3.2.3 Northeastern Region

(1) Outline

This district is a big plain except a part of Kalasin and Sakhon Nakhon Provinces. Therefore, it is advantageous to use a broadcasting station with high power. The center of the city of the surrounding area which are convenient for operation and maintenance should be selected.

The transmitting point will have a distance of about 100 - 150 Km in the same way as the plain in the northern region.

Program will be transmitted mostly using microwave relay link.

(2) Facilities per station

NE-1 Nakhon Ratchasima

Nakhon Ratchasima is located at the entrance to a wide plain which constitutes the northeastern part of Thailand. Space is wide and population is bit. There is no high hill convenient for service nearly. After all, it is advantageous to cover a wide area by constructing a steel mast of 150 m high at the location where the present translator station is located in the suburbs of Nakhon Ratchasima city.

Broadcast programs will be sent from the microwave repeating terminal station in the city by STL (radio).

TABLE NE-1-1 Main Specifications of Nakhon Ratchasima Station

Name of Station		Nakhon Ratchasima
Type of Station		TV Broadcasting Station
Transmitting Site	Site	Ref. to Fig. NE-1-1
	Latitude and Longitude	14°57'14" N. 102°03'43" E.
	Altitude	200 m
	Access Road	—
Transmitting Channel No.		6, 8
Transmitting Antenna	Height of Mast	150 m, Ref. to Fig 3-1-8
	Polarization	Horizontal
	Required E.R.P.	Max. 100 kW, Ref. to Fig. NE-1-2
Output Power of Transmitter		10 kW, Ref. to Fig. NE-1-3 & Table NE-1-2
Service Area	Area	Greater Part of Nakhon Ratchasima Province and Some Part of Buri Ram Province
	Population Covered	962,000 persons
Studio	Building	—
	Facilities	—
Receiving Station	Name	—
	Site	—
Master Station		—
Station Building		199 m^2, Ref. to Fig. 3-1-1 & Fig. 3-1-5
(Thousand Bahts) Construction Cost (1st Channel)	Equipment	5,870
	Building, Road, etc.	400
	Total	6,270

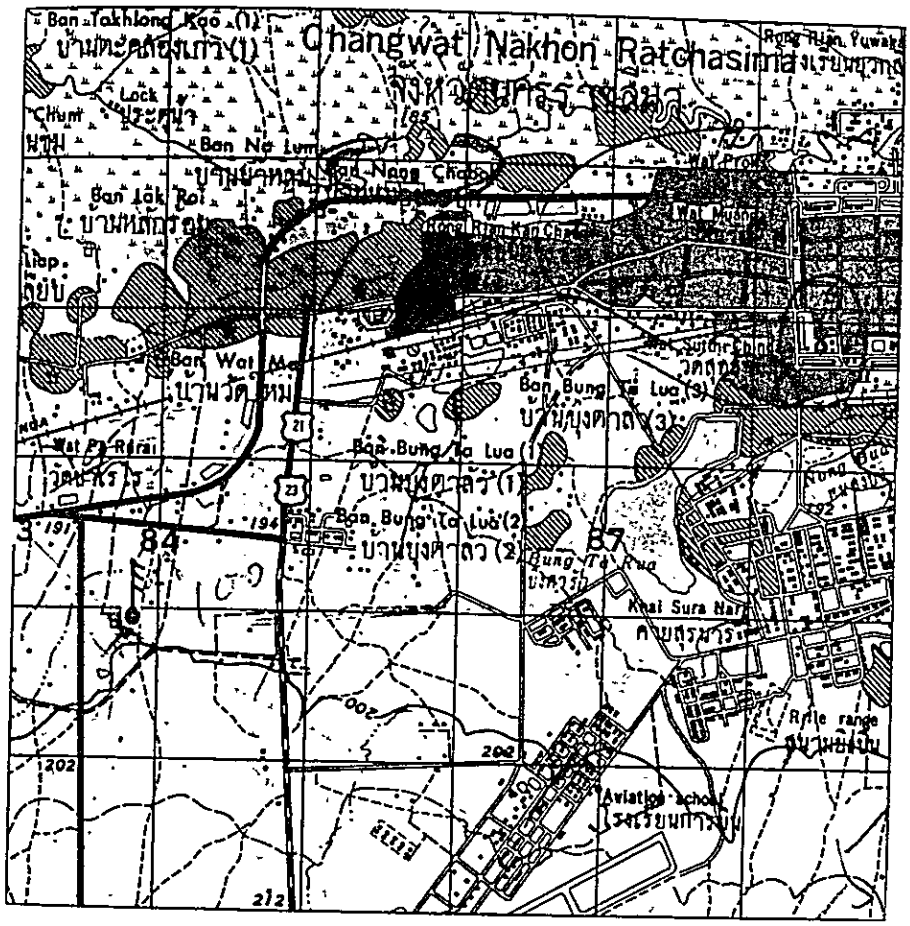

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Fig. NE-1-1 LOCATION OF TRANSMITTING SITE (NAKHON RATCHASIMA STATION)

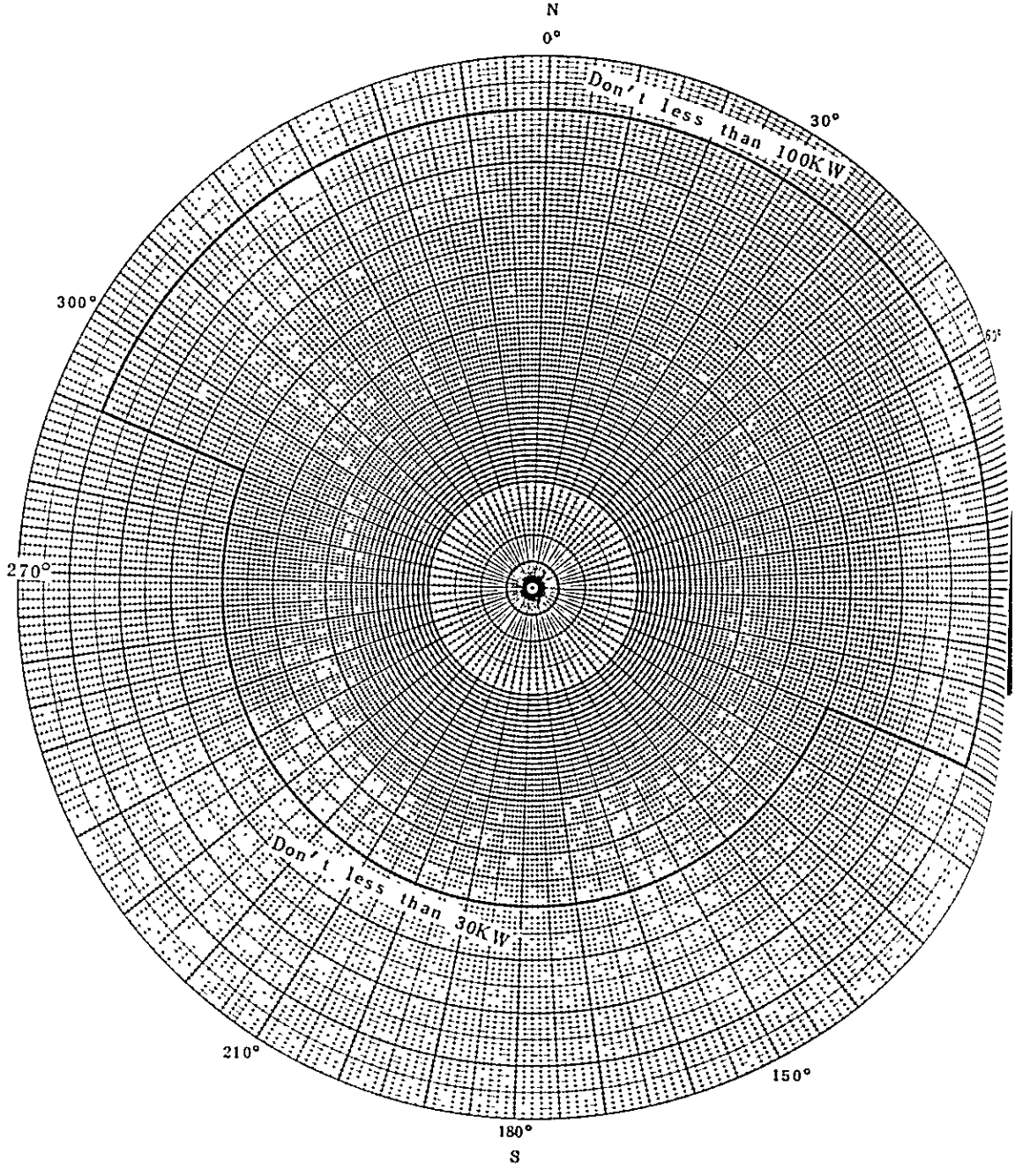


Fig. NE-1-2 HORIZONTAL PATTERN OF REQUIRED E.R.P. (NAKHON RATCHASIMA STATION)

TABLE NE-1-2 List of TV Transmitting Facilities

Nakhon Ratchasima Station, 1st Channel

Item	Description	Q'ty
(A)	TV Transmitting Facilities	1 set
1.	10 KW TV Transmitter	1 set
2.	Output Coaxial Equipment (Including Air Cooled Test Load)	1 set
3.	Transmitting Antenna	1 set
4.	Transmitting Feeder System	1 set
5.	150 Meters Antenna Mast	1 set
6.	Transmitter Input and Monitoring Equipment	1 set
7.	Measuring Instruments	1 set
8.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
9.	Emergency Power Supply	1 set
(B)	Microwave ST-Link Equipment	1 set
1.	Microwave Televevision Relay Equipment	1 set
2.	Program Input and Monitoring Equipment	1 set
3.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
4.	Emergency Power Supply	1 set
(C)	Installation Materials	1 set
(D)	Minor Spare Parts	1 set

Nakhon Ratchasima Station, 2nd Channel (Future Extension)

Item	Description	Q'ty
(A)	TV Transmitting Facilities	
1.	10 KW TV Transmitter	1 set
2.	Output Coaxial Equipment	1 set
3.	Transmitter Input and Monitoring Equipment	1 set
4.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
5.	Emergency Power Supply	1 set
(B)	Microwave ST-Link Equipment	1 set
1.	Microwave Television Relay Equipment	1 set
2.	Program Input and Monitoring Equipment	1 set
3.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
4.	Emergency Power Supply	
(C)	Installation Materials	1 set
(D)	Minor Spare Parts	1 set

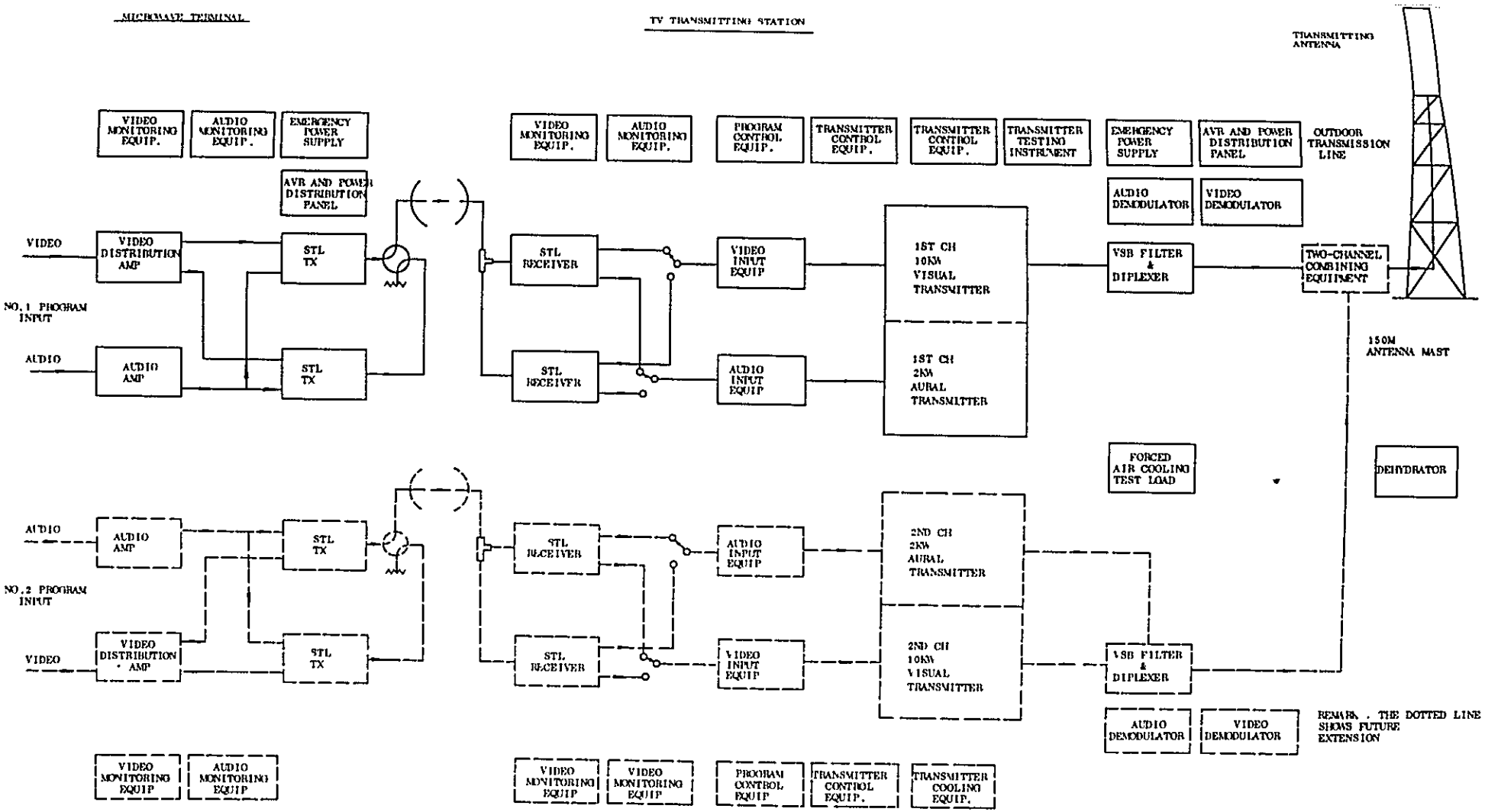


Fig. NE-1-3 SCHEMATIC DIAGRAM OF TV TRANSMITTING FACILITIES FOR NAKHON RATCHASIMA STATION

NE-2 Khon Kaen

The present transmitting site is the best. The Khon Kaen TV Station will have a studio for preparing its own programs. Therefore, programs will be transmitted from the microwave repeating terminal station to the studio building in the city via cable and then transmitted by the same method as the present one from the studio building through STL (radio). The existing broadcasting place, studio building and antenna mast will be used.

TABLE NE-2-1 Main Specifications of Khon Kaen Station

Name of Station		Khon Kaen
Type of Station		TV Broadcasting Station
Transmitting Site	Site	Ref. to Fig. NE-2-1
	Latitude and Longitude	16°28'38" N. 102°51'18" E.
	Altitude	200 m
	Access Road	—
Transmitting Channel No.		5, 7
Transmitting Antenna	Height of Mast	120 m
	Polarization	Horizontal
	Required E.R.P.	Max. 90 KW, Ref. to Fig. NE-2-2
Output Power of Transmitter		10 kW, Ref. to Fig. NE-2-5 & Table NE-2-3
Service Area	Area	Greater Part of Khon Kaen and Maha Sara Kham Province Some Part of Chaiyaphum Province
	Population Covered	1,019,000 persons
Studio	Building	—
	Facilities	Ref. to Fig. NE-2-3,4 & Table NE-2-2
Receiving Station	Name	—
	Site	—
Master Station		—
Station Building		—
(Thousand Bahts) Construction Cost (1st Channel)	Equipment	4,598 + 8,250
	Building, Road, etc.	—
	Total	4,598 + 8,250

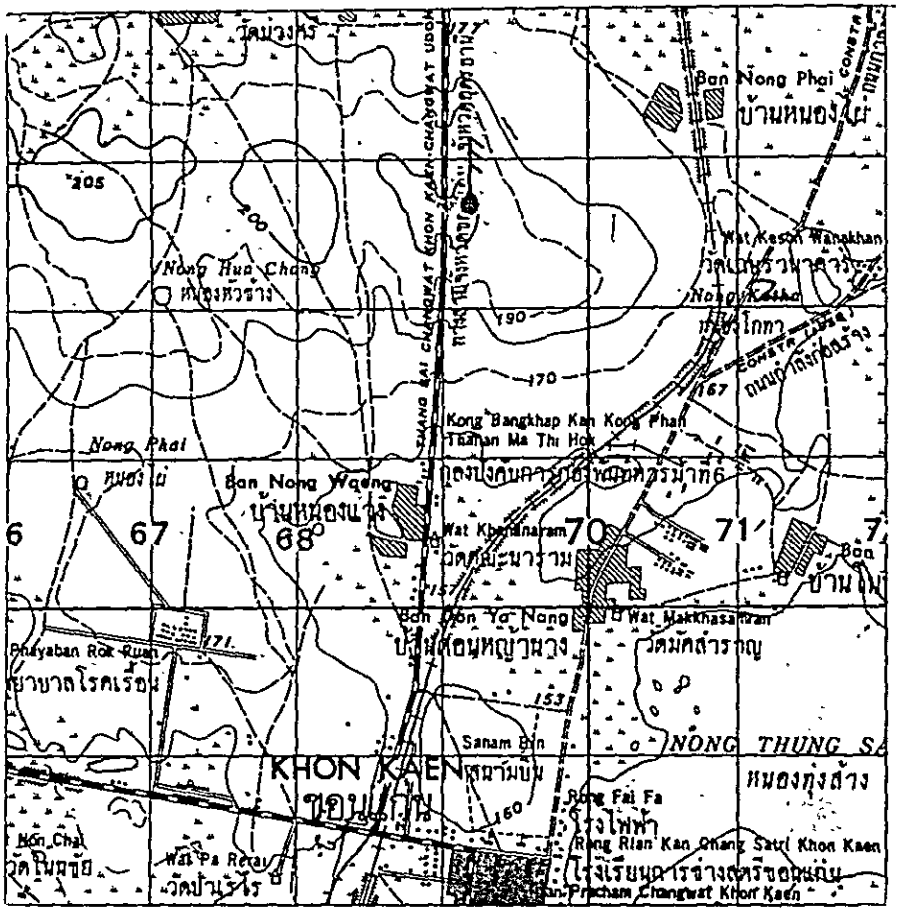


Fig. NE-2-1 LOCATION OF TRANSMITTING SITE (KHON KAEN STATION)

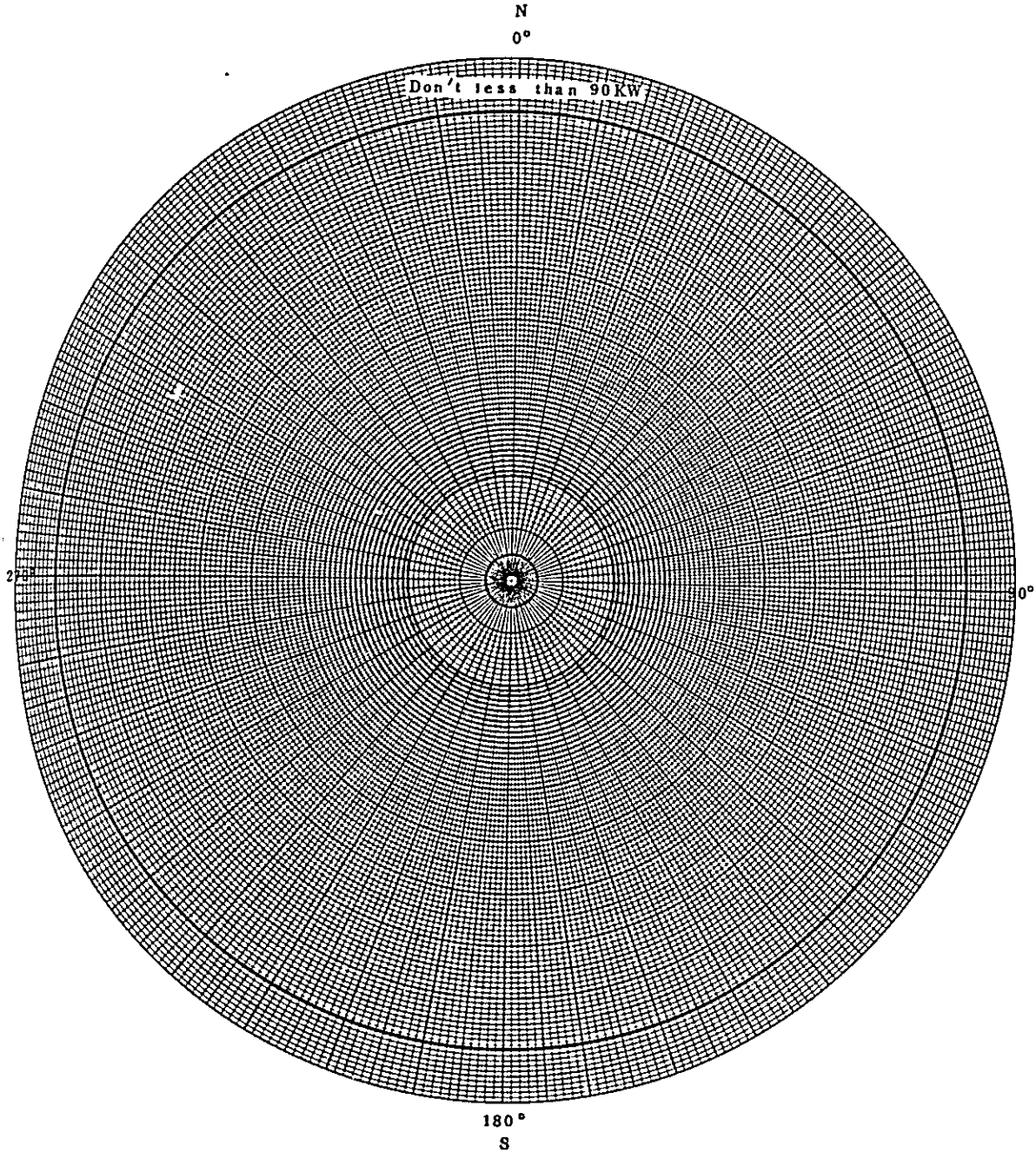


Fig. NE-2-2 HORIZONTAL PATTERN OF REQUIRED E.R.P.
(KHON KAEN STATION)

TABLE NE-2-2 LIST OF TV STUDIO FACILITIES

Item	Description	Q'ty
1	STUDIO EQUIPMENT	
	1. 4-½" Image orthicon camera chain	2 sets
	2. Video mixer	1 set
	3. Microphones and microphone boom stands	1 lot
	4. Picture monitors	1 lot
	5. Studio lighting equipment	1 lot
	6. Monitor speaker	1 lot
2.	MASTER CONTROL ROOM	
	1. Video control console	1 set
	2. Audio control console	1 set
	3. Picture monitors	1 lot
	4. Monitor speakers	1 lot
	5. Master monitor (picture and waveform monitor)	1 set
	6. Turn table (disc reproducer)	1 set
	7. Tape recorder and reproducer	1 set
	8. Sync. signal generator	1 set
	9. Video tape recorder	2 sets
	10. Vidicon film camera	1 set
	11. 16mm film projector	2 sets
	12. Slide projector	1 set
	13. Opaque scanner	1 set
	14. Off air check receiver	1 set
3.	TEST EQUIPMENT	
	1. Test equipment	1 lot
4.	TV OUTSIDE BROADCASTING SYSTEM	
	1. TV outside broadcasting van	1 set
5.	SPARE PARTS	
	1. Spare parts	1 lot

Item	Description	Q'ty
6.	INSTALLATION MATERIALS	
	1. Installation materials	1 lot
7.	CABLE LINK EQUIPMENT	
	1. Video and audio terminal equipment	1 set
	2. Transmission line	1 set
	3. Microwave IF demodulator	1 set
	4. Monitoring equipment	1 set

TABLE NE-2-3 List of TV Transmitting Facilities

Khon Kaen Station, 1st Channel

Item	Description	Q'ty
(A)	TV Transmitting Facilities	1 set
	1. 10 KW TV transmitter	1 set
	2. Output Coaxial Equipment (Including Air Cooled Test Load)	1 set
	3. Transmitting Antenna	1 set
	4. Transmitting Feeder System	1 set
	5. Transmitter Input and Monitoring Equipment	1 set
	6. Measuring Instruments	1 set
	7. Automatic Voltage Regulator and Power Distribution Equipment	1 set
	8. Emergency Power Supply	1 set
(B)	Cable Link Equipment	1 set
	1. Video and Audio Terminal Equipment	1 set
	2. Transmission Line	1 set
(C)	Installation Materials	1 set
(D)	Minor Spare Parts	1 set

Khon Kaen Station, 2nd Channel (Future Extension)

Item	Description	Q'ty
(A)	TV Transmitting Facilities	1 set
1.	10 KW TV Transmitter	1 set
2.	Output Coaxial Equipment (Including Air Cooled Test Load and Two-channel Combining Equipment)	1 set
3.	Transmitter Input and Monitoring Equipment	1 set
4.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
5.	Emergency Power Supply	1 set
(B)	Cable Link Equipment	
1.	Video and Audio Terminal Equipment	1 set
(C)	Installation Materials	1 set
(D)	Minor Spare Parts	1 set

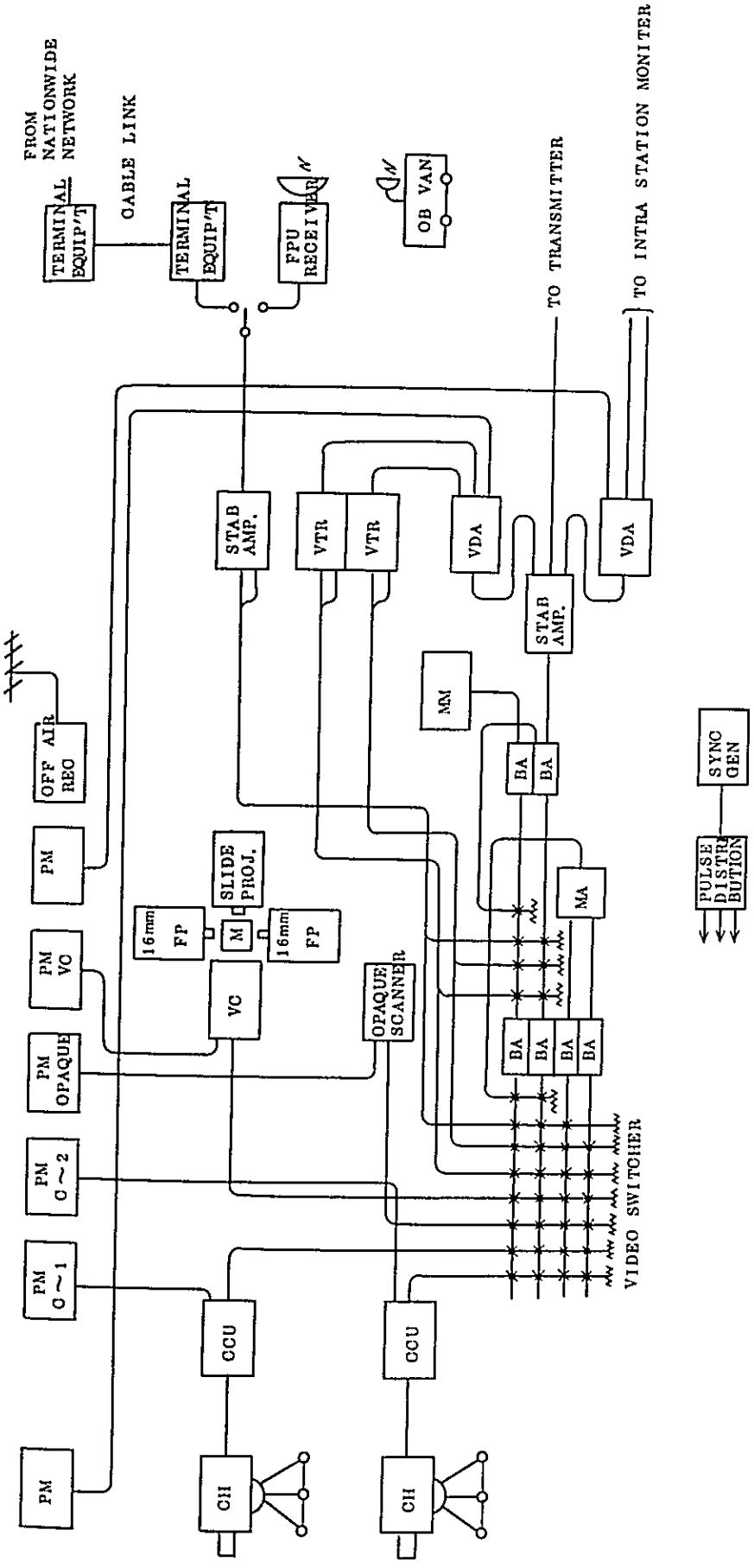
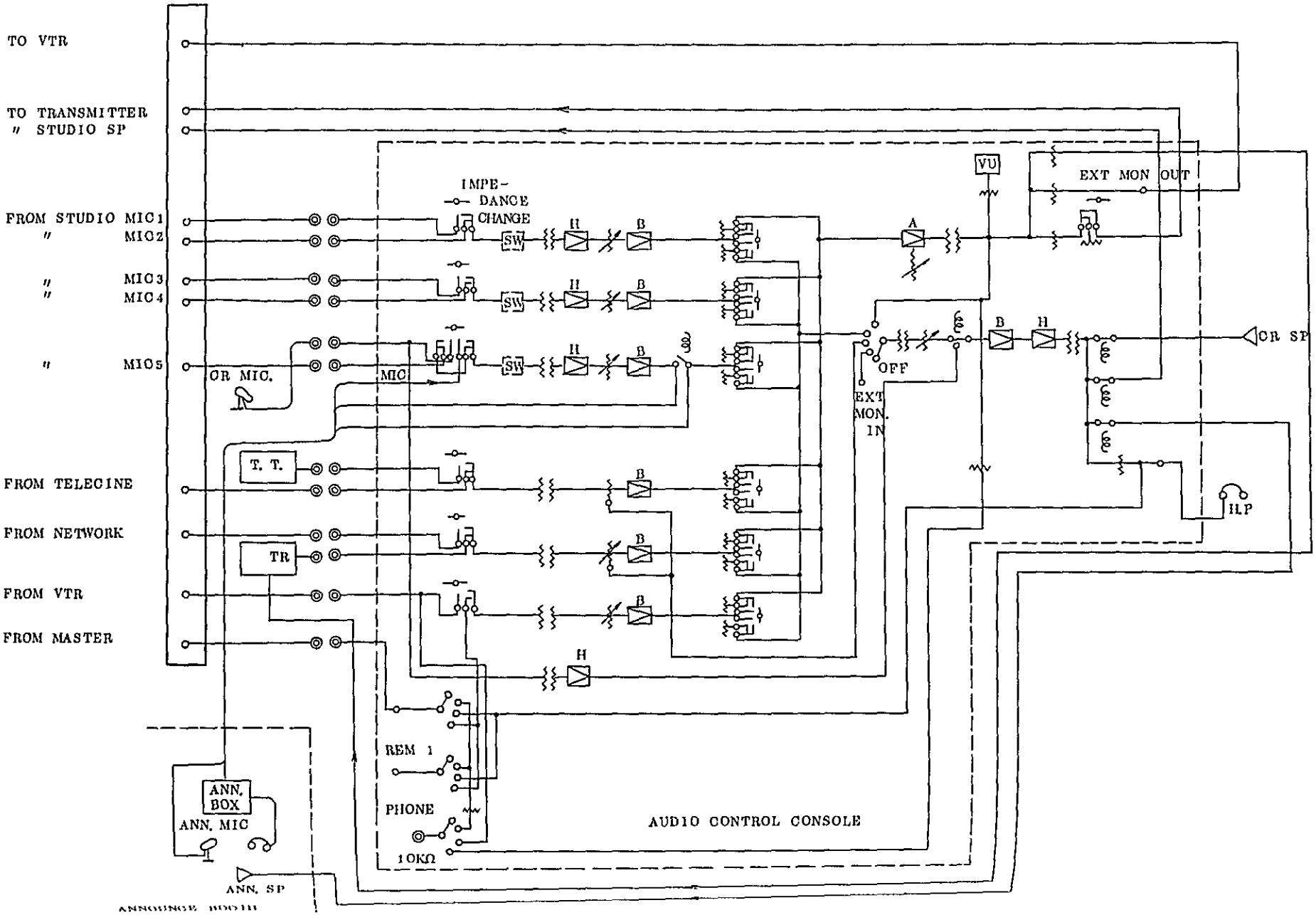


Fig. NE-2-3 VIDEO BLOCK DIAGRAM OF KHON KAEN STATION


TO VTR
TO TRANSMITTER
〃 STUDIO SP
FROM STUDIO MIC1
〃 MIC2
〃 MIC3
〃 MIC4
〃 MIC5
OR MIC.
MIC
IMPE-
DANCE
CHANGE
SW
H
B
A
VU
EXT MON OUT
OFF
EXT
MON.
IN
OR SP
ILP
T. T.
FROM TELECINE
FROM NETWORK
TR
FROM VTR
FROM MASTER
REM 1
PHONE
10KΩ
AUDIO CONTROL CONSOLE
ANN.
BOX
ANN. MIC
ANN. SP
ANNOUNCE BOOTH

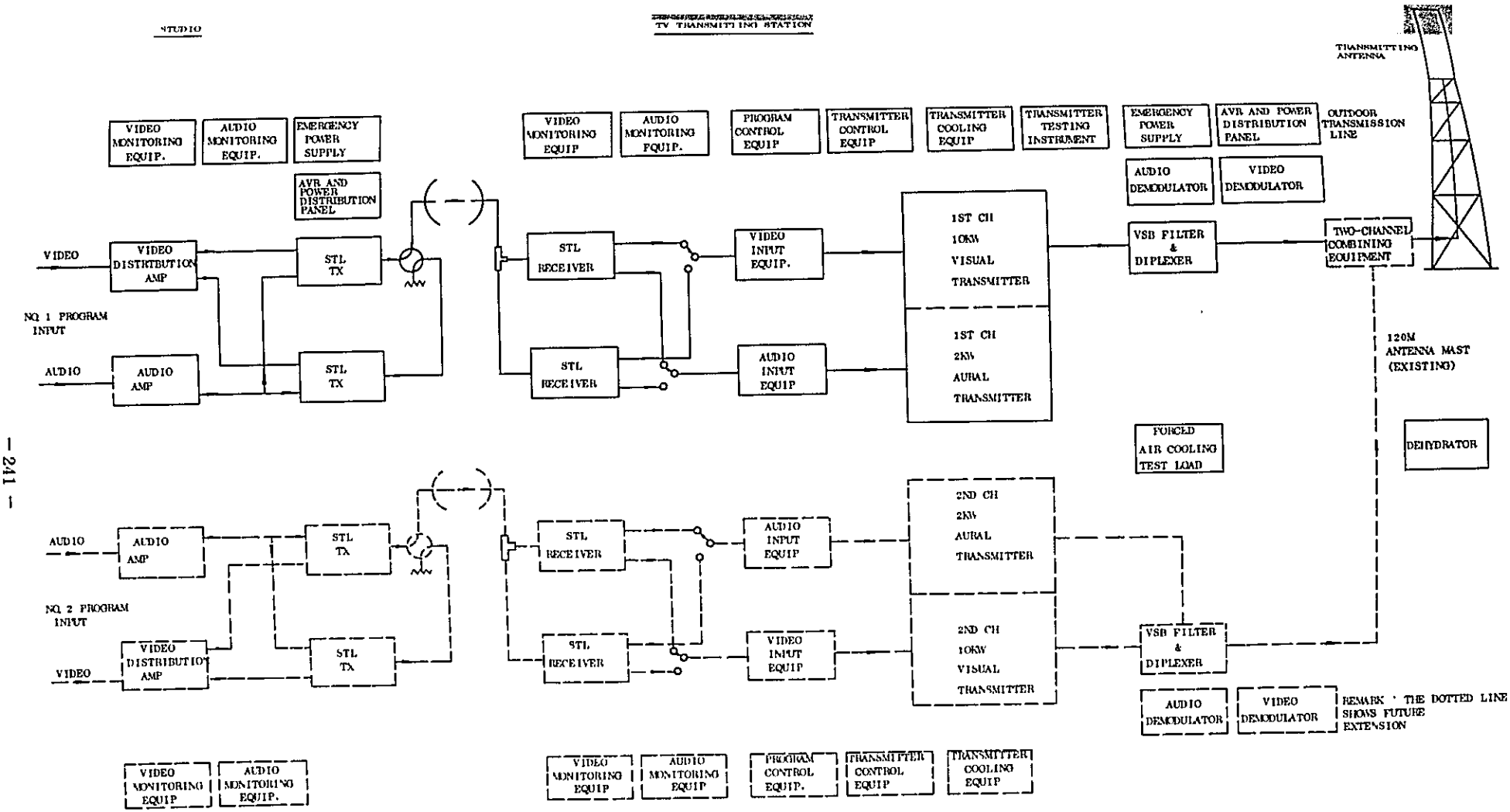


Fig. NE-2-5 SCHEMATIC DIAGRAM OF TV TRANSMITTING FACILITIES FOR KHON KAEN STATION

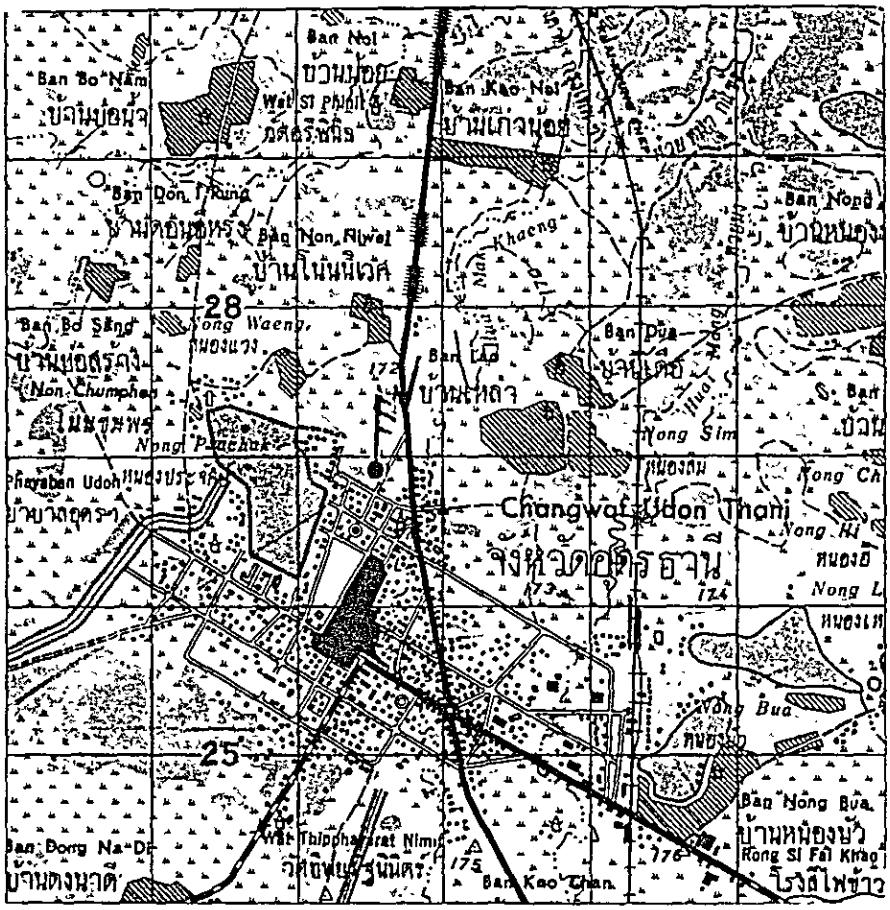
NE-3 Udon Thani

Nong Khai Province is located 30 kilometers north of Udon City. It is better to cover it together with Udon Province. Udon City is located in the central part of the two Provinces. It is most suitable as the transmitting point. However, due to the lack of proper hills, a mast 100 m high will be constructed at a location adjoining the microwave repeating terminal station in the city.

Broadcast programs will be supplied from the microwave repeating terminal station by the cable system.

TABLE NE-3-1 Main Specifications of Udon Thani Station

Name of Station		Udon Thani
Type of Station		TV Broadcasting Station
Transmitting Site	Site	Near the microwave relaying station Ref. to Fig. NE-3-1
	Latitude and Longitude	17°25'10" N. 102°47'37" E.
	Altitude	100 m
	Access Road	—
Transmitting Channel No.		9, 12
Transmitting Antenna	Height of Mast	100 m, Ref. to Fig. 3-1-9
	Polarization	Horizontal
	Required E.R.P.	Max. 90 kW Ref. to Fig NE-3-2
Output Power of Transmitter		10 kW, Ref. to Fig NE-3-3 & Table NE-3-2
Service Area	Area	Greater Part of Udon Province and some part of Nong Khai Province
	Population Covered	758,000 persons
Studio	Building	—
	Facilities	—
Receiving Station	Name	—
	Site	—
Master Station		—
Station Building		199 m^2 Ref. to Fig. 3-1-1 & Fig. 3-1-5
(Thousand Bahts) Construction Cost (1st Channel)	Equipment	4,666
	Building, Road, etc.	400
	Total	5,066



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AB12

Fig. NE-3-1 LOCATION OF TRANSMITTING SITE (UDON THANI STATION)

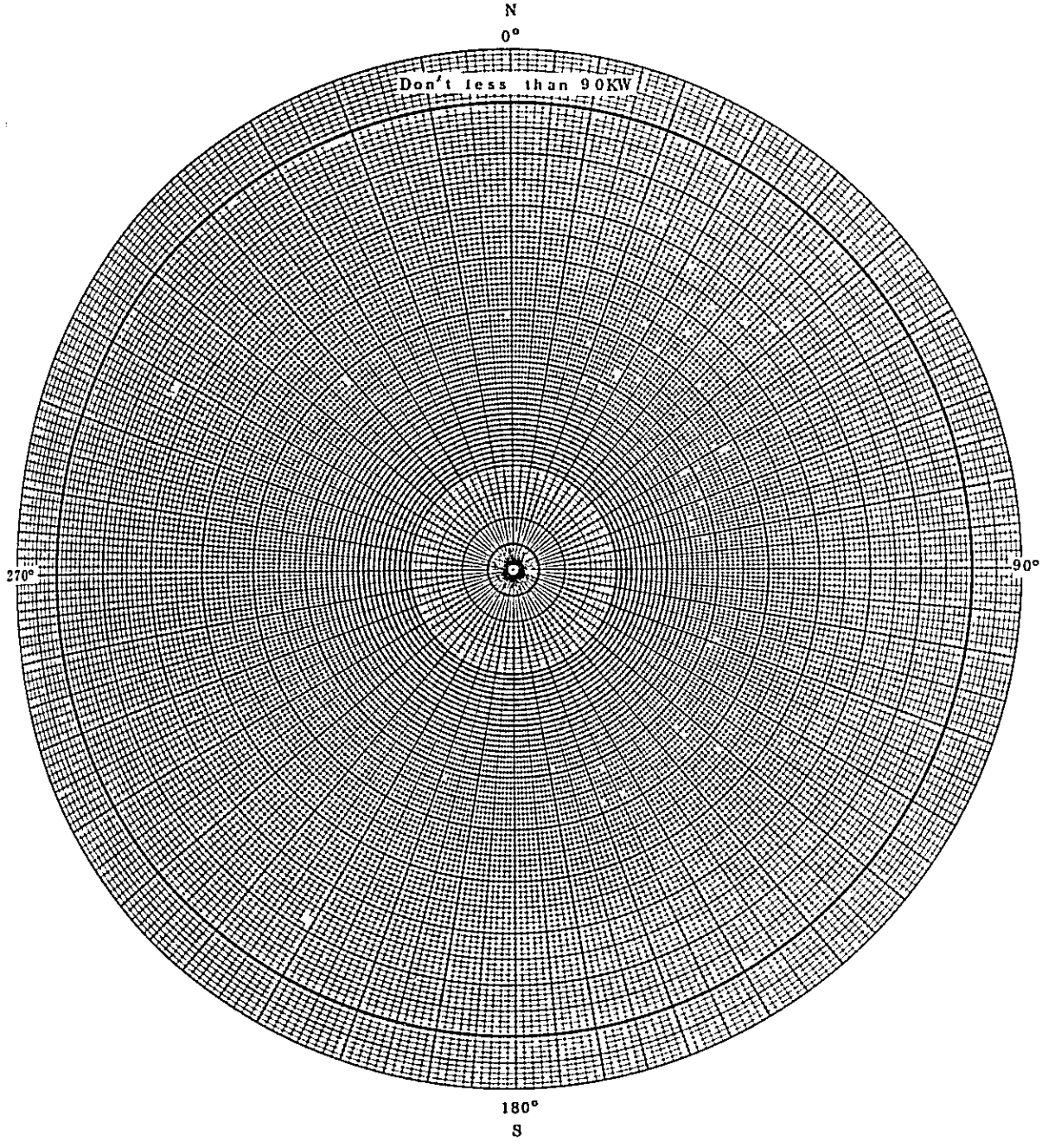

Fig. NE-3-2 HORIZONTAL PATTERN OF REQUIRED E.R.P.
(UDON THANI STATION)

TABLE NE-3-2 List of TV Transmitting Facilities

Udon Thani Station, 1st Channel

Item	Description	Q'ty
(A)	TV Transmitting Facilities	1 set
1.	10 KW TV Transmitter	1 set
2.	Output Coaxial Equipment (Including Air Cooled Test Load)	1 set
3.	Transmitting Antenna	1 set
4.	Transmitting Feeder System	1 set
5.	100 Meters Antenna Mast	1 set
6.	Transmitter Input and Monitoring Equipment	1 set
7.	Measuring Instrument	1 set
8.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
9.	Emergency Power Supply	1 set
(B)	Cable Link Equipments	1 set
1.	Video and Audio Terminal Equipment	1 set
2.	Transmission Line	1 set
(C)	Installation Materials	1 set
(D)	Minor Spare Parts	1 set

Udon Thani Station 2nd Channel (Future Extension)

Item	Description	Q'ty
(A)	TV Transmitting Facilities	1 set
1.	10 KW TV Transmitter	1 set
2.	Output Coaxial Equipment (Including Air Cooled Test Load and Two-channel Combining Equipment)	1 set
3.	Transmitter Input and Monitoring Equipment	1 set
4.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
5.	Emergency Power Supply	1 set
(B)	Cable Link Equipment	
1.	Video and Audio Terminal Equipment	1 set
(C)	Installation Materials	1 set
(D)	Minor Spare Parts	1 set

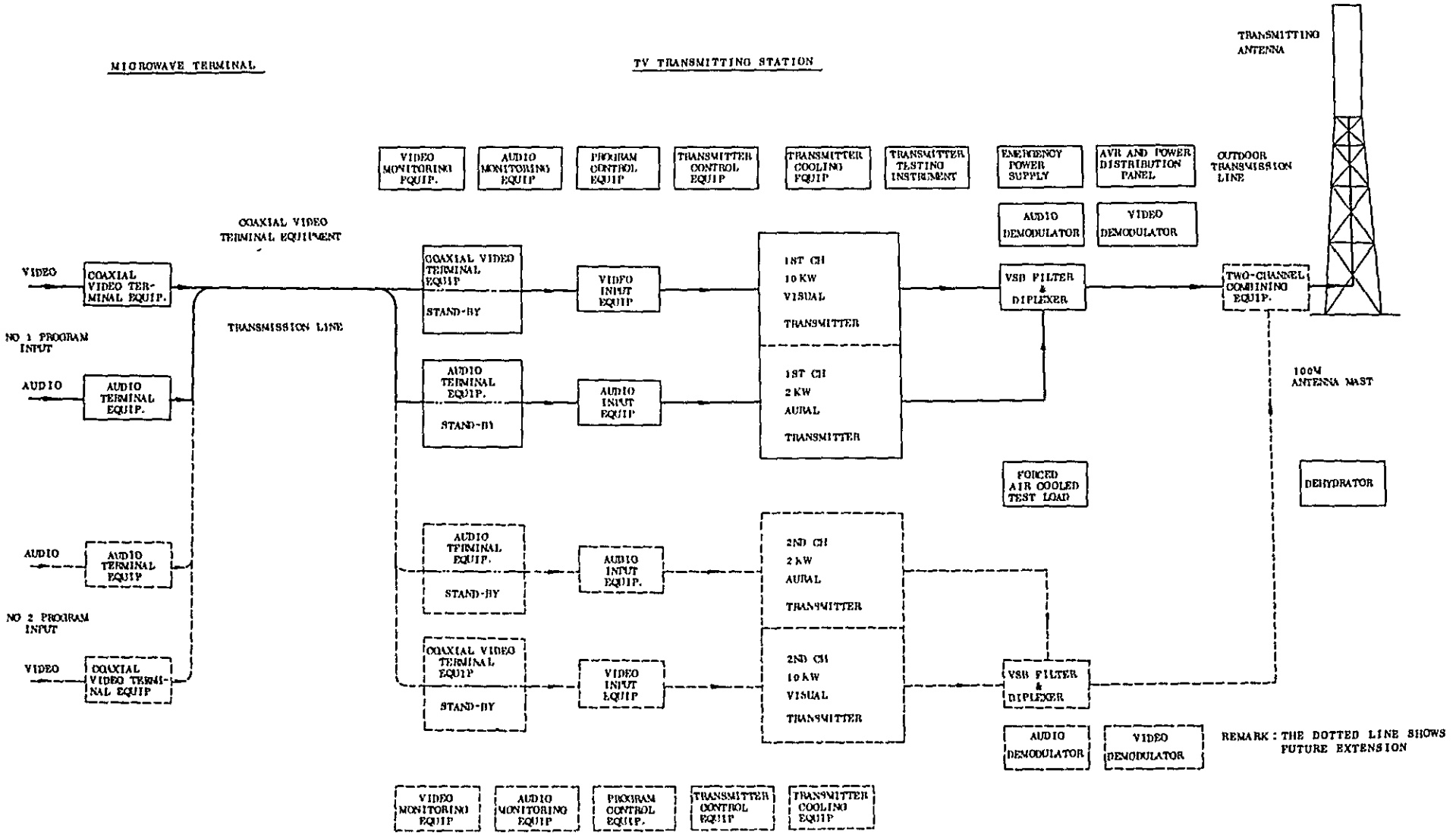

Fig. NII-3-1 SCHEMATIC DIAGRAM OF TV TRANSMITTING FACILITIES FOR

NE-4 Surin

Because there is no convenient hill for the transmitting point in this district, it is considered to construct 150 m iron mast near the microwave repeating terminal station in Surin City and cover there together with Buri Ram Province.

Programs will be sent from the microwave repeating terminal station through the cable system.

TABLE NE-4-1 Main Specifications of Surin Stations

Name of Station		Surin
Type of Station		TV Broadcasting Station
Transmitting Site	Site	Near the microwave relaying station Ref. to Fig. NE-4-1
	Latitude and Longitude	14°53'19" N. 103°29'44' E.
	Altitude	145 m
	Access Road	—
Transmitting Channel No.		10, 12
Transmitting Antenna	Height of Mast	150 m , Ref. to Fig. 3-1-8
	Polarization	Horizontal
	Required E.R.P.	Max. 90 kW, Ref. to Fig. NE-4-2
Output Power of Transmitter		10 kW, Ref. to Fig. NE-4-3 & Table NE-4-2
Service Area	Area	Greater part of Surin Province and about half part of Buri Ram Province
	Population Covered	827,000 persons
Studio	Building	—
	Facilities	—
Receiving Station	Name	—
	Site	—
Master Station		—
Station Building		199 m^2 Ref. to Fig. 3-1-1 & Fig. 3-1-5
Construction Cost (Thousand Bahts) (1st Channel)	Equipment	5,246
	Building, Road, etc.	414
	Total	5,660

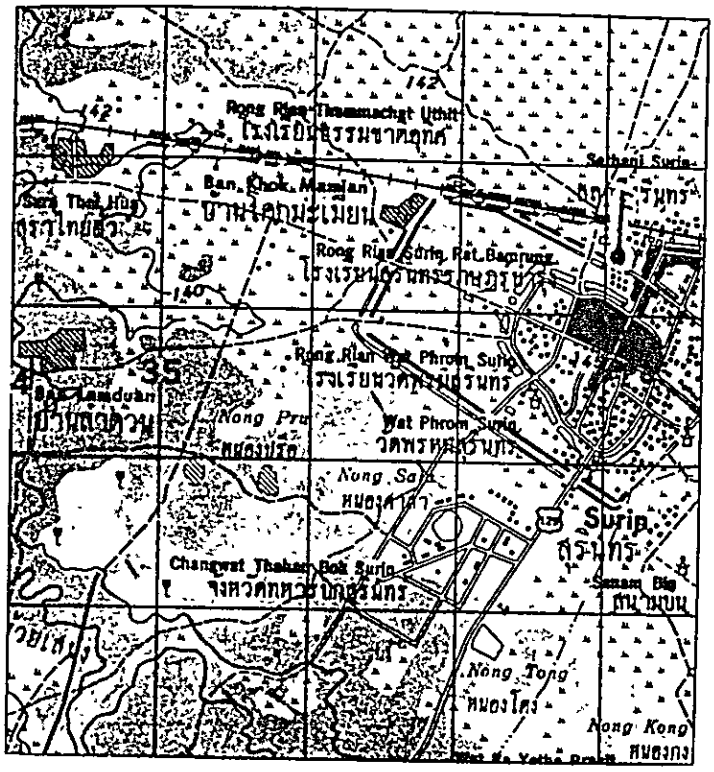

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Fig. NE-4-1 LOCATION OF TRANSMITTING SITE (SURIN STATION)

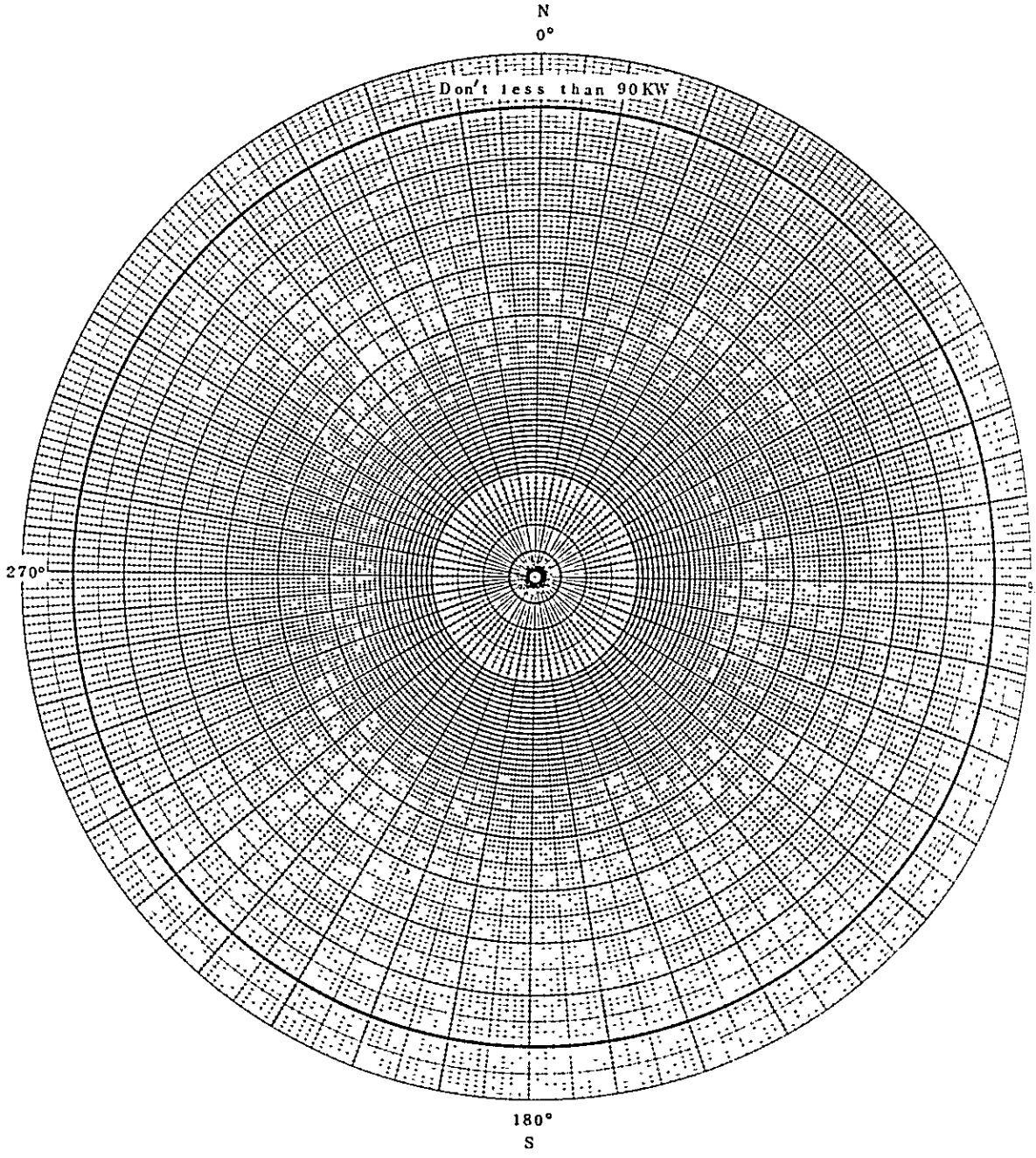


Fig. NE-4-2 HORIZONTAL PATTERN OF REQUIRED E.R.P.
(SURIN STATION)

TABLE NE-4-2 List of TV Transmitting Facilities

Surin Station, 1st Channel

Item	Description	Q'ty
(A)	TV Transmitting Facilities	1 set
1.	10 KW TV Transmitter	1 set
2.	Output Coaxial Equipment (Including Air Cooled Test Load)	1 set
3.	Transmitting Antenna	1 set
4.	Transmitting Feeder System	1 set
5.	150 Meters Antenna Mast	1 set
6.	Transmitter Input and Monitoring Equipment	1 set
7.	Measuring Instruments	1 set
8.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
9.	Emergency Power Supply	1 set
(B)	Cable Link Equipment	1 set
1.	Video and Audio Terminal Equipment	1 set
2.	Transmission Line	1 set
(C)	Installation Materials	1 set
(D)	Minor Spare Parts	1 set

Surin Station, 2nd Channel (Future Extension)

Item	Description	Q'ty
(A)	TV Transmitting Facilities	1 set
1.	10 KW TV Transmitter	1 set
2.	Output Coaxial Equipment (Including Air Cooled Test Load and Two-channel Combining Equipment)	1 set
3.	Transmitter Input and Monitoring Equipment	1 set
4.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
5.	Emergency Power Supply	1 set
(B)	Cable Link Equipment	
1.	Video and Audio Terminal Equipment	1 set
(C)	Installation Materials	1 set
(D)	Minor Spare Parts	1 set

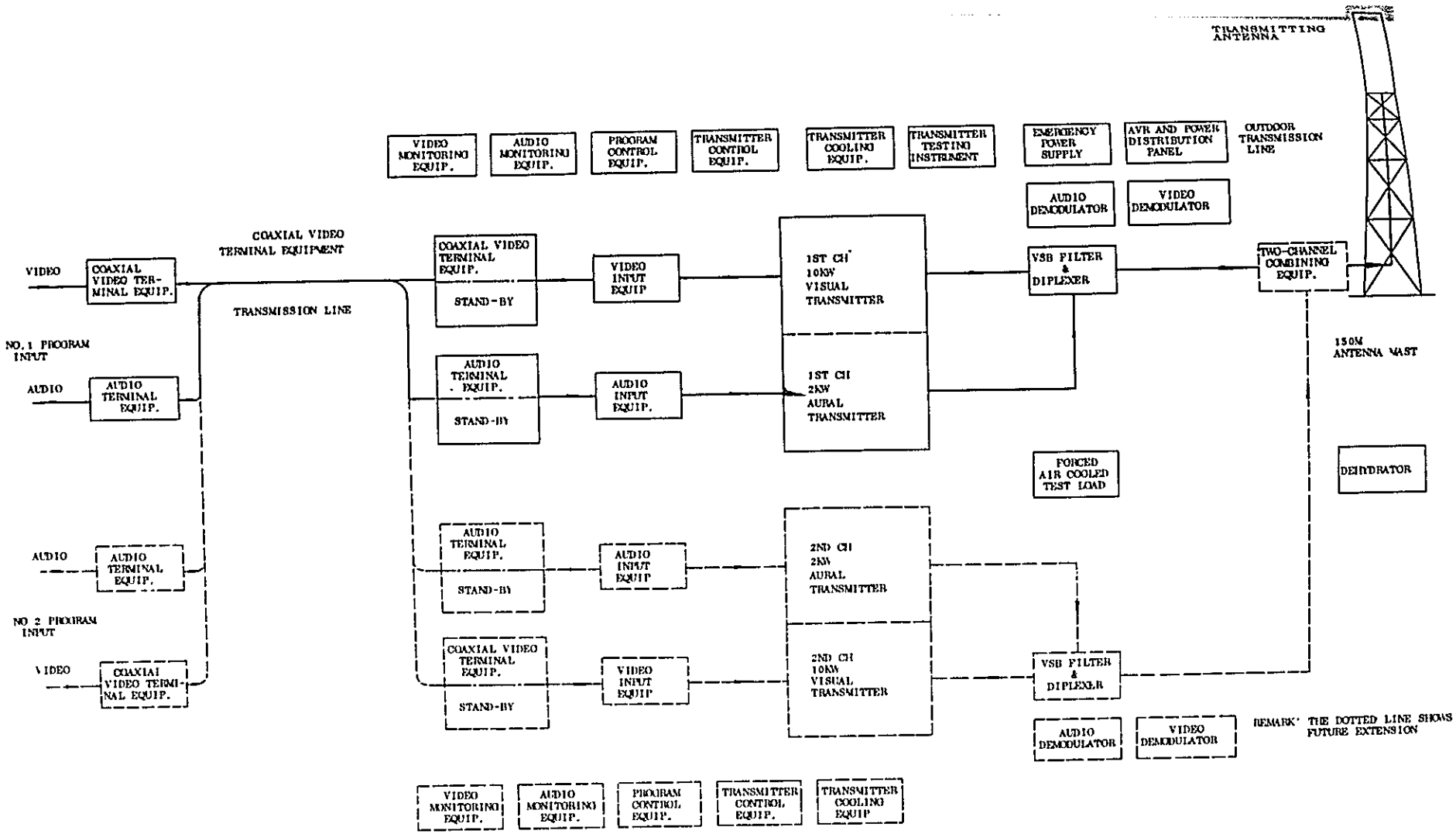


Fig. NE-4-3 SCHEMATIC DIAGRAM OF TV TRANSMITTING FACILITIES FOR SURIN STATION

NE-5 Ubon Ratchathani

Ubon Province is the largest Province in the northeastern region with a space larger than that of Nakhon Ratchasima Province. It is advantageous to construct a TV station to cover them together with the neighboring Si Sa Ket Province.

It is necessary to erect a high iron mast due to the lack of proper hills in the same way as others in these two provinces.

A place near the microwave repeating terminal station in the suburbs of Udon City is the best as its site.

Broadcast programs will be supplied from the microwave repeating terminal station through the cable system.

TABLE NE-5-1 Main Specifications Ubon Ratchathani Station

Name of Station		Ubon Ratchathani
Type of Station		TV Broadcasting Station
Transmitting Site	Site	Near the microwave relaying station Ref. to Fig. NE-5-1
	Latitude and Longitude	15°14'24" N. 104°51'14" E.
	Altitude	120 m
	Access Road	—
Transmitting Channel No.		5, 7
Transmitting Antenna	Height of Mast	150 m, Ref. to Fig. 3-1-8
	Polarization	Horizontal
	Required E.R.P.	Max. 90 kW, Ref. to Fig. NE-5-2
Output Power of Transmitter		10 kW, Ref. to Fig. NE-5-3 & Table NE-5-2
Service Area	Area	Greater Part of Ubon province and half part of Si Sa Ket Province
	Population Covered	1,032,000 persons
Studio	Building	—
	Facilities	—
Receiving Station	Name	—
	Site	—
Master Station		—
Station Building		199 m^2 Ref. to Fig. 3-1-1 & Fig. 3-1-5
(Thousand Bahts) Construction Cost (1st Channel)	Equipment	5,246
	Building, Road, etc.	400
	Total	5,646

Fig. NE-5-1 LOCATION OF TRANSMITTING SITE (UBON RATCHATHANI STATION)

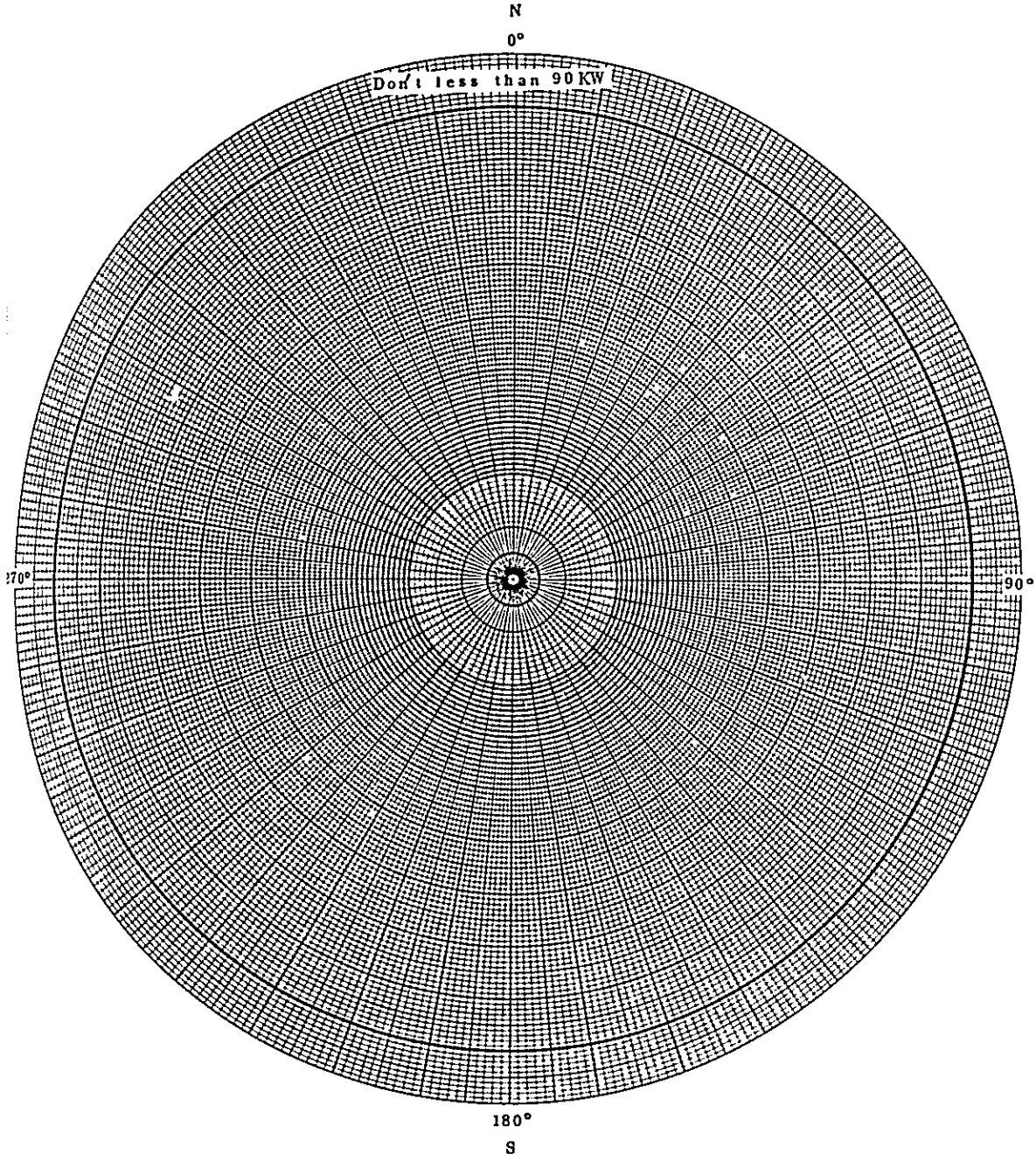


Fig. NE-5-2 HORIZONTAL PATTERN OF REQUIRED E.R.P.
(UBON RATCHATHANI STATION)

TABLE NE-5-2 List of TV Transmitting Facilities

Ubon Ratchathani Station, 1st Channel

Item	Description	Q'ty
(A)	TV Transmitting Facilities	1 set
1.	10 KW TV Transmitter	1 set
2.	Output Coaxial Equipment (Including Air Cooled Test Load)	1 set
3.	Transmitting Antenna	1 set
4.	Transmitting Feeder System	1 set
5.	150 Meters Antenna Mast	1 set
6.	Transmitter Input and Monitoring Equipment	1 set
7.	Measuring Instruments	1 set
8.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
9.	Emergency Power Supply	1 set
(B)	Cable Link Equipment	1 set
1.	Video and Audio Terminal Equipment	1 set
2.	Transmission Line	1 set
(C)	Installation Materials	1 set
(D)	Minor Spare Parts	1 set

Ubon Ratchathani Station, 2nd Channel (Future Extension)

Item	Description	Q'ty
(A)	TV Transmitting Facilities	1 set
1.	10 KW TV Transmitter	1 set
2.	Out put Coaxial Equipment (Including Air Cooled Test Load and Two-channel Combining Equipment)	1 set
3.	Transmitter Input and Monitoring Equipment	1 set
4.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
5.	Emergency Power Supply	1 set
(B)	Cable Link Equipment	
1.	Video and Audio Terminal Equipment	1 set
(C)	Installation Materials	1 set
(D)	Minor Spare Parts	1 set

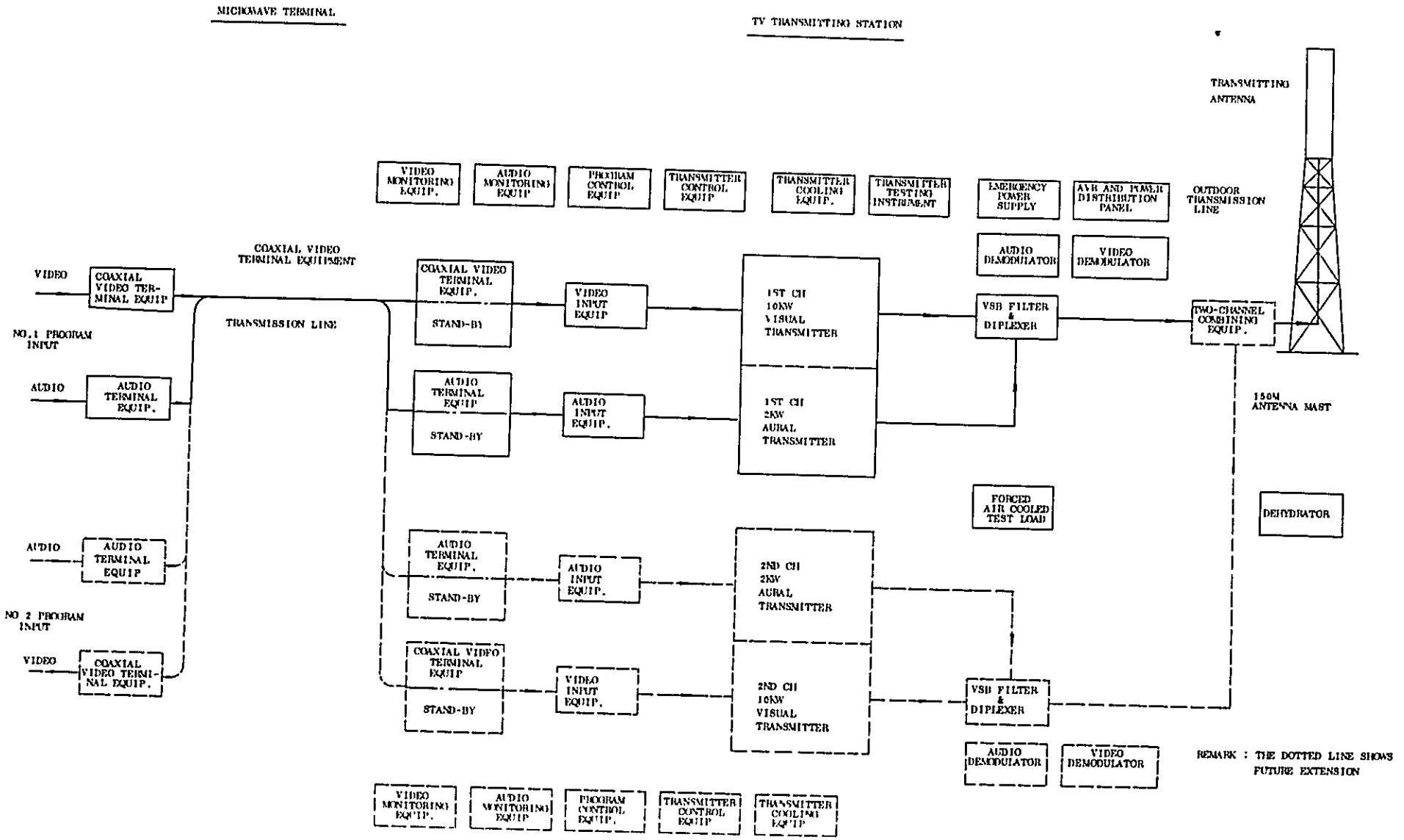


Fig. N13-5-3 SCHEMATIC DIAGRAM OF TV TRANSMITTING FACILITIES FOR MINSK MICROWAVE STATION

NE-6 Kalasin

Kalasin Province has a shallow basin in the northeastern part. Therefore, it is better to use the moderately high hill in between to have an effective service.

Broadcasting will be made through the translator system by which the radio wave from Khon Kaen TV station is received and rebroadcast.

TABLE NE-6-1 Main Specifications of Kalasin Station

Name of Station		Kalasin
Type of Station		Transrator
Transmitting Site	Site	Ref. to Fig. NE-6-1
	Latitude and Longitude	16°37'30" N. 103°37'52" E.
	Altitude	336 m
	Access Road	1000 m
Transmitting Channel No.		10, 12
Transmitting Antenna	Height of Tower	30 m, Ref. to Fig. 3-1-11
	Polarization	Horizontal
	Required E.R.P.	Max. 3 kW, Ref. to Fig. NE-6-2
Output Power of Transmitter		300 W, Ref. to Fig. 3-1-12 & Table NE-6-2
Service Area	Area	Greater Part of Kalasin province
	Population Covered	343,000 persons
Studio	Building	—
	Facilities	—
Receiving Station	Name	Kalasin
	Site	Same as the transmitting site
Master Station		Khon Kaen
Station Building		48 m^2, Ref. to Fig. 3-1-4 & Fig 3-1-6
(Thousand Bahts) Construction Cost (1st Channel)	Equipment	2,060
	Building, Road, etc.	1,100
	Total	3,160

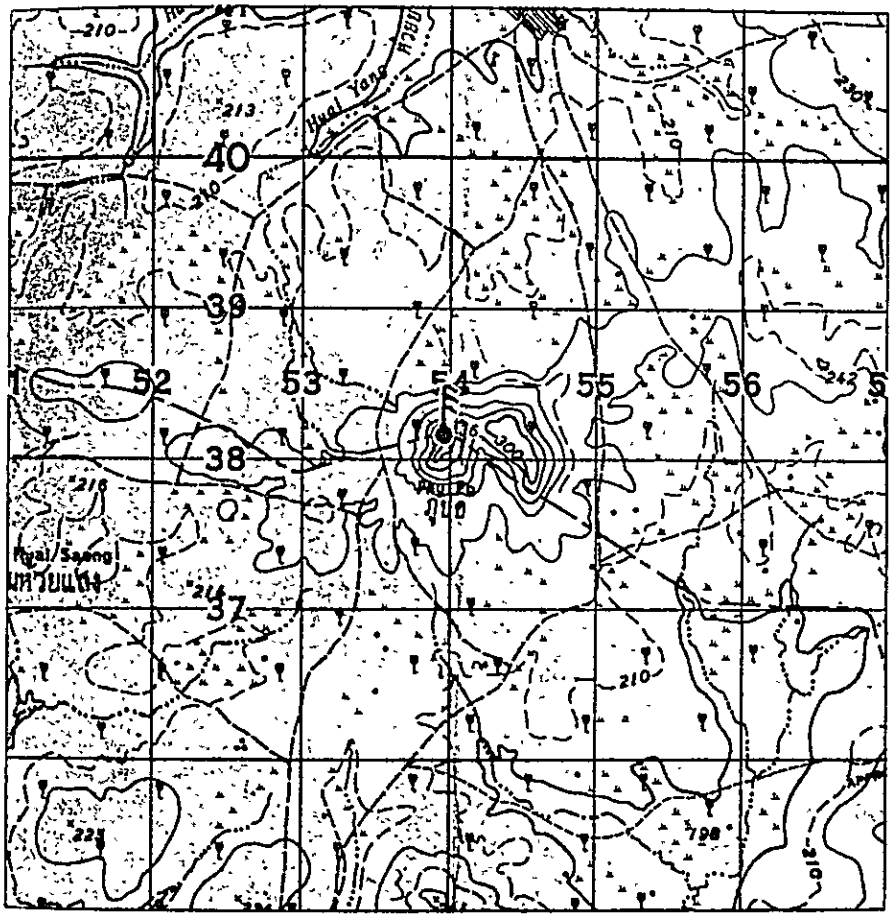


Fig. NE-6-1 LOCATION OF TRANSMITTING SITE (KALASIN STATION)

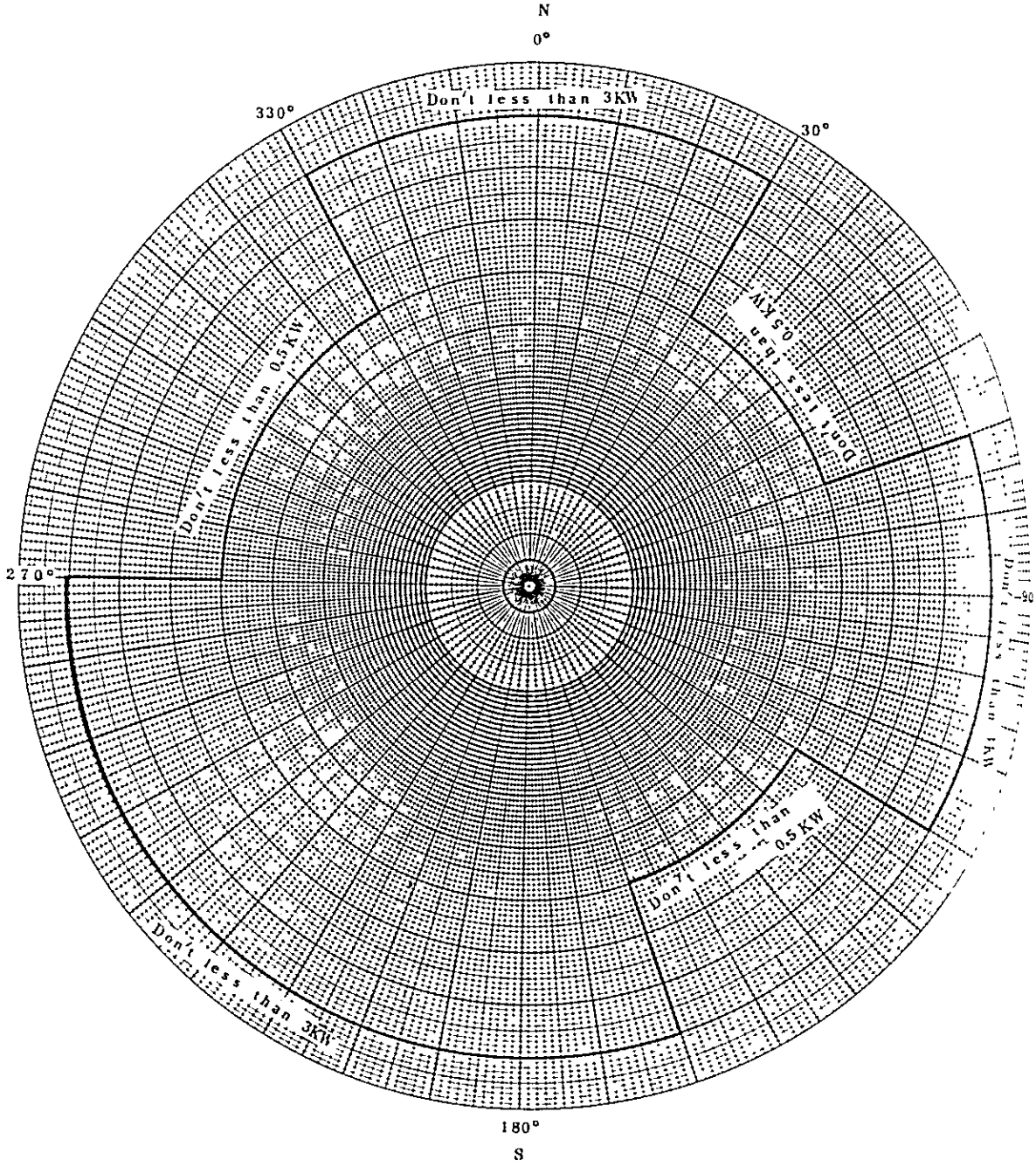


Fig. NE-6-2 HORIZONTAL PATTERN OF REQUIRED E.R.P.
(KALASIN STATION)

TABLE NE-6-2 List of TV Transmitting Facilities

Kalasin Translator Station, 1st Channel

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input Filter and Output Filter, etc.)	1 set
3.	Transmitting Antenna	1 set
4.	Transmitting Feeder System	1 set
5.	30 Meters Antenna Tower	1 set
6.	Monitoring Equipment	1 set
7.	Receiving Antenna and Feeder System	1 set
8.	Maintenance Instrument	1 set
9.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
10.	Emergency Power Supply	1 set
11.	Installation Materials	1 set
12.	Minor Spare Parts	1 set

Kalasin Translator Station, 2nd Channel (Future Extension)

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input and Output Filter, and Two-channel Combining Equipment, etc.)	1 set
3.	Monitoring Equipment	1 set
4.	Receiving Antenna and Feeder System	1 set
5.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
6.	Emergency Power Supply	1 set
7.	Installation Materials	1 set
8.	Minor Spare Parts	1 set

NE-7 Roi Et

Roi Et Province is outside the service area of Surin, Ubon and Kalasin stations. However, the population is big and the density is high. The translator system is adopted for broadcasting. Kalasin is the best as its master station. The maximum transmitting power of a translator station is comparatively small. Therefore it is desirable to cover an area as wide as possible by building a high tower.

TABLE NE-7-1 Main Specifications of Roi Et Station

Name of Station		Roi Et
Type of Station		Translator
Transmitting Site	Site	Ref. to Fig. NE-7-1
	Latitude and Longitude	16°2'59" N. 103°33'21" E.
	Altitude	150 m
	Access Road	300 m
Transmitting Channel No.		6, 8
Transmitting Antenna	Height of Mast	75 m,Ref. to Fig. 3-1-10
	Polarization	Horizontal
	Required E.R.P.	Max. 3 kW, Ref. to Fig. NE-7-2
Output Power of Transmitter		300 W, Ref. to Fig. 3-1-12 & Table NE-7-2
Service Area	Area	Greater Part of Roi Et Province an l Some Part of Maha Sarakham Province
	Population Covered	480,000 persons
Studio	Building	—
	Facilities	—
Receiving Station	Name	Roi Et
	Site	Same as the transmitting site
Master Station		Kalasin
Station Building		48 m^2, Ref. to Fig. 3-1-4 & Fig. 3-1-6
(Thousand Bahts) Construction Cost (1st Channel)	Equipment	2,486
	Building, Road, etc.	200
	Total	2,686

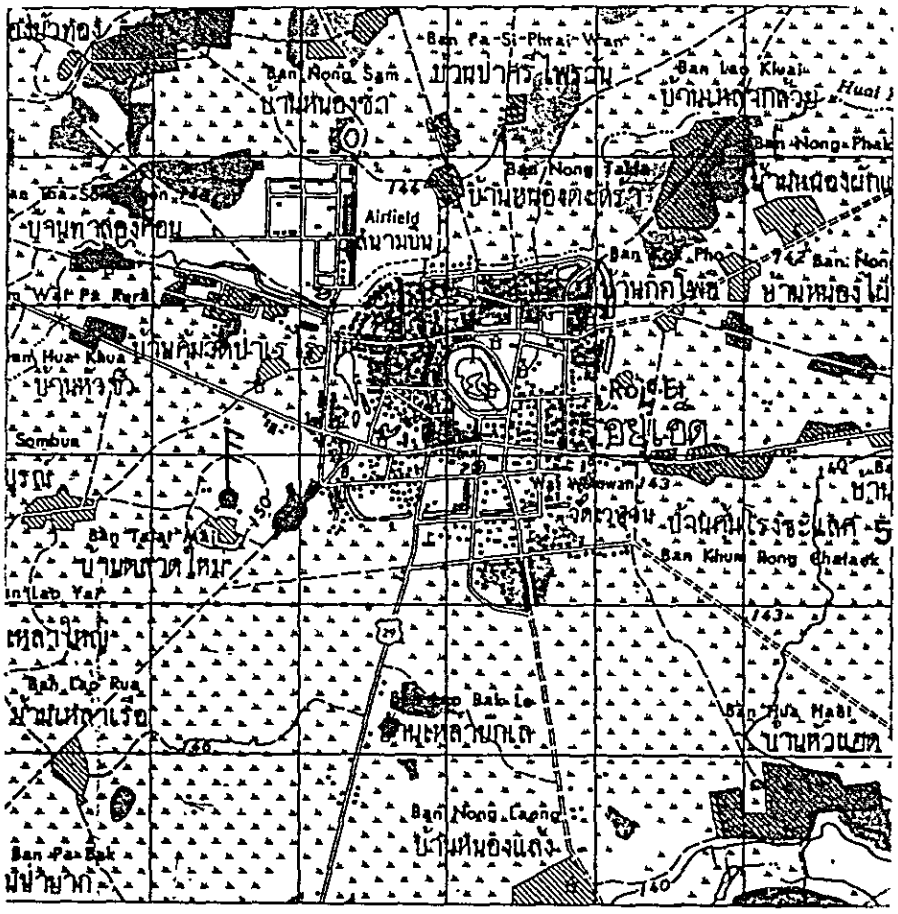


Fig. NE-7-1 LOCATION OF TRANSMITTING SITE (ROI ET STATION)

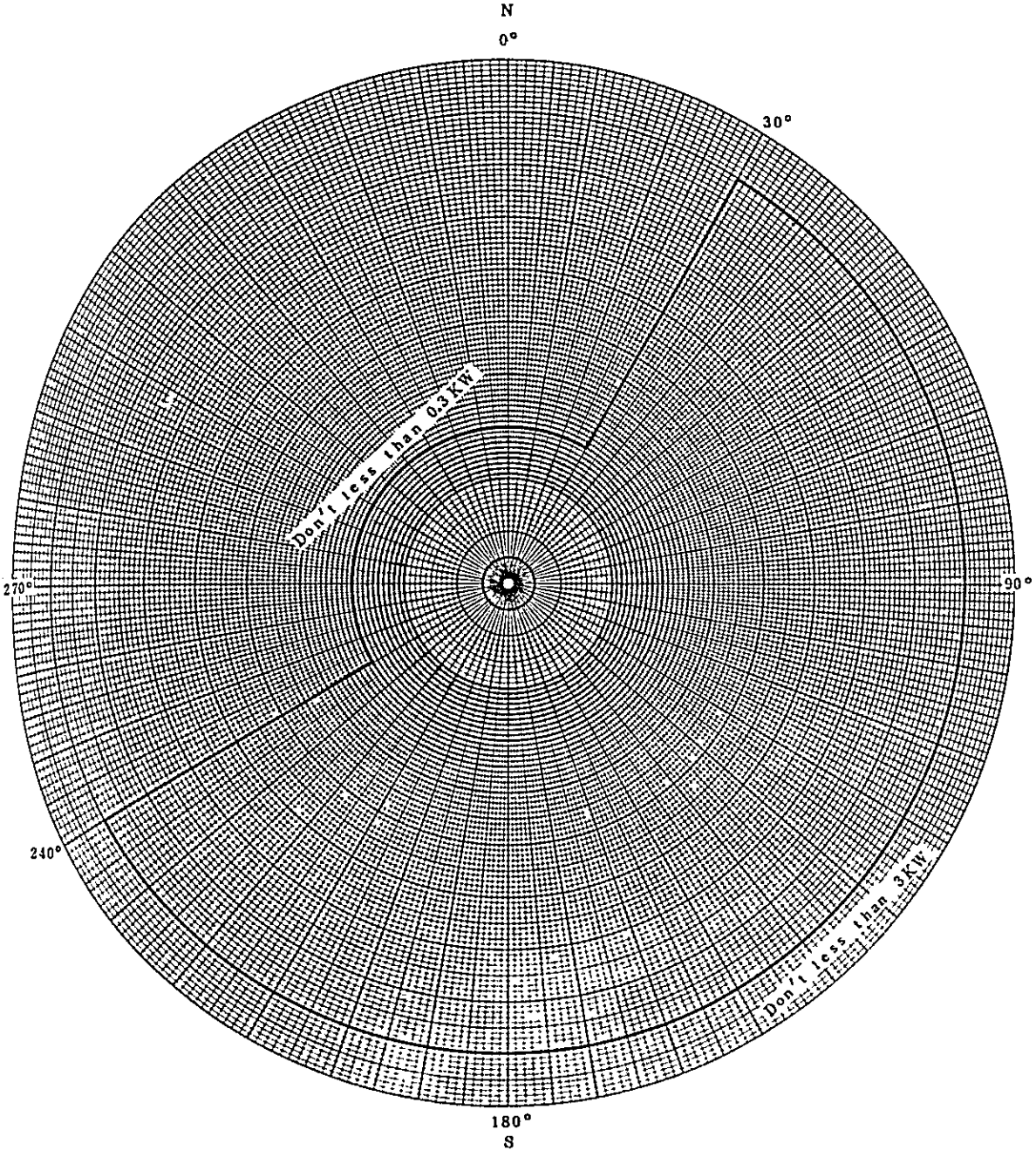


Fig. NE-7-2 HORIZONTAL PATTERN OF REQUIRED E.R.P. (ROI ET STATION)

TABLE NE-7-2 List of TV Transmitting Facilities

Roi Et Translator Station, 1st Channel

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input Filter and Output Filter, etc.)	1 set
3.	Transmitting Antenna	1 set
4.	Transmitting Feeder System	1 set
5.	75 Meters Antenna Mast	1 set
6.	Monitoring Equipment	1 set
7.	Receiving Antenna and Feeder System	1 set
8.	Maintennance Instrument	1 set
9.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
10.	Emergency Power Supply	1 set
11.	Installation Materials	1 set
12.	Minor Spare Parts	1 set

Roi Et Translator Station, 2nd Channel (Future Extension)

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input and Output Filter, and Two-channel Combining Equipment , etc.)	1 set
3.	Monitoring Equipment	1 set
4.	Receiving Antenna and Feeder System	1 set
5.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
6.	Emergency Power Supply	1 set
7.	Installation Materials	1 set
8.	Minor Spare Parts	

NE-8 Sawang Daen Din

Sakon Nakhon city is located in the eastern part of the Province. It is separated by a hundred and scores of kilometers from the neightboring station. In addition, because of the mountain area in the south of the Province, it is impossible to serve the central part of the Province such as Sakon Nakhon etc. by receiving waves from the neighboring TV station.

Therefore, it is considered that the station in Sawang Daen Din will be the master station for Nakhon Sawan TV station covering surrounding areas by relaying the wave from Udon TV station through the translator system on the hill in the suburbs of Sawang Daen Din located in the western end of the Province.

TABLE NE-8-1 Main Specifications of Sawang Daen Din Station

Name of Station		Sawan Daen Din
Type of Station		Translator
Transmitting Site	Site	Ban Huai Toei, Ref. to Fig. NE-8-1
	Latitude and Longitude	17°27'58" N. 103°29'19" E.
	Altitude	204 m
	Access Road	500 m
Transmitting Channel No.		5, 7
Transmitting Antenna	Height of Mast	75 m, Ref. to Fig. 3-1-10
	Polarization	Horizontal
	Required E.R.P.	Max. 3 kW, Ref. to Fig. NE-8-2
Output Power of Transmitter		300 W, Ref. to Fig 3-1-12 & Table NE-8-2
Service Area	Area	Western Part of Sakon Nakhon Provice
	Population Covered	133,000 persons
Studio	Building	—
	Facilities	—
Receiving Station	Name	Sawang Daen Din
	Site	Same as the transmitting site
Master Station		Udon
Station Building		48 m^2, Ref. to Fig. 3-1-4 & Fig. 3-1-6
(Thousand Bahts) Construction Cost (1st Channel)	Equipment	2,570
	Building, Road, etc.	300
	Total	2,870

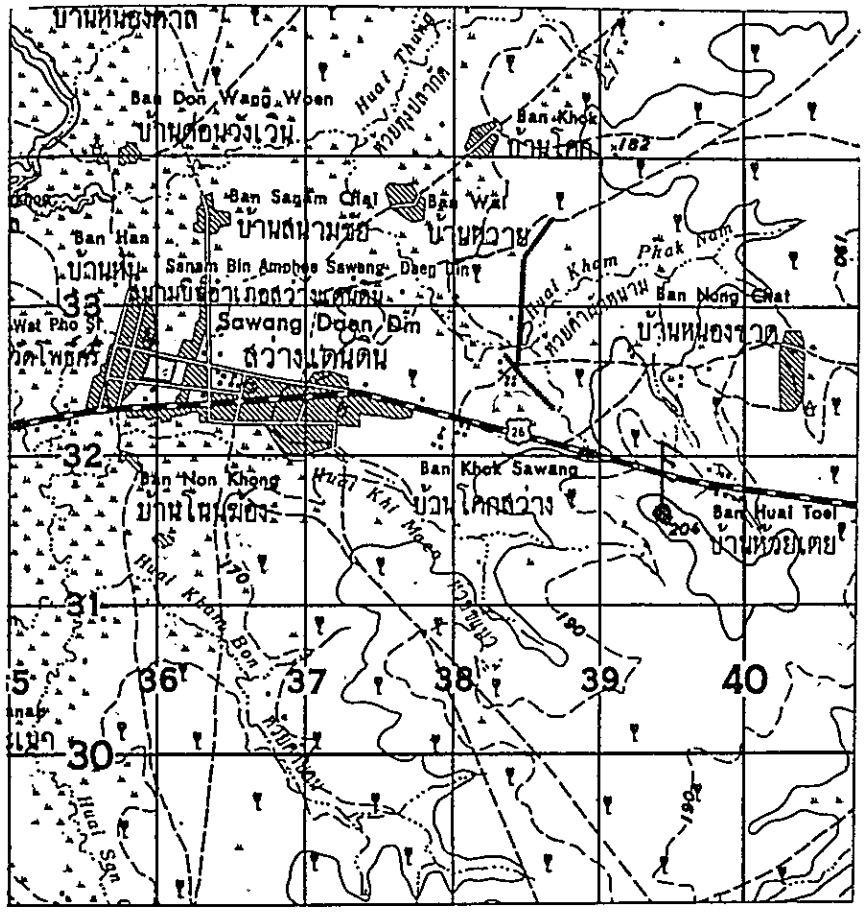


Fig. NE-8-1 LOCATION OF TRANSMITTING SITE (SAWANG DAEN DIN STATION)

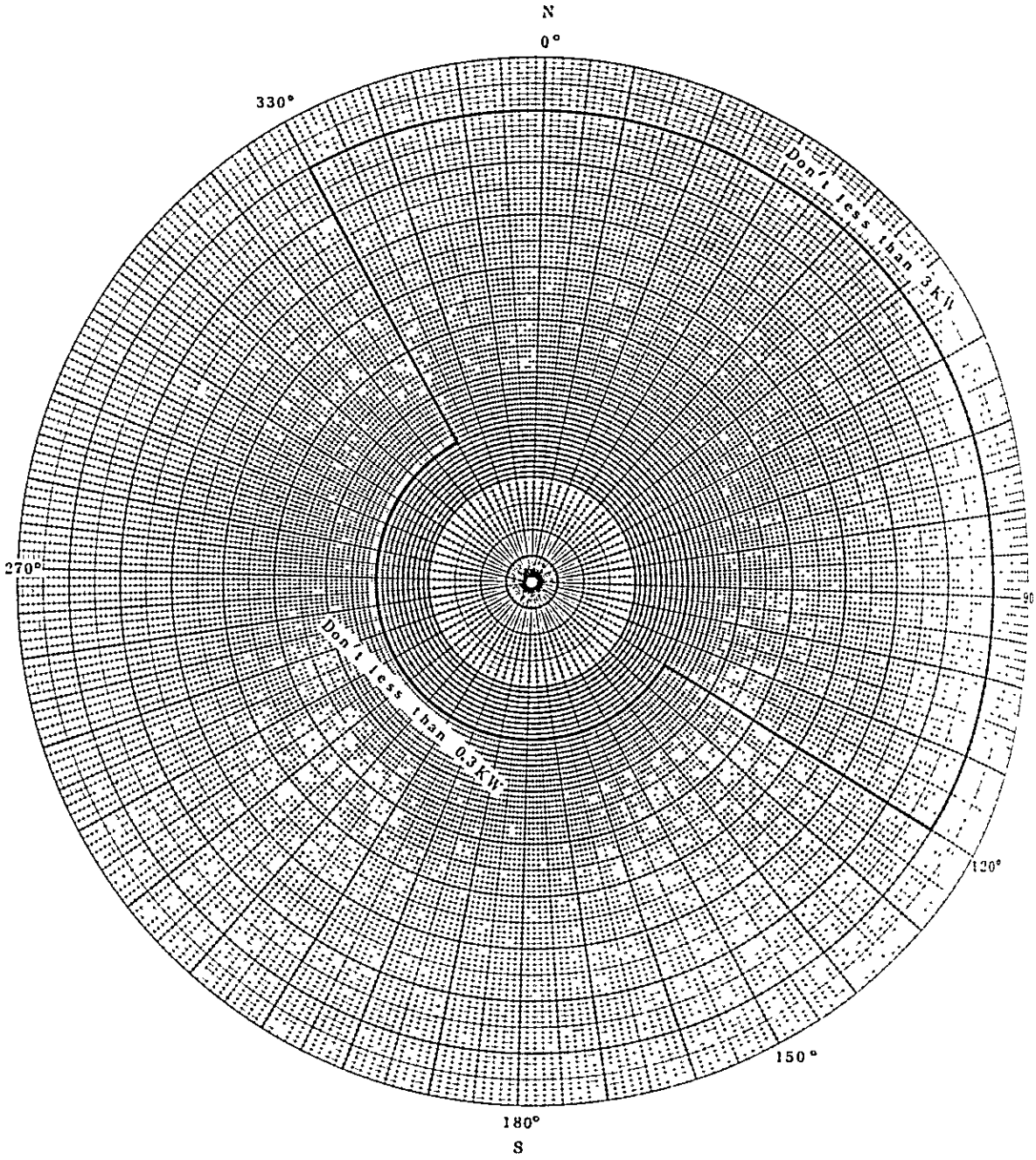


Fig. NE-8-2 HORIZONTAL PATTERN OF REQUIRED E.R.P. (SAWANG DAEN DIN STATION)

TABLE NE-8-2 List of TV Transmitting Facilities

Sawang Daen Din Translator Station 1st Channel

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input Filter and Output Filter, etc.)	1 set
3.	Transmitting Antenna	1 set
4.	Transmitting Feeder System	1 set
5.	75 Meters Antenna Mast	1 set
6.	Monitoring Equipment	1 set
7.	Receiving Antenna and Feeder System	1 set
8.	Maintenance Instrument	1 set
9.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
10.	Emergency Power Supply	1 set
11.	Installation Materials	1 set
12.	Minor Spare Parts	1 set

Sawang Daen Din Translator Station 2nd Channel (Future Extension)

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input and Output Filter, and Two-Channel Combining Equipment, etc.)	1 set
3.	Monitoring Equipment	1 set
4.	Receiving Antenna and Feeder System	1 set
5.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
6.	Emergency Power Supply	1 set
7.	Installation Materials	1 set
8.	Minor Spare Parts	1 set

NE-9 Sakon Nakhon

A translator station was established in Sawang Dean Din to serve the western part of the Province. However, a wide area centering around Sakon Nakhon City still remains uncovered. It is effective to broadcast from a mountain as high as possible in order to cover this area. On the other hand there is a problem in construction. Therefore, it is the best to serve by constructing a mast as high as possible on a hill in the suburbs of the city.

It will be a translator station using Sawang Daen Din station as the master station.

TABLE NE-9-1 Main Specifications of Sakon Nakhon Station

Name of Station		Sakon Nakhon
Type of Station		Translator
Transmitting Site	Site	Ban Thai, Ref. to Fig. NE-9-1
	Latitude and Longitude	17°10'42" N. 104°06'4" E.
	Altitude	180 m
	Access Road	200 m
Transmitting Channel No.		9, 11
Transmitting Antenna	Height of Mast	75 m, Ref. to Fig. 3-1-10
	Polarization	Horizontal
	Required E.R.P.	Max. 5 kW, Ref. to Fig. NE-9-2
Output Power of Transmitter		300 W, Ref. to Fig. 3-1-12 & Table NE-9-2
Service Area	Area	Eastern Part of Sakon Nakhon Province and Some Part of Nakhon Phanom Province
	Population Covered	255,000 persons
Studio	Building	—
	Facilities	—
Receiving Station	Name	Sakon Nakhon
	Site	Same as the transmitting site
Master Station		Sawang Daen Din TV Station
Station Building		48 m^2, Ref. to Fig. 3-1-4 & Fig. 3-1-6
(Thousand Bahts) Construction Cost (1st Channel)	Equipment	2,388
	Building, Road, etc.	180
	Total	2,568

FIG. NI-9-1 LOCATION OF TRANSMITTING SITE (SAKON NAKHON STATION)

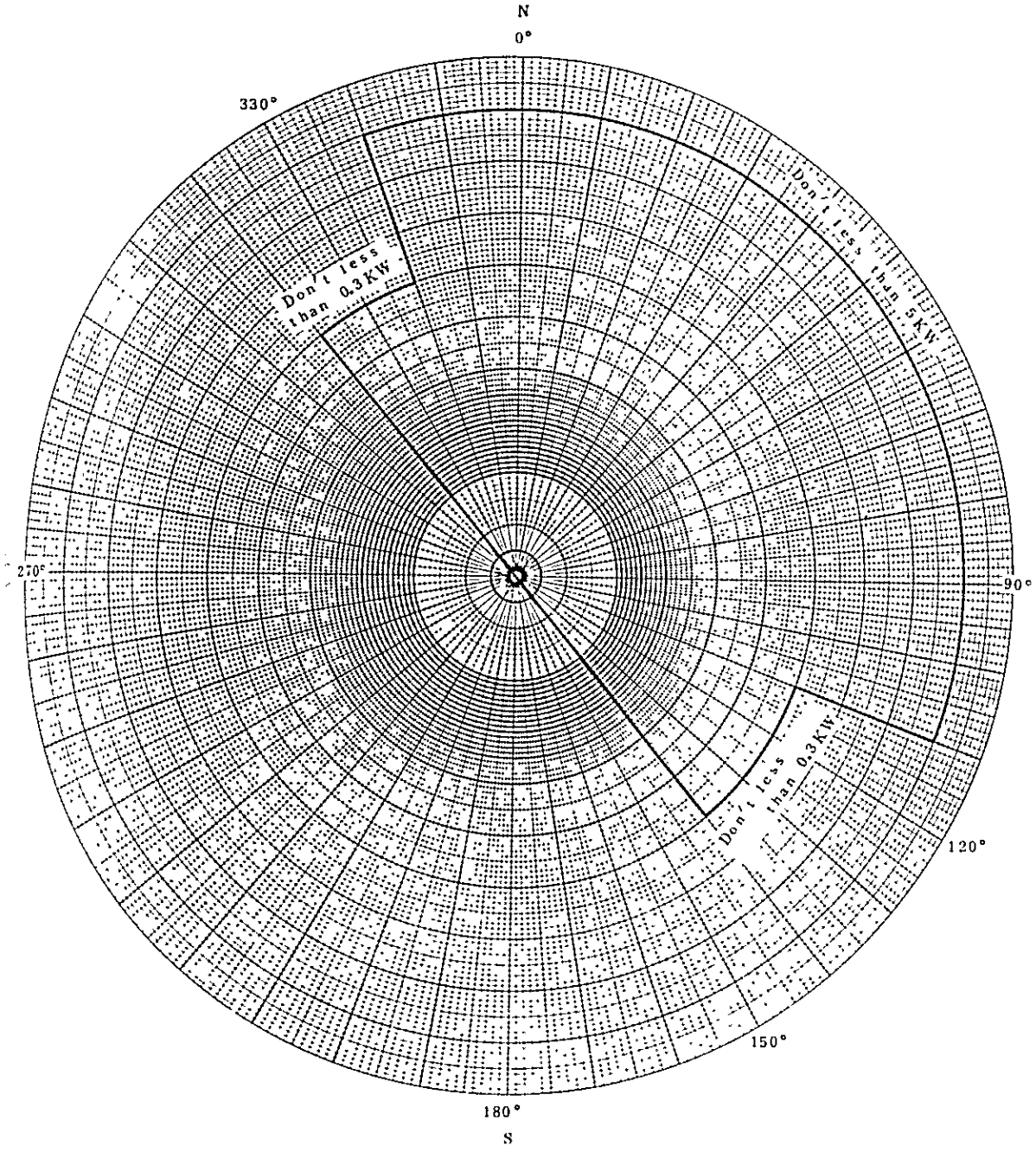


Fig. NE-9-2 HORIZONTAL PATTERN OF REQUIRED E.R.P.
(SAKON NAKHON STATION)

TABLE NE-9-2 List of TV Transmitting Facilities

Sakon Nakhon Translator Station 1st Channel

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input Filter and Output Filter, etc.)	1 set
3.	Transmitting Antenna	1 set
4.	Transmitting Feeder System	1 set
5.	75 Meters Antenna Mast	1 set
6.	Monitoring Equipment	1 set
7.	Receiving Antenna and Feeder System	1 set
8.	Maintenance Instrument	1 set
9.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
10.	Emergency Power Supply	1 set
11.	Installation Materials	1 set
12.	Minor Spare Parts	1 set

Sakon Nakhon Translator Station 2nd Channel (Future Extension)

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input and Output Filter, and Two-channel Combining Equipment, etc.)	1 set
3.	Monitoring Equipment	1 set
4.	Receiving Antenna and Feeder System	1 set
5.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
6.	Emergency Power Supply	1 set
7.	Installation Materials	1 set
8.	Minor Spare Parts	1 set

NE-10 Nakhon Phanom

This will be a translator station using Sakon Nakhon TV station as the master station.

This Province is a narrow long district extending along Mae Nam Khong with Nakhon Phanom city as the center. It is better to serve from a high position to a certain direction.

Due to the lack of a proper hill nearly, it will be served by constructing a 75 m mast from a comparatively high position in the western suburb of the city.

TABLE NE-10-1 Main Specifications of Nakhon Phanom Station

Name of Station		Nakhon Phanom
Type of Station		Translator
Transmitting Site	Site	Khao Wat Sai, Ref. to Fig. NE-10-1
	Latitude and Longitude	17°23'16" N. 104°45'46" E.
	Altitude	160 m
	Access Road	—
Transmitting Channel No.		5, 7
Transmitting Antenna	Height of Mast	75 m, Ref. to Fig. 3-1-10
	Polarization	Horizontal
	Required E.R.P.	Max. 4 kW, Ref. to Fig. NE-10-2
Output Power of Transmitter		300 W, Ref. to Fig. 3-1-12 & Table NE-10-2
Service Area	Area	Centre Part of Nakhon Phanom Province
	Population Covered	165,000 persons
Studio	Building	—
	Facilities	—
Receiving Station	Name	Nakhon Phanon
	Site	Same as the transmitting site
Master Station		Sakon Nakhon
Station Building		48 m^2, Ref. to Fig. 3-1-4 & Fig. 3-1-6
(Thousand Bahts) Construction Cost (1st Channel)	Equipment	2,660
	Building, Road, etc.	114
	Total	2,774

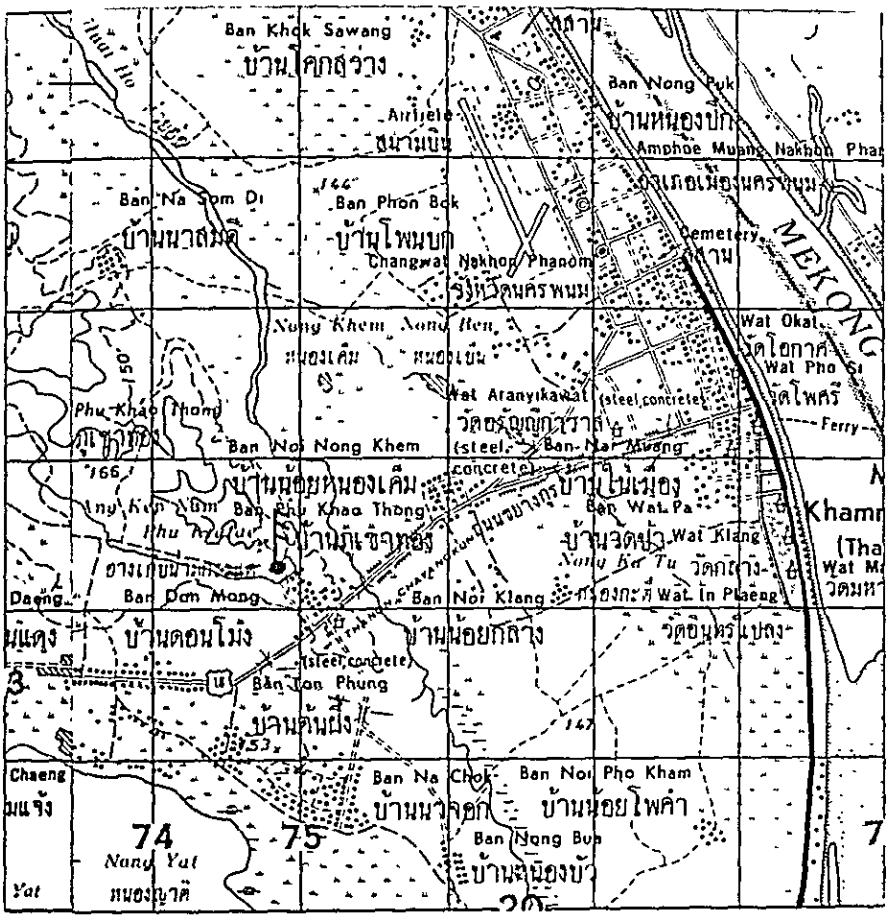


Fig. NE-10-1 LOCATION OF TRANSMITTING SITE (NAKHON PHANOM STATION)

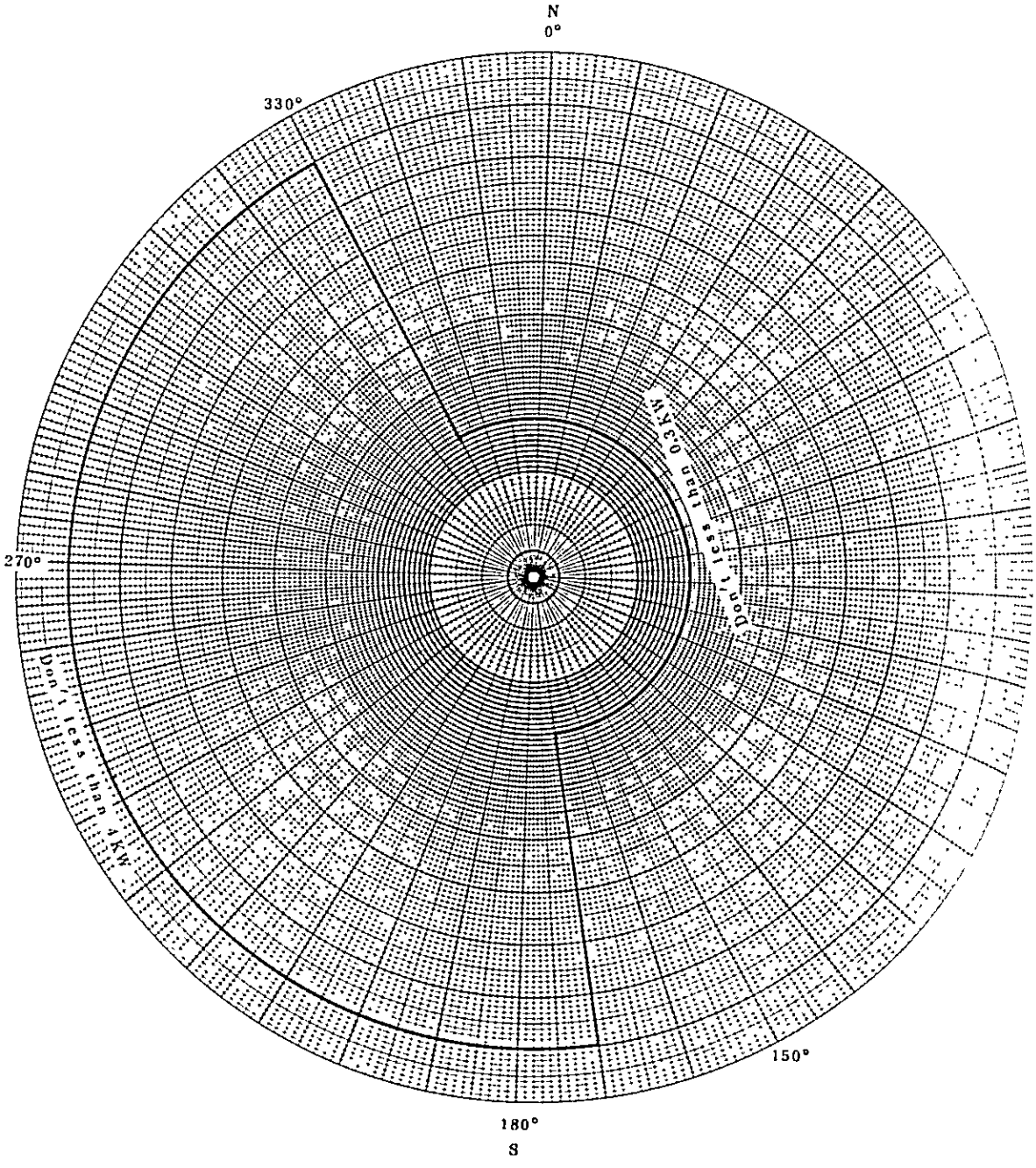


Fig. NE-10-2 HORIZONTAL PATTERN OF REQUIRED E.R.P.
(NAKHON PANOM STATION)

TABLE NE-10-2 List of TV Transmitting Facilities

Nakhon Phanom Translator Station 1st channel

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input Filter and Output Filter, etc.)	1 set
3.	Transmitting Antenna	1 set
4.	Transmitting Feeder System	1 set
5.	75 Meters Antenna Mast	1 set
6.	Monitoring Equipment	1 set
7.	Receiving Antenna and Feeder System	1 set
8.	Maintenance Instrument	1 set
9.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
10.	Emergency Power Supply	1 set
11.	Installation Materials	1 set
12.	Minor Spare Parts	1 set

Nakhon Phanom Translator Station 2nd Channel (Future Extension)

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input and Output Filter, and Two-channel Combining Equipment, etc.)	1 set
3.	Monitoring Equipment	1 set
4.	Receiving Antenna and Feeder System	1 set
5.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
6.	Emergency Power Supply	1 set
7.	Installation Materials	1 set
8.	Minor Spare Parts	1 set

3.2.4 Southeastern Region

(1) Outline

The southeastern Region consists of 4 Provinces of Chanthaburi, Rayong, Trat and a part of Chon Buri Province. However, topographically this belongs to the central region. The population is considerably small except around Chon Buri City and concentrated along the sea-coast. In view of these circumstance it is more advantageous to serve this area by off-the-air relay from the Bangkok Central Station.

However, in this case broadcast programs will be transmitted through microwave relay link up to Khao Chalak near Si Racha and then transmitted by off-the-air relay from the viewpoint that it is difficult to allocate frequency in the Bangkok area: it is necessary to prevent future deterioration of picture quality when a translator station is installed: and that the local programs use 2 channels etc.

(2) Facilities per station

SE-1 Si Racha

This TV station is constructed for the purpose of serving the southern Chon Buri Province which is difficult to be covered by the Bangkok Central Station and will be the master station for Rayong TV Station.

The transmitting point will be Khao Chalak (313 m) which commands a good view of Rayong and its service area. Broadcast programs will be transmitted from Bangkok through microwave relay link. This is for the purpose of decreasing the difficulty of allocation of 4 channels and preventing picture deterioration by multi-stage relay along with the future increase of translator stations as well as for the convenience of transmitting local programs of 2 channels.

TABLE SE-1-1 Main Specifications of Si Racha Station

Name of Station		Si Racha
Type of Station		TV Broadcasting Station
Transmitting Site	Site	Khao Chalak, Ref. to Fig. SE-1-1
	Latitude and Longitude	13°11'17" N. 100°57'10" E.
	Altitude	313 m
	Access Road	2 km
Transmitting Channel No.		6, 10
Transmitting Antenna	Height of Tower	30 m Ref. to Fig. 3-1-11
	Polarization	Horizontal
	Required E.R.P.	Max. 5kW Ref. to Fig. SE-1-2
Output Power of Transmitter		500 W Ref. to Fig. SE-1-3 & Table SE-1-2
Service Area	Area	Southern Part of Chon Buri Province
	Population Covered	97,000 persons
Studio	Building	—
	Facilities	—
Receiving Station	Name	—
	Site	—
Master Station		—
Station Building		140.5 m^2, Ref. to Fig. 3-1-3 & Fig. 3-1-7
Construction Cost (Thousand Bahts) (1st Channel)	Equipment	2,538
	Building, Road, etc.	1,780
	Total	4,318

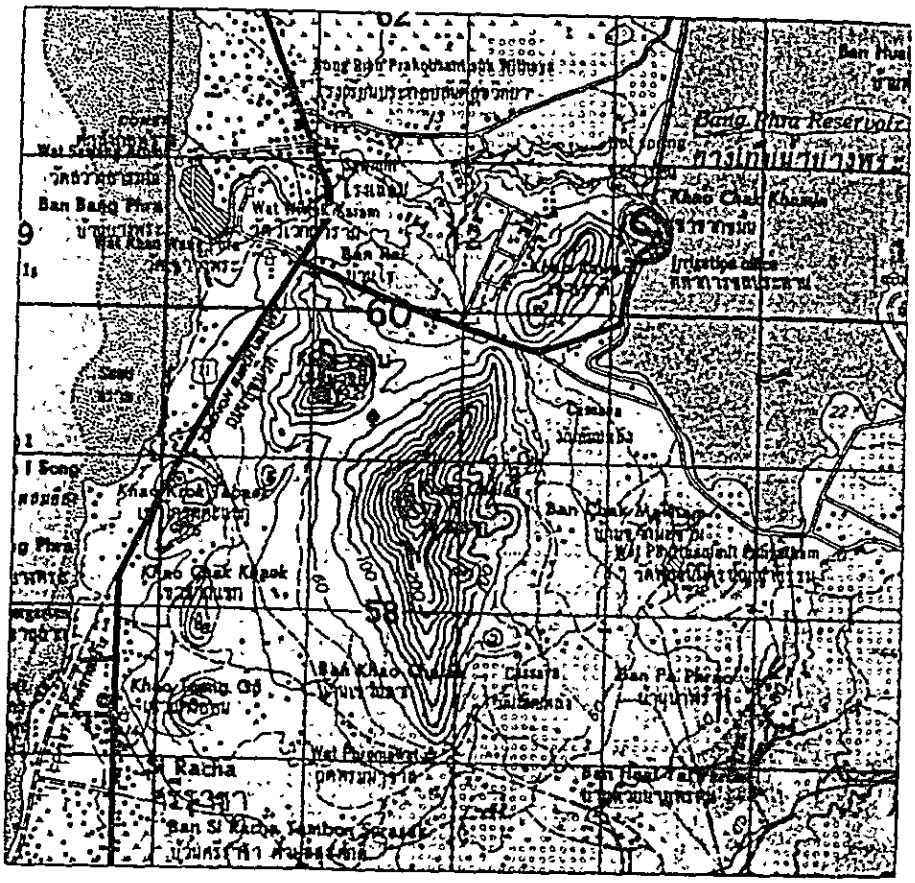


Fig. SE-1-1 LOCATION OF TRANSMITTING SITE (SI RACHA STATION)

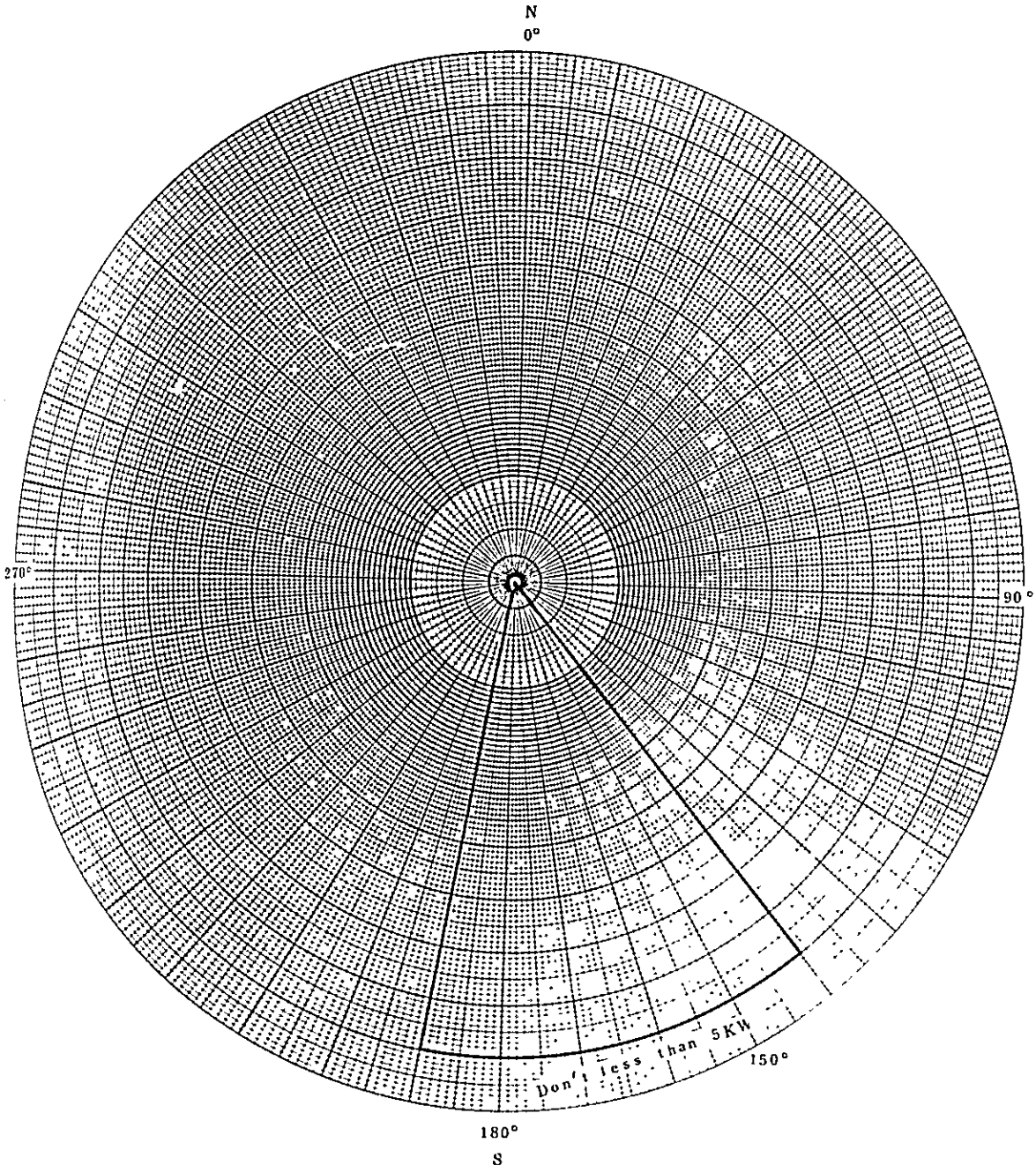


Fig. SE-1-2 HORIZONTAL PATTERN OF REQUIRED E.R.P.
(SI RACHA STATION)

TABLE SE-1-2 List of TV Transmitting Facilities

Si Racha Station, 1st Channel

Item	Description	Q'ty
(A)	TV Transmitting Facilities	1 set
1.	500 W TV Transmitter	1 set
2.	Output Coaxial Equipment (Including Air Cooled Test Load)	1 set
3.	Transmitting Antenna	1 set
4.	Transmittting Feeder System	1 set
5.	30 Meters Antenna Tower	1 set
6.	Transmitter Input and Monitoring Equipment	1 set
7.	Measuring Instruments	1 set
8.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
9.	Emergency Power Supply	1 set
(B)	Cable Link Equipment	1 set
1.	Video and Audio Terminal Equipment	1 set
2.	Transmission Line	1 set
(C)	Installation Materials	1 set
(D)	Minor Spare Parts	1 set

Si Racha Station, 2nd Channel (Future Extension)

Item	Description	Q'ty
(A)	TV Transmitting Facilities	1 set
1.	500 W TV Transmitter	1 set
2.	Output Coaxial Equipment (Including Air Cooled Test Load and Two-channel Combining Equipment)	1 set
3.	Transmitter Input and Monitoring Equipment	1 set
4.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
5.	Emergency Power Supply	1 set
(B)	Cable Link Equipment	
1.	Video and Audio Terminal Equipment	1 set
(C)	Installation Materials	1 set
(D)	Minor Spare Parts	1 set

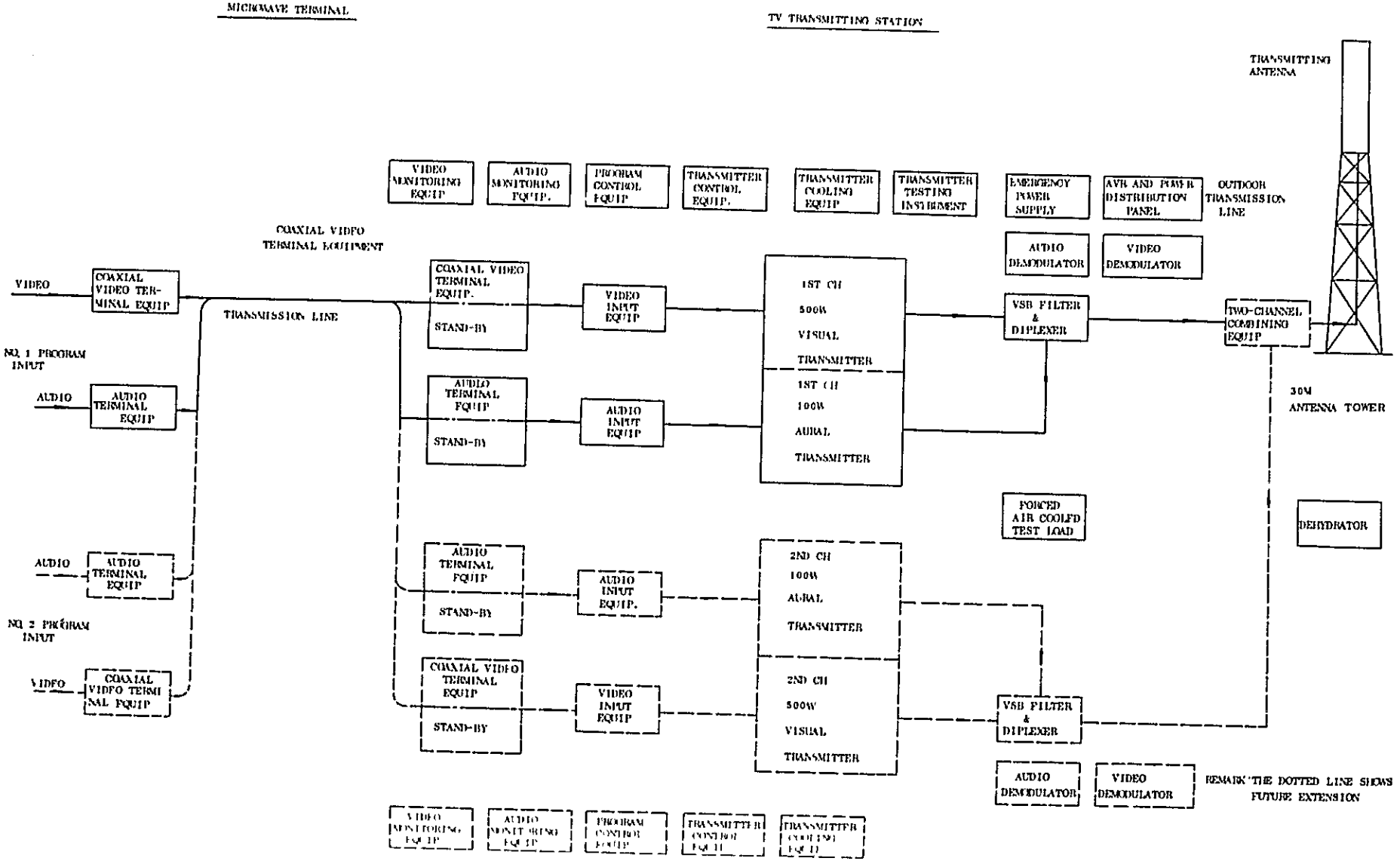


FIG. SU-1-3 SCHEMATIC DIAGRAM OF TV TRANSMITTING FACILITIES FOR SI RACHA STATION

SE-2 Rayong

The service area of the Rayong translator station is mostly the district along the sea-coast extending about 80 Km.

It is necessary that the transmitting point is capable of sufficiently receiving waves from Si Racha TV Station and that it commands a good view of the service area and it is advantageous for construction and maintenance.

From these viewpoints Khao Taphao Khwan and Khao Plet are considered. However, Khao Plet was selected because considerable difficulty is expected in construction in the former.

TABLE SE-2-1 Main Specifications of Rayong Station

Name of Station		Rayong
Type of Station		Translator
Transmitting Site	Site	Khao Plet, Ref. to Fig. SE-2-1
	Latitude and Longitude	12°35'44" N. 101°25'43" E.
	Altitude	125 m
	Access Road	
Transmitting Channel No.		8, 12
Transmitting Antenna	Height of Tower	30 m, Ref. to Fig. 3-1-11
	Polarization	Horizontal
	Required E.R.P.	Max. 9 kW, Ref. to Fig. SE-2-2
Output Power of Transmitter		300 W, Ref. to Fig. 3-1-12 & Table SE-2-2
Service Area	Area	Greater Part of Rayong Province and Some Part of Chon Buri Province
	Population Covered	160,000 persons
Studio	Building	—
	Facilities	—
Receiving Station	Name	Rayong
	Site	Same as the transmitting site
Master Station		Si Racha
Station Building		48 m^2, Ref. to Fig. 3-1-4 & Fig. 3-1-6
Construction Cost (Thousand Bahts) (1st Channel)	Equipment	2,010
	Building, Road, etc.	1,300
	Total	3,310

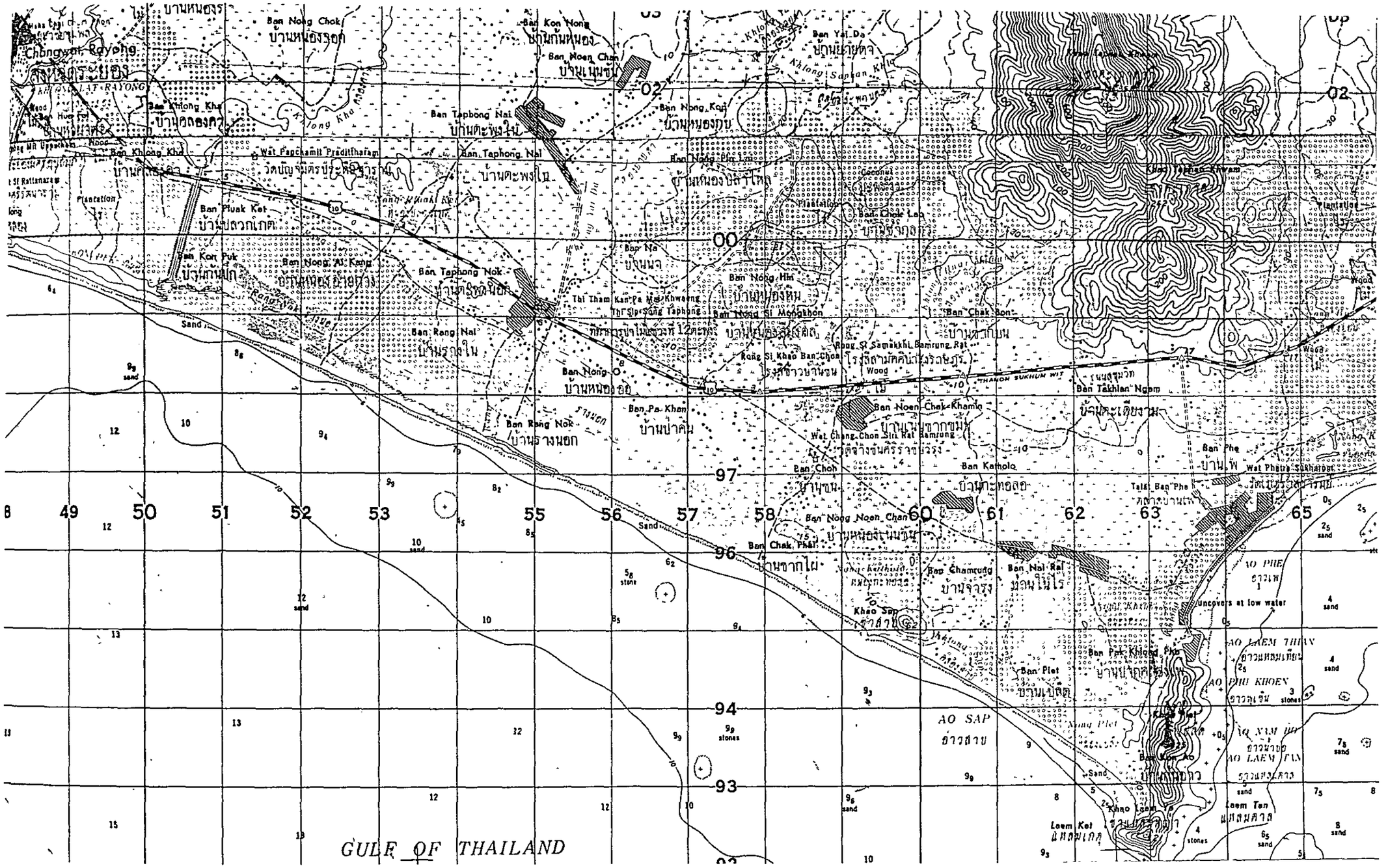


Fig. SE-2-1 LOCATION OF TRANSMITTING SITE (RAYONG STATION)

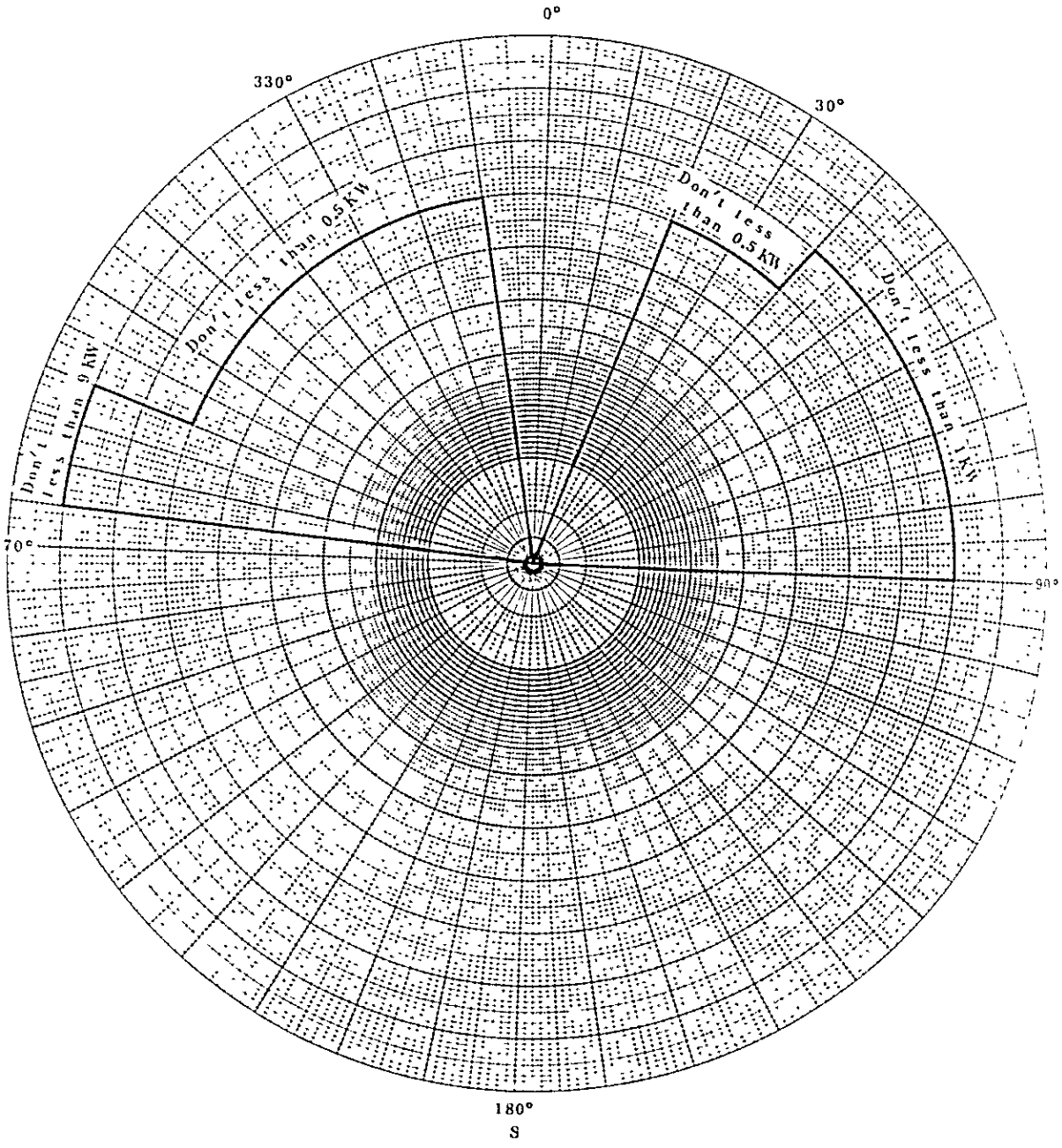


Fig. SE-2-2 HORIZONTAL PATTERN OF REQUIRED E.R.P. (RAYONG STATION)

TABLE SE-2-2 List of TV Transmitting Facilities

Rayong Translator Station, 1st Channel

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input Filter and Output Filter, etc.)	1 set
3.	Transmitting Antenna	1 set
4.	Transmitting Feeder System	1 set
5.	30 Meters Antenna Tower	1 set
6.	Monitoring Equipment	1 set
7.	Receiving Antenna and Feeder System	1 set
8.	Maintenance Instrument	1 set
9.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
10.	Emergency Power Supply	1 set
11.	Installation Materials	1 set
12.	Minor Spare Parts	1 set

Rayong Translator Station 2nd Channel (Future Extension)

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input and Output Filter, and Two-channel Combining Equipment, etc.)	1 set
3.	Monitoring Equipment	1 set
4.	Receiving Antenna and Feeder System	1 set
5.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
6.	Emergency Power Supply	1 set
7.	Installation Materials	1 set
8.	Minor Spare Parts	1 set

SE-3 Chanthaburi

Chanthaburi Province is separated more than 70 Km from the Rayong TV Station. It is impossible to serve from the Rayong Station.

There are several mountains in the Province. However, in most cases difficulty exists in construction and the effect of extending the service area is small.

As a result of the survey Khao Phlai Waen near Tha Mai City is considered as the transmitting point. Road conditions and command of views in the service area are good on the hill.

The translator system of receiving and rebroadcasting waves from the Rayong TV Station will be adopted.

TABLE SE-3-1 Main Specifications of Chanthaburi Station

Name of Station		Chanthaburi
Type of Station		Translator
Transmitting Site	Site	Khao Phlai Waen,Ref. to Fig.SE-3-1
	Latitude and Longitude	12°36'25" N. 102°2'42" E.
	Altitude	129 m
	Access Road	500 m
Transmitting Channel No.		6, 10
Transmitting Antenna	Height of Tower	30 m,Ref. to Fig.3-1-11
	Polarization	Harizontal
	Required E.R.P.	Max. 3 KW, Ref. to Fig. SE-3-2
Output Power of Transmitter		300 W,Ref. to Fig.3-1-12 & Table SE-3-2
Service Area	Area	Greater Part of Chanthaburi Province
	Population Covered	143,000 persons
Studio	Building	—
	Facilities	—
Receiving Station	Name	Chanthaburi
	Site	Same as the transmitting site
Master Station		Rayong
Station Building		48 m^2 Ref. to Fig.3-1-4 & Fig.3-1-6
(Thousand Bahts) Construction Cost (1st Channel)	Equipment	2,056
	Building, Road, etc.	500
	Total	2,556

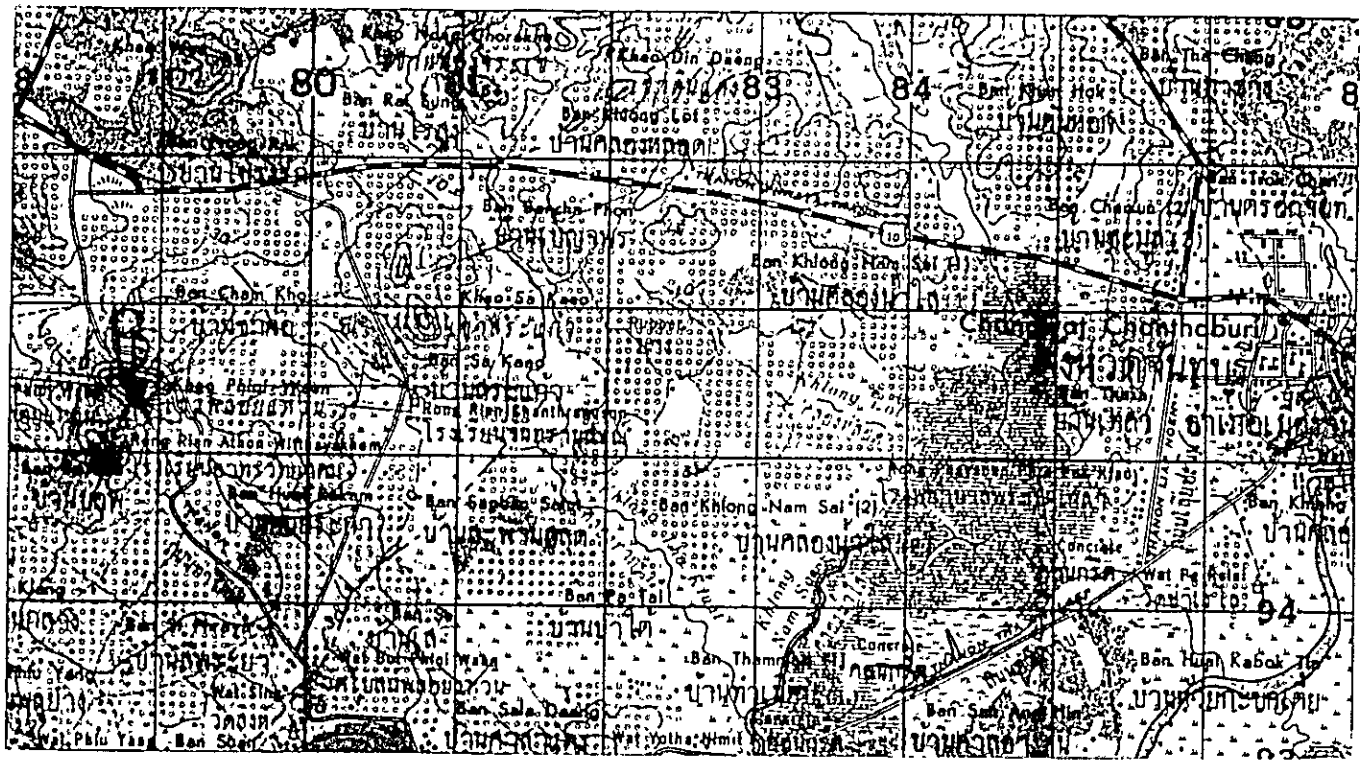


Fig. SP-3-1 LOCATION OF TRANSMITTING SITE (CHANTHABURI STATION)

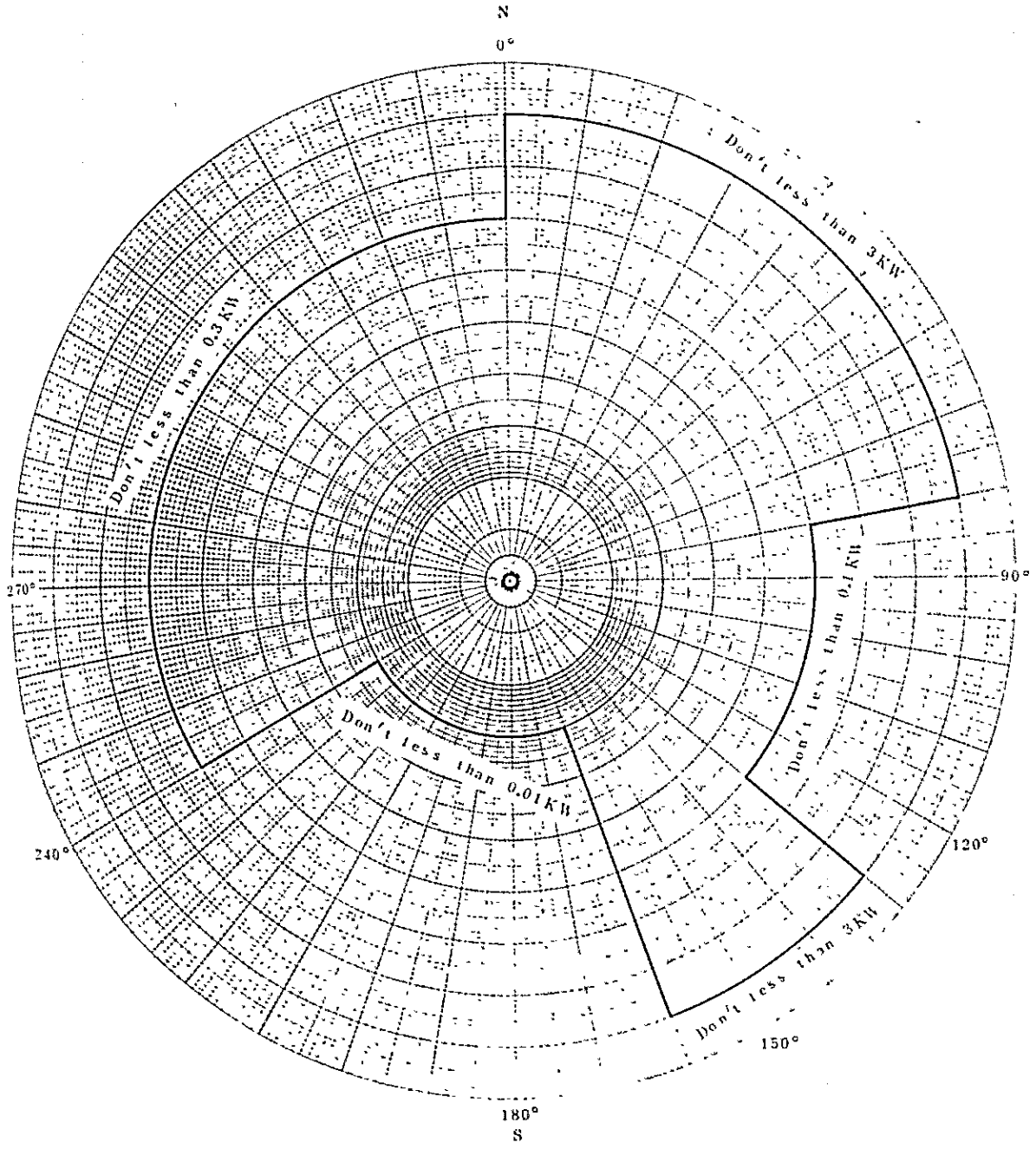


Fig. SE-3-2 HORIZONTAL PATTERN OF REQUIRED E.R.P. (CHANTHABURI STATION)

TABLE SE-3-2 List of TV Transmitting Facilities

Chanthaburi Translator Station, 1st Channel

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input Filter and Output Filter, etc.)	1 set
3.	Transmitting Antenna	1 set
4.	Transmitting Feeder System	1 set
5.	30 Meters Antenna Tower	1 set
6.	Monitoring Equipment	1 set
7.	Receiving Antenna and Feeder System	1 set
8.	Maintenance Instrument	1 set
9.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
10.	Emergency Power Supply	1 set
11.	Installation Materials	1 set
12.	Minor Spare Parts	1 set

Chanthaburi Translator Station 2nd Channel (Future Extension)

Item	Description	Q'ty
1.	300 W TV Translator	2 sets
2.	Coaxial Equipment (Including Air Cooled Test Load, Input and Output Filter, and Two-channel Combining Equipment, etc.)	1 set
3.	Monitoring Equipment	1 set
4.	Receiving Antenna and Feeder System	1 set
5.	Automatic Voltage Regulator and Power Distribution Equipment	1 set
6.	Emergency Power Supply	1 set
7.	Installation Materials	1 set
8.	Minor Spare Parts	1 set

CHAPTER Ⅳ
DESIGNING OF THE MICROWAVE SYSTEM

CHAPTER Ⅳ
DESIGNING OF THE MICROWAVE SYSTEM

4-1 Outline

As is shown in Fig. 4-1-1, the trunk telephone lines in Thailand connecting the main cities may be regarded as almost complete, if the lines under contemplation are included. In almost all the trunk lines the microwave system has been adopted, and it is most economical to use them for the transmission of television signals all over the country. For that reason, the survey has been conducted mainly concerning the existing repeater station, with relation to the broadcasting stations. The results of the survey have been classified, for convenience' sake, into the following four regions:

Southern Region: Bangkok —— Haad Yai —— Yala

Northern Region: Bangkok —— Sara Buri —— Chiang Mai

Northeastern Region: Sara Buri —— Nakhon Ratchasima  Udon Thani / Ubon

Southeastern Region: Bangkok —— Si Racha —— Chanthaburi

4-1-1 Southern Region

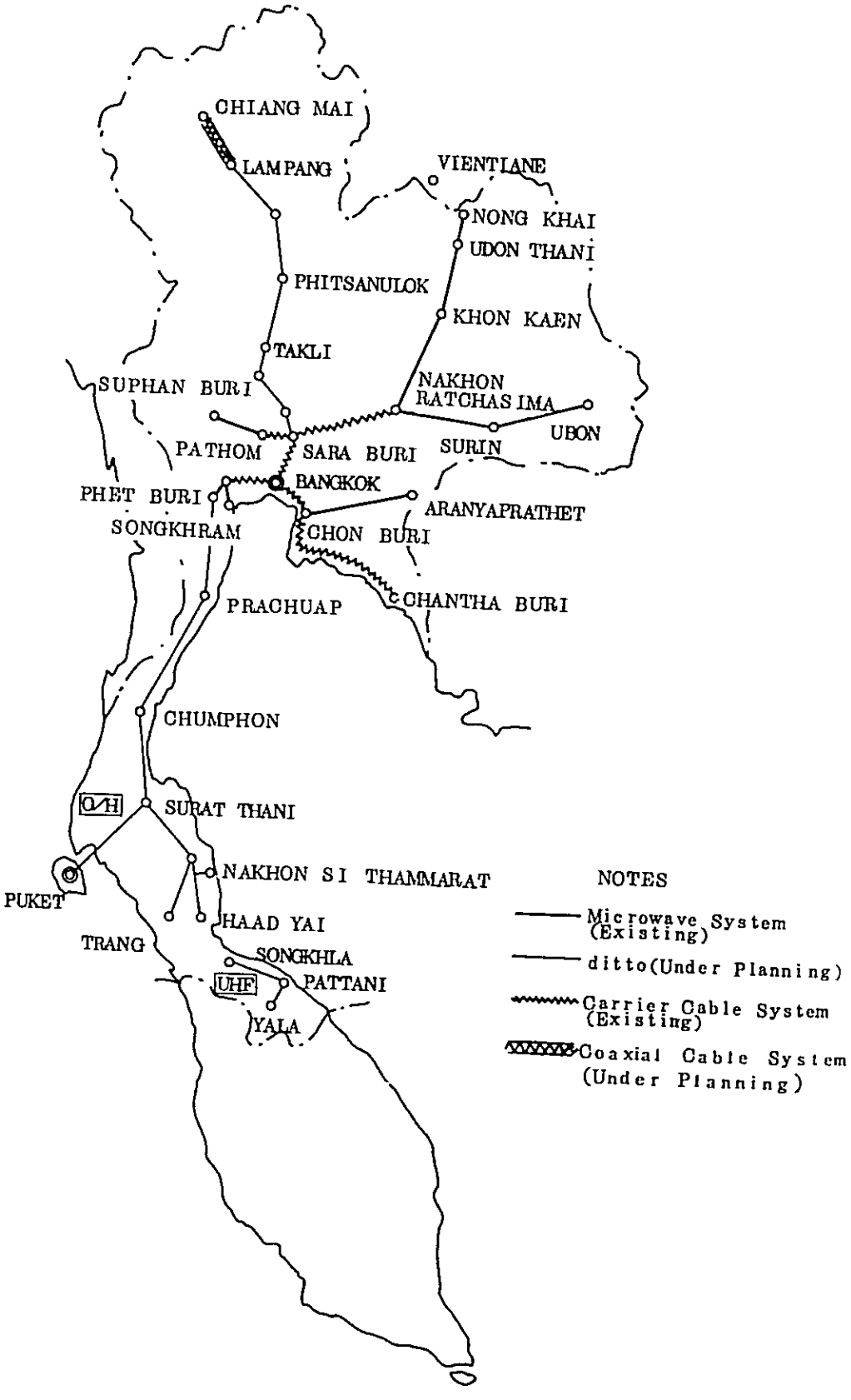
The microwave radio relay link between Bangkok and Haad Yai is being planned by the Telephone Organization of Thailand. The contents are one telephone system under the frequency diversity system and one down-line television system. In this report, therefore, mention will be made of the television terminal equipment between the broadcasting station and repeater station, which are being planned for this region. As Fig. 4-1-1 shows, the existing telephone line between Haad Yai and Yala is VHF, and it is necessary to construct a new microwave radio relay link. A study has been conducted in the site selection in this section.

4-1-2 Northern Region

Like the Southern Region, the microwave system between Bangkok and Chiang Mai is also being planned by the Telephone Organization of Thailand. Similarly, its contents will be stated in regard to the television terminal equipment.

4-1-3 Northeastern Region

Fig 4 - 1 - 1 Microwave Route in Thailand



The television signals transmitted from Bangkok must be relayed from the Sara Buri Station of the microwave link in the Northern Region, which is now being planned, to Nakhon Ratchasima, from where they must be further relayed to Udon Thani and Ubon. As is shown in Fig. 4-1-1, the existing telephone lines are using the cable system and the microwave system, both of which would not be suitable for television transmission for reasons that the cable system has a narrow band, and the microwave system uses control and alarm signals, etc., within the telephone signal band. The microwave radio relay links for television signal transmission in these regions, therefore, have been studied by the following methods:

(1) To construct a microwave circuit between Sara Buri and Nakhon Ratchasima.

(2) To construct a circuit along with the existing microwave circuit between Nakhon Ratchasima and Udon Thani and Nakhon Ratchasima and Ubon.

4-1-4 Southeastern Region

As the trunk telephone line in the Southeastern Region is under the cable system, it is necessary for television signal transmission from Bangkok to construct a new microwave link. In view of the density of population and the like considerations, however, it is uneconomical to cover the whole region with a microwave link. In order to obtain economical and technically satisfactory results, without deteriorating the quality of television signals, construction of a microwave line has been studied, as in Fig. 4-1-2, only between Bangkok and Si Racha.

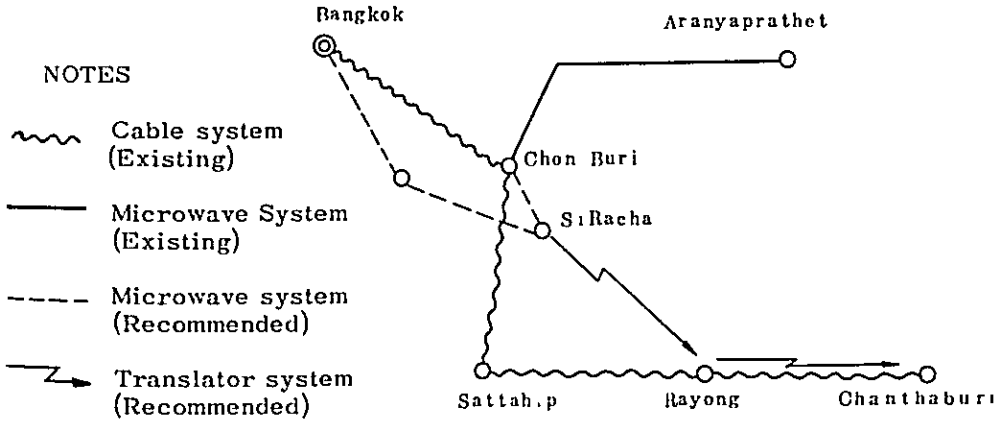


Fig. 4-1-2. Outline of the Communication Network in the Southeastern Region

4-2 Basic Conditions of Site Selection

4-2-1 Conditions concerning Roads and Commercial Electric Power

Before the construction of a microwave station, a site for it should be selected at a place where access roads are available for the construction and maintenance of the station, and commercial electricity can be obtained easily. If both conditions cannot be satisfied at the same time, accessibility to roads should have priority.

4-2-2 Consideration on Over-reach

In order to keep the interference noise due to over-reach below 100 Pico-Watts in one over-reach path, the D/U ratio at the power input of the interfered receiver should be raised above 54dB. On the other hand, as the directivity of the antenna to secure the above ratio is about 3^{o}, it will be safe to take more than 5^{o} as the over-reach angle, taking errors due to correction of the direction of the antenna and the like, into consideration.

4-2-3 Separation Distance

Generally speaking, standard separation distance within line of sight for microware radio relay system is 50Km. In the case of perfectly flat space like the plain of Bangkok, conceivable that the propagation path of radio waves is as low as several meters above the earth, and the rate of fading is high, so that standard separation distance between Bangkok and Si Racha has been estimated to be 10 to 20% shorter.

4-2-4 Question of Maintenance

It is desirable that, in case the apparatus of a unattended station goes out of order, access time necessary for the person in charge should be within 4 hours. Terminal and switching stations should be manned so that the performance of the circuit may be looked over.

4-3 Conditions of the System Planning

4-3-1 Radio Frequency

Generally speaking, for the purpose of obtaining a good transmission path which is in conformity with the recommendation of the C.C.I.R., the following points should be taken into consideration as conditions of constructing a long distance trunk line for the transmission of television video signals:

(A) The frequency band of transmission is equivalent to that of more than 600

telephone channels.

(B) Sufficient radio frequencies are available.

(C) The radio frequency band has stable propagation.

The best band fulfilling the above conditions is the 4GC band (3,800MC/s ~ 4,200MC/s) or the 6GC band (5,925MC/s ~ 6,425MC/s). But almost all the existing trunk telephone lines by the microwave system are using the 6GC band in Thailand. It is recommendable, therefore, that in consideration of interference from the earth station for space communication and that from the existing trunk telephone lines, the following frequency bands should be used:

(A)	For relaying from the television broadcasting station	7GC band
(B)	Bangkok ~ Si Racha	7GC band
(C)	Sara Buri ~ Nakhon Ratchasima	4GC or 6GC band
(D)	Nakhon Ratchasima ~ Udon Thani	ditto
(E)	Nakhon Ratchasima ~ Ubon	ditto
(F)	Haad Yai ~ Yala	ditto

For the above-mentioned regions where the 4GC or 6GC band may be used, it is more or less recommendable to use the frequency of the former band for the following reasons:

(1) In view of the possible increase in the number of telephone subscribers in the future, it will be necessary to reserve room in the allotted frequencies of the 6GC band, and to provide for a necessary extension of the existing microwave system of that band. This will prevent interference arising in cases where different systems are installed for one and the same frequency band.

(2) For the convenience of operation the telephone and television systems are better separated.

4-3-2 Transmission Performance and Relay System

As for performance of television transmission, it is necessary that the capacity of transmission, when converted into the telephone channel, should be corresponding to 600 channels for monochrome, and 960 channels for colour television. It is desirable that in Thailand where colour television transmission will be started in the future, a system for performance corresponding to 960 channels should be adopted. From the results obtained in foreign countries, it has been learned that relatively cheap

repeaters for this system are procurable.

For repeating system, the heterodyne relay system is advisable, for performance does not deteriorate particularly.

4-3-3 Aural Signal Relay System

Television aural signals are transmitted together with video signals or by a separate telephone channel. For the following reasons the former system is recommendable:

(1) It is economical.

(2) It is easier to operate, as a person for the maintenance of television equipments alone can make necessary adjustments.

4-3-4 Stand-by and Switching System

For the stand-by system, the stand-by arrangement ratio, switching sections, and the switching method should be determined.

4-3-4-a. Ratio of Normal to Stand-by System

There are the 1-to-1 system to prepare a stand-by circuit to the normal one-circuit system and the N-to-1 system having one stand-by circuit in common among the normal N-circuits. The microwave system now installed in Thailand is the former. In case several circuits are finally needed, however, the former system which requires twice as much radio installation as the latter is naturally uneconomical, and the maximum number of circuits which can be installed together is half as large. For these reasons, it is recommendable that the N-to-1 system should be adopted, for it is evident that in Thailand two systems of transmission of television video signals for the provinces will be started in the near future.

4-3-4-b. Distance for Circuit Switching Section

At what distance between relaying sections should a switching station, i.e., one for the switching of the normal and stand-by circuits, be established is a matter usually decided by the rate of faults of the installation and that of permissible circuit faults. It is not decided by taking improvement in the rate of safety from fading into consideration. The reason is that in a system where sites have been selected with due care for the keeping of the rate of deep fading as low as possible, that rate is certainly low for deep fading to occur at the same time on the same circuit line. If deep fading should take place in

more than two sections simultaneously, this would be the case more often with the next or nearby sections. Unless switching is made for each relaying section, no particularly good effect can be expected from division of the extent of a switching section into shorter ones. From such points of view, it is desirable that the number of the relaying stations for one circuit switching section should be between 5 and 6 as a standard.

4-3-4-c. Switching Method

It is hardly necessary to remark that the switching operation at the time of a fault or fading should be done automatically by the noise detecting system. In all cases, the outage time required between the detection of noise and the completion of switching should be shorter than 50ms. The fadeout speed of the receiving field strength is at most about 50dB/sec. at a point 40dB lower than the usual input value. If 50ms are necessary, therefore, between the starting of the noise detector and the completion of switching, the S/N ratio which falls in the meantime is at most 2.5dB. As a result, if the S/N value at the starting of the noise detector is set at 32.5dB, switching can be completed before the noise reaches one million PW. In the case of trouble with the installation, there will be a short period interruption of 50ms, but such trouble is not likely to occur frequently, and this point may be left out of consideration. As for the N-to-1 system, it is necessary for the receiving end to inform the transmitting end of the name of the circuit in trouble, etc., and for this at least 2ms are necessary. If the response of the noise detector is speeded up in the extreme, and noise may be caused near the work-limit-level, the control system is likely to be disturbed by the repetition of movements and recovery. Therefore, even if electronic devices are used for all the control circuits for the purpose of speeding up, it is hardly possible to lower the time necessary for the entire switching below 20ms.

4-3-5 Supervisory Control and Service Channel

The following are conditions which should be taken into consideration in designing the supervisory control system:

i) The number of the items of information for transmission and reception

ii) The speed of the transmission and reception of information

iii) Reliability

Concerning the number of the items of information, there can be three systems:

a) In the case of the transmission, as it stands, of the Analogue data, such as

the voltage, the electric current, and the balance of engine fuel, which indicate the condition of the installation, it is necessary to transmit the Analogue information or a large volume of digital information. For this purpose, a large-scale installation is needed.

b) Unlike the preceding paragraph, there is another method. The condition of the installation and the like is first evaluated by a certain standard, and the result is transmitted. In this case, digital information of at most 50 bits for a unattended station is sufficient.

c) The simplest method is to furnish the person in charge of maintenance with a minimum amount of information, the contents of which are whether he has to go immediately or somewhat slowly, and whether the person should be a radio or a engine specialist. Several bits only are therefore sufficient for a unattended station.

In view of the control of television programs and economical designing, the above paragraph (b) will be most suitable for Thailand. The speed of the transmission and reception of information may not be necessarily quick, for this is transmission of information to run to the spot and recover, and the work may take several hours. A few seconds may pass before information of the whole system has been transmitted.

As for the reliability of the information transmission, the cause of faulty operations may lie either in trouble with the control system itself or in noise in the transmission path or a change in the level. In both cases, faulty operations of the control system do not raise any serious question, if their results are only erroneous indications. When such indications are due to a short period interruption in the transmission path or noise, they may be corrected easily by a repeated transmission of the information. Faulty operations are very serious in cases where the supervisory control system in not merely for the transmission of alarms, but also for the stopping of the engine generator, as well as for the remote control of turning the installation on and off. In such cases, therefore, it is necessary to use an installation whose rate of faults is much lower than that of usual installations.

For the service channel, two forms of OMNIBUS and EXPRESS service shoud be taken up. The OMNIBUS service is service circuits connecting all the manless and manned stations within a one base band section, while the EXPRESS service is service circuits connecting manned stations with each other.

4-3-6 Control Line

There are two forms of control lines: for one a band other than the base band of the main circuit is used, and for the other an auxiliary circuit is specially provided. The latter is further divided into the case of using the same frequency band as the main circuit and that of using a different frequency band, such as VHF. Each form has its merits and demerits. As for Thailand, the form to use the same frequency band as the main circuit seems to be most appropriate. The reason is that although the method using a band other than the base band of the main circuit is naturally most economical, in the case of N-to-1 form, i.e., a stand-by circuit for one circuit is used in common by several normal circuits, the control lines also will be cut when a fault occurs, making transmission or reception of instructions or information on the switching of the circuit a difficult matter. Moreover, this method has a shortcoming that in transmitting television video signals, no frequency other than lower bands can be used. If VHF is used, the antenna and feeder have to be installed, and this will prove to be very uneconomical.

4-3-7 Television Relay Link

In the case of inserting or branching television signals in a microwave link, it is more advantageous to do it an intermediate frequency stage, for modulators need not be inserted in all the microwave stations. Consequently, branching to the stations at Huahin, Lop Buri, and Uttaradit on the north and south ciruits, as well as to those in the Northeastern and Southeastern Regions, has been decided to be carried out by inserting the branching amplifier with an intermediate frequency, and then by demodulating to the video band and to send forth to the broadcasting station. It is possible to transmit to the stations without demodulation, but the shortcoming in this case is that no television video can be monitored by a microwave relay station.

4-3-8 Antenna

Concerning the antenna, the following matters should be studied: decision on the kind of the antenna, the height of the antenna from the earth, and the method of its installation.

4-3-8-a. Kinds of Antennas

According to the frequency channel arrangement recommended by the C.C.I.R., neighbouring channels must use different polarization each of them. It would be ideal, therefore, to adopt the antenna which is dually polarized, vertically and horizontally. As such antennas are comparatively expensive, and it is difficult to make the necessary arrangements at the time of their installation, there is not much difference in price with the installation of two single polarized antennas. In view of the fact that after all transmission of television signals go through two systems, it has been decided to use the single polarized antenna.

The best microwave system for the transmission of television signals in Thailand, as has been stated, is the two-frequency repeating method. It this case, the antenna with a good F/B ratio (front-back ratio) must be used. The reflector plate therefore cannot be adopted. The feeder must use the wave-guide.

4-3-8-b Height of the Antenna from Earth

The height from earth is decided in consideration of clearance and reflection from the surface of the earth.

The calculation formula of clearance is shown below. Clearance h_c above the ridge with the height of h_s at the distances of d_1 km and d_2 km from the relay points at both ends, is shown in Fig. 4-3-1.

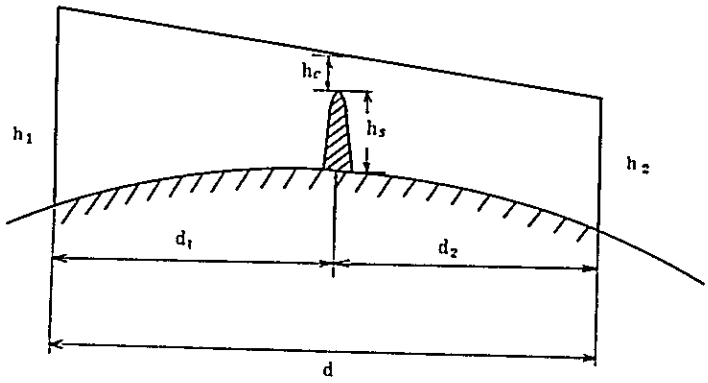


Fig. 4-3-1 Relation of Clearance

$$h_c = h_1 - \frac{d_1}{d}(h_1 - h_2) - \frac{d_1 d_2}{2Ka} - h_s$$

d . . . . . Distance between repeater stations (km)

h_1, h_2 . . . . . Height above sea level of both repeater stations (km)

h_s . . . . . Height of the ridge above sea level (km)

d_1, d_2 . . . . . Distances from both repeater stations to the ridge (km)

K . . . . . Ratio of the effective earth's radius to the earth's radius

a . . . . . Radius of the earth

In the above formula, $C = \frac{d_1 d_2}{2Ka}$ is obtained from the following formula:

$$C = \frac{d_1 d_2}{2Ka} = 0.0588\, d_1 d_2 \quad \cdots\cdots\cdots\cdots \quad K = \frac{4}{3}$$

$$= 0.1176\, d_1 d_2 \quad \cdots\cdots\cdots\cdots \quad K = \frac{2}{3}$$

The first Fresnel radius at the ridge is obtained from the following formula:

$$h_o = \sqrt{\frac{\lambda \cdot d_1 d_2}{d}}$$

Fig. 4-3-2 and Fig. 4-3-3 illustrate these relations. From the above, the following conditions must be fulfilled in order to obtain full clearance:

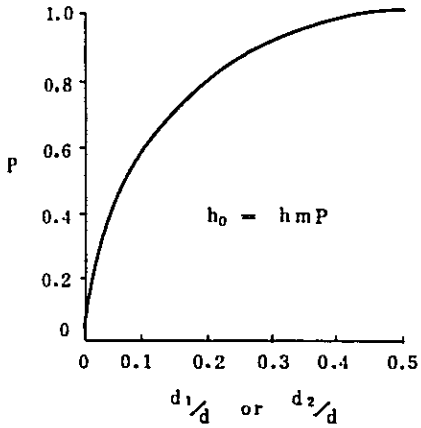


Fig 4-3-2 Depth of the first Fresnel zone

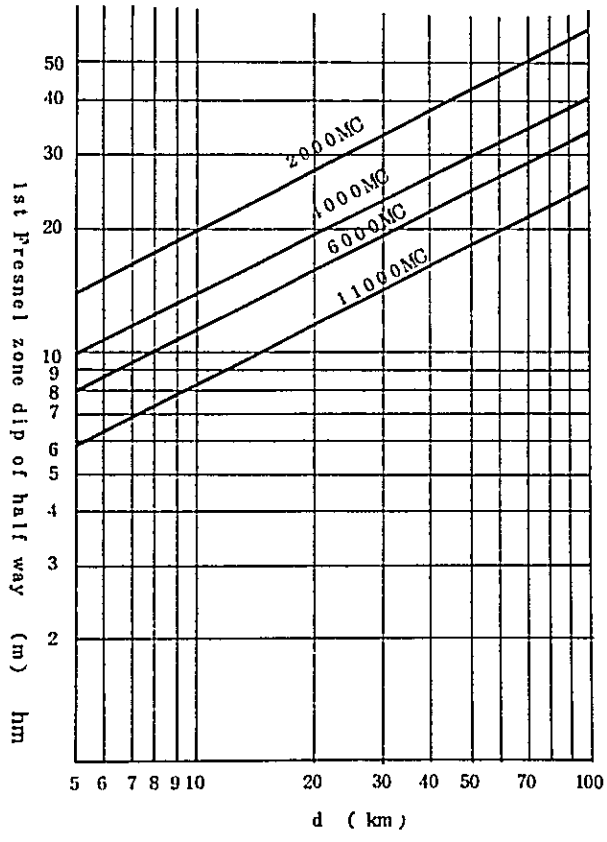


Fig 4-3-3 Depth of the first Fresnel zone

(1) In the case of K = $\frac{4}{3}$, ridge clearance should be more than the first Fresnel radius.

(2) In the case of K = $\frac{2}{3}$, ridge clearance should be more than $\frac{2}{3}$ of the first Fresnel radius.

Note: Where measures have to be taken against fading, it is necessary that, ridge clearance for an auxiliary antenna should be more than $\frac{2}{3}$ of the first Fresnel radius in the case of K = $\frac{4}{3}$.

In deciding the height of the antenna above earth for the plane earth, if large relection is likely to come, it is not enough to take only such obstacles as are existing between the antenna and the earth's surface into consideration. The height of the steel tower should be decided so that the reflection point falls on a place where the reflection coefficient is the smallest, e.g., a village, a forest, and the like. For this purpose, the following matters should be studied:

(1) Difference in the propagation path

(2) Effective height of the antenna

(3) Included angle between the direction of the direct wave and the reflected wave

(4) Height-gain pattern

(5) Equivalent reflection coefficient

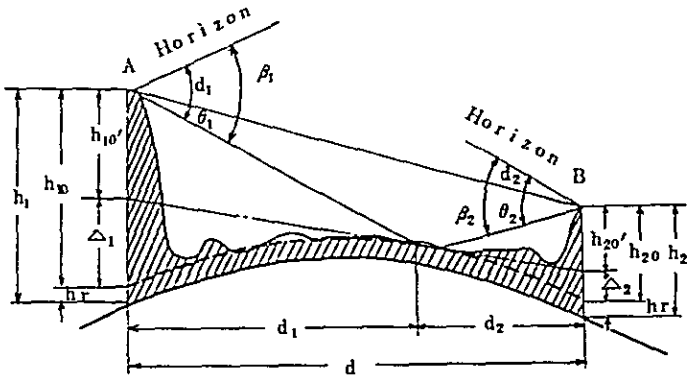


Fig 4-3-4 PROFILE

h_1 h_2 ····· Height of antenna above sea level (m)

h r····· Height of reflection point (m)

h_{10} h_{20} ···Height of antenna from reflection point (m)

d····· Distance between repeater station (km)

d_1 d_2 ····· Perpendicular angle of direct wave (mrad)

β_1 β_2 ····· Perpendicular angle of reflected wave (mrad)

θ_1 θ_2 ····· Included angle between direct and reflected wave (mrad)

(1) Difference in propagation path

In Fig. 4-3-4, S, the difference between the direct wave and the reflected wave in the propagation path is obtained from the following formula:

$$S = \frac{2 h_{10}' h_{20}'}{d}$$

d . . . . . Distance of relay section $d = d_1 + d_2$

h_{10}' h_{20}' . . . . Effective height of antenna at both repeater stations

$$h_{10}' = h_1 - \frac{d_1^2}{2Ka}$$

$$h_{20}' = h_2 - \frac{d_2^2}{2Ka}$$

What signify d_1 and d_2 are distances from both ends to the reflection point, obtainable from the following formula:

$$d_1 = d\,\frac{b+1}{2}, \quad d_2 = d - d_1$$

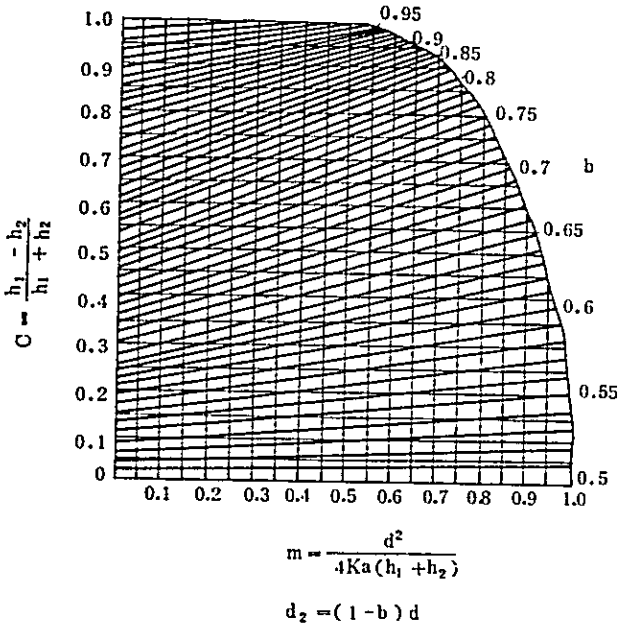


Fig 4-3-5 The figure for the calculation of b

The calculation table to obtain b is shown is Fig. 4-3-5. Both m and c are obtained from the following formulas:

$$m = \frac{d^2}{4Ka(h_1 + h_2)}$$

$$C = \frac{h_1 - h_2}{h_1 + h_2}$$

(2) Effective height of the antenna

The effective height of each antenna is obtained from the following formulas:

$$h_{10}' = h_{10} - \Delta_1 = h_1 - hr - \Delta_1$$

$$h_{20}' = h_{20} - \Delta_2 = h_2 - hr - \Delta_2$$

$$\Delta_1 = \frac{d_1^2}{2Ka} \qquad \Delta_2 = \frac{d_2^2}{2Ka}$$

(3) Included angle between the direct and reflected waves

For the included angle between the direct wave and the reflected wave the following calculation formulas are used:

$$\theta_1 = \frac{h_{10}}{d_1} - \frac{h_{10} - h_{20}}{d} - \frac{d_2}{2Ka}$$

$$\theta_2 = \frac{h_{20}}{d_2} - \frac{h_{20} - h_{10}}{d} - \frac{d_1}{2Ka}$$

(4) Height-Gain Pattern

The half-pitch of the height-gain pattern is obtained from the following formula:

$$\text{The } h_1 \text{ side} \cdots P_1 = \frac{\lambda d}{4 h_{20}'} \fallingdotseq \frac{\lambda}{2\theta_1}$$

$$\text{The } h_2 \text{ side} \cdots P_2 = \frac{\lambda d}{4 h_{10}'} \fallingdotseq \frac{\lambda}{2\theta_2}$$

The depth of the height gain pattern is obtained from the following formula:

$$20 \log \left(\frac{1}{1 - \rho_e}\right) \quad \alpha\beta$$

ρ_e is the effective reflection coefficient as follows:

ρe = Equivalent reflection coefficient of reflection point × Attenuation of reflected wave due to antenna directivity × Shielding ridge loss of reflected wave

(5) Coefficient of equivalent reflection

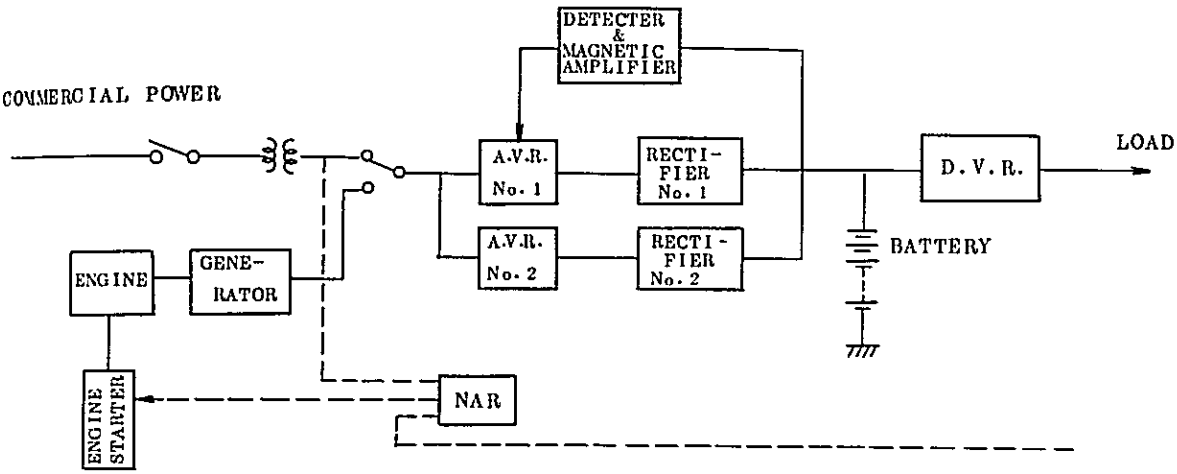
The coefficients of equivalent reflection are in Table 4-3-1.

Table 4-3-1. Coefficients of Equivalent Reflection

Condition at Reflection point / Frequency	Surface of Water		Rice Field		Field & Rice Field (Dried)		City, Forest, & Mountain	
	Coef-ficient	Loss	Coef-ficient	Loss	Coef-ficient	Loss	Coef-ficient	Loss
2 GC	1.0	0 dB	0.8	2 dB	0.6	4 dB	0.3	10 dB
4 GC	1.0	0	0.8	2	0.5	6	0.2	14
6 GC	1.0	0	0.8	2	0.5	6	0.2	14

4.3.9. Power Source

When the solid state repeater is used, the floating battery is the most economical non-stoppage source of power (Reference to Fig. 4-3-6). The capacity of the battery is decided by the way of maintenance, and is usually for 18 hours. No spare engine is needed for a station to which commercial electricity is available. In this case, however, one generator will have to be waiting for several stations, that is, a vehicle carrying a engine generator should be ready for any emergency. For stations to which commercial electricity is not available, installation of two engine generators to be operated alternately is desirable. In the case of the Northeastern line, where a new station will be established concurrently with the existing one, only the battery and the rectifier will have to be installed.



LEGEND

A. V. R. : AUTOMATIC VOLTAGE REGULATER

D. V. R. : D. C. VOLTAGE REGULATER

N. A. R. : SUPERVISORY EQUIPMENT

Fig 4-3-6 Apparatus of Power Source

4.4 Outline of the Results of Site Selection

Results of an examination of the site selection for microwave repeater stations made on maps will be stated here. Separate figures having the following contents have been prepared for different regions:

(1) Outline of routes

(2) Profiles

(3) Proposed sites

(4) Propagation characteristics

Note 1. Profiles are indicated at the atmospheric standard condition of $K = \frac{4}{3}$

The condition may well be much worse in the case of propagation on plane earth

Note 2. Profiles have been prepared, using in principle maps on the scale of 1/50,000. As no map on this scale was available for the Yala District, one on the scale of 1/250,000 has been used.

Concerning special features of propagation between plane earth sections, especially between Bangkok and Si Racha, an investigation in more detail is considered to be necessary. It is desirable that, on an appropriate occasion in the future, probability of the occurrence of fading and other fundamental features of propagation should be studied in representative section. At the time of actual planning, the speciality of reflection, e.g., the area of reflection points and other matters, will have to be investigated again.

4.4.1 Northeastern Region

Reference is made only to the section between Sara Buri and Nakhon Ratchasima, for the reason that, as has been stated in Paragraph 4.1.3 on the Outline, there already exists microwave systems for the Nakhon Ratchasima —— Udon Thani and Nakhon Ratchasima —— Ubon sections. A study has been made with the frequency of 4GC.

(1) Outline of routes

Reference to Fig. 4-4-1.

(2) Profiles

Reference to Fig. 4-4-2, Fig. 4-4-3, and Fig. 4-4-4.

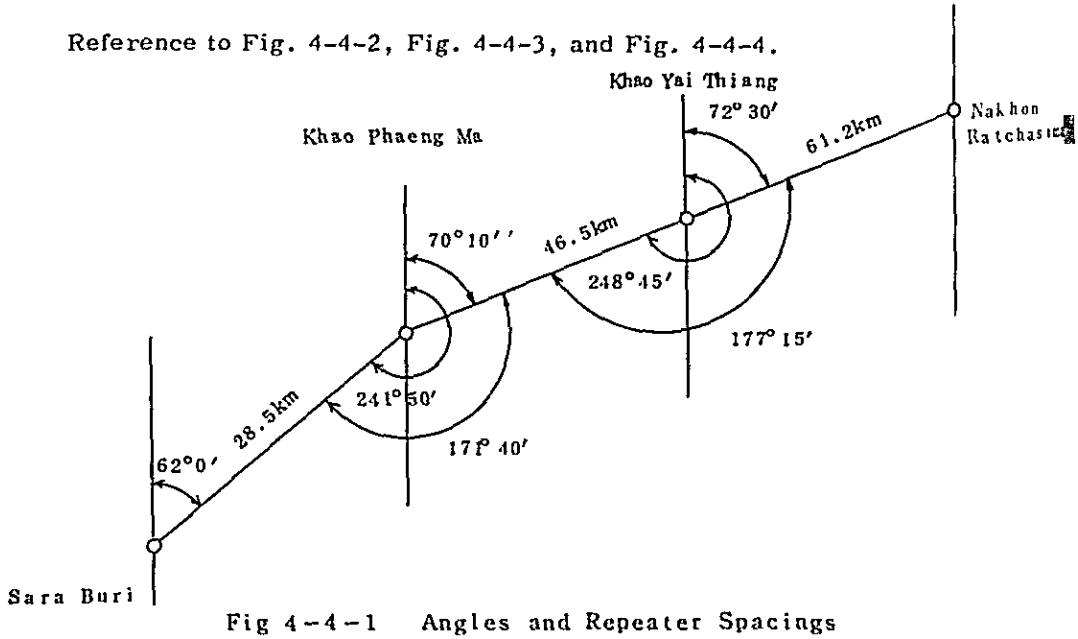


Fig 4-4-1 Angles and Repeater Spacings

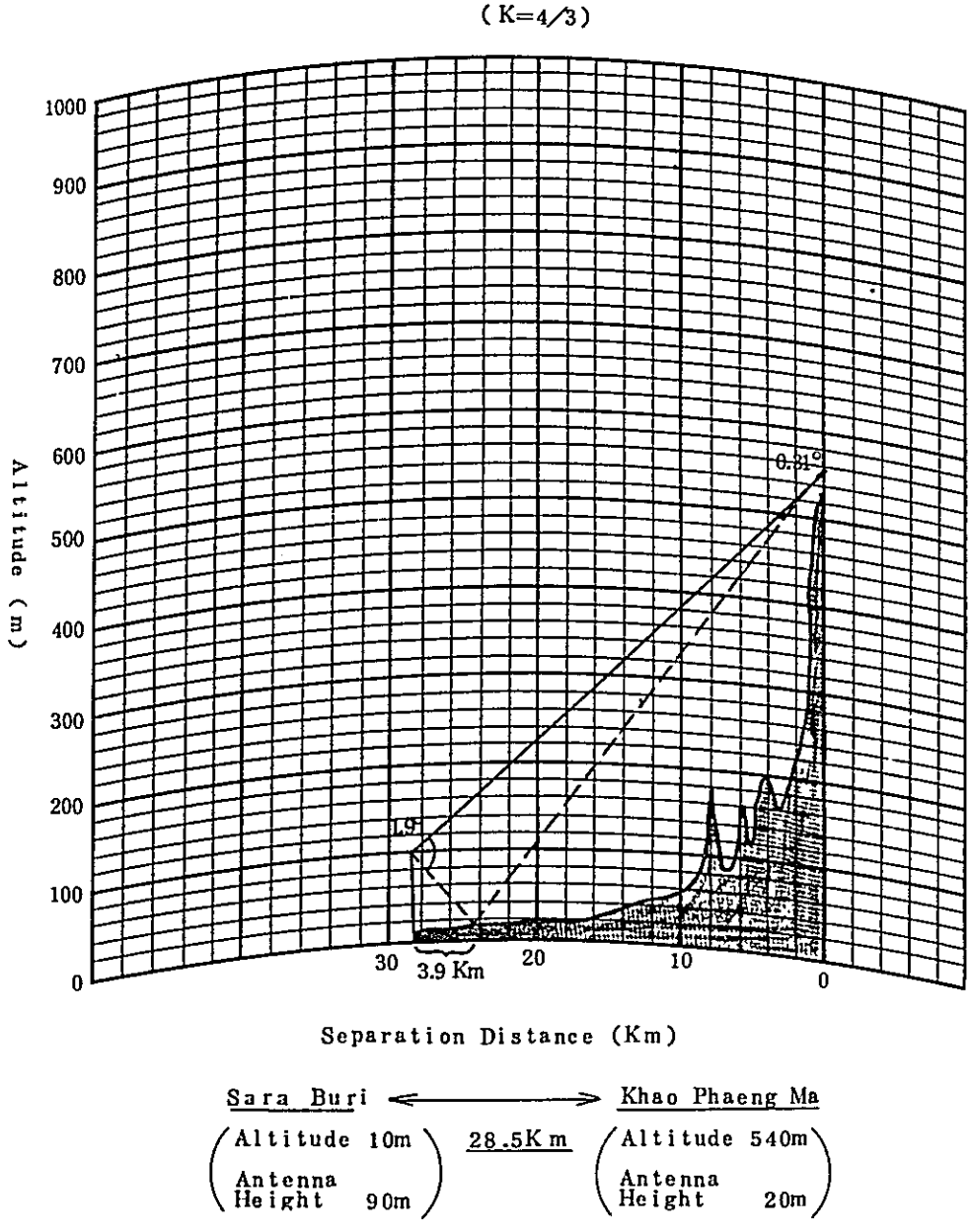


Fig. 4-4-2 PROFILES (Sara Buri - Khao Phaeng Ma)

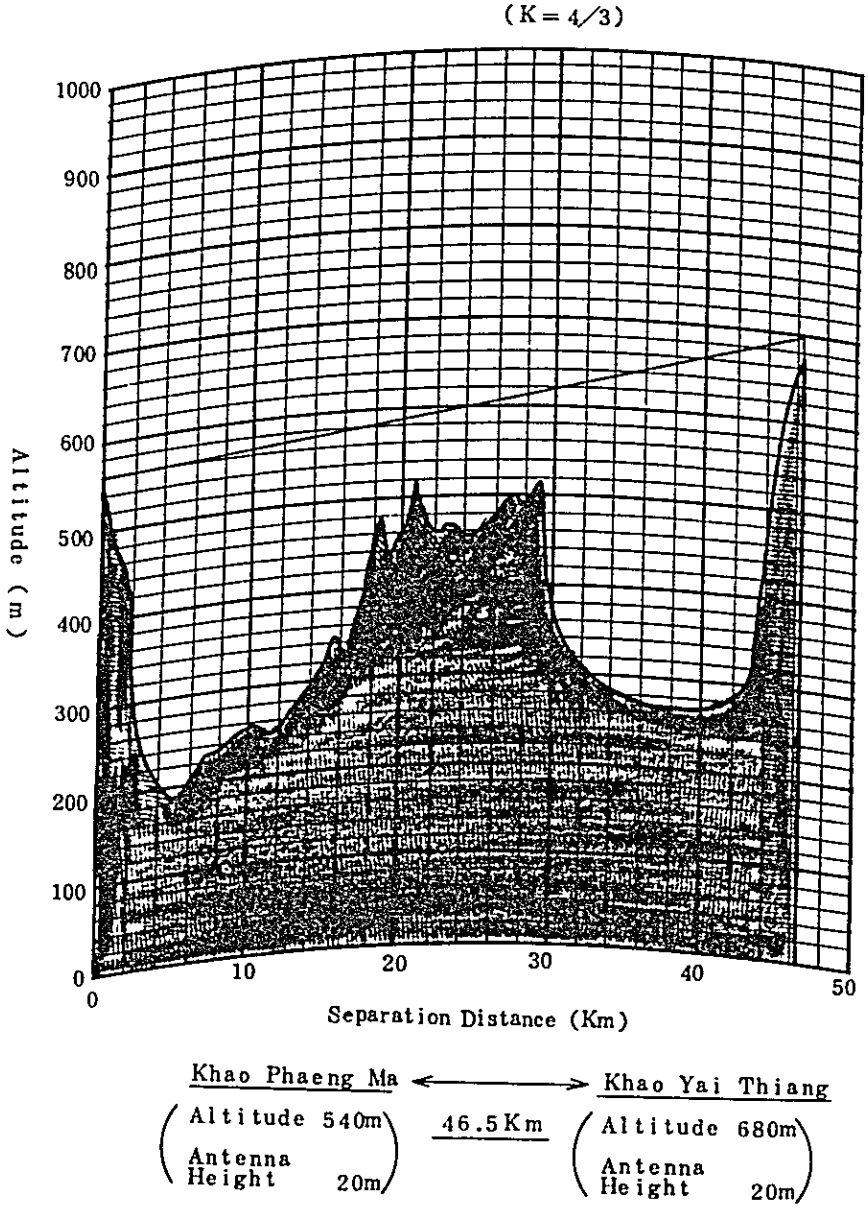


Fig. 4-4-3 PROFILES (Khao Phaeng Ma - Khao Yai Thiang)

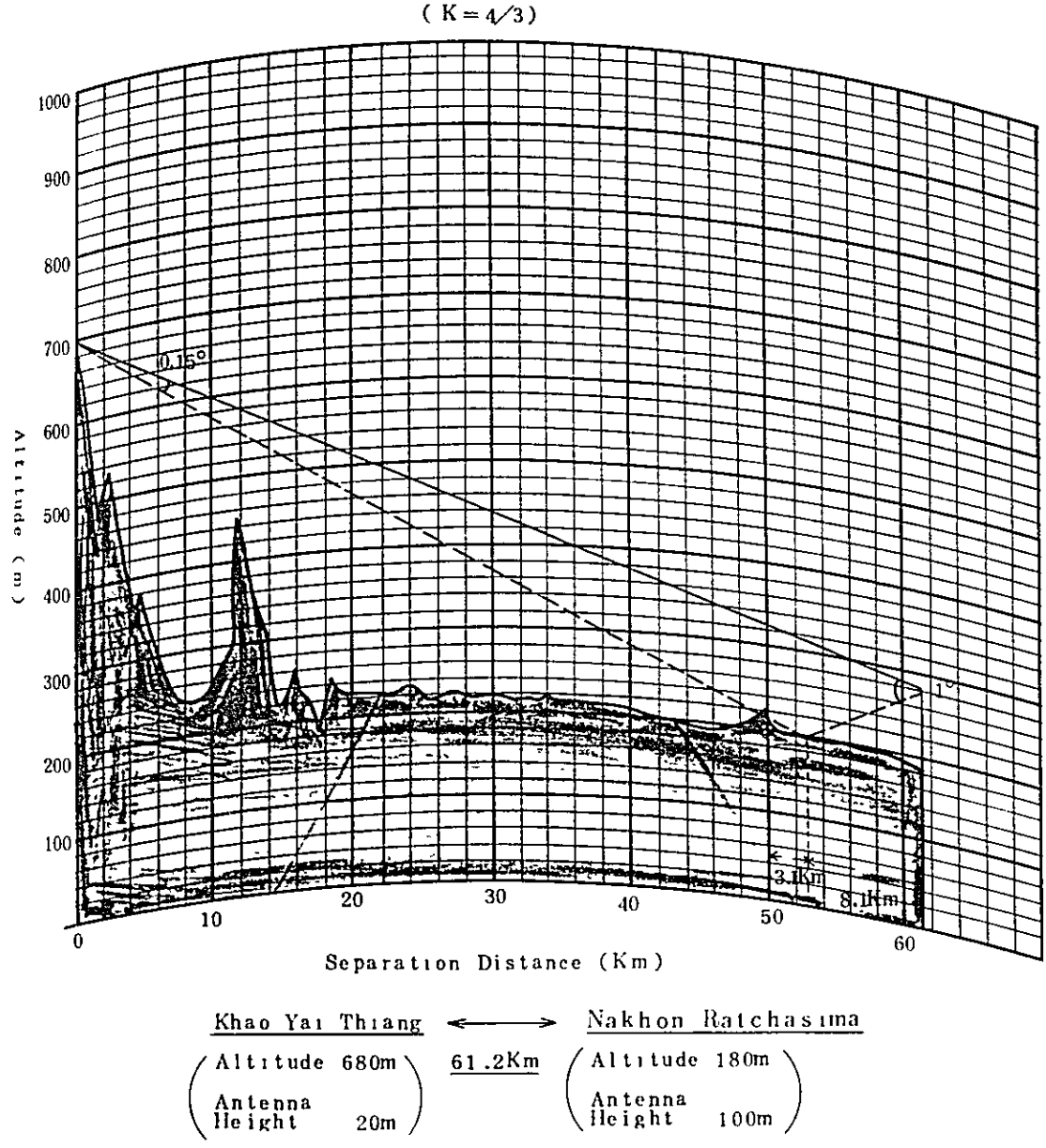


Fig. 4-4-4 PROFILES (Khao Yai Thiang~Nakhon Ratchasima)

(3) Position of proposed sites

Table 4-4-1 shows the sites.

Table 4-4-1 Position of Proposed Sites

Repeater Station	East Longitude	North Latitude	Above Sea Level
Sara Buri	Same as existing station		10m
Khao Phaeng Ma	101° 09' 23"	14° 38' 58"	540m
Khao Yai Thiang	101° 33' 06"	14° 47' 09"	680m
Nakhon Ratchasima	Same as existing station		180m

(4) Propagation characteristics

Reference to Table 4-4-2.

Table 4-4-2 Propagation Characteristics

Item \ Station		Sara-Buri		Khao Phaeng Ma		Khao Yai Thiang		Nakhon Ratchasima	
Altitude	m	10		540		680		180	
Antenna Height above Ground	m	90		20		20		100	
Effective Antenna Height	m		79.1	504.4	—	—	323	76.2	
Half Pitch Distance of Height-gain Pattern	m		—	—	—	—	—	—	
Effective Reflection Coefficient: Included Angle between Direct & Reflected Ray	o,		1.9°	0.31°	—	—	0.15°	1.0°	
Effective Reflection Coefficient: Attenuation of Reflected Wave Due to Antenna Directivity	dB		18	1	—	—	0	7.5	
Effective Reflection Coefficient: Shielding Ridge Loss of Reflected Wave	dB		0		—		12		
Reflection Point: Distance from Station	Km		3.9	24.6	—	—	53.1	8.1	
Reflection Point: Classification of Condition			rice field		—		field		
Reflection Point: Reflection Loss	dB		2		—		6		
Reflection Point: Altitude	m		20		—		200		
Total Loss of Reflected Wave	dB		21.0		—		25.5		
Path Difference between Direct & Reflected Wave	m		2.8		—		0.875		
Distance of Propagation Path	Km		28.5		46.5		61.2		
Free Space Loss	dB		134.0		138.5		141.0		

4.4.2 Southeastern Region

In the Bangkok —— Ban Bang —— Khao Chalak section, propagation on plane earth is on one side and that on the sea is on the other. Reflection loss therefore is small, as Table 4-4-4 shows it, and the space diversity system will be adopted for this section. The frequency to be used should preferably be 7GC in order to avoid interference from the space communication system.

(1) Outline of routes

Reference to Fig. 4-4-5.

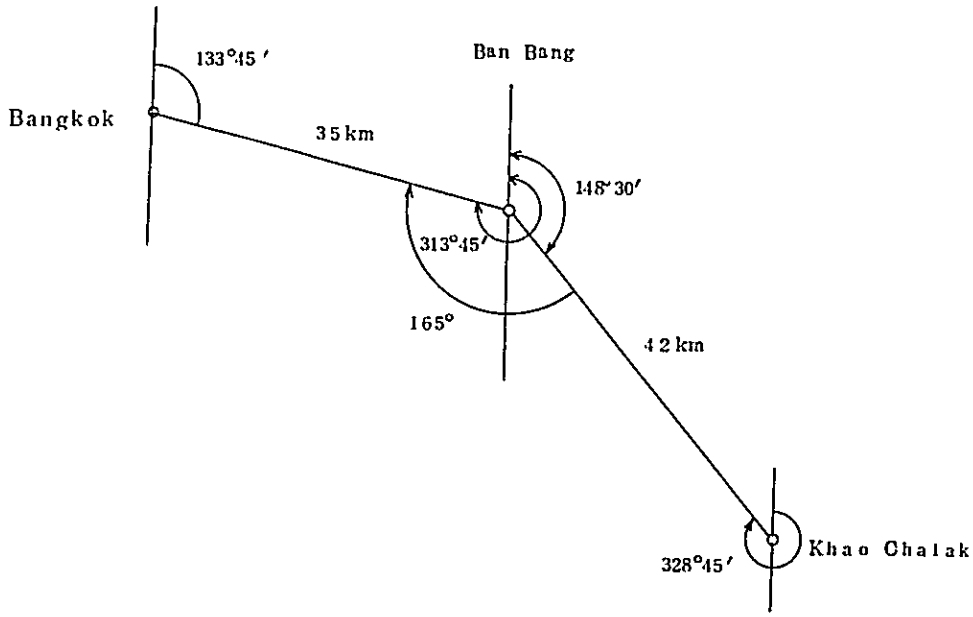


Fig 4-4-5 Angles and Repeater Spacings

(2) Profiles

Reference to Fig. 4-4-6.

(3) Position of proposed sites

Reference to Table 4-4-3.

Table 4-4-3 Position of Proposed Sites

Repeater Station	East Longitude	North Latitude	Above Sea Level
Bangkok	Bangkok Tole Centre		10m
Ban Bang	100° 45' 20"	13° 30' 24"	10m
Khao Chalak	100° 57' 22"	13° 11' 20"	313m

(4) Propagation characteristics

Reference to Table 4-4-4.

Table 4-4-4 Propagation Characteristics

Item \ Station			Bangkok	Ban bang		Khao Chalak	
Altitude		m	10	10		313	
Antenna Height above Ground		m	100	30		30	
Effective Antenna Height		m	63	24.4	38.22	251.8	
Half Pitch Distance of Height-gain Pattern		m	12.6	5	1.7	11.6	
Effective Reflection Coefficient	Included Angle between Direct & Reflected Ray	o	0.115°	0.29°	0.82°	0.13°	
	Attenuation of Reflected Wave Due to Antenna Directivity	dB	0	1	9	0	
	Shielding Ridge Loss of Reflected Wave	dB	0		0		
	Reflection Point: Distance from Station	Km	25.2	9.8	5.5	36.5	
	Reflection Point: Classification of Condition		rice field		sea		
	Reflection Point: Reflection Loss	dB	2		0		
	Reflection Point: Altitude	m	10		0		
	Total Loss of Reflected Wave	dB	3		9		
Path Difference between Direct & Reflected Wave		m	0.088		0.46		
Distance of Propagation Path		Km	35.0		42		
Free Space Loss		dB	139.5		141		

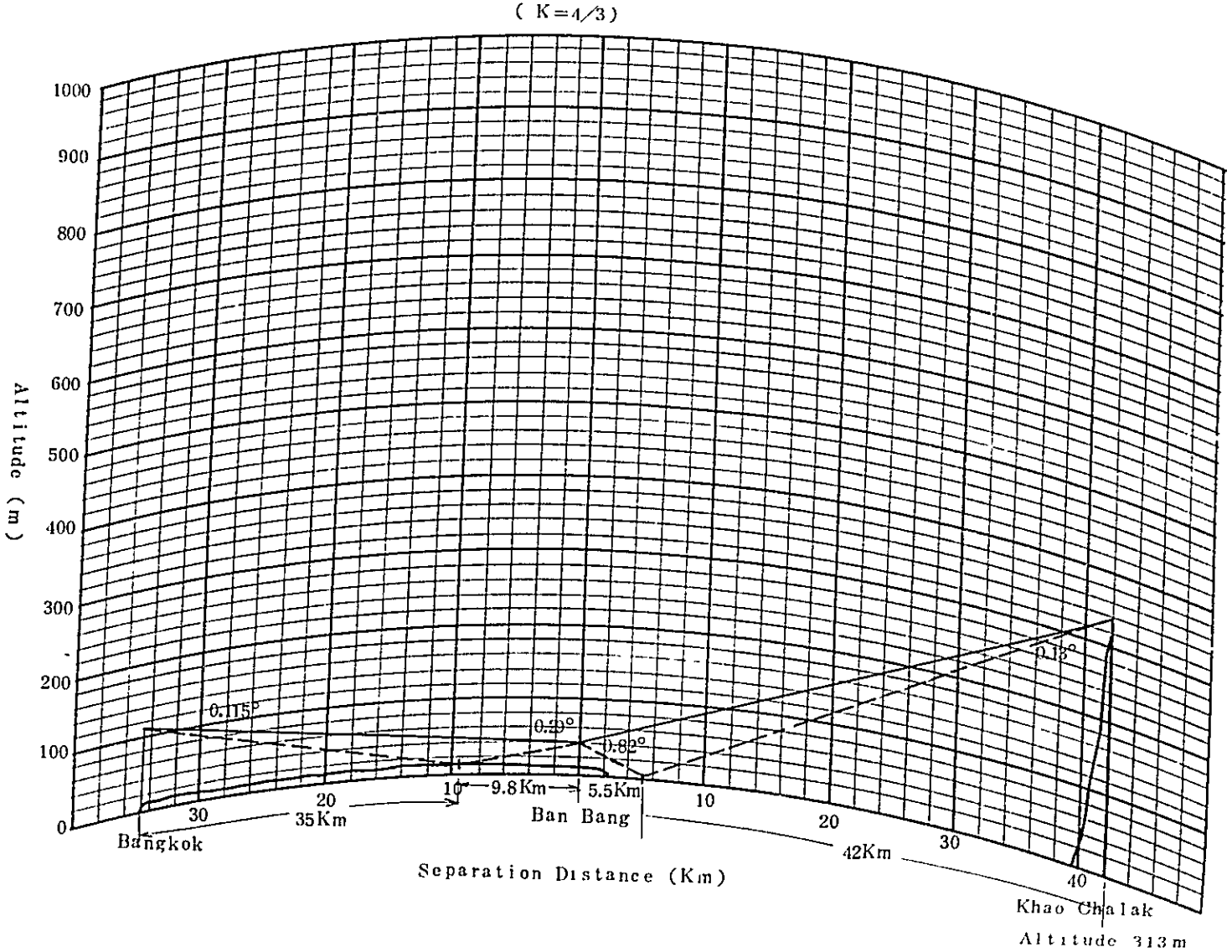


Fig. 1-1-6 PROFILE (Bangkok ~ Ban Bang ~ Khao Chalak)

4.4.3 Southern Region

As no maps of scale: 1/50,000 were available, profiles of the Haad Yai —— Yala section have been made on the basis of maps on the scale of 1/250,000. Calculations have been made, taking forests as the position of reflection points. With economical planning in view, a distance longer than that for standard repeater spacings has been taken. Profiles in the case of three relays (from Fig. 4-4-10 to Fig. 4-4-12) have been inserted as data for a detailed investigation in site selection to be conducted later. In this Report, forests have been taken as reflection points, and the results will serve as data for a future study of the advisability, if rice fields are taken as reflection points, of the three repeater system or the adoption of the diversity system under the two repeater system to which this Report refers.

(1) Outline of routes

Reference to Fig. 4-4-7.

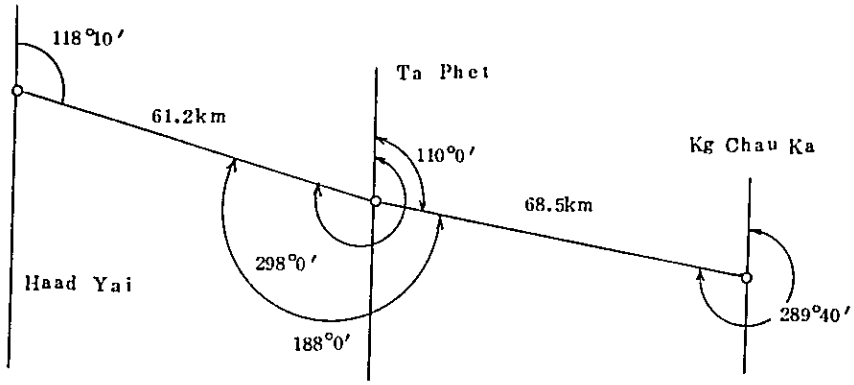


Fig. 4-4-7. Angles and Repeater Spacings

(2) Profiles

Reference to Fig. 4-4-8 and Fig. 4-4-9.

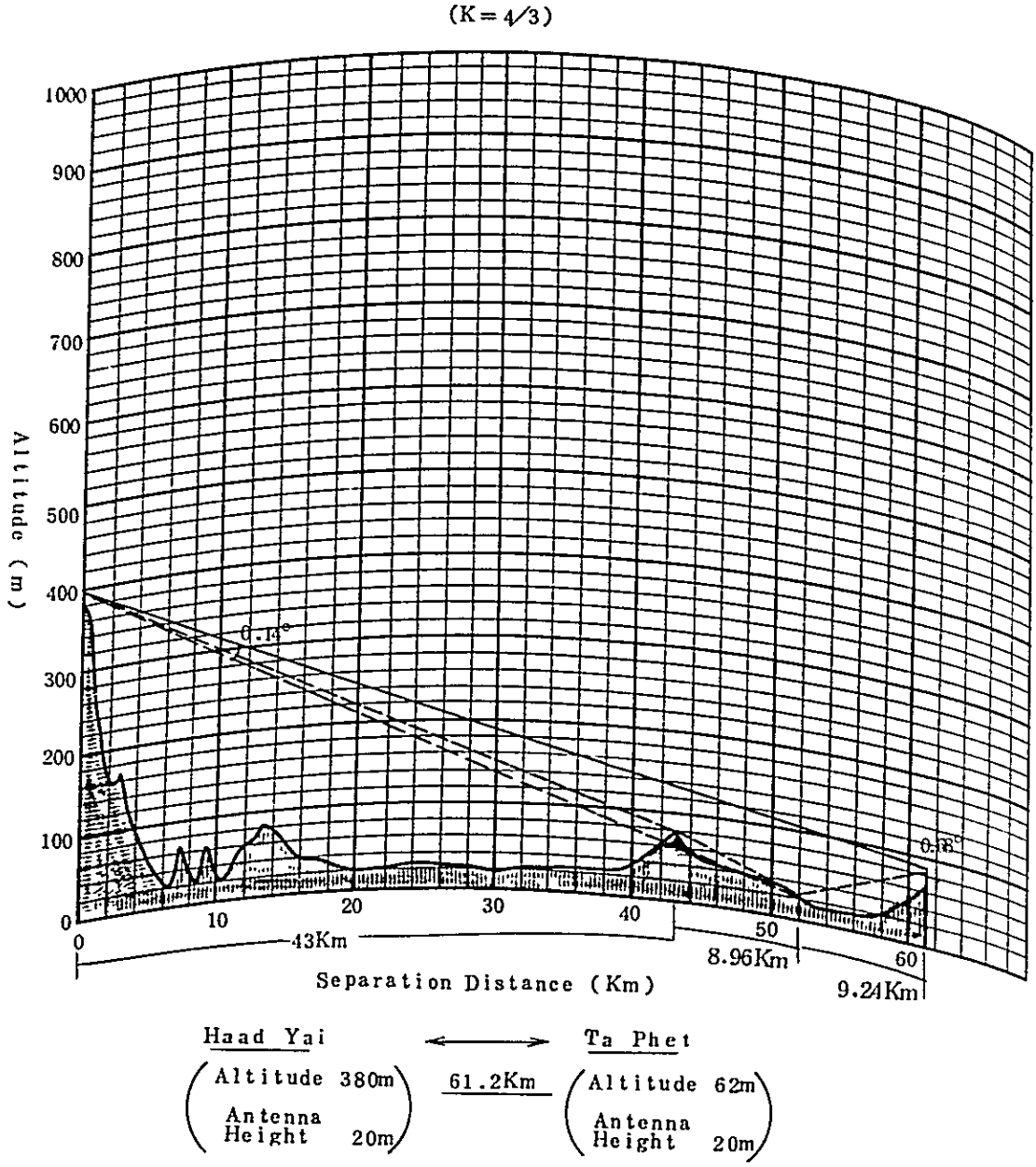


Fig. 4-4-8 PROFILES (Haad Yai - Ta Phet)

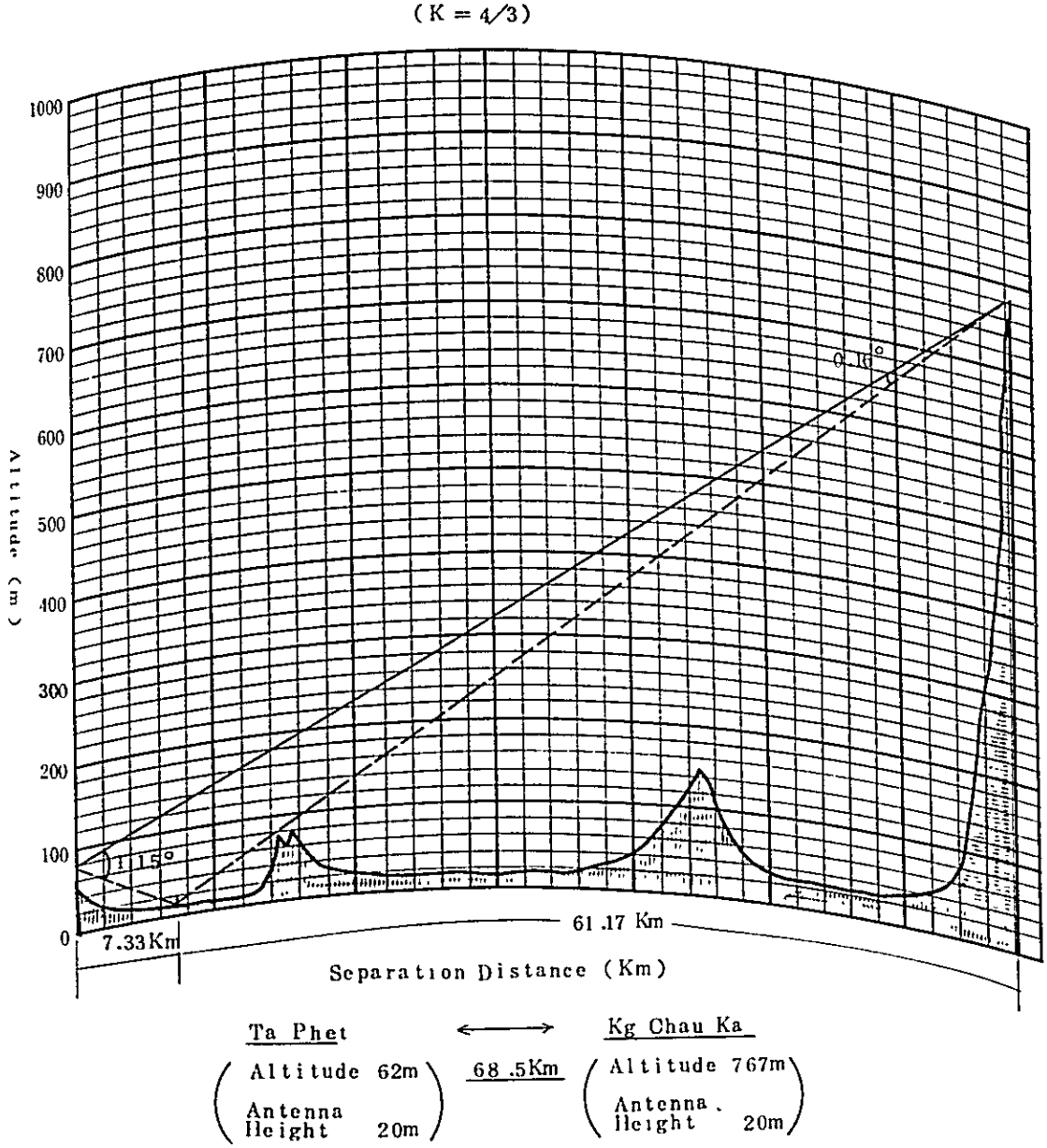


Fig. 4-4-9 PROFILES (Ta Phet - Kg Chau Ka)

(3) Position of proposed sites

Reference to Table 4-4-5.

Table 4-4-5 Position of Proposed Sites

Repeater Station	East Longitude	North Latitude	Above Sea Level
Haad Yai	Same as existing station		380 m
Ta Phet	101° 0' 58"	6° 45' 51"	62 m
Kg Chau Ka	101° 36' 10"	6° 33' 36"	767 m

(4) Propagation characteristics

Reference to Table 4-4-6

Table 4-4-6 Propagation Characteristics

Item \ Station			Haad Yai		Ta Phet		Kg chau Ka	
Altitude		m	380		62		767	
Antenna Height above Ground		m	20		20		20	
Effective Antenna Height		m		211	57.1	66.8	557	
Half Pitch Distance of Height-gain Pattern		m		16.7	3.1	1.9	15.7	
Effective Reflection Coefficient	Included Angle between Direct & Reflected Ray	o '		0.14	0.68°	1.15°	0.16°	
	Attenuation of Reflected Wave Due to Antenna Directivity	dB		0	4	9	0	
	Shielding Ridge Loss of Reflected Wave	dB		12.8		0		
	Reflection Point: Distance from Station	Km		51.96	9.24	7.33	61.17	
	Reflection Point: Classification of Condition			forest		forest		
	Reflection Point: Reflection Loss	dB		14		14		
	Reflection Point: Altitude	m		20		10		
	Total Loss of Reflected Wave	dB		30.8		22		
Path Difference between Direct & Reflected Wave		m		0.564		0.11		
Distance of Propagation Path		Km		61.2		68.5		
Free Space Loss		dB		141.0		141.8		

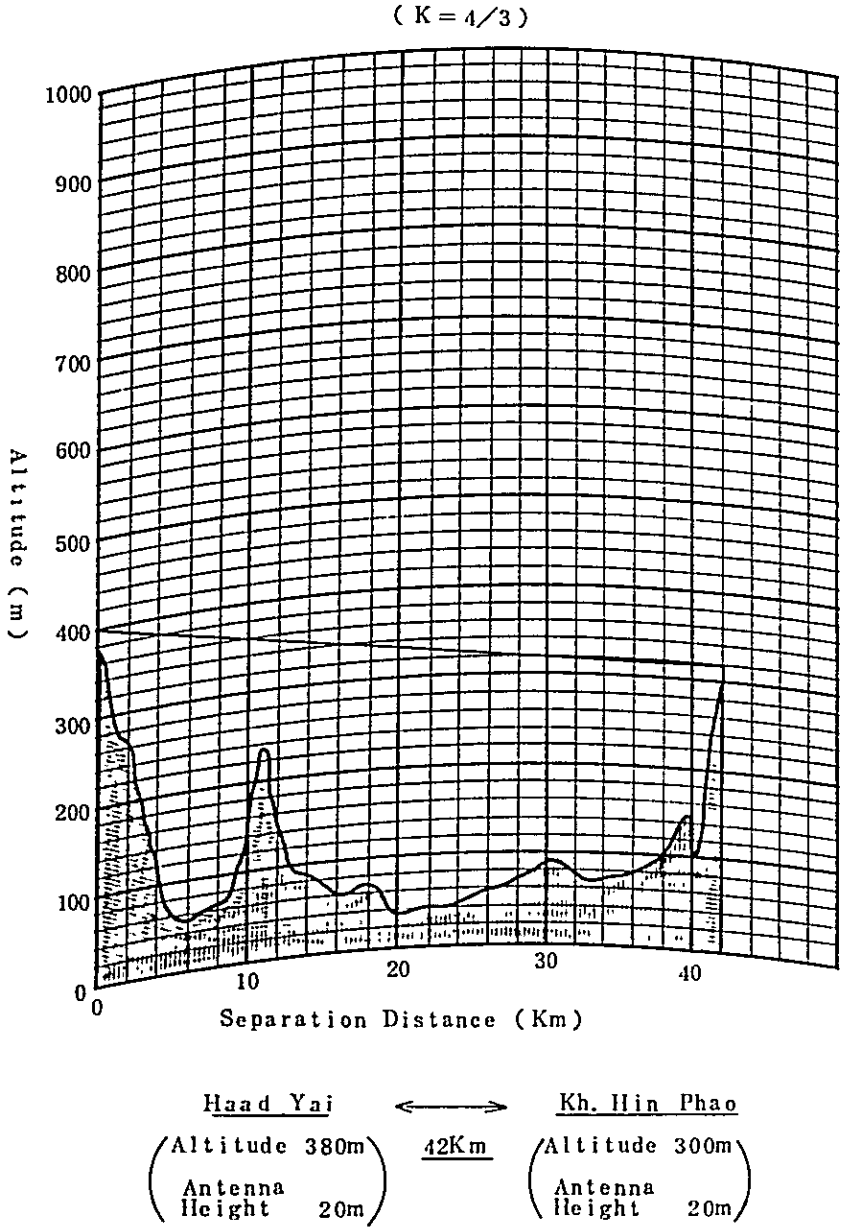


Fig. 4-4-10 PROFILES (Haad Yai - Kh. Hin Phao)

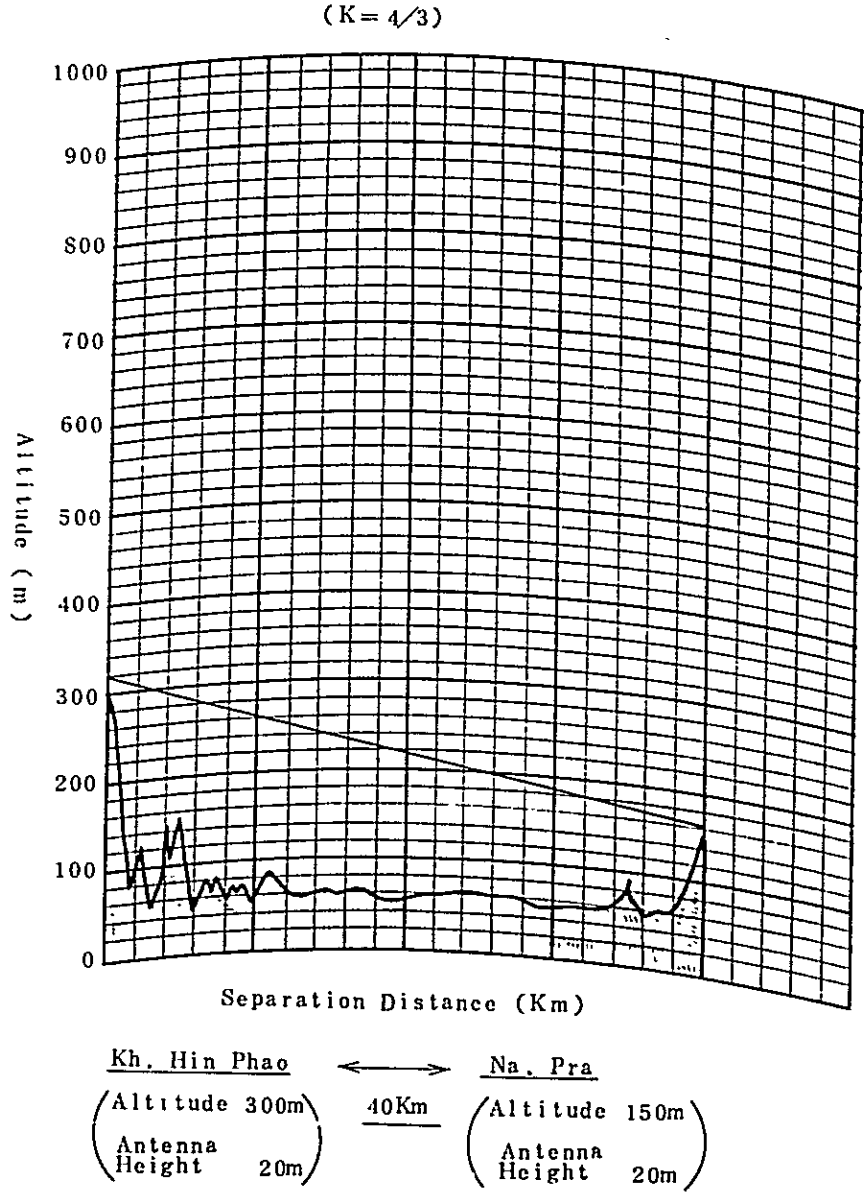


Fig. 4-4-11 PROFILES (Kh. Hin Phao~Na. Pra)

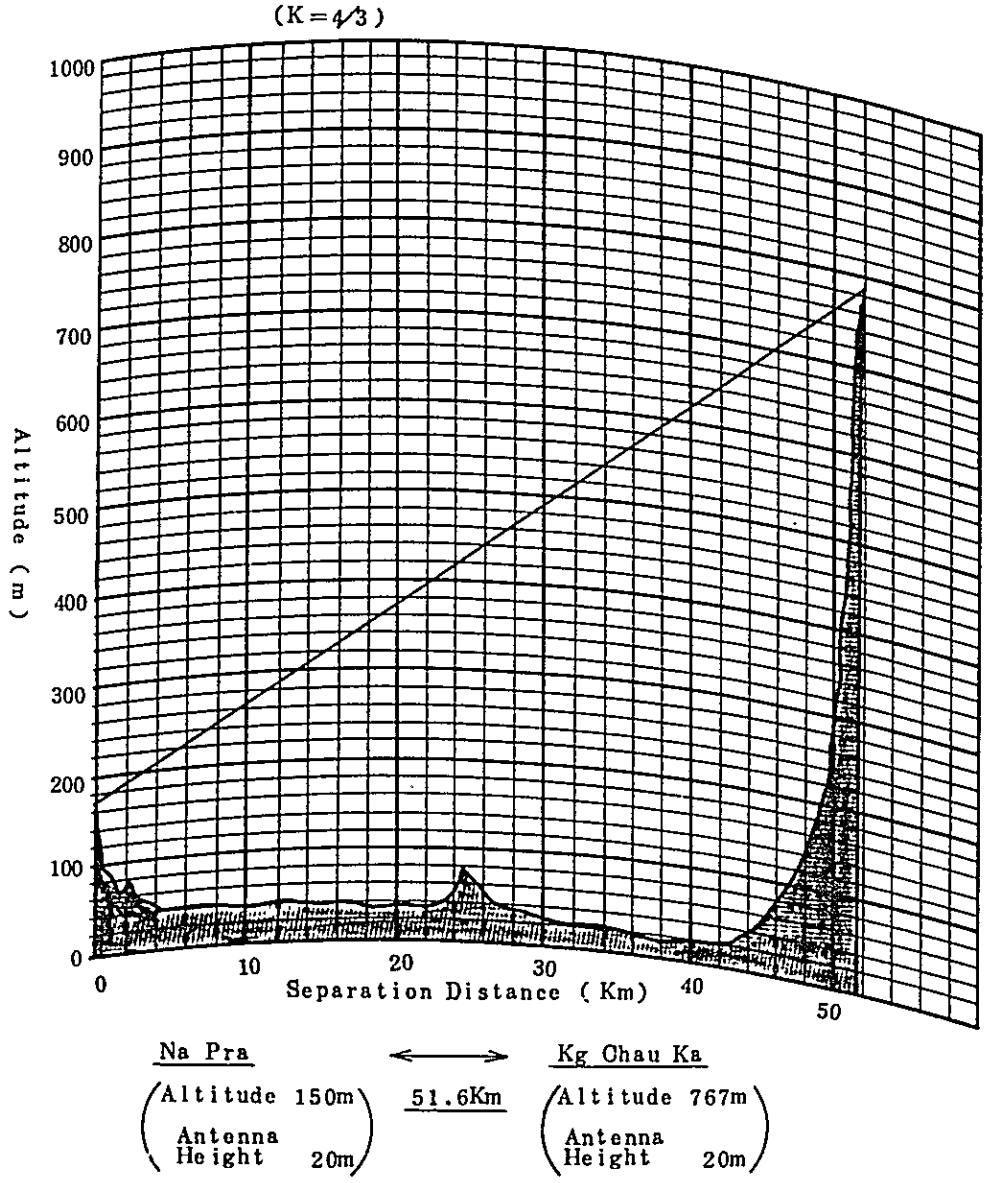
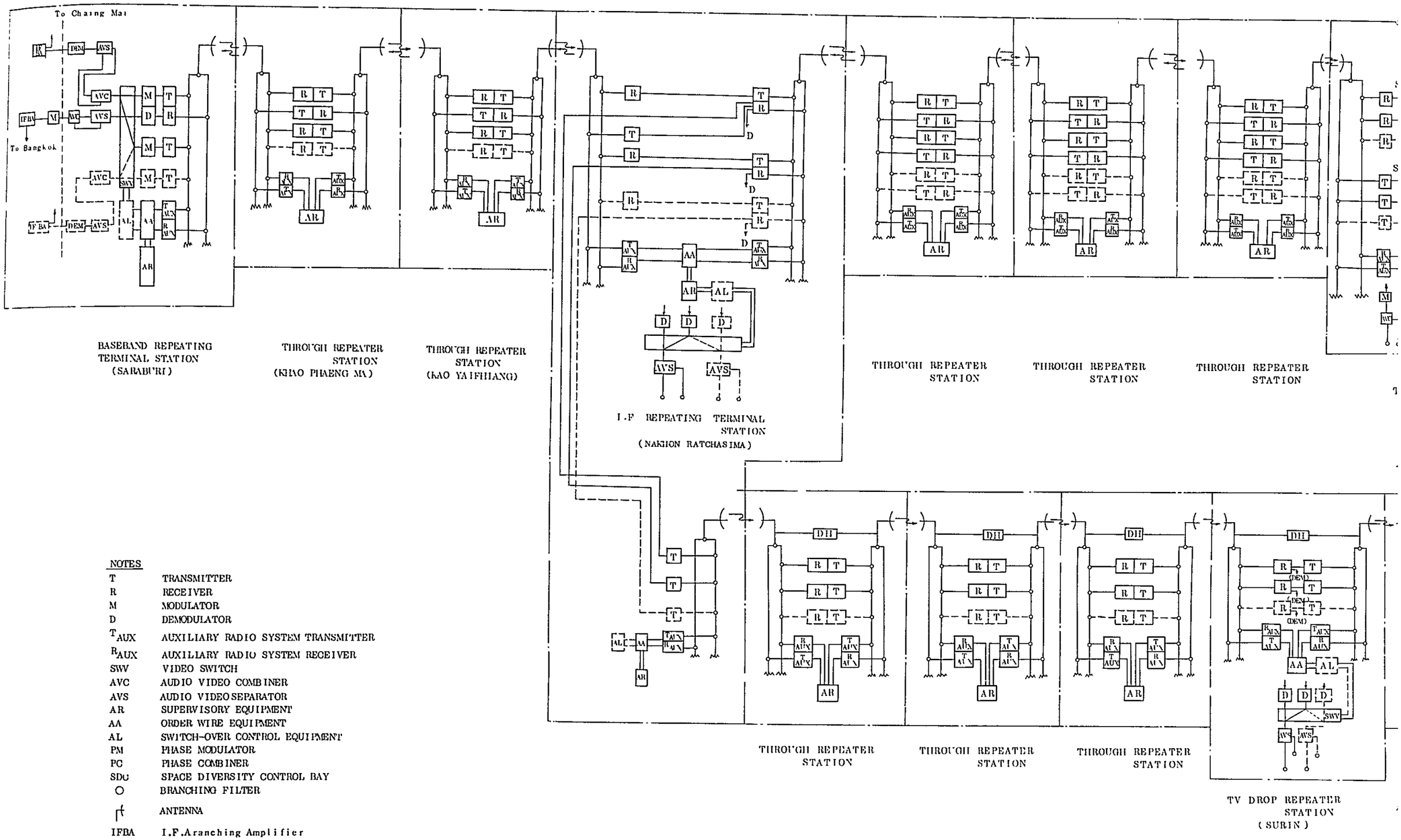


Fig. 4-4-12 PROFILES (Na. Pra Kg. Chau Ka)

4.5 Installation Planning

4.5.1 Structure of Systems

The microwave system for television signal transmission, the installation of which is recommended this time, as is shown in Fig. 4-5-1 and Fig. 4-5-3, will be two systems at the outset, including one system for actual use and the other stand-by. The structure is so planned that a third system for use may be added in the future. In view, however, of the use to be made of the system in the direction of Sara Buri from Nakhon Ratchasima, one system for actual use may suffice both at the outset and in the future, and no stand-by system will be installed.



NOTES

T	TRANSMITTER
R	RECEIVER
M	MODULATOR
D	DEMODULATOR
T_{AUX}	AUXILIARY RADIO SYSTEM TRANSMITTER
R_{AUX}	AUXILIARY RADIO SYSTEM RECEIVER
SWV	VIDEO SWITCH
AVC	AUDIO VIDEO COMBINER
AVS	AUDIO VIDEO SEPARATOR
AR	SUPERVISORY EQUIPMENT
AA	ORDER WIRE EQUIPMENT
AL	SWITCH-OVER CONTROL EQUIPMENT
PM	PHASE MODULATOR
PC	PHASE COMBINER
SDC	SPACE DIVERSITY CONTROL BAY
O	BRANCHING FILTER
	ANTENNA
IFBA	I.F.Aranching Amplifier
SWIF	I.F.SWITCH

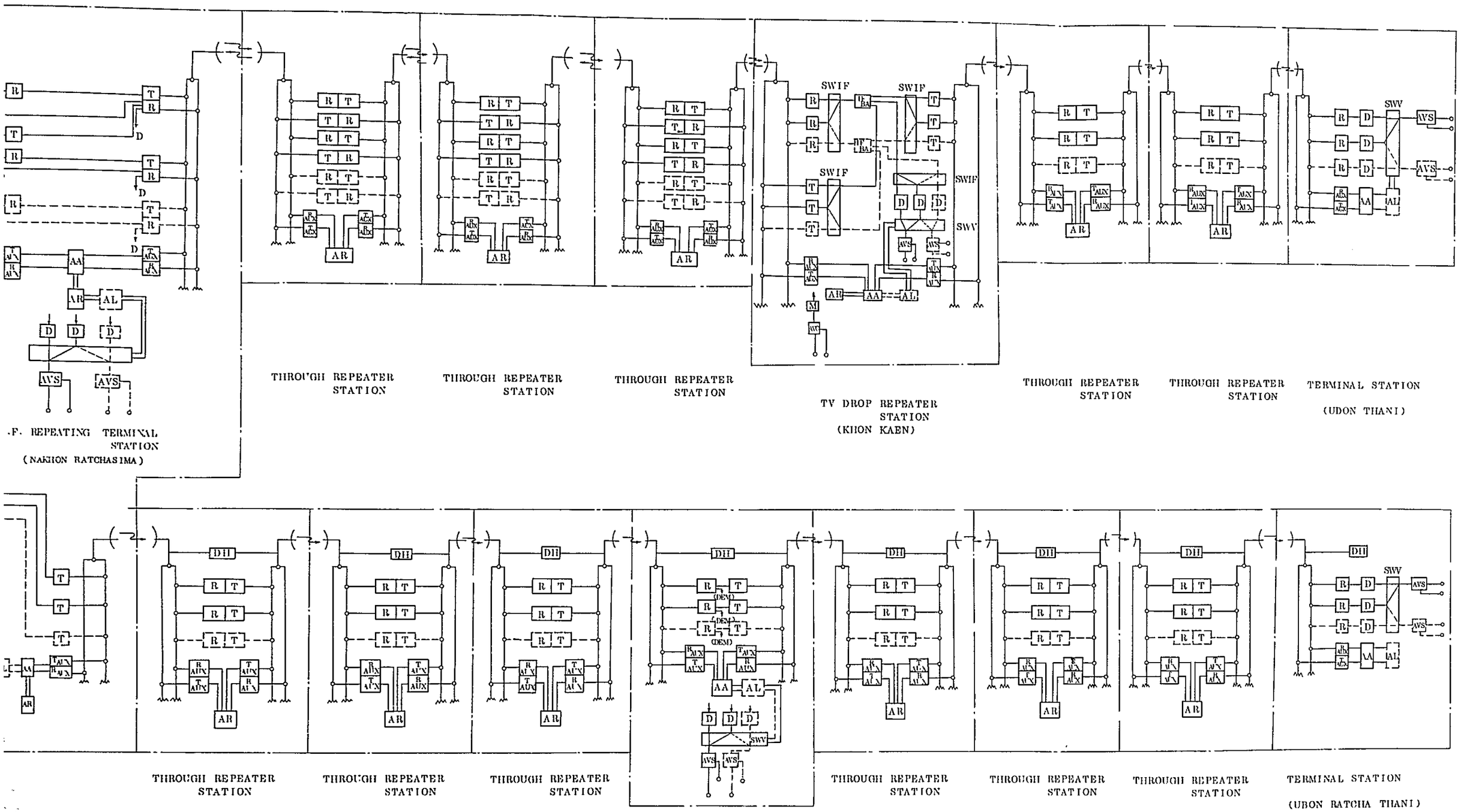
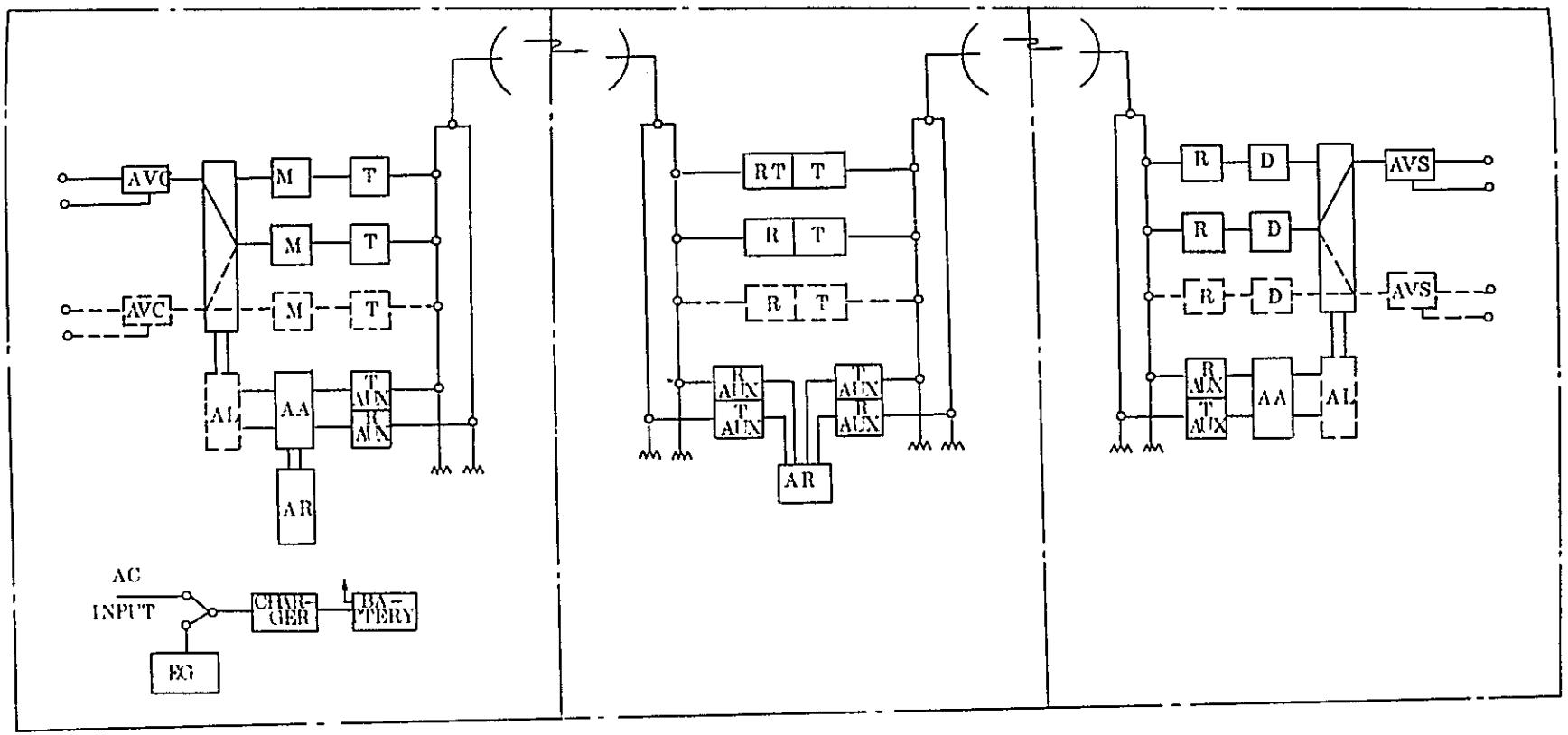


Fig. 4-5-1 SYSTEM BLOCK DIAGRAM OF MICROWAVE RELAYING NETWORK



TERMINAL STATION (HAAD YAI) THROUGH REPEATER STATION (TA PHET) TERMINAL STATION (YALA)

Fig. 4-5-2 SYSTEM BLOCK DIAGRAM OF MICROWAVE RELAYING NETWORK

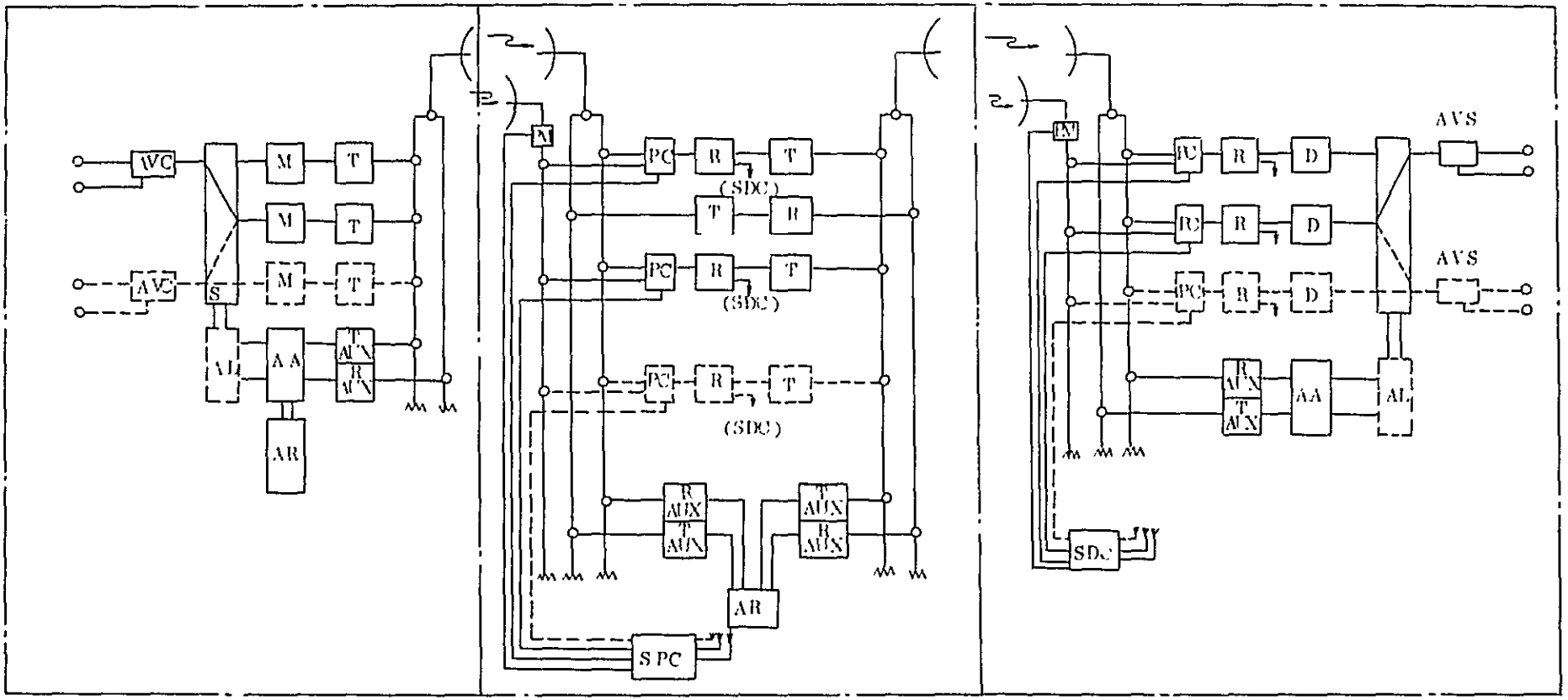


Fig. 4-5-2 SYSTEM BLOCK DIAGRAM OF MICROWAVE RELAYING NETWORK

An up-line has been planned for broadcasts from the local stations at Khon Kaen, Haad Yai, and Lampang, as well as for the transmission of programs from these stations to the central station of Bangkok. As for the North-and-South system, it is understood that the stand-by system of the telephone trunk line now being planned will become abailable.

As the switching system at the outset is that of one-to-one, the transmission terminal station will install an all-time parallel connection, and the reception terminal, by detecting the pilot signal and the S/N ratio, will switch in the case of disorder in the apparatus and of the deterioration of the S/N ratio due to fading, as the case may be. When one system is added in the future, the switching equipment of control circuits will have to be additionally installed.

Relations between the monitor station and monitored stations shall be as they are in Table 4-5-1.

Table 4-5-1. List of Monitor Stations

Monitor Station (Maintenance Centre)	Monitored Station (Intermediate Station)
Haad Yai	1 repeater station between Haad Yai and Yala
Bangkok	1 repeater station between Bangkok and Si Racha
Sara Buri	2 repeater station between Sara Buri and Nakhon Ratchasima
Nakhon Ratchasima	3 repeater stations between Nakhon Ratchasima and Khon Kaen
ditto	3 repeater stations between Nakhon Ratchasima and Surin
Khon Kaen	2 repeater stations between Khon Kaen and Udon Thani
Surin	3 repeater stations between Surin and Ubon

As Yala, Si Racha, Udon Thani, and Ubon, the stations are attended and no monitoring from distant stations will be performed. For economical planning, the switching system of the Khon Kaen Station in the Northeastern Region will be the I.F. (intermediate frequency band) switching. All the switching section are shown in Table 4-5-2.

Table 4-5-2. List of Switching Sections

Switching Sections
Sara Buri ——— Khon Kaen (Via Nakhon Ratchasima)
Khon Kaen ——— Udon Thani
Khon Kaen ——— Ubon (Via Nakhon Ratchasima and Surin)
Bangkok ——— Si Racha
Haad Yai ——— Yala

As for the North-and-South line, no structure of the circuit line was clarified during the period of investigation, and it is not mentioned in this Report. There will be no question, however, in the installation of one additional system in the future.

4-5-2 Inside Structure of the Station

Fig. 4-5-4 is a schematic diagram of the inner structure of a standard station. Except for the travelling wave tube, all the installations are equipped with solid state system. Thus they are of small sizes, consume comparatively little electricity, and are stable. In order to decrease chances of disorder and to prolong durability of the installations, it is desirable that the machine room should have a temperature regulator, and a switching terminal station at least, with its many complex installations, should be equipped with facilities for the regulation of temperature and moisture. Besides the installations shown in Fig. 4-5-4, a monitor station should have a control desk with television video monitor, operation key, trouble-indicator lamps, meters, communication telephones, etc.

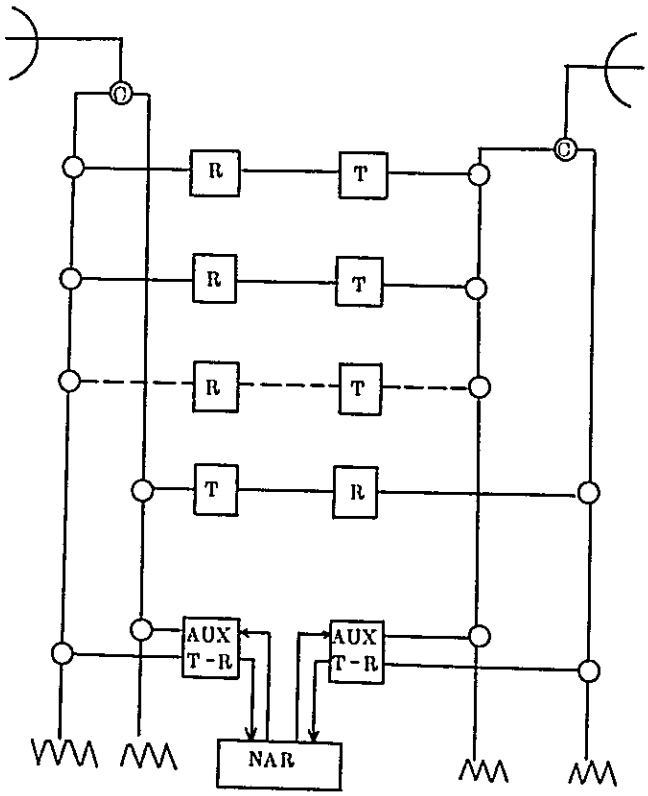


Fig. 4-5-4 Schematic Diagram of Through Repeater Station

4-5-3 Installation of Electricity

The entire installations are equipped with solid state system which may be operated with direct current. For an intermediate repeater station about 5KW will be sufficient.

The capacity of the battery at the same station is set at 24 hours, while 8 hours at a manned station.

At the new stations shown in Fig. 4-3-5, it is necessary to set up installations for electric power, but the repeater stations between Nakhon Ratchasima and Udon Thani as well as Nakhon Ratchasima and Ubon lines, where the existing microwave systems will be concurrently used, have been equipped with electric power installation, the battery and the rectifier only have to be installaed. On the other hand, such stations as are using electricity in common with a broadcasting station, e.g., the Si Racha and the Yala Station, may provide themselves with the battery and the rectifier, taking AC electricity from the broadcasting station.

In the case of long stoppage of current or trouble with the generator, and the like a vehicle carrying a engine generator may be ut ili zed. Such vehicles are provided at the following stations:

Sara Buri	Ban Bang
Nakhon Ratchasima	Haad Yai
Khon Kaen	
Surin	

4-5-4 Station Buildings

Fig. 4-5-5 shows an example of the ground plan of the station buildings, such as the intermediate repeater stations between Sara Buri and Nakhon Ratchasima, those between Haad Yai and Yala, the Yala Station, etc., which are to be established. A station where new installation will be set up at the existing microwave repeater station, it is advisable to make the most of the existing part.

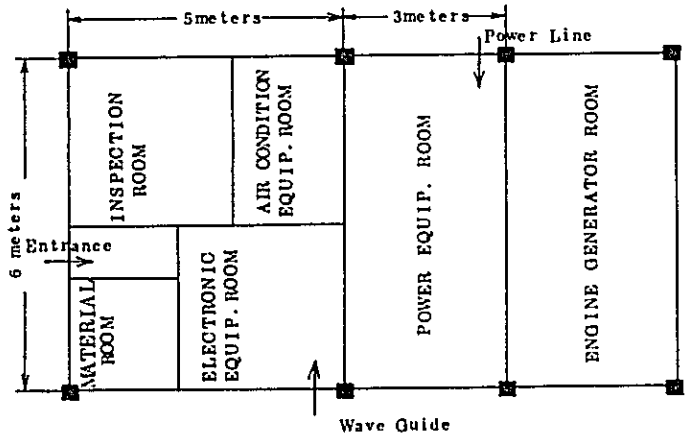


Fig. 4-5-5 Example of Through repeater station building

4-6 Estimate of Construction Expense

Construction expenses for a microwave radio relay link are in Table 4-6 (in 1,000 Bahts).

Table 4-6 Construction Expenses of Microwave Radio Relay Links

		Machinery & Equipment	Roads	Station Buildings	Power Transmission Line	Total
First Broadcasting Network	Southern Region	5,840	600*	300	200	6,940
	Northern Region	—	—	—	—	—
	Northeastern Region	41,950	3,600	1,020	170	46,740
	Southeastern Region	6,600	1,800	280	80	4,760
	Total	54,390	6,000	1,600	450	62,440
Second Broadcasting Network	Southern Region	9,540	—	—	—	9,540
	Northern Region	5,360	—	—	—	5,360
	Northeastern Region	8,100	—	—	—	8,100
	Southeastern Region	1,500	—	—	—	1,500
	Total	24,500	—	—	—	24,500
	Grand Total	78,890	6,000	1,600	450	86,940

* The road construction expense of the Kg Chau Ka Station is included in the construction expense of the Broadcasting Station, and is excluded from this amount.

CHAPTER Ⅴ BROADCATING SYSTEM

4-6 Estimate of Construction Expense

Construction expenses for a microwave radio relay link are in Table 4-6 (in 1,000 Bahts).

Table 4-6 Construction Expenses of Microwave Radio Relay Links

		Machinery & Equipment	Roads	Station Buildings	Power Trans-mission Line	Total
First Broadcasting Network	Southern Region	5,840	600*	300	200	6,940
	Northern Region	—	—	—	—	—
	Northeastern Region	41,950	3,600	1,020	170	46,740
	Southeastern Region	6,600	1,800	280	80	4,760
	Total	54,390	6,000	1,600	450	62,440
Second Broadcasting Network	Southern Region	9,540	—	—	—	9,540
	Northern Region	5,360	—	—	—	5,360
	Northeastern Region	8,100	—	—	—	8,100
	Southeastern Region	1,500	—	—	—	1,500
	Total	24,500	—	—	—	24,500
	Grand Total	78,890	6,000	1,600	450	86,940

* The road construction expense of the Kg Chau Ka Station is included in the construction expense of the Broadcasting Station, and is excluded from this amount.

CHAPTER V BROADCATING SYSTEM

CHAPTER V BROADCATING SYSTEM

5-1 Demand for Broadcasting and Supply of Broadcasting

Unlike the words "demand for communication" or "demand for power", the words "demand for broadcasting" are not much in use. Since broadcasting displays multiple uses which cannot be defined distinctly, unlike communication or power, it is difficult to determine its "demand". However, if we are to determine the future image, that is, the future volume of supply of broadcasting, it is necessary to seek to grasp the demand for broadcasting.

Demand for broadcasting may be divided, firstly, into that on the side of the supplier and that on the side of the receiver. The government, the broadcasting station, the sponsors or the promotors are considered to come under the category of supplier. The demand for broadcasting made by the government as its supplier is very large in volume. By furnishing various forms of information it seeks to accomplish political unification, to accelerate social and economic development and to bring about multifarious educational effects. The broadcasting station provides, as an information medium, all kinds of news and entertainment programs of recreation for general audience. To the sponser's demand in the form of presentation of commercial broadcast is large. To the promoter there is demand for presentation of entertainment programs, provided, however, that he be assured of adequate price for compensation. The magnitude of these demands can be recognized more distinctly by comparing the status of diffusion of TV with that of other mass media in Thailand. According to the "World Communications" for 1965 by the UNESCO, the condition of diffusion of mass communication media in Thailand for the 1960 - '62 period is as shown in the following table (Table 5-1).

Table 5-1 The Condition of Diffusion of Mass Communication Media in Thailand

Press	Daily newspapers 27	Total daily circulation 286,000	Copies per 100 people 1.4
Newsprint	Production — metric tons per year	Consumption 17,907 metric tons per year	Consumption per person 0.7 kilograms per year
Radio	Transmitters 20	Receivers 1,630,000 R	Receivers per 100 people 6.0
Television	Transmitters 2	Receivers 160,000 R	Receivers per 100 people 0.6
Film	Cinemas 230 35 and 16 mm. FC	Total seating capacity 138,000	Seats per 100 people 0.5

When compared with the diffusion targets set by the UNESCO: 10 copies per 100 people for the press, 5.0 receivers per 100 people for radio, 2.0 seats per 100 people for film, radio has already attained an adequate measure of diffusion. The diffusion of the press is still at a considerably low stage. That of film, too, may be said to be lower than the targets.

Broadcasting is said to be a medium with the best capital efficiency. To give priority to the development of broadcasting at a stage where other media have not been sufficiently developed yet, is desirable from the standpoint of the efficient use of national capital. But, because of this, even the demand for mass communication which should properly be absorbed by other media is being directed to broadcasting.

This situation causes the governmert and the sponsors as the major suppliers to evoke greater demand for broadcasting. Demand for broadcasting maybe said to have an immeasurable importance to the government which, after completing sucessfully the First Economic Development Plan, is now tackling the even more ambitious second Economic Development Plan as well as to the Thai economy which, showing a rapid advance to industrialization, is now embarking in the era of mass production and mass consumption.

Needless to say, the general televiewers as recipients have a great demand for broadcasting. Its magnitude is demonstrated plainly by the increase in the number of

the expensive receivers at a high annual rate of 30 %, and by the facts that, according to the audience survey conducted in the Bangkok area, those passed their leisure in viewing TV accounted for as much as 56%; that the present telecasting is securing a very high rating; and that, even at places where adequate quality of picture is not obtainable on account of much distance from the transmitting station, there are a fairly large number of televiewers.

Against this strong demand for broadcasting the only conceivable answer is that the volume of broadcasting should be as large as possible. There is nothing restrictive to the volume of broadcasting to be supplied in the aspect of demand for broadcasting.

"A decision as to whether it is possible to manage one or several radio channels, one or several television channels, can only be made in terms of the general revenue of the community these channels will serve, "(The Statutes and Financing of a Television Service by Jean d'Arcy.)

After all, volume of broadcasting is determined by the economic standards of Thailand. The general viewers supplied with broadcasting have to pay the compensation, either directly (as the licence fee) or indirectly (as the payment of the tax or the commodity price). The capacity of the general viewers to fear their payment is closely related with the economic standards of the country. (There is a pattern of "pay-TV" which provides only entertainment programs to specific viewers, but usually it takes the form of wire broadcasting. It is deemed to have nothing to do with the present project.)

For the reasons shown in the section of finance, we consider it feasible from the economic point of view to maintain 4-channel telecasting in the central area and 2-channel telecasting in other areas.

Of course, in economic terms, it is easier and safer to perform the service of a fewer channels. However, it is necessary to secure the largest possible volume of broadcasting against a very great demand. In affording 2-channel service, especially in the provincial area, care should be paid so that the per channel cost may be brought down sharply. Conversely, it may be said that a full advantage cannot be taken of the costly investment in construction without keeping up the volume of broadcasting at this level.

5-2 Financial Resources

The financial resources for telecasting usually are government subsidy, revenues from commercial broadcasts and licence fees. Other sources of revenue, that is, private contributions and income from incidental business, will do in the case of a small broadcasting enterprise, but are unsuitable as financial resources for a big broadcasting enterprise like this project. Therefore, we shall consider here the propriety and possibilities of the use of the abovementioned three sources of revenue.

5-2-1 Government subsidy

Financing of the working expenses wholly by government subsidy is not appropriate for the following reasons:

a) TV business needs a great deal of expenses and thus imposes strain on the general account of the Government.

b) In the particular case of Thailand, there is the established practice that the government does not, in principle, bear directly such expenses.

c) When viewers are restricted only to specific groups of people, others who are not the viewers have to bear the expenditure on TV business. This is lacking in the equibrium of incidence.

d) By government fund, ample funds required to meet rapid development cannot be secured.

e) Expansion of business and the amount of revenue will be related to each other but very indirectly, and thus the zeal for development of the business itself will be damped.

Allocation of government subsidy to part of the expenses for broadcasting is being made at Thai Television Company in the sense of payment of the compensation for government publicity. This practice is appropriated and will be necessary to follow in the future. Especially for the period between the establishment of a new public broadcasting corporation and the securing of licence fees, a considerable amount of expense must be defrayed.

5-2-2 Revenue from commercial broadcasts

The total advertising investment in Thailand are on the steady increase.

Table 5-2 Advertising Investment and growth rates of correlated items

Items	year	early average growth rate
Total advertising investment (estimate)	'60 - '64	10.7 %
TV advertising investment (Thai Television Company)	'59 - '64	20.2 %
Economic growth rate (G.N.P.)	'63 - '66	7.34 %
Economic growth rate (G.N.P.)	'66 - '71	7.7 %
Manufacturing growth rate (estimate)	'63 - '66	14.0 %
Manufacturing growth rate (estimate)	'66 - '71	12.0 %
Imported receivers	'59 - '64	30.0 %

In Japan, too, the total advertising investment rose at a 18 per cent growth rate, on the yearly average, for the 1960 - '64 period. This increase may be ascribed, firstly, to be rise in the level of production. With the emergence of new products on the boom of technical innovation as well as mass production backed by mass-producing techniques, the enterprises have come to expect much from advertisement for the opening up of new markets and the securing of the share of sales. Secondly, the increase is due to vigorous marketing in the case of the enterprise. Marketing is said to consist of four pillars, namely market reserach, commercialization plan, sales promotion and advertisement. This new managerial technique has spread with great force and thus advertisement as part of same has elevated its position in business management. Thirdly, the increase is due also to the growth of the advertisement medium. There has been a rapid development of the broadcast medium, that is, commercial telecasting, in addition to the printing medium.

These circumstance may be taken as contributing factors in the development, when we consider the future trend of the advertising expenses in Thailand.

The Promotion of Industrial Investment Act has steadily taken effect since 1962, with the result that the modern industry has come into existence one after another. Thus, the advertising investment made by these enterprises and in respect of commodities for imports in Thailand are expected to rise in the future as before with considerable force.

Needless to say, advertising investment which is the expression of the total sum volition for the enterprise to advertise, will not rise unlimitedly beyond the industrial level. As shown on Fig. 5-1, the share of the total advertising investment in the national income in industrial countries tends to fall somewhat or to level off. In Thailand, however, the capacity of the advertising media is considered to be at a lower level than that demanded by the enterprises, and therefore the rise of the percentage to the national income may be confidently expected. A level of 0.5 per cent to the national income may easily be attained.

The share taken by each advertising medium in the total advertising investment is varying from country to country, according to the degree of development of each medium. Generally speaking, the share of the TV medium grows rapidly with its more development and replenishment. For its impact as a medium is by far the stronger than that of radio. As Fig. 5-2, 3 and Table 5-3 show, the tempo of expansion in Japan has been very swift. Meanwhile, the absolute amounts of the printing, outdoor and other media have gone up. Then, it may be said that the increase in TV advertising investment has been brought about by absorbing the greater part of the increase of the total advertising investment and a certain portion of the share of radio. For there are many kinds of business in which appropriate use is being made of the printing medium. TV as the advertising medium is not always almighty.

It we estimate the share of each medium in the future advertising investment in Thailand from the above-mentioned stadpoint, it will be reasonable to estimate the share of TV at 35 per cent, that of the press at 30 per cent , that of outdoor and others at 30 per cent and that of radio at 5 per cent, in fiscal year of 1971. The prerequisites are that there are two or more of TV stations capable of commercial broadcasting in the central area and one unit network in a provincial area and that the condition of diffusion of the press is considerably improved.

Table 5-3 Shifts of Component Ratios by Media in Japan ('47 - '64)

Media / Year	Newspaper	Magazine	Radio	TV	D M	Outdoor & others	Export advertising	Total	Total Advertising Investment (100 million Yen)
1947	75.4	10.9				13.7		100.0	14.6
1948	84.9	6.0				9.1		100.0	33
1949	76.2	4.8				19.0		100.0	105
1950	71.6	4.2				24.2		100.0	167.5
1951	74.1	4.1	1.2			20.6		100.0	243
1952	70.1	4.7	5.7			19.5		100.0	385
1953	65.2	5.1	9.2	0.2		20.3		100.0	491
1954	58.5	5.5	13.5	0.7		21.8		100.0	550
1955	55.3	5.7	16.1	1.5		21.4		100.0	609
1956	54.3	5.4	17.4	2.8		20.1		100.0	745
1957	54.2	5.3	16.0	6.4		18.1		100.0	940
1958	49.3	5.2	14.7	9.9		19.7	1.2	100.0	1,065
1959	42.5	5.5	11.1	16.4		22.9	1.6	100.0	1,456
1960	39.3	5.7	10.2	22.3		21.5	1.0	100.0	1,740
1961	39.1	5.9	8.4	25.5	4.3	15.2	1.6	100.0	2,110
1962	37.9	5.9	7.1	28.3	4.2	14.5	2.1	100.0	2,435
1963	37.6	5.7	5.7	30.1	3.9	14.8	2.2	100.0	2,982
1964	37.1	5.6	4.9	31.0	3.3	15.6	2.5	100.0	3,491

Table 5-4 Estimation of Advertising Investment in Thailand

Year	1967	1968	1969	1970	1971
National Income (A) million Bahts	77,303	83,255	89,666	96,570	104,006
Total Advertizing Investment (B) million Bahts	271	316	368	425	520
ratio B/A %	0.35	038	0.41	044	0.50
Advertizing Investment (C) million Bahts	67.6	85.4	110.3	136.0	182.0
ratio C/B %	25	27	30	32	35

SOURCE

"International Advertiser October 1965"
International Advertising Association.

Legend

1 Population (000's) Estimates at mid-year
SOURCE: United Nations

2. Cost of Living Index
1960=100
Source: United Nations

3 Industrial Production Index
1960=100
Source: United Nations

4. National Income (000,000,000's)
in national currency
Source: United Nations

5 Advertising Investment (000,000's)
1960-1964, in national currency

Total Estimated Volume in two groupings of media
Group A: Press, Outdoor, Cinema, Radio, TV
Group B: the others

6. Advertising: National Income
Percentage of National Income
Invested in Group "A" Media

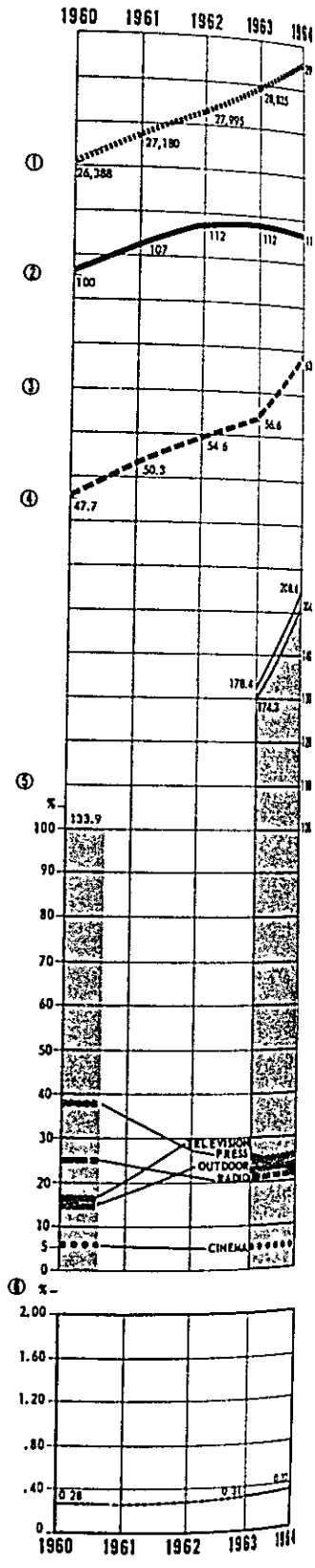


Fig. 5-1 (A) Advertising Investment

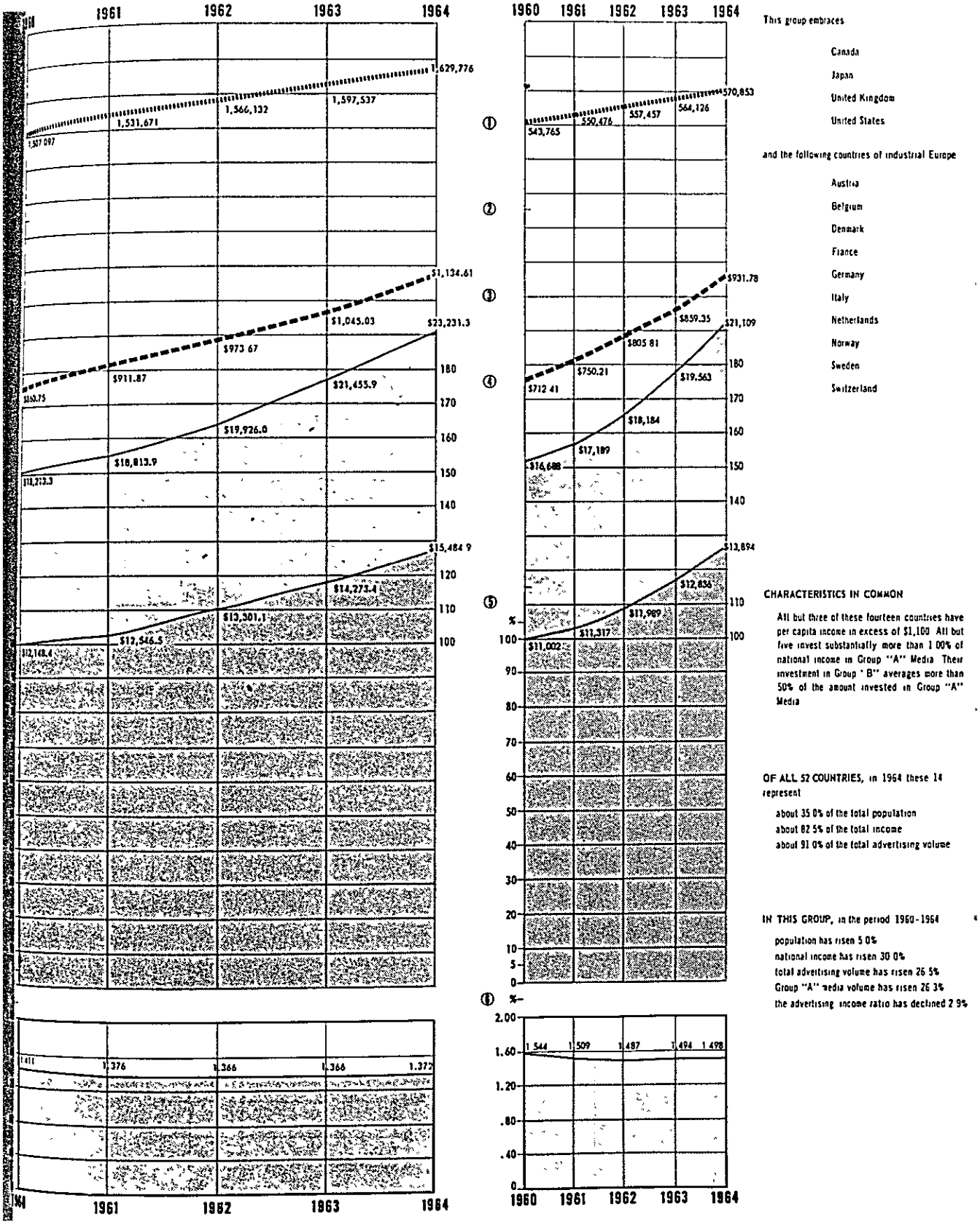


Fig. 5-1 (B) Advertising Investment

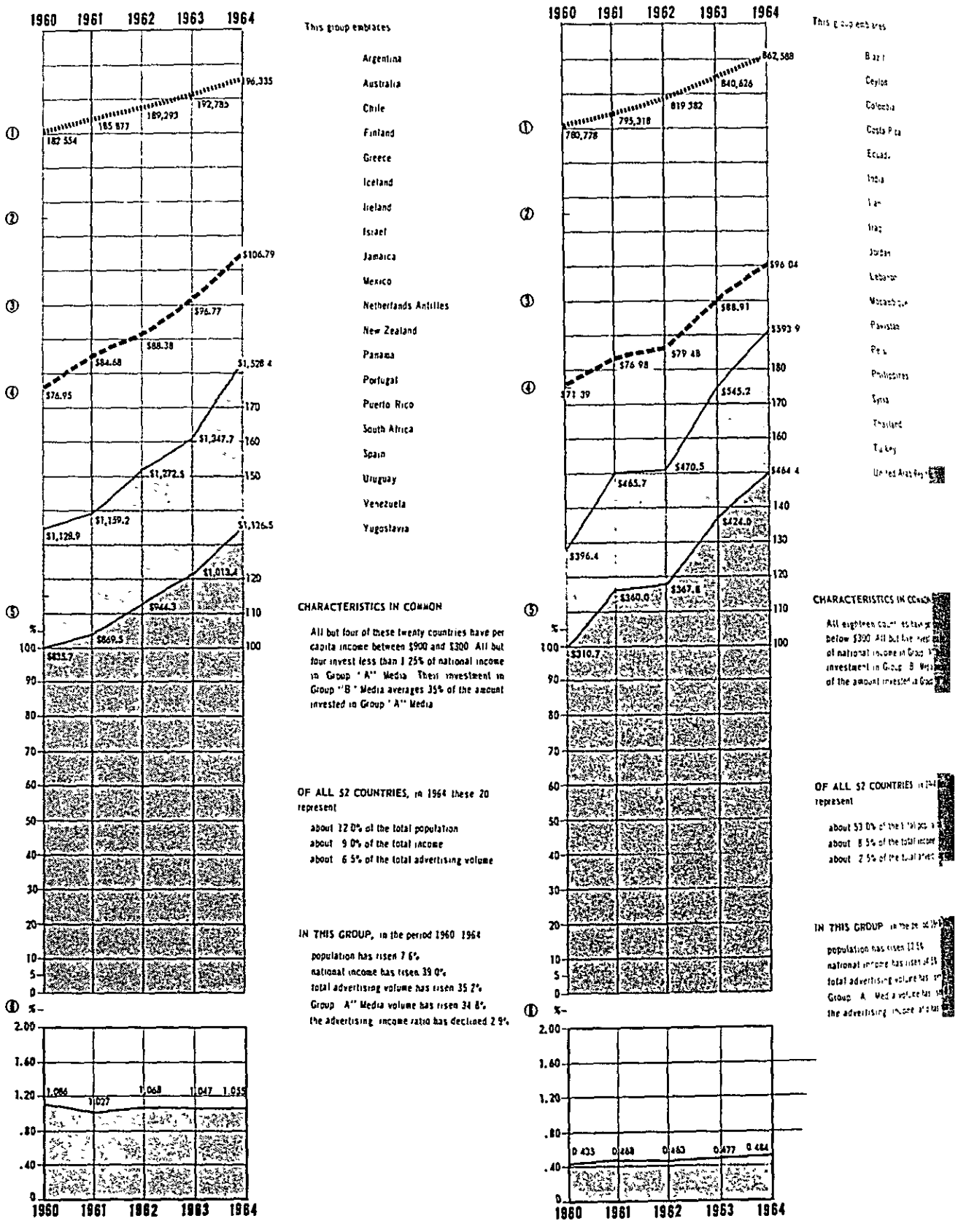


Fig. 5-1 (C) Advertising Investment

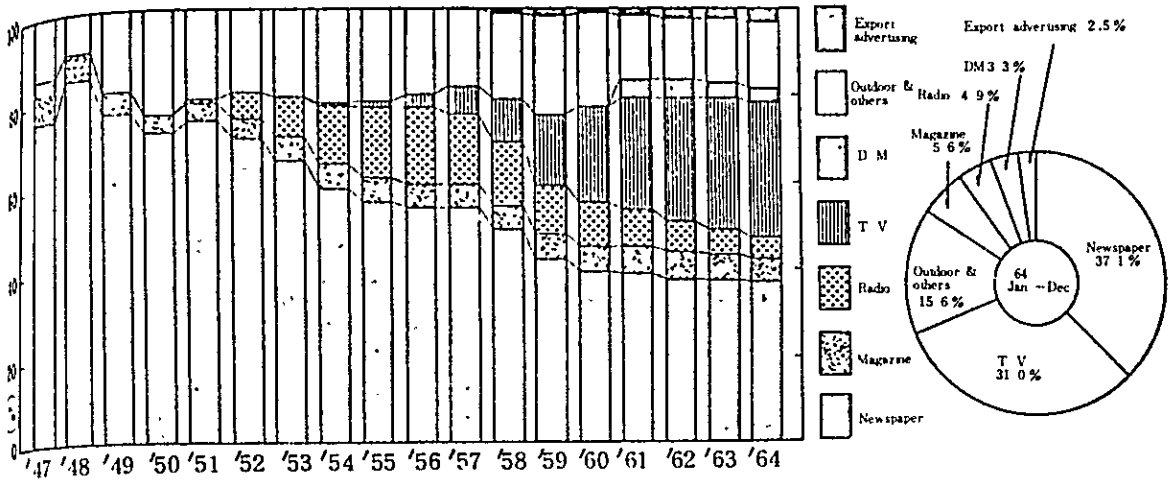


Fig. 5-2 Shifts of Advertising Investment by Media in Japan ('47 - '64)

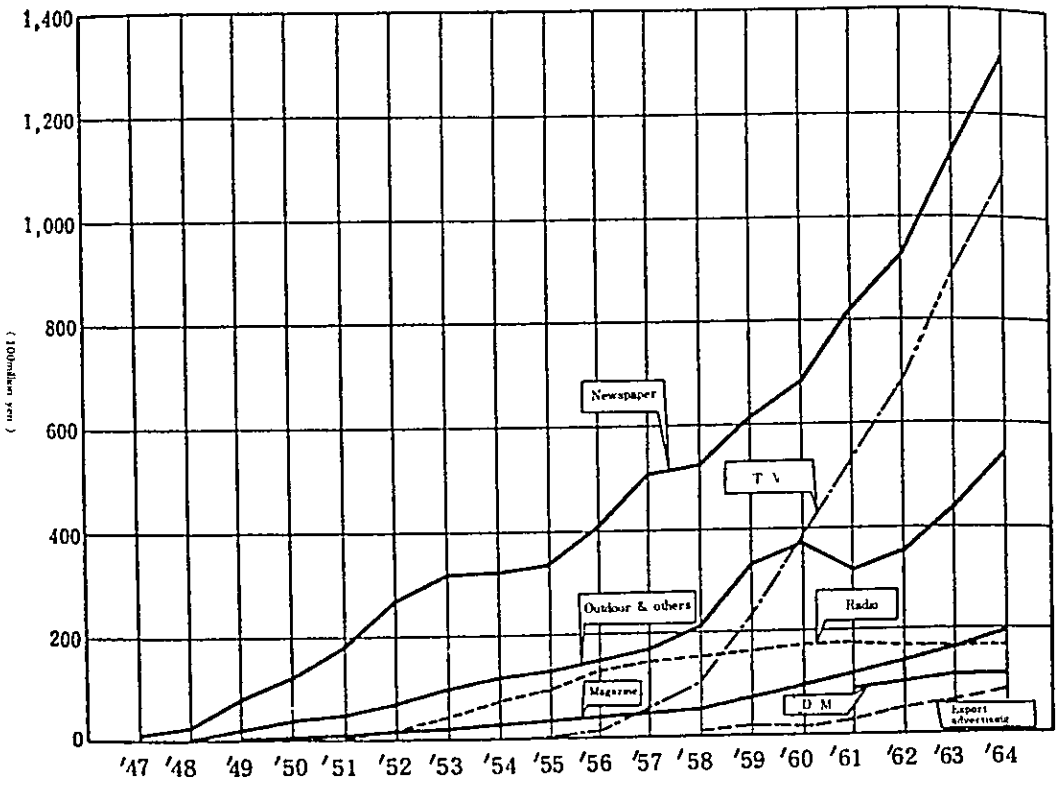


Fig. 5-3 Shifts of Component Ratios by Media in Japan ('47 - '64)

The estimation that, in fiscal year of 1971, 182 million Bahts will be invested in TV's commercial broadcasting is considered reasonable from another angle as well. Advertising investment in both Thai Television Company and Royal Thai Army Television is estimated at around 50 million Bahts in fiscal year of 1965. TV sets numbering 250,000 at present will increase to 1 million in 1971, that is, about 4 times as many. If the value of medium increases in proportion to the number of viewers, it is possible that advertising investment in the neighbourhood of 200 million Bahts will be attained. If the 20.2 per cent annual average grouth rate for the 1959 - '64 period is to be maintained for the 1965 - '71, the investment will become 3.026 times as much and fail to reach 180 million Bahts, whereas, if it is possible that the investment will increase at the annual growth rate of 23.8 per cent, it may become 3.6 times as much and attain 180 million Bahts.

5-2-3 Licence fee income

Licence fee income is worked out artificially. Its total amount is the sum of the broadcasting cost calculated by fixing the quantity and quality of broadcasting and the expence of collecting fees. The amount of the licence fee is obtained by dividing the above by the number of viewers at the time. However, since the TV business involves a vast amount of cost, the amount of licence fee may be far beyond the limit of financial ability of the ordinary viewer when there is not a sufficient number of them. Therefore, the amount of the licence fee must be fixed with due regard for the capacity of the general public to bear the financial burden. The licence fee is to be a factor checking more or less the diffusion of TV service, and therefore it should be in such an amount as may minimize this adverse effect. In other words, it should be in such an amount as may be available for defrayal in the household expenditure. Furthermore, it should be in such an amount as may not, psychologically, cause a feeling of resistance.

The licence fee system abolished in Thailand in 1959 was in the amount of 100 Bahts which was to be paid in a lump sum at the time of purchase of the receiver. According to the unofficial opinion, in case of the licence fee system being newly introduced, 100 Bahts a year is the most reasonable amount. In our opinion, 120 Bahts a year (10 Bahts a month), including the fee for collection, is the reasonable amount.

The typical amounts of licence fees in principal countries are given in Table 5-5, but they do not necessarily afford us a helpful guide.

The Household Expenditure Survey (National Statistical Office) shows that the expenses for recreation, reading and education are as given in Table 5-6. It seems rather difficult for the household to allocate from this item as much as 10 Bahts per month. However, if the economic growth from 1962 or 1963 to 1971 is taken into account, the scale of the household expenditure should, (if the per capita national income increase at the annual rate of 4 per cent), become 1.42 times as large. Then, the aforementioned amount is not incapable of being defrayed by the household at least in the urban area.

In Japan the monthly amount of 18 Bahts as licence fee corresponds to 34 per cent of 63 Bahts as the monthly average power charge with the standard household. Thirty-four per cent of 34.82 Bahts as the per household power charge in the Bangkok-Thonburi area and 34 per cent of 33.68 Bahts as the per household power charge in the provincial area (according to the source of Provincial Electricity Authority) work out at 11.84 Bahts and 11.45 Bahts, respectively. The household viewing TV should naturally pay for power consumption. As compared with the power charge, each household's sense of burden with respect to the licence fee is considered much the same as in Japan. The amount of licence fee has not undergone any upward revision in the past several years and it has posed hardly any question as the financial burden in every household.

The cost of collection of licence fees is varying greatly according to the method of collection. However, such cost can be included in the account and the business expenditure, so that Table 5-7 can be prepared by taking collection loss 10 % solely into account.

Table 5-5. Licence Fee System in Selected Countries

Item	United Kingdom	France	Italy	Au
Charactor & Authority	Receiver licence tax (Wireless law, 1949)	Fee for right to use of receiver (Decree relating to government operated broadcasting, 1959)	Fee for reception (Imperial order No. 246 of Feb. 21, 1938)	Licence fee (Broadcasting Act of 1942)
Collector	General Post Office	O R T F	Ministry of Finance (Tax Agency)	Postmaster-General's depar
Amount of Fee (annual) & Authority	Radio £ 1-5-0 (70 Bahts) Radio & Television £ 5-0-0 (280 Bahts) Equivalent amounts are to be paid when the receiver is installed in each room of a hotel, on a vehicle and a vessel. (Third Amendment to Regulations in licence taxes on wireless broadcasting , 1965)	Radio 25 francs (101 Bahts) Radio & Television 85 francs (345 Bahts) (Presidential decree relative to the fee for the right to use radio & TV receiver of 1960)	Radio 2,450 lire (79 Bahts) Radio & Television 12,000 lire (387 Bahts) Additional fees are charged in case of installation of receiver in restaurants, hotels, high class automobiles and extra fees are charged for additional installation of speaker and the second receiver of the dual system TV set. (Ministerial decree of Nov. 30, 1960)	Radio First service area Second service area Television Note: The first service ar 250 miles of a statio second service area first. (Broadcasting Act of 1942)
Method to Fix Sum	Fixed by the Postmaster-General with the consent of the Treasury	Determined by the House of Councilors under Presidential Decree on the basis of the report of the Ministers of Information and of Finance.	Determined by inter-ministerial Price Liaison Committee and anounced in the official gazette by the Minister of Posts and Telgraphs.	Determined legally (Article 1
Method of Payment	Paid in bulk to the post office at the time of issue or renewal of licence (valid for 12 months).	To be paid in bulk to the post office by notice of payment	To be paid in to the post office. Annual payment in principle. Additional charge for payment in 6-month or 3 month installments.	To be paid in bulk to the pos renewal of licence (valid for
Spent for:	Operation of BBC, Direct expenses for the Post Office		Expenses for nation-wide diffusion of broadcasting and improvement of programs. Payment to the government (9.6 % of the profit)	
Punishment to Offenders	Unlawful installer of receiver is punished with a monetary penalty and also with penal servitude, in addition to confiscation of receiver.	Failure to report installation is punished with a monetary penalty. According to circumstances, receiver may be confiscated. Delay in payment is subjected to additional charge and legal disposition.	Failure to conclude contract with RAI is punished with a monetary penalty. Delay in payment is subjected to legal disposition.	Unlawful installation is punis or with imprisonment.
Revenue other than licence Fee	Government subsidy for overseas broadcasting (16.4 % of the total income) Income from publications	Income from publication. Income from concerts opened for the public.	Income from advertisement (27.8 % of the total income)	Grant from the Treasury (Lic of the government and operati are granted from the Treasur

Australia	Sweden	Czechoslovakia	Japan
Licence fee (Broadcasting Act of 1942)	Licence fee (Imperial Order No. 231, relative to holding of receivers)	Licence fee	Licence fee (Broadcasting Law of 1950)
Postmaster-General's department	Telecommunications Administration	Government (Central Post Office)	N.H.K. (Japan Broadcasting Corporation)
Radio First service area £2-15-0 (124 Bahts) Second service area £1- 8-0 (63 Bahts) Television £5- 0-0 (225 Bahts) Note: The first service area refers to the area within 250 miles of a station disignated by ABCB, and the second service area to any area other than the first. (Broadcasting Act of 1942)	Radio 35 kr. (135 Bahts) Television 100 kr. (387 Bahts) (Imperial Order No. 231 relative to holding of receivers)	Radio 60 kr. (167 Bahts) Television 180 kr. (500 Bahts)	Radio ¥ 600 (33 Bahts) Radio & Television ¥3,960 (220 Bahts) (Art. 32 of Broadcasting Law)
Determined legally (Article 128 of the Broadcasting Act)	Determined by the Government by Cabinet Order	Determined by the Government by Order	Diet approval to the Budget estimate for N.H.K.
To be paid in bulk to the post office at time of issue or renewal of licence (valid for 12 months).	To be paid in to Telecommunication Administration or to the post office at time of grant or renewal of licence. Annual payment for radio and 3-month installment payment for TV.	To be paid in to the post office at time of grant or renewal of licence. Radio: payment by 3-months instalment. TV: payment by month.	To be collected from individual subscribers by N.H.K.
	Expenses for production and operation of the Swedish Broadcasting Corporation. Operating expenses for Telecommunications Administration.	Expenses for popularization of broadcasting.	Expenses necessary for the conduct of business of N.H.K.
Unlawful installation is punished with a monetary penalty or with imprisonment.	Installation of receiver without licence in punished with a monetary penalty.	Unlawful installation of receiver is punished with a monetary penalty and according to circumstances, the receiver is confiscated.	Liability to conclude licence contract.
Grant from the Treasury (Licence fee become the revenue of the government and operating expenses for broadcasting are granted from the Treasury) Income from publications.	Government grant in case of deficit.	Government subsidy to cover deficit.	Government grant for overseas broadcasting (0.2 % of the total income)

Table 5-6 Average Monthly Family Income

Source: Household Expenditure Survey 1962-3 (N.S.O.)

Item \ Area	Towns			Village	
	Bangkok Thonburi	South	Northeast	South	Northeast
Total Expenditure for Cloth & Clothing	128.49	144.62	155.58	107.63	67.47
Total Expenditure for Housing, Furnishing & Household Operations	233.43	176.10	148.93	102.25	41.25
(electricity)	(34.86)	(20.29)	(18.86)	(0.95)	(0.16)
Total Expenditure for Medical & Personal Care	95.07	87.71	72.11	46.51	23.59
Total Transportation Expence	91.78	41.33	74.77	30.48	13.30
Total Recreation, Reading & Education Expense	79.07	53.92	90.13	20.12	14.57
(Recreation)	(45.54)	(26.58)	(31.74)	(12.11)	(7.52)
<Cinema admissions>	<12.73>	< 8.90>	< 8.18>	< 1.09>	<0.51>
<Other admissions>	< 1.03>	< 1.30>	< 0.84>	< 0.56>	<0.31>
<Radio and TV>	< 1.03>	< 0.59>	< 3.47>	< 2.21>	<0.96>
<Club fees>	< 1.26>	< 0.05>	< 0.40>	< 0.01>	<0.01>
<Pets>	< 2.29>	< 0.97>	< 4.32>	< 0.97>	<1.74>
<Toys and other recreations>	< 0.63>	< 1.02>	< 3.94>	< 1.25>	<0.73>
<Purchase of Lottery Ticket>	<25.62>	<13.75>	<10.24>	< 6.03>	<3.12>
(Reading)	(9.25)	(7.01)	(6.39)	(0.93)	(0.17)
<News papers>	< 7.51>	< 5.07>	< 4.10>	< 0.59>	<0.09>
<Magazins>	< 1.03>	< 0.65>	< 0.48>	< 0.06>	<0.04>
<Books>	< 0.39>	< 1.13>	< 0.83>	< 0.14>	<0.03>
<Other Reading Materials>	< 0.32>	< 0.16>	< 0.98>	< 0.14>	<0.01>
(Educations)	(24.28)	(20.33)	(52.00)	(7.08)	(6.88)
Total Expenditure for Tabacco & Alcohol	66.05	50.81	56.25	25.47	16.58
Miscellaneous Expence	45.96	32.50	23.34	23.90	31.25
Tax	16.17	22.40	13.04	6.61	1.00
Gift and Contributions	35.71	59.16	34.11	30.00	19.40

Table 5-7 Estimation of Licence Fee Income

Year	1967	1968	1969	1970	1971
(thousand) Televiewers	294	367	535	767	1,029
(million Bahts) Gross Income	35.3	44.0	64.2	92.0	123.5
(million Bahts) Net Income	31.8	39.6	57.8	82.8	111.2

5-3 Form of Enterprise

5-3-1 Scale of enterprise

If the broadcasting business is to be formed on a local scale, certain pre-conditions should be in existence. To be more specific, there is to be a tendency that the principle of local autonomy is adopted and the system of centralization excluded; there are to be special local features, socially and economically, and there are to be positive grounds on which to maintain them; and, above all, there are to exist adequate financial resources by which to establish the broadcasting business independent from the central area.

Not that all such pre-conditions are not in existence in Thailand. Nevertheless, we consider for the following reasons that the TV broadcasting business on a local scale should not be planned, but the business should take the form of enterprising body on the national scale:

a) Local cost should be reduced as much as possible. In Japan, the local commercial broadcasting station is prohibited from concluding an exclusive supply contract for programs from another station, while it is encouraged to give priority to local programs. Whereas most stations cannot afford to have sustaining programs representing 10 - 20 per cent of the whole programs. The major reason is inadequate capacity to bear the financial burden. In Thailand enormous investment will be made to form the nation-wide network and highly expensive microwave radio relay link will be employed. This requires a form of business which can be operated with the least possible current expenditure.

b) It does not sound reasonable to form an enterprising body on a local scale so that many local programs may be provided. As mentioned in the

Chapter VII, adequate local programs can be provided by proper management even with the single enterprise.

c) If most of the programs broadcast by the local station are provided by the central station, one and the same enterprising body should be formed in view also of the needs of technical administration, microwave radio relay link lease contract, and organization control.

d) There is no sufficient local capital which may be invested in the local enterprise. Nor is there any proper organization in existance to which the government may entrust the local broadcasting business.

e) Where the licence fee system is introduced, the broadcasting business on a local scale naturally cannot have any place. Since the licence fees can be collected with the backing of the national authority, it is not feasible to officially recognize more than one collecting body.

5-3-2 Outline of broadcasting system

We consider it most desirable that the following broadcasting structure will be established in the final stage beginning 1972:

The New Public Corporation is equipped with the necessary facilities, organization and program switching functions. In the provincial area, it has the necessary facilities for 2-channel broadcasting and hires mainly from Telephone Organization of Thailand the microwave radio relay link needed for two programs of two systems. The New Public Corporation will broadcast, as the national TV broadcasting system, non-commercial programs of the same subject-matter on a nationwide basis.

Expenses involved will be covered by licence fees. The Program for the second network will be provided by a contract to be concluded by New Public Corporation with Thai Television Company or Royal Thai Army Television or with a fourth station.

These programs will include commercial ones. Expenses for them (charge for broadcasting over a nationwide relay — namely hire charge for microwave radio relay link plus the charge for using the facilities of the re-broadcasting station) will be paid by the station which is the other party to the contract. Consequently, program switching function will mainly consist in selecting the programs from 2 or 3 program sources at the final stage at which the second network is to be operated and providing them to the second network.

In regard to the nationwide broadcast relay contract which will form the basis of this switching function, direct supervision by Public Relations Department will have to be exercised. It is desired that its actual operation will be made by New Public Corporation.

Thai TV Company, Ltd. will, with its revenue from commercial programs, conduct 1-channel broadcasting in the central area and broadcasting for the number of channel hour (about $\frac{1}{2}$ - $\frac{1}{3}$ channel hour) to be fixed by its contract with the New Public Corporation. However, the facilities of Bangkok Central Station will be used jointly with the New Public Corporation yet a clearcut line will be drawn in business activities and organization between it and the New Public Corporation.

Royal Thai Army TV will carry on the operation conforming to the purpose of its establishment in the central area, while it will make use of the second network of New Public Corporation for its service in the provincial area.

As to the fourth station, it is difficult to decide, at the present stage, who is to operate it. This is a question which should be given careful consideration in the five years to come. In the Central area, the use of 1 channel and in the provincial area, that of part of the second network of New Public Corporation may well be considered to be made in the same way as in the case of Thai TV Company and Royal Thai Army TV.

Operation of the fourth station on a commercial basis is possible. However, in that case, Thai TV Company use it for educational programs by the Ministry of Education on a non-commercial basis. In order to secure educational programs of good quality, due consideration will have to be given so that at least the sum of 30 million Bahts may be provided as the annual working expenses.

5-3-3 Finance

Now we shall consider how the limited financial resources should be allocated so as to maintain the aforementioned volume and system of broadcasting.

a) There is not much question about the matter that the existing Thai TV Company and Royal Thai Army TV will be run in the future largely by their income from commercial broadcasts. Even if the commercial income amounting to 180 million Bahts expected at the final stage is divided among two or three stations, this will be by far the larger income than what may be expected from the present business scale. On the other hand, there is some question as to how the cost of broadcasting over a nation-wide

network should be financed by the commercial broadcast income.

Commercial broadcasts will be run at a paying basis in the central area which is blessed with strong financial capacity (about 50 per cent of the gross national product is accounted for by the central part of the country) and which has a high concentration rate of the population. By contrast, in other areas, the reverse is the case. It is obvious that commercial broadcasting in provincial area will not pay on a commercial basis. Actually, the existing local stations are financing a greater part of their working expenses by public funds, except for program expenses.

Therefore, the cost of broadcasting over a nation-wide network to be collected by New Public Corporation cannot be worked out as the amount based on the strict cost accounting.

The cost of broadcasting over a nation-wide second network must be smaller in amount than the increase which may be made in the commercial income by broadcasting over the provincial area. Then, there may be posed a question of why New Public Corporation must maintain the second network in the provincial area. Yet the hiring charge for microwave radio relay link, a very expensive item under the working expenditure, is based on the premise of hiring 2 routes. If only 1 route is hired, the charge will be larger in amount and pose a menace to the finances of New Public Corporation. If the charge for broadcasting over a nation-wide network is considerably larger in amount than the charge for hiring microwave radio relay link, it may be helpful to the finances of New Public Corporation. For the cost of extending the second network will be much lower than that of constructing the first network. Furthermore, the cost of maintaining the second network in addition to the first will be very low.

As Chapter VI shows, the ratio in percentage of the number of viewers in the central area to that in the provincial area is estimated to be 60 : 40 in 1972. Assuming that commercial broadcasting will be effected by 2 channel in the central area, at least 45 million Bahts ($\frac{40}{160}$) of 180 million Bahts may be presumed to be the income derived from commercial broadcasts for the provincial area. Of this amount, it will be reasonable to allocate 5 million Bahts as the expense for improving programs to be broadcast over a nation-wide

Table 5-8 Annual Business Income and Expenditure Program of New Public Corporation

(In million Bahts)

Item	Year	1968	1969	1970	1971	1972	1972 Component ratio in percentage	Remarks
Expenditure	1 Personnel	0.6	6.2	8.7	9.9	19.6	19.7%	2,000 Bahts (average pay, cf.8.1.6 (A)) × Number of persons (cf.2.1.7. (A))
	2 Broadcasting	0	6.2	9.0	14.5	31.1	31.3	For the basis of computation, see 7.2.6
	3 Technical	0.7	6.3	7.4	9.8	10.9	11.0	Construction cost × 3.5% { Maintenance 1% Power 1% Expendable supplies replacement like vacuum tubes 1% Miscellaneous expenses incl. hiring of vehicles 0.5%
	4 General administration	0	0.9	1.3	1.7	4.7	4.7	Five percent of the rest of the total expenditure excluding microwave radio relay link expenses is allowed for
	5 Collection of licence fees Trust Contract charge	0	0	0	0	7.2	7.2	See 8.1.4. (c)
	6 Depreciation	0	0	0	0	21.5	21.6	As to structures 2.5% annually (Revenue Code in Thailand shall apply) As to broadcasting equipment, 7.5% annually (Revenue Code, Electrical equipment of Thailand shall apply)
	7 Extra-business expense	0	0	0	0	4.5	4.5	Reserves refundment etc. about 3% of the total revenue is allowed for
	Total	1.3	19.6	26.4	35.9	99.5	100	
	Microwave radio relay link charge	0	17.0	21.1	24.5	48.9	—	
	Grand total	1.3	36.6	47.5	60.4	148.4	—	
Income	Licence fee	0	0	0	0	111.2	—	Introduction of licence fee system from 1972
	Nationwide broadcasting charge	0	12.2	18.0	30.0	40.0	—	Up to 1971 mainly from T.T.V. After 1972 from T.T.V. & A.T.V. etc.
	Government subsidy	1.3	24.4	29.5	30.4	0	—	
	Total income	1.3	36.6	47.5	60.4	151.2	—	

network or their profit and handle it as the income of Thai TV Company or Royal Thai Army TV. Consequently, 40 million Baths will be the maximum amount in which the commercial income may be paid as the charge for broadcasting over a nation-wide network. As to the period up to 1971 during which double operation of 625 to 525 scanning line system will be made, an approximately similar idea will be applied and the charge for broadcasting over a nation-wide network will be paid by Thai TV Company to New Public Corporation.

b) New Public Corporation's program of working expenditune and income is shown in Table 5-8.

Up until 1971 a high amount of Government subsidy will be needed to secure the balance between revenue and expenditure. It will be impossible, as will be explained elsewhere, to speed up the introduction of the licence fee system to preclude granting the subsidy. For lightening the burden on the Treasury, there will be no other recourse than to lessen the volume of programs produced by New Public Corporation or to plan to earn the commercial income by transferring the programs produced by New Public Corporation to Thai TV Company.

What comes to our notice when we make a comparative study of the items under working expenses at the final stage of 1972 by Table 5-9 is that the hire charge for microwave radio relay link expense and the depreciation expense are relatively very large. However, this is a matter inevitable to the present project intended to cover efficiently the vast area of land with a relatively low degree of density. The more efficiently you seek to operate it by cutting down the local costs, these expense will become the greater relatively.

After 1972, the scale of finance will maturally become larger with increase in the number of viewers and therefore we should be provided with the plan for the proportionate expansion of the business.

5-3-4 Transitionary process

In order to complete the above-mentioned final phase, the five-year period should be assigned for preparations for transition and a pattern different from that of the final phase should be followed in operating broadcasting business.

a) The end of 1971 should be set for the final time limit for changeover from 525 to 625 scanning line systems. The useful life of receivers is anything but clear. Nor could the time which may be required for remodeling receivers be exactly worked out. Thus, the question of standards changeover depends of the will on the part of the government to definitely fix the time limit for standards changeover and to put it into practice. We do not think that five years (after completion of Bangkok New Station, only 3 years and a half will be left for the dual operation of 525 and 625 scanning line systems) is short by any means. But it will be long enough to enable to standards changeover to be finished. To defer the final time limit uselessly will have only the disavantage of making the transition to the succeeding system all the more difficult.

b) The adoption of the licence fee system is desirable after the dual operation of 525 and 625 scanning line systems. This period is to be the one during which general viewers may have their receivers remodeled or buy new ones. This will be a considerably expensive item in their household expenditure. It will be impossible to impose a financial burden of introduction of the licence fee system in addition to this. It is not advisable to damp the ardor of the viewer for standards changeover.

c) During the period of dual operation of 525 and 625 scanning line systems, it may not be feasible, either, to carry on commercial broadcasts on the programs only under one system and to carry on non-commercial broadcasts on the programs under the other system. Then, commercial income will decline drastically. Nor will it be practicable for both systems to broadcast non-commercial programs. For, even if the licence fee system is forcibly introduced in the meantime, financial resources will run short owing to the insufficient number of viewers. Nor may it be practicable, that both systems will conduct commercial broadcasting, and while the licence fee system will be introduced with the object of obtaining the supplementary source of income. For the adoption of the licence fee system is possible only on the definite excuse that no commercial programs will be included. Since commercial broadcasts have so far been effected, the adoption of the licence fee system has become an extremely delicate problem.

d) There are to be observed varieties of opinions in all segments of community

against the licence fee system. It will take considerable time to give publicity so as to persuade the opponents to change their views, to give the general public adequate explanation and the arrage for the system and machinery for collection of the licence fees. It seems proper to allocate the period of this dual operation to these activities.

On the aforesaid grounds, during this five-year period, the programs produced will be broadcast mostly by Thai TV Company through both 525 and 625 scanning line systems, earning commercial income. On the other hand it is desirable that the New Public Corporation be established as early as possible and that the new construction investment be made so as to cover the establishment. In the meantime, many knotty problems will arise between the Thai TV Company and New Public Corporation com-plication of the relationships of the joint use or of hiring, of facilities. But this cannot be helped. It is desired that the undermentioned arrangements be made as the concrete steps of procedure for transition to the new system.

e) Within 1967, necessary preparations will be made for the establishment of New Public Corporation. More specifically, arrangements will be made for enactment of a new law, for establishing the procedure for placing government property under the control of the New Public Corporation (N.P.C.), inauguration of a prepartory committee for establishment.

f) In 1968, N.P.C. will start operation simultaneously with the opening of Bangkok New TV Center. New TV Center will be the property of N.P.C. part of the staff of the general administrative department and the technical staff will be assigned as the N.P.C. staff. A greater part of programs produced by TV Center will be provided by the Thai TV Company (T.T.V.). All staffs of T.T.V. for program and for management should be retained. Technical staff members of N.P.C. should be provided by the holding of concurrent post and the change of place of work from Public Relations Department (P.R.D.) and T.T.V. In the general administrative department, capable men should be sought extensively from related quarters including P.R.D. and T.T.V., with due regard for the future development of N.P.C.. As to the production of programs by T.T.V. by employing the studio of New TV Center and its broadcasting using a new transmitting equipment on 625 scanning line system, it is desirable that no hire relationship be made to

exist between N.P.C. and T.T.V..

g) At the beginning of 1969, the local P.R.D. station will be merged into N.P.C. with the starting of service in the southern and northern parts. The staff of the local P.R.D. will wholly become the staff of N.P.C.. Government outlay so far made to local P.R.D. station will entirely become government subsidy to N.P.C.. T.T.V. will either assign diffirent sponsors than those for the central area, to the provincial area, or raise the advertising rate proportionately to the expansion of the service areas.

h) As shown in programming and staffing planning, N.P.C. will gradually start producing sustaining programs and ensure the increase in the number of staff members of N.P.C..

i) Opening of station in the northeastern area scheduled for the middle of 1970 will be handled in the same way as in the southern and northern areas.

j) In 1970 and 1971, arrangements will be made in earnest for adoption of the licence fee system.

5.3.5 New Public Corporation (N.P.C.)

The following are the reasons for which New Public Corporation is considered necessary:

a) In Thailand, broadcasts not including commercial ones are needed.

"With regard to the national community, we assume that one major duty of a television service is the presentation of its independence vis-a-vis foreign influence" (The Statutes and Financing of a Television Service by Jean d'Arcy).

In the TV commercial broadcasts in Thailand, advertisements of foreign firms are occupying a considerable proportion at present. This situation is a reflection of the fact that the Thai Government, in its economic policy, is adopting the method of making positive use of foreing capital, in pushing on industrialization. Of course, the significant role of commercial programs cannot be denied. But programs without commercial broadcasts may be necessary to the people and to the State. A new enterprising body is demanded for providing such programs and ensuring such system.

b) A new form of enterprise is necessary for the improvement of the standard of programs.

At present, Thai TV Company (T.T.V.) is broadcasting public information for more than 45 minutes in a day, and, in terms of actual value, it is said to be using more than 35 per cent of broadcasting hours for non-commercial purposes. Undoubtedly, it may not be considered, because income is being drawn from commercial broadcasts, that this just means failure to perform the role of public broadcasting. T.T.V. is satisfactorily serving the state and the people, loyal to the aim of its establishment.

On the other hand, however, a trend cannot be denied that, "if income is derived exclusively from advertising, the broadcaster will inevitably seek to obtain a maximum audience at the lowest cost per program;" (Television in developing countries by Henry R. Cassirer). For larger program cost is required for studio programs than for film programs, for home-produced modern dramas than for foreign films, and furthermore far greater ardor and effort for creation is demanded. However excellent programs are planned, no future improvement cannot be hoped for, without the zeal of the enterprise to put it into practice. The enterprising body will decide the orientation of the future programs.

c) The adoption of the licence fee system is feasible. After 1971, sufficient income from collection of licence fees to keep up the nation-wide network and, as well be shown in another chapter, the method of their collection is sufficiently practicable.

As the enterprising body depending on licence fees for its revenue source, a New Public Corporation is most suitable. An enterprise whose revenue comes from licence fees will make various forms of effort to win the largest possible number of audience so as to increase its income. In other words, it will render various forms of service to arrange for programs of good quality and improvement of the receiving condition.

d) To entrust the Public Corporation with public broadcasting business will not only give its staff a sense of pride that they have been trusted with the business by the government and people, but we can also expect more efficient management than in the case of direct management by the State.

New Public Corporation should generally take the following pattern:

a) Status of juridical person: The Public Corporation should be a juridical person under a special law. Since it is an organization which has a definite object of public nature to produce nation-wide network, it is not desired that it be a juridical person under the Civil Code. On the other hand, it is desired that regulations over the public corporation be as moderate as possible. For example, pay standards should not be identified with that of other public corporations, but should be much higher. For broadcasting business depends more greatly on the quality and morale of its employees than any other business. In various other respects, due consideration should be given the special character of the broadcasting business.

b) Object: To conduct broadcasting so that national programs may be received on a nationwide basis.

c) Affairs: It is necessary to define, in concrete terms, the affairs required to attain the object. Also, such correlated affairs as international co-operation, research on broadcasting, service for viewers, should be specified. Affairs of the public corporation just refer to the uses to which licence fees are to be put, and therefore it will be necessary to prescribe them so that they may not be deviating from the original character of licence fee — compensation for broadcasting service.

d) Executive organ: It is desired that a committee on a consultative basis be made the executive organ to decide on managerial policy and other important affairs concening business operation. Also, due consideration should be given so that determination of the will of management may be made speedily and properly.

e) Relationship with the Government: The government's order to execute broadcasting and its general supervision over the conduct of business should be effected thoroughly, while it will be necessary to promote the growth of broadcasting in recognition in a certain measure of the autonomy of the broadcasting enterprise, consisting mainly in the responsibility of compiling programs.

f) Finance system: It should be expressly stated that it is an enterprise whose major source of revenue is licence fees and that it will not broadcast

commercial programs. All construction investment should be handled as the government's capital investment in N.P.C.. As the public corporation cannot derive income from licence fees until 1971, there cannot be depreciation. After 1971, however, appropriate depreciation to be prescribed by the revenue code should be made. It is natural to reserve the depreciation expense for re-acquisition of equipment, but, since the broadcasting industry has always a new equipment demand, these reserves may have to be applied as internal funds for re-investment, for the intervening period up to the time of equipment replacement. In addition, the method to raise new external funds should be established, to meet the demand for funds of the corporation.

5-3-6 Commercial broadcasting business

The dual system of the broadcasting business with its revenue from licence fees and of that with its revenue from commercial programs may cause many people to raise and objection as to why the development under the existing system or the development solely of the new system by New Public Corporation will not be possible. However, for the unaermentioned reasons we take the view that the dual system is most desirable for the development of the broadcasting business in Thailand.

a) The positive reasons for which the establishment of New Public Corporation is considered necessary have already been given. It might be possible that the commercial broadcasting business will be abolished with its establishment. But disdavantages therefrom is too great. First of all, loss of the revenue source of commercial broadcasts may result in the future decrease in the volume of broadcasting. This dual system will enable the rich volume of TV broadcasting satisfying the viewers to be secured and programs to have an adequate variety.

b) Mutual stimulation by competitive system will quicken the future growth more than the well-organized, monopolystic enterprising system. Especially the mutual stimulation of the broadcasting business with its different sources of revenue, consequently with its different types of enterprising activity, will bring about the qualitative improvement of programs and various forms of service to viewers.

c) The present activities of Thai TV Company and those of Royal Thai Army

TV are resembling with each other. In the future, this relationship should continue to exist. If one of them case to broadcast commercial programs, it will mean that TV medium fails to fully digest large demand for advertisement.

If the positive raisons d'être of the future commercial broadcasting are acknowledged, the following requirements should be considered for the development of commercial broadcasting:

a) The level of commercial rates should be raised. Overall raise in the rates has been made more that once in two years. Even so, they are very cheap when collective account is taken of the number of viewing households, the number of viewers per TV set and rating. Revision of unit cost should be made every year in proportion to increase in the number of viewers, on a well-organized plan. It may be agreed that sharp raise in the rates cannot be made because it will mean the loss of an opportunity to an advertiser of poor means for TV advertisement. This view may be countered by pointing out that, since many advertising media other than TV medium are existing, it is quite natural that some types of business and some scales of business cannot afford to make use of TV medium. TV covering the nationwide network will naturally be medium adapted for commodities put on the nationwide market and advertisers with big business scale.

Increase in income should be sought by raising the unit cost of rate, but not by increasing the commercial hours over the present level.

b) Rationalization of the system of rates should be ensured. Whether to admit the sponsorship of the program or not is an important question. There are many countries which do not recognize it, whereas it has so far been admitted in Thailand. If this policy is to be kept up in the future, it is necessary to consider the ratio of spot broadcasting rate to time sale broadcasting rate. In Japan, no uniform standard has been set among broadcasting corporations, the general time sale to spot income ratio is around 100 : 45 - 105. Income may be increased by giving priority in income to time sale, with smaller increase in the length of commercial broadcasting hours.

Meanwhile, with regard to time sale, it will be necessary to fix rates by

drawing a distinct line between time rates (radio wave rates) and production cost. For this may render it possible to lessen the burden of the broadcasting station and to spend adequate money on the production of programs. According to the ground total for 1963 of the four Japanese key stations in Tokyo, income from production expense corresponds to 71 per cent of income from radio wave rates.

The current rates have been fixed on a time basis, but it may be considered that there may well be a bit more difference between high and low in proportion to the actual rating.

The scale of rates in Japan is given in Table 5-10 for information. The table shows the case of the standard TV station with viewers numbering about 300,000 to 500,000 within the service area, as in 1963.

c) It is desirable that audience survey be conducted at regular intervals thereby to arrange so that the intentions of viewers may be adequately reflected in programs. For that purpose, full advantage should be taken of the function of the advertising agent who is interested in the intentions of viewers in the same way as the broadcasting station.

d) It cannot be denied that certain restrictions are currently being imposed as the state-operated broadcasting and that no full advantage can be taken of broadcasting hours. But, in the future when New Public Corporation actually offers programs, it will be necessary not to impose on the business the heavy burden as the state-operated broadcasting. Great success in commercial broadcasting such as has been achieved in the United States may be primarily ascribed to the affluence of its society. It may be recalled that this is also due to the fact that the broadcasting enterprise, for its part, has thoroughly pursued rationality in its activities as a free enterprise within the scope authorized on licence.

5-4 Legislation

5-4-1 Authority of law

As the law relating to broadcasting in Thailand, there is the "Radio and Television Act" consisting of 26 articles, which came into force in 1955. This act has been supplemented by the " Radio and Television Act" (No. 2) in 1959 whose amendment consists chiefly in the abolition of the licence fee system.

Table 5-9 Share of Items Composing Working Expenses

	New Public Corporation	Thai TV Company ('64)	N.H.K. ('64)	Commercial broadcasting in Japan
1. Personel	19.7 %	18.8 %	24.7 %	17 - 18 %
2. Broadcasting	31.3	24.1	27.6 *	25 - 28 *
3. Technical	11.0	5.2	5.5	4 - 5
4. General control	4.7	7.0	11.2	7.5 - 9
5. Business (sales)	7.2	7.1	9.2	19
6. Depreciation	21.6	8.5	13.2	6.5 - 8
7. Extra-business	4.5	3.2	8.8	5
8. Business income	0	26.1	0	16 - 18
Total	100.0	100.0	100.0	100
Others	(hire charge for microwave radio relay link) 49.1			

* Inclusive of hire charge for microwave radio relay link

Table 5-10 Examples of TV Broadcasting charges in Japan

1. Time Rates

(1) Time Class Division

	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Weekday (excl. Saturday & Sunday)	C						B		C			extra B		A		extra B	C
Saturday	C						extra B		B			extra B		A		extra B	C
Sunday & National Holiday	C		B			extra B	A					A				extra B	C

(2) Scale of Rates

(in Bahts)

Time class / Time	A	extra B	B	C
30 min.	13,900	11,700	10,000	7,700
25 min.	12,700	10,900	9,600	6,900
20 min.	11,600	10,000	8,700	6,400
15 min.	10,000	8,600	6,900	5,100
10 min.	9,200	7,800	6,500	4,800
5 min.	8,100	6,900	6,100	4,400

* Broadcasting time is actually shortened by 45 minutes
* Programs of 30 minutes or more are calculated on the basis of 30 minutes program
* In case of contract being made continuously over 13 times or over 26 times 5-percent and 10-percent discount is made respectively.

2 Spot Charges

(1) Spot time class

	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Weekday (excl. Saturday & Sunday)	C						B		C			extra B		A		extra B	C
Saturday	C						extra B		B			extra B		A		extra B	C
Sunday & National Holiday	C		B		extra B	A			extra B					A		extra B	C

(2) Scale of Charge

Station brake spot

(in Bahts)

Time class / Time	A	extra B	B	C
15 sec.	3,200	2,200	2,000	1,600
10 sec.	2,300	1,700	1,400	1,200
5 sec.	1,500	1,100	900	800

* Discount is made for contract for more than specified times same as in the case of time rate.

◎ I D (Station indentification)

(in Bahts)

Time class / Time	A	extra B	B	C
10 sec.	1,800	1,300	1,100	900
5 sec.	1,400	900	800	700

* No discount similar to the above is made.

◎ T V Guide (Commercial guide)

(in Bahts)

Time class / Time	A	extra B	B	C
30 sec.	1,900	1,400	1,200	1,000
15 sec.	1,200	800	700	600
10 sec.	1,000	700	600	500

* No discount similar to time rate is made.

* PT (Participating Anouncement)
Fixed by the station each time of broadcast according to the program to be inserted, length of time and volume of commercial.

As to the use of radio waves, there may be mentioned the "Radio Communication Act" 1935 — (No. 5) 1948. These acts are recognized to have maintained the broadcasting order for long in Thailand and operated effectively for the promotion of the people's welfare and for the embodiment of the national objectives.

Generally speaking, it is a matter for regret that, from its nature of adhering to formality, law attaches importance to legal stability, so much so, that it cannot readily cope with a new state of affairs as it arises. In implementing the present project in Thailand, we should provide for a new act which may meet the drastic reform and enable it to be executed on a solid basis.

The set of acts regulating broadcasting cover a wide area from the social and cultural realm of broadcasting programs to the sphere of radio waves, requiring a very highly technical supervision. They have too peculiar a character to be called part of the administrative law.

In the field of mass media in the form of printed matter, there are many countries which have no independent, special laws. There has been established historical tradition that trusts to the autonomy of mass media in connection with the freedom of speech. As to broadcasting, however, every country has various forms of elaborately worked out systems and legislation incorporating them.

Broadcasting must be regulated by law, firstly because broadcasting is possible only by dividing frequency spectrum with frequency and exercising strict technical control. The second reason is that broadcasting programs have a very strong influence over the social life of the people and are assigned a specially high place in the public relations activity of the Government. Therefore, for the expansion project of TV broadcasting, a new set of laws reflecting the new system is required.

5-4-2 Contents of the new legislation

The contents of the legislation should be such that may reflect faithfully the new broadcasting order when it is established. The scope to be covered will roughly be as follows:

a) Objects of broadcasting

It may be only too natural that the act should be aimed to have broadcasting well diffused among the people for the promotion of the nation's welfare and execution of the Government policy. Also, it will be necessary to

enunciate the priority given to educational functions.

b) Basic plan

The responsible body for broadcasting should be designated. If the Public Corporation and other government organs alone can undertake the responsibility, it would seem necessary to expressly state to that effect, or to define the requirements, if there is to be still room for authorizing a purely non-governmental body to do so.

c) Relevant matters to the Broadcasting Corporation

If the public corporation mentioned in Chapter 5-3-5 is to be formed, its framework should be provided by law. As regards other enterprising bodies, it will be necessary to legally prescribe the scope of business activity, and the relationship with the competent administrative agency (liability to report on business activities, etc.).

d) Matters relative to technical supervision

Details of technical standards should be prescribed by Ministerial Ordinance.

Liability of the broadcasting station to observe technical standards and the inspection system for equipment of the broadcasting station should be legally prescribed.

e) Matters relative to supervision over programs

The Government's order to execute broadcasting, the right of compiling programs and responsibility therefore and approval or disapproval of commercial broadcasts and like matters should be expressly fixed. The basic part of the program code should be legally difined.

5-5 Competent Bodies for Broadcasting Administration

Administrative organs for broadcasting are, as shown in Table 5-11, varying from country to country. In Thailand, the Public Relations Department assumes charge of this business. It is the most suitable organ in Thailand. However, there appears to be a certain area in which the authority given is inadequate to perform complete broadcasting administration. This is because, by virtue of Section 4 of the Radio and Television Act of 1955, too many Government organs are excluded from the application of the Act.

Section 4. This act shall have no effect with regard to

(1) The Public Relations Department

(2) The Post and Telegraph Department

(3) The Ministry of Defence

(4) Any Ministry, public body, department or juristic person as specified by Ministerial Regulations

It is a matter of course that a government organ or a similar body is excluded from the application of regulations of law with respect to the licensing system such as trade in receivers or the elimination of hindrance to operation of broadcasting business. However, the situation differs as to the perfect prohibition of the operation of broadcasting service as provided for in Section 5.

Section 5. It is forbidden to operate a radio or television service except under licence from the licensing officer.

It makes no difference in the use of radio waves, whether the broadcasting business is conducted by the governmental organ or the non-governmental organ. Therefore, if no coordination is made, overall utilization will become impossible. The coordination is being made actually by the cabinet, but sufficient coordination of the detailed technical matters including the allocation of frequency cannot be considered to be made by the cabinet alone. The fact that the Radio Committee of Thailand as the consultative organ between the ministries concerned has been substatially established and is working in his own way eloquently tells this situation. For TV broadcasting is more strongly demanded technical control such as protection from jamming than in the case of radio broadcasting.

From this standpoint, it is desired that Public Relations Department be given the authority to coordinate or that a Radio Control Board be set up as the basic broadcasting administration organ.

The Board is desired to have its members from the representatives of the ministries concerned and also from the prominent persons of the non-governmental circles. Its duties are to determine the frequency for broadcasting, the location of broadcasting station and operatable power, within the scope notified by the Director of the Post and Telegraph Department as available for use. Also, they are to fix the rules for technical standards and for the program code (the program code should

constitute the guideline to the program code prepared by the broadcasting corporation). When the Board is created, Public Relations Department will not only assume charge of general affairs as the executive office of the Board, but also should perform its role as the executory body for the decisions of the Board.

Table 5-11 Broadcasting Administration Agencies in Principal Counties

Item	United State	United Kingdom	Canada
Competent agency	The Federal Communications Commission (FCC)	General Post Office	Ministry of Transport BBG (Boards of Broadcast Governors) 1. BBG is an independent administrative from an advisory body. 2. The Ministry of Transport is parallel affairs relative to the wireless act is tion of the Ministry and affairs relativ act under that of BBG.
Organization	1. Composed of seven members. 2. Members are appointed by the President with the consent of the Senate. The Chairman is nominated by the President. (Four or more members may not be appointed from a single political party.) 3. The term of office of the member is to be 7 years. 4. The disqualifying conditions are prescribed for the membership.	Postmaster-General	(BBG) 1. Composed of 15 members (3 full-time, service.) 2. The members are appointed by the Gov with the advice and consent of the Cab 3. The tenure of office of the member is (5 years for those of part-time servic 4. Disqualifying conditions are prescribe 5. The parliament is authorized to recall
Powers invested	1. (a) To assign frequency and fix electric power, etc. (b) To license a broadcasting station. (c) To exercise control over the operation, programs, etc., of broadcasting Stations. 2. Invested with the quasi-legislative and the quasi-judicial powers.	To license a broadcasting station and to exercise supervision over its operation. (The Chancellor of the Exchequer intervenes in case of government grant being made to B.B.C.)	(Ministry of Transport) To license a broadcasting station. (BBG) To exercise control over the setting up an network of activities of CBC stations and p commercial stations, and the relations bet these two different categories.

	Canada	Australia	Others
	Ministry of Transport BBG (Boards of Broadcast Governors) 1. BBG is an independent administrative organ different from an advisory body. 2. The Ministry of Transport is parallel in function to BBG: affairs relative to the wireless act is under the jurisdiction of the Ministry and affairs relative to the broadcasting act under that of BBG.	Postmaster-General's department ABCB (Australian Broadcasting Control Boards) 1. ABCB is an administrative organization independent of the Postmaster-General's Department. 2. While ABCB looks very like BBG of Canada, it is different from the latter in: a) That it fixes, under the direction of the Minister, the frequency, electric power, the location of a broadcasting station and b) That it assumes charge of technical affairs, let alone programs and the operation of the network.	<u>West Germany</u> Federal Ministry of Posts Each Land government 1. The supervisory power over broadcasting service rests with each Land. 2. The competent agency on broadcasting is the Federal Ministry of Posts, and it has the authority to conduct the following purely technical affairs, in addition to the licensing of a broadcasting station under the Telecommunications Equipment Law: (a) To regulate technical conditions; (b) To control and assign the frequency; (c) To eliminate interference to reception.
	(BBG) 1. Composed of 15 members (3 full-time, 12 part-time service.) 2. The members are appointed by the Governor-General with the advice and consent of the Cabinet. 3. The tenure of office of the member is to be 7 years (5 years for those of part-time service). 4. Disqualifying conditions are prescribed. 5. The parliament is authorized to recall members.	(ABCB) 1. Composed of 5 members (3 full-time, 2 part-time) 2. The members are appointed by the Governor-General. 3. The tenure of office of the member is fixed by the Governor-General within the period of not more than 7 years. 4. Disqualifying conditions for membership are provided.	<u>France</u> Ministry of Information (Supervision over ORTF) <u>Italy</u> Ministry of Posts and Telegraph (Supervision over RAI)
e supervi- case of	(Ministry of Transport) To license a broadcasting station. (BBG) To exercise control over the setting up and operation of the network of activities of CBC stations and privately owned commercial stations, and the relations between stations of these two different categories.	(Postmaster-General's department) To issue a licence to a broadcasting station. (ABCB) 1. (a) To fix the frequency, electric power, location of a broadcasting station, etc. (b) To determine the conditions of commercial broadcasting. (c) To regulate the agreements concerning the operation, programs, setting up of a network, of a commercial broadcasting station. 2. An order of ABCB has the effect of law.	

CHAPTER Ⅵ

POPULARIZATION OF TV SERVICE

CHAPTER VI

POPULARIZATION OF TV SERVICE

6.1 The Current Status of Popularization

It is estimated that 250,000 TV receivers are now in use in Thailand. It is held that 90 per cent of them are being used in the metropolitan area of Bangkok - Thonburi and 10 per cent, the remainder, is being scattered over the provincial towns of Haad Yai, Lampang, Chian Mai, Khon Kaen and Nakhon Ratchasima. However, as the licence fee system was abolished in 1959, no accurate information is now available.

According to the customs clearance statistics in Table 6-1, TV receivers imported in the 1955 - '65 period totalled 187,460 sets. Receivers assembled at factories at home - the assembly began about 1963 or 1964 - maybe estimated, from the scale of production, at the 10,000 - 12,000 sets mark.

As the survey of per household popularization rate, we may mention the data under the Household Expenditure Survey conducted by the National Statistical Office in 1962. According to this information, as of 1962, 14.4 per cent popularization rate was registered in the Bangkok - Thonburi area. A survey conducted by a certain research institute reports that at the beginning of 1965, about one-third rate of popularization per household was recorded for the same area.

As the annual average increase rate of imported TV sets for the 1959 - '65 period is 30 per cent, the rise from 14.4 to 33.3 per cent in less than 3 years is not without sufficient reason. Also, according to the audience survey we conducted in June 1966, around 50 per cent of popularization rate was scored. If the annual average increase rate of 30 per cent was also kept up during the one year and a half period after 1965, 50 per cent popularization rate may well be considered reasonable. The results of the audience survey in the cities of Lampang, Haad Yai and Khon Kaen as well, (based on answers from high school students, no representability exists and reliability is small) showed 56 per cent popularization rate. With the income class corresponding to the average income household in provincial towns as well, the rate stands at 40 - 50 per cent. Anyhow, a considerable measure of popularization seems to have been shown in a brief space of time of 1963 - '66.

We may say that the popularization rate in the present service area in Thailand is very high. The special features are as follows:

Table 6-1. Numbers of Imported Receivers and Average CIF Prices by Years. (Customs Clearance Statistics)

Year	No. of Imported sets	Cumulative Total	Cumulative Index '59=100	Average CIF Price in Bahts	Index for above '59=100
'55	2,556	2,556	—	—	—
'56	3,194	5,750	—	—	—
'57	7,161	12,911	—	—	—
'58	13,342	26,253	—	—	—
'59	11,769	38,022	100	2,539	100
'60	13,551	51,573	136	2,290	90.2
'61	15,924	67,497	178	1,937	76.3
'62	22,024	89,521	235	1,766	69.6
'63	28,122	117,643	309	1,692	66.6
'64	30,765	148,408	390	1,666	65.6
'65	39,052	187,460	493	1,448	57.0

Fig. 6-1 Rising Trends in National Income, Number of Imported TV Receivers and Business Income of Thai TV Company

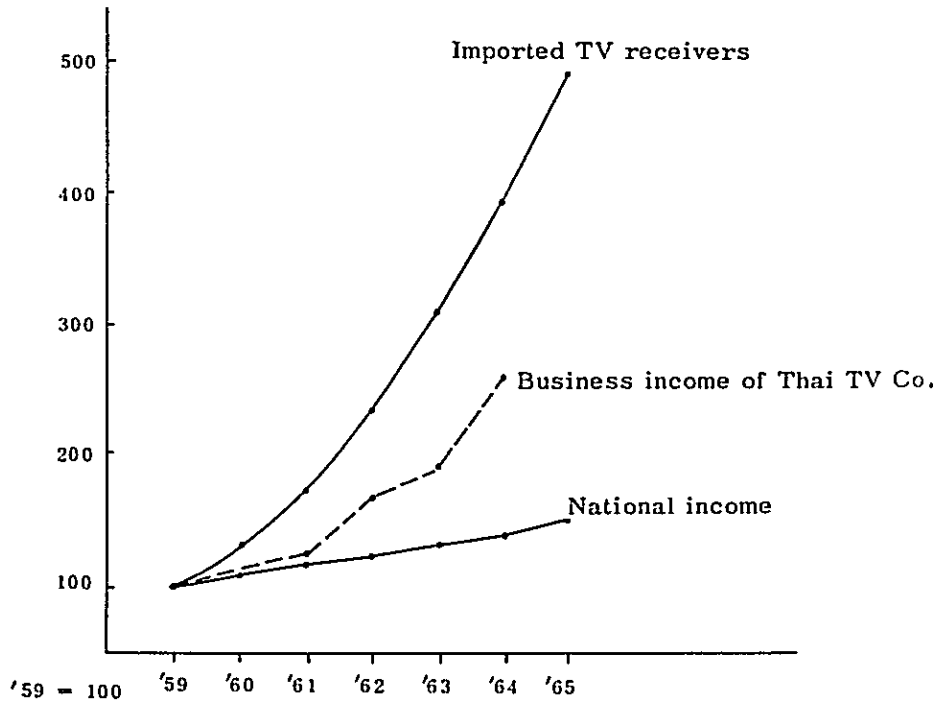


Fig. 6-2 Shifts in Popularization Rate of Selected Durable Goods in Households (Japan)

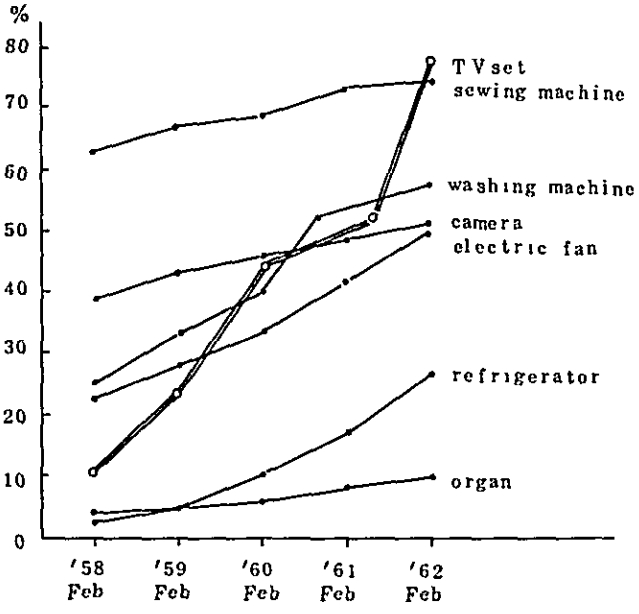


Fig. 6-3 *Shifts in Popularization Rate by Income Class (Japan)*

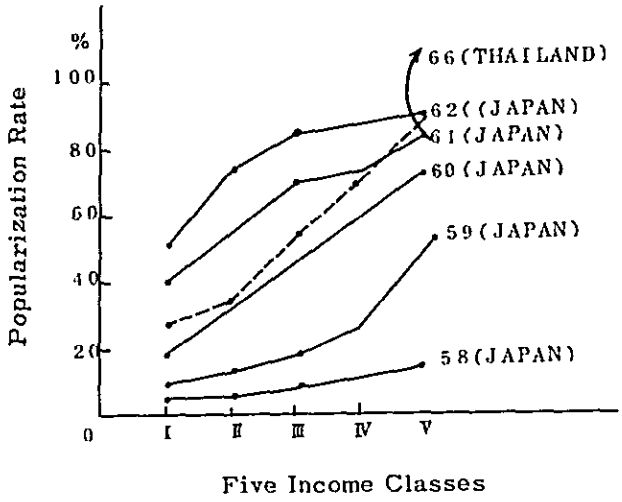


Fig. 6-4 Popularization Trend by Income Classes and by Years

Source: Audience Survey in Bangkok

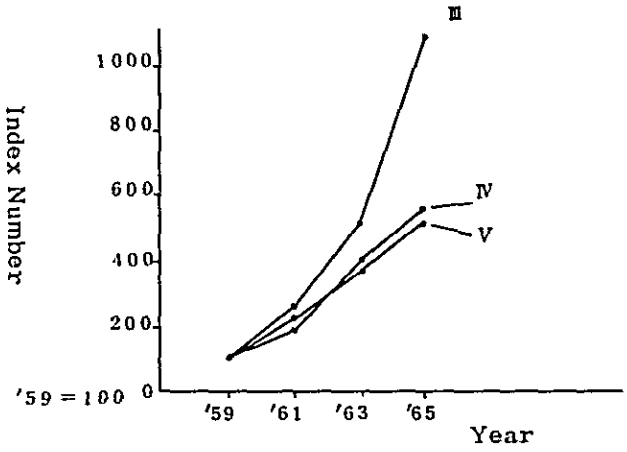
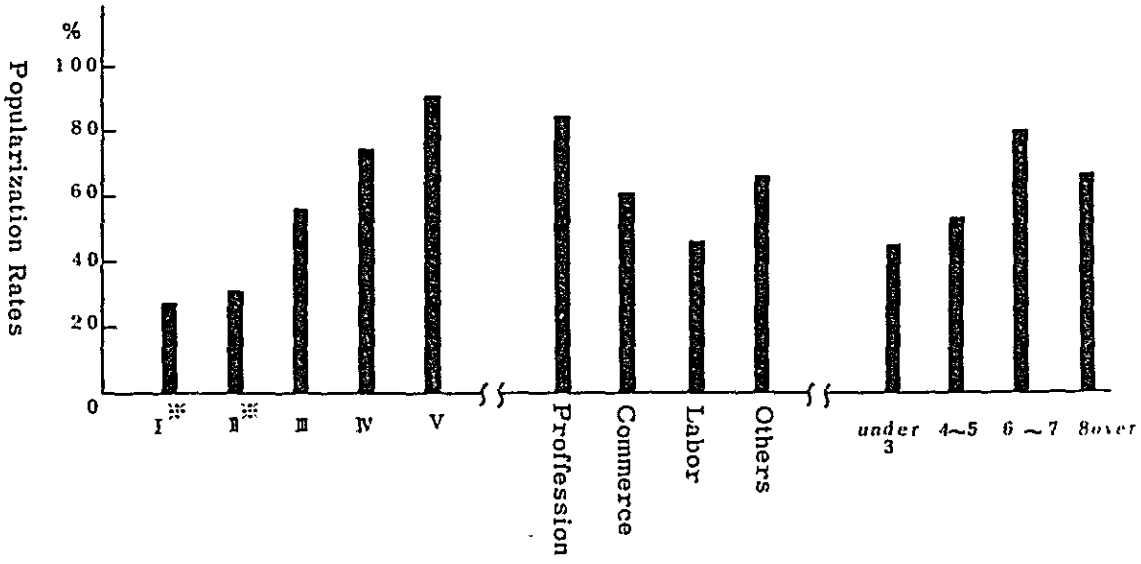


Fig. 6-5 Popularization Rates by Income Class, by Occupation and by Size of Family

※ I and II are not reliable because of the small number of samples.



by Five Income Classes by Occupation by Size of Family

a) High popularization increase rate;

As maybe seen in Fig. 6-1, the increase rate is so high that the economic growth rate can stand no comparison. As compared with about 6 per cent annual average economic growth rate and about 3 per cent annual average increase rate of the per capital national income in the 1961 - '65 period, the 30-per cent increase rate of TV sets (for the 1959 - '65 period) is startling. This remarkable increase rate cannot be seen in the case of the popularization of other durable consumer goods. As Fig. 6-2 indicates, the popularization process was represented in a high curve as distinct from other durable consumer goods. A similar trend is considered to be exhibited in Thailand.

b) From high income to low income classes

Although a clearcut statistical analysis in lacking, the popularization of TV sets in West European countries and the United States is said to have started from the medium income class or the relatively low income class and then penetrated into the high income and low income classes. In Japan the popularization process is such that it started from the high income class and came down to the low income class by way of the medium income class. A similar trend is observable in Thailand. As Fig. 6-4 shows, in the Bangkok - Thonburi area, the purchase peak came toward 1963 in the case of the high income class, while the popularization progressed into the medium income class in 1965 and it will develop into the low income class from the present to some time in the future. The difference of the pattern of the popularization process from the West European countries maybe due largely to the difference of the mode of social life.

c) Purchase motives

According to the audience survey, the purchase motives for TV receivers in Bangkok are as shown in Fig. 6-6. No remarkable difference exists in this trend if viewed by occupation and by income brackets. The purchase of a TV receiver upon the request of children maybe considered to be due to a big influence the entertainment programs exercise over children.

The considerably high rating of educational programs does not occupy a large importance as the immediate motive for purchase of the receiver. The purchase of TV receivers seems to mean the easy acquisition of a means of recreation.

Fig. 6-6 Purchase Motives for TV Receivers

Source: Audience Survey in Bangkok

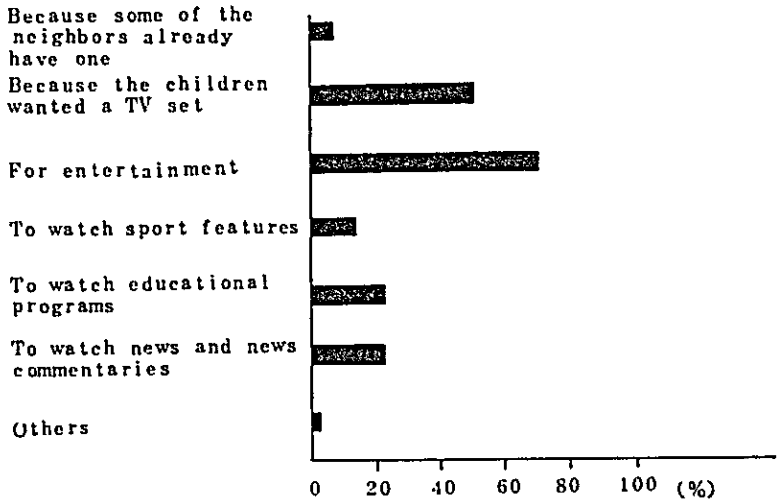
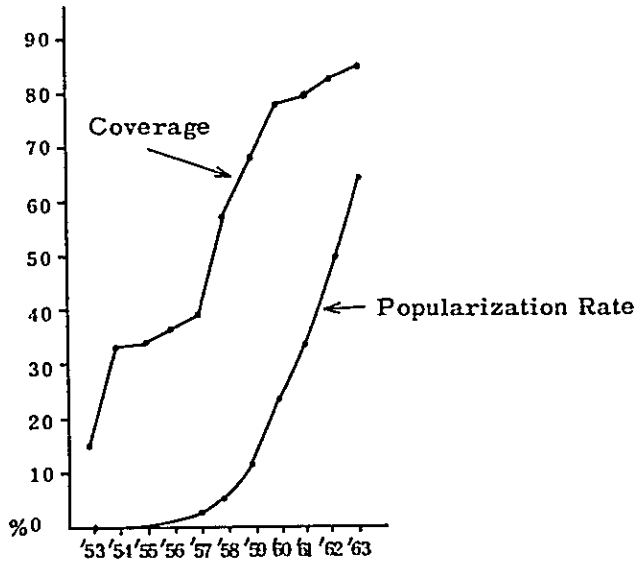


Fig. 6-7 Relationship between Coverage and Popularization Rate by Years (Japan)



6.2 Prediction of Popularization

Prediction of the future popularization of TV receivers is very difficult. Factors different from those are too many in the case of simple electric appliances.

a) It is obvious that before the popularization of TV receivers there must exist receivable radio waves. In other words, the first point of the popularization policy is the expansion of good service area. As Fig. 6-7 indicates, the expansion of the microwave network for TV transmission in Japan meant exactly the expansion of the popularization rate.

b) The demand for TV sets in the present service area is strong, as noted above. In the provincial area where future expansion is expected, there will be stronger demand, because the other mass media and recreational facilities there maybe much inferior to those in the existing service area.

This ardor for purchase is closely related with the number of TV channels, the number of broadcasting hours, and the contents of programs. There must be adequate arrangement for these items from the angle of promoting popularization. Once a start is made of popularization, the receivers will produce the demonstration effect among consumers and thereby accelerate popularization process.

c) The receiver being an expensive commodity, the purchasing standard of consumers should be given thorough consideration. In Japan, it is said though without statisical ground, that the household twice of whose monthly income exceeds the price of a receiver can afford to buy one. In Thailand, the standard type receivers are being put on the market at 2,300 - 2,600 Bahts. According to the Household Expenditure Survey (N.S.O.), the average household monthly income in the urban area is, with the special exception of 1,519 Bahts in the Bangkok - Thonburi area, 850 - 1,200 Bahts. If the increase in income in 1962 is taken into account, it matters little in the urban area. Actually, in the audience survey conducted at Bangkok, of those who have no plan to purchase receivers, 29.9 per cent gave as the reason for non-purchase because they found the receiver useless, and 15.5 per cent said that the receiver would have harmful effects on children. Those who gave 'high price' as the reason accounted for 26.8 per cent. This trend has had hardly anything to do with the amount of

income. But, in the rural area, there is some question. The Household Expenditure Survey shows that the average household monthly income in the rural area is 250 - 600 Bahts. If it is assumed that the per capita national income increases at the annual rate of 3 per cent, it is expected to rise to the 325 - 900 Bahts level in fiscal year of 1971. This prediction is based on the premise that the disparity in income between the urban and rural areas will stand at a similar level to the present. The ambitious government plan envisages that 80 per cent of the funds under the Second Economic Development Plan be assigned to the rural area and this plan is expected to raise the income level in the rural area by 1971. The per capita national income to be expected in 1971 is in the amount of 3,300 Bahts.

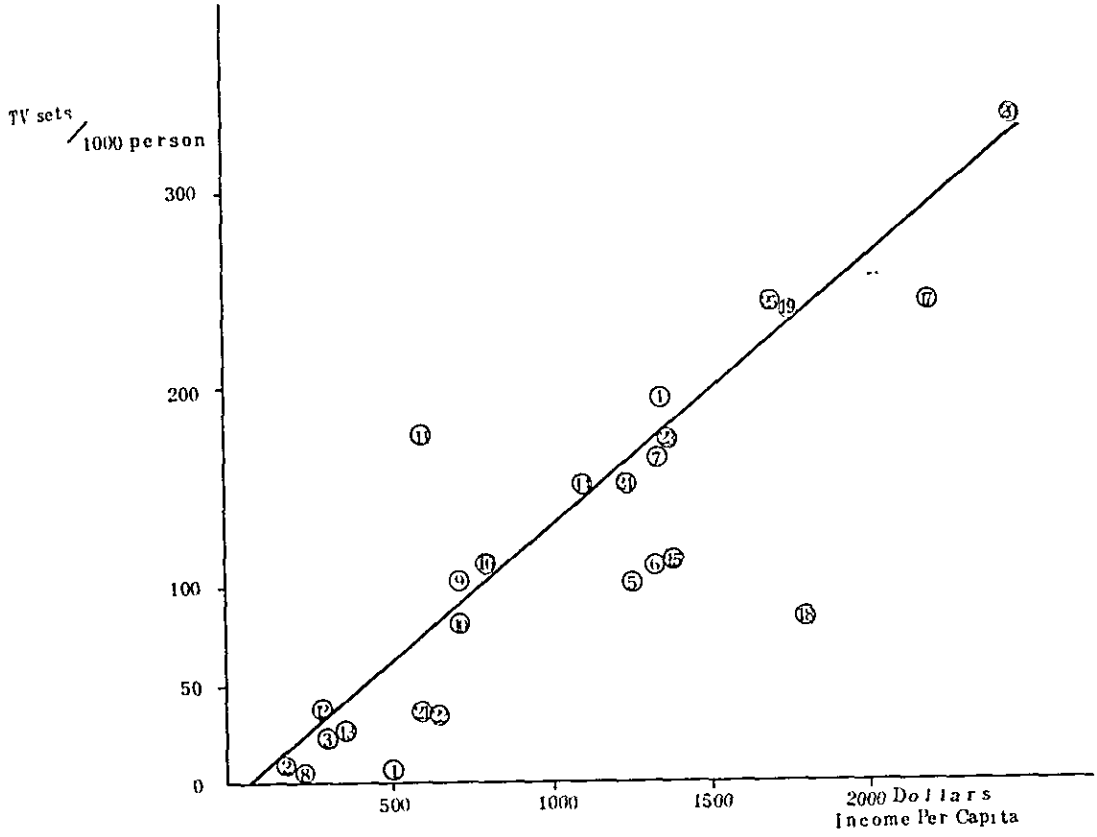
With the average household of 5 - 6 persons the monthly income will be in the amount of 1,540 Bahts. The average monthly household income in the rural area is expected, with a fair measure of certainly, to surpass 1,000 Bahts. Also, the following view is to be supported:

"While some estimated place annual per capita income at approximately $105, there is reason to believe that the actual current level is considerably higher. Family purchasing power for the mass of the population is greater than income statistics might suggest due to minimum expenditure by the predominantly rural and farm households for necessities of food and shelter." ("Report on the Manufacturing Electrical Appliances in Thailand" by Ebasco Service Incorporated.).

Thus, for 1971 or thereabouts, fairly optimistic view may well be taken of the question of income as a requirement for the popularization of TV receivers over Thailand including the provincial area.

As to the relationship between income and popularization rate, the following conclusion may be drawn from the international comparison in Fig. 6-8: The existence of correlationship between income level and popularization rate is distinctly recognized. Yet this relationship is not so close and the presence of many other factors maybe recognized. From this it maybe gathered that income level is a requirement for popularization and this, coupled with various other factors at work, raises the popularization rate. Thailand may be said to be fulfilling this basic requirement to a considerable extent.

Fig. 6-8 Relationship between Per Capita Income and Holding TV Receivers Rate (1963 - '64)



			Income Per Capita	TV set per 1000					
1	Chile	'63	527	5.4	11	Netherland	'64	1, 127.4	151.4
2	Colombia	'63	183	13.0	15	New Zealand	'64	1, 457	110.8
3	Costa-Rica	'63	311	25.2	16	Puerto-Rico	'64	816	112.8
4	Denmark	'63	1, 318	198.0	17	Sweden	'64	2, 284	248.5
5	Finland	'64	1, 282	103.9	18	Switzerland	'61	1, 799	82.0
6	France	'64	1, 369	111.8	19	U.K.	'64	1, 348	242.7
7	Germany	'64	1, 358	171.9	20	U.S.A.	'63	2, 539	313.2
8	Iran	'63	214	3.8	21	Venezuela	'63	581	37.3
9	Ireland	'64	732	101.9	22	Algentina	'64	631	36.3
10	Italy	'63	697	81.9	23	Australia	'64	1, 395	168.9
11	Japan	'61	587	176.8	24	Belgium	'61	1, 216	116.6
12	Lebanon	'63	290	36.8	25	Canada	'61	1, 699	245.0
13	Mexico	'64	385	22.7					

d) It is well known that there are factors, on the side of the supplier of receivers, which contribute to popularization, in addition to those on the side of the consumers. The advertising and propaganda activities services such as repair of receivers and eventual falling of price. These enhance the ardor for purchase on the part of the consumers and give an impetus for expansion of of demand. In Thailand, no plant is existing at present for the mass production of TV receivers. But as Fig. 6-9 indicates, the downward price trend since the past several years has been noted similarly to other TV set producing countries. It maybe recognized that the suppliers, for their part, have powerfully worked on the expansion of popularization of TV sets.

As well be noted in Chapter 6-3, even if the largescale home production is launched in Thailand, it is considered that this downward price trend should be pushed on in the future as before. If the falling of price on the part of the supplies and income increase on the part of consumers continue, explosive popularization in the future may be hoped for.

e) What causes our greatest anxiety in the future popularization is that the rural area is lagging in the spread of commercial power.

In 1963 about 230,000 households were supplied with power by the Metropolitan Electricity Authority; in 1966 about 310,000 households have been supplied with power by the Provincial Electricity Authority. On a nationwide scale, power-supplied households are estimated at 570,000 - 580,000 and popularization rate at 10.9 per cent level.

The number of households to be supplied with power by Provincial Electricity Authority in 1971 is as shown in Table 6-2. If it is assumed that the number increases at the similar rate within the service area of Metropolitan Electricity Authority, the result will be about 820,000 power-supplied households on a nationwide scale in 1971.

This is a considerably low level. It seems that the spread of TV to the rural area is likely to be restricted from power source aspect.

However, under the Second Economic Development Plan, it is contemplated that power supply will grow at the annual rate of 15 per cent, and there are many ambitious projects as illustrated by the Northeastern District Electrification Project. It is anticipated that the future power supply will be improved at a

Fig. 6-9 Lowering of Import Price of TV Receivers
(Customs Clearance Statistics in Thailand)

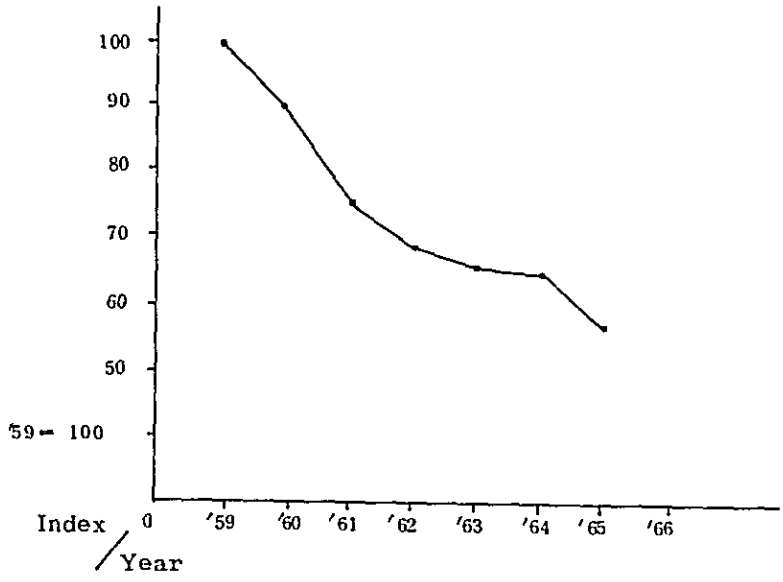


Table 6-2 Estimate of Increase in the Number of Electric Power Consumers (1966 - 1971)

source : Provincial Electricity Authority

REGION	No. OF CONSUMERS 1966	% INCREASE 1967	1968	1969	1970	1971	No. OF CONSUMERS 1971
NORTH 1	40,373	10.18	9.02	8.11	7.41	7.39	60,164
NORTH 2	28,504	11.51	10.12	8.97	8.82	7.80	44,864
NORTH-EAST 1	23,323	11.90	10.01	9.14	9.09	8.28	37,012
NORTH-EAST 2	28,882	10.40	9.90	8.15	8.16	7.49	44,062
NORTH-EAST 3	20,784	14.48	12.64	11.35	10.55	9.09	35,997
SOUTH 1	22,173	4.18	3.89	3.70	3.51	3.44	26,654
SOUTH 2	23,258	7.70	6.78	6.54	6.11	5.12	31,795
CENTRAL 1	21,820	8.81	7.36	7.45	6.75	5.98	30,995
CENTRAL 2	22,231	5.18	5.01	4.77	4.65	1.62	28,215
CENTRAL 3 A	24,859	5.57	4.78	4.51	4.14	1.34	31,326
CENTRAL 3 B	23,452	7.13	7.46	6.18	6.49	6.11	32,492
CENTRAL 4	24,564	9.91	9.25	8.64	7.95	7.22	37,087
TOTAL	304,223						440,993
Metropolitan Area (estimate)	260,000	Per anual growth rate 7.7%					376,870
Whole Country	564,223						817,863

Table 6-3 Estimate of the Increase in the Number of Viewers

Year	1967	1968	1969	1970	1971
Estimated Televiewer in the whole country (A)	294,000	367,000	535,000	772,000	1,029,000
(Index 1966-250,000 = 100)	(118)	(147)	(214)	(309)	(412)
Central Area	271,000	340,000	423,000	522,000	617,000
(Percent to A)	(92%)	(93%)	(79%)	(68%)	(60%)
Other	23,000	27,000	112,000	250,000	412,000
(Percent to A)	(8%)	(7%)	(21%)	(32%)	(40%)

considerably quick pace.

On the other hand, while no concrete figures are available, it is held that there are a sizable number of cases where power is being provided by private Diesel motors in the rural area. It may be thinkable that the popularization of receivers will promote that of the private power source.

Such being the case, we do not think that the problem of power source will become a deterrent to the popularization of TV until about 1971 which is expected to see the spread of around 1 million TV sets.

Popularization estimates have been made as in Table 6-3 and Table 6-4, in consideration of the aforementioned factors. The concrete methods adopted are as follows:

a) The central area is fixed as the area capable of receiving radio waves from the New Station in Bangkok, while, in respect of the south, north, northeast and southeast as well, they are each determined to be the area capable of viewing with respect to the New Station in the respective area.

b) The number of households is held, on the basis of 1960 census, to increase at the annual rate of 3 per cent. Possible change in household membership is left out of account.

c) It is difficult to draw a line between urban and rural households.

"All municipal areas have some characteristics generally recognized as urban, but some such areas are geographically extensive, with a population more rural than urban. Pending studies to define rural and urban areas, no attempt has been made to tabulate the population on a rural-urban basis." (N.S.O., 1960 Census).

The urban population has been obtained by adding one half of the total population (A) minus the population in the municipal area (B) and the population of agricultural households (C), to (B).

The number of urban households has been worked out by dividing the urban population by the average number of household members in the each region.

$$\frac{\frac{1}{2}(A-B-C)+B}{\left(\begin{array}{l}\text{Average household}\\ \text{membership}\end{array}\right)}$$

Table 6-4 Estimated Increase in the Number of Televiwers by Region

		1960 census	1967	1968	1969	1970	1971
Total	Total households	4,616,654	5,678,485	5,838,539	6,013,795	6,194,742	6,379,930
	Rate %	—	5.2	6.3	8.9	12.5	16.1
	Total Televiewers	—	293,725	366,895	535,115	772,248	1,028,808
	Urban households	874,731	1,075,918	1,108,195	1,141,442	1,175,685	1,210,952
	Urban Televiewers	—	—	—	—	471,892	480,633
	Rural households	3,741,923	4,602,567	4,730,344	4,872,353	5,019,057	5,168,978
	Rural Televiewers	—	—	—	—	300,356	448,175
Central	Total households	1,194,744	1,469,535	1,513,621	1,559,030	1,605,801	1,653,975
	Rate %	—	18.4	22.4	27.1	32.5	37.3
	Total Televiewers	—	270,925	339,535	422,642	522,325	617,166
	Urban households	469,799	577,853	595,189	613,045	631,436	650,379
	Rate %	—	—	—	—	—	—
	Urban Televiewers	—	264,500	304,175	349,801	402,271	462,612
	Rural households	724,945	892,682	918,432	945,985	974,465	1,003,596
	Rate %	—	0.72	5.0	10.0	16.0	20.0
	Rural Televiewers	—	6,427	35,360	72,841	120,054	154,554
South	Total households	644,339	792,535	816,311	840,800	866,024	892,005
	Rate %	—	0.3	0.4	4.9	9.4	14.8
	Total Televiewers	—	2,400	2,880	41,235	81,527	131,601
	Urban households	92,539	113,822	117,236	120,754	124,377	128,108
	Rate %	—	—	—	9.59	18.74	29.04
	Urban Televiewers	—	—	—	11,579	23,307	37,251
	Rural households	551,798	678,713	699,075	720,046	741,647	763,897
	Rate %	—	—	—	5.35	10.20	16.04
	Rural Televiewers	—	—	—	29,657	58,220	94,317
North	Total households	1,215,272	1,494,785	1,539,629	1,585,818	1,633,925	1,682,393
	Rate %		0.6	0.7	3.4	6.2	9.8
	Total Televiewers	—	8,400	10,080	53,958	101,821	165,657
	Urban households	178,488	219,540	226,126	232,910	239,897	247,093
	Rate %	—	—	—	6.70	12.79	20.03
	Urban Televiewers	—	—	—	15,435	30,687	49,493
	Rural households	1,036,784	1,275,245	1,313,503	1,352,908	1,394,028	1,425,302
	Rate %	—	—	—	3.70	6.63	10.59
	Rural Televiewers	—	—	—	38,523	71,134	116,164
Northeast	Total households	1,495,018	1,838,872	1,883,737	1,940,249	1,998,456	2,058,410
	Rate %	—	0.7	0.8	0.9	3.1	5.1
	Total Televiewers	—	12,000	14,400	17,280	62,022	105,156
	Urban households	122,984	151,270	155,808	160,482	165,296	170,253
	Rate %	—	—	—	—	8.65	16.81
	Urban Televiewers	—	—	—	—	14,300	28,618
	Rural households	1,372,034	1,687,602	1,727,929	1,779,867	1,833,160	1,888,157
	Rate %	—	—	—	—	3.21	5.29
	Rural Televiewers	—	—	—	—	47,722	76,838
Southeast	Total households	67,283	82,758	85,241	87,798	90,432	93,145
	Rate %	—	—	—	—	5.0	9.6
	Total Televiewers		—	—	—	4,553	8,928
	Urban households	10,921	13,433	13,836	14,251	14,679	15,119
	Rate %	—	—	—	—	9.04	17.57
	Urban Televiewers	—	—	—	—	1,327	2,650
	Rural households	56,362	69,325	71,405	73,547	75,753	78,026
	Rate %	—	—	—	—	5.53	10.41
	Rural Televiewers	—	—	—	—	3,226	6,272

Table 6-5 Percentage of Households Owing Selected Durable Goods

source: N.S.O. Household Expenditure Survey.

Area / Goods	Bangkok-Thonburi			South		North		Northeast		Eastern	
	All	Audience Survey Income III class	H.E.S. 1962	(T) Town	(V) Village	T	V	T	V	T	V
Radio	94.4	87.7	55.8	37.5	9.8	36.4	12.5	32.6	4.9	47.6	36.3
TV-set	64.0	56.2	14.4	0.4	—	0.8	—	0.6	—	7.4	0.7
Phonograph	20.6	9.3	4.7	1.3	0.2	1.4	0.1	2.2	0.2	0.6	—
Refrigerator	48.4	27.2	8.6	1.9	0.3	2.2	0.1	0.6	0.1	1.5	0.5
Washing machine	0.5	—	1.4	0.4	0.1	0.1	0.1	0.6	0.1	0.3	0.3
Electric fan	N.A.	N.A.	33.3	6.2	0.1	8.5	0.1	12.3	—	14.3	1.1
Air condition	4.1	1.2	0.6	N.A.	N.A.	N.A.	N.A.	0.3	—	N.A.	N.A.
Sewing machine	59.6	57.4	33.5	29.3	9.3	18.9	3.4	22.0	4.7	21.5	6.9
Automobile	25.4	10.5	7.4	2.1	1.0	2.5	0.2	3.9	0.3	2.6	0.9
Motor cycle	22.8	20.4	3.9	3.5	1.1	3.6	1.6	4.1	1.2	4.8	2.8
Bicycle	11.1	6.8	8.3	49.9	25.0	46.0	25.9	44.8	9.7	48.1	47.9
Camera	15.0	8.0	6.0	0.6	0.5	1.7	0.2	2.5	0.1	0.9	0.3

d) No particular consideration is given to the population increase rate which stands at 5.5 in the Bangkok area and at 6.0 in the Thonburi area or to the rising trend of the urban concentration rate.

e) From the results of the audience survey and of the Household Expenditure Survey (Table 6-5), the annual popularization rate by income class is held to be Table 6-6.

Table 6-6 Annual Popularization Rate by Income Classes.

Year / Income class	First year	Second year	Third year
I	2	3	5
II	5	10	15
III	8	15	25
IV	10	20	30
V	20	40	60

In combining this with Fequency Distribution of Family by Income Class under Household Expensiture Survey, we have obtained Table 6-7.

f) Population coverage may well reach 90 per cent in the sense of viewing capacity, so that it is put at 100 per cent for urban households, at 77 per cent for rural households. For the number of rural households representing 23 per cent corresponds to 10 per cent of the whole.

g) Pending the opening of TV stations in all provincial areas, the estimated number of popularized receivers within the service area of the existing stations, is to be increased at the annual rate of 20 per cent. After the inauguration of the New Station, they will be absorbed by those which enjoy the estimated popularization rate.

h) In the urban section of the central area, the estimated number of popularized receivers in 1966 is to be held to increase at the annual rate of 15 per cent, in consideration of the presence of various other factors than income. As regards the rural households of the central area, the division by income class is not clear, so that the popularization rates for the respective fiscal years will be fixed at 2 per cent, 5 per cent, 10 per cent, 16 per cent and 20 per cent, by referring to the estimated popularization rates in the provincial rural area.

Table 6-7 Estimated Diffusion Rate by Region

Region	Area	Income class	Frequency Distribution of Family by Income class	First year	Second year	Third year
South	urban	I	9.3 %	0.186 %	0.279 %	0.465 %
		II	16.3	0.815	1.63	2.445
		III	34.6	2.768	5.19	8.665
		IV	21.4	2.14	4.28	6.42
		V	18.4	3.68	7.36	11.04
		Total	100	9.589	18.739	29.035
	rural	I	35.5	0.71	1.065	1.775
		II	33.7	1.685	3.37	5.055
		III	22.8	1.824	3.42	5.7
		IV	4.3	0.43	0.86	1.29
		V	3.7	0.7	1.48	2.22
		Total	100	5.349	10.195	16.04
North	urban	I	33.4	0.668	1.002	1.67
		II	19.8	0.99	1.98	2.97
		III	27.0	2.16	4.05	6.75
		IV	10.0	1.0	2.0	3.0
		V	9.4	1.88	3.76	5.64
		Total	100	6.698	12.792	20.03
	rural	I	63.9	1.278	1.917	3.195
		II	20.2	1.01	2.02	3.03
		III	13.0	1.04	1.95	3.25
		IV	2.1	0.21	0.42	0.63
		V	0.8	0.16	0.32	0.48
		Total	100	3.698	6.627	10.585
Northeast	urban	I	16.8	0.336	0.504	0.84
		II	19.7	0.985	1.97	2.955
		III	32.5	2.6	4.875	8.125
		IV	14.7	1.47	2.94	4.41
		V	16.3	3.26	6.52	9.78
		Total	100	8.651	16.809	26.11
	rural	I	78.5	1.57	2.355	3.925
		II	11.2	0.56	1.12	1.68
		III	8.2	0.656	1.23	2.25
		IV	1.3	0.13	0.26	0.39
		V	0.8	0.16	0.32	0.42
		Total	100	3.206	5.285	8.465
Southeast	urban	I	13.2	0.268	0.396	0.66
		II	18.0	0.9	1.8	2.7
		III	37.0	2.96	5.55	9.25
		IV	14.5	1.45	2.9	4.25
		V	17.3	3.46	6.92	10.38
		Total	100	9.038	17.566	27.34
	rural	I	34.8	0.696	1.044	1.74
		II	28.2	1.41	2.82	4.23
		III	27.3	2.184	4.095	6.825
		IV	7.0	0.7	1.4	2.1
		V	2.7	0.54	1.08	1.62
		Total	100	5.53	10.439	16.515

However, as Bangkok New Station has not been opened for service in the initial fiscal year, the estimated popularization rate is put at a decrease of $\frac{64}{100}$, in consideration of the service area.

6.3 Popularization Policy

6.3.1 General

Special popularization policy is considered to be entirely unnecessary. In other words, installation of receivers for demonstration to the public, or a campaign staged for TV popularization by means of other mass media.

The popularization of TV in Thailand has already passed the initial stage.

Table 6-8 Shifts in the Number of Cinema Audience

Index of 1959 = 100

Year	'58	'59	'60	'61	'62	'63	'64	'65
Bangkok Thonburi area	97.1	100.0	100.2	100.4	95.4	92.7	107.4	115.4
Provincial area	87.1	100.0	105.8	129.4	131.7	138.2	136.4	141.9

Forward 1962 - '63 the cinema population in the Bangkok - Thonburi area showed a declining trend, while, from 1964 to 1965, it again exhibited a rising trend. It may be considered that this tendency, which cannot be perceived in the provincial area, shows the influence of TV in the central area, that the motion picture once had its audience taken by TV, but that, with the realization of the audience of the distinctive functions of TV and motion picture, a stable relationship has been formed between the two.

Most of the provincial area has not, as yet, received the baptism of TV radio waves.

But when the TV station is opened and popularization starts, it may not be considered that there will be the initial signs of TV popularization, the reaction of viewers. Past experience in popularization in the existing service area has been well diffused the land over. Within the new service area, TV receivers will penetrate quietly but rapidly into individual homes.

Under these circumstances, the popularization policy, after all, boils down to the qualitative as well as quantitative improvement of broadcasting. To be more

specific, expansion of the service area of good quality, increase in channel hours, attracting programs, interchange and linking in various forms between viewers and broadcasting stations.

6.3.2 Home production of TV receivers

New demands for receivers may be estimated as in Table 6-9.

Table 6-9 Estimate of New Demands for TV Receivers

Year	1968	1969	1970	1971
Number of Receivers	73,000	168,000	232,000	262,000

This rising trend will continue after 1972 as well. If, after the lapse of 10 to 15 years, 50 per cent per household popularization rate has been attained, we can expect to have a new demand for 3,000,000 receivers and also to have replacement demand for over 300,000 sets at an annual rate in the distant future, assuming that the useful life of receivers in 10 years at the longest.

This demand is considerable in terms of value as well. At the rate of average 1,700 Bahts (CIF) per set, foreign exchange equivalent to 510 million Bahts will be required for 300,000 sets. This corresponds to a little less than 4 per cent of the total value of imports of 1964, and it is not desirable, in view of the international balance of payments of Thailand, to spend such an amount of foreign exchange on the import of a single commodity. This constitutes the primary reason for necessitating the home production of receivers.

In addition, that it may serve to the improvement of the general domestic technical level, and to increase the employment at home may be mentioned as the reason for home production.

The home production of TV receivers must be pushed on in an orderly way, under the direction of the authorities concerned, in pursuance of the Promotion of Industrial Investment Act of 1962.

Here we wish to mention two requirements for home production.

One is that the scale of production must be that of the monthly production of 5,000 sets or more. The optimum scale of TV production is said to be that of the monthly production of the 20,000 sets level. Thus, up to 20,000 sets, it is desirable for enhancing production efficiency, that the scale of production be as large as

possible. However, since the future demand is not completely definitive, it is desired, at the initial stage, to check the scale at a lower level and enlarge it in the future.

The second is that due consideration should be given so that there may not be rise in price by the launching of home production. The nationwide TV network in Thailand is, ultimately, backed by the viewers. For the future development of the nationwide network, the rapid increase in the number of viewers is the absolute requirement. For the future popularization, now may be said to be the most important time.

There the price of receiver will have the most important part to play. The competition between the imported article and the home produced set may be rather trying to home production. For, in other countries, a considerable period of time has elapsed after the commencement of mass production, CIF price has been cut down to the lowest possible level. For the home production, placing of the scale of business at the appropriate level and rationalization of production should be pushed on thoroughly, while maximum priviledge in taxation should be given. It should be avoided to raise the domestic price as the result of protection by resorting, in an easy-going way, to the protective duties.

CHAPTER Ⅶ

PRODUCTION OF TV BROADCAST PROGRAMS

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PRODUCTION OF TV BROADCAST PROGRAMS

7.1. Means of Raising the Quality of Television Broadcast Programs

Since television is the most perfected medium for mass communication, the influence it exerts on its audience is considerable. Superior programs of good quality could play an important role in promoting social progress and in the enhancement of the livelihood of the people, whereas vulgar or unrefined programs will have a harmful effect on society. Particulary when we consider the strong influence of television programs on youth, it may well be said that the quality of programs could be a decisive factor in determining the future cultural standard of a nation. Accordingly, every possible step should be taken with a view to preserving and improving the quality of programs.

7.1.1. Establishment of a Program Study Council

To enable the New Public Corporation to carry out broadcasts on a national basis and to live up to its special role as a truly public service organization, it would be desirable to reflect the views of various circles in the formulation of its broadcast programs. For this purpose the establishment of a Broadcast Program Study Council, consisting of persons from outside the New Public Corporation might be considered. It will be formed of top persons from the political, economic, academic, artistic and religious fields and become an organ acting in a consultative capacity to the broadcasting bureau on basic matters relating to program planning (broadcasting hours, percentage of regular broadcasting hours by categories and content of programs).

7.1.2. Establishment of Standards of Broadcast Programs

Under the paragraphs dealing with the functional organization and the legal aspect, Chapter V, the necessity of laying down a "program code" which sets forth the broad framework of the purpose and basic concepts of broadcast programs has been stated. It would also be necessary, as internal regulations of the New Public Corporation to establish "standards of broadcast programs" which will indicate the specific measures toward realizing the purpose and basic concepts of broadcast programs laid down in the "program code." "Standards of broadcast programs"

should form the basis in the compilation and production of broadcast programs. (See reference: Standards of NHK's Domestic Broadcast Programs)

7.1.3. Establishment of an Examination Function

In order to utilize effectively the above standards of broadcast programs it would be necessary to establish within the New Public Corporation a function for examining broadcast programs in accordance with the standards of broadcast programs.

In order to carry out a thorough examination, it would be desirable to carry out examination of the script and previews prior to broadcast as well to examine the programs by audio-visual means during broadcast.

7.1.4. Opinion Surveys of Viewers

In the production and compilation of broadcast programs it is important to grasp the opinions and reactions of the viewers and listeners. For this purpose it is necessary for broadcasting organization to carry out through scientfic methods, opinion surveys of the television audience. A monitor system, whereby the reaction to programs can be obtained through correspondence from monitors entrusted with monitoring programs, might also be effective.

Reference

Standards of NHK'S Domestic Broadcast Programs

PREFACE

NHK was founded on the basic policy of serving the nation as its public service broadcasting medium without intervention from any other sources, zealously safeguarding its stand of being a non-partisan and independent organization, maintaining its code of upholding the freedom of speech and expression, and to exert its utmost toward the presentation of affluent and well-knit broadcasts, thus promoting the welfare of the public and exerting the best possible efforts toward the elevation of the nation's cultural standards.

On the basis of this realization, the Japan Broadcasting Corporation hereby defines the scope and the purpose of all domestic radio broadcasts under these set standards:

1 Broadcasts shall be conducted in such a manner as to contribute to the realization of the ideals of world peace as well as the welfare of mankind.

2 Basic human rights shall be respected and the spirit of democracy definitely instilled.

3 To be of service in improving the character building of the people through the promotion of cultural and moral levels and the fostering of rational attitudes.

4 The preservation of the out standing national cultures of the past and the upbringing of the newer phases in culture and its diffusion to the general public shall be effected

5 With the aim of sustaining the dignity of a public broadcast facility and in order to meet the requirements of the public at large as a basic principle, the following standards for the compilation of domestic broadcast programs are provided hereunder.

Article I. General Broadcast Program Standards

Section 1. Human Rights, Character, Honor

a. Human rights shall be safeguarded and personal character respected.

b. No broadcast shall be deterimental or injurious to the honor and dignity of an individual or organization, nor shall it bring discredit and loss of reputation in society.

c. No broadcast shall cause professional prejudice.

Section 2. Race, People, International Relations

a. No broadcast shall be such as to create racial or national prejudice.

b. No broadcast shall be made to obstruct international amity.

Section 3. Religion

Broadcasts pertaining to religion shall respect the freedom of worship and be treated with unprejudiced fairness.

Section 4. Politics, Economics

a. Broadcasts shall maintain impartiality in politics.

b. All political candidates appearing on radio in accordance with the Public Office Election Act to broadcast their campaign speech and their respective biographic sketches shall each be given an equal opportunity to voice their views on the air.

c. Broadcasts on various economic issues having a possible vital repercussion on the public shall be given special caution and discretion.

Section 5. Disputes, Litigations

a. Where there is a wide difference in the opinions of the public over an issue, as many angles of arguments should be clearly set forth and shall be given utmost unbiased treatment.

b. In any legal case which is currently on court trial, no broadcast shall be made that would interfere with proper legal adjustment.

Section 6. Community Life

a. Broadcasts are aimed at easing the national livelihood and espouse the spirit of mutual assistance.

b. No broadcast, either directly or indirectly, shall be detrimental to public safety and public interests.

c. Under no circumstances shall acts of violence be permitted to be approved.

Section 7. Home

Marriages shall be treated with solemn seriousness while home and family life be duly respected.

Section 8. Customs and Manners

a. Human life shall not be treated with contempt nor the act of suicide glorified.

b. Problems relating to sex shall be treated with seriousness and shall maintain dignity at all times.

c. The unwholesome relationship between the male and female shall not be treated with glamor, nor its expressions treated approvingly.

Section 9. Crime

a. In reference to crime, the law shall be upheld and the criminal shall not be given the impression of an attractive character nor shall the acts of crime be treated approvingly.

b. In portraying the methods and the actual processes of the acts of crime, such portrayal shall not be given to details any more than is necessary.

c. The acts of gambling and its related subjects shall not be treated approvingly nor shall it be portrayed to give it an impression of glamor.

d. The use of opiates other than for medical purposes shall not be referred to except as a detrimental factor.

Section 10. Expression

a. Expression should be understandable and the correct and proper use of words should be encouraged.

b. Broadcasting words shall be spoken basically on the standard dialect, but when using a provincial dialect, precaution and care should be exercised.

c. Avoid or minimize as much as possible the use of coarse languages and indecent words and actions.

d. Avoid expressions that tend to arouse fear, uneasiness or unpleasantness

e. The detailed descriptions of physical torture and savage treatment or the suggestions of elaborating such acts shall not be broadcast.

f. Every-consideration shall be made for the convenience of the listeners' time best suited for in compiling the contents of the broadcast and the expression used.

g. In the use of news, flash news, official items, weather reports in dramatic programs as effects, every caution should be given to differentiate such items from the actual and the fiction.

Section 11. Advertisement

a. Commercial advertising or broadcasts designed to publicize the mention of names for the purpose of propaganda is not used in any form.

b. In mentioning the names of a specific individual or organization or its professional status, or the mention of trade marks or the name of marchandise, an impartial decision shall be made to determine whether these are required on the program.

Section 12. Prizes

a. Any program designed to attract the listeners merely for the object of the prizes and remunerations, or those that stimulate unnecessary speculative issues shall be avoided.

b. In all prize-awarding programs, every step shall be taken to give the contestants a fair judgment and that the prizes be based in accordance with the merit of the skill displayed.

c. In any solicitation for radio manuscripts, the full details of the basis of the competition and the prize shall be made known distinctly.

Section 13. Corrections

In the event a broadcast is found to be counter to the facts, an immediate retraction or an amendment shall be made as quickly as possible.

Article II. Specific Broadcast Program Standards

Section 1. Cultural Programs

a. The objective is to elevate the cultural aspect in general and to bring about an uplift in the cultural level.

b. The requirements of not only the majority should be met, but every effort to satisfy the demands of the various class levels should be made.

c. Efforts shall be made to promote social and community interest and to further the knowledge on the cultural phases of general livelihood.

d. In making public an academic study and in all broadcasts pertaining to expert matters, the integrity and importance of such a subject shall be duly respected and shall be based on logical and professional standards.

Section 2. Educational Programs

a. The specified listener audience shall be made clear and the contents of the program shall be appropriate and beneficial.

b. In order to obtain the best educational results, it shall be well organized and continuous.

c. Equal opportunity in education shall be publicized through broadcast.

Section 3. School Broadcast Programs

a. Every effort shall be expended toward the basic plan of compiling a school educational program that can be done only through broadcast.

b. Grade school children's study attitude shall be given consideration along with the development of their mind and body.

c. Seek means of improving the teaching methods for the teachers.

Section 4. Children's Programs

a. Considerations shall be given for the reaction on the minds of the children. Strive to infuse wholesome spirit and cultivate abundant sentiments.

b. Avoid programs that would be imitated by the children to their detriment or those that would be easily misinterpreted by them.

c. Avoid expressions that would cause abnormal fear in the children.

d. Superstitions that may bring harm to the children shall not be referred to.

Section 5. News Programs

a. Uphold the freedom of speech and report the facts.

b. In the news, the facts shall be treated objectively and shall not be twisted, concealed nor used for purposes of agitation.

c. In inserting a certain opinion inside a news item, the facts and the opinions shall be distinctly set apart.

d. In the event of disaster and other major emergencies, the news shall be disclosed at once and the lives of the people in the disaster area be given every protection and thus contribute to the prevention of further casualties and property damage.

e. All news commentaries and general comments shall be distinctly separated from the news itself.

Section 6. Sports Programs

a. The infusion of a spirit of clean sports and the advancement of physical culture shall be promoted.

b. In handling amateur sporting events the spirit and the objective shall be duly respected. Special precaution and care shall be exercised in handling events involving the younger people.

Section 7. Entertainment Programs

a. Strive for the better class of entertainments and thus nurture the noble sentiments of life.

b. Efforts to preserve the classic entertainment and the nurture of various types of programs shall continue unabated.

c. Pioneer a new artistic field that would be available only through the media of broadcast.

d. In the presentation of an artistic subject, respect and common sence shall prevail at all times.

Section 8. Recreation Programs

a. Brighten the homes and strive for a wholesome, full and happy life.

b. If references must be made to physical deformities, particular care shall be exercised.

c. When using provincial dialects and colloquialism consideration shall be given for the feelings of the people of that area and avoid antipathy and unpleasant reactions.

7.2. Compilation of Programs

Broadcast programs acquire a raison d'être only when there is an audience to listen and to view them. Even when good programs are broadcast, if they are done so at times when the particular audience wishing such programs are unable to tune in, the hard work put in by the production staff will not be rewarded. This is where the work of program compilation comes in. Its basic objectives would consist of drawing up a time table of programs that could most easily be utilized by all types of audiences. For this purpose it would be necessary to carry out a thorough study and analysis of the factors which affect the transmitting side, such as the types of programs, the hours and the content of programs as well as the factors on the receiving side, such as the daily routine hours of the audience as well as the scope of them.

7.2.1. Basic Matters

(a) Percentage of Regular Broadcasting Hours by Categories.

Broadcast programs can be classified into the following functional categories as indicated in Table 7-1.

Table 7-1 Functional Categories of Broadcast Programs

	Function	Programs
A	News communication function	News, news commentary, sports and government public relations programs
B	Educational function	Educational and cultural programs
C	Function for providing entertainment	Entertainment Programs
D	Advertising media function	Commercials

The percentage of the combination of the functions indicated in A, B and C of the above table is an item of basic importance in the compilation of programs. This is because the character of a broadcasting channel is determined by this percentage of regular broadcast hours by categories. In any such determination, therefore, while the opinions of the audience should be taken into account, it is clear that such opinions should not be the only consideration that should be given precedence, for there should exist an intention on the part of the broadcasting organization which takes into account the country's policy and the actual conditions pertaining in that country.

In considering the current situation in Thailand:

(1) Other communication and news media (newspapers, magazines etc.) have not yet fully developed.

(2) The differential in the social and economic levels between the Bangkok - Thonburi area and the other local areas is considerable. In order to reduce this gap, television programs could play an important role.

(3) In the local areas, educational facilities are inadequate and there is a shortage of teachers.

For the above reasons emphasis should be placed on news programs and educational and cultural programs. Bearing this in mind,it is considered that the percentage of regular broadcasting hours by categories as indicated in the following table would be appropriate for the more stable period of operation anticipated for the New Public Corporation from 1972 and thereafter.

Table 7-2 Percentage of Regular Broadcasting Hours by Categories

Category	Percentage	Remarks
News	25 - 35	including sports and government public relations
Educational, Cultural	40 - 50	including broadcasting to schools
Entertainment	20 - 30	

Reference 1

According to the audience survey made in Bangkok, the programs preferred by Bangkok citizens in the order of preference were as Table 7-3.

Table 7-3 Programs preferred by Bangkok citizens

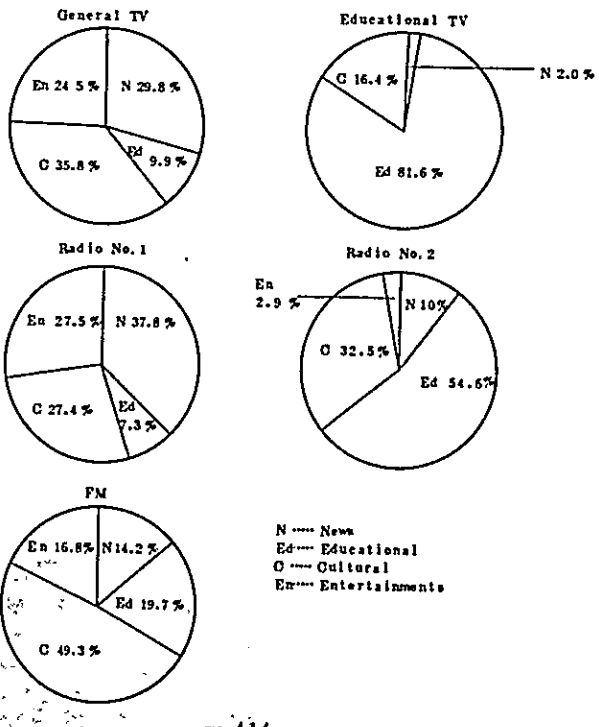
Order	Programs	Number of Preference
1	Educational Programs for women and children, Educational programs	193
2	TV drama, TV movie	159
3	News	150
4	Music	108
5	Documentary films	113

The above table fully substantiates the possibility of educational television programs being well received by the audience in Thailand. The number of persons expressing preference for educational programs far exceed the number showing preference for the currently most popular TV drama and movie programs.

Reference 2

Table 7-4 Percentage of Regular Broadcasting Hours by Categories of N.H.K.

(As of Dec. 1965)



(b) Scope of Television Audience

(1) General Audience and Special Audience

The tastes of viewers for television programs very widely according to age, sex, profession and academic background. It is not infrequent that , in attempting to satisfy all and every listener and viewer, a program has failed to bring satisfaction to any category of viewers. In this connection, the only solution is to meet the demand by a combination of general programs directed to the general public and special programs on a category-wise basis directed to a particular category of viewers.

(2) National Programs and Local Programs

Programs may be divided to national programs directed to viewers on a nation-wide basis and local programs directed at a particular region. Concerning the problem of the regional audience in Thailand, the immediate objectives of the New Public Corporation would be to send programs reflecting the high cultural standards of the Bangkok - Thonburi area to the other provincial areas, and thus reduce the gap between the regions and to contribute to the social development and elevation of the cultural standard of the provincial areas. For this purpose almost all the programs should consist of national programs produced by the Central Television Station at Bangkok.

However, in view of the differences in social activity, natural conditions and activities centering on agricultural production among the northern, southern and north-eastern areas of Thailand, and in connection also with the question of license fees, it would be necessary to provide local broadcasting service which is closely aligned to the local community. In view of this necessity, and taking into account the increase in expenditure and personnel required for putting local broadcasting in operation it is expected that by 1972 (when the national television network will be completed) the New Public Corporation will devote about 10% of its total broadcasting time to local broadcasts. At that particular juncture it is considered that the substance of the local broadcasts should be limited to such programs as news, weather forecasts and agricultural.

However, it is to be fully anticipated that because of such factors as the expansion of the managerial scope of the New Public Corporation,

social development and increase in production activities, the broadcast time for local broadcasts might well exceed the 10% level by 1972 or thereafter.

(c) Broadcast Time

The most favorable viewing hour of the day will differ with people according to their profession, category of occupation and age. It would be desirable to know the daily life pattern of all classes of viewers and then to schedule the broadcasting hours. For this purpose it would be necessary to carry out through scientific methods a survey on the daily routine hours of the nation.

7.2.2. Plans for Compilation of Programs

(a) Formulation of a Long-Term Plan

Prior to formulating specific plans for program compilation, it would be desirable, as a part of the cover-all long-term menagement plan for the New Public Corporation, to formulate a long-term program compilation plan which would be related to such phases as finance planning, construction planning and personnel planning.

(b) Formulation of an Annual Plan

Basically television programs must be of a journalistic character which reflect changes in the social condition. Consequently it is claimed that compilation of programs must be carried out in a fluid and flexible manner. However since

(1) Compilation of programs is closely related to the budget and other management plans

(2) A stable broadcast programs is useful to viewers,

(3) In order to preserve freshness in the programs it is necessary to change the programs at appropriate intervals;

For the above reasons it would be desirable to make a framework program compilation on an annual basis corresponding to the period of the fiscal year. This would not of course preclude providing of a special program outside the framework of programs already scheduled in case of sudden change in the social condition or in case of natural disasters.

7.3. Program Production

7.3.1. Content of Programs

Table 7-5 Content of programs by categories

Categories	Example of Content of Program	Audience
News programs	News	General
	Overseas news	-ditto-
	News commentaries	-ditto-
	Special news program (Special programs in case of emergency or natural calamity)	-ditto-
	Government public relations programs	-ditto-
	Others	-ditto-
Educational and cultural programs	School broadcast	Limited audience
	Kindergarten program	-ditto-
	Program for children	-ditto-
	Program for women	-ditto-
	Correspondence education program	-ditto-
	Social welfare program	General
	Program to impart most current knowledge and information related to social, economic political, industrial and cultural matters	-ditto-
	Health and hygiene program	-ditto-
	Program to disseminate scientific knowledge and to promote scientific technology	
	Program on management of factories and stores	Limited audience
	Program on farm management and farming techniques	-ditto-
	Vocational training program (technical guidance, etc.)	-ditto-
	Adult education program (dissemination of standard language, etc.)	General
	Program to introduce foreign customs, tradition, history, culture, etc.	-ditto-
	Religious program	-ditto-
	Others	-ditto-
Entertainment programs	Drama	General
	Music, Dancing program	-ditto-
	Quiz program	-ditto-
	Variety show	-ditto-
	Movie	-ditto-
	Others	-ditto-
Sports others	Sports broadcast	General
	Others	-ditto-

7.3.2 Educational Programs

Since the importance of educational programs is fully appreciated by educators and those concerned in television work in Thailand, such programs should become the focal point in program planning. In particular, school broadcasts which aim at the systematic character-building of the nation's next generation through the powerful educational medium of television, occupy an important position in educational programs. In order to assure the educational effectiveness of school broadcasts:

(1) They must be edited in a systematic and planned manner and utilized continuously.

(2) Since the opinion of officials of the Ministry of Education, teachers and specialists on education have to be heard, an Expert Committee on Programs should be established

(3) The content of the programs should be closely related to school education.

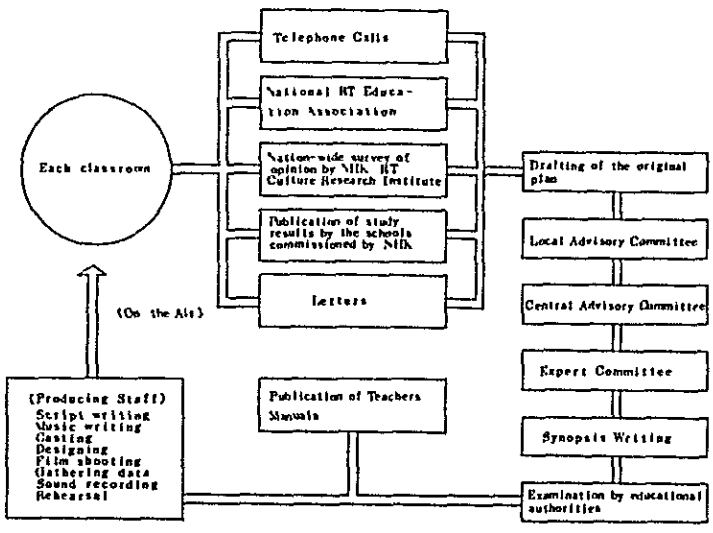
(4) Since they are to be viewed in the class room under the guidance of teachers, the content of the broadcasts should be made known to the teachers beforehand by the use of texts and other materials.

(5) The programs should be so edited as to be adaptable to the different stages of physical and mental development of the pupils who are to view them.

(6) They should be produced in a manner that fully utilizes the function of the television.

Reference

NHK How do school programs take shape?



7.3.3 Entertainment Programs

Entertainment programs are appreciated the most by viewers in general. The history of television has shown us that good entertainment programs have contributed greatly to increasing the number of viewers and to promoting the sale of television sets.

Entertainment programs bring healthy entertainment to the household and thus enrich the life of the people. They also play an important role in raising the nation's cultural level through the presentation of good artistic productions of domestic and foreign origin as well as through the presentation of productions of high artistic quality achieved by the broadcasting station's own creative efforts.

Furthermore, in order to create good entertainment programs, it becomes neses-sary to acquire a high level of production technique, excellent scenario writers, actors, fresh ideas in stage effects and to develop new techniques of production. Thus through such creative activities, the capacity for program production on the part of the broad-casting station itself is levelled up.

The role of entertainment programs assumed, therefore, a significance of major proportions both on the transmitting and the receiving side. From these considera-tions, it is desirable that the following points should be studied.

(1) At present foreign motion pictures occupy a major portion of entertainment programs. However, the New Public Corporation should reduce the number of foreign films and as far as possible broadcast programs produced by its own organization.

(2) It should invite prominent foreign musicians, theatrical companies and ballet and dancing troupes.

(3) It should produce serial television dramas.

Serial television dramas have the following advantages:

(i) As they can make use of the same props and the same costumes several times, they can, by comparison to single dramas economize on the expenses.

(ii) Because of the interest in the continuity of the stories, they can acquire a fixed and constant number of viewers.

(iii) Team-work will be created among those engaged in the production of programs such as the staff, actors and scenario writers, which will

contribute to efficiency in production work.

(iv) Through their participation in the production of serial dramas, the staff, actors and scenario writers can acquire experience that would be informative to themselves.

(v) They provide an excellent opportunity for fostering new talents.

(4) Portions of entertainment programs participated in by the audience can be recorded at Regional Center Stations and relayed to the national audience from Bangkok.

As stated in 7.2.1. (b) (2), since the percentage of local broadcasts in program planning is conceived as being small, broadcasting service to viewers in the provincial area would not be sufficient if only the local broadcasts were depended upon. Taking this into account, entertainment programs participated in by the audience should be produced by the Regional Center Stations and relayed to the national audience. When it becomes possible to use the microwave channel to Bangkok, the respective Regional Center Stations would be able to relay broadcasts on a nation-wide scale. In conjunction with the establishment of the license fee system from 1972, it is considered necessary to commence this type of service even prior to the completion of microwave links to Bangkok.

The viewers in the provincial areas will acquire a greater affinity for television when programs depicting their personal life environment are relayed on a nation-wide basis. In this way the popularization of television in the local areas will be further promoted.

7.4. Production Organization

7.4.1. Programs

The staff required for program compilation and production are indicated in Table 7-6.

Table 7-6 Staff Required for Program Compilation and Production

Categories	Function
Compilation and Management of Programs	Programming, drafting of budget and management related to programs
Broadcasting Service	Arrangement for the use of studios and rehearsal room, copyrights, preparation of data, promotion of utilization of broadcasts
Program Production	Program planning, production, effects film editing
Announcer	
Artistic Work	Stage effects design, manufacture and purchase of large and small props, costumes, make-up, making of pattern of opaque projector etc.
Script	Script-writing, translation of foreign films
Film Shooting	

Since television is a coordinated art and personnel from the various departments participate in the production of a program, as long as such personnel are proficient in their respective specialized fields, a program of high quality should be expected to be produced. It would be particularly desirable for writers and actors who require specialized ability and capacity to acquire such specialized knowledge and experience. The New Public Corporation shohld give positive assistance to such groups as the scenario study group, actors group and musicians group in order foster and strengthen this sector. The present television field in Thailand is such that there have been cases where a member of the staff of a television station was himself an actor or a musician. Such specialists are able to demonstrate their innate capacity to the full only when they devote themselves to their own special fields. Therefore the broadcasting organization should positively encourage the fostering of specialists. Since the broadcasting organization will be utilizing only the specialized ability of such persons, it does not have to employ them as regular members of the staff. It might be necessary however, to study the adoption of a system whereby writers and theatrical groups might be attached exclusively to the broadcasting station .

7.4.2. News

(a) The categories of functions required for coverage of news are given in Table 7-7.

Table 7-7 Categories Required for Coverage of News

Category	Function
Editing	Selection of news, editing
News Coverage	Covering the news
Film editing	
Newsreel Shooting (Including Assistants)	Taking films and stills for news-casting
Other functions related to production of news program	Selection of background music, etc.

(b) In order to establish a nation-wide news coverage network and to build an effective organizational system of news coverage, it would be necessary in the future not only to place news reporters at the Central Station in Bangkok and other Regional Center Stations, but also to assign personnel to report news from the principal cities of the provincial areas.

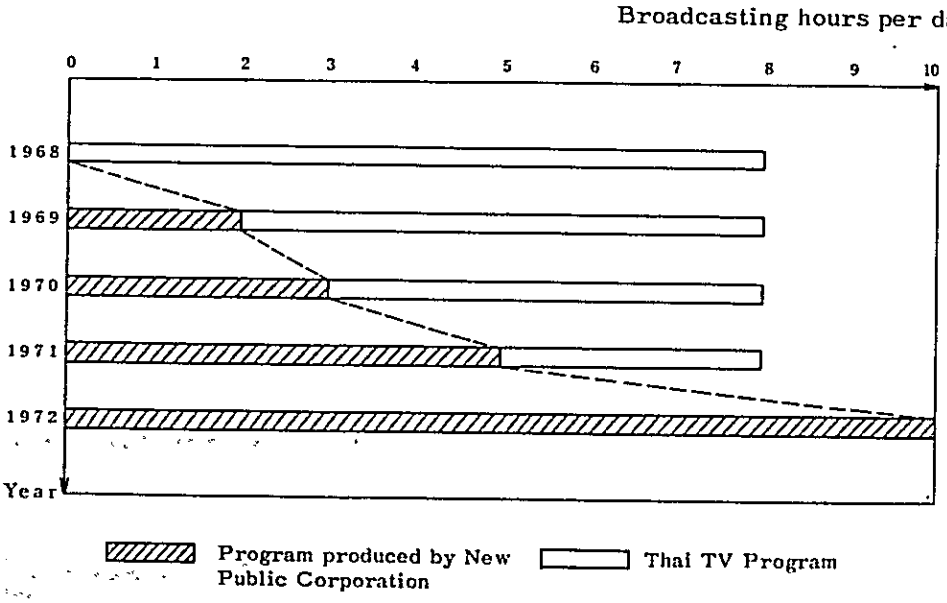
7.4.3. Examination of Programs, Research

In addition to the above, personnel to carry out examination of programs, public opinion surveys and research on overseas broadcasting data would be necessary.

7.5. Annual Programming Plan

7.5.1. Broadcast Hours and Content of Program

Table 7-8 Plan of New Public Corporation Broadcasting Hours



(a) According to the general plan of this project, by the middle of 1968 the Bangkok Central Station will be completed and the New Public Corporation will Commence broadcasting through 625 scanning line system. After the transitional period from then up to 1971, during which the conversion of system will be effected, in 1972 the second network of the second channel will be completed, whereupon broadcasting through 525 scanning line system will be totally abolished. It is then that the license fee system of the New Public Corporation will come into effect.

(b) Table 7-8 shows the annual plan for the broadcasting hours and production hours of the New Public Corporation. Until 1972 when it would be able to carry out ten hour broadcasts of programs produced entirely by itself, it will be concurrently using programs that it produces itself with Thai Television Company programs. Placing Thai Television Company programs on the 625 scanning line system broadcast is necessary also in effecting a smooth conversion of the system.

Therefore, the fact that between the period 1968-1971 the broadcast hours per day have been put at eight hours is to match it with the present average daily broadcasting hours of Thai Television Company. Thus if Thai Television Company increases its broadcasting hours there will be a corresponding increase on the part of the New Public Corporation. In this case, however, it will not effect the broadcasting hours of programs it produces on its own.

(c) Concerning the broadcasting hours of the New Public Corporation in 1972, taking into consideration the personnel plan and expenditure which will be mentioned later, as well as the performance of Thai Television Company and Royal Thai Army Television, ten hours a day or 70 hours per week would be considered appropriate.

To achieve the above targets, it is considerable that the New Public Corporation should itself begin to make positive efforts to begin production of programs, giving due consideration to improving its own program production set-up, to popularizing receivers with the 625 scanning line system and to the question of establishing a system of license fees scheduled to be put in operation in 1972.

(d) 1968

By the middle of 1968 the Bangkok Central Station is expected to be completed, so that the latter half of 1968 should be considered a period of

preparation leading up to the commencement of program production. Consequently it is considered that it should not begin its own program production.

(e) 1969

Since 1969 would be the first year in which program production will begin, production of programs which would come to about two hours would be appropriate. With respect to the content of program:

(1) It is considered that educational program constitute the principal theme in program planning for the New Public Corporation.

(2) There is very great interest in school broadcasts on the part of Ministry of Education officials in Thailand.

(3) It is necessary to popularize receivers with 625 scanning line system. As an effective means to achieve this, the promotion of mass or collective viewing by the people at large might be considered, for which purpose it would be appropriate to install receivers in schools. (Another solution would be to approach the Ministry of Education and other educational institutions to obtain financial assistance in installing television receivers in schools.)

For these reasons, it would be desirable to study the problem with the central focus on school broadcasts.

(f) 1970

For 1970 an increase of one hour over the previous year, that is a three-hour program per day consisting of educational and cultural programs with major emphasis on school broadcasts would be considered appropriate.

(g) 1971

Since 1971 will fall in the year preceding the commencement of the system of license fees, as well as the final year for television broadcasting using 525 scanning line system, and since also some efforts should be made increase viewers, the New Public Corporation would be called upon to further intensify its production activities. Accordingly, it would be necessary to produce programs consisting principally of school broadcasts but augmented by sports relay programs and quiz programs some of which being directed toward the general public.

(h) 1972

For 1972 it would be desirable to conceive program planning in terms of a general consolidated plan that would include education, news, entertainment and other items. The program ratio by categories should be in accordance with the Percentage of Broadcasting Hours by Categories mentioned previously under 7.2.1. (a) See Table 7-2.

Reference

Table 7-9 Example of a Weekly Program Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
10 A.M.	School broadcasts					Educational programs for general audience		10 A.M.
11								11
0 P.M.	News, information (including overseas news)							0 P.M.
30	Cultural programs (including programs for women, such as cooking)					Entertainment (music, etc.)		30
1						Cultural programs for general audience		1
2								2
3						Dramatic Movie		3
4								4
5	Cultural programs for youths					Relay (sports, etc.)		5
6								6
30	Cultural programs for general households							
7	News, information Government public relations (including news programs)						Special events Entertainment programs	30 7
8	Entertainment programs							8
9								9
30	News summary, information, commentary							30
10	Entertainment programs						News programs	10
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	

Note 1: Percentage by categories

News 20.4% Educational Cultural 43%

Entertainment 29.6% Relay & Special events 7%

Note 2: Broadcasting hours

Weekly 71 hours Average per day 10 hours

7.5.2. Broadcasting Hours and Content of Broadcasts of Local Stations

According to the overall plan the present Regional Center Stations at Haad Yai, Khon Kaen and Lampang are to be assimilated into the New Public Corporation at the time of the completion of the microwave radio relay link. These stations are expected to broadcast on the 625 scanning line system after receiving the programs from the New Public Corporation. With respect to local broadcasts they will go off for a portion of the national relay broadcast time of the New Public Corporation and broadcast within their own station area. As far as the number of hours for such broadcasts, as already stated under 7.2.1. (b) (2) taking into consideration expenditure and personnel, it should by 1972 come to roughly 10% of total broadcasting hours. That is to say, seven hours per week or an average of one hour per day.

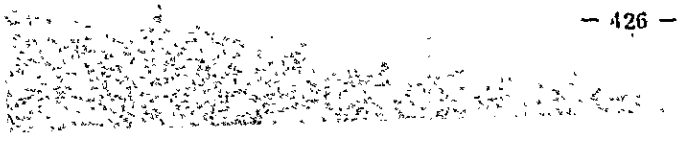
(a) Concerning the period of organizational adjustment between 1969-1971 for the New Public Corporation, the same problem of a period of transition to a new system exists with respect to Regional Center Stations, so that an average daily local broadcast of approximately thirty minutes would be considered appropriate.

(b) The content of the broadcast should be such that it should be made up principally of programs that are closely identified with the local communities and local cultural life, such as local news, announcements by government or other public organizations, weather forecasts and agricultural programs.

(c) Regional Center Stations should not only carry out local broadcasts but should also participate positively in national programs and attempt to extend their services to local people in this type of activity. Before the completion of the microwave radio relay link to Bangkok, video tapes recorded locally could be broadcast from the Bangkok Central Station while after the completion of the microwave relay link Regional Center Stations would be able to broadcast national programs direct.

The production of programs participated in by the viewers, as described under 7.3.3., relay broadcasts at various places by the use of the relay car, the providing of news films, all contribute significantly to national programs.

Moreover when the national microwave radio relay link is completed and Regional Center Stations will be linked to carry out their concerted relay programs, this will create a great attraction for television programs.



7.5.3. Annual Plan for Programs to be Produced by the New Public Corporation

Table 7-10 Annual plan for Programs

	Bangkok Central Station			Local Stations	
	Weekly Broadcast hours	Program		Weekly Broadcast hours	Program
1969	14	Educational program	14 hrs	3.5	Educational, Cultural News programs
1970	21	Educational Cultural News	14 hrs 7 hrs	-ditto-	-ditto-
1971	35	Educational Cultural News Sports & Special events	14 hrs 10 hrs 10 hrs 1 hrs	-ditto-	-ditto-
1972	71	Educationl Cultural News Entertainment Sports & Special events	14 hrs 16.5 hrs 14.5 hrs 21 hrs 5 hrs	-ditto-	-ditto-

Note: With respect to the column on 1972 reference
7.5.1. Table 7-9 Weekly program schedule

7.6. Annual Plan of Direct Expenses of Programs

Table 7-11 Annual Plan of Direct Expenses of Programs

Unit: 1000 Bahts

	Annual expense	Breakdown	
		National relay broadcasts	Local broadcasts
1969	6,260.8	4,804.8	1,456
1970	9,081.8	7,261.8	1,820
1971	14,528.8	12,344.8	2,184
1972	31,114.2	26,746.2	4,368

Note 1: For 1969 it is expected that the Bangkok Central Station will broadcast for 6 months

Note 2: 1969 Regional Center Stations will be Haad Yai Station and Lampang Station
1970 Regional Center Stations Haad Yai, Lampang, Khon Kaen (half year)

1971 Regional Center Stations Haad Yai, Lampang, Khon Kaen

Note 3: Program broadcasting hours and program content are according to Table 7-10 (7.5.3.)

Note 4: Basis of Calculation

Program unit cost Weekly broadcasting hours 52

Reference 1

Table 7-12 Unit cost of Program by Classification (direct expense per hour)

Unit 1000 Bahts

Classification	Cost
Talk, interview, group discussion	3
Film	15
Music (including variety)	8
Folk music, dance	6
Quiz game (including participation by viewers)	8
Serial drama	20
Single drama	30
Movies	6
Relay (including sports relay)	10

Note 1: Basis of calculation

Using the cost of general programs in Japan as reference, such factors as commodity prices, household expenditure in the cities were taken into consideration in calculating the above figures.

Note 2: With respect to direct expenses for movies, because of the different conditions of purchase by countries, calculation was based on the actual situation in Thailand.

Reference 2

Table 7-13 Unit Cost of Programs by Categories
(direct expense per hour)

Unit 1000 Bahts

	Categories by Classification		Expenses
News	Talks, interview, group discussion	60%	7.3
	Films	30%	
	Relay	10%	
Educational	Talks, interview, group discussion	70%	6.6
	Films	30%	
Cultural	Talks, interview, group discussion	60%	6.2
	Quiz	10%	
	Movie	10%	
	Films	20%	
Entertainment	Folk music, dance	20%	7.8
	Music (including variety)	10%	
	Movie	50%	
	Quiz, game	10%	
	Serial drama	10%	
Special events			10.0
Local			4.0

Note 1: The category classification was made for the purpose of computing cost, so that it is quite conceivable that other factors could enter into the category formation of each category. But as far as expenses are concerned the estimated amount should be sufficient.

Note 2: Concerning special events, such programs as relay broadcasts of national events, programs at times of emergencies could be freely compiled to keep up with charges in the social situation. Thus an overall program outside the scope of news, educational and entertainment programs is contemplated.

Note 3: With respect to local programs, because of the limited service area and the very small number of viewers as compared to national relay broadcast viewers and because of difference in prices from Bangkok, regardless of the categories, 4,000 Bahts appear to be the appropriate amount.

CHAPTER Ⅷ
OPERATION AND MANAGEMENT PLAN

CHAPTER Ⅷ
OPERATION AND MANAGEMENT PLAN

8.1. Organization

8.1.1. Organization of the New Public Corporation in its final age after 1972

(a) Bangkok Central Station

(1) Highest Organ

With regard to the highest organ that will determine the policy of the New Public Corporation it would be desirable to manage it in the best way possible in accordance with the Policy of the Thai Government. Also, in order to effect its most smooth operation and management from a practical and realistic standpoint, it would be necessary for the Steering Committee (Provisional name) composed of the Directors of the respective Divisions of the Bangkok Central Station and the Heads of the Regional Center Stations, to participate in policy making decisions and for the highest organ to consult such committee on matters of policy.

(2) Management Planning Division

As secretariat of the Steering Committee the function of a Management Planning Division is necessary. The respective departments in a television enterprise have a close interrelationships among themselves. For example:

Increase of programs would of necessity result in increase technical expense and personnel expense.

Plans to build facilities would in principle necessitate increase of personnel.

Moreover, the various departments, particularly the functions of the program production department and the technical department, will become highly specialized. To carry out an efficient and smooth operation of these departments as an organized unit, a management function based on a broad outlook becomes necessary. That is to say, the function of a Management Planning Division, which would carry out necessary research and provide accurate data which would enable the highest organ to make a correct managerial judgement and determine policy with a long range vision.

The principal functions of the Management Planning Division would be as follows:

Survey and Research

(i) Technical research

(ii) Viewers' opinion survey

(iii) Statistics

Basic Planning

(i) Formulation of long-term plans

(ii) Formulation of basic policy (programs, technical matters, popularization measures, etc.)

(iii) Formulation of annual business plans

(iv) Formulation of plans relating to facilities and equipment

(v) Formulation of subscription fee plans

(vi) drawing up the budget for business plans

(vii) Formulation of organization plans

(viii) Formulation of recruitment plans (determining the number of persons to be employed as a result of the business plan requirement)

(ix) Formulation of recruit training program

Coordination and Management

(i) Personnel management

(ii) Budget management

(iii) Receipts and disbursements accounting

(iv) Audit

(v) Stipulation of regulations governing the total organization

Others

(i) Business relating to legal matters

(ii) Liaison with the Government and other external organizations concerned

(iii) Exchange of programs

(3) Business organization

It would be necessary to establish the following divisions (Table 8-1) to carry out daily business in accordance with the basic policy on operation and management.

Table 8-1 Divisions to Carry out Daily Business

Divisions	Contents of Functions
Broadcasting Division	Planning, compilation, production and examination of broadcast programs News coverage Announcement Subsidiary function to broadcasting (use and maintenance of studios, preparation of material and data, copyright, etc.)
Technical Division	Technical function for production of programs (including developing of films) Program transmission Maintenance Operation of transmitting machine
Fees Division	Receiver's subscription, receipts business Increasing the number of viewers Public relations measures toward viewers
General Affairs Division	Accounting (Receipts and disbursements and management of funds) Fixed assets, maintenance and custody of properties Procurement of goods Business pertaining to personnel and salaries Business pertaining to training program Other general administrative and clerical business

(b) Regional Center Stations

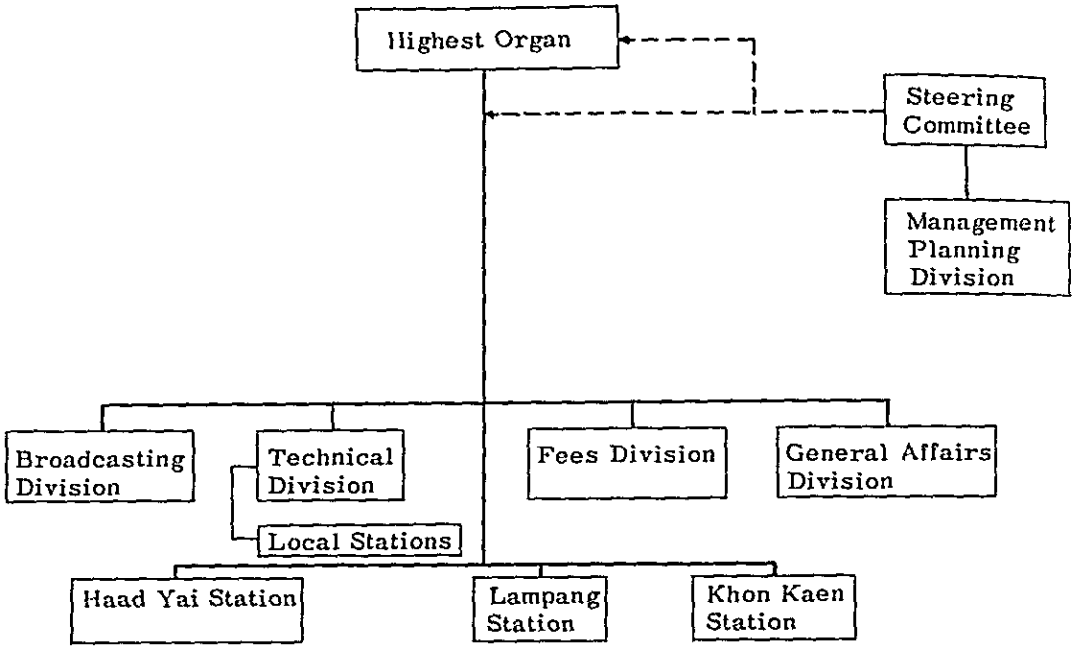
The establishment of a separate division dealing with staff matters in the Regional Center Stations would not be necessary.

Table 8-2 Functions by Divisions of Regional Center Stations

Divisions	Contents of Functions
Broadcasting Division	Same as the Broadcasting Division of the Bangkok Central Station
Technical Division	Same as the Technical Division of the Bangkok Central Station
Management Division	Budget drafting, management business Personnel management Business pertaining to receiver's subscription and receipts Increasing the number of receivers General administrative and clerical business

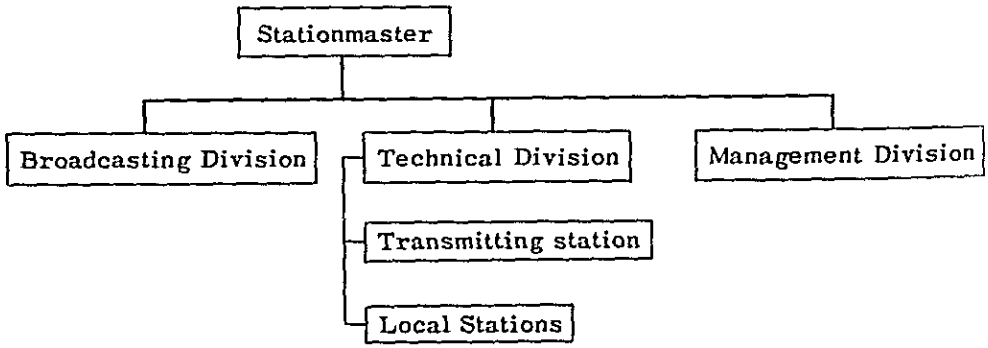
(c) Organizational Chart

National Organizational Chart



Note: If we were to differentiate the functional levels of the various organizations we could consider the Management Planning Division to be at the "staff" level, and the Broadcasting Division, the Technical Division, the Fees Division, the General Affairs Division and the Regional Center Stations could be considered to be at the "line" level. It would be necessary for the heads of the Divisions at the "line" level to be given the responsibility and the authority to carry out efficiently the work of their respective organizations.

Organizational Chart of the Regional Center Stations



Note: Within the scope of business plans and the budget approved by the highest organ, a stationmaster has the authority give decisions on the work of the Regional Center Station.

8.1.2. Organization During the Period 1968-1971

When the organization for the period 1968-1971 is considered in conjunction with annual personnel plan which will be discussed later under 8.7.1., the following personnel plan which will be discussed later under 8.7.1., the following personnel distribution (Table 8-3) would be considered appropriate.

Table 8-3 Organization During the Period 1968-1971

		1968	1969	1970	1971
Bangkok Central Station	Number of Personnel	46	102	127	178
	Organization	Broadcasting Division Technical Division	Broadcasting Division Technical Division General Affairs Division	-ditto-	-ditto-
Haad Yai Station	Number of Personnel	0	36	36	36
	Organization		Broadcastind Division Technical Division (administrative affairs coming under Broadcasting Division)	-ditto-	-ddito-
Lampang Station	Number of Personnel	0	38	38	38
	Organization		Broadcasting Division Technical Division (administrative affairs coming under Broadcasting Division)	-ditto-	-ditto-
Khon Kaen Station	Number of Personnel	0	0	38	38
	Organization			Broadcasting Division Technical Division (administrative affairs coming under Broadcasting Division)	-ditto-

8.2. Ways to Augment Personnel

8.2.1. Prior to the commencement of broadcast by the New Public Corporation, because a high degree of specialized ability and technical skill are required of program production and technical personnel, it would be important to acquire persons with experience to form the nucleus of such personnel.

Since Thailand has had long experience in radio and a history of television exceeding 10 years, it is possible to acquire such persons. It would be desirable, therefore, to work out ways to positively assimilate such personnel into the New Public Corporation from various radio broadcasting institutions and such organizations as the Thai Television Company and the Public Relations Department.

8.2.2. In the regional center stations at Haad Yai, Lampang and Khon Kaen, simultaneously with their assimilation into the New Public Corporation, almost all their programs will be placed on the microwave radio relay link system resulting in a sweeping reduction of personnel. Therefore, the transfer of this excess personnel to the Bangkok Central Station and other regional stations might well be considered.

8.3. Personnel Training Program

8.3.1. Personnel Training Center

Among different types of training, one is the " on the job training" which is carried out in the course of daily routine work, and the other is group training carried out in a group at a particular place.

In order to provide group training the New Public Corporation should establish in the future a Personnel Training Center.

For the time being, the Thai Telecommunications Training Center at Nondhaburi is the most suited as a personnel training center. It has studio and camera facilities which could be fully utilized for technical and producer training.

In case it would not be possible to use the Telecommunication Training Center, the " off-hours" use of the rehearsal room, studio and other facilities of the Bangkok Central Station might be one solution.

8.3.2. Organized Training

Training of recruited personnel

For the newly recruited personnel it would be desirable to carry out a recruited personnel training program which would provide a psychological training to inclucate an understanding of the objectives of the enterprise as well as a minimum basic knowledge and ability demanded in his work.

Particularly during the period 1968-1972, as indicated in the program plans and personnel plans, considerable increases in work as well as personnel are contemplated. With respect to technical personnel and broadcasting personnel, therefore, it would be necessary to hire and give them a recruit training course at least six months before the programs are increased.

8.3.3. Ability Training

In order to develop and raise the ability and skills of employees it is very important to carry out ability training by providing different levels of training commensurate to ability. The raising of the efficiency of employers will in the final analysis prevent increase in personnel and contribute toward rationalizing manage - ment.

Reference

Traning at the NHK Central Training Institute

1. Training of the recruited

The purpose of this training was to learn a mission as the NHK Personnel, inspire a will of the youth, cultivate the ability to meet an unexperienced work at eachpport and forter active freshmen.

2. Qualification Training

At the time of promotion, they were trained to learn the importance of their own duties from a new standpoint of view of NHK, arranging the experience and knowledges so far acquired in order that they could perform a higher function. In this course, their insight was enhanced and the informations on the related business were made known.

3. Functional Training

The purpose of this systematic and intentional training was to raise an ability necessary for the performance of their own jobs and help cultivate positively a talent answering to a new post.

(1) Broadcast training

The A class personnel who had not much experience were trained as to their own jobs. Each station also temporarily trained those who needed an in-service training. Those who had several works were trained intensively according to their conditions. At each training rationalization of business was stressed and the knowledges of EDPS were introduced.

(2) Engineering Training

The fundamental Engineering of TV and radio was learned in anticipation of the extension of broadcasting engineering and business, in addition to the technical training concerning adjustment at studio, film projection, video tape recording fitted to the needs of routine technical works.

Further, the techniques of TV transmission, FM transmission, UHF TV transmission, control and handling of an independent electric power unit were learned aiming at a prompt correspondence to the modernization of installations and improvements of maintenance and application techniques. Moreover, the techniques of color television reception and transmission were learned in connection with the extension of color television business. Then to meet the modernization of business, meeting was held on the technical administration including the personnel of Management class. Besides, necessary number of staffs were trained to improve quality and adapt promptly to a development of technology and business. Technical correspondence education, and technical conference contributed greatly to this.

Office Work Training

This training aimed at an accounting and subscription covering every phase of management all over the country. For this purpose, general affairs training course (A) was opened.

4. Other Training

Those who were newly promoted to the personnel learned the substance of enterprise and the functional responsibilities. Preliminary training was executed to those who were informally decided to be recruited in 1964.

8.4. License Fee

8.4.1. Character of License Fee

License fee constitute the value of broadcast programs and may be considered to be the viewers' share of the expenses of the New Public Corporation which operates as a public service for the nation.

The New Public Corporation should have a clear understanding of the character of license fee and to indicate to the viewers the manner in which they would be used and to make sincere efforts in its business management.

8.4.2. Public Relations Activities Prior to Implementation of the License Fee System

It would be necessary to carry out public relations activities before the implementation of the license fee system. Particularly in the Metropolitan Area and other areas where television is viewed, it is expected that the reaction of viewers to the license fee system would be considerable. Therefore, with respect to the character of the license fee system, the purpose and mission of the New Public Corporation, public relations activity should be started at the earliest possible time (at least two years prior to implementing the system). For this purpose, every kind of communication media, from television, radio, newspapers to publications should be utilized.

Particularly in the Metropolitan Area and other areas where television is viewed, it would be necessary to hold meetings with viewers to engage directly in discussions on the subject of license fees.

8.4.3. Methods of Collecting Fees

(a) The question of what should be the principal body or organ to collect the license fees is an important problem that has a bearing on the basic character of the New Public Corporation.

In countries where broadcasting business is state-operated or operated by a public corporation which has a special relationship with the state, it is the general custom for the state to receive a specified amount from the viewers. In many countries thus the system of permit fees on license is prevalent. In other words, the installation of a television receiver is subject to state permit and license fees are coupled to this permit, so that any person equipped with a receiver is obligated to pay the permit fee for the installation of the receiver. Any person found to have installed a receiver without permit would thus be

liable to punishment.

License fees are in general paid in at post offices. This is because the government agency issuing approval with respect to telegraphic and telephone communications in most countries is the Ministry of Post, Telegraph and Telephones and post offices come under such Ministry. The service given at the window by the post offices has become widespread on a national scale so that they are useful from the point of view of paying in the fees. The license fees thus paid in at the post offices will become the income of the national treasury.

In the case of state-operated broadcasting stations, the state disburses the necessary expenses out of the national budget. In such cases a part or all of the permit fees or an amount exceeding the receipts may be disbursed.

In the case of public corporations, it is customary for the state to disburse the necessary expenses within the scope of the license fees received.

The advantages of this system are as follows:

(1) It is systematically well set-up.

(2) Through public action the burden can be imposed on the owners of receivers in a fair manner.

(3) The amount of receipts is assured.

The disadvantages may be enumerated as follows:

(1) There is a possibility that the amount granted by the state may be affected by the particular condition of the national finance at any given time and hence make it difficult to formulate long-range management policy.

(2) It is not clear where the responsibility lies in the management of enterprise and consequently there is a possibility that service toward the viewers may be insufficient.

(3) No exchange could take place between the broadcasters and the viewers.

(4) There might be no moral incentive on the part of the broadcasters to exert themselves in their work.

(5) Thailand has had experience before in operating a receiver fee system resembling the above license system. Hence it would be almost impossible now to revive such a system.

Therefore, the most desirable form would be in principle for the New Public Corporation itself to collect the fees.

The basis for collection of fees and the best method of doing this is for the collectors to visit directly to each household and collect the fees. Unless it is accompanied by fines based on law it would be very difficult to cause the viewers to deliver the license fee to a stipulated place. Moreover, it would not be desirable, in view of the purpose of the New Public Corporation and the nature of license fee, to provide for legal penalties against non-payment of license fee. Therefore, it would be necessary to adopt a method of collecting fees through visits to households.

Taking into consideration the advantage of direct collection by the New Public Corporation and the personnel expenses involved in visiting households, the method of collection may be divided into two categories of the metropolitan area of Bangkok — Thonburi and the provincial areas.

(b) Metopolitan area

(1) It is the capital of Thailand and the seat of the Bangkok Broadcasting Center and is the most important area from a social, economic and cultural point of view.

(2) It has a high population density and a high degree of popularization of television receivers. Hence it is suited to the system of collecting fees by calling at individual households. Households of viewers come to 400,000 or 40% of total receiving households.

For these reasons, the direct collection system by the New Public Corporation would be desirable in this area.

(c) Provincial area excluding the metropolitan area

(1) Because of the low population density and the low degree of popularization of television, the direct collection method would require a very large number of persons and personnel expenditure will become a heavy burden.

(2) The establishment of a license fee collection management set-up on a nationwide basis would be impossible for the moment.

(3) For these reasons the New Public Corporation should not adopt the system of direct collection but to commission some other agency for this purpose.

With respect to an agency to be commissional to perform collection functions:

(1) The popularization of television receivers is closely related to the development of electricity;

(2) Electric companies are presently carrying out fee collection by the method of visiting individual households;

(3) While commissioning post offices might be considered, the post offices in Thailand are not at present handling cash receiving functions;

For these reasons, it would be appropriate to conclude a contract with the electric company and commission it to collect the fees.

(d) In addition to the foregoing methods, the establishment of a public corporation to handle collection of public fees might be studied.

8.4.4. Fee Collectors

(a) Number of Collectors

(1) According to the popularization plan, the number of viewer households in the metropolitan area is estimated at 400,000.

(2) To present increase in personnel and personnel expenditure, collection should not be made on a monthly basis, but on a bi-monthly basis.

(3) Taking into consideration the population density and rate of popularization of television receivers, the appropriate number of cases to be handled by a person should average about 4,000 (2,000 households per month).

Accordingly,

$$\text{Number of collectors} = \frac{400,000}{4,000} = 100 \text{ persons}$$

In addition to the above, in order to deal with cases where collection is difficult a subsidiary personnel of some 20 persons might be considered. Therefore the number of collectors would be about 120 persons.

(b) Salaries

Collection is a difficult task, and to ensure its successful accomplishment some incentives must to given to the collectors. Therefore, in addition to the fixed salaries, it would be necessary to provide a system for paying various incentive premiums. The paying of a bonus for acquiring new subscription or a bonus for a high rate of collection would be effective in giving the necessary

incentive to collectors. In any event, with the fixed salaries alone, the business of fee collection could not be achieved.

The average salary of a collector including the above bonuses and premiums would be around 2,000 Bahts per month. This corresponds to the average salary of an ordinary employee which will be mentioned later.

(c) Commissioning Contract

In concluding a contract with the electric company the percentage of the commission is the most important consideration.

In the provincial areas, because of the low density of population and the low degree of popularization of TV receivers, the percentage of the commission could become quite high. It should, however, be kept down to about 10%.

In this case, as in the case of the collecting personnel, it would be desirable to have a contract that would reflect the collection records of the persons making the collection on their salaries.

Reference

Income and expenditure comparison between the revenue from license fee and personnel expenses for fee collectors and contract commission.

The average collection rate for the metropolitan area and the provincial areas it is estimated at 90%.

Table 8-4 Comparison between the Revenue from License fee and Expenses

Unit 1000 Bahts

	A Number of households	B Total annual license fee	C Annual actual license fee	D Personnel expense & commission	E $\frac{D}{C}$ x 100
Metropolitan area	400	48,000	43,200	2,880	6.7
Provincial area	600	72,000	64,800	6,480	10.0
T o t a l	1,000	120,000	108,000	9,360	8.7

8.4.5. Measures toward Receivers

In consequence of the payment of license fee, the following points should be considered in the future as measures toward receivers.

(1) Repairing and adjusting mechanic failures in receiving sets and dissemination of information and knowledge to viewers in the handling of receiving equipment through the use of travelling "service cars."

(2) To provide after service for receiving sets with the cooperation of manufacturers of electrical equipment.

(3) To take steps to improve the situation in areas where there are reception difficulties.

(4) Hold meeting with the viewers in the various districts and discuss with them as to their wishes and provide the opportunity to exchange their opinions with the viewers.

Reference 1

Regulations concerning receiver's fee stipulated in the Japan Broadcast Law

(Receiver's Contract and Receiver's Fee)

Article 32. Any person who is equipped with a receiving equipment capable of receiving the broadcasting provided by the Corporation shall conclude a contract with the Corporation with regard to the reception of its broadcasting. However, this shall not apply to one equipped with receiving equipment not intended for the reception of broadcasting.

Excerpts from the Japan Broadcasting Corporation Broadcast Reception By-law

Contracts concerning the reception of broadcast concluded in accordance with the provisions of Article 32, paragraph 1 of the Broadcast Law (Law No. 132 of 1950) shall be subject to the following provisions.

(Kinds of Receiver's Contracts)

Article 1: Contracts (to be hereafter called the receiver's contracts) concerning the reception of broadcasts provided by the Japan Broadcasting Corporation (to be hereafter called NHK) shall be divided into contracts for the reception of every type of broadcasts (to be hereafter called Contract A) and contracts concerning the reception of radio broadcasts only (to be hereafter called Contract B).

2. Of the receiving equipment (home receiving equipment, portable receiving equipment, receiving equipment on automobiles and receiving equipment for joint use, which are capable of receiving broadcasts by NHK, hereafter the

same) any person who installs (to place it in a condition where it can be used, the same hereafter) a receiving equipment for television broadcasts, he shall conclude Contract A, while any person who installs a receiving equipment for radio broadcasts only, he shall conclude Contract B.

(Unit of Receiver's Contract)

Article 2: Receiver's contract shall be concluded with respect to each of the places where receiving equipments are installed. In such cases, with respect to receiving equipment capable of receiving broadcasts of NIIK by connecting, telephone apparatus, loudspeakers of television tubes to other receiving equipment, the contract must be concluded with respect to each of the places where such telephone apparatus, loudspeakers or television tubes are installed.

2. The unit of the place of installation of receiving equipment shall be according to the unit of rooms, automobiles or facilities or vehicles corresponding thereto. Provided that, in case where there are two or more rooms in a single house belonging to one household, notwithstanding the number of rooms, the place of installation shall be deemed to be one. In this case, a household shall be considered a group of persons living together under a common domestic budget or a person maintaining an independent living and domestic budget.

3. In cases where two or more receiving equipments are installed in one place, notwithstanding their number, one receiver's contract may be concluded.

(Submission of Receiver's Contract Document)

Article 3: Any person who has installed a receiving equipment shall, without delay, send the receiver's contract document containing the following entries, to the broadcasting station (NIIK Broadcasting Station, the same hereafter).

(1) Address and name of the person installing the receiving equipment

(2) Date of installation of the receiving equipment

(3) Kind of receiver's contract

(4) The kinds of broadcasts that can be received and the number of receiving equipments

(5) Place of installation of the receiving equipment (In case of portable receiving equipment its usual location, in case of receiving equipment installed on a moving object, the kind of object, its name, number or

usual location)

2. In case by installing a receiving equipment for television broadcast, or by discontinuing it, a person who has previously concluded a receiver's contract alters the category of his receiver's contract from Contract A to Contract B, or from Contract B to Contract A, such person shall, in addition to the items enumerated in the preceding paragraph, send the receiver's contract document indicating the category of receiver's contract prior to such alteration, together with the broadcast receiver's license to the Broadcasting Station.

(Effective date of the Receiver's Contract)

Article 4: The receiver's contract shall become effective on the date of installation of the receiving equipment .

2. The date of alteration of the category of the receiver's contract shall be the installation of the altered receiving equipment or the date on which report has been made of discontinuation in accordance with paragraph 2 of the preceding Article.

(Obligation to pay the Receiver's Fee)

Article 5: Any person who has concluded a receiver's contract, shall, from the month in which the receiving equipment was installed, until the month in which its discontinuation was reported, pay, with respect to each receiver's contract, receiver's fee in the amounts indicated in the following chart. Provided that, this shall not apply in the case mentioned in Article 13 paragraph 2.

Category	Monthly amount	6 months' payment in advance	12 months' payment in advance
Contract A	330 yen	1,820 yen	3,630 yen
Contract B	50 yen	280 yen	550 yen

2. In the case of the preceding paragraph, when there has been an alteration in the category of the receiver's contract, the receiver's fee for that month shall be the amount of Contract A.

(Indication of receiver's contract holder)

Article 7: To the holder of a receiver's contract a broadcast receiver's license

shall be issued in accordance with the category of the receiver's contract.

2. The broadcast receiver's license shall be attached at the entrance of the location of the receiving equipment or other places which can be easily seen from the outside.

3. In case a person loses or damages the broadcast receiver's license, he shall report it without delay to the Broadcasting Station and request a re-issuance of such license.

(Amendment of By-law)

Article 14: This by-law may be amended by the approval of Minister of Posts and Telecommunications.

8.5. Budget Management

8.5.1. Long-term plan

Long-term planning is necessary both as a basis of drawing up the annual budget as well as in determining the future direction of the enterprise. Particularly with respect to the television enterprise, which integrates the respective specialized fields, a long-term plan that coordinates the business plans for programs, technical functions, license fee, personnel to the respective business plans is necessary. In order to formulate a long-term plan, there are various unknown factors and it would be difficult to pin down everything with accuracy. Therefore to meet any new situation such a plan would have to be revised every year. It would also be desirable to formulate the budget in close conformity with the long-term plan.

8.5.2. Formulation of the Budget

(1) The long-term plan forms the basis of formulating the budget.

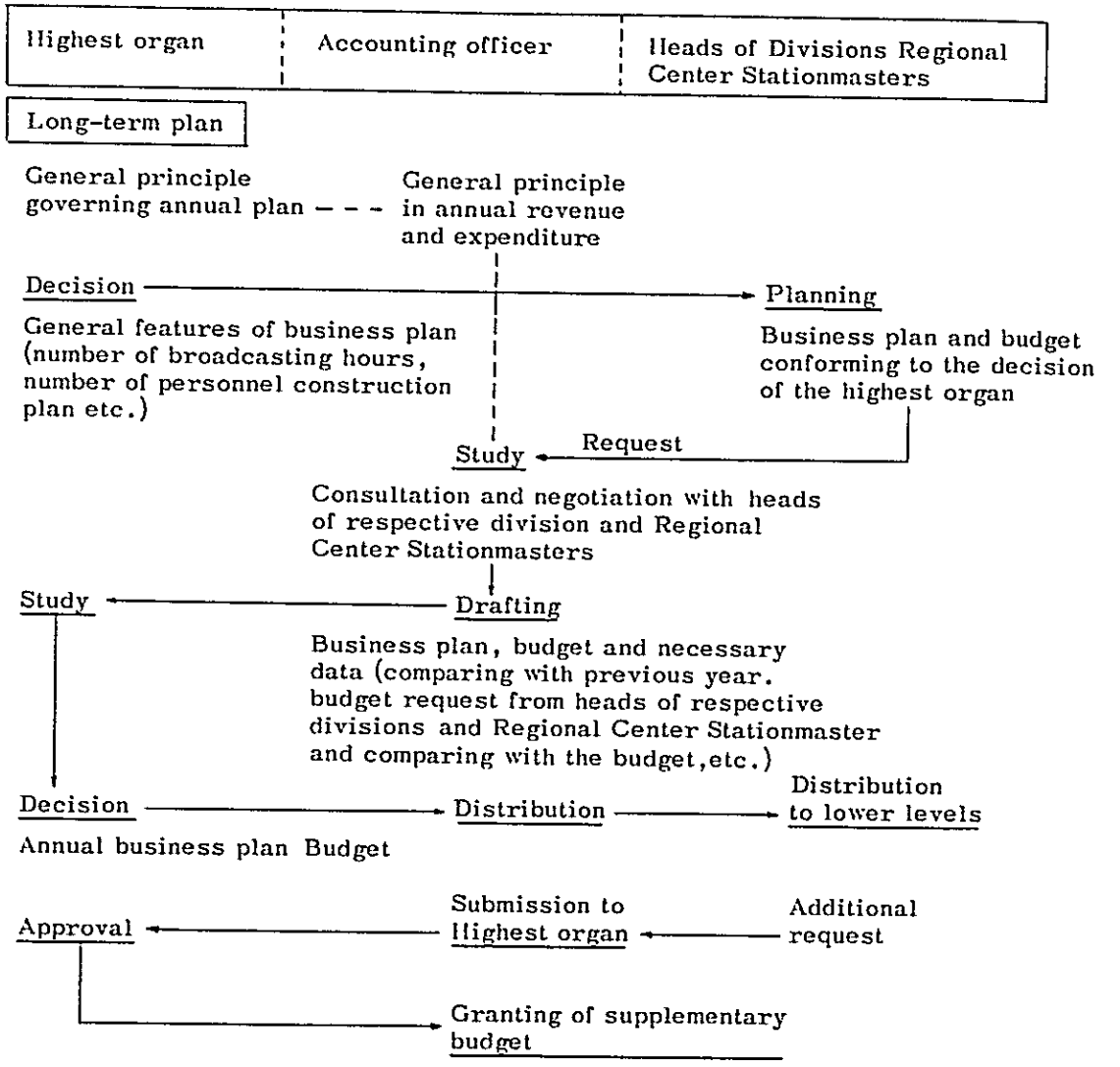
(2) The budget must be drawn up in close alignment with the business plan. That is to say, if the same plan were to be regarded from the budget side it becomes the budget plan, while if it is regarded from the business standpoint it becomes the business plan.

(3) It would be necessary to send the annual business plan and budget to the respective divisions and local stations by the beginning of each fiscal year or by the end of the previous fiscal year.

(4) The heads of the respective divisions and the respective local station masters should assume responsibility for the management of the budget thus granted.

Resort to supplemental budgets, except in unavoidable cases, would not be desirable in principle.

(5) General procedure in the approval of business plans and budget.



(6) In order to carry out an effective management of the budget, it is necessary to appraise the differencial between the budget and the settlement of accounts. In case where there is a wide differential between the budget and the settled accounts, the cause should be studied and in same cases the redrafting of the budget might be necessary.

8.6. Personnel Management

8.6.1. Salaries

The New Public Corporation must acquire superior personnel. Involving as it

does the production of a sophisticated product in the form of broadcast programs, the television-industry calls for a high level of knowledge, skills and the capacity to carry through the work on the part of its personnel as distinct from such ordinary workers as are employed in factories. Consequently it would be necessary for the employees of the New Public Corporation to receive relatively high salaries.

On the other hand due consideration should also be given to the fact that personnel expenses would have a strong impact on the disbursements of the New Public Corporation. From the above considerations an average monthly salary of around 2,000 Bahts would be considered appropriate.

8.6.2. Establishment of Merit Evaluating System

The basic consideration in personnel management is to treat the employees according to ability in a fair and equitable manner. In other words efforts should be directed toward raising the morale of the employees and to improve efficiency by carrying out promotion and pay-raise in an equitable manner. For this purpose the establishment of a rational system of merit evaluation would be necessary. This will enable an objective assessment of the performance and capacity for work on the part of the employees so that promotion and wage raise could be carried out according to such performance and capacity for work on the part of the employees so that promotion and wage raise could be carried out according to such performance or ability.

(Note)

Merit Rating System in NHK

1. Element

To estimate the ability and degree of contribution, we adopt the merit rating system as follows.

The degree of weight on each item is different according to classes.

Class / Element	A	B	C
1. Ability of supervision & leadership		o	o
2. Planning	o	o	◎
3. Execution	◎	◎	◎
4. Understanding & judgement	o	◎	o
5. Professional knowledge and ability	o	o	o
6. Intelligence			o

◎ the most important element for rating. o more important element

2. Questionnaire

These elements are measured in each case with a questionnaire as follows.

1) Is he able to assume leadership over his follows according to their character and ability?

* Is he able to preside over a meeting fruitfully?

* Is he able to keep and create good human relations among his followers, thinking heighly of teamwork?

2) Is he able to make plans with a wide range view?

* Is he able to pursue efficient ways to realize the idea?

3) Is he able to carry out complicated duties exactly, rapidly, and efficiently only with general indication?

* Is he able to express his view to the point ?

* Is he able to accomplish his purpose in spite of some changes, in conditions?

Two or three questions for A class.

4) Is he able to make judgements with a wide range view?

* Is he able to understand indications exactly?

* Is he able to reach a useful conclusion after analyses of data and information?

5) Has he enough knowledge and ability for his job?

* Does he make good use of his knowledge and experience in his work?

* Does he make good use of available data and information for his business?

6) Does he understand the present and future situation of the Corporation?

* Does he have good understanding of his own task and position in the organization?

* Has he a definite opinion of his duties? As to L.M. Class, these items (except (2) and (6)) will be rated as a whole.

In addition to above questionnaire, we take the following items into account.

* Sense of Responsibility

* Spirit of cooperation

* Positive attitude

* Diligence

* Health

* Adaptability for change of situation.

The estimate for each question is scored from 1 to 5, and all these scores, after being weighted according to items, are summed up. More than two persons including the chief of the section and his service superior are concerned in the merit rating of one person to avoid a biased view as much as possible.

8.7. Personnel Plan

8.7.1. Plan for annual personnel requirement

Table 8-5 Plan for annual total personnel requirement

Station	Function	1968	1969	1970	1971	1972
Bangkok Central Station	A	0	28	44	74	147
	B	23	37	44	60	119
	C	0	0	0	0	120
	D	3	7	9	14	77
	E	20	30	30	30	55
	F	46	102	127	178	518
Haad Yai Station	A	0	10	10	10	17
	B	0	13	13	13	16
	C	0	0	0	0	0
	D	0	3	3	3	10
	E	0	10	10	10	15
	F	0	36	36	36	58
Lampang Station	A	0	10	10	10	17
	B	0	15	15	15	18
	C	0	0	0	0	0
	D	0	3	3	3	10
	E	0	10	10	10	15
	F	0	38	38	38	60
Khon Kaen Station	A	0	0	10	10	17
	B	0	0	15	15	18
	C	0	0	0	0	0
	D	0	0	3	3	10
	E	0	0	10	10	15
	F	0	0	38	38	60
Sub-total	A	0	48	74	104	198
	B	23	65	87	103	171
	C	0	0	0	0	120
	D	3	13	18	23	107
	E	20	50	60	60	100
	F	46	176	239	290	696
Local Station		0	84	121	121	121
Grand Total		46	260	360	411	817

A : Broadcasting
B : Technical
C : Fee collection
D : Administrative
E : Peripheral business
F : Sub-total

Note: For basis of computation, refer to the following paragraph.

8.7.2. Broadcasting Personnel Plan

(a) Annual Plan for Broadcasting Personnel for Bangkok Central Station

Table 8-6 Annual Plan for Broadcasting Personnel for Bangkok Central Station

Work category \ Year	1968	1969	1970	1971	1972
Compilation Management Broadcasting Service function	0	2	3	5	10
Program production (including news production work)	0	18	27	44	88
Announcing	0	3	5	6	10
Art designer	0	1	2	3	6
Film shooting (including news films)	0	2	3	5	10
News Coverage	0	0	0	5	10
Manager	0	2	4	6	13
Total	0	28	44	74	147

Note 1: Since it is a large station the scope of control has been narrowed. One manager for every 10-11 persons was estimated as an appropriate ratio.

Note 2: One person should work for 35 hours per week (2 days of rest per week).

Note 3: According to the over-all plan the station will not be producting its own programs in 1968, so that there will be no need of personnel.

Note 4: Basis of computation

(1) Personnels excluding those engaged in program production and management on the basis of one person working for five days per week may be obtained by;

$$\text{(number required per day)} \quad x \quad \frac{7}{5}$$

(2) "Personnel engaged in program production" may be obtained as follows;

The number of program broadcasting hours for the respective categories per week = A

Personnel hour required for respective programs by categories (per hour) = B

(Personnel hour = work load per person x one hour)

Thus one person's working hours per week being 35 hours, we obtain the formula:

$$\text{Number of personnel required for program production} = \frac{A \times B}{35}$$

(3) Nature of work by occupation: reffer to 7.4.1. Table 7-6

(4) Compilation, management and services related to broadcasting

1969 = 1 person	no shift
1970 = 2 persons	-do-
1971 = 3 persons	-do-
1972 = 7 persons	-do-

(5) Personnel engaged in program production

By correlating the required personnel hour in the reference Table, to the yearly broadcast program (Table 7-10 annual plan for self-production of programs) the computation was made using the aforementioned mathematical formula.

(6) Announcing

1969 = 2 persons	no shift
1970 = 3 persons	-do-
1971 = 4 persons	-do-
1972 = 7 persons	(shift between 4 persons on day duty and 3 persons on night duty)

(7) Art designer

Separate computation will be made regarding personnel engaged for costume, make-up large props, small props work under the section on "peripheral work personnel". Here only designers have been considered.

1969 Since educational programs are scheduled for 14 hours, the work load of designers is expected to be very light. However, to maintain the quality of the programs the total absence of designers would not be appropriate so that one designer should be placed.

1970	1 person	no shift
1971	2 persons	-do-
1972	4 persons	-do-

(8) Film shooting

1969	1 person	no shift
1970	2 persons	-do-
1971	3 persons	-do-

1972 Since they will be concurrently engaged in shooting news films, they would be expected to do night duty. Hence a shift between 5 persons on day duty and 2 persons on night duty might be considered. That is 7 persons per day.

(9) News coverage

7.4.2. Table 7-7 describes the various types of work of personnel engaged in news production of these "editing", "film editing" and "work related to news" have been considered to be included under "program production" of the above Table and news shooting has been considered to be included in "film shotting". Thus only those persons engaged in news coverage outside the station has been computed.

Since program compilation until 1970 is focussed on educational and cultural programs it has been marked o.

1971 3 persons no shift

1972 5 persons on day duty and 2 persons on night duty, that is 7 persons are required per day.

Reference

Table 8-7 Required Personnel Hour for programs by Sub-category and Category

(per hour)

Sub-category		Category		
Sub-category	Required personnel hour	Category	Sub-category	Required personnel hour
Talk Interview Group discussion	20	News	Talk, interview, group discussion 60% Films 30% Rebroadcast 10%	46
Films	100	Educational	Talk, interview, group discussion 70% Films 30%	44
Music (including variety)	50			
Folk music, Dance	40	Cultural	Talk, interview, group discussion 60% Quiz 10% Movies 10% Films 20%	39
Quiz, Game	40			
Serial drama	120	Enter-tainment	Folk music, dance 20% Music (including variety) 10% Movies 50% Quiz, game 10% Serial drama 10%	44
Movies	30			
Rebroadcast	40			
		Special events		45
		Local		25

Note 1: Personnel hour = one person's work x one hour

Note 2: Composition of the different forms of program is the same as (Reference 2) Table 7-13 unit cost of programs by category.

Note 3: In the required personnel hour by category computation, decimals have been raised by a unit.

Note 4: Required personnel hour by sub-categories is a standard table which used the pattern of program production in Japan as reference and was adapted to conditions in Thailand.

Note 5: Under the form composition it was difficult to forecast special events and they are not indicated therein. However, a relatively large-scale program is envisaged.

Note 6: With respect to local programs, as in the case of expenses, because of the wide difference in composition with national rebroadcast programs, in such respects as broadcasting area and the number of viewers, regardless of the form under the Sub-category it was considered appropriate to assign around 25 personnel hours.

(b) Regional Center Station

Table 8-8 Personnel required per Station

Category of function	Broadcasting hours In case of 30 min.	Broadcasting hours In case of 1 hour
Compilation, management, broadcasting service function	1	2
Program production (including news production work)	3	5
Announcing	2	3
Art designer	0	1
Film shooting (including news films)	1	2
News coverage	2	3
Manager	1	1
Total	10	17

(1) Personnel requirement was calculated by functional category. However in actual inplementation, it would be desirable for the personnel not to be rigidly fixed to the respective functions but to be permitted reasonable rotation in the

performance of the various functions. In particular, there is a great deal in common as between news coverage and film shooting and between program production and film shooting so that rotation of the personnel is necessary.

Moreover, the nurturing of generalists as a member of the station, particularly in a station such as the Regional Center Station which is operated by a small staff, is an important factor in preventing increase of personnel and raising of efficiency.

(2) In compilation, management and service function related to broadcasting, in case of 30 minutes broadcast, the minimum of one person should be sufficient.

In case of one hour broadcast person will be required regularly.

(3) Program Production

Same calculation as in the case of the Bangkok Central Station.

(4) Announcing

In case of 30 minutes broadcast one person without shift and in case of an hour broadcast two persons without shift.

(5) Art designer

Since local programs are made up principally of such items as news, announcements, weather forecasts and agricultural broadcasts, a specialized designer would not be necessary. However, taking into consideration the commencement of national rebroadcasts by the Regional Center Stations at the time that local broadcast programs will be for an hour one person will be assigned.

(6) Film shooting (including news films)

In case of 30 minutes broadcast the minimum of one person will be assigned.

In case of one hour broadcast, one person will be required regulary.

To this function, it is expected to be participated in by the personnel of program production and of news coverage.

(7) Covering the news

In case of 30 minutes broadcast one person without shift.

In case of 1 hour broadcast two persons without shift.

(8) Manager

The total broadcasting personnel consists of a modest formation of some 17 persons. This function is considered appropriate for one manager to maintain amicable human relations.

Table 8-9 Plan for Annual Requirement of Broadcasting Personnel for Regional Center Stations

Year / Station	1968	1969	1970	1971	1972
Haad Yai Station	0	10	10	10	17
Lampang Station	0	10	10	10	17
Khon Kaen Station	0	0	10	10	17
Total	0	20	30	30	51

(c) Annual Plan of Broadcasting Personnel

Table 8-10 Annual plan of Broadcasting Personnel

1969	1970	1971	1972
48	74	104	198

8.7.3. Plan of Technical Personnel

(a) Annual Plan of Technical Personnel for the Bangkok Central Station

Table 8-11 Annual Plan of Technical Personnel for the Bangkok Central Station

Year / Category of Function	1968	1969	1970	1971	1972
Transmission	6	6	6	6	6
Technical Operation (Master Monitor)	6	6	6	6	9
Transmission of films-slides and VTR	0	2	2	6	12
Program production	0	9	15	25	67
Maintenance	9	9	9	9	9
Film developing	0	2	2	3	6
Manager	2	3	4	5	10
Total	23	37	44	60	119

Note 1: With respect to managers, as in the case of the broadcasting personnel, calculation was made at the rate of 1 to 10-11 persons.

Note 2: One person should work for 35 hours per week (2 day of rest per week).

Note 3: Basis of computation

(1) Excluding personnel engaged in "management" and "program production", the number of personnel is as follows; The number of persons required constantly per day = A

When a person works 7 hours per day and works exceeds 7 hours per day, a shift becomes necessary. In such case, assuming the number of shifts to be = B the working days per week of the person being 5, then: The number of personnel required = $A \times B \times \frac{7}{5}$

(2) With regard to "personnel engaged in program production";

The number of program broadcasting hours for the respective categories per week = A.

Personnel hour required for respective programs by categories = B

(Personnel hour = work load per person x one hour)

Thus one persons working hours per week being 35 hours we obtain the formula:

Number of personnel required for program production = $\frac{A \times B}{35}$

(3) Transmission

With the completion of the Bangkok Central Station it will be carried out by the personnel of the New Public Corporation .

2 persons will be constantly assigned on a 2 shifts per day basis.

2 persons x 2 shifts x $\frac{7}{5}$ (one person works 5 days per week) ≒ 6

(4) Technical operation

It will be carried out by personnel of the New Public Corporation with the completion of the Bangkok Central Station.

1968-1971 2 persons on constant duty, 2 shifts

1972 Following the commencement of the Second Channel, 3 persons and 2 shifts system will be adopted.

(5) Transmission of film — slides, VTR

Work will begin in 1969, with the commencement of program production by the New Public Corporation.

1969-1970 In principle, one person on duty constantly.

1971 2 persons, 2 shifts

1972 3 persons, 2 shifts

(6) Program Production

By correlating the required personnel hour in the reference Table to the yearly broadcast program (7.5.3. Table 7-10) the computation was made using the abovementioned formula.

(7) Maintenance

With the commencement of operation of the Bangkok Central Station, the personnel of the New Public Corporation will begin maintenance of equipment on a 3 persons with 2 shifts basis.

(8) Developing

Following the commencement of program production by the New Public Corporation in 1969, developing work will begin. During 1969-1970 one person will be working on a constant basis but without shifts.

1971 One person, 2 shifts

1972 Two persons, 2 shifts

Note 4: In the technical personnel table, the personnel requirement was calculated by independent functional category. However, in case of implementation, it would be desirable for the personnel not to be fixed to the respective functions but to be so organized as to permit reasonable rotation in their duties.

Reference 1

Table 8-12 Necessary personnel hour calculation for technical personnel engaged in production of programs by program pattern

A Sub-category	B Time spent by technical personnel in production	C Number of persons	D Contents of Functions						E Required personnel hour B x C
			TD	SW	AE	C	VE	L	
Talk Interview Group discussion	4	7		1	1	3	1	1	28
Films	3	2			1		1		6
Music (including variety)	8	13	1	1	3	3	2	3	104
Folk music, Dance	7	13	1	1	3	3	2	3	91
Quiz, Game (including participation of audience)	5	9		1	2	3	1	2	45
Serial drama	10	13	1	1	3	4	1	3	130
Movie	3	2			1		1		6
Rebroadcast	10	10	1	1	2	3	3		100

Note 1: TD = Technical Director

SW = Switcher

AE = Audio Engineer (including Boom-man)

C = Cameraman

VE = Video Engineer

L = Light Engineer (including Light Director and Light Operator)

Note 2: This is a standard table of technical personnel formation. It makes use of the program production pattern in Japan as a reference and was made with due consideration being given to conditions in Thailand. Therefore depending upon individual programs, the technical personnel formation will be changed. Basically, however, the foregoing personnel formation would be considered appropriate.

Note 3: Excluding film composition and movies in programs where the Technical Director is not included in the calculation, the Switcher assumes the work concurrently.

Note 4: In Thailand there are many cases at present where the P.D. is concurrently the Switcher. Since the P.D. is the principal personnel in program production

and hence must pay the most detailed attention to all the aspects of programs, it would not be desirable for him to assume concurrently the work of the Switcher.

Reference 2

Table 8-13 Number of Technical Personnel required for Production of Program by Categories

	Composition by Categories		Required technical personnel (man hours)
News	Talk, interview, group discussion, etc.	60%	29 (28.6)
	Film composition	30%	
	Rebroadcast	10%	
Educational	Talk, interview, group discussion, etc.	70%	22 (21.4)
	Film composition	30%	
Cultural	Talk, interview, group discussion, etc.	60%	24 (23.1)
	Quiz	10%	
	Movies	10%	
	Film composition	20%	
Entertainment	Falk music, dance	20%	50 (49.1)
	Music (including variety)	10%	
	Movies	50%	
	Quiz, game	10%	
	Serial drama	10%	
Special events			30

Note 1: The composition by categories of program is the same as the program unit cost Table 7-13 in 7.6. Reference 2.

Note 2: Decimals were raised a unit.

Note 3. Under the categories classification it was not easy to forecast the contents of special events, so that they are not mentioned under the column. However, a relatively large scale program is envisaged.

(b) Annual plan of Technical Personnel for Regional Center Stations

Table 8-14 Annual Plan of Technical Personnel for Regional Center Station

Year / Regional Center Station	1968	1969	1970	1971	1972
Haad Yai Station	0	13	13	13	16
Lampang Station	0	15	15	15	18
Khon Kaen Station	0	0	15	15	18
Total	0	28	43	43	52

Note 1: Basis of computation

(1) Prior to and including 1971

Manager

As in the case of the broadcasting personnel, from the standpoint of increasing efficiency it would be desirable to place one manager in each Regional Center Station.

General employees 12

Master Monitor 2 persons system, 2 shifts

Developing 1 persons system, 2 shifts

Personnel for master monitor and developing = $3 \times 2 \times \frac{7}{5} \fallingdotseq 9$

In addition, 2 cameramen should be assigned (without shift) as program production personnel. $2 \times \frac{7}{5} \fallingdotseq 3$

Thus, personnel at each regional center station up to and including 1971 would come to 13.

(2) 1972

With the increase of programs, the personnel will be augmented by one technical director and one audio engineer without shifts. $2 \times \frac{7}{5} \fallingdotseq 3$

That is, there will be an increase of three persons, bringing the total of technical personnel to 16.

(3) With respect to such service as maintenance, transmission of film and of slides and VTR, since the work load would not be sufficiently great enough to justify a separate computation the matter will be taken care of through the rotation of technical personnel.

(4) In addition to the technical personnel of the respective regional station the following service and maintenance personnel have been placed at Lampang and Khon Kaen. In anticipation of rotation to other duties, it would be desirable for personnel to be placed on the Lampang and Khon Kaen Station rather than the transmitting stations.

Table 8-15 Plan of Technical Personnel prior to and including 1971

Station name	Number of persons	Translator to be maintained
Lampang Station	2	Wang Nua, Chiang Rai
Khon Kaen Station	2	Kalasin, Roi Et

Note: Personnel for the transmitting stations at Lampang and Khon Kaen will be calculated separately in the next paragraph.

(c) Transmitter personnel at the regional station and translator maintaining personnel at the translator stations

(1) At the regional stations personnel will be on a 2 persons system with 2 shifts: $2 \times 2 \times \frac{7}{5} \fallingdotseq 6$. Thus there will be 6 persons for each Station.

(2) Translator station will not be attended in principle. The maintenance personnel could be assigned to the nearest regional station or to the translator station depending upon its location.

Table 8-16 Maintenance Personnel

Local areas	Number of stations		Transmitter personnel	Translator maintaining personnel	Total number	Placements of maintenance personnel			Remarks
	Transmitter	Translator				Place	No.	Translator to be maintained	
South	7	3	42	3	45	Nakhon Si Thammarat	2	Thung Song	
						Phuket	1	Phuket Ao Luk	
North	6	5	36	3	39	Uttradit	2	Nan Phrae	Maintenance personnel of Wang Nua, Chiang Rai already assigned to Lampang Station
						Nakhon Sawan	1	Phetchabun	
Northeast	5	5	30	2	32	Sawan Daen Din	2	Sawan Daen Din Sakon Nakhon Nakhon Phanon	Maintenance personnel of Kalasin Roi Et already assigned to Khon Kaen Station
Southeast	1	2	3	2	5	Si Racha	2	Rayong Chanthaburi	

(d) Number of personnel by year

Table 8-17 Number of Personel by year

Local areas	1968	1969	1970	1971	1972
South	0	45	45	45	45
North	0	39	39	39	39
Northeast	0	0	32	32	32
Southeast	0	0	5	5	5
Total	0	84	121	121	121

(e) Plan for total technical personnel by year

Table 8-18 Plan for total Technical Personnel by Year

	1968	1969	1970	1971	1972
Number	23	149	208	224	293

8.7.4. Personnel for Collecting Fees

It is necessary for the Bangkok Central Station to have 120 persons for this work in 1972 (See paragraph on Collection Personnel under 8.4.4.).

8.7.5. Plan for annual requirement of administrative personnel

Table 8-19 Plan for Annual Requirement of Administrative Personnel

Year / Station	1968	1969	1970	1971	1972
Bangkok Central Station	3	7	9	14	77
Haad Yai Station	0	3	3	3	10
Lampang Station	0	3	3	3	10
Khon Kaen Station	0	0	3	3	10
Total	3	13	18	23	107

Note: Method of computation

(1) The administrative personnel may be divided functionally into general administrative personnel and personnel handling fees and subscription.

(2) General administrative personnel may be regarded basically as personnel engaged in the management of operational work of broadcasting (broadcasting and technical work) and in providing service. It is expected that they will come to around 10% of the technical personnel. Only with respect to the administrative personnel for the Bangkok Central Station in 1972, ten persons have been ear-marked as personnel of the Management Planning Division.

(3) Concerning administrative personnel for handling matters related to fee, at the Bangkok Central Station, 40 persons on one-third of the number of collectors are scheduled to be employed to manage and provide service to the fee collecting personnel. In 1972, 5 persons for each Regional Center Stations are expected to be employed to handle business relating to subscription.

8.7.6. Annual Plan for Personnel Engaged in Peripheral Functions

(a) This work would include that of car drivers, air-conditioning service personnel, guards, studio workers handling artistic effects such as large and small props, make-up, typists, telephone operators, workers to clean the station premises and other manual workers.

(b) Annual plan.

Table 8-20 Annual Plan for Personnel engaged in Peripheral Functions.

Year / Station	1968	1969	1970	1971	1972
Bangkok Central Station	20	30	30	30	55
Haad Yai Station	0	10	10	10	15
Lampang Station	0	10	10	10	15
Khon Kaen Station	0	0	10	10	15
Total	20	50	60	60	100

(c) Currently in Thailand personnel engaged in this type of work are extremely numerous. The New Public Corporation should study this problem thoroughly with a view to preventing increase of the number of personnel employed in such capacity and to rationalize this aspect of the personnel problem.

8.8. Fees for Hire of Microwave Radio Relay Link

8.8.1. General

In case the New Public Corporation or the Public Relations Department hires the microwave radio relay link owned by the Telecommunication Project Administration Office (or the Telephone Organization of Thailand), a proper fee must be paid according to contract. This fee is quite considerable in its amount and has an important effect on the maintenance cost of a national network. Without the details of the original construction cost of the microwave radio relay link system in Thailand, as well as detailed data on the cost of maintenance, it would be difficult to arrive at an equitable fee based on accurate cost accounting methods. By explaining the method of determining and computing microwave fees employed in Japan and by comparing the amount invested per unit in the construction of microwave radio relay link in Thailand with that of Japan, we would wish to indicate what we generally consider to be a proper fee.

8.8.2. Determination of Fee in Japan

It is difficult to calculate the total expense of all the microwave radio relay links in Japan. Because of the diversified number of users such as the private broadcasting companies and NHK the computation of number of hours that microwave radio relay links are used is very complicated. For these reasons a typically

representative route such as Tokyo-Osaka is first taken up and fee which can become a standard is obtained through cost accounting a fee system is created. After the fee system is authorized it is applied on a nation-wide basis.

(a) Computation of Original Construction Cost (100)

Building and reapiring expense (32.7)

Land	Station premises	Living quoters	Roads
(2.7)	(17.5)	(2.7)	(9.8)

Wireless installation (66.6)

Machinery	Aerial cables	Facilities to provide electric power
(33.3)	(11.6)	(21.7)

Others (0.7)

Maintenance cars etc.

The figures in parenthesis is the ratio when we consider the original construction cost (for 2 routes) to be 100.

In this case the expenses for building and repairs is used jointly for telephone and telegraphic facilities. The expense for TV can be obtained through the ratio with the total channel.

(b) Computation of annual expense

	Building and repair	Wireless facilities	others
Interest	(8.9)	(18.1)	(0.2)
Cost of depreciation of assets	(0.3)	(14.5)	(0.5)
Maintenance cost	(1.2)	(54.8)	(1.5)

The total of these amounts comes to annual expense (for 2 routes) (100).

It should be added that assuming original construction cost to be 100, annual expense will be 23.9.

(c) Computation of annual expense per route

Since the above annual expense is for two routes, half of that amount becomes the annual expense per route. However, in the final stage the Tokyo-Osaka route will have six routes and this should be taken as a standard in computing annual expense per route. Hence

(annual expense for 2 routes + expense for one additional route x 4) ÷ 6
(100) (20.9)

(d) Computation of unit cost per standard route per hour per kilometer. Assuming average daily use to be 22.4 hours annual expense will be $\frac{1}{365 \times 22.4}$. 25% of expense per hour will be made the expense for terminal station sector and 75% will be made the expense for the relay station sector and the two would respectively be made the basic fee and cumulative fee.

(e) Such fees as branching fee, cancellation fee, insertion relay fee, and conversion fee are respectively computed from other factors and basis.

8.8.3 Fees for Hire of Microwave Radio Link in Thailand

(a) It should be a lump contract fee between the Telephone Organization of Thailand and the New Public Corporation or with the Public Relations Department.

(b) Therefore, incidental fees such as branching fees should be eliminated and fees based on time element should not be considered for the moment and instead fees based only one unit distance per route should be determined and applied. However, when in future microwave radio relay link to Bangkok is commenced and its utilization becomes more frequent fees based on the time factor would become necessary. Exclusive use fees need not be divided into basic fees and cumulative fees.

(c) It is considered that 9,200 Bahts would be an appropriate fee per kilometer per route. This figure was obtained after comparison between unit cost of construction and unit cost of maintenance in Japan with the unit cost of construction in Thailand. It would be necessary in the future to carry out exact cost accounting and amend it accordingly. However, considering the financial capacity of the television industry the expenses relating to building and repairing within the cost accounting should to a certain extent be borne by the telegraphic and telephone group so as to produce reasonably low fees.

(d) Fees for hire of Microwave radio link by years are as Table 8-21.

Table 8-21 Fees for Hire of Microwave Radio Link in Thailand (Unit 1,000 Bahts)

Area	Total distance	1969	1970	1971	1972
South	1130(km)	10,396	10,396	10,396	20,792
North	720	6,624	6,624	6,624	13,248
Northeast	735		3,381	6,762	13,524
Southeast	77		708.4	708.4	1,416.8
Total	2662	17,020	21,109.4	24,490.4	48,980.8

Note 1: In 1972 two routes will be used.

Note 2: The 9,200 Bahts f ee which was decided as unit fee for one route, was computed on the premise that the two route system will be adopted in future. That is, when a new route is added to an existing route, the construction cost will come to about $\frac{1}{5}$. Consequently annual cost will also come to about $\frac{1}{5}$. The case where two routes are used is far less expensive than when only one route is used.