

**FEASIBILITY STUDY REPORT  
ON  
THE FIVE YEARS PLAN  
FOR  
THE INTEGRATED DEVELOPMENT  
OF  
RADIO AND TELEVISION BROADCAST  
IN  
THE REPUBLIC OF INDONESIA**

JULY 1964

**THE JAPAN INTERNATIONAL COOPERATION AGENCY**

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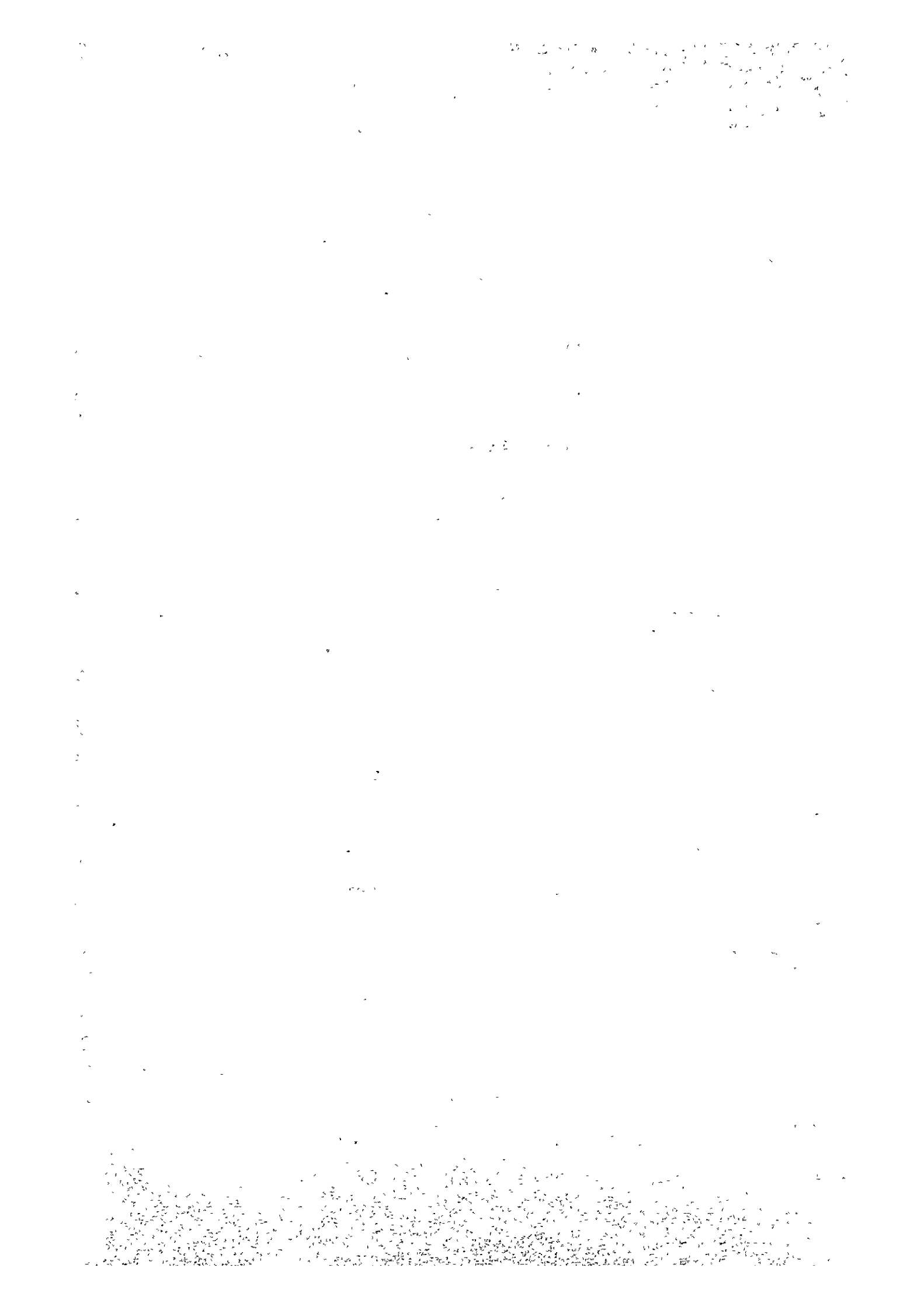
**JULY 1984**

**THE JAPAN INTERNATIONAL COOPERATION AGENCY**

国際協力事業団

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## PREFACE



## PREFACE

In response to the request of the Government of the Republic of Indonesia, the Government of Japan decided to conduct a study on the Integrated Radio and Television Development Project and entrusted the study to the Japan International Cooperation Agency (JICA).

The JICA sent to Indonesia a survey team headed by Mr. Yojiro Inoue, Deputy Director, International Cooperation division, Minister's Secretariat, Ministry of Posts and Telecommunications, from July 23rd to August 1st, 1983 and another survey team headed by Mr. Hiroaki Sogabe, Special Technical Adviser, International Cooperation division, Minister's Secretariat, Ministry of Posts and Telecommunications, from Sept. 6th to Sept. 20th, 1983.

The survey teams exchanged views the Project with the officials concerned of the Indonesian Government and conducted a series of detailed survey.

After the teams returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

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

July 1984

A handwritten signature in black ink, reading "Keisuke Arita", is written over a horizontal line.

Keisuke Arita  
President  
Japan International  
Cooperation Agency



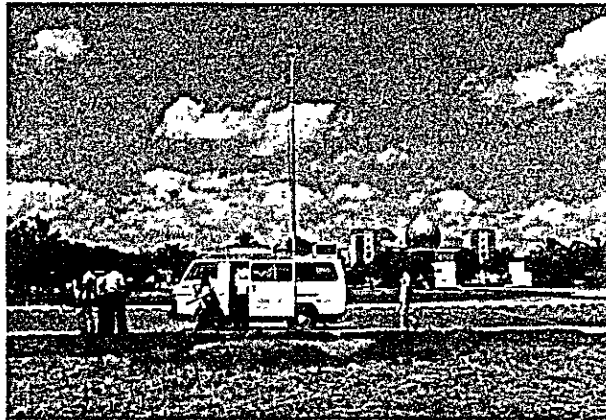




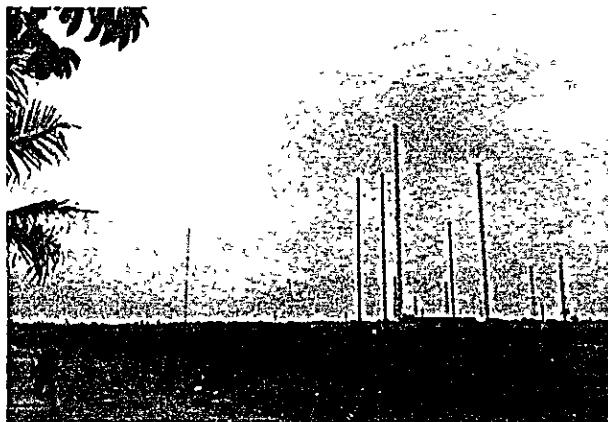
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Guidance of FC Van



TV Signal Measurement by FC Van



RRI Cimanggis Transmitting Station



TVRI Medan Station



## CONTENTS

	Page
SUMMARY AND RECOMMENDATION	1
PART I INTRODUCTION	22
PART II DEVELOPMENT PLAN OF PROGRAMME PRODUCTION FACILITIES AND TRANSMITTING FACILITIES FOR THE NATIONWIDE RADIO AND TV PROGRAMME SERVICE AND THE ESTABLISHMENT PLAN OF RADIO AND TV PROGRAMME TRANSMISSION NETWORK	29
CHAPTER 1 PROGRAMME PLANNING	30
1 - 1 Radio Programme	31
1 - 2 TV Programme	38
CHAPTER 2 ESTABLISHMENT PLAN OF THE RADIO AND TV PROGRAMME TRANSMISSION NETWORK	42
2 - 1 Radio Programme Transmission Network	42
2 - 2 TV Programme Transmission Network	49
CHAPTER 3 IMPROVEMENT PLAN OF STUDIO FACILITY	63
3 - 1 Radio Studio Facility	63
3 - 2 TV Studio Facility	70
CHAPTER 4 IMPROVEMENT PLAN OF TRANSMITTING FACILITY	82
4 - 1 Radio Transmitting Facility	82
4 - 2 Installation Plan of FM Transmitting Facility	89

4 - 3	Installation Plan of TV Transmitting Facility	91
CHAPTER 5	CONSTRUCTION PLAN OF TRANSMITTING STATION	103
5 - 1	Construction and Improvement Plan of MW and SW Transmitting Facility	103
5 - 2	Construction Plan of High Power SW Transmitting Station for Overseas Service	104
5 - 3	Construction Plan of FM Transmitting Facility	105
5 - 4	Construction Plan of New TV Transmitting Station	105
CHAPTER 6	FREQUENCY ALLOCATION PLAN	113
6 - 1	MW Broadcasting	113
6 - 2	SW Broadcasting	114
6 - 3	FM Broadcasting	114
6 - 4	TV Broadcasting	115
CHAPTER 7	ESTABLISHMENT PLAN OF INTERCOMMUNICATION NETWORK	136
7 - 1	The Importance of Intercommunication Network for Broadcasting Activity	136
7 - 2	Definition of Intercommunication Network	136
7 - 3	Constitution of the Operational Intercommunication Network	138
7 - 4	Installation of Exclusive Intercommunication Network	139
7 - 5	Installation of Branch Line Other than Trunk Line	
		139

CHAPTER 8	TECHNICAL STANDARDS TO BE APPLIED FOR PREPARATION, PLANNING PROCUREMENT CONSTRUCTION, OPERATION AND MAINTENANCE OF BROADCASTING FACILITY	142
8 - 1	Application of International Technical Standards for Broadcast	142
8 - 2	Standards Related to Sound Recording	142
8 - 3	Standards Related to the Radio Programme Transmission Line	142
8 - 4	Standards Related to AM Radio Broadcasting	143
8 - 5	Standards Related to FM Broadcasting	143
8 - 6	Standards Related to PAL Colour TV Broadcasting	143
8 - 7	Site Location for MW or SW High Power Transmitting Station	143
8 - 8	Maintaining of Original Signal Quality during the Signal Transmission from Broadcasting Station to Receivers in the Service Area	144
CHAPTER 9	PERSONNEL PLAN	180
9 - 1	Personnel for Transmitting Facility	180
9 - 2	Personnel for Studio Facility	180
9 - 3	Management Staff	180
CHAPTER 10	CONSTRUCTION AND OPERATION COST	181
10 - 1	Construction Cost	181
10 - 2	Operation Cost	
PART III	CONSTRUCTION PLAN OF THE SECOND TELEVISION BROADCASTING NETWORK	185
CHAPTER 1	PROGRAMME PLAN	185
CHAPTER 2	PROGRAMME TRANSMISSION PLAN	187

CHAPTER 3	STUDIO FACILITY PLAN	191
CHAPTER 4	TRANSMITTING FACILITY PLAN	192
CHAPTER 5	FREQUENCY ALLOCATION PLAN	194
CHAPTER 6	PERSONNEL PLAN	197
CHAPTER 7	CONSTRUCTION AND OPERATION COST	198
<b>PART IV</b>	<b>ESTABLISHMENT PLAN OF THE INTEGRATED MAINTENANCE SYSTEM AND THE CONSTRUCTION OF MAINTENANCE CENTRE</b>	<b>201</b>
GENERAL DESCRIPTION		201
CHAPTER 1	NEED OF ESTABLISHMENT OF AN INTEGRATED MAINTENANCE SYSTEM	208
1 - 1	Maintenance Work of Broadcasting Facility	210
1 - 2	Needs and Roles of Maintenance Centre	211
CHAPTER 2	ORGANIZATION AND PERSONNEL FOR INTEGRATED MAINTENANCE SYSTEM	218
2 - 1	Preparation for Establishment of Maintenance System	218
2 - 2	Organizational Structure and Maintenance Centre	219
CHAPTER 3	TASK OF THE MAINTENANCE CENTRE PREPARATORY EXPLANATION	223
3 - 1	Control and Maintenance of Facilities and Equipment	226
3 - 2	Formulation and Implementation of the Maintenance Plan	226
3 - 3	Storage and Control of Material and Parts for Repair	227

3 - 4	Procurement and Control of Repairing Material and Parts	227
3 - 5	Rationalization of Completion of Maintenance Centre	228
<b>CHAPTER 4</b>	<b>FACILITY OF THE MAINTENANCE CENTRE</b>	<b>234</b>
4 - 1	Common Broadcasting Equipment for Maintenance in Jakarta Maintenance Centre	234
4 - 2	Machine Tool	234
4 - 3	Measuring Instrument	234
4 - 4	Computer System	235
4 - 5	Field Checking Vehicles(F/C Van)	236
4 - 6	Information Equipment	237
4 - 7	Library Equipment	237
4 - 8	Warehouse for Spare Parts	237
<b>CHAPTER 5</b>	<b>OPERATION OF MAINTENANCE CENTRES</b>	<b>245</b>
5 - 1	Communication System among the Maintenance Centres and each Station	245
5 - 2	Restoration	248
5 - 3	Periodical Maintenance and Improvement of Facility	249
5 - 4	Accumulation of Information on Facility and the Others	250
5 - 5	Management of Spare Parts	251
<b>CHAPTER 6</b>	<b>CONSTRUCTION AND OPERATION COSTS OF MAINTENANCE CENTRE</b>	<b>256</b>
6 - 1	Construction Cost	256
6 - 2	Operation Cost	256

<b>PART V</b>	<b>IMPLEMENTATION PLAN</b>	<b>261</b>
CHAPTER 1	CONSTRUCTION SCHEDULE	261
CHAPTER 2	CONSTRUCTION COST	265
CHAPTER 3	OPERATION COST	268
CHAPTER 4	PERSONNEL SUPPLEMENT PLAN	269
CHAPTER 5	THE POINTS OF CONSIDERATION IN THE EXECUTION OF THE PLANS	270
<b>PART VI</b>	<b>ECONOMIC EVALUATION</b>	<b>271</b>
	INTRODUCTION	271
CHAPTER 1	FINANCIAL PLAN	273
1 - 1	Investment Plan	273
1 - 2	Financial Analysis	276
1 - 3	Fund Procurement Plan	306
CHAPTER 2	SOCIAL AND ECONOMIC BENEFIT	325
2 - 1	Social Impact	325
2 - 2	Economic Analysis	325



## SUMMARY AND RECOMMENDATION



## SUMMARY AND RECOMMENDATION

### I. SUMMARY

This report was prepared after conducting a series of detailed surveys of the current conditions, considering the results of such surveys and a number of meetings held with the Indonesian officials concerned to discuss and examine the plans to improve and expand the broadcasting facilities. This report was also prepared under the recognition of the recent progress made in the various approaches to the positive use of radio and TV broadcasting system for educational and instructional activities by other institutions and DEPPEN must be involved in those approaches because DEPPEN is the most experienced organization operating nationwide radio and TV broadcasting services in Indonesia.

A feasibility study was conducted with regard to the following plans which are scheduled to be carried out during the period of the 4th 5-year Plan:

1. The plan to improve and expand the programme production facilities and the transmitting facilities for the nationwide broadcasting service in radio and TV, and the plan to improve and expand the radio and TV programme transmission network.
2. The plan to construct the 2nd TV (TVN-II) broadcasting network.
3. The plan to establish an integrated maintenance system and to set up an Maintenance Centre.

The following is a summary of the results of the feasibility study.

- (1) The plan to improve and expand the programme production facilities and the transmitting facilities for the nationwide broadcasting service in radio and television and the plan to improve and expand the Radio and TV programme transmission network.

- 1) Sound Broadcasting

The present radio programmes were composed of the following four programme systems in Jakarta: National Programme, Khusus Programme, Ibukota Programme and Music Programme. In order to emphasize the characteristics of each programme

system and to avoid overlapped programme service the following three distinctive programme systems are newly set up.

National-I programme ..... general programmes

National-II programme ..... educational programmes

Music and Ethnic Culture programmes ...

popular music, ethnic culture and  
enter-tainment programmes

As for the National-I (RN-I) broadcasting service, general programmes for the entire country will be broadcast 24 hours a day from all the broadcasting stations in the country. The programming will include the local programmes.

In order to establish a 24-hour broadcasting system, a medium-wave standby transmitter will be installed at each of the 26 regional broadcasting stations as shown in the attached Table-1. Furthermore, MW transmitter will be installed at each of the 10 stations out of 12 stations where no MW transmitting facilities have been provided in order to improve the radio broadcasting service.

At the same time, the shortwave transmitting facilities will be reinforced to complement the medium wave broadcasting service in order to improve receiving condition in the remote area.

As for the National II (RN-II) Broadcasting service, the programmes which are provided by several executive bodies to assist the classroom education, out of school education, adult education, etc., will be broadcast through this channel.

At present, many countries have already set up a special broadcasting channel for the educational purpose besides general broadcasting service, so that education through broadcasting channel has been expected by many people to supplement the lack of educational facilities or skilled teachers and it is an effective way of enhancing the human development.

Most convenient assignment of the broadcasting time is 4 hours each in the morning and in the afternoon, and the cultural, vocational education for several fields and other type of programmes intended for the adult audience will be broadcast

for 2 hours early in the morning and 5 hours in the evening with the aim of attaining the total target broadcast time of 17 hours a day.

As for the service area of RN-II broadcasting service, a system of MW transmitting facility will be newly installed at the 5 Nusantara Stations so as to ensure the service in the most populated area for the time being and also one of existing SW transmitting facilities at the 5 Nusantara Stations will be operated for the service to remote area. But, in the future, RN-II broadcasting service network by using MW transmitter will be expanded to the same area as for the RN-I broadcasting service.

At present, the radio programmes are distributed to local stations through the narrow bandwidth transmission lines. But in this plan, it is proposed that the wide-bandwidth transmission lines should be used to distribute the programmes of the RN-I and those of the RN-II to all regional stations.

About the allocation of frequencies in relation to the establishment of new medium wave transmitting facilities, all the plans are based on the IFRB frequency allocation plan.

As to the FM broadcasting service, the programmes consisting mainly of music programmes and the programmes dealing with local culture, arts and entertainment will be broadcast 15 hours a day.

As regards the FM broadcasting facilities, transmitters of 100W - 5kW class will be installed according to the priority order at the 39 TV transmitting stations as shown in the attached Table-2.

As for the radiation power of FM transmitter will be determined in such a way as that the service area of the FM broadcasts shall be the same as that of TV broadcast.

As to the allocation of frequency, the plan has been drawn up by taking into account the possible interferences caused by FM or TV broadcasting Stations in the neighbouring countries.

Incidentally, in view of the difficulty to distribute stereophonic programmes through the present programme transmission network, it is proposed that the stereophonic programmes shall be distributed for the time being to regional stations by use of prerecorded tapes which is duplicated at Jakarta station.

As to the production facilities for the sound broadcast programmes, six studios will be constructed additionally in the Jakarta Station in preparation for the start of the RN-II programme service and for the establishment of 24 hours service on the RN-I nationwide broadcasting. Also, the construction of the stereophonic studio facilities for the National-III (RN-III) programmes will be carried out in this stages.

## 2) Television Broadcasting

As to the National TV (TVN-I) broadcasting, the programmes will consists of general programmes for nationwide broadcast.

On weekdays, the broadcasting has been conducted for an average of 7 hours a day and, on Sundays an average of 13 hours a day.

This broadcasting format will be improved for the time being by extending broadcast hours on national holiday to the same pattern as on Sunday.

In order to produce additional programmes as mentioned above, studio facilities will be newly set up in Jakarta, including two TV production studios and one TV news centre.

In order to improve the quality of the programmes produced by the regional stations, the OB Vans, colour VTRs, ENG systems and others will be provided at the regional stations.

In response to the strong wishes expressed by the TV viewers living in the area using different local standard time, nationwide TV programmes will be transmitted repeatedly at an interval of two hours.

In order to further expand the service area of TV broadcasts, fully solid states unattended TV relay stations with an output of about 10 - 100W will be set up at 50 locations (each with a population of about 50,000 -100,000) in the country as shown in

the attached Figure-1. Those 50 locations have been selected by taking into account such factors as the number of households whose reception conditions need to be improved and the degree of importance of the area concerned.

Furthermore, in order to send programme or news material produced in the Regional station, up-link equipment will be installed in 8 TV stations in which studio facilities are equipped.

(2) TVN-II Network

In parallel with Radio Educational Network, 2nd TV broadcasting network for the purpose of education has been established in many countries in the world and the educational system through the TV broadcasting is contributing to the enhancement of human development as well as Radio educational broadcasting service.

Therefore, TVN-II network service in Indonesia is as important as radio educational broadcasting service and people are expecting the expansion of TVN-II service throughout the country.

As for the TVN-II broadcasting, the service may be scheduled with the ultimate aim of 4 hours each in the morning and in the afternoon for school and out of school education and also 2 hours in the daytime and 5 hours in the evening for the lifelong education.

It is necessary to study the possibility of implementing this service in the 4th 5-year development plan.

For technical consideration, it is proposed that the service area will be as follows:

- a) Ujung Pandang and its coverage of existing relay around Ujung Pandang, Medan and Surabaya
- b) Yogyakarta, Palembang and Denpasar
- c) Balikpapan and Manado

This plan should be discussed with the department and institutions which are in charge of national education and training.

The distribution of TVN-II programme will be carried out by use of recorded video tape if the service start before transmission network system through PALAPA is available.

As for the transmitting facilities, it is proposed that the facilities should be installed on the same sites of the existing TV transmitting stations, taking into consideration of the advantages in the operational aspects as well as those in relation to the effective utilization of the existing facilities and the convenience of TV viewers.

The radiation power of the TVN-II transmitters has been determined in such a way as to make the service area of the TVN-II broadcasts substantially the same as that of the TVN-I broadcasts.

As to the frequency allocation plan, considerations have been made to ensure that no interference will occur with other TV stations presently operating in the same channel or in the adjacent channels.

While the programme production will be conducted in Jakarta, some of the existing TV studios will be put to use in producing educational programmes when the new studio facilities now under construction for the production of TVN-I programmes complete.

- (3) The establishment of an integrated maintenance system and construction plan of Maintenance Centre (Attached Fig-2)

Under the 1st, 2nd and 3rd national development plans, the broadcasting facilities have been constructed and the broadcasting operations expanded at a rapid pace. As a result, a delay has occurred with regard to the establishment of efficient operational system and maintenance system. Hence, it is proposed that steps will be taken to improve the present conditions in the aspects of personnel and facility in order to realizing the systematic and preventive maintenance work.

It is proposed that an integrated maintenance system should be established so that the maintenance work for radio and TV may be carried on under a unified system which will bring about a



vast improvement in the maintenance work, in view of the integration of the two organization (RRI and TVRI) in the near future.

To begin with, an integrated Maintenance Centre will be set up in Jakarta, fully equipped with necessary measuring devices, the machine tools for use in the repair work, and will be managed with specialized engineers and technicians.

Furthermore, in order to expand this system to the nationwide scales, a branch maintenance centre will be established at each of the two cities in addition to Jakarta, viz., Medan and Ujung Pandang taking into account such factors as the time required in dispatching the officers to the local stations under the responsibility of the Centre.

It is considerable to establish branch centres in every Nusantara area. However, it will be more effective to establish in the above mentioned two locations from the viewpoints of traffic condition and the placement of the personnel.

The Integrated Maintenance Centre will not only be sharing such work as the drawing up of the maintenance plans for the existing facilities and the compiling of budgets for the maintenance work but also be taking part in the drawing up of new construction plans from the points of view of maintenance.

(4) Construction Cost (Attached Table-3)

The construction cost estimated for each project are as follows. In estimating the construction cost, the price as of February 1984 were used. The prices of equipment and materials were all estimated as CIF prices at the suitable port of Indonesia because exact data on the prices of domestic made equipment and materials were not available when preparing this F/S report. The cost of construction of access road, building and tower, purchasing the land and also of inland transportation have been calculated as payable in the local currency.

As to the conversion rate, the exchange rate of 1 Yen = 4 Rupiah which was effective as of February 1984 was used.

- 1) For the plan to improve and expand the programme production facilities and the transmitting facilities for the nationwide broadcasting in radio and television and the plan to improve and expand the radio and TV programme transmission networks:  
40,801.6 mYen ( 163,206.4mRp)
  - 2) For the plan to construct the TVN-II network  
1,312.0mYen ( 5,248.0mRp)
  - 3) For the plan to establish an integrated maintenance system and to set up a maintenance centre  
1,273.7mYen ( 5,094.8mRp)
  - 4) Consultant fees and contingencies:  
6,725.1mYen ( 26,900.4mRp)
- Total 50,112.4mYen ( 200,449bRp)

(5) Operation Cost

The operation cost for each project are as follows:

- 1) For the plan to improve and expand the programme production facilities and the transmitting facilities for the nationwide broadcasting in radio and television and the plan to improve and expand the radio and television programme transmission networks.  
14,119.8mRp
  - 2) For the plan to construct the TVN-II network:  
2,611.6mRp
  - 3) For the plan to establish an integrated maintenance system and to set up an integrated maintenance centre:  
94.2mRp
- Total 16.83 bRp

(6) Personnel Supplement Plan

As of the end of 1983, the total number of staff member of RRI and TVRI were 5,140 and 4,286, respectively. With the completion of the projects under the present 5-year plan, the following increase in the number of staff members will become necessary with regard to each project:

- 1) For the plan to improvement and expand the programme production facilities and the transmitting facilities for the nationwide broadcasting in radio and television and the plan to improve and expand the radio and TV programme transmission networks.  
663
  - 2) For the plan to construct the TVN-II network.  
200
  - 3) For the plan to establish an integrated maintenance system and to set up an integrated maintenance centre.  
50
- Total      913

(7) Economic Evaluation

With regard to the investments to be executed during the period of the 4th 5-year plan, studies were made on the financial and economic aspects.

On assumption that the investment plan described hereinafter be implemented during th 4th 5-year, detailed evaluation was made based on the following;

cost-performance analysis of investments, forecast of the financial statements and impact of investment on the financial position of the broadcasting sector in the government.

As regards the developmental investments made in the broadcasting sector in Indonesia, the amounts in Rp during the periods of PELITA I -III have been as follows:

PELITA	RRI	TVRI	Total (bRp)
I	1.3	2.3	3.6
II	29.7	45.9	75.6
III	31.4	96.0	127.4

Meanwhile, the grand total of the funds required under the

investment plan to be carried out during the period of the 4th 5-year plan corresponds to about bRp 243.2 (comprising RRI - bRp 136.1 and TVRI -bRp 107.1).

Refer to Attached Table 4.

As to the estimation of demands for radio and TV receivers, the diffusion rates for the broadcast receivers as of the year 2000 or 15 years from now were estimated based on the data available with regard to two aspects; the international statistical figures and the trend of the popularization of radio and TV receivers in Indonesia from the past to the present.

Year	Radio receivers	TV receivers	Total (a million sets)
1983	25.0	5.0	30.0
2000	46.2	18.9	65.1

Based on the demand estimation as outline above, the total revenues from radio and TV broadcasting service for five years can be estimated at bRp 692.24 .

On the other hand, the operation costs required in maintaining and operating the broadcasting activities including the system to be developed under the present plan would total bRp 543.49 for a period of five years.

On the basis of the above-mentioned revenue expenditure estimation, the analyses of financial statements and cost performance, have been made as follows:

(From the financial statement analysis)	(PELITA IV)
Operation Ratio .....	1.10 to 0.94
Rate of Return (ROI).....	-10.3 to 1.9
Debt Equity Ratio.....	91/9 to 79/21
Debt Service Coverage.....	1.1 to 2.6
(From the cost performance analysis)	
Financial Benefit/Cost Ratio	1.34

The costs for the procurement of systems and equipment have all been estimated at the prices of imported goods.

At least from the comparison made with the records of investments during PELITA I - III, the past 5-year plans, it may be considered that the funds required under the present plan are well within the range where they can be procured from foreign loans and from the Indonesian Government's development fund. Following shows each shadow conversion factor and its value estimated.

- |  |   |      |
|--|---|------|
| 1. Standard Conversion Factor (SCF)    | : | 0.98 |
| 2. Shadow Wage Rate (SWR)              | : | 0.30 |
| 3. Consumption Conversion Factor       | : | 0.95 |
| 4. Average Propensity to Consume (APC) | : | 0.90 |
| 5. Investment Conversion Factor (ECF)  | : | 0.90 |

Financial costs, such as construction and operation costs are converted to economic costs by being multiplied by shadow prices.

Economic costs converted are considered to be substantial economic cost burdening the national economic growth.

(Refer to Table 5-2-1)

The Financial Benefit/Cost Ratio of 1.34 has been estimated based on the assumption that the TV license fee collection rate will be improved and therefore financial assistance from the General Account would naturally be necessary to the extent that return on investment will guarantee the cost of investments made in the broadcasting sector.

The fund raising plan was explained in detail in the Chapter on Economic Evaluation. The funds to be obtained from foreign loans, which account for the larger part of the required funds, were evaluated on the premise that the equipment will be imported. However, from the point of view of fostering the local industries of Indonesia, it would be possible to switch a part of the plan to purchase home produced equipment from the local manufacturing companies.

Even considering the financial cost to be paid for by the Government on the operation cost, this plan may be regarded as one that can be carried out without causing excessive financial strains on Indonesia, by means of the internal fund of DEPPEN, the Government's development fund including foreign loan and also budget from the General Account budget of the Indonesian Government.

Review of Economic feasibility is introduced as follows in terms of Economic Cost Benefit Estimates.

(1) Present Value of Net Economic Benefit : bRp 2,873

(2) Economic Benefit Cost Ratio : 5.0

Economic B/C Ratio (5.0) is expected to be 4 times as much as financial ratio (1.34).

This was analysed in terms of estimation of consumer and user surplus based on the willingness to pay for the system utilization. Thus, economic effect given to the industrial society and to the consumers by the development of broadcasting was estimated to be high in the analytical aspect.

Today, contribution of the broadcasting to the national development in Indonesia as the quasi-industrialized country is highly related to promotion of not only social instruction for the national peoples but also the economic activities.

(8) Overall Evaluation

In the Republic of Indonesia, the radio and television broadcasting services, in accordance with the 1st, the 2nd and the 3rd development plans, have been improved and expanded, with the result that broadcasting has played an extremely important roles as the most appropriate means of achieving the unification of a multiracial nation extending over a vast territory.

According to the present plan, the RN-I service will be further developed to achieve 24 hours continuous broadcasting in addition to the improvement of poor receiving condition in the remote areas.

Therefore, it is expected that the general broadcasting service will be further reinforced in such a way that more and more of news and daily life information will be broadcast by making the best of the maneuverability of radio broadcasting and that, as a result, the communication among the people will be reactivated.

In this way, the expanded radio services are expected to contribute greatly to the fostering of an integrated nation.

In view, in particular, of the fact that some 80% of the entire population reside in the rural regions, the communication between the centre of the country and those sparsely populated regions will be further improved as a result of the improvement and expansion of radio broadcasting services.

Meanwhile, the educational and cultural broadcasts conducted for the nationwide listeners and viewers by the RN-II and the TVN-II service, coupled with the school education, will be responding most effectively to the desire held by the adults and the rest of the people of all ages and in all walks of life to study things in addition to what they have learned at schools with regard to the educational broadcast directed to schools, in particular, they will enable schools to conduct education more efficiently and in a wider geographical area, as compared with the time required in expanding the school facilities or in increasing the number of teachers.

The steps taken in eliminating the poor reception areas for the TVN-I broadcasts and in conducting the time differential broadcasting will prove to be of great benefit to the nationwide audiences. As a result, the people of Indonesia living in the vast territory will be able to hear or view, at the hours most suited to them, the regional programmes as well as the national programmes compiled for reception by the entire nation.

Furthermore, with the start of the RN-III service, the people throughout the country will become able to enjoy a great variety of programmes including the entertainment programmes as well as the music programmes in stereophony. Consequently, the people's interest in broadcasting will be further enhanced.

As a result of the setting up of the Maintenance Centre, stable radiation of high quality signal will be secured on an efficient and long-term basis, thereby ensuring the continuation radio and TV broadcasting of high quality.

As mentioned above, the funds needed to cover such expenses as the construction costs and annual maintenance and operational costs will come up to a considerable amount, but the social contributions that are expected to be made by the improved and expanded radio and TV broadcasting services to the national development and to the elevation of the nation's educational and cultural levels can be considered as being immeasurable.



		Fiscal Year				
		84/85	85/86	86/87	87/88	88/89
Installation of MW Standby Transmitter	Tj. Pinang	10kW	Jambi 10kW	B. Aceh 10kW	Padang 10kW	Malang 10kW
	Yogyakarta	50kW	Bengkulu 5kW	Cirebon 10kW	Bandung 10kW	Jember 10kW
	Denpasar	10kW	Tj. Karang 5kW	Manado 10kW	Purwokerto 10kW	Mataran 10kW
	Pontianak	25kW	Surakarta 10kW	Biak 10kW	Sumenep 10kW	Kendari 10kW
	Jayapura	10kW	Samarinda 25kW Palu 10kW Ambon 10kW		Singaraja 1kW	Merauke 10kW
Installation of MW Transmitter in the Existing Station without MW Transmitting Facility	Palangkaraya	5kW	Bkt. Tinggi 10kW	Ternate 10kW	Fak-Fak 10kW	Manokwari 10kW
	Sorong	10kW		Serui 5kW	Wamena 5kW	
	Kupang	5kW				
	Dili	2kW				

Attached Table - 2

	Fiscal Year				
	84/85	85/86	86/87	87/88	88/89
Construction Schedule of FM Transmitting Station	Medan Pekanbaru Palembang Yogyakarta Surabaya Denpasar Banjarmasin Ujung Pandang Manado Jayapura	B. Aceh Jambi Bandung Pontianak Samarinda Ambon	Bengkulu Cirebon Semarang Purwokerto Mataram Palangkaraya Sorong	Padang Bkt. Tinggi Malang Balikpapan Kupang Ternate Biak	TJ. Karang Madiun Surakarta Jember Palu Kendari Gorontalo Dili Manokwari

## Construction Cost (Equipment)

(Unit: mRp)

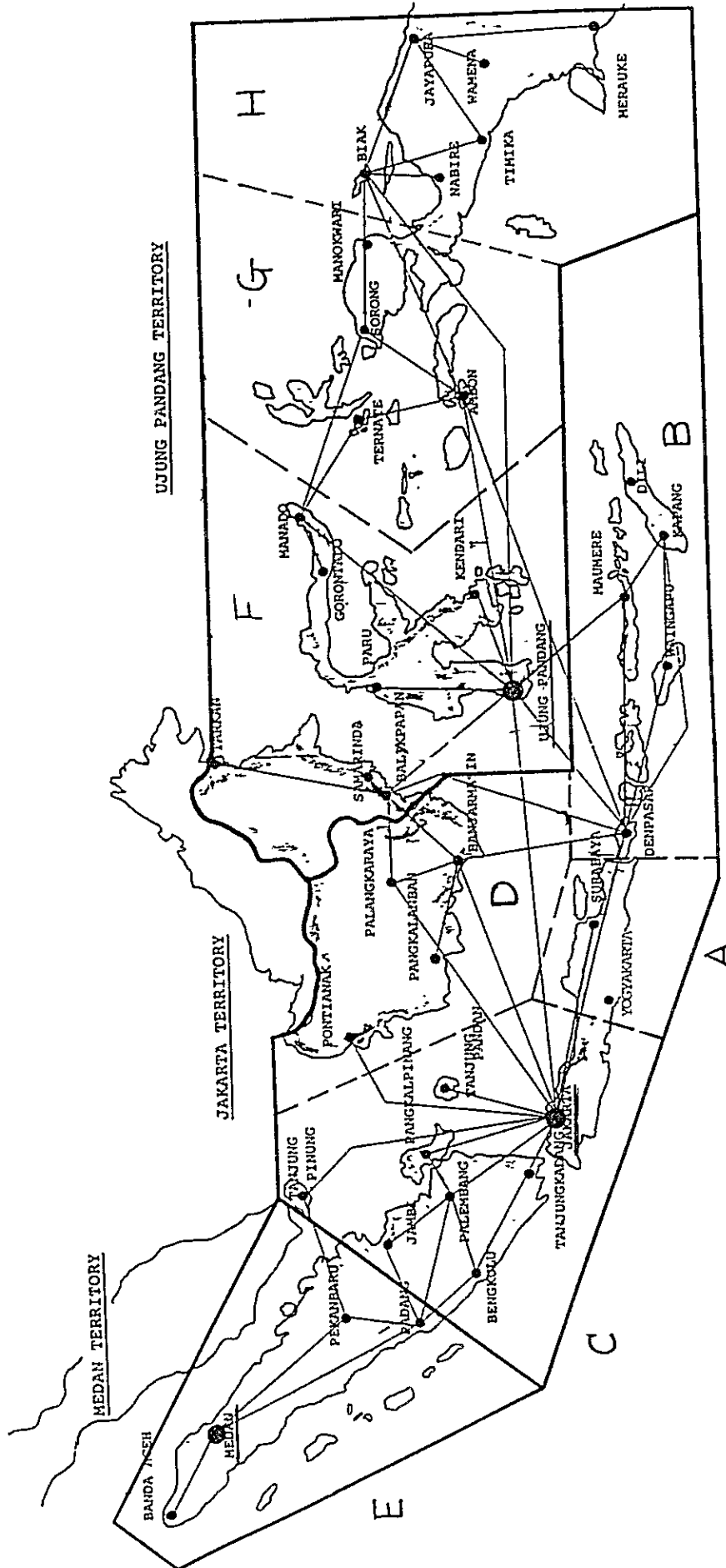
PROJECT	FISCAL YEAR					TOTAL
	84/85	85/86	86/87	87/88	88/89	
1. MW. SW. TRANSMITTING FACILITIES	3,428.0	3,176.0	3,472.0	2,412.0	1,688.0	14,176.0
2. OVERSEAS SW. SERVICE	—	—	560.0	5,040.0	—	5,600.0
3. FM TRANSMITTING FACILITIES	4,620.0	2,516.0	2,684.0	2,148.0	3,256.0	15,224.0
4. TV TRANSMITTING FACILITIES	3,189.6	3,085.6	3,033.6	3,033.6	2,981.6	15,324.0
5. RADIO STUDIO FACILITIES	7,997.2	8,288.4	15,368.8	13,683.2	9,524.8	54,862.4
6. TV STUDIO FACILITIES	2,328.0	5,584.0	8,536.0	5,376.0	4,196.0	26,020.0
7. SECOND TV TX	—	—	2,288.0	1,516.0	1,444.0	5,248.0
8. PROGRAM TRANSMISSION NETWORK	—	—	16,000.0	8,000.0	8,000.0	32,000.0
9. MAINTENANCE CENTRE	—	2,696.4	—	1,105.2	1,293.2	5,094.8
SUB-TOTAL	21,562.8	25,346.4	51,942.4	42,314.0	32,383.6	173,549.2
CONSULTANT FEE (5%)						8,677.5
(A) SUB-TOTAL						182,226.7
(B) CONTINGENCY (10%)						18,222.7
TOTAL						200,449.6

Investment Plan

( Unit : BRR )

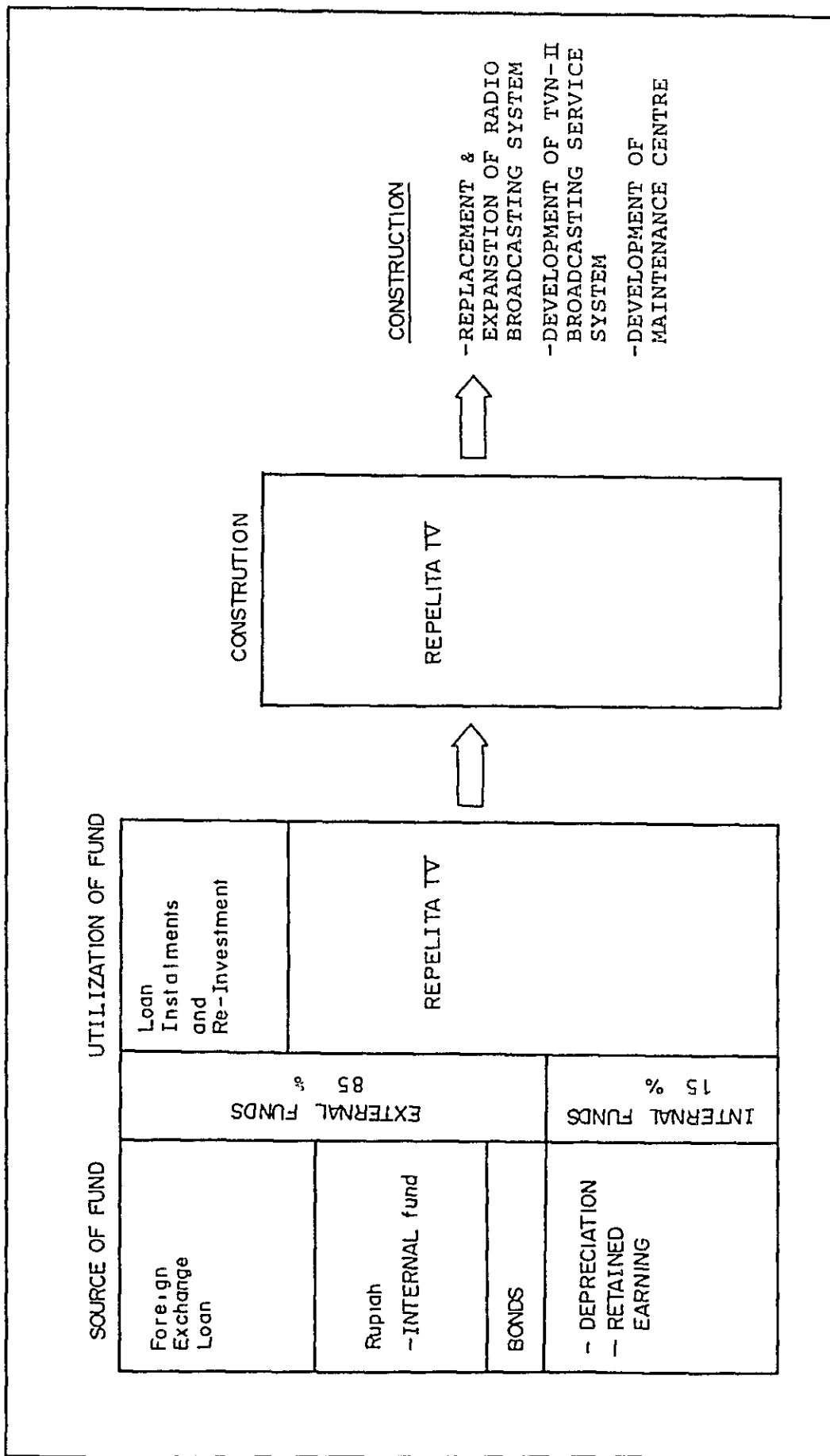
Description	84/85		85/86		86/87		87/88		88/89		Total	
	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign
Radio Broadcasting Facilities	-	3.43	-	3.33	-	4.44	-	8.64	-	2.06	-	21.90
FM & SW Transmitting Facilities	-	4.62	-	2.64	-	2.95	-	2.49	-	3.97	-	16.68
FM Transmitting Facilities-	-	8.00	-	8.70	-	21.31	-	18.19	-	14.06	-	70.26
Programme Production Facilities	-	-	-	0.94	-	-	-	0.43	-	0.53	-	1.90
Maintenance Facilities	0.72	-	1.03	-	2.37	-	2.18	-	1.99	-	8.3	-
Civil work	0.03	0.80	0.05	0.78	0.11	1.43	0.10	1.49	0.09	1.03	0.38	5.54
Consultancy	0.08	1.13	0.12	1.40	0.28	3.00	0.25	2.58	0.23	2.08	0.97	10.18
Contingency	0.84	17.98	1.20	17.80	2.75	33.13	2.54	33.82	2.31	23.73	9.64	126.6
Sub Total												
Television Broadcasting Facilities	-	-	-	-	-	-	-	-	-	-	-	-
Transmitting Facilities	-	3.19	-	3.24	-	5.85	-	5.28	-	5.40	-	22.96
Programme Production Facilities	-	2.33	-	5.86	-	22.59	-	13.20	-	12.44	-	56.42
Maintenance Facilities	-	-	-	1.99	-	-	-	0.85	-	1.05	-	3.79
Civil work	0.72	-	1.03	-	2.37	-	2.18	-	1.99	-	8.30	-
Consultancy	0.03	0.28	0.05	0.55	0.11	1.42	0.10	3.97	0.09	0.94	0.37	4.16
Contingency	0.08	1.13	0.12	1.40	0.27	3.00	0.25	2.58	0.23	2.08	0.96	10.18
Sub Total	0.83	6.92	1.20	12.94	2.75	32.87	2.54	22.87	2.31	21.91	9.63	97.51
Grand Total	1.67	24.90	2.40	30.74	5.50	66.00	5.07	56.69	4.62	45.64	19.26	224.01
Annual Total Investment by Rupee/Currency	36.57		33.14		71.50		61.76		50.26		243.27	

Territory of Each Maintenance Centre



Financial Plan for REPELITA IV

1984 ~ 1988



## II RECOMMENDATION

1. As regards the maintenance work for the broadcasting facilities of enormous scale installed at various places of the vast national territory, an *integrated maintenance system* shall be established to cover both the radio and the TV facilities. However, it is desirable that, through the integration of the organizations of RRI and TVRI at the *earliest opportunity*, the maintenance system is further reinforced so as to enhance the efficiency of the maintenance work for both radio and television.
2. By carrying out this plan, the *programme production facilities* will be improved and expanded and the programmes will come to be transmitted as stable radio-wave of high quality. Therefore, it is hoped that guidance will be promoted with regard to the radio and TV reception techniques so as to help the listeners and viewers receive the broadcasts in good condition and that efforts will be made to enhance the *collection ratio of license fees*.
3. It is recommended to ensure sufficient investment budget of Rupiah portion for the smooth implementation of the project.
4. In carrying out the *construction work under this plan*, it is necessary to have capable consultants undertake the detailed designing and scheduling of the work. Hence, the hiring of consultants is desired, also from the point of view of ensuring efficient and smooth progress of construction work.
5. It is recommended that the task force team and its headquarters should be set up in the *Engineering centre* so as to be able to manage and promote these projects efficiently in consideration of the fact that this is to be continued for the consecutive five years period.





PART I INTRODUCTION



## PART I INTRODUCTION

The government of the Republic of Indonesia earlier drew up a 25-year long-term development plan after having established its basic idea of achieving an integrated development of radio and television broadcasting services throughout the country. And the government, on the basis of such a long-range development plan, has been pushing ahead the construction of radio and television facilities.

Incidentally, as the year 1984 correspond to the first year of the 4th 5-year plan as well as the first year of 15 years period out of the 25-year long-term development plan which was established in 1974.

On this occasion, it would be valuable to review the result of construction effort proceeded in the past 10 years and to reorient the basic ideas set up at the time of the start of long-term development plan.

On the other hand, as the result of rapid expansion being made in broadcasting activities, there has been some delay in the establishment of a system to ensure efficient operation and maintenance of the broadcasting facilities, and the stagnancy has also begun to be apparent in the work replacing the superannuated equipment.

At the request of the Government of the Republic of Indonesia, the Government of Japan, as a part of its overseas technical cooperation programmes, decided to assist the Indonesian Government on the execution of the Integrated Development plan of Radio and Television Broadcast. Accordingly, the Japan International Cooperation Agency (JICA) has conducted a series of surveys in connection with those plans.

### 1. Outline of the Feasibility Study on the 5-year plan for the Integrated Development of Radio and Television Broadcast

The feasibility study were conducted on the following three items of 5-year plan which is required to be carried out urgently, though long-range plans for the integrated development of radio and television broadcast in the Republic of Indonesia will be drawn up later on.

- (1) Development Plan of programme production facilities and transmitting facilities for the nationwide radio and

- television programme service and the establishment plan of radio and television programme transmission networks
- (2) Construction Plan of the second television broadcasting network
  - (3) Establishment Plan of the integrated maintenance system and the construction of maintenance centres

## 2. Objectives of the Feasibility Study

The objectives of this study are to prepare the feasibility study report on some part of the entire long-range plans which are needed to be carried out urgently. Said long-range plans shall include the integration of the most essential activities of broadcasting in the field of programming, news service and engineering as follows:

### Programming

The integration should apply among others to :

- programme planning
- programmes for special groups
- religious programmes
- sports programmes
- entertainment programmes
- traditional cultural performances

### News service

The integration should apply among others to :

- sources of news
- coverage of domestic and foreign news
- news editing

### Engineering

The integration should apply among others to :

- engineering planning
- maintenance
- facilities and other engineering aspects

The final target is integration of Radio and TV, and the integrated development of radio and television broadcasting service in the entire country of the Republic of Indonesia will be carried out on a step by step basis.

### 3. Policies for the Study

In carrying out the work of the feasibility study, the following basic policies were adopted:

- (1) Utmost efforts will be made to fully grasp the basic ideas and the background on the long-range plan, which the Republic of Indonesia intends to achieve, by exchanging mutual opinions thoroughly so that this feasibility study may be carried out in such a way as to fully respond to the needs and desire of the Indonesian side.
- (2) In order to encourage cooperative work, the frequent joint Indonesian-Japanese study meeting shall be held at each stage of the study to review and examine the results of the studies made so that the Indonesian side may be kept informed fully and accurately of the progress and results of the study.

### 4. Brief History of the Feasibility Study

In response to the request made by the Government of Indonesia, the Japan International Cooperation Agency sent to Indonesia the preliminary survey team composed of six members from April 3rd. to 14th, 1983. The survey team was led by Mr. Yoshiaki Imaizumi, Broadcast Department, Ministry of Posts and Telecommunications.

The survey team, during its stay in Indonesia, discussed the Scope of Work with the officials concerned of the Government of the Republic of Indonesia and conducted on-the-spot surveys.

As a result, the survey team was able to gather various data and materials needed for the full-scale studies to follow.

On the basis of the results of the preliminary survey as mentioned above, the first survey team, led by Mr. Yojiro Inoue, Deputy Director, International Cooperation Division, Minister's Secretariat, Ministry of Posts and Telecommunications, was sent to Indonesia from July 23, 1983. The survey team took with it and explained to the Indonesian Government officials concerned an Inception Report consisting mainly of the contents of the survey work and the plans proposed. Then, after making detailed

consultations with the Indonesian side, Mr. Inoue and his survey team conducted a survey of the current condition of broadcasting facilities until September 20, 1983 and submitted a Progress Report to the Indonesian Government officials concerned.

After its return to Japan, Mr. Inoue's team analysed and studied the results of the survey it had conducted on the broadcasting facilities as well as the data and materials brought back from Indonesia, and drew up its Interim Report.

Further, the second survey team, led by Mr. Hiroaki Sogabe, Technical Adviser for international cooperation, International Cooperation Division, Minister's Secretariat, Ministry of Posts and Telecommunications, was sent to Indonesia from December 1983 and, after consulting with the Government officials concerned about the Interim Report, carried out a series of surveys and measurements on the radiation signal of radio and TV stations at various parts of the country until February 15, 1984.

After the return of Mr. Sogabe's team to Japan, a series of studies and analyses were made on the data and materials obtained as a result of the preliminary survey, the 1st and 2nd field surveys. The Report now being presented here is the result of such studies and analyses.

## 5. List of the Japanese Survey Team Member

### The 1st Survey

- |     |                                |  |
|-----|--------------------------------|--|
| (1) | Yojiro INOUE (Team Leader)     | Ministry of Posts and<br>Telecommunications                      |
| (2) | Masayuki HIRATA                | Japan Broadcasting<br>Corporation (NHK)                          |
| (3) | Tsutomu KIMURA (Survey Leader) | All Japan Radio &<br>Television Engineering<br>Services Co.,Ltd. |
| (4) | Shigeo HORI                    | All Japan Radio &<br>Television Engineering<br>Services Co.,Ltd. |

- |     |                                       |   |
|-----|---------------------------------------|---|
| (5) | Jiro OHNO                             | All Japan Radio &<br>Television Engineering<br>Services Co., Ltd. |
| (6) | Masami DOUCHI                         | All Japan Radio &<br>Television Engineering<br>Services Co., Ltd. |
| (7) | Morio KANEKO                          | All Japan Radio &<br>Television Engineering<br>Services Co., Ltd. |
| (8) | Koichiro S <sup>o</sup> (Coordinator) | The Japan International<br>Cooperation Agency<br>(JICA)           |

The 2nd survey

- |     |                           |   |
|-----|---------------------------|---|
| (1) | Hiroaki SOGABE (Leader)   | Ministry of Posts and<br>Telecommunications                       |
| (2) | Eimi UMEDA                | Ministry of Posts and<br>Telecommunications                       |
| (3) | Shinichiro UDA            | Japan Broadcasting<br>Corporation (NHK)                           |
| (4) | Masayuki HIRATA           | Japan Broadcasting<br>Corporation (NHK)                           |
| (5) | Fumio NISHIMURA           | All Japan Radio &<br>Television Engineering<br>Services Co., Ltd. |
| (6) | Shigeo HORI               | All Japan Radio &<br>Television Engineering<br>Services Co., Ltd. |
| (7) | Satoru YAMANAKA           | All Japan Radio &<br>Television Engineering<br>Services Co., Ltd. |
| (8) | Kunio KUGE                | All Japan Radio &<br>Television Engineering<br>Services Co., Ltd. |
| (9) | Koichiro SO (Coordinator) | The Japan International<br>Cooperation Agency<br>(JICA)           |

6. List of the Indonesian Team Member

- |      |                         |  |
|------|-------------------------|--|
| (1)  | Mr. Ir. B. SEMBIRING    | Secretary of the<br>Directorate General<br>Radio, Television and<br>Film |
| (2)  | Mr. Ir. M. ARIFIN       | Director of Television   |
| (3)  | Mr. Ir. ISKANDAR ARFAN  | Director of Radio  |
| (4)  | Mr. ANWAR SIREGAR       | RRI Jakarta Station<br>Manager   |
| (5)  | Mr. Drs. WILLY KARAMOY  | Head of Programme<br>TVRI  |
| (6)  | Mr. TANTRAWAN           | Head of Programme<br>RRI   |
| (7)  | Mr. Ir. NURHADI SUBROTO | Head of Engineering<br>Development TVRI                                  |
| (8)  | Mr. Ir. SUKARNO         | Head of Engineering<br>Development RRI                                   |
| (9)  | Mr. Ir. DEWABRATA       | Head of Engineering<br>Facilities TVRI                                   |
| (10) | Mr. Ir. SUMARTONO       | Inspector of<br>Development DEPPEN                                       |
| (11) | Mr. SOETOJO             | Senior Staff of the<br>Director General Radio<br>Television and Film     |
| (12) | Mr. HOETOJO HOERIP      | Head of TVRI Training<br>Centre  |
| (13) | Mr. Drs. SUWARDI HASAN  | Head of RRI Training<br>Centre   |
| (14) | Mr. Drs. SUPO SUNARDI   | Head of Programme &<br>Report RTF  |
| (15) | Mr. Ir. SUBARDJO        | Head of Technology &<br>Information DEPPEN<br>R.T                        |
| (16) | Mr. Ir. ISHAK           | Staff to the Head of<br>Engineering<br>Development RRI                   |



## 7. Subjects and Scope of Surveys

The basic matters concerning the surveys are shown in the Scope of Work (Annex I ) as agreed on between the Government of the Republic of Indonesia and the Japan International Cooperation Agency.

The 1st survey, which was made with regard to the current condition of broadcasting facilities, was conducted for the major part of the territory of the Republic of Indonesia.

The 2nd survey, in which the broadcast signals were measured and analysed, was conducted in the islands of Jawa and Sumatera, using field survey van to make measurements in the areas where the construction of the TVN-II transmitting station and TVN-I relay stations are planned. The results of the field surveys are shown in Annex II-VIII.



PART II DEVELOPMENT PLAN OF PROGRAMME  
PRODUCTION FACILITIES AND  
TRANSMITTING FACILITIES FOR  
THE NATIONWIDE RADIO AND TV  
PROGRAMME SERVICE AND THE  
ESTABLISHMENT PLAN OF RADIO  
AND TV PROGRAMME TRANSMISSION  
NETWORK



**PART II DEVELOPMENT PLAN OF PROGRAMME PRODUCTION FACILITIES AND TRANSMITTING FACILITIES FOR THE NATIONWIDE RADIO AND TV PROGRAMME SERVICE AND THE ESTABLISHMENT PLAN OF RADIO AND TV PROGRAMME TRANSMISSION NETWORK**

The broadcasting development plan starts from the programme planning, then goes to production and transmission planning with regard to the basic planning principles and planning methods. Then refers to the personnel, construction cost and operation cost which are necessary for the wholesome operation of the broadcasting stations.

These plans are closely related to the major broadcasting activities of the Governmental Radio and TV broadcasting organizations, and every effort has been placed on the establishment and development of the radio and TV broadcasting networks in the past 1st, 2nd and 3rd 5-year national development plan period. Now, on the assumption that the radio and TV broadcasting organizations would be integrated soon, the radio and TV broadcasting activities should be developed more systematically and functionally, by full use of the more advanced programme transmission network to give the wider and deeper effects of broadcasting service to the nations.

As for the maintenance of broadcasting facilities, it will be described in PART-IV, and the Implementation plan and the Economic Evaluation of the plan will be described in PART V and VI, respectively.



# CHAPTER 1 PROGRAMME PLANNING





## CHAPTER 1. PROGRAMME PLANNING

In the broadcasting programmes composed in accordance with the basic policies of broadcasting programmes, which are made ruled order to achieve the mission of RRI and TVRI as national broadcasting organizations, should reflect the following national policies.

- (1) Generating the spirit of rendering services to the nation and its struggle, to cement national unity and integrity, to strengthen the sense of responsibility and national discipline, to socialize Indonesia's culture and identity and to stimulate people's participation in development efforts.
- (2) should be able to socialize Pancasila and the 1945 Constitution in all aspects of society's life and to evaluate people's sense of nationhood and good citizenship for the Indonesian people. Accordingly, the subject of radio and TV broadcasting for the time being is to find the way of making it concrete through the implementation of development plans on the basis of the present state of organization, broadcasting activities and broadcasting facilities.

Especially as the programme planning is the starting point of the broadcasting activities, planning of facility, programme transmission and personnel arrangement must all match with the programme planning.

With the realization of this plan, the following remarkable effects are expected.

- (1) A remarkable expansion in broadcasting with the commencement of RN-II and TVN-II broadcasting will support education and various kinds of service.
- (2) Improvement in integrated effect of broadcasting with the suitable proportion of national broadcasting service and regional broadcasting service, the inherent characteristics of radio and TV broadcasting will be exhibited thoroughly, and as the result, the additive effects of broadcasting will be highly increased.
- (3) In addition to these broadcasting service for the regions of different local time will be remarkably improved.

As paying attention to the above points, the programme is to be planned as regards to the following items classified by each of broadcasting media and programmes.

### 1 - 1 Radio Programme

The present radio programmes were composed of the following four programme systems in Jakarta: National Programme, Khusus Programme, Ibukota Programme and Music Programme. In order to emphasize the characteristics of each programme system and to avoid overlapped programme service the following three distinctive programme systems are newly set up.

- |     |                        |   |
|-----|------------------------|---|
| (1) | RN-I programme .....   | general programmes  |
| (2) | RN-II programme .....  | special programmes  |
| (3) | RN-III programme ..... | news, music, ethnic<br>culture and<br>entertainment<br>programmes |

These three programme channels are intended for nationwide broadcasting service. In addition to these, Nusantara Stations and regional stations prepare their own local programmes independently and insert them into the framework of nationwide programmes. In this way, the broadcasting service will be more familiar with the listeners in the region.

#### 1-1-1 RN-I Programme

This programme system is intended for the Indonesian general public and the programmes are composed of the following components.

News, report and official programmes ...	25%
Educational programmes ... ..	20%
Cultural and entertainment programmes ..	45%
Others .....	10%

The Jakarta National Station and regional stations share the production of programmes of the above lineup with each other at the ratio shown in Fig. 2-1-1. The following programmes will be suitable items for local production in each regional station.

- (1) Special programmes in which the residents of the town where the station is located participate, and exclusively intended to the people of that region
- (2) Music and drama programmes in which talents of the region participate, and intended to the people of that region
- (3) Story, folk-song and drama programmes in regional language
- (4) Local music programmes composed of requests from the listeners of the region
- (5) Quiz programmes in which the people of the region participate
- (6) Discussion programmes on local problems, promotion of local industries, local culture, local art, etc.

The programmes of RN-I will increase gradually aiming at 24 hours continuous broadcasting service. At present, Jakarta National Station broadcasting is 22 hours a day on Saturday and Sunday, and 18 hours on week days, it will be a total of 134 hours per a week. Therefore, in order to establish a 24 hours continuous service it will be necessary to increase the amount of programme production by the average of 25% (34 hours a week).

#### 1-1-2 RN-II Programme

As the present the "Khusus" Programme contains programmes produced for selected audiences, such as news, serious talks, literature, drama, cultural and classical music.

However, another Jakarta channel, the Metropolitan (Regional-I) is broadcasting classroom programmes on weekdays one half hour each in the morning and in the afternoon for school in the Jakarta area. Some other regional-I and II stations (13 stations) also have some school broadcast type programmes within their weekdays programming in the form of school broadcast. The proposed RN-II Programme system will be designed for the promotion of national education suitable for people of every age, educational level and occupation. Then, programmes put on the air in this RN-II service will include informal education and can also accommodate school programmes for adult education and the classroom types for elementary, secondary and higher learnings.

By broadcasting these programmes on a nationwide scale, everyone will be given opportunity for education at homes according to their convenience. The RN-II programmes will be composed at Jakarta and the target broadcasting time schedule will be at an average of 17 hours a day (from 05:00 until 22:00).

Regarding the programmes for adults, they include educational programmes on the law, politics, economics, basic social knowledge, etc. which the nation is required to know, job training programmes for working men and women, educational programmes for housewives on child care, nursing, health, house keeping, etc., and other educational programmes on the science, technology, world situation, foreign language, etc., which cultivate the base of the nation so that they can participate in the national development programme as its basic force. The Ministry of Information plans and produces these programmes for adults, in connection and cooperation with the Ministries concerned.

#### 1-1-3 RN-III Programme (News, Music, Ethnic Culture and Entertainment Programmes)

The programmes of this new broadcasting service are mainly composed of entertainment programmes such as popular music widely listened by the people Indonesia. Programmes introducing ethnic culture and languages of every region are added to these music programmes. The programme would cultivate better relationship among the tribes all over the countries and enhance the nation's unity through the music and ethnic entertainment programmes.

As the programme mainly consists of music, it is broadcast in FM system which provides high quality sound. The plan sets a goal of providing FM broadcasting facilities in all the existing 49 stations.

Most of the programmes will be produced in Jakarta. However, some ethnic culture and ethnic language programme materials will be produced in each region and it will be send to Jakarta for the preparation of complete programmes. The broadcasting hours of the RN-III programme will finally reach 17 hours a day.

The high fidelity programme transmission lines will be provided at the fifth year in this plan period to distribute these music programmes to all stations.

#### 1-1-4 City Broadcasting Service

Well-balanced nationwide programmes composed of news, information, educational and cultural programmes, sports and entertainment programmes will be disseminated to the people of various social classes all over the country, through the above mentioned three nationwide programme systems.

In addition to these, broadcasting service for the city where the station is located is planned. This broadcasting service is intended to give local information to the people who live in the city, in contrast with the above mentioned three National Programmes, which are aimed at the general public of Indonesia. 4 - 8 hour of local programmes will be suitable proportion in consideration of programme production capability at each local station. These local programmes will be properly inserted and arranged in the frame of above mentioned three National Programme Systems.

#### 1-1-5 Role of Each Station in News Gathering Activity

The nationwide news or information programme is one of the most important programmes of the RN-I programme. They are edited in Jakarta and broadcast for 10 minutes on every on the hour from all stations. Even the stations which do not belong to the RRI are obliged to relay for certain hours the same nationwide news and information programmes put on the air by RRI stations.

The news and information programmes are transmitted from Jakarta to all part of the country using high-power SW transmitting system, and at the same time relayed to each station via the Palapa Satellite, so that each station is able to relay these programmes clearly and stably.

When any usable material for a nationwide news programme is found in the news gathering activities of each Nusantara station and regional station, or the material collected under instructions from Jakarta, it is immediately transferred to Jakarta and edited as a part of nationwide news programme. Nusantara Stations broadcast Nusantara News for about five minutes after the nationwide news programme, because they need to inform the local news for the listeners living in the Nusantara area which are not covered by the nationwide news programme. In this case, the cooperative relation between the Nusantara Station and

the regional stations in the Nusantara area is the same as that between the Jakarta National Station and the Nusantara stations in case of nationwide news gathering. In this way, the people of each region will be able to listen nationwide and international news as well as news of the Nusantara area where they live.

#### 1-1-6 Broadcast Planning

The following items shall be considered when the RN-I, II and III programmes are planned, so that the people of each region can receive them in good conditions and utilize them effectively.

- (1) Broadcasting service for the region using different local standard time

Indonesia lies east and west, from Long.  $95^{\circ}$  E. to  $140^{\circ}$  E. As one hour of time difference occurs every  $15^{\circ}$  of longitude, there are 3 hours of time difference between Irian Jaya Area in the east and the North Sumatera Area in the west. Therefore, the following three standard times are settled to meet the convenience of administration, and daily life of the people in the area.

Jawa, Bali and Sumatera Area

Western standard time 0 hour

Kalimantan, Sulawesi and Nusa Tenggara Area

Central standard time +1 hour

Irian Jaya and Maluku Area

Eastern standard time +2 hours

Generally, broadcasting programmes should be met with the life time pattern of the people if the programmes put on air are utilized by listeners at the maximum. It is necessary to take a note of the fact that the nationwide programmes are composed in Jakarta and broadcast it according to the Western standard time and therefore, how this broadcasting schedule influences the listeners who live in the area using Central and Eastern standard time, should be investigated for taking necessary countermeasure to improve the influences.

Broadcasting the same programmes three times with one hour time lag according to each standard time is an ideal solution. However, three repeated programme transmission will be necessary and it means that the operation cost of the transmission lines and the volume of transmission operation task will become triple. Therefore, as a point of compromise between the operation cost saving and the elimination of the influence caused by time difference, double or single transmission of the same programme will be better than triple transmission.

Jakarta lies at  $107^{\circ}$  of east longitude and the following principal cities lie respectively:

Medan	$99^{\circ}$
Surabaya	$114^{\circ}$
Denpasar	$115^{\circ}$
Banjarmasin	$115^{\circ}$

If these cities are included in the same time zone, broadcasting effect may not be affected so much. So, Jawa, Sumatera, Kalimantan and Bali can be covered by the same programmes.

As for the districts to the east of the above, if another programme transmission is done at 2 hours advanced time, the area including Jayapura ( $141^{\circ}$  of east longitude), Ambon and Ternate ( $126^{\circ}$  of east longitude) can be covered by the same programmes.

In Sulawesi District located in between the above two time zones, listeners should selected either one of the programme depend on their listening convenience.

The nationwide news and information programmes broadcast from Jakarta may not influence upon the time difference, as they are repeated 24 times a day, renewing the contents every hour.

(2) Broadcast Planning of RN-II programmes

The school programmes in the RN-II programme system should be broadcast in accordance with the schedule of in school

teaching. As the schedule may be different in each province and in each prefecture, the above mentioned broadcasting system with 2 hours of time shift cannot solve the problem of school programmes completely.

Generally, the school programmes are prepared in advance at the beginning of each school term in accordance with the curriculum. Therefore, each regional station shall make its own broadcasting plan so that the schools of the region can use the programme materials according to their teaching schedule.

Therefore, methods of distribution of the school programme materials prepared in the Jakarta National Station to regional stations can be considered as follows;

- a. The first broadcasting is done for the Irian Jaya and Maluku Area according to the eastern standard time.

The same programme is broadcast repeatedly two hours later for Kalimantan, Jawa and Sumatera Area according to the western standard time.

- b. The programmes are transmitted via the Palapa Satellite only once at the western standard time. The RN-I, II stations receive the programmes and rebroadcast them to local stations in their regions, or each local station directly receives the programmes and rebroadcasts them to its area.

For the Nusantara III, IV, V stations prerecorded programme materials are distributed in advance, and they are rebroadcast from each station by playing back the tapes to local stations in their regions.

### (3) Transmission of the RN-III Programme

As the RN-III Programme is broadcast by FM transmitting system, the sound quality (frequency response, distortion and noise characteristics, etc.) shall be carefully kept as high fidelity as possible when it is transmitted to regional stations. Especially for stereophonic programmes, phase difference of the right and left channels and cross talk between the channels shall be suppressed within an allowable range. (For details, refer to Chapter 2.)



It would take considerable time until satisfactory Hi-Fi programme transmission lines are prepared. Therefore for the moment, the FM programmes should be duplicated on the tapes, and distribute them to stations, in advance to the on-air time and each station plays them back according to the broadcasting time table.

For the RN-III Programme, the effect of time difference may not be taken into consideration. If it is broadcast once a day according to the western standard time, sufficient broadcasting effects can be expected.

## 1 - 2 TV Programme

Though the existing nationwide TV programmes, system will be almost maintained, extension of broadcasting time, increase of local colour programme production in more contributonal production activities in regional stations to nationwide programmes, etc. are planned so that TV programmes could be improved qualitatively as well as quantitatively.

As for the plan of the TVN-II Programme dealing in support of educational programmes and other services mainly in parallel with this plan, refer to PART-III.

### 1-2-1 Extension of Broadcasting Time of The Nationwide TVN-I Programme

The present broadcasting time of the TVN-I is 6 hours 55 minutes on week days, 7 hours 45 minutes on Saturdays and 12 hours 55 minutes on Sundays; a total of 55 hours 45 minutes in a week. The capacity of programme production will be expanded for increasing the broadcasting time for an average of 13 hours a day and 91 hours a week finally. In the first year, 13 hours of broadcasting are planned on 12 national holidays as well as on Sundays.

Most of the TVN-I programmes are now composed and produced in Jakarta. However, in order to avoid the programmes excessively inclined toward Jakarta, programmes introducing unique ethnic arts,

public entertainments, life style, manners and customs of every region shall be produced by regional stations and MPU (Mobile Programme Production Unit) and broadcast it to all the country. In a certain occasion, these stations may conduct live broadcast, feed to Palapa Satellite and/or terrestrial link and televised by TVN-I. In this way, better mutual understanding among the people of every region will be achieved.

It shall also be intended to produce programmes to increase interest of the people in the national development plan, for example, those introducing the construction works being realized in various regions.

#### 1-2-2 News Programmes

It is a matter of course that news programmes are very important in the TVN-I broadcasting, and many hours are devoted to news and information programmes. At present, four news programmes (17:00 - 17:15, 19:00 - 19:30, 21:00 - 21:25 and 22:15 - 22:20) are arranged and have a duration of about one hour and 15 minutes of newscast every day. In addition to these information programmes such as interviews, reports, documentaries, features, magazines, commentaries etc., are broadcast one hour and 10 minutes average daily.

Immediacy in broadcasting is naturally very important for the news programmes. However, the news programme in Jakarta, what appears on TV screen two hours delayed in the eastern areas, following the East Indonesian Standard Time, is calling for improvement. To solve the problem, it is necessary to reinforce the news programme production system in Jakarta and increase the transmission frequency of news programmes. For this purpose, existing News Centre shall be improved in the period of this plan.

#### 1-2-3 Countermeasures to the Local Time Difference

The TVN-I Programme ends at 23:25 on week days according to the western standard time. This time corresponds to 1:25 a.m. of the next day according to the eastern standard time. As the time is not

appropriate for the life time of the region, the broadcasting is signed off at 22:30 when the last five-minute news programme ends in Indonesia Eastern Standard Time region (at 24:30 in EST). In order to improve the present conditions and provide the viewers in the eastern areas with the same TV broadcasting service as that in Jakarta, it is necessary to realize the double TV programme transmission according to Eastern and Western local standard time.

For this purpose, reinforcement of the TV programme transmission networks, improvement of the TV programme transmission facilities and expansion of the news programme production capability are required. For details of these, refer to Chapter 2 and 3.

#### 1-2-4 Role of the Studios in the Regional TV Stations

8 regional stations (Medan, Palembang, Yogyakarta, Surabaya, Denpasar, Balikpapan, Ujung Pandang, Manado) have one or two TV studio production facilities and OB Van in addition to the Jakarta Central Station, and they are used for producing regional TV programmes. Some of locally produced programme materials are sent to Jakarta as a segment of nationwide programmes.

However, as the present network constitution of programme transmission is designed only for distribution of nationwide programmes prepared at Jakarta to local stations.

In the period of this plan, priority is given to the expansion of the nationwide TV service and, accordingly, the constitution of local programme networks shall be studied in the later part of the long-term plan period.

#### 1-2-5 Ratio of Local Programmes

In local stations which produce local programmes, a part of nationwide programmes sent from Jakarta through transmission lines are replaced with their own local programmes. This is preferable from the point of view of the broadcasting closely related to the region. However, in considering the fact that the local programmes can be watched only by the limited viewers in the region, so, the appropriate ratio of local programmes to nationwide programmes shall be decided as a guide line for the balanced programme composition at the local TV stations. The present ratio of 20% is considered appropriate for the moment.

Table 2-1-1

## Origination &amp; Distribution of RN-1 Programme

CLASS OF STATION PROGRAMME	JAKARTA NATIONAL STATION		NUSANTARA STATION		REGIONAL-I STATION		REGIONAL-II STATION	
	A *1	B *2	A	B	A	B	A	B
	NATIONAL NETWORK NEWS INFORMATION	25%			25%		25%	
OTHERS	40%			40%		40%		40%
NUSANTARA NETWORK NEWS, INFORMATION								
OTHERS			5%			5%		5%
REGIONAL NETWORK LOCAL PROGRAMME			30%					
LOCAL PROGRAMME AT EACH STATION	35%				30%			20%
								10%

Remarks: \*1 : ORIGINATION

\*2 : DISTRIBUTION

## CHAPTER 2 ESTABLISHMENT PLAN OF THE RADIO AND TV PROGRAMME TRANSMISSION NETWORK



## CHAPTER 2 ESTABLISHMENT PLAN OF THE RADIO AND TV PROGRAMME TRANSMISSION NETWORK

The existing programme transmission network shall be greatly improved in order to broadcast each programme to its target area at the most convenient time for listeners and viewers according to the programme plan described in CHAPTER 1. The radio programme transmission network requires the higher transmission characteristics than that of normal public telephone communication lines. The usage of programme transmission network will be more complicated along with the expansion of networks and various programmes such as radio programmes, stereophonic programmes and TV programmes should be transmitted and the direction of transmission should be both way not only from the Jakarta Station to regional stations, but also from the regional stations to the Nusantara stations. Under these conditions, it will be appropriate to plan the programme transmission network in consultation with the PERUMTEL.

The PERUMTEL, specialized in public telecommunication service, may not be able to understand such special requirements as broadcasting programme transmission. To solve this problem, both the PERUMTEL and the broadcasting organizations shall try to understand each other.

In many countries, also in Indonesia, the interface of the responsibility of the programme transmission is fixed at the input and output terminal in the facility of the broadcasting station.

### 2 - 1 Radio Programme Transmission Networks

As described in CHAPTER 1, the constitution and the operation of the network for radio programme transmission shall be reviewed generally in order to operate harmoniously and efficiently all the radio broadcasting system as a whole. For planning the overall network, it is necessary to consider a good balance of technology, management and cost over the broadcasting operation. The construction cost, rental cost and efficient use of the network can not be ignored even when pursuing an ideal broadcast service.

2-1-1 The Programme Transmission Networks for The RN-I Programme System

(1) Technical standards of programme transmission lines:

As the RN-I programmes are transmitted by MW or SW transmitter, the use of 7 kHz bandwidth line will be enough for AM radio broadcasting. No need to say, a 7 kHz programme transmission line needs more wider frequency bandwidth than that of telephone lines. The standard characteristics required for this programme transmission line are indicated in Table 2-2-1. This line can transmit signals of 100 Hz to 6.4 kHz at an attenuation deviation less than  $\pm 0.1$  dB. An example of the frequency allocation for such 7kHz programme transmission line is shown in Fig 2-2-1.

(2) Network Constitution:

The network constitution for the transmission of RN-I programmes is indicated in Fig. 2-2-2 to meet with the requirement of programme distribution from Jakarta to 48 regional stations. The transmission lines shall be maintained so that they can be used continuously for 24 hours.

In order to transmit the same programme twice with 2 hours of time shift to improve the broadcasting service for eastern region, another programme transmission line is necessary. It will be appropriate that the preparation of another transmission line be postponed until the 24-hour broadcasting system has been established all over the country and the necessity of the twice programme transmission with 2 hours time shift has been confirmed based on the result of survey on the influence of the time difference on the listeners in the region and the possibility of solving this problem only by rearrangement of broadcast programmes.

Therefore, once transmission of RN-I programmes through 7 kHz line according to the western standard time shall be adequate for the moment.



## 2-1-2 The Programme Transmission Network for The RN-II Programmes

The RN-II programmes shall be prepared and transmitted at the most convenient time for the listeners. Therefore the difference of life time among the listeners of various areas cannot be ignored. The ideal broadcasting system is to transmit the same programme twice with 2 hours of time shift or three times with one hour time shift. This needs to rent two or three transmission lines and consequently rental fees will be twice or triple. To avoid this, it shall be examined how the influence of the time difference be reduced by nicely arranging the programmes even if single transmission is applied.

### (1) Single transmission according to the eastern standard time

In this method, in Irian Jaya and Maluku Areas the programmes can be received by the listeners in these Areas at the appropriate time. In other Areas the transmitted programmes shall be once recorded on a tape, and later be played back according to the life time of the area. In this case, the number of the stations which should transmit the programmes with one hour of time lag is 14 (2 Nusantara Stations, 11 Regional-I Stations and 1 Regional-II Station), and the number of those which should transmit the programmes with 2 hours of time lag is 23 (2 Nusantara Stations, 14 Regional-I Stations and 7 Regional-II Stations), except the Jakarta National Station (transmitting station). The total number of the stations thus is 37.

### (2) Single transmission according to the western standard time

In this method, there are 23 stations in the areas which do not need any time adjustment, 14 stations which need one hour of time advance and 11 stations which need 2 hours of time advance: A total of 25 stations. This number is less than 37 of the case (1). So, this method can be considered profitable from the point of view of the installation of additional recording/playback equipment. However, it requires technique of programme arrangement and transmission in Jakarta, as Jakarta time is one or two hours behind with central or eastern local time.

(3) Special single transmission

If the school broadcast programme materials recorded on tapes are distributed to each Nusantara Station in advance, and the same material is used for both classes in the morning and in the afternoon, programme transmission mode, as indicated in Fig 2-2-3 from Jakarta, will considerably reduce the troublesome requirement for recording and playback. However, more complicated transmission operation will be required in Jakarta, and the similar complicated operation will also be required at each local stations.

2-1-3 The Programme Transmission Networks for The RN-III Programmes

Since the most RN-III programmes are stereophonic programme special attention shall be paid to the standards of the programme transmission lines. Especially, in order to maintaining stereophonic effect, the transmission characteristics of the right and left channels should be the same, the phase difference between the signals of both channels should be within  $15^{\circ}$  at the central part of the transmission range (from 200 Hz to 4 kHz) and the cross talk between the channels should be better than 50 dB (measured with the sinusoidal signal).

To transmit the programmes in accordance with the J-31 standards CCITT recommendation which are specified for stereophonic sound programme transmission, it is necessary to occupy the whole 48 kHz bandwidth (corresponding to 12 telephone channels) in the fundamental modulation group of the FDM system (60 kHz - 108 kHz), in case of the short-distance, analog transmission system is used. In case of long-distance transmission, stereophonic signals shall be coded and changed into digital signals so that they be transmitted through a digital transmission line as the primary PCM group (1544 Mbit/s) or through a conventional analog transmission line.

For the analog transmission using the PCM-FDM techniques an transmission method using the 5th and 6th super modulation groups of multichannel carrier transmission system ,corresponding to 120 telephone channels and a frequency range of 344 kHz (1,188 kHz - 1,532 kHz) has been put to practical use.

As mentioned above, the FM stereophonic programme transmission lines require very high-level standards, therefore it is very important to ask the PERUMTEL sufficient technical cooperation. Even if the PERUMTEL improve the terminal equipment, it will take much time and cost. It will be appropriate for the moment that each station broadcast RN-III programme by use of playing back of prerecorded programme sources, independently.

2-1-4 Summary of the Construction Plan of Downstream Programme Transmission Networks from the Jakarta National Station to the Regional Stations

The separately mentioned networks of programme transmission lines can be integrated clearly as follows.

- (1) Recent conditions of the earth stations for the Palapa system located in the places of the regional stations

As indicated in the following Table, a total of 37 broadcasting stations can use the existing earth stations. These stations and earth stations are classified according to its scales as follows.

Earth station Broadcasting Station	SBB	SBS	SBK
Nusantara Station	5	-	-
Regional-I Station	13	8	-
Regional-II Station	-	7	3
<b>Total</b>	<b>18</b>	<b>15</b>	<b>4</b>

Notes: SBB: Main Earth Station

SBS: Light Traffic Earth Station

SBK: Small Earth Station

If there is no local earth station, the programmes reached at the nearest earth station should be sent to the broadcasting station via a programme transmission line between the stations or an

SRO (earth station for sound reception only) shall be installed in the site of the broadcasting station. There are 11 stations corresponding to these conditions which are indicated in Table 2-2-3.

- (2) Since all the RN-I and RN-II programmes can be transmitted through a 7 kHz line via Palapa, it will be necessary to send the programme arrived at nearest earth station to the RRI station by providing a terrestrial link lines of similar transmission characteristics to the Palapa line, if there is no Palapa earth station near the RRI station.
- (3) Transmission of the RN-III programmes  
As mentioned before, wide-bandwidth, high-level lines are necessary for transmission of the RN-III programmes. This means that a ground transmission line between the earth station and the broadcasting station also requires special transmission equipment. Therefore, installation of an SRO in each station can be considered rather economical in most cases. Even if the existing earth station is available, for the terminal equipment shall to be modified to meet with the reception of stereophonic programmes. In any case, sufficient pre-investigation and transmission tests shall be made before the practical operation of stereophonic programme transmission is carried out.
- (4) Downstream network of 7 kHz lines from Jakarta  
It shall be appropriate to provide two of nationwide programme transmission networks of 7 kHz lines in the period of the 4th 5-year plan.
  - a. One network is for RN-I programme transmission and is operated for 24 hours. The improvement of the terminal equipment of earth stations shall be carried out according to the following priority
    - o The 1st and 2nd years

Nusantara Station	5 stations
Regional-I Station	18 stations
    - o The 3rd and 4th years

Remaining Regional-I Station	8 stations
------------------------------	------------

- |   |                               |             |
|---|-------------------------------|-------------|
|   | Regional-II Station           | 10 stations |
| o | The 5th year                  |             |
|   | Remaining Regional-II Station | 7 stations  |

At some of these stations, a terrestrial programme transmission line may be available without taking Palapa route of the earth station. It will be appropriate to negotiate with the PERUMTEL on this matters.

- b. Another network is for RN-II programme transmission, and is operated for 19 hours a day. The programmes are transmitted from 3:00 a.m. to 22:00, continuously. Improvement of the terminal equipment of the earth stations starts from the Nusantara Stations, and then followed by the stations of the areas where school broadcasting is in great demand.

#### 2-1-5 Up Stream Radio Programme Transmission Network

In the future RN-I programme planning, there may arise more demand to transmit the programme produced in regional station to Jakarta to draw up into nationwide programmes, or to produce programmes in the form of programme relay by connecting many local stations. In order to meet the above demand, it is necessary to provide a network of 7 kHz up station link between the Jakarta National Station and the Nusantara or regional stations. However, for the regional stations it may be premature to provide upstream programme transmission network, in the period of this 5-year plan, or the following reasons.

- (1) There are not so many opportunities of programme planning in which the programme produced in a regional station should be immediately transmitted through upstream programme transmission line.
- (2) If the immediacy is somewhat sacrificed, a programme with a similar programme relay format can be produced by sending a tape produced and recorded in a regional station to Jakarta by air mail and editing it into a programme at Jakarta.

- (3) If the sound quality is somewhat sacrificed, a similar programme relay format can be produced by using the telephone lines.
- (4) The 7 kHz down link lines provided for RN-II programme transmission can be used as up link when they are not in use. However, the earth stations should be equipped with the terminal equipment for transmission and reception of 7 kHz bandwidth signal.
- (5) The network for nationwide programme transmission circuits (downstream line only) has been already constituted. If the up-stream line is to be composed one by one between the regional stations connected to this network, circuit switching operation will be necessary at the traffic control centre in PERUMTEL. This limits programme planning to a certain extent.

## 2 - 2 TV Programme Transmission Network

The most important problem in TV broadcasting is to improve the broadcast service for the areas of different local standard time. The additional programme transmission network for solving the problem shall be provided within the period of this plan.

There are plans to produce news programmes mixing the news from Jakarta with those from regional stations and transmit them one after another by switching the programme relay circuit immediately. However, it will be necessary to study the effectiveness of such format of news cast in comparison with the amount of equipment investment for this scheme.

### 2-2-1 Programme Transmission Networks for Special Broadcasting Service to the Areas of Different Local Standard Time

In order to transmit nationwide TV programmes from Jakarta in according to the eastern standard time, the programme production and transmission work in Jakarta shall be improved as follows.

- (1) All the programme production and transmission work in Jakarta shall be advanced two hours. For this purpose, a part of the programme production schedule shall be changed. Especially the editing and production of news programmes, which are now being conducted to be ready for the first news transmission at 17:00, shall be changed so that the first news programme can be transmitted at 15:00. Accordingly, the system of news gathering and editing shall be changed first of all.
- (2) Since the same programme should be transmitted twice with 2 hours of time shift, the necessary equipment and staff for controlling the TV programme transmission shall be increased approximately twice.
- (3) There may be no problem in transmitting operation in Jakarta, if the news programmes at 17:00 and 19:00 Jakarta time are used for the news programmes at 19:00 and 21:00 eastern standard time. However, the news programmes at 17:00 and 22:15 eastern standard time, shall be prepared additionally for the eastern areas only.  
It will be also possible to use the news programmes at 21:00 Jakarta time for the time at 23:00 eastern standard time. In this case, the sequence of the programmes before and after the news programme shall be changed slightly.

Regarding these matters, an adjustment shall be made between the programme planning section and the programme production and transmission section.

- (4) It will take approximately 2 years to complete the preparation for the special broadcasting service to the viewers in the areas of different local standard time. Besides, the additional installation of terminal equipment in the earth stations will take almost the same period. Therefore, the start of additional transmission of nationwide TV programmes will be later than the end of the 3rd year of the 4th 5-year plan.

## 2-2-2 Upstream Networks from The Regional Stations

(1) If the transponder presently being used exclusively for transmission of TVN-I programmes or additional one to be newly rent for transmission of the programmes for the eastern areas is used, upstream networks from the regional stations equipped with studio facilities to the Jakarta Station can be constituted. However, if the operation time of the upstream lines falls within the time zone for nationwide programme transmission, the third transponder shall be temporarily rent for the upstream transmission.

(2) If the local programmes are transmitted to Jakarta and recorded on tapes in advance, then played back at the broadcasting time, the upstream lines circuits may be constituted in sacrifice of the real-time transmission

For this purpose, additional terminal equipment for TV signal transmission will be needed at the transmitting earth stations and also the Jakarta earth station may be needed to equip with additional terminal equipment for TV signal reception.

(3) Among the earth stations in the same locations of the regional TV stations, only the Surabaya earth station has been equipped with the terminal equipment for TV signal transmission. Then, it will be necessary to install the terminal equipment for TV programme transmission and the upstream programme line between TV station and earth station accordingly.

The under mentioned 8 regional stations are equipped with studio facilities: Medan, Palembang, Yogyakarta, Surabaya, Denpasar, Balikpapan, Ujung Pandang and Manado, and the following 10 regional stations are equipped with MPU: Banda Aceh, Padang, Bandung, Semarang, Pontianak, Banjarmasin, Kupang, Dili, Ambon and Jayapura. The priority of the installation of transmission terminal equipment in these 18 stations shall be decided in consideration of programme planning. In the period of the 4th 5-year plan, 2 regional stations per year from the 2nd year of the plan period, thus a total of 8 stations will be equipped with the terminal equipment.



- (4) These upstream programme lines, of course, can also be used for transmission of news materials. Special attention shall be paid to the news material transmission, because this requires more immediate transmission than ordinary programme transmissions.

PERFORMANCE CHARACTERISTICS OF AM RADIO PROGRAM TRANSMISSION CIRCUITS  
(CCITT Rec.J23)

1. NOMINAL BANDWIDTH  
7kHz CIRCUITS: 0.05 - 7kHz
2. INSERTION GAIN AT 1kHz
  - (1) ADJUSTMENT ERROR: LESS THAN 0.5dB
  - (2) DAILY VARIATION: LESS THAN 0.5dB
3. GAIN/FREQUENCY RESPONSE REFERRED TO 1kHz
  - 0.05 - 0.1kHz: +1 - -3dB
  - 0.1 - 6.4kHz: 1dB
  - 6.4 - 7.0kHz: +1 - -3dB
4. DIFFERENCE OF GROUP DELAY AT GIVEN FREQUENCY
  - 0.05kHz: LESS THAN 80mS
  - 0.1kHz: LESS THAN 20mS
  - 6.4kHz: LESS THAN 5mS
  - 7.0kHz: LESS THAN 10mS
5. MAXIMUM WEIGHTED NOISE LEVEL  
-44dBqOps (NOTE: dBqOps Rec.J15 ANNEX A)
6. NON-LINEAR DISTORTION
  - BELOW 0.1kHz: LESS THAN 2%
  - ABOVE 0.1kHz: LESS THAN 1.4%
7. CROSSTALK BETWEEN TELEPHONE CIRCUIT
  - 0.5kHz - 3.2kHz: LESS THAN 74dB
  - NEAR OR FAR END: LESS THAN 65dB

Table 2-2-2(1)

**PERFORMANCE CHARACTERISTICS  
OF AM RADIO PROGRAM TRANSMISSION CIRCUITS  
(CCITT Rec.J23)**

1. NOMINAL BANDWIDTH  
15kHz CIRCUITS: 0.04 - 15kHz
2. INSERTION GAIN AT 1kHz  
(1) ADJUSTMENT ERROR: LESS THAN 0.5dB  
(2) DAILY VARIATION: LESS THAN 0.5dB
3. GAIN/FREQUENCY RESPONSE REFERRED TO 1kHz  
0.04 - 0.125kHz: +0.5 - -2.0dB  
0.125 - 10kHz: 0.5dB  
10 - 14kHz: +0.5 - -2.0dB  
14 - 15kHz: +0.5 - -3.0dB
4. DIFFERENCE OF GROUP DELAY AT GIVEN FREQUENCY  
0.04kHz: LESS THAN 55mS  
0.075kHz: LESS THAN 24mS  
14kHz: LESS THAN 8mS  
15kHz: LESS THAN 12mS
5. MAXIMUM WEIGHTED NOISE LEVEL  
-42dBqOps (NOTE: dBqOps Rec.J15 ANNEX A)
6. NON-LINEAR DISTORTION  
0.04 - 0.125kHz: LESS THAN 1%  
0.125 - 7.5kHz: LESS THAN 0.5%
7. CROSS TALK BETWEEN TELEPHONE CIRCUIT  
0.04kHz: LESS THAN -50dB  
0.5 - 5kHz: LESS THAN -74dB  
15kHz: LESS THAN -60dB  
0.04 - 0.5kHz: Oblique straight-line segment on linear-decibel  
5 - 15kHz: and logarithmical-frequency scales.  
NEAR OR FAR-END: LESS THAN -65dB
8. DIFFERENCE IN GAIN BETWEEN A AND B CHANNELS  
0.04 - 0.125kHz: LESS THAN 1.5dB  
0.125 - 10kHz: LESS THAN 0.8dB  
10 - 14kHz: LESS THAN 1.5dB  
14 - 15kHz: LESS THAN 3.0dB

9. PHASE DIFFERENCE BETWEEN THE A AND B CHANNELS

0.04kHz: 30 DEGREE

0.2 - 4kHz: 15 "

14kHz: 30 "

15kHz: 40 "

0.04 - 0.2kHz: Oblique straight-line segment on linear-degree  
4 - 14kHz: and logarithmic-frequency scales.

Table 2-2-3-(1)

Earth Station & Exchange in the Same Location of RRI Station

	Nusantara Station	Regional Station		Earth Station	Exchange	
		I	II			
1	Medan			SBB		
2		Banda Aceh		SBB		
3		Bkt. Tinggi		-		
4		Pekanbaru		SBB		
5		Jambi		SBB		
6		Padang		SBB		
7		Palembang		SBB		
8		Benkulu		SBS		
9		Tj. Karang		SBS		
10				Sibolga	-	
11			Tj. Pinang	SBS		
12	Yogyakarta			SBB		
13		Bandung		SBB		
14		Semarang		SBB		
15		Surakarta		-	-	
16		Surabaya		SBB		
17		Denpasar		SBB		
18		Mataram		SBS		
19				Bogor	-	
20				Cirebon	-	
21				Purwokerto	-	
22			Madiun	-		
23			Jember	-		
24			Malang	-		
25			Sumenep	-	-	
26			Singaraja	-		
27	Banjarmasin			SBB		
28		Pontianak		SBB		
29		Palangkaraya		SBS		
30		Samarinda		SBB		

Table 2-2-3-(2)

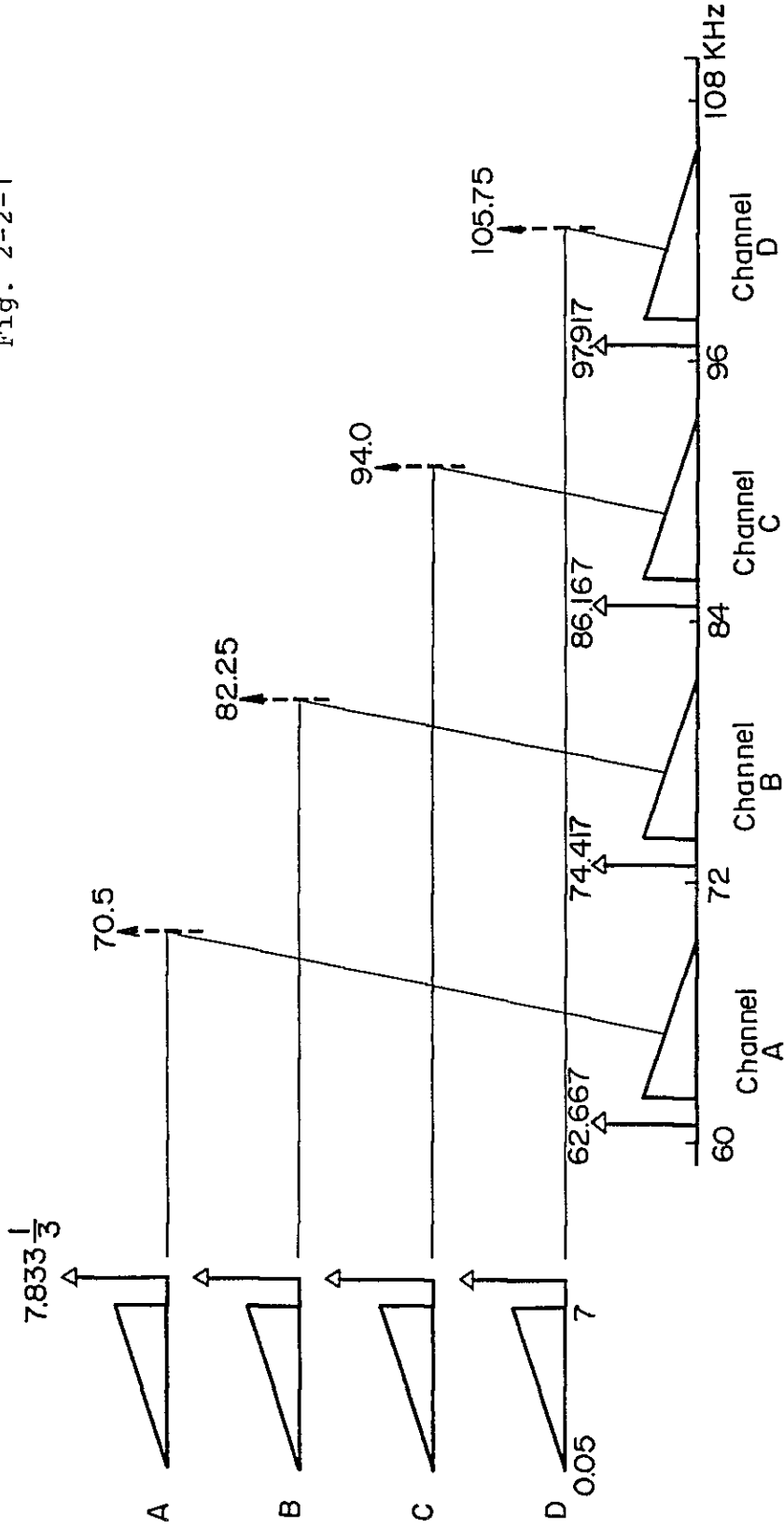
31	Ujung Pandang			SBB	■
32		Manado		SBB	○
33		Kendari		SBS	●
34		Palu		SBS	●
35		Kupang		SBS	●
36		Dili		SBK	—
37		Gorontalo		SBS	▲
38	Jayapura			SBB	●
39		Sorong		SBS	▲
40		Blak		SBS	●
41		Merauke		SBS	▲
42		Ambon		SBB	■
43			Fak-Fak	SBS	△
44			Manokwari	SBS	▲
45			Nabire	SBK	—
46			Serui	SBK	△
47			Wamena	SBK	—
48			Ternate	SBS	▲

- △ Primary Trunk Centre (Manual)
- ▲ Secondary Trunk Centre (Manual)
- Primary Trunk Centre (Automatic)
- Secondary Trunk Centre (Automatic)
- Tertiary Trunk Centre

Table 2-2-4  
Link between RRI Station & Earth Station or Telephone Office

RRI Station	PERUMTEL Line (Existing or Planned)		Remarks
1. Sibolga	Medan - - - - -	Bkt.Martimbang	SHF Link Necessary Demodulator and Additional Link (Bkt.Martimbang - Sibolga)
2. Bkt.Tinggi	Padang - - - - -	Bkt.Tinggi	SHF Link
3. Bogor	Jakarta - - - - -	Bogor	Coax. Cable UHF Link
4. Cirebon	Yogyakarta - - - - -	Cirebon	SHF Link
5. Madiun	Surabaya - - - - -	Madiun	Coax. Cable
6. Malang	Surabaya - - - - -	Malang	Coax. Cable
7. Purwokerto	Semarang - - - - -	Pekalongan - Purwokerto	Coax. Cable SHF Link
8. Surakarta	Yogyakarta - - - - -	Surakarta	SHF Link
9. Jember	Surabaya - - - - -	Jember	
10. Sumenep	Surabaya - - - - -	Sumenep	
11. Singaraja	Denpasar - - - - -	Singaraja	UHF Link

Fig. 2-2-1



Note - The carrier frequencies are multiples of 11.75 kHz and can be derived from a common generator frequency

Frequency allocation for four 7 kHz type sound-programme channels set up on one group



Fig 2-2-2

RN-I Programme Transmission Network (First Phase)

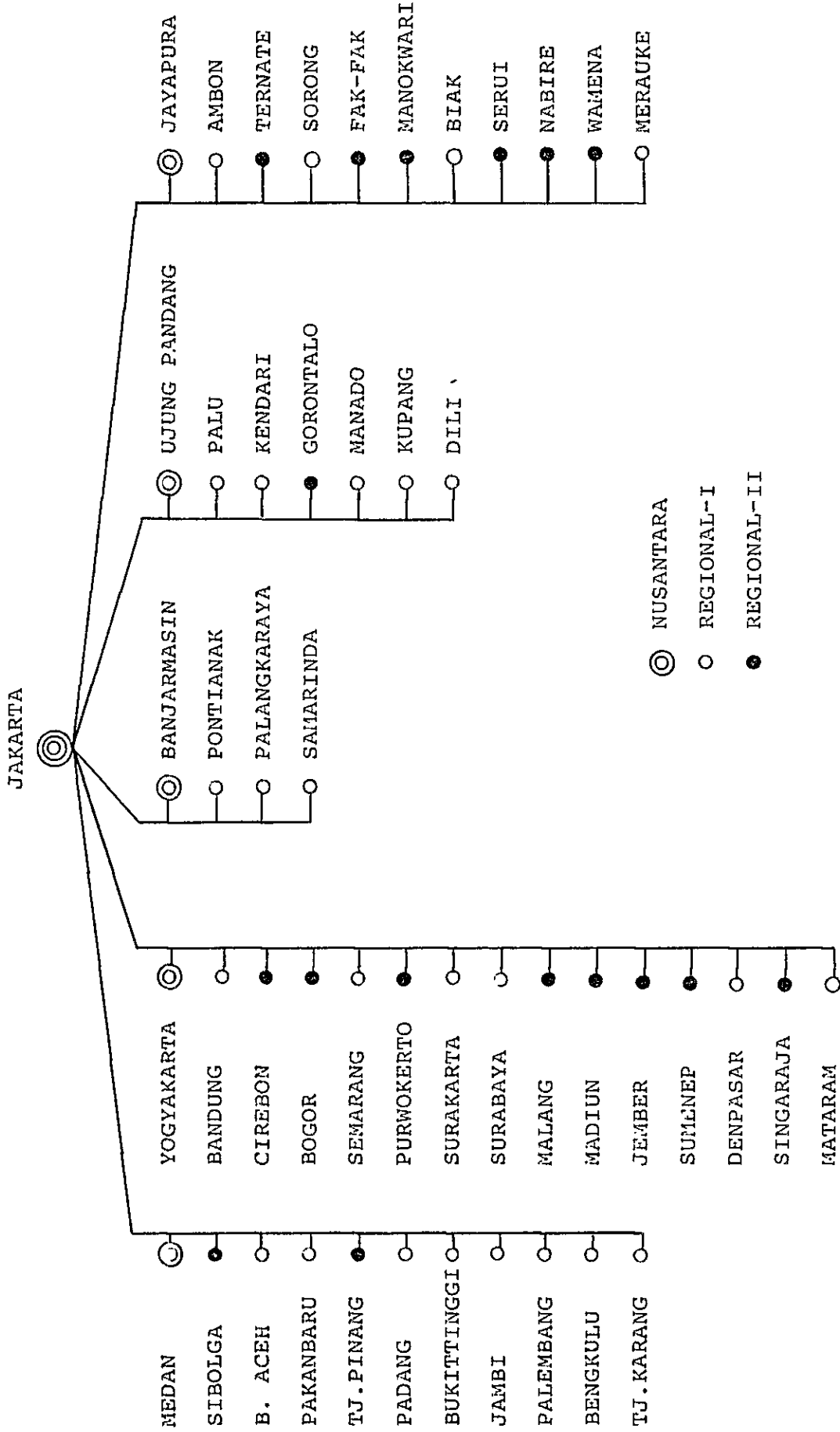
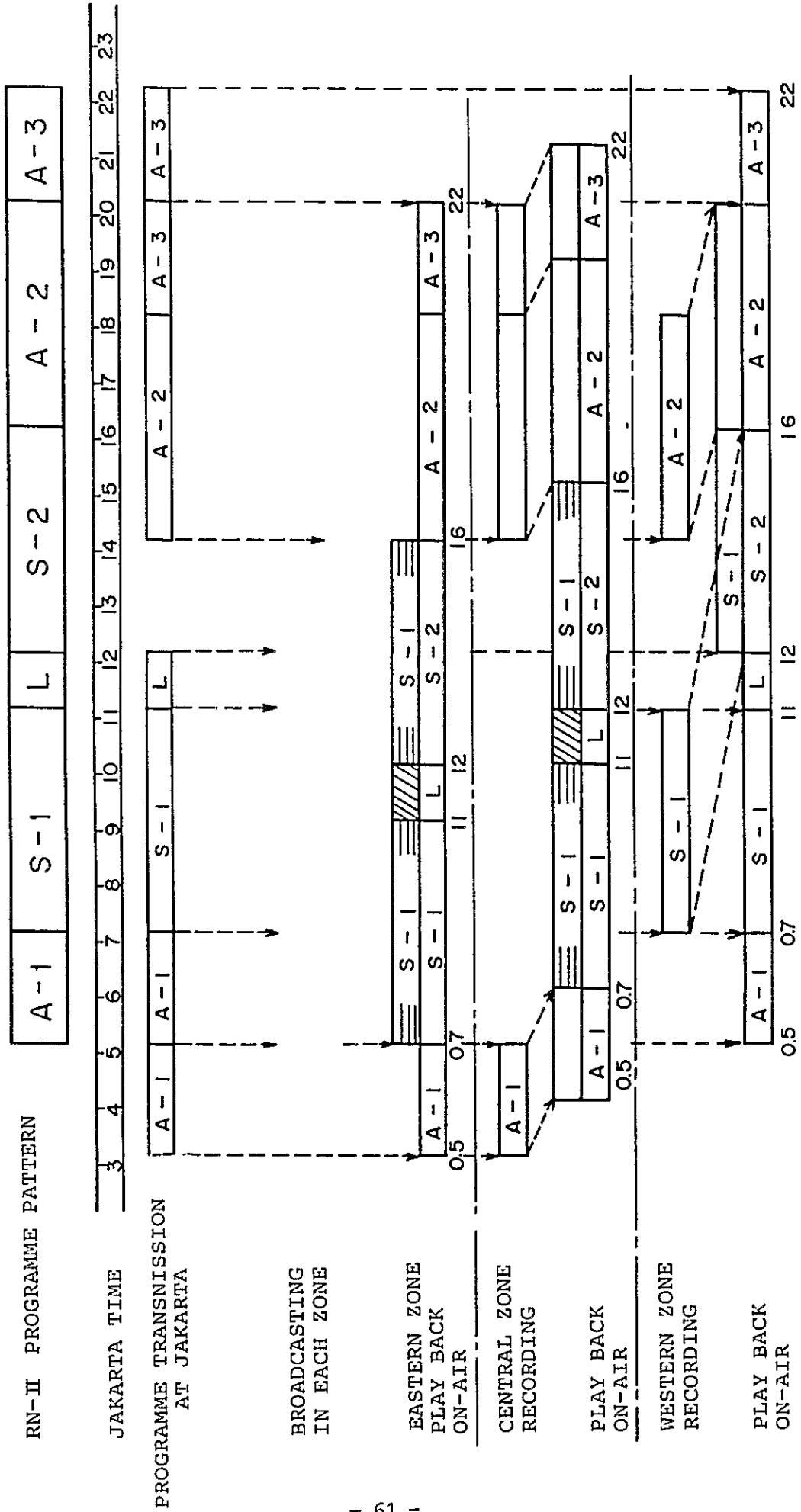


Fig 2-2-3

RN-II Programme



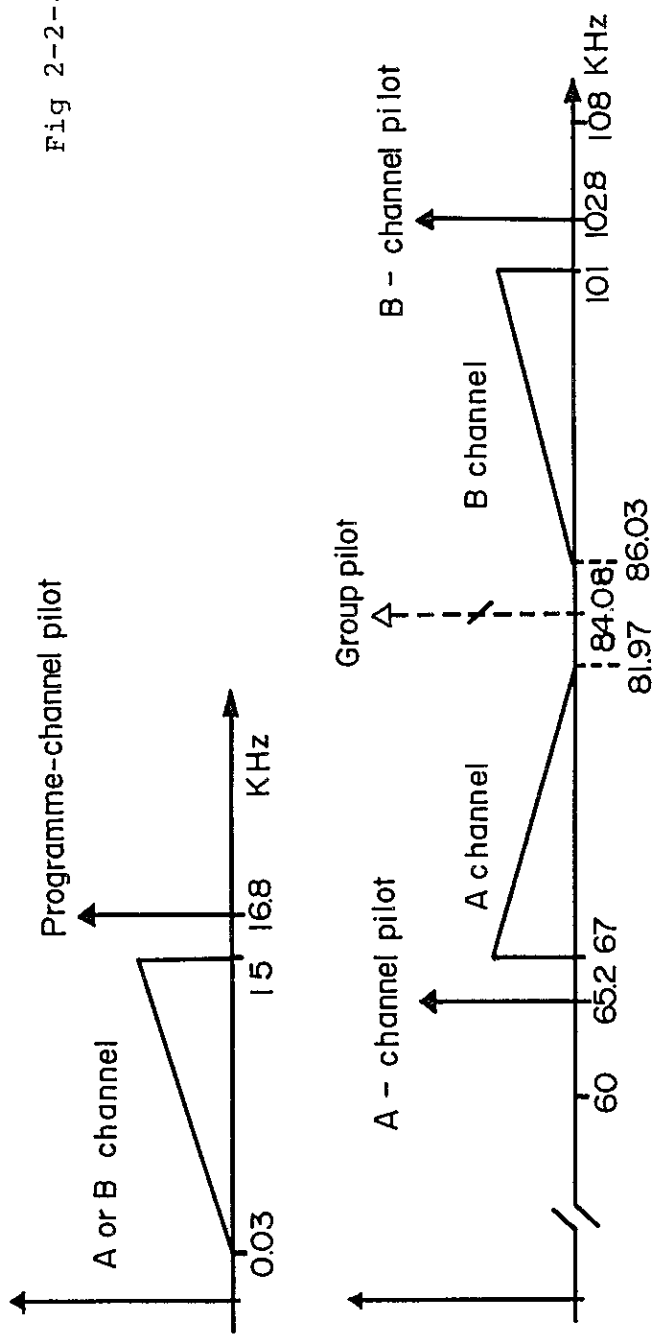


Fig 2-2-4

Line-frequency positions of the two-programme channels in the group



## CHAPTER 3 IMPROVEMENT PLAN OF STUDIO FACILITY



## CHAPTER 3 IMPROVEMENT PLAN OF STUDIO FACILITY

Under the assumption that RRI and TVRI will be integrated, facilities in the programme transmission section, news section and common Radio/TV programme production section, among the radio and television programme production facilities, will be installed in the same compound however, there are many matters to be solved to realize integration. In this plan, all facility plan will be proceeded in the existing facilities which are used for daily operation or under construction.

Therefore, radio studio equipment will be installed in the main office building of RRI at Merdeka Barat, and the television studio equipment in the TVRI at Senayan.

### 3 - 1 Radio Studio Facility

The following items are the basic conditions to be considered when preparing the Radio Studio Facility Plan.

- (1) Renewal of aged facilities in existing studios.
- (2) Installation of studio facilities to meet with increasing programme production capability brought about by increasing plan of broadcast hours.
- (3) Installation of studio equipment for production and transmission of FM stereophonic programmes.
- (4) Improvement of radio programme transmission equipment to meet with more complicated programme transmission procedures.
- (5) Construction of news centre for more efficient operation of news gathering, editing and transmission.
- (6) Installation of recording/playback equipment to improve broadcasting service for the area using different local standard time.
- (7) Installation of tape copying system to distribute taped programme to local stations.

### 3-1-1 Renewal of Aged Studio Equipment

#### (1) Jakarta National Station

As of January 1984, the Jakarta National Station is broadcasting the following radio programmes.

RN-I Programme	18 hours (approximately)
Khusus Programmes (To be RN-II in the future)	8
Music Programme (To be RN-III in the future)	15
City Service Programme	19
Overseas Service Programme	11
<hr/>	
Total	71 hours

Presently, to produce these programmes, the following studio facilities are being used near to the limit.

Large Studio (More than 150m <sup>2</sup> )	1
Medium Studio (100 - 150m <sup>2</sup> )	2
Medium - Small Studio (50 - 100m <sup>2</sup> )	3
Small Studio (Less than 20m <sup>2</sup> )	13
<hr/>	
Total	19

Condition of the studio equipment are fairly good but studio facilities in five rooms will be renewed with new high performance units to improve operation efficiency.

#### (2) Regional Broadcasting Station

Although the Nusantara stations have 5 - 6 rooms, the Regional-I stations have 3 - 4 rooms, and the Regional-II stations have 2 - 3 rooms of radio studio facilities, about half at the earlier established stations and about 1/3 of the comparatively lately opened stations are in poor condition and therefore, the aged facilities in the above studios will successively be renewed each year in accordance with Table 2-3-1.



3-1-2 Construction of Additional Studio Facilities to Meet with the Programme Plan

- (1) To setup 24 hours continuous broadcasting service in RN-I programme system and to start the nationwide broadcast service of RN-II programmes, 3 new studios at first and 6 studios in total will be installed in Jakarta station within the term of this plan. The programme transmission network for disseminating above two categories of programme from Jakarta throughout the nation will be expected to be provided in the early stage of the plan period. Via these network, programmes produced in Jakarta are sent to regional station in good sound quality and 30 - 40% of them are put on air from each station.

Thus provided, programmes hitherto produced in each regional station will be replaced with those sent from Jakarta and thus reduce their burden of local programme production. Consequently, additional studios will not be provided in regional stations during this plan period.

- (2) Radio studio mentioned in this Section 3-1-2 are used for medium wave and short wave radio broadcasting service and can handle only monophonic signals.

3-1-3 Studio Facilities for FM Stereophonic Programmes

Presently, stereophonic programmes are broadcast only in Jakarta. Base on this experience, FM broadcast service will be extended throughout the nation beginning with the Nusantara stations and then regional-I stations, by setting up of new programme system that is RN-III programmes. To this end, stereophonic programme studios will be provided based on the following conditions and according to Table 2-3-2.

- (1) Nusantara station - 3 studios
- |   |   |
|---|---|
| Medium studio* (Stereophonic recording of small scale chorus and instrumental performances) | 1 |
| Small studio (For disc jockey)  | 2 |
- (2) Regional-I station - 2 studios
- |                                |   |
|--------------------------------|---|
| Medium studio* (Same as above) | 1 |
| Small studio (Same as above)   | 1 |

- (3) Other stations - 1 studio  
Small studio (Same as above) 1  
\* If an auditorium is provided within the station compound or available in the city, then the medium studio will be changed to a small studio.

3-1-4 Other Studio Facilities

(1) Radio programme transmission facilities

- 1) Three different programme transmission modes such as transmission of the nationwide programmes from Jakarta to all Regional stations via Palapa relay line and by high power short wave transmitters in Cimanggis transmitting station, transmission of Jakarta local and city service programmes and FM stereophonic programmes to Cimanggis and/or Kebayoran transmitting stations are carried out at Jakarta National Station. Furthermore, the transmitting frequency must be changed depending on the on-air time even for the same programmes.

Thus, switching operation at Jakarta National Station is extremely complicated to send various programmes from the studio to transmitters at Cimanggis, Kebayoran and PERUMTEL.

Also, this programme switching pattern is different between weekdays and weekends.

Hitherto, manual switching system has been adopted but will be changed to automatic operation system during this plan period. As a preparation to this, a programme operation room provided with switching system expecting future adoption automatic switching system, will be installed.

- 2) Although switching operation at the Nusantara and Regional-I stations are not so complicated as in Jakarta National Station, in order to achieve more smooth switching operation, continuity studios and continuity facilities for programme transmission will be installed as shown in Table 2-3-3.

(2) Construction of a news centre in Jakarta

By execution of the 24 hour broadcasting service on the RN-I programme system, the similar working pattern of gathering

editing and sending of news must be repeated 24 times every day. To allow smooth operation of this work, a suitable working space will be provided for efficient news gathering, news material screening, editing, copy writing, etc., and equipment such as telex, facsimile, tape recorder, and overseas broadcast reception facility, all of which will be nicely arranged around the news studio. This news centre will tentatively be established in the RRI Head office building in Jakarta city and a floor space of about 300 m<sup>2</sup> shall be acquired.

- (3) Record/playback equipment installation in regional stations to match the programme with local standard time.

At each of the 11 stations in the eastern standard time zone, 4 recorders will be provided - two for playback of the school broadcast programmes on RN-II programme system; one for record and playback of RN-I and RN-II programmes; and one for stand-by. At each of the 14 stations in the central standard time zone, 5 recorders will be provided; 2 for playback of school broadcast programmes; 2 for record and playback of RN-I and RN-II programmes; and 1 for standby. (Refer to Table 2-3-4)

All tape recorders mentioned above will be the cassette type for the purposes of reduction in facility cost, operation cost, and convenience in tape management.

- (4) Installation plan of tape copying equipment

The following tape copying equipment will be installed in the Jakarta National station to meet with the programme plan mentioned in CHAPTER 1.

- 1) Recording equipment for FM stereophonic programme copying

One set of tape copying system will be installed in the Jakarta National station which can playback a master tape containing original stereophonic programme, distribute its output signal to 5 tape recorders and make 5 duplicated programmes at once in high fidelity. When more FM stations are established in the future, the number of slave recorders will be increased accordingly. As the programmes to be recorded will be music, the sound quality of duplicated programme must be kept at a high level and for this reason, the magnetic tape shall be of

the speed of 19-38cm/s and width of 6.3mm and recorder is two track open reel type. In consideration of work efficiency, these copying system should be special machine possible of high performance record playback machines utilizing digital technique have been developed but as the worldwide standard specifications is not settled, the conventional analog type will be used here.

Special attention should be paid to the following points when providing the stereophonic programme copying system.

- o The record/playback characteristics between the master machine for playback of the original tape and the slave machine for copying shall be identical and deviation be within  $\pm 1$ dB for the frequency range of 20Hz - 20kHz.
- o In consideration to repeated copying operation, it is desirable that S/N shall be high and, at least, 55dB shall be kept at a tape speed of 38 cm/s.
- o Wow/flutter shall be less than 0.1%
- o There shall be no inconsistency in time required for the tape to reach the specified running speed from start of both the master and slave machines and the recorders shall contain a speed control system to maintain tape speed deviation during operation to within  $\pm 0.2\%$ .

As this tape copying system will be used under severe conditions, equipment shall be selected so that it is not only mechanically strong but electrically stable for long time periods.

## 2) Recording equipment for monophonic programme copying

This equipment is to be used for copying of various educational programmes of the RN-II programme when programmes are distributed to all regional stations by recorded tapes. Therefore, master machine shall be the open reel type using 6.3 mm tape and the slave machines shall be the cassette type using 3 mm cassette tapes.

Both master and slave machines shall be operated in double speed to improve operation efficiency. Two copying systems,

each consisting of one master machine and 12 slave machines, will be installed to be able to distribute copied tapes to the 25 regional stations in the eastern and central standard time zone.

### 3-1-5 Summary of Studio Facilities to be Provided during the 4th 5-Year Plan Period

The above mentioned various plans are arranged on five years as shown in Table 2-3-5 This table list up all items of plan to be materialized during this plan period. For the Regional-I and Regional-II stations, only number of studios and equipment are listed for each Nusantara area. This will be more convenient for a effective implementation of the development for selecting the stations to be implemented in each year.

### 3-1-6 Allotment Plan of Radio OB Van

Each broadcasting station presently has at least one OB van for programme production activity outside of the studio but generally they are not in good condition.

Most of the OB vans kept in local station are full equipped medium size bus, and such a heavily equipped OB van has less occasion of being used. Therefore, demand is increasing for small OB vans of four wheel drive type loaded with lightweight broadcasting equipment and possible of wide range reporting activity over bad road conditions.

In view of this situation, small size OB vans will be attached during this plan period.

#### (1) Functions required in small size OB vans

The following functions will be incorporated in the small size OB vans under the assumption that they will be operated in localities of bad road conditions.

- o The vehicle shall be four wheel drives which can endure bad road driving and be as small as possible.
- o The programme production equipment must be able to operate as mounted in racks inside of the van but when they are removed from the van, stored in carrying containers and transported by ship or aircraft to the location of use, they

must be able to be quickly assembled for use in the field or indoors.

- o Therefore, the programme production equipment must be small, lightweight, able to withstand vibration and shock, and be of low power consumption.
- o It is the principle that the programme is only recorded at the actual production point in occasion where programme transmission line cannot be used from that point to the broadcasting station however, the wireless programme transmission equipment will be provided to deal with the requirement of immediate transmission.
- o The power source required for operating the equipment loaded on the OB van will all be self sustaining.

(2) OB van allotment plan

Stations which require additional supply of OB vans amount to 45 and in accordance with Table 2-3-6, at least one unit will be supplied, to these 45 stations at the rate of 8 to 10 units each year during this plan period.

3 - 2 TV Studio Facility

The following facilities will be installed to comply with the improvement plan of television broadcasting services such as extension of broadcasting time of the TVN-I programmes, starting of the TVN-II broadcasting service and upgrading of programme production capability in regional stations.

3-2-1 Installation of Programme Production and Transmission Facilities in Jakarta Station

(1) Expansion of television studio facilities

Succeeding to the two television studios presently under construction at Jakarta, video and audio control equipment, studio lighting facilities and other peripheral equipment should be installed as soon as possible in two other television studios which has been provided in the new studio building.

(2) Installation of television programme continuity equipment  
 Programme continuity equipment for the TVN-I programmes and the TVN-II Programmes will be installed in the newly constructed studio building.

(3) Installation of the news centre  
 A news centre will be provided in the Jakarta broadcasting station to deal with increased news sending operation along with the extension of broadcasting time and additional transmission of TVN-I programmes for different local time zone and for improving efficiency in news gathering activities.

3-2-2 Reinforcement Plan of Studio Equipment in Regional TV Stations

(1) Modification of existing studios  
 At present, there are 8 stations which have regional television programme production equipment. However, most of the stations except for 2 stations are equipped with black-and-white studio equipment. Thus colour equipment will be installed in accordance with Table 2-3-7.

(2) Additional television studio facilities  
 Additional production studios will be provided in some of the regional TV stations as shown in Table 2-3-8, to raise programme production capability of regional television stations which will serve to improve their programme quality and at the same time, to allow them to participate in nationwide programme production.

3-2-3 Distribution Plan of Other Production Equipment

The following equipment will be additionally provided to deal with increased in the TVN-I programmes and starting of the TVN-II service and at the same time, to meet with the demand in programme production scheduling.

- (1) One inch VTR for colour TV programme recording and playback..... 20 sets (6+14)
- (2) ENG System including 1/2" VTR System ..... 40 " (16+24)
- (3) 3/4" or 1/2" video tape electronic editing system ..... 28 " (12+16)

- (4) One inch video tape copying system  
(combination of one inch master VTR  
and five 3/4" or 1/2" slave machines) ..... 2 sets for Jakarta
- (5) Colour film processor..... 2 set for regional
- (6) Colour telecine chain ..... 5 " ( 2 + 3)
- (7) TV OB van ..... 7 " ( 3 + 4)

Points of distribution of each equipment are given in Table 2-3-8.

#### 3-2-4 Distribution of MPU

This will be distributed to 9 stations, aside from those which already have them, for production of programmes introducing ethnic performance by utilizing local programme resources at regional stations which have television programme production studios.

Points of distribution fiscal year are given in Table 2-3-9.



Improvement Plan of Existing Studio Table 2-3-1

PROJECT	AREA	STATION	84/85	85/86	86/87	87/88	88/89	TOTAL	
1. RENEWAL OF OLD STUDIO EQUIPMENT	NUSANTARA-I	JAKARTA	2	2	1	-	-	5	5
		MEDAN	2	1	-	-	-	3	3
2. IMPROVEMENT OF ACOUSTIC CHARACTERISTICS OF EXISTING STUDIO	NUSANTARA-I	REGIONAL-I	2	3	3	4	4	16	23
		REGIONAL-II	2	1	1	-	-	4	4
NUSANTARA-II	NUSANTARA-II	YOGYAKARTA	2	1	-	-	-	3	3
		REGIONAL-I	2	2	3	3	2	12	31
		REGIONAL-II	3	3	4	3	3	16	16
NUSANTARA-III	NUSANTARA-III	BANJARMASIN	2	-	-	-	-	2	8
		REGIONAL-I	1	3	2	-	-	6	6
NUSANTARA-IV	NUSANTARA-IV	UJUNG PANDANG	-	1	-	1	-	2	2
		REGIONAL-I	2	2	2	2	2	10	14
		REGIONAL-II	1	-	1	-	-	2	2
NUSANTARA-V	NUSANTARA-V	JAYAPURA	1	1	-	-	-	2	2
		REGIONAL-I	2	1	1	2	2	8	18
		REGIONAL-II	-	2	2	2	2	8	8
		SUB-TOTAL	24	23	20	17	15	99	99

Table 2-3-2

New Studio for FM Stereophonic Broadcasting Service

(RN-III Programme Service)

STATION	SIZE	84/85	85/86	86/87	87/88	88/89	TOTAL
JAKARTA	MEDIUM	-	-	1	-	-	1
	SMALL	2	1	-	-	-	3
MEDAN	"	1	1	-	1*	-	3
YOGYAKARTA	"	1	1	-	-	1*	3
BANJARMASIN	"	1	-	1	-	-	2
UJUNG PANDANG	"	1	-	1	-	-	2
JAYAPURA	"	1	-	-	1	-	2
Regional-I	"	8	12	12	10	10	52
Regional-II	"	-	-	-	7	10	17
TOTAL		15	15	15	19	21	85

\* Medium size studio

Table 2-3-3

Construction Plan of Programme Transmission Control Facilities

PLAN	FISCAL YEAR						TOTAL
	84/85	85/86	86/87	87/88	88/89		
IMPROVEMENT OF PROGRAMME TRANSMISSION FACILITIES IN JAKARTA	3	2	1	1	1	8	
	-	←	→	-	AUTOMATION	1	
CONSTRUCTION OF CONTINUITY STUDIO FOR TRANSMISSION OF RN-I & RN-II PROGRAMME IN NUSANTARA STATION			2			2	
			2			2	
	2					2	
		2				2	

Table 2-3-4

Distribution Plan of Cassette Tape Recorder.

(RN-I &amp; II Time Difference Service)

STATION	FISCAL YEAR					TOTAL SET
	84/85	85/86	86/87	87/88	88/89	
Nusantara-III	-	-	8	8	4	20
" -IV	-	-	20	20	10	50
" -V	-	-	18	15	11	44
Sub-Total	0	0	46	43	25	114

Table 2-3-5

Construction and Improvement of  
Radio Studio Equipment

	84/85	85/86	86/87	87/88	88/89	Total
Monaural Studio (Jakarta)	2	2	2			6
Stereophonic Studio	15	15	15	19	21	85
Continuity Studio (Jakarta & Nusantara)	5	6	5	1	1	18
Programme Switching Board (Jakarta)		↔			Automatic Control	1
News Centre (Jakarta) Studio	1	1				2
Peripheral Equipment		↔				1
Tape Duplicator (Jakarta)						
Stereophonic		1	1			2
Monaural		1	1			2

Table 2-3-6

Distribution Plan of Radio OB VAN

AREA	FISCAL YEAR						TOTAL
	84/85	85/86	86/87	87/88	88/89		
JAKARTA	1 Set	—	1 Set	—	—	2 Sets	
1 MEDAN	2 Sets	2 Sets	2 Sets	3 Sets	1 Set	10 Sets	
2 YOGYAKARTA	2 Sets	2 Sets	4 Sets	3 Sets	1 Set	12 Sets	
3 BANJARMASIN	1 Set	2 Sets	1 Set	—	—	4 Sets	
4 UJUNG PANDANG	2 Sets	2 Sets	1 Set	1 Set	1 Set	7 Sets	
5 JAYAPURA	2 Sets	2 Sets	1 Set	1 Set	1 Set	7 Sets	
TOTAL	10 Sets	10 Sets	10 Sets	8 Sets	4 Sets	42 Sets	

N U S A N T A R A

Equipment List for TV Studio

	DESCRIPTION	NEW STUDIO	COLOURIZATION STUDIO
1	COLOUR CAMERA CHAIN	3 Sets	3 Sets
2	VIDEO PRODUCTION EQUIPMENT	1 Set	1 Set
3	AUDIO PRODUCTION EQUIPMENT	1	-
4	MONITORING EQUIPMENT	1	- *
5	LIGHTING EQUIPMENT	1	1 - 1/2*
6	STUDIO INTERCOM	1	-
7	COLOUR FLYING SPOT SCANNER	1	1
8	COLOUR EFFECT GENERATOR	1	1
9	STUDIO BUILDING	1	-
10	STUDIO REMODELLING	-	1

\* Depend on the condition of existing studio

Table 2-3-8

Distribution Plan of TV Programme Production Equipment

Station	OB Van	1" VTR	ENG System	VTR Editing System	Video Tape Duplicator	Colour Telecine Chain	Colour Film Processor
Jakarta	3	6	16	12	2	2	-
Medan	-	-	3	2	-	-	-
Palembang	1	2	3	2	-	-	-
Yogyakarta	1	2	3	2	-	1	-
Surabaya	-	2	3	2	-	-	-
Denpasar	1	2	3	2	-	-	-
Balikpapan	1	2	3	2	-	1	1
Ujung Pandang	-	2	3	2	-	-	-
Manado	-	2	3	2	-	1	1
Total	7	20	40	28	2	5	2



Table 2-3-9

Distribution Plan of Mobile Production Unit (MPU)

TV STATION	FIACAL YEAR				
	84/85	85/86	86/87	87/88	88/89
1. PEKANBARU				○	
2. JAMBI			○		
3. BENGKULU			○		
4. TANJUNG KARANG		○			
5. MATARAM			○		
6. , DILLI		○			
7. PALANGKARAYA		○			
8. PALU				○	
9. KENDARI				○	
TOTAL		3	3	3	

