

REPORT ON THE LONG TERM DEVELOPMENT PROGRAMS
OF THE INTERNATIONAL TELECOMMUNICATIONS
FOR
THE REPUBLIC OF INDONESIA

JUNE, 1983

JAPAN INTERNATIONAL COOPERATION AGENCY

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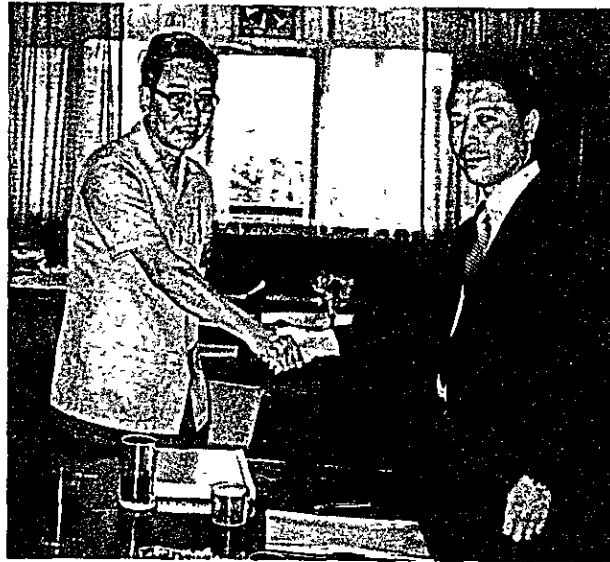
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Ir. Agus Darman, POSTEL, and Mr. Sogabe, Leader of JICA Study Team, shaking hands after signing of the meeting minutes.



▲ Scenes of the meeting. ▼



PREFACE

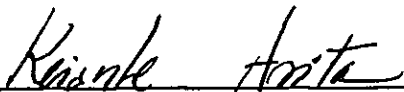
In response to the request of the Government of the Republic of Indonesia, the Government of Japan decided to conduct a survey on the Master Plan Study for the International Telecommunication Network Project and entrusted it to the Japan International Cooperation Agency (JICA).

The JICA sent to Indonesia a survey team headed by Mr. Hitoshi Ikeda, Deputy Director, Tariff Regulation Division, Telecommunication Policy Bureau, Ministry of Posts and Telecommunications, from June 21st to July 2nd, 1982 and the subsequent team headed by Mr. Fumio Kotani, Deputy Director, International Cooperation Division, Ministry of Posts and Telecommunications, from July 27th to August 4th, 1982.

After the surveys, further studies and consultations with the officials concerned of Indonesia over the said Project were made and the present report has been prepared. I hope that this report will contribute to the future development and prosperity of the region involved and to the promotion of friendly relations between our two countries.

I take this opportunity to express my deep appreciation to the officials concerned of the Government of Republic of Indonesia for their close cooperation extended to the team.

May 1983



Keisuke ARITA
President
Japan International
Cooperation Agency

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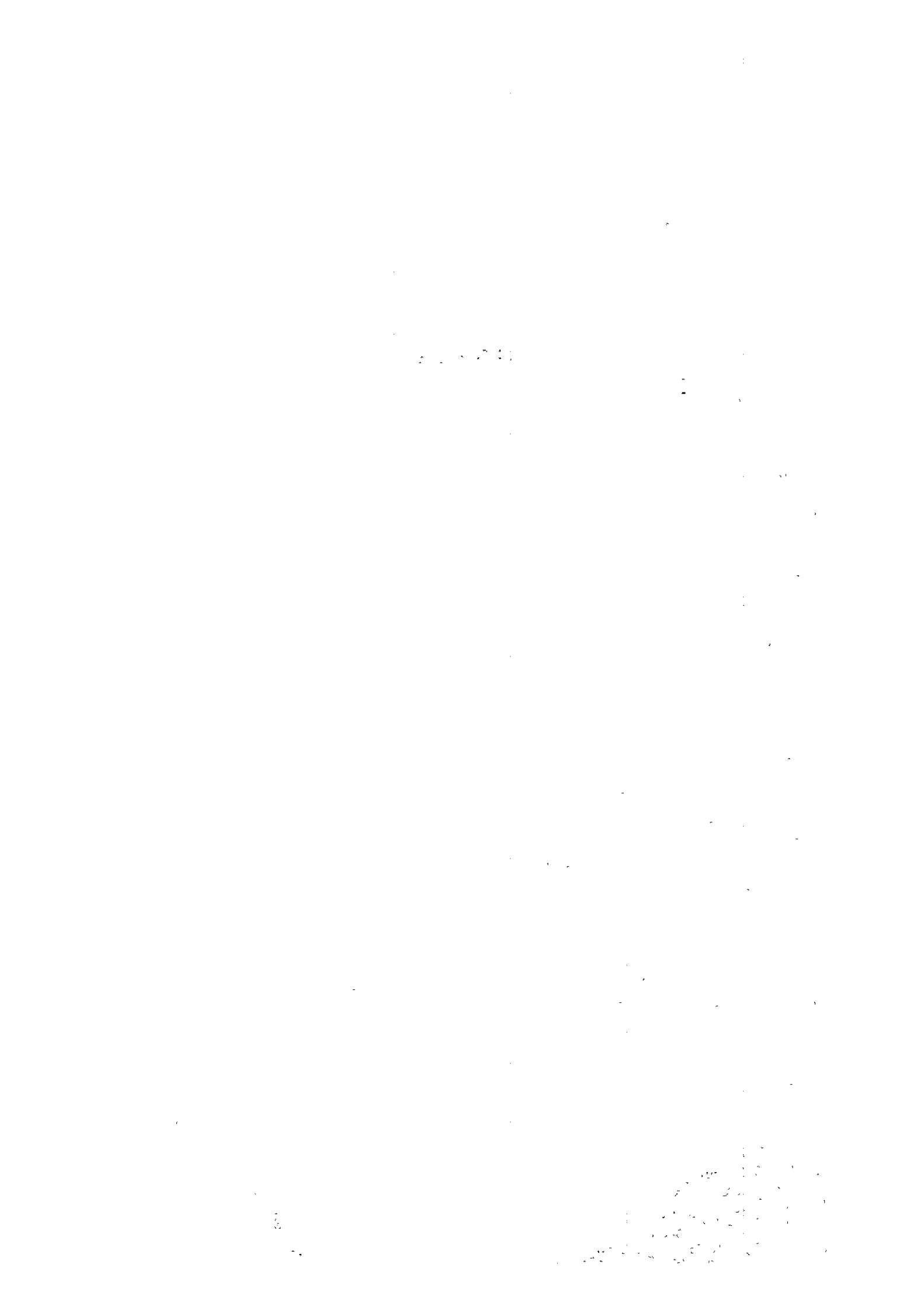
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SUMMARY



SUMMARY

1. Worldwide trends and the development of international telecommunications in Indonesia

In the world community, a close relationship will continue to form among member nations during the last two decades of this century. Large amounts of information, goods and people will enter and leave countries around the globe. The trend in major countries is towards a post industrial society called the information society, where a huge amount of telecommunication traffic must be exchanged more reliably and at much higher speeds.

Recent developments in telecommunications and computers have produced high technologies such as LSI (Large Scale Integration), fiber optics and SPC (Stored Program Control). They contribute to the digitalization of telephone network which will be diffused to the extent that IDNs (Integrated Digital Networks) will be established as well as contributions to the advent of PSDNs (Public Switched Data Networks). These technologies are the answer for the above-mentioned worldwide requirements. The development of IDN and PSDN will lead to the establishment of ISDN.

Indonesia is blessed with abundant natural resources and manpower and geographically faces the main traffic route in Southeast Asia for Europe, the Middle East and Oceania. These conditions point to the possibility of Indonesia making a remarkable progress in their future development not only in trade and commerce but also in industry and technology. In order to support such developments, which requires close relations with foreign countries, international telecommunications will play an important role as a main tool for international distribution channels.

As is symbolized by the success of Palapa, Indonesia is taking a leadership role in regional communications among ASEAN countries. By introducing modernized communication systems and providing more reliable and higher quality communication media

with large capacity for international use, Indonesia will make further progress in their relations with many countries.

For this purpose efforts should be made to extend conventional services, i.e. telephone and telex, and to introduce new services such as data communication and telematic services (Teletex, facsimile, etc.) supported by active marketing.

Main projects to be accomplished are:

- (1) the extension of conventional networks, i.e. the establishment of new gateways with balanced regional development in Medan, Jakarta and, in the distant future, Surabaya.
- (2) the digitalization of networks leading to IDN, i.e. the introduction of optical fiber in submarine cables, TDMA in satellite circuits and digital SPC exchanges.
- (3) the establishment of packet switched data network for new services.

A conceptual image and the developments which will result in ISDN up to the year 2000 from the viewpoint of networks, traffic, services and technologies are shown in Fig. S-1.

2. Demand Forecast and Introduction of New Services

The results of demand forecasts are shown in Fig. S-2. The telephone traffic will reach three times that of 1984 and will keep growing steadily until the year 2000. The telephone is regarded as the most important international telecommunications service in Indonesia.

Telex traffic will grow twice as much in 1989. In the future it will receive considerable influence from new record communications services such as Teletex, facsimile, etc. and will gradually be saturated. Telegram traffic will continue to decrease.

Although the demand for new services, represented by data communication and telematics, are expected to grow remarkably in the future, its share of the total international telecommunications traffic is small. However these new services may create a large amount of traffic. A number of countries are introducing or planning to introduce these new services using their own strategies.

Therefore, P.T. Indosat should, in accordance with other countries, also promote the introduction of new services with positive marketing activities awaking the potential demand in order to secure its share in the field of international telecommunications. New services to be introduced other than existing services are shown in Table S-1.

3. Facilities

3.1 Establishment of Gateways

P.T. Indosat should establish a self-operated and self-maintained network which is independent from and interconnected with the domestic network. Following the construction of the Medan gateway, P.T. Indosat will construct a new international telecommunications center in Jakarta in 1985. Around 1990, the third gateway will be constructed in Surabaya.

The establishment of these three gateways will not only handle the international telecommunications traffic in a balanced manner but will also contribute to awakening potential demand and support the economic activities of each region.

Fig. S-3 shows the forecasted Indonesian International Telecommunication Network in the year 2000. Main facilities to be introduced are described in the following.

3.2 Switching

3.2.1 Telephone

- (1) A digital SPC exchange will be introduced in Jakarta in 1985 in order to cope with the traffic growth and to realize service enhancement. Exchanges introduced hereafter should all be digital SPC systems.
- (2) The No.6 signalling system will be introduced in the Medan and Jakarta exchanges. The No.7 signalling system should be studied for possible future use in ISDN in association with the technical trends in PERUMTEL and foreign countries.
- (3) For the purpose of efficient use of international and intergateway circuits, a network control system should be introduced to control traffic with foreign countries and among gateways.

- (4) The promotion of ISD and CLR (Combined Line & Recording) operation should be encouraged together with the introduction of the following additional services: automatic notification of chargeable time, abbreviated dialling and more efficiently operated information services.

3.2.2 Telex

- (1) In 1984, an SPC exchange will be installed in the second gateway in Medan and in 1985, a new SPC exchange will be installed at the new telecommunications center in Jakarta. The existing TWK D2B will be kept as a stand-by in the event of an emergency in the new exchange.
- (2) Associated with the inauguration of Teletex service, a conversion facility will be installed to implement the interworking between telex and Teletex.
- (3) Abbreviated dialling, camp-on, announcement, automatic notification of chargeable time, stored and forward and multi address are to be introduced in association with the introduction of SPC exchanges.

3.2.3 Data Communication

- (1) In 1985 a packet switch will be introduced in Jakarta to establish the IPSDN (Indonesian International Packet Switched Data Network) and to start real time data transmission and data base access services.
- (2) In 1986 Teletex will begin through the IPSDN.
- (3) In the future, digital facsimile will be offered with the IPSDN.

3.3 Transmission

3.3.1 Satellite Communications

- (1) In 1984 TDMA/DSI will be introduced for the Indian Ocean Region (IOR).

- (2) In 1984 the operation of TDM Reference Station will start.
- (3) In 1986 TDM/DSI will be introduced for the Pacific Ocean Region (POR).
- (4) Maritime satellite communications will be introduced in the following phases:
 - i) Phase-1: Starting from 1984 ship earth stations are to be installed on Indonesian ocean-going ships over 5,000 tons and communication links are to be set up via foreign coast earth stations (SES).
 - ii) Phase-2: According to the demand forecast and financial analysis of the INMARSAT service, a CES of P.T. Indosat should be introduced after 1990.

3.3.2 Submarine Cable

- (1) Medan-Colombo Submarine Cable will be installed in 1985.
- (2) The life time of the existing SEACOM System is expected to end around 1987. The Australia-Indonesia-Singapore Cable will be installed in 1987 in order to cope with the traffic growth from and to Oceania.
- (3) As for an optical fiber submarine cable, it should be installed after 1990 in due consideration of the technical trends in other countries.

3.4 Third Gateway

The third gateway should be constructed in Surabaya around 1990. This could be the time when the first stage of digitalization of the domestic network, based on the PERUMTEL network plan in the eastern part of Indonesia, would be realized in this region. Surabaya would be the transit center of the international traffic for the eastern part of Indonesia. Telephone and telex exchanges will be installed in the Surabaya

gateway. Direct international circuits for major countries will be provided with new satellite stations for IOR and POR, because it is more economical to set up a satellite link than a submarine cable.

4. Organization

- (1) An organization should be established in P.T. Indosat to cope with the introduction of new technologies and new services.
- (2) The number of administrative staff, such as accounting, personnel and marketing, should be kept to a minimum by increasing productivity through computerization in the office. The technical planning and engineering departments should increase the number of staff to introduce new equipment and to undertake projects. The number of maintenance personnel should be rationalized by means of centralized supervising and testing. The estimated number of total personnel is around 2300 in the year 2000.
- (3) To provide up-to-date knowledge and skills required for personnel of P.T. Indosat, a career development program and training program for engineers and management should be established. A training center should be built near Jakarta in the distant future.
- (4) P.T. Indosat should establish a research and development center in the distant future in order to promote the development of Indonesian telecommunications especially in international telecommunications.

5. Service Operations

5.1 International Telephone Service

- (1) Efficient telephone operations should be achieved by introducing CLR and installing electronic switchboards.
- (2) The number of operators and switchboards required in the telephone exchanges of P.T. Indosat in the year 2000 is expected about 1400 and 500 respectively.
- (3) Although ISD is expected to constitute 85% of total calls in the year 2000, traffic handled by an operator will be about eight times as much as that of 1981. Traffic control in telephone operations should be able to cope with variations in the traffic level, response and processing conditions.

5.2 Telex

Fully automatic telex service is a worldwide trend. In the near future, the operators' responsibilities will change from switching to information service operation.

5.3 Telegram

The demand for international telegrams is decreasing around the world. Telegrams could be processed manually, maintaining its present operating status into the future. ASR (Automatic Send & Receive) type terminals with TDs (Transmitter Distributors) should be used to provide more efficient operation.

6. Marketing

- (1) Several new services will be introduced in the future. To encourage active business participation, it is always necessary to anticipate customer needs, undertake market research, and spot world trends.
- (2) Sales branch offices controlled by P.T. Indosat should be located in local cities, where booths for international telephone and telex services are available for customer use. These arrangements should be publicized to promote better public relations.
- (3) A data processing system should be introduced for automatic charge accounting and collection, for enhancement of office work and for analysis of statistics for various administrative purposes.

7. Cooperation with PERUMTEL

- (1) When a new communication center for P.T. Indosat starts operating, it is necessary to review the existing basic cooperation agreements with PERUMTEL.
- (2) As new services are introduced in the future, it is necessary to cooperate with PERUMTEL. Regularly scheduled meetings should be held to exchange views and to present the plans of both P.T. Indosat and PERUMTEL. Such close cooperation will contribute to the development of an efficient telecommunication network in Indonesia.

8. Finance

- (1) In the coming several years, P.T. Indosat's revenues are expected to increase substantially because of the favorable condition surrounding international telecommunications. Telephone revenue is, among all, the most important factor in growth. Telex service will be facing stiffer competition from such services as leased circuits, packet switching and facsimile, but it continues to contribute to the revenue base. New services such as packet switching may have a bright future. During the coming several years, however, their share in the total Indosat's revenue is very small compared with those of telephone and telex.

On the other hand, the biggest factor in the total expenses is the operation expense, most of which is accounted for by the compensation to PERUMTEL. From the viewpoint of worldwide trend for decreasing international telecommunications tariff, the strict application of the current tariff would be a burden of P.T. Indosat. Therefore, some measures should be taken to improve this situation, while keeping good relationship with PERUMTEL.

- (2) Financial Analysis for New Service and Third Gateway

- 1) Maritime Satellite Communication

In 10 years from the start of this service, the traffic will increase around 12 times. However, the absolute traffic value is small. Introduction of maritime satellite service is not feasible, at least, for the time being.

Therefore, after it stimulates the latent demands and secures the sufficient traffic, P.T. Indosat should install its own coast earth station.

- 2) Third Gateway

At present, international calls to and from Eastern part of Indonesia takes only small portion of total Indonesian international telecommunications. PERUMTEL is, however, planning to enhance the domestic network in the Eastern part of Indonesia. After around

1990, therefore, we assumed that the traffic to and from Eastern part of Indonesia would increase considerably. The traffic to and from Eastern part of Indonesia is concentrated on Surabaya, so we further assumed that the third gateway would be installed at Surabaya after 1990. The major facilities will be earth stations for IOR, POR, telephone & telex switchings and carrier systems.

The conclusion can be drawn that this project is quite feasible from the financial point of view.

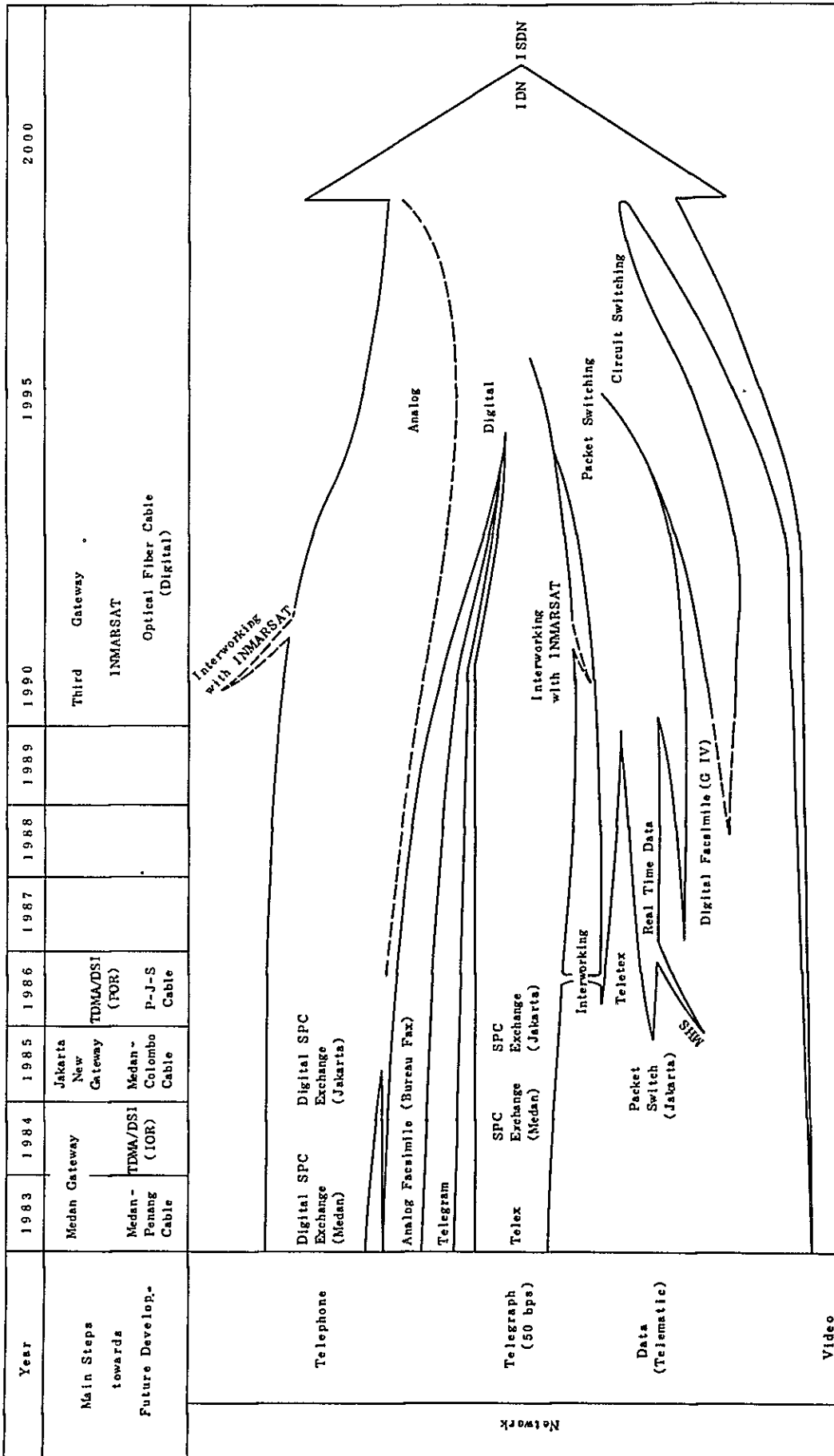


Fig. S-1 Conceptual Image for Developments towards ISDN in Indonesian International Telecommunication

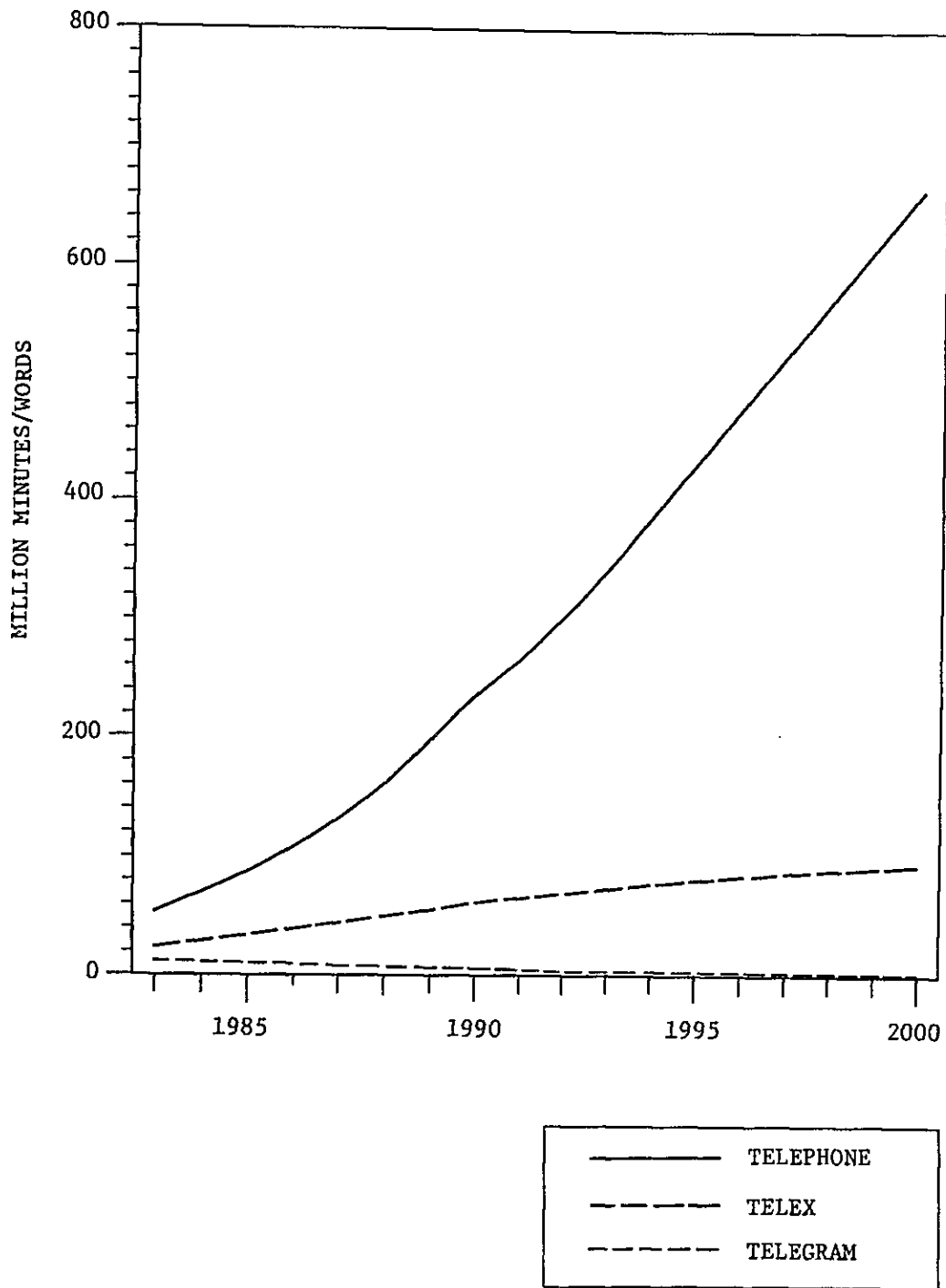


Fig. S-2 Demand Forecast for Major International Telecommunications Services

Table S-1 Introduction Schedule of New Services

		1984	1985	1986	1987	1988	1989	1990~2000
Packet	Database Access (IDAS)		▲					
	Realtime Data Transmission		▲					
	Teletex			▲				
	Message Handling Service			▲				
	Data Facsimile (Datafax)				▲			
Maritime Satellite							▲	
Video Conference						▲		
Videotex							▲	
Others	Electronic Mail Service							▲
	Direct Satellite Commu.							▲
	Mobile Telecommunications							▲

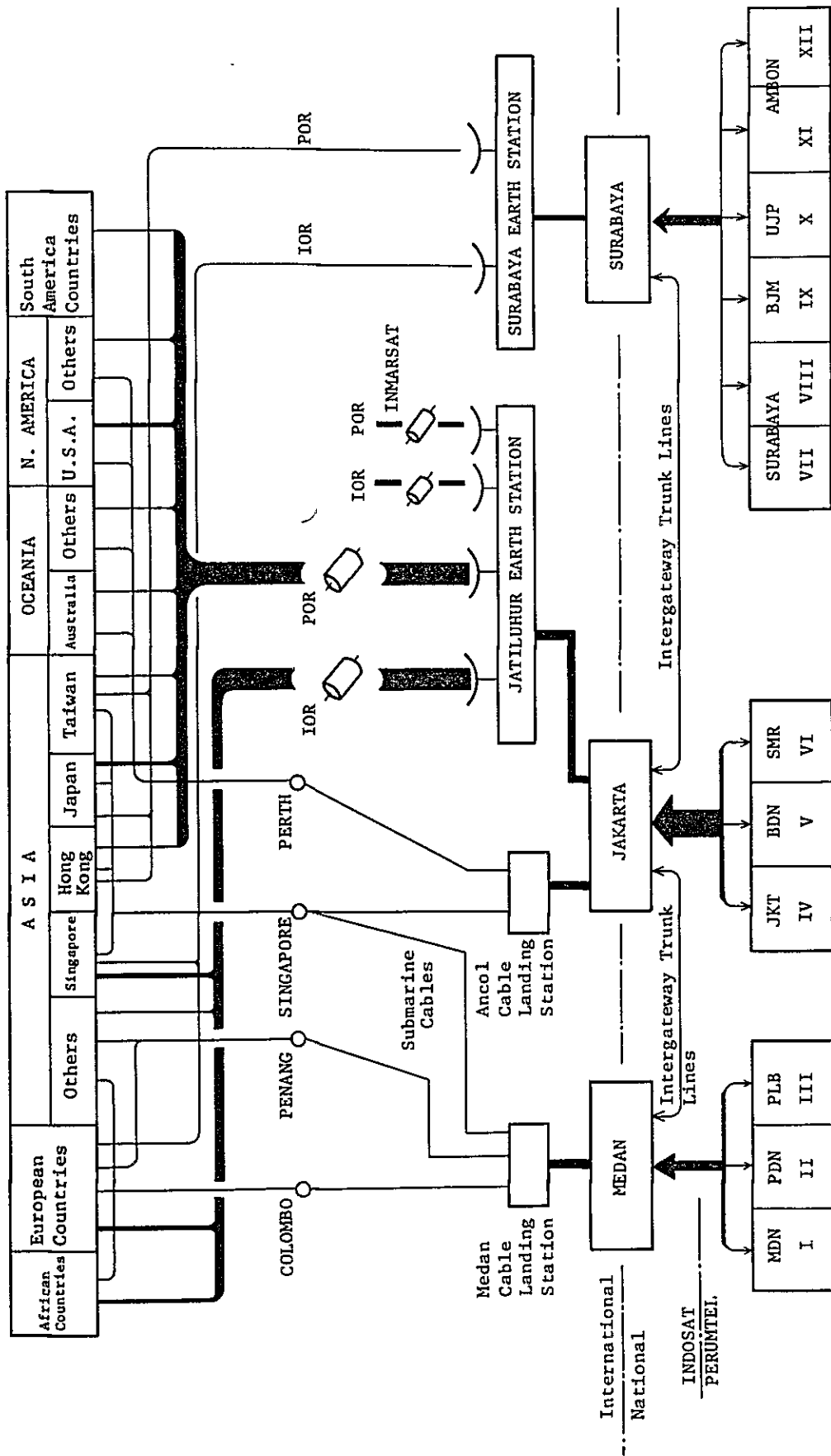
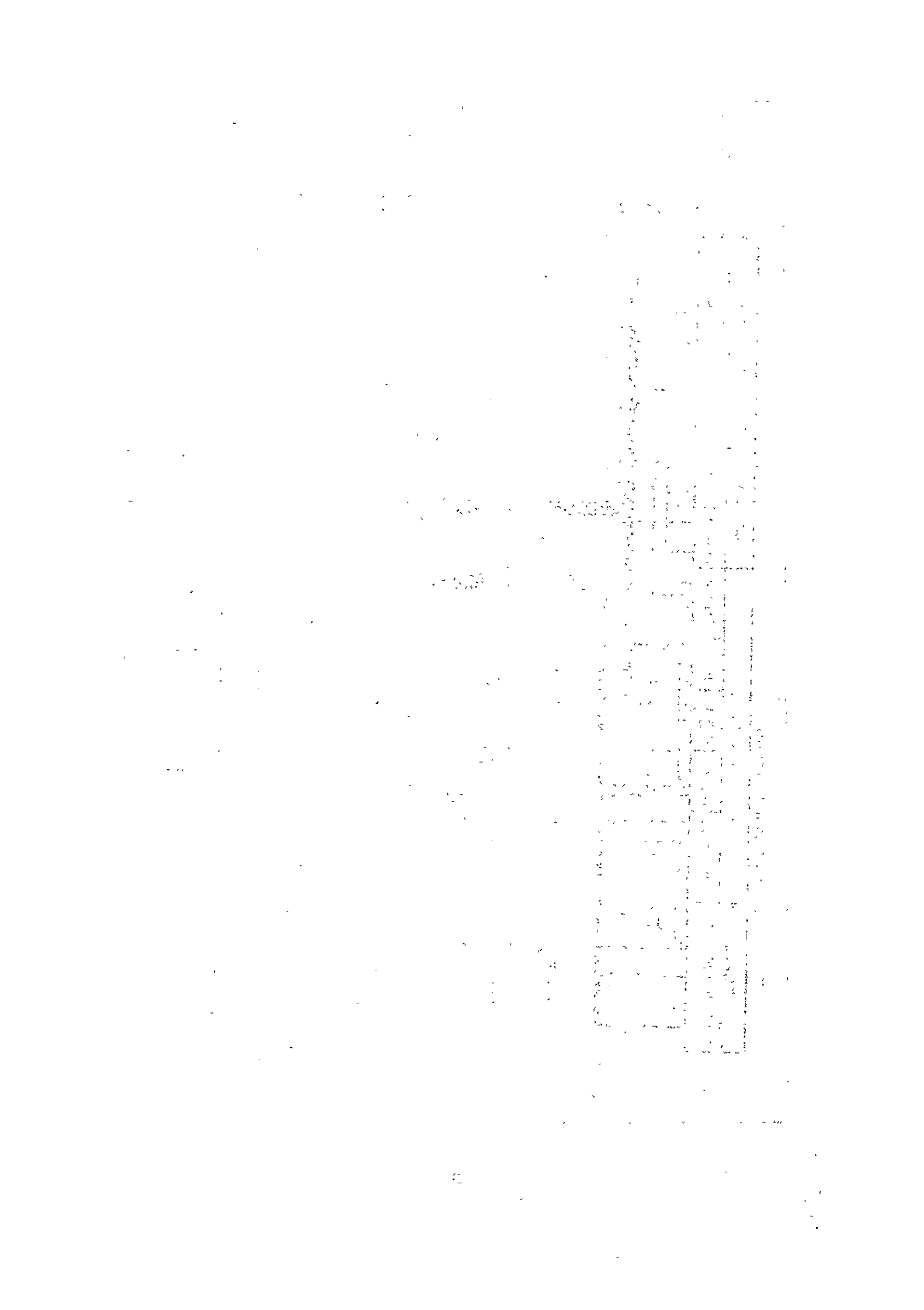
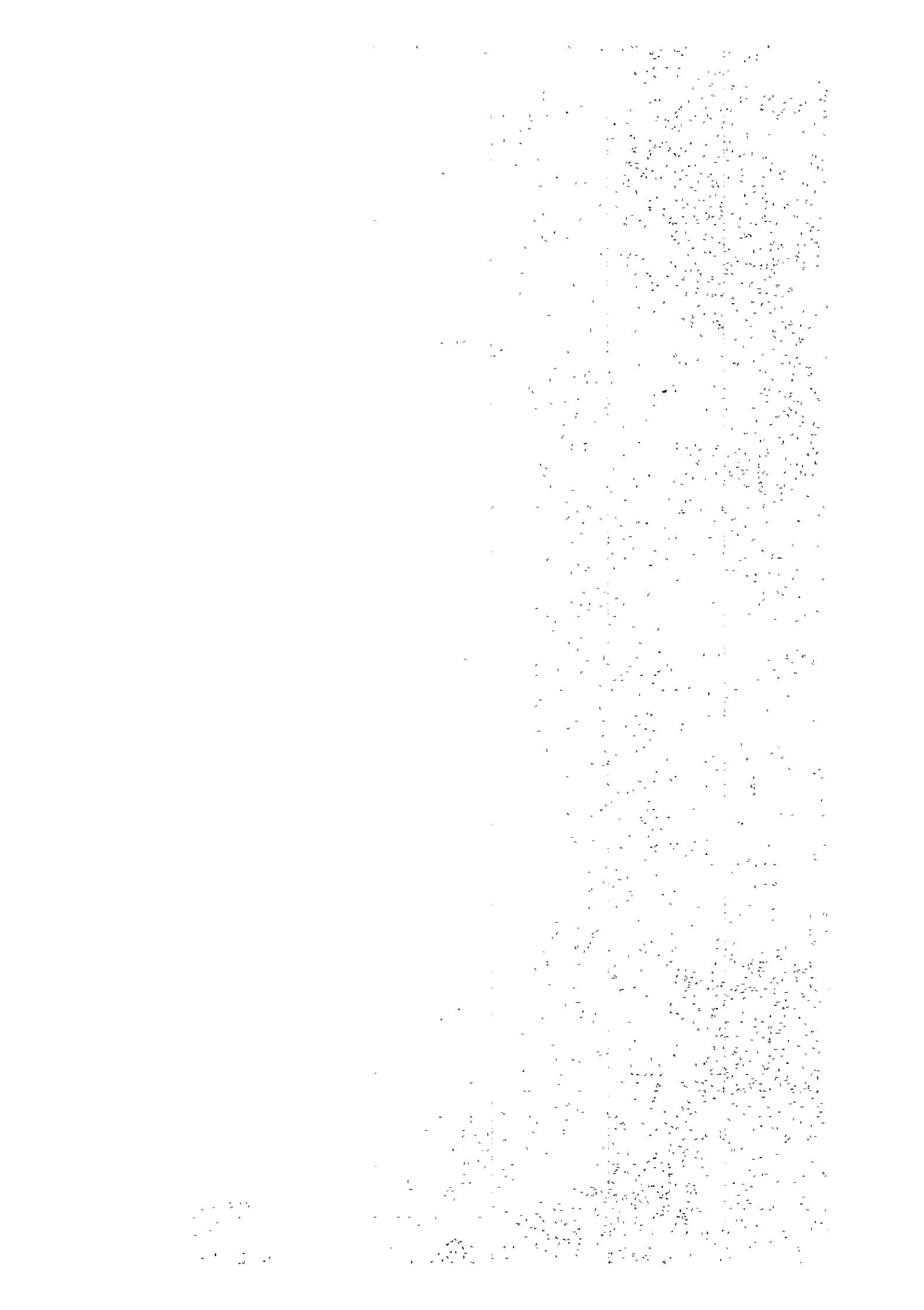


Fig. S-3 Indonesian International Telecommunication Network in 2000



CHAPTER 1



I. Introduction

1. Background of the Survey

P.T. Indosat controls and manages the international telecommunications business in Indonesia. The company is a public corporation which was started on December 30, 1980 by purchasing all stocks held by ITT of the USA.

During the period it was under ITT management, P.T. Indosat was working only for Jatiluhur satellite earth station, operating international TV transmissions and international telephone calls. Since its start as a public corporation, it procured the rights for international telegrams, telephone and telex, services which had been offered by PERUMTEL. As a result, P.T. Indosat started as a sole operating agency in the international telecommunications business in Indonesia, for both operation and control.

In order for the company to exert its full power as a public corporation, it is urgently required to establish consolidated and long-term planning including how to regulate and expand the international telecommunications network to cope with the increasing demand for international telecommunications as well as planning the organization, personnel and operations of the enterprise.

On the basis of the above, Indonesia has requested the Japanese government to cooperate in studying a long-term development plan for international telecommunications, which will be used as a guideline for P.T. Indosat.

In response to the above request, the Japanese government sent a preliminary survey team headed by Mr. Fumio Kotani, Ministry of Posts and Telecommunications, to Indonesia in February, 1982. The survey team consulted with the Directorate General of Posts and Telecommunications and reached a conclusion regarding the scope of the survey work, the tentative survey period, etc. On February 26, 1982, letters were exchanged between the Indonesian government and the team with an agreement for the scope of work.

As a result, it was decided to establish a long-term plan for international telecommunications in Indonesia and to perform a Feasibility Study as requested by the Indonesian government out of the subjects to be included in the plan.

2. Purposes and Scope of the Survey

The survey was undertaken for international telecommunications in Indonesia to establish a master plan for facility expansion, personnel and operation and the introduction of technical licenses, while being based on a demand forecast up to the year 2000 for Indonesian international telecommunications (1984 was set as the 1st year for implementation of the plan).

The master plan was generated to offer a guideline for the operation and management of Indonesian international telecommunications by P.T. Indosat in the future, on the basis of data acquired during the study.

However, it will be necessary to revise the master plan when P.T. Indosat accumulates various kinds of data in the future. For this purpose, the master plan includes methods and means to be referred to by P.T. Indosat whenever it studies a new plan.

3. Members of the Study Team

Members of the study team organized for the survey are as shown below.

Also, prior to the survey, the following members were sent to Indonesia from February 15 to 28, 1982.

Study Team

Mr. Hiroaki Sogabe	Team Leader -	Ministry of Posts & Telecommunications
Mr. Hitoshi Ikeda	Team Leader	Ministry of Posts & Telecommunications
Mr. Yukiharu Aoki	Telecommunication Policy	Ministry of Posts & Telecommunications
Mr. Tokuro Kato	Satellite Communication	Kokusai Denshin Denwa Co., Ltd.
Mr. Seiya Kato	Tariff Structure, New Service	Kokusai Denshin Denwa Co., Ltd.
Mr. Daisaburo Kubo	Telex and Data Switching	Kokusai Denshin Denwa Co., Ltd.
Mr. Akio Mizukoshi	Submarine Cable	Kokusai Denshin Denwa Co., Ltd.
Mr. Shigeyuki Higashi	Business, Operation and Financial Analysis	Kokusai Denshin Denwa Co., Ltd.
Mr. Noboru Yamamoto	Demand Forecast and Circuit Planning	Kokusai Denshin Denwa Co., Ltd.
Mr. Masami Murata	Telephone Switching	Kokusai Denshin Denwa Co., Ltd.
Mr. Shuji Toyokawa	Organization, Personnel and Training	Kokusai Denshin Denwa Co., Ltd.
Mr. Tadashi Tomizawa	Coordinator	Japan International Cooperation Agency

Preliminary Study Team

Mr. Fumio Kotani	General Team Leader (the first half)
Mr. Yuzo Yamamoto	Telecommunication Policy
Mr. Isao Yaguchi	Submarine Cable
Mr. Yukio Nomura	Sub-leader, Satellite Communication
Mr. Yasuhiko Handa	Organization, Personnel and Training
Mr. Tatsu Hirose	Traffic and Circuit Forecast
Mr. Tadashi Tomizawa	Coordinator

(1) Field Survey

This field survey was carried out for 45 days from June 21, 1982 to August 4, 1982. The major jobs conducted during the field survey period are as shown below:

- 1) Submission, explanation and discussion of the inception report
- 2) Field survey and collection of related data and information
- 3) Analysis and study of collected data
- 4) Submission and explanation of the progress report

(2) Submission of the Interim Report

On the basis of the field survey results, an interim report was edited, submitted and explained to the Indonesian government from January 16, 1983 to January 27, 1983, in Indonesia.

(3) Submission of the Final Report (draft)

A final report (draft) was generated including a comment by the Indonesian government criticizing the interim report. It was submitted and explained in Indonesia from March 14 to 24, 1983.

(4) Submission of the Final Report

After submitting and explaining the final report (draft), the formal final report for the survey was generated and mailed to the Indonesian government in June 29, 1983, thus completing the survey job.

4. Personnel in Charge

Personnel concerned with this study on Indonesian side are as follows:

(1) DITJEN POSTEL

Ir. Rollin
Ir. Agus Darman
Mr. H.V.R. Saragih BC. TT.
Mr. Sutarto
Mr. Moher Malano

(2) P.T. Indosat

Ir. J. Parapak
Ir. J. Djajadi
Ir. Sumitro Roestam
Ir. Sam Jasin
Ir. Bambang Sulistyو
Ir. Tjahjono Soerjodibroto
Ir. Safwan Natanegara
Ir. Iwan D. Simatupang
Ir. Noor S.D.K. Devi
Mr. Poernomo Bambang Trisula
Mr. Darnis Amly

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