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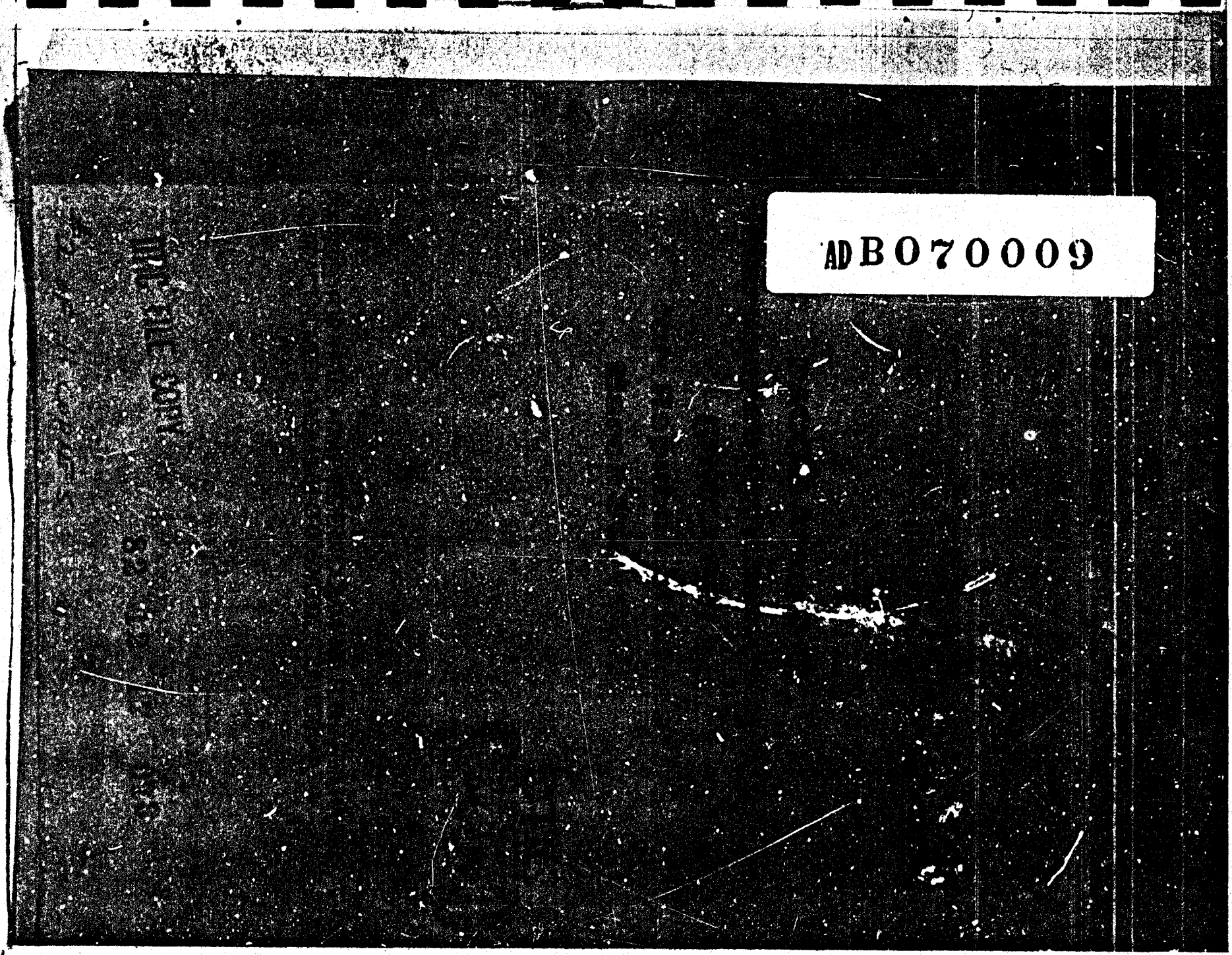

THE BDM CORPORATION

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PACOM ARMY C-E INTEROPERABILITY ASSESSMENT 82 (PACIA 82) FOR: REPUBLIC OF KOREA

(FINAL REPORT)

March 30,1982

BDM/W-82-154-TR

Prepared for the U.S. Army Western Command, Ft. Shafter, Hawaii
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a. Provides description of major indigenous communications systems in Korea;

b. Assess interoperability of indigenous communications systems with those of the United States during the 1982-1985 and 1986-1990 time frames, and c

c. Recommends possible enhancements to interoperability between indigenous and US communications systems.

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FOREWORD

This draft report contains a compilation of the major civilian and military communications networks operated by the Republic of Korea (ROK). The report covers both the current time period and projections for the 1986-1990 time-frame. This data is intended to enhance the U.S. Government's readiness for quick response to a ROK request for communications-electronic (C-E) support in the event of national disasters and/or civilian requests for assistance. An overall assessment of the interoperability of the ROK communications networks with those of the United States DCS and TRI-TAC systems is presented. Recommendations are given for overcoming identified technical deficiencies.

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CHAPTER I
NARRATIVE ASSESSMENT

A. EXECUTIVE SUMMARY

This report contains a compilation of the major indigenous civilian and military communications networks operating in the Republic of Korea (ROK) and assesses the interoperability of these networks with those of the United States DCS and TRI-TAC systems. The data reported in this volume were acquired from a number of U.S. Government Agencies, CONUS technical libraries, and equipment manufacturers. Sixty percent of the reference documents cited were published within the past two years (1980-1982), twenty percent within the preceding three years (1977-1976), and the remaining twenty percent within the preceding six years (1971-1976). No documents were used that were published prior to 1971.

There are six major ROK communications networks applicable to this study. These are: (1) the Ministry of Communications (MOC) civilian telephone system, (2) the Korean National Railroad (KNR) system, (3) the Korean Electric Power Company (KEP) network, (4) the Korean National Police (KNP) system, (5) the ROK Army (ROKA) network, and (6) the ROK Air Force (ROKAF) "Peace Fortune" communications network.

BDM was directed by the U.S. Army to include the TRI-TAC system for this study even though it is not currently deployed in Korea. As detailed in this chapter, the current MOC digital short-haul trunks are interoperable with the digital portions of the DCS but not with TRI-TAC. The current MOC analog long-haul trunks are not directly interoperable with TRI-TAC. DCS data which has entered the digital MOC trunk can be transmitted across the current MOC analog long-haul circuits, utilizing existing MOC digital/analog/digital conversions. The current ROK Army and Air Force networks are interoperable with MOC telephone system. Therefore, in the event of a crisis, the U.S. Army can access the MOC civilian network via the alternate routing (60 channels) which DCS has through the current

ROKA system. The U.S. Army can enter into the ROKAF network at Seoul, Osan, Kunsan and Yongmunson. The current KNR, KER and KNP are all analog FDM/FM transmission systems. Both U.S. systems could conceptually interoperate with these networks provided suitable electronic hardware interfaces are developed. The U.S. Army can access the current KNR electromechanical and cross-bar type switching network via the MOC civilian network.

The ROK communication networks will retain much of their current technical characteristics in the 1986-1990 time-frame. However, during that time-frame, TRI-TAC will be developing a Digital Transmission Interconnection (DTI) to permit interconnection of TRI-TAC switches through bulk transmission facilities of the DCS. This development will make TRI-TAC interoperable with the ROK civilian and military networks as well.

B. BACKGROUND

1. International Standardization

It is desirable that one communication system be able to communicate with another, and so standardization of signalling procedures is necessary. Standardization exists within countries, however, many different incompatible signalling systems exist in different countries. The Consultative Committee on International Telegraphy and Telephony (CCITT) has standardized a number of signalling systems for general use in international automatic and semi-automatic switching networks. These are designated by serial numbers 3, 4, 5, 6 and 7. For this report, systems No. 5 and 6 are of special interest. System No. 5 is the international in-band system for two-way operation. It uses two frequencies, 2400 Hz and 2600 Hz, for link-by-link supervision; and two-out-of-six frequencies (700, 900, 1100, 1300, 1500 and 1700 Hz) for addressing. System No. 6 is the international system designed for digital two-way signalling over a common channel. The digital signals may be transmitted over a quasi-analog channel at 2400 b/s or over digital channels derived from the Pulse Code Modulation (PCM) multiplexer at 4 kb/s. The North American Common Channel Interoffice Signalling (CCIS) system is

similar to System No. 6. The differences noted are largely due to the fact that the system No. 6 was developed for use internationally, whereas CCIS is being implemented for domestic use in the U.S. on toll networks. A comparison between North American T-1 carrier rates and European CCITT T-1 rates is shown in Table I-1.

2. Relation With DCS and TRI-TAC Systems

Near-term DCS equipment is not interoperable with TRI-TAC and European CCITT recommended T-1 systems at their digital group rates. Interfacing of orderwires poses problems, as does signalling from one system to the other. The various characteristics are summarized in Table I-2.

C. CURRENT ASSESSMENT

1. Introduction

There are currently six indigenous communications networks operating in the Republic Korea (ROK). These are briefly discussed below.

a. Ministry of Communications (MOC)

The MOC is responsibile for the complex civilian telephone system and its associated microwave and cable transmission system. The vast majority of the long-haul circuits are transmitted as standard analog microwave FDM/FM using Collins radio equipment. Many of the short-haul trunks are now digital PCM utilizing the North American T-1 standard (Northern Telecom equipment, and others). Telephone signaling is generally CCITT #5 except for the international circuits to Japan and the United States which are CCITT #6. The MOC also provides telegraph, telex and data communications which are integral to the telephone network, primarily using voice grade channels. There is a network of coaxial cables linking many of the larger cities, most of which are FDM/FM carrier systems. The MOC operates three satellite ground stations as part of the INTELSAT organization. The most recent electronic telephone switching equipment (ESS No. 3 and ESS No. 4) is being supplied to Korea by the Western Electric Company. Older switching equipment which is still in use, includes semi-automatic BTM-ITT (Metaconta-IOCN), electro-mechanical NEC and Siemens (Strowger and EMD), and crossbar

TABLE I-1. COMPARISON BETWEEN NORTH AMERICAN AND CCITT RECOMMENDED DIGITAL CARRIER

PARAMETER	NORTH AMERICAN T-1 CARRIER SYSTEM	EUROPEAN CCITT CARRIER SYSTEM
Sampling Rate	8000/S	8000/S
Modulation	PCM (8 Bit)	PCM (8 Bit)
Companding	μ255 law	A-law
Bits/time slot	8	8
Bits/frame	193	256
Bit duration	0.6479μ s	0.4882μ s
Time slot duration	5.181μ s	3.9056μ s
Frame duration	125μ s	125μ s
Bit rate	1544 kb/s	2048 kb/s
Voice channels/frame	24	30
Bit rate/channel	64 kb/s	64 kb/s
Signalling scheme	1 bit borrowed in 6th frame	16th channel dedicated
Signalling rate	1.300 b/s per channel	2000 b/s per channel
Synchronization	Overhead bits	CCIS
Conditioning	Bal. NRZ/ Bipolar (AMI)	Bal. NRZ/ Bipolar (AMI)

TABLE I-2. DIGITAL MULTI-CHANNEL CHARACTERISTICS

PARAMER	DCS	TRI-TAC	CCITT RECOMMENDED T-1 RATE
Channel rate	64 kb/s	16/32 kb/s	64 kb/s
Modulation technique	PCM (8 bit)	CVSD	PCM (8 bit)
Signalling	Interleaved	CCIS (Overhead)	In channel/CCIS
Conditioning	Bal. NRZ/ Bipolar	Unbal. NRZ Diphase Dipulse Bipolar	Bal. NRZ/ Bipolar (AMI)
Synchronization	Overhead bits	CCIS	CCIS
Closest group rate	1544 kb/s	576 kb/s (18 ch.)	2048 kb/s (32 ch) (30 + 2 Overhead)
Encoding law	μ 255 law	CVSD	A-law

(Fujitsu). The MOC also provides limited tropo-scatter radio and cable circuits to Japan.

b. Korean National Railroad (KNR)

The government-owned KNR is under the Ministry of Transportation and operates its own communications network to support its rail operations. At present there are 61 telephone exchange centers utilizing electro-mechanical and crossbar switching systems. There are 7 microwave sites and 8 terminals using Motorola 300-channel FDM/FM, 2 GHz radio multiplex equipment.

c. Korean Electric Power Company (KEP)

The KEP operates a communications network consisting of 10 microwave sites. The system utilizes NEC 300-channel FDM/FM equipment operating in the 6.5-6.9 GHz frequency band. Typical characteristics of the microwave equipment are given in Table I-3.

d. Korean National Police KNP)

The KNP communications network consists of 9 microwave sites operating in the 6.6-6.9 GHz freqeuncy band. The network uses Motorola 300-channel FDM/FM equipment. Typical characteristics of the microwave equipment are given in Table I-3.

e. Republic of Korea Army (ROKA)

The ROKA microwave communications network consists of 16 major sites utilizing Collins Radio Company FDM/FM equipment. Sixty channels are available to the DCS for alternate routing purposes. The ROKA network is interoperable with the MOC civilian network.

f. Republic of Korea Air Force (ROKAF)

The ROKAF microwave communications network, also known as the "Peace Fortune" system, includes over 30 fixed sites. It provides the primary support for Korean air defense. The USAF has access to the ROKAF network on a routine and on an alternate basis in the event of DCS failure. U.S. entry into the ROKAF system can be accomplished at Seoul, Osan, Kunsan, and Yongmunson.

TABLE I-3. TYPICAL CHARACTERISTICS OF KNP AND KEP MICROWAVE EQUIPMENT

	(KNP) Motorola TR-30/300	(KEP) NEC TR-7CD300-7
Transmitter Characteristics:		
Power Output:	1 watt (30 dBm)	1 watt (30 dBm)
Spurious Emission Attenuation:	100 dB	100 dB
Modulation Type:	F9	F9
Theoretical Emission Bandwidth:		
3 dB	6 MHz	6 MHz
20 dB	90 MHz	90 MHz
50 dB	190 MHz	190 MHz
Receiver Characteristics:		
Minimum Acceptable Signal:	-79 dBm	-79 dBm
IF Selectivity:		
3 dB	20 MHz	15 MHz
20 dB	35 MHz	35 MHz
40 dB	40 MHz	40 MHz
Waveguide Filter Selectivity:		
3 dB	35 MHz	35 MHz
40 dB	90 MHz	90 MHz
100 dB	240 MHz	240 MHz
Spurious Response:		
Rejection (Minimum):	80 dB	80 dB
Image Rejection:	100 dB	100 dB

2. Interoperability Assessment

a. MOC Telephone/Microwave Network

Table I-4 shows the key technical parameters required to assess the current interoperability between the MOC system and the current US DCS and TRI-TAC systems. The following observations can be made:

(1) The MOC digital short-haul trunks are interoperable with the digital portions of the DCS but not with TRI-TAC.

(2) The MOC analog long-haul trunks are not directly interoperable with TRI-TAC. DCS can interoperate with MOC at the local end office/toll office digital trunk (same channel and group rate). Therefore, DCS data which has entered the digital MOC trunk could be transmitted across the existing MOC analog long-haul circuits, utilizing MOC digital/analog/digital conversions.

(3) The current TRI-TAC system is not interoperable with any MOC link without first being converted to analog channels or groups. Modulation, signaling, synchronization, conditioning, and encoding are not compatible and would have to be converted.

b. MOC International Gateways (Satellite)

The MOC INTELSAT earth stations are, by design, interoperable with the U.S. commercial network. The MOC has provided for CCITT #6 telephone switching at its ground support toll exchanges for compatibility with the U.S. and Japan. Since DCS is compatible with the U.S. commercial network, it follows that DCS is also compatible with the MOC earth stations and MOC telephone network. TRI-TAC is not compatible with the MOC gateways.

c. KNR, KEP, and KNP Networks

The DCS and TRI-TAC systems are not directly compatible with the KNR, KEP and KNP communications networks since these Korean systems are all analog FDM/FM transmission systems. On a case-by-case basis, both U.S. systems could be interoperable with these networks provided that a suitable digital to analog transformation was made at the channel or group rates. Signaling could remain as a problem but not enough data is currently available to fully assess this aspect.

TABLE I-4. INTEROPERABILITY ASSESSMENT (CURRENT)

PARAMETER	CURRENT DCS *	CURRENT ** TRI-TAC	CURRENT MOC	
			SHORT-HAUL TRUNKS	LONG-HAUL TRUNKS
Channel Rate	64 KBPS	16/32 KBPS	64 KBPS	4 KHz (analog)
Group Rate	1544 KBPS (24 Ch)	576 KBPS (18 Ch)	1544 KBPS (24 Ch)	96 kHz (24 Ch)
Technique	PCM (8 bit)	Delta Modulation (CVSD)	PCM (8 bit)	FDM/FM
Signaling	Interleaved	CCIS (Overhead)	Interleaved	Common Channel
Synchronization	Overhead Bits	CCiS	Overhead Bits	N/A
Conditioning	Balanced NRZ/ Bipolar	Unbalanced NRZ/Diphase, Dipulse, Bipolar	Balanced NRZ/Bipolar	N/A
Encoding Law	μ - law = 255	CVSD	μ - law = 255	N/A

* Portions of DCS in Korea are PCM (Reference 4).

** TRI-TAC is not presently deployed in the Republic of Korea.

d. ROKA and ROKAF

The ROKA network is interoperable with the MOC telephone system. The DCS has an alternate routing through the ROKA system and therefore, also has connectivity to the MOC civilian network. The ROKAF network also provides USAF and DCS access for alternative routing. No major technical issues are outstanding.

e. Telex and Data Communications

By international convention, the transmission of telex (teleprinter) data is standardized and is therefore compatible with U.S. equipment. Within the MOC network, virtually all telex and data communications are contained within voice grade channels (4 kHz analog or 64 KBPS digital). This situation lends itself to fast access by a variety of users and poses no interoperability problems of consequence.

D. FUTURE ASSESSMENT

1. Introduction

The following sub-sections highlight the ROK planned communications upgrades which will have an impact upon U.S. interoperability in the 1986-1990 time-frame.

a. Ministry of Communications (MOC)

The MOC civilian telephone network will have increased utilization of electronic switching systems (ESS) and PCM transmission in its short-haul toll/gateway exchanges. The predominant long-haul transmission media will remain analog (FDM/FM). The local telephone exchanges will continue to utilize a high percentage of the older electronic, electromechanical and crossbar switching systems. No separate telex or data communications networks are planned. The MOC will have its fourth satellite earth station operational as part of the INTELSAT organization.

b. KNR, KEP, and KNP Networks

The Korean railroad, electric power and police networks are expected to add some additional circuit terminals and repeater sites. How-

ever, these plans will not affect overall circuit capacities or technical characteristics. Specifically, they are all expected to remain FDM/FM, 300-channel systems.

c. ROKA and ROKAF Networks

The Korean military communications systems are anticipated to remain largely unchanged in the 1986-1990 time-frame. They are expected to be comprised of multi-channel analog FDM/FM transmission systems tied to DCS compatible switches. There are no known plans to convert to digital PCM transmissions.

2. Interoperability Assessment

As discussed in the preceding section, the ROK communications networks will retain much of their current technical characteristics in the 1986-1990 time-frame. However, during that time-frame TRI-TAC will be developing a Digital Transmission Interconnection (DTI) to provide interconnection of TRI-TAC switches through bulk transmission facilities of the DCS. This interface device will make TRI-TAC interoperable with the ROK civilian and military networks as well. Table I-5 shows the interoperability parameters of the future DCS, proposed TRI-TAC and future MOC systems. The fact that the MOC long-haul transmissions are expected to remain analog does not pose a significant problem assuming entry to the indigenous network is made through a digital short-haul trunk or international gateway.

In the 1986-1990 time-frame, a large number of Ground Mobile Forces (GMF) satellite equipment is expected to be in operation. These terminals will be designed primarily for tactical use, and their interfaces are therefore compatible with TRI-TAC equipment. This would enable the U.S. Army communication network to be linked with Korean military and civilian networks via the DCS. In the same time-frame, AN/TSC-86 satellite communication terminals will be fielded to enhance the transmission capability at Echelon Above Corps. The AN/TSC-86 has no inherent limitations with respect to the type of traffic it can support -- for which it provides circuits and interfaces which comply with U.S. military standards. Thus, in the 1985-1990 time-frame, GMF satellite equipment and AN/TSC-86 terminals will have very significant contribution towards the interoperability between the U.S. Army systems and ROK civilian and military networks.

TABLE I-5. INTEROPERABILITY ASSESSMENT (FUTURE)

PARAMETER	FUTURE DCS	PROPOSED TRI-TAC*	FUTURE MOC	
			SHORT-HAUL TRUNKS	LONG-HAUL TRUNKS
Channel Rate	64 KBPS	64 KBPS	64 KBPS	4 KHz (analog)
Group Rate	1544 KBPS (24 Ch)	1544 KBPS (24 Ch)	1544 KBPS (24 Ch)	96 kHz (24 Ch)
Technique	PCM (8 bit)	PCM (8 bit) (as converted)	PCM (8 bit)	FDM/FM
Signaling	Interleaved	Interleaved	Interleaved	Common Channel
Synchroni-zation	Overhead Bits	Overhead Bits	Overhead Bits	N/A
Conditioning	Balanced NRZ/ Bipolar	Balanced NRZ/ Bipolar	Balanced NRZ/ Bipolar	N/A
Encoding Law	μ - law = 255	μ - law = 255	μ - law = 255	N/A

* Assumes proposed TRI-TAC interfaces are implemented.

E. POTENTIAL FUNCTIONS OF KOREAN CIVILIAN AND MILITARY COMMUNICATIONS NETWORKS IN CRISIS SITUATIONS

1. Introduction

Korean civilian and military communications networks may be utilized for initial warning, coordination, and recovery operations during crisis situations. Some Korean civilian and all Korean military communications networks are interoperable with U.S. military networks. In these cases, the U.S. military in Korea can directly participate in crisis situation operations.

2. Civilian Communications Networks

The largest civilian communications network is operated by the MOC. This network is interoperable with U.S. military communications networks in Korea and so all MOC network crisis functions could be carried out via the U.S. military networks. The first function of the MOC network is that of initially warning government officials and the public of a crisis situation. Once this task is begun, proper emergency coordination is essential so as not to compound the problems being faced. The MOC communications network would be used to permit key emergency coordination officials and agencies to properly respond to the particular crisis situation. For example, in the event of a major earthquake, the police department, fire department, transportation department, electric company, and hospitals should respond as soon as possible and carry out their individual responsibilities for this particular crisis. In order to assure timely response, other civilian communications networks such as the KNP, KNR, and KEP networks could also be utilized.

The KNP communications network could be used to coordinate the crisis response of the police department. Primary functions of the police would include civilian security and aid in civilian evacuation.

The KNR communications network could be used by the Korean Ministry of Communications to coordinate civilian evacuation from the

crisis area; transport emergency medical, food, and clothing supplies; and to transport members of security forces, both KNP and military, to aid in crisis response. In addition, ambulance service could be coordinated via the combined MOC and KNR communications networks.

The KEP communications network could function as a checking mechanism for the electrical dependent portions of the MOC, KNR, and KNP networks to see which links are operable for crisis response utilization.

All Korean civilian communications networks could be utilized for coordination of crisis recovery functions such as temporary housing and disaster assistance.

3. Korean Military Communications Networks

The ROKA and ROKAF communications networks are completely interoperable with the U.S. forces communications networks, thus both Korean and U.S. military networks could fulfill identical crisis functions. These functions are much the same as those of the civilian communications networks. However, the primary function of the military communications networks would be to provide coordination of physical security forces responding to the crisis situation.

4. Conclusion

The MOC, KNP, KNR, and KEP civilian communications networks carry out initial warning, coordination, and recovery operations during crisis situations. The ROKA and ROKAF communications network carry out the same functions; however, these networks primarily focus their efforts on coordination of physical security forces. THe U.S. military communications networks in Korea can interact with the crisis situation functions of the MOC, ROKA, and ROKAF networks, should the need arise, because each of these networks are interoperable.

F. RECOMMENDATIONS

The overall conclusions drawn from the analysis of the ROK communications networks vis-a-vis interoperability with the U.S. Army systems are:

(1) DCS and ROK networks are interoperable currently at toll/gateway exchanges (channel and group level), and

(2) TRI-TAC is currently not interoperable with either the DCS or ROK networks.

It is therefore recommended that the U.S. Army develop the aforementioned electronic interfaces for TRI-TAC that will enable interoperability with DCS, and consequently with the ROK switching centers. As recommended in the January 1980 USACC White Paper on "Communications Interoperability and Network Evaluation," the proposed TRI-TAC interface should:

(a) Interface DCS and TRI-TAC at the digital channel and group rates,

(b) Interfaces DCS (and TRI-TAC) to both North American PCM and European PCM,

(c) Convert TRI-TAC framing and signaling from its overhead channel to the DCS IN-band technique, and

(d) Convert the TRI-TAC delta modulation format to 8-bit PCM.

Furthermore, BDM recommends that the U.S. Army consider the transmission of PCM (pulse code modulation) over the existing ROK FDM/FM microwave radio network. Electronic equipment is commercially available (e.g., GTE Lenkurt) to accomplish this type of transmission. This type of equipment is capable of transmitting 48 PCM channels over most frequency modulated microwave radios. The U.S. Army could use this field tested technique to interoperate with the Korean FDM microwave network on a short term basis.

CHAPTER II
COMMUNICATIONS MANAGEMENT STRUCTURE

A. CIVILIAN COMMUNICATIONS MANAGEMENT

1. Overview

Communications in Korea are largely dominated by the government Ministry of Communications (MOC). The only exceptions are the military, the police, the railroads, the electric company, and certain other agencies that have their own networks. A law has been proposed to put all national communications networks under the MOC to avoid duplication.

2. Domestic Telecommunications

The MOC performs the following functions and provides for the following domestic services:

a. telephone services
b. telex services
c. leased circuits
d. sale/maintenance of modems, terminals and equipment
e. data processing services.

Figure II-1 depicts the organization of the Ministry of Communications. As is readily apparent, the majority of the headquarters and subordinate organizations are related to domestic affairs. The offices most relevant to this study are:

(1) Communications Engineering Policy,
(2) International Cooperation Officer,
(3) Planning Bureau,
(4) Telecommunications Bureau, and
(5) Electric and Communications Laboratory.

The MOC headquarters are located in Seoul (154-1 Seoulin-dong, Chong-ku, telephone 70-4787). The Domestic Telecommunications Division is located in the headquarters building (telephone 73-0969).

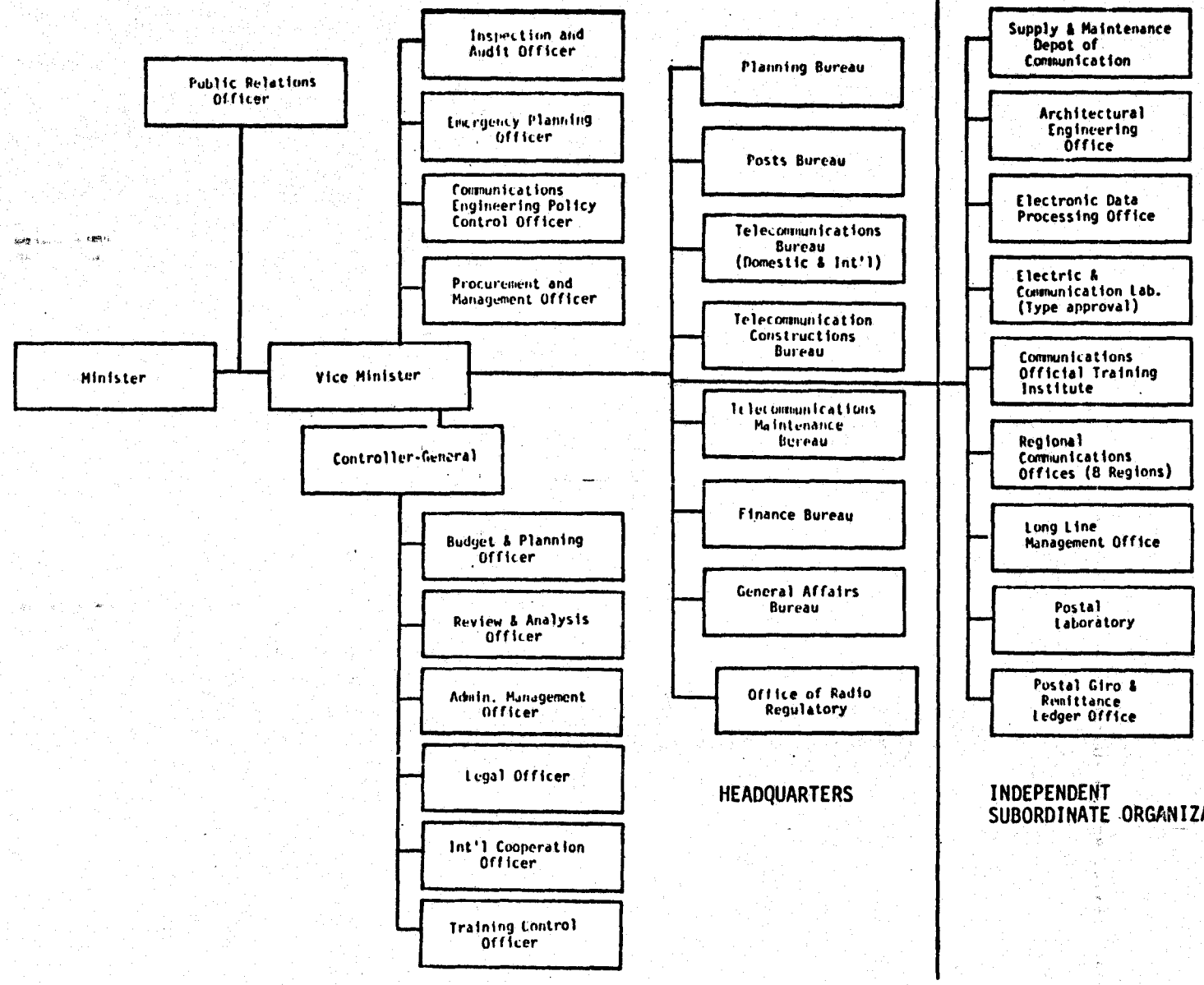

Figure II-1. ORGANIZATION OF THE MINISTRY OF COMMUNICATIONS

3. International Telecommunications

Organizationally under the MOC's Telecommunications Bureau is the International Telecommunications Division (also known as the Korean International Telecommunications Office (KIT)). KIT provides the following international services:

a. telephone services
b. telex services
c. leased circuits.

Figure II-2 shows the KIT office organization. The functions of each subdivision are also shown on the figure. The KIT office is located in Seoul in a different building from that of the MOC domestic division (200-16 Soongin-dong, Chongio-ku, telephone 70-3930).

B. MILITARY COMMUNICATIONS MANAGEMENT

The three Korean military services (ROKA, ROKAF, and ROKN) manage their communications structure through the Director of Communications and Electronics Bureau of the Joint Chiefs of Staff in coordination with the Ministry of Communications. Although the MOC is not presently chartered to directly manage the frequency assignments, etc., for the military, there is general agreement amongst the high level Korean civilian and military leaders that such coordination is prudent to avoid potential electronic interference problems. Figure II-3 shows the organization of the Korean military communications management structure.

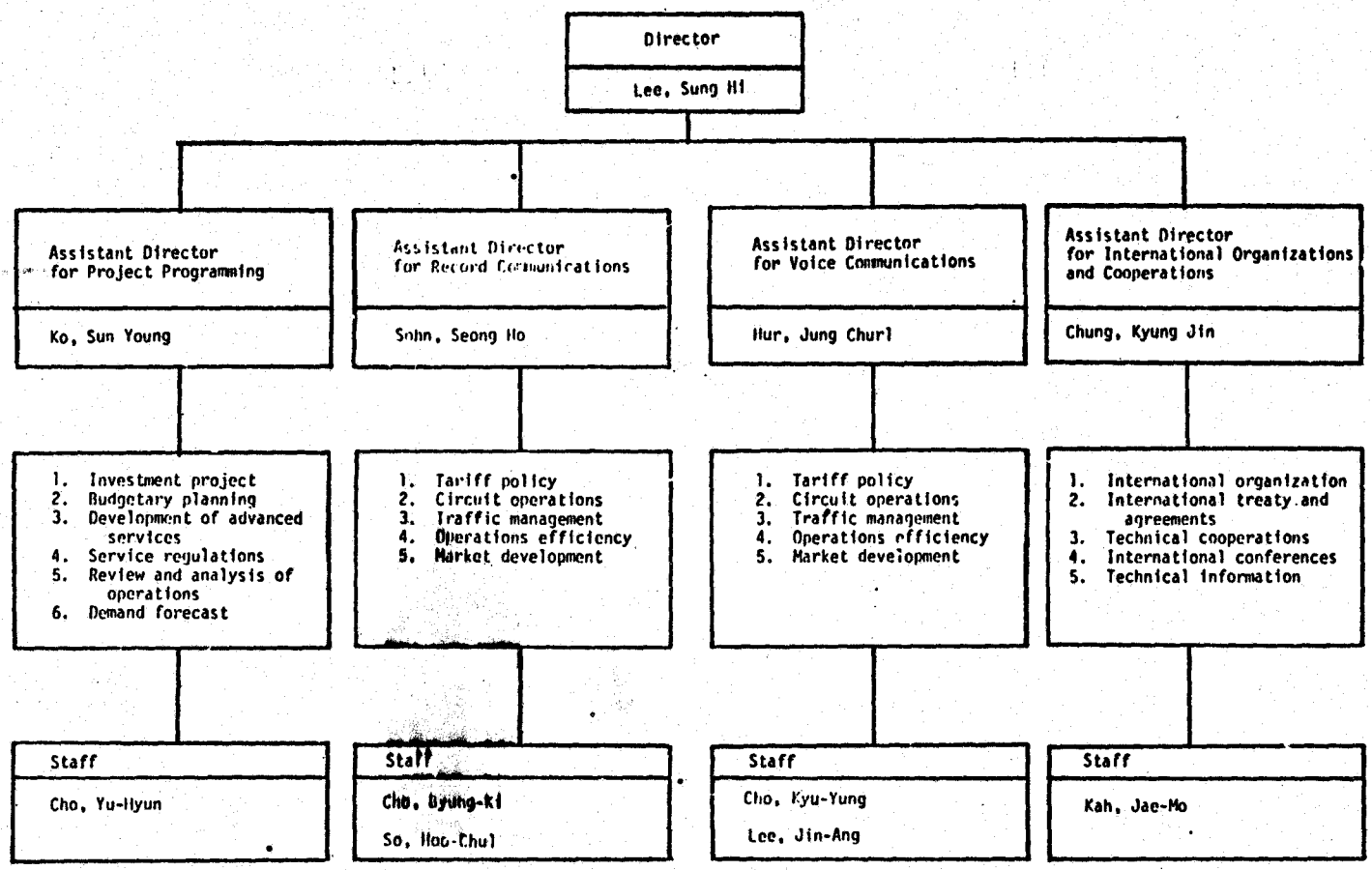

Figure II-2. ORGANIZATION - INTERNATIONAL TELECOMMUNICATIONS DIVISION

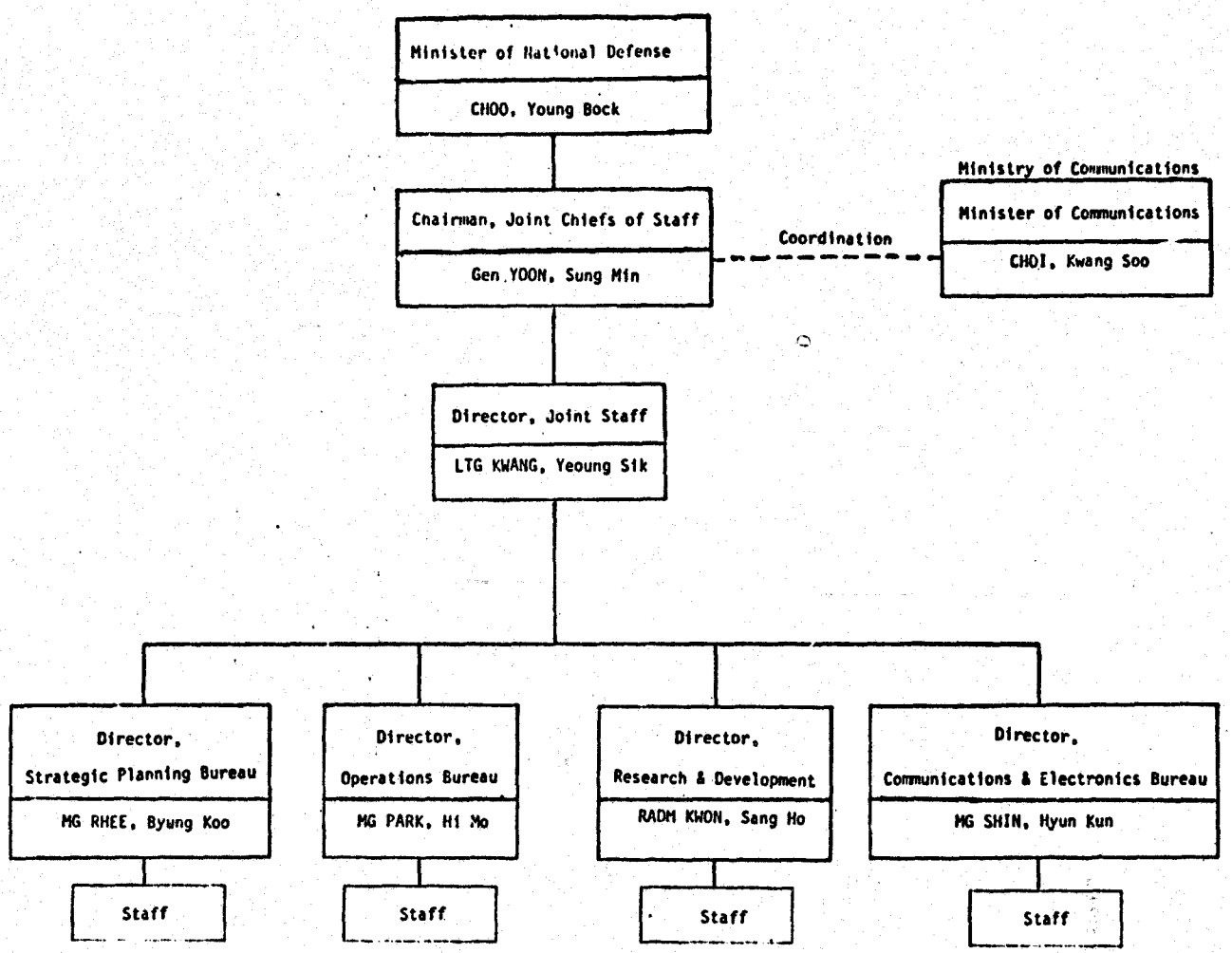

Figure II-3. ORGANIZATION OF KOREAN MILITARY COMMUNICATIONS MANAGEMENT STRUCTURE

CHAPTER III
CURRENT CAPABILITY

A. ECONOMIC AND POLITICAL OVERVIEW

1. Background Data

The Republic of Korea (ROK) has experienced significant economic growth during the last decade and this growth in the manufacturing, mining and industrial sectors has improved the average Korean's standard of living. Since 1971, the Gross National Product (GNP) has nearly tripled, and the growth rate, in real terms, has averaged about 12% annually. In 1978, the GNP rose by more than 12%. These achievements have established Korea as a model for other countries at a comparable stage of development. However, as shown in Table III-1, there exist only modest telecommunications services in relation to the total population.

2. Geography and People

The Republic of Korea occupies a peninsula on the northeast coast of Asia. In size Korea is comparable to the state of Indiana, or 2.5 times the size of the Netherlands. Korea's population density, one of the highest in the world, exceeds 370 per Km^2. Korea's population centers, Seoul, Pusan, and Taegu, attract one-third of the total population. The only land border separates North Korea from South Korea. Japan is approximately 200 km across the Korean straits from Pusan on the southern coast of Korea. The major cities of the two countries, Seoul and Tokyo, are 1100 km apart.

The interior of South Korea is generally mountainous, with lower coastal plains in the west facing the Yellow Sea. While the Korean peninsula is fairly abundant in timber and mineral resources, the greatest wealth in natural resources is located in North Korea. Therefore, South Korea must depend upon foreign imports for nearly all raw materials, items of modern technology, and other basic necessities, as well as luxury items.

Korean thinking is dominated by the question of national security. In considerations of political structure, economic policy, and urban planning,

TABLE III-1. BACKGROUND DATA, ROK

ECONOMIC DATA		
Area, in sq. km.	99,591	
Population (est.)	38,806,000	(1981)
Population Growth Rate (est.)	1.6%	(1980-90)
GNP at Market Prices, in billions	$65.1	(1981)
GNP per Capita (est.)	$1,676	(1981)
GNP per Capita, real growth rate	8.7%	(1970-76)
Occupied Living Quarters	4,334,000	(1970)
Office Workers	3,659,000	(1976)
MILITARY DATA		
Defense Expenditures, in billions	$3.46	(1980)
Total Armed Forces	604,000	(1980)
o Army	525,000	
o Navy	47,000	
o Air Force	32,000	
Total Reserves	1,665,000	
TELECOMMUNICATIONS DATA		
Total Telephone Lines*	1,997,390	(1978)
Long Distance Lines	39,648	(1978)
Telex Subscriber Lines	4,030	(1979)
Data Modems	--	
Satellite Earth Stations	3	(1981)

* Direct exchange lines

decisions are founded on the premise that a renewed conflict with North Korea is a possibility. This overshadowing threat unites South Koreans of all persuasions in their militant anti-communistic beliefs. As a nation, Koreans take great pride in their accomplishments, which have gained them a significant position in the mainstream of world affairs. Ideologically, Koreans are inclined to believe that a modest standard of material well-being is a basic human right.

Korea's future plans include the construction of new cities at Banwae (near Seoul), Changwon, and Yachon that would be centers of industrial development. Also planned is a new administrative capital in a more central location. The motivation for this move is to lessen vulnerability to an attack from the North, reduce the population inflow, and secure a more balanced development within the country.

3. Politics and Government

Korea experienced a great upheaval in her government structure in the early 1970s. In October 1972, President Park proclaimed martial law, dissolved the National Assembly, and suspended the 1962 Constitution. A new constitution was then approved in referendum in November 1972 giving the President greatly expanded powers. An election in 1973 selected representatives to a new unicameral body to serve six-year terms in the National Assembly. Of the 219 members, 73 were elected on the recommendation of the President for three-year terms.

In the mid-1970s, there was increasing political dissent, which was allayed by 1977. An election for the 2583 members of the National Conference for Unification was held in 1978. This conference, which is responsible for electing the President, re-elected President Park for a further six-year term in July of 1978. President Park was assassinated in October 1979 by a member of the Korean CIA, whereupon the Prime Minister took over as acting President. Kim Jong Pil was elected to succeed Park as the President of the ruling Democratic Republican Party. An aspiring Presidential candidate, Kim Jong Pil has agreed to cooperate with the leader of the main opposition party, the New Democratic Party, in an effort to revise the Constitution and restore democratic rule. A policy of purification is being rigidly applied across the whole political spectrum and the ensuing stability will ensure continuity of the economic program.

4. The Economy

South Korea's economic achievements in the past two decades have been extraordinary. From a nation that was not even a producer of bicycles in the 1950s, Korea has become a manufacturer of supertankers. This dramatic growth is largely attributable to Korea's success in orienting her economy toward the international trading community. Exports reveal a steady upward trend, reaching $100 million for the first time in 1964; continued growth brought the export market to the $10 billion mark in 1977. The target figure of $12.5 billion export trade was attained in 1978. With a thriving economy, and bustling cities and factories, Korea is looking ahead to the 1980s with self-confidence.

Korea's economic problems are no longer those of a developing country, but like other industrialized nations, she must confront the issues of a tight labor market, including that for skilled labor, double-digit inflation, and the specter of rising energy costs. These present economic threats are less serious to her future, however, than those accompanying the oil shock of 1973-1974, which Korea overcame admirably. It must be assumed that Korea's economic managers will again rise to the occasion.

In response to current economic problems, the Korean government has adopted a "stabilization" policy. The target for the 1981 GNP growth rate was revised to a more modest figure of 7%, with stricter limits imposed on the money supply, wage hikes, and government outlays. Tight money measures to hold the inflation rate under 20-25% will have a definite impact on export growth, and will very likely force a deferral of some planned industrial expansion.

Presently 60% of Korea's imported goods come from her two major trading partners, Japan and the United States. Saudi Arabia is Korea's principal oil supplier, while other trading partners are Germany, the United Kingdom, Hong Kong, Australia, and Indonesia.

The primary Korean exports are textiles, iron and steel, ships, footwear, fish products, and electrical and electronic products. The electronic industry represents over 10% of total exports, and is the key

industry in Korea's industrial strength. In 1978, its more than 600 electronic firms showed a gross turnover of $2 billion.

Little change is foreseen in either the composition of Korean exports or the principal markets for these goods in the near future. Nevertheless, during the decade of the 1980s, both exported goods and principal markets are expected to shift as Korea assists in the industrialization of other developing countries, and as the country's machinery and heavy industry develops further.

5. Organization and Regulation of Telecommunications

The Ministry of Communications is responsible for virtually all civilian telecommunications services. The only exceptions are the police, the railroads, the electric company and certain other agencies that have their own networks. The Ministry of Communications is also responsible for all postal activities. The overall planning for growth in telecommunications is conducted by the Ministry under a series of five-year plans, the current five-year plan (1981-1986) being the fifth. Financing for the required investments comes from retained earnings on services, from foreign aids, and through supply credit.

The Ministry purchases telecommunications equipment through the government procurement agency, Osrok, as do all other government agencies. Nevertheless, the Ministry exercises a decisive role in determining procurement policies. Whenever feasible, locally manufactured items are favored, and high import tariffs are placed on foreign manufacturers.

The Ministry also regulates radio services, issues licenses, and assigns frequencies to broadcasters and private operators. While the law provides for the ownership of private radio systems, in practice only a few individuals own private radios. For security reasons, CB radio systems are strictly illegal in Korea.

B. CIVILIAN NETWORKS

1. Current Status of Telecommunications

a. Overview

The demand for residential and business telephone service exceeds the supply by a wide margin. At the end of 1975, the waiting list for telephone service exceeded 110,000, and by 1979, the number had risen to 800,000. Presently there are more than 1.8 million telephone subscribers; the number of telephone main stations has been increasing at 17-19% over the last ten years. Until 1977, the numbers of business and residential telephones grew at the same rate, but since then the proportion of residential main stations has increased sharply, reflecting a growing affluence as well as changes in the Ministry's policy for determining priorities for service. One such project of the Ministry called the New Community Movement, is specifically concerned with extending telephone service to rural area

As with telephone service, the number of telex subscribers is growing as fast as system capacity is installed by the Ministry. The average annual growth rate of telex subscribers from 1968-1977 was 28%. By year-end 1979, there were about 4000 telex subscribers in the Korean network.

Telecommunications revenues have been growing at about 35% per year. Consequently, the Ministry's gross capital expenditures on telecommunications facilities have increased at a high rate since the late 1960's, reaching the $1.04 billion mark for 1979.

Future plans of the Ministry include installation of more 1.2 million lines of electronic telephone switching systems between 1980 and 1982, and adding in total 1.85 million lines of switching by 1985. By 1986, the end of the Fifth Five-Year Plan, the number of telephone lines will be an estimated 9.4 million. Projections for 1990 estimate a total of 11.5 million lines.

In international long-distance telephone service, Korea now has three earth stations in the Intelsat network. At the end of 1980, the first submarine cable system between Korea and Japan was completed. This cable supplements the existing 380-channel troposcatter radio link by additional capacity of 2700 channels.

b. Public Telephone System

1) Switching

The growth of the Korean telephone system has been impressive. The development of the national telephone service began in earnest in the early 1960's at a time when there were less than 150,000 total telephones and only 5 instruments for every 1,000 inhabitants. Growth over the next decade followed an average pattern for countries at this level of technical development. Not until the introduction of the third economic plan in 1972 was the necessary stimulus provided for the rapid increase in the number of telephones in use.

By the end of 1978, Korea had approximately 1644 local exchanges and 1531 toll exchanges in public telephone service. Of the local exchanges, there were 217 electro-mechanical (EM) exchanges serving 1.5 million subscriber lines, approximately 85% of the total. The remaining 280,000 subscribers were connected to the national network via 1427 manual exchanges. Most of the installed manual and electro-mechanical equipment has been assembled in Korea by two companies, Oriental Precision and Gold Star-Tele-Electric from imported components supplied respectively by NEC and Siemens. The rate of production and installation still lags behind demand. While rural telephone service continues to grow gradually, more than 50% of the telephone subscribers are located in urban areas; approximately 40% are in Seoul, and 10% in Pusan.

The most significant feature of the current plan is the Governmental decision to concentrate all future development on electronic switching systems (ESS). This decision was taken because ESS was seen to be the only practical means of providing for the rapid increase in demand for telephone services, especially in the newly founded industrial areas and in the capital itself. Another major determinant was the lack of space in Seoul either for expanding existing electro-mechanical exchanges or for building new ones.

A contract was issued in late 1977 for ESS No. 1 to ITT/BTM for METACONTA 10CN electronic exchanges and about 2 million telephone lines. By the end of 1981, approximately 400,000 lines had been installed.

A contract for ESS No. 2 was awarded to Western Electric in 1979 for 2 million additional lines. To date, about 100,000 lines have been installed. The Western Electric Company is currently negotiating contracts for ESS No. 3 and No. 4. The ESS No. 4 toll/gateway exchange will switch a total of 53,000 telephone lines, of which 1,200 lines are to/from international trunk circuits. The allocation of these international trunks are shown in Table III-2.

2) Microwave Transmission

Although there is still a large amount of open- wire used in long-distance transmission, microwave radio serves as the backbone media for this rather mountainous country. First introduced in 1965, the Ministry of Communications (MOC) national microwave network now has in service some 18,500 channels (1981). Figure III-1 shows the geographical network layout for the MOC microwave system which corresponds to the detailed technical listings in Section B2 of this Chapter (III). Essentially all long-haul transmisison facilities in Korea are analog, frequency division multiplex (FDM). This MOC system was contracted to the Collins Radio Company, now a division of Rockwell International. The MOC system can be interfaced with the ROK Army (ROKA) microwave network at Seoul, Wonju, Taegu and Pusan. Digital transmission, pulse code modulation (PCM), was introduced in Korea in 1979 for short haul inter-city, inter-office traffic. PCM has not yet been used for long-haul circuits.

3) Cable Transmission

The Ministry of Communications has also undertaken the installation of coaxial cables since 1968, the total length of which reached 2,100 kilometers at the end of 1981. Currently, the coaxial cable system provides approximately 50% of all service channels in the toll network. Figure III-2 illustrates the layout of the MOC cable network which corresponds to detailed technical data in Section B2 (Chapter III).

TABLE III-2. ALLOCATION OF INTERNATIONAL LINES TO PLANNED ESS NO. 4 EXCHANGE

COUNTRY	NUMBER OF LINES	SIGNALING
JAPAN	502	CCITT No. 6
U.S.A.	194	CCITT No. 6
AUSTRALIA	20	CCITT No. 5
CANADA	16	CCITT No. 5
CHINA (ROC)	20	"
HONGKONG	46	"
INDIA	7	"
MALAYSIA	6	"
PHILIPPINES	7	"
SINGAPORE	7	"
THAILAND	5	"
AUSTRIA	2	"
BELGIUM	5	"
FRANCE	12	"
GERMANY	31	"
GREECE	4	"
IRAN	6	"
ITALY	14	"
KUWAIT	10	"
NORWAY	4	"
NETHERLANDS	5	"
SAUDIARABIA	12	"
SPAIN	7	"
SWITZERLAND	5	"
GREAT BRITAIN	14	"
SAMOA	2	"
SPARE	237	"
TOTAL	1,200	

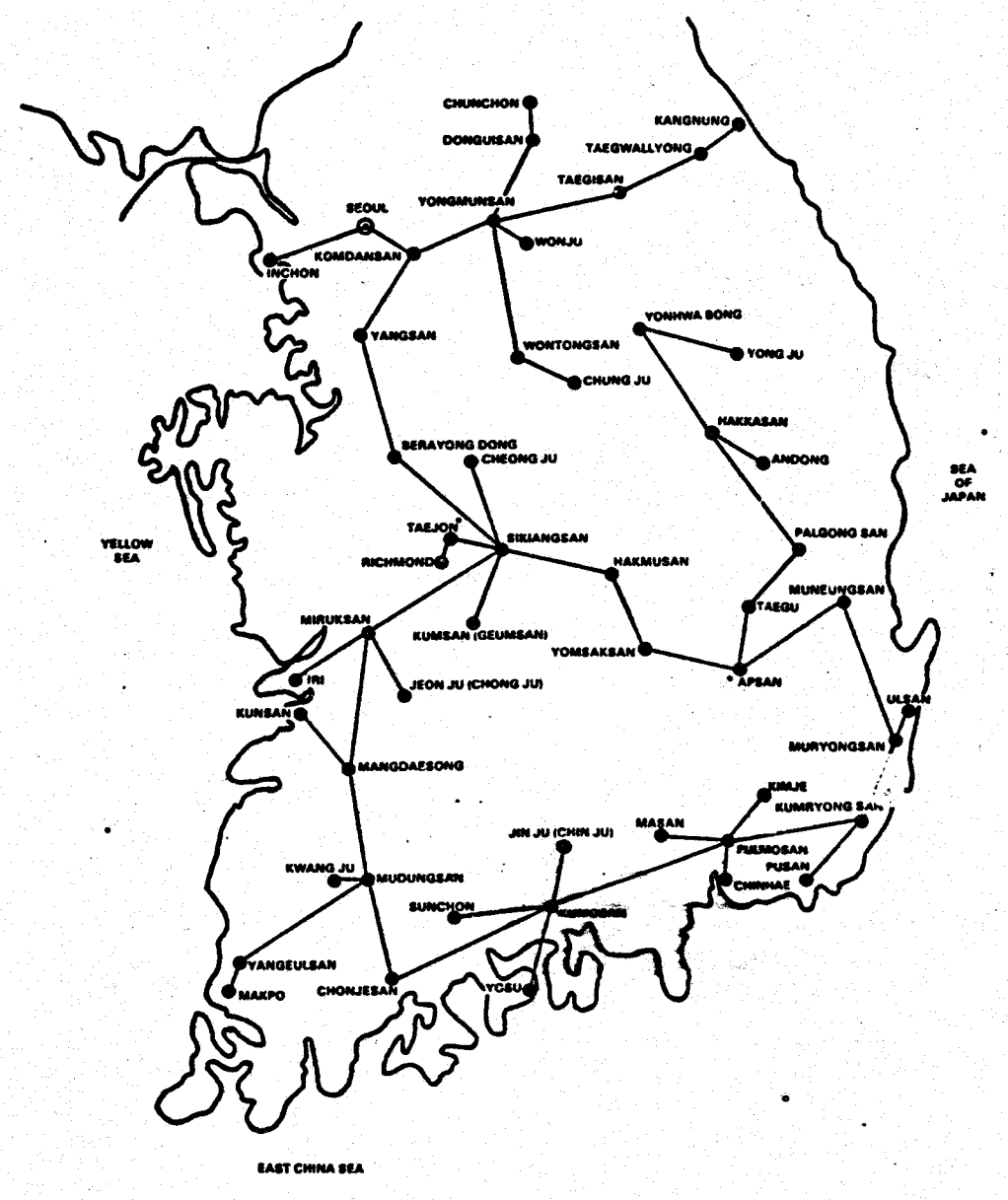

Figure III-1. MOC MICROWAVE SYSTEM

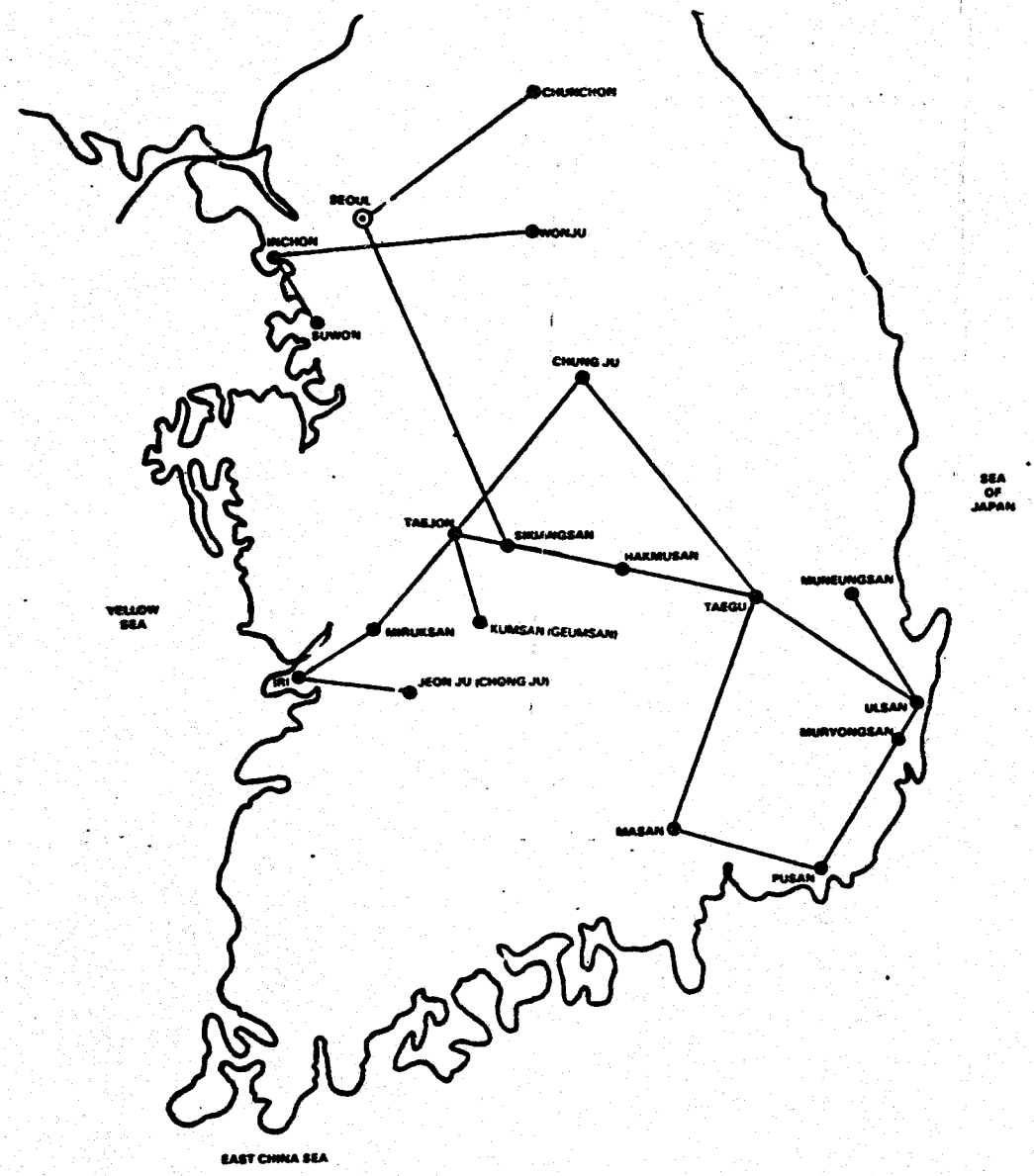

Figure III-2. MOC CABLE SYSTEM

Coaxial cable is in use between Seoul and Pusan, and two other inter-city links are being installed between Taegu-Masan-Pusan, and between Chungju-Taejon.

Modernization is evident in many areas of the telephone system. The urban transmission media, which in the mid-1970s was 25% open-wire, is today predominantly cable in conduit. As part of this modernizing project, the interexchange cable capacity was more than doubled. Service to remote villages is a challenge and is being met in part by the Ministry's New Community Movement. By early 1979, lines had been installed in about 18,600 villages as part of this project; 6000 more were to be connected in 1979 and 5500 in 1980.

c. Telegraph, Telex and Data Communications

Telegraph, telex, and other non-telephone services account for approximately 10% of the 39,648 domestic long-distance transmission circuits in use. The allocation for these lines at the end of 1977 was:

Teleprinter (telegraph)	1235
Telex	180
Sound	400
Telegraph Relay	147
Reserve Equipment (back-up)	829
Administrative (hot line)	228
Pictorial (video)	5
	3024

By 1979, the number of telex subscribers had grown to 4,030. Demand for telex facilities exceeds the capacity, particularly in the industrial and business centers of Seoul and Pusan. The Ministry plans to install another 3,300 telex subscriber lines in 1982 to meet the anticipated demand.

Telex and telegraph (50 baud) service is operated by both the MOC and the Korea Institute of Science and Technology (KIST) by the frequency division multiplexing (FDM) method, but no special channels of over 50 baud are available for data communication except for voice grade leased

lines. Some of the existing circuit facilities available for high-speed data communication are 475 circuits between Seoul and Pusan (coaxial cables), 264 circuits between Seoul and Paega (also coaxial), and 86 circuits between Seoul and Kwangju (microwave), most of which are leased telephone lines.

The Ministry presently assumes a passive role in data communications, providing leased circuits but assuming no responsibility for the quality of transmission. Nevertheless, the Ministry anticipates greater involvement at some time in the near future.

Korean Airlines is an active user of data communications, with terminals operating at 2400 bps in Seoul. Recently installed at Kimpo Airport by Collins Radio is a 48-line, store-and-forward automatic message switch; the switch is integrated into a network of HF, VHF, and microwave radio links.

d. Satellite Communications and International Gateways

Korea is a member of the INTELSAT organization and currently has three operational earth stations for use with INTELSAT IV satellites.

(1) KUM SAN 1: A standard type-"A" earth station with a 27 meter diameter antenna is operating into the INTELSAT Pacific Ocean Sector, initially providing 132 telephone channels and television services. The station was built by PHILCO-FORD (now Ford Aerospace) in 1970 at a contract price of US$5 million. NEC (Japan) supplied a number of the radio sub-systems. The station was upgraded in 1972 by PHILCO-FORD through a follow-on contract.

(2) KUM SAN 2: A second standard type-"A" antenna, built by Ford Aerospace in 1977, is operating into the INTELSAT Indian Ocean Sector.

(3) KUM SAN 3: A non-standard antenna installed in 1980 to act as a standby for KUM SAN 1 during routine maintenance and upgrading. Further details of KUM SAN 3 are not available.

As of the end of 1981, there were 199 circuits or channels in commercial service between the United States and Korea. All of these circuits are routed via the INTELSAT Pacific Ocean Region Satellite to the Kum San earth station as shown in Figure III-3.

Figure III-4 shows that seventy-seven (77) of the channels are presently routed via the Jamesburg earth station in Carmel, California, and one hundred and one (101) channels are routed via the Brewster, Washington, earth station. It should be emphasized that the division of circuits shifts frequently between the Jamesburg and Brewster earth stations. In addition to the foregoing circuits from the U.S. mainland there are sixteen (16) circuits from the Pago-Pago earth station on American Samoa and three (3) circuits from the Pulantat earth station on Guam. All of these circuits utilize the Pacific Ocean Region Satellite and the Kum San earth station (Figure III-5).

The international switch for the Kum San earth station is located in Seoul, Korea, in the Sin Sul Dong Building. This switch is presently a Siemens ESK machine. A No. 4 ESS switching machine manufactured by Western Electric Co. is scheduled to replace the Siemens ESK switch. The scheduled cutover for the No. 4 ESS machine is the middle of 1983. Location of the new No. 4 ESS machine will be in the He Hwa Building in Seoul.

On the U.S. Mainland, the international switch for both the Brewster and Jamestown earth stations is located in Denver, Colorado.

Presently 48% of the international facility requirement is between Korea and Japan, which is now served by troposcatter radio. Installation of a 2700-channel submarine coaxial cable, completed in 1980, will satisfy the demand until at least 1990.

e. Specialized Networks

There are three specialized Korean communications networks applicable to this study. They are (1) the Korean National Railroad, (2) the Korean Electric Power Company, and (3) the Korean National Police systems.

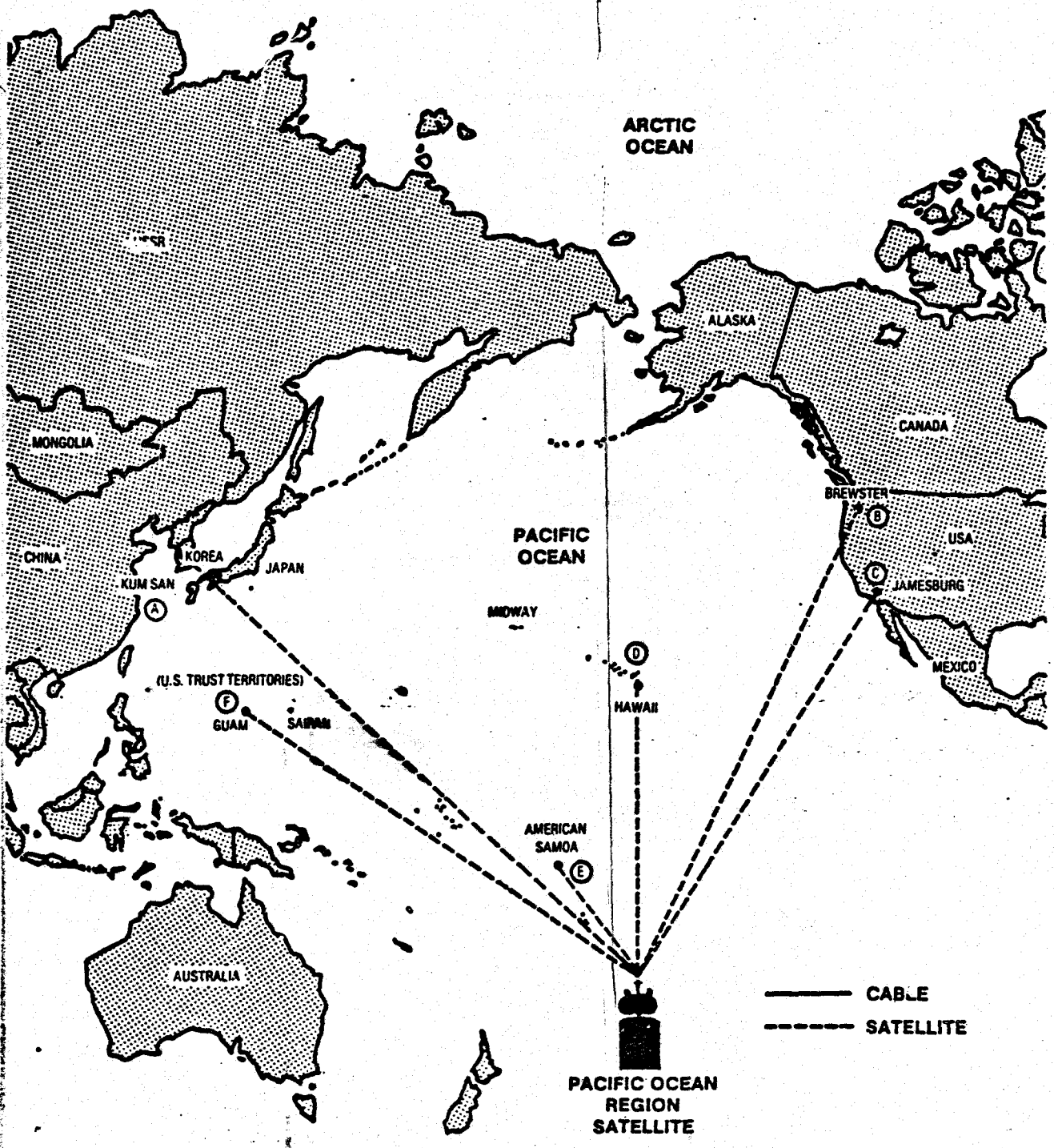

Figure III-3. United States - Korea Satellite Circuits

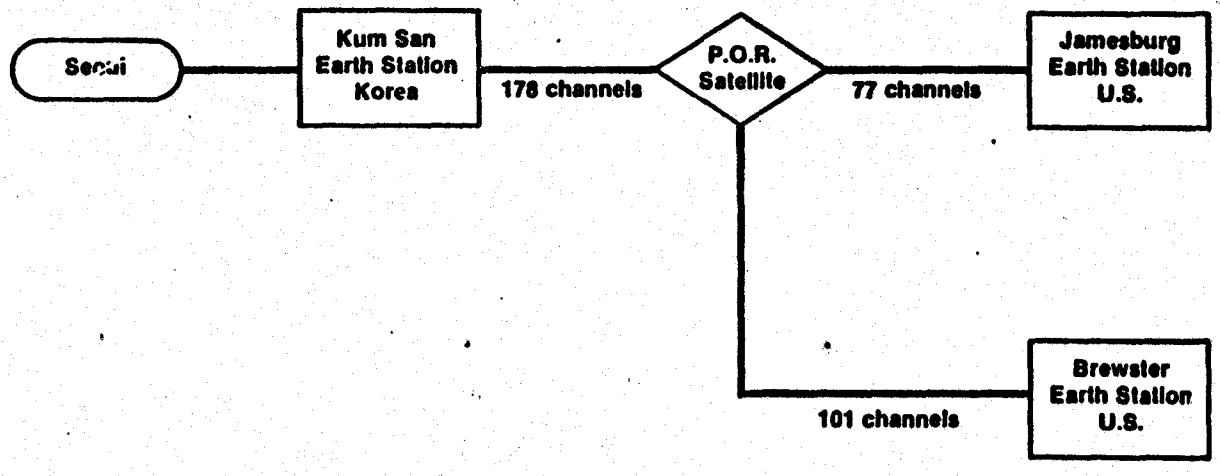

Figure III-4. U.S. Mainland - Korea Satellite Circuits

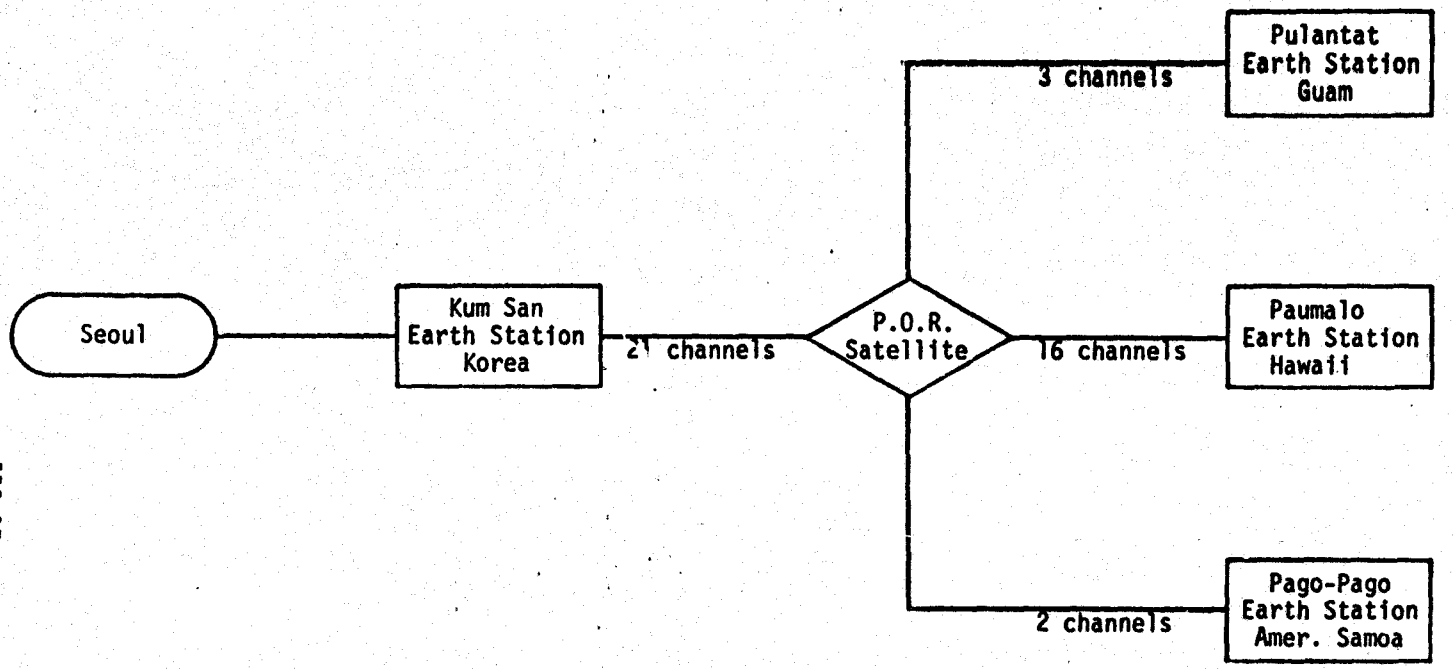

Figure III-5. U.S. Possessions - Korea Satellite Circuits

1) Korean National Railroad

The government-owned Korean National Railroad (KNR) is under the Ministry of Transportation and operates all rail transportation in the Republic of Korea. It operates its own communications network, but there is some question about the future because of a law which might be introduced in the National Assembly to put all national communications networks under the Ministry of Communication to avoid duplication.

At present the KNR has 61 telephone exchange centers, including electro-mechanical and cross bar types, with circuits as follows:

28 automatic switching systems with 8,240 circuits
23 common battery " " " 1,650 "

Five of the regional bureaus have automatic exchanges. As budgets permit the common battery exchanges are expected to be changed to automatic.

In January of 1977 KNR opened a microwave system to transmit long distance calls within its organization from Seoul to Pusan, a distance of 389 kms. There are 7 microwave sites and 8 terminals. The system with 300 channel capacity (2 gigahertz) was largely supplied by Motorola with foreign exchange financed by the International Bank for Reconstruction and Development (World Bank). Figure III-6 portrays the KNR communications network layout which corresponds to the detailed data in Section B2.

2) Korean Electric Power Company

The Korean Electric Power Company (KEP) operates a microwave network in the frequency, range of 6500-6900 MHz utilizing 300-channel NEC FDM equipment (type TR-7GD300-7). The network consists of ten terminal locations, as shown in Figures III-7 and III-8. The assigned carrier frequencies in MHz are shown in Figure III-8.

3) Korean National Police

The Korean National Police (KNP) operates a microwave network consisting of nine terminal locations, as shown in Figures III-9 and III-10. The network operates in the 6600-6900 MHz frequency range using 300-channel Motorola FDM equipment (type TR-30/300). The assigned carrier frequencies are shown in Figure III-10.

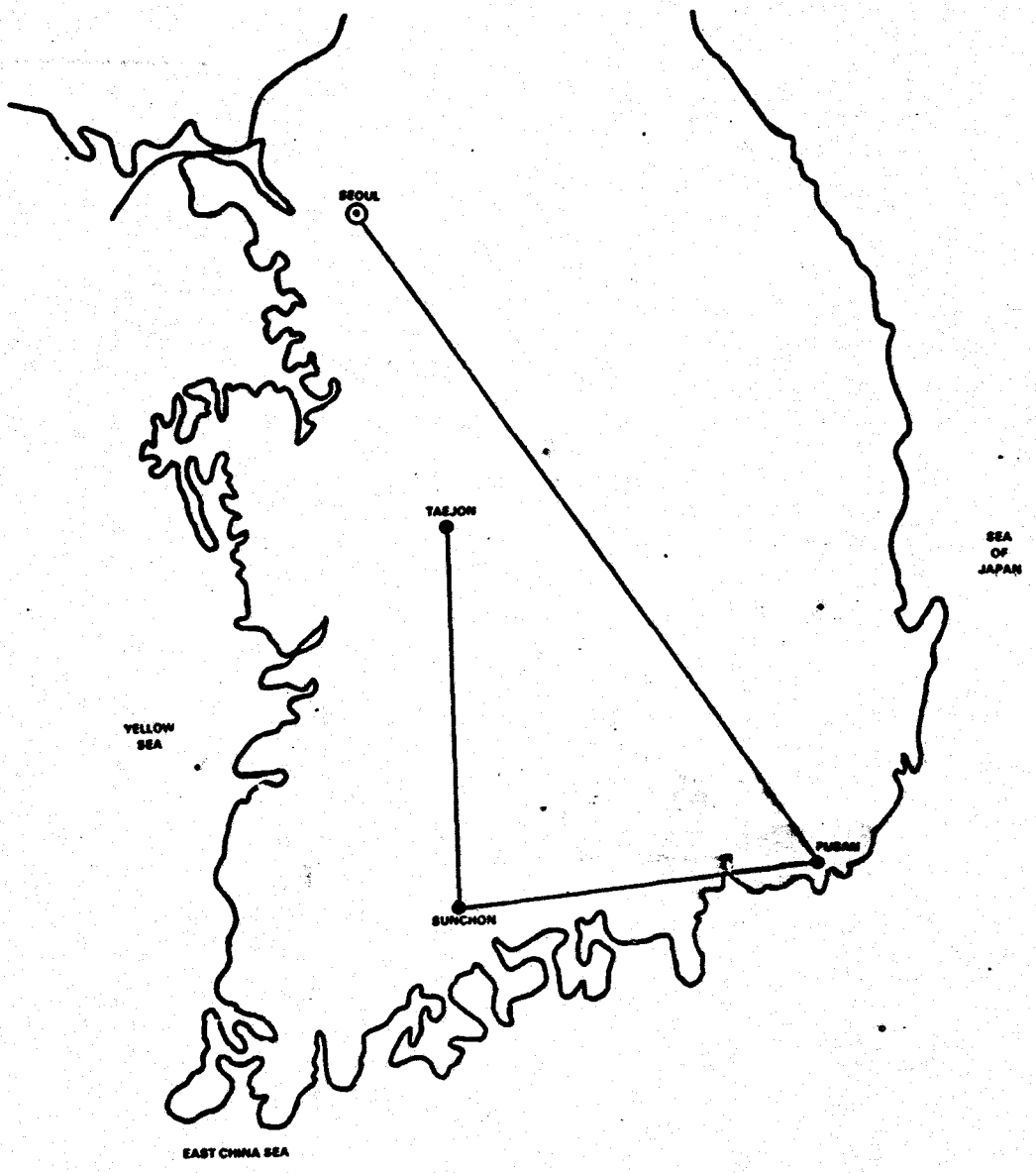

Figure III-6. KNR COMMUNICATIONS SYSTEM

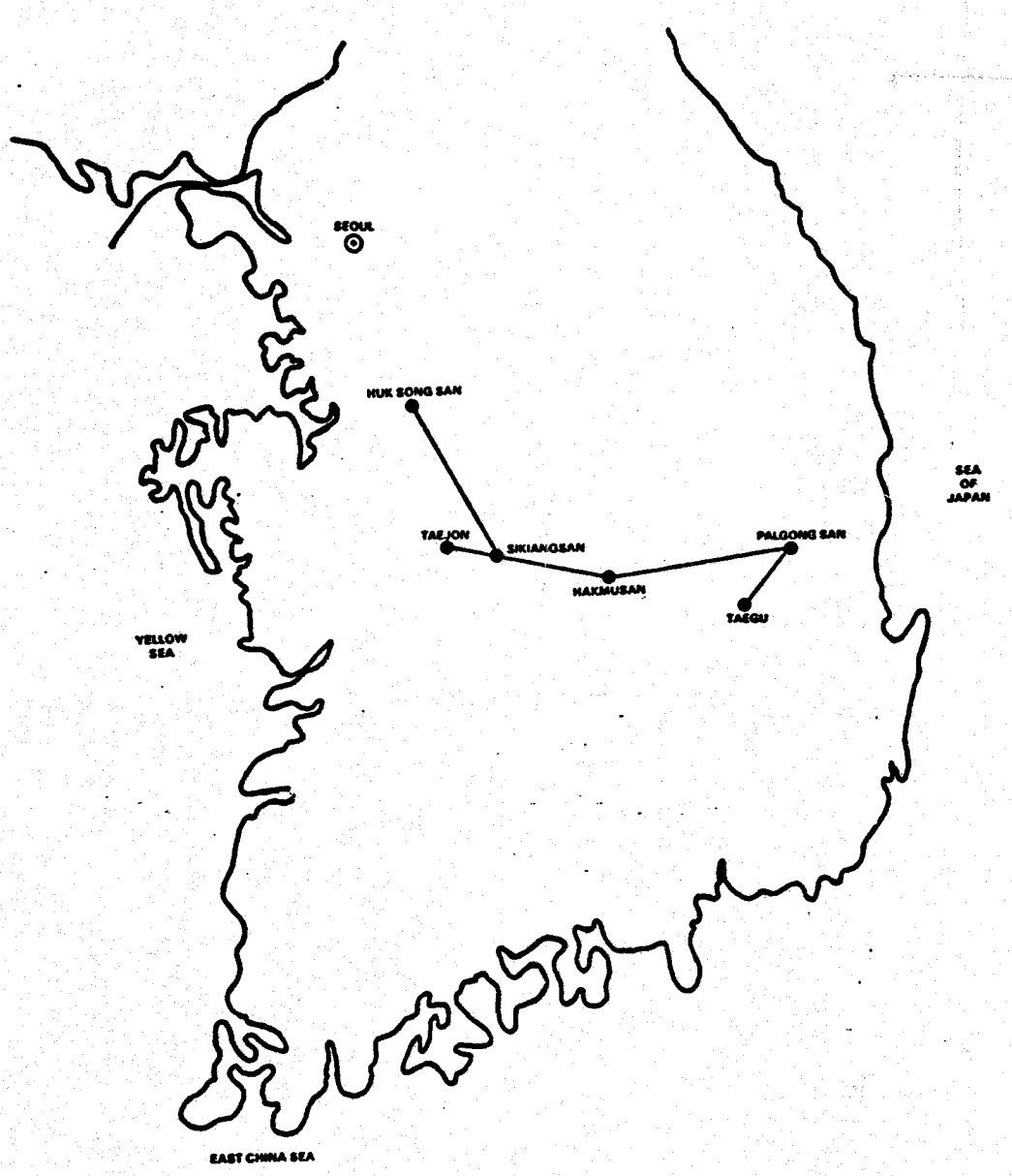

Figure III-7. KEP COMMUNICATIONS SYSTEM

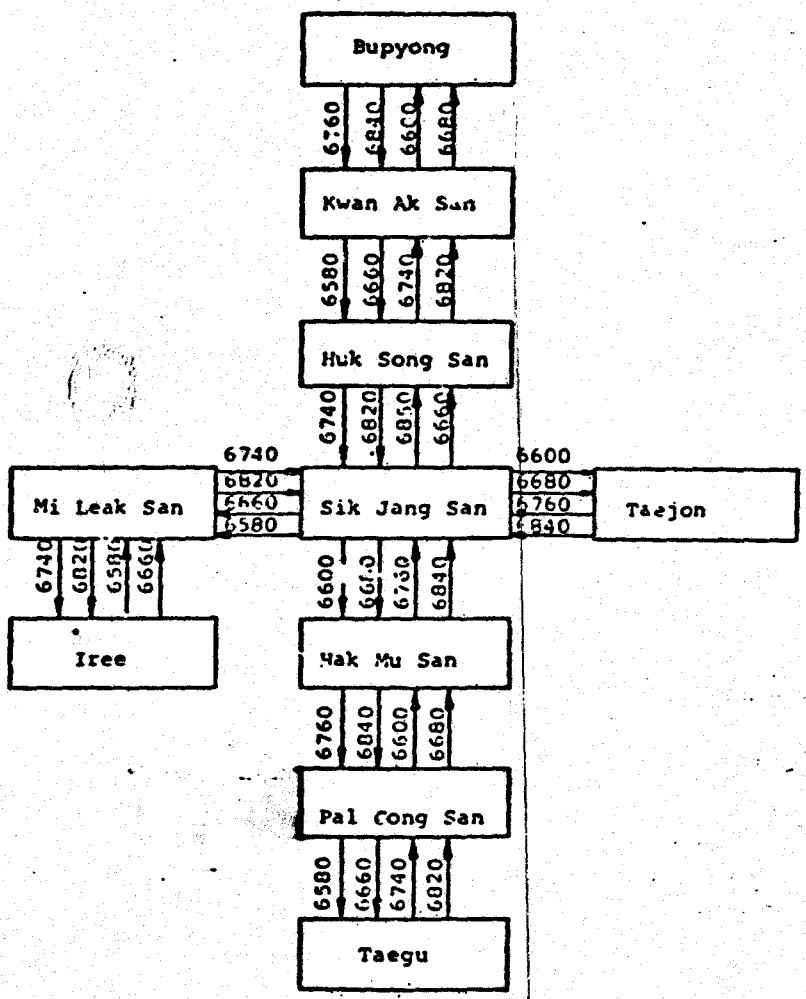

Figure III-8. KEP Microwave System

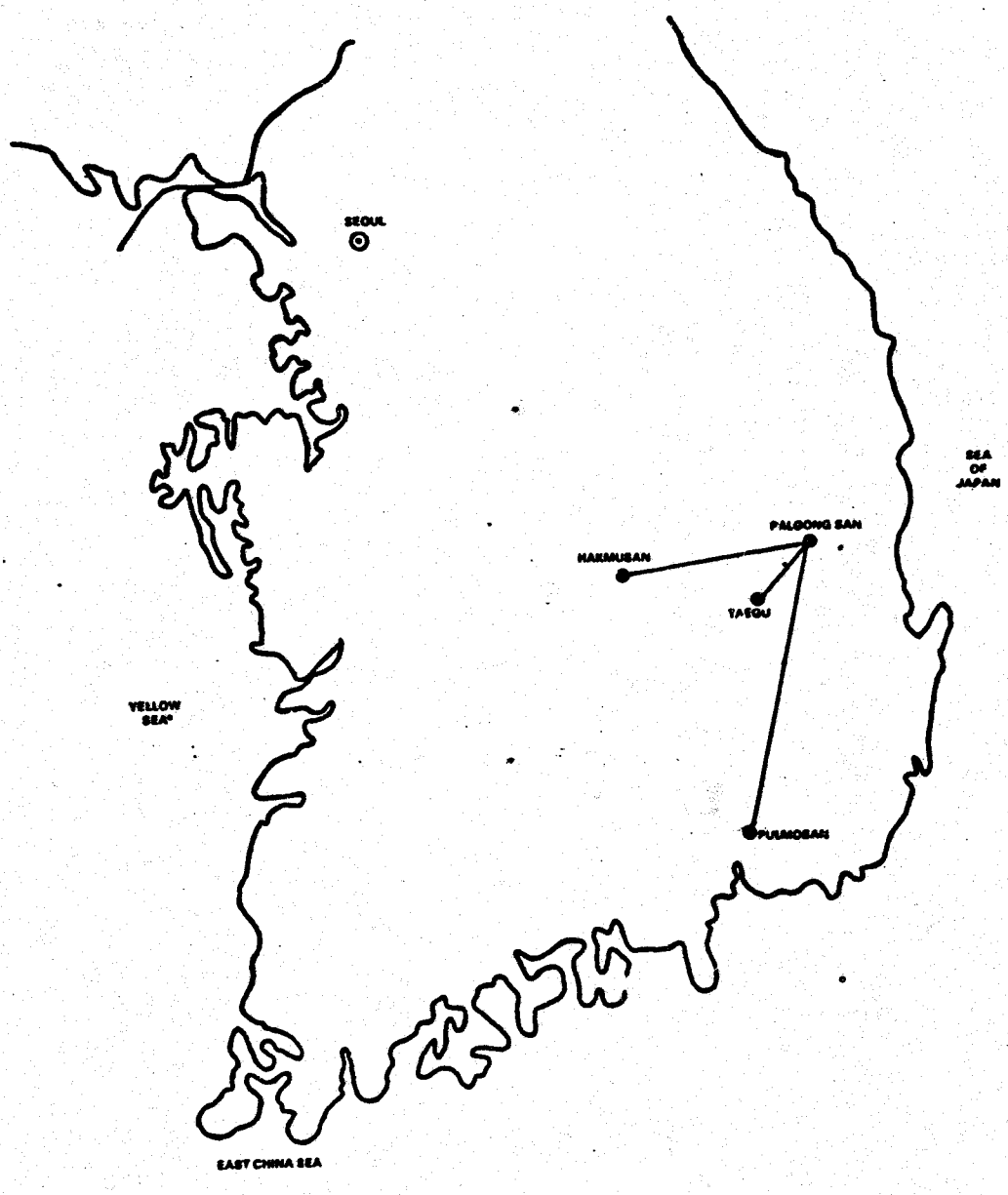

Figure III-9. KNP COMMUNICATIONS SYSTEM

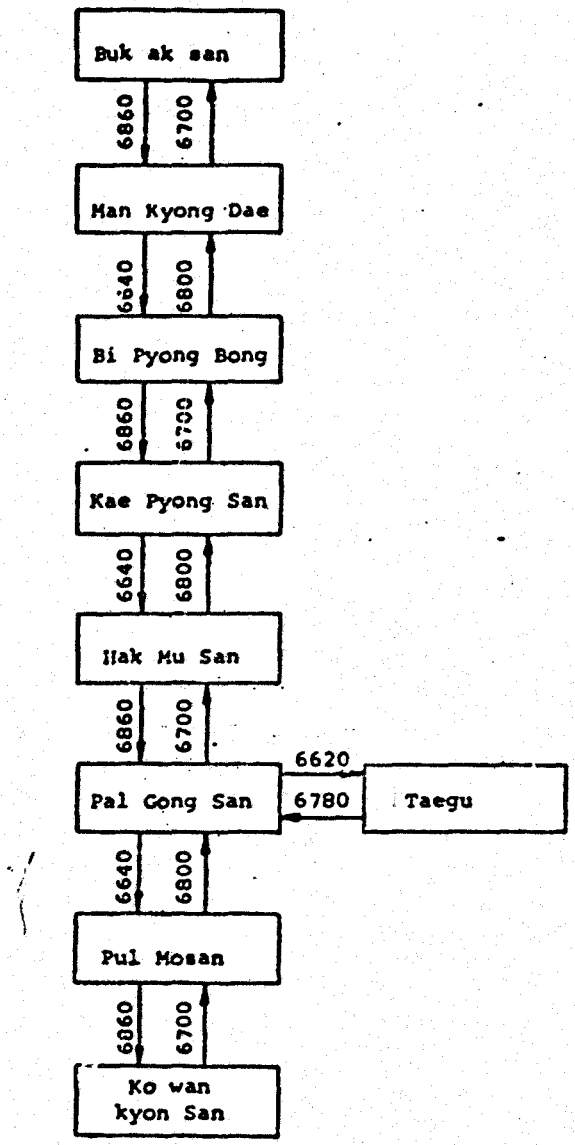

Figure III-10. KNP Microwave System

2. Detailed Listings (Current Civilian)

a. Remarks

In this section, detailed listings are provided which describe the current civilian communications capabilities discussed in the preceding sections. The switch or link designators identify the operating organization (e.g., MOC) and the geographical name of the city or cities served/located. The Glossary in Chapter V describes all abbreviations used. The numbered data sources are listed in the Bibliography of Chapter V.

b. Telephone Switches (Table 1)
(Current Civilian)

SWITCH:	MOC-YONGDONG
TYPE:	ESS
MANUFACTURER:	
YEAR INSTALLED:	79
CAPACITY:	10K LNS
FILL:	
NETWORK FUNCTION:	LEO
SIGNALLING:	CCITT
NUMBERING PLAN:	
LOCATION:	YONGDONG
OPERATED BY:	MOC
DATA SOURCE:	19

SWITCH:	MOC-TANGSAN
TYPE:	ESS
MANUFACTURER:	
YEAR INSTALLED:	79
CAPACITY:	10K LN
FILL:	
NETWORK FUNCTION:	LEO
SIGNALLING:	CCITT
NUMBERING PLAN:	
LOCATION:	TANGSAN
OPERATED BY:	MOC
DATA SOURCE:	19

SWITCH:	MOC-SEOUL
TYPE:	ESS-1
MANUFACTURER:	ITT/BTM
YEAR INSTALLED:	
CAPACITY:	20 K LN
FILL:	
NETWORK FUNCTION:	LEO
SIGNALLING:	CCITT
NUMBERING PLAN:	
LOCATION:	SEOUL
OPERATED BY:	MOC
DATA SOURCE:	19

SWITCH:	MOC-SEOUL
TYPE:	ESS-1
MANUFACTURER:	ITT/BTM
YEAR INSTALLED:	
CAPACITY:	20 K LN
FILL:	
NETWORK FUNCTION:	LEO
SIGNALLING:	CCITT
NUMBERING PLAN:	
LOCATION:	SEOUL
OPERATED BY:	MOC
DATA SOURCE:	19

SWITCH:	MOC-SEOUL
TYPE:	ESS-2
MANUFACTURER:	WECO
YEAR INSTALLED:	82
CAPACITY:	10K ERLANG
FILL:	
NETWORK FUNCTION:	LEO
SIGNALLING:	CCITT
NUMBERING PLAN:	
LOCATION:	SEOUL
OPERATED BY:	MOC
DATA SOURCE:	22

c. Transmission Capability (Table 2)
(Current Civilian)

LINK:	MOC-TAEGU TO JINJU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	24 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	JINJU
OPERATED BY:	MOC
LOCATION:	PUSAN
DATA SOURCE:	1

LINK:	MOC-PUSAN TO MOKPO
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MOKPO
OPERATED BY:	MOC
LOCATION:	PUSAN
DATA SOURCE:	1

LINK:	MOC-SEOUL TO TAEJON
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	108 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEJON
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-SEOUL TO PUSAN
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	252 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	PUSAN
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-SEOUL TO KWANGJU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	72 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KWANGJU
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-SEOUL TO CHUNG JU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	24 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	CHUNG JU
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-TAEGU TO MASAN
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MASAN
OPERATED BY:	MOC
LOCATION:	TAEGU
DATA SOURCE:	1

LINK:	MOC-PUSAN TO JINJU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	JINJU
OPERATED BY:	MOC
LOCATION:	TAEGU
DATA SOURCE:	1

LINK:	MOC-TAEGU TO TAEJON
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	24 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEJON
OPERATED BY:	MOC
LOCATION:	TAEGU
DATA SOURCE:	1

LINK:	MOC-PUSAN TO SUNCHON
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	SUNCHON
OPERATED BY:	MOC
LOCATION:	PUSAN
DATA SOURCE:	1

LINK:	MOC-PUSAN TO KWANJU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KWANJU
OPERATED BY:	MOC
LOCATION:	PUSAN
DATA SOURCE:	1

LINK:	MOC-PUSAN TO TAEGU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	84 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEGU
OPERATED BY:	MOC
LOCATION:	PUSAN
DATA SOURCE:	1

LINK:	MOC-PUSAN TO JEONJU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	JEONJU
OPERATED BY:	MOC
LOCATION:	PUSAN
DATA SOURCE:	1

LINK:	MOC-SEOUL TO CHEONG JU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	24 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	CHEONG JU
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-PUSAN TO MASAN
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	36 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MASAN
OPERATED BY:	MOC
LOCATION:	PUSAN
DATA SOURCE:	1

LINK:	MOC-TAEGU TO KWANG JU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KWANG JU
OPERATED BY:	MOC
LOCATION:	TAEJON
DATA SOURCE:	1

LINK:	MOC-KWANG JU TO JEON JU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	24 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	JEON JU
OPERATED BY:	MOC
LOCATION:	KWANG JU
DATA SOURCE:	1

LINK:	MOC-SEOUL TO TAEGU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	192 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEGU
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-SEOUL TO CHUNCHON
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	36 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	CHUNCHON
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-TAEJUN TO CHEONG JU
MODE:	MICROWAVE
TECHNOLOGY:	[illegible]M/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	CHEONG JU
OPERATED BY:	MOC
LOCATION:	TAEJON
DATA SOURCE:	1

LINK:	MOC-KWANG JU TO JINJU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	JINJU
OPERATED BY:	MOC
LOCATION:	KWANG JU
DATA SOURCE:	1

LINK:	MOC-SEOUL TO MOKPO
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	24 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MOKPO
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-SEOUL TO KANGNUNG
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	36 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KANGNUNG
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-PUSAN TO TAEJON
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEJON
OPERATED BY:	MOC
LOCATION:	PUSAN
DATA SOURCE:	1

LINK:	MOC-TAEJON KWANG JU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	24 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KWANG JU
OPERATED BY:	MOC
LOCATION:	TAEGU
DATA SOURCE:	1

LINK:	MOC-KWANG JU TO MOCKPO
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	36 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MOCKPO
OPERATED BY:	MOC
LOCATION:	KWANG JU
DATA SOURCE:	1

LINK:	MOC-MOKPO TO YANGEULSAN
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YANGEULSAN
OPERATED BY:	MOC
LOCATION:	MOKPO
DATA SOURCE:	23

LINK:	MOC-KWANG JU TO YOSU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	24 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YOSU
OPERATED BY:	MOC
LOCATION:	KWANG JU
DATA SOURCE:	1

LINK:	MOC-YANGEUL SAN TO TAELAK SAN
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAELAK SAN
OPERATED BY:	MOC
LOCATION:	YANGEUL SAN
DATA SOURCE:	23

LINK:	MOC-HAKMUSAN TO YOMSOK SAN
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YOMSOK SAN
OPERATED BY:	MOC
LOCATION:	HAKMUSAN
DATA SOURCE:	3

LINK:	MOC-TAEJON TO JINJU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	JINJU
OPERATED BY:	MOC
LOCATION:	TAEJON
DATA SOURCE:	1

LINK:	MOC-CHUNCHON TO KANGNELING
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KANGNELING
OPERATED BY:	MOC
LOCATION:	CHUNCHON
DATA SOURCE:	1

LINK:	MOC-WAEGWAN TO YOMSOK SAN
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YOMSOK SAN
OPERATED BY:	MOC
LOCATION:	WAEGWAN
DATA SOURCE:	3

LINK:	MOC-SEOUL TO JEONJU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	60 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	JEONJU
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-KWANG JU TO SUNCHON
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	36 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	SUNCHON
OPERATED BY:	MOC
LOCATION:	KWANG JU
DATA SOURCE:	1

LINK:	MOC-SEOUL TO JINJU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	JINJU
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-TAEGU TO YOMSOK SAN
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YOMSOK SAN
OPERATED BY:	MOC
LOCATION:	TAEGU
DATA SOURCE:	3

LINK:	MOC-SEOUL TO SUNCHON
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	SUNCHON
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-CHUNG JU TO CHEONG JU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	CHEONG JU
OPERATED BY:	MOC
LOCATION:	CHUNG JU
DATA SOURCE:	1

LINK:	MOC-TAEJON TO SUNCHONG
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	SUNCHONG
OPERATED BY:	MOC
LOCATION:	TAEJON
DATA SOURCE:	11

LINK:	MOC-SUNCHONG TO PUSAN
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	PUSAN
OPERATED BY:	MOC
LOCATION:	SUNCHONG
DATA SOURCE:	11

LINK:	MOC-GOOMI TO PALGONG SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	PALGONG SAN
OPERATED BY:	MOC
LOCATION:	GOOMI
DATA SOURCE:	3

LINK:	MOC-TAEGU TO PALGONG SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	PALGONG SAN
OPERATED BY:	MOC
LOCATION:	TAEGU
DATA SOURCE:	3

LINK:	MOC-CHUNCHON TO TAGPYONG SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAGPYONG SAN
OPERATED BY:	MOC
LOCATION:	CHUNCHON
DATA SOURCE:	3

LINK:	MOC-KANGNKUNG TO TAEGWAL
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEGWAL
OPERATED BY:	MOC
LOCATION:	KANGNKUNG
DATA SOURCE:	3

LINK:	MOC-SIKJANGSAN TO HAKMUSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	HAKMUSAN
OPERATED BY:	MOC
LOCATION:	SIKJANGSAN
DATA SOURCE:	3

LINK:	MOC-CHONGUP TO MANTAE BONG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MANTAE BONG
OPERATED BY:	MOC
LOCATION:	CHONGUP
DATA SOURCE:	3

LINK:	MOC-SUNCHON TO JINJU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	JINJU
OPERATED BY:	MOC
LOCATION:	SUNCHON
DATA SOURCE:	1

LINK:	MOC-SIKJANGSAN TO BERRYONG SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	BEERYONG SAN
OPERATED BY:	MOC
LOCATION:	SIKJANGSAN
DATA SOURCE:	3

LINK:	MOC-KOMDANSAN TO YONGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YONGSAN
OPERATED BY:	MOC
LOCATION:	KOMDANSAN
DATA SOURCE:	3

LINK:	MOC-KOMDANSAN TO SEOUL
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	SEOUL
OPERATED BY:	MOC
LOCATION:	KOMDANSAN
DATA SOURCE:	3

LINK:	MOC-YONGMUNSAN TO TAEGISAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEGISAN
OPERATED BY:	MOC
LOCATION:	YONGMUNSAN
DATA SOURCE:	3

LINK:	MOC-YONGMUNSAN TO KOMDANSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KOMDANSAN
OPERATED BY:	MOC
LOCATION:	YONGMUNSAN
DATA SOURCE:	3

LINK:	MOC-YONGMUNSAN TO KAYUPSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KAYUPSAN
OPERATED BY:	MOC
LOCATION:	YONGMUNSAN
DATA SOURCE:	3

LINK:	MOC-CHUNGJU TO KAYUPSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KAYUPSAN
OPERATED BY:	MOC
LOCATION:	CHUNGJU
DATA SOURCE:	3

LINK:	MOC-SIKJANGSAN TO CHONGJU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	CHONGJU
OPERATED BY:	MOC
LOCATION:	SIKJANGSAN
DATA SOURCE:	3

LINK:	MOC-MIRUK SAN TO KUNSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KUNSAN
OPERATED BY:	MOC
LOCATION:	MIRUK SAN
DATA SOURCE:	3

LINK:	MOC-YANGSAN TO BERRYONG SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	BEERYONG SAN
OPERATED BY:	MOC
LOCATION:	YANGSAN
DATA SOURCE:	3

LINK:	MOC-ICHON TO YONGMUNSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YONGMUNSAN
OPERATED BY:	MOC
LOCATION:	ICHON
DATA SOURCE:	3

LINK:	MOC-TAGPYONG SAN TO YONGMUNSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YONGMUNSAN
OPERATED BY:	MOC
LOCATION:	TAGPYONG SAN
DATA SOURCE:	3

LINK:	MOC-WONJU TO YONGMUNSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YONGMUNSAN
OPERATED BY:	MOC
LOCATION:	WONJU
DATA SOURCE:	3

LINK:	MOC-MIRUK SAN TO MANTAE BONG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MANTAE BONG
OPERATED BY:	MOC
LOCATION:	MIRUK SAN
DATA SOURCE:	3

LINK:	MOC-KIMJE TO MANTAEBONG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MANTAEBONG
OPERATED BY:	MOC
LOCATION:	KIMJE
DATA SOURCE:	3

LINK:	MOC-YUNGHUN TO PALGONG SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	PALGONG SAN
OPERATED BY:	MOC
LOCATION:	YUNGHUN
DATA SOURCE:	3

LINK:	MOC-HAKKA SAN TO ANDONG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	ANDONG
OPERATED BY:	MOC
LOCATION:	HAKKA SAN
DATA SOURCE:	3

LINK:	MOC-MUDUNGSAN TO MIRUK SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MIRUK SAN
OPERATED BY:	MOC
LOCATION:	MUDUNGSAN
DATA SOURCE:	3

LINK:	MOC-YONHWA BONG TO KAYUPSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KAYUPSAN
OPERATED BY:	MOC
LOCATION:	YONHWA BONG
DATA SOURCE:	3

LINK:	MOC-HAKKA SAN TO YONGJU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YONGJU
OPERATED BY:	MOC
LOCATION:	HAKKA SAN
DATA SOURCE:	3

LINK:	MOC-YONHWA BONG TO YEONG WOL
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YEONG WOL
OPERATED BY:	MOC
LOCATION:	YONHWA BONG
DATA SOURCE:	3

LINK:	MOC-HAKKA SAN TO PALGONG SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	PALGONG SAN
OPERATED BY:	MOC
LOCATION:	HAKKA SAN
DATA SOURCE:	3

LINK:	MOC-SIKJANGSAN TO KUMSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KUMSAN
OPERATED BY:	MOC
LOCATION:	SIKJANGSAN
DATA SOURCE:	3

LINK:	MOC-YONHWA BONG TO JECHON
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	JECHON
OPERATED BY:	MOC
LOCATION:	YONHWA BONG
DATA SOURCE:	3

LINK:	MOC-MUKHO TO KANGNKUNG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KANGNKUNG
OPERATED BY:	MOC
LOCATION:	MUKHO
DATA SOURCE:	3

LINK:	MOC-PULMOSAN TO KUMRYONSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KUMRYONSAN
OPERATED BY:	MOC
LOCATION:	PULMOSAN
DATA SOURCE:	3

LINK:	MOC-PULMOSAN TO CHUNGMU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	CHUNGMU
OPERATED BY:	MOC
LOCATION:	PULMOSAN
DATA SOURCE:	3

LINK:	MOC-MIRUKSAN TO SIKJANGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	SIKJANGSAN
OPERATED BY:	MOC
LOCATION:	MIRUKSAN
DATA SOURCE:	3

LINK:	MOC-TAEGWALYONG TO TAEGISAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEGISAN
OPERATED BY:	MOC
LOCATION:	TAEGWALYONG
DATA SOURCE:	3

LINK:	MOC-YONHWA BONG TO HAKKA SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	HAKKA SAN
OPERATED BY:	MOC
LOCATION:	YONHWA BONG
DATA SOURCE:	3

LINK:	MOC-MUDEUNG SAN TO KWANG JU MOC
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KWANG JU MOC
OPERATED BY:	MOC
LOCATION:	MUDEUNG SAN
DATA SOURCE:	3

LINK:	MOC-MUDEUNGSAN TO MANGTAE BONG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MANGTAE BONG
OPERATED BY:	MOC
LOCATION:	MUDEUNGSAN
DATA SOURCE:	3

LINK:	MOC-MIRUKSAN TO KONGJU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KONGJU
OPERATED BY:	MOC
LOCATION:	MIRUKSAN
DATA SOURCE:	3

LINK:	MOC-MIRUKSAN TO CHONJU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	CHONJU
OPERATED BY:	MOC
LOCATION:	MIRUKSAN
DATA SOURCE:	3

LINK:	MOC-MIRUKSAN TO IRI
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	IRI
OPERATED BY:	MOC
LOCATION:	MIRUKSAN
DATA SOURCE:	3

LINK:	MOC-PULMOSAN TO KUMOSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KUMOSAN
OPERATED BY:	MOC
LOCATION:	PULMOSAN
DATA SOURCE:	3

LINK:	MOC-CHONGJESAN TO MUDEUNGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MUDEUNGSAN
OPERATED BY:	MOC
LOCATION:	CHONGJESAN
DATA SOURCE:	3

LINK:	MOC-NAMWON TO MUDEUNGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MUDEUNGSAN
OPERATED BY:	MOC
LOCATION:	NAMWON
DATA SOURCE:	3

LINK:	MOC-KUMRYONSAN TO MURYONGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MURYONGSAN
OPERATED BY:	MOC
LOCATION:	KUMRYONSAN
DATA SOURCE:	3

LINK:	MOC-KUMRYONSAN TO PUSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	PUSAN
OPERATED BY:	MOC
LOCATION:	KUMRYONSAN
DATA SOURCE:	3

LINK:	MOC-MURGYONGSAN TO MUNEUNGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MUNEUNGSAN
OPERATED BY:	MOC
LOCATION:	MURGYONGSAN
DATA SOURCE:	3

LINK:	MOC-MURYONGSAN TO ULSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	ULSAN
OPERATED BY:	MOC
LOCATION:	MURYONGSAN
DATA SOURCE:	3

LINK:	MOC-MUNEUNG SAN TO TAEGU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEGU
OPERATED BY:	MOC
LOCATION:	MUNEUNG SAN
DATA SOURCE:	3

LINK:	MOC-TAELAKSAN TO HAENAM
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	HAENAM
OPERATED BY:	MOC
LOCATION:	TAELAKSAN
DATA SOURCE:	3

LINK:	MOC-TAELAKSAN TO CHEJU
MODE:	MW
TECHNOLOGY:	
CAPACITY:	
MANUFACTURER:	
NETWORK FUNCTION:	PTP
ROUTING:	CHEJU
OPERATED BY:	MOC
LOCATION:	TAELAKSAN
DATA SOURCE:	

LINK:	MOC-TAELAKSAN TO CHEJU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	CHEJU
OPERATED BY:	MOC
LOCATION:	TAELAKSAN
DATA SOURCE:	3

LINK:	MOC-CHINJU TO KUMOSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KUMOSAN
OPERATED BY:	MOC
LOCATION:	CHINJU
DATA SOURCE:	3

LINK:	MOC-YOSU TO KUMOSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KUMOSAN
OPERATED BY:	MOC
LOCATION:	YOSU
DATA SOURCE:	3

LINK:	MOC-CHONGJESAN TO KUMOSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KUMOSAN
OPERATED BY:	MOC
LOCATION:	CHONGJESAN
DATA SOURCE:	3

LINK:	MOC-PULMOSAN TO MIRYANG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MIRYANG
OPERATED BY:	MOC
LOCATION:	PULMOSAN
DATA SOURCE:	3

LINK:	MOC-PULMOSAN TO CHINHAE
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	CHINHAE
OPERATED BY:	MOC
LOCATION:	PULMOSAN
DATA SOURCE:	3

LINK:	MOC-GEUMSAN
MODE:	SAT
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC.2/25/75
NETWORK FUNCTION:	PCFSSRS
ROUTING:	GEUMSAN
OPERATED BY:	MOC
LOCATION:	127E29 36N07
DATA SOURCE:	6

LINK:	MOC-SEOUL TO MASAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	24CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MASAN
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	1

LINK:	MOC-YANGEUL SAN TO MUDEUNG SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MUDEUNG SAN
OPERATED BY:	MOC
LOCATION:	YANGEUL SAN
DATA SOURCE:	23

LINK:	MOC-GEUMSAN
MODE:	SAT
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC.2/25/75
NETWORK FUNCTION:	PCFSSRS
ROUTING:	GEUMSAN
OPERATED BY:	MOC
LOCATION:	127E29 36N07
DATA SOURCE:	8

LINK:	MOC-GEUMSAN
MODE:	SAT
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC.2/25/75
NETWORK FUNCTION:	PCFSSRS
ROUTING:	GEUMSAN
OPERATED BY:	MOC
LOCATION:	127E29 36N07
DATA SOURCE:	8

LINK:	MOC-GEUMSAN
MODE:	SAT
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC.2/25/75
NETWORK FUNCTION:	PCFSSRS
ROUTING:	GEUMSAN
OPERATED BY:	MOC
LOCATION:	127E29 36N07
DATA SOURCE:	8

LINK:	MOC-GEUMSAN
MODE:	SAT
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC.2/25/75
NETWORK FUNCTION:	PCFSSRS
ROUTING:	GEUMSAN
OPERATED BY:	MOC
LOCATION:	127E29 36N07
DATA SOURCE:	8

LINK:	MOC-GEUMSAN
MODE:	SAT
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC.2/25/75
NETWORK FUNCTION:	PCFSSRS
ROUTING:	GEUMSAN
OPERATED BY:	MOC
LOCATION:	127E29 36N07
DATA SOURCE:	8

LINK:	MOC-INTELSAT 4 PAC 1
MODE:	SAT
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC,2/25/75
NETWORK FUNCTION:	PCFSSTS
ROUTING:	INTELSAT 4 PAC 1
OPERATED BY:	MOC
LOCATION:	127E29 36N07
DATA SOURCE:	8

LINK:	MOC-INTELSAT 4 PAC 1
MODE:	SAT
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PCFSSTS
ROUTING:	INTELSAT 4 PAC 1
OPERATED BY:	MOC
LOCATION:	GEUMSAN
DATA SOURCE:	8

LINK:	MOC-INTELSAT 4 PAC 1
MODE:	SAT
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC,2/25/75
NETWORK FUNCTION:	PCFSSTS
ROUTING:	INTELSAT 4 PAC 1
OPERATED BY:	MOC
LOCATION:	127E29 36N07
DATA SOURCE:	8

LINK:	MOC-MURYONG SAN TO HAMADA JAPAN
MODE:	UHF
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PCFSSTS
ROUTING:	HAMADA JAPAN
OPERATED BY:	MOC
LOCATION:	MURYONG SAN
DATA SOURCE:	8

LINK:	MOC-ICHON TO WONGJU
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	WONGJU
OPERATED BY:	MOC
LOCATION:	ICHON
DATA SOURCE:	3

LINK:	MOC-ICHON TO YONGIN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	YONGIN
OPERATED BY:	MOC
LOCATION:	ICHON
DATA SOURCE:	3

LINK:	MOC-IRI TO TAEJON
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	TAEJON
OPERATED BY:	MOC
LOCATION:	IRI
DATA SOURCE:	3

LINK:	MOC-YONGIN TO SEOUL
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	SEOUL
OPERATED BY:	MOC
LOCATION:	YONGIN
DATA SOURCE:	3

LINK:	MOC-SUWON TO INCHON
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	INCHON
OPERATED BY:	MOC
LOCATION:	SUWON
DATA SOURCE:	3

LINK:	MOC-CHUNGJU TO TAEGU
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	TAEGU
OPERATED BY:	MOC
LOCATION:	CHUNGJU
DATA SOURCE:	3

LINK:	MOC-IRI TO CHONJU
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	CHONJU
OPERATED BY:	MOC
LOCATION:	IRI
DATA SOURCE:	3

LINK:	MOC-CHONAN TO TAEJON
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	TAEJON
OPERATED BY:	MOC
LOCATION:	CHONAN
DATA SOURCE:	3

LINK:	MOC-CHONAN TO SUWAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	SUWAN
OPERATED BY:	MOC
LOCATION:	CHONAN
DATA SOURCE:	3

LINK:	MOC-TAEGU TO ULSAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	ULSAN
OPERATED BY:	MOC
LOCATION:	TAEGU
DATA SOURCE:	23

LINK:	MOC-KYUNGJU TO TAEGU
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	TAEGU
OPERATED BY:	MOC
LOCATION:	KYUNGJU
DATA SOURCE:	3

LINK:	MOC-TAEJON TO KUMSAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	KUMSAN
OPERATED BY:	MOC
LOCATION:	TAEJON
DATA SOURCE:	3

LINK:	MOC-MURYONGSAN TO ULSAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	ULSAN
OPERATED BY:	MOC
LOCATION:	MURYONGSAN
DATA SOURCE:	3

LINK:	MOC-SEOUL TO CHUNCHON
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	CHUNCHON
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	3

LINK:	MOC-SIKJANGSAN TO SEOUL
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	SEOUL
OPERATED BY:	MOC
LOCATION:	SIKJANGSAN
DATA SOURCE:	3

LINK:	MOC-KWANG JU MOC TO CHON JU
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	CHON JU
OPERATED BY:	MOC
LOCATION:	KWANG JU MOC
DATA SOURCE:	3

LINK:	MOC-NA JU TO WANG JU MOC
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	WANG JU MOC
OPERATED BY:	MOC
LOCATION:	NA JU
DATA SOURCE:	3

LINK:	MOC-PUSAN TO KYUNG JU
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	KYUNG JU
OPERATED BY:	MOC
LOCATION:	PUSAN
DATA SOURCE:	3

LINK:	MOC-TAEJON TO TAEGU
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	TAEGU
OPERATED BY:	MOC
LOCATION:	TAEJON
DATA SOURCE:	3

LINK:	MOC-PUSAN TO ULSAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	ULSAN
OPERATED BY:	MOC
LOCATION:	PUSAN
DATA SOURCE:	3

LINK:	KNR MOT-SUNCHONG TO PUSAN
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	MOTOROLA
NETWORK FUNCTION:	PL
ROUTING:	PUSAN
OPERATED BY:	KNR MOT
LOCATION:	SUNCHONG
DATA SOURCE:	26

LINK:	KNR MOT-TAEJON TO SUNCHONG
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	MOTOROLA
NETWORK FUNCTION:	PL
ROUTING:	SUNCHONG
OPERATED BY:	KNR MOT
LOCATION:	TAEJON
DATA SOURCE:	26

LINK:	KNR MOT-SEOUL TO PUSAN
MODE:	MW
TECHNOLOGY:	2 GHZ
CAPACITY:	300 CH
MANUFACTURER:	MOTOROLA ??
NETWORK FUNCTION:	PL
ROUTING:	PUSAN
OPERATED BY:	KNR MOT
LOCATION:	SEOUL
DATA SOURCE:	26

LINK:	KEP-HUK SONG SAN TO SIK JANG SAN
MODE:	MICROWAVE
TECHNOLOGY:	VHF.FM
CAPACITY:	
MANUFACTURER:	NEC TR-7GD300-7
NETWORK FUNCTION:	PTP
ROUTING:	SIK JANG SAN
OPERATED BY:	KEP
LOCATION.	HUK SONG SAN
DATA SOURCE:	13

LINK:	KEP-KWAN AK SAN TO HUK SONG SAN
MODE:	MICROWAVE
TECHNOLOGY:	VHF.FM
CAPACITY:	
MANUFACTURER:	NEC TR-7GD300-7
NETWORK FUNCTION:	PTP
ROUTING:	HUK SONG SAN
OPERATED BY:	KEP
LOCATION:	KWAN AK SAN
DATA SOURCE:	13

LINK:	KEP-BUPYONG TO KWAN AK SAN
MODE:	MICROWAVE
TECHNOLOGY:	VHF.FM
CAPACITY:	
MANUFACTURER:	NEC TR-7GD300-7
NETWORK FUNCTION:	PTP
ROUTING:	KWAN AK SAN
OPERATED BY:	KEP
LOCATION:	BUPYONG
DATA SOURCE:	13

LINK:	KEP-SIK JANG SAN TO TAEJON
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	NEC-TR-7GD300-7
NETWORK FUNCTION:	PTP
ROUTING:	TAEJON
OPERATED BY:	KEP
LOCATION:	SIK JANG SAN
DATA SOURCE:	13

LINK:	KEP-SIK JANG SAN TO MI LEAK SAN
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	NEC-TR-7GD300-7
NETWORK FUNCTION:	PTP
ROUTING:	MI LEAK SAN
OPERATED BY:	KEP
LOCATION:	SIK JANG SAN
DATA SOURCE:	13

LINK:	KEP-SIK JANG SAN TO HAK MU SAN
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	NEC-TR-7GD300-7
NETWORK FUNCTION:	PTP
ROUTING:	HAK MU SAN
OPERATED BY:	KEP
LOCATION:	SIK JANG SAN
DATA SOURCE:	13

LINK:	KEP-MI LEAK SAN TO IREE
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	NEC-TR-7GD300-7
NETWORK FUNCTION:	PTP
ROUTING:	IREE
OPERATED BY:	KEP
LOCATION:	MI LEAK SAN
DATA SOURCE:	13

LINK:	KEP-HAK MU SAN TO PAL GONG SAN
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	NEC-TR-7GD300-7
NETWORK FUNCTION:	PTP
ROUTING:	PAL GONG SAN
OPERATED BY:	KEP
LOCATION:	HAK MU SAN
DATA SOURCE:	13

LINK:	KEP-PAL GONG SAN TO TAEGU
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	NEC-TR-7GD300-7
NETWORK FUNCTION:	PTP
ROUTING:	TAEGU
OPERATED BY:	KEP
LOCATION:	PAL GONG SAN
DATA SOURCE:	13

LINK:	KNP-BI PYONG BONG TO KAE PYONG SAN
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	MOTOROLA TR-30/300
NETWORK FUNCTION:	PTP
ROUTING:	KAE PYONG SAN
OPERATED BY:	KNP
LOCATION:	BI PYONG BONG
DATA SOURCE:	13

LINK:	KNP-KAE PYONG SAN TO HAK MU SAN
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	MOTOROLA TR-30/300
NETWORK FUNCTION:	PTP
ROUTING:	HAK MU SAN
OPERATED BY:	KNP
LOCATION:	KAE PYONG SAN
DATA SOURCE:	13

LINK:	KNP-HAK MU SAN TO PAL GONG SAN
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	MOTOROLA TR-30/300
NETWORK FUNCTION:	PTP
ROUTING:	PAL GONG SAN
OPERATED BY:	KNP
LOCATION:	HAK MU SAN
DATA SOURCE:	13

LINK:	KNP-PAL GONG SAN TO TAEGU
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	MOTOROLA TR-30/300
NETWORK FUNCTION:	PTP
ROUTING:	TAEGU
OPERATED BY:	KNP
LOCATION:	PAL GONG SAN
DATA SOURCE:	13

LINK:	KNP-PAL GONG SAN TO PUL MOSAN
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	MOTOROLA TR-30/300
NETWORK FUNCTION:	PTP
ROUTING:	PUL MOSAN
OPERATED BY:	KNP
LOCATION:	PAL GONG SAN
DATA SOURCE:	13

LINK:	KNP-PUL MOSAN TO KOWAN KYON SAN
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	MOTOROLA TR-30/300
NETWORK FUNCTION:	PTP
ROUTING:	KOWAN KYON SAN
OPERATED BY:	KNP
LOCATION:	PUL MOSAN
DATA SOURCE:	13

LINK:	KNP-BUK AK SAN TO MAN KYONG DAE
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	MOTOROLA TR-30/300
NETWORK FUNCTION:	PTP
ROUTING:	MAN KYONG DAE
OPERATED BY:	KNP
LOCATION:	BUK AK SAN
DATA SOURCE:	13

LINK:	KNP-MAN KYONG DAE TO BI PYONG BONG
MODE:	MICROWAVE
TECHNOLOGY:	FM VHF
CAPACITY:	
MANUFACTURER:	MOTOROLA TR-30/300
NETWORK FUNCTION:	PTP
ROUTING:	BI PYONG BONG
OPERATED BY:	KNP
LOCATION:	MAN KYONG DAE
DATA SOURCE:	13

d. Record/Data Equipment (Table 3)

(Current Civilian)

As yet no private common carriers in Korea provide data transmission services, as do AT&T and Western Union of the United States. Consequently, most subscribers to the existing data communications system are compelled to use voice grade telephone leased lines.

There are no regulations to govern data communications standards in Korea. Largely by compliance with worldwide usage, speeds of full duplex, half duplex, 300, 1200, 2400, 4800, and 9600 bps are used depending on the type of modems or terminal apparatus (with quality equivalent to that of 3002 unconditioned line in the United States).*

The Ministry of Communications (MOC) and the Korea Institute of Science and Technology (KIST) use an estimated 4,000 circuits or about 6% of long distance circuits for data subscribers. KIST has set up an experimental network linking Telex subscribers to a KIST computer terminal which they can reach simply by dialing KIST's Telex code. KIST is using IBM and CDC computers; the source of the network's 12 interactive terminals is unknown. It is reported that KIST started in 1973 with an ICC model 2200/24 modem, and with data communications via leased lines (voice grade telephone circuits) up to 400 kilometers at a maximum of 4800 bps with an ICC 4600/48 modem. Details of the existing circuit facilities are given in Table 3.

*Reference: Martin, James, Telecommunications and the Computer, Second Edition, 1976, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, USA, pp. 344-345.

SWITCH NODES:	KIST-INCHEON
TECHNICAL TYPE:	TELEX
MANUFACTURER:	CYBER 174
YEAR INSTALLED:	1978
CAPACITY:	
LOCATION:	INCHEON
OPERATED BY:	KIST
STANDARD PROTOCOLS:	50 BAUD
DATA SOURCE:	7

SWITCH NODES:	KIST-SEOUL
TECHNICAL TYPE:	TELEX
MANUFACTURER:	CYBER 174
YEAR INSTALLED:	1978
CAPACITY:	
LOCATION:	SEOUL
OPERATED BY:	KIST
STANDARD PROTOCOLS:	50 BAUD
DATA SOURCE:	7

SWITCH NODES:	KIST-WEONJU
TECHNICAL TYPE:	TELEX
MANUFACTURER:	CYBER 174
YEAR INSTALLED:	1978
CAPACITY:	
LOCATION:	WEONJU
OPERATED BY:	KIST
STANDARD PROTOCOLS:	50 BAUD
DATA SOURCE:	7

SWITCH NODES:	KIST-EUMSEONG
TECHNICAL TYPE:	TELEX
MANUFACTURER:	CYBER 174
YEAR INSTALLED:	1978
CAPACITY:	
LOCATION:	EUMSEONG
OPERATED BY:	KIST
STANDARD PROTOCOLS:	50 BAUD
DATA SOURCE:	7

SWITCH NODES:	KIST-CHEONGJU
TECHNICAL TYPE:	TELEX
MANUFACTURER:	CYBER 174
YEAR INSTALLED:	1978
CAPACITY:	
LOCATION:	CHEONGJU
OPERATED BY:	KIST
STANDARD PROTOCOLS:	50 BAUD
DATA SOURCE:	7

SWITCH NODES:	KIST-DAEDEOG
TECHNICAL TYPE:	TELEX
MANUFACTURER:	CYBER 174
YEAR INSTALLED:	1978
CAPACITY:	
LOCATION:	DAEDEOG
OPERATED BY:	KIST
STANDARD PROTOCOLS:	50 BAUD
DATA SOURCE:	7

SWITCH NODES:	KIST-YEOCHEON
TECHNICAL TYPE:	TELEX
MANUFACTURER:	CYBER 174
YEAR INSTALLED:	1978
CAPACITY:	
LOCATION:	YEOCHEON
OPERATED BY:	KIST
STANDARD PROTOCOLS:	50 BAUD
DATA SOURCE:	7

SWITCH NODES:	KIST-MASAN
TECHNICAL TYPE:	TELEX
MANUFACTURER:	CYBER 174
YEAR INSTALLED:	1978
CAPACITY:	
LOCATION:	MASAN
OPERATED BY:	KIST
STANDARD PROTOCOLS:	50 BAUD
DATA SOURCE:	7

SWITCH NODES:	KIST-PUSAN
TECHNICAL TYPE:	TELEX
MANUFACTURER:	CYBER 174
YEAR INSTALLED:	1978
CAPACITY:	
LOCATION:	PUSAN
OPERATED BY:	KIST
STANDARD PROTOCOLS:	50 BAUD
DATA SOURCE:	7

SWITCH NODES:	KIST-ULSAN
TECHNICAL TYPE:	TELEX
MANUFACTURER:	CYBER 174
YEAR INSTALLED:	1978
CAPACITY:	
LOCATION:	ULSAN
OPERATED BY:	KIST
STANDARD PROTOCOLS:	50 BAUD
DATA SOURCE:	7

SWITCH NODES:	MOC-TAEGU
TECHNICAL TYPE:	LL
MANUFACTURER:	
YEAR INSTALLED:	
CAPACITY:	264 CKTS
LOCATION:	TAEGU
OPERATED BY:	MOC
STANDARD PROTOCOLS:	CCITT
DATA SOURCE:	10

SWITCH NODES:	MOC-KWANGJU
TECHNICAL TYPE:	LL
MANUFACTURER:	
YEAR INSTALLED:	
CAPACITY:	86 CKTS
LOCATION:	KWANGJU
OPERATED BY:	MOC
STANDARD PROTOCOLS:	CCITT
DATA SOURCE:	10

SWITCH NODES:	MOC-SEOUL
TECHNICAL TYPE:	LL
MANUFACTURER:	
YEAR INSTALLED:	
CAPACITY:	475 CIRCUITS
LOCATION:	SEOUL
OPERATED BY:	MOC
STANDARD PROTOCOLS:	CCITT
DATA SOURCE:	10

SWITCH NODES:	MOC-SEOUL
TECHNICAL TYPE:	LL
MANUFACTURER:	
YEAR INSTALLED:	
CAPACITY:	264 CKTS
LOCATION:	SEOUL
OPERATED BY:	MOC
STANDARD PROTOCOLS:	CCITT
DATA SOURCE:	10

SWITCH NODES:	MOC-SEOUL
TECHNICAL TYPE:	LL
MANUFACTURER:	
YEAR INSTALLED:	
CAPACITY:	86 CKTS
LOCATION:	SEOUL
OPERATED BY:	MOC
STANDARD PROTOCOLS:	CCITT
DATA SOURCE:	10

SWITCH NODES:	MOC- PUSAN
TECHNICAL TYPE:	LL
MANUFACTURER:	
YEAR INSTALLED:	
CAPACITY:	475 CIRCUITS
LOCATION:	PUSAN
OPERATED BY:	MOC
STANDARD PROTOCOLS:	CCITT
DATA SOURCE:	10

e. International Gateways (Table 4)
(Current Civilian)

GATEWAY:	COMSAT-JAMESBURG CARMEL, CA TO PAC OC REGION SAT
TYPE:	TRANSMISSION
CAPACITY:	77 CIRCUITS
TRANSMISSION:	SATELLITE
OPERATED BY:	COMSAT
LOCATION:	JAMESBURG CARMEL, CA
CONNECTS TO:	PAC OC REGION SAT
DATA SOURCE:	21

GATEWAY:	COMSAT-PAUMELU, HA TO PAC OC REGION SAT
TYPE:	TRANSMISSION
CAPACITY:	16 CIRCUITS
TRANSMISSION:	SATELLITE
OPERATED BY:	COMSAT
LOCATION:	PAUMELU, HA
CONNECTS TO:	PAC OC REGION SAT
DATA SOURCE:	21

GATEWAY:	COMSAT-PAGO-PAGO AMER SAMOA TO PAC OC REGION SAT
TYPE:	TRANSMISSION
CAPACITY:	2 CIRCUITS
TRANSMISSION:	SATELLITE
OPERATED BY:	COMSAT
LOCATION:	PAGO-PAGO AMER SAMOA
CONNECTS TO:	PAC OC REGION SAT
DATA SOURCE:	21

GATEWAY:	COMSAT-PULANTAT GUAM TO PAC OC REGION SAT
TYPE:	TRANSMISSION
CAPACITY:	3 CIRCUITS
TRANSMISSION:	SATELLITE
OPERATED BY:	COMSAT
LOCATION:	PULANTAT GUAM
CONNECTS TO:	PAC OC REGION SAT
DATA SOURCE:	21

GATEWAY:	COMSAT-BREWSTER, WA, USA TO PAC OC REGION SAT
TYPE:	TRANSMISSION
CAPACITY:	101 CIRCUITS
TRANSMISSION:	SATELLITE
OPERATED BY:	COMSAT
LOCATION:	BREWSTER, WA, USA
CONNECTS TO:	PAC OC REGION SAT
DATA SOURCE:	21

GATEWAY: MOC-PUSAN TO HAMADA, JAPAN
TYPE: NEC
CAPACITY: 2700 CH
TRANSMISSION: CABLE
OPERATED BY: MOC
LOCATION: PUSAN
CONNECTS TO: HAMADA, JAPAN
DATA SOURCE: 3

GATEWAY: MOC-NAHA TO KAGOSHIMA, JAPAN
TYPE: NEC
CAPACITY: 2700 CH
TRANSMISSION: CABLE
OPERATED BY: MOC
LOCATION: NAHA
CONNECTS TO: KAGOSHIMA, JAPAN
DATA SOURCE: 3

GATEWAY: MOC-KUM SAN 1 TO PACIFIC REGION SAT
TYPE: FORD AEROSPACE 70
CAPACITY: 199 CIRCUITS
TRANSMISSION: SAT,STRD A EARTH STATION
OPERATED BY: MOC
LOCATION: KUM SAN 1
CONNECTS TO: PACIFIC REGION SAT
DATA SOURCE: 30

GATEWAY: MOC-ULSAN TO HAMADA, JAPAN
TYPE: COLLINS
CAPACITY: 216 CH
TRANSMISSION: TROPO
OPERATED BY: MOC
LOCATION: ULSAN
CONNECTS TO: HAMADA, JAPAN
DATA SOURCE: 3

GATEWAY: RCA FOR KIT-KUM SAN 3 TO PACIFIC REGION
TYPE: FORD AEROSPACE,1981
CAPACITY:
TRANSMISSION: SAT
OPERATED BY: RCA FOR KIT
LOCATION: KUM SAN 3
CONNECTS TO: PACIFIC REGION
DATA SOURCE: 29

GATEWAY: RCA FOR KIT-KUM SAN 2 TO INDIAN OCEAN SAT
TYPE: FORD AEROSPACE 77
CAPACITY:
TRANSMISSION: SAT,INTELSAT IV
OPERATED BY: RCA FOR KIT
LOCATION: KUM SAN 2
CONNECTS TO: INDIAN OCEAN SAT
DATA SOURCE: 28

C. MILITARY NETWORKS

1. Current Status of Telecommunications

a. Overview

There are presently four major military communications systems in Korea:

- o The ROK Army microwave system
- o The ROK Air Force "peace fortune" system
- o The U.S. DCS backbone system
- o Eight U.S. Army non-DCS communications systems

Available data indicates that the Korean Army and Air Force will continue to use its analog (FDM/FM) transmission facilities in the foreseeable future. A description of the Korean assets are given in sub-sections b and c.

The existing U.S. Army Korean Communications Networks are composed of landline, tactical VHF radio, and tactical and fixed-plant microwave radio systems. The DCS backbone system runs south from Seoul through eight relay or terminal stations to Changsan, and consists largely of AN/FRC-109 fixed-plant solid state microwave radio installed in 1975, some additional channel capacity utilizing AN/FCC-18 fixed-plant, solid state (FDM/FM) multiplex equipment, and an extension of the backbone of Camp Red Cloud.

The U.S. Army non-DCS communications systems consists mostly of links north of Seoul, with spurs connecting to the DCS backbone providing communications to isolated facilities south of Seoul, as well as links paralleling the capital DCS backbone which are used to augment the capacity of the backbone system. Many of these links and spurs are currently being upgraded with fixed-plant transistorized microwave and (FDM/FM) multiplex equipment similar to, and compatible with, the equipment used for the backbone upgrade.

A major study completed in February, 1977 by the 1st Signal Brigade entitled "Economic Analysis Camp Cassey-Pusan, Korean Coaxial Cable System" provides a detailed cost analysis of various alternatives for

upgrading communications capabilities of the U.S. Army in Korea. (Its basic conclusion was that coaxial cable was the most economical and secure form of communications, pending the availability of fiber optic transmission links.)

b. ROK Army System

The Republic of Korea Army (ROKA) microwave communications system is a commercial type; line-of-sight, fixed-plant FDM/FM radio relay system.

The Collins Radio Company provided the equipment for this system and constructed the relay and terminal sites under the supervision of USASTRATCOM. The system was completed in August 1967. This system interfaces with the DCS at Seoul (ROKA)/Seoul TCG, Palgongsan/Taegu TCG, and finally between Pulmosan/Changsan TCG. Sixty channels are available to the DCS for alternate routing purposes over the ROK Army bypass system. Figure III-11 shows the geographical layout of the ROKA microwave network which corresponds to the detailed data in Section C2.

c. ROK Air Force System

The Republic of Korea Air Force (ROKAF) microwave communications system was first installed in 1967. Also known as the "Peace Fortune" system, the ROKAF network consists of over 30 fixed sites including two relays. It provides the primary support for Korean air defense. The USAF has access to the ROKAF system on a routine and on an alternate basis in the case of DCS failure. US entry into the ROKAF system can be accomplished at the following locations: Osan, Kunsan, Yongunson and Seoul.

Figure III-12 shows the geographical layout of the ROKAF microwave network. The detailed data in Section C2 is keyed to this map.

2. Detailed Listings (Current Military)

a. Remarks

In this section, detailed listings are provided which describe the current military communications capabilities discussed in the preceding sections. The switch or link designators identify the operating organization (e.g., ROKA) and the geographical name of the city or cities served/located. The Glossary in Chapter V describes all abbreviations used. The numbered data source is listed in the Bibliography of Chapter V.

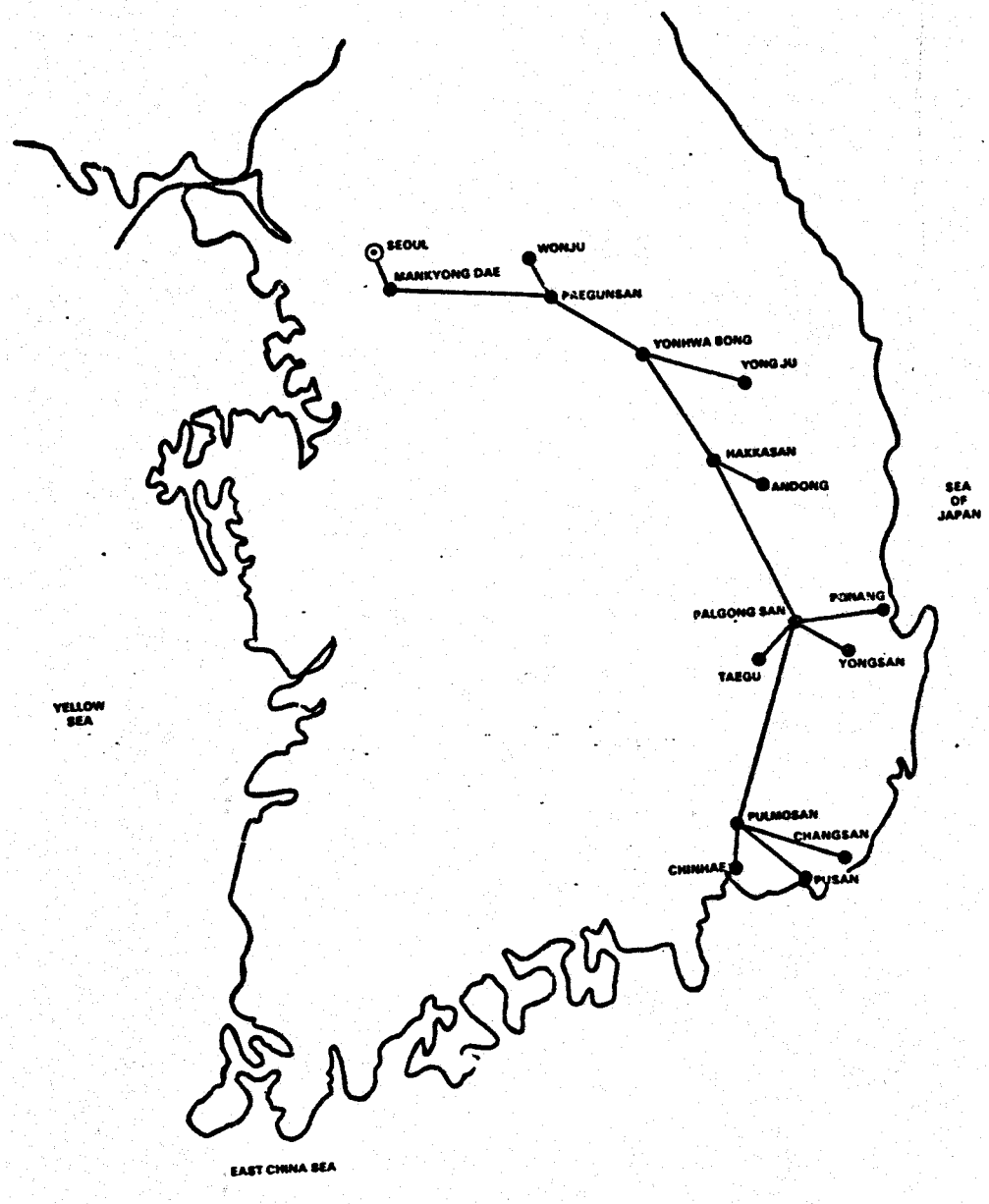

Figure III-11. ROKA MICROWAVE SYSTEM

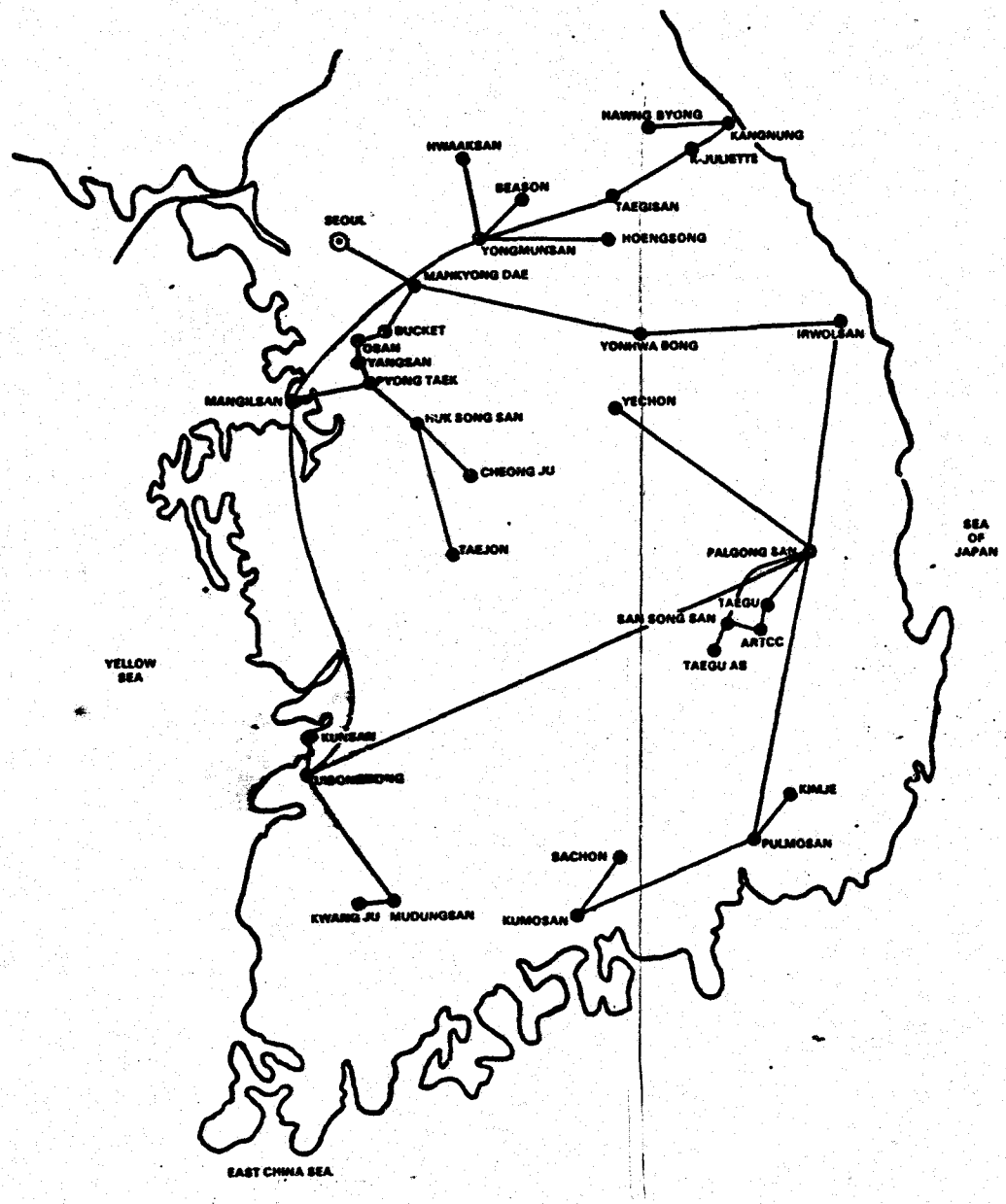

Figure III-12. ROKAF MICROWAVE SYSTEM

b. Telephone Switches (Table 1)
(Current Military)

SWITCH:	ROKA-PUSAN
TYPE:	X-Y STEP
MANUFACTURER:	STROMBERG CARLSON CO
YEAR INSTALLED:	73
CAPACITY:	
FILL:	
NETWORK FUNCTION:	LEO
SIGNALLING:	CCITT
NUMBERING PLAN:	
LOCATION:	PUSAN
OPERATED BY:	ROKA
DATA SOURCE:	6

SWITCH:	ROKA-CAMP HUMPHREYS
TYPE:	X-Y STEP
MANUFACTURER:	STROMBERG CARLSON CO
YEAR INSTALLED:	71
CAPACITY:	
FILL:	
NETWORK FUNCTION:	LEO
SIGNALLING:	CCITT
NUMBERING PLAN:	
LOCATION:	CAMP HUMPHREYS
OPERATED BY:	ROKA
DATA SOURCE:	6

SWITCH:	ROKA-CAMP HENRY
TYPE:	X-Y STEP
MANUFACTURER:	STROMBERG CARLSON CO
YEAR INSTALLED:	72
CAPACITY:	
FILL:	
NETWORK FUNCTION:	LEO
SIGNALLING:	CCITT
NUMBERING PLAN:	
LOCATION:	CAMP HENRY
OPERATED BY:	ROKA
DATA SOURCE:	6

c. Transmission Capability (Table 2)
(Current Military)

LINK:	ROKA-YONGINROKA TO MAN-KYUNGDAEROKA
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	60 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MAN-KYUNGDAEROKA
OPERATED BY:	ROKA
LOCATION:	YONGINROKA
DATA SOURCE:	3

LINK:	ROKA-SEOUL TO MAN-KYUNGDAEROKA
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	384 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	MAN-KYUNGDAEROKA
OPERATED BY:	ROKA
LOCATION:	SEOUL
DATA SOURCE:	27

LINK:	ROKA-YONGHW ABONG TO HAKASAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	268 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	HAKASAN
OPERATED BY:	ROKA
LOCATION:	YONGHW ABONG
DATA SOURCE:	27

LINK:	ROKA-PAEGUNSANROKA TO MAN-KYUNGDAEROKA
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	360 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	MAN-KYUNGDAEROKA
OPERATED BY:	ROKA
LOCATION:	PAEGUNSANROKA
DATA SOURCE:	27

LINK:	ROKA-PALGONGRANROKA TO POHANGROKA
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	72 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	POHANGROKA
OPERATED BY:	ROKA
LOCATION:	PALGONGSANROKA
DATA SOURCE:	27

LINK:	ROKA-PULMOSAN ROKA TO CHANGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	120 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	CHANGSAN
OPERATED BY:	ROKA
LOCATION:	PULMOSAN ROKA
DATA SOURCE:	3

LINK:	ROKA-PULMOSAN ROKA TO CHINHAE ROKA
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	96 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	CHINHAE ROKA
OPERATED BY:	ROKA
LOCATION:	PULMOSAN ROKA
DATA SOURCE:	27

LINK:	ROKA-PULMOSAN ROKA TO BONGHWA
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	144 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	BONGHWA
OPERATED BY:	ROKA
LOCATION:	PULMOSAN ROKA
DATA SOURCE:	27

LINK:	ROKA-PUSAN ROKA TO BONGHWASAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	121 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	BONGHWASAN
OPERATED BY:	ROKA
LOCATION:	PUSAN ROKA
DATA SOURCE:	27

LINK:	ROKA-HAKASAN TO ANDONG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	60 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	ANDONG
OPERATED BY:	ROKA
LOCATION:	HAKASAN
DATA SOURCE:	27

LINK:	ROKA-HAKASAN TO PALGONGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	270 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	PALGONGSAN
OPERATED BY:	ROKA
LOCATION:	HAKASAN
DATA SOURCE:	27

LINK:	ROKA-YONGWABONG TO YONG JU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	49 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	YONG JU
OPERATED BY:	ROKA
LOCATION:	YONGWABONG
DATA SOURCE:	1

LINK:	ROKA-PUSAN TO YONGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	120 CH
MANUFACTURER:	NEC 61
NETWORK FUNCTION:	PTP
ROUTING:	YONGSAN
OPERATED BY:	ROKA
LOCATION:	PUSAN
DATA SOURCE:	6

LINK:	ROKA-PUSAN TO SEOUL
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	240 CH
MANUFACTURER:	NEC 61
NETWORK FUNCTION:	PTP
ROUTING:	SEOUL
OPERATED BY:	ROKA
LOCATION:	PUSAN
DATA SOURCE:	6

LINK:	ROKA-PAEGUNSAN TO WONJU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	132 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	WONJU
OPERATED BY:	ROKA
LOCATION:	PAEGUNSAN
DATA SOURCE:	27

LINK:	ROKA-PAEGUNSAN TO YONGHW ABONG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	248 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	YONGHW ABONG
OPERATED BY:	ROKA
LOCATION:	PAEGUNSAN
DATA SOURCE:	27

LINK:	ROKA-PALGONGSANROKA TO TAEGUROKA
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	288 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	TAEGUROKA
OPERATED BY:	ROKA
LOCATION:	PALGONGSANROKA
DATA SOURCE:	27

LINK:	ROKA-PALGONGSANROKA TO YONGCHONROKA
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	120 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	YONGCHONROKA
OPERATED BY:	ROKA
LOCATION:	PALGONGSANROKA
DATA SOURCE:	27

LINK:	ROKA-PALGONGSANROKA TO PULMOSANROKA
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	234 CH
MANUFACTURER:	COLLINS 67
NETWORK FUNCTION:	PTP
ROUTING:	PULMOSANROKA
OPERATED BY:	ROKA
LOCATION:	PALGONGSANROKA
DATA SOURCE:	27

LINK:	ROKA-ROK 5TH CORPS TO ALBANY
MODE:	UHF
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	ALBANY
OPERATED BY:	ROKA
LOCATION:	ROK 5TH CORPS
DATA SOURCE:	3

LINK:	ROKA-ROK 6TH CORPS TO ALBANY
MODE:	UHF
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	ALBANY
OPERATED BY:	ROKA
LOCATION:	ROK 6TH CORPS
DATA SOURCE:	3

LINK:	ROKA-ROKA TO CAMP CASTLE
MODE:	VHF
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	CAMP CASTLE
OPERATED BY:	ROKA
LOCATION:	ROKA
DATA SOURCE:	3

LINK:	ROKA-CAMP CASTLE TO ALBANY
MODE:	VHF
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	ALBANY
OPERATED BY:	ROKA
LOCATION:	CAMP CASTLE
DATA SOURCE:	3

LINK:	ROKA-CAMP CASTLE TO ROK MC
MODE:	VHF
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	ROK MC
OPERATED BY:	ROKA
LOCATION:	CAMP CASTLE
DATA SOURCE:	3

LINK:	ROKA-TANGOROKA TO MAN-KYUNGDAEROKA
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	150 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	MAN-KYUNGDAEROKA
OPERATED BY:	ROKA
LOCATION:	TANGOROKA
DATA SOURCE:	3

LINK:	ROKA-SEOUL TO SEOUL TCG
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	120 CH
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	SEOUL TCG
OPERATED BY:	ROKA
LOCATION:	SEOUL
DATA SOURCE:	3

LINK:	ROKA-PALGONGSANROKA TO TAEGU
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	240 CH
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	TAEGU
OPERATED BY:	ROKA
LOCATION:	PALGONGSANROKA
DATA SOURCE:	3

LINK:	ROKA-HILL 153 TO TANGO
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	200 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	TANGO
OPERATED BY:	ROKA
LOCATION:	HILL 153
DATA SOURCE:	3

LINK:	ROKA-HILL 153 TO SEOUL AIR FIELD
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	100 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	SEOUL AIR FIELD
OPERATED BY:	ROKA
LOCATION:	HILL 153
DATA SOURCE:	3

LINK:	ROKA-YONGINROKA TO SEOUL
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	180 CH
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	SEOUL
OPERATED BY:	ROKA
LOCATION:	YONGINROKA
DATA SOURCE:	3

LINK:	ROKA-YONGINROKA TO WONJUROKA
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	180 CH
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	WONJUROKA
OPERATED BY:	ROKA
LOCATION:	YONGINROKA
DATA SOURCE:	3

LINK:	ROKAF-PALGONGSAN TO SACHON
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	2PR 60 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	SACHON
OPERATED BY:	ROKAF
LOCATION:	PALGONGSAN
DATA SOURCE:	3

LINK:	ROKAF-TAEGU TCG TO TAEGU AB
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	84 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEGU AB
OPERATED BY:	ROKAF
LOCATION:	TAEGU TCG
DATA SOURCE:	3

LINK:	ROKAF-PALGONGSAN TO TAEGUSANSONGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	540 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEGUSANSONGSAN
OPERATED BY:	ROKAF
LOCATION:	PALGONGSAN
DATA SOURCE:	3

LINK:	ROKAF-PALGONGSAN TO YECHON
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	60 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YECHON
OPERATED BY:	ROKAF
LOCATION:	PALGONGSAN
DATA SOURCE:	3

LINK:	ROKAF-TAEGU AB TO TAEGUSANSONGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	360 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEGUSANSONGSAN
OPERATED BY:	ROKAF
LOCATION:	TAEGU AB
DATA SOURCE:	3

LINK:	ROKAF-MOSULPO TO KWANG:JU AB
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	24 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KWANG:JU AB
OPERATED BY:	ROKAF
LOCATION:	MOSULPO
DATA SOURCE:	3

LINK:	ROKAF-PALGONGSAN TO IRWOLSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	360 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	IRWOLSAN
OPERATED BY:	ROKAF
LOCATION:	PALGONGSAN
DATA SOURCE:	3

LINK:	ROKAF-MANG YUNGDAE TO IRWOLSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	360 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	IRWOLSAN
OPERATED BY:	ROKAF
LOCATION:	MANG YUNGDAE
DATA SOURCE:	3

LINK:	ROKAF-PUSAN TO KIMHAE
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KIMHAE
OPERATED BY:	ROKAF
LOCATION:	PUSAN
DATA SOURCE:	3

LINK:	ROKAF-TAEGU ARTCC TO TAEGUSANSONSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	180 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEGUSANSONGSAN
OPERATED BY:	ROKAF
LOCATION:	TAEGU ARTCC
DATA SOURCE:	3

LINK:	ROKAF-IRWOLSAN TO SANG JU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	1 CH AVAIL
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	SANG JU
OPERATED BY:	ROKAF
LOCATION:	IRWOLSAN
DATA SOURCE:	3

LINK:	ROKAF-UISONGBONG TO PALGONGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	264 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	PALGONGSAN
OPERATED BY:	ROKAF
LOCATION:	UISONGBONG
DATA SOURCE:	3

LINK:	ROKAF-KANG NUNG TO KOJIN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KOJIN
OPERATED BY:	ROKAF
LOCATION:	KANG NUNG
DATA SOURCE:	3

LINK:	ROKAF-YONG MUNSAN TO TAEGI-SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	132 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEGI-SAN
OPERATED BY:	ROKAF
LOCATION:	YONG MUNSAN
DATA SOURCE:	3

LINK:	ROKAF-K-JULIETTE TO KANGNUNG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	132 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KANGNUNG
OPERATED BY:	ROKAF
LOCATION:	K-JULIETTE
DATA SOURCE:	3

LINK:	ROKAF-PYONG TAEK TO TAEJON
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	4 CH AVAIL
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEJON
OPERATED BY:	ROKAF
LOCATION:	PYONG TAEK
DATA SOURCE:	3

LINK:	ROKAF-OSAN AB TO MANGYUNGDAEROKAF
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	420 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MANGYUNGDAEROKAF
OPERATED BY:	ROKAF
LOCATION:	OSAN AB
DATA SOURCE:	3

LINK:	ROKAF-BYOLIPSAN TO MANGILSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MANGILSAN
OPERATED BY:	ROKAF
LOCATION:	BYOLIPSAN
DATA SOURCE:	3

LINK:	ROKAF-PYONG TAEK TO MANGILSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	420 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MANGILSAN
OPERATED BY:	ROKAF
LOCATION:	PYONG TAEK
DATA SOURCE:	3

LINK:	ROKAF-UISONGBONG TO YONG JUNG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	1 CH AVAIL
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YONG JUNG
OPERATED BY:	ROKAF
LOCATION:	UISONGBONG
DATA SOURCE:	3

LINK:	ROKAF-PYONG TAEK TO OSAN AB
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	408 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	OSAN AB
OPERATED BY:	ROKAF
LOCATION:	PYONG TAEK
DATA SOURCE:	3

LINK:	ROKAF-PYONG TAEK TO SUWON
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	72 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	SUWON
OPERATED BY:	ROKAF
LOCATION:	PYONG TAEK
DATA SOURCE:	3

LINK:	ROKAF-UISONGBONG TO MANGILSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	240 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MANGILSAN
OPERATED BY:	ROKAF
LOCATION:	UISONGBONG
DATA SOURCE:	3

LINK:	ROKAF-DAESUNG SAN TO PAPYONGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	TRC-IX2.COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	PAPYONGSAN
OPERATED BY:	ROKAF
LOCATION:	DAESUNG SAN
DATA SOURCE:	3

LINK:	ROKAF-PALGONGSAN TO KIMHAE
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	120 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KIMHAE
OPERATED BY:	ROKAF
LOCATION:	PALGONGSAN
DATA SOURCE:	3

LINK:	ROKAF-KANG NUNG TO HAWNG BYONG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	24 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	HAWNG BYONG
OPERATED BY:	ROKAF
LOCATION:	KANG NUNG
DATA SOURCE:	3

LINK:	ROKAF-YONG MUNSAN TO MANGILSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	300 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MANGILSAN
OPERATED BY:	ROKAF
LOCATION:	YONG MUNSAN
DATA SOURCE:	3

LINK:	ROKAF-YONG MUNSAN TO YOJO
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	1 CH AVAIL
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	YOJO
OPERATED BY:	ROKAF
LOCATION:	YONG MUNSAN
DATA SOURCE:	3

LINK:	ROKAF-YONG MUNSAN TO HWA AKSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	24 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	HWA AKSAN
OPERATED BY:	ROKAF
LOCATION:	YONG MUNSAN
DATA SOURCE:	3

LINK:	ROKAF-SIN GAL TO SUWON
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	1 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	SUWON
OPERATED BY:	ROKAF
LOCATION:	SIN GAL
DATA SOURCE:	3

LINK:	ROKAF-K-JULIETTE TO TAEGI-SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	132 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEGI-SAN
OPERATED BY:	ROKAF
LOCATION:	K-JULIETTE
DATA SOURCE:	3

LINK:	ROKAF-OSAN AB TO SUN SO SAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	4 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	SUN SO SAN
OPERATED BY:	ROKAF
LOCATION:	OSAN AB
DATA SOURCE:	3

LINK:	ROKAF-SEOUL TO MANGYUNGDAEROKAF
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	420 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MANGYUNGDAEROKAF
OPERATED BY:	ROKAF
LOCATION:	SEOUL
DATA SOURCE:	3

LINK:	ROKAF-OSAN AB TO TAEJON ROKAF
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	60 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	TAEJON ROKAF
OPERATED BY:	ROKAF
LOCATION:	OSAN AB
DATA SOURCE:	3

LINK:	ROKAF-UISONGBONG TO KUNSAN AB
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	180 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KUNSAN AB
OPERATED BY:	ROKAF
LOCATION:	UISONGBONG
DATA SOURCE:	3

LINK:	ROKAF-UNISONGBONG TO KWANG:JU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	180 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KWANG:JU
OPERATED BY:	ROKAF
LOCATION:	UNISONGBONG
DATA SOURCE:	3

LINK:	ROKAF-OSAN AB TO K-46
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	60 CH
MANUFACTURER:	COLLINS*
NETWORK FUNCTION:	PTP
ROUTING:	K-46
OPERATED BY:	ROKAF
LOCATION:	OSAN AB
DATA SOURCE:	3

LINK:	ROKAF-YONGMUNSAN TO PAPYONGSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	TRC:2P, COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	PAPYONGSAN
OPERATED BY:	ROKAF
LOCATION:	YONGMUNSAN
DATA SOURCE:	3

LINK:	ROKAF-YONGMUNSAN TO HOENGSONG
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	HOENGSONG
OPERATED BY:	ROKAF
LOCATION:	YONGMUNSAN
DATA SOURCE:	4

LINK:	ROKAF-PYONG TAEK TO P-Y-DO
MODE:	TROPO
TECHNOLOGY:	FDM/FM
CAPACITY:	36 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	P-Y-DO
OPERATED BY:	ROKAF
LOCATION:	PYONG TAEK
DATA SOURCE:	3

LINK:	ROKAF-KUNSAN TO MOSULPO
MODE:	TROPO
TECHNOLOGY:	FDM/FM
CAPACITY:	36 CH
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	MOSULPO
OPERATED BY:	ROKAF
LOCATION:	KUNSAN
DATA SOURCE:	3

LINK:	ROKAF-YUNGMUNSAN TO BEASON
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	50 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	BEASON
OPERATED BY:	ROKAF
LOCATION:	YUNGMUNSAN
DATA SOURCE:	3

LINK:	ROKAF-OSAN ROKAF TO BUCKET TCG OSAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	400 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	BUCKET TCG OSAN
OPERATED BY:	ROKAF
LOCATION:	OSAN ROKAF
DATA SOURCE:	3

LINK:	ROKAF-ROK ADA TO OSAN MDF
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	400 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	OSAN MDF
OPERATED BY:	ROKAF
LOCATION:	ROK ADA
DATA SOURCE:	3

LINK:	ROKAF-OSAN MDF TO BUCKET TCG OSAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	800 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	BUCKET TCG OSAN
OPERATED BY:	ROKAF
LOCATION:	OSAN MDF
DATA SOURCE:	3

LINK:	ROKAF-SEOUL YONG DONG DO TO SIN CHON
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	50 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	SIN CHON
OPERATED BY:	ROKAF
LOCATION:	SEOUL YONG DONG DO
DATA SOURCE:	3

LINK:	ROKAF-TAEGU ARTCC TO TAEGU TCG
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	400 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	TAEGU TCG
OPERATED BY:	ROKAF
LOCATION:	TAEGU ARTCC
DATA SOURCE:	3

LINK:	ROKAF-TAEGU AB TO TAEGU AB
MODE:	CABLE
TECHNOLOGY:	FDM//FM
CAPACITY:	400 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	TAEGU AB
OPERATED BY:	ROKAF
LOCATION:	TAEGU AB
DATA SOURCE:	3

LINK:	ROKAF-KWANG JU AB TO KWANG JU
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	300 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	KWANG JU
OPERATED BY:	ROKAF
LOCATION:	KWANG JU AB
DATA SOURCE:	3

LINK:	ROKAF-KUNSAN TO KUNSAN TCG
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	200 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	KUNSAN TCG
OPERATED BY:	ROKAF
LOCATION:	KUNSAN
DATA SOURCE:	3

LINK:	ROKAF-OSAN AB TO MND
MODE:	CABLE
TECHNOLOGY:	PCM
CAPACITY:	24 CH
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	MND
OPERATED BY:	ROKAF
LOCATION:	OSAN AB
DATA SOURCE:	3

LINK:	ROKAF-OSAN TACC JOINT TO OSAN DIAL CDF
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	400 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	OSAN DIAL COF
OPERATED BY:	ROKAF
LOCATION:	OSAN TACC JOINT
DATA SOURCE:	3

LINK:	ROKAF-OSAN AB TO OSAN DIAL CDF
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	100 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	OSAN DIAL COF
OPERATED BY:	ROKAF
LOCATION:	OSAN AB
DATA SOURCE:	3

LINK:	ROKAF-SEOUL TO MND
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	75 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	MND
OPERATED BY:	ROKAF
LOCATION:	SEOUL
DATA SOURCE:	3

LINK:	ROKAF-OSAN DIAL CDF TO BLDG 932
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	200 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	BLDG 932
OPERATED BY:	ROKAF
LOCATION:	OSAN DIAL COF
DATA SOURCE:	3

LINK:	ROKAF-OSAN AB TO SURISAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	36 CH
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	SURISAN
OPERATED BY:	ROKAF
LOCATION:	OSAN AB
DATA SOURCE:	3

LINK:	ROKAF-YONG MUNSAN TO BEASON TCG
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	50 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	BEASON TCG
OPERATED BY:	ROKAF
LOCATION:	YONG MUNSAN
DATA SOURCE:	3

LINK:	ROKAF-OSAN DIAL CDF TO BLDG 932
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	1200 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	BLDG 932
OPERATED BY:	ROKAF
LOCATION:	OSAN DIAL CDF
DATA SOURCE:	3

LINK:	ROKAF-PYONG TAEK TO CROWN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	300 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	CROWN
OPERATED BY:	ROKAF
LOCATION:	PYONG TAEK
DATA SOURCE:	3

LINK:	ROKAF-OSAN AB TO BUCKET TCG
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	400 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	BUCKET TCG
OPERATED BY:	ROKAF
LOCATION:	OSAN AB
DATA SOURCE:	3

LINK:	ROKAF-OSAN DIAL CDF TO BUCKET TCG
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	800 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	BUCKET TCG
OPERATED BY:	ROKAF
LOCATION:	OSAN DIAL CDF
DATA SOURCE:	3

LINK:	ROKAF-PYONG TAEK TO PYONG TAEK
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	200 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	PYONG TAEK
OPERATED BY:	ROKAF
LOCATION:	PYONG TAEK
DATA SOURCE:	3

LINK:	ROKAF-MOC YONGSAN TO SEOUL TCG
MODE:	CABLES(3)
TECHNOLOGY:	FDM/FM
CAPACITY:	600 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	SEOUL TCG
OPERATED BY:	ROKAF
LOCATION:	MOC YONGSAN
DATA SOURCE:	3

d. Record/Data Equipment (Table 3)

(Current Military)

Detailed unclassified information on current military record/data equipment is not available for this report.

e. International Gateways (Table 4)
(Current Military)

GATEWAY:	36TH SIG BATTALION-SONG SO TO HAWAII & JAPAN
TYPE:	AN/MSC-46
CAPACITY:	
TRANSMISSION:	SAT
OPERATED BY:	36TH SIG BATTALION
LOCATION:	SONG SO
CONNECTS TO:	HAWAII & JAPAN
DATA SOURCE:	6

CHAPTER IV
PLANNED IMPROVEMENTS

A. PROJECTED GROWTH

1. The Economy

In the mid-May 1981 the Korean Economic Planning Board issued its draft of overall policy guidelines for the fith in a series of five-year economic plans, the first of which was formulated in 1961. The guidelines call for liberalization of the economy to allow market forces to operate more freely, and for encouragement of industries which have a comparative advantage in domestic and/or international markets. The guidelines also place greater emphasis on social development and price stability than did previous Five-Year Plans. Social development is in line with President Chun's call for the establishment of a "welfare state" in the Republic, albeit a welfare state modest by Western European or U.S. standards. The emphasis will be on adequate housing for lower-income Koreans, better health care delivery systems and establishment of a pension plan for the country's workers. Until about two years ago, price stability was not given much emphasis by Korean economic planners; in general, high inflation was accepted as a by-product of fast economic growth, and the high rates of growth allowed room for wage increases which kept ahead of inflation. The recent Korean experience of high inflation accompanied by declining GNP, however, has caused the government to rethink its high-growth strategy somewhat. The Plan guidelines call for average annual GNP growth of 7.5 percent, and per capital GNP (in real terms) to grow from 1980's $1508 to $2076 by 1986. Commodity exports will remain the main engine of growth, rising from 1981's estimated $20.5 billion (later revised upward to $21.3 billion) to an estimated $52.7 billion in 1986.

2. Telecommunications

The ROK Government announced in November 1981 that it will spend about $9 billion to finance a long-term communications program to be implemented during the country's fifth 5-year economic and social development plan beginning in 1983. This represents a substantial increase in funding

over that allocated for telecommunications during the fourth 5-year plan (1977-1982) which is reported to be $1.5 billion. Of the projected $9 billion investment, Ministry of Communications (MOC) officials have indicated that 70 percent will go to the expansion of intra-city telephone circuits, 20 percent to the inter-city telephone network and 10 percent to telegraph and international communications facilities. The MOC officials have also indicated that the fifth 5-year plan is also a part of the communications support plan for the 1988 summer olympic games in Seoul. The communications planning objectives are summarized by the following:

(1) Development of a modern national network integrating domestic and international facilities in order to facilitate and sustain high economic growth.

(2) Establishment of a balanced system to meet the needs of both urban and rural communities.

(3) Improvement in the efficiency of the international service to facilitate foreign trade and communications upon which the economy depends.

(4) Implementation of research and development programs aimed at establishing self-sufficiency in the design and manufacture of switching and transmission systems and in the development of a domestic expertise in matters of network planning and information management systems.

B. CIVILIAN NETWORKS

1. Telecommunications Development Plans

a. Public Telephone System

The communications program calls for $6.1 billion over the next five years to significantly increase the number of intra-city telephone lines to 9,231,000. This would increase the available telephone lines in 1986 to 19.3 per 100 population versus the present rate of 8.9 per 100 population. Ninety-eight percent of telephones will be operated by automatic switching systems, and 62 percent will be connected to electronic switch-

ing systems (ESS) by the end of the 5-year period.

Though the last non-electronic exchange lines are scheduled for 1984, manufacture and installation of electro-mechanical switching equipment for public exchanges will continue at something approaching full capacity during the middle 1980's in order to provide spares and replacements for existing exchanges.

The installation of new ESS equipment and exchanges will go on well into the 1990's with the possibility of extending existing contracts with B T M, Western Electric, and their associated joint venture companies in Korea.

Essentially all transmission facilities in Korea are currently analog (FDM). Introduction of digital (PCM) transmission began for short haul interoffice trunks in the 1981/1982 time frame. Digital switching and transmission facilities are anticipated to be introduced in the toll network and between the toll network and local offices in the 1982/1983 time frame. It is anticipated, however, that the toll implementation will proceed rather slowly on a route-by-route basis. Major growth is anticipated within the telecommunications network of Korea, from roughly 2 million subscribers (in 1978) to a level of 12 or 13 million subscribers within 10 years; thus, capacity increase requirements will accelerate introduction of new digital long haul facilities. It is not anticipated that these major long haul routes will be implemented until 1985.

It has been reported that the President of the Korean Telecommunications Research Institute provided the following estimates regarding digital transmission in the Korean public network:

> By 1983, 30% of their transmission facilities on an intra-office basis (local/local and local/local/toll) will be digital. Their plan is that 50% of the additional capacity installed between now and 1988 will be digital. Initial development of digital transmission and switching both will be for the development of rural telecommunications capability. This will be followed by digital transmission between toll/regional offices, and toll/local offices. These will likely go digital in both the transmission and switching with the 1982 1983 time frame as a starting point.

b. Telegraph, Telex and Data Communications

The Ministry of Communications in Korea provides data communications in the form of teletype circuits, and data transmission on commercial voice-grade circuits. It would appear that there are no plans for a separate voice-public data network, or substantial additional facilities specifically for data, other than dedicated portions of analog links on a point-to-point basis.

The MOC announced in October 1981 that the international telex lines will be increased to 1,508 circuits in 1986 from the present 485 lines. The ministry said it estimates the demand by about 5,000 journalists for the telex lines will be great for reporting on the 1988 Seoul Olympic Games. The international facsimile lines will be increased by more than 40 circuits from the present one circuit used with Japan. The facsimile will enable the Seoul Olympics to be seen live around the world, the ministry said. Current forecasts indicate that there will be a total of 10,000 telex subscriber lines installed by 1985 (both domestic and international).

In comparison to telex transmission which is regulated/standardized by the CCITT, there are no regulations to govern data (computer terminal) communications standards in Korea. Largely by way of compliance with worldwide usages, speeds of full duplex, half duplex, 300, 1,200, 2,400 and 4,800 bps are used depending on the type of modems or terminal apparatus in use (with quality equivalent to that of unconditioned lines in the United States).

MOC is planning to propose a special law to regulate the growing communication of data, but no enactment is yet in sight. Full utilization of a nationwide direct dialing network for data communications will probably not take place in Korea until the late 1980's.

c. Satellite Communications and International Gateways

An estimated 25% of Korea's international traffic is to the United States. With continued growth likely, the capacity of the eastward-looking earth stations will need to be increased by nearly 1000 channels by 1990. Circuits to destinations west and south will also require expansion by an estimated 4000 channels by 1990.

Fully automatic telephone calls to 24 nations, including the United States, Japan, the United Kingdom, and around the world will be possible from Seoul by the end of 1983, and from Pusan by 1985. About $7.5 million has been earmarked for this development in the current 5-year plan.

Presently, a total of 549 overseas telephone lines are operated by semiautomatic methods.

MOC officials announced in late 1981 that the country will build the fourth earth station for the Pacific international telecommunication satellite by 1985 with a total cost of about $12.3 million.

The No. 4 station, which will replace the old No. 1 station, will provide more satellite telecommunication services, including live television coverage of major events happening around the world.

The No 4 earth station, to be built, will be linked with the INTELSAT V Satellite stationed above the Pacific Ocean. It is to provide about 3,000 fully automatic electronic switching overseas telephone lines.

The ministry said that it has not decided on the necessity of its own separate communications satellite for the 1988 Seoul Olympics, adding that it should await consultation with the yet-to-be-formed Cabinet-level Olympic Organizing Committee (OCOG).

d. Specialized Networks

Subject to possible legislation affecting its independent communications, KNR has a four-year plan for the 1979-1982 period to install a computerized reservation system using the microwave circuits. The first stage would comprise about 16 stations linked with 50 sets of terminal equipment covering the Seoul to Pusan trunk line via Taejon.

In 1975 the first installation of computerized reservation equipment was made to handle local reservations in the Seoul area, using 45 terminals.

The KNR at present uses some facsimile equipment of the type made by Nippon Electric Co., Ltd. (NEC) of Japan.

The future plans for the Korean Electric Power Company (KEP) and the Korean National Police (KNP) communications networks are not known. It is expected that they will also remain FDM/FM for the foreseeable future due to the investment already made in such equipment.

2. Detailed Listings (Future Civilian)

a. Remarks

In this section, detailed listings are provided which describe the future planned civilian communications assets discussed in the preceeding sections. The abbreviations may be interpreted as previously defined in Chapter III.

b. Telephone Switches (Table 1)
(Future Civilian)

SWITCH:	MOC-DAEGU
TYPE:	DDD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	474 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	DAEGU
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KYONGJU
TYPE:	DDD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	36 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	KYONGJU
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-CHUNCHON
TYPE:	DDD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	98 LNS
FILL:	.49
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	CHUNCHON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-POCHEON
TYPE:	EM
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	65
FILL:	.48
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT NO5
NUMBERING PLAN:	
LOCATION:	POCHEON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KWANGJANG
TYPE:	EM
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	396LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT NO5
NUMBERING PLAN:	
LOCATION:	KWANGJANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-YONGSANG
TYPE:	EMD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	270
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	YONGSANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-SUNGBUK
TYPE:	EMD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	272 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	SUNGBUK
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-CHONGRYANG
TYPE:	EMD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	347 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	CHONGRYANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-A HYUN
TYPE:	EMD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	283 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	A HYUN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KWANGHWAMOON
TYPE:	EMD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	865 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	KWANGHWAMOON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-HEHWA
TYPE:	EMD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	295 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	HEHWA
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-YOUI
TYPE:	EMD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	173 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	YOUI
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-WONHYO
TYPE:	EMD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	295 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	WONHYO
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-GAZWA
TYPE:	EMD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	223 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	GAZWA
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-BULKWANG
TYPE:	EMD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	371 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	BULKWANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-SHINCHON
TYPE:	EMD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	347 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	SHINCHON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-JEONGOK
TYPE:	EMD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	47 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	JEONGOK
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-GONGNUNG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	262 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	GONGNUNG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KURI
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	478LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT NO5
NUMBERING PLAN:	
LOCATION:	KURI
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-HAENGDANG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	396 LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	HAENGDANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-JINKWAN
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	554 LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	JINKWAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-HONGJU
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	289 LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	HONGJU
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-A HYUN
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	527 LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	A HYUN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-DAEBANG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	19 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	DAEBANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KWANGJANG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	183 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	KWANGJANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-SEONGSOO
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	263 LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	SEONGSOO
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-MYUNMOK
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	212 LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	MYUNMOK
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-YEOMRI
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	212LNS
FILL:	56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT NO5
NUMBERING PLAN:	
LOCATION:	YEOMRI
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-BOKWANG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	263LNS
FILL:	.41
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT NO5
NUMBERING PLAN:	
LOCATION:	BOKWANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-YANGJAE
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	6 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	YANGJAE
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-SADANG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	10 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	SADANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-EULJI
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	1004 LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	EULJI
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-WONHYO
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	290 LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	WONHYO
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KWANGHWAMOON
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	554 LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	KWANGHWAMOON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-HEHWA
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	289 LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	HEHWA
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-YONGSANG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	238 LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	YONGSANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-GAEBONG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	12 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	GAEBONG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-HWAGOK
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	13 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	HWAGOK
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-JEONNONG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	396LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT NO5
NUMBERING PLAN:	
LOCATION:	JEONNONG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-CHANGDONG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	395 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	CHANGDONG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-WOLGOK
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	286 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	WOLGOK
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-MIA
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	262 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	MIA
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-CHONGRYANG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	262 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	CHONGRYANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-YANGSEO
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	16 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	YANGSEO
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-JAMSIL
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	17 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	JAMSIL
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-CHEONHO
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	14 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	CHEONHO
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-YONGDONG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	13 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	YONGDONG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-SHIHUNG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	12 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	SHIHUNG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-BANPO
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	15 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	BANPO
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-SHINSA
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	10 LNS
FILL:	.56
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	SHINSA
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-GURO
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	20 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	GURO
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-BONGCHON
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	25 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	BONGCHON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-DANGSAN
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	34 LNS
FILL:	.59
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	DANGSAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-NORYANGJIN
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	17 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	NORYANGJIN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-GUNPO
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	3 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	GUNPO
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-SUNGNAM
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	7 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	SUNGNAM
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-ANYANG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	7 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	ANYANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-SONGNIM
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	4 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	SONGNIM
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-WONDANG
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	149 LNS
FILL:	.52
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	WONDANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-GANSEOK
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	6 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	GANSEOK
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-SANGOK
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	8 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	SANGOK
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-SEOINCHON
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	5 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	SEOINCHON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-GWACHEON
TYPE:	ESS
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	7 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	GWACHEON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-CHANGDONG
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	246 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	CHANGDONG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-DONGDAEMOON
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	371 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	DONGDAEMOON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-MIA
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	320
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT NO5
NUMBERING PLAN:	
LOCATION:	MIA
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-MYUNMOK
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	396 LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	MYUNMOK
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-EULJI
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	1312LNS
FILL:	.57
NETWORK FUNCTION:	LOCAL EXCHANGE
SIGNALLING:	CCITT NO5
NUMBERING PLAN:	
LOCATION:	EULJI
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KIMPO
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	160 LNS
FILL:	.52
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	KIMPO
OPERATED BY:	MOC
DATA SOURCE:	21A

SWITCH:	MOC-GAPYUNG
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	53 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	GAPYUNG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-ISLAN
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	47 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	ILSAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-GOSAN
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	47 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	GOSAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-TONGJIN
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	110 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	TONGJIN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-BUBWONRI
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	35 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	BUBWONRI
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KUMCHON
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	78 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	KUMCHON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KURI
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	220 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	KURI
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-UIJUNGBU
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	806 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	UIJUNGBU
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	LLL
TYPE:	MOC-CHULWON
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	95 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	CHULWON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KANGHWA
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	156 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	KANGHWA
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-DONGDUCHON
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	222 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	DONGDUCHON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-DONGSONG
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	92 LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	DONGSONG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-MOONSAN
TYPE:	ST
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	143LNS
FILL:	.53
NETWORK FUNCTION:	AREA EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	MOONSAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-PUSAN
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	728LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT NO5
NUMBERING PLAN:	
LOCATION:	PUSAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-CHOCHIWON
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	73 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	CHOCHIWON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-CHUNCHON
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	183 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	CHUNCHON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-CHEONAN
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	196 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	CHEONAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-ONYANG
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	142 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	ONYANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-GONGJU
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	91 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	GONGJU
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-CHOONGJU
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	151 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	CHOONGJU
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-DAEJEON
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	566 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	DAEJEON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-NONSAN
TYPE:	S.D
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	66 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	NONSAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-BOOYA
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	46 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	BOOYA
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-HONGSUNG
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	86 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	HONGSUNG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-DAECHUN
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1973
CAPACITY:	73 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	DAECHUN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-CHONGJU
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	215 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	CHONGJU
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-DANGJIN
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	46 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	DANGJIN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-YAESAN
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	98 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	YAESAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-PUSAN
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	2316 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	PUSAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-ULSAN
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	446 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	ULSAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-MASAN
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	586 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	MASAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-JINHAE
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	116 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	JINHAE
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-JINJU
TYPE:	STD
MANUFACTURER:	WECO.
YEAR INSTALLED:	1983
CAPACITY:	147 LNS
FILL:	.48
NETWORK FUNCTION:	TOL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	JINJU
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-NAMHAE
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	25 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	NAMHAE
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KIMHAE
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	26 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	KIMHAE
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-JAECHUN
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	147 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	JAECHUN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-DAEGU
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	882 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	DAEGU
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-WAEKWAN
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	25 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	WAEKWAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KUMI
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	307 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	KUMI
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-KIMCHUN
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	102 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	KIMCHUN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-SEOSAN
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	102 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	SEOSAN
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-POHANG
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	331 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	POHANG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-ANDONG
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	123 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	ANDONG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-YONGJU
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	88 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	YONGJU
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-UISUNG
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	26 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	UISUNG
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-JUMCHON
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	34 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	JUMCHON
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-SANGJU
TYPE:	STD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	63 LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT5
NUMBERING PLAN:	
LOCATION:	SANGJU
OPERATED BY:	MOC
DATA SOURCE:	21

SWITCH:	MOC-DAEJEON
TYPE:	DDD
MANUFACTURER:	WECO
YEAR INSTALLED:	1983
CAPACITY:	202LNS
FILL:	.48
NETWORK FUNCTION:	TOLL EXCHANGE
SIGNALLING:	CCITT N05
NUMBERING PLAN:	
LOCATION:	DAEJEON
OPERATED BY:	MOC
DATA SOURCE:	21

c. Transmission Capability (Table 2)
(Future Civilian)

LINK:	MOC-TAEGU TO MASAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	MASAN
OPERATED BY:	MOC
LOCATION:	TAEGU
DATA SOURCE:	19

LINK:	MOC-CHUNGJU TO TAEJON
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	TAEJON
OPERATED BY:	MOC
LOCATION:	CHUNGJU
DATA SOURCE:	19

LINK:	MOC-TAEJON TO RICHMOND
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	RICHMOND
OPERATED BY:	MOC
LOCATION:	TAEJON
DATA SOURCE:	3

LINK:	MOC-YONGSAN TO SEOUL
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	60CH
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	SEOUL
OPERATED BY:	MOC
LOCATION:	YONGSAN
DATA SOURCE:	3

LINK:	MOC-MASAN TO PUSAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	PUSAN
OPERATED BY:	MOC
LOCATION:	MASAN
DATA SOURCE:	19

LINK:	MOC-SEOUL TO PUSAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	475 CKTS
MANUFACTURER:	NEC
NETWORK FUNCTION:	LL DATA COMM
ROUTING:	PUSAN
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	24

LINK:	MOC-SEOUL TO TAEGU
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	264 CKTS
MANUFACTURER:	NEC
NETWORK FUNCTION:	LL DATA COMM
ROUTING:	TAEGU
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	25

LINK:	MOC-SEOUL TO KWANGJU
MODE:	MICROWAVE
TECHNOLOGY:	FDM/FM
CAPACITY:	96 CKTS
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	LL
ROUTING:	KWANGJU
OPERATED BY:	MOC
LOCATION:	SEOUL
DATA SOURCE:	25

LINK:	MOC-CHANGSAN TO JAPAN
MODE:	MICROWAVE
TECHNOLOGY:	DIGITAL
CAPACITY:	24 CH
MANUFACTURER:	1979 COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	JAPAN
OPERATED BY:	MOC
LOCATION:	CHANGSAN
DATA SOURCE:	9

LINK:	MOC-PUSAN TO HAMADA
MODE:	UNDERSEA TEIE CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	2700 CKTS
MANUFACTURER:	KOKUSAI 80
NETWORK FUNCTION:	PTP
ROUTING:	HAMADA
OPERATED BY:	MOC
LOCATION:	PUSAN
DATA SOURCE:	14

d. Record/Data Equipment (Table 3)

(Future Civilian)

Because of legal restrictions and technological difficulties, no use of direct distance dialing (DDD) facilities can currently be made for data communications. The MOC hopes to pass a special regulatory law which will permit full utilization of a nationwide DDD network for data communications, on the same scale as in Japan and the United States. If this law passes, the DDD data communications network will be in place by the late 1980's. No further information is available on this network at this time.

e. International Gateways (Table 4)
(Future Civilian)

GATEWAY:	MOC-SEOUL TO AUSTRALIA
TYPE:	WECO.ESS-4.1983
CAPACITY:	20LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	AUSTRALIA
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO REPUBLIC OF CHINA
TYPE:	WECO.ESS-4.1983
CAPACITY:	20LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	REPUBLIC OF CHINA
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO HONGKONG
TYPE:	WECO.ESS-4.1983
CAPACITY:	44LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	HONGKONG
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO MALAYSIA
TYPE:	WECO.ESS-4.1983
CAPACITY:	6LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	MALAYSIA
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO PHILIPPINES
TYPE:	WECO.ESS-4.1983
CAPACITY:	7LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	PHILIPPINES
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO SINGAPORE
TYPE:	WECO.ESS-4
CAPACITY:	7LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	SINGAPORE
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO JAPAN
TYPE:	WECO,ESS-4,1983
CAPACITY:	502LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	JAPAN
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO USA
TYPE:	WECO,ESS-4,1983
CAPACITY:	194LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	USA
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO ITALY
TYPE:	WECO ESS-4 1983
CAPACITY:	14 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	ITALY
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO CANADA
TYPE:	WECO,ESS-4,1983
CAPACITY:	16LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	CANADA
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO INDIA
TYPE:	WECO,ESS-4,1983
CAPACITY:	7LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	INDIA
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO THAILAND
TYPE:	WECO ESS-4 1983
CAPACITY:	5 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	THAILAND
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO AUSTRIA
TYPE:	WECO ESS-4 1983
CAPACITY:	2 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	AUSTRIA
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO BELGIUM
TYPE:	WECO ESS-4 1983
CAPACITY:	5 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	BELGIUM
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO FRANCE
TYPE:	WECO ESS-4 1983
CAPACITY:	12 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	FRANCE
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO GERMANY
TYPE:	WECO ESS-4 1983
CAPACITY:	31 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	GERMANY
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO GREECE
TYPE:	WECO ESS-4 1983
CAPACITY:	4 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	GREECE
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO IRAN
TYPE:	WECO ESS-4 1983
CAPACITY:	6 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	IRAN
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO SPAIN
TYPE:	WECO ESS-4 1983
CAPACITY:	7 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	SPAIN
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO KUWAIT
TYPE:	WECO ESS-4 1983
CAPACITY:	10 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	KUWAIT
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO NORWAY
TYPE:	WECO ESS-4 1983
CAPACITY:	4 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	NORWAY
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO NETHERLANDS
TYPE:	WECO ESS-4 1983
CAPACITY:	3 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	NETHERLANDS
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO SAUDI ARABIA
TYPE:	WECO ESS-4 1983
CAPACITY:	12 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	SAUDI ARABIA
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO GREAT BRITAIN
TYPE:	WECO ESS-4 1983
CAPACITY:	14 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	GREAT BRITAIN
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO SWITZERLAND
TYPE:	WECO ESS-4 1983
CAPACITY:	5 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	SWITZERLAND
DATA SOURCE:	21

GATEWAY:	MOC-SEOUL TO SAMOA
TYPE:	WECO ESS-4 1983
CAPACITY:	2 LNS
TRANSMISSION:	SAT
OPERATED BY:	MOC
LOCATION:	SEOUL
CONNECTS TO:	SAMOA
DATA SOURCE:	21

C. MILITARY NETWORKS

1. Telecommunications Development Plans

The analysis of available data indicates that with the exception of specialized lower speed facilities for secure voice, the Korean Military systems will remain analog (FDM) in their basic character in the foreseeable future. Quantitative data relative to the planned growth of these networks were not available for this study.

2. Detailed Listings (Future Military)

a. Remarks

In this section, detailed listings are provided which describe future planned military communications assets. The abbreviations may be interpreted as previously defined in Chapter III.

b. Telephone Switches (Table 1)

(Future Military)

Detailed unclassified information concerning future military telephone switches is not currently available.

c. Transmission Capability (Table 2)
(Future Military)

LINK:	ROKA-ROKA 1 CORP TO CP CASTLE
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	12 CH
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	CP CASTLE
OPERATED BY:	ROKA
LOCATION:	ROKA 1 CORP
DATA SOURCE:	2

LINK:	ROKA-SEOUL TO SEOUL
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	120 CH
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	SEOUL
OPERATED BY:	ROKA
LOCATION:	SEOUL
DATA SOURCE:	2

LINK:	ROKA-PUSAN TO PUSAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	PUSAN
OPERATED BY:	ROKA
LOCATION:	PUSAN
DATA SOURCE:	2

LINK:	ROKA-PULMOSAN TO PALGONSAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	25 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	PALGONSAN
OPERATED BY:	ROKA
LOCATION:	PULMOSAN
DATA SOURCE:	2

LINK:	ROKA-PULMOSAN TO PULMOSAN
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLINS
NETWORK FUNCTION:	PTP
ROUTING:	PULMOSAN
OPERATED BY:	ROKA
LOCATION:	PULMOSAN
DATA SOURCE:	2

LINK:	ROKAF-OSAN TO BUCKET
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	120 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	BUCKET
OPERATED BY:	ROKAF
LOCATION:	OSAN
DATA SOURCE:	2

LINK:	ROKAF-YONGMUNSAN TO BEASON
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	50 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	BEASON
OPERATED BY:	ROKAF
LOCATION:	YONGMUNSAN
DATA SOURCE:	2

LINK:	ROKAF-PYONG TAEK TO PYONG TAEK
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	25 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	PYONG TAEK
OPERATED BY:	ROKAF
LOCATION:	PYONG TAEK
DATA SOURCE:	2

LINK:	ROKAF-PYONG TAEK TO H-TACC
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	H-TACC
OPERATED BY:	ROKAF
LOCATION:	PYONG TAEK
DATA SOURCE:	2

LINK:	ROKAF-KUNSAN TO KUNSAN
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	KUNSAN
OPERATED BY:	ROKAF
LOCATION:	KUNSAN
DATA SOURCE:	2

LINK:	ROKAF-ARTCC TO CP WALKER
MODE:	CABLE
TECHNOLOGY:	FDM/FM
CAPACITY:	50 PR
MANUFACTURER:	NEC
NETWORK FUNCTION:	PTP
ROUTING:	CP WALKER
OPERATED BY:	ROKAF
LOCATION:	ARTCC
DATA SOURCE:	2

LINK:	ROKAF-KUNSAN TO KWANGJU
MODE:	MW
TECHNOLOGY:	FDM/FM
CAPACITY:	
MANUFACTURER:	COLLINS
NETWORK FUNCTION:	PTP
ROUTING:	KWANGJU
OPERATED BY:	ROKAF
LOCATION:	KUNSAN
DATA SOURCE:	2

d. Record/Data Equipment (Table 3)

(Future Military)

The Republic of Korea military utilizes voice-grade channels within its telephone network for telex and data communications, and it has no current plans for a separate data network. Therefore, it is not appropriate to include detailed, unclassified information on future military record/data equipment and networks since this information is incorporated in Table 2.

e. International Gateways (Table 4)

(Future Military)

The Korean military will utilize future civilian gateways for selected international traffic. Refer to Section IV-B2.e for detailed information.

CHAPTER V
NOTES AND REFERENCES

A. EQUIPMENT SUPPLIERS

1. Overview

The key to determining the future impact upon interoperability of the Korean telecommunications development plans is to understand the history and trends of the major Korean equipment suppliers, both foreign and domestic. This information provides the technical and political insight required to formulate the future interoperability assessment and recommendations.

2. Domestic Suppliers

In the early 1960s, the Ministry of Communications adopted a policy to encourage domestic manufacture of telecommunications equipment. In 1965, Siemens of Germany provided the initiative by aligning with the Korean Gold Star Company in the production of electro-mechanical telephone switching equipment. Six years later, Gold Star was producing 70% of Korea's switching equipment, with the other 30% (Strowger switching) supplied by Oriental Precision Company. Throughout the 1970s, Gold Star was a principal supplier of telecommunications equipment to the Ministry, although such items as satellite earth stations, microwave radio and multiplex, and other unique equipment were supplied by off-shore manufacturers.

In 1975, the concept of General Trading Companies (GTC) emerged. These companies are Korea's answer to the Japanese conglomerates, the "zaibatsu." The companies are export-import trading houses that market their own goods as well as the goods of smaller, independent Korean companies. In order to be designated as a GTC, a company must export at least five different commodities to the value of $1 million each, maintain 20 or more overseas branch offices, be publicly owned, and have minimum export sales of 2% of the nation's combined exports. The GTCs are given a great deal of support by the Korean government. For example, government

assistance is provided in submitting tenders in overseas competition, preferential banking service is granted, and overseas activities are subject to less government control than are those of other trading firms.

In 1978, the 13 GTCs of Korea provided $4 billion in export trade, or 32% of all Korean exports. In the electronics industry, an estimated 1%, or $14 million, of exports was communications equipment. Among the GTC, several deal in communications and electronics: Lucky Group (which includes Gold Star), Samsung Group, Samhwa, Sunkyong Ltd., and Kumho. The Korean General Trading Companies will undoubtedly be significant competitors of international telecommunications in the 1980s.

The outcome of 17 years of governmental encouragement is that the major part of the established network of public and private exchanges, together with the associated transmission carrier and multiplex systems, have been made in Korea. Initial manufacture has been from imported components, but with joint ventures and technology transfer arrangements with foreign suppliers, up to 90% of all electro-mechanical switching and analogue transmission equipment is wholly indigenous. The most recent important development has been the decision to adopt electronic switching systems (ESS) as the national standard and the measures taken to ensure that such systems are established both quickly and with a large measure of local participation.

Table V-1 details the major Korean electronic companies, and shows the primary products and licensing arrangements with foreign companies.

3. Foreign Suppliers and Major Contracts

In the early 1970s, the most important foreign participant in Korea was Siemens, associated with Gold Star. Other suppliers in that period were Collins Radio, Ford Aerospace and Communications, and Hitachi. In 1976, the government decided to build an assembly plant to produce electronic switching equipment, utilizing technology purchased from abroad, but relying on local companies to supply necessary components, and local technicians who would be trained in a special training center. The government corporation, Korea Telecommunications Company, signed a

TABLE V-1. MAJOR KOREAN GROUPS AND COMPANIES

GROUP/COMPANY	PRODUCT AND ARRANGEMENTS
LUCKY GROUP (22 Subsids.)	
Gold Star Co. Ltd.	Consumer electronics and electrical appliances.
Gold Star Cable Co.	Electric wire and cable.
Gold Star Tele-Electric Co. Ltd.	Mfr. and assembly of tcms. equipment and systems. Joint venture with SIEMENS of WEST GERMANY.
Gold Star Electric Co.	Mfr. of long line telephone and microwave equipment, under license from NEC.
Busan Mun Hwa Corporation	Television Broadcasting.
ORIENTAL PRECISION CO. (OPC)	1950 mfr. of magneto and common battery telephone switchboard and exchange equipment. 1962 mfrd. electro-mechanical STROWGER Xch equipment under license from NEC. Now almost 100% local. 150,000 lines per year.
SAMSUNG GROUP (26 Subsids.)	
Samsung Electronics Co.	TV sets assembled under license.
Samsung GTE Tcms Ltd.	1977, assemble and mfr. electronic PABX's as joint venture with GTE (USA) with KIST (Korean Institute for Science and Technology).
Samsung Semi Conductors Ltd.	Mfrs. semi conductors for use in BTM-ITT METACONTA ESS's, under license from INTERMETALL GmbH - ITT associate company.

TABLE V-1 (CONTINUED). MAJOR KOREAN GROUPS AND COMPANIES

GROUP/COMPANY	PRODUCT AND ARRANGEMENTS
TAI HAN GROUP	
Tai Han Electric	Assembles TV sets under license.
Tai Han Electric Wire	Wire and cable manufacture.
Tai Han Tcms.	1976, cross-bar PABX's under license from FUJITSU.
Kwangjin Electric Ind.	Joint venture with FUJITSU to mfr. FDM and PCM cable carrier and multiplex systems, domestic and export.
HANKUK (COLLINS)	Joint venture with ROCKWELL-COLLINS INTL. & KEMCO (Korean Eng. & Mfr. Co.) - 1979, mfrs. microwave radio and multiplex equipment.
KOREA TCMS CO. LTD.	Government owned company - 1978, mfr. of electronic switching systems under license from BTM-ITT using METACONTA technology.

seven-year technical assistance contract with ITT in October of 1977. The total cost of this venture is expected to amount to approximately $1.5 to $2 billion, of which $500 million will be for imported equipment. The technology involved is Metaconta 10C semi-electronic switching.

The Ministry issued a second request for bids, in 1979, for a 1.7 million line switching project covering the period 1980-1984. The request was responded to by Western Electric, GTE, Siemens, NEC, and Fujitsu. Western Electric proposed No. 1A ESS technology for local switching in large urban areas; and the company was selected by the Ministry to negotiate a five-year contract. The $1 billion plus contract is reported to cover both supply of manufactured switching, and transfer of technology and training for establishment of local manufacturing plants. Subsequent to the No. 1A ESS announcement, Western Electric International reported it had been chosen to provide No. 4 ESS equipment for toll switching. Unlike the earlier contract, the manufacture of No. 4 ESS in Korea is not planned.

In mid-1979, Hankuk Collins, a joint venture of Rockwell International and the Korean Engineering & Manufacturing Company (Kemco), opened a manufacturing facility in South Korea for the production of multiplexers and microwave radios. The plant, near Seoul, is expected to have an initial capacity of 40,000 channel-ends of multiplex per year.

In early 1981, Northern Telecom Ltd. (Toronto) announced that it signed a $60 million (Canadian) contract with the ROK government to provide digital transmission equipment to that country's telephone network. The contract calls for over 200,000 voice grade channels of DE-4 pulse code modulation (PCM) equipment and associated digital line equipment. Deliveries began in late 1981 and will continue for 18 months. Talks concerning a second phase have been held but no announcement has yet been made.

4. Summary

The major equipment suppliers to the ROK telecommunications networks are summarized in Table V-2. Included in the table are technical notes useful for the interoperability assessment.

TABLE V-2. IDENTIFIED EQUIPMENT SUPPLIERS

COUNTRY AND COMPANY	SWITCHING		TRANSMISSION			
	PUBLIC EXCHANGES AND NETWORKS	PRIVATE PABX AND EQUIPMENT	CABLE AND WIRE	CARRIER AND MULTIPLEX	MICROWAVE AND RADIO	SATELLITE AND EARTH STATION
Republic of Korea						
GOLDSTAR	EM(SIEMENS)	EM(SIEMENS)	FDM(NEC)	FDM& PCM(NEC)		
HANKUK				FDM&PCM (COLLINS)	FDM&PCM (COLLINS)	
KEMCO				FDM&PCM (COLLINS)	FDM&PCM (COLLINS)	
KOREA TELECOM.	ES(BTM)	ES(BTM)				
KWANGJIN ELEC.				FDM&PCM		
ORIENTAL PRECISION	EM(NEC)					
SAMSUNG		ES(GTE)				
TAI HAN ELEC. WIRE		XB(FUJITSU)				
United States						
FORD AEROSPACE						INTELSAT-A
GTE		ES				
PLANTRONICS	TLX					
ROCKWELL-COLLINS				FDM	FDM	
WESTERN ELECTRIC	ES	ES				

TABLE V-2 (CONTINUED). IDENTIFIED EQUIPMENT SUPPLIERS

COUNTRY AND COMPANY	SWITCHING		TRANSMISSION			
	PUBLIC EXCHANGES AND NETWORKS	PRIVATE PABX AND EQUIPMENT	CABLE AND WIRE	CARRIER AND MULTIPLEX	MICROWAVE AND RADIO	SATELLITE AND EARTH STATION
Canada						
NORTHERN TELECOM.				PCM		
Belgium						
BTM-ITT	ES	ES				
Germany						
SIEMENS	EM&TLX	EM				
Japan						
FUJITSU	XB	XB				
NEC	EM	EM				SUB-SYSTEMS

B. GLOSSARY OF TERMS

A

AB	Air Force Base
ADA	Air Division Headquarters
AVAIL	Available

B

BLDG	Building
BTM	Bell Telephone Manufacturing Company (Antwerp)

C

CCITT	Consultative Committee on International Telegraph and Telephone
CH	Channel
CKTS	Circuits
COF	Central Office
(Company)	Company Issuing License

D

DCS	Defense Communications System
DDD	Direct Distance Dialing

E

EM	Electro-mechanical Switching
EMD	Electro-mechanical Switching
ES	Electronic Switching
ESS	Electronic Switching System

F

FDM	Frequency Division Multiplex (Analog)
FM	Frequency Modulation

G

GHZ	Gigahertz

I

ITT	International Telegraph and Telephone Company

K

KAF	Republic of Korea Air Force
KEP	Korean Electric Power Company
KIST	Korean Institute of Science and Technology
KNR	Korean National Railroad

L

LEO	Local End Office
LL	Leased Line
LNS	Lines

M

MDF	Main Distribution Frame
MOC	Ministry of Communications
MOT	Ministry of Transportation
MW	Microwave

N

NEC	Nippon Electric Company

P

PABX	Private Automatic Branch Exchange
PBX	Private Branch Exchange
PCFSSRS	Public Correspondence, Fixed-satellite Service, Receive Station
PCFSSTS	Public Correspondence, Fixed-satellite Service, Transmit Station

PCM	Pulse Code Modulation (Digital)
PL	Private Line
PR	Pair
PTP	Point-to-Point

R

ROK	Republic of Korea
ROKA	Republic of Korea Army
ROKAF	Republic of Korea Air Force
ROKN	Republic of Korea Navy

S

SAT	Satellite
ST	Step Switch
STD	Simplified Toll Dialing

T

TCG	Technical Control Facility Army
TELE	Telephone
TLX	Telex Switching
TR	Trunk

U

UHF	Ultra High Freqquency

V

VHF	Very High Frequency

X

XB	Cross-bar Switching

W

WECO	Western Electric Company

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