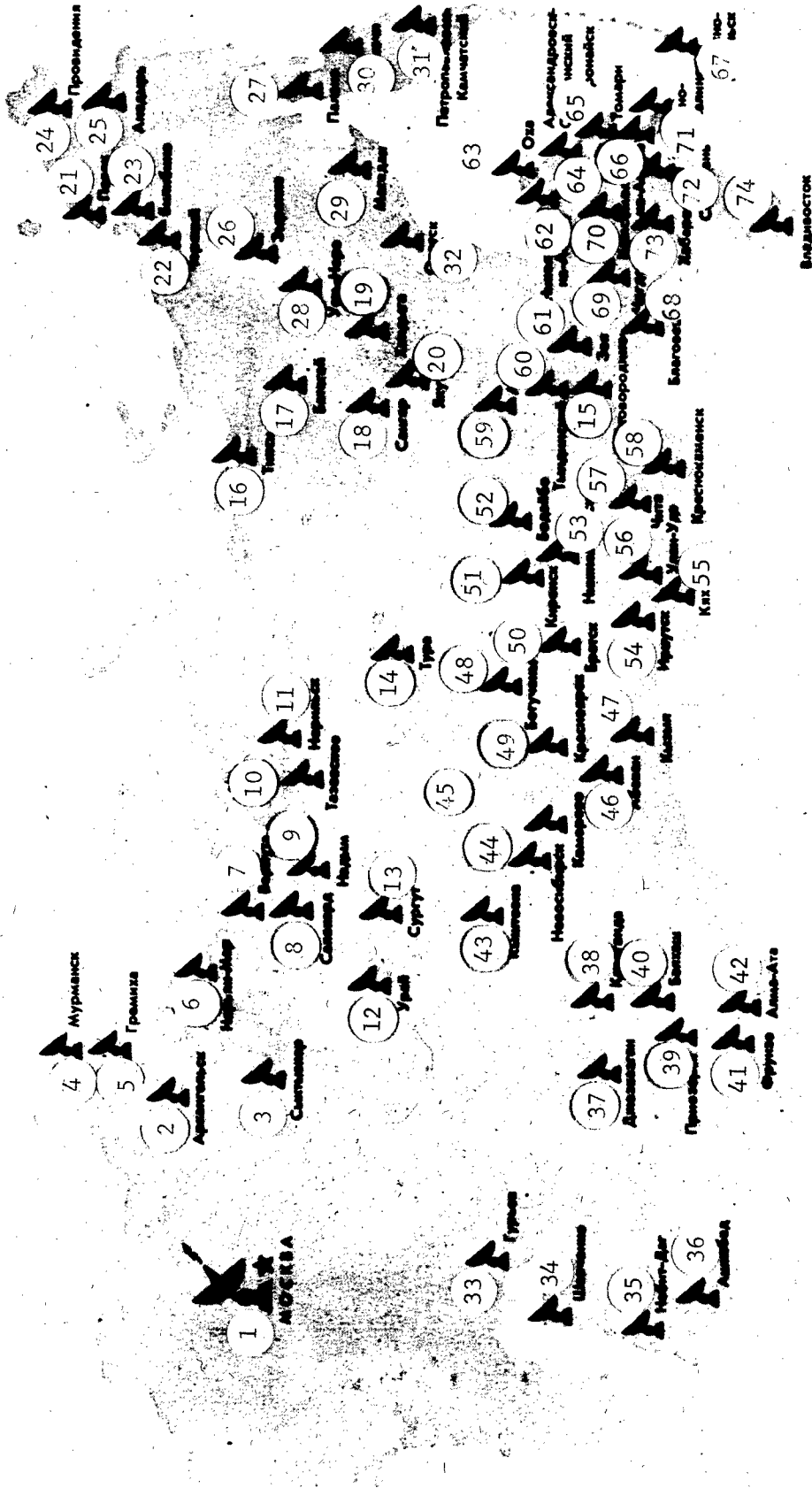
In the mid sixties, television had spread to the Baltic republics, the Caucasus, the Crimea and beyond the Urals, but the viewers in a number of regions of Siberia, the Far East, the Central Asia and the Far North, however, would have been still deprived of watching direct transmissions from Moscow for years to come, were it not for the rapid development of cosmonautics.

Take a look at the map. The first couple of dozen of ground stations for receiving television signals from communication satellites were built in Kemerovo, Magadan, Yakutsk, Yuzkno-Sakhalinsk and in other cities of Siberia and the Far East. Now there are more than 70 of these stations.

Now tens of millions of people living in a vast territory thousands of kilometers away from Moscow can watch daily the transmissions of the USSR Central Television. The blue screens lit up in the homes of hunters of the Koryakskiy National Okrug, Tyumen' petroleum workers, Yakutiya diamond miners, Sakhalin fishermen, and Chukotka trappers. The 'Orbita' system, with its ability to reach the outermost regions, has justly earned the gratitude of viewers.

However, a modern long-range space radio-communication system is more than just relaying the programs of Central Television. A space telecommunication line has a large number of channels for relaying telephone calls, telegrams, teletype messages, photographs, including newspaper type pages.

Orbit Satellite Communication System Map



Key:

- |                 |                                   |                                    |
|-----------------|-----------------------------------|------------------------------------|
| 1. Moscow       | 26. Zyryanka                      | 50. Bratsk                         |
| 2. Arkhangel'sk | 27. Palana                        | 51. Kirensk                        |
| 3. Syktyvkar    | 28. Ust'-Nera                     | 52. Bodaybo                        |
| 4. Murmansk     | 29. Magadan                       | 53. Nizhneangarsk                  |
| 5. Gremikha     | 30. Klyuchi                       | 54. Irkutsk                        |
| 6. Nar-yan-Mar  | 31. Petropavlovsk-<br>Kamchatskiy | 55. Kyakhta                        |
| 7. Vorkuta      | 32. Okhotsk                       | 56. Ulan-Ude                       |
| 8. Salekhard    | 33. Gur'yev                       | 57. Chita                          |
| 9. Nadym        | 34. Shevchenko                    | 58. Krasnokamensk                  |
| 10. Tazovskoye  | 35. Nebit-Dag                     | 59. Aldan                          |
| 11. Noril'sk    | 36. Ashkhabad                     | 60. Tyndinskiy                     |
| 12. Uray        | 37. Dzhezkazgan                   | 61. Zeya                           |
| 13. Surgut      | 38. Karaganda                     | 62. Nikolayevsk-na-Amure           |
| 14. Tura        | 39. Priozersk                     | 63. Okha                           |
| 15. Skovorodino | 40. Balkhash                      | 64. Aleksandrovsk-<br>Sakhalinskiy |
| 16. Tiksi       | 41. Frunze                        | 65. Poronaysk                      |
| 17. Batagay     | 42. Alma-Ata                      | 66. Tomari                         |
| 18. Sangar      | 43. Kyshtovka                     | 67. Yuzhno-Kuril'sk                |
| 19. Khandyga    | 44. Novosibirsk                   | 68. Blagoveshchensk                |
| 20. Yakutsk     | 45. Kemerevo                      | 69. Chegdomyn                      |
| 21. Pevek       | 46. Abakan                        | 70. Komsomol'sk-na-Amure           |
| 22. Cherskiy    | 47. Kyzyl                         | 71. Yuzhno-Sakhalinsk              |
| 23. Bilibino    | 48. Boguchany                     | 72. Sovgavan'                      |
| 24. Provideniya | 49. Krasnoyarsk                   | 73. Khabarovsk                     |
| 25. Anadyr'     |                                   | 74. Vladivostok                    |

In the Ninth Five-Year Plan period, in addition to 'Molniya-1' communication satellites, 'Molniya-2' and 'Molniya-3' satellites with higher carrying capacity were put into operation. They operate in the centimeter band. These satellites became the backbone of the 'Intersputnik' international communication system. The new communication satellite 'Raduga' used for transmission was launched into circular equatorial orbit about 36,000 km above the earth, its angular velocity being equal to the rotational speed of the earth. A geostationary satellite of this kind will be stationary relative to the observer on earth.

During the Tenth Five-Year Plan period, telecasting will supposedly become available practically to all the population of our country. The decisions of the 25th CPSU Congress stipulate wider use of earth's satellites, primarily to provide telecasting to Western and Eastern Siberia, as well as telephone and telegraph communication with remote regions of the country.

On 26 October 1976, a telecasting satellite 'Ekran' was launched into orbit. It represents an entirely new generation of repeater satellites. It ensures the relaying of color and black-and-white programs of Central Television to a network of ground communal antennas. Also, the receiving equipment is a comparatively simple converter device.

The achievements of Soviet science and technology have opened the way for transition from single-channel telecasting via 'Molniya' type communication satellites to three-channel telecasting, which also makes use of the 'Raduga' communication satellite.

With the introduction of the three-channel telecasting of 'Orbita' program via satellites, the inhabitants of the Far East, Siberia, the Central Asian republics, Kazakhstan and the Far North are able to see the first all-Union program of Central Television at a more convenient time.

The 'Orbita-1' program is beamed to the areas of the country located in the time zones which are 10, 9 and 8 hours ahead of Moscow time (Chukotka, Kamchatka, Sakhalin and the Magadan Oblast).

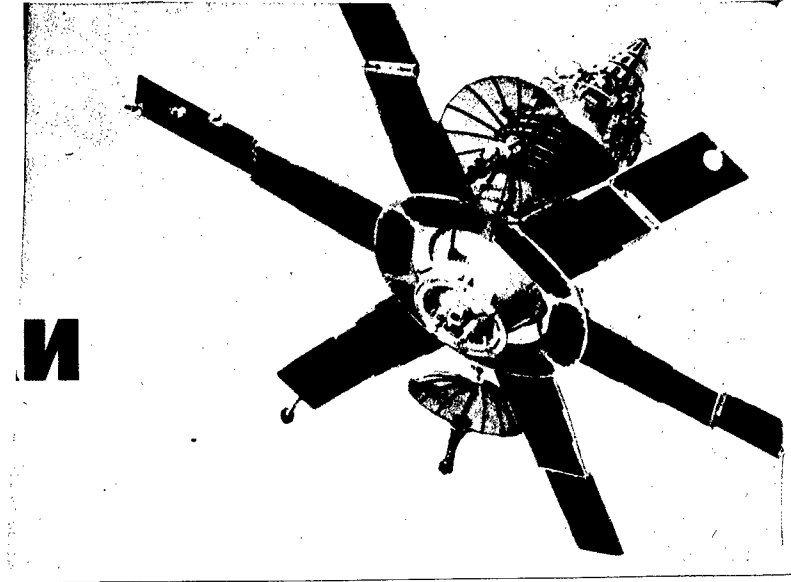
The 'Orbita-2' program is relayed to the regions of Eastern Siberia and the Far East which are 5, 6 and 7 hours ahead of Moscow time (the areas of Primor'ye, the Khabarovskiy Kray, the Yakutskaya ASSR, the Amurskaya Oblast and the Chitinskaya Oblast, the Buryatskaya ASSR, the Irkutskaya Oblast and the eastern part of the Krasnoyarskiy Kray). And, finally, the 'Orbita-3' program is intended for the areas of Western Siberia, Altay, Kazakhstan and the republics of Central Asia that are 4, 3 and 2 hours ahead of Moscow.

The first program of Central Television is relayed in full via each of these satellites.

The fourth program of Central Television is telecast from 1900 hours Moscow time to the viewers in the areas of Western Siberia, Kazakhstan and the Central Asian republics living in the zone of 'Orbita' receiver stations, as well as in the northern regions of the European part of the country. The program is available to people living in Arkhangel'sk, Murmansk, Vorkuta, Syktyvkar, Ashkhabad, Surgut, Karaganda, Frunze and Alma-Ata.

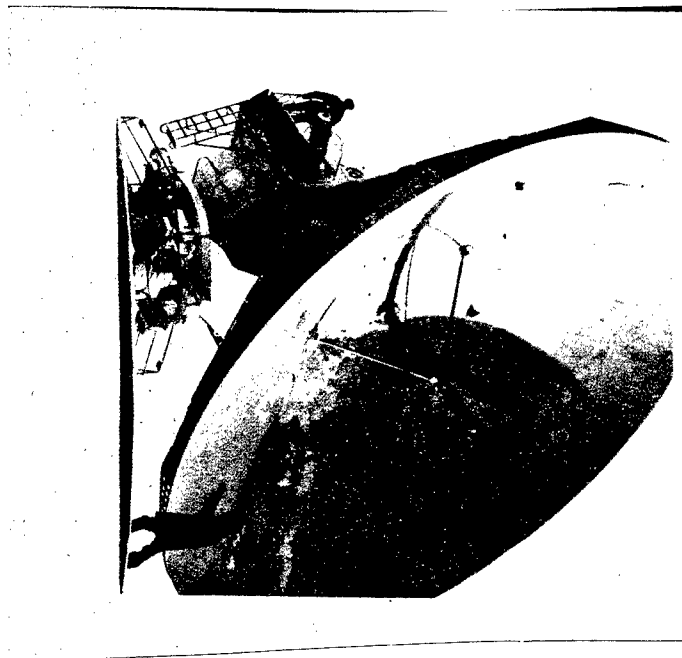
The 'Orbita' system will continue to be developed and improved. In the field of television, the plan for the Tenth Five-Year Plan calls for further widening of the stable reception zone, a considerable increase in the number of regions relaying two-program and color television and improved operation of relaying equipment. Twenty new 'Orbita' stations are earmarked for construction, first of all to provide television to a number of regions in Western and Eastern Siberia, as well as in the Far North.

Photo Appendix



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FRANCE

CIT-ALCATEL TELEPHONE SALE TO EGYPT NOTED

Paris LE MONDE in French 8 Sep 77 p 32

[Unattributed article: "CIT-ALCATEL Sells Two Complete Telephone Systems to Egypt."]

[Text] The French telecommunications equipment company CIT-ALCATEL (of the General Electric Company group) has just obtained a contract in Egypt. It will deliver two complete telephone systems for the Nile delta and the southern part of Cairo, including notably four E10 "temporal" exchanges. They amount in all to 19,000 lines, with a possibility of extension to 60,000 lines.

This contract, valued at 55 million francs, was obtained at the end of a consultation in which eight construction contractors had taken part. CIT-ALCATEL had already supplied Egypt a few months previously with two small "private" exchanges worth 35 million francs. To date, the company has delivered a total of a dozen E10 exchanges, amounting to some 160,000 lines, according to the "temporal" technique: Morocco, Malta, Ivory Coast, Mauritius, Mexico, North Yemen. License agreements for local manufacture have been signed with Poland and Syria. Negotiations are in progress for the sale of E10 exchanges, accompanied by possible sale of license, with Finland, South Africa, and Lebanon. Lastly, CIT-ALCATEL is participating in the Greek PTT's call for bids.

Compared to the fabulous contracts now being negotiated in Saudi Arabia, Iran, and South America, this Egyptian contract may seem modest. However, it makes it possible for CIT-ALCATEL and the French "temporal" network, developed, it should be remembered, by the National Center for Telecommunications Research (CNET), to score a point in the struggle being waged by major builders to impose their products and their technology on the world market.

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CSO: 5500

FRANCE

BRIEFS

RADIO BROADCAST POWER INCREASE--Beginning in October, the Radio Popular de Bilbao, known as "la voix d'Euskadi" [the Voice of the Basques] by the Basque nationalists, will increase its broadcast power so as to be heard in Bordeaux. It will also broadcast a daily news program in French and in Basque. [Text] [Paris LE POINT in French 26 Sep 77 p 67]

CSO: 3100

GREECE

OTE PROMISES 'CLEAN' TELEPHONE CALLS

Atenss ELEVTHEROTYPIA in Greek 10 Aug 77 p 6

[Text] The government has definitely decided to use electronic technology in the country's telecommunications. This means that we shall abandon standard telephone calls and that we shall also leave behind:

--The present unacceptable situation in telephone connections, as, for instance, unintentional overhearing of conversations, lengthy voids, unnerving buzzing, etc.

Furthermore, electronic technology will ensure that:

--Requests for new telephone connections will be met to a very large extent, since the OTE [Greek Telecommunications Organization] centers will acquire an unlimited number of new lines.

A factory controlled by the state will be established in order to apply electronic technology and will manufacture electronic telecommunications materiel. Already, according to reliable sources:

--Premier Kon. Karamanlis has authorized the ministers of coordination, finance and communications, as well as the ETVA [Hellenic Industrial Development Bank] management, to initiate in common the planning for the procedure through which the state factory will be established.

As a result, the procedure for an international solicitation to select the electronic technology to be used in the new factory will start soon.

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END