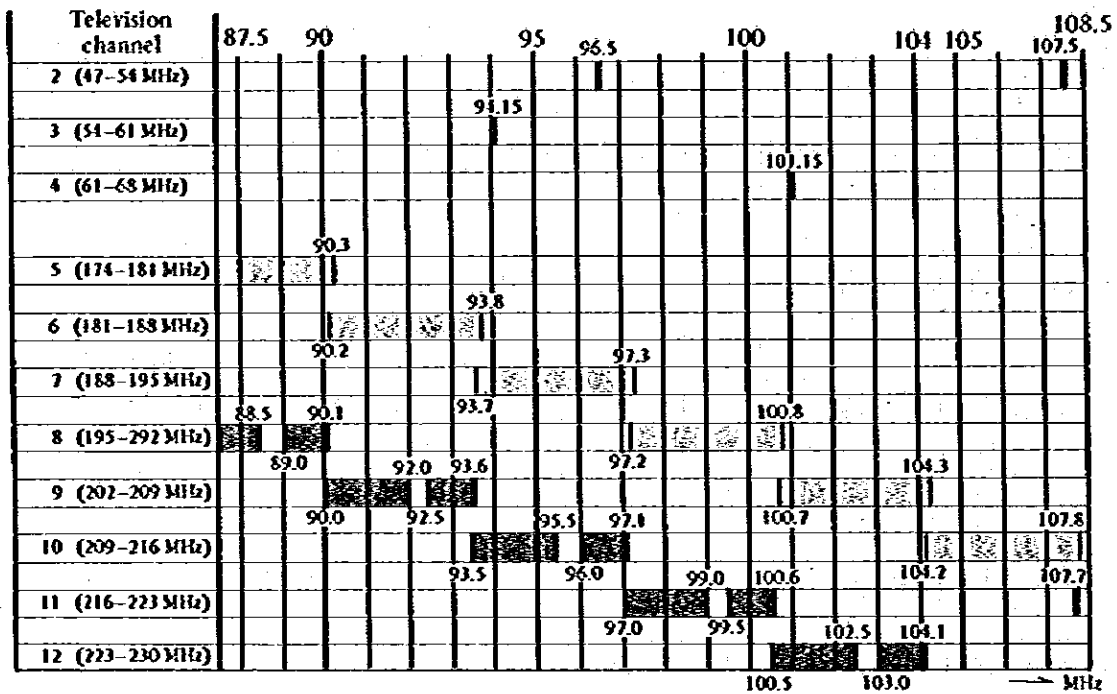


"A Consideration of local interference problems in VHF/FM broadcasting"

By K. N. Stokke

EBU REVIEW - TECHNICAL, 1981 DECEMBER



- || Second harmonics of channel-2 sound and vision carriers interfering with Band II
- || Local oscillator of television receiver tuned to channels 3 or 4 interfering with Band II
- ▨ Second harmonic of VHF/FM carrier interfering with Band III
- Second harmonic of VHF/FM local oscillator interfering with Band III

Fig. 3 Diagram showing potential sources of interference between VHF/FM transmissions and television transmission in Bands I and III (system B).

チャンネルプラン策定用受信機の規格

日本におけるチャンネルプラン策定のために使用する受信機の規格，およびFM放送の特質を考慮した参考性能をそれぞれ表C-4-1，C-4-2に示す。

表C-4-1 受信機の規格

項 目	規 格
(1) 中 間 周 波 数	10.7 MHz
(2) 中 間 周 波 妨 害 比	50 dB以上
(3) 局 部 発 振 周 波 数	(-)側
(4) 局 部 発 振 周 波 数 の 漂 動	10 kHz 以内
(5) 最 大 感 度	出力50 mWをうるための感度 20 $\mu$ V以下
(6) 感 度 差	3 dB以内
(7) イ メ ー ジ 妨 害 比	30 dB以上
(8) 選 択 度	$\pm 200$ kHz : -14 dB $\pm 400$ kHz : -34 dB
(9) 信号対雑音比を規定したときの所要最小入力	信号対雑音比 30 dB : 30 $\mu$ V以下 45 dB : 100 $\mu$ V以下
(10) 左 右 分 離 度	100 Hz ~ 10 kHz にわたり 20 dB以上

(電技審36年度答申，10は38年度答申)

表C-4-2 受信機の参考性能

項 目	規 格
(1) 中間周波数帯域幅	参考値として200 kHz
(2) 高調波入力インピーダンス	300Ω平衡形(中間タップを付けて不平衡形となしうること)
(3) 不要放射	暫定値として50μV/m以下, 距離30m
(4) A M 抑 圧 度	入力レベル1mVで30 dB以上
(5) デエンファシス特性	50μS
(6) 電 気 的 忠 実 度	デエンファシス曲線からの偏差は50 Hz ~ 15 kHzの範囲で±2 dB以内
(7) ひ ず み 率	400 Hz, 100%変調の信号1mVの場合, 50mW出力での高調波含有率2%以下
(8) 最 大 出 力	高調波含有率10%で2W以上
(9) 残 留 ハ ム	400 Hz, 30%変調の信号入力1mVで50mW出力に対するハムレベル-30 dB以下
01 雑 音 指 数	推奨値として8~9 dB
02 ステレオチャンネルの電 気的忠実度	デエンファシス曲線からの偏差は50 Hz ~ 15 kHzの範囲で±2 dB以内
03 左 右 レ ベ ル 差	左右チャンネルのデエンファシス特性間のレベル差は100 Hz ~ 10 kHz で1.5 dB以内
04 ステレオチャンネルのひ ずみ率	400 Hz 45%変調の信号1mVの場合, 50mW出力で高調波含有率 2%以下
05 混 交 調	400 Hz ~ 10 kHz の範囲で-30 dB以下

(電技審36年度答申, 01~04は38年度答申)

附属資料D

F M放送波帯における潜在電界強度測定データ一覽表

$$\text{Field Strength; dB } (\mu\text{V/m}) = \text{dBo} - 20\log\frac{\lambda}{r} + 3$$

I. Sabah

Station	Observed at:	Frequency	Polarization plane	Azimuth degree	Observed value (dBo)	Remarks
LAYANG-LAYANG	Ranau	91.5	H	295	29.0	Lawa Mandau/Kudat
		93.5	H	310	81.0	Layang-Layang
		97.5	H	310	81.5	Layang-Layang
	Tambunan	88.5	H	28	37.0	Carrier
		91.5	H	340	23.0	Lawa Mandau/Kudat
		93.5	H	28	74.0	Layang-Layang
		97.5	H	28	75.0	Layang-Layang
	Keningau	88.5	H	20	30.0	Carrier
		91.5	H	0	16.0	Lawa Mandau/Kudat
		92.3	H	230	22.0	Brunei
		93.5	H	30	68.0	Layang-Layang
		95.9	H	230	20.0	Brunei
		97.5	H	30	68.0	Layang-Layang
		107.5	H	40	39.5	Carrier
	SIPITANG	Sipitang	88.5	H	50	11.0
92.3			H	250	55.0	Brunei
93.5			H	45	54.0	Layang-Layang
93.8			H	250	30.0	Brunei
95.9			H	250	52.0	Brunei
96.9			H	250	25.5	Brunei
97.5			H	45	48.0	Layang-Layang
Weston Hospital		92.3	H	240	37.0	Brunei
		93.5	H	50	32.0	Layang-Layang
		95.9	H	240	33.0	Brunei
		97.5	H	50	36.0	Layang-Layang
Beaufort		92.3	H	240	33.0	Brunei
		93.5	H	50	39.0	Layang-Layang
		97.5	H	50	45.0	Layang-Layang
LAYANG-LAYANG		Nabawan	93.5	H	10	48.0
	97.5		H	10	45.0	Layang-Layang

Station	Observed at:	Frequency	Polarization plane	Azimuth degree	Observed value (dBo)	Remarks	
KOTA KINABALU	Paper	88.5	H	45	41.0	Carrier	
		91.5	H	45	33.0	Lawa Mandau/Kudat	
		92.3	H	230	47.5	Brunei	
		92.9	H	45	30.0	Lawa Mandau/Kudat	
		93.5	H	60	71.0	Layang-Layang	
		93.8	H	230	46.0	Brunei	
		95.9	H	230	43.5	Brunei	
		96.9	H	230	42.0	Brunei	
		97.5	H	60	70.0	Layang-Layang	
	Kota Kinabalu	88.5	H	65	37.0	Carrier	
		91.5	H	55	43.0	Lawa Mandau/Kudat	
		92.3	H	230	42.0	Brunei	
		92.9	H	55	44.0	Lawa Mandau/Kudat	
		93.5	H	65	72.0	Layang-Layang	
		93.8	H	230	30.0	Brunei	
		94.7	H	25	31.0	K.K./Tuaran	
		95.9	H	230	45.5	Brunei	
		96.9	H	230	33.0	Brunei	
		97.5	H	65	70.5	Layang-Layang	
		100.2	H	25	23.0	K.K./Layang-Layang	
	103.7	H	25	26.0	K.K./Layang-Layang		
	Kota Belud-1	91.5	H	215	31.0	Lawa Mandau/Kudat	
		92.9	H	215	27.0	Lawa Mandau/Kudat	
		93.5	H	165	24.5	Layang-Layang	
		97.5	H	165	25.0	Layang-Layang	
	Kota Belud-2	93.5	H	165	27.0	Layang-Layang	
		97.5	H	165	26.0	Layang-Layang	
	SANDAKAN	Sandakan-1	93.5	H	280	49.0	Layang-Layang
			97.5	H	280	49.0	Layang-Layang
Sungai Manifa		93.5	H	275	54.0	Layang-Layang	
		97.5	H	275	53.0	Layang-Layang	
Bt. Garam		93.5	H	295	53.0	Layang-Layang	
		97.5	H	295	51.0	Layang-Layang	
Sandakan-2		93.5	H	280	44.5	Layang-Layang	
		97.5	H	280	45.0	Layang-Layang	
Beluran		93.5	H	280	61.0	Layang-Layang	
		97.5	H	280	61.0	Layang-Layang	
Telupid		93.5	H	310	46.0	Layang-Layang	
		97.5	H	310	41.0	Layang-Layang	

Division	Observed at:	Frequency	Polarization plane	Azimuth degree	Observed value (dBo)	Remarks
LAHAD DATU	Sungai Sabahan	93.5	H	310	23.0	Layang-Layang
		97.5	H	310	24.5	Layang-Layang
	Madai Cares	93.5	H	310	21.0	Layang-Layang
		97.5	H	310	21.0	Layang-Layang
	Tungku	93.0	H	260	28.0	Carrier
		93.5	H	290	15.0	Layang-Layang
		97.5	H	290	17.0	Layang-Layang
	Silibukan	93.5	H	290	27.0	Layang-Layang
		97.5	H	290	29.0	Layang-Layang
	Airport	93.5	H	300	31.0	Layang-Layang
97.5		H	300	32.0	Layang-Layang	
TAWAU	Kalabakan	93.5	H	330	27.0	Layang-Layang
		97.5	H	330	25.0	Layang-Layang
	Kunak	93.5	H	310	19.0	Layang-Layang
		97.5	H	310	17.0	Layang-Layang
	Merutai	93.5	H	320	24.0	Layang-Layang
		97.5	H	320	27.0	Layang-Layang
	Semporna	93.5	H	300	22.0	Layang-Layang
		97.5	H	300	22.0	Layang-Layang
	KPG Tanjung Batu	93.5	H	315	28.0	Layang-Layang
		97.5	H	315	28.0	Layang-Layang
Tawau Air port	93.5	H	320	38.0	Layang-Layang	
	97.5	H	320	37.0	Layang-Layang	

2. Sarawak

Division	Observed at:	Frequency	Polarization plane	Azimuth degree	Observed value (dB <sub>0</sub> )	Remarks
6th	Sarikei	88.0	V	200	65.0	-
3rd	Sibintek	87.8	H	240	14.0	Talk
		96.9	H	60	7.0	Brunei
4th	Bintulu	96.9	V	45	4.0	Brunei
		Niah	92.3	H	45	5.0
	93.8		H	60	15.0	Brunei
	95.5		V	315	7.5	Brunei (s)
	97.5		H	45	17.0	Layang-Layang
	Miri	89.5	V	270	2.0	Indian music
		92.3	H	45	12.0	Brunei
		93.5	H	45	19.0	Layang-Layang
		93.8	H	90	36.0	Brunei
		95.9	H	45	13.0	Brunei
		96.9	H	90	34.0	Brunei
		97.5	H	90	17.0	Layang-Layang
	Kuala Balam	89.5	V	90	7.0	English Music
		92.3	H	90	26.0	Brunei
		93.5	H	45	18.5	Layang-Layang
		93.8	H	45	39.0	Brunei
		95.9	H	45	22.5	Brunei
		96.9	H	45	41.0	Brunei
	Murdi	90.8	H	20	Minimal	Music
		92.3	H	45	31.0	Brunei
93.5		H	45	24.0	Layang-Layang	
93.8		H	40	43.0	Brunei	
95.9		H	45	30.0	Brunei	
96.9		H	20	42.0	Brunei	
97.5		H	45	21.0	Layang-Layang	
5th	Lawas	90.8	H	30	3.0	Music
		92.3	H	225	47.0	Brunei
		93.5	H	45	28.0	Layang-Layang
		93.8	H	0	23.0	Brunei
		95.9	H	270	45.0	Brunei
		96.9	H	255	25.0	Brunei
		97.5	H	90	24.0	Layang-Layang

Division	Observed at:	Frequency	Polarization plane	Azimuth degree	Observed value (dBo)	Remarks
5th	Buang Soil	90.5	H	45	21.0	Brunei (s)
		91.8	V	0	17.0	Brunei (s)
		92.3	H	135	74.9	Brunei
		92.9	V	315	12.0	Lawa Mandau/Kudat
		93.5	H	45	23.0	Layang-Layang
		93.8	H	150	43.0	Brunei
		94.0	V	0	24.0	Cinese
		94.4	V	0	4.0	Music
		95.2	V	0	6.0	Brunei (s)
		95.5	V	0	16.0	Brunei (s)
		95.9	H	135	73.0	Brunei
		96.9	H	215	36.5	Brunei
		97.5	H	225	24.5	Layang-Layang
	Kpg. Bakol	90.5	H	45	22.0	Brunei (s)
		91.8	H	0	13.0	Brunei (s)
		92.3	H	45	73.0	Brunei
		93.5	H	0	44.0	Layang-Layang
		93.8	H	315	40.0	Brunei
		93.9	H	315	19.0	Brunei (s)
		95.5	H	45	12.0	Brunei (s)
95.9		H	45	74.0	Brunei	
96.9	H	45	38.0	Brunei		
97.5	H	315	41.0	Layang-Layang		

Note: (s) Spurious emission



プラン A その他の使用可能 FM 周波数一覧

これらの周波数の実行においては、アンテナ結合器など機器設計に際し更に詳細な検討を要する。

局名	ch	ch7 (MHz)	ch8 (MHz)
KOTA KINABALU		100.9	101.7
KUDAT		89.5	107.7
SANDAKAN		102.1	
TAWAU		89.1	
LAHAD DATU		100.7	104.1
TAMBUNAN/KENINGAU (Layang-layang)			
SIPITANG		107.7	
RANAU			
PENSIANGAN			
TENOM			
NABAWAN			
KUCHING		98.1	99.9
BANDAR SRI AMAN		88.5	94.9
SIBU			
MIRI			
BINTULU		104.9	105.7
LIMBANG			
SARIKEI		103.3	
KAPIT		97.7	
SARATOK		104.9	
BAREO		97.7	
BELAGA		98.9	

既設無線局周波数リスト

1. サバ州

局名	KOTA KINABALU (Bt. Lawa Mandau)	KUDAT (Bt. Kelapa)	SANDAKAN (Mt. Trig)	TAWAU (Mt. Andasi)	LAHAD DATU (Mt. Silam)	TANBUNAN/ EKINGAU (Layang- Layang)	SIPITANG (Bt. Tampalagus)
受	100.2	70.075	75.55	75.6	75.525	100.2	75.6
信	103.7	91.5	75.775	75.825	75.750	103.7	75.825
周	153.25	92.9		154.775	155.350		76.225
波				157.3	155.500		
数				157.35	157.25		
(MHz)					157.3		

2. サラワク州

局名	KUCHING (Gn. Serapi)	BANDAR SRI AMAN (Bt. Temudok)	SIBU (Bt. Singalang)	MIRI (Bt. Lambur)	BINTULU (Bt. Nyatou)	LIMBANG (Bt. Mas)	SARIKEI (Bt. Kayu Mafan)	KAPIT (Kapit)
受	72.15	154.1		71.55	72.25	86.9	156.8	82.75
信	72.20	157.0		71.6	72.3	87.5	157.0	155.025
周	155.025	158.5		71.65	82.0	87.55	157.25	155.150
波	155.350			71.825	82.2	126.1	157.35	155.9
数	160.0			72.2	82.5	152.3		
	162.3			72.3	82.8	155.025		
	162.35			141.7	155.075	155.35		
	162.4			142.3	155.35	156.8		
	162.5			142.9	156.9	157.0		
(MHz)	166.0			162.0	157.0	157.25		
					157.1			
					157.25			
					157.35			
					162.4			
					162.5			
					165.9			

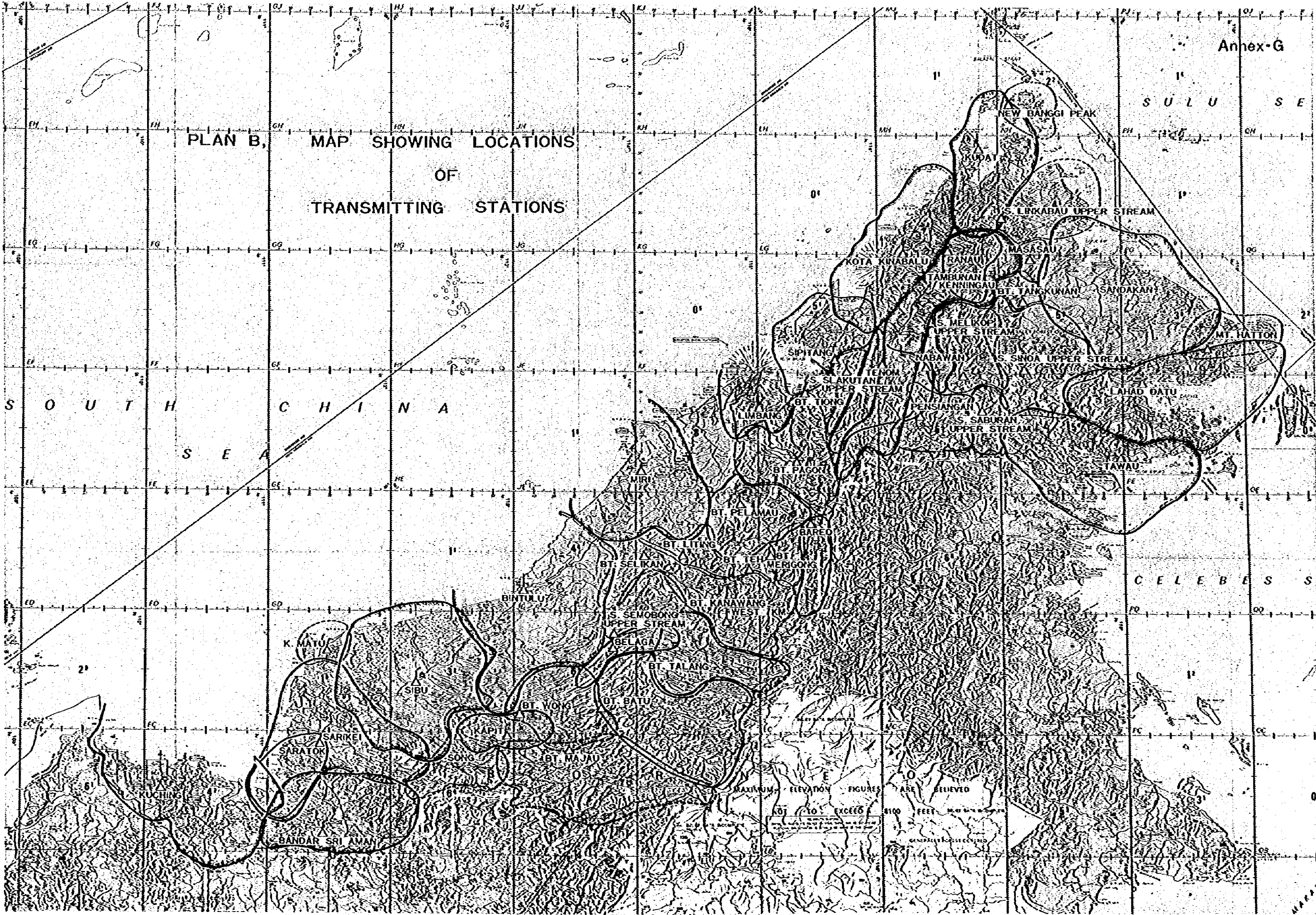
1. サバ州

局名	KOTA KINABALU (Bt. Lawa Mandau)	KUDAT (Bt. Kelapa)	SANDAKAN (Mt. Trig)		TAWAU (Mt. Andrassy)	LAHAD DATU (Mt. Sifam)	TAMBUNAN/ KENINGAU/ RANAU (Layang-Layang)	SIPITANG (Bt. Tampalagus)
	W	W	W	W	W	W	W	W
送信周波数 (MHz)	153.275(100)	82.600(60)	70.075(25)	159.975(10)	70.125(50)	70.050(50)	70.100(50)	82.600(60)
	153.375(100)	153.525(10)	72.775(25)	160.275(25)	82.600(60)	82.525(60)	82.575(60)	82.825(60)
	154.30(10)	153.775(10)	82.550(60)	160.700(25)	82.825(60)	82.750(60)	82.800(60)	160.425(25)
	160.275(25)	153.975(10)	82.775(60)	161.800(25)	160.550(25)	133.305(250)	125.100(50)	
		160.225(50)	84.025(10)	161.900(25)	161.900(60)	153.425(10)	126.100(250)	
			84.200(10)	162.225(10)	161.950(60)	160.7(25)	133.295(250)	
			84.475(10)	162.275(10)		161.850(60)	153.540(10)	
			148.325(10)	162.450(10)		161.9(60)	160.450(25)	
			148.525(10)	162.675(10)		171.0(20)	160.550(25)	
			148.825(10)	162.900(10)			161.800(50)	
			148.875(10)	163.125(10)			161.900(50)	
			148.925(10)	163.800(10)			164.400(140)	
			148.975(10)	164.025(10)			165.400(140)	
			155.375(10)	164.250(10)			165.900(20)	
			158.675(10)	165.025(10)			167.700(20)	
		159.225(10)	166.600(10)			169.200(20)		

2. サラワク州

局名	KUCHING (G. Serapi)	BANDAL SRIAMAN (Bt. Temudok)	SIBU (Bt. Singalang)	MIRI (Bt. Lambir)	BINTULU (Bt. Nyabau)	LIMBANG (Bt. Mas)	SARIKEI/ SARATOK (Bt. Kayu Malam)	KAPIT (Kapit)
	W	W	W	W	W	W	W	W
送信周波数 (MHz)	50.0	99.533(50)	86.4(10)	76.55(10)	77.45(100)	81.9(10)	156.80(40)	87.25(10)
	77.35(100)	99.616(50)	86.6(10)	76.6(10)	77.50	82.25(10)	161.60(40)	160.225(5)
	77.40(100)	161.6(50)	86.85(10)	76.65(10)	87.0(100)	82.55(10)	161.85(40)	160.350(5)
	121.5(51)	166.5(18)	87.05(10)	76.825(10)	87.2(100)	121.3(50)	161.95(40)	167.4(2)
	134.5(51)	170.0(18)	87.15(10)	77.40(50)	87.5(100)	156.8(50)		
	150.0(21)		87.20(10)	77.5(50)	87.8(100)	160.225(20)		
	157.70(100)		87.30(10)	148.0(25)	154.4(20)	160.550(20)		
	157.75(100)		87.50(10)	155.2(50)	155.8(100)	161.6(50)		
	157.8		87.70(10)	155.3(50)	157.8(50)	161.85(50)		
	157.95		87.75(10)	155.5(50)	157.95(50)	163.8(20)		
	160.225		87.80(10)		160.55(100)			
	160.550		87.85(10)		160.275(100)			
			88.0(10)		161.5(100)			
					161.6(100)			
					161.7(100)			
				161.85(100)				
				161.95(100)				

PLAN B, MAP SHOWING LOCATIONS OF TRANSMITTING STATIONS



S O U T H C H I N A S E A

S U L U S E

C E L E B E S S

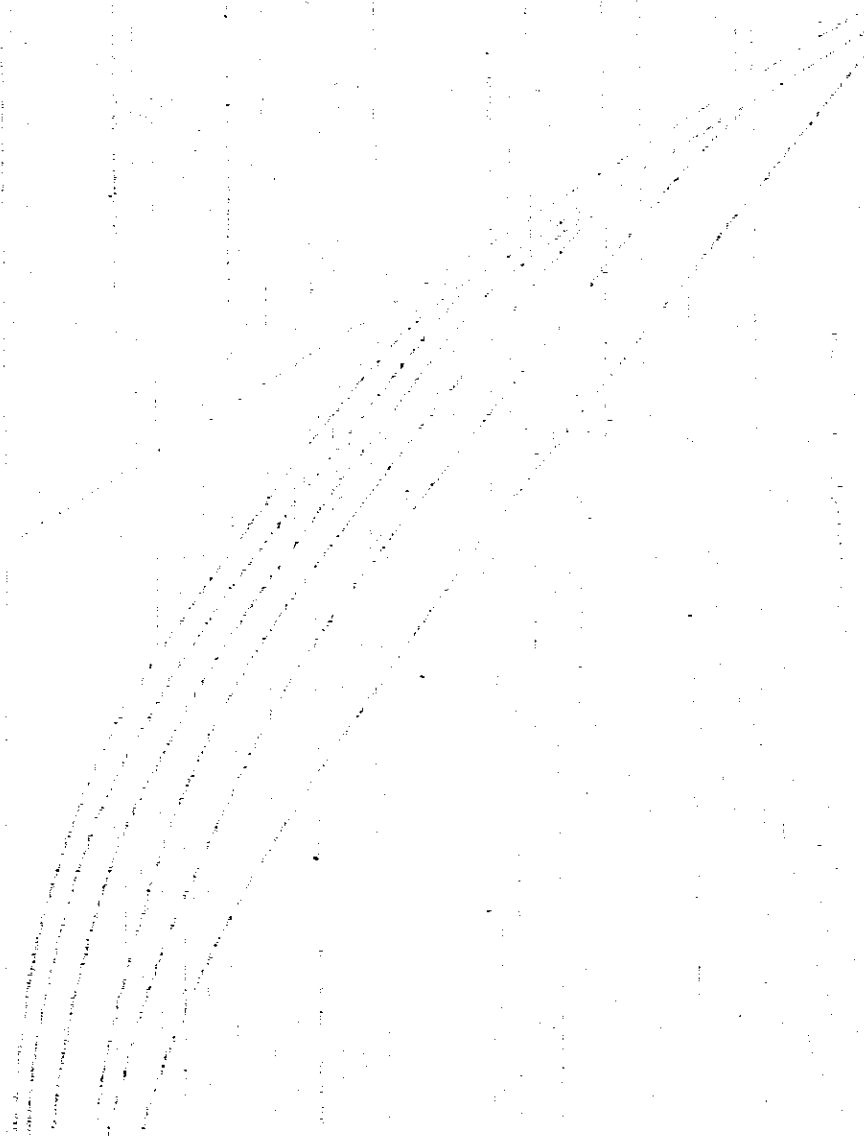
MAXIMUM ELEVATION FIGURES ARE BELIEVED TO EXCEED 1100 FEET

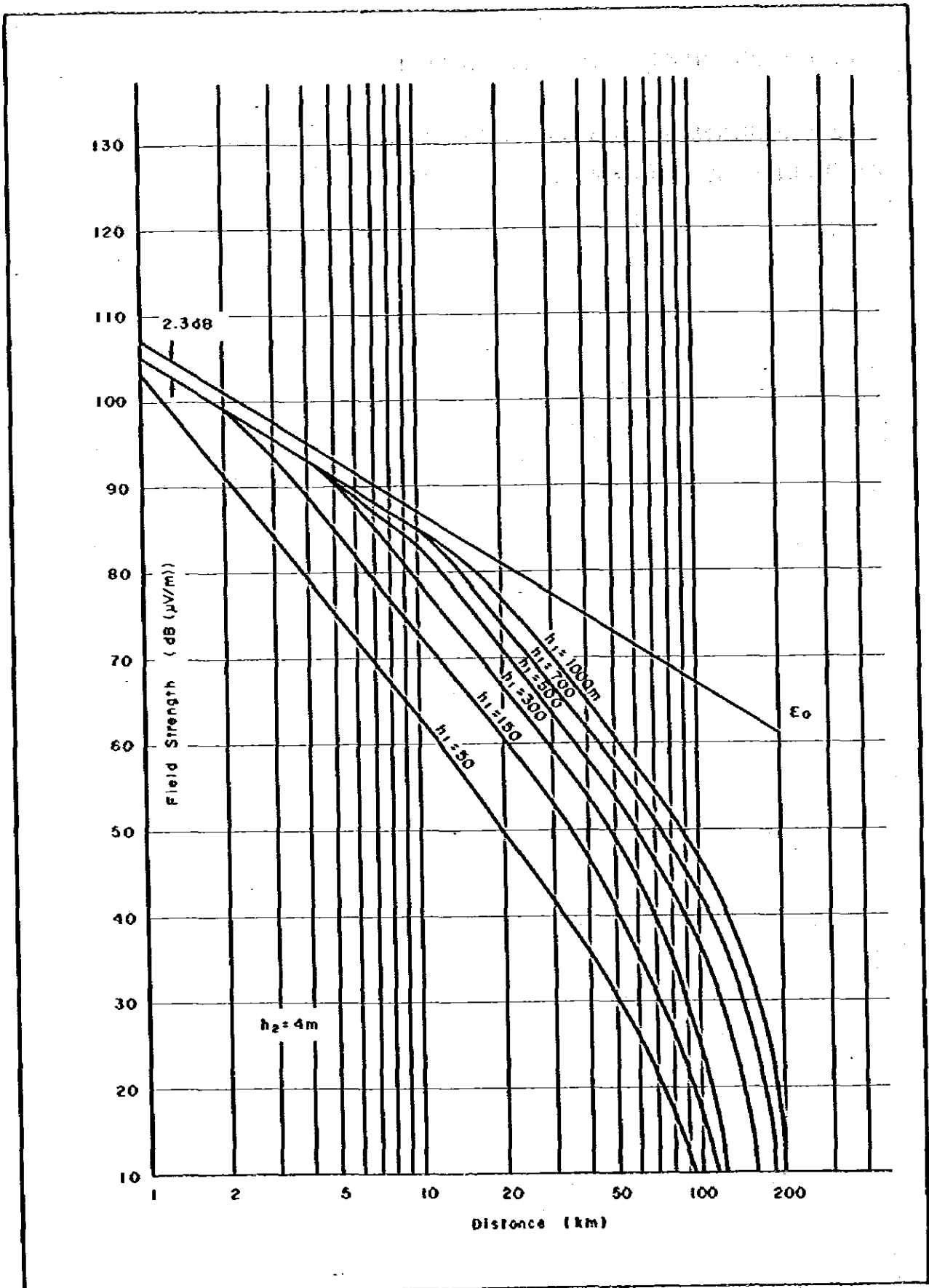
MARAS

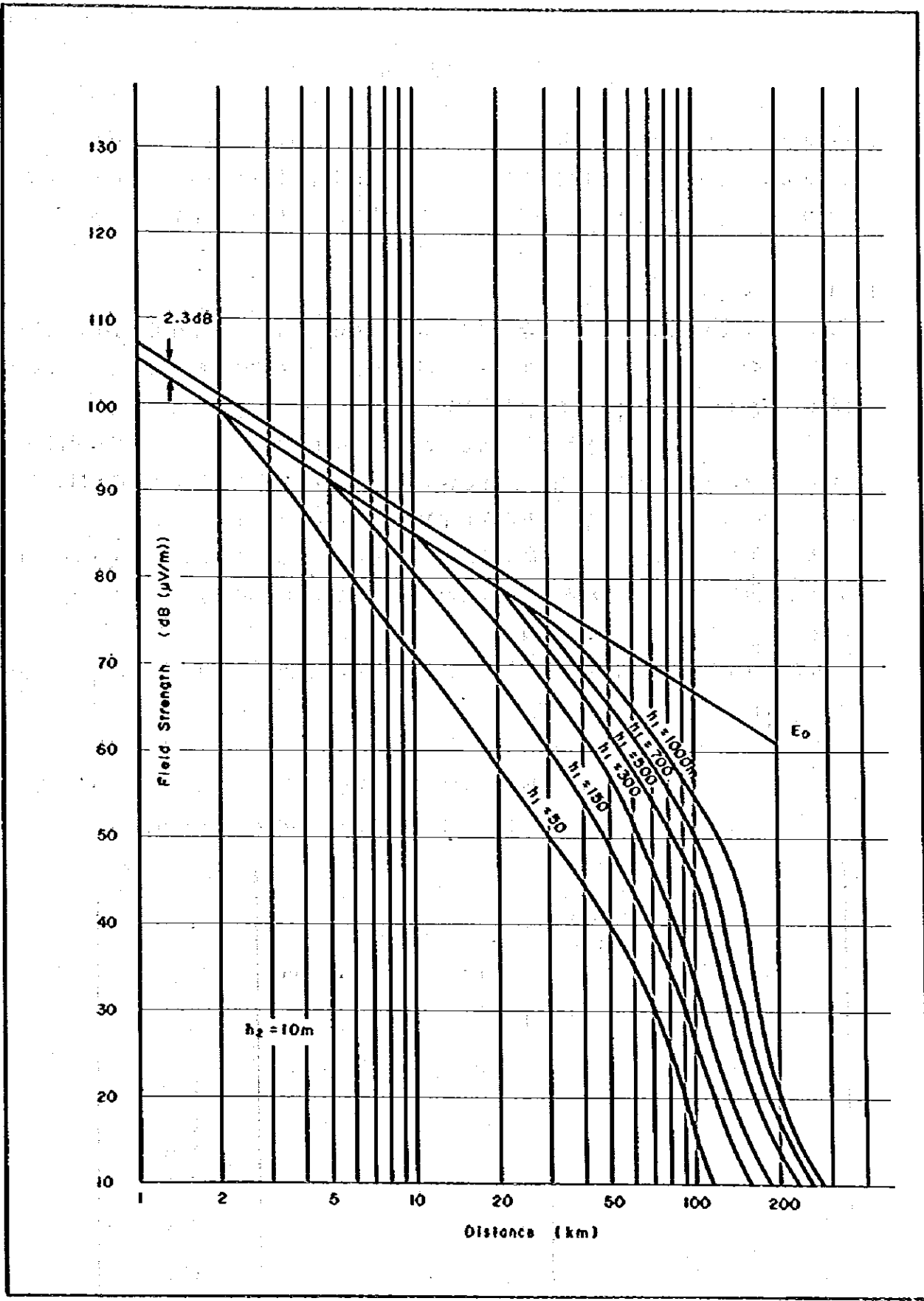


マレーシア国におけるしゃへい物のない場合のFM電界強度図表

ここに示す図表は第2章3項1および3項2で求められた計算値をなめらかな曲線で結び、さらに調査で得られた実測値との差である-2.3 dBの補正値を加えて算出したものである。









スタジオ設備

1. プランAのためのスタジオ設備

プランAに基づく放送は6系で実施される。スタジオ設備はリジョナル局、とローカル局の夫々の用途により目的に合致した設備を検討したので、その概略を記述する。

1-1. リジョナル局スタジオ設備

リジョナル放送(FM-4)およびローカル放送(FM-5)を夫々1日当り10時間と想定した。この想定によってリジョナルスタジオは20時間/日の放送番組の制作と送出に充分耐えるスタジオ設備を準備しなければならない。

リジョナル局では、また教育放送の送出も実施する。教育放送番組の制作は教育省所属のプロダクションスタジオで実施され、放送できる状態となった放送番組テープをRTMリジョナルスタジオに運び込み、送出業務のみRTMリジョナルスタジオで担当する。

半島マレイシア調査時のデータによると番組のパッケージ率は70%、残り30%は運行室に於て生番組として処理される。今回もこのデータに基づいて検討することにした。

1-1-1 マスターコントロール設備

6系統の放送番組の入、出力分配とモニタリング機能を持たせたマスターコントロール設備を準備する。

1-1-2 運行設備

リジョナル番組、ローカル番組および教育番組の送出処理のため、夫々1室ずつ合計3室の運行室とその設備が必要である。運行室設備は1室あたり次の構成となる。

	内 容	数 量
1.	サウンドミキシング コントロール(ステレオ)	10チャンネル 1台
2.	円盤再生機 (ステレオ)	33 $\frac{1}{3}$ r.p.m, 45 r.p.m 2台
3.	テープ録音/再生機 (ステレオ)	19cm/S, 38cm/S 2台
4.	ブナウンスリピーター	録音/再生, 1チャンネル 1台
		再生オンリー, 10チャンネル 1台
5.	電話放送装置	- 1台
6.	マイクロフォン (ステレオ)	- 3本
7.	モニタリング装置 (ステレオ)	- 2式
8.	付属機材	マイクスタンドなど 1式

### 1-1-3 番組制作スタジオ

リジョナルとローカル番組、延20時間の放送に対してパッケージ率70%を想定すると、プロダクションスタジオで制作する番組は14時間分である。1番組制作のためのスタジオ占有時間は放送時間の約3.5~4倍が標準である。従って14時間分の番組制作を行うための延スタジオ占有時間は $14 \times 3.5 = 49$ 時間/日、1日の制作時間を朝10時から夜の20時、すなわち10時間とすると、スタジオ設備は $49 \div 10 \approx 5$ 室分必要となる。プロダクション・スタジオ設備は1室当り次の構成とする。

	内 容	数 量
1. サウンドミキシング コンソール(ステレオ)	16チャンネル	1台
2. 円盤再生機 (ステレオ)	$33\frac{1}{2}$ r.p.m., 45 r.p.m	2台
3. テープ録音/再生機 (ステレオ)	19 cm/s, 38 cm/s	2台
4. エコーマシン	—	2台
5. マイクロフォン (ステレオ)	—	10本
6. モニタリング装置 (ステレオ)	—	3式
7. 付属機材	マイクスタンドなど	1式

### 1-1-4 リジョナルスタジオの放送システム

リジョナルスタジオシステムは図1-1、運行スタジオを図1-2およびプロダクションスタジオを図1-3に示した。

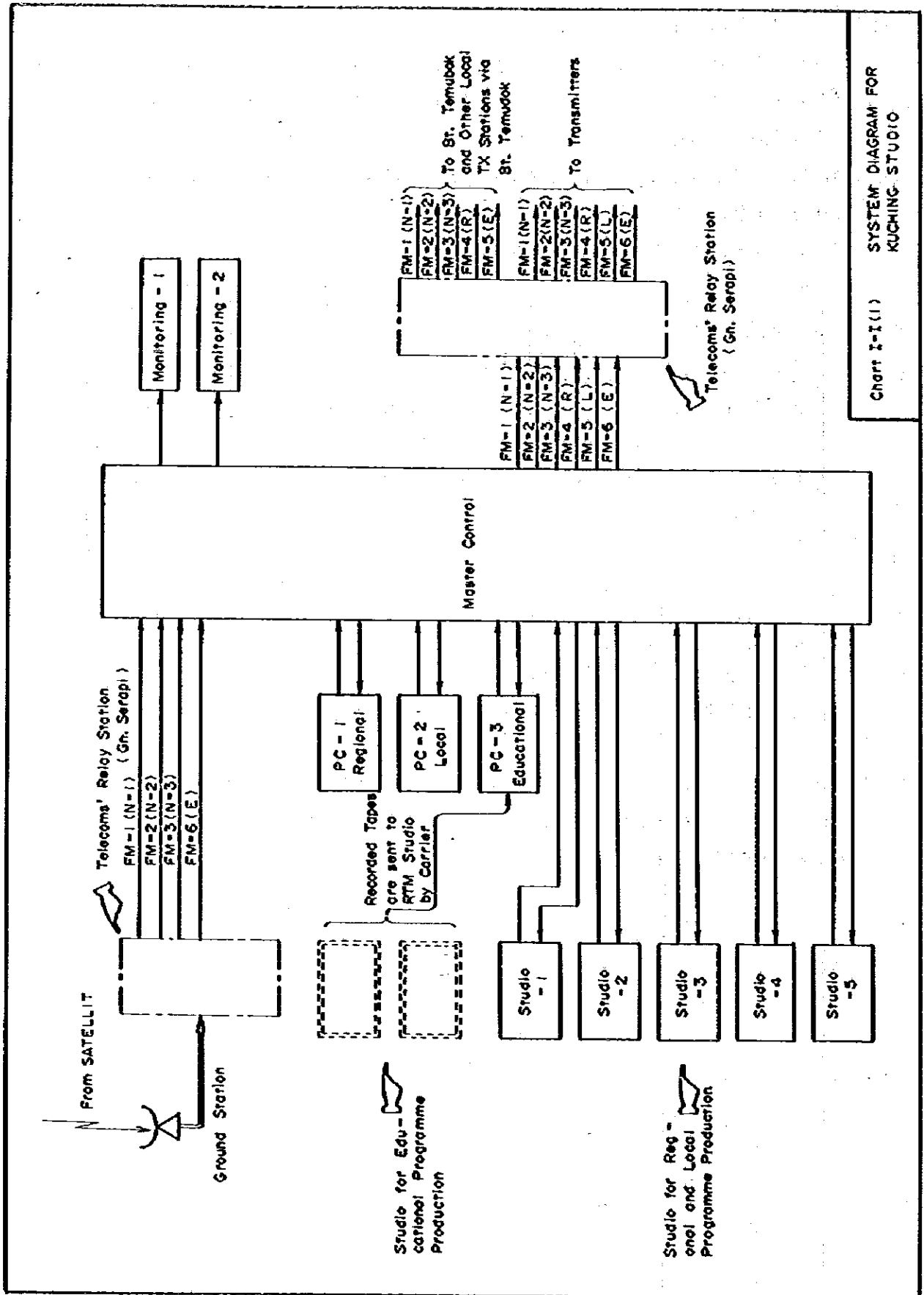


Chart I-I(1) SYSTEM DIAGRAM FOR KUCHING STUDIO

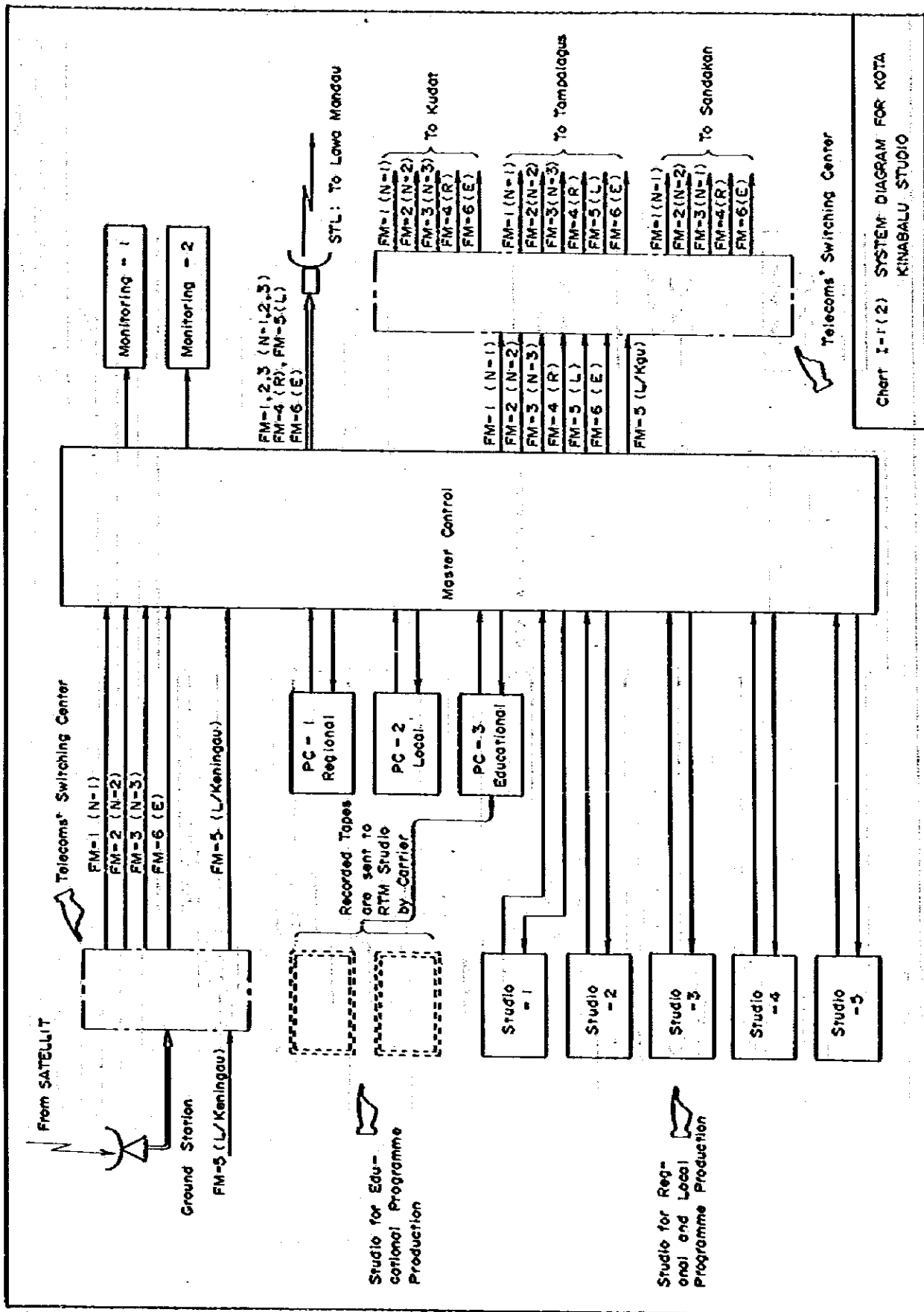


Chart I-1(2) SYSTEM DIAGRAM FOR KOTA KINABALU STUDIO

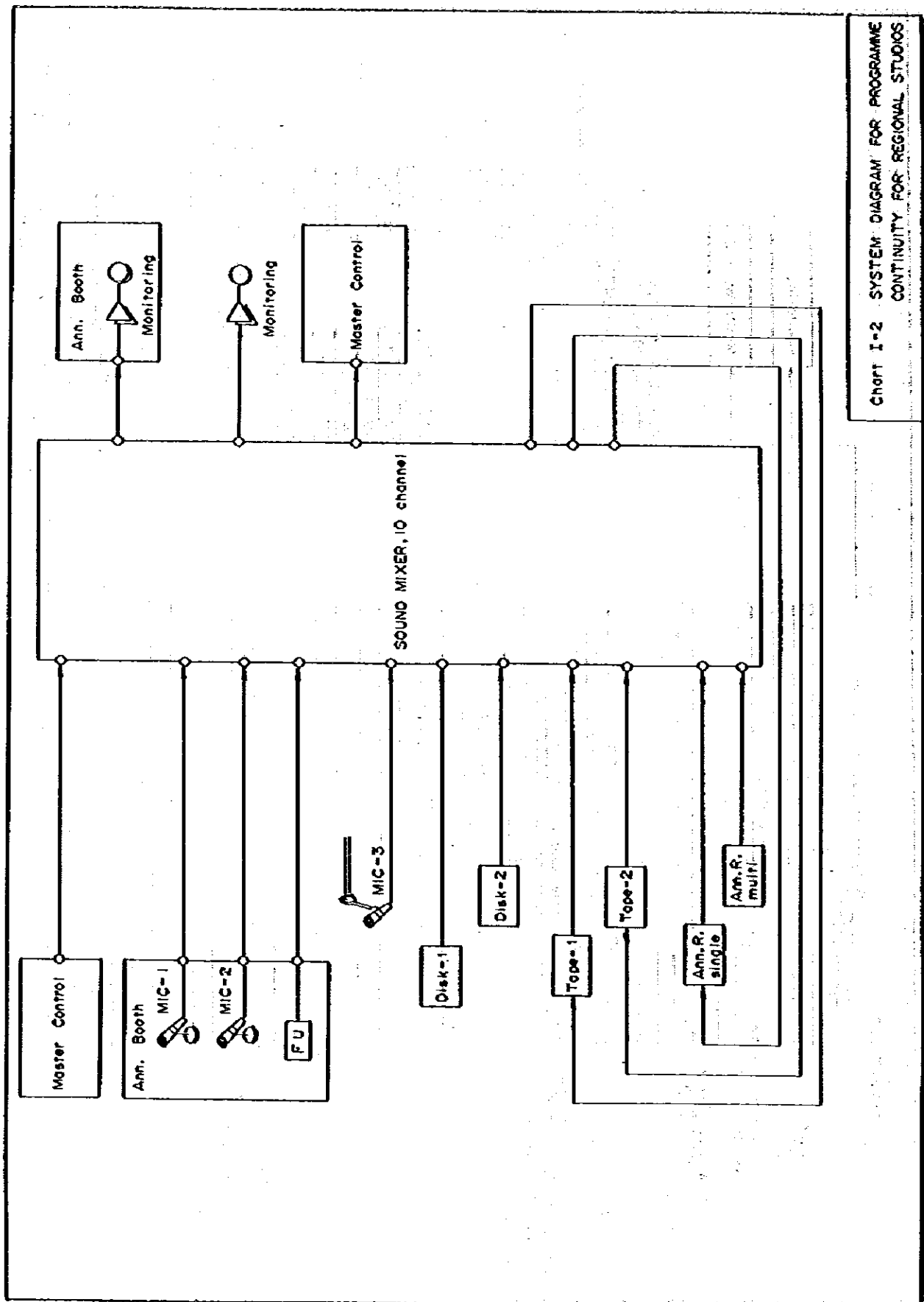


Chart I-2 SYSTEM DIAGRAM FOR PROGRAMME CONTINUITY FOR REGIONAL STUDIOS

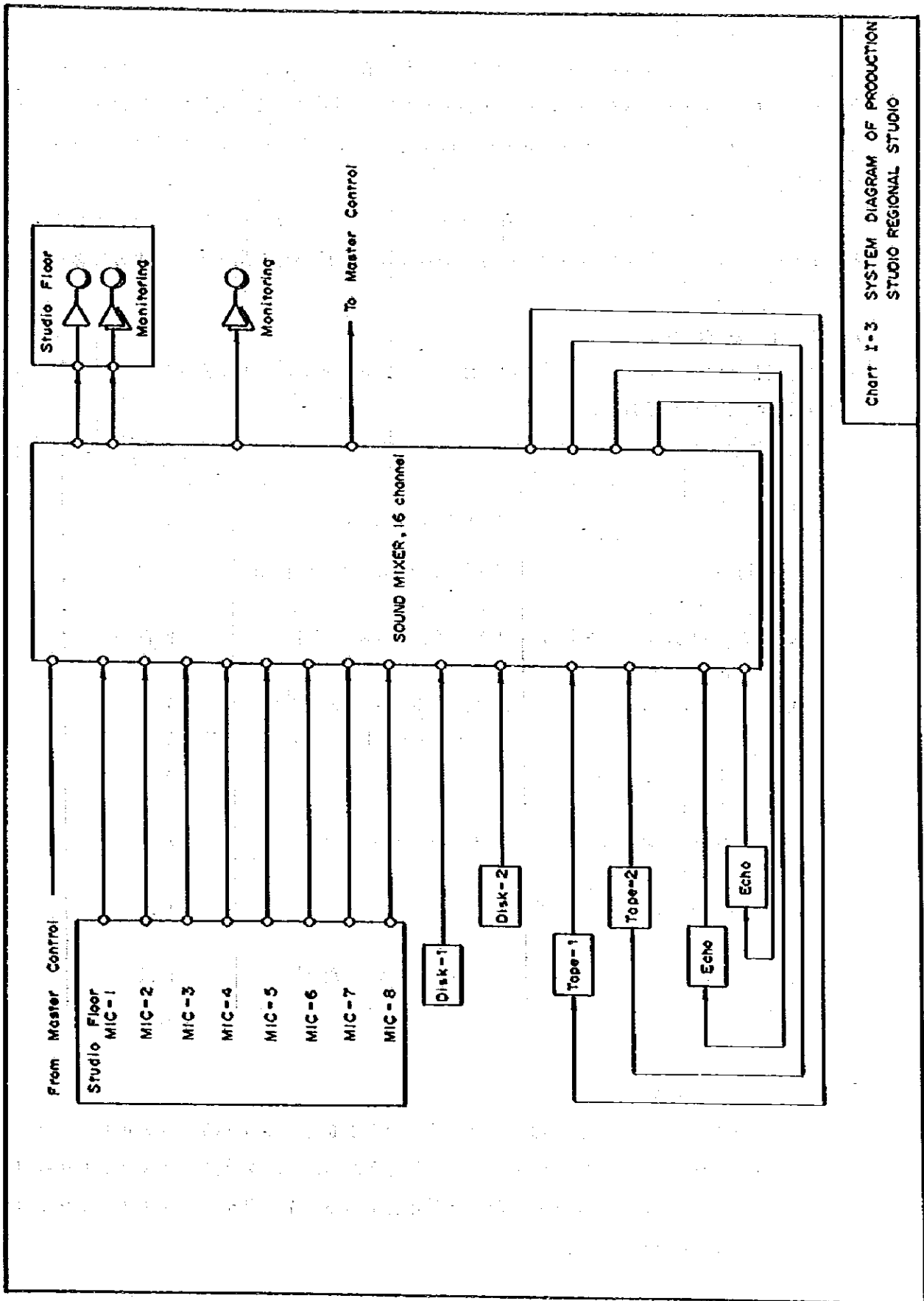


Chart 1-3 SYSTEM DIAGRAM OF PRODUCTION STUDIO REGIONAL STUDIO

## 1-2 ローカル局設備

現在、東マレーシア地区にはローカルスタジオは存在しない従ってローカル放送開始の時に於て居住スペースを含む局舎の建設が必要である。要員計画で算出した人数を収容すると共に運行室、プロダクション・スタジオを含む建物は建設計画の項で示した通り延面積360㎡となる。

ローカルスタジオは番組放送形態からマスターコントロールは必要ない。プロダクションスタジオで制作したローカル放送番組を運行室から直接送信所へ送り出す方法で充分である。

### 1-2-1 運行室

運行室とその設備はローカル番組のみを対象とすることから1室で充分である。運行室設備の構成は次の通りである。

	内 容	数 量
1. サウンドミキシング コンソール(ステレオ)	10チャンネル	1台
2. 円盤再生機 (ステレオ)	33 $\frac{1}{2}$ , r.p.m., 45r.p.m	2台
3. テープ録音/再生機 (ステレオ)	19cm/S, 38cm/S	2台
4. アナウンスリピーター	録音/再生, 1チャンネル 再生オンリー, 10チャンネル	1台 1台
5. マイクロフォン (ステレオ)	-	3本
6. モニタリング装置 (ステレオ)	含エアーモニター	2式
7. リモートコントロール装置	-	1式
8. 付属機材	マイクスタンドなど	1式

### 1-2-2 番組制作スタジオ

ローカル局に於て制作する番組はローカル番組のみ10時間の放送時間の70%パッケージ率で7時間分のプログラムプロダクションを行うためには、7時間×3.5倍÷10時間/日=2.45室≒2室のスタジオとその設備が必要である。1室当りのプロダクション設備の構成は次の通りである。

	内 容	数 量
1. サウンドミキシング コンソール(ステレオ)	12チャンネル	1台
2. 円盤再生機 (ステレオ)	33 $\frac{1}{2}$ , r.p.m. 45r.p.m	2台
3. テープ録音/再生機 (ステレオ)	19cm/s, 38cm/s	2台
4. エコーマシン	—	1台
5. マイクロフォン (ステレオ)	—	6本
6. モニタリング装置 (ステレオ)	—	2式
7. 付属機材	マイクスタンドなど	1式

### 1-2-3 ローカルスタジオの放送システム

ローカルスタジオシステムは、運行スタジオを図1-4、プロダクションスタジオを図1-5に示した。



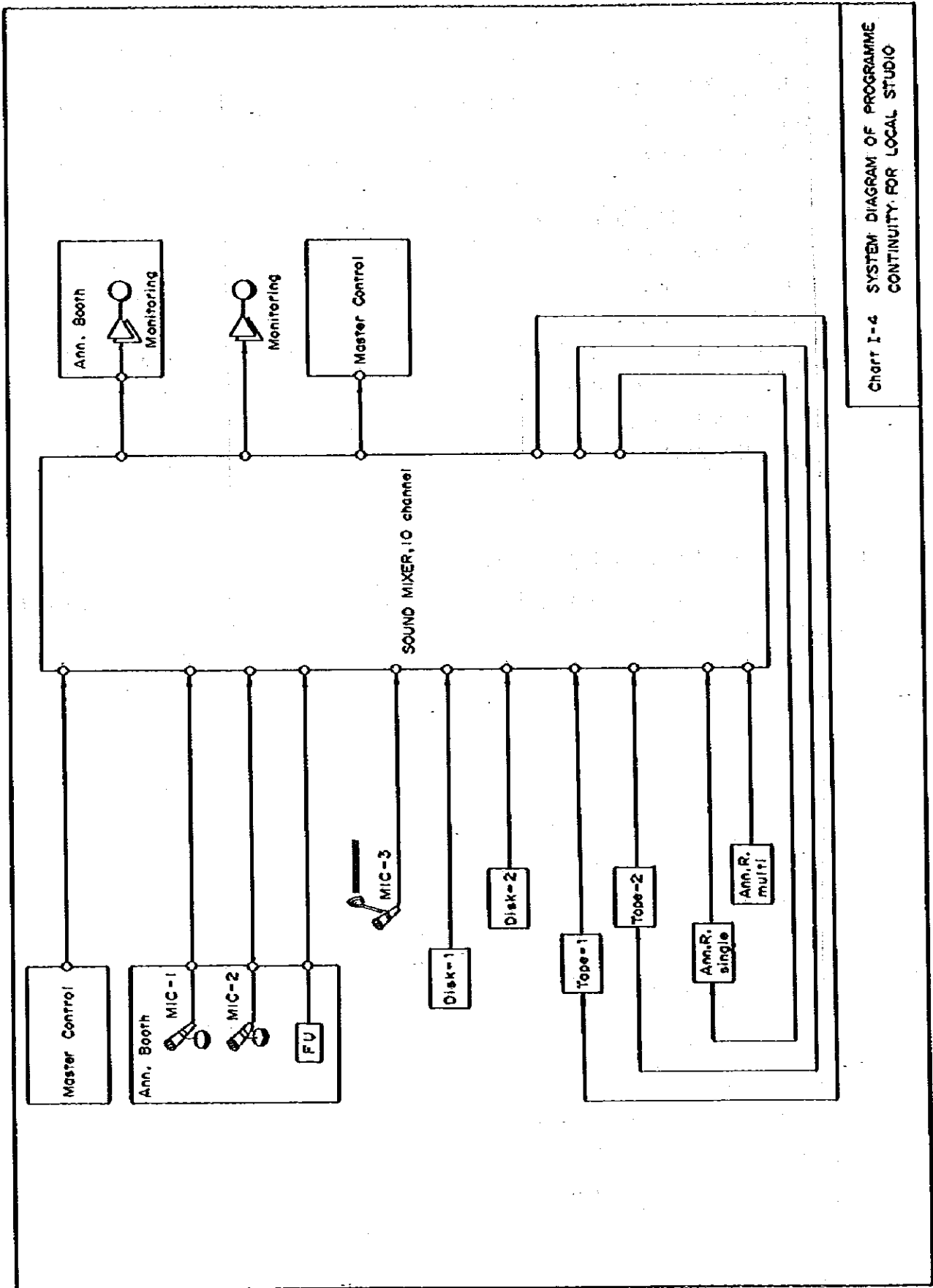


Chart I-4 SYSTEM DIAGRAM OF PROGRAMME CONTINUITY FOR LOCAL STUDIO

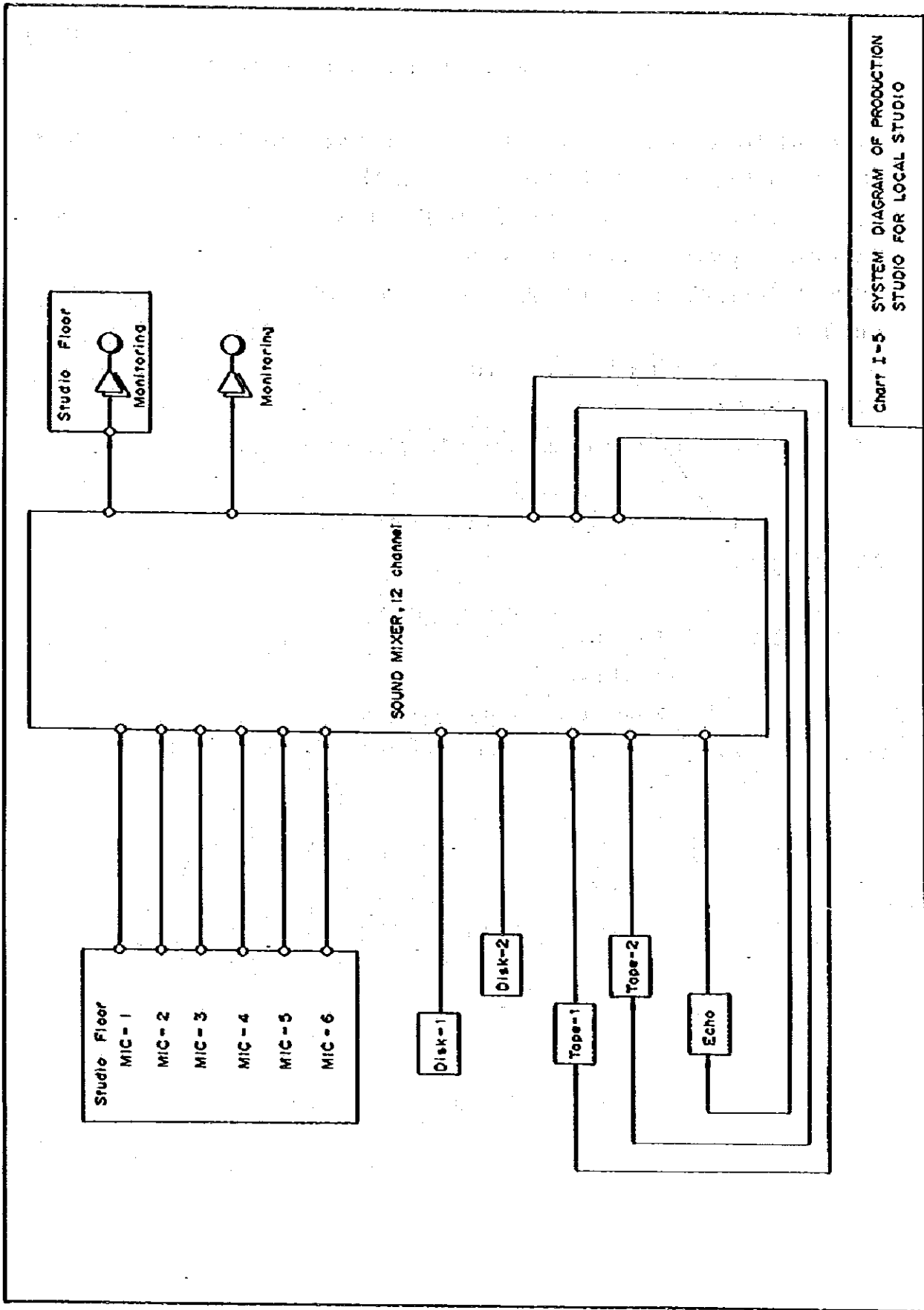


Chart I-5- SYSTEM DIAGRAM OF PRODUCTION STUDIO FOR LOCAL STUDIO

サバ州東部 3 地区へのサービスカバレッジの検討

プラン A において、全ての局にステレオホニックスで最低 6 波を割り当てているので、新たな地区に対する周波数割り当ては現在の状態では不可能である。

しかし、モノホニックス受信の場合の最低所要電界強度はステレオホニックスのそれに比して評価 4 で 6 dB 低くて良い。(本文 2-6-3 参照)

評価 4 と評価 3 の所要電界値の差は表 2-6-2 より 80% 値で

$$28 - 14 = 14 \text{ (dB)}$$

低くて良い事がわかる。

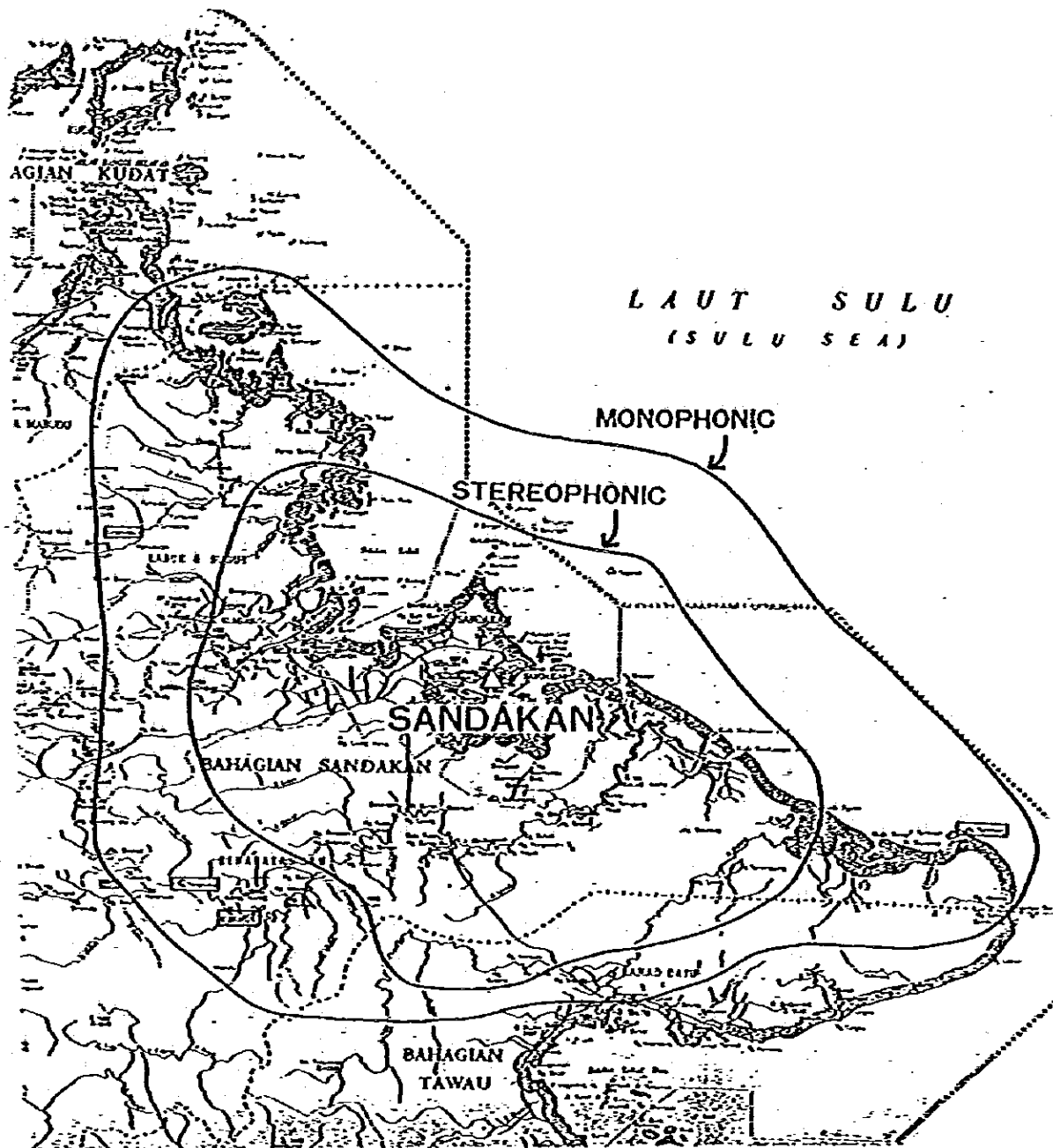
従って、モノホニックス受信で評価 3 で受信の場合の最低所要電界強度は

$$54 - (6 + 14) = 34 \text{ (dB}\mu\text{v/m)}$$

である事がわかる。

- 3 地区
- ① Lingkabau
  - ② Tambisan
  - ③ Kuamut および Tangkulap

に対するサンダカンのコンタを次に示す。此のコンタ地図に示す通りこの 3 地区は十分カバーできることが確認された。



Sandakan 送信所のサービスエリア



附 錄 資 料 一 2



**INTERIM REPORT  
FOR  
FEASIBILITY STUDY  
ON  
VHF/FM BROADCAST COVERAGE PLAN  
FOR  
THE STATES OF SABAH AND SARAWAK, MALAYSIA**

**Japan International Cooperation Agency**

**The Japanese Feasibility Study Team**



**This Interim Report is agreed on by the following two authorities concerned.**

**Economic Planning Unit, Prime Minister's Department, Malaysia**

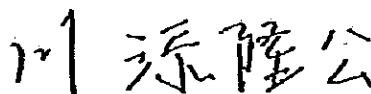
**Japan International Cooperation Agency, the official agency responsible for implementation of technical cooperation programmes of the Government of Japan**

**To confirm the aforementioned, Interim Report is herewith attached and signed by the representatives of the said authorities concerned.**

**Kuala Lumpur August, 1982**



.....  
**(HALMI MOCHAMMED NOOR)**  
**DIRECTOR OF SOCIAL SERVICES**  
**ECONOMIC PLANNING UNIT**  
**PRIME MINISTER'S DEPARTMENT**  
on behalf of  
**THE GOVERNMENT OF MALAYSIA**



.....  
**(TAKAHIRO KAWAZOE)**  
**LEADER**  
**JAPANESE FEASIBILITY**  
**STUDY TEAM**  
on behalf of  
**JAPAN INTERNATIONAL**  
**COOPERATION AGENCY**

## TABLE OF CONTENTS

<b>1. Introduction .....</b>	<b>230</b>
<b>2. Records of Itinerary of Field Survey .....</b>	<b>230</b>
<b>3. The Summary of The Survey .....</b>	<b>230</b>
<b>(1) The Survey Related to Site Selection and Frequency Assignment Plan .....</b>	<b>230</b>
<b>(2) Survey on Land Space, Buildings and Towers at Existing TV Sites .....</b>	<b>231</b>
<b>4. Work Diagram for Feasibility Study .....</b>	<b>232</b>
<b>5. Contents of Draft Final Report .....</b>	<b>232</b>

## **1. Introduction:**

In response to a request from the Government of Malaysia for technical assistance on VHF/FM Broadcast coverage plan for the States of Sabah and Sarawak, Malaysia, the Government of Japan through the Japan International Cooperation Agency has sent a Study Team headed by Mr. Takahiro Kawazoe, Deputy Director of Planning Division, Broadcasting Department, Radio Regulatory Bureau, Ministry of Posts and Telecommunications, to Malaysia, to carry out a feasibility study on this project from June 15th to August 3rd, 1982.

The Team has conducted field survey an investigation throughout the States of Sabah and Sarawak, Malaysia and data collection and also has held a series of discussions and exchanged view with officials of the Government of Malaysia. The Team finalized its necessary activities in Malaysia successfully with close cooperation of authorities and officials concerned.

On the basis of the results of field activities, the Team shall retain further study after return to Japan in order to prepare the Feasibility Study Report.

Finally, the Team would like to express sincere gratitude to the Authorities and officials concerned.

## **2. Record of Itinerary of Field Survey.**

The member of Feasibility Study Team are shown in attached table 1. Day by day activities of the Feasibility Study Team are Summarized into attached table 2.

## **3. The summary of the survey:**

### **(1) The survey related to site selection and frequency assignment plan.**

#### **(A) Field strength measurements of radiated signal in VHF band;**

The Team measured field strength, picture quality and azimuth of incoming signals of TV signals and existing radio waves in VHF band at 60 spots in service area of protected coverage, in main cities and as proposed sites. These data will make available to us

##### **a) prediction of field strength of interfering signals;**

Channel separation among each site is determined on the basis of these predictions.

##### **b) estimation of proposed service area to be covered by FM Tx which will be co-sited at TV Tx and/or TELECOM's repeater stations.**

##### **c) prediction of multi-path distortion in proposed FM reception.**

##### **d) estimation of signal quality in the case of off-air relay.**

#### **(B) Observation of the actual condition of Social Development in the States of Sabah and Sarawak;**

Relation between the Social Development and Broadcasting is a very important element, therefore, the Team checked the receptional condition for broadcasting signals at the various places.

#### **(C) Checking the actual situation of the existing TV Tx buildings and antenna towers;** The Team visited 14 TV sites and checked a possibility to accommodate the FM Broad-

casting facilities in the existing TV Tx buildings in the future.

The antenna towers were also checked by the Team. Results of checking, the team considered that Fm Broadcasting facilities will be accommodated at the existing TV Tx buildings (including extension of the building) and existing antenna towers, in principle.

However, its decision will be made after analysis of data by the team in Japan.

**(2) Confirmation of FM Broadcasting Network Plan;**

The following items were confirmed by and between both parties to prepare the Final Report

**(A) Technical Standard;**

The same Technical Standard will be adopted as that adopted in the Feasibility Study Report on VHF/FM Broadcast Coverage for Peninsular Malaysia, dated March 1981. However, the supplementary value of propagation curves will be calculated based on the actual measuring in order to check whether it will be same or not with the case of Peninsular Malaysia.

**(B) Assignment plan of FM broadcasting stations;**

**(B-1) Network;**

**a) National Network;**

The National Network will be planned for throughout the nation. National Programmes will be produced at the Studio RTM/K.L. and distributed for the nation wide as same plan as Peninsular Malaysia.

**b) Regional Network;**

The Regional Network will be planned separately for the two (2) states level.

**c) Local Network;**

The Local Network will be planned for the five (5) for Sabah and eight (8) for Sarawak.

The Local Broadcasting Programmes will be prepared separately for each district level and its programmes will be served for the inhabitants in each district level.

**d) Education Network;**

The Educational Network will be established for the School Education and completely separated from other Networks. And various educational programmes will be produced at National Studio and Regional Studio/Ministry of Education, and transmission will be carried out at RTM studio site.

**(B-2) Programme production Studio;**

Four (4) kinds of Studios will be established for each Network as follows;

**a) For National Network;**

The Programme production and sending out of the National Programme will be done by RTM/K.L. studio.

**b) For Regional Network;**

The Programme Production and sending out of the Regional programmes will be RTM/studio Kota Kinabalu for the state of Sabah and RTM/studio Kuching for

the state of Sarawak.

**c) For Local Network;**

The Programme production and sending out of the Local programmes will be done by the following studios;

**(c-1) Sabah**

- a) Residenci Pantai Barat : Studio Kota Kinabalu
- b) Residenci Kudat : Studio Kudat
- c) Residenci Sandakan : Studio Sandakan
- d) Residenci Tawau : Studio Tawau
- e) Residenci Pendalaman : Studio Keningau

**(c-2) Sarawak**

- a) 1st Division : Studio Kuching
- b) 2nd Division : Studio Bandar Sri Aman
- c) 3rd Division : Studio Sibul
- d) 4th Division : Studio Miri, Bintulu
- e) 5th Division : Studio Limbang
- f) 6th Division : Studio Sarikei
- g) 7th Division : Studio Kapit

**d) For Educational Network;**

The Educational Programmes will be produced at Studio K.L./Ministry of Education for Nation-wide, Studio K.K. and Kuching Ministry of Education for Region-wide.

The two (2) kinds of programmes mentioned above will be broadcasted for the school educational purposes according to the daily broadcasting time schedule, which will be prepared based on the curriculum, under management of the Ministry of Education.

**(C) Sites of FM transmitting station;**

Existing TELECOM's repeater stations as well as existing TV-TX stations will be examined for the main sites of FM transmitting station.

**(D) FM broadcasting system and Programme transmission network lines;**

Stereophonic system will be employed for this purpose.

**4. Work Diagram for Feasibility Study;**

See attached table 3.

**5. Contents of Draft Final Report;**

1. Introduction
2. Technical Standards
3. Site and ERP of the Project
4. Frequency Assignment
5. Transmitting Facilities

6. Station Building and Tower
7. Programme Planning
8. Programme Transmission Line
9. Staff Planning
10. Construction Schedule
11. Construction Cost
12. Operation Cost
13. Basic Study for the Plan-B
14. Project Evaluation

**Table 1. Names and Duty of Study Team Members**

Name		Duty
Takahiro	KAWAZOE	Team Leader
Masayuki	HIRATA	Broadcasting System
Hitoshi	SHIODA	Frequency Planning
Hiroshi	NARITA	Ditto
Shoji	TSUDA	Site Planning
Yoshiaki	HIGASHI	Equipment Planning
Masami	DOUCHI	Ditto
Tetsuya	NOHMURA	Building & Antenna Tower
Hogara	CHIBA	Ditto
Mitsutoshi	KIKUCHI	Coordinator

Table 2. Survey Schedule

JOB ITEMS	Leader and Coordinator	Group-1	Group-2	Group-3
Name of Japanese Experts	Mr. T. KAWAZOE Mr. M. KIKUCHI	Field Survey for SABAH Mr. M. HIRATA Mr. H. SHIODA Mr. M. DOUCHI	Field Survey for SARAWAK Mr. S. TSUDA Mr. H. NARITA Mr. Y. HIGASHI	Survey for Site situation of the existing TX stations (Building and Antenna Tower) Mr. T. NOEMURA Mr. H. CHIBA
1 JUNE 15 (TUE)	TOKYO (10:00 Lv.) - MH-11 via Taipei, Hong Kong. - KUALA LUMPUR (19:50 Ar.)			
2 16 (WED)	Team meeting with members of JICA/K. L. at JICA office			
3 17 (THU)	Visiting the Embassy of Japan			
4 18 (FRI)	Discussion on the project and submission of the Inception Report at EPU's office			
5 19 (SAT)	Discussion and confirmation with the members of Telecoms and RTM for the survey schedule at RTM's office			
6 20 (SUN)	Detailed study for the results of discussion			
7 21 (MON)	Preparation and checking the measurement equipment			
8 22 (TUE)	KUALA LUMPUR (10:50 Lv.) - MH-63 - KOTA KINABALU (13:10 Ar.) Discussion on the project and survey schedule with Telecoms and RTM at Telecom's office			
9 22 (WED)	Cutsey-call to the Japanese Consulate and meeting KOTA KINABALU (13:45 Lv.) - Travelling K.K. to MH-672 KUNDASANG KUALA LUMPUR (17:50 Ar.) Report to the JICA/K. L.	Checking the equipment	Same as Group-1	
10 24 (THU)	KUALA LUMPUR (10:35 Lv.) JL-714 TOKYO (19:45 Ar.)	AM: Travelling to Mt. Kinabalu PM: Inspection of Layang-Layang Station	K. K. (12:35 Lv.) MH-242 KUCHING (16:25 Ar.)	Same as Group-1
11 JUNE 25 (FRI)		AM: Measuring the Field Strength at RANAU PM: Measuring the Field Strength at Kpg. SILAD and SEGINDAL	AM: Technical meeting at Telecoms office PM: Measuring the Field Strength at RTM Studio site	Travelling to K. K. by car

	Leader and Coordinator	Group-1	Group-2	Group-3
12 JUNE 26 (SAT)		AM: Measuring the Field Strength at TAMBUNAN PM: Measuring the Field Strength at KENINGAU	AM: Inspection of Gr. SERAPI TX STATION AND RTM Studio Complex PM: Measuring the Field Strength at SEMARJAN	Inspection of Bt. LAWA MAN-DAU TX station
13		AM: Data analysis PM: Inspection of Bt. TIGA & Telecoms Station	Data Analysis	Data Analysis
14		AM: Travelling to Bt. TAMPULAGUS Station PM: Measuring the Field Strength at SIPITANG	AM: Measuring the Field Strength at BAU & LUNDU PM: Measuring the Field Strength at SEMATAN	Inspection of Bt. TAMPULAGUS Station
15		AM: Measuring the Field Strength at WESTON HOSPITAL PM: Measuring the Field Strength at BEUFORT	AM: Measuring the Field Strength at SIBRAN PM: Technical meeting at RTM	K. K. (12:25 Lv.) MH-242 KUCHING (15:50 Ar.)
16		AM: Inspection of Bt. LAWA MANDAU Station PM: Measuring the Field Strength at PAPAR & K. K.	AM: Travelling to BANDAR SRI AMAN Measuring the Field Strength at SERIAN PM: Measuring the Field Strength at PANTU Technical meeting at RTM and Inspection of RTM Studio Complex	Same as Group-2
17 JULY 1 (THU)		AM: Measuring the Field Strength at KOTA BELUD PM: Travelling to KUDAT and Inspection of Bt. KELA-PA Station	AM: Curtsey-call to RESIDENT SECOND DIVISION Measuring the Field Strength at ENGGILLI	AM: Curtsey-call to RESIDENT SECOND DIVISION PM: Inspection of Bt. TEMU-DOK Station



	Leader and Coordinator	Group-1	Group-2	Group-3
18 JULY 2 (FRJ)		AM: Travelling to DPG. SENA- JA PM: Measuring the Field Strength at KPG. ROSOB, KOTA MARUDU and KUDAT	AM: Measuring the Field Strength at RTM studio site Inspection of Bt. TEMUDOK Station PM: Technical meeting at RTM	AM: Travelling to KUCHING PM: Technical meeting at Tele- coms Office
19 3 (SAT)		AM: Measuring the Field Strength at MATUNG- GONG PM: Travelling to K. K.	AM: Reconfirmation of the Flight PM: Site Planning	Inspection of Gn. SERAPI Station
20 4 (SUN)		AM: Travelling to KPG. NABA- WAN PM: Measuring the Field Strength at KPG. NABA- WAN	Data Analysis	Data Analysis
21 5 (MON)		AM: Inspection of RTM Studio Complex PM: Technical meeting at RTM	KUCHING (11:00 Lv.) MH-257 SIBU (12:00 Ar.) PM: Technical-meeting at RTM and Telecoms Inspection of Bt. LIMA Station	Same as Group-2
22 6 (TUE)		AM: Travelling to SANDAKAN PM: Inspection of TRIG HILL Station	AM: Curtsey-call to RESIDENT THIRD DIVISION Measuring the Field Strength at SARIKEI PM: Measuring the Field Strength at JULAU	AM: Curtsey-call to RESIDENT THIRD DIVISION Travelling to SARIKEI by ship PM: Inspection of SARIKEI Radio Station Travelling to SIBU by ship







	Leader and Coordinator	Group-1	Group-2	Group-3
23 JULY 7 (WED)		AM: Measuring the Field Strength at SANDAKAN PM: Ditto	AM: Measuring the Field Strength at SIBINTEK PM: Measuring the Field Strength. Technical meeting at LI HUA HOTEL	AM: SIBU (8:05 Lv.) MH-271 BINTULU (8:40 Ar.) Inspection of NYABAU Station. PM: BINTULU (14:20 Lv.) MH-242 SIBU (14:45 Ar.)
24		AM: Measuring the Strength at Bt. GALAM PM: Measuring the Field Strength at BELURAN	AM: Travelling to SONG by Express ship Measuring the Field Strength at SONG. Travelling to KAPIT PM: Inspection of KAPIT Station Measuring the Field Strength at KAPIT	AM: Travelling to KAPIT by Express ship Technical meeting at Telecoms. PM: Inspection of KAPIT Station
25		AM: Travelling to TELUPID PM: Measuring the Field Strength at TELUPID AND travelling to SANDAKAN	AM: Measuring the Field Strength at suburbs KAPIT PM: Travelling to SIBU by Express ship	PM: Travelling to SIBU by Express ship
26		Data Analysis	AM: Measuring the Field Strength at SIBINTEK PM: Data Analysis	SIBU (11:35 Lv.) MH-243 MIRI (12:40 Ar.)
27		Travelling to LAHAD DATU	Data Analysis	Data Analysis
28		AM: Technical meeting at Telecoms PM: Inspection of Mt. SILAM Station.	SIBU (12:10 Lv.) MH-273 BINTULU (12:45 Ar.) PM: Inspection of Bt. NYA-BAU Station. Measuring the Field Strength at Suburbs BINTULU Technical meeting at HOOVER HOTEL	AM: Technical meeting at Telecoms PM: Inspection of Bt. Lumbir Station

	Leader and Coordinator	Group-1	Group-2	Group-3
29 JULY 13 (TUE)		<p>AM: Measuring the Field Strength at KPG. TONG-KU</p> <p>PM: Measuring the Field Strength at KPG. SILL-BUKAN &amp; LAHAD DATU</p>	<p>AM: Measuring the Field Strength at suburbs BIN-TULU &amp; BINTULU</p> <p>PM: Technical meeting at Telecoms BINTULU (15:55 Lv.) MH-245</p> <p>MIRI (16:30 Ar.)</p>	<p>MIRI (8:45 Lv.) MH-954</p> <p>LIMBANG (9:25 Ar.)</p> <p>PM: Technical meeting at Telecoms Inspection of Bt. MAS</p>
30	14 (WED)	<p>AM: Travelling to TAWAU</p> <p>PM: Inspection of Mt. ANDRASSY</p>	<p>AM: Technical meeting at Telecoms &amp; RTM Inspection of LAMBIR Station</p> <p>PM: Measuring the Field Strength at NIAH Inspection of Bt. ANOHARANG</p>	<p>LIMBANG (13:30 Lv.) MH-907</p> <p>MIRI (14:10 Ar.)</p>
31	15 (THU)	<p>AM: Travelling to KALABAKAN</p> <p>PM: Measuring the Field Strength at KALABAKAN &amp; MERUTAI Travelling to TAWAU</p>	<p>AM: Cursey-call to RESIDENT FOURTH DIVISION</p> <p>Measuring the Field Strength at MIRI</p> <p>PM: Measuring the Field Strength at K. BARAM Picture Quality (10CH) Survey in front of CLO-RJA HOTEL.</p>	<p>AM: Cursey-call to RESIDENT FOURTH DIVISION</p> <p>MIRI (13:10 Lv.) via K. K. MH-243.219</p> <p>SANDAKAN (15:30 Ar.)</p>
32	16 (FRI)	<p>AM: Travelling to KUNAK</p> <p>PM: Measuring the Field Strength at KUNAK, SEMPORNA and TINAGAT. Travelling to TAWAU</p>	<p>AM: Site Planning</p> <p>PM: Technical meeting and Site Planning at Telecom &amp; RTM</p>	<p>Inspection of TRIG HILL Station.</p>

	Leader and Coordinator	Group-1	Group-2	Group-3
33		AM: Measuring the Field Strength at KPG. TAN-JUNG BATU and TAWAU	MRI (9:00 Lv.) By Chartered Plane BN-2 MURUDI (9:15 Ar.) Measuring the Field Strength at MURUDI AIRPORT MURUDI (10:30 Lv.) BN-2 LAWAS (11:00 Ar.) Measuring the Field Strength at LAWAS AIRPORT LAWAS (11:4 Lv.) BN-2 LIMBANG (12:10 Ar.) PM: Inspection of Bt. MAS Station. Technical meeting at RTM.	SANDAKAN (8:30 Lv.) MH-223 LAHAD DATU (8:55 Ar.) Inspection of Mt. SILAM Station
34		Data Analysis	Data Analysis	LAHAD DATU (15:10 Lv.) MH-225 TAWAU (15:55 Ar.)
35		AM: Travelling to K. K. PM: Report to Japanese Consulate	AM: Measuring the Field Strength at BUANG SOIL and KPG, BAKOL LIMBANG (15:10 Lv.) BN-2 MIRI (15:55 Ar.)	Inspection of Mt. ANDRASSY
36		AM: Meeting with RTM & Telecoms PM: Data Analysis	AM: Technical meeting at RTM and Telecoms MIRI (13:10 Lv.) MH-243 KOTA KINABALU (14:50 Ar.)	TAWAU (12:2 Lv.) MH-532 KOTA KINABALU (13:00 Ar.)
37		AM: Meeting with RTM KOTA KINABALU (13:50 Lv.) MH-672, via SINGAPORE KUALA LUMPUR (17:40 Ar.)		Travelling to KUDAT Inspection of Bt. KELAPA Station Travelling to K. K.
38		Data Analysis		KOTA KINABALU (13:50 Lv.) MH-672, via SINGAPORE KUALA LUMPUR (17:40 Ar.)

	Leader and Coordinator	Group-1	Group-2	Group-3
39	JULY 23 (FRI)		Preparing the Interim Report	
40	24 (SAT)		Ditto	
41	25 (SUN)	TOKYO (10:00 Lv.) MH-11 via TAIPEI & HONG KONG KUALA LUMPUR (19:50 Ar.)	Ditto	
42	26 (MON)	Ditto		
43	27 (TUE)		Technical meeting with R.T.M. & Telecoms at R.T.M. office and submission of the Interim Report	
44	28 (WED)		Making and signature of minutes of technical meeting	
45	29 (THU)		Gathering of information & datas at Telecoms	
46	30 (FRI)		Gathering of information & datas at Telecoms	
47	31 (SAT)		Preparation for departure	
48	AUGUST 1 (SUN)		Ditto	
49	2 (MON)		Submission of Interim Report including of minutes of technical meeting to EPU and signature. Reporting the Results of survey to Embassy of Japan and JICA office/ KUALA LUMPUR	
50	3 (TUE)	KUALA LUMPUR (11:40 Lv.) CX-720 HONG KONG (15:15 Ar.) HONG KONG (16:25 Lv.) CX-500 TOKYO (21:35 Ar.)		

Table 3. STUDY SCHEDULE

	1982					1983								
	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Field Survey														
Preparation of Draft Final Report														
Submission of Draft Final Report														
Explanation of Draft Final Report														
Preparation of Final Report														
Submission of Final Report														

Remarks:  Work in Malaysia  
 Work in Japan

**FEASIBILITY STUDY OF VHF/FM BROADCASTING  
IN THE STATES OF SABAH AND SARAWAK**

Discussion between members of JICA Study Team, RTM and Telecoms Officials

Date : 19th June, 1982  
Time : 11:00 morning  
Venue : Meeting Room at 2nd Floor Angkasapuri

The list of participants appears as annex.

**1. Introduction**

The discussion aimed to facilitate the JICA Study Team to undertake their field survey in Sabah and Sarawak. A number of questions were also raised by RTM and Telecoms officials as regards to the Inception Report prepared by JICA.

**2. Mr. Tham (RTM) asked whether any other areas will be surveyed apart from those shown in the schedule of Inception Report.**

JICA replied no.

**3. Mr. Tham also asked JICA to relate the Inception Report to Plan A and Plan B as envisaged in earlier discussions. JICA replied that Plan A is in the Inception Report but Plan B is on the map survey and will be prepared later.**

**4. JICA requested RTM and Telecoms to furnish it with the following information:**

- a. Priority of channels and the reasons.
- b. Can the frequencies for e.g. Layang-Layang be shifted if necessary?
- c. Broadcasting differences between medium wave radio and FM, including future plan.
- d. Where will the broadcast programmes be produced?
- e. What kind of transmission lines do you plan to use?
- f. Also what is the operation costs for different transmission lines used.
- g. Any future plan as regards to transmission lines from station to station in Sabah and Sarawak and also estimated costs per year.
- h. Based on the Final Report of Peninsular Malaysia where the possible height is more than 100 meter for the tower which is also used for FM, does this apply to Sabah and Sarawak. Therefore information on the detail drawings of the tower.
- i. Seismic data (and range of wind velocity for design of tower).

**Other matters raised**

5. JICA wanted to know whether RTM and Telecoms have any comments on the Final Report for Peninsular Malaysia particularly from the personnel and costs viewpoint.

Mr. Tham replied that Economic Planning Unit has due to say.

6. JICA asked whether there is any difference between frequency planning for Sabah and Sarawak and Peninsular Malaysia.

Mr. Tham replied that basically there is no difference and said that what RTM and Telecoms wanted is a master frequency plan with the maximum number of networks.

7. JICA wanted to know the Acts governing telecommunications.

8. JICA enquired whether there is any future plan for VHF frequency.

Mr. Chong (Telecoms) will give details of this soon.

9. JICA requested for frequency details.

**Discussion on Feasibility Study of VHF/FM Broadcasting in the States of Sabah and Sarawak, held on 19th June, 1982 at Angkasapuri, Kuala Lumpur**

**Present**

Mr. S. K. Tham (Chairman)

R. T. M.

Mr. Takahiro Kawazoe

J. I. C. A.

Mr. Masayuki Hirata

"

Mr. Hitoshi Shioda

"

Mr. Tetsuya Nohmura

"

Mr. Masami Douchi

"

Mr. Shoji Tsuda

"

Mr. Hiroshi Narita

"

Mr. Yoshiaki Higashi

"

Mr. Hogara Chiba

"

Mr. H. S. Gendeh

R. T. M.

Mr. P. Balagopal

"

Mr. Chandra Malairaja

Ministry of Information

Mr. Chong Beng Tiat

Telecoms

Mr. Khen Wah

"



**MINUTES OF MEETING FOR FEASIBILITY STUDY ON VHF/FM  
BROADCAST COVERAGE PLAN FOR THE STATES OF SABAH AND SARAWAK**

Discussion between members of RTM, telecoms Officials and JICA Study Team.

Date : 27th of July, 1982

Time : 14:30 - 17:30

Venue : Meeting Room at 2nd Floor Angkasapuri

**1. Introduction**

The Meeting aimed to confirm the basic data and references for preparation of the Draft Final Report and to report the completion of field survey in Sabah and Sarawak by JICA Study Team to RTM and Telecoms.

2. Minutes of last meeting, which was held dated 19th of June, was introduced by the Malaysian side and its contents were confirmed by both parties.

3. A number of data and information, which were requested by JICA Study Team at the time of the last meeting, were introduced by the Malaysian side and also the Malaysian side promised to give the reply by letter as soon as possible for some items as that could not be prepared yet so far.

4. Mr. T. Kawazoe, Leader of JICA Study Team, expressed appreciation for the cooperation and assistance extended to JICA Study Team by counterparts at the time of field survey on the spot.

5. The 'Interim Report' was submitted and explained by JICA Study Team to RTM and Telecoms and agreed by RTM and Telecoms.

**Other matters raised**

**6. Existing FM Radio Transmitters, (at Layang Layang) and STL's**

(from Kota Kinabalu Studio to Lawa Mandau, Layang Layang, Tuaran)

a) JICA wanted to know whether the FM Radio Transmitter frequencies at Layang Layang can be shifted to other frequencies, if necessary. RTM agreed to this provided the frequency shiftings are within the FM Broadcast Band.

b) The existing STL frequencies are within the FM Broadcast Band. RTM said that these STL frequencies will eventually be shifted out of the FM Broadcast Band. RTM informed the Meeting that they have indications from Telecoms that in future all STL frequencies should be in the 2 GHz Band, however this is to be confirmed by Telecoms.

**7. Maps**

JICA Study Team requested for assistance in getting some maps for states of Sabah and Sarawak. Most of the maps of 1/50,000 scale have already been supplied by EPU to JICA Study Team, however eight (8) sheets of the map are still lacking.

Mr. S.K. Tham (RTM) promised to try to obtain these maps and send to JICA, Tokyo by mail as soon as possible.

And also JICA Study Team wanted a letter giving permission to take the Maps out of Malaysia to Japan.

Mr. S. K. Tham (RTM) agreed to arrange for this.

Above mentioned matters were confirmed and agreed by and between the both parties.

Kuala Lumpur, 27th of July, 1982.

川添隆公

.....  
(Takahiro Kawazoe)

Leader

Japanese Feasibility Study Team

on behalf of

JAPAN INTERNATIONAL COOPERATION  
Agency.



.....  
(S. K. THAM)

Deputy Director General (Engineering)

Department of Broadcasting,

Malaysia.

**List of attendants**

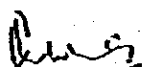
<b>Mr. S. K. Tham (Chairman)</b>	<b>R. T. M.</b>
<b>Mr. P. Balagopal</b>	<b>"</b>
<b>Mr. Ahmad Abdullah</b>	<b>"</b>
<b>Mr. Cheah Fook Yen</b>	<b>Telecoms.</b>
<b>Mr. Chandra Malairaja</b>	<b>Ministry of Information</b>
<b>Mr. Takahiro Kawazoe</b>	<b>J. I. C. A.</b>
<b>Mr. Masayuki Hirata</b>	<b>"</b>
<b>Mr. Hitoshi Shioda</b>	<b>"</b>
<b>Mr. Hiroshi Narita</b>	<b>"</b>
<b>Mr. Shoji Tsuda</b>	<b>"</b>
<b>Mr. Yoshiaki Higashi</b>	<b>"</b>
<b>Mr. Tetsuya Nohmura</b>	<b>"</b>
<b>Mr. Hogara Chiba</b>	<b>"</b>
<b>Mr. Masami Douchi</b>	<b>"</b>
<b>Mr. Mitsutoshi Kikuchi</b>	<b>"</b>

Scope of Work (S/W)

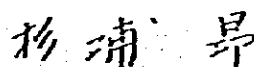
**SCOPE OF WORK FOR FEASIBILITY STUDY  
ON VHF/FM BROADCAST COVERAGE PLAN  
FOR THE STATES OF SABAH AND SARAWAK, MALAYSIA  
ABREED BETWEEN  
THE GOVERNMENT OF MALAYSIA  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY**

Kuala Lumpur

22ND MARCH 1982



.....  
**(TAN SRI ISHAK BIN PATEH AKHIR)**  
DIRECTOR GENERAL  
ECONOMIC PLANNING UNIT  
PRIME MINISTER'S DEPARTMENT  
on behalf of  
THE GOVERNMENT OF MALAYSIA



.....  
**(TAKASHI SUGIURA)**  
LEADER  
JAPANESE PRELIMINARY  
STUDY TEAM  
on behalf of  
JAPAN INTERNATIONAL COOPERATION  
AGENCY

## **I. Introduction**

In response to the request of the Government of Malaysia, the Government of Japan has agreed to conduct a Feasibility Study on VHF/FM Broadcast Coverage Plan for the States of Sabah and Sarawak (hereinafter referred to as 'the Study') in accordance with laws and regulations in force in Japan, and the Japan International Cooperation Agency (hereinafter referred to as JICA), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan, will carry out the Study in close cooperation with the Government of Malaysia and the authorities, in particular the Ministry of Information and the Telecommunications Department of Malaysia.

The present document sets forth the Scope of Work for the Study.

## **II. Objective of the study**

To conduct the Feasibility Study on the VHF/FM Broadcasting Coverage Plan for the states of Sabah and Sarawak.

## **III. Outline of study**

The Study will entail field survey in Malaysia and analysis work in Japan. Items to be covered by the Study are as follows:

### **1. General**

Present status of broadcasting facilities and services in Malaysia:

- 1) Existing facilities and future plan of domestic telecommunications network.
- 2) Present technical standards of broadcasting facilities
- 3) Laws and regulations concerned
- 4) Broadcasting service revenue and expenditure

### **2. Project**

- 1) Preparation of frequency allocation plan for the optimum number of networks.
- 2) Determination of transmitter power, ERP and estimate coverage area for each expected transmitting station.
- 3) Topographical condition and their surroundings at expected sites.
- 4) Selection of sites
  - a) Using existing Telecoms stations
  - b) Other alternative sites
- 5) Radio propagation test
- 6) Selection of optimum system
- 7) Determination of programme relay system
- 8) Preparation of preliminary engineering designs
- 9) Preparation of specification with respect to international standards
- 10) Programme plan
- 11) Personnel plan
- 12) Estimation of construction, equipment, operation and maintenance costs

- 13) Preparation of implementation schedule
- 14) Project evaluation including socio-economic aspect

#### **IV. Schedule of study**

The Study shall be undertaken in accordance with the schedule of Study (refer to Annex).

#### **V. Report**

The JICA will prepare and submit the following reports in English to the Government of Malaysia.

1. **Draft final report (20 copies)**  
To be submitted within four-half months after completion of the field survey. The government of Malaysia is requested to provide its comments on the draft final report within a period of two months after its submission.
2. **Final report (50 copies)**  
To be submitted within two months after receiving comments on the draft final report from the Government of Malaysia.
3. All reports when finalised and submitted to the Government of Malaysia shall remain the property of the Government of Malaysia.

#### **VI. Undertakings of the government of Malaysia**

1. To provide the team with relevant data, information and materials necessary for implementation of the Study.
2. To exempt the Study Team from taxes and duties normally accorded under the provision of General Circular No.1 of 1979 for materials, equipment and personal effects brought into Malaysia for the purpose of the Study.
3. To appoint counterpart personnel to the Study Team during the Study period.
4. To arrange adequate means of transportation (expenses for transportation will be borne by the team).
5. To provide the Study Team with suitable office space, necessary office equipment and secretarial services for the study wherever available.
6. To make arrangement for the Study Team to take back to Japan the data, maps and materials connected with the Study subject to the approval by the Government of Malaysia in order to prepare the reports.
7. To secure the necessary entry permits for the Study Team to conduct field surveys in Malaysia.
8. To inform the members of the Study Team of any existing risk in the study area and take any measure deemed necessary to secure the safety of the members of the Team.

9. To indemnify any member of the Study Team in respect of damages arising from any legal action against him in relation to any act performed or omissions made in undertaking the survey except when the two Governments agree that such a member is guilty of gross negligence or wilful misconduct.
10. To provide the Study Team with medical facilities when needed, but medical expenses shall be chargeable to the Study Team.

#### **VII. Undertaking of the government of Japan**

1. To send a Study Team in relevant fields to undertake the Study.
2. To bear travelling expenses and fares between Japan and Malaysia and also within Malaysia including necessary aircraft charters for members of the Study Team.
3. To meet the cost of accommodation and living expenses for members of the Study Team during their visits to Malaysia.
4. To perform technology transfer to Malaysian counterpart personnel in the course of the Study.

#### **The Principle in Frequency Assignment Planning on Proposed Report**

Upon request of the Government of Malaysia, the Study Team would like to propose the under-mentioned principle in frequency assignment planning on proposed report.

- PLAN A**      Frequency assignment plan for most populated area  
Estimated number of the sites will be 10-15 for 1st Stage, while 3-10 for 2nd stage.
- PLAN B**      Frequency assignment plan to cover entire population Land  
Land coverage will be 98%.  
Number of possible networks by Plan B will be less than that of Plan A.  
The reason is that it is necessary to avoid mutual interference among stations by means of estimation at initial planning stage.  
If Plan B is made after completion of Plan A networks, it is much easier to find more possible channels in number because it will be possible to measure actual radiated field strength to predict mutual interference in more precise way.

Thus, we stressed the merit of Plan A. Meanwhile, the merit of Plan B is that possible number of networks is guaranteed to cover whole States though the number of networks is less than that of Plan A. Therefore, when implementation of the project, the Government of Malaysia will have to choose one of Plan A or B.

**Proposed Frequency Assignment Plan**

Implementation schedule	PLAN A		PLAN B
	1st Stage	2nd Stage	
Number of site	10 – 15	3 – 10	30 – 50
Number of network	6 – 7	6 – 7	2 – 4
Station names (MHz)	Kuching (88.0, 90.0, ..., 98.0) Simmangang (100.0, 102.0, ... ) . . . Tawau (90.0, 92.0 ..., 100.0)	Long Geng (88.0, 90.0, ... ) Long Tebangan (91.0, ... ) . . .	Kuching (88.0, 90.0, 92.0) Simmangang (100.0, 102.0, 104.0) . . . Long Geng (88.0, 90.0, 92.0) . Long Tebangan (91.0, . . . ) . . Tawau (90.0, 92.0, 94.0) . . Long Seridan (97.0, 99.0, 101.0) . .
Population coverage	90 (%)	95 (%)	100 (%)
Land coverage	50 (%)	55 (%)	98 (%)



**TERMS OF REFERENCE**

7th December, 1981.

**URGENT/BY HAND:**

**Mr. K. Takada,  
First Secretary,  
Embassy of Japan,  
6th Floor, AIA Building,  
Jalan Ampang,  
KUALA LUMPUR**

Dear Mr. Takada,

**Feasibility Study on VHF/FM Broadcasting in the States of Sabah and Sarawak**

Further to the discussions held on 6th July, 1981 in this Unit with the Japanese Technical Cooperation Mission, I am pleased to submit herewith the Terms of Reference for the above-mentioned Study for your onward transmission to Tokyo.

2. We look forward to the early despatch of the Preliminary Survey Mission for the Study.
3. Your kind cooperation in this matter is much appreciated.

Yours sincerely,

**(WONG PEG HAR)**  
for Director General  
Economic Planning Unit

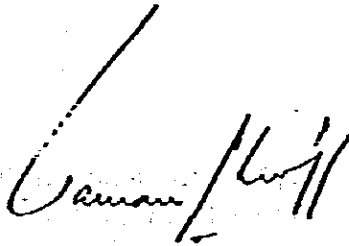
WPH/rs.

**MINUTES OF MEETING ON THE DRAFT FINAL REPORT  
FOR THE FEASIBILITY STUDY ON VHF/FM BROADCAST COVERAGE  
FOR THE STATES OF SABAH AND SARAWAK, MALAYSIA**

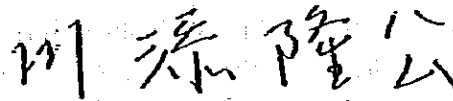
A series of discussion on the Draft Final Report was held and views were exchanged between the JICA Study Team headed by Mr. T. Kawazoe and relevant authorities of the Government of Malaysia, namely the Economic Planning Unit of the Prime Minister's Department, Ministry of Information and the Department of Telecommunications.

The Final Report, which would incorporate comments and amendments attached herewith, should be submitted to the Government of Malaysia by the end of May, 1983.

Kuala Lumpur  
9th March, 1983.



(KAMARUZZAMAN SHARIFF)  
DIRECTOR  
EXTERNAL ASSISTANCE/  
GENERAL SERVICES SECTION  
ECONOMIC PLANNING UNIT  
PRIME MINISTER'S DEPARTMENT



(TAKAHIRO KAWAZOE)  
LEADER  
JAPANESE FEASIBILITY STUDY TEAM  
on behalf of  
JAPAN INTERNATIONAL COOPERATION  
AGENCY

**Scope of Work and Terms of Reference for Feasibility Study of VHF/FM Broadcasting  
in the States of Sabah and Sarawak**

1. To formulate a Master Frequency Plan for the maximum number of networks covering the total land area of Sabah and Sarawak irrespective of concentration of population.
2. To recommend transmitter power, Effective Radiated Power (ERP) and estimated coverage area for each transmitting station.
3. To recommend a suitable programme relay interconnecting the proposed stations and between Sabah, Sarawak and Peninsular Malaysia taking into consideration the existing telecommunication networks.
4. To prepare radio profiles and confirm through radio propagation tests.
5. To recommend suitable Transmitting Station sites, taking into consideration the existing Telecoms Stations.
6. To prepare preliminary engineering designs.
7. To prepare preliminary cost estimates.

**Reports**

To prepare and submit the following reports in English to the Government of Malaysia:-

- (a) Draft Final Report — 20 copies
- (b) Final Report — 50 copies

**Training**

On completion of the preliminary surveys in Sabah and Sarawak, local counterpart engineers involved in the Study should be provided with training in Japan to learn how the data obtained is processed and the techniques employed in carrying out the frequency planning.

**COMMENT**

The Malaysian Government requested the JICA Study Team to include if possible, under Plan A, the coverage of the following three areas;

- (a) LINKABAU
- (b) TAMBISAN
- (c) KUAMUT and TANGKULAP

(It is understood that the three areas are covered under Plan B. However, JICA Study Team is requested to see if there is any possibility of covering these areas in Plan A.)

JICA Study Team agreed to look into this request and will incorporate their findings as an Annex to the Final Report.





