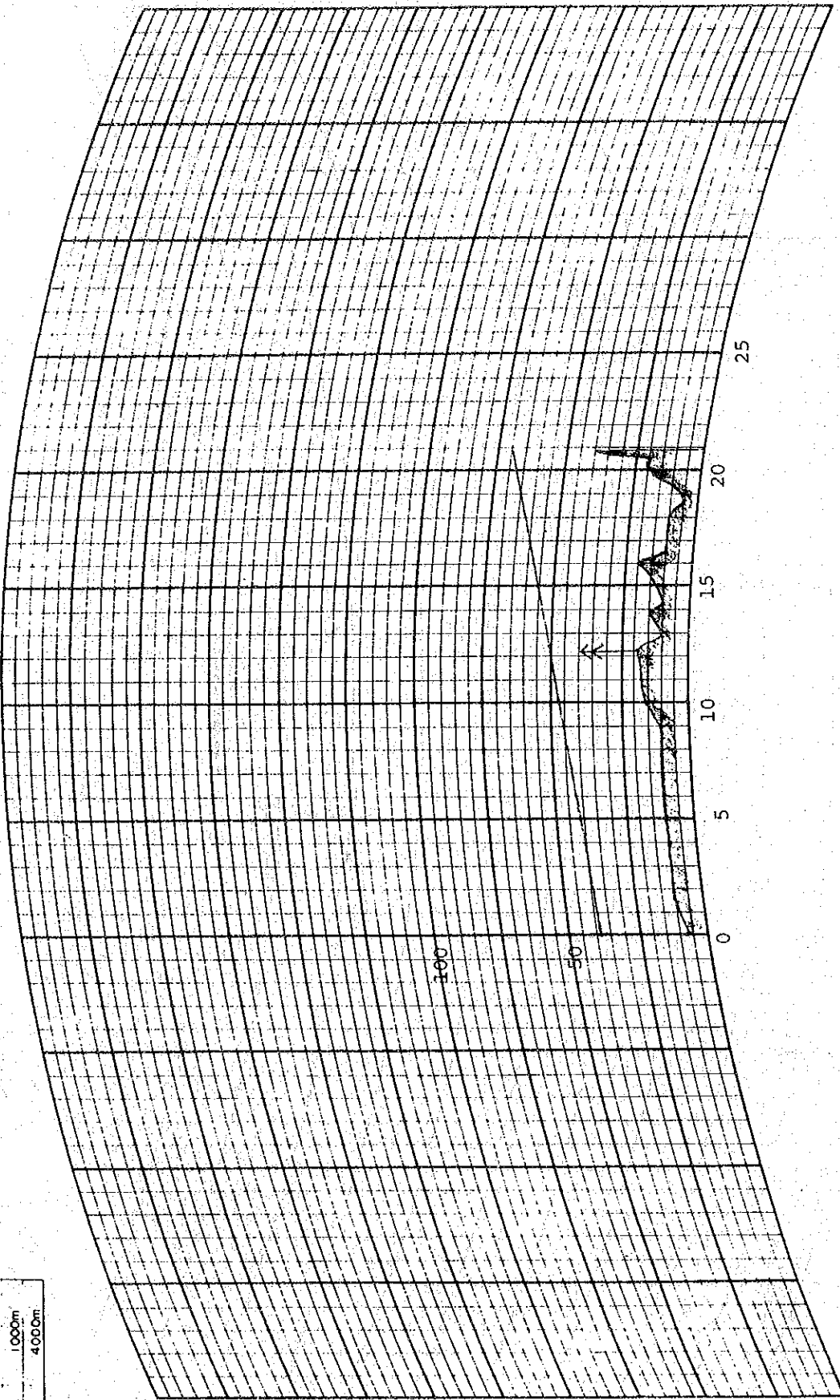


PATH PROFILE ( 4/3 RADIUS )

FULL SCALE	
DISTANCE	HEIGHT
0	250m
120km	1000m
240km	4000m



SITE: Bengabong R.S.  
 GROUND ELEVATION: 40 m  
 ANTENNA HEIGHT: 30 m

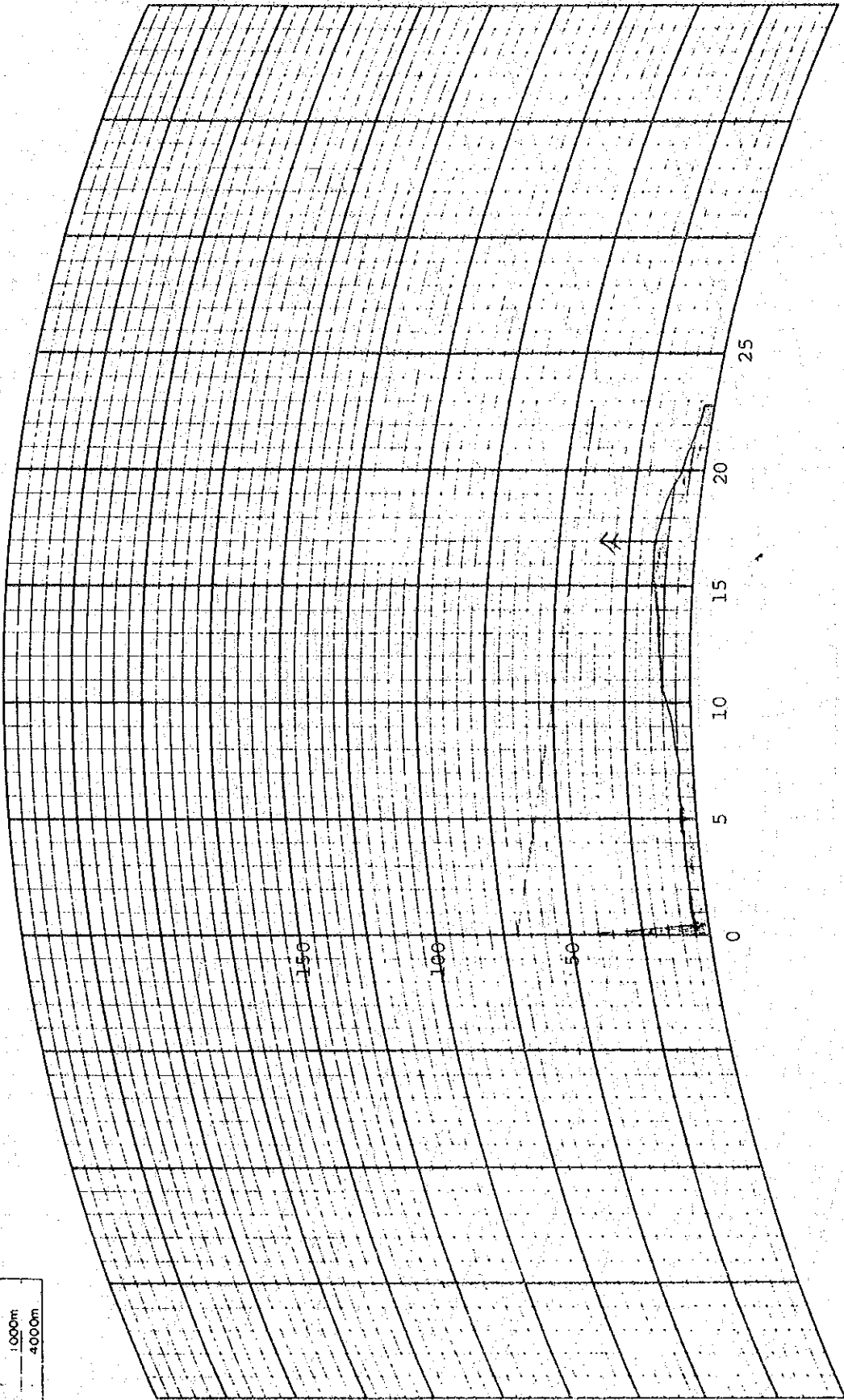
DISTANCE: 20.8 km

SITE: Gloria  
 GROUND ELEVATION: 7 m  
 ANTENNA HEIGHT: 30 m

Fig. VII-2-2-4 (30/33)

PATH PROFILE ( 4/3 RADIUS )

FULL SCALE	
DISTANCE	HEIGHT
60km	250m
120km	1000m
240km	4000m



SITE Roxas  
 GROUND ELEVATION 3 m  
 ANTENNA HEIGHT 40 m

DISTANCE 22.8 km

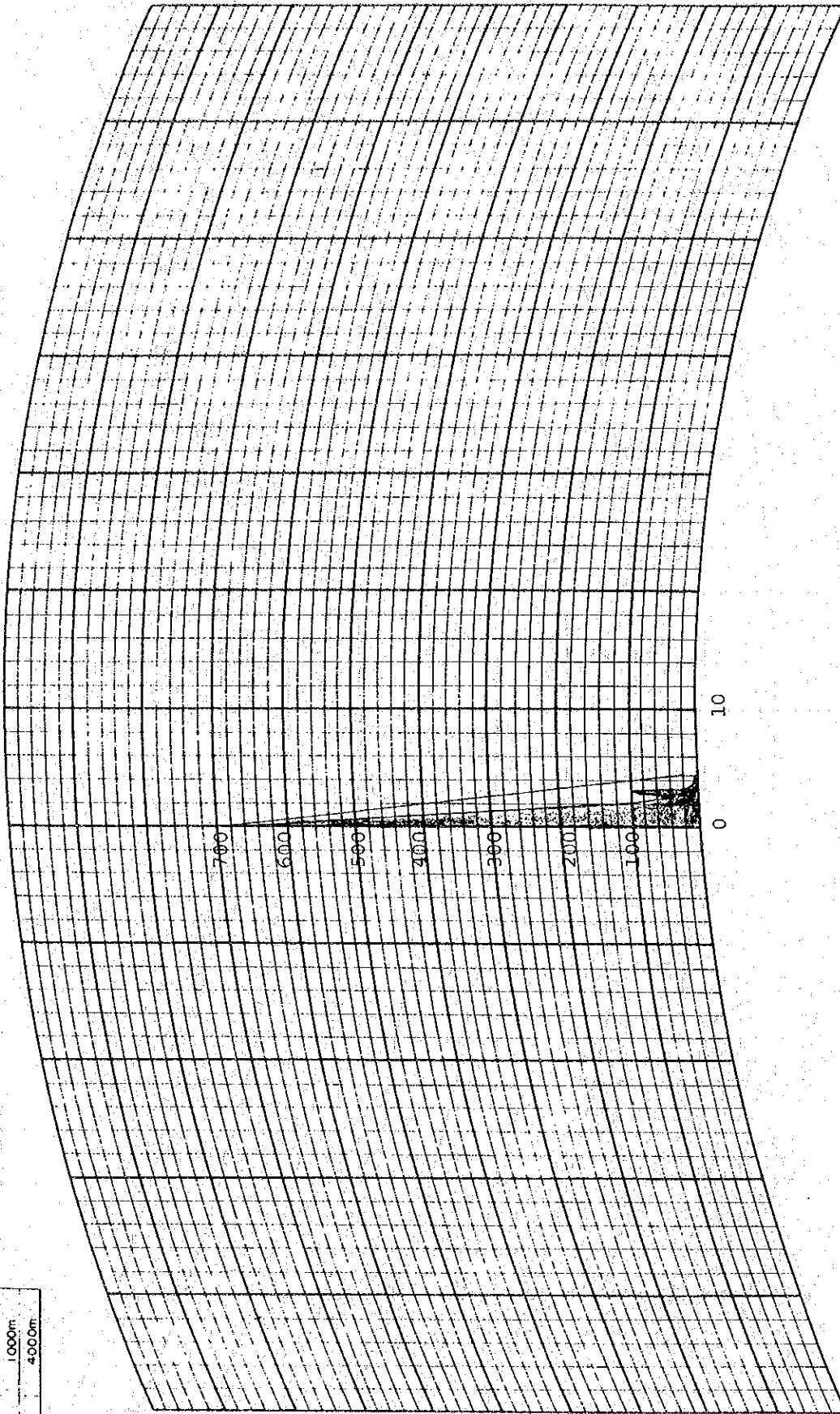
SITE Bongabong R.S.  
 GROUND ELEVATION 40 m  
 ANTENNA HEIGHT 30 m

Fig.VII-2-2-4 (31/33)

PATH PROFILE ( 4/3 RADIUS )

FULL SCALE

DISTANCE	HEIGHT
60km	250m
120km	1000m
240km	4000m



SITE: San Agustin  
 GROUND ELEVATION: 2 m  
 ANTENNA HEIGHT: 20 m

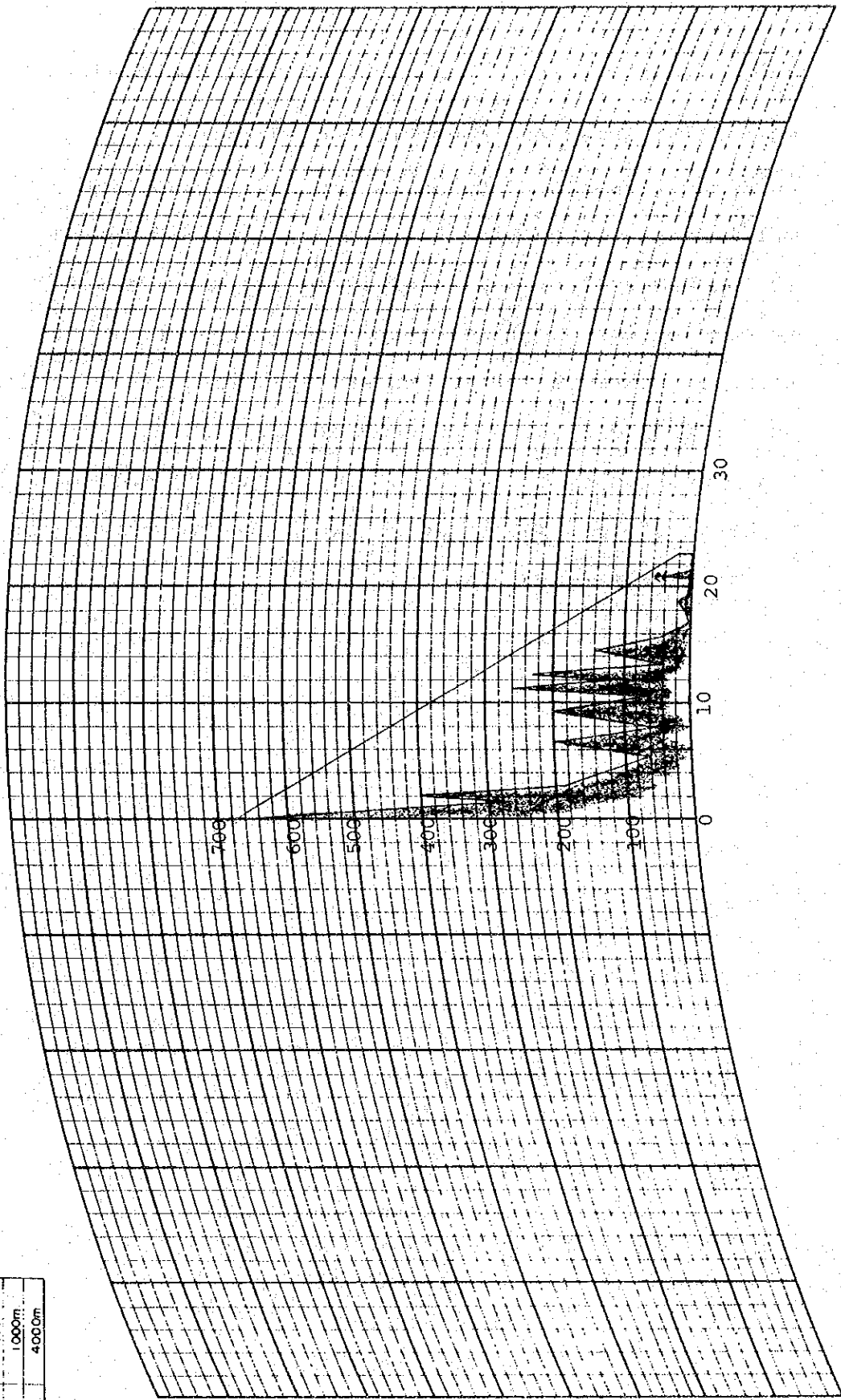
DISTANCE: 4.3 km

SITE: Tablas R.S.  
 GROUND ELEVATION: 640 m  
 ANTENNA HEIGHT: 30 m

Fig. VII-2-2-4 (32/33)

# PATH PROFILE ( 4/3 RADIUS )

FULL SCALE	
DISTANCE	HEIGHT
60 km	250 m
120 km	1000 m
240 km	4000 m



SITE Odiongan  
 GROUND ELEVATION 2 m  
 ANTENNA HEIGHT 20 m

DISTANCE 23.2 km

SITE Tablas R.S.  
 GROUND ELEVATION 640 m  
 ANTENNA HEIGHT 30 m

Fig. VII-2-2-4(33/33)

when these IPTSs are concentrated in an area, an economical design is to be introduced by adopting a multi-direction multiplex radio system (MDM system). In the MDM system, a pair of radio frequencies are to be used for one base station and its surrounding terminal stations (IPTSs) so as to achieve the effective use of frequencies and economy of equipment. Radio systems to be set up at individual telephone exchange offices and radio repeater stations are given in Tables VII-2-2-5 ~ 6.

Table VII-2-2-5 (1/3) Radio Systems to Be Set Up at  
Individual Stations (Phase I)

Item Station		Maximum Capacity							
		SHF		VHF/UHF					
		960CH	TV	240CH	60CH	24/30CH	6CH	OH	MDA
Nueva Ecija	Cabanatuan	○ x2		○ x2	○	○	○		
	Cabiao					○			
	Jaen				○				
	Kitakita R.S.	○							
	Pantabangan			○					
	Quezon			○					
	Zaragosa							○	
Tarlac	Gerona			○					
	La Paz					○			
	Tarlac R.S.			○		○			
Pampanga	Magalang					○			
	Porac R.S.					○			
	Sexmoan						○		
	San Fernando R.S.			○		○ x2	○		
Bulacan	Bulacan					○			
	Catanpacan R.S.	○ x2							
	Pandi R.S.	○ x2			○	○ x2			
	San Ildefonso				○				
	San Rafael					○			
Bataan	Dinalupihan			○ x2					
	Samal			○					
M.M.	Manila R.S.	○ x2	○						

Legend R.S.: Radio Station, REF: Radio Reflector  
 OH: Over the Horizon Radio System  
 MDA: Multi-Direction Multiplex Radio System  
 (Ⓟ): Base Station 48CH, ○: Terminal Station 6CH)  
 TV: Television Terminal  
 x2: Numbers of Directions of Radio Route

Table VII-2-2-5 (2/3) Radio Systems to Be Set Up at Individual Stations (Phase I)

Item Station		Maximum Capacity							
		SHF		VHF/UHF					
		960CH	TV	240CH	60CH	24/30CH	6CH	OH	MDA
Ca- vi- te	Mt. Gonzares R.S.	○ x2							
	Agoncillo						○		
	Batangas	○							
	Calaca					○			
	Ibaan					○			
	Mt. Banoy R.S.	○ x3		○		○ x2	○ x2	○ 6CH	
Marin-Que- duque zon	Padre Garcia						○		
	Lucena R.S.	○							
	Marinduque R.S.	○ x2							
	Bangili REF.			(○)					
Occ. Mindoro	Cabacao R.S.			○ x3					
	Lubang							○ 6CH	
	Mamburao			○					
	Sablayan			○					
	Sablayan REF.			(○)					
	Sablayan R.S.			○ x3					
	San Jose R.S.			○					
	Bongabong R.S.			○	○				
Or. Mindoro	Calapan R.S.	○ x2	○				○		
	Gloria			○ x2					
	Mt. Dumali R.S.	○ x2	○	○			○		
	Naujan					○			
	Puerto Galera R.S.						○		
	Roxas				○				

Legend R.S.: Radio Station, REF: Radio Reflector  
 OH: Over the Horizon Radio System  
 MDA: Multi-Direction Multiplex Radio System  
 (ⓑ): Base Station 48CH, (○): Terminal Station 6CH)  
 TV: Television Terminal  
 x2: Number of Directions of Radio Route

Table VII-2-2-5 (3/3) Radio Systems to Be Set Up at Individual Stations (Phase I)

Item Station		Maximum Capacity							
		SHF		VHF/UHF					
		960CH	TV	240CH	60CH	24/30CH	6CH	OH	MDA
Or. Mindoro	Socorro						○		
	Victoria	○ x2				○			
Romblon	Odiongan					○			
	Romblon R.S.	○	○						
	S. Agustin						○		
	Tablas R.S.	○ x2				○	○		
Akulan	Kalibo	○							
Total	55	28	4	28	6	20	14	2	0

Legend

R.S.: Radio Station, REF: Radio Reflector

OH: Over the Horizon Radio System

MDA: Multi-Direction Multiplex Radio System

(⊙): Base Station 48CH, ○: Terminal Station 6CH

TV: Television Terminal

x2: Number of Directions of Radio Route



Table VII-2-2-6 (1/6) Radio Systems to Be Set Up at Individual Stations (Phase II)

Item Station		Maximum Capacity							
		SHF		VHF/UHF					
		960CH	TV	240CH	60CH	24/30CH	6CH	OH	MDA
Nueva Ecija	Cabanatuan						○ x2	○ 60 CH	
	Carranglan						○		
	Gabalton							○ 60 CH	
	Nampicuan						○		
	Natividad						○		
	Pantabangan			○			○		
	Penaranda						○		
	Quezon						○		
Tarlac	Anao								○
	Gerona								Ⓟ
	Mayantoc								○
	Ramos								○
	San Manuel								○
Pampanga	San Fernando R.S.						○		
	San Simon						○		
	Bagac						○		
	Dinalupihan						○		
Bataan	Mt. Samat R.S.						○ x2		
	Pilar						○		
	Samal						○		
M.M.	Manila R.S.			○					

- Legend
- R.S.: Radio Station, REF: Radio Reflector
  - OH: Over the Horizon Radio System
  - MDA: Multi-Direction Multiplex Radio System
  - (Ⓟ: Base Station 48CH, ○: Terminal Station 6CH)
  - TV: Television Terminal
  - x2: Number of Directions of Radio Route

Table VII-2-2-6 (2/6) Radio Systems to Be Set Up at Individual Stations (Phase II)

Item		Maximum Capacity							
		SHF		VHF/UHF					
		960CH	TV	240CH	60CH	24/30CH	6CH	OH	MDA
Cavite	Magallanes						○		
	Mt. Gonzales R.S.						○ x2		
	Ternate						○		
Laguna	Kalayaan								○
	Mabitac								○
	Paete R.S.			○ x2					Ⓟ
	Pakil								○
	Pangil								○
	Pila								○
	Rizal								○
	Siniloan								○
	Victoria								○
Batangas	Alitagtag								○
	Balite								○
	Laurel						○		
	Lobo						○		
	Mataasnakahoy								○
	Mt. Banoy R.S.						○ x3		Ⓟ
	San Luis								○
	San Nicolas								○
	Santa Teresita								○
	Taysan								○
	Tingloy								○
Tuy							○		

Legend R.S.: Radio Station, REF: Radio Reflector  
 OH: Over the Horizon Radio System  
 MDA: Multi-Direction Multiplex Radio System  
 (Ⓟ: Base Station 48CH, ○: Terminal Station 6CH)  
 TV: Television Terminal  
 x2: Number of Directions of Radio Route

Table VII-2-2-6 (3/6) Radio Systems to Be Set Up at Individual Stations (Phase II)

Station	Item	Maximum Capacity							
		SHF		VHF/UHF					
		960CH	TV	240CH	60CH	24/30CH	6CH	OH	MDA
Quezon	Alabat			○ x2			○		
	Burdeos								○
	Buenavista						○		
	Catanauan R.S.			○		○	○		
	Dolores						○		
	General Nakar								○
	Guinayangan					○			
	Jumalig								○
	Lucena R.S.			○			○ x2		
	Mulanay R.S.					○			
	Panukulan								○
	Patnanangan								○
	Perez						○		
	Pitogo				○				
	Plaridel R.S.			○ x2			○		
	Polillo								○
	Polillo R.S.			○					ⓑ
	Quezon						○		
	Real								○
	San Andres						○		
San Antonio						○			
San Francisco						○			
San Narciso				○		○			
Tagkawayan R.S.			○	○	○	○			

- Legend
- R.S.: Radio Station, REF: Radio Reflector
  - OH: Over the Horizon Radio System
  - MDA: Multi-Direction Multiplex Radio System
  - ⓑ: Base Station 48CH, ○: Terminal Station 6CH
  - TV: Television Terminal
  - x2: Number of Directions of Radio Route

Table VII-2-2-6 (4/6) Radio Systems to Be Set Up at Individual Stations (Phase II)

Item	Station	Maximum Capacity							
		SHF		VHF/UHF					
		960CH	TV	240CH	60CH	24/30CH	6CH	OH	MDA
Quezon (Aurora)	Unisan R.S.			○ x3	○				
	Baler								○
	Casiguran				○		○		
	Dilasag						○		
	Dinalongan			○	○				
	Dipaculao			○ x2					
	Maria Aurora								○
	Maria Aurora R.S.			○ x2					ⓑ
	San Luis								○
Occ. Mindoro	Abra de Ilog						○		
	Cabacao R.S.						○		
	Calintaan						○		
	Looc						○		
	Magsaysay						○		
	Mamburao						○ x2		
	Paluan						○		
	Rizal						○		
	San Jose	○					○ x2		
	San Jose R.S.			○			○ x2		
	Santa Cruz						○		
Or. Mindoro	Baco						○		
	Bulalacao						○		
	Bansud						○		

Legend R.S.: Radio Station, REF: Radio Reflector  
 OH: Over the Horizon Radio System  
 MDA: Multi-Direction Multiplex Radio System  
 ⓑ: Base Station 48CH, ○: Terminal Station 6CH  
 TV: Television Terminal  
 x2: Number of Directions of Radio Route

Table VII-2-2-6 (5/6) Radio Systems to Be Set Up at Individual Stations (Phase II)

Item Station		Maximum Capacity							
		SHF		VHF/UHF					
		960CH	TV	240CH	60CH	24/30CH	6CH	OH	MDA
Or. Mindoro	Calapan R.S.						○ x3		
	Knob Peak R.S.	○ x2					○ x2		
	Mansalay						○		
	Mt. Dumali R.S.						○ x2		
	Pola						○		
	Roxas						○		
	San Teodoro						○		
Romblon	Alcantara			○	○				
	Banton						○		
	Caratrava						○		
	Concepcion						○		
	Corcuera						○		
	Magdiwang						○		
	Romblon R.S.			○			○ x2		
	San Andres						○		
	San Fernando				○				
	San Jose						○		
	Santa Fe						○		
	Tablas R.S.	○ x3					○ x4		
Palawan	Aborlan						○		
	Agutaya						○		
	Araceli								○
	Bacuit R.S.			○ x2			○		ⓑ
	Balabac						○		

Legend R.S.: Radio Station, REF: Radio Reflector  
 OH: Over the Horizon Radio System  
 MDA: Multi-direction multiplying System  
 (ⓑ): Base Station 48CH, ○: Terminal Station 6CH  
 TV: Television Terminal  
 x2: Number of Directions of Radio Route

Table VII-2-2-6 (6/6) Radio Systems to Be Set Up at  
Individual Stations (Phase II)

Item Station		Maximum Capacity							
		SHF		VHF/UHF					
		960CH	TV	240CH	60CH	24/30CH	6CH	OH	MDA
Palawan	Batarasa				○		○		
	Busuanga						○		
	Cagayancillo						○		
	Coron R.S.			○ x3					
	Cuyo			○			○ x2		
	Dumaran R.S.			○ x2					
	El Nido								○
	Inaguan R.S.			○ x2			○ x2		
	Linapacan								○
	Narra			○ x2	○				
	Panitian R.S.			○ x2					
	Puerto Princesa						○		
	Quezon			○					
	Quezon REF.			(○)					
	San Vicente								○
Taytay								○	
Total	135	6	0	38	12	4	98	2	Ⓟ 6 35

Legend R.S.: Radio Station, REF: Radio Reflector  
OH: Over the Horizon Radio System  
MDA: Multi-Direction Multiplex Radio System  
(Ⓟ: Base Station 48CH, ○: Terminal Station 6CH)  
TV: Television Terminal  
x2: Number of Directions of Radio Route

## 2-3 Multiplex Equipment and Cable PCM System

The capacity of multiplex equipment to be employed has been determined in consideration of the number of toll telephone circuit, that of telegraph circuits, and that of miscellaneous circuits.

- (1) First order PCM multiplex equipment is to be installed at connecting points by voice channels between a PCM system and a trunk cable system and between a PCM system and an FDM system. The number of circuits to be set up by this project is as follows.

Phase I: 107 circuits

Phase II: 420 circuits

- (2) Digital multiplex equipment of higher than second order is to be used for a 960-channel and 240-channel PCM systems. The number of primary blocks to be included in PCM systems is given below.

Phase I 960-channel system: 143 systems

240-channel system: 41 systems

Phase II 960-channel system: 18 systems

240-channel system: 118 systems

- (3) When a PCM radio system is connected to a cable PCM system through a primary block, regenerative repeater, power feeding facility, etc., required

for the cable PCM system are to be installed.

Phase I: 67 systems

Phase II: 73 systems

- (4) When digital electronic exchange and digital transmission equipment are to be installed in the same building of an SC, PC, or LE, the exchange and transmission equipment are to be connected with each other by a PCM primary block. In this case, PCM multiplex equipment and regenerative repeater are to be useless.

Phase I: 76 systems

Phase II: 70 systems

- (5) For interconnection of supergroups in FDM system and primary blocks in PCM system, PCM/FDM translating equipment (transmultiplexer) is to be used. In this case, capacity of equipment has been estimated in combinations of one FDM supergroup and two PCM blocks.

Phase I: 2 sets

Phase II: 9 sets

- (6) The number of circuits to be incorporated in the FDM system has been estimated by the number of channel translating equipments.

Phase I: 53 circuits

Phase II: 156 circuits



### 3. Telegraph

In determining the main amounts of works to be implemented in this project, the following principles have been introduced.

- (1) In Phase I, gentex stations are to be set up in the telephone service areas of this project. In Phase I, telex exchange equipment or the heart of a telex network is to be installed at two places and telex concentrator equipment at nine stations and 38 large- or intermediate-scale stations with much traffic are to be set up as gentex stations.
- (2) In Phase II, gentex service is to be spread to intermediate and small cities/municipalities. In Phase II, a gentex station is to be set up at 84 places, so that expansion in exchange capacity is to be introduced to the telex exchange equipments and a telex concentrator is to be installed at five places.
- (3) In Phase II, the telegraph demand to be required by the year 2001 is to be met
- (4) The following numbers of telex station equipments are to be installed which include gentex and telex station equipments and spares.

Phase I: 119 sets

Phase II: 157 sets

(5) For telegraph transmission, the transmission lines to be constructed by this project are to be used as much as practicable. In some areas, however, leased circuits served by private operating companies are to be used. The amounts of telegraph equipment installation work to be accomplished on the above-mentioned principles are given in Tables VII-3-1 and VII-3-2.

Table VII-3-1 (1/3) Amounts of Telegraph Equipment  
Installation Works (Phase I)

	Station	Required No. of Lines *	No. of Concen- trators	Kind of Lines	Section	Leased Circuit		Remarks
						Distance (km)	Needed or Not (O:Needed)	
Telex Exchange	San Fernando	Telegraph channels 73(1)	8	Trunk (TDM)	To Manila	57	O	PLDT,TC,LE
	Batangas	39(1)	5	Trunk (TDM)	To Manila	100	O	RETELCO
Concentrator	Balanga	3(1)	1	Trunk (TDM)	To	42	O	RETELCO
	Cabanatuan	14(1)	1	do.	S. Fernando do.	57	O	RETELCO
	Tarlac	7(1)	1	do.	do.	54	O	PLDT,LE,TC
	Malolos	16(1)	1	do.	do.	23	O	RETELCO
	Olongapo	4(1)	1	do.	do.	49	O	PILTEL
	Iba	2(1)	1	do.	do.	54	O	Iba-Tarlac- S.F.P.
	Calapan	5(1)	1	Trunk (TDM)	To Batangas	7	O	Calapan Tel Sys.
Romblon	5(1)	1	do.	do.				
San Jose	5(1)	1	do.	do.				
Gentex or Telex Station	Balanga	Telephone lines(2W) 2	-	Subs. line (Cable)	To Balanga	Intra- service area		
	Dinalupihan	1	-	do.	To S. Fernando	do.		
	Mariveles	1	-	do.	To Balanga	28	O	RETELCO
	Cabiao	1	-	do.	To Cabanatuan			
	Cabanatuan	6	-	do.	do.	Intra- service area		
	CLSU (munos)	1	-	do.	do.	26	O	PLDT,LE(x-4)
	Guimba	1	-	do.	do.	28	O	PLDT,LE(x-4)
	Jaen	1	-	do.	do.			
	Quezon	1	-	do.	do.			
	S. Antonio	1	-	do.	do.			
S. Jose	1	-	do.	do.	34	O	PLDT,LE(x-4)	
Sta. Rosa	1	-	do.	do.				

\* Figures in ( ) indicate the number of telephone line (4W).

Table VII-3-1 (2/3) Amounts of Telegraph Equipment  
Installation Works (Phase I)

	Station	Required No. of Lines	No. of Concen- trators	Kind of Lines	Section	Leased Circuit		Remarks
						Distance (km)	Need or Not (O:Needed)	
Gentex or Telex Station	F. Blanca	1	-	Subs. line (Cable)	To S. Fernando	19	O	PLDT.LE(x-4)
	Guagua	4	-	do.	do.	10	O	Filipinas Tel. Co. Evang Elista Tel. Co.
	Angeles	2	-	do.	do.	16	O	
	S. Fernando	19	-	do.	do.	Intra- service area		
	Tarlac	6	-	do.	To Tarlac	Intra- service area		
	Gerona	1	-	do.	do.			
	Baliuag	3	-	do.	To Malolos	15	O	RETELCO
	Hagonoy	5	-	do.	do.	8	O	RETELCO
	Malolos	7	-	do.	do.	Intra- service area		
	S. Ildelfonso	1	-	do.	do.	18	O	PLDT.IPTS (x-5)
	Olongapo	4	-	do.	To Olongapo	Intra- service area		
	Iba	2	-	do.	To Iba	Intra- service area		
	Batangas	10	-	do.	To Batangas	Intra- service area		
	Bataan	3	-	do.	do.	6	O	RETELCO (From Batangas)
	Calaca	1	-	do.	do.			
Lipa	3	-	do.	do.	23	O	RETELCO	
Nasugubu	4	-	do.	do.	57	O	PLDT.TC(x-4)	

Table VII-3-1 (3/3) Amounts of Telegraph Equipment  
Installation Works (Phase I)

	Station	Required No. of Lines	No. of Concen- trators	King of Lines	Section	Leased Circuit		Remarks
						Distance (km)	Needed or Not (O:Needed)	
Gentex or Telex Station	Boac	3	-	Sub. line (Cable)	To Lucena	Intra- service area		
	Bongabon	1	-	do.	To Calapan	Intra- service area		
	Calapan	3	-	do.	do.			
	Victoria	1	-	do.	do.			
	Odiongan	2	-	do.	To Romblon	Intra- service area		
	Romblon	3	-	do.	do.			
	Mamburao	1	-	do.	To S. Jose	Intra- service area		
	Sablayan	1	-	do.	do.			
	San Jose	3	-	do.	do.			

Table VII-3-2 (1/6) Amounts of Telegraph Equipment  
Installation Works (Phase II)

\* Only such numbers of lines that are different from those in the case of Phase I are given in this table.

	Station	Required No. of Lines	No. of Concentrators	Kind of Lines	Section	Leased Circuit		Remarks
						Distance (km)	Needed or Not (O:Needed)	
Telex Exchange	San Fernando	Telegraph channels 278 (2)	10	Trunk (TDM)	To Manila	57	O	PLDT, TC, LE
	Batangas	269 (2)	13	do.	do.	100	O	RETELCO
Concentrator	Balanga	16 (1)	1	do.	To S. Fernando	42	O	RETELCO
	Cabanatuan	27 (1)	1	do.	do.	57	O	RETELCO
	Tarlac	22 (1)	1	do.	do.	54	O	PLDT, LE, TC
	Malolos	72 (2)	2	do.	do.	23	O	RETELCO
	Olongapo	43 (1)	1	do.	do.	49	O	PILTEL
	Iba	5 (1)	1	do.	do.	54	O	Iba-Tarlac-S.F.P.
	Calapan	5 (1)	1	do.	To Batangas	7	O	Calapan Tel. Sys.
	Romblon	10 (1)	1	do.	do.			
	San Jose	9 (1)	1	do.	do.			
	Taytay	78 (2)	2	do.	do.	116	O	RETELCO (From Cainta)
	Calamba	54 (2)	2	do.	do.	50	O	RETELCO
	Cavite	19 (1)	1	do.	do.	117	O	Filipinas Tel. Co.
	P. Princessa	9 (1)	1	do.	do.	7	O	PILTEL
	Lucena	36 (1)	1	do.	do.	7	O	PLDT, LE
Gentex or Telex Station*	Balanga	Telephone lines (2W) 5	-	Subs. line (Cable)	To Balanga	Intra-service area		
	Mariveles	2	-	do.	do.	28	O	RETELCO
	Limay	8	-	do.	do.	14	O	RETELCO
	Orion	1	-	do.	do.	8	O	PLDT. IPTS (x-5)

Table VII-3-2 (2/6) Amounts of Telegraph Equipment  
Installation Works (Phase II)

	Station	Required No. of Lines	No. of Concen- trators	Kind of Lines	Section	Leased Circuit		Remarks
						Distance (km)	Needed or Not (O: Needed)	
Centex or Telex Station	Cabanatuan	10	-	Subs. line (Cable)	To Cabanatuan	Intra- service area		
	Gapan	1	-	do.	do.	20	O	PLDT, LE
	Lupao	1	-	do.	do.	44	O	PLDT, LE (x-4)
	Munos	1	-	do.	do.	26	O	do.
	Palayan	1	-	do.	do.	15	O	do.
	Rizal	1	-	do.	do.	30	O	PLDT.TC(x-5)
	Talavera	1	-	do.	do.	13	O	PLDT.LE(x-4)
	S. Leonardo	1	-	do.	do.	14	O	do.
	Sto. Domingo	1	-	do.	do.	15	O	do.
	Baler	1	-	do.	do.			
	Guagua	9	-	do.	To S.Fernando	10	O	Filipinas Tel. Co.
	Angeles	42	-	do.	do.	16	O	Evang Elista Tel. Co.
	San Fernando	38	-	do.	do.	Intra- service area		
	Apalit	1	-	do.	do.	12	O	Valencia Tel. Co.
	Lubao	1	-	do.	do.	15	O	PLDT.LE(x-4)
	Tarlac	16	-	do.	To Tarlac	Intra- service area		
	Camiling	1	-	do.	do.	30	O	PLDT.LE
	Concepcion	1	-	do.	do.	20	O	do.
	Paniqui	1	-	do.	do.	20	O	PLDT.LE(x-4)
	Moncada	1	-	do.	do.	26	O	PLDT.LE(X-4)
Victoria	1	-	do.	do.	14	O	PLDT.IPTS (x-4)	

Table VII-3-2 (3/6) Amounts of Telegraph Equipment

## Installation Works (Phase II)

	Station	Required No. of Lines	No. of Concentrators	Kind of Lines	Section	Leased Circuit		Remarks	
						Distance (km)	Needed or Not (O:Needed)		
Centex or Telex Station	Baliuag	8	-	Subs. line (Cable)	To Malolos	15	O	RETELCO	
	Hagonoy	11	-	do.	do.	8	O	RETELCO	
	Malolos	12	-	do.	do.	Intra-service area			
	Balagtas	1	-	do.	do.	9	O	DELASIS	
	Bocaue	1	-	do.	do.	14	O	Radio City Tel.Sys.	
	Calumpit	1	-	do.	do.	9	O	PLDT.LE(x-4)	
	Marilao	1	-	do.	do.	18	O	Radio City Tel. Sys.	
	Meycauyan	18	-	do.	do.	21	O	Meycauyan Tel. Sys.	
	Plaridel	1	-	do.	do.	7	O	From Malolos	
	Pulilan	1	-	do.	do.	7	O	PLDT.LE(x-4)	
	S. Miguel	1	-	do.	do.	36	O	PLDT.LE	
	Sta. Maria	15	-	do.	do.	19	O	Radio City Tel.Sys.	
	Olongapo	41	-	do.	To Olongapo	Intra-service area			
	S. Antonio	1	-	do.	do.	25	O	PLDT.LE(x-4)	
	Subic	1	-	do.	do.	8	O	PILTEL	
	Masinloc	2	-	do.	To Iba	25	O	PLDT.TC(x-5)	
	Sta. Cruz	1	-	do.	do.	50	O	PLDT.LE(x-4)	
	Batangas	16	-	do.	To Batangas	Intra-service area			
	Bauan	7	-	do.	do.	6	O	RETELCO (From Batangas)	



Table VII-3-2 (4/6) Amounts of Telegraph Equipment  
Installation Works (Phase II)

	Station	Required No. of Lines	No. of Concen- trators	Kind of Lines	Section	Leased Circuit		Remarks
						Distance (km)	Needed or Not (O:Needed)	
Gentex or Telex Station	Lipa	7	-	Subs. line (Cable)	To Batangas	23	O	RETELCO
	Nasugubu	6	-	do.	do.	57	O	PLDT.TC(x-4)
	Balayan	3	-	do.	do.	40	O	Western Tel.
	F. Air Base	1	-	do.	do.	20	O	Western Tel.
	Lemery	1	-	do.	do.	22	O	Western Tel. (From Taal)
	Rosario	1	-	do.	do.	19	O	PLDT.IPTS (x-4)
	S. Jose	1	-	do.	do.	15	O	PLDT.IPTS. (x-5)
	Tanauan	3	-	do.	do.	36	O	RETELCO
	S. Juan	1	-	do.	do.	37	O	PLDT.IPTS (x-4)
	Binan	9	-	do.	To Calamba	16	O	Independent Tel. Co.
	Cabuyao	1	-	do.	do.	9	O	RETELCO (From Calamba)
	Calamba	18	-	do.	do.	Intra- service area		
	College	2	-	do.	do.	10	O	RETELCO
	Kalayaan	1	-	do.	do.			
	Liliw	1	-	do.	do.	35	O	PLDT.IPTS (x-5)
	Los Banos	1	-	do.	do.	10	O	RETELCO
	Mabitac	1	-	do.	do.			
	Magdalena	1	-	do.	do.	30	O	PLDT.IPTS (x-5)
	Majayjay	1	-	do.	do.	35	O	do.
	San Pablo	16	-	do.	do.	23	O	PLDT.TC
San Pedro	1	-	do.	do.	21	O	RETELCO(x-5)	
Sta. Cruz	1	-	do.	do.	30	O	RETELCO	

Table VII-3-2 (5/6) Amounts of Telegraph Equipment

## Installation Works (Phase II)

	Station	Required No. of Lines	No. of Concentrators	Kind of Lines	Section	Leased Circuit		Remarks
						Distance (km)	Needed or Not (O:Needed)	
Gentex or Telex Station	Infanta	1	-	Subs. line (Cable)	To Calamba	173	O	PLDT.LE(x-4)
	Cavite	10	-	do.	To Cavite	Intra-service area		
	Imus	4	-	do.	do.	7	O	Filipinas Tel. Co.
	Tagaytay	4	-	do.	do.	45	O	PLDT.LE(x-4)
	Tanza	1	-	do.	do.	12	O	CEDA (From G.Trias)
	San Fernando	2	-	do.	To Romblon			
	Alcantara	1	-	do.	do.			
	Banton	1	-	do.	do.			
	Looc	1	-	do.	do.			
	P.Princesa	6	-	do.	To P. Princesa			
	Coron	1	-	do.	do.			
	Culion	1	-	do.	do.			
	El Nido	1	-	do.	do.			
	Gasán	1	-	do.	To Lucena			
	Calauag	1	-	do.	do.	73	O	PLDT.IPTS (x-4)
	Candelaria	5	-	do.	do.	20	O	PLDT.LE(x-5)
	Lucena	14	-	do.	do.	Intra-service area		
	Catanauan	1	-	do.	do.			
	G. Luna	1	-	do.	do.			
Gunaca	3	-	do.	do.	52	O	Jaime Ramos Tel. Co.	
Guinayangan	1	-	do.	do.				

Table VII-3-2 (6/6) Amounts of Telegraph Equipment  
Installation Works (Phase II)

	Station	Required No. of Lines	No. of Concen- trators	Kind of Lines	Section	Leased Circuit		Remarks
						Distance	Needed or Not (O:Needed)	
Gentex or Telex Station	Unisan	1	-	Subs. line (Cable)	To Lucena			
	Lopez	1	-	do.	do.	70	o	PLDT.LE(x-5)
	Macalelon	1	-	do.	do.			
	Mauban	1	-	do.	do.	30	o	PLDT.LE(x-4)
	Mulanay	1	-	do.	do.			
	Pitogo	1	-	do.	do.			
	San Jose	5	-	do.	To San Jose	Intra- service area		
	Paluan	1	-	do.	do.			
	Sta. Cruz	1	-	do.	do.			
	Antipolo	14	-	do.	To Taytay	5	o	RETELCO (From Cainta)
	Cainta	38	-	do.	do.	3	o	RETELCO
	Tanay	6	-	do.	do.	18	o	RETELCO
	Taytay	20	-	do.	do.	Intra- service area		

#### 4. Outside Plants

##### 4-1 Local Cables

The amounts of outside plants for local cable have been determined on the principles introduced in facility planning so as to meet the demand of 1996. The amount of cable works for each exchange office has been determined through calculation by the following equations in consideration of the design, etc., being made by BUTEL.

$$\begin{aligned} & \text{No. of cable entrance pairs} \\ & = (\text{Demand to be made by 1996}) \times 1.5 \end{aligned}$$

$$\begin{aligned} & \text{Amount of cable work (km)} \\ & = \frac{\text{No. of cable entrance pairs}}{100 \text{ pairs}} \times 1.2 \end{aligned}$$

In principle, cable entrance to LE is to be made by using conduit cable. For IPTSS, the cable length to be laid is 1km and cable entrance to the exchange is to be made by using aerial cable.

The amounts of cable works to be carried out for individual exchange offices are given in Table VII-4-1-1.

To summarize, the amounts of main works to be accomplished in Phases I and II are as follows.

Table VII-4-1-1(1/7) Local Cable Plan for Region III (Phase I)

Province	City/ Municipality	Type of Exchange	Cable Length (km)	No. of Tel. Sets	No. of Manholes	Conduit Length (m)
Nueva Ecija	Aliaga	LE	6	200	1	50
	Cabiao	LE	6	190	1	50
	Jaen	LE	8	260	1	50
	Pantabangan	LE	6	200	1	50
	Quezon	IPTS	1	40	0	0
	San Antonio	LE	7	250	1	50
	Santa Rosa	LE	6	210	1	50
	Zaragoza	IPTS	1	40	0	0
Tarlac	Gerona	LE	8	290	1	50
	La Paz	LE	7	250	1	50
Zambales	Botolan	LE	7	230	1	50
	Iba	LE	9	300	1	50
Pampanga	Magalang	LE	5	190	1	50
	Porac	LE	8	270	1	50
	Saxmoan	IPTS	1	40	0	0
Bulacan	Angat	LE	8	280	1	50
	Bulaçan	LE	8	260	1	50
	Pandi	LE	5	160	1	50
	San Ildefonso	LE	9	320	1	50
	San Rafael	LE	6	200	1	50
Bataan	Abucay	LE	6	220	1	50
	Dinalupihan	LE	10	360	1	50
	Samal	LE	6	200	1	50
	Total	23	144	4,960	20	1,000

Table VII-4-1-1 (2/7) Local Cable Plan for Region IV (Phase I)

Province	City/ Municipality	Type of Exchange	Cable Length (km)	No. of Tel. Sets	No. of Manholes	Conduit Length (m)
Batangas	Agoncillo	IPTS	1	40	0	0
	Calaca	LE	5	170	1	50
	Ibaan	LE	9	300	1	50
	Padre Garcia	IPTS	1	40	0	0
Occ. Mindoro	Lubang	IPTS	1	40	0	0
	Mamburao	LE	5	160	1	50
	Sabluyan	LE	9	300	1	50
	San Jose	LE	21	750	1	50
Or. Mindoro	Bongabong	LE	9	310	1	50
	Gloria	IPTS	1	40	0	0
	Naujan	LE	7	230	1	50
	Puerto Galera	IPTS	1	40	0	0
	Roxas	LE	6	200	1	50
	Socorro	IPTS	1	40	0	0
	Victoria	LE	6	200	1	50
Romblon	Odiongan	LE	5	180	1	50
	Romblon	LE	5	170	1	50
	San Agustin	IPTS	1	40	0	0
	Total	18	94	3,250	11	550
	Phase I G. Total	41	238	8,210	31	1,550



Table VII-4-1-1 (4/7) Local Cable Plan for Region IV (Phase II)

Province	City/ Municipality	Type of Exchange	Cable Length (km)	No. of Tel. Sets	No. of Manholes	Conduit Length (m)
Cavite	Magallanes	IPTS	1	40	0	0
	Ternate	IPTS	1	40	0	0
Laguna	Kalayaan	IPTS	1	40	0	0
	Mabitac	IPTS	1	40	0	0
	Pakil	IPTS	1	40	0	0
	Pangil	IPTS	1	40	0	0
	Pila	IPTS	1	40	0	0
	Rizal	IPTS	1	40	0	0
	Siniloan	IPTS	1	40	0	0
	Victoria	IPTS	1	40	0	0
Batangas	Alitagtag	IPTS	1	40	0	0
	Balite	IPTS	1	40	0	0
	Laurel	IPTS	1	40	0	0
	Lobo	IPTS	1	40	0	0
	Mataasmakahoy	IPTS	1	40	0	0
	San Luis	IPTS	1	40	0	0
	San Nicolas	IPTS	1	40	0	0
	Santa Teresita	IPTS	1	40	0	0
	Taysan	IPTS	1	40	0	0
	Tingloy	IPTS	1	40	0	0
	Tuy	IPTS	1	40	0	0
Quezon	Agdangan	IPTS	1	40	0	0
	Alabat	IPTS	1	40	0	0
	Buenavista	IPTS	1	40	0	0
	Burdeos	IPTS	1	40	0	0
	Catanauan	LE	11	480	1	50
	Dolores	IPTS	1	40	0	0



Table VII-4-1-1 (5/7) Local Cable Plan for Region IV (Phase II)

Province	City/ Municipality	Type of Exchange	Cable Length (km)	No. of Tel. Sets	No. of Manholes	Conduit Length (m)
Quezon	General Luna	IPTS	1	40	0	0
	General Nakar	IPTS	1	40	0	0
	Guinayangan	LE	5	240	1	50
	Jumalig	IPTS	1	40	0	0
	Macalelon	IPTS	1	40	0	0
	Mulanay	LE	5	230	1	50
	Panukulan	IPTS	1	40	0	0
	Patnanangan	IPTS	1	40	0	0
	Perez	IPTS	1	40	0	0
	Pitogo	IPTS	1	40	0	0
	Plaridel	IPTS	1	40	0	0
	Polillo	IPTS	1	40	0	0
	Quezon	IPTS	1	40	0	0
	Real	IPTS	1	40	0	0
	San Andres	IPTS	1	40	0	0
	San Antonio	IPTS	1	40	0	0
	San Francisco	IPTS	1	40	0	0
	San Narciso	LE	5	240	1	50
	Unisan	LE	4	200	1	50
	Baler	IPTS	1	40	0	0
	Casiguran	IPTS	1	40	0	0
	Dilasag	IPTS	1	40	0	0
	Dinalongan	IPTS	1	40	0	0
	Dingalan	IPTS	1	40	0	0
Dipaculao	IPTS	1	40	0	0	
Maria Aurora	IPTS	1	40	0	0	
San Luis	IPTS	1	40	0	0	

Table VII-4-1-1 (6/7) Local Cable Plan for Region IV (Phase II)

Province	City/ Municipality	Type of Exchange	Cable Length (km)	No. of Tel. Sets	No. of Manholes	Conduit Length (m)
Occ. Mindoro	Abra de Ilog	IPTS	1	40	0	0
	Calintaan	IPTS	1	40	0	0
	Looc	IPTS	1	40	0	0
	Magsaysay	IPTS	1	40	0	0
	Paluan	IPTS	1	40	0	0
	Rizal	IPTS	1	40	0	0
	Santa Cruz	IPTS	1	40	0	0
Or. Mindoro	Baco	IPTS	1	40	0	0
	Bansud	IPTS	1	40	0	0
	Bulalacao	IPTS	1	40	0	0
	Mansalay	IPTS	1	40	0	0
	Pola	IPTS	1	40	0	0
	San Teodoro	IPTS	1	40	0	0
Romblon	Alcantara	IPTS	1	40	0	0
	Banton	IPTS	1	40	0	0
	Cajidiocan	IPTS	1	40	0	0
	Calatrava	IPTS	1	40	0	0
	Concepcion	IPTS	1	40	0	0
	Corcuera	IPTS	1	40	0	0
	Looc	IPTS	1	40	0	0
	Magdiwang	IPTS	1	40	0	0
	San Andres	IPTS	1	40	0	0
	San Fernando	IPTS	1	40	0	0
	San Jose	IPTS	1	40	0	0
	Santa Fe	IPTS	1	40	0	0
Pala- wan	Aborlan	IPTS	1	40	0	0
	Agutaya	IPTS	1	40	0	0

Table VII-4-1-1 (7/7) Local Cable Plan for Region IV (Phase II)

Province	City/ Municipality	Type of Exchange	Cable Length (km)	No. of Tel. Sets	No. of Manholes	Conduit Length (m)
Palawan	Araceli	IPTS	1	40	0	0
	Balabac	IPTS	1	40	0	0
	Batarasa	IPTS	1	40	0	0
	Busuanga	IPTS	1	40	0	0
	Cagayancillo	IPTS	1	40	0	0
	Coron	IPTS	1	40	0	0
	Cuyo	IPTS	1	40	0	0
	Dumaran	IPTS	1	40	0	0
	El Nido Bacuit	IPTS	1	40	0	0
	Linapacan	IPTS	1	40	0	0
	Magsaysay	IPTS	1	40	0	0
	Narra Aborlan	IPTS	1	40	0	0
	Quezon	IPTS	1	40	0	0
	San Vicente	IPTS	1	40	0	0
	Taytay	IPTS	1	40	0	0
	Total	96	121	5,030	5	250
	Phase II G. Total	110	135	5,590	5	250

Amounts of Main Works to Be Accomplished in Phase I

Item Region	Cable Length (km)	No. of Poles	No. of Manholes	Conduit Length (km)
Region III	144	1,008	20	1.00
Region IV	94	658	11	0.55
Total	238	1,666	31	1.55

Amounts of Main Works to Be Accomplished in Phase II

Item Region	Cable Length (km)	No. of Poles	No. of Manholes	Conduit Length (km)
Region III	12	98	0	0
Region IV	121	672	5	0.25
Total	133	770	5	0.25

4-2 Trunk Cables

The system design of trunk cables has been made on the basis of the transmission standard and the principles for facility planning so as to meet traffic to be demanded between exchange offices in 2001.

Trunk cable configurations to be employed are shown in Table VII-4-2-1.

Table VII-4-2-1(1/6) Trunk Cable Plan for Region III (Phase I)

Section	No. of Trunks	No. of PCM Systems	No. of Cable Pairs	Cable Length	Line Configuration
Cabanatuan	Cabanatuan -- Santa Rosa PC LE	25	14	9.0 km	0.65 PEF-LAP PCM PC ———— LE
	Jaen -- San Antonio LE LE	27	14	9.0 km	0.65 PEF-LAP PCM LE ———— LE
	Quezon -- Aliaga IPTS LE	25	14	7.0 km	0.65 PEF-LAP PCM IPTS ———— LE
Tarlac	Tarlac -- Tarlac RS PC	198	28	2.0 km	0.65 PEF-LAP PCM RS ———— PC
San Fernando	San Fernando -- San Fernando RS SC	203	28	0.4 km	0.65 PEF-LAP PCM RS ———— SC
	Porac -- Porac RS LE	30	14	1.0 km	0.65 PEF-LAP PCM RS ———— LE
	Samal -- Abucay LE LE	25	14	6.1 km	0.65 PEF-LAP PCM LE ———— LE

Table VII-4-2-1(2/6) Trunk Cable Plan for Region III (Phase I)

Section	No. of Trunks	No. of PCM Systems	No. of Cable Pairs	Cable Length	Line Configuration
Pandi -- Pandi RS PC	175	8+1 <sup>s</sup>	28	6.0 km	0.65 PEF-LAP PCM O ————— O RS PC
Pandi -- Angat RS LE	28	1+1 <sup>s</sup>	14	6.5 km	0.65 PEF-LAP PCM O ————— O RS LE
Total				47 km	9 Sections

Table VII-4-2-1 (3/6) Trunk Cable Plan for Region IV (Phase I)

Section	No. of Trunks	No. of PCM Systems	No. of Cable Pairs	Cable Length	Line Configuration
Manila -- Manila (Sampaloc) RS SC	1,642	70+1 <sup>s</sup>	200	3.6 km	0.65PEF-LAP PCM RS — SC
	12	-	14	3.8 km (7.4)	0.65PEF-LAP NL SC — P.O. (Telegraph)
Lucena -- Lucena RS PC	376	15+1 <sup>s</sup>	38	1.5 km	0.65PEF-LAP PCM RS — PC
Calapan -- Calapan RS PC	612	31+1 <sup>s</sup>	74	6.0 km	0.65PEF-LAP PCM RS — PC
Puerto Galera -- Puerto Galera RS IPTS	6	-	8	0.3 km	0.65PEF-LAP NL RS — IPTS
Bongabon -- Bongabon RS LE	30	1+1 <sup>s</sup>	14	6.0 km	0.65PEF-LAP PCM RS — LE
Romblon -- Romblon RS LE	22	1+1 <sup>s</sup>	14	4.0 km	0.65PEF-LAP PCM RS — LE
San Jose -- San Jose RS PC	466	24+1 <sup>s</sup>	74	6.0 km	0.65PEF-LAP PCM RS — PC
Total				31.2 km	8 sections
Phase I G. Total				78.2 km	17 sections

Table VII-4-2-1 (4/6) Trunk Cable Plan for Region III (Phase II)

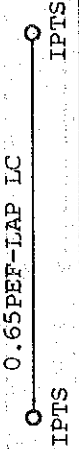
Section	No. of Trunks	No. of PCM Systems	No. of Cable Pairs	Cable Length	Line Configuration
Cabana- tuan Gabaldon -- Dingalan IPTS	6	-	8	12.0 km	 0.65PEF-LAP LC IPTS ————— IPTS
Total				12.0 km	1 section



Table VII-4-2-1 (5/6) Trunk Cable Plan for Region IV (Phase II)

Section	No. of Trunks	No. of PCM Systems	No. of Cable Pairs	Cable Length	Line Configuration	
Unisan	Unisan -- Unisan RS PC	437	22+1 <sup>s</sup>	54	5.0 km	0.65PEF-LAP PCM RS ○-----○ PC
	Unisan -- Agdangan PC IPTS	6	-	8	8.5 km	0.65PEF-LAP LC PC ○-----○ IPTS
	Plaridel -- Plaridel RS IPTS	6	-	8	3.5 km	0.65PEF-LAP NL RS ○-----○ IPTS
	Pitogo -- Macalelon IPTS IPTS	6	-	8	7.0 km	0.65PEF-LAP LC IPTS ○-----○ IPTS
	Catanauan -- General Luna RS IPTS	6	-	8	16.3 km	0.65PEF-LAP LC RS ○-----○ IPTS
	Catanauan -- Catanauan RS LE	35	2+1 <sup>s</sup>	14	10.0 km	0.65PEF-LAP PCM RS ○-----○ LE
	Mulanay -- Mulanay RS LE	23	1+1 <sup>s</sup>	14	3.0 km	0.65PEF-LAP PCM RS ○-----○ LE
	Alcantara -- (Branch Point) IPTS B.P.	18	-	28	4.5 km	0.65PEF-LAP LC IPTS ○-----○ B.P.
	(Branch Point) -- Looc B.P. IPTS	6	-	8	4.5 km (9.0)	0.65PEF-LAP LC B.P. ○-----○ IPTS
	Calapan					

Table VII-4-2-1 (6/6) Trunk Cable Plan for Region IV (Phase II)

Section	No. of Trunks	No. of PCM Systems	No. of Cable Pairs	Cable Length	Line Configuration
Calapan	(Branch Point) -- Santa Fe B.P. IPTS	12	14	10.2 km (14.7)	0.65PEF-LAP LC B.P. IPTS
	San Fernando -- Cajidiocan IPTS	6	8	12.0 km	0.65PEF-LAP LC IPTS IPTS
San Jose	Coron -- Coron RS IPTS	6	8	9.0 km	0.65PEF-LAP LC RS IPTS
	Dumaran -- Dumaran RS IPTS	6	8	3.0 km	0.65PEF-LAP NL RS IPTS
	Cuyo -- Magsaysay IPTS	6	8	5.0 km	0.65PEF-LAP LC IPTS IPTS
Total				101.5 km	14 sections
Phase II G. Total				113.5 km	15 sections

Legend

RS: Radio Station  
 SC: Secondary Center  
 PC: Primary Center  
 LE: Local Exchange  
 P.O.: Post Office (Telex Center)  
 B.P.: Branch Point

IPTS: Inter Provincial Telephone Station  
 PCM: PCM  
 NL: No Load Cable  
 LC: Load Cable

To summarize, the amounts of main works to be accomplished in Phases I and II are as follows.

Amounts of Main Trunk Cable Works in Phase I

Region \ Item	Trunk Cable	
	No. of Sections	Cable Length (km)
Region III	9	47
Region IV	8	31.2
Total	17	78.2

Note: Those works to be accomplished between Manila R.S. and Manila SC and between Manila R.S. and Post Office (PO) are to be included in Region IV.

Amounts of Main Trunk Cable Works in Phase II

Region \ Item	Trunk Cable	
	No. of Sections	Cable Length (km)
Region III	1	12.0
Region IV	14	101.5
Total	15	113.5

4-3 Subscriber's Facility

The subscriber's facility is to range from the

terminal box (distribution box) to the telephone set. In more detail, it is to include the drop wire to pass from the terminal box to the arrester, the house wire from the arrester to the rosette of the telephone set, and the telephone cord from the rosette to the telephone set. As many subscriber's facilities as will meet the demand of 1991 are to be installed in Phase I and as many subscriber's facilities as will meet the demand of 1994 are to be installed in Phase II. The number of subscribers to be served in Phase I and that in Phase II are given in the following tables where each IPTS is to accommodate 40 subscribers.

Number of Subscribers to Be Served in Phase I

Item Region	Number of Subscribers		
	LE	IPTS	Total
Region III	4,840	120	4,960
Region IV	2,970	280	3,250
Total	7,810	400	8,210

Number of Subscribers to Be Served in Phase II

Item Region	Number of Subscribers		
	LE	IPTS	Total
Region III	0	480	480
Region IV	1,390	3,640	5,030
Total	1,390	4,120	5,510

## 5. Power Plants

Commercial power is to be used as the basic power supply and one engine generator is to be provided for stand-by use. Accordingly, commercial power is to be led to such radio repeater stations atop hills/mountains that are not fed with commercial power for the time being and that are located within about 4km in power cable lead-in length in consideration of convenience of operation and maintenance. Power line is to be led to the following stations.

### Phase I

Catanpacan R.S.	1.0 km
Puerto Galera R.S.	0.2 km
Calapan R.S.	1.0 km
Bongabong R.S.	1.0 km
San Jose R.S.	0.2 km

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Total length: 3.4 km

### Phase II

Unisan R.S.	4.0 km
Plaridel R.S.	2.0 km
Tagkawayan R.S.	3.0 km
Mulanay R.S.	0.1 km
Catanauan R.S.	0.1 km

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Total length: 9.2 km

Exchange and transmission equipments are to be operated from -48V power and the basic power plant is to supply

-48V power. +60V power necessary for concentrators are to be obtained from -48V power through a DC-DC converter.

At other stations/offices not expected to be fed with commercial power by the commencement of the construction of this project, two engine generators are to be furnished. The following stations/offices are to be furnished with a mobile generator in consideration of their geometrical conditions.

Phase I	Cabanatuan
	San Fernando
	Batangas
	Calapan
Phase II	Unisan
	Puerto Princesa

Power plants to be installed at individual stations/offices are given in Table VII-5-1 (Phase I) and Table VII-5-2 (Phase II).

Table VII-5-1 (1/5) Power Plant Plan for Individual  
Offices/Stations (Phase I)

Equipment Office/Station	Telecom. Facilities			Power Plant		
	Telephone Exchange	Telegraph Equipment	Trans- mission Equipment	Recti- fier (A)	Battery (AH)	Engine Generator (KVA)
Nueva Ecija						
Aliaga	LE			60	400	10
Cabanatuan	TS	Conc.	S, V/U, M	230	1000	25
Cabiao	LE		V/U, M	80	520	15
Jaen	LE		V/U, M	80	520	15
Pantabangan	LE		V/U, M	80	600	10
Quezon	IPTS		V/U, M	50	220	5
San Antonio	LE			60	400	10
Santa Rosa	LE		M	100	400	15
Zaragosa	IPTS		V/U	40	220	3
Tarlac						
Gerona	LE		V/U, M	80	520	10
La Paz	LE		V/U, M	80	520	10
Tarlac		Conc.		10	50	
Tarlac R.S.			V/U, M	30	200	7
Zambales						
Botolan	LE		M	60	400	10
Iba	LE	Conc.	M	90	570	15
Olongapo		Conc.		10	50	

Table VII-5-1 (2/5) Power Plant for Individual  
Offices/Stations (Phase I)

Equipment Office/ Station	Telecom. Facilities			Power Plant		
	Telephone Exchange	Telegraph Equipment	Trans- mission Equipment	Recti- fier (A)	Battery (AH)	Engine Generator (KVA)
Pampanga						
Magalang	LE		V/U, M	80	520	10
Porac	LE		M	80	520	10
Porac R.S.			V/U, M	30	120	5
San Fernando R.S.		ex. Conc. (10)	V/U, M	100	520	10
Sexmoan	IPTS		V/U	40	220	3
Bulacan						
Angat	LE		M	60	400	10
Bulacan	LE		V/U, M	80	520	10
Catanpacan R.S.			S	50	500	10
Malolos		Conc. (2)		20	100	
Pandi	TS+LE		M	250	1300	25
Pandi R.S.			S, V/U, M	50	500	10
San Ildefonso	LE		V/U, M	80	520	10
San Rafael	LE		V/U, M	80	520	10
Bataan						
Abucay	LE		M	60	400	10
Balanga		Conc.		10	50	
Dinalupihan	TS+LE		V/U, M	220	920	15
Samal	LE		V/U, M	80	520	10



Table VII-5-1 (3/5) Power Plant Plan for Individual  
Offices/Stations (Phase I)

Equipment Office/ Station	Telecom. Facilities			Power Plant		
	Telephone Exchange	Telegraph Equipment	Trans- mission Equipment	Recti- fier (A)	Battery (AH)	Engine Generator (KVA)
Metro Manila						
Manila R.S.			S, V/U, M	50	500	13
Cavite						
Mt. Gonzales R. S.			S, V/U, M	80	800	13
Batangas						
Angoncillo	IPTS		V/U	40	220	3
Batangas	TS	ex. Conc. (5)	S, M	400	1800	30
Calaca	LE		V/U, M	80	520	10
Ibaan	LE		V/U, M	80	520	10
Mt. Banoy R.S.			S, V/U, M	80	800	13(D)
Padre Garcia	IPTS		V/U	40	220	3
Quezon						
Lucena R.S.			S, V/U, M	30	250	7
Marinduque						
Marinduque R.S.			S, M	80	800	13(D)

Table VII-5-1 (4/5) Power Plant Plan for Individual  
Offices/Stations (Phase I)

Equipment Office/ Station	Telecom. Facilities			Power Plant		
	Telephone Exchange	Telegraph Equipment	Trans- mission Equipment	Recti- fier (A)	Battery (AH)	Engine Generator (KVA)
Occ. Mindoro						
Cabacao R.S.			V/U, M	30	200	5(D)
Lubang	IPTS		V/U	40	220	3
Mamburao	LE		V/U, M	80	520	10
Sablayan	LE		V/U, M	80	520	10
Sablayan R.S.			V/U, M	50	400	7(D)
San Jose	TS+LE	Conc.	M	230	970	25
San Jose R.S.			V/U, M	50	500	13
Or. Mindoro						
Bongabong	LE		M	80	520	10
Bongabong R.S.			V/U, M	30	120	5
Calapan	TS	Conc.	M	240	970	25
Calapan R.S.			S, V/U, M	50	500	13
Gloria	IPTS		V/U, M	50	220	5
Mt. Dumali R.S.			S, V/U, M	80	800	13(D)
Naujan	LE		V/U, M	80	520	10
Puerto Galera	IPTS			20	100	3
Puerto Galera R.S.			V/U	30	120	5
Roxas	LE		V/U, M	80	520	10
Socorro	IPTS		V/U	40	220	3
Victoria	LE		S, V/U, M	90	600	10



Table VII-5-2 (1/8) Power Plant Plan for Individual  
Offices/Stations (Phase II)

Equipment Office/ Station	Telecom. Facilities			Power Plant		
	Telephone Exchange	Telegraph Equipment	Trans- mission Equipment	Recti- fier (A)	Battery (AH)	Engine Generator (KVA)
Nueva Ecija						
Carranglan	IPTS		V/U	40	220	3
Gabaldon	IPTS		V/U, M	40	220	3
Nampicuan	IPTS		V/U	40	220	3
Natividad	IPTS		V/U	40	220	3
Penaranda	IPTS		V/U	40	220	3
Tarlac						
Anao	IPTS		V/U	40	220	3
Mayantoc	IPTS		V/U	40	220	3
Ramos	IPTS		V/U	40	220	3
San Manuel	IPTS		V/U	40	220	3
Pampanga						
San Simon	IPTS		V/U	40	220	3

Table VII-5-2 (2/8) Power Plant Plan for Individual  
Offices/Stations (Phase II)

Equipment Office/ Station	Telecom. Facilities			Power Plant		
	Telephone Exchange	Telegraph Equipment	Trans- mission Equipment	Recti- fier (A)	Battery (AH)	Engine Generator (KVA)
Bataan						
Bagac	IPTS		V/U	40	220	3
Mt. Samat R.S.			V/U	30	200	5 (D)
Pilar	IPTS		V/U	40	220	3
Cavite						
Cavite		Conc.		10	50	
Magallanes	IPTS		V/U	40	220	3
Ternate	IPTS		V/U	40	220	3
Rizal						
Taytay		Conc. (2)		20	100	
Laguna						
Calamba		Conc. (2)		20	100	
Kalayaan	IPTS		V/U	40	220	3
Mabitac	IPTS		V/U	40	220	3
Paete R.S.			V/U, M	30	200	5 (D)
Pakil	IPTS		V/U	40	220	3
Pangil	IPTS		V/U	40	220	3
Pila	IPTS		V/U	40	220	3
Rizal	IPTS		V/U	40	220	3
Siniloan	IPTS		V/U	40	220	3

Table VII-5-2 (3/8) Power Plant Plan for Individual  
Offices/Stations (Phase II)

Equipment Office/ Station	Telecom. Facilities			Power Plant		
	Telephone Exchange	Telegraph Equipment	Trans- mission Equipment	Recti- fier (A)	Battery (AH)	Engine Generator (KVA)
Victoria	IPTS		V/U	40	220	3
Batangas						
Alitagtag	IPTS		V/U	40	220	3
Balite	IPTS		V/U	40	220	3
Laurel	IPTS		V/U	40	220	3
Lobo	IPTS		V/U	40	300	5(D)
Mataasnakahoy	IPTS		V/U	40	220	3
San Luis	IPTS		V/U	40	220	3
San Nicolas	IPTS		V/U	40	220	3
Sta. Teresita	IPTS		V/U	40	220	3
Taysan	IPTS		V/U	40	220	3
Tingloy	IPTS		V/U	40	220	3
Tuy	IPTS		V/U	40	220	3
Quezon						
Agdangan	IPTS			40	100	3
Alabat	IPTS		V/U, M	50	220	5
Buenavista	IPTS		V/U	40	220	3
Burdeos	IPTS		V/U	40	300	5(D)
Catanauan	LE		M	60	520	10
Catanauan R.S.			V/U, M	30	200	5
Dolores	IPTS		V/U	40	220	3

Table VII-5-2 (4/8) Power Plant Plan for Individual  
Offices/Stations (Phase II)

Equipment Office Station	Telecom. Facilities			Power Plant		
	Telephone Exchange	Telegraph Equipment	Trans- mission Equipment	Recti- fier (A)	Battery (AH)	Engine Generator (KVA)
General Luna	IPTS			20	100	3
General Nakar	IPTS		V/U	40	220	3
Guinayangan	LE		V/U, M	80	520	10
Jumalig	IPTS		V/U	40	300	5 (D)
Lucena		Conc.		10	50	
Macalelon	IPTS			20	100	3
Mulanay	LE		M	60	520	10
Mulanay R.S.			V/U, M	30	200	5
Panukulan	IPTS		V/U	40	300	5 (D)
Patnanangan	IPTS		V/U	40	300	5 (D)
Perez	IPTS		V/U	40	220	3
Pitogo	IPTS		V/U, M	50	220	5
Plaridel	IPTS			20	100	3
Plaridel R.S.			V/U, M	30	200	5 (D)
Polillo	IPTS		V/U	40	300	5 (D)
Polillo R.S.			V/U, M	30	200	5
Quezon	IPTS		V/U	40	220	3
Real	IPTS		V/U	40	220	3
San Andres	IPTS		V/U	40	220	3
San Antonio	IPTS		V/U	40	220	3
San Francisco	IPTS		V/U	40	220	3
San Narciso	LE		V/U, M	80	520	10 <sup>1</sup>
Tagkawayan R.S.			V/U, M	30	200	5

Table VII-5-2 (5/8) Power Plant Plan for Individual  
Offices/Stations (Phase II)

Equipment Office/ Station	Telecom. Facilities			Power Plant		
	Telephone Exchange	Telegraph Equipment	Trans- mission Equipment	Recti- fier (A)	Battery (AH)	Engine Generator (KVA)
Unisan	TS+LE		M	220	920	25
Unisan R.S.			V/U, M	50	240	7
Quezon (Aurora)						
Baler	IPTS		V/U	40	220	3
Casiguran	IPTS		V/U, M	40	220	3
Dilasag	IPTS		V/U	40	220	3
Dinalongan	IPTS		V/U, M	40	220	5
Dingalan	IPTS			20	100	3
Dipaculao	IPTS		V/U, M	40	220	5
Maria Aurora	IPTS		V/U	40	220	3
Maria Aurora R.S.			V/U, M	30	200	5 (D)
San Luis	IPTS		V/U	40	220	3
Occ. Mindoro						
Abra de Ilog	IPTS		V/U	40	220	3
Calintaan	IPTS		V/U	40	220	3
Looc	IPTS		V/U	40	220	3
Magsaysay	IPTS		V/U	40	220	3
Paluan	IPTS		V/U	40	220	3
Rizal	IPTS		V/U	40	220	3
Santa Cruz	IPTS		V/U	40	220	3



Table VII-5-2 (6/8) Power Plant Plan for Individual  
Offices/Stations (Phase II)

Equipment Office/ Station	Telecom. Facilities			Power Plant		
	Telephone Exchange	Telegraph Equipment	Trans- mission Equipment	Recti- fier (A)	Battery (AH)	Engine Generator (KVA)
Or. Mindoro						
Baco	IPTS		V/U	40	220	3
Bansud	IPTS		V/U	40	220	3
Bulalacao	IPST		V/U	40	220	3
Knob Peak R.S.			S, V/U	50	400	7 (D)
Mansalay	IPTS		V/U	40	220	3
Pola	IPTS		V/U	40	220	3
San Teodoro	IPTS		V/U	40	220	3
Romblon						
Alcantara	IPTS		V/U, M	50	300	5
Banton	IPTS		V/U	40	300	5 (D)
Cajidiocan	IPTS			20	200	5 (D)
Calatrava	IPTS		V/U	40	220	3
Concepcion	IPTS		V/U	40	300	5 (D)
Corcuera	IPTS		V/U	40	300	5 (D)
Looc	IPTS			20	100	3
Magdiwang	IPTS		V/U	40	300	5 (D)
San Andres	IPTS		V/U	40	220	3
San Fernando	IPTS		V/U, M	40	300	5 (D)
San Jose	IPTS		V/U	40	300	5 (D)
Santa Fe	IPTS		V/U	40	220	3

Table VII-5-2 (7/8) Power Plant Plan for Individual  
Offices/Stations (Phase II)

Equipment Office/ Station	Telecom. Facilities			Power Plant		
	Telephone Exchange	Telegraph Equipment	Trans- mission Equipment	Recti- fier (A)	Battery (AH)	Engine Generator (KVA)
Palawan						
Aborlan	IPTS		V/U	40	220	3
Agutaya	IPTS		V/U	40	300	5 (D)
Araceli	IPTS		V/U	40	300	5 (D)
Bacuit R.S.			V/U, M	30	200	5
Balabac	IPTS		V/U	30	200	5 (D)
Batarasa	IPTS		V/U, M	40	220	5
Busuanga	IPTS		V/U	40	220	3
Cagayancillo	IPTS		V/U	40	300	5 (D)
Coron	IPTS			20	100	3
Coron R.S.			V/U, M	20	200	5
Cuyo	IPTS		V/U, M	40	220	5
Dumaran	IPTS			20	200	5 (D)
Dumaran R.S.			V/U, M	20	200	5 (D)
El Nido	IPTS		V/U	40	220	3
Inaquan R.S.			V/U, M	30	200	5
Linapacan	IPTS		V/U	40	300	5 (D)
Magsaysay	IPTS			20	100	3
Narra	IPTS		V/U, M	40	220	5
Panitian R.S.			V/U, M	30	200	5
Puerto Princesa		Conc.	V/U	30	170	
Quezon	IPTS		V/U	40	220	3
San Vicente	IPTS		V/U	40	220	3

Table VII-5-2 (8/8) Power Plant for Individual  
Offices/Stations (Phase II)

Office/ Station	Telecom. Facilities			Power Plant		
	Telephone Exchange	Telegraph Equipment	Trans- mission Equipment	Recti- fier (A)	Battery (AH)	Engine Generator (KVA)
Taytay	IPTS		V/U	40	220	3

Legend

- TS: Toll Switch
- LE: Local Exchange
- IPTS: Inter-Provincial Telephone Station
- EX.: Telex Exchange
- Conc.: Telex Concentrator. Figures in ( ) indicate  
No. of units.
- S: SHF radio equipment
- V/U: VHF or UHF radio equipment
- M: Multiplexer
- In the case of 6-channel radio system, M is not  
written.
- (D): Dual engine

## 6. Civil Work

### 6-1 Buildings

#### 6-1-1 Types of Building

Those types of building and rooms given in Table VII-6-1-1 are assumed to be provided for this project.

#### 6-1-2 Floor Space

Floor space estimation has been made in consideration of the following items.

- (1) For the exchange equipment room, radio-carrier equipment room, power room, and telegraph equipment room, the number of equipments, working space, etc., have been considered.
- (2) The space for the office room is to include the space for a private room for senior engineers and space for a small conference room. A floor space of about  $3 \text{ m}^2$  per personnel is to be secured.

The estimated floor spaces of individual rooms for different types of office/station buildings which have been obtained on the above-mentioned conditions are given in Table VII-6-1-2.

Table VII-6-1-3 gives the total building floor spaces to be provided in the individual provinces in Phases I and II.

Table VII-6-1-1 Floor Spaces of Individual Rooms for Different Types of Office/Station Buildings

(Unit Space = 6m x 6m)

Type of Building	Room	Exchange Equipment Room	Radio Equipment Room	Power Room	Telegraph Equipment Room	Office Room	Maint. Worker Room	Rest. Room	Store Room	Lobby	Sanitary Area, etc.	Total
A	TS+LE+R	$2\frac{1}{2}$	1	1	$1\frac{1}{2}$	$1\frac{1}{3}$	$1\frac{1}{2}$	$1\frac{1}{3}$	$1\frac{1}{2}$	1	$1\frac{1}{3}$	9 (324)
A'	TS+R	1	$\frac{2}{3}$	1	$1\frac{1}{2}$	1	$1\frac{1}{2}$	$1\frac{1}{3}$	$1\frac{1}{3}$	$1\frac{1}{3}$	$1\frac{1}{3}$	6 (216)
A''	LE+R	1	$\frac{2}{3}$	1	$1\frac{1}{2}$	1	$1\frac{1}{2}$	$1\frac{1}{3}$	$1\frac{1}{3}$	1	$1\frac{1}{3}$	$6\frac{2}{3}$ (240)
B	TS	1	-	1	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{3}$	$1\frac{1}{3}$	$1\frac{1}{3}$	$1\frac{1}{3}$	$1\frac{1}{3}$	$4\frac{2}{3}$ (168)
B'	LE	1	-	1	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{3}$	$1\frac{1}{3}$	$1\frac{1}{3}$	1	$1\frac{1}{3}$	$5\frac{1}{3}$ (192)
B''	TS+LE	$2\frac{1}{2}$	-	1	$1\frac{1}{2}$	$1\frac{1}{3}$	$1\frac{1}{2}$	$1\frac{1}{3}$	$1\frac{1}{2}$	1	$1\frac{1}{3}$	8 (288)
C	IPTS+R	-	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{3}$	$1\frac{1}{3}$	-	$1\frac{1}{3}$	-	$1\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{3}{4}$ (99)
C		-	$\frac{2}{3}$	$\frac{2}{3}$	$1\frac{1}{3}$	$1\frac{1}{3}$	-	$1\frac{1}{3}$	-	$1\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{11}{12}$ (105)
D	IPTS	-	-	$1\frac{1}{3}$	$1\frac{1}{3}$	$1\frac{1}{3}$	-	-	-	$1\frac{1}{2}$	$1\frac{1}{4}$	$3\frac{1}{4}$ (63)
E	R (attended)	-	1	$1\frac{1}{2}$	-	-	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{4}$	-	$1\frac{1}{4}$	$3\frac{3}{4}$ (132)
E'	R (un-attended)	-	$\frac{2}{3}$	$1\frac{1}{2}$	-	-	-	$1\frac{1}{4}$	-	-	$1\frac{1}{4}$	$2\frac{1}{3}$ (60)
F	TS+R+TELEX	$2\frac{1}{2}$	1	1	$1\frac{1}{2}$	1	$1\frac{1}{2}$	$1\frac{1}{3}$	$1\frac{1}{3}$	$1\frac{1}{2}$	$1\frac{1}{3}$	8 (288)
G	R (attended) + TELEX	$1\frac{1}{2}$	1	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{3}$	$1\frac{1}{3}$	$1\frac{1}{2}$	$1\frac{1}{3}$	7 (252)

Legend  
 TS: Toll Switching Center  
 LE: Local Exchange Center  
 R: Radio Station  
 TELEX: TELEX Switching Center  
 IPTS: Inter Provincial Telephone Station

Table VII-6-1-2 (1/4) Floor Spaces of Individual Offices/Stations

Type of Office/ Station Building	Floor Space (m <sup>2</sup> )	Phase I		
		Office/Station	No. of Offices/ Stations	Total Space (m <sup>2</sup> )
TS+LE+R	324	• (Dinalupihan)	-	-
TS+R	216	• Cabanatuan	1	216
LE+R	240	• Cabiao, • Jaen, • Pantabangan, • Gerona, • Lapaz, • Magalang, • Bulacan, • Samal, • S. Idefonso, • San Rafael, • Calaca, • (Ibaan), • (Mamburao), • Sabulayan, • Naujan, • Roxas, • Victoria, • Odiongan	16	3,840
TS	168	• Calapan	1	168
LE	192	• Abucay, • Angat, • Aliaga, • San Antonio, • Botolan, • (Iba), • Romblon, • Santa Rosa, • Porac, • Bongabong	9	1,728
TS+LE	288	• (Pandi), • (San Jose)	-	-
IPTS+R	105	• Agoncilo, • Gloria, • Socorro, • S. Agustin, • Quezon, • Zaragosa, • Sexmoan, • P. Garcia, • Lubang	9	945
IPTS	63	• Puerto Galera	1	63
R(attended)	132	• Lucena R.S., • San Jose R.S., • Calapan R.S. (Tarlac R.S., Manila R.S., Romblon R.S., Kalibo)	3	396
R(unattended)	60	• Pandi R.S., • Marinduque R.S., • Mt. Dumali R.S., • Tablas R.S., • Porac R.S., • Catuncapan R.S. • Mt. Gonzales R.S. • Mt. Banoy R.S., Cabacao R.S., • Sabulayan R.S., Bongabong R.S. • P. Galera R.S., (Kitakita R.S.)	12	720

Table VII-6-1-2 (2/4) Floor Spaces of Individual Offices/Stations

Type of Office/ Station Building	Floor Space (m <sup>2</sup> )	Phase I		
		Office/Station	No. of Offices/ Stations	Total Space (m <sup>2</sup> )
TS+R+Telex	288	Batangas	1	288
R(attended)+Telex	252	San Fernando R.S.	1	252
Total			54	8,616
<p><u>Note:</u> For stations in ( ), the existing may be employed.</p>				

Table VII-6-1-2 (3/4) Floor Spaces of Individual Offices/Stations

Type of Office/ Station Building	Floor Space (m <sup>2</sup> )	Phase II		
		Office/Station	No. of Offices/ Stations	Total Space (m <sup>2</sup> )
TS+LE	288	• Unisan	1	288
LE+R	240	• Guinayangan, • San Narciso	2	480
LE	192	• Catanauan, • Mulanay	2	384
IPTS+R	99	• G. Luna, • Macalelon, • Cajidiocan, • Looc, • Coron, • Santa Teresita, • Burudeos, • Buenavista, • Dolores, • Panuclan, • Pitago, • Polillo, • Quezon, • Real, • Baler, • S. Andres, • S. Antonio, • S. Francisco, • Baco, • Casiguran, • Dipaculao, • Maria Aurora, • Calintaan, • Looc, • Magsaysay, • Rizal, • Santa Cruz, • Bulalacao, • Bansud, • Pola, • Mansalay, • S. Fernando, • Balabac, • Cuyo, • El Nido, • Taytay, • Dingalan, • Taysan, • Tingloy, • Tuy, • Alabat, • Alitagtag, • Lobo, • Laurel, • Mataasnahoy, • S. Simon, • Pilar, • Similoan, • Victoria, • Mayantoc, • Ramos, • Carranglan, • Natividad, • Penaranda, • Nampicuan, • Anao, • S. Manuel, • Bagac, • Magallanes, • Ternate, • Kalayaan, • Pangil, • Rizal, • G. Nakar, • Jumalig, • Patnanangan, • Peres, • Dilasag, • S. Luis, • Abla de Ilog, • Paluan, • S. Teodoro, • S. Luis	73	7,227
	105	• Dinalongan, Gabaldon, • Narra	3	315



Table VII-6-1-2 (4/4) Floor Spaces of Individual Offices/Stations

Type of Office/ Station Building	Floor Space (m <sup>2</sup> )	Phase II		
		Office/Station	No. of Offices/ Stations	Total Space (m <sup>2</sup> )
R(unattended)	60	• Coron R.S., • Bacuit R.S., • Unisan R.S., • Mt. Samat R.S., • Paete R.S., • Catanauan R.S., • Mulanay R.S., • Plaridel R.S., • Pollio R.S., • Togkawayan R.S., • Maria Aurora R.S., • Knob Peak R.S., • Dumarán R.S., • Inagauan R.S., • Pamitian R.S.	15	900
IPTS	63	• Alcantara, • Banton, • Calatrava • Concepcion, • Corcuera, • Magdiwang, • San Andres, • San Jose, • Santa Fe, • Aborlan, • Agutaya, • Araceli, • Batarasa, • Busuanga, • Cagayancillo, Linapacan, • Quezon, • San Vicente • Nabitac, • Pakil, • Pila, • Balite, • San Nicolas, • Agdangan • Plaridel, • Dumarán, • Magsaysay	27	1,701
Total			123	11,295

Table VII-6-1-3 (1/5) Total Building Floor Spaces of  
Individual Provinces (Phase I)

Province	Office/Station	No. of Offices/ Stations	Type of Office/Station	Total Floor Space (m <sup>2</sup> )	Remarks
Bataan	Samal, Abucay	2	LE+R 1 LE 1	432	
Bulacan	Bulacan, San Ildefonso, Pandi R.S., Catanpacan R.S., San Rafael, Angat	6	LE+R 3, R(unattended) 2 LE 1	1,032	
Pampanga	Magalang, Porac, S. Fernando Telex, Sexmoan, Porac R.S.	5	LE+R 1, LE 1 TELEX 1, IPTS+R 1 R(unattended) 1	849	
Tarlac	Gerona, Lapaz	2	LE+R 2	480	
Nueva Ecija	Aliaga, Cabiao, Jaen, Pantabangan, San Antonio Sta. Rosa, Quezon, Zaragoza, Cabanatuan	9	LE 3 LE+R 3 IPTS+R 2 TS+R 1	1,722	
Batangas	Calaca, Agoncillo, Mt. Banoy R.S., Padre Garcia, Batangas Telex	5	R(unattended) 1 LE+R 1 TELEX 1 IPTS+R 2	798	
Zambales	Botolan	1	LE 1	192	
Occ. Mindoro	Lubang, Sablayan, Cabacao R.S., San Jose R.S., Sablayan R.S.	5	LE+R 1 R(attended) 1 R(unattended) 2 IPTS+R 1	597	
Or. Mindoro	Bongabong, Naujan, Roxas Victoria, Gloria, P. Galera, Socorro, Calapan R.S., Mt. Dumali R.S., Calapan, Bongabong R.S., P. Galera R.S.	12	TS 1 LE 1, LE+R 3 R(attended) 1 R(unattended) 3 IPTS+R 2 IPTS 1	1,665	

Table VII-6-1-3 (2/5) Total Building Floor Spaces of  
Individual Provinces (Phase I)

Province	Office/Station	No. of Offices/ Stations	Type of Office/Station	Total Floor Space (m <sup>2</sup> )	Remarks
Romblon	Odiongan, Romblon, San Agustin, Tablas R.S.	4	LE+R 1 LE 1 R(unattended) 1 IPTS+R 1	597	
Quezon	Lucena R.S.	1	R(attended) 1	132	
Marinduque	Marinduque R.S.	1	R(unattended) 1	60	
Cavite	Mt. Gonzales R.S.	1	R(unattended) 1	60	
Total		54		8,616	

Table VII-6-1-3 (3/5) Total Building Floor Spaces of Individual Provinces (Phase II)

Province	Office/Station	No. of Offices/Stations	Type of Office/Station	Total Floor Space (m <sup>2</sup> )	Remarks
Bataan	Bagac, Pilar, Mt. Samat R.S.	3	R(unattended) 1 IPTS+R 2	258	
Bulacan	-	-	-	-	
PanPanga	San Simon	1	IPTS+R 1	99	
Tarlac	Anao, Mayantoc, Ramos, S. Manuel	4	IPTS+R 4	396	
Nueva Ecija	Carranglan, Gabaldon, G. Natividad, Nampicuan, Penaranda	5	IPTS+R 5	501	
Quezon	Plaridel R.S., Casiguran, Dilasag, Dingalan, Dinalongan, Dipaculao, Baler, Maria Aurora, San Luis, Dolores, San Antonio, Agdangan, Alabat, Perez Buenavista, G. Luna, Pitogo, Macalelon, San Francisco, Plaridel, Quezon, San Andress, Unisan, Catanauan, Guinayangan, Mulanay, San Narciso, Burdeos, G. Nakar, Jumalig, Panukulan, Patnanangan, Pollilo, Real, Mulanay R.S., Unisan R.S., Maria Aurora R.S., Pollilo R.S., Tagkawayan R.S., Catanauan R.S.	40	IPTS+R 26 IPTS 2 TS+LE 1 LE+R 2 LE 2 R(unattended) 7	4,278	

Table VII-6-1-3 (4/5) Total Building Floor Spaces of Individual Provinces (Phase II)

Province	Office/Station	No. of Offices/Stations	Type of Office/Station	Total Floor Space (m <sup>2</sup> )	Remarks
Batangas	Alitagtag, San Luis, San Nicolas, Santa Teresita, Taysan, Tingloy, Tuy, Balite, Laurel, Mataasnaakahoy, Lobo	11	IPTS+R 9 IPTS 2	1,017	
Occ. Mindoro	Looc, Calintaan, Magsaysay, Paluan, Rizal, Santa Cruz, Abra de Ilog	7	IPTS+R 6 IPTS 1	657	
Or. Mindoro	Baco, Bansud, Mansalay, Pola, San Teodoro, Bulalacao, Knob Peak R.S.	7	IPTS+R 6 R(unattended) 1	654	
Romblon	Alcantara, Banton, Cajidiocan, Calatrava, Concepcion, Corcuera, Looc, Magdiwang, San Andres, San Fernando, San Jose, Santa Fe	12	IPTS+R 3 IPTS 9	864	
Palawan	Aborlan, Agutaya, Araceli, Balabac, Batarasa, Busuanga, Cagayancillo, Coron, Cuyo, Dumarán, El Nido, Bacuit R.S., Inagauan R.S., Linapacan, Magsaysay, Panitian R.S., Narra, Quezon, San Vicente, Taytay, Coron R.S., Dumarán R.S.	22	IPTS+R 7 IPTS 10 R(unattended) 5	1,623	
Laguna	Kalayaan, Nabitac, Pakil, Pangil, Pila, Rizal, Siniloan, Victoria, Paete R.S.	9	IPTS+R 5 R(unattended) 1 IPTS 3	744	

Table VII-6-1-3 (5/5) Total Building Floor Spaces of Individual Provinces (Phase II)

Province	Office/Station	No. of Offices/Stations	Type of Office/Station	Total Floor Space (m <sup>2</sup> )	Remarks
Cavite	Magallanes, Ternate	2	IPTS+R 2	198	
<b>Total</b>		<b>123</b>		<b>11,295</b>	

## 6-2 Towers and Others

### 6-2-1 Towers

The selection of antenna towers has been made as per paragraph II-7-7-2 and tower heights have been designed for radio wave propagation.

The types, heights, and numbers of towers to be constructed in Phases I and II are given in Tables VII-6-2-1 and VII-6-2-2. The total amount of steel frames necessary for constructing towers in Phase I is to be about 1800 tones and that in Phase II about 1100 tons.

### 6-2-2 Access Roads

Access roads to be required for the construction and maintenance of radio repeater stations are given in Tables VII-6-2-1 and VII-6-2-2. The net width of each access road is to be 3m. The total road length to be covered in Phase I is about 42km and that in Phase II about 56km.

### 6-2-3 Site Areas

In this project sites necessary for the construction of exchange offices including radio facilities are supposed to be procured free of charge from the applicable administrative organization and sites are to be appropriated only for those radio repeater stations to be constructed independently.

Table VII-6-2-1 Towers and Access Roads

Item		Phase I	Phase II	
Tower	Selfsupporting Type	Height: 20 m	5	13
		30 m	18	11
		40 m	3	
		50 m	3	
		Subtotal	29	24
	Guyed Type	Height: 20 m	10	6
		30 m	2	0
		40 m	1	
		50 m		
		Subtotal	13	6
	20m Steel Pole		6	81
	Total		48	111
	Access Roads		9 Stations, 32.5 km	15 Stations, 55.7 km



Table VII-6-2-2 (1/8) Necessary Tower Heights and  
Access Road Lengths (Phase I)

Station \ Item		Tower Height			Road Length (km)
		Self-supporting Tower (m)	Guyed Tower (m)	20m Steel Pole	
Nueva Ecija	Cabanatuan	50			
	Cabiao		30		
	Jaen		20		
	Kitakita R.S.	Existing			
	Pantabangan	30			
	Quezon	20			
	Zaragosa			0	
Tarlac	Gerona	20			
	La Paz		20		
	Tarlac R.S.	30			
Pampanga	Magalang		30		
	Porac R.S.		20		
	Sexmoan			0	
	San Fernando R.S.	40			
Bulacan	Bulacan		20		
	Catanpacan R.S.	30			1
	Pandi R.S.	50			
	San Ildefonso		20		
	San Rafael		20		
Bataan	Dinalupihan	50			
	Samal	40			

Table VII-6-2-2 (2/8) Necessary Tower Heights and  
Access Road Lengths (Phase I)

Station		Item	Tower Height			Road Length (km)
			Self-supporting Tower (m)	Guyed Tower (m)	20m Steel Pole	
Cavite	M.M.	Manila R.S.	Antenna Base			
		Mt. Gonzales R.S.	30			
Batangas		Agoncillo			0	
		Batangas	Existing			
		Calaca		20		
		Ibaan		20		
		Mt. Banoy R.S.	30			2
		Padre Garcia			0	
Quezon		Lusena R.S.	30			
Marinduque		Marinduque R.S.	30			6
		Cabacao R.S.	30			5
		Lubang	20			
Occ. Mindoro		Mamburao	20			
		Sablayan	30			
		Sablayan R.S.	30			5
		San Jose R.S.	30			
Or. Mindoro		Bongabong R.S.	30			1
		Calapan R.S.	40			2
		Gloria	30			
		Mt. Dumali R.S.	30			5
		Naujan	30			
		Puerto Galera R.S.			0	
	Roxas		40			

Table VII-6-2-2 (3/8) Necessary Tower Heights and  
Access Road Lengths (Phase I)

Station \ Item		Tower Height			Road Length (km)
		Self-supporting Tower (m)	Guyed Tower (m)	20m Steel Pole	
Or. Mindoro	Socorro			0	
	Victoria	30			
Romblon	Odiangan		20		
	Romblon R.S.	30			
	San Agustin		20		
	Tablas	30			5.5
Akulan	Kalibo	20			

Table VII-6-2-2 (4/8) Necessary Tower Heights and  
Access Road Lengths (Phase II)

Station	Item	Tower Height			Road Length (km)
		Self-supporting Tower (m)	Guyed Tower (m)	20m Steel Pole	
Nueva Ecija	Carranglan			o	
	Gabaldon	20			
	Nampicuan			o	
	Natividad			o	
	Penaranda			o	
Tarlac	Anao			o	
	Mayantoc			o	
	Ramos			o	
	San Manuel			o	
Pampanga	San Simon			o	
Bataan	Bagac			o	
	Mt. Samat R.S.	20			2
	Pilar			o	
Cavite	Magallanes			o	
	Ternate			o	
Laguna	Kalayaan			o	
	Mabitac			o	
	Paete R.S.	30			5
	Pakil			o	
	Pangil			o	
	Pila			o	

Table VII-6-2-2 (5/8) Necessary Tower Heights and  
Access Road Lengths (Phase II)

Station	Item	Tower Height			Road Length (km)
		Self-supporting Tower (m)	Guyed Tower (m)	20m Steel Pole	
Laguna	Rizal			o	
	Siniloan			o	
	Victoria			o	
Batangas	Alitagtag			o	
	Balite			o	
	Laurel			o	
	Lobo			o	
	Mataasnakahoy			o	
	San Luis			o	
	San Nicolas			o	
	San Teresita			o	
	Taysan			o	
	Tingloy			o	
	Tuy			o	
Quezon	Alabat	30			
	Burdeos			o	
	Buenavista			o	
	Catanauan R.S.	30			0.1
	Dolores			o	
	General Nakar			o	
	Guinayangan		20		
	Jumalig			o	
	Mulanay R.S.	20			0.1

Table VII-6-2-2 (6/8) Necessary Tower Heights and  
Access Road Lengths (Phase II)

Station	Item	Tower Height			Road Length (km)
		Self-supporting Tower (m)	Guyed Tower (m)	20m Steel Pole	
Quezon	Panukulan			o	
	Patnanangan			o	
	Perez			o	
	Pitogo		20		
	Plaridel R.S.	30			2.5
	Polillo			o	
	Polillo R.S.	30			3
	Quezon			o	
	Real			o	
	San Andress			o	
	San Antonio			o	
	San Francisco			o	
	San Narciso		20		
	Tagkawayan R.S.	30			3
	Unisan R.S.	30			2
Quezon (Aurora)	Baler			o	
	Casiguran		20		
	Dilasag	30		o	
	Dinalongan	30			
	Dipaculao			o	
	Maria Aurora			o	
	Maria Aurora R.S.	20			7
	San Luis			o	

Table VII-6-2-2 (7/8) Necessary Tower Heights and  
Access Road Lengths (Phase II)

Station	Item	Tower Height			Road Length (km)
		Self-supporting Tower (m)	Guyed Tower (m)	20m Steel Pole	
Occ. Mindoro	Abra de Ilog			o	
	Calintaan			o	
	Looc	20			
	Magsaysay			o	
	Paluan			o	
	Rizal			o	
	Santa Cruz			o	
Or. Mindoro	Baco			o	
	Bulalacao			o	
	Bansud			o	
	Knob Peak R.S.	20			10
	Mansalay			o	
	Pola			o	
	San Teodoro			o	
Romblon	Alcantara	20			
	Banton			o	
	Calatrava			o	
	Concepcion			o	
	Corcuera			o	
	Magdiwang			o	
	San Andres			o	
	San Fernando		20		
	San Jose			o	
	Santa Fe			o	

Table VII-6-2-2 (8/8) Necessary Tower Heights and  
Access Road Lengths (Phase II)

Station	Item	Tower Height			Road Length (km)
		Self-supporting Tower (m)	Guyed Tower (m)	20m Steel Pole	
Palawan	Aborlan			o	
	Agutaya			o	
	Araceli			o	
	Bacuit R.S.	30			8
	Balabac			o	
	Batarasa		20		
	Busuanga			o	
	Cagayancillo			o	
	Coron R.S.	20			7
	Cuyo	20			
	Dumaran R.S.	30			1
	El Nido			o	
	Inaguan R.S.	20			3
	Linapacan			o	
	Narra	20			
	Panitian R.S.	20			2
	Puerto Princesa			o	
	Quezon	20			
San Vicente			o		
Taytay			o		



The estimated site area necessary for the construction of a radio repeater station is obtained as the sum of the site area for the building and that for the tower. Each site area for the office/station building is to be three times as large the floor space of the building (paragraph VII-6-1) and that for the tower to be equal to the square of a value two times as large as the tower stance, as follows.

<u>Tower Height</u>	<u>Stance</u>	<u>Site Area</u>
20 m	4 m	64 m <sup>2</sup>
30 m	6 m	144 m <sup>2</sup>
50 m	8 m	256 m <sup>2</sup>

For grading necessary for the construction of access roads for radio repeater stations, the grading width necessary for cutting and filling for achieving a net road width of 3m is estimated to be 15m in average. Site areas for the station buildings and access roads necessary for the individual radio repeater stations are given in Table VII-6-2-3.

Table VII-6-2-3 (1/2) Site Areas for Individual Radio Repeater Stations (Phase I)

Radio Repeater Station		Site for Building			Site for Road	
		Floor Space (m <sup>2</sup> )	Steel Tower Height (m)	Area (m <sup>2</sup> )	Road Length (km)	Area (m <sup>2</sup> )
Nueva Ecija	Kitakita R.S.	-	-	-	-	-
Tarlac	Tarlac R.S.	-	30	-	-	-
Pampanga	Porac R.S.	60	20	300	-	-
	San Fernando R.S.	252	40	-	-	-
Bulacan	Catanpacan R.S.	60	30	400	1	15,000
	Pandi R.S.	60	50	-	-	-
M.M.	Manila R.S.	-	-	-	-	-
Cavite	Mt. Gonzales R.S.	60	30	-	-	-
Batangas	Mt. Banoy R.S.	60	30	400	2	30,000
Quezon	Lucena RS	132	30	600	-	-
Marinduque	Marinduque R.S.	60	30	400	6	90,000
Occ. Mindoro	Bangili REF.	/	/	400	/	/
	Cabacao R.S.	60	30	400	5	75,000
	Sablayan REF.	/	/	400	/	/
	Sablayan R.S.	60	30	400	5	75,000
	San Jose R.S.	132	30	600	-	-
Or. Mindoro	Bongabong R.S.	60	30	400	1	15,000
	Calapan R.S.	132	40	600	2	30,000
	Mt. Dumali R.S.	60	30	400	5	75,000
	Puerto Galera R.S.	60	20	300	-	-
Romblon	Romblon R.S.	-	30	-	-	-
	Tablas R.S.	60	30	400	5.5	82,500
Total		6,400			487,500	

Note: Mark - indicates "existing."

Table VII-6-2-3 (2/2) Site Areas for Individual Radio Repeater Stations (Phase II)

Radio Repeater Station		Site for Building			Site for Road	
		Attended or Unattended	Steel Tower Height (m)	Area (m <sup>2</sup> )	Road Length (km)	Area (m <sup>2</sup> )
Bataan	Mt. Samat R.S.	Unattended	20	300	2	30,000
Laguna	Paete R.S.	do.	30	400	5	75,000
Quezon	Catanauan R.S.	do.	30	400	0.1	1,500
	Mulanay R.S.	do.	20	300	0.1	1,500
	Plaridel R.S.	do.	30	400	2.5	37,500
	Polillo R.S.	do.	30	400	3	45,000
	Tagkawayan R.S.	do.	30	400	3	45,000
	Unisan R.S.	do.	30	400	2	30,000
	Maria Aurora R.S.	do.	30	400	7	105,000
Or. Mindoro	Knob Peak R.S.	do.	30	400	10	150,000
Palawan	Bacuit R.S.	do.	30	400	8	120,000
	Coron R.S.	do.	30	400	7	105,000
	Dumaran R.S.	do.	30	400	1	15,000
	Inaguan R.S.	do.	30	400	3	45,000
	Panitian R.S.	do.	20	300	2	30,000
	Quezon REF.			400		
Total				6,100		835,500

7. Connection with Private Operating Companies

Of all telephones used in the Philippines, telephone operated by BUTEL is only 7% and the remaining 93% are operated by private operating companies.

Although the service area of BUTEL will be expanded by the implementation of this project, most major cities including Manila will still be served by private operating companies.

Accordingly, connection between LE offices to be constructed in this project by DDD calls will not alone prove of great benefit to people; Unless DDD calls are available to Manila and other major cities such as San Fernando, Cabanatuan and Batangas and unless, on the other hand, DDD connection is available from these major cities to BUTEL's LEs, a great contribution to the enhancement of benefits to people, that is, to the social and economic development in Regions III and IV can not be expected.

Accordingly, necessary facilities for DDD connection with private operating companies' facilities, that is, toll switching equipment, transmission equipment, etc., are to be installed in this project so as to make all connections with private operating companies' facilities by DDD.

Private operating companies will also be required to expand/modify their toll and local switchig equipments and transmission systems. Facilities for adjusting

toll call charges will also be required. All these things will be determined through mutual agreement with private operating companies. If such agreement is not achievable, the effect of this project will be greatly lessened and it may even be said that this project is not feasible.

Connection with private operating companies' facilities is to be made in the following sections in this project.

- (1) Tarlac Toll Exchange Office (PLDT) ~ Tarlac Radio Repeater Station (BUTEL)
- (2) San Fernando Toll Exchange Office (PLDT) ~ San Fernando Radio Repeater Station (BUTEL)
- (3) Manila Toll Exchange Office (PLDT) ~ Manila Radio Repeater Station (BUTEL)
- (4) Lucena Toll Exchange Office (PLDT) ~ Lucena Radio Repeater Station (BUTEL)