

CHAPTER 6 TRANSMITTING FACILITY PLAN

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All of the radio and TV transmitting facilities are required to maintain their regular transmitting power always stable from the beginning to the end of the broadcasting service without interruption of signal. For this purpose, the transmitter which is a core of the transmitting facilities should be designed and produced as to have especially high reliability, and the constitution of whole system is arranged so as that the original function of which always can be restored with minimum stoppage hours of wave, if trouble occurs at the transmitter.

At the 5th and 6th 5-year plan many of newly constructed transmitting facilities will be different from those of trunk station, they will be established at the location with such conditions shown as follows:

- a. Target area of the broadcasting service is local small cities where the infrastructure will not be sufficiently progressed.
- b. Since the target service areas are relatively small, needed transmitting power is generally small.
- c. Inferiority of the situation of electric power supply including capacity of electric power supply, supplying hour of electric power, frequency of electric power suspension and change of voltage, etc.
- d. Since transportation facilities from capital city Jakarta and provincial capital are poor, human and material exchanges are not always performed smoothly.
- e. Utilization of communication line is limited often.

Installation of the transmitting facilities which is to be propelled during the long-term plan period should be conducted by considering about above-mentioned circumstances and with the points of view shown below.

- a. Since transmitting power is generally low, fully solidified equipment will be used as well as possible.
- b. Adoption of unmanned operation system will be actively made so as to make possible to continue broadcasting service without standing station of maintenance and operation staff.
- c. The power supply system which is able to avoid the interruption of the broadcasting service by use of unstable city power source.
- d. It will be performed to lower the happening of trouble at broadcasting facilities -- for example, selection of equipment with high reliability, adoption of a system having high self-restoring ability, countermeasure for power breakdown, countermeasure for the damage caused by thunder and arrangement of structure for operation, superintendence and maintenance system, etc.
- e. The preservation countermeasure for the unmanned operation station will be carried out enough.

6-1 Installation plan of radio transmitting facilities

6-1-1 Installation plan of medium wave transmitting facilities

As for the medium wave transmitting facilities among the radio transmitting facilities, the installation will be progressed considering following points.

- a. Rapid establishment of 24-hour broadcasting system of RN-I broadcasting service.
- b. Systematic replacement of superannuated equipment among the existing transmitting facilities for RN-I broadcasting.
- c. Newly installed of transmitting facilities for RN-II broadcasting service will be comprehensively arranged considering the relationship to those for RN-I.

d. As for additional installation of power source equipment, STL facilities and transmitting antenna system, etc., for RN-II transmitting facilities a system will be constituted effectively assuming that facilities for RN-I and RN-II broadcasting will be accommodated in the same station building.

e. At newly constructed station the construction will be advanced by the design which will be satisfy the above-mentioned various conditions from the beginning.

(1) Transmitting facilities for RN-I broadcasting

a. Arrangement of transmitting facilities at existing station

Since superannuated facilities among RN-I broadcast transmitting facilities are actually used now, first of all, in this long-term plan the replacement work of those facilities will be propelled. The replacement plan of superannuated equipment of existing facilities is shown in Table 6-1.

To keep stable 24 hours continuous service, standby transmitter will be installed at 26 existing stations where standby transmitting facility have not been provided. This construction work will be completed before 1990 as shown in Table 6-2.

b. Construction of transmitting facilities at newly built station

At newly constructed station, the design of the system will be made so as to be able to conduct 24-hour broadcasting service from the beginning. Power supply equipment, STL equipment or SRO earth station equipment also will be arranged considering to be able to maintain high reliability.

Besides, various equipment in the transmitting station will be comprehensively designed supposing simultaneous operation of RN-I and RN-II service, even RN-II service is conducted later than that of RN-I.

(2) Transmitting facilities for RN-II broadcasting

The plan was made as that at the early stage of the long-term plan, transmitting frequency and power which are presently registered by IFRB will be tentatively allocated for the RN-II

broadcasting of Nusantara station and the construction will be carried out according to that scale. And by the plan of later stage, real construction will be propelled on the basis of the frequency allocation plan which are to be newly registered by IFRB by the re-application, and the system will be arranged to all of existing 49 RRI stations will be able to broadcast both of RN-I and RN-II broadcasting programmes by 2000.

6-1-2 Improvement plan of short wave transmitting facilities

- (1) Many superannuated short wave transmitting facilities are actually used now. Of these, 23 transmitters will be replaced by the 4th 5-year plan. Furthermore, 30 and 12 each of superannuated transmitters will be renewed respectively during the 5th and 6th 5-year plan period.

In Jawa and Sumatera area, where the degree of dependency on the short wave broadcasting service will be decreasing gradually in accordance with the new establishment of mediumwave transmitting facilities, it is considered that gradual abolishment of the shortwave transmitting facilities along with the progress of superannuation of shortwave transmitters and reducing the role of radio broadcasting service by use of shortwave transmitting facilities step by step basis will be reasonable countermeasure.

On the one hand, in the area where the population density is thin and shortwave broadcasting service is judged as more effective means for disseminating programmes, it is necessary to replace superannuated transmitter with new one and accordingly total of 65 shortwave transmitters will be renewed during the long term plan period as shown in Table 6-3. As the result of this effort, shortwave transmitting facilities will be furnished at Jakarta National station, Nusantara stations and other local stations which have to cover the vast area by use of limited number of transmitters and after all total number of shortwave transmitter will be reduced down to 70 transmitters. However, the total power output will be increased about 100 kW and its total sum will reach up to 1,784 kW.

(2) Short wave transmitting antenna system.

At present, half-wavelength dipole antennas are widely used as short wave antenna at the regional short wave station. However, in order to make signal diffuse efficiently within a limited range of service area with radius of 300 - 500 km, it is important to arrange the antenna system having the radiation directivity such that radiated wave from certain station is densely diffusing in the service area but is rapidly weakened outside of the service area considering the relationship of position between the location of station and the service area concerned.

By making so, effective supplementary service will be able to be made by short wave broadcasting to the region where the service by medium wave is impossible.

(3) The standards of short wave transmitter

According to the result of discussion in the first session of World Administrative Conference of the High Frequency Broadcasting Service (WARC-HFBC) held in Geneva in early 1984 for the short wave Broadcasting frequency plan, since the sound quality of shortwave broadcasting service will not be improved even if sound frequency band expand wider than the necessary bandwidth in the case of double sideband system, it was confirmed that upper limit of sound frequency band should be kept less than 4.5 kHz.

And at the same time, it was defined that the lower part of sound frequency band should be attenuated at the rate of 6 dB per octave from the point of 150 Hz. Accordingly, the necessary signal bandwidth of shortwave transmitter should be limited within 9 kHz bandwidth.

Moreover, though channel separation of short wave broadcasting service is 10 kHz, the adoption of interleaving system which sets the station by the separation of 5 kHz was approved at the location where no fear of overlapping of the receiving region is kept by viewpoint of the effective utilization of frequency.

The necessity of introduction of SSB (single sideband) system was recognized for the effective utilization of frequency spectrum and the standard specification of SSB system was constituted as shown in ANNEX-IV-3-4, but at the same time it was confirmed that about 20 years of time should be set as the transient time period until the diffusion of SSB receiving set utilizing synchronizing detecting system which is possible to select either sideband and that the gradual introduction of SSB shortwave broadcasting service will be appropriate. Accordingly, it is forecast that replaced or newly established short wave transmitting facilities after the end of 6th 5-year plan should be possible to transmit SSB signal.

6-1-3 Installation plan of FM transmitting facilities

At the 4th 5-year plan, firstly at 39 stations except for Jakarta the installation of FM transmitting facilities ranged from 5 kW to 0.1 kW will be made, also at the 5th and 6th 5-year plan, successively installation of FM transmitting facilities will be made at the rate of 7 - 9 stations per year and 120 FM stations will be completed during the long term plan period.

FM transmitting facilities will be intentionally installed at appropriate places within the service area of medium-wave stations which are scheduled to progress their construction in the long-term plan period, but in these cases, when the installation of the FM transmitting facilities is possible within the site of TV relay stations, and when it is able to forecast to gain the curtailment of building cost and operational convenience by common use of facilities, the FM transmitting facilities will be installed by the common use with TV transmission facilities.

It was decided as final target to make RN-III FM broadcasting service to be able to be received at every region same as RN-I and RN-II broadcasting services, however it will be needed to control the pace of construction taking care that covering nationally by medium and short wave broadcasting for RN-I service should be achieved by the first priority order and diffusing condition of FM set, etc.

Concerning to effective radiation power of FM transmitting facilities established at FM station is as a rule selected as to make service area of that FM stations almost equal at least to those of existing TV station or medium-wave station, but according to the location condition, it is considered to adjust the power properly is unavoidable as a transitional measure.

The power of transmitter itself should be selected properly among 10, 5, 3, 1, 0.5, 0.3, 0.1 kW considering operational and maintenance convenience, and it will be made to be able to get necessary practical radiation power by assorting with gain of the transmitting antenna.

6-2 Installation plan of TV transmitting facilities

As for TV transmitting facility installation will be advanced considering the following points.

- a. Superannuated facilities among existing transmitting facilities for TVN-I broadcasting will be intentionally replaced.
- b. Concerning to newly constructed transmitting facilities for TVN-II broadcasting service will be comprehensively installed considering the relationship to transmitting facilities for TVN-I.
- c. Additional construction of power facilities, STL equipment transmitting antenna etc., for TVN-II transmitting facilities will be constituted effectively assuming that facilities for TVN-I, and RN-III broadcasting are set within same station building.
- d. At the newly established station construction will be progressed according to a design which satisfies above-mentioned conditions.

6-2-1 Transmitting facilities for TVN-I broadcasting

(1) Improvement of transmitting facilities at existing station

Since some of the transmitting facilities which are in actual use are already superannuated, in this plan period, these superannuated facilities will be replaced as shown in Table 6-4. And at the trunk station, which has no standby equipment or output power of standby equipment of which is low, standby equipment with same output power will be set as shown in Table 6-5. Moreover, Banda Aceh, Tj. Karang, Gn. Priksa, Gn. Gubug etc., which at present are using VHF Band-I will be changed to VHF Band III or UHF Band IV or V.

(2) Construction of transmitting facilities at newly established transmitting station

Since all of the transmitting stations which are to be established newly are low powered transmitting facilities, they will be operated by unmanned system. For that reason, as for the equipment, one which has sufficient reliability will be chosen, and especially as for the power source, a site will be selected so as to be able to get city power source as well as possible and if it is impossible to obtain that, power source with high stability like solar battery will be used.

And the comprehensive design will be made so as that transmitting facilities for TVN-II broadcasting will be able to be set easily later.

6-2-2 Transmitting facilities for TVN-II broadcasting

As for the transmitting facilities for TVN-II broadcasting, first of all they will be installed at Ujung Pandang and its suburbs and Medan in the 4th 5-year plan and continuously, in the 5th and 6th plan period, the construction will be gradually propelled at Surabaya, Yogyakarta, Palembang, Denpasar, Balikpapan and Manado which were scheduled already and also provincial capital and besides main cities, thus 110 stations in total will be completed in the long term plan period.

6-3 Introduction of new technologies for the transmitting facilities

6-3-1 Introduction of solidifying technique for the transmitter

Operatable frequency and power of electric signal for solid-state elements are become much higher and integration density, processing speed and processing activity are also rapidly proceeded by the progress of developing technique for semiconductor elements.

By introducing these technologies, it is expected to improve the reliability of transmitting facility, and to save the operation and maintenance work for transmitting stations, therefore, it is desirable to adopted these technologies as wide as possible for the construction of transmitting facilities in the long-term plan period.

Especially, according to disperse the vacuum tube by adopting solid-state element for the power amplifier, it is possible to realize unmanned operation of transmitting station.

Already, fully solidified power amplifier unit used for medium wave transmitter is developed up to 3 kW, by using this and 25 kW medium wave transmitter by using 9 units of 3 kW in parallel is manufactured for actual use. Moreover, 50 kW medium wave transmitter is also developed. Moreover, several number of 50 kW medium wave transmitting stations in which two 25 kW transmitters are operated in parallel have been established in Japan and other Asian area.

Similarly, solid-state TV transmitter up to 25 kW output in VHF band, 10 kW output in UHF band and FM transmitter up to 25 kW are already manufactured for actual use. The reliability and economical efficiency of solid-state transmitters are enough proved. Therefore, in principle, fully solidified equipment will be adopted for renewal of superannuated transmitter and newly installed transmitter in the long-term plan.

6-3-2 Introduction of unmanned operation system

Unmanned operation will be adopted for low power output transmitting stations which can be received stable city power source or can be operated by battery.

Unmanned operation will be positively adopted for transmitting station which can be received stable city power source or can be operated by battery as its power output is low, on and after the 5th 5-year plan.

Incidentally, the engine generators are used for power source of transmitter, but since unmanned operation for the engine generator is very difficult, manned operation system is adopted for all of the transmitting stations.

However, if manned operation system is continued, staff will be increased in proportion to the increase of the number of newly installed transmitting stations, and the results, it is afraid that smooth progress of the site plan will be obstructed by the difficulty of staff supplement.

In Indonesia, unmanned operation for transmitting station is hardly distrusted, however, it is recommended to adopt the unmanned operation system with a firm belief by referring to the actual results of the unmanned operation in Japan.

6-3-3 Synchronizing operation system and double feed system of an antenna in medium wave transmitting station

To solve the matters of frequency allocation for newly established medium wave transmitting station, synchronizing operation system which has widely been applied in Japan and other countries. This system is very convenience method to utilize limited number of frequency effectively.

In case new RN-II transmitting facility will be installed in the existing RN-I transmitting station, it is recommended that transmitting antenna is used commonly for RN-I and RN-II by adoption of double feed system which has been utilized in many countries. If exclusive antennas are installed for each of transmitters, space between two antennas should be more than twice of wavelength to avoid mutual interference of radiation pattern of transmitting antenna, accordingly, it is necessary to require the land and to construct the building and the results, the construction cost will be increased, and besides, the process of construction plan will be delayed.

6-4 Problems to be studied on the DBS plan

6-4-1 DBS System and Terrestrial System

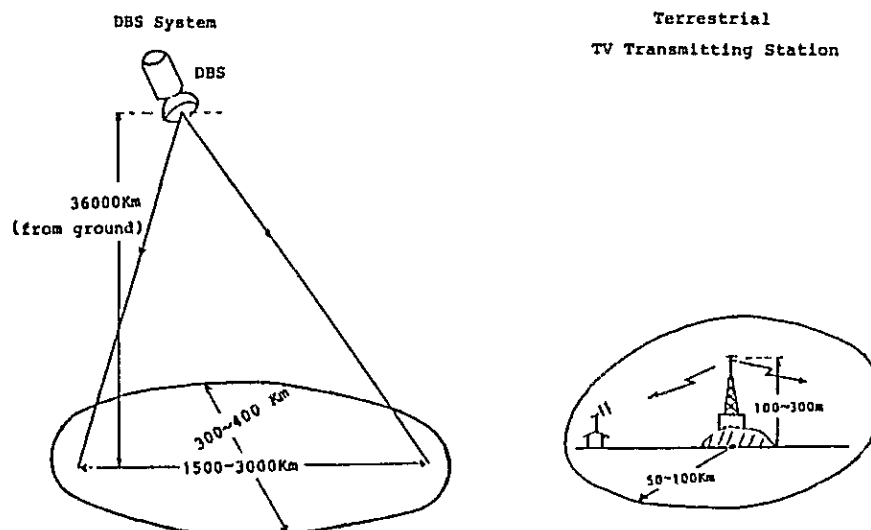
DBS is the abbreviation of "Direct Broadcast by Satellite" and it is one of the communication satellite system which is specially designed to send powerful TV broadcasting signal from the stationary orbit satellite to be received directly by the simple home DBS receivers.

On the contrary, conventional terrestrial TV broadcasting system is the system which is designed to send TV broadcasting signal from the terrestrial TV transmitting facility to be directly received by conventional TV receiver.

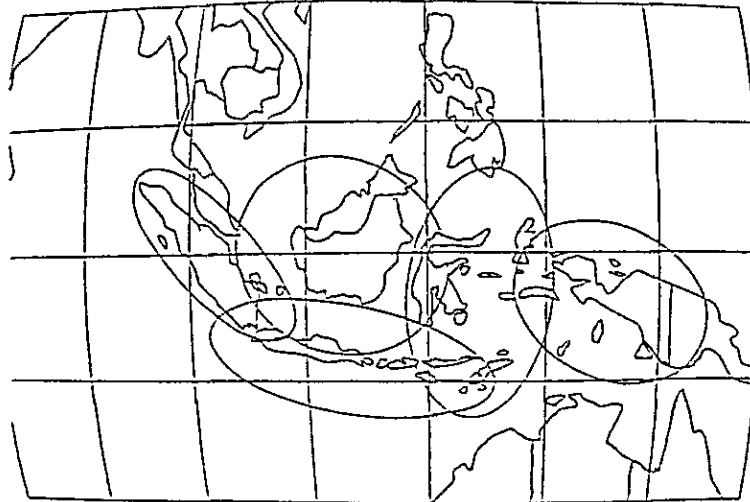
There are the point of common as well as the point of difference between the above two TV broadcasting systems. The main points can be listed up as follows:

- (1) Both system transmits video and audio signals by the aid of electro-magnetic wave to be reproduced it by the home receiving set. However, the height of TV transmitting antenna is usually up to several hundred metres above ground surface, and accordingly the practical service area will be limited up to 100 km radius or so in the case of terrestrial TV broadcasting system. On the contrary, the transmitting antenna are attached on the stationary orbit satellite, that location is about 36,000 km above the surface of earth, and accordingly one radiation beam of TV signal can cover the whole area of sumatera island or Jawa island and Nusatenggara all at once in the case of DBS System. The concept of DBS System and Terrestrial TV System are shown in the following illustration.

TYPICAL COVERAGE AREA OF DBS & TERRESTRIAL TV-TX



Therefore, four or five beams of TV broadcasting signal radiated from the stationary orbit satellite can cover the whole territory of Indonesia as shown in the following map.



All territory of Indonesia can be covered by 5 beams of DBS
(3 beams from DBS stationed over 80° E, 2 beams from DBS stationed over 104° E)

- (2) The frequency bands allotted to the terrestrial TV broadcasting system are Band-I (48-68MHz), Band-III (175-230MHz), Band-IV(470-608MHz) and Band-V (615-856MHz). IN contrast to the above, the very high frequency band such as 11.7-12.2 GHz are allotted to DBS system.

The necessary bandwidth for the terrestrial TV broadcasting system (PAL-B system, which is used in Indonesia) is only 7 MHz per one TV channel. In contrast to this, 27 MHz bandwidth will be necessary for the DBS system. Accordingly, it will be necessary to provide additional devices such as small parabolic antenna, low noise amplifier, down converter and FM/AM converter and so on to watch TV programmes of DBS by use of conventional TV receiving set.

- (3) As mentioned above, one radiation beam from DBS can cover the large area ranging over one million square km and every home within the service area can enjoy TV broadcasting service from DBS if each home provides with DBS receiving device. This is the remarkable feature of DBS and accordingly this system will be the most suitable approach to disseminate TV broadcasting signals within the short time period over the widely spread area like Indonesia, which is ranging 5,100 km from

east to west and 1,900 km from north to south and having 13,677 islands beside five main islands. However, how to popularize the DBS receiving device in a short period will be the serious problem for utilizing DBS system efficiently and otherwise this DBS signals will not be utilized effectively.

Furthermore, if the same programmes are broadcast from DBS and terrestrial TV system, the programme service from DBS will not be effectively utilized in the area of Jawa or Sumatera where terrestrial TV broadcasting service has been fairly popularized. Therefore, it will be better to start first DBS service over the less developed area of terrestrial TV broadcasting service such as Irian Jaya, Maluku, Kalimantan Region.

6-4-2 Comparison between DBS and Palapa Domestic Satellite

- (1) Though, both satellite system looks like quite different system, both satellite is equally stationary orbit satellite and transponder loaded on the satellite equally receive the up link signal sent from the earth station and retransmit it back to the earth.

If dare to pick up the differences between the two systems will be as follows:

	DBS (WARC)	PALAPA-B
Frequency Band up-link	14 GHz	6 GHz
down-link	12 GHz	4 GHz
Transponder		
Transmission Bandwidth	27 MHz	36 MHz
Transponder Power Output	400 Watt	10 Watt
EIRP at beam center	63-64 dBW	36 dBW
Number of Transponder	2-3	24
Location	80°E. 104°E	108°E
Receiving Antenna (diameter)	0.9meter (for personal use) 1.8meter (for community reception)	5 meter or more

- (2) It is discussed here on what points are different between the two systems in the process of conveying of TV programmes from TV station to the viewers.

At present, TVN-I programmes are relayed by Palapa-B satellite to all local TV stations from Jakarta central TV station and 115 stations out of 190 TV transmitting stations put on air by utilizing Palapa relay system through Perumtel earth station or TVRO except for 75 off-air relay stations.

The necessary size of receiving antenna for TVRO (receive only earth station) is around 5 meters.

On the contrary, the receiving antenna used in the device for direct reception of DBS signals is around 0.9 meters and the transmitting power of DBS is designed so as to secure the practical picture quality at home DBS receiver in any propagational conditions.

At the present stage of development of DBS system, it is not so easy to materialize such high power out put and then quasi-direct satellite broadcast system such as community reception system is also proposed. In the case of community reception, more larger size of receiving antenna such as 1.8 metres are usually used. Therefore, power out put of DBS system can be reduced about 8 dB that is the difference between the G/T of 0.9 metre and 1.8 metre antenna.

Though the frequency used for down-link from DBS or Palapa satellite are not same, from the viewpoint of comparison between the receiving devices for both system, the size of receiving antenna are list up and compared as follows:

DBS - Direct reception: 0.9 metre
 Community reception : 1.8 metre
Palapa - for receive only earth station : about 5 metre

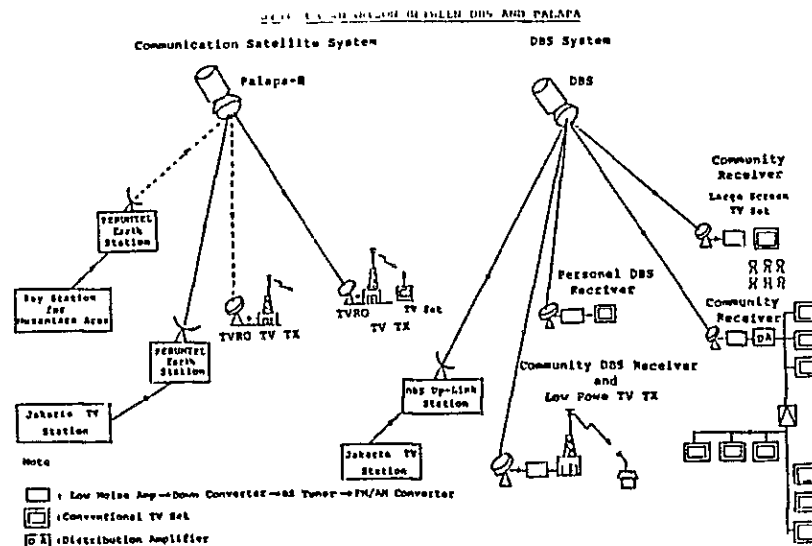
As it is clear from the above comparison, the basic difference between the two systems will be the difference of power output of down-link signal. For example, EIRP of DBS is about 2 MW in contrast with only about 4 kW in the case of Palapa system.

(3) In the DBS system, though antenna size is designed as about 0.9 meter to reduce the cost of home receiver as much as possible in consideration of the fast popularization of DBS receiving device, it will not be easy to realize the fast development of DBS system because of the inherent high price of DBS home receiver compared with that of conventional TV receiver.

To improve this weak point, community reception system has been discussed in place of actual direct receiving system.

In this community reception system, though receiving device is more expensive than home receiver it is shared by many homes and received signal are distributed to each subscribers through coaxial cable or commonly receive at community hall or some other public place. However, if subscribers home are scattered in wide area construction cost of cable distribution system will not be negligible and in some case the use of low power TV transmitter will be better and less expensive than cable distribution system.

(4) This last system, that is received DBS signal by use of community receiving device is distributed by low power TV transmitter, is very similar to the system now widely used in this country, that is received programme which is sent from Jakarta central station through Palapa relay network is retransmitted by local TVRI low power TV transmitting stations, as shown in the following illustration.



In the case of Palapa-B satellite, 24 transponders are loaded on the space segment and it will be possible to sent three kind of programmes such as TVN-I, TVN-II and Regional Programmes at the same time if necessary in contrast to the DBS system which can handle rather limited number of programmes.

- (5) From those discussion, it can be said that the more detailed case study will be needed on the both systems that is how to develop the system utilizing Palapa relay network or the practical launching plan of DBS.
- (6) In case of DBS system, it is possible to broadcast more advanced TV signal such as high definition TV which needs very wide frequency bandwidth and it is difficult to realize this by use of conventional TV transmitting system and therefore further study on the DBS system will also be needed in view of the future materialization of such kind of advanced TV broadcasting service.

6-4-3 The effective utilization of existing terrestrial TV transmitting facilities when DBS system is developed during the long term plan period.

It will be a serious problem to be studied that how to effectively utilize the existing terrestrial TV broadcasting facilities to which large amount of investment has been spending, if DBS system is realized during the long term plan period.

Assuming that the construction of terrestrial TV transmitting station should be proceeded along with the long term plan until the plan of launching of DBS is finally decided, the number of TV transmitting station will be increased up to 254 in 1990, 341 stations in 1996 and 450 stations in 1999 if superannuated transmitter are replaced and keep the total number of TV station of 190 in 1984.

Now, if DBS is launched to expand the TV service area to all over the country all at once and broadcast the same programmes as the terrestrial TV broadcasting network, both broadcasting service will be completely overlapped.

This new DBS service will be usefully utilized in the area where has not been covered by the signals from the terrestrial TV stations in contrast with the inefficient use of DBS broadcasting signal in the area where TV broadcasting service has already been popularized owing to the past development effort of the construction of terrestrial TV transmitting facilities.

This kind of dilemma can not be avoided during the course of development of TV broadcasting service.

On the contrary, it will be needed to continue the terrestrial TV broadcasting service for 5-10 years as a transient period even after the start of DBS broadcasting service in consideration of the necessary time period for popularizing DBS home receiving set in the less developed area of TV broadcasting service such as Irian Jaya as well as in other area where the TV broadcasting service is already spread out.

After such transient period, existing terrestrial TV transmitting network can be converted to the use for the additional service as regional programme service, local programme service together with the national service from DBS system for all over the country, Regional service and local service from terrestrial TV network to respective region or each local area by use of both systems effectively and efficiently.

6-4-4 How to expand the TV broadcasting service in case of development of DBS is not progressed during the long term plan period.

If DBS system is not materialized during the long term plan period, low power terrestrial TV transmitting station composed of TVRO and solar battery operated TV transmitter should be continuously constructed according to the long term plan and programmes are distributed by the aid of Palapa relay network together with the improvement of existing terrestrial TV transmitting station such as increase of power output and antenna gain or rearrangement of antenna radiation pattern.

If continue this method, total number of TV transmitting station will be reached more than several thousands and therefore it will be necessary to develop standardization of transmitting equipment and unmanned operation system for all TV station regardless of its power ranking in view of the future operation and maintenance system.

For example, even in Japan, which land area is about 1/5 of that of Indonesia, about 3,500 TV transmitting stations have been operating to cover the 99.9% area of the country with good TV broadcasting signal for each programme system and all of the stations are operating in the unmanned operation mode.

Renewal Plan of the Transmitter (RN-I) Table 6-1 (2)

Name of Station	Present Situation (1988)		5th 5-year plan period					6th 5-year plan period					Result (1989)		Remarks	
	Freq. Kil.	Output (Kil.)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Proj. (Kil.)	Diff. (Kil.)		
Cirebon	046	10.0											046 (Kil.)	10.0	07	Standby
Purwokerto	756	10.0											756	10.0	08	Standby
Halang	091	10.0											091	10.0	09	Standby
Inditum	1000	10.0											1000	10.0	09	Standby
Jember	963	10.0											963	10.0	09	Standby
Sumenep	1098	10.0											1098	10.0	07	Standby
Singaraja	1000	10.0											1000	10.0	09	Standby
Musanegara III																
Danjeneasin	1134	50.0											1134	50.0	06	
Palangkaraya	1197	5.0	X										1197	5.0	07	
Pontianak	1233	50.0											1233	50.0	09	
Samarinda	900	10.0											900	25.0	05	Standby
Musanegara IV																
Ujung Pandang	630	100.0											630	100.0	05	
Manado	1305	1.0											1305	10.0	01	
Palu	1125	1.0											1125	10.0	09	Standby
Kendari	954	10.0											954	10.0	05	Standby
DILI	711	2.0											711	2.0	05	
Kupatani	1107	5.0											1107	5.0	05	
Gorontalo													1503	5.0	00	

Table 6-2

Installation of MW Standby Transmitter

Nusantara	Station	84/85	85/86	86/87	87/88	88/89
I	B.Aceh			10 kW		
	Padang				10 kW	
	Jambi		10 kW			
	Benkulu		5 kW			
	Tj.Pinang	10 kW				
	Tj.Karang		5 kW			
II	Yogyakarta	50 kW				
	Bandung				10 kW	
	Cirebon			10 kW		
	Malang					10 kW
	Surakarta		10 kW			
	Purwokerto				10 kW	
	Jember					10 kW
	Sumenep				10 kW	
	Denpaeer	10 kW				
	Singaraja				1 kW	
Mataram					10 kW	
III	Pontianak	25 kW				
	Samarinda		25 kW			
IV	Manado			10 kW		
	Kendari					10 kW
	Palu		10 kW			
V	Jayapura	10 kW				
	Biak			10 kW		
	Merauke					10 kW
	Ambon		10 kW			
Number of Transmitter	1 kW	-	-	-	-	-
	5 kW	-	2	-	1	-
	10 kW	3	4	4	4	5
	25 kW	1	1	-	-	-
	50 kW	1	-	-	-	-
Total		5	7	4	5	5

Total : 26

Table 6-3 (1)

Renewal and Improvement Plan of the SW Transmitter

	Name of Station	Present Situation (1984)		4th 5-year plan period					5th 5-year plan period					6th 5-year plan period					Result (1999)		
		Freq. MHz	Output(KW)	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	Freq. MHz	Output(KW)	Install.
1	<u>RUSAITTARA I</u> Medan	3.375	7.5			○			⊙									4.765	50.0	1987	
		4.765	50.0							○								3.375	10.0	1990	
2	Padang	3.96	10.0							x			x					—	—		
		3.365	1.0							x								—	—		
		6.19	10.0															—	—		
3	Bukittinggi	3.305	0.3							x			x					—	—		
		4.91	1.0												x			—	—		
		3.232	10.0															—	—		
4	Sibolga	3.241	1.0								x							—	—		
		5.26	5.0													x		—	—		
5	Band Aceh	2.4	0.075									x						—	—		
		4.985	1.0								x							—	—		
		4.985	10.0								x							—	—		
		3.908	50.0															—	—		
6	Palembang	4.855	10.0									x						2.435	50.0	1989	
7	Jambi	3.355	1.0										x					4.927	10.0	1988	
8	Pekanbaru	5.885	1.0															5.085	10.0	1987	
9	Tj Pinang	2.36	0.3															—	—		
		4.98	1.0													x		—	—		
		3.225	10.0															—	—		
10	Tj Karang	2.835	1.0															—	—		
		3.945	2.5															—	—		
		3.395	10.0															—	—		

x : Discard ⊙ : Renew (Power Increase) ○ : Renew ⊗ : Newly Install

Table 6-3 (2)

Renewal and Improvement Plan of the SW Transmitter

	Name of Station	Present Situation (1984)		4th 5-year plan period					5th 5-year plan period					6th 5-year plan period					Result (1999)		
		Freq. MHz	Output (KW)	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	Freq. MHz	Output (KW)	Install.
11	Bengkulu	3.947 3.265	1.0 10.0																		
	<u>Musantara II</u>																				
1	Yogyakarta	5.047 2.35 7.10	20.0 1.0 7.5																		
2	Bandung	4.945 3.205 2.752 2.42	3.0 10.0 2.5 1.0																		
3	Surakarta	4.90 2.44 4.932	0.5 1.0 10.0																		
4	Semarang	2.49 3.935 3.935 2.490	0.2 5.0 10.0 1.0																		
5	Surabaya	3.975 3.975 2.370 2.370	2.0 10.0 1.0 0.2																		
6	Denpasar	3.945 2.42	10.0 0.1																		
7	Mataram	2.492	0.25																		
8	Bogor	3.945	1.0																		

x : Discard ⊗ : Renew (Power Increase) ○ : Renew ⊙ : Newly Install

Renewal and Improvement Plan of the SW Transmitter

Table 6-3 (3)

	Name of Station	Present Situation (1984)		4th 5-year plan period					5th 5-year plan period					6th 5-year plan period					Result (1999)	
		Freq. MHz	Output(kW)	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	Freq. MHz	Output(kW)
9	Cirebon	2.390	1.0				○											2.39	10.0	1988
10	Purwokerto	2.230	1.0										x							
11	Malang	3.400	1.0																	
		3.305	1.0									x								
12	Madium	3.450	0.5																	
		3.286	0.15					○			x							3.286	10.0	1989
13	Jember	3.323	0.5																	
		3.323	1.0									x								
14	Sumenp	3.355	1.0																	
15	Singaraja	3.395	1.0																	
<u>Husantata III</u>																				
1	Banjarasin	2.43	0.15																	
		3.25	20.0																	
2	Palangkaraya	3.905	5.0																	
		3.325	10.0																	
3	Pontianak	3.442	1.0																	
		3.345	10.0																	
4	Samarinda	3.295	7.5																	
		3.295	0.5																	

x : Discard ⊗ : Renew (Power Increase) ○ : Renew ⊕ : Newly Install

Table 6-3 (4)

Renewal and Improvement Plan of the SW Transmitter

Name of Station	Present Situation (1984)		4th 5-year plan period					5th 5-year plan period					6th 5-year plan period					Result (1999)		
	Freq. (MHz)	Output (KW)	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	Freq. (MHz)	Output (KW)	Install.
Masantara IV																				
1 Ujung Pandang	3.214 2.49	0.3 2.0		○				○			x x							9.550 4.751 4.72	50.0 20.0 50.0	1987 1990 1993
2 Manado	7.290	1.0		○					⊗									7.290 5.99 3.215	50.0 50.0 10.0	1992 1986 1997
3 Palu	3.960 3.960 2.320	1.0 10.0 0.075						○			○							3.960 3.960	1.0 10.0	1990 1994
4 Kendari	3.188	0.1		○							⊗							3.995 3.180	10.0 1.0	1985 1993
5 Dili	2.50 3.12 4.282	0.3 10.0 10.0										⊗ ⊗						2.50 3.12 4.282	1.0 10.0 10.0	1995 1995 1996
6 Kupang	4.805 3.385 3.259 3.385	0.3 10.0 1.0 10.0										x ⊗						3.305 3.259 3.385	10.0 1.0 10.0	1992 1995 1997
7 Gorontalo	3.80 2.50 3.265	1.0 0.1 10.0							⊗									2.50 3.265	1.0 10.0	1991 1996

x : Discard ⊗ : Renew (power increase) ○ : Renew ⊕ : Newly Install

Renewal and Improvement Plan of the SW Transmitter

Table 6-3 (5)

	Name of Station	Present Situation (1984)		4th 5-year plan period					5th 5-year plan period					6th 5-year plan period					Result (1999)		
		Freq. MHz	Output(kW)	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	Freq. MHz	Output(kW)	Install.
1	<u>Hasantara V</u> Jayapura	9.61 6.070 2.490	1.0 20.0 0.5	○														9.61 6.070	50.0 10.0 50.0	1905 1991 1991	
2	Ambon	3.241 4.845 2.900	1.0 10.0 0.05	○				⊗ x	⊗ x									3.241 7.14 4.845	10.0 50.0 50.0	1990 1985 1990	
3	Blak	5.451	1.0		○			○										7.306 5.451	10.0 1.0	1986 1990	
4	Ternate	3.326 3.945 3.915 3.345	0.3 0.3 1.0 10.0					x		x									3.915 3.345	1.0 10.0	1994 1996
5	Mezauke	3.905	1.0		○						○							9.475 3.905	10.0 1.0	1986 1992	
6	Fak-Fak	4.790	1.0					○								x		7.23	10.0	1987	
7	Sorong	9.745 3.365 4.975	0.5 10.0 10.0															9.745 3.365 4.975	1.0 10.0 10.0	1991 1991 1995	
8	Hanokiwari	6.105 3.345 3.945	0.5 1.0 0.5						○			x						3.345 3.945	1.0 1.0	1991 1994	
9	Manana	5.040 5.040	0.25 0.25					⊗			⊗							5.040 5.040	1.0 1.0	1990 1993	

x : Discard ⊗ : Renew (Power Increase) ○ : Renew ⊕ : Newly Install

Table 6-3 (6)

Renewal and Improvement Plan of the SW Transmitter

	Name of Station	Present Situation (1984)		4th 5-year plan period					5th 5-year plan period					6th 5-year plan period					Result (1999)	
		Freq. MHz	Output(KW)	04/85	05/86	06/87	07/88	08/89	09/90	10/91	11/92	12/93	13/94	14/95	15/96	16/97	17/98	18/99	Freq. MHz	Output(KW)
10	Nabire	3.305	0.15			○												7.595	10.0	1987'
11	Serul Jakarta	6.125	0.5															—	—	—
		4.866	0.5						X						⊗			6.125	1.0	1996
1	National Prog	3.395	0.3															3.395	1.0	1990
		2.320	2.5					X										—	—	—
2	Ibukota Prog	11.77	100.0															—	—	—
		6.045	120.0										X					—	—	—
3	Kusus Prog	2.45	1.0					X										—	—	—
		13.335	10.0										X					—	—	—
4	Slaran Luar	4.775	50.0							X								—	—	—
		3.275	7.5															—	—	—
5	Negari Prog	11.790	100.0															11.790	100.0	1981
		15.150	100.0															15.150	100.0	1981
6	Cadangal	6.045	50.0						X									—	—	—
		120.0	1969						X									—	—	—
7	National	11.77	100.0															11.77	100.0	1981
		7.27	100.0															7.27	100.0	1981
9	Baru	9.68	100.0															9.68	100.0	1981

X : Discard ⊗ : Renew (Power Increase) ○ : Renew ⊙ : Newly Install

Renewal Plan of the Transmitter (TVN-I) Table 6-4 (1)

No.	Station	Transmitter (Under Planning)		5th 5-Year Plan Period					6th 5-Year Plan Period					Remarks		
		Channel	Output (kW)	Installation	1990	1991	1992	1993	1994	1995	1996	1997	1998		1999	
	Sumatera															
1	Banda Aceh	3	1.0	1976												
2	Lhokseumawe	9	1.0	1978												
3	Langsa	7	1.0	1982												
4	Bandarbaru	5	10.0	1970	○											
5	Pemantang Stantar	6	1.0	1977												
6	Rantan Parapat	6	10.0	1981					○							
	"	"	1.0	1981												
7	Sibolga	4	1.0	1982												
8	Simarjarunjung	10	10.0	1982												
9	G. Geopong	8	5.0	1977				○								
10	Pekanbaru	7	10.0	1977												
11	Pandaisikat	5	5.0	1977												
12	Pulau Batam	5	5.0	1978												
13	G. Muncung	8	1.0	1973												
14	Dumai	3	10.0	1983												
	"	"	1.0	1983												
15	Slak	4	10.0	1983												
	"	"	1.0	1983												
16	Sungai Pakning	6	10.0	1983												
17	Jambi	5	10.0	1977												
18	Kuala Tungkal	10	1.0	1982												
19	Palembang		10.0	1972												
	"		5.0	1972												
20	G. Manumbing	6	5.0	1973												
21	G. Matigkol	4	1.0	1973												
22	G. Muntai	7	5.0	1973												
23	G. Tajam	5	1.0	1973												
24	Brabumulih	6	5.0	1981												
25	Daturaja	11	1.0	1982												
26	Lehas	4	1.0	1982												
27	Huara Enim	4	1.0	1982												
28	Tebing Tinggi	0	1.0	1982												

Table 6-4 (2)

Renewal Plan of the Transmitter (TVN-I)

No.	Station	Transmitter Channel	Output (KW)	Under Planning	Installation	5th 5-Year Plan Period					6th 5-Year Plan Period					Remarks	
						1990	1991	1992	1993	1994	1995	1996	1997	1998	1999		
29	Bengkulu	6	1.0	1977													
30	G. Betung	3	1.0	1977													
31	Kota Bumi	8	1.0	1982													
	Jawa																
32	Senayan	6	5.0	1962													
	"	8	10.0	1976													
33	Gombel	4	5.0	1966													
34	G. Gantungan	6	1.0	1968													
35	Depok	9	5.0	1979													
36	Kungurejo	10	1.0	1982													
37	Yogyakarta	8	10.0	1965													
	"	"	5.0	1965													
38	Surabaya	9	10.0	1971													
39	Cemoro Sewu	6	2.0	1971													
40	G. Brengik	6	1.0	1978													
41	G. Doek	7	1.0	1978													
42	G. Gonding	4	1.0	1978													
43	G. Pandan	11	5.0	1982													
	Kalimantan																
44	Pontianak	7	10.0	1977													
45	Horakel	7	1.0	1982													
46	Sambas	4	1.0	1982													
47	Semtau II	4	1.0	1982													
48	Palangkaraya	8	10.0	1977													
49	Banjarmasin	5	10.0	1977													
50	Asuntai	9	1.0	1982													
51	Balikpapan	9	1.0	1973													
	"	"	0.6	1973													

Table 6-5 (1)

Installation Plan of Standby Transmitter (TVN-I)

	Present Situation (1984)		Long Term Plan Period										Remarks					
	Name of Station	Ch..	Output (kw)	Installation	5-year plan period					6-year plan period								
					1990	1991	1992	1993	1994	1995	1996	1997		1998	1999			
	<u>Sumatera</u>																	
1	Sigli	4	0.3	1982														o
2	Tebing Tinggi	9	0.1	1977														o
3	Taropo	5	0.01	1977														o
4	Parapat	6	0.01	1977														o
5	Padang	9	0.1	1977														o
6	Bontang	7	0.1	1977														o
	<u>Jawa</u>																	
7	Semanggi	7	0.6	1974														o
8	Kledung	7	1.0	1975														o
9	Mandiraja	5	0.1	1975														o
10	Depok	9	5.0	1979														o
	<u>Kalimanta</u>																	
11	Sanggau Ledo	7	0.3	1980														o
12	Balaikarangan	4	0.3	1980														o
13	Semitan I	6	0.3	1980														o

CHAPTER 7 MAINTENANCE PLAN

CHAPTER 7 MAINTENANCE PLAN

7-1 Integrated Maintenance System

The broadcasting facilities, as well as biological substance, have a mechanical life. Fig. 7-1 shows a statistical model allegedly reflecting a chronological trend of such impediments as illness and failures during the life. Therefore, the broadcasting facilities can be maintained required characteristics by suitable maintenance and good circumstance, same as human life can be extended without illness by taking good care of health and sanitary conditions. (sec. Fig. 7-2)

Expansion of broadcasting facilities in Indonesia has been progressed rapidly, however, maintenance activity and organization are not yet secured and gathering arrangement of the information of whole broadcasting facilities, synthetic inspection and periodical maintenance are not enforced.

Therefore, at the each site, preventive maintenance is not carried into effect, only troubleshooting is scarcely enforced, but according to unfavorable factors such as insufficiency of spare parts, taking long time for repairing by manufacturer, etc., and the results, passable number of equipment are depressed, furthermore, some equipment are not in operation for a long time.

Problems of present situation concerning maintenance work for broadcasting facilities are

- 1) nonstandard, large number of facilities
- 2) Few maintenance staff, actually not enough
- 3) Incomplete restoration system in terms of equipment and organization
- 4) Insufficient maintenance work by unskilled technician
- 5) Not up-dated maintenance work system
- 6) Insufficient consolidation of workshop function
- 7) Shortage of experts and skillful engineers
- 8) Long lead time to obtain parts for repair
- 9) Restricted outlay for maintenance resulting in frequent failures
- 10) Many obsolescent equipment

From now on, expansion of the broadcasting facilities will be progressed broadly, it is impossible to operate whole facilities in favorable condition without establishment of integrated maintenance system.

7-2 Establishment of The Maintenance Centre

The maintenance centre will be settled in the RTF Engineering Centre. The organization and activities of RTF Engineering Centre, job flow between the maintenance centre and other sections, etc. are shown in Fig. 7-3, 4 and 5.

At the first step, the central maintenance centre will be installed in Jakarta and the regional maintenance centre will be installed in each of Medan and Ujung Pandang in consideration of transportation condition especially domestic airlines. Territories of maintenance centres in charge are shown in Fig. 7-6.

Furthermore, to arrange nationwide system, the regional maintenance centre will be installed in Yogyakarta (Surabaya), Banjarmasin and Jayapura and the branch office will be installed in Palembang, Denpasar, Balikpapan (Samarinda) and Ambon in the long-term plan period.

Territories of maintenance centres and branch offices are as shown in Fig. 7-7.

7-3 Task of The Maintenance Centre

In order to carry out the maintenance work of nationwide facilities effectively and to sustain their standard of reliability, information about existing facilities and data to be processed must be correct and a failure recovery system must be provided and the technical level of staff must be improved. From these points of view, the items necessary for establishing the maintenance system are summarized as follows:

- (1) Outline of facilities
A document summarizing the outline of facilities including ratings of equipment, floor layout of buildings, power sources, antennas and other special mentions, which should take a form allowing registration to computers, should be prepared.
- (2) Technical standards for facilities and equipment
Technical standards for independent equipment are provided in the form of normal specifications, but the standards for maintenance work should be established separately.
- (3) Establishment of communication and reporting routes
To set up the Maintenance Centre, information communication routes and methods must be established. For routine communication, failure notification, restoration support, and requesting of parts supply communication methods and routes must be determined before the introduction of the new organization.
- (4) Measures and procedure for failure restoration
A guideline should be established to clarify the responsibility and support system for failure restoration and to carry out aftercare properly. The policy should also be set up at the preparation stage prior to the start of the maintenance centre.
- (5) Maintenance Plan
Since the plan is related to a smooth transition from current RRI, TVRI and Film organizations to integrated organization, a temporary plan for transition must be prepared paying careful attention to interface with a future maintenance plan. The plan will have influence over the results of R/TV/Film integration. So nationwide participation of broadcasting engineering departments is essential to discuss and determine the plan.
- (6) Grasp of equipment data
At the preparation stage, the data on broadcasting facilities be particularly arranged on the common among between Radio, TV and FILM to shift to a new maintenance system.

(7) Standardization of technical service records

The best way for processing technical data is the use of computer for the work, compiling histories and other data on the equipment. Shifting toward this direction calls for an effort and cooperation of overall technical departments, but essential for integration of the maintenance work.

(8) Centralization of parts control

The quantity of spare parts for Radio, TV and FILM could be greatly reduced by centralizing a whole control system, and purchasing for replenishment can be carried out properly without losses by computer control.

(9) Compiling and offering of technical information

All data on facilities and equipment, after periodical arrangement, are offered and sent to each related section.

Books, magazines and other materials on electronics and broadcasting technologies should be collected and offered for perusal so that broadcasting staff can know the newest trend of major overseas broadcasting organizations and electronics industries.

Lending service and listing of important technical papers will be computerized and contents of important documents are stored as microfilmed if necessary. Drawings and specifications are also .

(10) Periodical maintenance procedures

Standard procedures for periodical maintenance should be preliminary established.

(11) Improvement of technical level of maintenance personnel

As already explained, improvement of technical level of maintenance personnel is one of the most important items which saves directly the expenses for equipment operation and increases the efficiency of the job through reduced frequency of failures and improved equality of radiated signal. Especially trouble shooting of television transmitter station needs the assistance of Up-stream stations in opposition to the case of radio where failures are restored by local technicians. The training in MMTC will greatly contribute to the establishment of

the same trouble shooting system in local television stations as that for radio.

(12) Budgeting and others

Budgeting is required for maintenance expenses related to R/TV/Film integration, transitional actions (as office moving, for moving personnel, etc.) and operational expenses after shifting including the cost of tower painting and engine repair by contract.

Daily activities of the maintenance centre are as follows:

(1) Control and Maintenance of Facilities and Equipment

While all broadcasting facilities are operated by broadcasting operation departments, a comprehensive maintenance of the equipment except minor maintenance is put under control of the Maintenance Centre. The scope of work should be decided complying with actual situation. The equipment in studios in particular should be maintained as much as possible by operating departments, while the Maintenance Centre is in charge of such matters as to be entrusted to specialized contractors. The maintenance staff of local station corresponding to this new organization are incorporated into a series of instruction system regarding the maintenance work.

Therefore, local stations are in charge of following jobs, and the rest is left for the Maintenance Centre.

- 1) Management of lists and information on the facilities and equipment within the area in charge.
- 2) Delivery and filing of technical service records.
- 3) Countermeasures necessary for failure restoration of the facilities
- 4) Some minor repair work.

(2) Formulation and Implementation of the Maintenance Plan

The maintenance plan must be prepared in tune with the facilities divisions to make it systematic and efficient, thereby

to maintain the facilities at minimum expense and personnel. A data bank which contains the information on the current status of facilities and the requirement from local stations should be prepared and used for the planning and trade-off of them have to be taken into account to make balance among them.

In other words, there must be consistency established among 3M's -(Man, Materials and Money, and 2P's - (Philosophy and Policy) to make matching between information and time lines. Thus, all matters related to following items are managed by the maintenance centre as a major part of its function.

- 1) Formulation and implementation of long and short term maintenance plan.
- 2) Dispatch of specialities for the above.
- 3) Maintenance work by specialists or specialized contractors.

(3) Storage and Control of Material and Parts for Repair

A reasonable parts management is essential for maintenance and replenishment of materials for urgent repair. Existing spare parts should be reviewed from this point and their inventory control is to be computerized. Also, to rationalize the work, a workshop is set up to maintain the equipment, and in the future to carry out repairs of measuring instruments and periodical maintenance of special devices which have been so far entrusted to specialized contractors. This shift will take several years for smooth transition. Therefore, major maintenance works are as follows:

- 1) Storage and control of common parts
- 2) Storage and lending of substitute units
- 3) Maintenance and repairs of equipment requested
- 4) Dealing with requirements from other departments.

Within the category of maintenance and repairs work included painting of steel tower and some minor improvement of building.

(4) Procurement and Control of Repairing Material and Parts

Inventory control of repairing material and parts can be effectively computerized, and thus the ordering system is much

simplified. Procedure for delivery of parts requires approval of computer section, data input for the delivery and entry in technical service records. Inventory control can be readily effected by an interactive computer.

7-4 Facilities of the Maintenance Centre

The Central Maintenance Centre in Jakarta will be provided with a series of mechanical and measuring equipment necessary for the maintenance work of all broadcasting facilities. The Centres in Medan and Ujung Pandang projected in the 3rd/4th and 4th/5th years will be equipped in a simplified mode. The facilities roughly consist of;

- (1) Common broadcasting equipment for maintenance purpose
- (2) Machine tools
- (3) Measuring instruments
- (4) Computer and peripherals
- (5) F/C Van
- (6) Information equipment
- (7) Library equipment
- (8) Spare parts, warehouse for spare parts, etc.

Distribution of Failures

Fig. 7-1

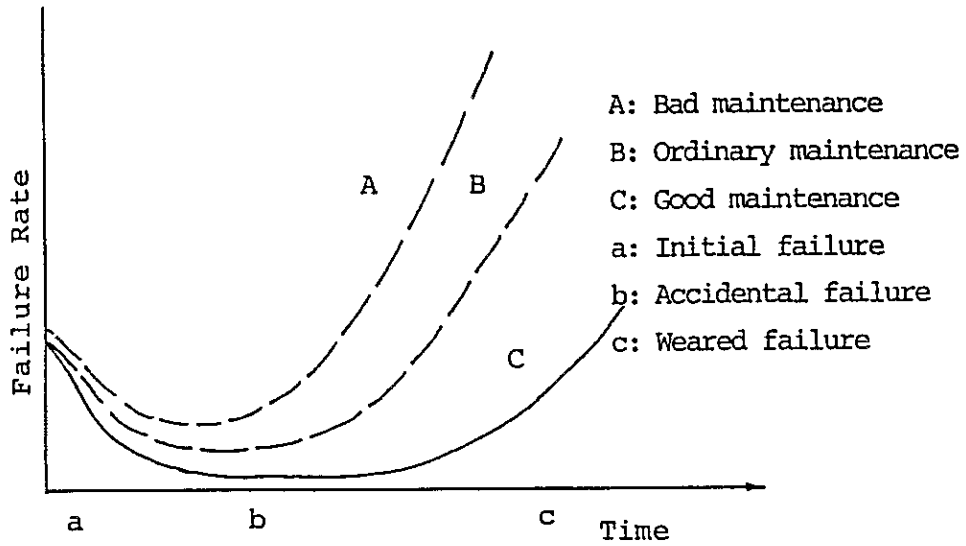
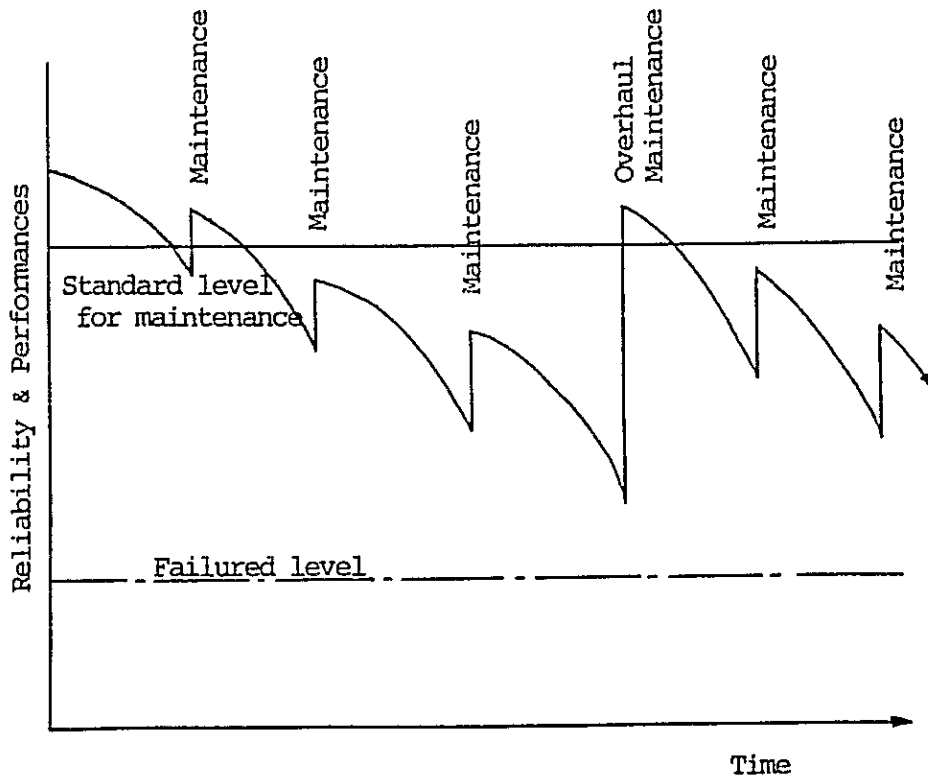
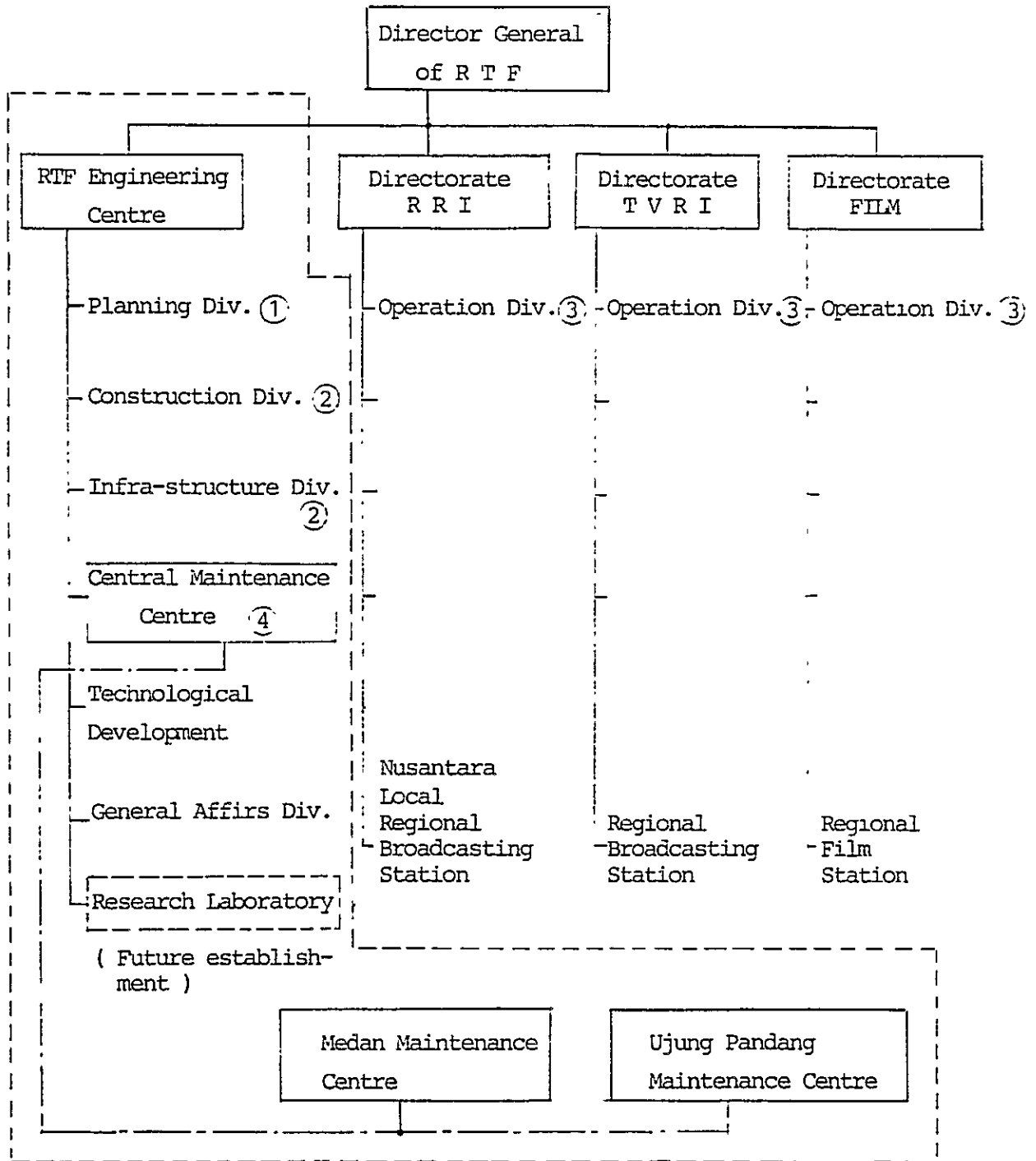


Fig. 7-2

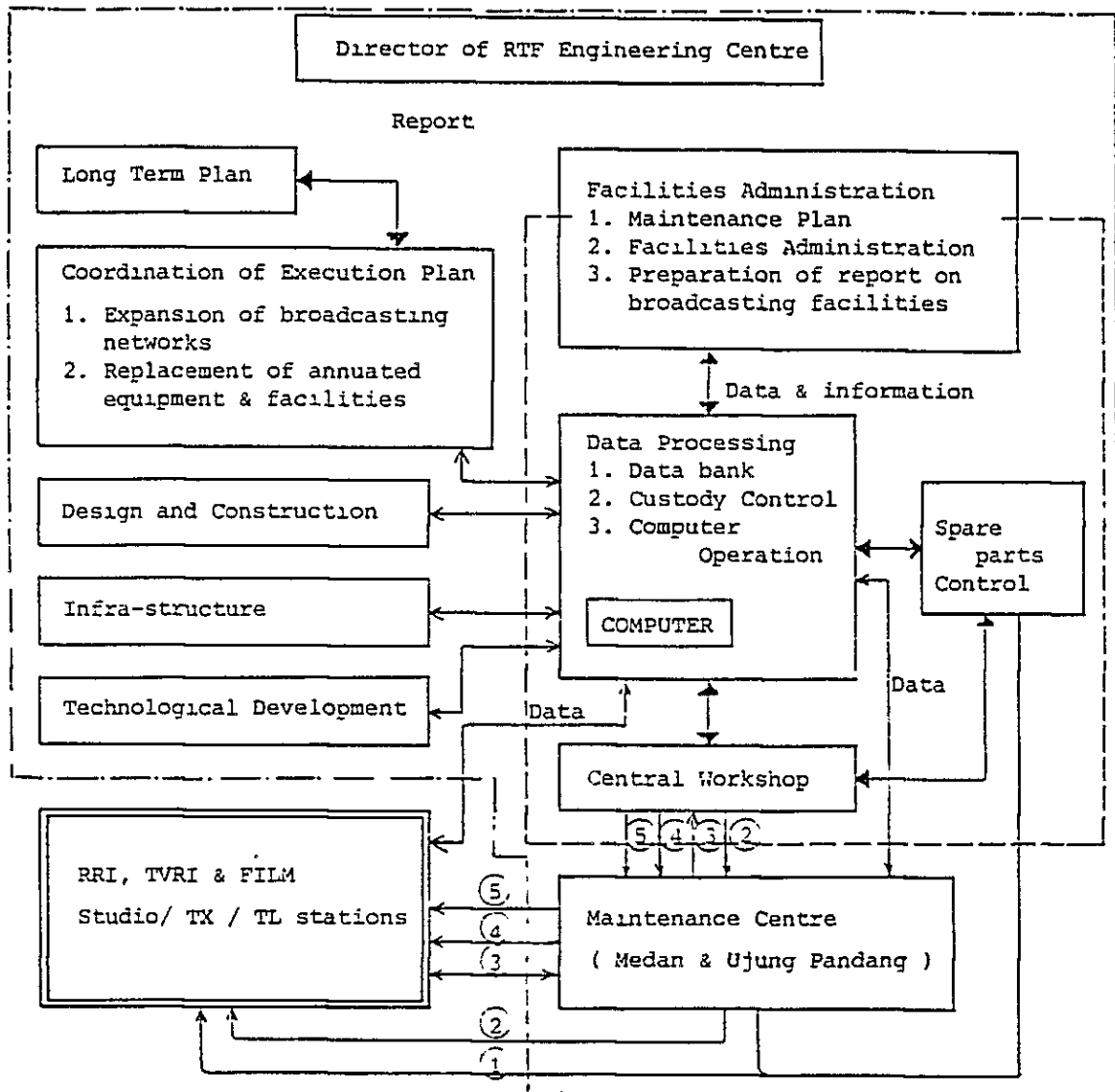
Maintenance and Performance Preservation



Organizational Structure of RTF Engineering Centre



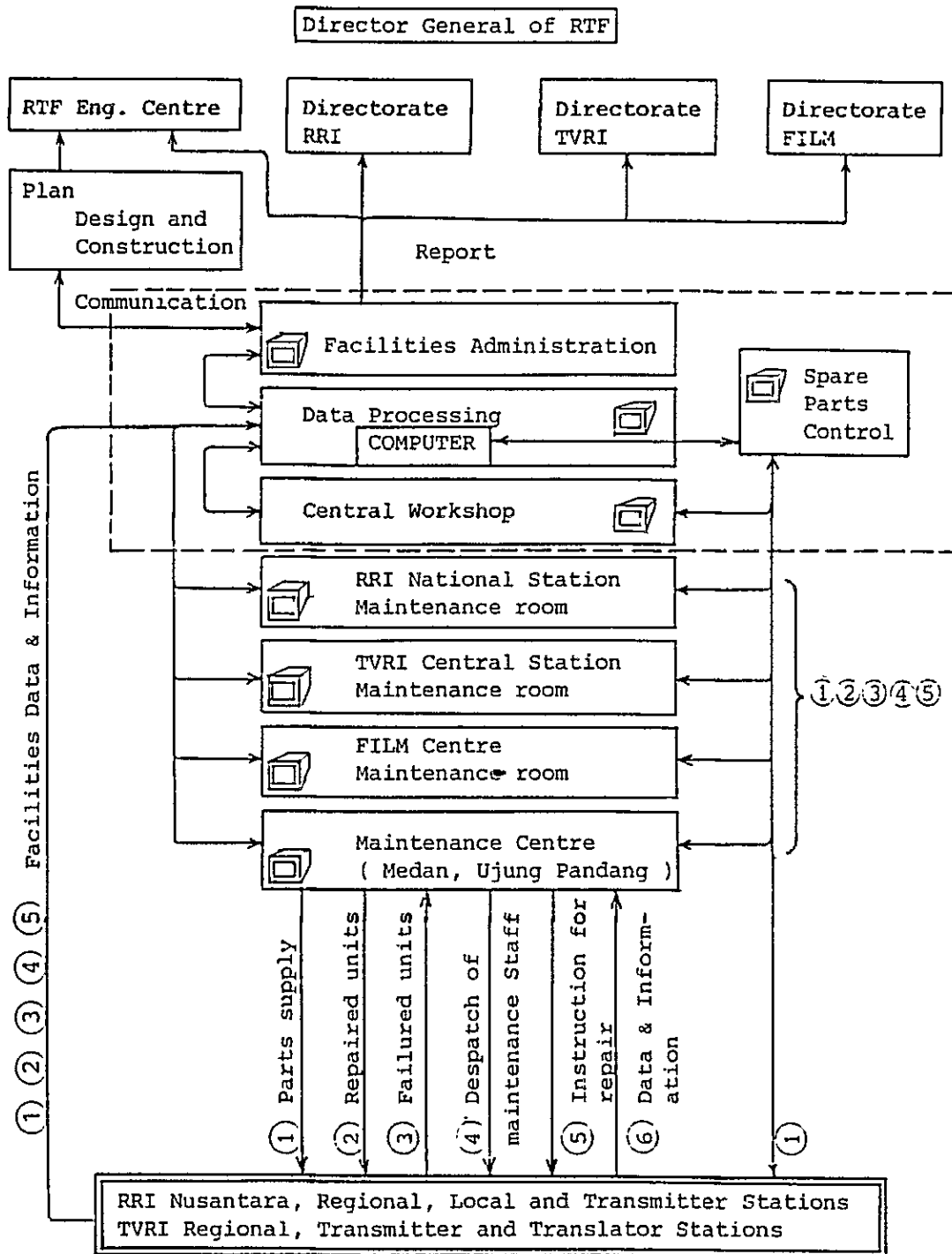
Job of RTF Engineering Centre



- Notes :
- RTF Engineering Centre
 - Central Maintenance Centre
 - Directorate RRI, TVRI and FILM
 - ① Spare parts supply ② Repaired units
 - ③ Failed units ④ Despatch of maintenance staff
 - ⑤ Instruction for repair

Fig. 7-5

Flow of the Jobs among Each Division and Maintenance Centre



Note: Enclosed with dotted line shows the jobs of Central Maintenance Centre.

Fig. 7-6

Territory of Each Maintenance Centre

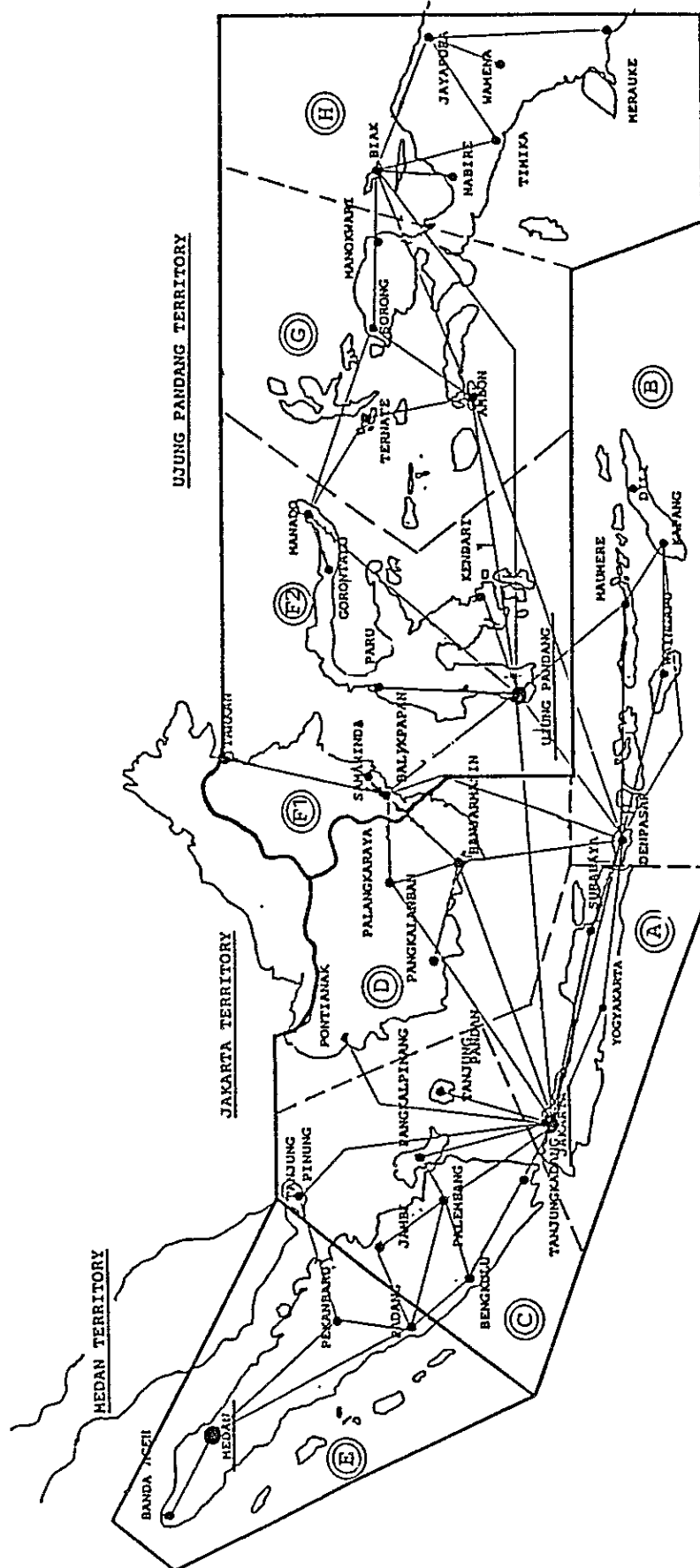
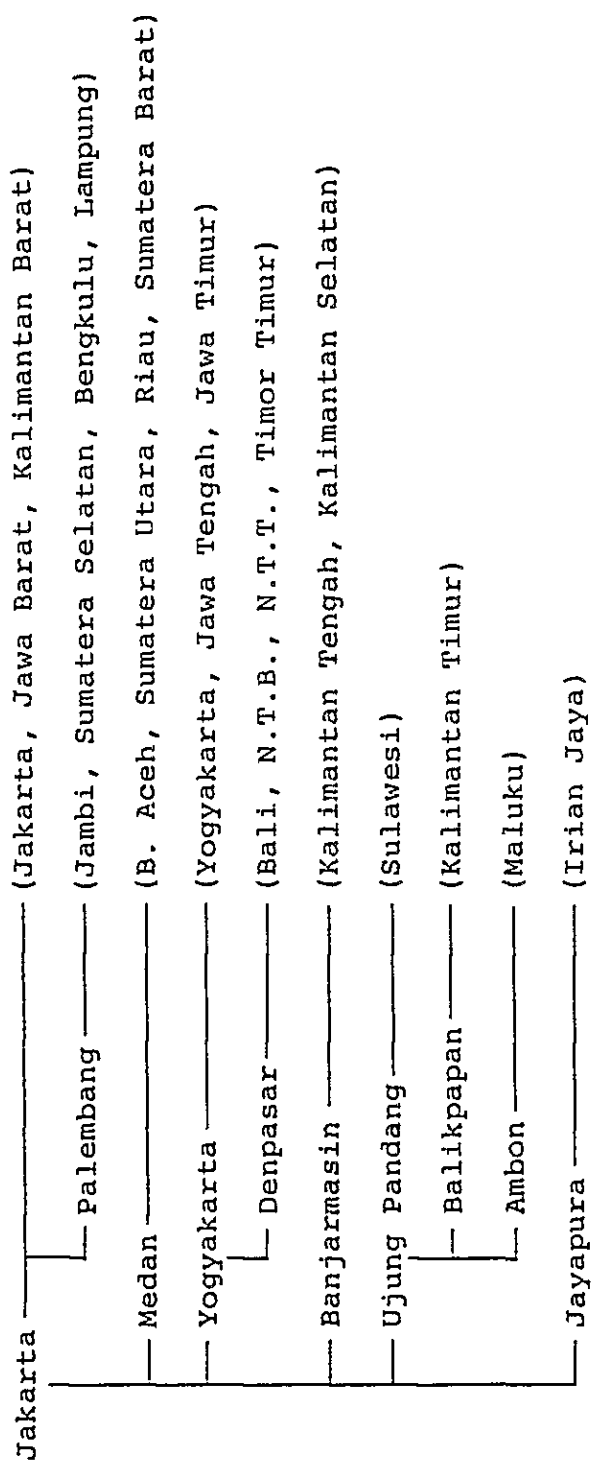


Fig. 7-7

Territory of each Maintenance Centre (Final)



Jakarta : Central Maintenance Centre
Medan, Yogyakarta, Banjarmasin, Ujung pandang, Jayapura
: Regional Maintenance Centre
Palembang, Denpasar, Balikpapan, ambon
: Branch Office of Maintenance Centre

CHAPTER 8 RECEPTION SERVICE PLAN

CHAPTER 8 RECEPTION SERVICE PLAN

No matter how good a condition the broadcasting wave may be beamed from the transmission antenna, the broadcasting service can not be said perfect unless the quality of sound or picture from the receiver is good.

With regard to the programming, staging and production technique of programmes, the programmes can not claim the merits of good planning or good programmes unless they satisfy the audiences, despite of efforts on the part of the station.

Unless the programmes satisfy the service subscribers sufficiently in all respects of the service; i.e. programme contents, production technique and service time etc., the audiences would feel reluctant to pay the fee. Therefore , the broadcasting service can not subsist, unless the station wins the trust of the audiences and audiences are satisfied with the programmes. Herein crops up the problem of service.

An important consideration on the part of the station is guidance and advice to the audiences by checking the receiving conditions in various regions so that the service may be received satisfactorily by them.

And also by making a survey of the interests of the audiences reflect the findings on the programme contents, production and the broadcasting time etc., then the audiences may feel affinity to the station. It would contribute to the increase in the audience rating and would eventually result in the efficiency of the collection of the audience fees.

8-1 Grasping of the receiving conditions and improvement thereof

Broadcasting station authorities are expected to have the knowledge about the distribution of the electric field of each medium of service in their service area as well as the condition of interference. The problem taking up here is the matters concerning the receiving condition of individual audiences especially in respect to:

- 1) Antenna: its type, gain, directivity, height, direction, the type of feeder, length and the spanned method etc.
- 2) Type of the receiver,
- 3) Condition of the power source,
- 4) Man-made noise in the respective area.

Favorable reception is hampered in case there is any problem concerning any of the items mentioned above. Defective conditions regarding the above matters, of course, should not be ascribed to the servicing station. However, station authorities are expected to make effort to assist individual viewers or listeners to be able to enjoy favorable reception of service by giving appropriate guidance or advice if any problems are found in the receiving facilities.

Regarding the antenna 1), the station should inform to educate people properly especially in the case the station has been newly opened. As for the condition of power source 3), it is incumbent on the station to warn the power supplier, should the power voltage go down or become unstable. With regard to the man-made noise in the servicing area, the station should advise the party which is the source of the noise to install a noise stopper.

As a result of the present survey on the spot, it was found that no positive effort of public information or guidance had ever been made on the part of the station. While a small power station of Band I was opened in order to eliminate areas of difficult viewing or listening, it was found that individual receivers in the area were trying to catch service from remote stations on the reasons that no antennas for Band I were available etc. or were using receivers of old type and were unable to receive to service of newly opened stations of Channel 10 or 11.

In the circumstance that a number of new stations are to be opened consequent on expansion of the service such as FM station of RN-III, TVN-I and TVN-II etc., sufficient efforts of public information and guidance are deemed necessary.

It is also necessary to broadcast programmes or prepare literature to inform the public on the knowledge about reception of the service always favorably at home.

8-2 Links of the Station with Listeners

The broadcasting service can not be unilateral of the station. Unless programmes are compiled and produced with the audiences in mind, they would not be prompted to pay fee for service.

Even public information programmes which are primarily meant not for entertainment may be produced attractively to audiences by dint of positive contrivance of the way of production. For such purpose, opinions and requests from audiences by letter or by telephone should be positively sought so as to have them adequately reflected on programmes. That would eventually contribute to raise the audience rating.

Especially in local cities, it would be further effective to win the audiences if musical, folk art or quiz programmes inviting participation of audiences are positively produced. It would promote audiences' interest in broadcasting service to inform the station publicity and to hold the conference concerned on programmes so as to listen audiences opinion, at that time.

It would also be imperative to have a setup of the system to correspond with various inquiries from audiences either by letter or by telephone apart from contact with them on the programmes.

In designing station house to be newly built by the radio-TV integration, it is advised to provide facilities for visitors to observe station facilities as well as the operation of the station etc. Of course, care needs to be taken to protect the normal operation of the station. It may be a good idea to build a broadcasting museum in the future to preserve various kinds of old equipment, photos and graphical illustration etc. to tell the history of broadcasts.

It is expected that the interest of the audiences in broadcasting service would be promoted by bringing them closer to the service.

8-3 Effective Method of Service Fee Collection

The broadcast reception fee means a fee that the recipient of the service pays to the serving broadcasting station. Different from electricity or water, the consumer or the receiving party of the service is able to enjoy the service free of charge only if he has installed an adequate receiving equipment according to his convenience without making a contract for reception of service with the station.

In the case of electricity or water, the supplier is capable of suspending the supply of service, if the consumer fails to pay the fee. But the condition of broadcasting is different. The station can not suspend the service against individual receivers of the service. In other words, the audiences are able to continue to enjoy broadcast programmes even if they do not pay the fee.

But since there is a fee-paying system, the broadcasting service can not subsist as an industry but for the fee paid. It is socially problematical to condone the situation that there are people who are enjoying broadcasting programmes freely while the rest of people are paying the fee for it.

Therefore, some legal measures concerning the reception of radio or television broadcast service would be necessary to cope with such situation. However, it all depends on the idea of the people about the social significance of broadcasting service and so it would be advisable to create the atmosphere so that people may be positively induced to pay the fee in recognition of the social merits of broadcast.

For that matter, efforts of public information on the media of newspapers or magazines etc. may be necessary. On the other hand, it would be also important to facilitate payment of the reception fee, not only through the post office but also by such system as paying from the bank account etc. It may be effective to prompt the fee payment if discount is allowed for long-term contracts. It may be an idea to prompt the payment if an attractive sticker to certify the service reception is distributed to households to be stucked on the doorstep.

The campaign for promotion of reception contracts carried out in the summer of '83 proved effective in collecting the reception fee. to obligate the shops which have sold receiving sets to report the names and addresses of the purchasers to the station or to make use of a small reception detector which can confirm reception of broadcasting service by the radio wave emission form the local oscillator of the receiver may be useful to detect malicious persons who are listening the service without paying the fee.

8-4 Organization of Reception Service Businesses and its Operation

In order to operate various businesses mentioned so far, a system to take charge of these businesses is naturally required. Depending on the nature of business, there are ones which can be conveniently assigned to other section dealing with mechanical aspects. Since the broadcasting industry covers a very wide field of activities. There are sections which can not be sufficiently covered by the originally assigned staff, but for cooperation from other sections.

Firstly, there should be a section to deal with the business concerning reception contracts. At present, the business concerning the reception contract and the collection of the reception fee is entirely placed in the charge of the post offices. Leaving the matter of fee collection entirely to the post offices may not improve the rate of fee collection. Therefore, the section to be set up specifically is expected to work for prompting the reception contract as well as prevention of non-paying receiving, taking charge of public information about the broadcasting enterprise as a whole.

The flow of dialogue (or information) between the broadcasting station and audiences is viewed roughly as Fig. 8-1.

According to this, inquiries from audiences concern various aspects of broadcasting as enumerated as follows:

- 1) Programme plans
- 2) Programme contents
- 3) Broadcasting time zone
- 4) Programme presentation
- 5) Programme production technology
- 6) Programme transmission
- 7) Overall station facilities
- 8) Reception of service
- 9) Others, concerning the entire aspects of broadcasting enterprise

Thereupon, a specific department to respond to these inquiries becomes necessary. For the sake of convenience of audiences who make inquiries, the reception desk is to be unified. But depending on the nature, enquiries are to be sorted out to be referred to sections in charge of the matter specifically. Telephone inquiries will be answered by the

specific section to which the inquiries have been referred and inquiries by letter will be answered by the dealing section but mailing will be handled by the reception desk. It is also a duty of the reception desk to sort out inquiries item wise and compile them as statistical material to be used for a survey of the trend of audiences etc.

Regarding inquiries about the reception of broadcast, it would be proper to set up a special section to deal with them to check the actual condition of service reception by despatching a surveying car etc. so that advice on improvement of the receiving facilities etc. may be provided on the spot. For the time being, however, a FC Van being used for itinerant maintenance check by the maintenance centre is to be substituted for this purpose. On the occasion of the patrolling check, it is advised to visit homes of audiences positively to seek for their opinions concerning the reception condition or programmes. In case that it is difficult to give answers on the spot, to questions made, they may be taken back to the station and give replies later by the usual process by letter or by telephone.

The system and operation concerning the service to audiences mentioned above may be summed up as Fig. 8-2.

Fig. 8-1

Flow of Information between
Audiences and Broadcasting Station

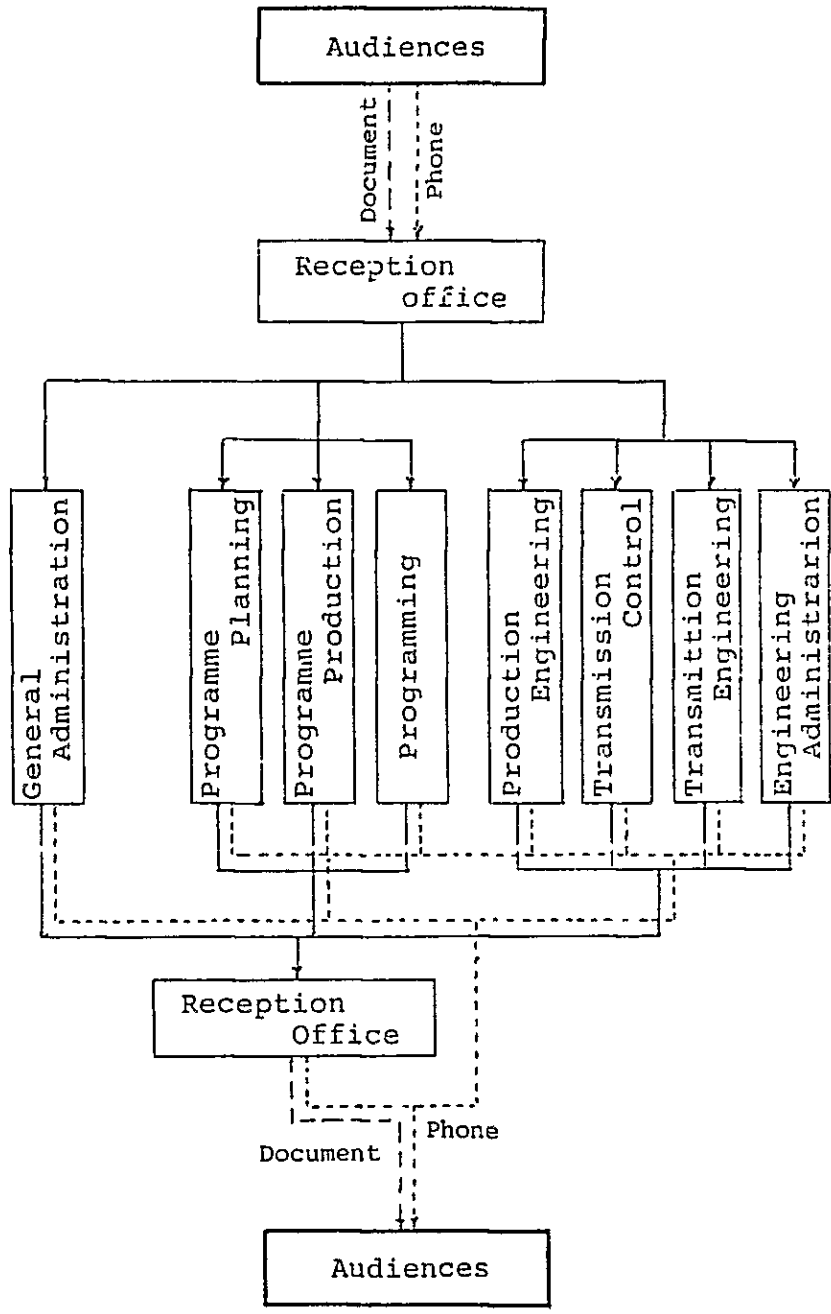
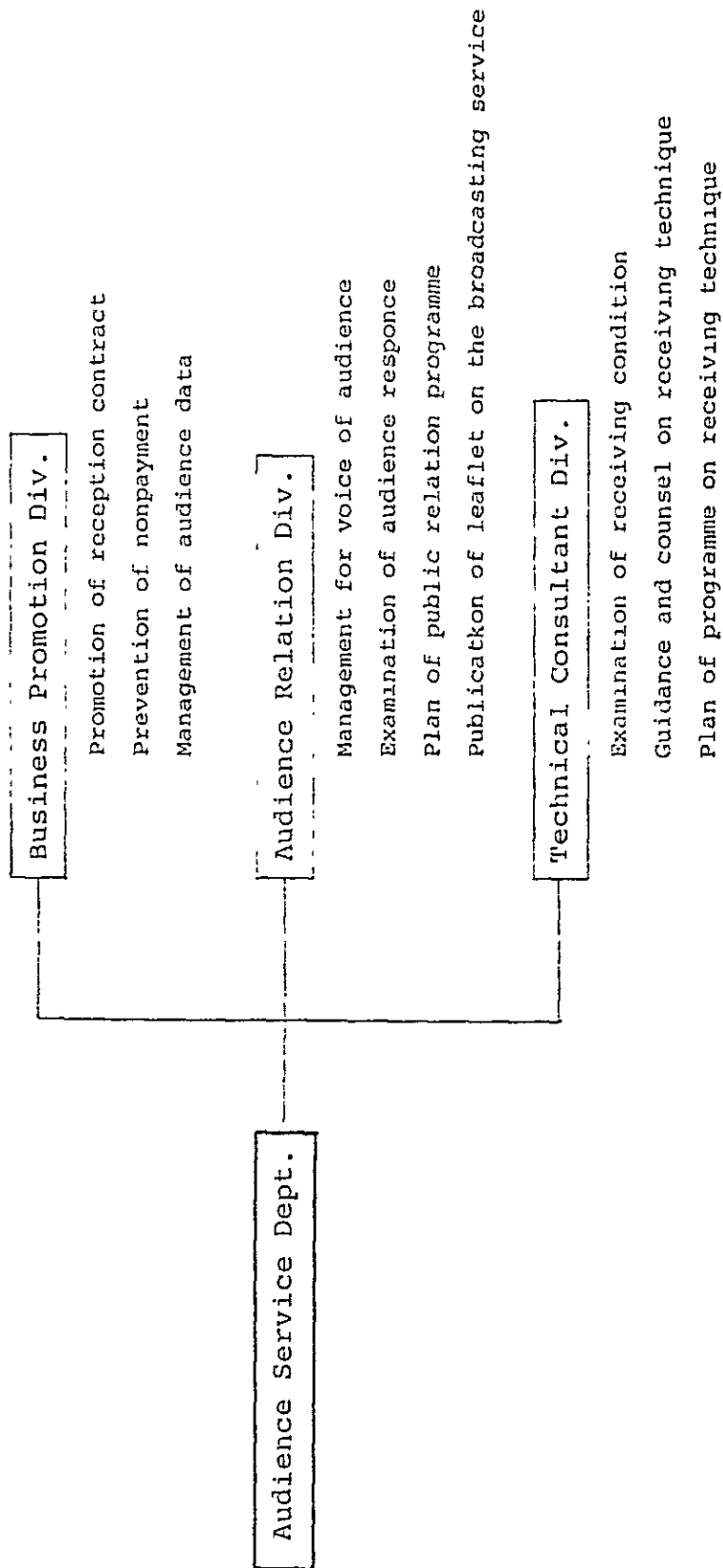


Fig. 8-2

An Example of Organization and Operation for Audience Service



CHAPTER 9 · STAFF PLAN

CHAPTER 9 STAFF PLAN

9-1 Plan of Staff Assignment

During this long term plan period, it will be needed to increase the staff because of the commencement of RN-II and III, TVN-II broadcasting service, increase in broadcasting time and resulted increase in the number of programmes, expansion of production facilities for the purpose of enlargement of service area and the new establishment of additional station for improving receiving condition.

On the other hand, there will be the surplus of staff derived from the integration of radio and TV organization, the streamlining of work or use of highly automated equipment, unmanned operation of transmitting station and automatic control system, etc.

At an early stage of this long term plan, though the urgent expansion should be carried out including 24 hours broadcasting service of RN-I broadcasting, the commencement of each of RN-II and III and TVN-II broadcast service, but on the contrary, the integration of both organization will not so rapidly progress and the effect of integration of organization will not be so much remarkable then some amount of staff increase will not be avoided.

However, it will be possible to keep total number of staff as small as possible by controlling the progress of construction work and the integration of organization.

It is not easy to calculate the number of staff at the year of 2000, namely 15 years from now, at present programme, progress in engineering and change of social situation, however the forecast of round figures are given as below.

(1) Staff related to programme production

1) Jakarta Central station

Radio programme	154 persons
TV "	310 "

2)	Regional station	
	Radio programme	180 persons
	TV "	330 "
(2)	Staff related to transmission facilities	
1)	Radio transmission (including overseas broadcasting)	370 persons
2)	TV transmission (including FM)	190 "
(3)	Administration	17 persons
(4)	Total	1,551 persons

9-2 Total Number of Staff of Integrated Radio and TV Broadcasting Organization at the end of Long Term Plan Period

Assuming radio and TV broadcasting activities are carried out under the same administration of the integrated organization, the necessary total number of staff are estimated based on the following conditions.

- (1) The integration of radio and TV broadcasting organization are accomplished and all activities such as estimation of budget, programme planning, construction plan, gathering of news and programme materials, programme production and transmission, operation and maintenance of transmitting station, personnel administration, accounting and liaison business and so on are carried out as a united system regardless of radio or TV.
- (2) The number of operation staff are calculated based on the assumed typical team for each activity in consideration of the total number of programme system, daily broadcasting hour in each programme system, number and size of transmitting station, category of programme which will be realized at the end of long term plan period.

- (3) At the transmitting station where on air time is 24 hours a day three shift operation system (8 hours operation per team) are adopted and assigned four team to each station in consideration of holiday for each team.
- (4) Indirect business division other than operational group, necessary number of staff were counted according to the duty of each section or division without taking account of ranking of staff.
- (5) As for the distribution of sex distinction, level of education, ages and so on, it was not specified because these classification would be decided along with the past experience in radio and TV broadcasting groups.
- (6) In this estimation, the saving factors due to the introduction of unmanned operation of transmitting station, automatic transmission of radio and TV programmes and cooperative work of radio and TV broadcasting activities are taken into consideration.
- (7) The special cares were taken to save the number of staff by defining clear classification of each duty in the division or section to avoid unnecessary overlap of similar type of work.

As the results of the above estimation, the total number of staff in the integrated organization will be about 18,770 at the end of long term plan period.

The breakdown of the above are as follows;

a)	Jakarta	
	General Affairs, Administration Department	410
	Broadcasting Department	2,630
	Programme Transmission Department	165
	RTF Engineering Centre	275
	Service Division for Listeners/Viewers	165
	Total	<u>3,650</u>

b)	General Affairs, Administration Department at local stations	<u>6,140</u>
c)	Programme Production Department at local stations	<u>3,530</u>
d)	Operation staff at local transmitting stations	<u>5,450</u>

The typical scale of staff composition at each class of broadcasting station will be as follows;

Nusantara Station	470-500 persons
Regional-I Station	250-300 persons
Regional-II Station	180-200 persons

Furthermore, the detail of above are shown in Table 9-1.

9-3 Staff training plan

In order to advance the broadcasting, activities according to the progress of the world, each of belonging staff should always elevate himself and the result obtained by that effort should be reflected intensively to the job at working place. Development of the activities never be able to be demanded if rely only on the experience.

For this reason, intentional plan of staff training should be made. As the training of staff, followings are shown.

- 1) Training for new employee to make them learn basic knowledge in order to carry out own job at each working place
- 2) Training for middle and upper classes to make those who reach certain technical level learn higher level of knowledge
- 3) Professional training to make learn higher technique in the specified field
- 4) Administrator training which is carried out for those who promoted from common staff to administrator
- 5) Very effective on-the-job training (OJT) made at each daily working place in which the trainees intentionally enhance their ability which executing their own job.

Training for the new employee will be made at MMTC and the term will be one year and the limit of number of personnel will be 480. This number is forecast such that from about 290, persons retiring under the age limit will increase accordingly, new employee will increase. And the content of the training will be made as enough for those who graduated from school and engage in job at broadcasting organization as staff.

Concerning to the middle and upper class training, those will be carried out corresponding to the improvement of general technique and at each field of broadcasting, engineering and administration in order to progress individual ability, and it will be conducted mainly at the organization which will be made by the integration of the training centres of present RRI and TVRI. Moreover, overseas training etc. also will be efficiently utilized.

Professional training is one which makes the trainee learn high knowledge on the single item in the each field, and it is the professional training of both sides of software and hardware, for example, in the field of engineering, technology relating to Laser ray, stereo recording technique of orchestra and high level technique of TV studio lighting, etc.

As for this professional training, if training place is not necessarily be limited in Jakarta but is also in Nusantara station by despatching the instructor, there will be spare about traveling expenses and days of the trainee and, as a result, it will also be able to increase the number of trainee and it will be effective.

And training course of AIBD also should be largely utilized.

Concerning to the training for administrator, it is to make trainees develop their spirit and culture and recognize about not only speciality but also broadcasting activities as a whole moreover contribute to the development of broadcasting activities through planning, execution of the job and administration and education of their subordinates. And this training will be conducted at a training centre in Jakarta and it is desired for the centre to be able to be made effective by not only inviting the lecturers from inside but also from outside. Still more, as the overseas training, though there is a limit on the number of trainee, since JICA etc. are carrying out that, it will be convenient to join those.

Those trainings are of course carried out by making plan of long period and the selection of trainee and the effect emerging after training etc. should be taken care of.

As for the selection of trainee, it is needed to considerate enough about not only simply the term of continuous service or the experience but also actuality and probability in the future, etc. For that, it will be important to arrange detailed personal data at any time.

And the training itself unavoidably conducted for the limited number of staff but the effect obtained at least should reach whole of the working place. Up to now, it seems that especially trainees of overseas training have not given the knowledge obtained by the training and they have occupied materials gotten individually, however that should absolutely be excluded. Heads of the department or section should execute training and order the presentation of materials received and make as to bring more large effect.

Moreover, those training will be limited of which will be limited also, therefore, even in the case of professional training, it will be impossible cover all matters of each item, by that reason, if the trainee bears in mind to make effort to brush himself up after the training continuously by making the training as an opportunity for that, ability of the working place as a whole, of course of the trainee himself, will be progressed.

Surplus numbers will be raised at administration section by the integration of RRI and TVRI organizations and it will be necessary that the reshuffle of those staff to programme section and reception section. And for the staff of programme section of RRI, the knowledge on the TV programme will be required and, at the same time, for the staff of programme section of TVRI that on the radio programme will be demanded and moreover, for the staff of engineering section of RRI that on the TV engineering will be required. Moreover since by making unmanned and automatic operation etc. of transmission facilities and operational facilities the surplus will be emerged to staff who at present concern to those work the reshuffle of them to production engineering section will be made.

According to those, it will be necessary to conduct training, and there will be the method of on-the-job training and meeting training at Nusantara station, since large part of the content of training is same as that for new employee, to utilize a part of training at MMTC is also be considered.

Table 9-1(1)

Total Number of Staff of The Integrated
Radio and TV Broadcasting Organization
at the year of 2,000

This figure are estimated based on the minimum necessary
number of staff for the functional acitivities to be
operated by the organization.

At Jakarta Head Office	<u>3,650</u>
1. Administration	<u>415</u>
General Secretary.....	25
General Planning.....	60
Administrative Plan.....	15
Management Plan.....	15
Broadcast Plan.....	20
Financial Plan.....	10
Public Relation.....	55
Liaison Office.....	10
PR for Listeners/viewers	30
International Affairs...	15
Personnel Affairs.....	100
Survey.....	20
Personnel Management....	30
Labor Mangement.....	20
Welfare Management.....	20
Recruit.....	10
Finance & Accounting.....	80
Budget.....	15
Finance.....	15
Accounting.....	30
General Management.....	20
Property Administration & Purchasing Control.....	95
Real Estate.....	10
Building & Facilities...	20
Materials.....	20

Table 9-1 (2)

Building & Structure Maintenance	
.....	30
Purchasing Control.....	10
Regal Matters.....	5
2. Broadcasting Operation	<u>2,630</u>
(1) General Planning	10
(2) Broadcasting Policy.....	15
(3) Programming Policy	30
(4) Production Planning	30
(5) Programme Production Planning...	430
Educational Programme.....	30
Social Education	30
Youth & Infant Education...	20
Adult Education.....	30
Agricultural, Fishery & Forestry	
.....	30
Industrial Programme.....	20
Infrastructure Programme...	20
Mining	10
House Keeping, Nursing.....	20
Cultural, Scientific Pro...	30
Drama Programme.....	30
Music Programme.....	30
Entertainment Programme...	50
Sports Programme.....	20
Special Programme.....	20
Film Programme (Feature, Cartoon & Documentary)	
.....	30
Other Programmes.....	10
(6) News & Information.....	285
General Planning	15
News Desk	40
Political News Programme...	20
Economic News Programme...	30
Social News	20
National Development News..	10
Foreign News.....	20

Table 9-1(3)

	Information Programme.....	30
	Sports News Programme.....	20
	News Camera Teams.....	60
	News Gathering Network.....	20
(7)	Programme Production Support... 400	
	Stage Set Design.....	30
	Art Design.....	30
	Graphic Design.....	30
	Still Photography.....	20
	Special Effect	10
	Announcer Pool.....	50
	Technical Support.....	30
	Remote Pickup-OB Van.....52 (Jakarta only)	
	-MPU	24
	-EFP, ENG...94	
	Film Camera Team.....	30
(8)	Overseas Radio Broadcast Service..120	
	Europe (west)	15
	Europe (east)	10
	Middle East	10
	North West Asia	10
	South East Asia (ASEAN)..20	
	Pacific, Oceania	10
	North America	15
	Central, South America...15	
	Foreign News Monitoring..15	
(9)	Programme Production Team	1090
	Radio Studio Operation..440	
	TV Studio Operation650	
(10)	Programme Post Production.....	50
(11)	Programme Transmission.....	45
(12)	News Centre Operation.....	50
(13)	Studio Supporting (VTR, Telecine)..30	
(14)	Studio Daily Maintenance.....	45

Table 9-1(4)

3.	Programme Transmission.....	<u>165</u>
(1)	Radio - Cimanggis	70
	- Kebayoran	35
(2)	TV & FM - Senayan	30
(3)	Daily Maintenance.....	30
4.	RTF Maintenance Centre	<u>275</u>
(1)	General Affairs	75
	Long Term Plan	5
	Annual Plan	10
	Coordination	30
	Facility Administration.....	30
(2)	Engineering	85
	Engineering Survey	20
	Design.....	20
	Construction	30
	Infrastructure	15
(3)	Maintenance Centre	
	Maintenance Plan	30 85
	Workshop (Central)	30
	Spare Parts Stock Control....	15
	Data Collection.....	10
(4)	Technical Development	30
5.	Listener's & Viewer's Service.....	<u>165</u>
(1)	Survey	80
	Population Coverage	30
	Receiving Condition	20
	Programme Reaction	15
	Opinion of listener/Viewer...	15
(2)	Technical Assistance	60
	Technical Guidance	30
	Promotion of good reception..	30
(3)	Statistics	10
(4)	General Service	15

Table 9-1(5)

6.	Administration Staff at Local Stations ..	<u>6,140</u>
	(except production staff)	
(1)	Nusantara Station (240X5).....	1,200
(2)	Regional-I Station (120X26).....	3,120
(3)	Regional-II Station (70X26).....	1,820
7.	Programme Production Staff	
	at Local Stations	<u>3,530</u>
(1)	Nusantara Station (108X5)	540
	Local Production:	
	RN-I Programme	600 minutes
	RN-III Programme	325 minutes
	Local Programme	600 Minutes
(2)	Regional-I Station (36X26)	936
	Local Production:	
	RN-I Programme	435 minutes
	Local Programme	360 minutes
(3)	Regional II Station (27X17).....	459
	Local Production:	
	RN-I Programme	310 minutes
	Local Programme	300 minutes
(4)	Radio Programme Remote Pickup	314
	Nusantara Station (10X5)	50
	Local Station (6X44)	264
(5)	TV Local Key Station(60X11).....	660
	Local Production	220 minutes
(6)	TV Programme Remote Pickup	607
	OB Van Operation (13X9)	117
	MPU Operation (8X27)	216
	EFP Operation (6X27)	162
	ENG Operation (4X28)	112
(7)	Others	14

CHAPTER 10 THE ADVANCEMENT METHOD
OF LONG-TERM PLAN

CHAPTER 10 THE ADVANCEMENT METHOD OF LONG TERM PLAN

1. As having stated up to foregoing chapters, to expand more efficiently and economically both activities of radio and TV broadcasting first of all intends to integrate the both organizations of radio and TV broadcasting, and arrange a system by which sections which are common to both organizations, especially administrative and construction sections will be able to be operated uniformly.

2. By that integration of organizations, promotion of various items of the plan stated below will be made harmoniously along with the direction shown in this long-range plan, and determination of establishing its basis by the 21st century and preparation for the big activities in the 21st century will be made.

- a. Qualitative and quantitative completion of broadcasting programmes.
- b. To commence new national broadcasting service around educational and cultural programmes especially and to intend to expand their service area.
- c. To expand transmission facilities as to diffuse throughout the nation stable broadcasting signal in good quality.
- d. To intend the completion of programme production facilities in order to produce programmes with higher degree and good quality.
- e. To arrange properly the national programmes (RN-I and TVN-I), regional and local broadcasting programmes in order to conduct the broadcasting service more closely related to inhabitants of each region, make effort to promote the expansion and improvement of radio & TV programme transmission network in cooperation with PERUMTEL.
- f. To develop the countermeasure for listeners and viewers widely which has not been conducted so actively owing to geographical situations, etc. and to grasp response and demands of listeners and viewers to the broadcasting and to make those reflect to planning, programming and improvement of network.

- g. Moreover, in parallel to above mentioned countermeasure for listeners and viewers, to intend progress of license fee income thus try to improve revenue and expenditure of activities.
- h. To establish training system of staff to maintain distinguished broadcasting programme and engineering staff supporting those activities.
- i. To arrange maintenance system of broadcasting facilities nationally and to intend to utilize effectively the existing various facilities.

3. To try to limit the content of this long-range plan to that of which realizability is high, and at realization of the plan the effort to remove the matter which is a kind of forecast of the future including uncertain elements will be made as well as possible.

4. To complete the function of Directorate of Engineering Centre established newly in order to intend the unification of construction plan and to intend smooth promotion of building work and besides, to expand more the activities of Maintenance Centre in order to establish maintenance system of existing facilities.

5. To look at again the long-range plan every year and to add necessary amendment by reflection of the result of the plan execution every year, and at the same time, to amend a part of direction of the plan according to necessity in order to deal with change etc. of a national demands and social surroundings.

6. On the other hand, on the occasion of a plan every year to decide appropriateness of selection of plan along with to make the priority order of the plan clear in the light of long-term prospect made in this long-term plan.

7. For this, to look at again about the long-range prospect at early time of each 5-year plan and to make needed amendment of direction and to try to make long-range plan not to be commonplace and losing of utility value.

8. About 863 bRp in the total, namely 40 bRp in the first year and 79 bRp in last year and 57.5 bRp in annual average as a sum of an investment for facilities during this long-term plan is judged as appropriate considering forecast of increase in license fee income, GDP and forecast of increase in governmental investment.

PART IV FORECAST OF THE RESULT AND SOCIAL
ESTIMATION OF LONG-TERM PLAN

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in the context of public administration and government operations. This section also highlights the role of technology in streamlining record management processes and reducing the risk of data loss or corruption.

2. The second part of the document focuses on the implementation of robust internal controls and risk management frameworks. It outlines the need for regular audits and assessments to identify potential vulnerabilities and ensure compliance with relevant laws and regulations. This section also discusses the importance of fostering a culture of integrity and ethical behavior among all employees and stakeholders.

3. The third part of the document addresses the challenges of data security and privacy protection in the digital age. It emphasizes the need for strong encryption protocols, access controls, and regular security updates to safeguard sensitive information from unauthorized access and cyber threats. This section also discusses the importance of educating employees about data security best practices and the potential consequences of data breaches.

4. The fourth part of the document discusses the importance of effective communication and stakeholder engagement. It emphasizes the need for clear, concise, and timely communication to ensure that all parties involved in the process are well-informed and aligned with the organization's goals and objectives. This section also discusses the importance of listening to feedback and addressing concerns in a transparent and responsive manner.

5. The fifth and final part of the document provides a summary of the key findings and recommendations. It reiterates the importance of maintaining high standards of transparency, accountability, and integrity in all operations. It also provides a clear roadmap for implementing the recommended measures and ensuring ongoing monitoring and improvement of the organization's performance and compliance.

PART IV FORECAST OF THE RESULT AND SOCIAL ESTIMATION OF LONG-TERM PLAN

The republic of Indonesia has been intending to develop the basic industries and the relevant modern production industries starting from the development of industries for agriculture and, furthermore to realize the modernized and highly industrialized nation supported by the stable economical background until the year of 2000 along with the 6 consecutive 5-year development plans.

It is observed that the final target of the national development plan is, after all, to develop the human ability which is contributive to the national development by conducting the development of human resources. Therefore, the national broadcasting organization have to cooperate and contribute to the promotion of this national development plan by deploying the overall abilities which is derived from the radio and television broadcasting activities.

It is expected that the following improvement can be materialized by executing the various items proposed in this long-term integrated development plan of broadcasting activities.

- a) Enlargement of broadcasting service area -- the broadcast signal will be disseminated to all over the country and all of the nation will be able to receive radio and television broadcast in good receiving condition.
- b) Extension of broadcasting hour -- the most up-to-date news and information can be heard by the listeners at any time and it will be possible to receive the most favourite programme chosen in accordance with the living pattern of each listener.
- c) Production of multifarious programmes -- 3 radio programme systems and 2 TV programme systems are effectively programmed to meet with a variety of demands which is asked for the broadcasting service by the listeners and viewers.
- d) Qualitative improvement of programme -- FM Broadcast service in radio broadcast and full colourization of TV programmes in TV broadcast will be realized to be able to fully response to the demands of listeners and viewers for the better broadcasting service.

- e) Improvement in the reception service -- to realize the more close communication between broadcaster and receiver to reflect the opinions of receiver into the programming and to make broadcasting service more useful to the development of Indonesian human resources.

If this long-term plan shifts smoothly and various plans are executed, the following results can be expected.

1. Expansion of Radio Broadcasting Service

(1) Radio broadcasting stations:

	1985		1999
a. Programme RN-I stations:	49	----	135
b. Programme RN-II stations:	1	----	95
c. Programme RN-III stations:	1	----	120

The population coverage of favorable reception of the above broadcasting services is estimated as follows:

- a. RN-I: 100% (30% by short wave)
- b. RN-II: 80% (15% by short wave)
- c. RN-III 70% (FM broadcast)

(2) Radio Programme Production Facilities (Studios)

As a result of the increase of studios in the Central station, 'Nusantara' stations and local stations in order to uplift the radio broadcasting hour and the programme systems as planned, the number of studios on the respective levels of stations at the end of the long range plan would be:

Central station, 23 studios; 'Nusantara' station, six each; local station, three to four each, and the following air time would be feasible:

- RN-I: 24 hours daily
- RN-II: 18 hours "
- RN-III 18 hours "

As regards RN-I broadcast, a 24-hour daily service would realize at all stations in the country, facilitating the reception of this programme service everywhere in the country.

2. Expansion of TV Broadcasting Service

(1) TV Stations:

	1985		1999
a. TVN-I service stations:	212	----	356
b. TVN-II service stations:	1	----	110

The population coverage of favorable TV service reception in respect of TVN-I would reach 80% on the national basis and in such densely populated areas as Jawa and Sumatera, the coverage would be come nearly 100%. In other regions, people could receive TV service, either on the national network or on the local service in leading cities.

It would also become possible to receive the educational programmes in major cities in the country.

(2) TV Studios

As a result of the establishment of TV programme production facilities to cope with the increase in the TVN-I service hour and the start of TVN-II service at the central station at Jakarta and local stations, a total of 59 studios for colour TV production would go into operation, including 15 at the Jakarta station, two each at stations at major cities and one each at 20 local stations. These facilities would be able to produce TV programmes daily for 18 hours of TVN-I service and 17 hours of TVN-I service.

3. Improvement of Broadcasting Service

In order to promote the unity of the multiracial state of Indonesia, enhancing nationalism, it is imperative that the programmes prepared at the Central station at Jakarta be received by all the people in the country. On the other hand, ethnic culture and folk arts are still widely preserved in various regions of the land together with local ethnic languages. In such circumstances, it is also important to supply

broadcasting service so as to meet regional interests. To satisfy these demands, there is need to supply programmes closely related to the respective inhabitants. Therefore, programmes may have to be compiled in an adequate ratio among ones for the national network, those for regions and remote localities so that programmes specifically oriented to specific localities may be put on the air in an appropriate time zone. It is so planned that towards the end of this long range plan, RN-I programmes may be received on the national network from Jakarta, regional programmes from 'Nusantara' stations and local programmes from respective local stations by the listeners according to the broadcast time table.

In respect of the national network of TVN-I, the similar arrangement is planned to be made to facilitate reception of the national service as well as the local station service accordingly.

4. Diversification of Programming

Since the broadcasting service is beamed to unspecific masses of people, it is difficult to satisfy every and all of the listeners, even if programmes are compiled with the life of the people in the region in mind.

To remedy the situation, a method now being widely adopted in various countries is a system of simultaneous broadcasting of different channels of programmes allowing a wide range of the option of programme reception by the listeners. In Indonesia, three channels of radio broadcast and two channels of telecast would be made available for parallel receptions toward the end of the long range plan.

5. Improvement of Programme Making Mobility & Extension of Mobility Range

During the period of this long range plan, in addition to the preparation of studios for programme production, field pick-up vans, about 60 for radio and 13 for TV are planned to be allocated to various stations. Besides, over 100 sets of equipment such as MPU, EFP and ENG etc. are to be installed over the period. These would facilitate programme production in principal cities fitting to the respective

localities, eventually enriching the contents of programmes further promoting cultural exchange among people in different regions of the country.

6. Social Estimation

By national diffusion of broadcasting services, contribution of followings will be expected.

- a. To promote the diffusion of standard language usable commonly by multiracial nation having many languages.
- b. To improve the quality of teacher and to compensate the shortage in educational institutions and teachers and to progress school education.
- c. By systematic educational broadcasting every class of nation will be able to intend to make self-enlightenment and progress the knowledge and skill according to each job field and the level of ability.
- d. To furnish healthy entertainment and to enhance sentiments of the nation.
- e. To let the nation know correctly about the tendency of national development plan, and urge to participate in national activities.
- f. To promote exchange between nation of each region who differ each other living surroundings and manners and customs, and to build up common national consciousness.

As a result of nationwide development of radio and TV broadcasting service, every people of the country can equally enjoy the benefits of broadcast and, accordingly, it is estimated that the number of radio and TV receiving set in use will be zoomed up to the order of 46,000,000 and 18,900,000, respectively.

To meet with the needs of such large amount of receiving set, the production activity of radio and TV receiving set in the domestic electronics industry will also be stimulated and in conjunction with the popularization of the radio and TV receiving set, the annual income from the license fee will also increase up to the order of 400 billion Rp as shown in Attached Figure.

This amount of income may be more than enough for the operation of broadcasting organization on a self-paying basis and the surplus can be allotted to the investment for enlargement of the broadcasting facilities.

In the republic of Indonesia such as composed of multi-racial population and holding a large territories, it is substantially necessary to continue further effort to improve and develop the broadcasting activities.

At the end of this long-term integrated development plan, though the nationwide diffusion of RN-I programme service will be completed for the time being, it is needed to continue the effort of transfer of shortwave transmitting facilities to mediumwave transmitting facilities in order to realize the more stable radio broadcasting service will offer the great contribution and benefits to every level of the people in the country as the common treasure of the nation.

Attached Figure

Growth of Revenue

