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ANNEX

- 1. Alternative Plan
- 1-1. Outline of Plan
 - (1) In the sections where terrestrial transmission link and satellite link co-exist, toll traffic is to be distributed between terrestrial link and satellite link, as already stated in the main report. As for distribution ratios, PERUMTEL proposal is twofold. That is to say:

<u>Case</u>	X: Crow-Flight Distance	Terrestrial Link	Satellite Link
l	X < 500 km	808	20%
	X <u>></u> 500 km	40%	60%
2	X < 800 km	(100 - <u>X</u>)%	<u> </u>
	X <u>></u> 800 km	20%	80%

- (2) Case 1 above is taken up as the main plan and necessary comments are made in the main report.
- (3) Here, Case 2 is taken up for comments. When traffic is distributed by Case 2 distribution ratios, what will be the effect on this project? Study results, including the results of economic and financial analyses, are reported hereunder.
- (4) Traffic distribution ratio differences are given in Table AN-1-1.

1-2. Traffic

- Traffic calculation results are the same as in the main plan.
- (2) Traffic distribution is made according to network configuration, and calculation is made for traffic that flows via terrestrial transmission system, using Case 2 distribution ratios. Calculation results are given in Figure AN-1-1 and AN-7 (4/6 ∿ 6/6).
- (3) Figure AN-1-2 presents calculation results for required number of circuits between trunk centers.
- (4) Results of circuit distribution for telephone and non-telephone services appear in Figure AN-1-3.

1-3. Transmission Route Plan

Except for difference in the undermentioned arrangement, the alternative plan is the same as the main plan (Case 1) described in Chapter 5: Transmission Route Plan and System Design.

In the main plan, additional installation of 1 RF channel between Ujung Pandang and Kalaena repeater by the year 2005 is required. In the alternative plan, all transmission routes do not need additional channel installation but can consist of (1 + 1) radio system up to the end of project life. (Refer to Figure AN-1-4 through Figure AN-1-6: Channel Accommodation Plan.)

1-4. Construction Cost

Construction cost estimate for the alternative plan (Case 2) is made by the same terms and conditions as for the main plan (Case 1) described in Chapter 7: Construction Cost. Cost estimate breakdown follows:

Initial stage work cost	¥27,962 million (Rp.68,352 million)
Intermediate stage work cost	¥2,270 million (Rp.5,549 million)
Final stage work cost	¥ 4,013 million (Rp.9,809 million)

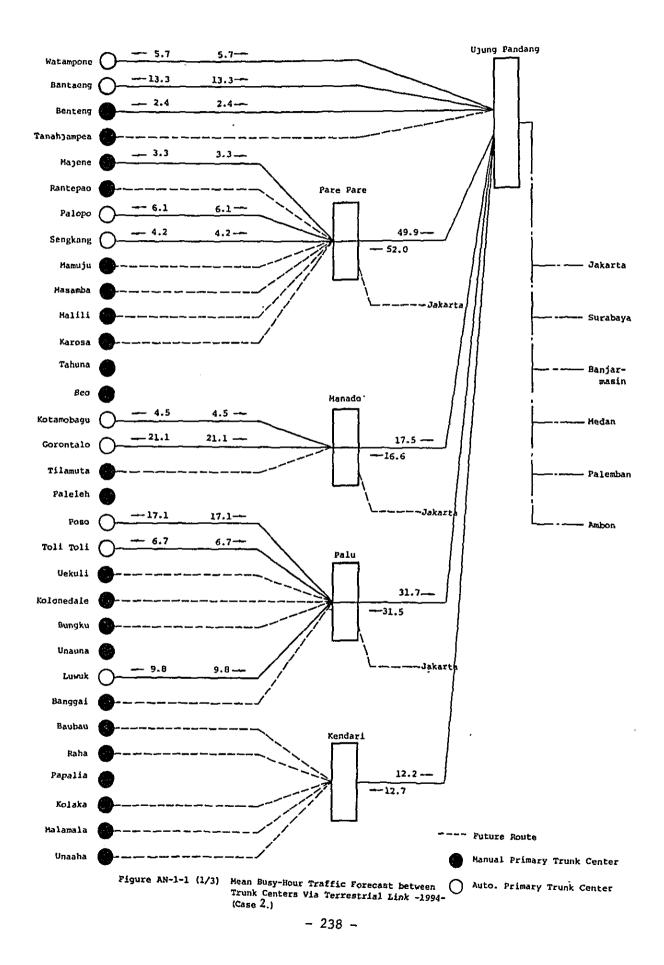
Note: The amount quoted above does not include contingency. Reference: Exchange Rate = Rp.660/¥270/US\$

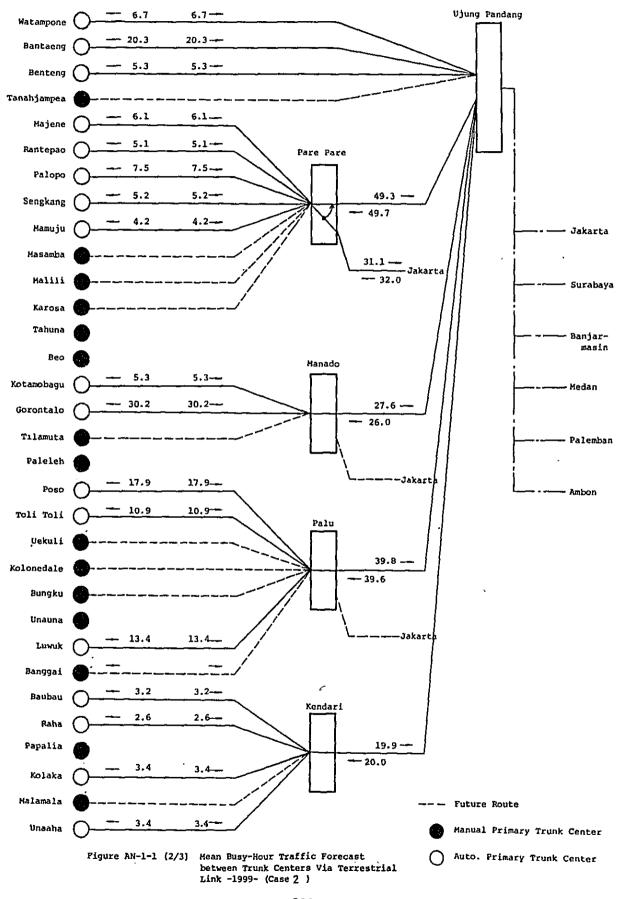
1-5. Financial and Economic Analyses

For the alternative plan (Case 2), Internal Financial Rate of Return (IFRR) and Internal Economic Rate of Return (IERR) are calculated by the same methodology as for the main plan (Case 1). Calculation results appear in Table AN-1-2 and Table AN-1-3. In gist:

IFRR = 14.62% IERR = 12.29%

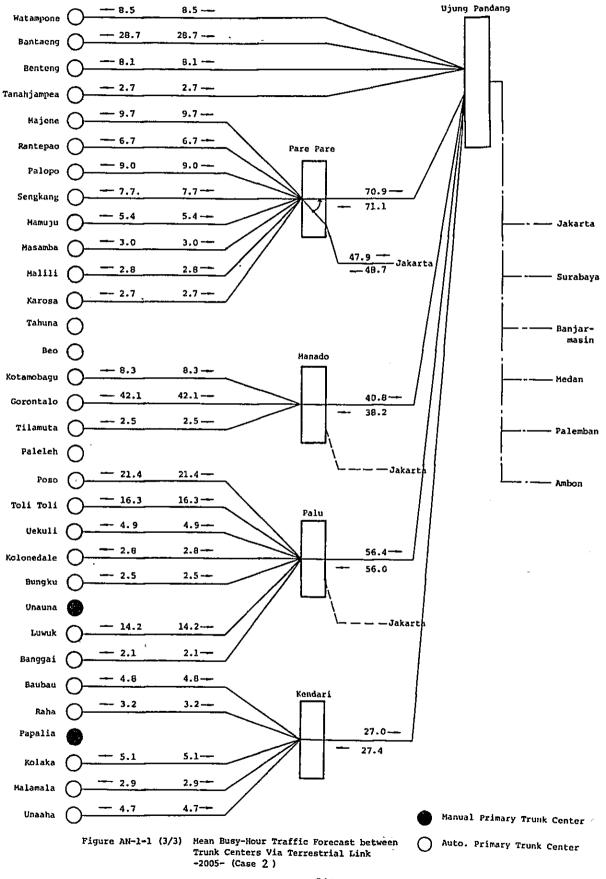
Consequently, in case where this Project is implemented by the alternative plan (Case 2), as in the case of project implementation by the main plan (Case 1), this Project can be termed as feasible both financially and economically.



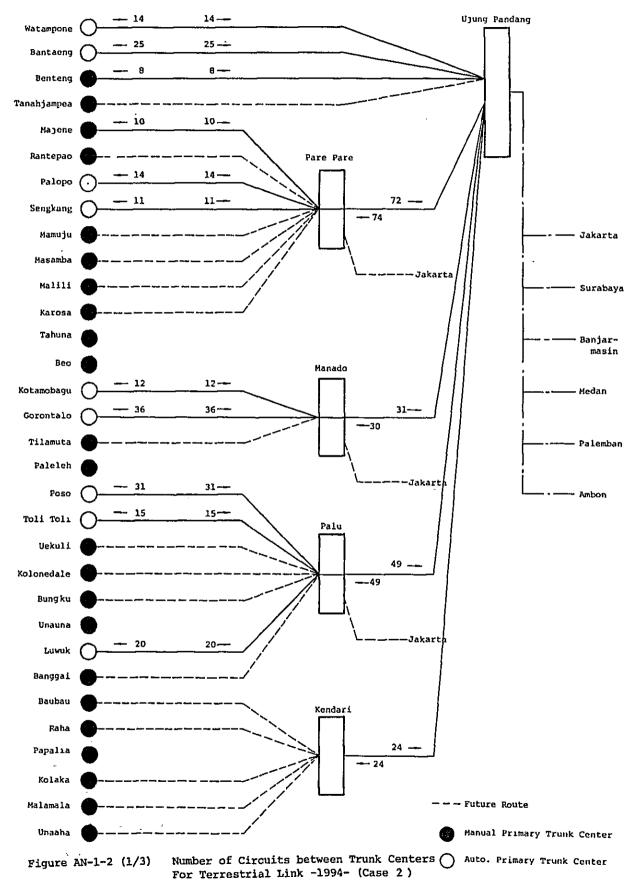


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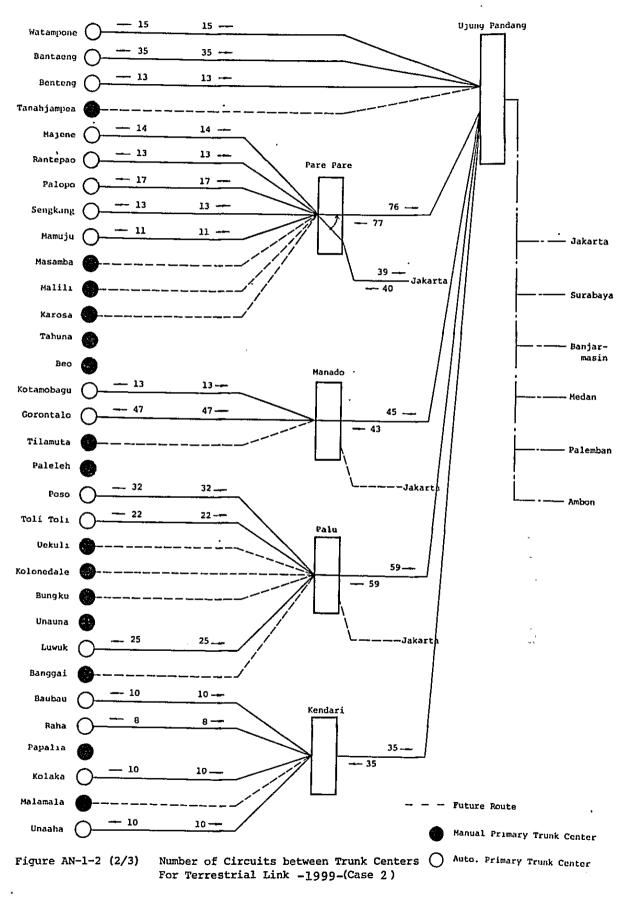


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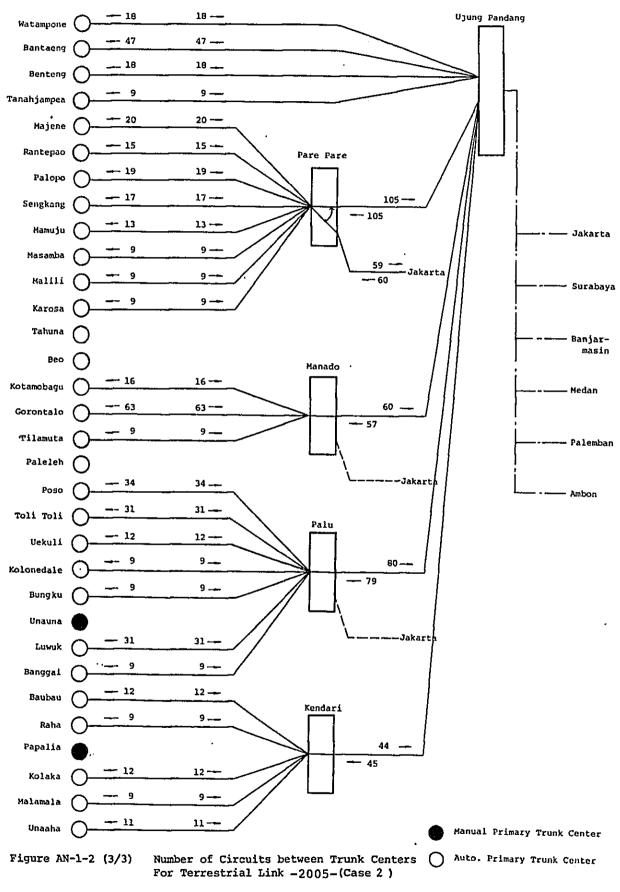


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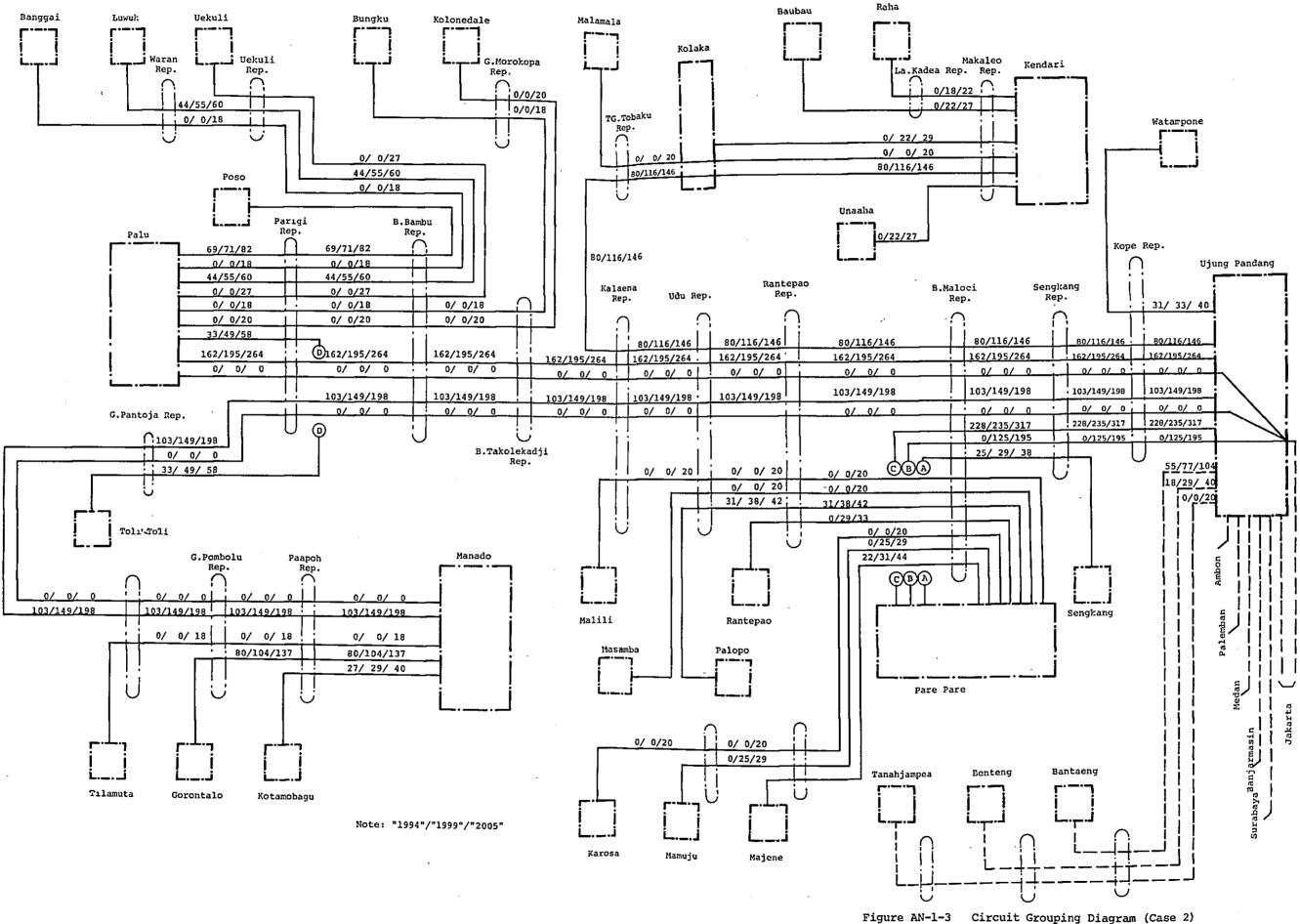
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List of Abbreviations of Exchange Names

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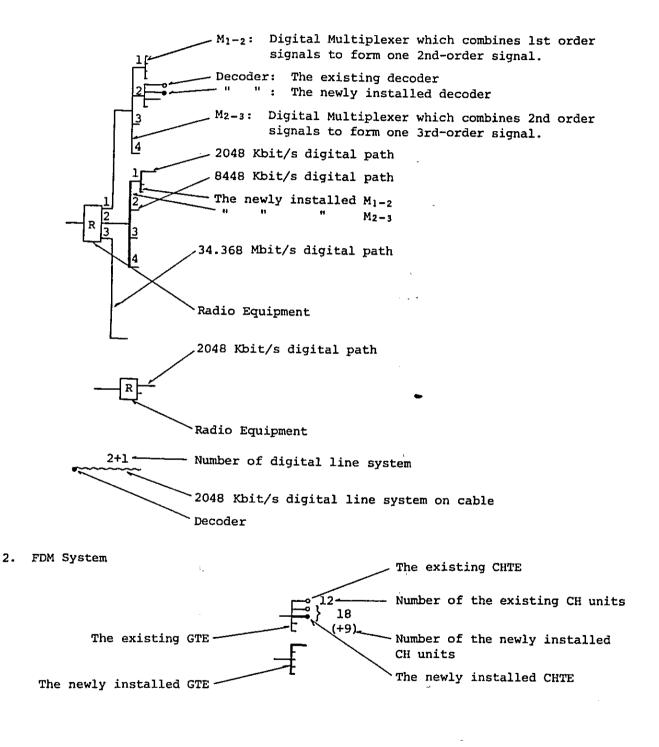
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Jakarta	JK
Ujung Pandang	UP
Pare Pare	PP
Manado	MN
Palu	PL
Kendari	KD
Watampone	WPN
Bantaeng	BTE
Benteng	- BEN
Tanahjampea .	TJP
Rantepao	RTP
Palopo	PLP
Masamba	MSB
Malili	MLI
Karosa	KRS
Kotamobagu	KTM
Gorontalo	GRT
7721	
Tilamuta	TLM
111amuta	TLM
Poso	TLM PSO
Poso	PSO
Poso Toli Toli	PSO TOL
Poso Toli Toli Vekuli	PSO TOL UKL
Poso Toli Toli Uekuli Kolonedare	PSO TOL UKL KLD
Poso Toli Toli Uekuli Kolonedare Bungku	PSO TOL UKL KLD BNK
Poso Toli Toli Uekuli Kolonedare Bungku Luwuk	PSO TOL UKL KLD BNK LWK
Poso Toli Toli Uekuli Kolonedare Bungku Luwuk	PSO TOL UKL KLD BNK LWK
Poso Toli Toli Vekuli Kolonedare Bungku Luwuk Banggai	PSO TOL UKL KLD BNK LWK BAG
Poso Toli Toli Uekuli Kolonedare Bungku Luwuk Banggai	PSO TOL UKL KLD BNK LWK BAG BAU
Poso Toli Toli Uekuli Kolonedare Bungku Luwuk Banggai Baubau Raha	PSO TOL UKL KLD BNK LWK BAG BAU RAH

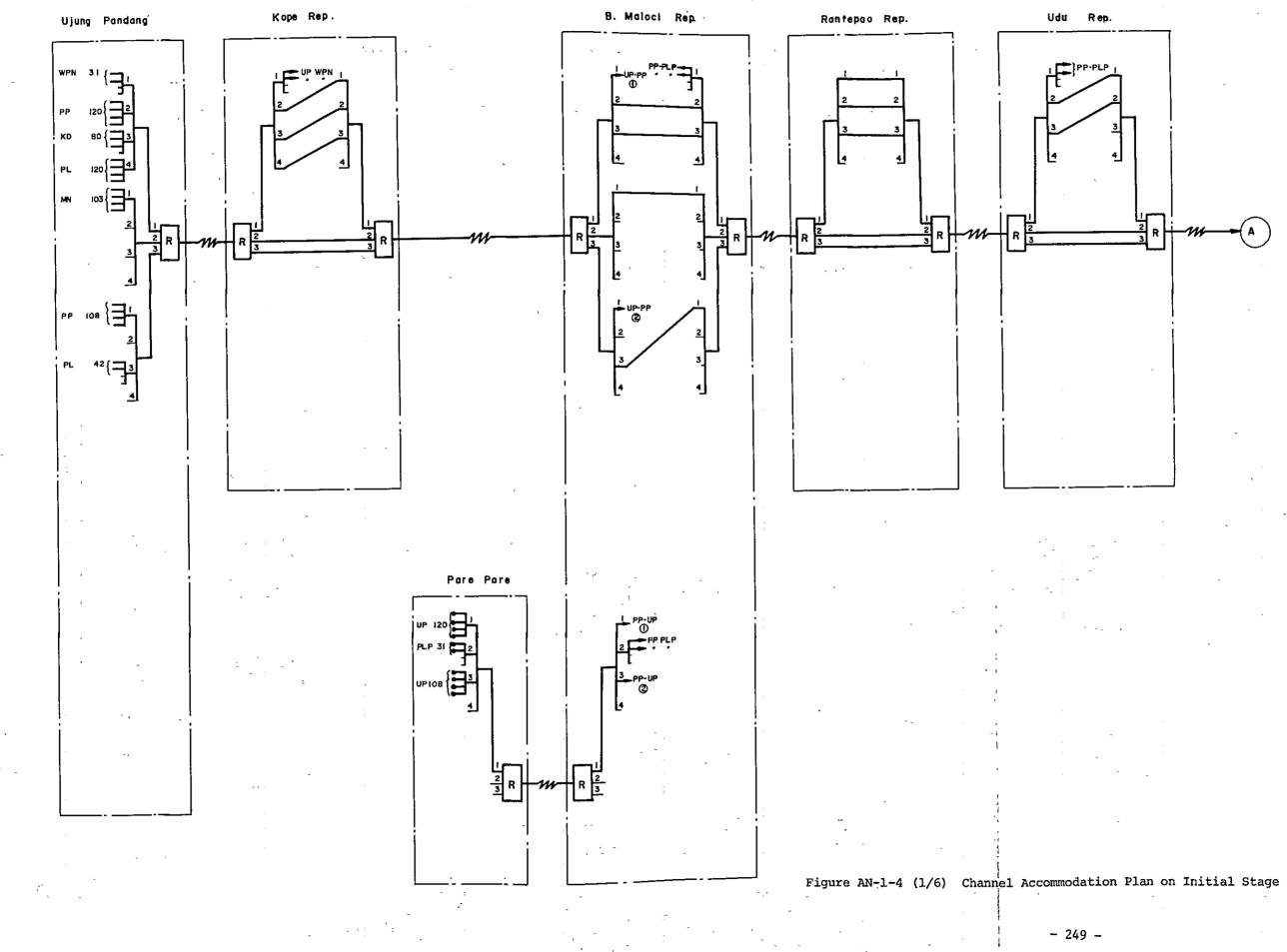
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1. PCM System



Symbols used in Channel Accommodation Plan



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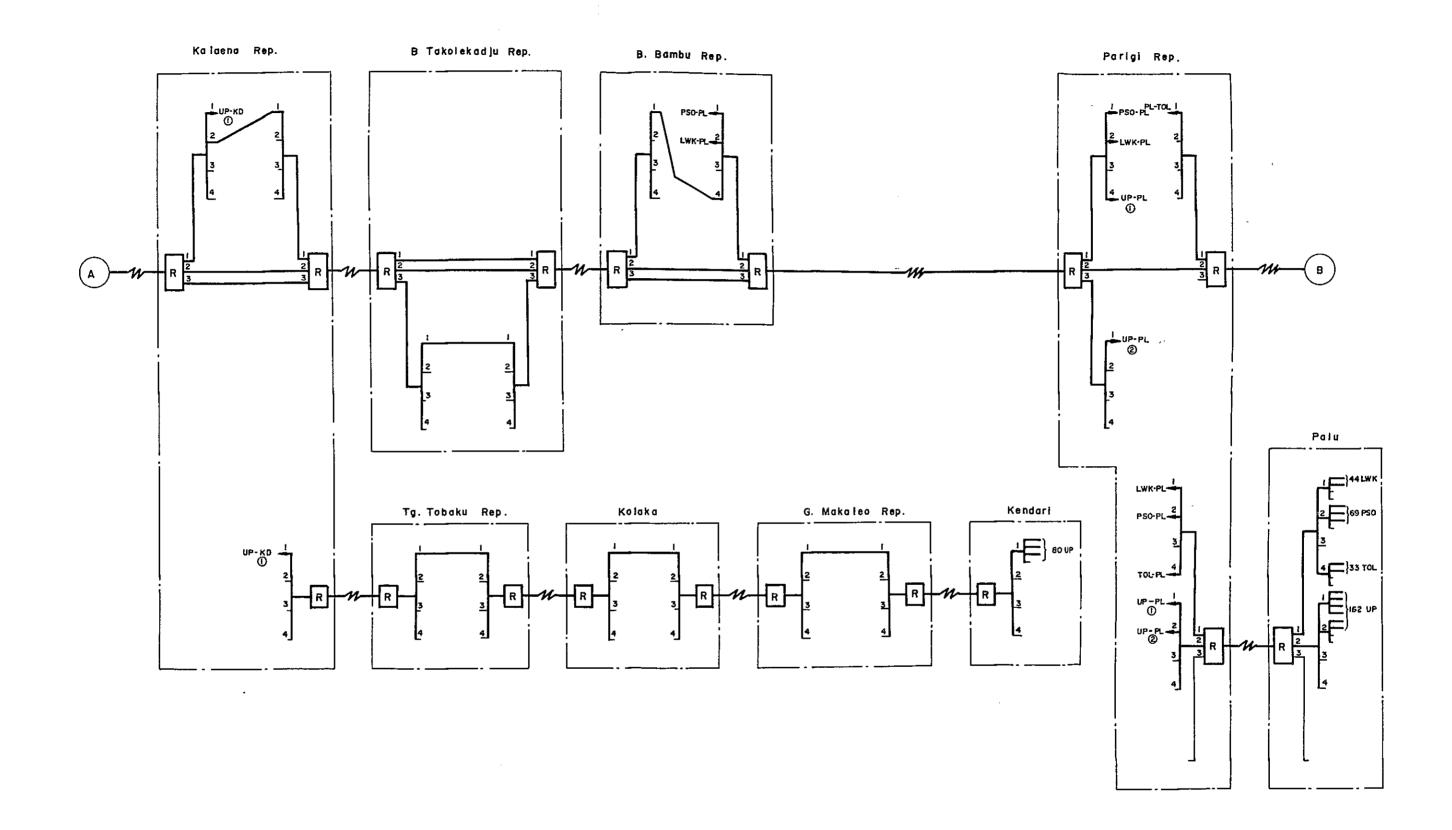
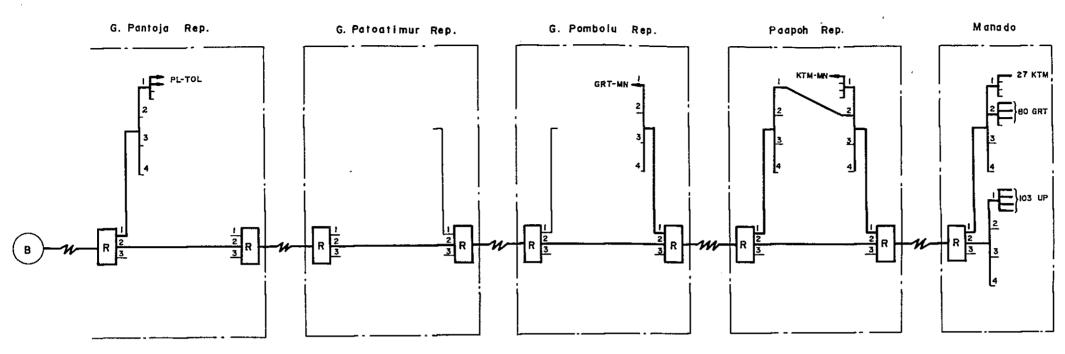


Figure AN-1-4 (2/6) Channel Accommodation Plan on Initial Stage

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Figure AN-1-4 (3/6) Channel Accommodation Plan on Initial Stage

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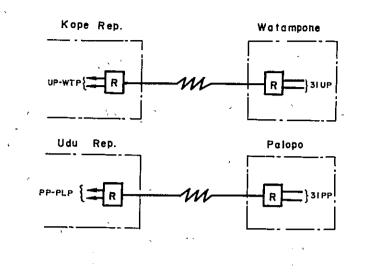
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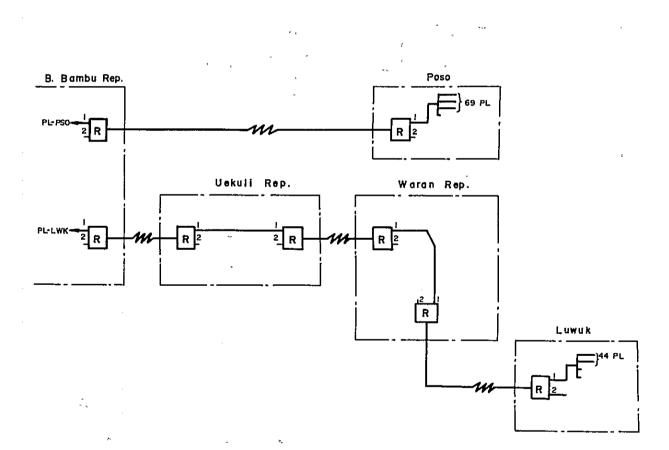
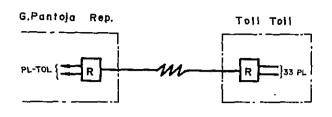


Figure AN-1-4 (4/6) Channel Accommodation Plan on Initial Stage



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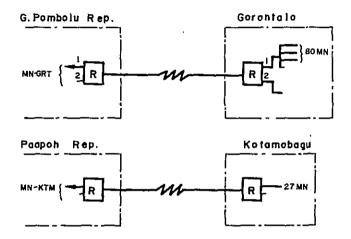
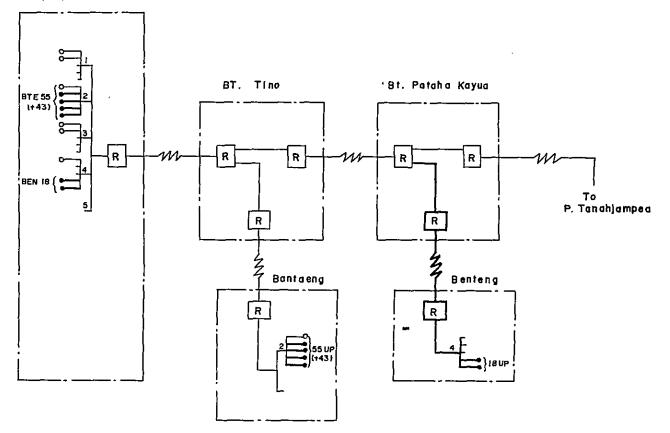


Figure AN-1-4 (5/6) Channel Accommodation Plan on Initial Stage

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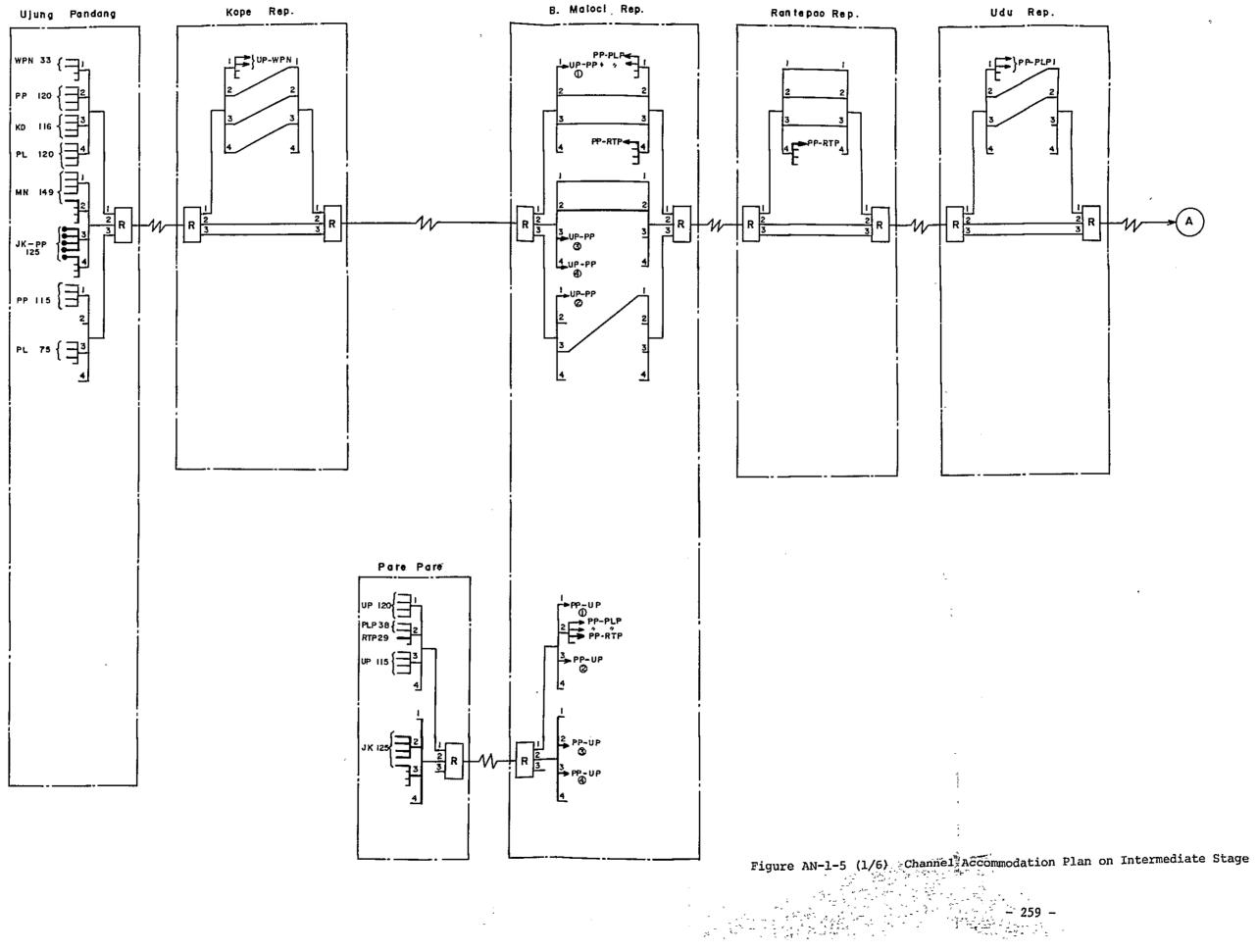


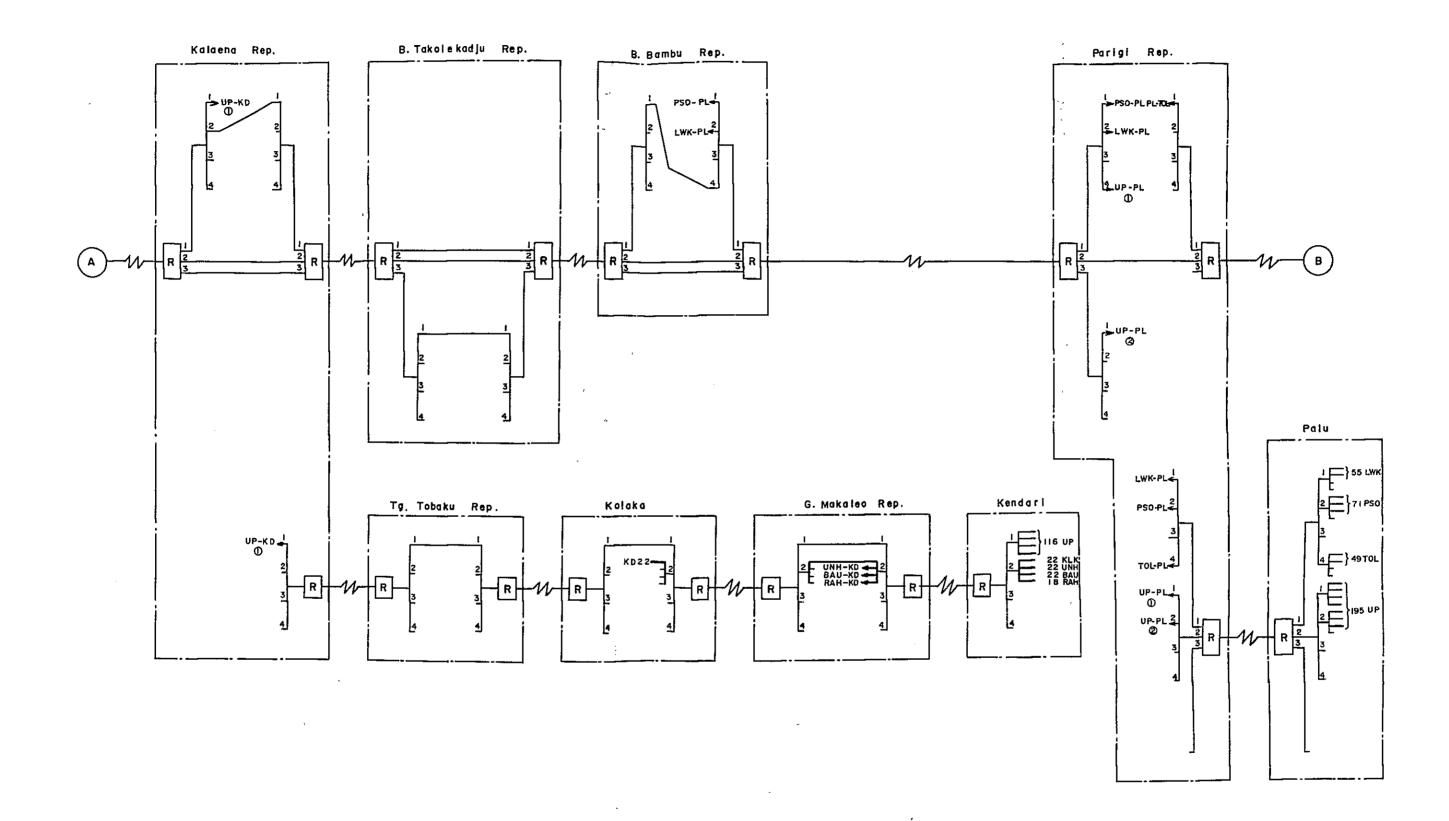
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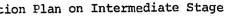
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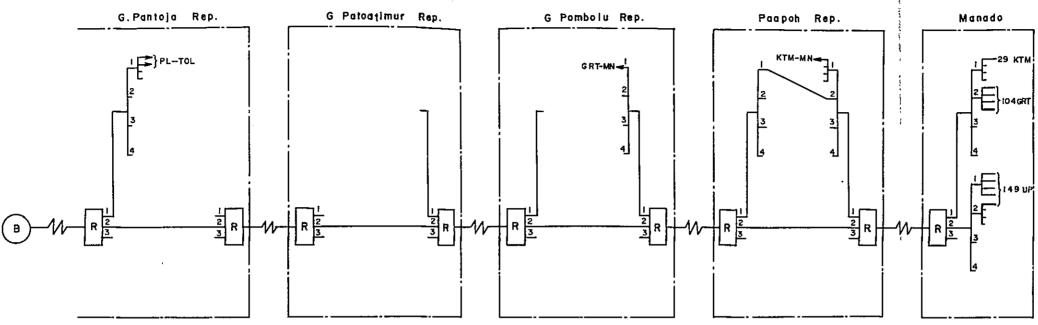
Figure AN-1-5 (2/6) Channel Accommodation Plan on Intermediate Stage

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Figure AN-1-5 (3/6) Channel Accommodation Plan on Intermediate Stage

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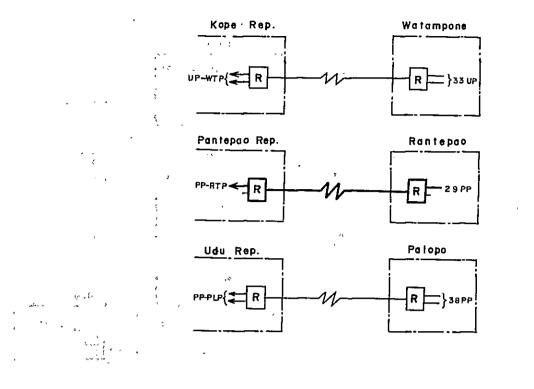


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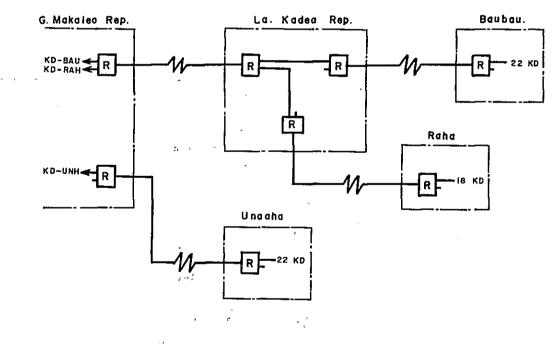
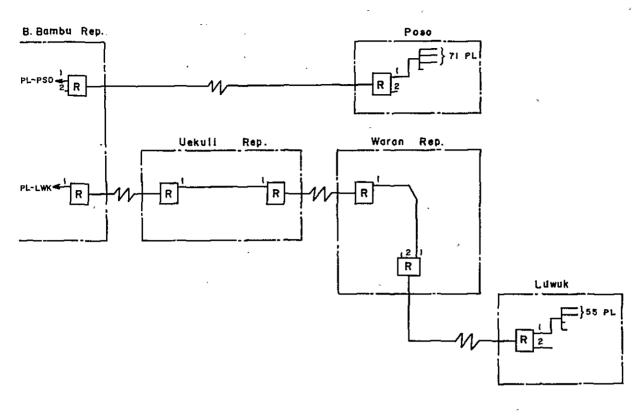
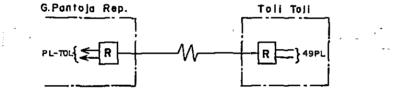


Figure AN-1-5 (4/6) Channel Accommodation Plan on Intermediate Stage

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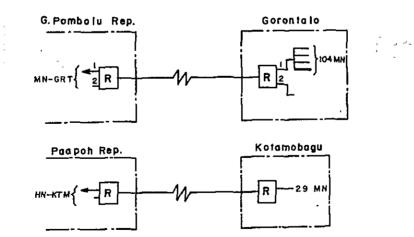
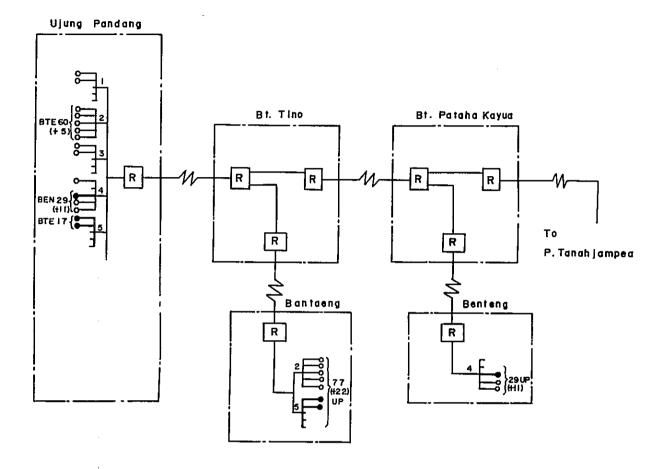


Figure AN-1-5 (5/6) Channel Accommodation Plan on Intermediate Stage

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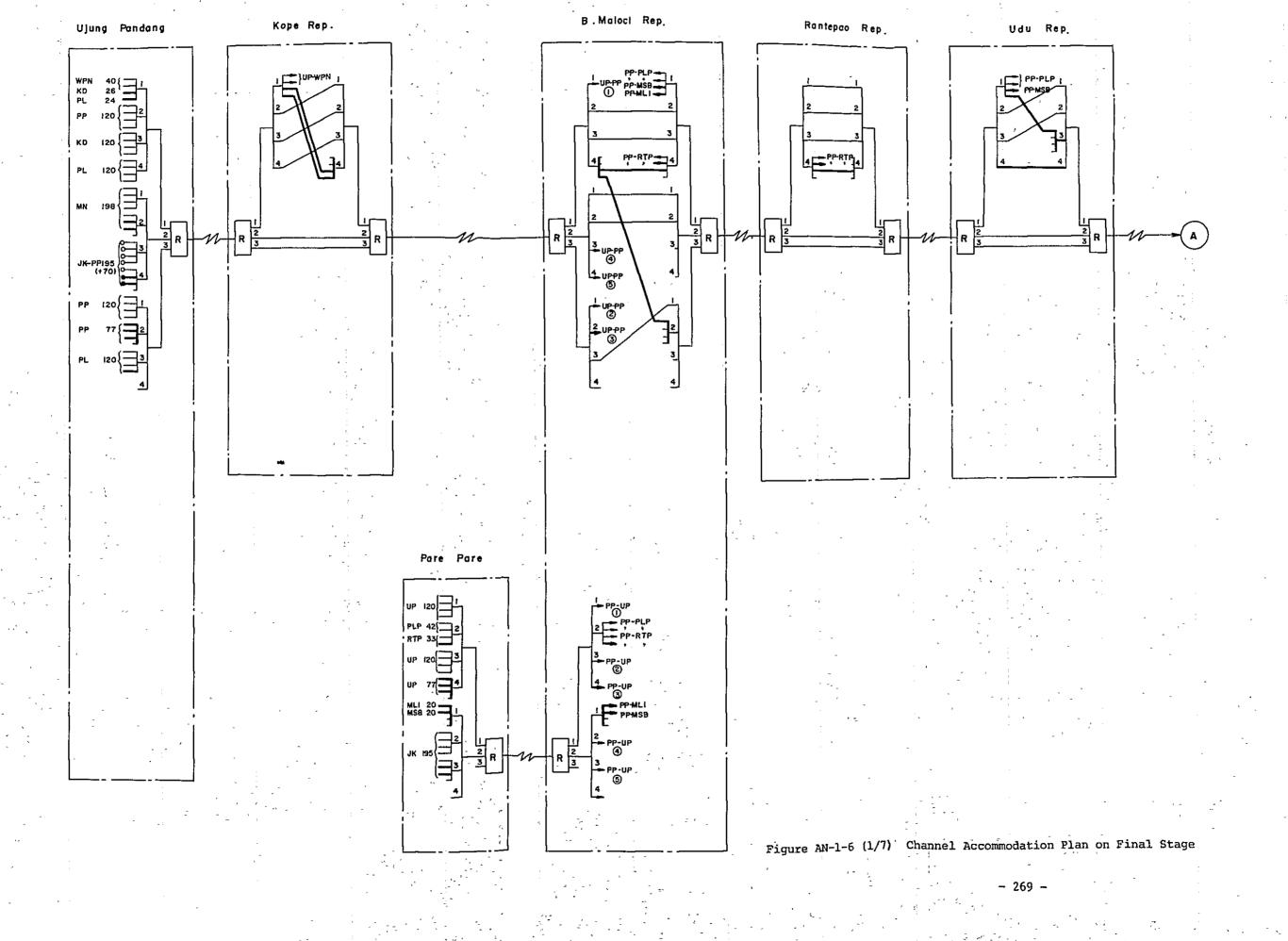


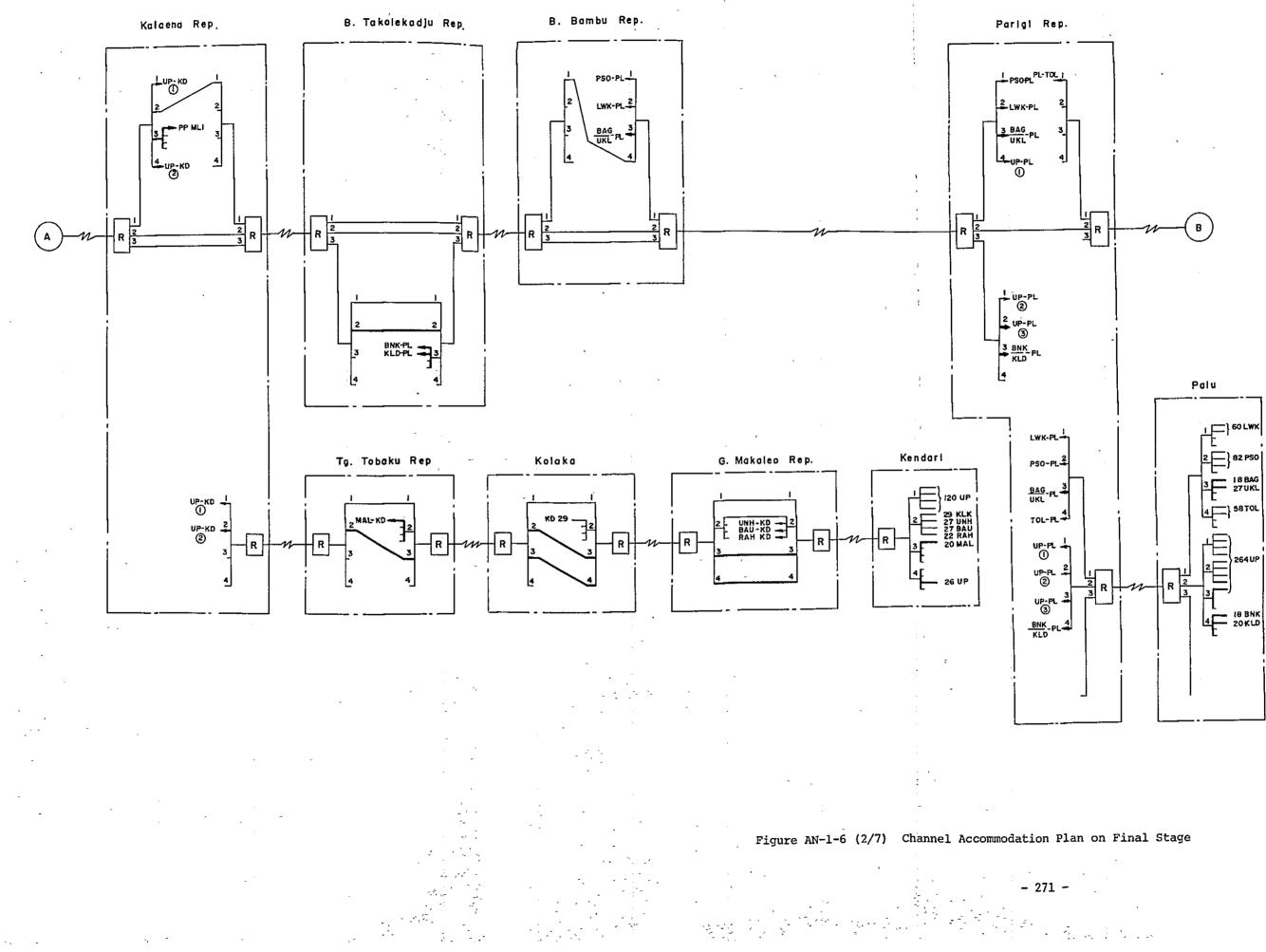
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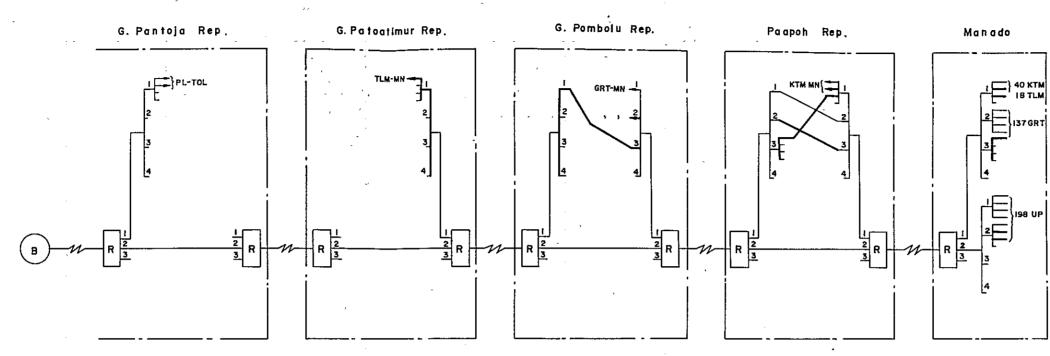
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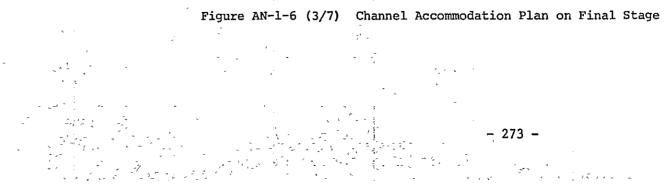
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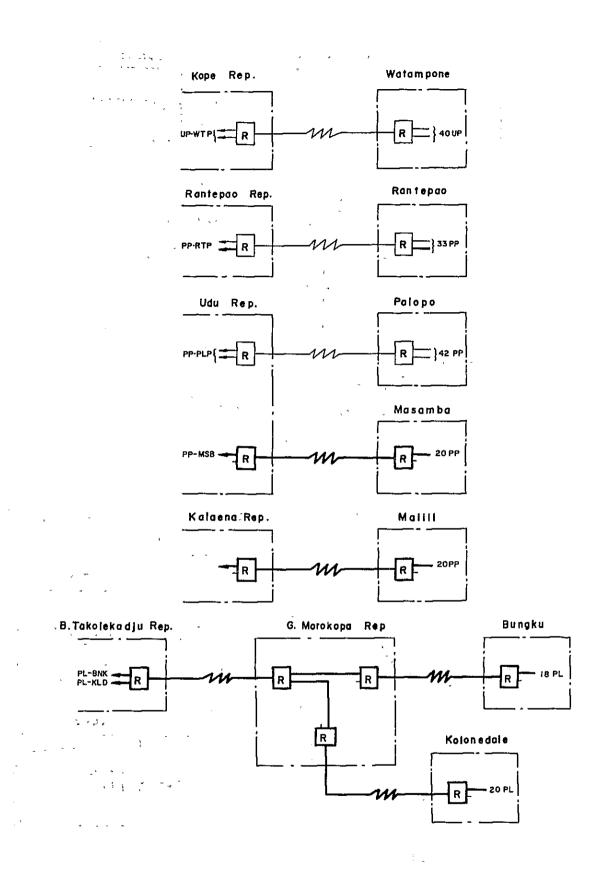


Figure AN-1-6.(4/7) Channel Accommodation Plan on Final Stage

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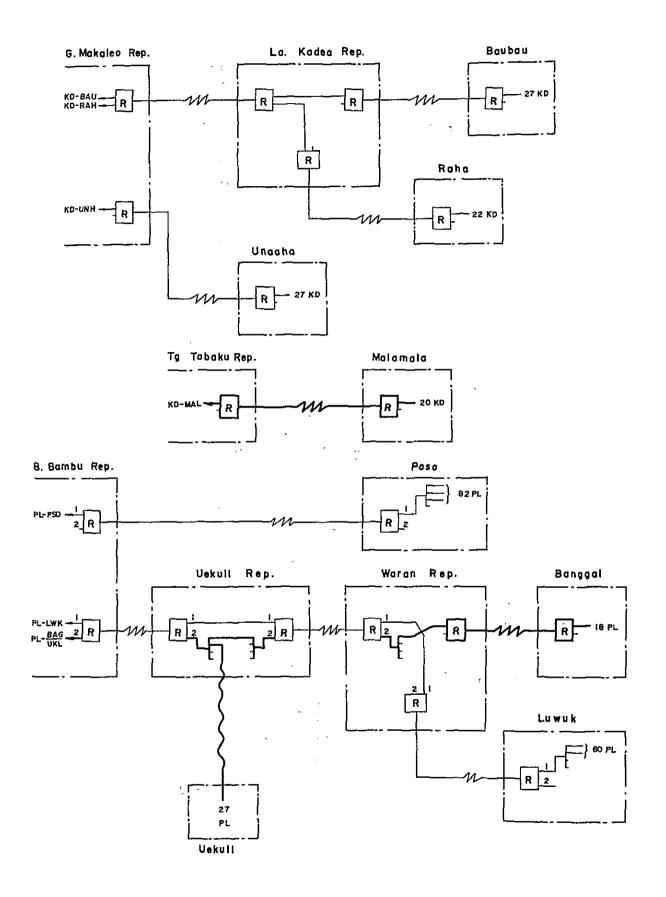
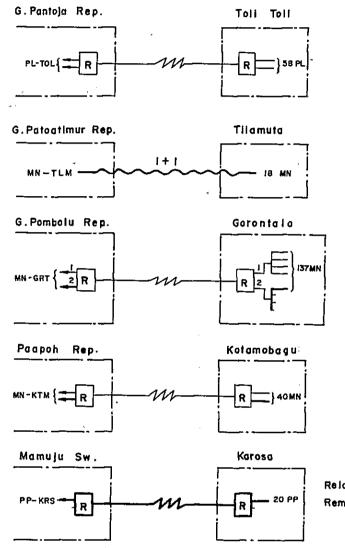


Figure AN-1-6 (5/7) Channel Accommodation Plan on Final Stage



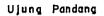
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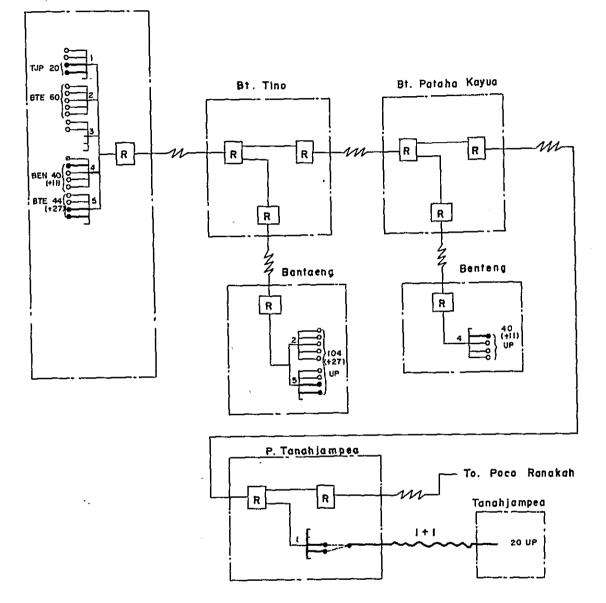
Figure AN-1-6 (6/7) Channel Accommodation Plan on Final Stage

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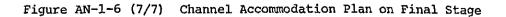
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Secti	on / ` ^	Crow-flight - Distance -	Distribution	Ratio (%)
A	В	(km)	Case-1	Case-2
Ujung Pandang	Watampone	125	80	88
	Bantaeng	75	80	93
	Benteng	160	80	84
	Tanahjampea	260	80	74
Pare Pare	Majene	90	80	91
	Rantepao	1.20	80	88
	Palopo	130	80	87
,	Sengkang	45	80	96
	Mamuju	170	80	83
	Masamba	180	80	82
-	Malili	220	80	78
	Karosa	240	80	76
Manado	Tahuna	_	0	0
	Вео	-	0	0
	Kotamobagu	100	80	90
	Gorontalo	225	80	78
	Tilamuta	300	80	70
	Paleleh	-	0	0
Palu	Poso	, 125	80	88
_`	Toli Toli	240	80	76
× .	Uekuli	155	80	85
<u>r</u> ,	Kolonedare	210	80	79
	Bungku	300	80	70
<u>د</u> ری س	Unauna		0	0

Table AN-1-1 (1/2) Traffic Distribution Ratio for Terrestrial Link

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Secti	on	Crow-flight - Distance -	Distribution	n Ratio (%)
A	В	- Distance - (km)	Case-1	Case-2
Palu	Luwuk	330	80	67
	Banggai	415	80	59
Kendari	Baubau	165	80	84
~	Raha	100	80	90
· · · · · · · · · · · · · · · · · · ·	Papalia		0	0
ч) (Kolaka	110	80	89
~~~ ~	Malamala	200	80	80
<b>∧</b>	Unaaha	60	80	94
Ujung Pandang	Pare Pare		100	100
,	Manado	960	40	20
	Palu	480	80	52
	Kendari	370	80	63
Pare Pare	Manado	850	40	20
-	Palu	350	80	65
	Kendari	320	80	68
lanado	Palu	620	40	38
	Kendari	660	40	34
Palu	Kendari	460	80	54
Jjung Pandang	Jakarta	1,400	40	20
	Surabaya	800	40	20
-	Banjarmasin	600	40	40
یں ، -	Medan	2,500	40	20
<b>*</b>	Palembang	1,600	40	20
	Ambon	1,000	40	20

## Table AN-1-1 (2/2) Traffic Distribution Ratio for Terrestrial Link

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Unit: Million Rupiah

Period		D		t Value iscount)		it Value liscount)
(Year)	Cost	Benefit ~	Cost	Benefit	Cost	Benefit
1984	684	494	684	494	684	494
1985	10,049	494	8,812	433	8,744	430
1986	19,387	7,245	14,909	5,571	14,657	5,478
1987	19,834	14,170	13,388	9,565	13,051	9,323
1988	21,044	17,580	12,459	10,408	12,036	10,056
1989	2,481	7,534	1,288	3,911	1,232	3,745
1990	2,193	7,600	1,000	3,466	948	3,283
1991	2,009	8,111	804	3,244	755	3,051
1992	4,965	8,622	1,743	3,026	1,623	2,818
1993	4,816	9,108	1,484	2,806	1,366	2,586
1994	4,014	9,704	1,083	2,620	992	2,398
1995	3,948	10,902	936	2,584	848	2,344
1996	6,463	11,765	1,344	2,447	1,208	2,200
1997	8,580	12,591	1,562	2,290	1,398	2,053
1998	9,084	13,422	1,454	2,149	1,281	1,892
1999	3,618	14,254	506	1,995	445	1,753
2000	3,745	14,882	460	1,831	401	1,591
2001	3,659	16,097	396	1,738	340	1,496
2002	3,796	17,280	362	1,642	308	1,401
2003	3,386	18,495	281	1,535	237	1,296
2004	3,280	19,707	240	1,440	200	1,203
2005	494	20,805	32	1,332	27	1,102
	Total		65,227	66,527	62,781	61,993
Be	nefit - C	ost	+1,	300	····	-788

 $IFRR = 14 + \frac{1,300}{1,300 + 788} = 14.628$ 

Period	)* (	Description		t Value liscount)		nt Value liscoùnt)
(Year)	Cost	Benefit -	Cost	Benefit	Cost	Benefit
1984	665	<u> </u>	665	-	665	-
1985	7,617	-	6,803		6,742	-
1986	16,076	-	12,765		12,540	-
1987	17,678	_	12,586	_	12,252	-
1988	18,214	3,527	11,584	2,244	11,166	2,163
1989	1,007	7,304	572	4,141	545	3,960
1990	716	7,859	347	3,977	345	3,772
1991	535	8,389	242	3,791	227	3,566
1992	3,129	8,917	1,264	3,603	1,176	3,354
1993	2,982	9,421	1,076	3,400	992	3,136
1994	748	10,037	242	3,232	220	2,960
1995	741	11,276	213	3,236	193	2,943
1996	3,012	12,168	777	3,126	699	2,811
1997	4,955	13,022	1,134	2,982	1,012	2,657
1998	5,485	13,882	1,124	2,845	992	2,513
1999	667	14,749	122	2,699	108	2,359
2000	856	15,393	139	2,508	120	2,171
2001	829	16,649	122	2,430	103	2,080
2002	1,034	17,871	134	2,322	115	1,985
2003	692	19,128	81	2,220	68	1,875
2004	655	20,382	68	2,119	56	1,772
2005	-2,066	21,518	-193	2,002	-159	1,657
	Total		51,867	52,877	50,177	47,734
Be	nefit - C	ost	+1,	010	-2	,443

### Table AN-1-3 Internal Economic Rate of Return

Unit: Million Rupiah

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- Supplementary Comments on Demand Forecast and Traffic Forecast
- 2-1. Demand Forecast Model Formula

Supplementary comments are made below on demand forecast methodology, i.e., to estimate future growth trend from correlations between GDP per capita and main telephone density.

- (1) When applying the above methodology to telephone demand forecast for Sulawesi area, it is not proper to use data that include data of developed countries. Hence, in this Study, data of countries where GDP per capita is less than US\$2,000, chosen out of Asian, African and South American countries. Such data are identified in Table AN-2-1.
- (2) Regression formula obtained from Table AN-2-1 data appears below. It is graphically presented in Figure AN-2-1.

 $Y = 0.000136 \cdot x^{1.37}$  (Correlation coefficient: 0.87)

where

**`**,

- Y : Number of main telephones per population of 100
- X : GDP per capita (as of 1979; in US\$)
- (3) Regression formula appearing above indicates how the number of main telephones per population of 100 varies in accordance with the growth of GDP.

For Sulawesi area, main telephone density variations with GDP growth can be forecasted by drawing a parallel line with the trend of variations line referred to above, using main telephone density in the area as of 1981 and telephone density inclusive of waiting subscribers as two starting points. (Refer to Figure AN-2-2.)

Telephone subscribers in Sulawesi area as of 1981 number 19,850 and waiting subscribers 4,400. In other words, telephone demand density with unfulfilled applications taken into account stands at 0.23. Assuming that the demand is to be fulfilled 100% and that the trend line, B - D, in Figure AN-2-2 is to be used, regression formula can be obtained as follows:

 $Y = 0.000077 \cdot x^{1.37}$ 

where

- Y : Forecasted main telephone density in Sulawesi area
- X : GDP per capita (in US\$; reference year: 1979)
- (4) In the above model formula, GDP per capita is obtained on assumptions:
  - GDP per capita in Sulawesi area as of 1979 is 90% of that of all Indonesia. Meanwhile, the actual record for 1977 was about 72%.
  - Real growth rate of GDP in Sulawesi area does exceed the average growth rate for all Indonesia.
     Hence, slightly over 8% annually up to 1984 and slightly over 7% annually thereafter.

#### 2-2. SLDD Calling Rates

(1) In this Study, call metering records and data of toll calls via manual boards at Ujung Pandang and Manado Exchanges could be obtained. January to October 1981 records follow:

Exchange	Call Meterings	Toll Calls via <u>Manual Boards</u>
Ujung Pandang	93,573,018	91,660
Manado	51,689,999	48,255

Note: Call metering records above include local call records.

- (2) According to January to October 1982 data obtained at Manado Exchange, ratio of SLDD call meterings to total call meterings stands at 93.5% in 10-month average and 89.9% in 10-month total. These figures allow an estimate that 90% of the combined sum of call meterings above will account for SLDD call meterings.
- (3) From total call meterings and number of toll calls via manual boards, SLDD calling rates are estimated. Formulas used are as follows:

 $A_{0} = C_{1} \cdot C_{2} \cdot C_{3} \cdot P \cdot Z \cdot K$   $A_{1} = C_{1} \cdot C_{2} \cdot C_{3} \cdot T \cdot M$   $A = (A_{0} + A_{1} \cdot C_{4}) \cdot B / N$ where

A : Estimated SLDD calling rate per subscriber (Erlang)

A_o: SLDD busy hour traffic (Erlang)

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- A₁: Busy hour traffic via manual boards (Erlang)
- C1: Coefficient for conversion of 10-month total to one-month total (1/10)
- C2: Coefficient for conversion of one-month total to per day value. Commonly, the average number of working days per month is used. (1/25)
- C3: Busy hour concentration rate (1/7.5) (Calculated from Ujung Pandang Exchange rectifier equipment discharge current curve. Refer to Figure AN-2-3.)
- C₄: Coefficient for correction of traffic increment as improvement effect by transfer to automatic exchange system (1.5)
- P : Average metering pulse interval by SLDD from Sulawesi area Ujung Pandang: 3.0/3,600 Manado: 2.5/3,600
- Z: January October 1982 sum total of meterings
  - K : SLDD ratio to sum total of meterings
     (0.9)
  - T : Average holding time of call connected (180/3,600)
  - M : January October 1981 sum total of toll calls via manual boards

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B : Coefficient for correction of traffic
 increment due to ineffective calls (1.1)
 N : Number of subscribers accommodated

(4) Calculation results are:

	N	A		A (11-1)
	<u> </u>	<u>(Erl)</u>	<u>(Erl)</u>	<u>(Erl)</u>
Ujung Pandang	9,000	37.43	2.44	0.0050
Manado	3,350	17.23	1.23	0.0063

#### 2-3. Traffic Distribution

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- (1) Results of traffic flow study are reported in Master Plan also. However, considering that existing network is still in developmental stage, those study results cannot be easily used, without comparative study with other related data, for estimation of traffic distribution as of the time the telephone diffusion progresses further and the network improvement will have been carried out.
- (2) The table below presents comparison of data concerning SLDD traffic distribution in Sulawesi area.

from Ujung P.	, Data andang	A	В	С
<u></u>	Surabaya	10 %	20 %	30 %
to	Jakarta	40 %		
Outside of	Banjarmasin	6. %	65 %	50 %
Sulawesi	Medan	4 %		50 %
	Palemban	4 %		
-	Ambon	6 %		
to	Manado		7 %	
Inside of Sulawesi	Others	30 %	8 %	20 %
Ť	otal	100 %	100 %	100 %

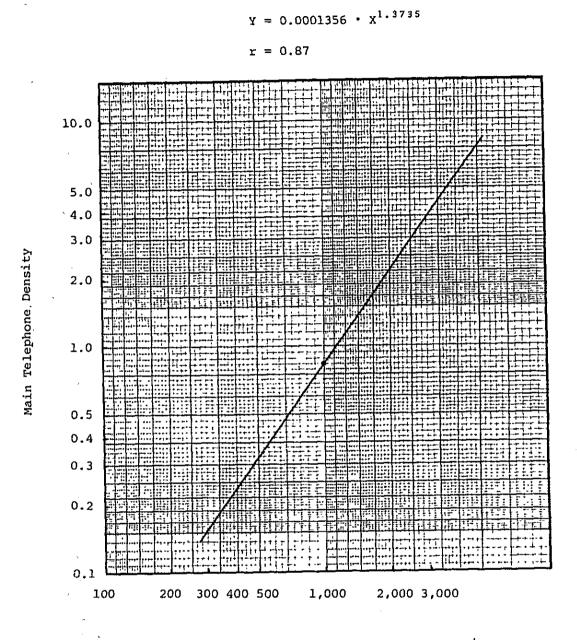
where

- A : Estimate as of the year 2005 by "Fundamental Plan 1972 for the Telephone Network in Indonesia"
- B : Value obtained from report on traffic measurements of April 22/23, 1981, at Ujung Pandang Exchange

C : Value used in Master Plan final report

(3) From the foregoing data, at least the following estimates can be made:

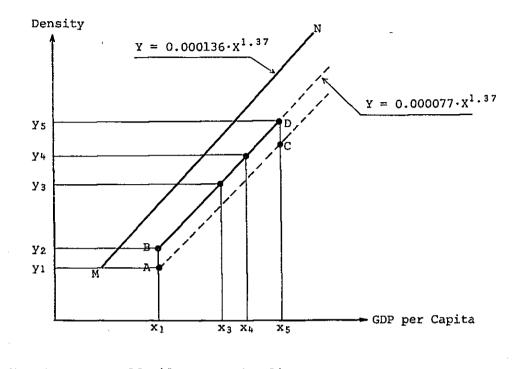
-Outgoing traffic from Sulawesi area to other areas occupies about 80% of total SLDD traffic.



GDP/Capita (US\$)

Figure AN-2-1 GDP and Main Telephone Density in 31 Countries (1979)

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M - N : Mean world-wide regression line

y1 : Present density (1981 - 0.19)

y₂ : Present density with waiting subscriber's (1981 - 0.23)

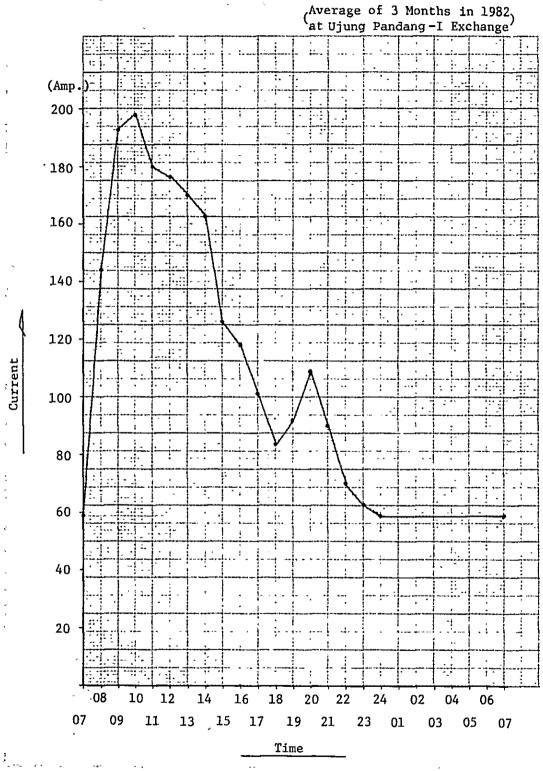
x1 : GDP per Capita in 1981 (343 US\$)

A - C : Progression of the density forecast B - D : (depend on the solution adopted)

x₃, x₄, x₅ : GDP per Capita in 1994, 1999, 2005

Y3, Y4, Y5 : Density forecasted in 1994, 1999, 2005

Figure AN-2-2 Method of the Graphical Caluculation of Future Density



Distribution of Daily Load Current Figure AN-2-3 - ...

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Country	GDP/Capita(US\$)	Main Telephone D sity/100 persons
Indonesia	340	0.3
Papua New Guinea	707	0.7
Philippines	629	0.7
Thailand	607	0.7
Korea	1605	6.3
India	170	0.3
Pakistan	225	0.3
Turkey	1277	2.5
Brazil	1755	3.4
Chile	1919	3.1
Colombia	967	4.7
Costa Rica	1814	5.7
Ecuador	1174	2.7
Haiti	241	0.4
Honduras	528	1.0
Mexico	1852	3.3
Nicaragua	600	1.5
Panama	1539	6.7
Peru	864	0.6
Dominica	987	3.8
Jamaica	1086	2.2
Algeria	1638	1.4
Egypt	416	1.1
Kenya	345	0.5
Liberia	522	0.4
South Africa	1857	5.7
Sudan	427	0.2
Malawi	210	0.2
Тодо	417	0.2
Tunisia	979	1.6
Zambia	579	0.5

## Table AN-2-1 GDP and Main Telephone Density in 31 Countries (1979)

Source: "World Development Report, 1981" (World Bank) "The World Telephones, 1981" (AT & T)

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Primarv	Local Area		Present Condition (Jun.82)	tion (Jun.82)	Z	No. of Line	e Capacity		
Area	Name	Туре	No. of Line Capacity	No. of Line Connected	1989	1994	1999	2005	
	Ujung Pandang	Auto.	12,200	10,169	32,000	41,000	50,000	72,500	
2 ~	Maros	LB	(400)	(249)	1,000	2,000	3,000	5,000	
	Sungguminasa	LB	(400)	(169)	(400)	1,000	1,500	2,500	×
-	Takalar	LB	(80)	(62)	(80)	(120)	600	1,500	
Ujung	Malino	Г.В	(20)	(38)	(50)	(08)	400	1,000	
Fandang	Mandai	ILB	(20)	(28)	1,000	2,000	3,000	5,000	Ţ
444	Pangkajene	LB	(200)	(170)	400	1,000	1,500	2,500	,
			,						
	Sub Total	į			34,930	47,200	60,000	90,000	
		-							
Watampone	Watampone	LB	(370)	(367)	1,000	1,200	1,400	1,800	1
"412"									
								ı	
	Bantaeng	LB	(200)	(185)	600	1,200	1,500	2,000	
	Bulukumbu	ЯЛ	(200)	(197)	(400)	600	1,000	1,500	
	Jeneponto	ГВ	(100)	(72)	(001)	(200)	500	006	
Bantaeng	Sinjai	LB	(120)	(127)	(150)	(300)	600	1,000	
"413"				- 4					
	Sub Total				1,250	2,300	3,600	5,400	

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Primary	Local Area		Present Condition(Jun.82)	tion(Jun.82)	Nc	No. of Line	of Line Capacity		Remarks
Area	Name	Type	No. of Line Capacity	No. of Line Connected	1989	1994	1999	2005	
	Benteng	ГВ	1	t	(200)	(400)	1,000	1,800	
Benteng "414"									
414									
Tanahiam-	Tanahjampea	ľ	I	1	1	(100)	(200)	500	-
pea				, , ,					
"415"									
-	Pare Pare	Auto.	1,000	947	4,000	5,000	8,000	12,000	<b>.</b>   
	Enrekang	ГВ	(20)	(38)	500	600	1,000	1,500	
	P.Sideureng	LB	(150)	(011)	(150)	(200)	500	700	
Pare Pare	Pinrang	EI	(120)	(117)	400	600	1,000	1,500	ψ υπ
"421"	Barru	E.B	(00T)	(21)	600	- 001	1,000	1,500	
	Rappang	EJ EJ	(001)	(48)	(200)	(250)	500	800	
	Watang Sopeng	LB	(200)	(121)	400	600	1,000	1,500	
	Sub Total				6,250	7,950	13,000	19,500	
Majene									
"422"	Majene	EII	(100)	(81)	(001)	(150)	400	700	
	Pole Wali	ELB	(120)	(86)	(200)	(300)	600	1,000	
	- -								<u> </u>
								~	
	Sub Total				300	450	1,000	1,700	
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Primary	Local Area		Present Condition (Jun.82)	tion (Jun. 82)	~	No. of Lin	of Line Capacity	~	
Area	Name	Type	No. of Line Capacity	No. of Line Connected	1989	1994	1999	2005	Kelliarks
	Rantepao	LB	(100)	(16)	(150)	(250)	400	600	
Rantepao	Makale	LB	(100)	(13)	(100)	(200)	400	600	
"423"									
	Sub Total				250	450	800	1,200	
Palopo "	Palopo	LB	(200)	(187)	1,000	1,300	1,600	1,900	
424									
	Sengkang	LB	(170)	(153)	400	500	600	700	
Sengkang	Cebenge	ТВ	(50)	(15)	(20)	(100)	(200)	500	4
"425"									
	Sub Total				450	600	800	1,200	<b>.</b>
Mamuju "ac"	Mamuju	81			(200)	(400)	(800)	1,200	
440									
•							-		
Masamba	Masamba		1	1	-	(200)	(300)	500	
17#						,	-		
Malili	Malili	   		1	,	(200)	(300)	500	
"428"									

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Primary	Local Area		Present Condition(Jun.82)	tion (Jun. 82)		No. of Lir	Line Capacity		Remarks
Area	Name	Type	No. of Line Capacity	No. of Line Connected	1989	1994	1999	2005	:
Karosa	Karosa	L	F	1	1	(200)	(300)	500	
"429"									
								`	-
	· Manado	Auto.	4,600	3,361	10,000	12,500	20,000	27,500	
4	Tondano	ILB	(280)	(187)	500	800	1,500	3,000	
	Amurang	LB	(100)	(45)	(001)	(200)	500	1,000	-
OnebeM	Air Madidi	EI	(02)	(26)	(50)	(100)	(300)	500	
11 1 2 1	Bitung	LB	(400)	(321)	2,000	2,500	4,000	7,000	
+ ;	Kawangkoan	LB	(091)	(65)	(160)	(200)	500	1,000	
	Tomohon	EI	(200)	(181)	500	700	1,200	2,000	1 1 1
2	Sub Total				13,310	17,000	28,000	42,000	
		-			 				,
Tahuna	· Tahuna	fl	(200)	(5)	(200)	(300)	(400)	500	
"432"			-						
	~		2			, , ,			·
Beo	· Beo	1	<b>I</b>	f	1	(100)	(200)	500	, 
"433"									
Kotamo- Baqu	Kotamobagu	LB	(400)	(173)	600	800	1,100	1,700	

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 3		* , r =		<u>,                                     </u>	-	<u>:</u>	<u>`</u>			· _			T T		,	، بر 		1			<del></del>		
-		CY TOILDY	,	•		* 						, , ~											
		2005	7,000	5,000		12,000		500			500		9,000	5,000	700	-	14,700		5,400		2,800	450	3,250
·	he Capacity	1999	5,000	3,000		8,000		(300)			(300)		6,000	2,500	(300)		8,800		4,500		2,200	(300)	2,500
· ,	No. of Line	1994	3,500	1,500		5,000		(200)			(200)		5,000	2,000	(100)	-	7,100		3,600	7	1,500	(100)	1,600
2	*	1989	3,000	1,000		4,000		L	~		3		4,000	1,000	(20)	~	5,050		2,900		1,000	(20)	1,050
l Forecast 5/7	tion (Jun. 82)	No. of Line Connected	(1,173)	-				1			1		975	(153)	(30)			-	(582)		(20)	(1)	1.7.9.7. ±1
Microscopic Telephone Demand Forecast	Présent Condition (Jun.82)	No. of Line Capacity	(40) (1,160)			÷ -		1			T		1,000	(200)	(50)		-		(600)		· (640) (50)	(20)	•
scopic Te		Type	CB CB	Auto.				T			1		Auto.	LB	LB				LB		CB LB	LB	
Table AN-2-2 Micro	Local Area	Мате	Gorontalo	Limboto		Sub Total		Tilamuta			Paleleh		Palu	Donggala	Tawaeli		Sub Total		Poso		Toli Toli	. Parigi	Sub Total
Tal	Primary	Area	*	Goron~	1435"	1	- -		. 95 #	1 1 1	Palelen	; "437" ,		Palu	"451" -		, , , , , ,	I	Poso		roli roli	2 C U Z Z	

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Remarks							       									 	
	2005	400	400		800	500	i	500	_	(300)		4,700		500		6,000	1
e Capacity	1999	(001)	(100)		200	(200)		(200)		(200)		3,700		(200)		5,000	
No. of Line Capacity	1994	(20)	(20)		100	(100)		(100)		(100)		2,700		(100)		4,000	
N	1989	1	1		I	1		1		1		2,000		1		3,000	
tion (Jun.82)	No. of Line Connected		ľ					1				(593)				874	
Present Condition(Jun.82)	No. of Line Capacity		ſ			<b>I</b>				1		(800)		1		1,000	
	Туре	1	i			1		1		1		LB		1		Auto.	
Local Area	Name	Uekuli	Ampana		Sub Total	Kolonedale		Bungku		Unauna		Luwuk		Banggai		Kendari	
Primary	Area		Uekuli	"454"		Kolone-	"455"	Bungku	<b>4</b> 56"	Unauna	"457"	Luwuk	"458"	Bnaggai	"459"	Kendari	"401"

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Primary	Local Area		Present Condition (Jun.82)	tion (Jun.82)		No. of L	No. of Line Capacity	ity	•
Агеа	Мате	Type	No. of Line Capacity	No. of Line Connected	1989	1994	1999	2005	, Kemarks
•									
Baubau "402"	Baubau	LB	(200)	(25)	(200)	(400)	600	006	
3									
•									
Raha	Raha	LB	(200)	(18)	(200)	(300)	400	500	
Papalla "	Papalia	1	90	1	1	(100)	(200)	(300)	
404									_
;									
KOLAKA "ADE"	Kolaka	LB	(200)	(15)	(200)	(300)	600	006	
C07									
ויזטביי	Malamala	1	·	1	1	(001)	(200)	500	
00									
	Unaaha	r	1		I	(300)	500	800	
1									
Grand Total	otal		1	1	78,540	107,550	151,400	225,950	

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Exchange
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Program
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	Domotion	Veliatko										-											· ,	
	End of	PELITA IV	10,000	200	600	500	100	50	2,000	50	500	3,000	3,000	200	100	200	2,900	4,000	1,000	2,000	1,000	50		
		88/89	1	,	600	500	1	1	I	-	1	1	1	1	1	1	1	1	I	I	1	1		
Draft - )	Program	87/88	5,000	1	I	1	t	-	1,000	1	500	1	1,000	1	I	ł	I	1,000	t	-	1	-		
1		86/87	1	1	1		1	1	1	1	1	1,000	J	1	I	t	1	ł	I	1	1,000	I		
PERUMTEL 15.06.82	Expansion	85/86	1	I	1	t	I	1	I	I	J	I	1	I	I	I	2,000	I	I	1,000	J	1		
		84/85	1	1	5	1		1	1	١	1	1	1,000	١	1	1	,	1,000	1,000	1	ı	1		
REPELITA IV	End of	PELITA III	5,000	200	(400)	(600)	100	50	1,000	50	(007)	2,000	1,000	200	100	200	006	2,000	(079)	1,000	(400)	50		
(Source :	ing	Manual	1	200	400	600	100	50	1	5Ò	400	I	1	200	100	200	1	I	640	2	400	50		
	Existing	Auto.	5,000	-		ł	ł	1	1,000	1		2,000	1,000	1	1	I	006	2,000	1	1,000	1	1		
	 !	Type	PC-1000	ABJ	ABK/ABJ	DIG	ABH	ABH	DIG	ABH	ABK	DIG	PC-1000	ABK	Lab	АВJ	MCR	PC-1000	ADK	DIG	ABK	ABH		
		Local Area	Manado	Tahuna	Kotamobagu	Tondano	Amurang	Air Madidi	Bitung	Kawangkoan	Tomohon	Gorontalo	Kendari	Raha	Baubau	Kolaka	Poso	Palu	Toli Toli	Τμωμκ	Donggala	Parigi		

Note; () : Removal of Existing Switches

Table AN-2-3 Expansion Program for Local Exchange in WITEL-X 2/3

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, <u> </u>	, , , , , , , , , , , , , , , , , , ,	Kemarks		6 e						Ŧ				-									
	End of	PELITA IV	50	4,000	600	500	100	100	1,000	400	400	200	150	200	400	400	50	150	32,000		1,000	1,000	
•		88/89	1	1	I	1		l	1,000	400	400	1	1	1	1	400	1		1				
- Draft - )	Program	87/88	1	I	600	500	1	1	1	1	1	1	1	1	007		1	1	t				
		86/87	I	2,000	I	I	1	3	1	1	1	F	I	I	1		t		16,000				
rel 15.0	Expansion	85/86	ι	1	-	1	t .	I	I	t	t	1	t	I	t	1	1	1	I		1,000	1,000	
V PERUMI		84/85	1	ł	ļ	1	1	1	1	1	1	I	1	1	1	1	1		10,000		- 1	1	
REPELITA IV PERUMTEL 15.06.82	End of	PELITA III	50	2,000	(200)	(150)	100	100	(300)	(400)	(400)	200	150	200	(400)	(400)	50	150	(6,200)	6,000	(400)	(20)	-
(Source :	ing	Manual	50	1	200	150	100	100	300	400	400	200	150	200	400	400	50	150	. 1	1	400	50	
	Existing	Auto.	1	2,000	1	1	1	-	1	t	I	1	1	1	1	1	1	1	8,200	4,000		1	
ť	E	ıype	ABH	PC-1000	ABK	ABK	ABK	ABK	ABK+ABJ	ABK	ABK	ABK	ABK	ABK	ABK	ABK	ABH	ABK	HKS	PC-1000	ABK	ABK	
		- POCAL AFEA	Tawaeli	· Pare Pare	Barru	Enrekang	Majene	Makale	Falopo	Pangkajene	Pinrang	Pole Wali	Rantepao	Rappang	Sengkang	Watang Sopeng	Cebenge	P. Sideureng	Ujung Pandang		Maros	Mandai	

Note; () : Removal of Existing Switches

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:	Pamarka																			1
٤	End of PELITA IV		80	50	100	600	400	1,000	150	400	200	200	1,000	200					047	N£C,8/
		88/89	1	1	1	ı	1	1,000	1	-	1	I	I	i	 !				4,300	
- Draft - )	ram	87/88	1	1	1	600	1	1	J	I	1	1	ı	1					10,600	
1 1	ion Program	86/87	\$	1	t	t	t	]	I	1	-	1	1	1					20,000 10,600	53,900
EL 15.0	Expansion	85/86	I	i	)	8	1	-	-	1	1	3	1,000	1					6,000	
V PERUMI		84/85	1	I	;	ł	1	1	1	1	] ]	1	J	I					13,000	
: REPELLTA IV PERUMITEL 15.06.82	End of	PELITA III	80	50	100	(007)	400	(450)	150	400	200	200	(200)	200		ī				31,020
(Source :	ting	Manual	80	50	100	400	400	450	150	400	200	200	200	200						9,920
	Existing	Auto.	:	1	1	1	ł	-	ſ	1	1	1	I	1						2/,100
	U L	туре	ABK	ABH	ABK	ABK	ABK	ADK	ABJ+ADK	ABK	ABK	ABK	ABK	ABK						1
	Toool Aroo	TOCAL PICA	Takalar	Malino	Jeneponto	Bantaeng	Bulukumbu	Watampone	Sinjai	Sungguminasa	Mamuju	Benteng	Limboto	Sp. Binangkal						Total

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 Table AN-2-3
 Expansion Program for Local Exchange in WITEL-X 3/3

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Note; ( ) : Removal of Existing Switches

### 3. PATH PROFILE MAPS

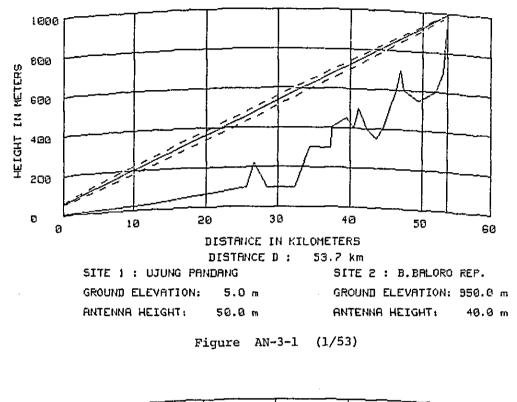
### 3-1. MAIN ROUTE

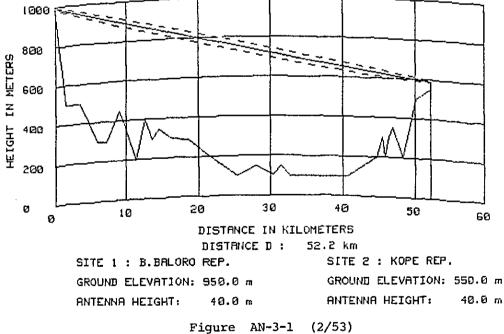
Figure AN-3-1 (2/53)       B. Baloro Rep.       - Kope Rep.         Figure AN-3-1 (3/53)       Kope Rep.       - Sengkang Rep.         Figure AN-3-1 (4/53)       B. Maroci Rep.       - Pare Pare         Figure AN-3-1 (5/53)       B. Maroci Rep.       - B. Parangian Rep.         Figure AN-3-1 (6/53)       B. Maroci Rep.       - Rene Rep.         Figure AN-3-1 (7/53)       B. Perangian Rep.       - Rebane Rep.         Figure AN-3-1 (8/53)       Lebane Rep.       - Kawalean Rep.         Figure AN-3-1 (10/53)       Kawalean Rep.       - Wau Rep.         Figure AN-3-1 (10/53)       Kawalean Rep.       - Sangke Rep.         Figure AN-3-1 (11/53)       Udu Rep.       - Bangke Rep.         Figure AN-3-1 (12/53)       Bangke Rep.       - Staleana Rep.         Figure AN-3-1 (12/53)       B. Takolekadju Rep.       - B. Banbu Rep.         Figure AN-3-1 (13/53)       Kalaena Rep.       - Tampemadoro Rep.         Figure AN-3-1 (16/53)       Tampemadoro Rep.       - Staleij Rep.         Figure AN-3-1 (17/53)       B. Bambu Rep.       - B. Mariko (2) Rep.         Figure AN-3-1 (16/53)       Tampemadoro Rep.       - Bangke Rep.         Figure AN-3-1 (16/53)       B. Mariko (2) Rep.       - B. Mariko (2) Rep.         Figure AN-3-1 (16/53)       B. Mariko (	Figure AN-3-1	(1/53)	Ujung Pandang	- B. Baloro Rep.
Figure AN-3-1 (4/53)       Sengkang Rep.       - B. Maroci Rep.         Figure AN-3-1 (5/53)       B. Maroci Rep.       - Pare Pare         Figure AN-3-1 (6/53)       B. Maroci Rep.       - B. Perangian Rep.         Figure AN-3-1 (7/53)       B. Perangian Rep.       - Lebane Rep.         Figure AN-3-1 (8/53)       Lebane Rep.       - Rantepao Rep.         Figure AN-3-1 (9/53)       Rantepao Rep.       - Kawalean Rep.         Figure AN-3-1 (10/53)       Kawalean Rep.       - Udu Rep.         Figure AN-3-1 (11/53)       Udu Rep.       - Bangke Rep.         Figure AN-3-1 (12/53)       Bangke Rep.       - Kalaena Rep.         Figure AN-3-1 (12/53)       Bangke Rep.       - B. Takolekadju Rep.         Figure AN-3-1 (12/53)       B. Takolekadju Rep.       - B. Takolekadju Rep.         Figure AN-3-1 (14/53)       B. Takolekadju Rep.       - Tampemadoro Rep.         Figure AN-3-1 (16/53)       Tampemadoro Rep.       - B. Bambu Rep.         Figure AN-3-1 (16/53)       Tg. Malejati Rep.       - Parigi Rep.         Figure AN-3-1 (19/53)       Parigi Rep.       - B. Mariko (2) Rep.         Figure AN-3-1 (19/53)       B. Mariko (2) Rep.       - B. Mariko (1) Rep.         Figure AN-3-1 (20/53)       B. Mariko (1) Rep.       - Palu         Figure AN-3-1 (22/53)<	Figure AN-3-1	(2/53)	B. Baloro Rep.	- Kope Rep.
Figure AN-3-1 (5/53)       B. Maroci Rep.       - Pare Pare         Figure AN-3-1 (6/53)       B. Maroci Rep.       - B. Perangian Rep.         Figure AN-3-1 (7/53)       B. Perangian Rep.       - Lebane Rep.         Figure AN-3-1 (8/53)       Lebane Rep.       - Rantepao Rep.         Figure AN-3-1 (9/53)       Rantepao Rep.       - Kawalean Rep.         Figure AN-3-1 (10/53)       Kawalean Rep.       - Udu Rep.         Figure AN-3-1 (10/53)       Kawalean Rep.       - Udu Rep.         Figure AN-3-1 (11/53)       Udu Rep.       - Bangke Rep.         Figure AN-3-1 (12/53)       Bangke Rep.       - Kalaena Rep.         Figure AN-3-1 (12/53)       B. Takolekadju Rep.       - B. Takolekadju Rep.         Figure AN-3-1 (14/53)       B. Takolekadju Rep.       - B. Bambu Rep.         Figure AN-3-1 (16/53)       Tampemadoro Rep.       - B. Bambu Rep.         Figure AN-3-1 (16/53)       Tag. Malejati Rep.       - Farigi Rep.         Figure AN-3-1 (18/53)       Tg. Malejati Rep.       - Parigi Rep.         Figure AN-3-1 (19/53)       B. Mariko (2) Rep.       - B. Mariko (1) Rep.         Figure AN-3-1 (20/53)       B. Mariko (1) Rep.       - Balu         Figure AN-3-1 (21/53)       B. Mariko (1) Rep.       - Palu         Figure AN-3-1 (22/53)       P	Figure AN-3-1	(3/53)	Kope Rep.	- Sengkang Rep.
Figure AN-3-1 (6/53)       B. Maroci Rep.       - B. Perangian Rep.         Figure AN-3-1 (7/53)       B. Perangian Rep.       - Lebane Rep.         Figure AN-3-1 (8/53)       Lebane Rep.       - Rantepao Rep.         Figure AN-3-1 (9/53)       Rantepao Rep.       - Kawalean Rep.         Figure AN-3-1 (10/53)       Kawalean Rep.       - Udu Rep.         Figure AN-3-1 (11/53)       Udu Rep.       - Bangke Rep.         Figure AN-3-1 (12/53)       Bangke Rep.       - Kalaena Rep.         Figure AN-3-1 (12/53)       Bangke Rep.       - Kalaena Rep.         Figure AN-3-1 (12/53)       Bangke Rep.       - B. Jakolekadju Rep.         Figure AN-3-1 (14/53)       B. Takolekadju Rep.       - B. Bambu Rep.         Figure AN-3-1 (16/53)       Tampemadoro Rep.       - Tampemadoro Rep.         Figure AN-3-1 (16/53)       Tag. Malejati Rep.       - Tg. Malejati Rep.         Figure AN-3-1 (18/53)       Tg. Malejati Rep.       - B. Mariko (2) Rep.         Figure AN-3-1 (19/53)       Parigi Rep.       - B. Mariko (1) Rep.         Figure AN-3-1 (20/53)       B. Mariko (1) Rep.       - Palu         Figure AN-3-1 (22/53)       Parigi Rep.       - Ogotai Rep.         Figure AN-3-1 (22/53)       Gotai Rep.       - Laementa Rep.         Figure AN-3-1 (24/53)       <	Figure AN-3-1	(4/53)	Sengkang Rep.	- B. Maroci Rep.
Figure AN-3-1 (7/53)       B. Perangian Rep.       - Lebane Rep.         Figure AN-3-1 (8/53)       Lebane Rep.       - Rantepao Rep.         Figure AN-3-1 (9/53)       Rantepao Rep.       - Kawalean Rep.         Figure AN-3-1 (10/53)       Kawalean Rep.       - Udu Rep.         Figure AN-3-1 (10/53)       Kawalean Rep.       - Udu Rep.         Figure AN-3-1 (11/53)       Udu Rep.       - Bangke Rep.         Figure AN-3-1 (12/53)       Bangke Rep.       - Kalaena Rep.         Figure AN-3-1 (12/53)       Bangke Rep.       - Kalaena Rep.         Figure AN-3-1 (12/53)       B. Takolekadju Rep.       - B. Takolekadju Rep.         Figure AN-3-1 (14/53)       B. Takolekadju Rep.       - B. Bigentjiloh Rep.         Figure AN-3-1 (16/53)       Tampemadoro Rep.       - B. Bambu Rep.         Figure AN-3-1 (16/53)       Tag. Malejati Rep.       - Tag. Malejati Rep.         Figure AN-3-1 (16/53)       Tg. Malejati Rep.       - Tg. Malejati Rep.         Figure AN-3-1 (16/53)       Tg. Malejati Rep.       - B. Mariko (2) Rep.         Figure AN-3-1 (16/53)       Tg. Malejati Rep.       - B. Mariko (2) Rep.         Figure AN-3-1 (16/53)       B. Mariko (2) Rep.       - B. Mariko (1) Rep.         Figure AN-3-1 (20/53)       B. Mariko (1) Rep.       - Palu	Figure AN-3-1	(5/53)	B. Maroci Rep.	- Pare Pare
Figure AN-3-1 (8/53)       Lebane Rep.       - Rantepao Rep.         Figure AN-3-1 (9/53)       Rantepao Rep.       - Kawalean Rep.         Figure AN-3-1 (10/53)       Kawalean Rep.       - Udu Rep.         Figure AN-3-1 (11/53)       Udu Rep.       - Bangke Rep.         Figure AN-3-1 (11/53)       Udu Rep.       - Bangke Rep.         Figure AN-3-1 (12/53)       Bangke Rep.       - Kalaena Rep.         Figure AN-3-1 (13/53)       Kalaena Rep.       - B. Takolekadju Rep.         Figure AN-3-1 (14/53)       B. Takolekadju Rep.       - B. Bjentjiloh Rep.         Figure AN-3-1 (16/53)       B. Bigentjiloh Rep.       - Tampemadoro Rep.         Figure AN-3-1 (16/53)       Tampemadoro Rep.       - B. Bambu Rep.         Figure AN-3-1 (16/53)       Tg. Malejati Rep.       - Tg. Malejati Rep.         Figure AN-3-1 (17/53)       B. Bambu Rep.       - Tg. Malejati Rep.         Figure AN-3-1 (18/53)       Tg. Malejati Rep.       - B. Mariko (2) Rep.         Figure AN-3-1 (20/53)       B. Mariko (1) Rep.       - Palu         Figure AN-3-1 (22/53)       Parigi Rep.       - Ogotai Rep.         Figure AN-3-1 (22/53)       Ogotai Rep.       - Laementa Rep.         Figure AN-3-1 (24/53)       Laementa Rep.       - Kasumba Rep.	Figure AN-3-1	(6/53)	B. Maroci Rep.	- B. Perangian Rep.
Figure AN-3-1 (9/53)Rantepao Rep Kawalean Rep.Figure AN-3-1 (10/53)Kawalean Rep Udu Rep.Figure AN-3-1 (11/53)Udu Rep Bangke Rep.Figure AN-3-1 (12/53)Bangke Rep Kalaena Rep.Figure AN-3-1 (13/53)Kalaena Rep B. Takolekadju Rep.Figure AN-3-1 (14/53)B. Takolekadju Rep B. Bigentjiloh Rep.Figure AN-3-1 (16/53)B. Bigentjiloh Rep Tampemadoro Rep.Figure AN-3-1 (16/53)B. Bambu Rep B. Bambu Rep.Figure AN-3-1 (18/53)Tg. Malejati Rep Parigi Rep.Figure AN-3-1 (18/53)Farigi Rep B. Mariko (2) Rep.Figure AN-3-1 (20/53)B. Mariko (1) Rep B. Mariko (1) Rep.Figure AN-3-1 (22/53)Parigi Rep Ogotai Rep.Figure AN-3-1 (22/53)Ogotai Rep Laementa Rep.Figure AN-3-1 (22/53)Laementa Rep Kasumba Rep.Figure AN-3-1 (22/53)Kasumba Rep Laementa Rep.Figure AN-3-1 (22/53)Kasumba Rep Laementa Rep.Figure AN-3-1 (22/53)Kasumba Rep Kasumba Rep. <td>Figure AN-3-1</td> <td>(7/53)</td> <td>B. Perangian Rep.</td> <td>- Lebane Rep.</td>	Figure AN-3-1	(7/53)	B. Perangian Rep.	- Lebane Rep.
Figure AN-3-1 (10/53)       Kawalean Rep.       - Udu Rep.         Figure AN-3-1 (11/53)       Udu Rep.       - Bangke Rep.         Figure AN-3-1 (12/53)       Bangke Rep.       - Kalaena Rep.         Figure AN-3-1 (13/53)       Kalaena Rep.       - B. Takolekadju Rep.         Figure AN-3-1 (14/53)       B. Takolekadju Rep.       - B. Jakolekadju Rep.         Figure AN-3-1 (14/53)       B. Takolekadju Rep.       - B. Bjentjiloh Rep.         Figure AN-3-1 (15/53)       B. Bijentjiloh Rep.       - Tampemadoro Rep.         Figure AN-3-1 (16/53)       Tampemadoro Rep.       - B. Bambu Rep.         Figure AN-3-1 (17/53)       B. Bambu Rep.       - Tg. Malejati Rep.         Figure AN-3-1 (18/53)       Tg. Malejati Rep.       - Parigi Rep.         Figure AN-3-1 (18/53)       Tg. Malejati Rep.       - B. Mariko (2) Rep.         Figure AN-3-1 (20/53)       B. Mariko (2) Rep.       - B. Mariko (1) Rep.         Figure AN-3-1 (21/53)       B. Mariko (1) Rep.       - Palu         Figure AN-3-1 (22/53)       Parigi Rep.       - Ogotai Rep.         Figure AN-3-1 (22/53)       Ogotai Rep.       - Laementa Rep.         Figure AN-3-1 (24/53)       Laementa Rep.       - Kasumba Rep.         Figure AN-3-1 (24/53)       Laementa Rep.       - Dungkas Rep.	Figure AN-3-1	(8/53)	Lebane Rep.	- Rantepao Rep.
Figure AN-3-1 (11/53)       Udu Rep.       - Bangke Rep.         Figure AN-3-1 (12/53)       Bangke Rep.       - Kalaena Rep.         Figure AN-3-1 (13/53)       Kalaena Rep.       - B. Takolekadju Rep.         Figure AN-3-1 (14/53)       B. Takolekadju Rep.       - B. Bjentjiloh Rep.         Figure AN-3-1 (14/53)       B. Takolekadju Rep.       - B. Bjentjiloh Rep.         Figure AN-3-1 (14/53)       B. Takolekadju Rep.       - Tampemadoro Rep.         Figure AN-3-1 (15/53)       B. Bjentjiloh Rep.       - Tampemadoro Rep.         Figure AN-3-1 (16/53)       Tampemadoro Rep.       - B. Bambu Rep.         Figure AN-3-1 (16/53)       Tg. Malejati Rep.       - Tg. Malejati Rep.         Figure AN-3-1 (17/53)       B. Bambu Rep.       - Tg. Malejati Rep.         Figure AN-3-1 (18/53)       Tg. Malejati Rep.       - B. Mariko (2) Rep.         Figure AN-3-1 (20/53)       B. Mariko (1) Rep.       - B. Mariko (1) Rep.         Figure AN-3-1 (21/53)       Bamiko (1) Rep.       - Palu         Figure AN-3-1 (22/53)       Parigi Rep.       - Ggotai Rep.         Figure AN-3-1 (22/53)       Ogotai Rep.       - Laementa Rep.         Figure AN-3-1 (24/53)       Laementa Rep.       - Kasumba Rep.         Figure AN-3-1 (25/53)       Kasumba Rep.       - Dungkas Rep.	Figure AN-3-1	(9/53)	Rantepao Rep.	- Kawalean Rep.
Figure AN-3-1 (12/53)Bangke Rep Kalaena Rep.Figure AN-3-1 (13/53)Kalaena Rep B. Takolekadju Rep.Figure AN-3-1 (14/53)B. Takolekadju Rep B. Bjentjiloh Rep.Figure AN-3-1 (15/53)B. Bjentjiloh Rep Tampemadoro Rep.Figure AN-3-1 (16/53)Tampemadoro Rep B. Bambu Rep.Figure AN-3-1 (16/53)B. Bambu Rep Tg. Malejati Rep.Figure AN-3-1 (17/53)B. Bambu Rep Tg. Malejati Rep.Figure AN-3-1 (18/53)Tg. Malejati Rep Parigi Rep.Figure AN-3-1 (19/53)Parigi Rep B. Mariko (2) Rep.Figure AN-3-1 (20/53)B. Mariko (1) Rep PaluFigure AN-3-1 (21/53)B. Mariko (1) Rep PaluFigure AN-3-1 (22/53)Parigi Rep Ogotai Rep.Figure AN-3-1 (22/53)Laementa Rep Laementa Rep.Figure AN-3-1 (24/53)Laementa Rep Kasumba Rep.Figure AN-3-1 (25/53)Kasumba Rep Dungkas Rep.	Figure AN-3-1	(10/53)	Kawalean Rep.	- Udu Rep.
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Figure AN-3-1 (14/53)B. Takolekadju Rep B. Bjentjiloh Rep.Figure AN-3-1 (15/53)B. Bjentjiloh Rep Tampemadoro Rep.Figure AN-3-1 (16/53)Tampemadoro Rep B. Bambu Rep.Figure AN-3-1 (16/53)Tampemadoro Rep Tg. Malejati Rep.Figure AN-3-1 (17/53)B. Bambu Rep Tg. Malejati Rep.Figure AN-3-1 (18/53)Tg. Malejati Rep Parigi Rep.Figure AN-3-1 (18/53)Parigi Rep B. Mariko (2) Rep.Figure AN-3-1 (19/53)Parigi Rep B. Mariko (1) Rep.Figure AN-3-1 (20/53)B. Mariko (1) Rep B. Mariko (1) Rep.Figure AN-3-1 (21/53)B. Mariko (1) Rep PaluFigure AN-3-1 (22/53)Parigi Rep Ogotai Rep.Figure AN-3-1 (23/53)Ogotai Rep Laementa Rep.Figure AN-3-1 (24/53)Laementa Rep Kasumba Rep.Figure AN-3-1 (25/53)Kasumba Rep Dungkas Rep.	Figure AN-3-1	(12/53)	Bangke Rep.	- Kalaena Rep.
Figure AN-3-1 (15/53)B. Bjentjiloh Rep Tampemadoro Rep.Figure AN-3-1 (16/53)Tampemadoro Rep B. Bambu Rep.Figure AN-3-1 (17/53)B. Bambu Rep Tg. Malejati Rep.Figure AN-3-1 (18/53)Tg. Malejati Rep Parigi Rep.Figure AN-3-1 (19/53)Parigi Rep B. Mariko (2) Rep.Figure AN-3-1 (20/53)B. Mariko (2) Rep B. Mariko (1) Rep.Figure AN-3-1 (21/53)B. Mariko (1) Rep PaluFigure AN-3-1 (22/53)Parigi Rep Ogotai Rep.Figure AN-3-1 (22/53)Dogotai Rep Laementa Rep.Figure AN-3-1 (24/53)Laementa Rep Kasumba Rep.Figure AN-3-1 (25/53)Kasumba Rep Dungkas Rep.	Figure AN-3-1	(13/53)	Kalaena Rep.	- B. Takolekadju Rep.
Figure AN-3-1 (16/53)Tampemadoro Rep B. Bambu Rep.Figure AN-3-1 (17/53)B. Bambu Rep Tg. Malejati Rep.Figure AN-3-1 (18/53)Tg. Malejati Rep Parigi Rep.Figure AN-3-1 (19/53)Parigi Rep B. Mariko (2) Rep.Figure AN-3-1 (20/53)B. Mariko (2) Rep B. Mariko (1) Rep.Figure AN-3-1 (21/53)B. Mariko (1) Rep PaluFigure AN-3-1 (22/53)Parigi Rep Ogotai Rep.Figure AN-3-1 (22/53)Parigi Rep Laementa Rep.Figure AN-3-1 (23/53)Ogotai Rep Laementa Rep.Figure AN-3-1 (24/53)Laementa Rep Kasumba Rep.Figure AN-3-1 (25/53)Kasumba Rep Dungkas Rep.	Figure AN-3-1	(14/53)	B. Takolekadju Rep.	- B. Bjentjiloh Rep.
Figure AN-3-1 (17/53)       B. Bambu Rep.       - Tg. Malejati Rep.         Figure AN-3-1 (18/53)       Tg. Malejati Rep.       - Parigi Rep.         Figure AN-3-1 (19/53)       Parigi Rep.       - B. Mariko (2) Rep.         Figure AN-3-1 (20/53)       B. Mariko (2) Rep.       - B. Mariko (1) Rep.         Figure AN-3-1 (20/53)       B. Mariko (1) Rep.       - Palu         Figure AN-3-1 (21/53)       B. Mariko (1) Rep.       - Palu         Figure AN-3-1 (22/53)       Parigi Rep.       - Ogotai Rep.         Figure AN-3-1 (22/53)       Ogotai Rep.       - Laementa Rep.         Figure AN-3-1 (24/53)       Laementa Rep.       - Kasumba Rep.         Figure AN-3-1 (25/53)       Kasumba Rep.       - Dungkas Rep.	Figure AN-3-1	(15/53)	B. Bjentjiloh Rep.	- Tampemadoro Rep.
Figure AN-3-1 (18/53)       Tg. Malejati Rep.       - Parigi Rep.         Figure AN-3-1 (19/53)       Parigi Rep.       - B. Mariko (2) Rep.         Figure AN-3-1 (20/53)       B. Mariko (2) Rep.       - B. Mariko (1) Rep.         Figure AN-3-1 (21/53)       B. Mariko (1) Rep.       - Palu         Figure AN-3-1 (22/53)       Parigi Rep.       - Ogotai Rep.         Figure AN-3-1 (23/53)       Ogotai Rep.       - Laementa Rep.         Figure AN-3-1 (24/53)       Laementa Rep.       - Kasumba Rep.         Figure AN-3-1 (25/53)       Kasumba Rep.       - Dungkas Rep.	Figure AN-3-1	(16/53)	Tampemadoro Rep.	- B. Bambu Rep.
Figure AN-3-1 (19/53)       Parigi Rep.       - B. Mariko (2) Rep.         Figure AN-3-1 (20/53)       B. Mariko (2) Rep.       - B. Mariko (1) Rep.         Figure AN-3-1 (21/53)       B. Mariko (1) Rep.       - Palu         Figure AN-3-1 (22/53)       Parigi Rep.       - Ogotai Rep.         Figure AN-3-1 (23/53)       Ogotai Rep.       - Laementa Rep.         Figure AN-3-1 (24/53)       Laementa Rep.       - Kasumba Rep.         Figure AN-3-1 (25/53)       Kasumba Rep.       - Dungkas Rep.	Figure AN-3-1	(17/53)	B. Bambu Rep.	- Tg. Malejati Rep.
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Figure AN-3-1 (23/53)Ogotai Rep Laementa Rep.Figure AN-3-1 (24/53)Laementa Rep Kasumba Rep.Figure AN-3-1 (25/53)Kasumba Rep Dungkas Rep.	Figure AN-3-1	(21/53)	B. Mariko (1) Rep.	- Palu
Figure AN-3-1 (24/53) Laementa Rep Kasumba Rep. Figure AN-3-1 (25/53) Kasumba Rep Dungkas Rep.	Figure AN-3-1	(22/53)	Parigi Rep.	- Ogotai Rep.
Figure AN-3-1 (25/53) Kasumba Rep Dungkas Rep.	Figure AN-3-1	(23/53)	Ogotai Rep.	- Laementa Rep.
	Figure AN-3-1	(24/53)	Laementa Rep.	- Kasumba Rep.
Figure AN-3-1 (26/53) Dungkas Rep G. Pantoja Rep.	Figure AN-3-1	(25/53)	Kasumba Rep.	- Dungkas Rep.
	Figure AN-3-1	(26/53)	Dungkas Rep.	- G. Pantoja Rep.

	Figure AN-3-1 (27/53)	G. Pantoja Rep.	- Gijo Rep.
	Figure AN-3-1 (28/53)	Gijo Rep.	- Molosipat Rep.
	Figure AN-3-1 (29/53)	Molosipat Rep.	- Dudu Rep.
	Figure AN-3-1 (30/53)	Dudu Rep.	- Tg. Tamboo Rep.
	Figure AN-3-1 (31/53)	Tg. Tamboo Rep.	- Dolangolijo Rep.
	Figure AN-3-1 (32/53)	Dolangolijo Rep.	- G. Patoatimur Rep.
	Figure AN-3-1 (33/53)	G. Patoatimur Rep.	- G. Pombolu Rep.
	Figure AN-3-1 (34/53)	G. Pombolu Rep.	- Tg. Besar Rep.
	Figure AN-3-1 (35/53)	Tg. Besar Rep.	- Pontak Rep.
	Figure AN-3-1 (36/53)	Pontak Rep.	- Tg. Batu Rep.
	Figure AN-3-1 (37/53)	Tg. Batu Rep.	- Komangaan Rep.
	Figure AN-3-1 (38/53)	Komangaan Rep.	- Paapoh Rep.
	Figure AN-3-1 (39/53)	Paapoh Rep.	- Motoling Rep.
	Figure AN-3-1 (40/53)	Motoling Rep.	- Rumoongatas Rep.
	Figure AN-3-1 (41/53)	Rumoongatas Rep.	- Makaweinbeng Rep.
	Figure AN-3-1 (42/53)	Makaweinbeng Rep.	- Manado
	Figure AN-3-1 (43/53)	Kalaena Rep.	- Torara Rep.
	Figure AN-3-1 (44/53)	Torara Rep.	- Batunong Rep.
	Figure AN-3-1 (45/53)	Batunong Rep.	- Tg. Tobaku Rep.
	Figure AN-3-1 (46/53)	Tg. Tobaku Rep.	- Tg. Tabuso Rep.
	Figure AN-3-1 (47/53)	Tg. Tabuso Rep.	- Tg. Ladongi Rep.
3	Figure AN-3-1 (48/53)	Tg. Ladongi Rep.	- Konaweha Rep.
	Figure AN-3-1 (49/53)	Konaweha Rep.	- Kolaka
	Figure AN-3-1 (50/53)	Kolaka	- Watuputih Rep.
	Figure AN-3-1 (51/53)	Watuputih Rep.	- G. Makaleo Rep.
	Figure AN-3-1 (52/53)	G. Makaleo Rep.	- Laumera Rep.
	Figure AN-3-1 (53/53)	Laumera Rep.	- Kendari
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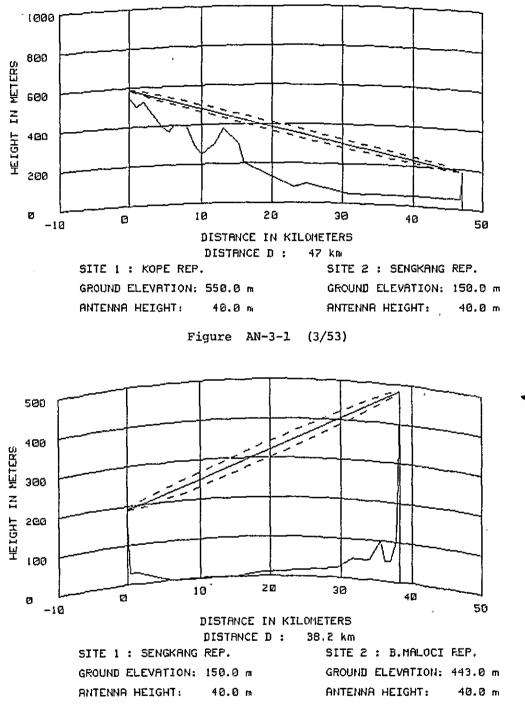
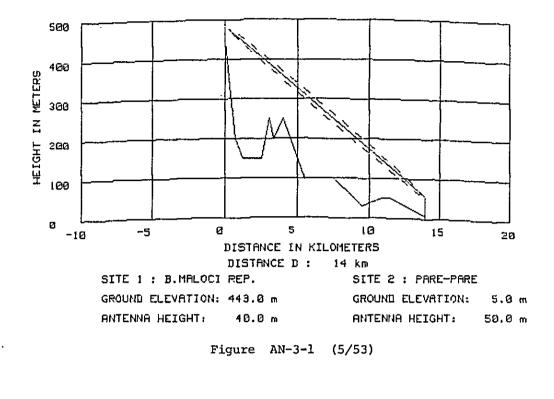


Figure AN-3-1 (4/53)





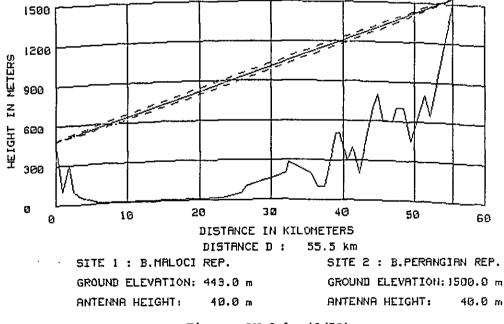


Figure AN-3-1 (6/53)

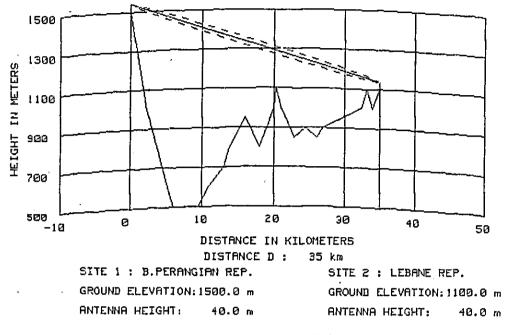


Figure AN-3-1 (7/53)

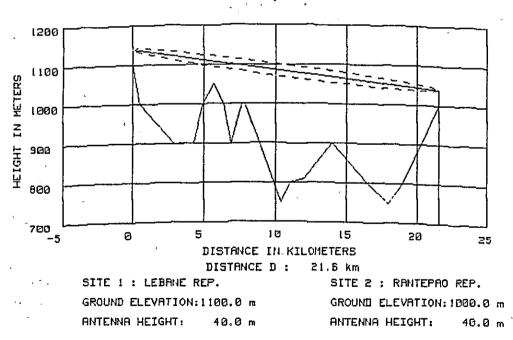


Figure AN-3-1 (8/53)

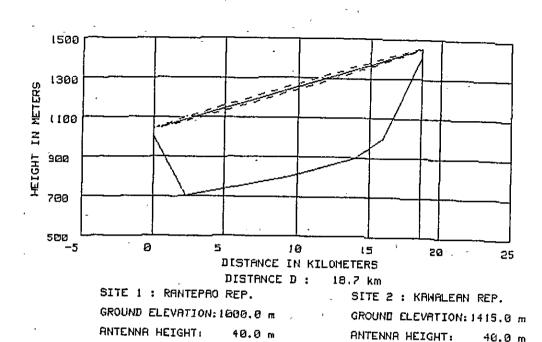


Figure AN-3-1 (9/53)

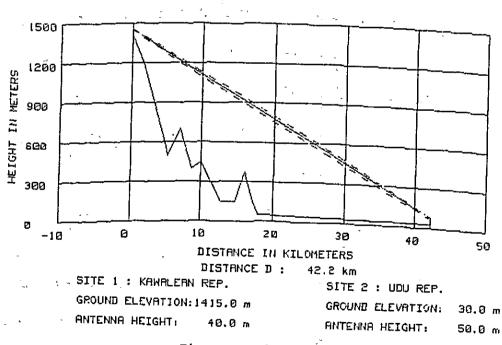


Figure AN-3-1 (10/53)

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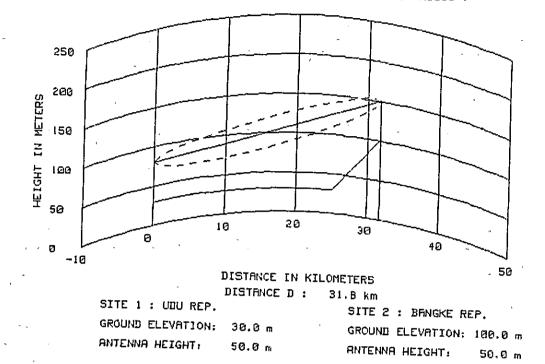
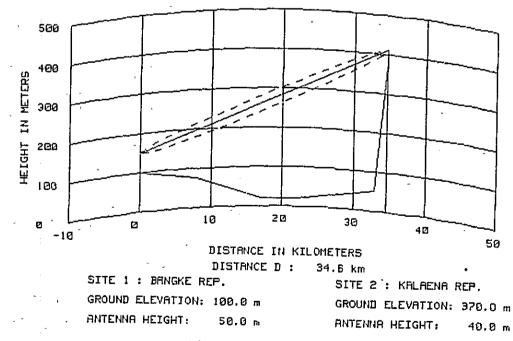
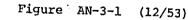
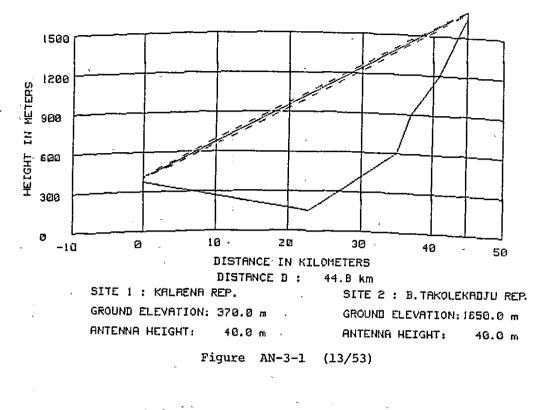


Figure AN-3-1 (11/53)





- 310 -



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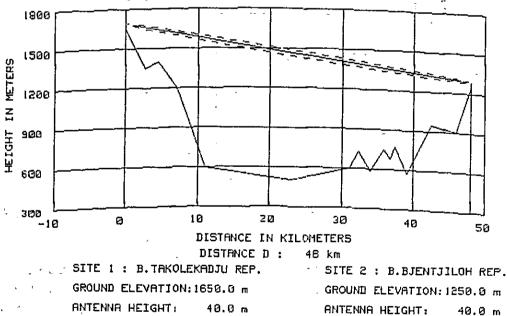
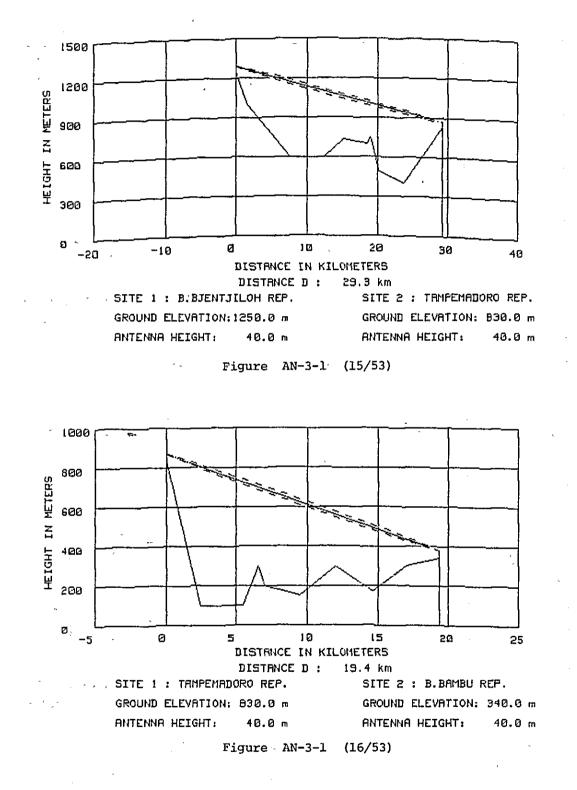
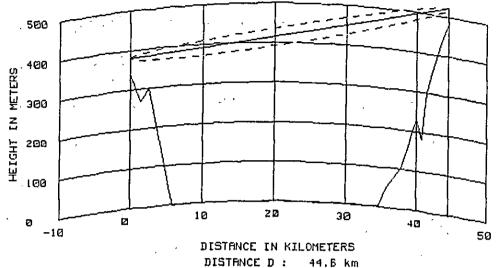


Figure AN-3-1 (14/53)



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SITE 1 : B.BAMBU REP.SITE 2 : TG.MALEJATI REP.GROUND ELEVATION: 340.0 mGROUND ELEVATION: 400.0 mANTENNA HEIGHT:40.0 mANTENNA HEIGHT:40.0 m

Figure AN-3-1 (17/53)

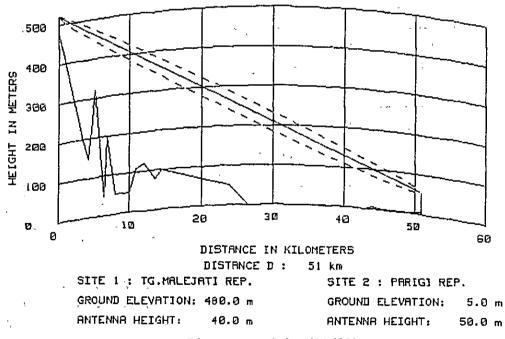
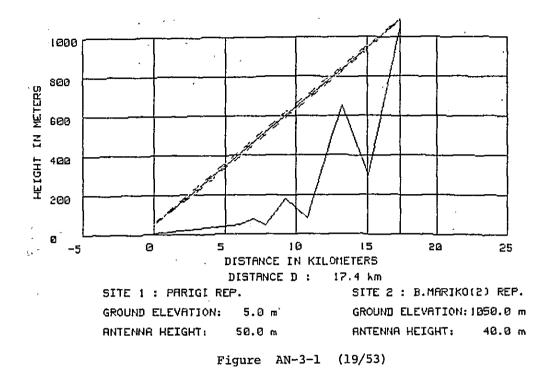
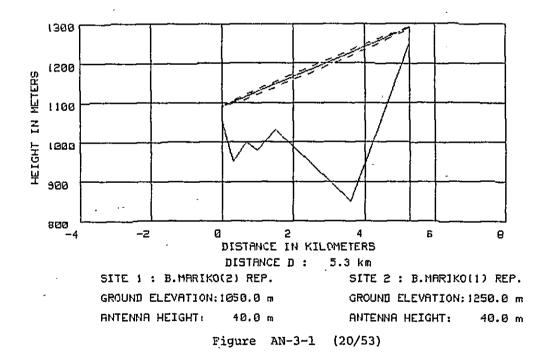


Figure AN-3-1 (18/53)

- 313 -







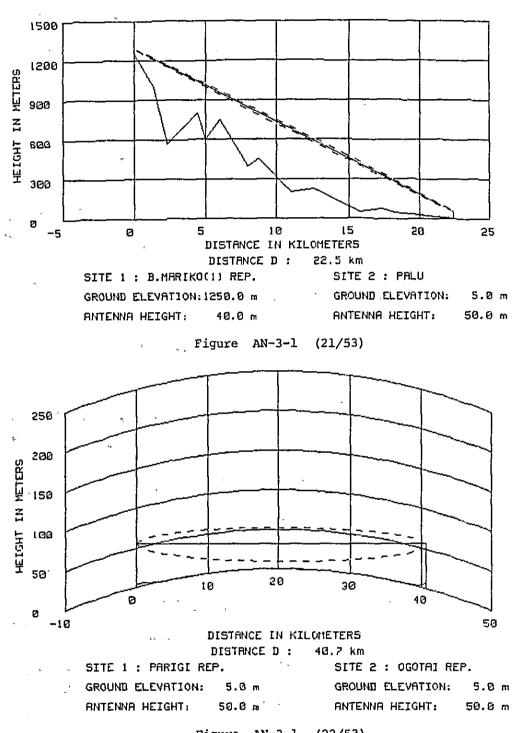


Figure AN-3-1 (22/53)

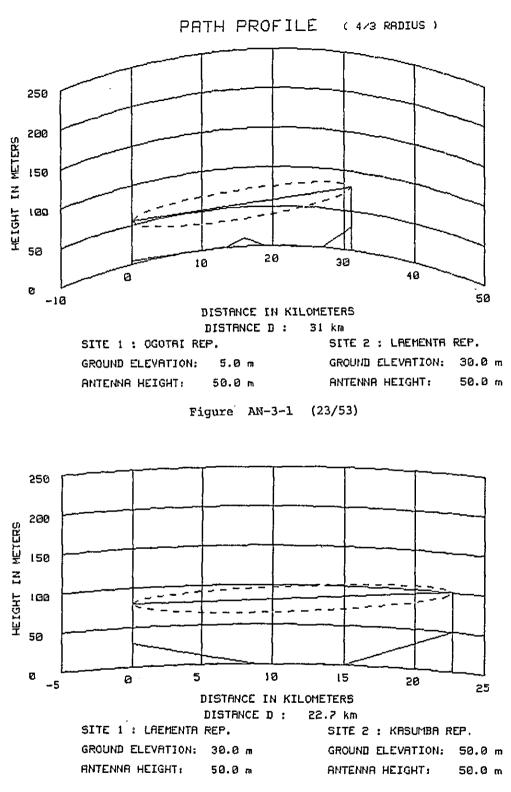
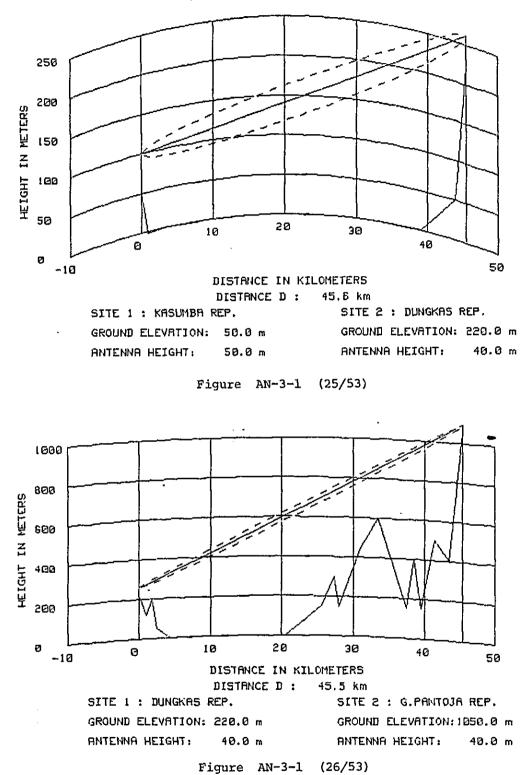


Figure AN-3-1 (24/53)



- 317 -

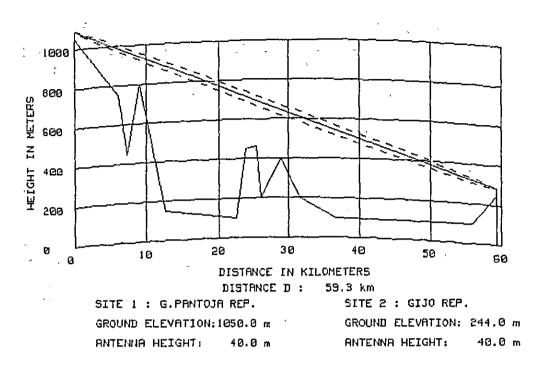


Figure AN-3-1 (27/53)

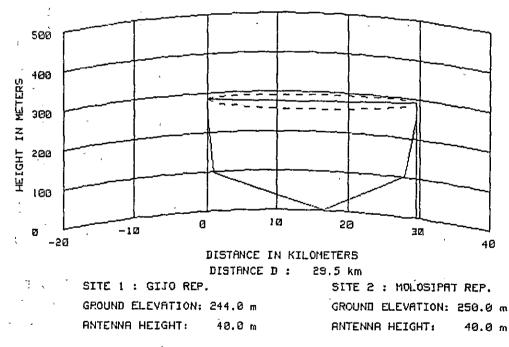


Figure AN-3-1 (28/53)

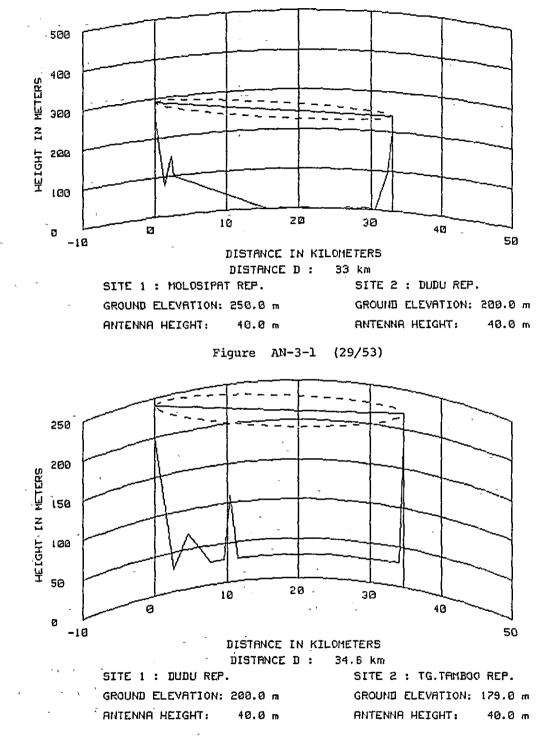
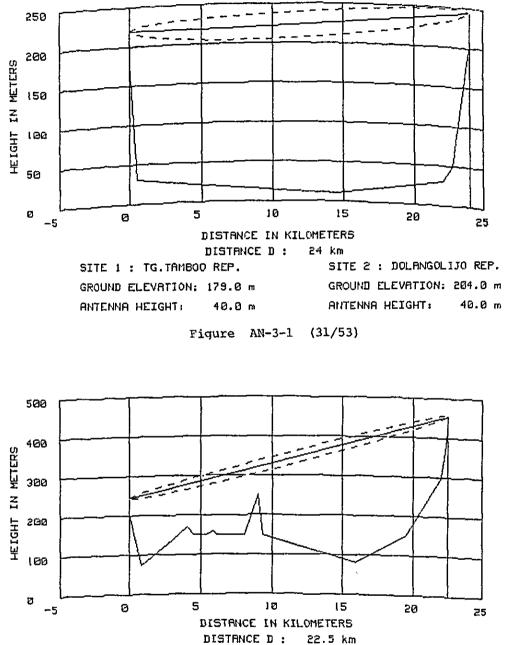


Figure AN-3-1 (30/53)

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- 319 -

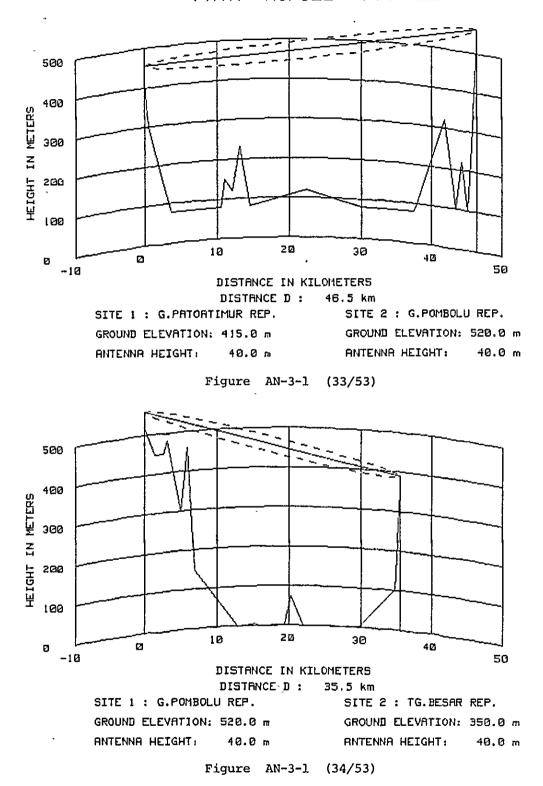
PATH PROFILE ( 4/3 RADIUS )



SITE 1 : DOLANGOLIJO REP. GROUND ELEVATION: 204.0 m ANTENNA HEIGHT: 40.0 m SITE 2 : G.PATOATIMUR REP. GROUND ELEVATION: 415.0 m ANTENNA HEIGHT: 40.0 m

Figure AN-3-1 (32/53)

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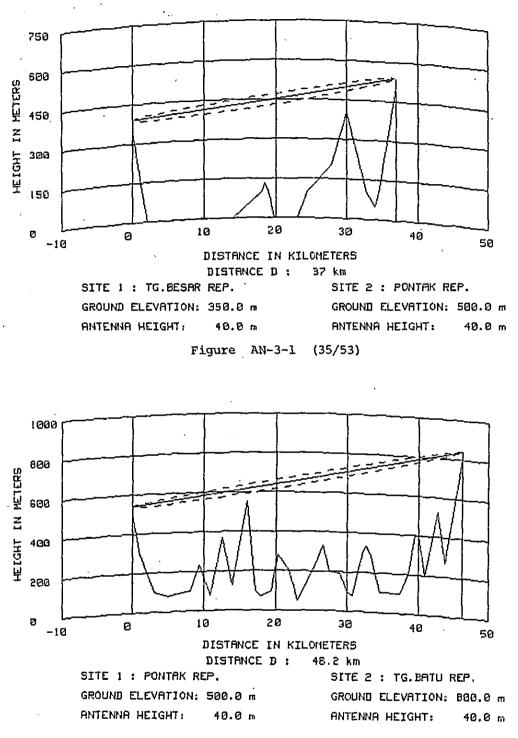
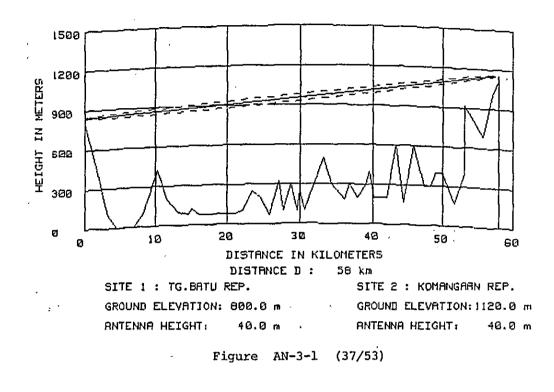


Figure AN-3-1 (36/53)



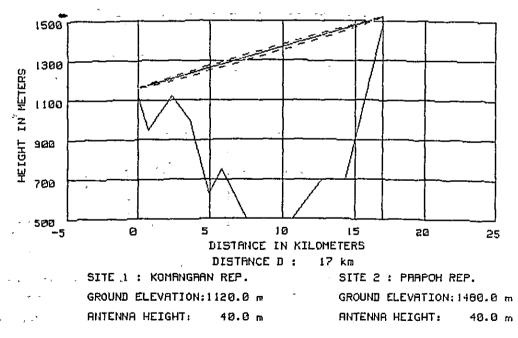


Figure AN-3-1 (38/53)

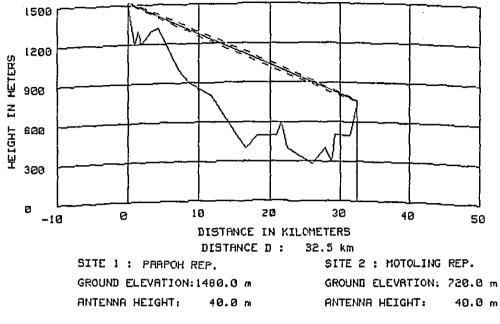
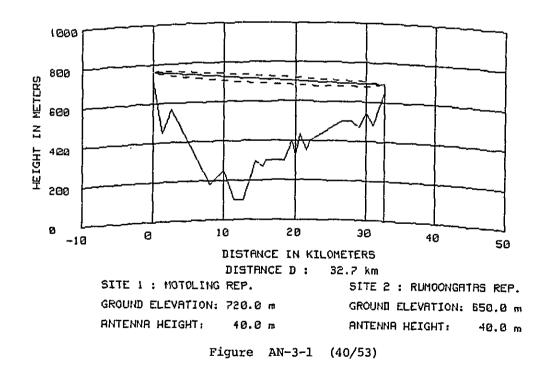


Figure AN-3-1 (39/53)



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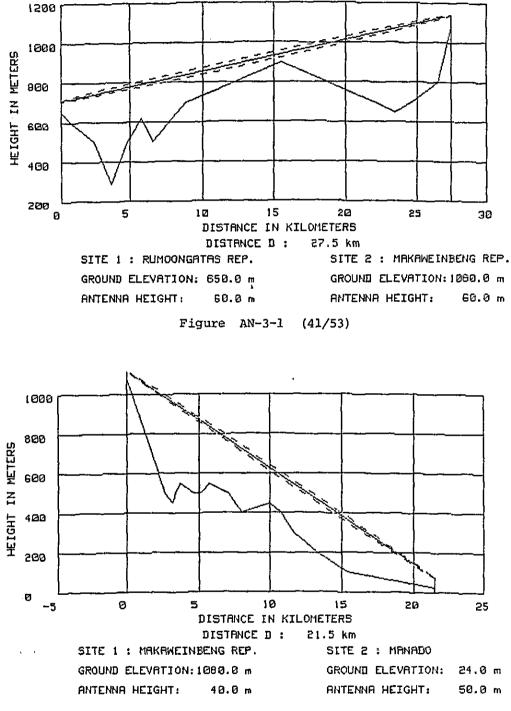


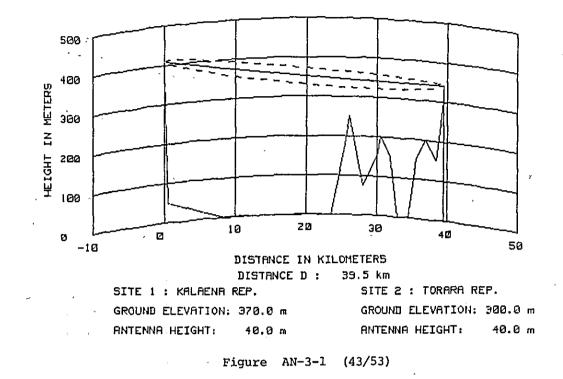
Figure AN-3-1 (42/53)

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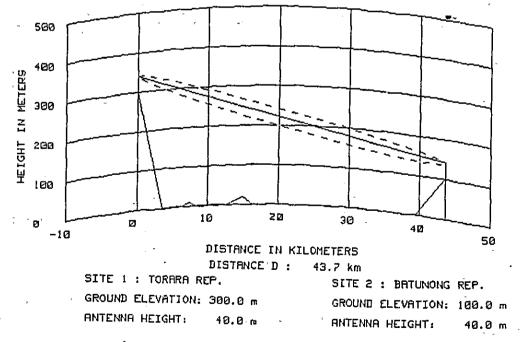
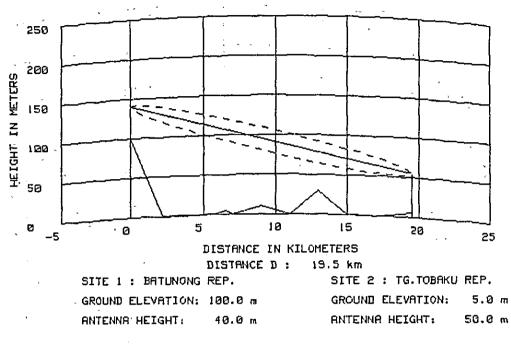
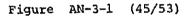


Figure AN-3-1 (44/53)



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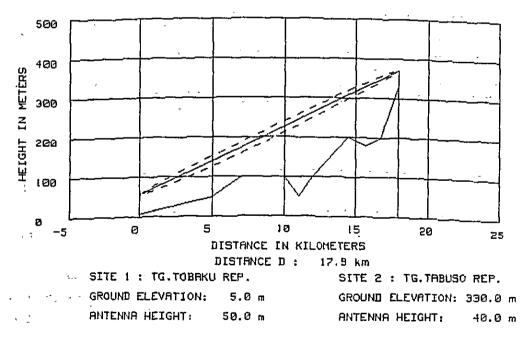
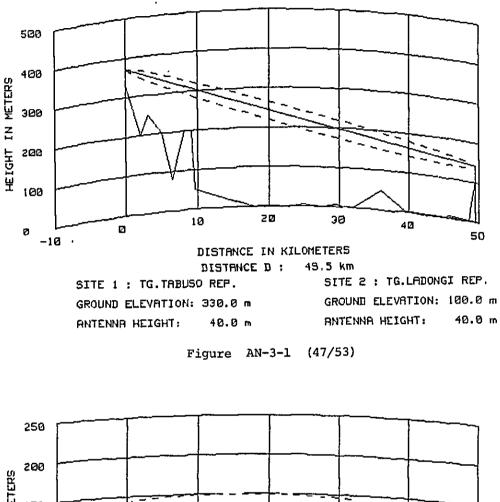
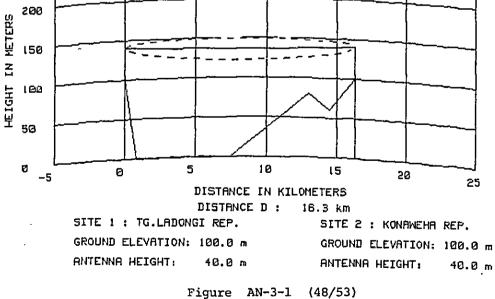


Figure AN-3-1 (46/53)

PATH PROFILE ( 4/3 RADIUS )







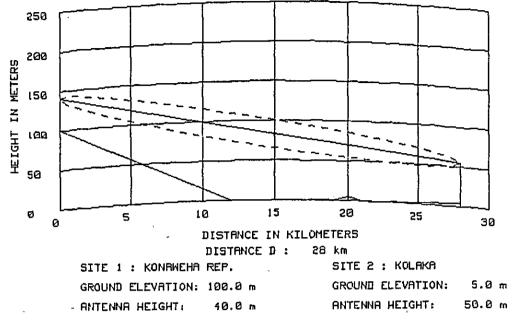


Figure AN-3-1 (49/53)

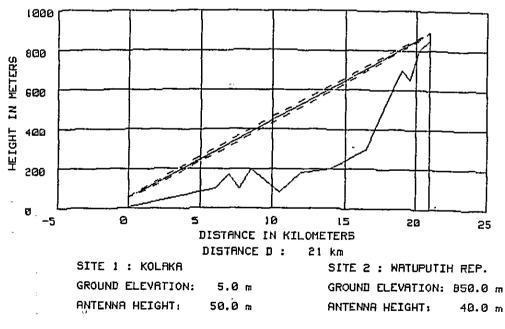


Figure AN-3-1 (50/53)

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PATH PROFILE ( 4/3 RADIUS )

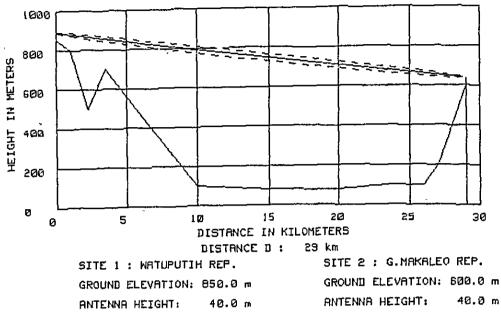
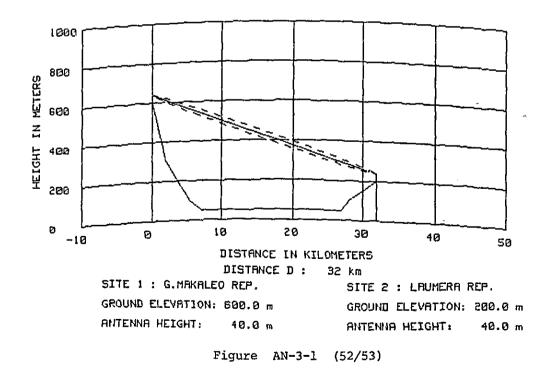
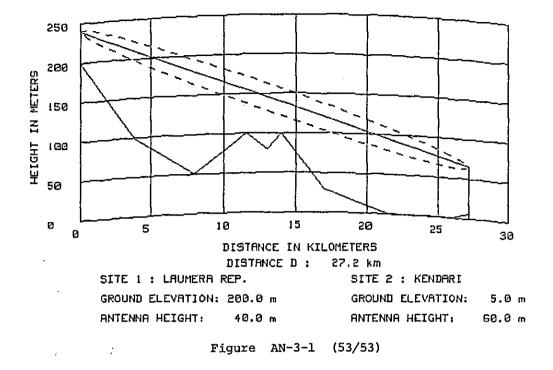


Figure AN-3-1 (51/53)







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## 3-2. SPUR ROUTE

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Figure AN-3-2 (1/38)	Kope Rep.	- Watampone
Figure AN-3-2 (2/38)	Rantepao Rep.	- Rantepao
Figure AN-3-2 (3/38)	Udu Rep.	- Palopo
Figure AN-3-2 (4/38)	Udu Rep.	- Masamba
Figure AN-3-2 (5/38)	Kalaena Rep.	- Malili
Figure AN-3-2 (6/38)	B. Bambu Rep.	- Poso
Figure AN-3-2 (7/38)	G. Pantoja Rep.	- Dadakan Rep.
Figure AN-3-2 (8/38)	Dadakan Rep.	- Toli Toli
Figure AN-3-2 (9/38)	G. Pombolu Rep.	- Gorontalo
Figure AN-3-2 (10/38)	Paapoh Rep.	- Kotamobagu Rep.
Figure AN-3-2 (11/38)	Tg. Tobaku Rep.	- Malamala
Figure AN-3-2 (12/38)	G. Makaleo Rep.	- Unaaha
Figure AN-3-2 (13/38)	B. Bambu Rep.	- Uekuli Rep.
Figure AN-3-2 (14/38)	Uekuli Rep.	- Tongku Rep.
Figure AN-3-2 (15/38)	Tongku Rep.	- Podi Rep.
Figure AN-3-2 (16/38)	Podi Rep.	- Tg. Salumimi Rep.
Figure AN-3-2 (17/38)	Tg. Salumimi Rep.	- Tobalombang Rep.
Figure AN-3-2 (18/38)	Tobalombang Rep.	- Kuilo Rep.
Figure AN-3-2 (19/38)	Kuilo Rep.	– Siuna Rep.
Figure AN-3-2 (20/38)	Siuna Rep.	- Waran Rep.
Figure AN-3-2 (21/38)	Waran Rep.	- Luwuk
Figure AN-3-2 (22/38)	Waran Rep.	- Bokilis Rep.
Figure AN-3-2 (23/38)	Bokilis Rep.	- Banggai
Figure AN-3-2 (24/38)	B. Takolekadju Rep.	- G. Tometindo Rep.

Figure AN-3-2 (25/38)	G. Tometindo Rep.	- G. Morokopa Rep.
Figure AN-3-2 (26/38)	G. Morokopa Rep.	- Kolonedare
Figure AN-3-2 (27/38)	G. Morokopa Rep.	- Tg. Dongkala Rep.
Figure AN-3-2 (28/38)	Tg. Dongkala Rep.	– Bungku
Figure AN-3-2 (29/38)	G. Makaleo Rep.	- Watumohati Rep.
Figure AN-3-2 (30/38)	Watumohati Rep.	- Matandasa Rep.
Figure AN-3-2 (31/38)	Matandasa Rep.	- La. Kadea Rep.
Figure AN-3-2 (32/38)	La. Kadea Rep.	- Raha
Figure AN-3-2 (33/38)	La. Kadea Rep.	- Bombonabulu Rep.
Figure An-3-2 (34/38)	Bombonabulu Rep.	- Baubau
Figure AN-3-2 (35/38)	Mamuju SW.	- Bojo Rep.
Figure AN-3-2 (36/38)	Bojo Rep.	- Tg. Lalereh Rep.
Figure AN-3-2 (37/38)	Tg. Lalereh Rep.	- Karosa
Figure AN-3-2 (38/38)	G. Patahakayua Rep.	- Benteng

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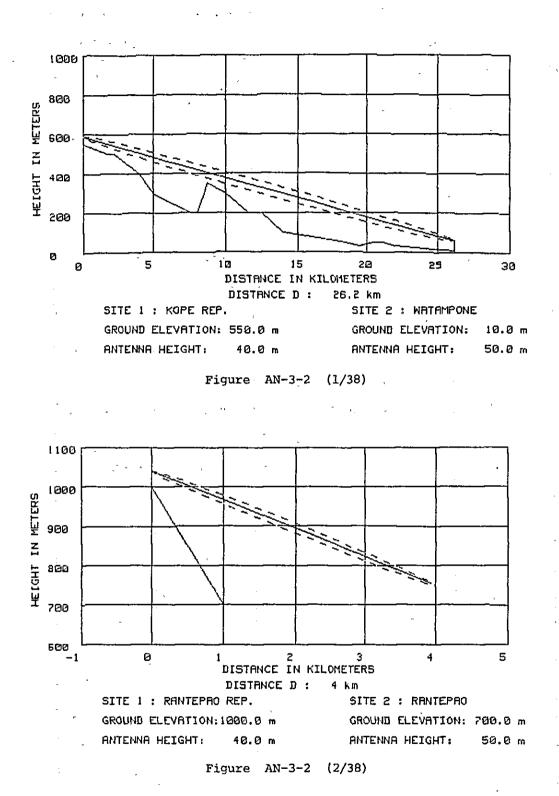
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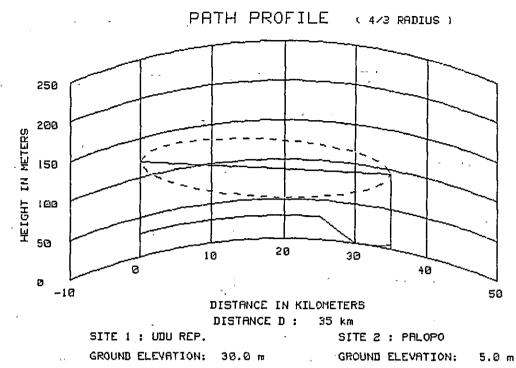
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ANTENNA HEIGHT: 90.0 m ANTENNA HEIGHT: 90.0 m

Figure AN-3-2 (3/38)

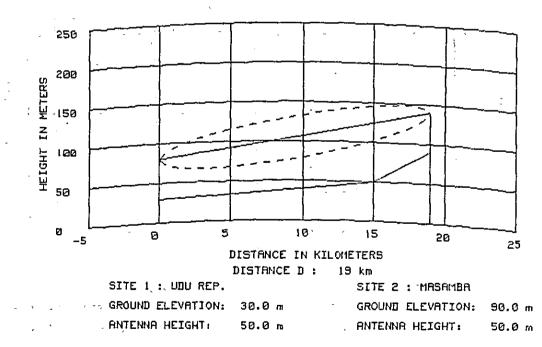


Figure AN-3-2 (4/38)

PATH PROFILE (4/3 RADIUS)

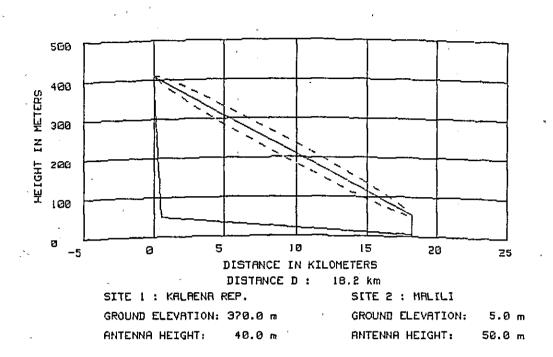


Figure AN-3-2 (5/38)

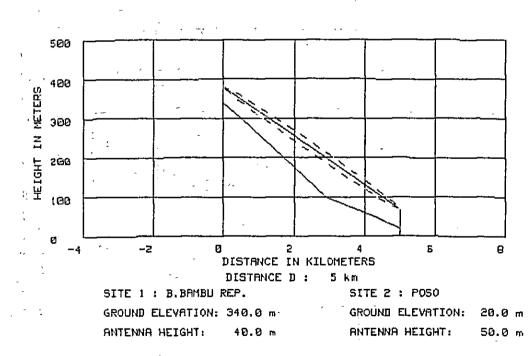


Figure AN-3-2 (6/38)

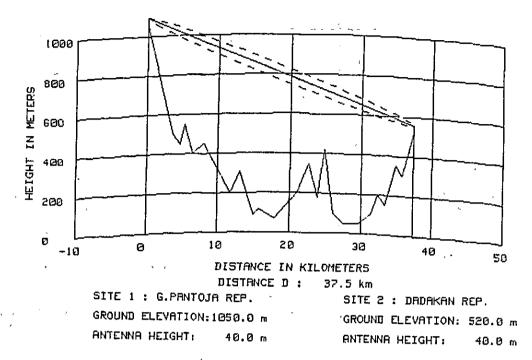


Figure AN-3-2 (7/38)

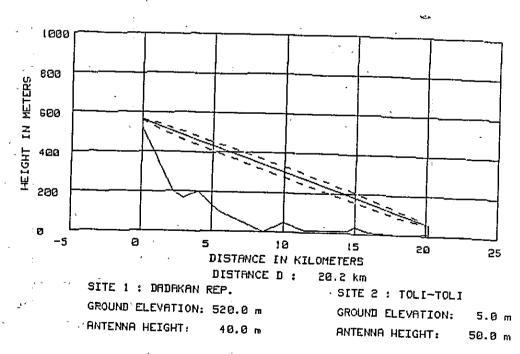


Figure AN-3-2 (8/38)

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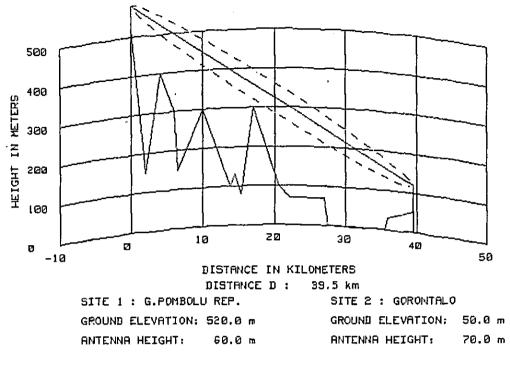


Figure AN-3-2 (9/38)

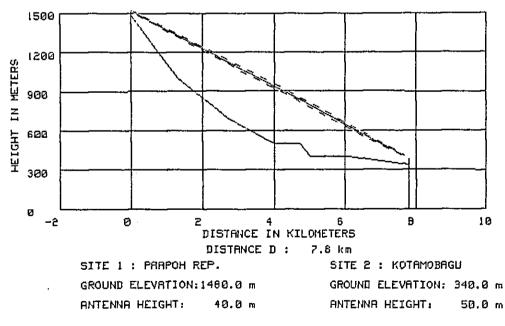


Figure AN-3-2 (10/38)



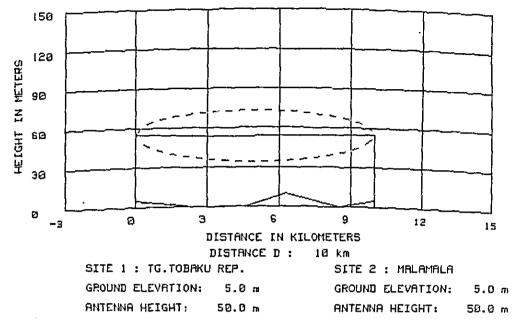


Figure AN-3-2 (11/38)

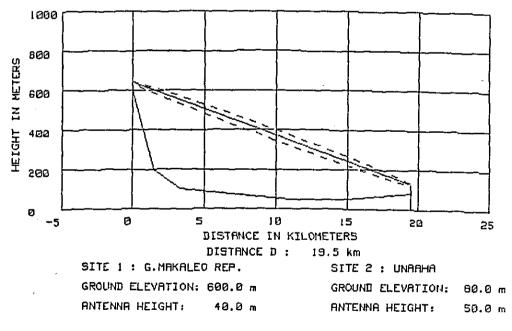
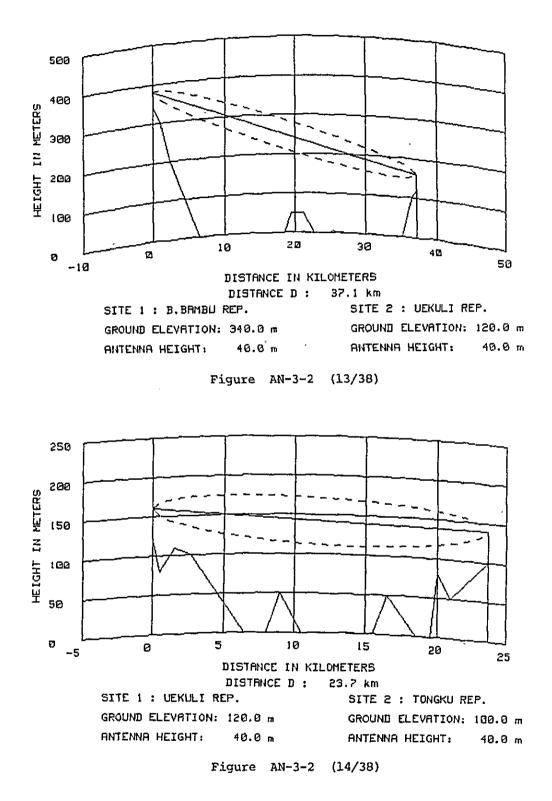


Figure AN-3-2 (12/38)

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PATH PROFILE ( 4/3 RADIUS )



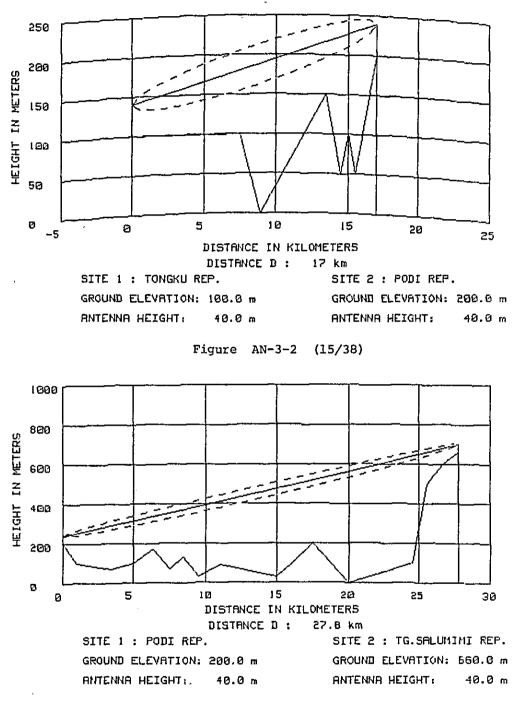


Figure AN-3-2 (16/38)

- 341 -

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PATH PROFILE ( 4/3 RADIUS )

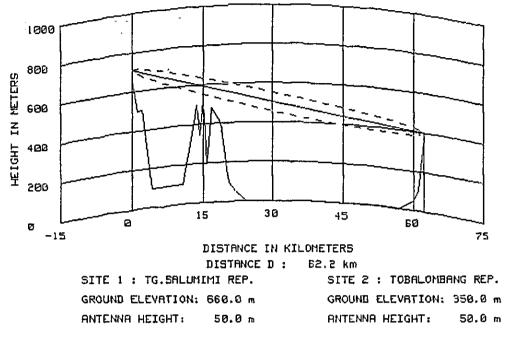


Figure AN-3-2 (17/38)

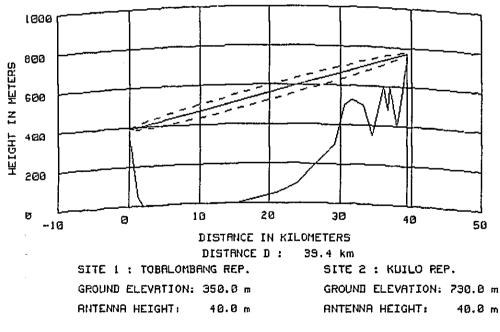


Figure AN-3-2 (18/38)

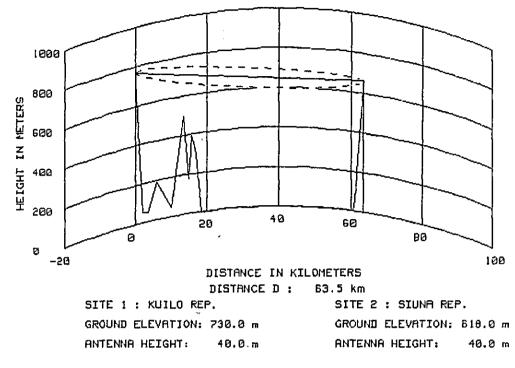


Figure AN-3-2 (19/38)

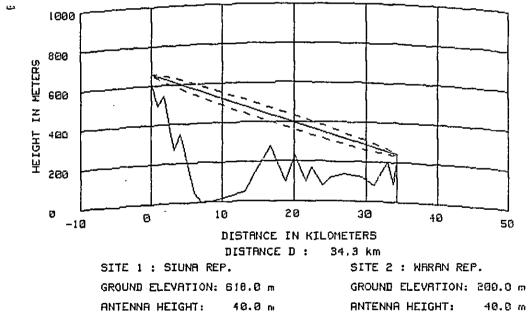


Figure AN-3-2 (20/38)

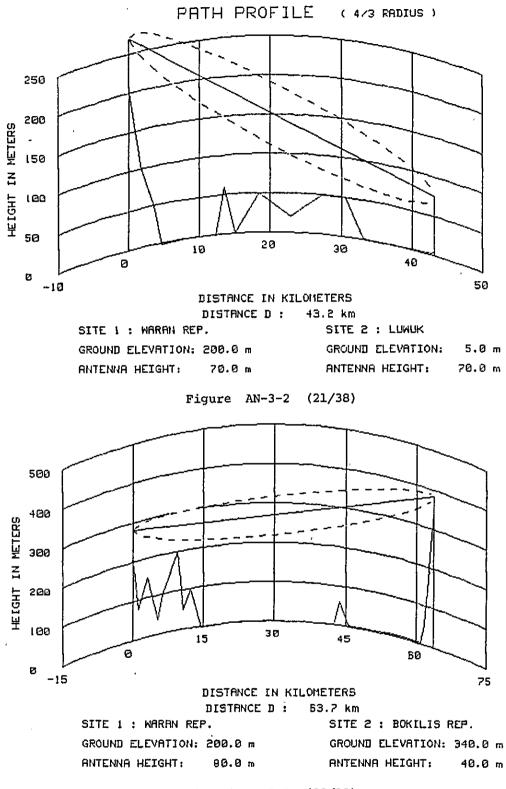
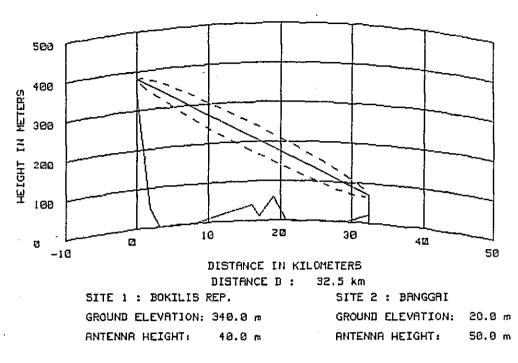


Figure AN-3-2 (22/38)



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Figure AN-3-2 (23/38)

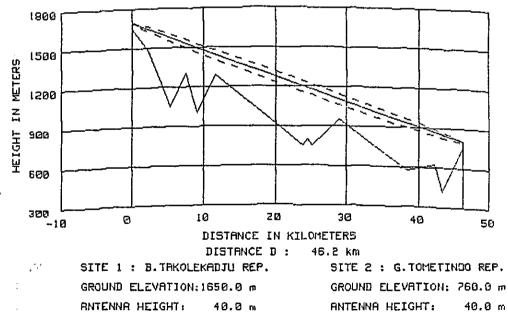
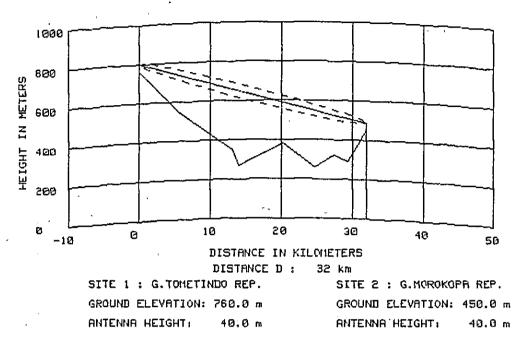
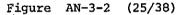


Figure AN-3-2 (24/38)





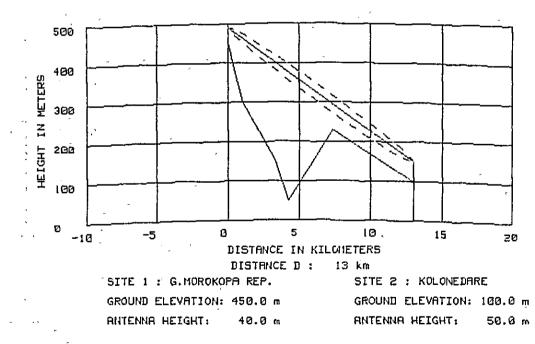
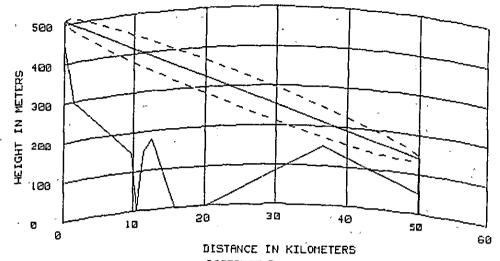


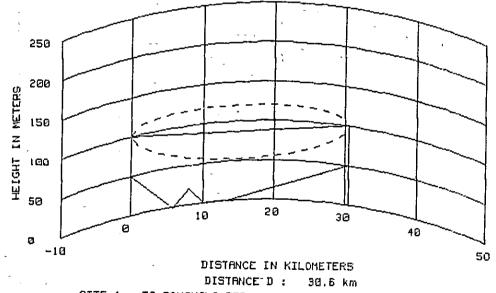
Figure AN-3-2 (26/38)

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DISTANCE D : 50.2 km SITE 1 : G.MOROKOPA REP. SITE 2 : TG.DONGKALA REP. GROUND ELEVATION: 450.0 m ANTENNA HEIGHT: 60.0 m GROUND ELEVATION: 50.0 m ANTENNA HEIGHT: 90.0 m

Figure AN-3-2 (27/38)

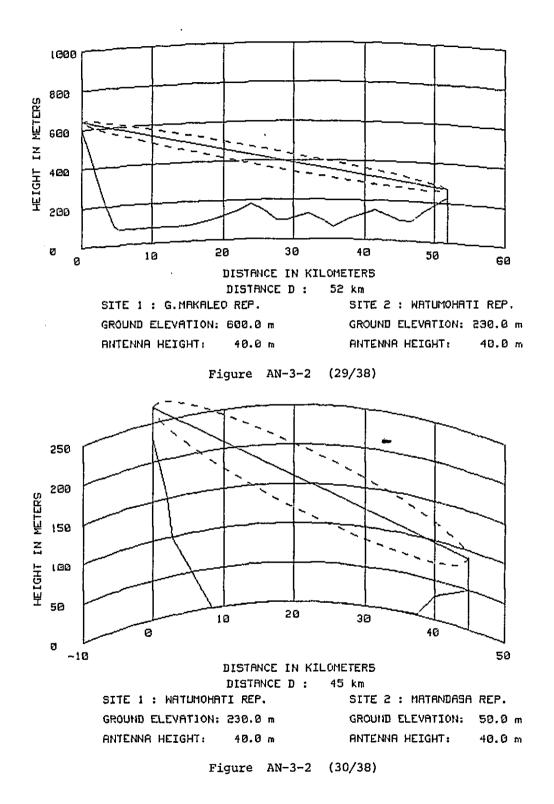


SITE 1 : TG.DONGKALA REP. SITE 2 : BUNGKU GROUND ELEVATION: 50.0 m GROUND ELEVATION: 50.0 m ANTENNA HEIGHT: 50.0 m

Figure AN-3-2 (28/38)

<u>.</u>

PATH PROFILE ( 4/3 RADIUS )



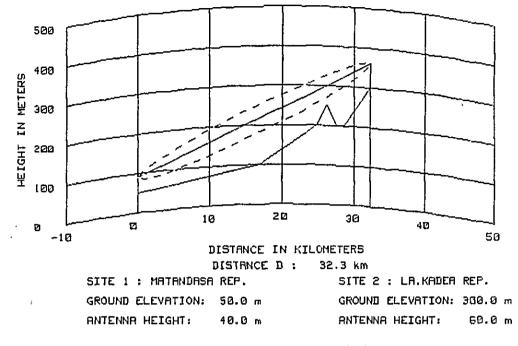


Figure AN-3-2 (31/38)

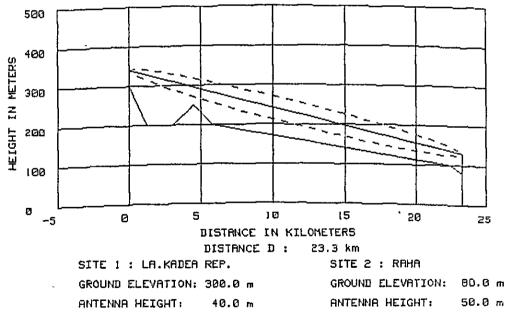


Figure AN-3-2 (32/38)

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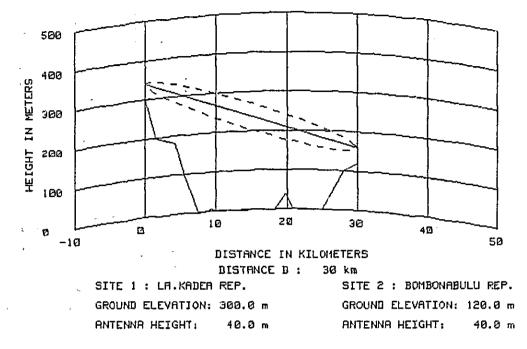


Figure AN-3-2 (33/38)

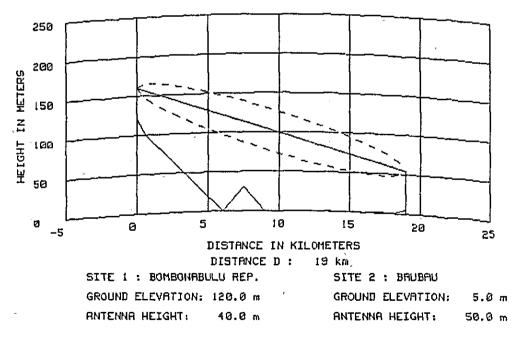
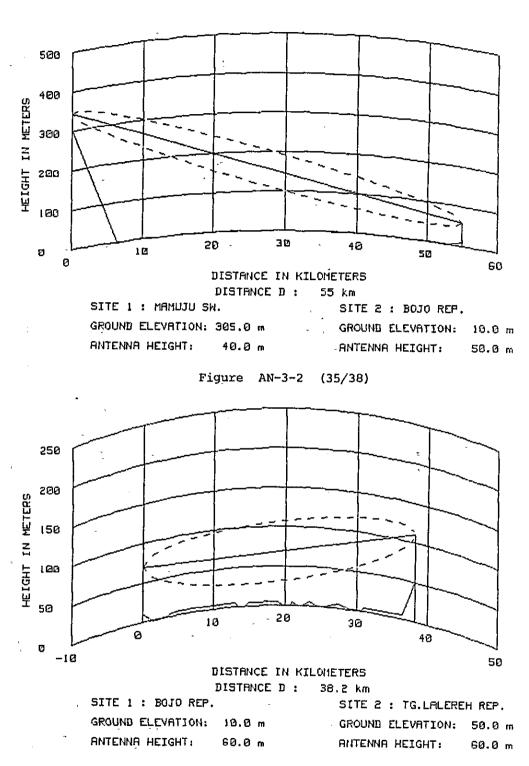


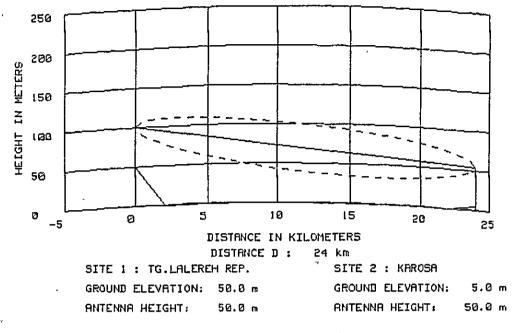
Figure AN-3-2 (34/38)



PATH PROFILE ( 4/3 RADIUS )

Figure AN-3-2 (36/38)

PATH PROFILE ( 4/3 RADIUS )



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Figure AN-3-2 (37/38)

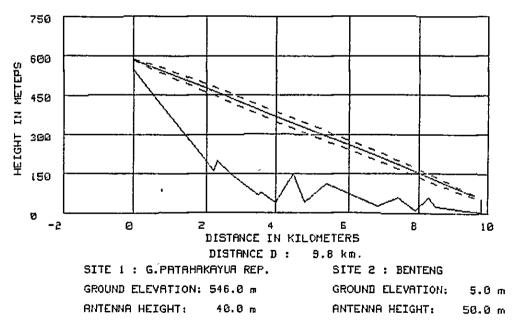


Figure AN-3-2 (38/38)

- 4. Comparison between Radio Leading-in System and Cable Leading-in System
- 4-1. Conditions for System Selection
  - (1) For leading-in system to connect radio repeater station and telephone exchange, cable leading-in system is worth consideration by reason of low cost, in case the section, where to apply the system, is of relatively short distance.

Which to use, radio leading-in system or cable leading-in system, depends after all upon the result of comparative study. Matters to be considered in such comparative study are described below.

(2) Cable leading-in system is free from restrictions relating to radio propagation. In terms of maintenance, however, radio leading-in system can do with "dot" maintenance whereas cable leading-in system requires "line" maintenance. In not a few respects, both systems contradict each other because one differs broadly from the other in characteristics. Therefore, when deciding which system to use, it is important to make a comprehensive comparative study including the study of topography and other natural environment of the section concerned, as well as technical and maintenance requirements, so that the system selected proves to be economically more advantageous than the other.

- (3) Following are the items that must be studied when the decision is to use cable leading-in system:
  - a) Whether requirements pertinent to cable maintenance are satisfied or not. (For instance, whether maintenance preparations, including maintenance roads, maintenance personnel and vehicles, are well organized or not.)
  - b) Whether cable route is in good condition or not. (For instance, whether the route is with or without obstacles, and whether cable bridge and catenary by which to cross valley and river are necessary or not.)
  - c) Environmental conditions. (For instance, whether damage hazards to cable exist or not, including damage by birds/insects or from seawater, as well as chemical corrosion and electromagnetic induction.)
  - d) Whether cable leading-in system still remains economically more advantageous than radio leading-in system, or not, even if all the foregoing requirements can be satisfied or necessary measures to overcome impediments to such purpose have been taken.
- (4) The study mentioned above must be made severally for each section where to apply cable leading-in system. However, conditions to study vary according to the time the study is made. Therefore, further study is required at the time of implementation of this Project.

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## 4-2. Modus Operandi of Study

- For calculation of facilities/equipment cost of each leading-in system, the undermentioned items must also be studied in addition to the aforementioned:
  - Transmission system and transmission capacity, as well as facilities and equipment required
  - Countermeasure against trouble in each section concerned, cable laying method, and status of existing installations
- (2) When those additional items to be studied are considered, simple cost comparison between the two leading-in systems is hazardous. Nevertheless, using general requirements plus several assumptions, initial cost comparison is made. The assumptions are:
  - a) Transmission system is PCM system.

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b) Pair-cable or coaxial cable or optical fiber cable is used.

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- c) Cable installation is by aerial system.
- d) Radio repeater station tower can be commonly used for main route and leading-in route, so that tower cost is not appropriated in leading-in route cost.
- e) Cable route is without specific environmental difficulty. Hence no crossing of valley or river.

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- f) For initial investment cost comparison, relative price based on average price level as of the time of this Study is used. Initial investment cost comparison between the two leading-in systems, based on the foregoing assumptions, is charted in Figure AN-4-1.
- (3) When making comparison between the two leading-in systems, using Figure AN-4-1 chart, attention is required to the following points:
  - a) In case where transmission capacity is 480 
     1,440 CH and section distance is 15 17 km and
     where transmission capacity is below 120 CH and
     section distance is 20 22 km, economic
     comparison in detail and in concrete terms should
     be made instead of comparison by the
     abovementioned chart.
  - b) In case where specific condition arises in regard to the aforementioned assumptions and items enumerated in paragraph 4-1, economic comparison in detail and in concrete terms should be made instead of comparison by the abovementioned chart.

# 4-3. Conclusions

As the result of study based on the foregoing requirements and assumptions, selection is made as follows:

(1) System to Apply

Transmission system : System to generate and repeat 2,048 kbit/s digital signal Transmission capacity: 30 CH/system Type of cable to use : Pair-cable

(2)	Sections Where to Apply the System					
	Leading-in to Uekuli Station					
	(Cable length: Approx. 7 km)					
	Leading-in to Tilamuta Station					
	(Cable length: Approx. 15 km)					
	Leading-in to Tanahjampea Station					
	(Cable length: Approx. 10 km)					

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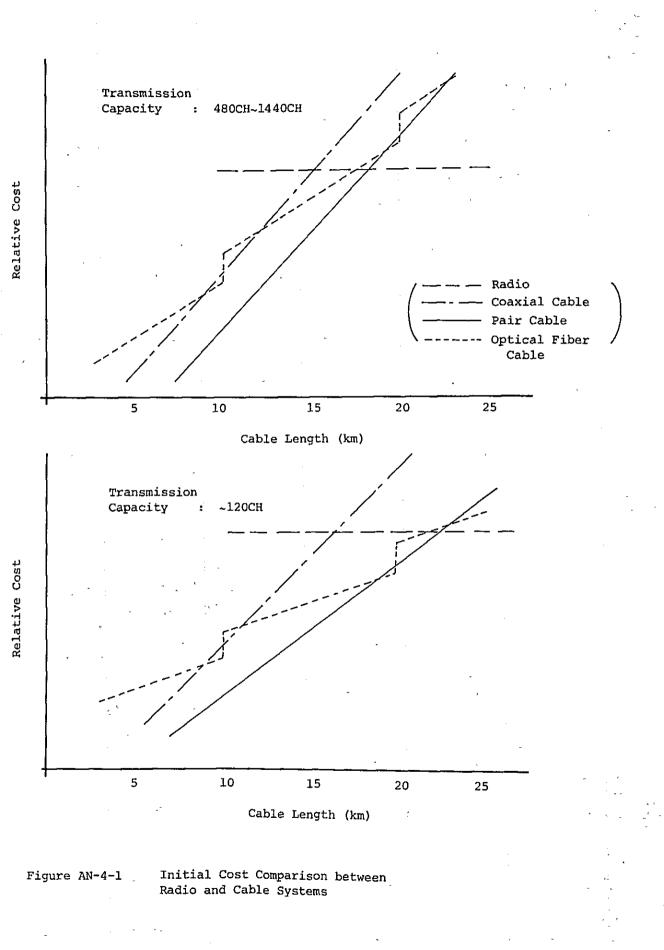
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### 5. Transmission Loss Distribution Plan

### 5-1. Introduction of Digital System

For introducing digital system in existing analog network two strategies are available. One is "stand alone introduction of switching or transmission". The other is "integrated switching and transmission". The latter is better known for its acronym, IST.

"Stand alone introduction of switching or transmission" stands for introducing digital switching equipment or digital transmission system by itself in analog network.

"Integrated switching and transmission" is to introduce digital switching equipment and digital transmission system simultaneously in analog network in coordinated manner. In this case, digital transmission system is for interface with digital group switching hierarchies.

The assumption is that Primary, Secondary and Tertiary Trunk Centers, be the digital type except in Pare Pare Exchange.

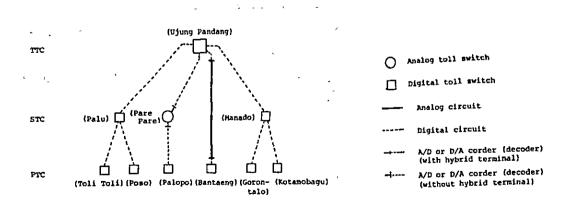
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Existing terrestrial transmission systems that connect Primary and higher ranking centers mutually consist of either UHF/SHF system or coaxial cable system. That is to say, Ujung Pandang - Pare Pare route consists of single core coaxial cable system, and Ujung Pandang -Bantaeng - Benteng route consists of SHF system (constituting part of Eastern Microwave System). Both these systems are the analog type.

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Now assume that Primary Centers, where switching system is to be remodelled into automatic system from now forward, will have such remodelling accomplished with digital type equipment. Then follows a foregone conclusion that digital system introduction in Sulawesi area transmission network will be IST oriented.

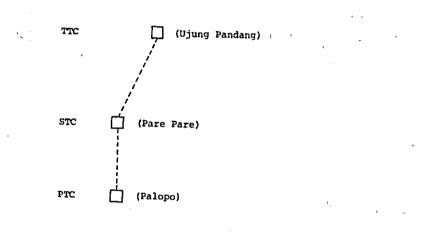
- 5-1-1 Digital System Introduction and Trunk Center Hierarchy In this Project, digital system will be introduced at Primary and higher ranking centers.
- 5-1-2 Introduction Scenario
  - (1) First Stage (As of termination of REPELITA IV)
    - Digital switches will be introduced at Primary Centers included in REPELITA IV targets; Manado, Palu and Kendari Secondary Centers; and Ujung Pandang Tertiary Center. At the same time, terrestrial transmission route of digital radio system will be established to connect those centers and Pare Pare Secondary Center where switching system is of analog type. Figure below presents network configuration in the section concerned as of the time the avobe arrangement has been completed.



· (2) Second Stage

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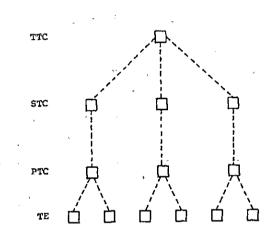
Pare Pare Exchange toll switching equipment (analog type, 2-wire switches) will be remodelled into digital system. Network configuration in the section concerned after the remodelling appears below.



(3)

Third Stage (Final stage of network digitalization)

Existing analog transmission system is near the end of service life so that it will be replaced with digital transmission system. All toll switches at Primary Center hierarchy exchanges will become the digital type. At terminal exchange level, analog switching equipment will gradually draw close to the end of service life. In due time, all automatic switching equipment in all parts of Sulawesi area will become digitalized. Network configuration at that time appears below.



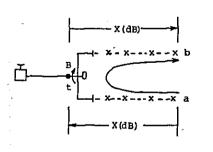
5-2. Digital Network Transmission Loss Distribution Plan

The following description is about temporary transmission loss distribution plan at each stage of network digitalization as per the scenario given in the preceding paragraph, and transmission loss distribution plan at final stage of network digitalization where network is full-digitalized.

5-2-1 Transmission Loss of Full-Digitalized Telephone Connection

> For analog 4-wire type telephone connection with 2-wire/ 4-wire terminating equipment, loop stability should preferably conform to the value recommended by CCITT in Rec. G 122. According to this recommendation, transmission loss of path a - t - b should be more than (10 + n) dB in the mean value at least, provided that the mean balance return loss of 2-wire/4-wire terminating equipment is 6 dB or more, where n denotes the number of links of analog 4-wire type circuit.

> As seen Figure below, when 4-wire type circuit and switching equipment are digital, n is nearly equal to 0. Hence, transmission loss of path a - t - b is 10 dB.



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Path a - t or t - b single direction transmission loss
(X) can be obtained by the following formula:

 $2X + B \ge 10$ 

In the above formula, B stands for the mean balance return loss of 2-wire/4-wire terminating equipment.

When based on CCITT recommended B = 6 dB (objective value), X is 2 dB. When based on B = 3 dB (existing value), X is 3.5 dB. In this Project, B = 6 dB applies.

5-2-2 Transmission Loss of Telephone Connection Where Analog and Digital Systems Co-exist

In the case of circuit that includes n-number of analog 4-wire links, relationships among path a - t or t - b transmission loss (X), balance return loss (B) and n can be expressed as follows:

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2X + B > 10 + n

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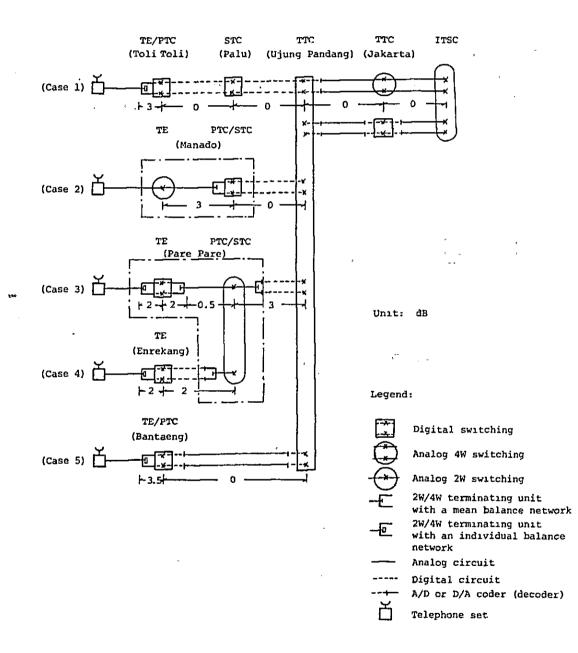
At n = 2 and B = 6, X of 3 dB is obtainable.

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## 5-2-3 Transmission Loss Distribution Plan

#### (1) First Stage Plan

Transmission loss distribution plan at first stage of network digitalization is illustrated below.



#### Transmission Loss Distribution Plan

(First Stage)

Calculation of X for Case 1 in above illustration follows:

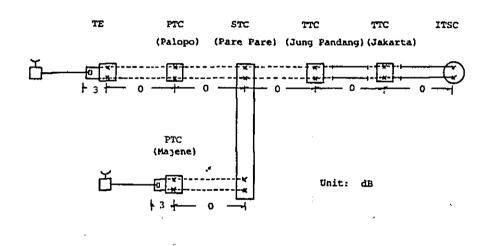
 $2X + B \ge 10 + n$ 

When n = 2 and B = 6 are substituted in the above equation, the result is:

X > 3 dB

(2) Second Stage Plan

Transmission loss distribution plan at second stage of network digitalization is illustrated below.



Transmission Loss Distribution Plan (Second Stage)

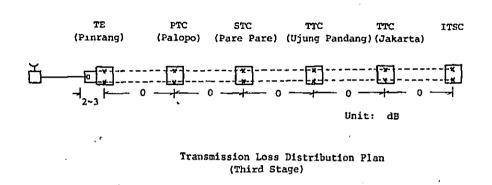
## (3) Third Stage Plan

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Transmission loss distribution plan at third stage of network digitalization is illustrated below.



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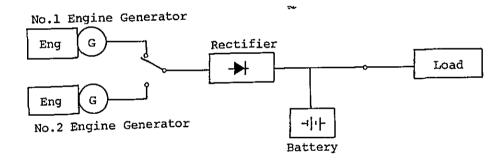
6. Independent Power Generation System

At radio repeater stations in this Project, commercial power supply is seldom or never available. Hence the need for independent power generation system.

Comparative study is made below about several different types of independent power generation systems.

- 6-2. System and Characteristics
  - (1) Dual Prime Mover System

Two prime movers (mainly diesel engines) are operated alternately at fixed time intervals for the purpose of power generation. Feeding to telecommunication loads is as illustrated below.

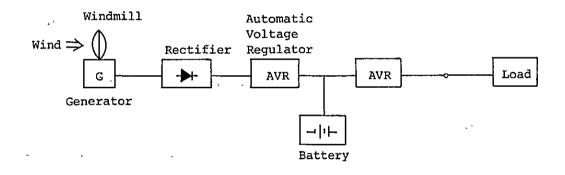


Dual prime mover sytem holds these merit and demerit:

- Performance is stable and reliability is high.
- When used at remote sites, fueling is difficult. Hence high maintenace cost.

- Note: For feeding to telecommunication loads, alternate charge-discharge system may be used instead of full floating system. In this case, prime mover rate of operation can be reduced but large storage battery capacity is required; control circuit also becomes complicated. These necessitate high initial investment cost and difficult maintenance practice.
- (2) Wind Force Generating System

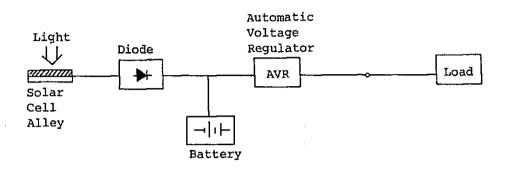
Propeller type or Dalius type windmill is operated by wind energy for the purpose of power generation. Feeding to telecommunication loads is as illustrated below.



Wind force generating system holds these characteristics:

- Upkeep cost (energy cost, maintenance cost) is relatively low.
- Initial cost is relatively high.
- Operation cannot be constant; hence, operation efficiency is low.

- (3) Solar Cell System
  - Optical energy is directly converted into electric power. Feeding to telecommunication loads is as illustrated below.

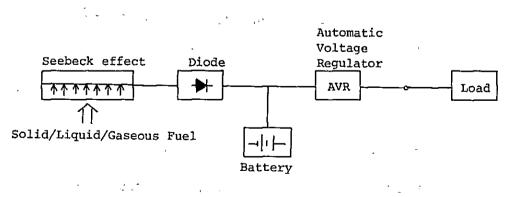


System chracteristics are:

- Upkeep cost is low.
- Operation is unstable so that large scale power generation is difficult.
- Initial investment cost is extremely high.

(4) Thermo-Electric Generating System

Combustion heat by solid, liquid or gaseous fuel is used for power generation, utilizing Seebeck effect. Feeding to telecommunication loads is as illustrated below.

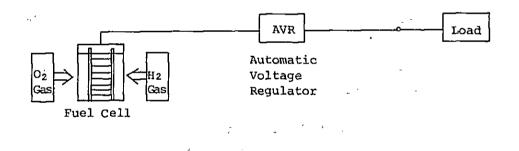


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System chracteristics are:

- Small size and light weight; easiness to handle.
- No driving part; high reliability.
- Easy maintenance.
- Low operation efficiency; high initial investment cost.
- (5) Fuel Cell System

Hydrogen and oxygen are caused to react against each other electrochemically. Electric energy is generated by contrary principle to hydroelectrolysis. Feeding to telecommunication loads is as illustrated below.



System characteristics are:

- Small size and light weight.

- Direct element to energy conversion; hence high efficiency.

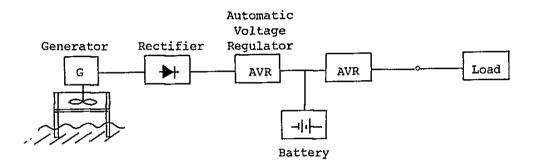
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- High initial cost and maintenance cost.

(6) Wave Force Generating System

Marine energy from waves, tidal current, etc., is used to drive pneumatic turbine for the purpose of power generation. Feeding to telecommunication loads is as illustrated below.



System characteristics are:

- Small capacity up to large capacity generation is possible.
- Initial cost is extremely high.
- Location is restricted to seaboard area; generation volume is variable.
- 6-2. Comparative Study of Systems

All the foregoing power generation systems except dual prime mover system are still in developmental stage technically. Merits and demerits aforementioned are based on annual cost comparison in about 1 kWH generated output as of present. Initial investment cost is fluid a great deal. Initial investment cost comparison between solar cell system and thermo-electric generating system now in the limelight as independent power supply systems for telecommunication use, on one hand, and dual prime mover system already in common use, on the other, is in Figure AN-6-1.

Comparative study by initial investment cost plus operation and maintenance cost arrives at the following conclusion that serves as a guideline to selection of optimum system for independent power generation:

Up to 100 W : Solar cell system 100 - 300 W : Thermo-electric generating system Over 300 W : Dual prime mover system

Meanwhile, approximate operation and maintenance cost is as follows:

Dual prime mover system: Initial investment cost x approx. 2% / year

Solar cell system: Initial investment cost x approx. 0.1% / year

Fuel cell system:

Initial investment cost x approx. 3% / year

Load carrying capacity of telecommunication equipment to be adopted in this Project is in the range of 800 W -2.5 kW. When collateral facilities loads besides telecommunication loads are considered, independent power generation by dual prime mover system proves to be advantageous to a great degree.

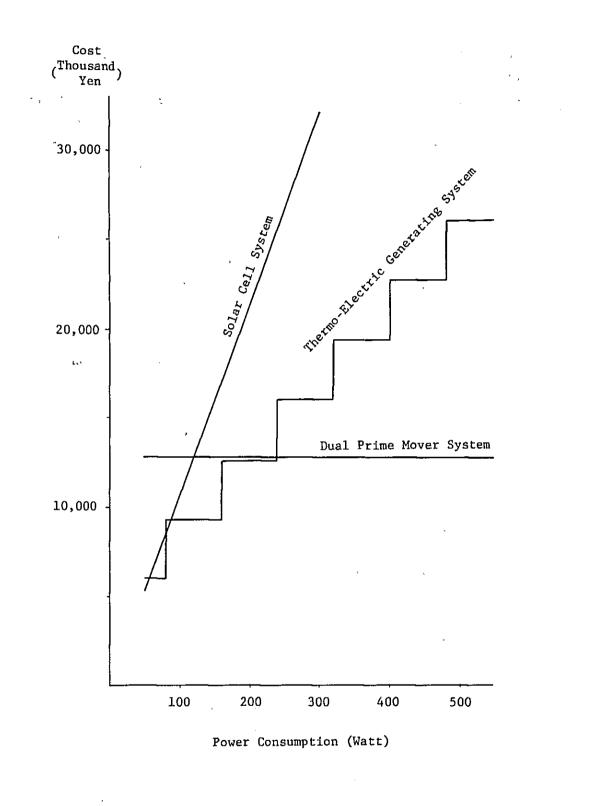


Figure AN-6-1 Initial Investment Cost Comparison of Various Power Supply Systems

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Jakarta T.C.	$-\frac{11.1}{2.5}$	_ <u>10.6</u>	
Surabaya T.C.		2 <u>.9</u>	Surabaya T.C.
Banjarmasin T. C.		<u> </u>	Banjarmasin T.C.
Medan T.C.			
Palembang T.C.		Kendari $\frac{1.3}{1.3}$	Palembang T.C.
Ambon T.C.	0.2	1	
U.Pandang T.C.	1.7 19.5x80Z=15.6	s.c. <u>1.0</u>	19.5x802-15.6 U.Pandang T.C.
Pare Pare S.C.		<u> </u>	
Manado S.C.		·	Pare Pare S.C.
Palu S.C.	/	/0.3	Palu S.C.
Kendari S.C. Area		· 2.1 \	Kendari S.C. Area
Jakarto T.C.	<u> </u>	ر <b>3</b> 3_7	
Surabaya T.C.		9.3	Jakarta T.C.
Banjatmasin T.C.		2.9	Surabaya T.C.
Medan T.C.			Banjarmasin T.C.
· · · · · · · · · · · · · · · · · · ·		4.3	
Palembang T.C. Ambon T.C.		E	Palembang T.C.
	4.7 59.5x802-47.6		61 6:907-70 2 Ambon T.C.
U.Pandang T.C.	- 1.5		61.6x807=49.3 U.Pandang T.C.
Pare Pare S.C.			Pare Pare S.C.
Manado S.C.		\`	Manado S.C.
Kendari S.C.		/ \ `0.4)_	Kendari S.C.
Palu S.C. Area			Palu S.C. Area
Jakarta T.C.	<u>-</u>	48.2	
Surabaya T.C.		/_13.3	Jakarta T.C.
Banjarmasin T.C.		4.2	Surabaya T.C.
Medan T.C.		4.7	Banjarmasin T.C.
Palembang T.C.		6.1	
Ambon T.C.		Manado 1.6	Palembang T.C.
U.Pandang T.C.	4.7 > 80.4x40Z-32.2	s.c. 4.55	87.8x40x=35.1Ambon T.C.
Pare Pare S.C.	- 1.4	2.6	U.Pandong T.C.
Palu S.C.			Pare Pare S.C.
Kendari S.C.		0.6	Palu S.C.
Manado S.C. Area	-[		Kendari S.C.
Tablado S.G. Afea		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Handado S.C. Area
Jakarta T.C.	┓_╩╩┧╴、	_23.4] _	
Surabaya T.C.		1 - 5.4	Jakarta T.C.
Banjarmasin T.C.	7-17	1 2.0	Surabaya T.C.
Medan T.C.			Banjarmasin T.C.
Palembang T.C.		2.9	Medan T.C.
Ambon T.C.		Pare Pare 0.8	Palembang T.C.
U.Pandang T.C.	8.8 49.0x1007-49.0		8.5x100%=48.5 Ambon T.C.
lanado S.C.	2.6	1.4	U.Pandang T.C.
Palu S.C.	2.0		Manado S.C.
Kendari S.C.		/\ <u></u>	Palu S.C.
Pare Pare S.C. Area		( ) <u> </u>	Kendari S.C.
			Pare Pare S.C. Area
lakarta T.C.	182.9x40Z=73.2	178,4x40X	=71.4
iurabaya T.C.	40.7x40x-16.3	48.9×402	
anjarmasin T.C.	$12.8 \times 402 = 5.1$	15.4x407	
ledan T.C.	12.2x402- 4.9	17.5x402	= 7.0 Banjarmasin T.C.
alembang T.C.	<u>16.4x40z 6.6</u>	22.3x402	Medan T.C.
mbon T.C.		U.Pandang 6.0x40z	2.4 Palembang T.C.
are Pare S.C.	48.5x1002-48.5	T.C. 49.0x1002	Ambon T.C.
anado S.C.	87.8x40Z-35.1	80.4x40%-	32.2 Pare Pare S.C.
alu S.C.	61.6x80Z-49.3	59.5x80%-	47.6 Manado S.C.
endari S.C.	19.5×80Z-15.6	19.5x80Z-	15.6 Palu S.C.
.Pandang T.C. Area			Kendari S.C.
			U.Pandang T.C. Area

Figure AN-7 (1/6)

SLDD Traffic Distribution between Secondary/Tertiary Centers via Terrestrial Link ( Case 1 in 1994 )

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Jabora T. C.       J. 3         Jabora T. C.       J. 4         Banjarana T. C.       J. 4         Banjarana T. C.       J. 4         Jabora T. C.       J. 4         Banjarana T. C.       J. 4         Jabora T. C.       J. 4         Banjarana T. C.       J. 4         Jabora T. C.       J. 4		7		
Spersbays T.G.         3-3         4-2         Spersbays T.G.           Bin Jarcastin T.G.         1-4         1.4         1.4         1.4           Addem T.G.         1.4         1.4         1.4         1.4           Addem T.G.         1.4         1.4         1.4         1.4           Unandem T.G.         0.7         1.4         1.4         1.4           Unandem T.G.         0.4         0.4         1.4         1.4           Medam T.G.         0.4         0.4         0.4         1.4           Medam T.G.         0.4	Jakarta T.C.	<u> </u>		Jokarta T.C.
Jang Langkang II. C.         J2         Bang Langkang II. C.         J2         J2         Bang Langkang II. C.         J2         J2 <th< td=""><td></td><td>1</td><td>4.5</td><td> Surabaya T.C.</td></th<>		1	4.5	Surabaya T.C.
Heids T.G.         1.4         Heids T.G.         1.4         Heids T.G.           Paleshog T.G.         0.7         10.0807-94.8         5.6.         1.1         20.4807-76.0         Paleshog T.G.           D.Farding T.G.         0.9         1.0         5.6.         1.10         D.4807-76.0         Paleshog T.G.           Bands S.G.         0.3         0.4         0.4         Paleshog T.G.         Paleshog T.G.           Bands S.G.         0.3         0.4         Paleshog T.G.         Paleshog T.G.         Paleshog T.G.           Bandston T.G.         0.3         0.4         Paleshog T.G.         Paleshog T.G.           Bandston T.G.         0.4         Paleshog T.G.         Paleshog T.G.         Paleshog T.G.           Bandston T.G.         0.4         Paleshog T.G.         Paleshog T.G.         Paleshog T.G.           Paleshog T.G.         0.4         Paleshog T.G.         Paleshog T.G.         Paleshog T.G.           Paleshog T.G.         0.4         Paleshog T.G.         Paleshog T.G.         Paleshog T.G.           Paleshog T.G.         0.4         Paleshog T.G.         Paleshog T.G.         Paleshog T.G.           Paleshog T.G.         0.4         Paleshog T.G.         Paleshog T.G.         Paleshog T.G.      <		1-4-4	// — — —	
Falamang T.G.         J.A.         J.A.         Fandari S.G.         J.A.         J.A. <thj.a.< th="">         J.A.&lt;</thj.a.<>				
Adden T.G.         0.2         11.0.807-94.6         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10         2.10 <td></td> <td>1</td> <td></td> <td> Palembang T.C.</td>		1		Palembang T.C.
J. Parkeng T.G.       2.3       31.00002724.8       5.1       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       1.14       <		L-&		Anbon T.C.
Pare Pare S.C.       0.0       Pare Pare S.C.         Manado S.C.       0.3       0.4       Pare Pare S.C.         Manado S.C.       0.3       0.4       Pare Pare S.C.         Strabay T.C.       9.8       0.4       Pare Pare S.C.         Manado S.C.       9.8       0.4       Pare Pare S.C.         Marato T.C.       9.8       0.4       Pare Pare S.C.         Manado S.C.       7.0       0.4       Pare Pare S.C.         Marato T.C.       9.8       0.4       Pare Pare S.C.         Marato T.C.       9.8       0.4       Pare Pare S.C.         Marato S.C.       0.4       7.0       Pare Pare S.C.         Marato S.C.       0.4       7.0       Pare Pare S.C.         Marado S.C.       0.4       0.4       Pare Pare S.C.         Marado S.C.       0.4       0.5       Pare Pare S.C. <td></td> <td>2.3 31.0x802-24.8</td> <td>· · · · · · · · · · · · · · · · · · ·</td> <td>&gt; 30.4x801-24.3</td>		2.3 31.0x802-24.8	· · · · · · · · · · · · · · · · · · ·	> 30.4x801-24.3
Binsdo S.C.         0.5         0.5         Pails S.C.           Jaka G.         0.5         0.5         0.5         9.6           Jaka G.C.         0.5         0.5         0.5         9.6           Strady S.C.         0.5         0.5         0.5         9.6           Strady T.C.         0.5         0.5         0.5         9.6           Banjatronin T.C.         0.5         0.5         9.7         9.6           Jakarta T.C.         0.5         0.5         9.7         9.7         9.7           Headen T.C.         0.5         0.5         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7         9.7			· ۱	Pare Pare S.C.
Fall S.G.       0.51       0.51       Fall S.G.         Kondurt S.G. Area       3.3       6.41       Fall S.G.         Markin T.G.       9.8       9.8       14.6       Strabays T.G.         Surchays T.G.       9.1       9.8       14.6       Strabays T.G.         Markin T.G.       5.7       14.6       Strabays T.G.       Strabays T.G.         Markin T.G.       5.6       1.8       Strabays T.G.       Strabays T.G.         Pate Sec.       5.2       77.5x602-62.1       Pate Sec.       Advant T.G.         V.Fandang T.G.       2.4       77.5x602-62.1       Vanades T.G.         Pare Face S.G.       2.3       -2.4       Fall S.G.       Strabays T.G.         Mando S.E.       0.4       0.4       0.4       Strabays T.G.         Jakarts T.C.       17.5x602-62.1       Vanades S.G.       Strabays T.G.         Strabays T.G.       0.4       0.4       Strabays T.G.       Strabays T.G.         Jakarts T.C.       17.5x602-62.1       Vanades T.G.       Strabays T.G.       Strabays T.G.         Jakarts T.G.       0.4       0.4       Strabays T.G.       Strabays T.G.         Jakarts T.G.       0.5       59.1x602-62.5       Vanades T.G.       Strabays		┶ーユ・リーーーー๛//*	· // //	
Sandari S.C. Area       43.3       Jakati S.C. Area         Jakati T.C.       9.6       Jakati S.C. Area         Jakati S.C. Area       Jakati S.C. Area       Jakati S.C. Area         Jakati S.C. Area       Jakati S.C. Area       Jakati S.C. Area         Jakati S.C. Area       Jakati S.C. Area       Jakati S.C. Area         Jakati S.C. Area       Jakati S.C. Area       Jakati S.C. Area         Jakati S.C. Area       Jakati S.C. Area       Jakati S.C. Area         Jakati S.C. Area       J.S. 77.5x002-62.1       Jakati S.C. Area         Jakati S.C. Area       J.S. 75.5x002-30.4       Jakati S.C. Area         Jakati S.C. Area       J.S. 75.5x002-30.4       Jakati S.C. Area         Jakati S.C. Area       J.S. 50.5002-52.1       Jakati S.C. Area         Jakati S.C. Area       J.S. 50.5002-52.5       Jakati S.C. Area         Jakati S.C. Area       J.S. 50.5002-52.6       Jakati S.C. Area         Jakati S.C. Area       J.S. 50.5002-52.5       Jakati S.C. Area         Jakati S.C. Area       J.S. 50.5002-52.5       Jakati S			/	
Jakerta T.C.       9,8         Surabays T.C.       3.4         Banjarasin T.C.       3.4         Mada T.C.       3.4         Jakerta T.C.       3.5         Jakerta T.C.       3.4         Jakerta T.C.       3.5         Jakerta T.C.       3.5         Jakerta T.C.       3.5         Jakerta T.C.       3.6         Jakerta T.C.       3.5         Jakerta T.C.       3.5         Jakerta T.C.       3.5         Jakerta T.C.       3.5         Jakerta T.C.       3.5 <td></td> <td></td> <td></td> <td>p</td>				p
Barlassys T.C.         9.8         11.6         Surabays T.C.           Barlassent T.C.         4.7         Barlassent T.C.         Barlassent T.C.           Barlassent T.C.         4.7         Barlassent T.C.         Barlassent T.C.           Barlassent T.C.         3.4         Falsebarg T.C.         Barlassent T.C.           Barlassent T.C.         3.4         Falsebarg T.C.         Barlassent T.C.           U.Pondang T.C.         2.4         Falsebarg T.C.         Barlassent T.C.           J.Pare Pare S.C.         2.3         Falsebarg T.C.         Barlassent T.C.           J.Pare Pare S.C.         2.4         Pare Pare S.C.         Kendart S.C.           Pare S.C.         2.4         Pare Pare S.C.         False S.C.           Jobarta T.C.         3.3         Falsebort T.C.         Barlassent T.C.           Jobarta T.C.         5.4         Falsebort T.C.         Barlassent T.C.           J.Pare Pare S.C.         5.4         Falsebort T.C.         Barlassent T.C.           J.Pare Pare S.C.         5.4         Software T.C.         Software T.C.           J.Pare Pare S.C.         5.4         Software T.C.         Pare Pare S.C.           J.Pare Pare S.C.         4.6         Software T.C.         Pare Pare S.C. <tr< td=""><td>11</td><td>- </td><td>42.9</td><td></td></tr<>	11	- 	42.9	
Banjarsanin T.C.       3.2       Banjarsanin T.C.         Medan T.C.       3.6       -4.4       Paluebang T.C.         Advan T.C.       1.8       7.5       -4.4       Paluebang T.C.         Medan T.C.       1.8       7.5       -4.4       Paluebang T.C.         Medan T.C.       2.8       7.5       -4.4       Paluebang T.C.         Menado S.C.       2.8       7.5       -4.4       Pare Pare S.C.         Pare Pare S.C.       2.8       7.5       -4.4       Pare Pare S.C.         Mendo S.C.       2.8       -4.4       -4.4       Pare Pare S.C.         Pare Pare S.C.       2.8       -5.4       -5.5       -5.4       -7.5         Jakarta T.C.       3.5       -5.5       -5.5       -5.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5       -7.5		9.8	/ 11.6	
And T.C.       4.7       Palembang T.C.         Addom T.C.       3.6       77.6x802+62.1       Paleb S.C.         U.Pandang T.C.       3.4       77.6x802+62.1       Paleb S.C.         U.Pandang T.C.       3.4       77.6x802+62.1       Paleb S.C.         U.Pandang T.C.       3.4       77.6x802+62.1       Paleb S.C.         Pare Pare S.C.       2.8       1.9       Pare Pare S.C.         Hanado S.C.       2.4       0.4       9.3       Pare Pare S.C.         Kendart S.C.       0.4       31.4       77.5x602+02.1       21.4       Pare Pare S.C.         Jakarta T.C.       31.5       77.5x602+02.1       31.1-6.6+24.5       76.1x602+02.1       Jokarta T.C.         Jakarta T.C.       35.5       10.3       6.4       Pare Pare S.C.       P		3.1	1 3.7	
Andom T.C.       3.6       Image: Solution of the solution of				
Abbor T.C.       1.4       1.4       Abbor T.C.         9. Pandang T.C.       2.2       77.6x502-62.1       Palu S.C.       1.5       77.9x602-62.3         Wanado S.C.       2.4       2.4       1.4       1.4       1.4       1.4         Wanado S.C.       2.4       2.4       1.4       1.4       1.4       1.4         Wanado S.C.       2.4       2.4       1.4       1.4       1.4       1.4       1.4         Wanado S.C.       2.4       2.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4       1.4			1/	
Johnson T.C.         S.2         T7.5x802r-62.3         U.Bandang T.C.           Pare Pare S.C.         2.3         U.Bandang T.C.         Pare Pare S.C.           Manado S.C.         2.4         0.4         J.2           Pare Pare S.C.         0.4         J.2         Pare Pare S.C.           Manado S.C.         0.4         J.2         Pare Pare S.C.           Pare Pare S.C.         0.4         J.2         Pare Pare S.C.           Pare Pare S.C.         0.4         J.2         Pare Pare S.C.           Jakarta T.C.         0.4         J.2         Jakarta T.C.           Banjarnasin T.C.         0.3         J.3         Jakarta T.C.           Banjarnasin T.C.         0.4         J.3         Jakarta T.C.           Pare Pare S.C.         2.6         Kedan T.C.         J.3           Pare Pare S.C.         2.6         Jakarta T.C.         J.3           Pare Pare S.C.         2.6         Jakarta T.C.         J.4           Jakarta T.C.         0.6         J.3         J.4           Jakarta T.C.         J.5         J.4         Jakarta T.C.           Jakarta T.C.         J.5         J.4         J.4         Jakarta T.C.           Jakarta T.C.         J.		1.8	1.4	
Pare Pare S.C.       2.3       2.4         Hanado, S.C.       2.4       2.4         Kendart S.C.       2.4       2.4         Jakarta T.C.       1.3       3.16, 6-24.5         Jakarta T.C.       1.3       3.66         Banjarasain T.C.       3.5       70.3x01-30.4         Jakarta T.C.       1.3       3.66         Jakarta T.C.       1.3       5.6.         Banjarasain T.C.       6.3       5.6.         Vandon T.C.       6.3       59.1x401-21.6         J.Alandar, T.C.       2.6       5.0.         J.Jadang T.C.       2.6       4.7         Jakarta T.C.       5.7.6       8.6         J.Jadang T.C.       2.6       4.7         Jakarta T.C.       5.7.6       9.1x401-21.6         S.C.       4.7       4.8         Jakarta T.C.       2.6       9.1x401-21.6         Jakarta T.C.       2.6       9.2         Jakarta T.C.       2.7       9.4         Jakarta T.C.       2.7       9.4         Jakarta T.C.       2.7       9.1         Jakarta T.C.       2.7       9.1         Jakarta T.C.       2.7       9.1		5.2 77.6x80%=62.1		> 77.9x80z=62.3
Fate Fate S.C.       2.4       1.9       Fate Fate S.C.         Kendart S.C.       0.4       0.4       Nanado S.C.       Kendart S.C.         Palu S.C.       Area       0.4       Nanado S.C.       Falu S.C.         Jakarta T.C.       17.3       31.3-6.6-24.5       76.3×07-30.4       30.4-6.7-22.7       Jakarta T.C.         Banjarnasin T.C.       5.3       6.6       Serabaya T.C.       Banjarnasin T.C.       6.6       Nanado S.C.       Redart S.C.         Palus S.C.       6.6       59.1       Nanado S.C.       Nanano S.C.       Nanano S.C.		2.3	2,8	/
Henado S.C.       0.4       0.4         Palu S.C.       0.4       0.3         Akarta T.C.       77.8x407-31.1       31.2-6.6-24.5       76.1x407-30.4       30.4-6.7-23.7         Jakarta T.C.       77.35.6       0.4       0.4       0.4-6.7-23.7         Jakarta T.C.       77.35.6       0.4       0.4       0.4-6.7-23.7         Jakarta T.C.       5.5       0.4       0.4       0.4-6.7-23.7         Jakarta T.C.       5.5       0.4       0.4       0.4-6.7-23.7         Jakarta T.C.       5.5       0.4       0.4       0.4-6.7-23.7         Jakarta T.C.       0.43       0.4-6.7-23.7       Jakarta T.C.       Banjarmasin T.C.         Medon T.C.       0.43       0.4-6.7-23.7       Jakarta T.C.       Banjarmasin T.C.         Palembong T.C.       0.43       0.4-6.7-23.7       Jakarta T.C.       Banjarmasin T.C.         Pale S.C.       2.6       1.7       Redemag T.C.       Palembong T.C.         Palu S.C.       1.9       1.1       Palembong T.C.       Palembong T.C.         Palu S.C.       1.5.3       31.5-7.1-30.4       Starta T.C.       Starta T.C.         Jakarta T.C.       32.5-7.1-30.4       Jakarta T.C.       Starta T.C.       Starta T.C.<			//	
Kendart 5.C.       Palu S.C. Area         Palu S.C. Area       77.8x402-31.1         Jakarta T.C.       17.3 56.6         Strahaya T.C.       5.5         Banjarmaain T.C.       5.5         Hedan T.C.       5.5         Jakarta T.C.       5.5         J.Pandang T.C.       3.3         J.Pandang T.C.       3.3         J.Pandang T.C.       3.3         J.Pandang T.C.       3.4         J.Pandang T.C.       3.5         J.Pandang T.C.       3.6         J.Pandang T.C.       2.6         J.Pandang T.C.       2.6         J.Pandang T.C.       2.6         J.S.C.       4.7         Falu S.C.       4.7         Banjarmasin T.C.       3.4-7, 8-30, 6         Jakarta T.C.       3.4-7, 8-30, 6         Jakarta T.C.       3.4-7, 8-30, 6         J.S. C.       4.7         Paleshang T.C.       4.1         J.S. School S.C.       4.2         Paleshang T.C.       4.1 <td>Manado S.C.</td> <td></td> <td></td> <td></td>	Manado S.C.			
Jakarta T.C.       77.8x402r31.1       31.1-6.6-24.5       76.1x401-30.4       30.4-6.7-23.7       Jakarta T.C.         Surabaya T.C.       5.5       17.3       6.6       30.2       6.4       Surabaya T.C.         Banjarmasin T.C.       6.4	·			
Jakarta T.C.       17.3 6.6       Jakarta T.C.         Surabaya T.C.       3.3       3.3         Balaraaain T.C.       9.3         Nedan T.C.       9.3         Palenbang T.C.       3.3         Abon T.C.       6.4         J.Pandang T.C.       3.3         Spandang T.C.       3.3         J.Pandang T.C.       6.4         J.Pandang T.C.       6.5         J.Pandang T.C.       2.6         J.Pandang T.C.       2.6         J.Pandang T.C.       2.6         Jakarta T.C.       9.6         Pale S.C.       2.6         Pale S.C.       2.6         Pale S.C.       2.6         Mando S.C. Area       9.6         Jakarta T.C.       9.7         Jakarta T.C.       9.7	Palu S.C. Area			
Surabaya T.C.       17.3       5.6       Surabaya T.C.         Banjarmasin T.C.       5.3       5.6       Surabaya T.C.         Banjarmasin T.C.       5.4       Surabaya T.C.       Banjarmasin T.C.         Banjarmasin T.C.       5.4       Surabaya T.C.       Palenbang T.C.         D.Pandang T.C.       5.6       Surabaya T.C.       Palenbang T.C.         Parte Fare S.C.       2.6       Surabaya T.C.       Palenbang T.C.         Palu S.C.       1.5       Surabaya T.C.       Palenbang T.C.         Palu S.C.       0.6       Surabaya T.C.       Palenbang T.C.         Palu S.C.       0.6       Surabaya T.C.       Palenbang T.C.         Palu S.C.       0.6       Surabaya T.C.       Palenbang T.C.         Banjarmasin T.C.       2.7       Banjarmasin T.C.       Banjarmasin T.C.         Banjarmasin T.C.       2.7       Banjarmasin T.C.       Banjarmasin T.C.         Banjarmasin T.C.       12.3       48.6x1002-48.6       Surabaya T.C.	Jakarta T.C.	77.8x40x-31.1 31.1-6.6-24.5	76.1x40%-30.	4 30.4-6.7=23.7
Banjarmasin T.C.       5.2       5.6       Medan T.C.         Palenbang T.C.       6.4       9.5       7.6         Anbon T.C.       9.6       9.6       9.6         J.Pandang T.C.       6.6       59.1x401=23.6       8.6       9.6         J.Pandang T.C.       6.6       59.1x401=23.6       8.6       9.6         J.Pare Pare S.C.       2.6       10.2       9.7       9.7         Pare Pare S.C.       1.9       9.6       10.1       7.6         Pare Pare S.C.       1.9       9.6       10.1       7.6         Pare Pare S.C.       1.9       9.7       10.1       7.6         Mandado S.C.       Arc.       15.3       7.5       7.1       9.6         Surabaya T.C.       2.6       11.1       7.6       10.1       7.1       9.1         Surabaya T.C.       2.7       10.1       7.1       9.1       9.1       9.1         Banjarmasin T.C.       4.1       10.1       7.1       9.1       9.1       9.1         Banjarmasin T.C.       2.7       10.1       10.1       7.1       9.1       9.1       9.1         V.Pandang T.C.       2.7       12.1       10.1       10.1		17.3 6.6	20.5	\ °. /
Medan T. C.       9.3       6.4         Palenbang T. C.       3.3       7.6         Ambon T. C.       2.5       9.6         D.Pandang T. C.       2.6       8.6         Pale BARG T. C.       2.6       9.6         D.Pandang T. C.       2.6       9.6         Pale S. C.       2.6       9.6         Mando S. C. Area       15.3       7.5-7.1+30.4         Jakarta T. C.       38.4-7,8-30.6       37.5-7.1+30.4       Jakarta T. C.         Surabaya T. C.       8.6       7.5-7.1+30.4       Jakarta T. C.         Balgarmasin T. C.       3.1       9.7       9.7.1+30.4       Jakarta T. C.         Balagarasin T. C.       3.1       9.7       9.7.1+30.4       Jakarta T. C.         Palenbang T. C.       3.1       9.7       9.7       9.7       9.7         Palenbang T. C.       3.1       9.7       9.7       9.7       9.7         Palenbang T. C.       3.1       9.7       9.7       9.7       9.7		5.5	6.6	
Instruct       6.4       Hanado       9.6       Healenbarg T.C.         Anbon T.C.       3.3       5.0       2.6       Anbon T.C.         J.Pardang T.C.       2.6       5.0       4.7       Hanado         S.C.       6.7       58.6x402=27.5       U.Pandang T.C.         Pare Pare S.C.       2.6       4.7       Pare Pare S.C.         Pare S.C.       1.4.2       2.8       Pare Pare S.C.         Manado S.C.       4.7       Pare S.C.       Pare S.C.         Jakarta T.C.       38.4-7, B-30.6       31.5-7.1-10.0,4       Jakarta T.C.         Banjarmasin T.C.       8.5       7.8       Surabaya T.C.         Banjarmasin T.C.       4.1       Surabaya T.C.       Banjarmasin T.C.         Medan T.C.       2.1       Banjarmasin T.C.       Banjarmasin T.C.         Medan T.C.       2.1       Banjarmasin T.C.       Banjarmasin T.C.         Medan T.C.       2.4       Palembang T.C.       Banjarmasin T.C.         Medan T.C.       2.6       2.6       Surabaya T.C.         Pare Pare S.C.       2.6       Surabaya T.C.       Pale S.C.         Pare Pare S.C.       2.6       Surabaya T.C.       Surabaya T.C.         Pare Pare S.C. Area		8.3		
Anbon T.C.       3.3       59.1x407-23.6       S.C.       6.6       S.C.       6.7       58.6x407-27.5       Mandon T.C.         Pare Pare S.C.       1.9       1.9       2.6       4.7       Patu S.C.       Patu S.C.         Kendari S.C.       0.6       0.5       7.8       88.6x407-27.5       W.Pandang T.C.         Jakarta T.C.       0.6       0.6       37.57.1=30.4       Jakarta T.C.         Jakarta T.C.       0.5       0.7       88.6x407-27.5       Mandodo S.C. Area         Jakarta T.C.       0.6       37.57.1=30.4       Jakarta T.C.         Surabaya T.C.       0.5       7.8       Surabaya T.C.       Benjarmasin T.C.         Banjarmasin T.C.       4.1       10.1       1.1       Medan T.C.         V.Pandang T.C.       1.6       2.7       Reinbang T.C.       1.6         V.Pandang T.C.       1.6       2.7       Reinbang T.C.       1.6       1.7         V.Pandang T.C.       1.2       48.6x1002*48.6       S.C.       2.6       Mando S.C.       Patu S.C.         V.Pandang T.C.       1.6       2.4       1.3       1.3       47.4x1002*47.4       Mando S.C.         Patu S.C.       2.6       1.3       1.5       47.4x1002*47.4 <td></td> <td>6.4</td> <td></td> <td></td>		6.4		
U. Pandang T. C.       6.6       39.18401221.6       5.0.       6.7       58.6x407-27.5       U. Pandang T. C.         Pate Pare S. C.       2.6       2.6       9.18401221.6       5.0.       4.7       Pate S. C.         Palu S. C.       2.6       2.6       2.8       Palu S. C.       Palu S. C.       Palu S. C.         Kendari S. C.       0.6       15.3       37.5-7.1-30.4       Jakarta T. C.       Surabaya T. C.         Jakarta T. C.       38.4-7.8-30.6       37.5-7.1-30.4       Jakarta T. C.       Surabaya T. C.         Banjarmasin T. C.       4.1       10.17.1       Surabaya T. C.         Palembang T. C.       2.7       4.1       9.1       Surabaya T. C.         Banjarmasin T. C.       2.7       4.1       9.1       Surabaya T. C.         Banjarmasin T. C.       2.7       4.1       9.1       Surabaya T. C.         Banjarmasin T. C.       2.7       4.1       9.1       Madod S. C.       Pale S. C.         V. Pandang T. C.       1.1       2.4       10.17.4       Surabaya T. C.         Madon S. C.       1.2       4.6       6.5       7.2       1.3         Pale S. C.       1.1       1.3       47.4x1007-47.4       U. Pandang T. C.      <		3.3	Manado 2.6	
Pare Fare S.C.       2.5       2.5       2.7         Palu S.C.       0.6       11       2.8       Palu S.C.         Manado S.C. Arca       38.4-7,8-30.6       37.5-7.1-30.4       Jakarta T.C.         Jakarta T.C.       38.4-7,8-30.6       37.5-7.1-30.4       Jakarta T.C.         Banjarmasin T.C.       2.7       3.2       Surabaya T.C.         Banjarmasin T.C.       4.1       3.2       Banjarmasin T.C.         Medan T.C.       3.2       Banjarmasin T.C.       Medan T.C.         V.Pandang T.C.       4.1       11.5       47.4x100z-47.4         Jakarta T.C.       2.6       11.5       47.4x100z-47.4         Medan T.C.       2.6       11.5       47.4x100z-47.4         Jakarta T.C.       2.6       11.5       47.4x100z-47.4         Manado S.C.       2.3       Palembang T.C.       11.5         Jakarta T.C.       12.2       48.6x100z-48.6       11.5       47.4x100z-47.4         V.Pandang T.C.       12.3       48.6x100z-47.4       49.6x010z-47.4       49.10x10z-47.4         Jakarta T.C.       12.3       12.9       12.9       12.9       12.9         Jakarta T.C.       12.9       12.9       12.9       12.9       12.9		6.6 59.1x402-23.6	s.c. 6.7	68.8x407=27.5
Palu S.C.       1.9       2.8       Palu S.C.         Kendari S.C.       0.6       1.1       Kendari S.C.         Mando S.C. Area       15.3       Nandado S.C. Area         Jakarta T.C.       38.4-7,8-30.6       37.5-7.1-30.4       Jakarta T.C.         Surabaya T.C.       8.5       7.8       10.17/11       Surabaya T.C.         Banjarmasin T.C.       4.1       4.1       10.17/11       Surabaya T.C.         Banjarmasin T.C.       4.1       4.1       10.17/11       Surabaya T.C.         Palembang T.C.       4.1       4.1       10.17/11       Surabaya T.C.         Mando S.C.       2.2.7       Kendart S.C.       Kendart S.C.       Neadan T.C.         Palembang T.C.       4.1       48.6x1002-48.6       S.C.       N.4.1002-47.4         Nanada S.C.       2.6       11.5       47.4x1002-47.4       Mando S.C.         Palu S.C.       2.6       10       V.Pandang T.C.       Mando S.C.         Pare Pare S.C. Area       19.1k402-77.2       188.3x402-75.3       Jakarta T.C.         Jakarta T.C.       26.8x402-10.7       24.2x402-9.7       Jakarta T.C.         Pare Pare S.C. Area       10.5x402-4.2       U.Pandang       Nedan T.C.         Palenhang T.C. </td <td></td> <td>2.6</td> <td>4.7</td> <td></td>		2.6	4.7	
Part 3.C.       Point S.C.       Part S.C.         Kendart S.C.       Kendart S.C.       Kendart S.C.       Kendart S.C.         Jakarta T.C.       38.4-7, 8-30.6       37.5-7.1=30.4       Jakarta T.C.         Surabaya T.C.       8.5       7.8       37.5-7.1=30.4       Jakarta T.C.         Banjarmasin T.C.       4.1       9.4       Jakarta T.C.       Surabaya T.C.         Banjarmasin T.C.       4.1       9.4       Jakarta T.C.       Surabaya T.C.         Medan T.C.       4.1       9.7       9.4       Jakarta T.C.         V. Pandang T.C.       1.5       47.4×1002=47.4       Jakarta T.C.       Surabaya T.C.         Manado S.C.       2.6       11.5       47.4×1002=47.4       U.Pandang T.C.         V. Pandang T.C.       2.6       11.5       47.4×1002=47.4       U.Pandang T.C.         Manado S.C.       2.6       11.5       47.4×1002=47.4       U.Pandang T.C.         Jakarta T.C.       2.6       11.5       47.4×1002=47.4       U.Pandang T.C.         Jakarta T.C.       2.6       11.5       47.4×1002=47.4       U.Pandang T.C.         Jakarta T.C.       2.6       13.3×002=75.3       50.1×402=77.2       188.5×402=75.3       Jakarta T.C.         Surabaya T.C.		1.9	2.8	
Kendarl S.C.       Kendarl S.C.         Manado S.C. Area       38.4-7, B-30.6         Jakarta T.C.       38.5, 7.8         Sutabaya T.C.       8.5, 7.8         Banjarmasin T.C.       4.1         Hedan T.C.       3.1         Palembang T.C.       4.1         Jakarta T.C.       3.1         Palembang T.C.       4.1         Manado S.C.       4.1         Wedan T.C.       4.1         Palembang T.C.       4.1         Manado S.C.       1.3         Ambon T.C.       4.1         Wedan T.C.       4.1         Palembang T.C.       4.1         Manado S.C.       2.6         Nanado S.C.       2.6         Palu S.C.       2.6         Jakarta T.C.       2.6         Ja				
Jakarta T.C.       38.4-7.8-30.6       37.5-7.1-30.4         Jakarta T.C.       Jakarta T.C.         Banjarmasin T.C.       Jakarta T.C.         Banjarmasin T.C.       Jakarta T.C.         Jakarta T.C.         Banjarmasin T.C.         Jakarta T.C.				
Jakarta T.C.       8.5       7.8         Surabaya T.C.       8.5       7.8         Banjarmasin T.C.       4.1       3.2         Banjarmasin T.C.       4.1         Wedan T.C.       3.1         Palembang T.C.       4.1         Medan T.C.       1.3         Ambon T.C.       1.3         V.Pandang T.C.       4.7         Mando S.C.       2.6         Yakarta T.C.       4.7         Mando S.C.       2.6         Pate Bare S.C.       4.7         Manado S.C.       2.6         Pate S.C.       1.0         V.Pandang T.C.       4.7         Manado S.C.       2.6         Pate S.C.       1.0         V.Pandang T.C.       4.7         Manado S.C.       2.6         Pate S.C.       1.0         V.Pandang T.C.       1.0         Jakarta T.C.       5.1x407-77.2         Jakarta T.C.       5.1x407-77.2         Jakarta T.C.       1.3         Jakarta T.C.       4.7         Jakarta T.C.       26.5x407-9.7         Jakarta T.C.       1.0         Jakarta T.C.       1.0         Jakarta T.C.	Manado S.C. Area	J		
Surabaya T.C.       8.5       1.0       10,17/1       Surabaya T.C.         Banjarmasin T.C.       4.1       3.2       3.2       Ranjarmasin T.C.         Medan T.C.       3.1       9.1       9.2       Redan T.C.         J.Pandang T.C.       1.6       41.6       9.2       9.2         Ambon T.C.       1.6       41.7       1.3       Ambon T.C.         J.Pandang T.C.       12.3       48.6x1002-48.6       S.C.       9.4.7       Medan T.C.         V.Pandang T.C.       4.7       1.3       Ambon T.C.       W.Pandang T.C.       Mando S.C.         Palu S.C.       2.6       9.4       Mando S.C.       Palu S.C.       Kendari S.C.         Pare Pare S.C. Area       19.1x402-77.2       188.3x40x-75.3       Palu S.C.       Kendari S.C.         Surabaya T.C.       56.1x40z-22.4       8.6       21.3x40z-85.2       Pare Pare S.C. Area         Jakarta T.C.       26.8x40x-19.1       24.2x40x-9.7       Medan T.C.       Surabaya T.C.         Banjarmasin T.C.       10.5x40x-4.2       U.Pandang       1.2.4x0x-85.2       Banjarmasin T.C.         Abon T.C.       10.5x40x-1.4       External       Falembang T.C.       Ambon T.C.         Palenhang T.C.       10.5x40x-1.5 <t< td=""><td>Jakarta T.C.</td><td></td><td></td><td></td></t<>	Jakarta T.C.			
Banjarmasin T.C.       2.7       3.2       Banjarmasin T.C.         Medan T.C.       3.7       J.C.       Hedan T.C.         Palembang T.C.       1.6       7.2       J.C.         Mando S.C.       12.3       48.6x1002=48.6       S.C.       11.5       47.4x1002=47.4         Mando S.C.       2.8       1.0       S.C.       11.5       47.4x1002=47.4         Mando S.C.       2.8       2.8       S.C.       11.5       47.4x1002=47.4         Mando S.C.       2.8       2.8       S.C.       11.5       47.4x1002=47.4         Pate S.C.       2.8       2.8       S.C.       Hando S.C.       Palu S.C.         Kendari S.C.       1.0       2.8       2.4       Palu S.C.       Kendari S.C.         Pare Pare S.C. Area       193.1x402=77.2       188.3x402=75.3       Pale S.C.       Pare Pare S.C. Area         Jakarta T.C.       193.1x402=22.4       66.5x402=26.6       Surabaya T.C.       Surabaya T.C.         Banjarmasin T.C.       26.8x402=19.1       1.3x402=85.2       Jakarta T.C.       Banjarmasin T.C.         Medan T.C.       20.5x402=4.2       U.Pandang       8.2x402=9.7       Banjarmasin T.C.         Paleshang T.C.       47.4x1002=47.4       S.C.			/	
Medan T.C.       3.2       Jakarta T.C.         Palembang T.C.       1.6       4.1         Ambon T.C.       1.6       48.6x100Z=48.6         U. Pandang T.C.       4.7       Ambon T.C.         W. Pandang T.C.       4.7       4.7         Manado S.C.       2.8       2.6         Pate Pare       1.3       47.4x100Z=47.4         W. Pandang T.C.       4.7       4.7         Manado S.C.       2.8       2.6         Pate Pare S.C.       1.0       2.6         Manado S.C.       1.0       2.8         Pare Pare S.C. Area       193.1x40Z=77.2         Jakarta T.C.       10.1       10.1         Jakarta T.C.       10.1       10.1         Surabaya T.C.       47.8x60Z=19.1       10.8.6         Banjarmasia T.C.       10.5x40Z=22.4       10.3x40Z=75.3         Banjarmasia T.C.       10.5x40Z=4.2       10.7         Medan T.C.       10.5x40Z=4.2       10.8.6         Pare Pare S.C.       66.5x40Z=26.6       Surabaya T.C.         Banjarmasia T.C.       10.5x40Z=4.2       U.Pandang         Pare Pare S.C.       68.8x0Z=75.5       10.480X=72.6         Pare Pare S.C.       68.8x0Z=27.5       10.59			3.2	
Palembang T.C.       3.1       Ambon T.C.       Palembang T.C.       Palembang T.C.         Mandang T.C.       12.3       48.6x1002=48.6       Pare Pare       Ambon T.C.         U.Pandang T.C.       4.7       Ambon T.C.       U.Pandang T.C.         Manado S.C.       2.6       Manado S.C.       Palembang T.C.         Pale S.C.       1.0       U.Pandang T.C.       Manado S.C.         Pare Pare S.C.       1.0       0.9       Kendari S.C.         Pare Pare S.C. Area       193.1x402=77.2       188.3x402=75.3       Jakarta T.C.         Jakarta T.C.       56.1x402=22.4       66.5x402=26.6       Jakarta T.C.         Surabaya T.C.       47.8x602=19.1       21.3x402=75.3       Banjarmasia T.C.         Medan T.C.       26.8x407=10.7       24.2x407= 9.7       Banjarmasia T.C.         Pare Pare S.C.       10.5x407= 4.2       U.Pandang       R.2407= 3.3         Ambon T.C.       68.8x607=10.7       Medan T.C.       Palembang T.C.         Pare Pare S.C.       68.8x607=10.7       Medan T.C.       Palembang T.C.         Palembang T.C.       10.5x407= 4.2       U.Pandang       R.C.       Surabaya T.C.         Pare Pare S.C.       68.8x607=27.5       Palembang T.C.       Palembang T.C.       Palembang T.C.		h	3.2	
Ambon T.C.       1.6       Ambon T.C.       Ambon T.C.         U. Pandang T.C.       12.3       48.6x1002-48.6       S.C.       11.5       47.4x1002-47.4         Manado S.C.       2.6       11.5       47.4x1002-47.4       U.Pandang T.C.         Palu S.C.       2.6       2.3       Palu S.C.         Palu S.C.       1.0       2.6       Palu S.C.         Jakarta T.C.       193.1x402-77.2       188.3x402-75.3       Rendari S.C.         Jakarta T.C.       56.1x402-22.4       66.5x402-26.6       Jakarta T.C.         Jakarta T.C.       26.8x607-19.1       13.3x402-75.3       Banjarmasin T.C.         Banjarmasin T.C.       26.8x607-10.7       21.3x402-85.2       Banjarmasin T.C.         Pale Bang T.C.       10.5x402-4.2       U.Pandang       0.92402-12.4         Pale Bang T.C.       10.5x402-4.2       U.Pandang       1.C.         Pale Bang T.C.       10.5x402-4.2       U.Pandang       1.C.         Pare Fare S.C.       68.8x402-27.5       7.6       9.7         Pare Fare S.C.       68.8x402-27.5       7.6x80x-62.1       7.6x80x-62.1         Palu S.C.       7.7.9x80x-62.3       7.6x80x-24.6       Palu S.C.         Palu S.C.       10.4x80x-24.3       25.5 <td< td=""><td></td><td></td><td></td><td>· · · · · · · · · · · · · · · · · · ·</td></td<>				· · · · · · · · · · · · · · · · · · ·
U. Pandang T.C.       12.3       48.6x100Z=48.6       5.C.       11.5       47.4x100Z=47.4       U. Pandang T.C.         Manado S.C.       2.8       2.8       2.6       Wando S.C.       Palu S.C.         Palu S.C.       1.0       0.9       Palu S.C.       Palu S.C.         Jakarta T.C.       193.1x40Z=77.2       188.3x40Z=75.3       Pare Pare S.C. Area         Jakarta T.C.       193.1x40Z=77.2       188.3x40Z=75.3       Jakarta T.C.         Surabaya T.C.       10.5x40Z=22.4       66.5x40Z=26.6       Jakarta T.C.         Banjarmasin T.C.       26.8x60Z=10.7       24.2x60Z=9.7       Banjarmasin T.C.         Palembang T.C.       10.5x40Z=47.4       U. Pandang       R.C.       Nedan T.C.         Pare Fare S.C.       47.4x100Z=47.4       U. Pandang       R.C.       Nedan T.C.         Pare Fare S.C.       68.8x40Z=27.5       U. Pandang       R.C.       Nedan T.C.         Pare Fare S.C.       68.8x40Z=27.5       T.C.       48.6x100Z=48.6       Pare Fare S.C.         Manado S.C.       77.9x80X=62.3       T.C.       48.6x100Z=24.6       Palu S.C.         Manado S.C.       30.4x80Z=24.3       25.5       U. Pandang T.C. Area       V.Pandang T.C. Area			Pare Pare 1.3	
Manado S.C.       4.7         Palu S.C.       2.8         Rendari S.C.       1.0         Pare Pare S.C. Area       9.9         Jakarta T.C.       193.1x402-77.2         Jakarta T.C.       193.1x402-77.2         Jakarta T.C.       56.1x402-22.4         Jakarta T.C.       56.1x402-22.4         Surabaya T.C.       66.5x402-26.6         Banjarmasin T.C.       26.8x402-19.1         Banjarmasin T.C.       26.8x402-19.1         Palembang T.C.       10.5x402-4.2         Medan T.C.       24.2x402-9.7         Banjarmasin T.C.       10.5x402-4.2         Medan T.C.       10.5x402-4.2         Abon T.C.       47.4x1002-47.4         Pare Fare S.C.       68.8x402-27.5         Manado S.C.       77.9x802-62.3         Jakarta S.C.       10.4x802-24.3         U.Pandang T.C. Area       26.5				
Palu S.C.       2.8       2.3       Palu S.C.         Kendari S.C.       1.0       9       Palu S.C.         Pare Pare S.C. Area       193.1x402-77.2       188.3x402-75.3       Pare Pare S.C. Area         Jakarta T.C.       56.1x402-22.4       66.5x402-26.6       Jakarta T.C.         Surabaya T.C.       47.8x402-19.1       188.3x402-75.3       Jakarta T.C.         Medan T.C.       26.8x402-10.7       24.2x402-9.7       Banjarmasin T.C.         Palembang T.C.       10.5x402-4.2       0.9x402-12.4       Palembang T.C.         Abon T.C.       10.5x402-4.2       0.9x402-12.4       Palembang T.C.         Pare Fare S.C.       68.8x402-27.5       7.0x802-42.6       Pare Pare S.C.         Manado S.C.       77.9x802-62.3       T.C.       48.6x1002-48.6       Pare Pare S.C.         Palu S.C.       30.4x802-24.3       26.5       21.3x402-24.8       W.Pandang T.C. Area		<u> 42</u> ,/, , , , , , , , , , , , , , , , , ,	2.6	
I.0       1.0       Pate S.C.       Kendari S.C.         Pare Pare S.C. Area       193.1x402-77.2       188.3x402-75.3       Pare Pare S.C. Area         Jakarta T.C.       56.1x402-72.4       66.5x402-26.6       Jakarta T.C.         Surabaya T.C.       47.8x402-19.1       24.2x402-9.7       Banjarmasin T.C.         Medan T.C.       26.8x402-10.7       24.2x402-9.7       Banjarmasin T.C.         Pare Fare S.C.       10.5x402-4.2       0.9x402-12.4       Palembang T.C.         Pare Fare S.C.       10.5x402-4.2       0.9x402-12.4       Palembang T.C.         Pare Fare S.C.       10.5x402-4.2       0.9x402-12.4       Palembang T.C.         Pare Fare S.C.       68.8x402-27.5       7.0x802-62.3       Ambon T.C.         Palu S.C.       30.4x802-27.5       71.5x802-62.1       9.1x402-23.6         Wanado S.C.       77.5x802-62.1       9.1x402-23.6       Palu S.C.         W.Pandang T.C. Area       26.5       26.5       W.Pandang T.C. Area		2.8/		
Pare Pare S.C. Area       193.1x402-77.2       188.3x40x=75.3         Jakarta T.C.       56.1x402=22.4       66.5x402=26.6       Jakarta T.C.         Surabaya T.C.       47.8x402=19.1       13.3x402=85.2       Jakarta T.C.         Medan T.C.       26.8x402=10.7       24.2x402=9.7       Banjarmasin T.C.         Pare Pare S.C.       10.5x402=4.2       0.9x402=12.4       Palembang T.C.         Abbon T.C.       10.5x402=4.2       U.Pandang       R.2x402=3.3       Palembang T.C.         Pare Pare S.C.       68.8x402=27.5       T.C.       48.6x1002=48.6       Pare Pare S.C.         Manado S.C.       77.9x802=62.3       J.0.4x802=24.3       J.0.4x802=24.3       J.0.4x802=24.3       J.akarta T.C.		1_1.0		
193.1x402-77.2       188.3x402-75.3         Jakarta T.C.       56.1x402-22.4         Surabaya T.C.       56.1x402-19.1         Banjarmasin T.C.       26.8x402-19.1         Medan T.C.       26.8x402-10.7         Pate Pate S.C.       21.3x402-85.2         Banjarmasin T.C.       20.6x602-8.2         Pate Pate S.C.       Medan T.C.         Pate Pate S.C.       47.8x402-19.1         Medan T.C.       24.2x402-9.7         Banjarmasin T.C.       10.5x402-4.2         Ambon T.C.       10.5x402-4.2         Ambon T.C.       48.6x1002-48.6         Pare Pate S.C.       68.8x002-97.5         Manado S.C.       77.9x802-62.3         Palu S.C.       30.4x802-24.3         U.Pandang T.C. Area       26.5			8.6	
Jakarta 1.C.       56.1x40Z=22.4       56.5x40Z=26.6       Jakarta T.C.         Surabaya T.C.       47.8x40Z=19.1       21.3x40Z=85.2       Surabaya T.C.         Banjarmasin T.C.       26.8x40Z=10.7       24.2x40Z=9.7       Banjarmasin T.C.         Medan T.C.       10.5x40Z=4.2       U.Pandang       8.2x40Z=9.7       Medan T.C.         Palembang T.C.       10.5x40Z=4.2       U.Pandang       8.2x40Z=3.3       Palembang T.C.         Ambon T.C.       10.5x40Z=4.2       U.Pandang       7.C.       Ambon T.C.         Pare Fare S.C.       68.8x40Z=27.5       7.C.       48.6x100Z=48.6       Fare Pare S.C.         Manado S.C.       77.9x80Z=62.3       71.6x80Z=62.1       71.6x80Z=62.1       Palu S.C.         W.Pandang T.C. Area       26.5       26.5       U.Pandang T.C. Area		1 193.1x40Z=77.2		
Surabaya 1.C.       47.8x402=19.1       Surabaya 1.C.       21.3x402=85.2       Surabaya 1.C.         Banjarmasin T.C.       26.8x402=10.7       24.2x402=9.7       Banjarmasin T.C.         Medan T.C.       20.6x402=4.2       U.Pandang       30.9x402=12.4       Palembang T.C.         Ambon T.C.       10.5x402=4.2       U.Pandang       8.2x402=3.3       Ambon T.C.         Pare Fare S.C.       68.8x402=27.5       7.       48.6x1002=48.6       Pare Fare S.C.         Manado S.C.       77.9x802=62.3       71.6x802=62.1       Palu S.C.       10.4x802=24.3         W.Pandang T.C. Area       26.5       26.5       9.1x402=24.6       W.Pandang T.C. Area				
Banjarmasin T.C.       26.8x40Z-10.7       Banjarmasin T.C.         Medan T.C.       20.6x40Z-8.2       U.Pandang         Palembang T.C.       10.5x40Z-4.2       U.Pandang         Ambon T.C.       47.4x100Z-47.4       T.C.         Pare Fare S.C.       68.8x40Z-27.5       48.6x100Z-48.6         Palu S.C.       77.9x80Z-62.3       77.6x80Z-24.8         Wendari S.C.       30.4x80Z-24.3       26.5	Surabaya T.C.		/	
Medan T.C.       20.6x607= 8.2       Medan T.C.         Palembang T.C.       10.5x407= 4.2       U.Pandang       30.9x407=12.4       Palembang T.C.         Ambon T.C.       10.5x407= 4.2       U.Pandang       8.2x407= 3.3       Ambon T.C.         Pare Fare S.C.       68.8x407=27.5       7.6x807=62.3       Ambon T.C.         Palu S.C.       77.9x807=62.3       31.0x807=24.8       Manado S.C.         V.Pandang T.C. Area       26.5       0.9x407=24.8       W.Pandang T.C. Area	Banjermasin T.C.			VA-03.2
Palembang T.C.       10.5x402* 4.2       U.Pandang       33.9x403*12.4       Palembang T.C.         Ambon T.C.       47.4x1002*47.4       T.C.       8.2x402* 3.3       Ambon T.C.         Pare Fare S.C.       68.8x402*27.5       9.1x402*23.6       Pare Fare S.C.       Pare Fare S.C.         Manado S.C.       77.9x803*62.3       71.6x802*62.1       Palu S.C.       Palu S.C.         Yandang T.C. Area       26.5       26.5       U.Pandang T.C. Area	Medan T.C.			Vadan T.C
Ambon T.C.       47.4x1002-47.4       T.C.       48.6x1002-48.6       Ambon T.C.         Pare Fare S.C.       68.8x402=27.5       59.1x402=23.6       Pare Fare S.C.         Manado S.C.       77.9x802=62.3       77.6x802=62.1       Palu S.C.         Palu S.C.       30.4x802=24.3       31.0x802=24.6       Kendari S.C.         U.Pandang T.C. Area       26.5       0.25.5       0.25.5	Palembang T.C.			Dalashan Balashan Ba
Pare Pare S.C.       68.8x402=27.5       91.01002=43.6       Pare Pare S.C.         Manado S.C.       77.9x802=62.3       91.x402=23.6       Manado S.C.         Palu S.C.       30.4x802=24.3       91.0x802=24.6       Manado S.C.         U.Pandang T.C. Area       26.5       92.5       91.0x802=24.6	Ambon T.C.			Ambon T.C
Manado S.C.         32.1%402#23.6         Manado S.C.           Palu S.C.         77.9x80%=62.3         77.6x80%=62.1         Palu S.C.           30.4x80%=24.3         31.0x80%=24.6         Palu S.C.           U.Pandang T.C. Area         26.5         U.Pandang T.C. Area	Pare Fare S.C.			Pare Pare S.C.
Paiu S.C.         Paiu S.C.           30.4x80Z=24.3         32.0x80Z=24.6           V.Pandang T.C. Area         25.5	Manado S.C.		A N	02#23.6
Kendari S.C. U.Pandang T.C. Area U.Pandang T.C. Area	Palu S.C.			VA-02.1
U.Pandang T.C. Area U.Pandang T.C. Area	Kendari S.C.		1 31.0x8	
Utranualing i.c. Area	U.Pandang T.C. Area	F	-26.5	
		igure AN-7 (2/6) SLDD Traffi		

Figure AR-7 (2/6)

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SLDD Traffic Distribution between Secondary/Tertiory Centers via Terrestrial Link ( Case 1 in 1999 )

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Jakarta T.C.	<u>}</u> <u>22.9</u> }		22.3 	- Jakarta T.C.
Surabaya T.C.			/	- Surabaya T.C.
Banjarmasin T.C.	7	*	//_2.1	- Banjarmasin T.C.
Medan T.C.	7-2.5	N		+ Medan T.C.
Palembang T.C.	2.0		2.9	Palembang T.C.
Ambon T.C.	1.0	Kendari		Ambon T.C.
U.Pandang T.C.	3.2 41.7x80x-33.4	S.C.	2.0 > 40.9×802=32.8	- U.Pandang T.C.
Pare Pare S.C.	1	3	L. <u>1-</u> 3	Pare Pare S.C.
Manado S.C.	بر مد	·	<u> ~````</u>	Manado S.C.
Palu S.C.	1/	$i \in I \setminus I$	<u>_0.5</u>	Palu S.C.
Kendari S.C. Area	~  			Kendari S.C. Area
		e	60.6x40x=24.2 24.2-6.1=18.1	
Jakarta T.C.	13.8 5.8	0	16.4 6.1	Jakarca T.C.
Surabaya T.C.	_+- <u>-,-</u> ,-}/		//	Surabaya T.C.
Banjarmasin T.C.	+~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	X	// - 5.6	-Banjarmasin T.C.
Medan T.C.		3	7/	- Medan T.C.
Palembang T.C.			K	- Palembang T.C.
Ambon T.C.	]2.8-{	Palu S.C.		Ambon T.C.
U.Pandang T.C.	7.6 \$54.5x802=43.6	7	5.2 56.8x802=45	U.Pandang T.C.
Pare Pare S.C.	1-334	2	<u></u>	Pare Fore S.C.
Munado S.C.	⁻ //	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Manado S.C.
Kendari S.C.	°µ∕	$\langle X \rangle$	<u>`_0.</u>	Kendari S.C.
Palu S.C. Area	7		~ _ ~ _ ~ _ ~ _ ~ _ ~ _ ~ _ ~ _ ~ _ ~ _	Palu S.C. Area
······	ם 113.4x40z=45.4 45.4-8.2=37,	n 1	11.4x40X=44.6 44.6-7.8=36.8	
Jakarta T.C.	25.4 8.2		30.1 7.8	▶ Jakarta T.C.
Surabaya T.C.			//	Surabaya T.C.
Banjarmasin T.C.		×	10.3	Banjarmasin T.C.
Medan T.C.				Medan T.C.
Palembang T.C.	·	Manado		► Falembang T.C.
Ambon T.C.		s.c.	F	Ambon T.C.
U.Pondang T.C.		3	10.2 100.8x402=40.	U.Pandang T C.
Pare Pare S.C.	رَ∕ → → → → → → <u>→ +</u> → - ¹			Pare Pare S.C.
Palu S.C.		$\overline{\Lambda}$	~~~	Palu S.C.
Kendarí S.C.	<u>↓-º.8</u>	įΛ	<u>_1.4</u>	Kendari S.C.
Manado S.C. Area		22.8	~ ~ ~ <b>~ ~ ~</b> ~ ~ ~ ~ ~ ~ ~ ~ ~	Mandado S.C. Area
	- 		55.0-8.7=46.3	
Jakarta T.C.	12.5 9.0)		14.8 8.7	Jakarta T.C.
Surabaya T.C.	╱╭╭╴╴╴╴╴╎╴┥╴┈╴╴╮╲		//	Surabaya T.C.
Banjarmasin T.C.	]-4-2-]- {	<u> </u>	<u></u>	Banjarmasin T.C.
Medan T.C.		N	V - 5.4	Medan T.C.
Palembang T.C.		8	E	Palembang T.C.
Ambon T.C.	*****	Eare Pare	2.0	Ambon T.C.
U.Pandang T.C.		s.c.	17.2 69.1x1002-69.	U.Pandang T.C.
Manado S.C.	] <u>7-1</u>	1	N-3.9	Manado S.C.
Palu S.C.	F	1	·/~==	Palu S.C.
Kendari S.C.	] ¹ ·4	/	<u>1.3</u>	Kendari S.C.
Pare Pare S.C. Area	}			Pare Pare S.C. Area
	229.8x40z=91.9		226.2x40%~90.5	
Jakarta T.C.	81.3x40x-32.5		96.3x407-38.5	Jakarta T.C.
Surabaya T.C.	27.7x40x-11.1		33.2x40Z=13.3	Surabaya T.C.
Banjarmasin T.C.	38.7×402=15.5	·	35.2x402=14.1	Banjarmasin T.C.
Medan T.C.	32.2x40z-12.9	9	48.2x407=19.3	Medan T.C.
Palembang T.C.	16.2x40x= 6.5	U.Pandang	12.9x402- 5.2	Palembang T.C.
Ambon T.C.	69.1x100Z-69.1	T.C.	70.3x1002-70.3	Aubon T.C.
Pare Pare S.C.				Pare Pare S.C.
Manado S.C.	100.8x40x-40.3	a	86.6x40Z-34.6	Manado S.C.
Palu S.C.	<u>56.8x80x=45.4</u> 40.9x80x=32.8	<u></u>	54.5x80Z=43.6	Palu S.C.
Kendari S.C.		$-/\lambda$	41.7x807-33.4	Kendari S.C.
U.Pandang T.C. Area	}			U.Pandang T.C. Area
	-			ind the area

Figure AN-7 (3/6) SLDD Traffic

SLDD Traffic Distribution between Secondary/Tertiary Centers via Terrestrial Link ( Case 1 in 2005 )

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Jakarta T.C.	┠ᅳ╩ᅆ┝╴╴╴╴╴┑		<u></u> ]	Jakarta T.C.
Surabaya T.C.			2.8	
Banjarmasin T.C.	] <u>-</u> •• 、`\`,	•	// 22	- Banjarmasin T.
Medan T.C.	]==	8		Medan T.C.
Palembang T.C.	<u>?</u>	Kendari	<u>-</u> <u>1:</u> ³ <u>-</u>	+ Palembang T.C.
Ambon T.C.		4		Ambon T.C.
U.Pandang T.C.	1.8 > 20.1x63%=12.7	S.C.	1.0 > 19.4x63%=12.2	U.Pandang T.C.
Pare Pare S.C.	] <u>0-</u> 5-	2	0.6	Pare Pare S.C.
Manado S.C.	]//	<u> </u>	┛╲╲-⁰-⁴┿╾╾╴╴╴╴╴	Manado S.C.
Palu S.C.	] <u>0.3</u> /	/ \	<u></u>	- Palu S C.
Kendari S.C. Area	}	/2.2_		🗕 Kendari S.C. Area
Jakarta T.C.	᠆᠆ᢃ᠍᠊᠂ᢃ᠘᠆᠆᠆᠆᠆᠆᠆᠆		33.5]	
Surabaya T.C.			9.1	Jakarta T.C.
Banjarmasin T.C.	2_4		2.9	Surabaya T.C.
Medan T.C.	3.6	·	-1/- 3.3	<ul> <li>Banjarmasin T.C.</li> <li>Medan T.C.</li> </ul>
Palembang T.C.		2	4.2	
Ambon T.C.	1.4	Palu S.C.	1.1	Palembang T.C.
V.Pandang T.C.	4.8 60.6x52%=31.5		3.1 60.9x522=31.7	Ambon T.C.
Pare Pare S.C.		1	2.0	U.Pandang T.C.
Manado S.C.	1.9	A		Pare Pare S.C.
Kendari S.C.	L_0.3L/	$\sim 10^{-1}$	0.3	Manado S.C.
Palu S.C. Area				Kendari S.C.
······································	ש ק 49.4	0.0	48.3	Palu S.C. Area
Jakarta T.C.			/	Jakarta T.C.
Surabaya T.C.			/	Surabaya T.C.
Banjarmasin T.C.	5.3	L	4.2	<ul> <li>Banjarmasin T.C.</li> </ul>
Medan T.C.	4.0	<b>}</b> .	<u>4.7</u> 6.1	- Medan T.C.
Palembang T.C.		Manado	1.6	<ul> <li>Palembang T.C.</li> </ul>
Ambon T.C.	4,8 83.2x202=16.6	s.c.		Ambon T.C.
U.Pandang T.C.	1.4	1		U.Pandang T.C.
Pare Pare S.C.	1.3	<u> </u>		Pare Pare S.C.
Palu S.C.		$\wedge$		Palu S.C.
Kendarí S.C.		- $($ $)$	~	Kendari S.C.
Manado S.C. Area	F=================	· 9.8 \ ·		Mandado S.C. Area
Jakarta T.C.	$-\frac{24.7}{1}$		_ <u>24.1</u> ]	Jakarta T.C.
Surabaya T.C.			6.5	Surabaya T.C.
Banjarmasin T.C.			2.1	
Medan T.C.		·····	V/	Banjarmasin T.C.
Palembang T.C.	<u>2.0</u>		F	Medan T.C. Palembang T.C.
Ambon T.C.	<u>1.0</u>	Pare Pare		Ambon T.C.
U.Pandang T.C.	9,2 52.0x100z=52.0	s.c.	7.6 49.9x100Z=49.9	U.Pandang T.C.
Manado S.C.	2.7			Manado S.C.
Palu S.C.	┝╶ <u>╩╙</u> ┥╾╼╺╌╼╴┵╱╴	<u></u>	ゴンショットーーーー	Palu S.C.
Kendari S.C.	<u>e.e.</u>	/ \	<u>0.5</u>	Kendari S.C.
Pare Pare S.C. Area				Pare Pare S.C. Area
Jakarta T.C.	163.1x202=32.6		159.4x20 <b>2=31</b> .9	
Surabaya T.C.	36.4x202= 7.3		43.0x202= 8.6	Jakarta T.C.
Banjarmasin T.C.	11.4x407= 4.6		13.8x40%= 5.5	Surabaya T.C
Medan T.C.	17.4x20%= 3.5	·	15.6x20%= 3.1	Banjarmasin T.C.
Palembang T.C.	13.4×20%= 2.7		19.9x20Z= 4.0	Medan T.C.
Ambon T.C.	6.7x20%~ 1.3	U.Pandang	5.4x20Z= 1.1	Palembang T.C.
Pare Pare S.C.	49.9x100%=49.9	T.C.	52.0x1002=52.0	Ambon T.C.
	87.7x202-17.5		83.2×202=16.6	Pare Pare S.C.
Manado S.C.	60.9x522-31.7		60.6x522=31.5	Manado S.C.
Palu S.C.	19.4x63%=12.2	i	20.1x637-12.7	Palu S.C.
Kendari S.C.				Kendari S.C.
U.Pandang T.C. Area		20.5		U.Fandang T.C. Area

Figure AN-7 (4/6)

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SLDD Traffic Distribution between Secondary/Tertiary Centers via Terrestrial Link ( Case 2 in 1994 )

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Jakarta T.C.	$-\frac{1}{4.0}$ $+$ $         -$		<u></u>	Jakarta T.C.
Surabaya T.C.	b====+==,		/	
Banjarmasin T.C.	<u>}```</u>	4	11-1-5	Banjarmasin T.C.
Medan T.C.				Medan T.C.
Palembang T.C.		Kendari	2.2	Palembang T.C.
Ambon T.C.		-	0.6	Ambon T.C.
U.Pandang T.C.	2.4 > 31.8x63Z=20.0	S.C.	1.5 > 31.6x63Z-19.9	U.Pandang T.C.
Pare Pare S.C.			N-194	Pare Pare S.C.
Manado S.C.	╊╺╩╩╆╼╼╼╼╼╱╱	Λ		Manado S.C.
Palu S.C.	<u>↓0.5</u>	/ \	0.4	Palu S.C.
Kendari S.C. Area	1	<i>i</i> 3.5`_		Kendari S.C. Area
	- 		42.27	
Jakarta T.C.	9.6		/ 11.4	Jakarta T.C.
Surahaya T.C.	3.0		3.5	Surabaya T.C.
Banjarmasin T.C.		<u> </u>	-///	Banjarmasin T.C.
Hedan T.C.	3.5	8		- Medan T.C.
Palembang T.C.		3	£	Palembang T.C.
Ambon T.C.		Palu S.C.	1.4 3.5 76.5x52x-39.8	Ambon T.C.
U.Pandang T.C.				U.Pandang T.C.
Pare Pare S.C.	]2 <u>.3</u> /	A		- Pare Pare S.C.
Manado S.C.	] ² · ¹ //	$\sim 10^{-1}$	╴╲╲━┵╩┽ ┈┈┈ ╌	Manado S.C.
Kendari S.C.	]	/ N	<u>\0.5</u>	Kendari S.C.
Palu S.C. Area	] <b>-</b>	8.5		Palu S.C. Area
	<u> </u>		76.0 -	
Jakarta T.C.	17.3		/ 20.5	Jakarta T.C.
Surabaya T.C.			// 6.3	Surabaya T.C.
Banjarmasin T.C.	8.2		7.5	Banjormasin T.C.
Medan T.C.	6.3		9.6	Medan T.C.
Palembang T.C.	3.2	Manado	2.6	Palembang T.C.
Ambon T.C.	6.5 > 129.8x20%=26.0	] s.c.	6.8 } 137.9x202-27.	
U.Pandang T.C.	2.7	1	4.8	U.Pandang T.C.
Pare Pare S.C.		<u>المعامة المعامة المعام</u>	2.7	Pare Pare S.C.
Palu S.C.	0.6	$\wedge$	1.1	Palu S.C.
Kendari S.C.		1.5		Kendari S.C.
Manado S.C. Area	J+			Mandado S.C. Area
Jakarta T.C.	39.6-7.6-32.0		38.7-7.6-31.1	Jakarta T.C.
Surabaya T.C.	18.8 ] 7.6		10.47.6	Surabaya T.C.
Banjarmasin T.C.			// <u>3.3</u>	
Hedan T.C.	4.2	<b>\</b>	1/3.2	Banjarmasin T.C.
Palembang T.C.	1	1	4.9	Medan T.C.
Ambon T.C.	<u> </u>	Pare Pare	<u> 1.3</u>  _	Palembang T.C.
U.Pandang T.C.	12.8 49.7×1002-49.7	5.C.	11.9 49.3x100z=49	.3 U.Pandang T.C.
Manado S.C.	<u>4.8</u>			Hanado S.C.
Palu S.C.	//,*	n	¹ <u>2.3</u>	
Kendari S.C.	<u> </u> <u>}</u>	-	<u>\1.0</u>	Palu S.C.
Pare Pare S.C. Area	1	'e.e'		Kendari S.C. Pare Pare S.C. Area
	• •		188.4x20Z=37.7	rate rate S.L. Area
Jakarta T.C.	<u>192.2x203-38.4</u>		59.2x202=11.8	Jakarta T.C.
Surabaya T.C.	<u>50.1x20x-10.0</u>		//	Surabaya T.C.
Banjarmasin T.C.	15.8x40X= 6.3		18.4x40Z= 7.4	Banjarmasin T.C.
Medan T.C.	23.8x20X= 4.8		21.6x20X= 4.3	Hedan T.C.
Palembang T.C.	$\frac{18.3 \times 207 = 3.7}{9.3 \times 207 = 1.9}$	U.Pandang	27.6x20%= 5.5	Palembang T.C.
Ambon T.C.	9.3x202= 1.9	T.C.	7.3x20Z= 1.5	Ambon T.C.
Pare Pare S.C.	49.3x1002-49.3	1.0.	49.7x1002=49.7	Pare Pare S.C.
Manado S.C.	137.9x20%=27.6		129.8x20%-26.0	Manado S.C.
Palu S.C.	76.5x527=39.8		76.2x52%=39.6	Palu S.C.
Kendari S.C.	<u>31.6x637-19.9</u>	/	31.8x632=20.0	Kendari S.C.
U.Pandang T.C. Area	<b>/</b>			- U.Pandang T.C. Area

Figure AN-7 (5/6) SLDD Traffic Distribution between Secondary/Tertiary Centers via Terrestrial Link ( Case 2 in 1999 )

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Jakarta T.C. Surabaya T.C. Banjarmasin T.C. Hedan T.C. Palembang T.C. Ambon T.C. U.Pandang T.C. Pare Pare S.C. Manado S.C. Palu S.C. Kendari S.C. Area	<u>23.8</u> <u>5.3</u> <u>1.8</u> <u>2.6</u> <u>2.1</u> <u>1.1</u> <u>3.3</u> 43.5x63 <b>x</b> -27.4 <u>1.4</u>	Kendari	23.2 5.3 2.2 2.3 2.3	Jakarta T.C. Surabaya T.C. Banjarmasin T.C.
Surabaya T.C.         Banjarmasin T.C.         Hedan T.C.         Palembang T.C.         Ambon T.C.         U.Pandang T.C.         Pare Pare S.C.         Manado S.C.         Palu S.C.	1.8 2.6 2.1 1.1 3.3 43.5x632=27.4	Kendari	2.2	Banjarmasin T.C.
Banjarmasin T.C.         Hedan T.C.         Palembang T.C.         Ambon T.C.         U.Pandang T.C.         Pare Pare S.C.         Manado S.C.         Palu S.C.	2.6 2.1 1.1 3.3 43.5x632=27.4	Kendari		
Hedan T.C.         Palembang T.C.         Ambon T.C.         U.Pandang T.C.         Pare Pare S.C.         Manado S.C.         Palu S.C.	2.1 1.1 3.3 43.5x632-27.4	Kendari		
Palembang T.C.          Ambon T.C.          U.Pandang T.C.          Pare Pare S.C.          Manado S.C.          Palu S.C.	1.1 3.3 43.5x63x-27.4	Kendari		Medan T.C.
Ambon T.C.     -       U.Pandang T.C.     -       Pare Pare S.C.     -       Manado S.C.     -       Palu S.C.     -	3.3 43.5x63Z=27.4	Kendar 1	3.2	Palembang T.C.
U.Pandang T.C. Pare Pare S.C. Manado S.C. Palu S.C.	<u> </u>		0.9	Ambon T.C.
Pare Pare S.C. Manado S.C. Palu S.C.	1.4	s.c.	2.0 42.9x63%=27.0	U.Pandang T.C.
Manado S.C. Palu S.C.			1.4	Pare Pare S.C.
Palu S.C.	1.5//	Δ	⁻	Manado S.C.
	0.6]	$/\chi$	<u>`</u>	Palu S.C.
		- J _{4,8} \		Kendari S.C. Area
	60.1			Jakarta T.C.
Jakarta T.C.	13.5		/ 16.0	Surabaya T.C.
Surabaya T.C.	4.6		5.5	Banjarmasin T.C.
Banjarmasin T.C.	6.4		- 5.B	Hedan T.C.
Medan T.C.	5.3		8.0	
Palembang T.C.	2.7		2.1	Palembang T.C.
Ambon T.C.	7.4 107.7x52%-56.0	Palu S.C.	5.0 > 108.5x522=56.4	Ambon T.C.
U.Pandang T.C.	3.3		3.9	U.Pandang T.C.
Pare Pare S.C.	3.9		2.5	Pare Pare S.C.
Manado S.C.		Ä		Manado S.C.
Kendari 5.C.		<i>i</i> .		Kendari S.C.
Palu S.C. Area				Palu S.C. Area
Jakarta T.C.	<del>112.2</del> }		<u></u>	Jakarta T.C.
Surabaya T.C.			/	Surabaya T.C.
Banjarmasin T.C.			//10.3	Banjarmasin T.C.
Medan T.C.		,		Medan T.C.
Palembang T.C.		••	15.0	Palembang T.C.
Ambon T.C.	5_1	Manado	<u> </u>	Ambon T.C.
U.Pandang T.C.	9.8 191.1x20X-38.2	S.C.	10.1 > 203.9x202-40.8	_U.Pandang T.C.
Pare Pare S.C.	4.0		7.2	Pare Pare S.C.
Palu S.C.	2.5	<u> </u>		Palu S.C.
Kendari S.C.		$\sim 10$	` <u>1.5</u> ]	Kendari S.C.
Manado S.C. Area		22. )	· •	Mandado S.C. Area
Hallaud S.C. Alea		22.1	cc 7 9 9-67 0	Handado 5.0. Atea
Jakarta T.C.	57.6-8.9=48.7		56.7-8.8-47.9	Jakarta T.C.
Surabaya T.C			- 15.2 8.8	Surabaya T.C.
Banjarmasin T.C			//	Banjarmasin T.C.
Medan T.C.				Medan T.C.
Palembang T.C.		<b>n</b>		Palembang T.C.
Ambon T.C.	· ^{2.6} + <b>2</b>	Pare Pare		Ambon T.C.
U.Pandang T.C.	<u>19.0 71.1x1007-71.1</u>	S.C.	17.7 70.9x1002-70.9	U.Pandang T.C.
Hanado S.C.				Manado S.C.
Palu S.C.		A	$-\frac{3.3}{1.4}$	Palu S.C.
Kendari S.C.	<u>1.4</u>	/	`*	Kendari S.C.
Pare Pare S.C. Area	·			Pare Pare S.C. Area
Jakarta T.C.	274.8x202-55.0		270.2x203-54.0	Jakarta T.C.
Surabaya T.C.	71.9x20Z=14.4		85.7×207-17.1	Surabaya T.C.
Banjarmasin T.C.	24.6x40Z= 9.8		29.6x40Z=11.8	Banjarmasin T.C.
Medan T.C.	34.4x202= 6.9		31.2x20Z= 6.2	Medan T.C.
Palembang T.C.	28.7x20%= 5.7	11 Day 1	42.8×207= 8.6	Palembang T.C.
Ambon T.C.	14.5x20%= 2.9	U.Pandang	11.5×202- 2.3	Ambon T.C.
Pare Pare S.C.	70.9x1002=70.9	<b>T.C.</b>	71.1x1002=71.1	Pare Pare S.C.
Manado S.C.	203.9x207-40.8		191.1x207=38.2	Manado S.C.
Palu S.C.	108.5x52%-56.4	<u> </u>	107.7x522-56.0	Palu S.C.
Kendari S.C.	42.9x63X=27.0	$/\Lambda$	43.5x632=27.4	Kendari S.C.
		/ 1	-	U.Pandang T.C. Area

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Figure AN-7 (6/6) SLDD Traffic Distribution between Secondary/Terriary Centers via Terrestrial Link ( Case 2 in 2005 )

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