

資料集 B

電波伝搬調査

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第1編 多重通信回線プロフィール

第1編 多重通信回線プロフィール

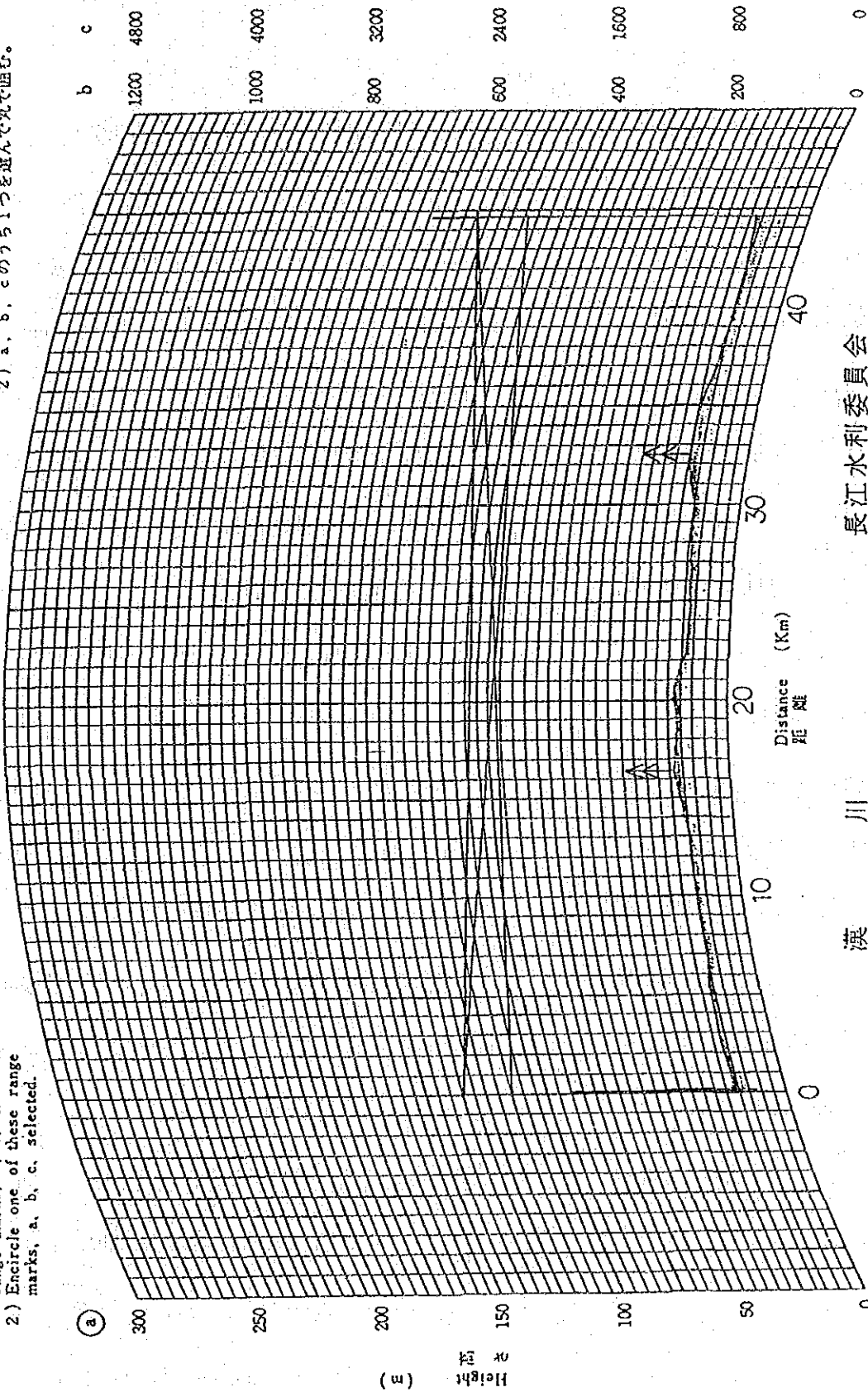
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Note: 1) The range of Distance and Height can be selected in the range marks, a, b, c.
 2) Encircle one of these range marks, a, b, c, selected.

Terrain Profile 見透図

(K=4/3)

注1) 距離と高さの範囲は、a, b, cの中から選ぶことができます。
 2) a, b, cのうち1つを選んで丸で囲む。



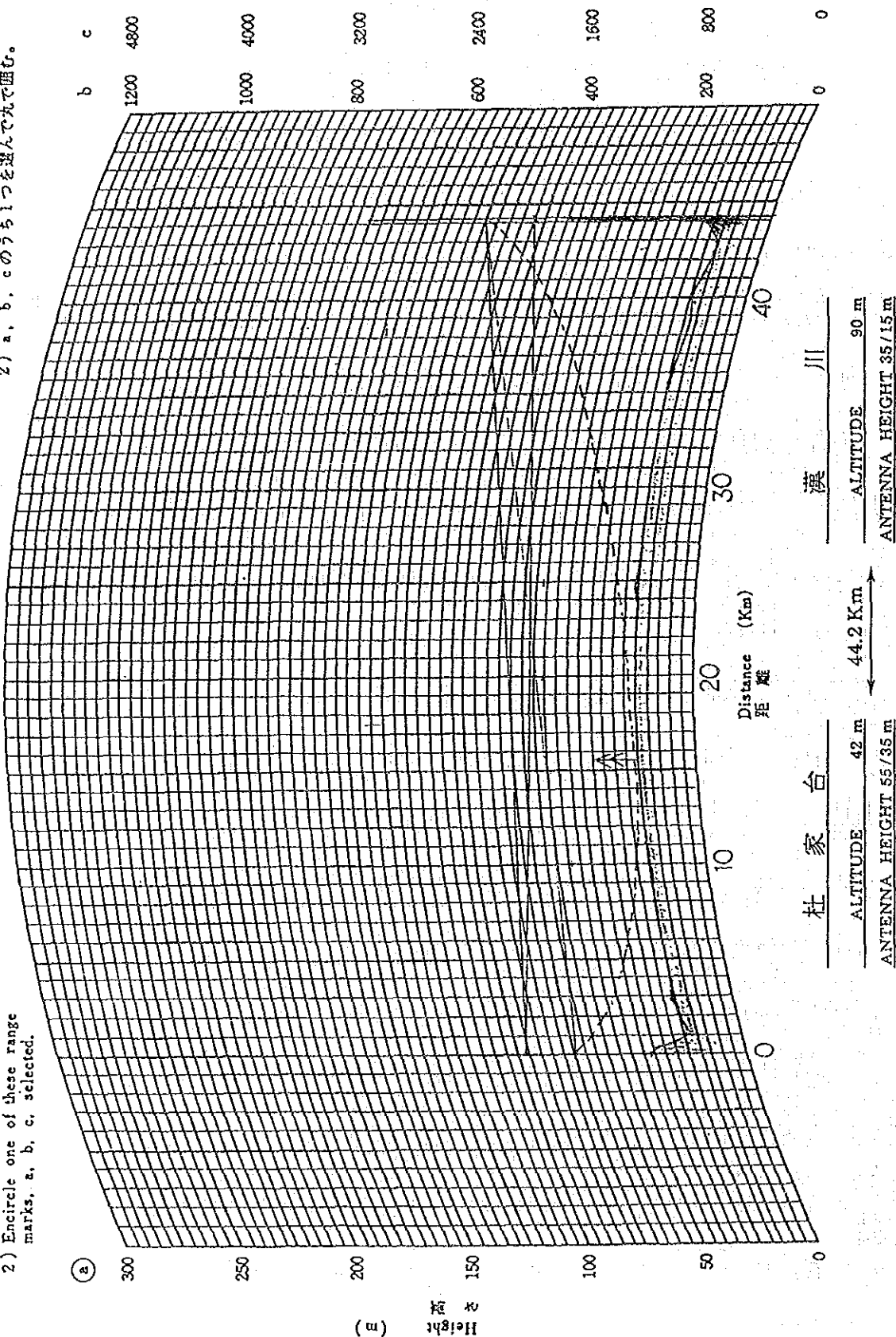
漢	川	長江水利委員会
ALTITUDE 90 m	44.7 Km	ALTITUDE 24 m
ANTENNA HEIGHT 45/25 m		ANTENNA HEIGHT 115/94 m

Note: 1) The range of Distance and Height can be selected in the range marks, a, b, c.
 2) Encircle one of these range marks, a, b, c, selected.

Terrain Profile 見透図

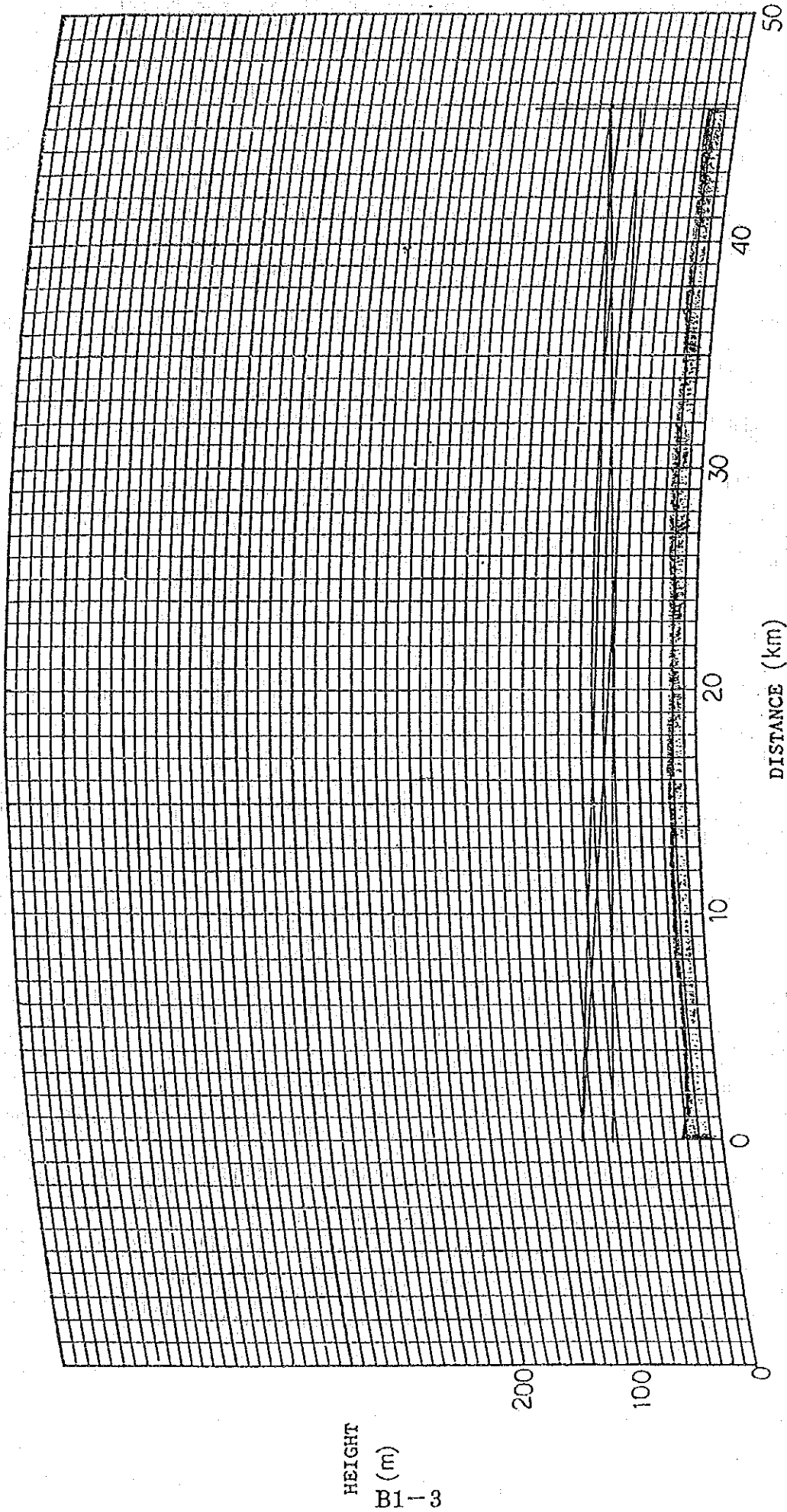
($K=4/3$)

注1) 距離と高さの範囲は、a, b, cの中から選ぶことができます。
 2) a, b, cのうち1つを選んで囲む。



Scale; E Type 60km/600m
(30km/150m; 120km/2400m)

TERRAIN PROFILE



杜家台	天門
ALTITUDE 42 m	ALTITUDE 30 m
ANTENNA HEIGHT 80/51 m	ANTENNA HEIGHT 80/54 m

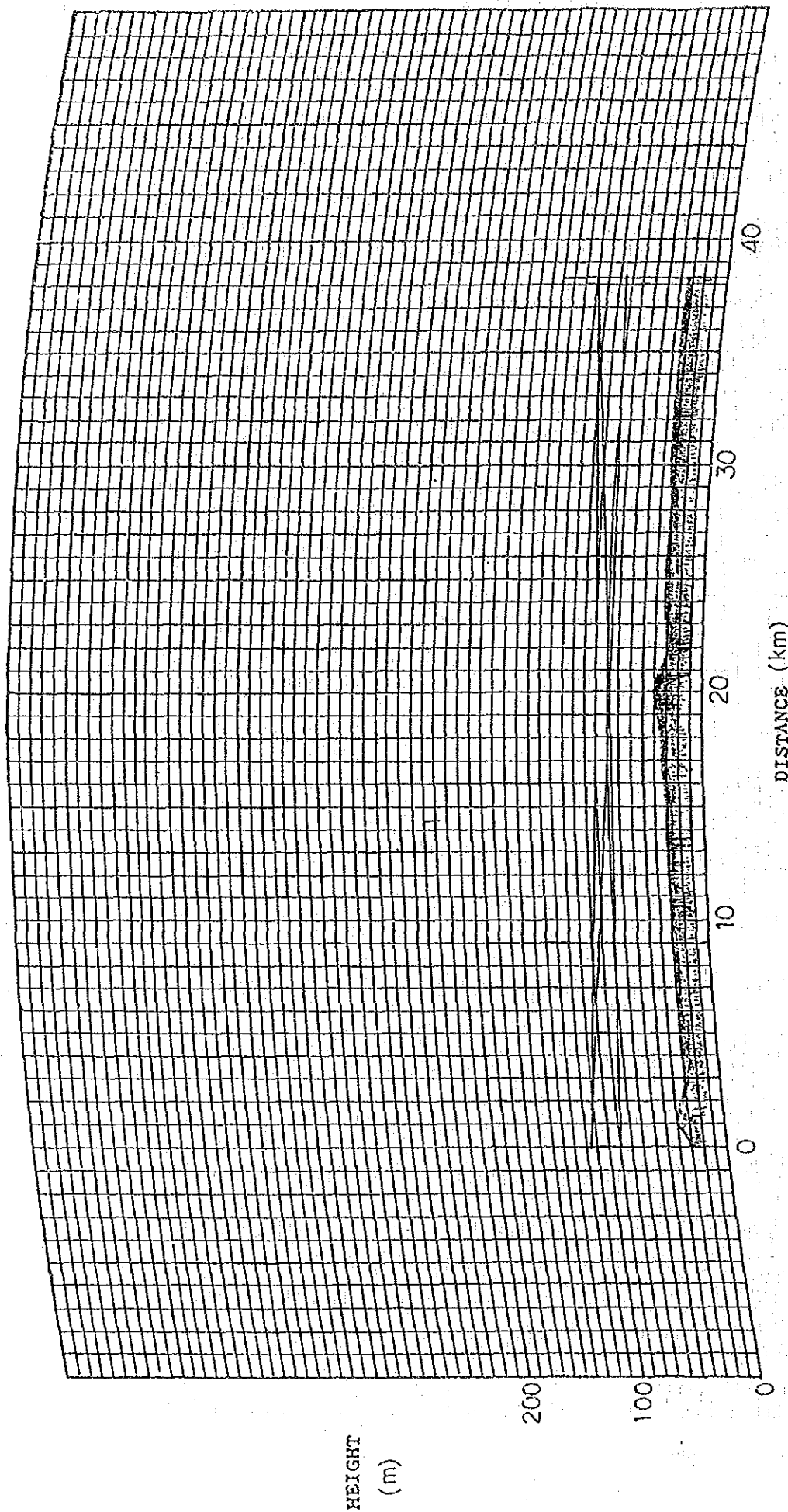
45.8 Km

K=4/3

Scale; E Type 60km/600m

(30km/150m; 120km/2400m)

TERRAIN PROFILE



濠江		天門	
ALTITUDE	35 m	ALTITUDE	30 m
ANTENNA HEIGHT	80/55 m	ANTENNA HEIGHT	80/56 m

38.3 Km

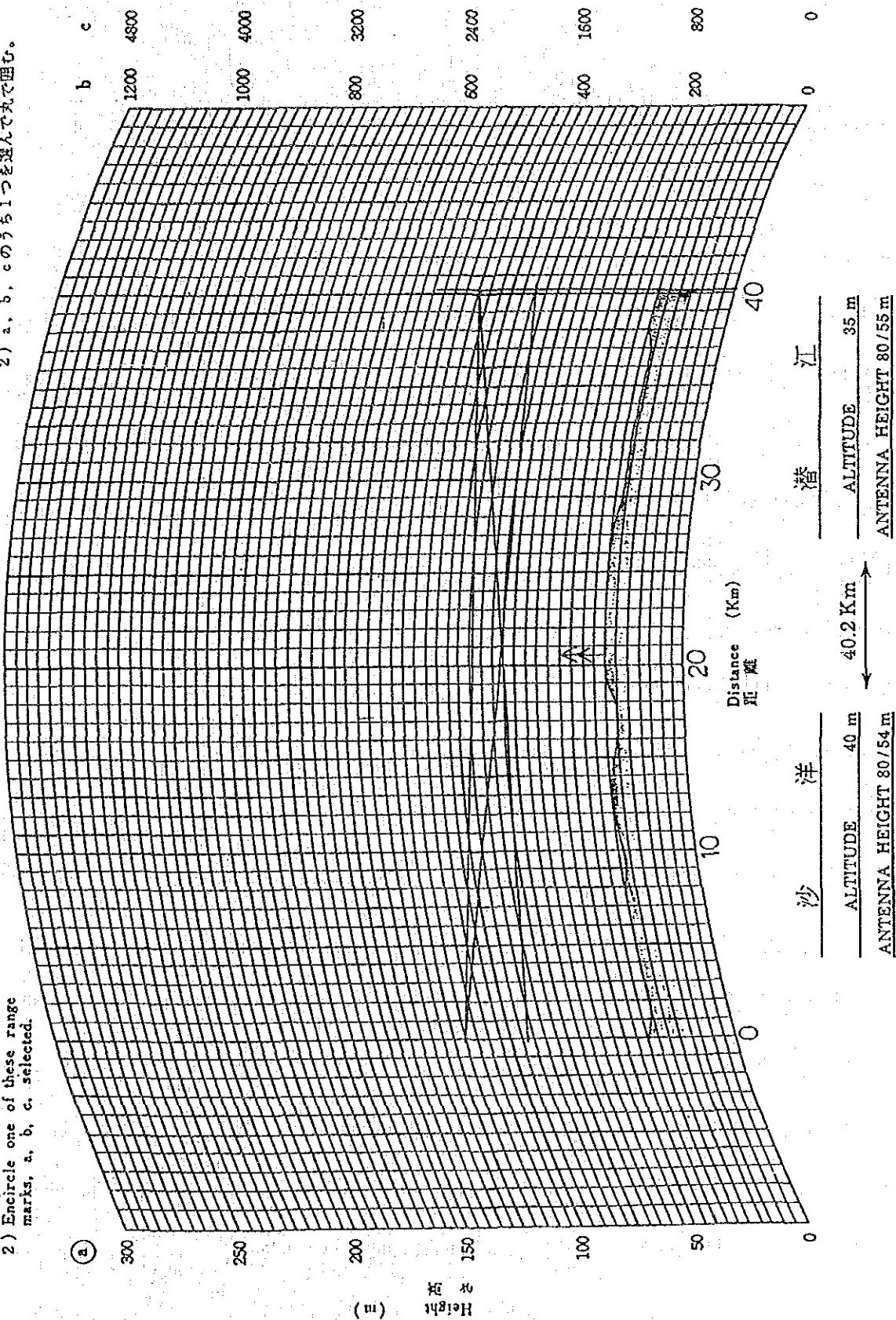
K=4/3

Note: 1) The range of Distance and Height can be selected in the range marks, a, b, c.
 2) Encircle one of these range marks, a, b, c. selected.

Terrain Profile 見透図

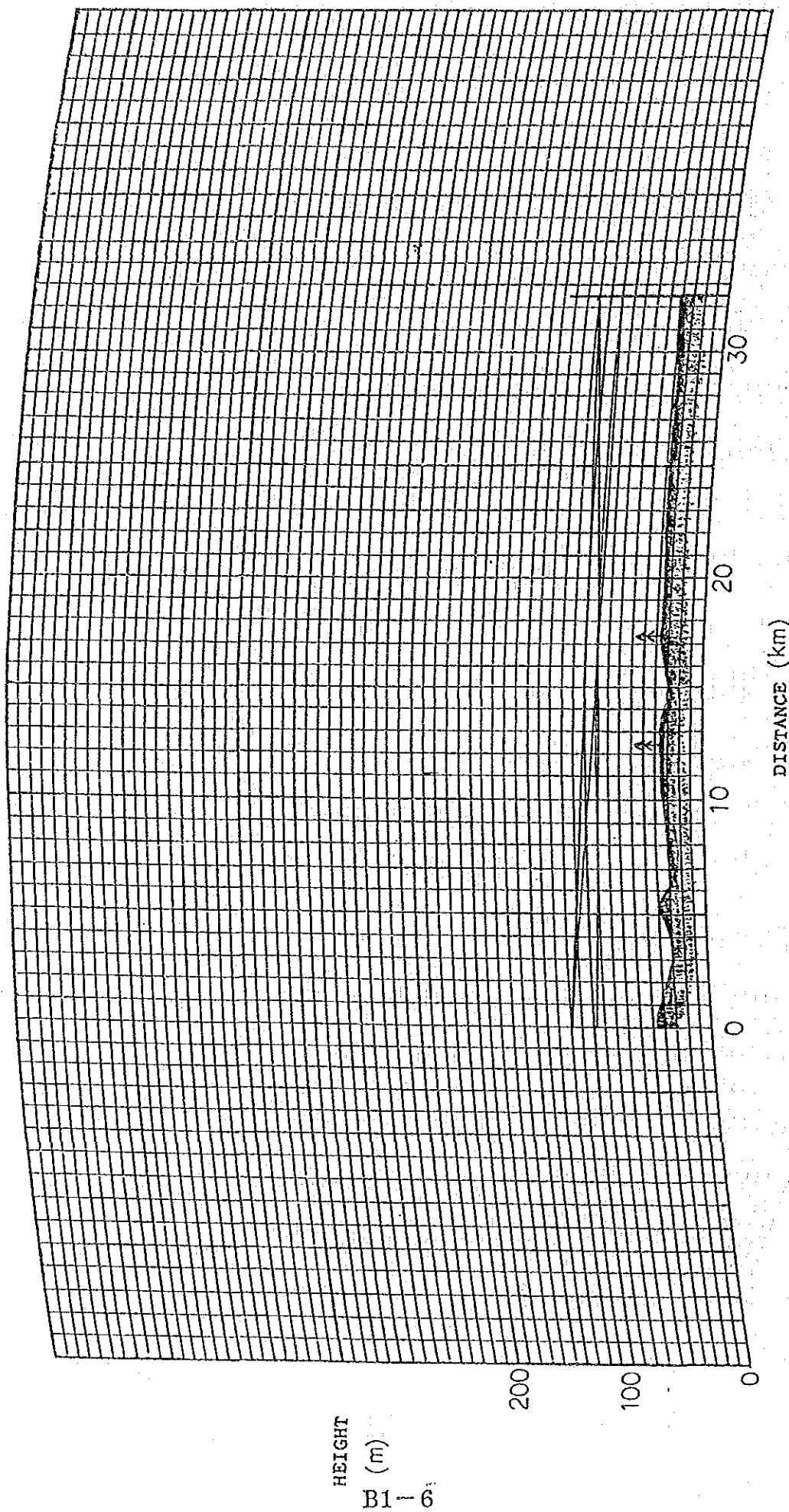
(K=4/3)

注1) 距離と高さの範囲は、a, b, cの中から選ぶことができます。
 2) a, b, cのうち1つを選んで丸で囲む。



Scale; E Type 60km/600m
(30km/150m; 120km/2400m)

TERRAIN PROFILE



沙	洋	柴	湖
ALTITUDE 40 m	32.4 Km	ALTITUDE 40 m	
ANTENNA HEIGHT 80/58 m		ANTENNA HEIGHT 70/50 m	

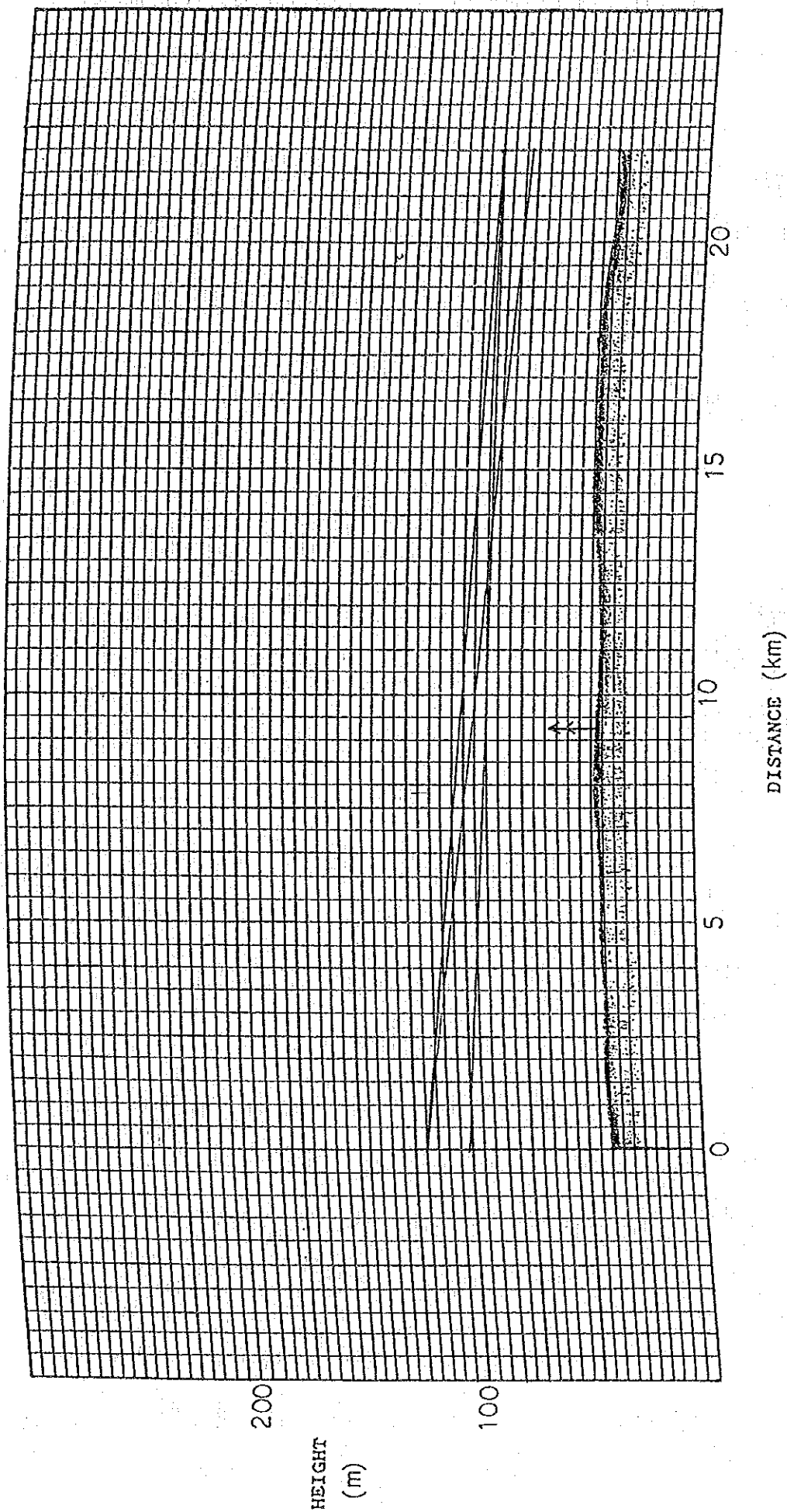
K=4/3

HEIGHT
(m)

B1-6

Scale: F Type 60km/1200m
(30km/300m)

TERRAIN PROFILE



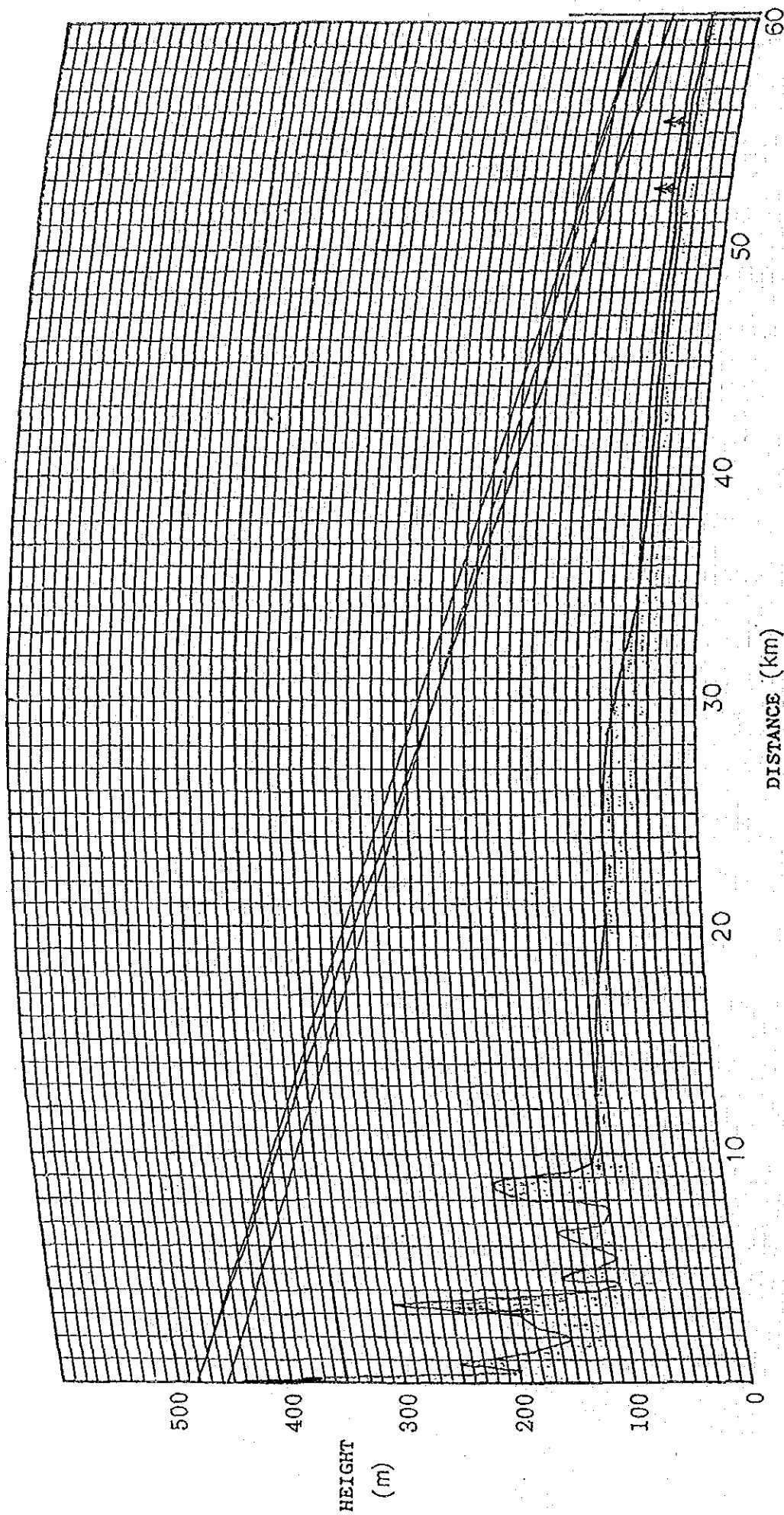
皇 庄	柴 湖
ALTITUDE 40 m	ALTITUDE 40 m
ANTENNA HEIGHT 80/62 m	ANTENNA HEIGHT 50/38 m
22.0 Km	

K=4/3

Scale; E Type 60km/600m

(30km/150m; 120km/2400m)

TERRAIN PROFILE



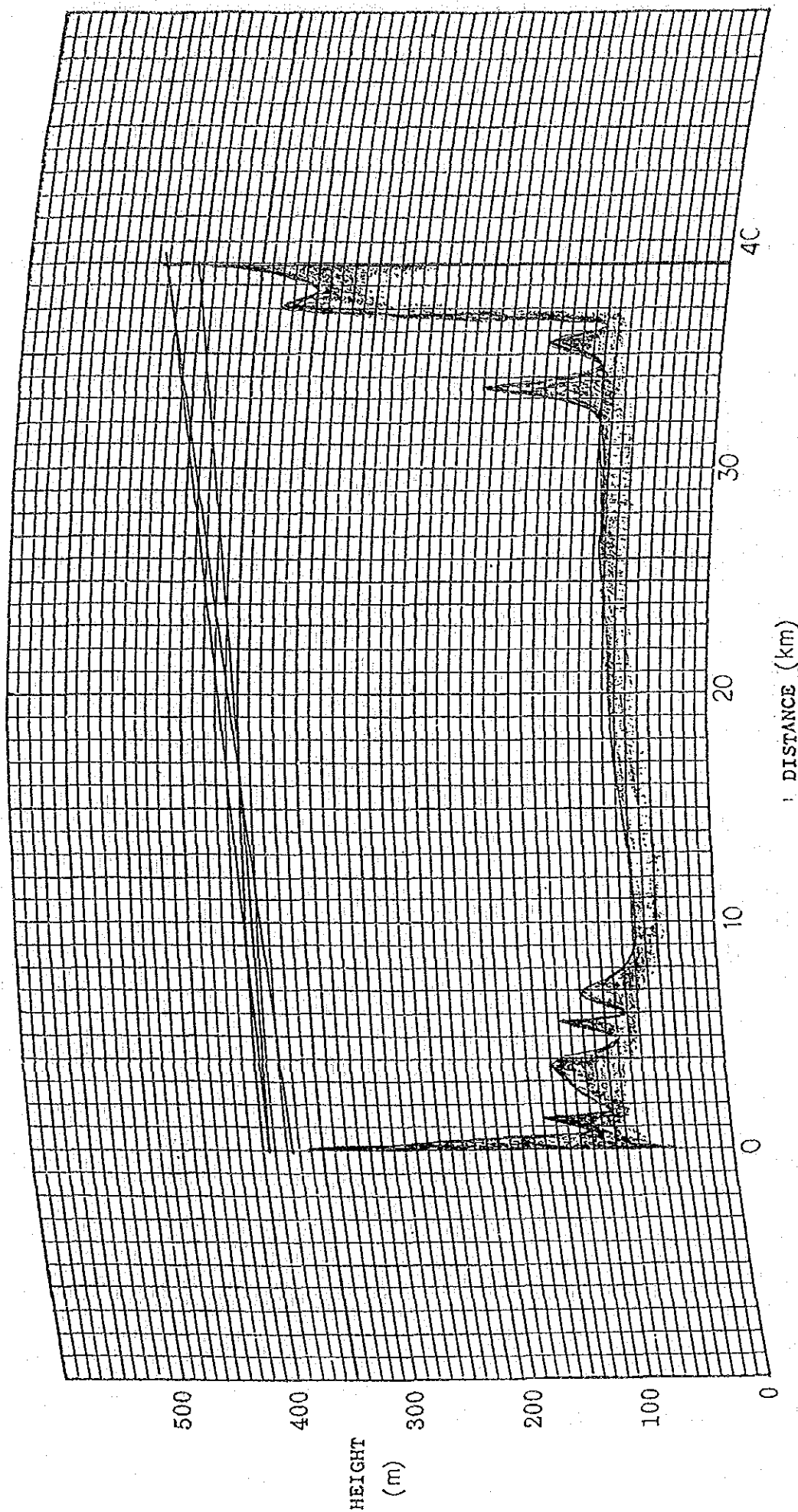
陽家大山		皇庄	
ALTITUDE	447 m	ALTITUDE	40 m
ANTENNA HEIGHT	35/10 m	ANTENNA HEIGHT	50/35 m

60.3 Km

K=4/3

Scale; E Type 60km/600m
(30km/150m; 120km/2400m)

TERRAIN PROFILE



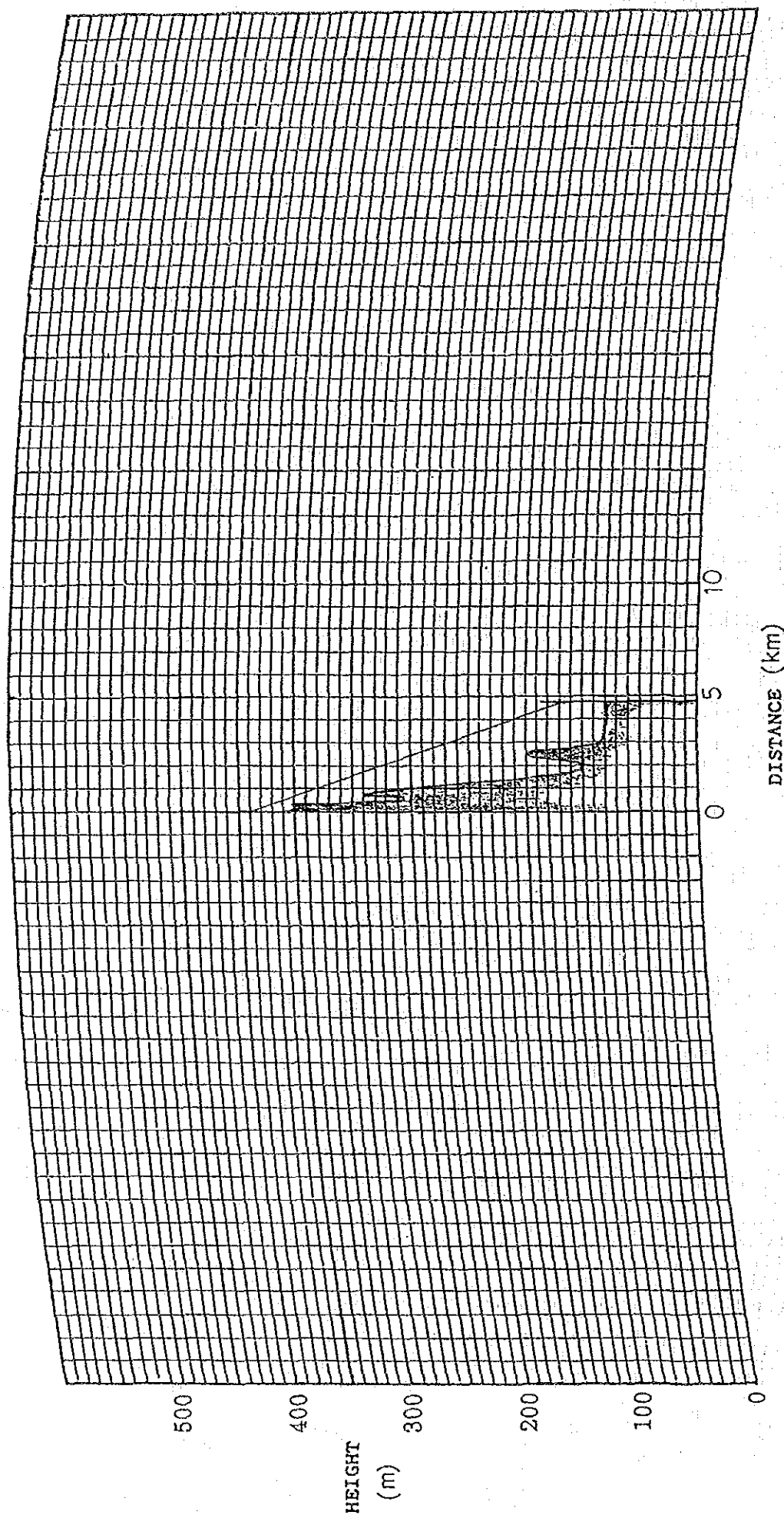
東 邊 山		陽 家 大 山	
ALTITUDE	360 m	ALTITUDE	446 m
ANTENNA HEIGHT	35/15 m	ANTENNA HEIGHT	35/10 m

38.9 Km

K=4/3

Scale; E Type 60km/600m
(30km/150m; 120km/2400m)

TERRAIN PROFILE



東 通 山		襄 樊 水 文 站	
ALTITUDE	360 m	ALTITUDE	80 m
ANTENNA HEIGHT	30 m	ANTENNA HEIGHT	35 m

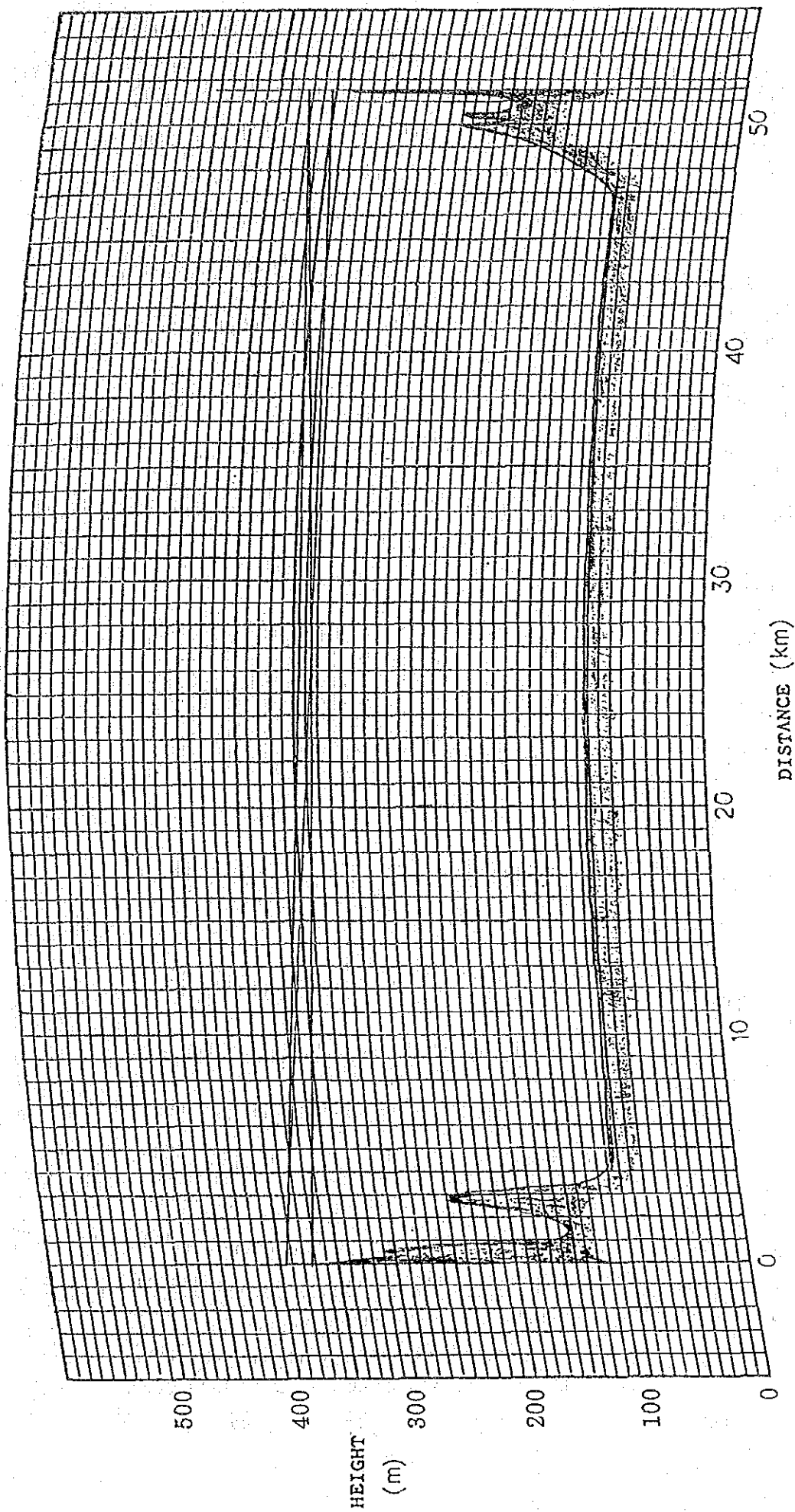
4.7 Km

K=4/3

Scale; E Type 60km/600m

(30km/150m; 120km/2400m)

TERRAIN PROFILE



東 邊 山	北 沖 山
ALTITUDE 360 m	ALTITUDE 338.4 m
ANTENNA HEIGHT 35/13 m	ANTENNA HEIGHT 35/14 m

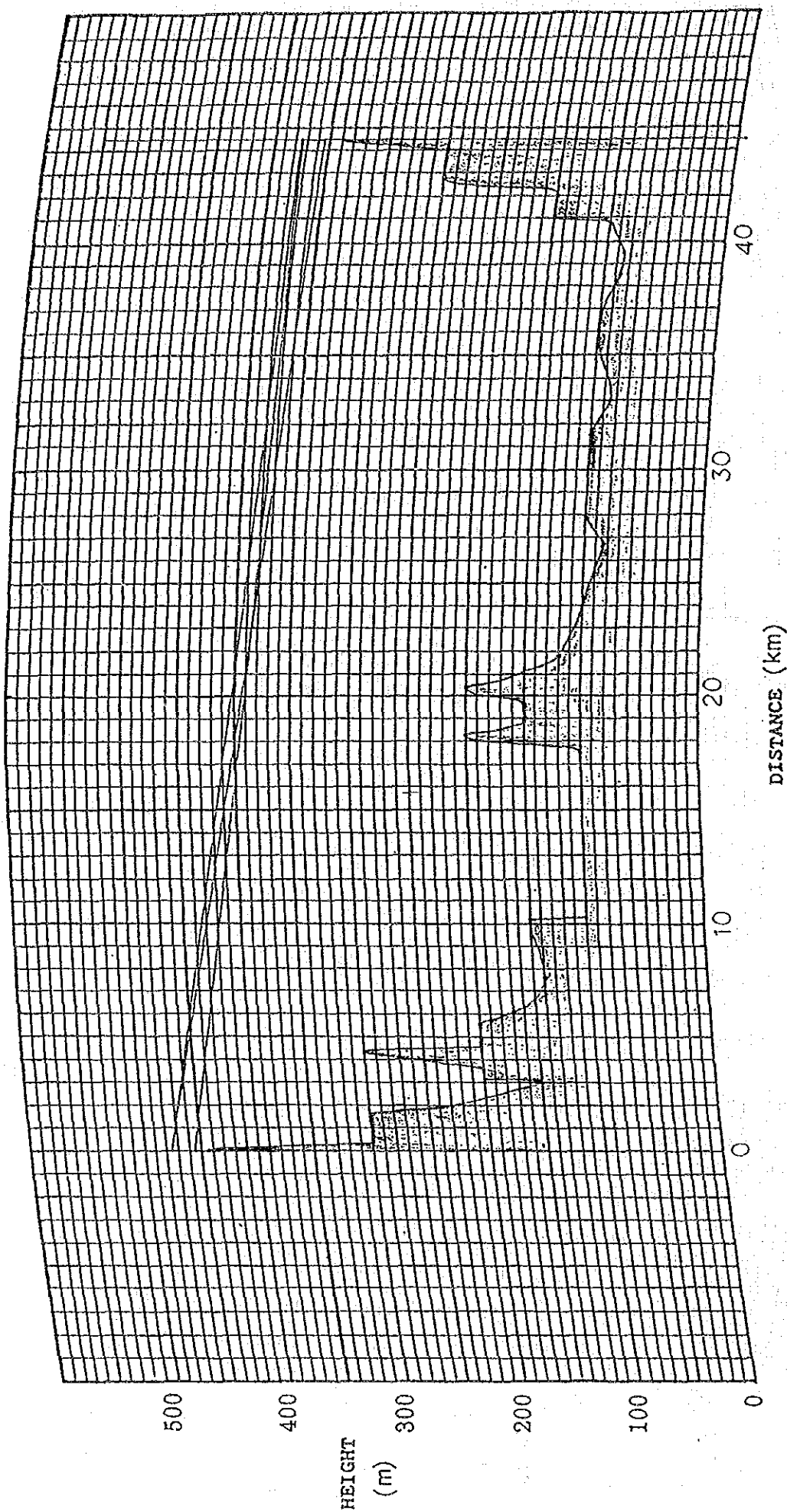
51.45 Km

K=4/3

Scale; E Type 60km/600m

(30km/150m; 120km/2400m)

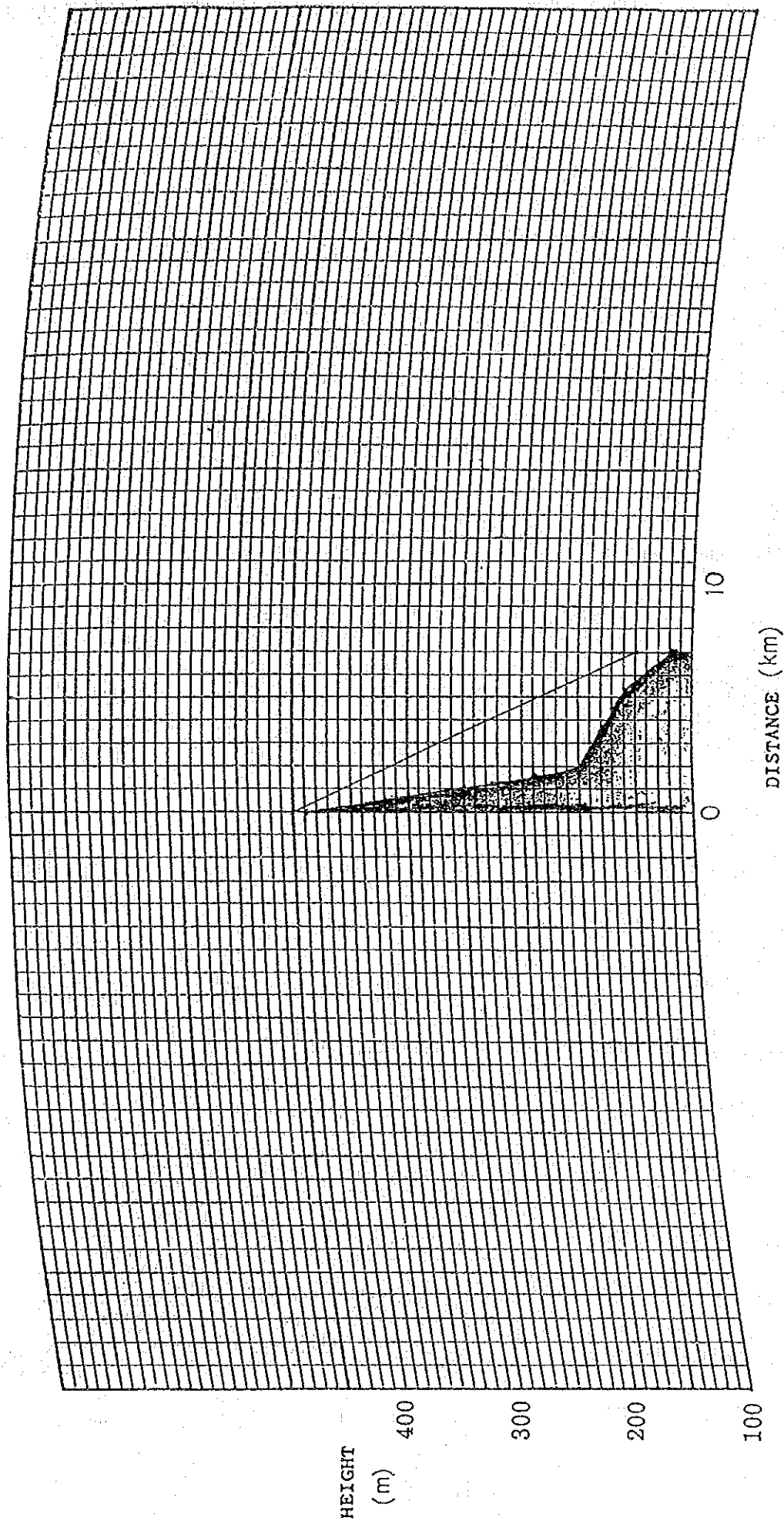
TERRAIN PROFILE



楊 山		北 冲 山	
ALTITUDE	441 m	ALTITUDE	339 m
ANTENNA HEIGHT	35/15 m	ANTENNA HEIGHT	35/15 m
44.5 Km			

Scale: E Type 60km/600m
(30km/150m; 120km/2400m)

TERRAIN PROFILE

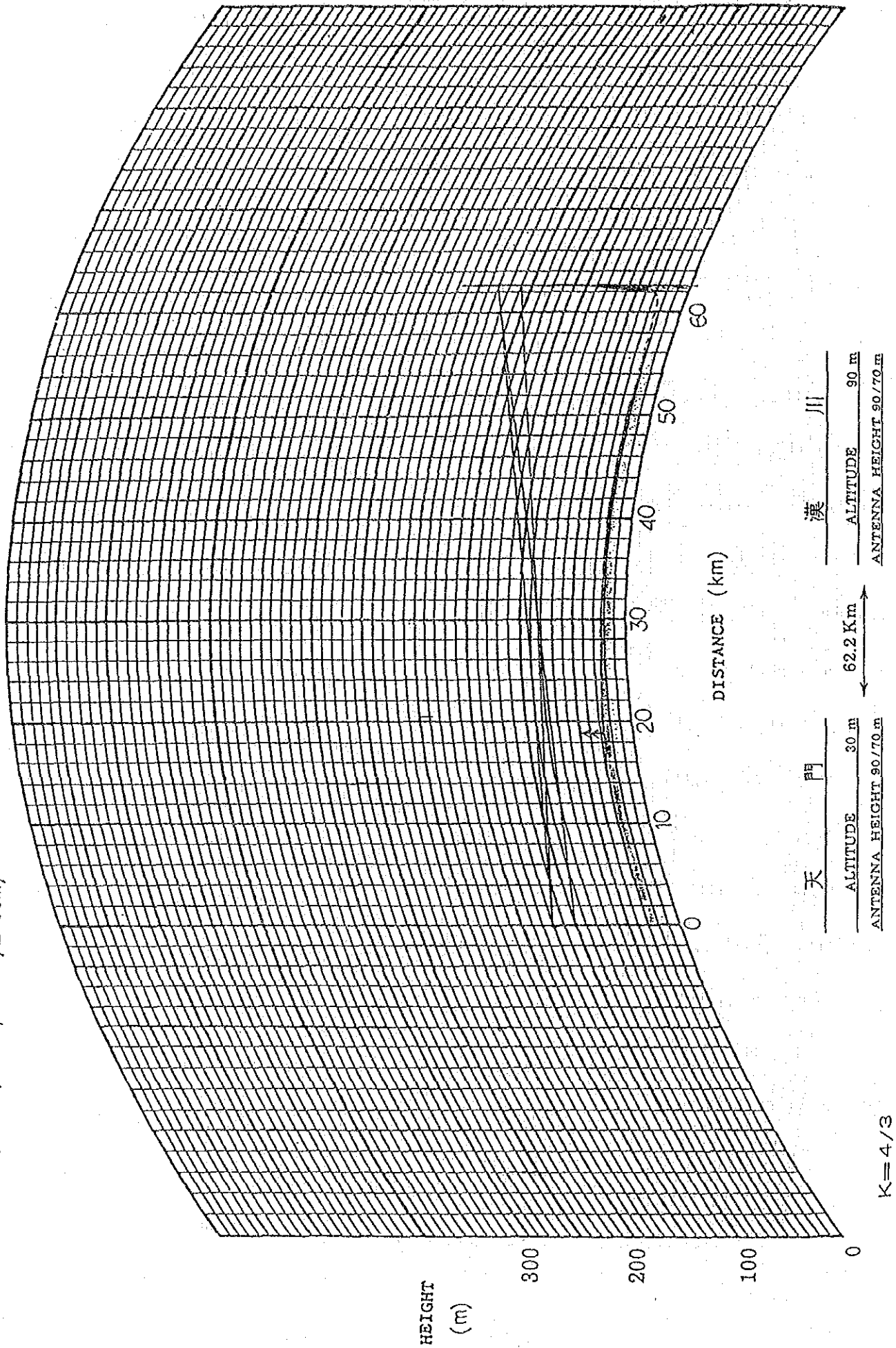


楊	山	F-12	丹江口水文總局
ALTITUDE	441 m	7.0 Km	ALTITUDE 120 m
ANTENNA HEIGHT	10 m		ANTENNA HEIGHT 30 m

$K=4/3$

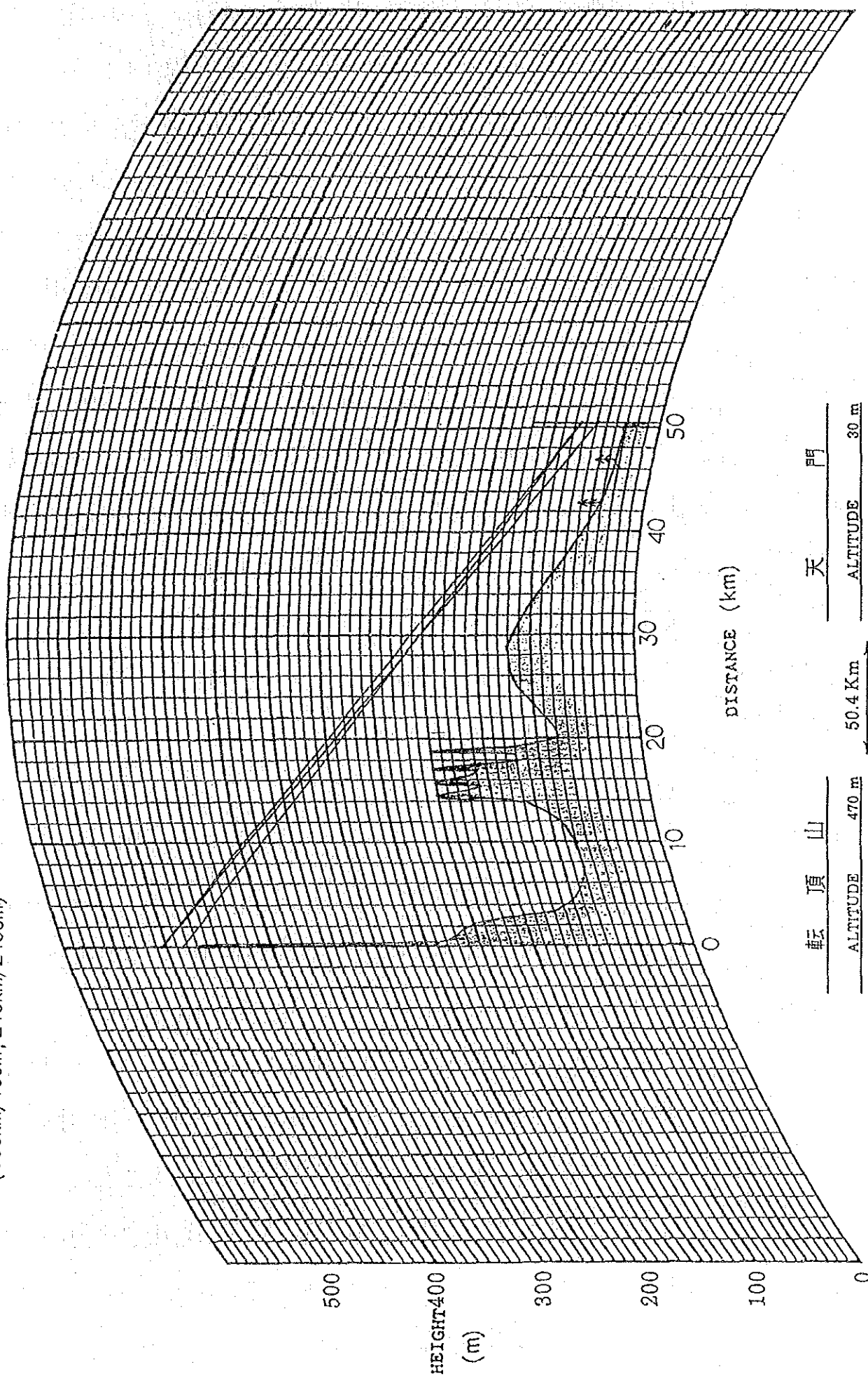
Scale; G Type 120km/600m
(600km/150m; 240km/2400m)

TERRAIN PROFILE



TERRAIN PROFILE

Scale; G Type 120km/600m
(600km/150m; 240km/2400m)



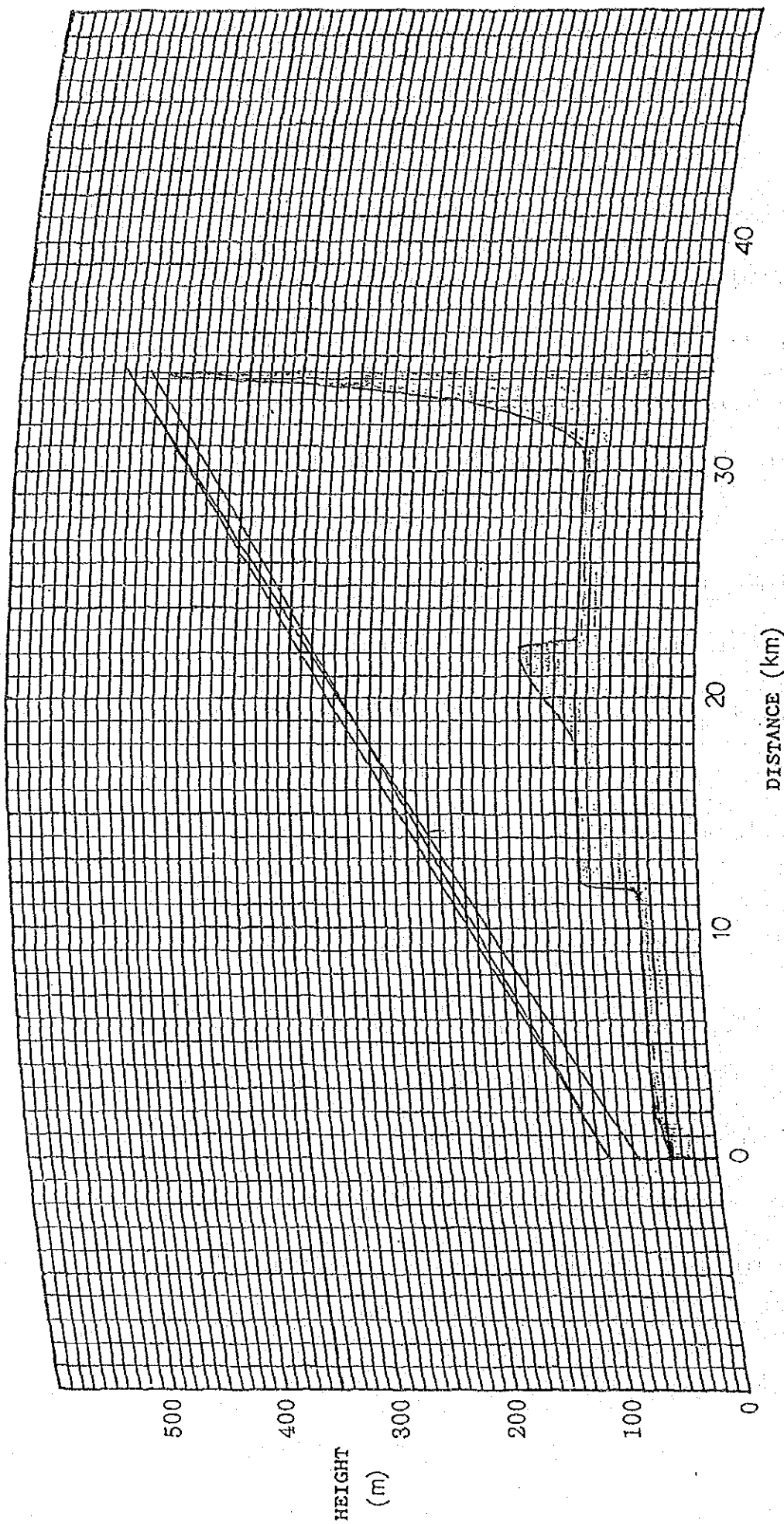
山頂	天	門
ALTITUDE 470 m	ALTITUDE 30 m	
ANTENNA HEIGHT 35/15 m	50.4 Km	ANTENNA HEIGHT 45/29 m

K=4/3

Scale; E Type 80km/600m

(30km/150m; 120km/2400m)

TERRAIN PROFILE



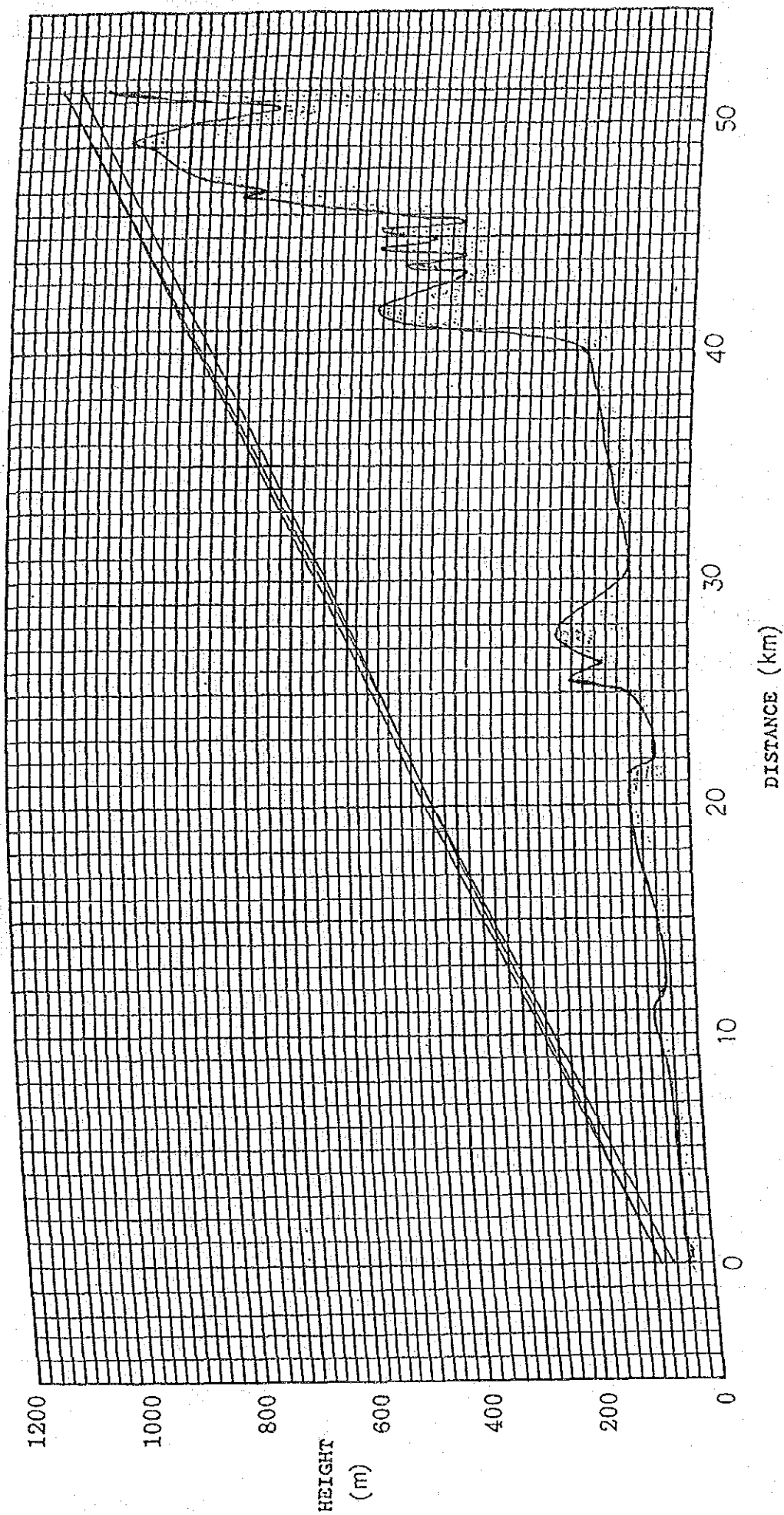
皇 庄	輦 頂 山
ALTITUDE 40 m	ALTITUDE 470 m
ANTENNA HEIGHT 50/27 m	ANTENNA HEIGHT 35/15 m

34.2 Km

K=4/3

Scale; F Type 60km/1200m
(30km/300m)

TERRAIN PROFILE



皇 庄	大 洪 山
ALTITUDE 40 m	ALTITUDE 1049 m
ANTENNA HEIGHT 50/23 m	ANTENNA HEIGHT 80/53 m

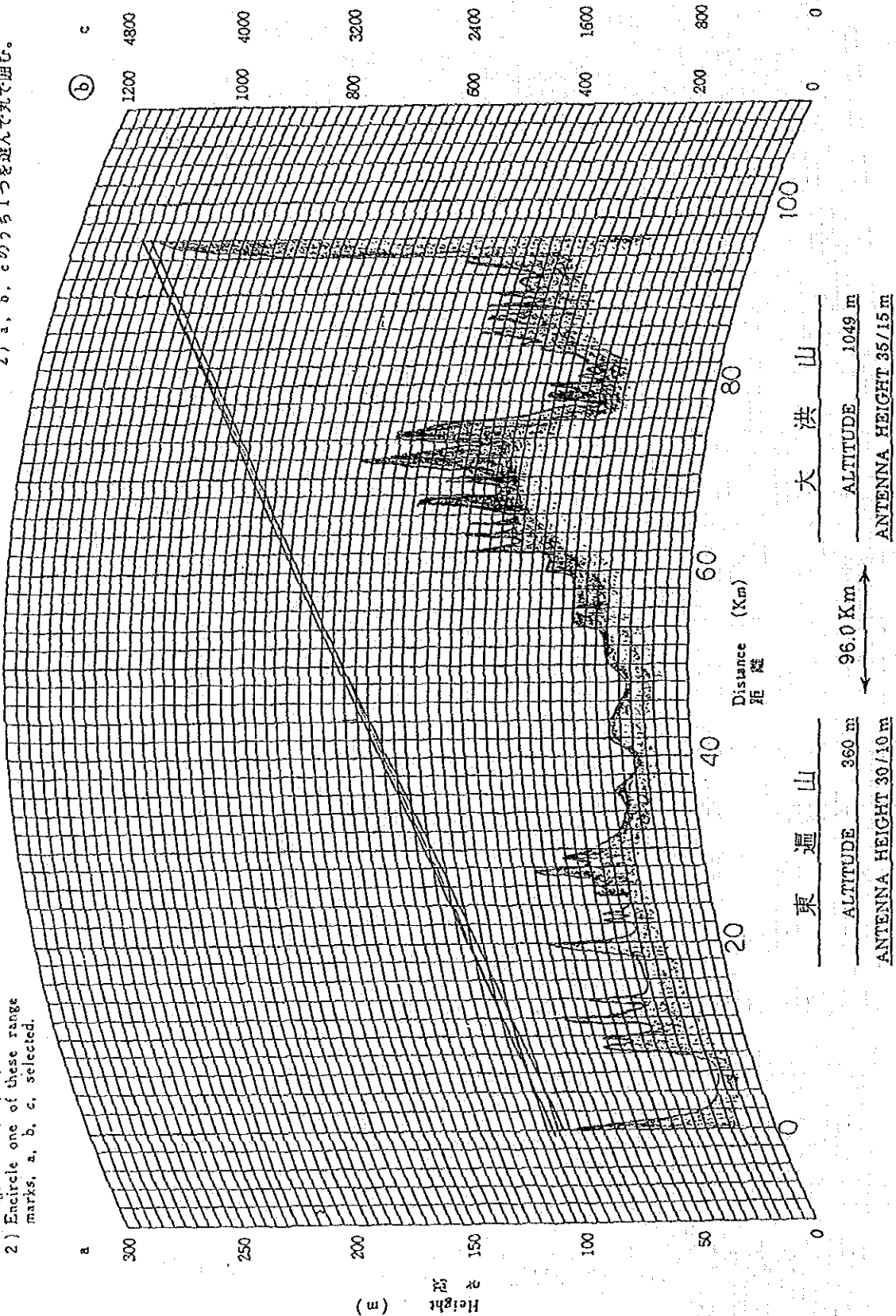
K=4/3

Note: 1) The range of Distance and Height can be selected in the range marks, a, b, c.
2) Encircle one of these range marks, a, b, c, selected.

Terrain Profile 見透図

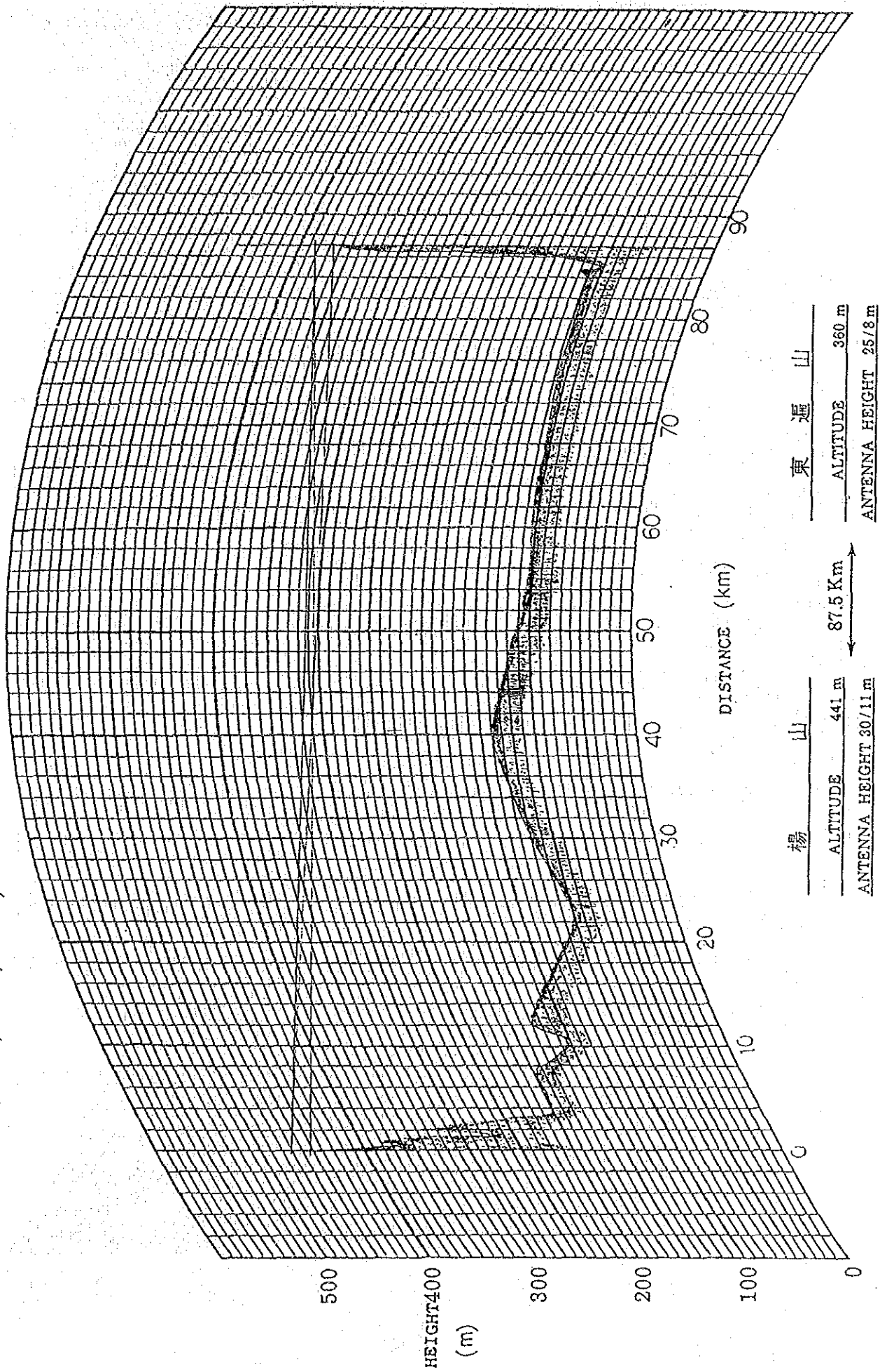
(K=4/3)

注1) 距離と高さの範囲は、a, b, cの中から選ぶことができます。
2) a, b, cのうち1つを選んで丸で囲む。



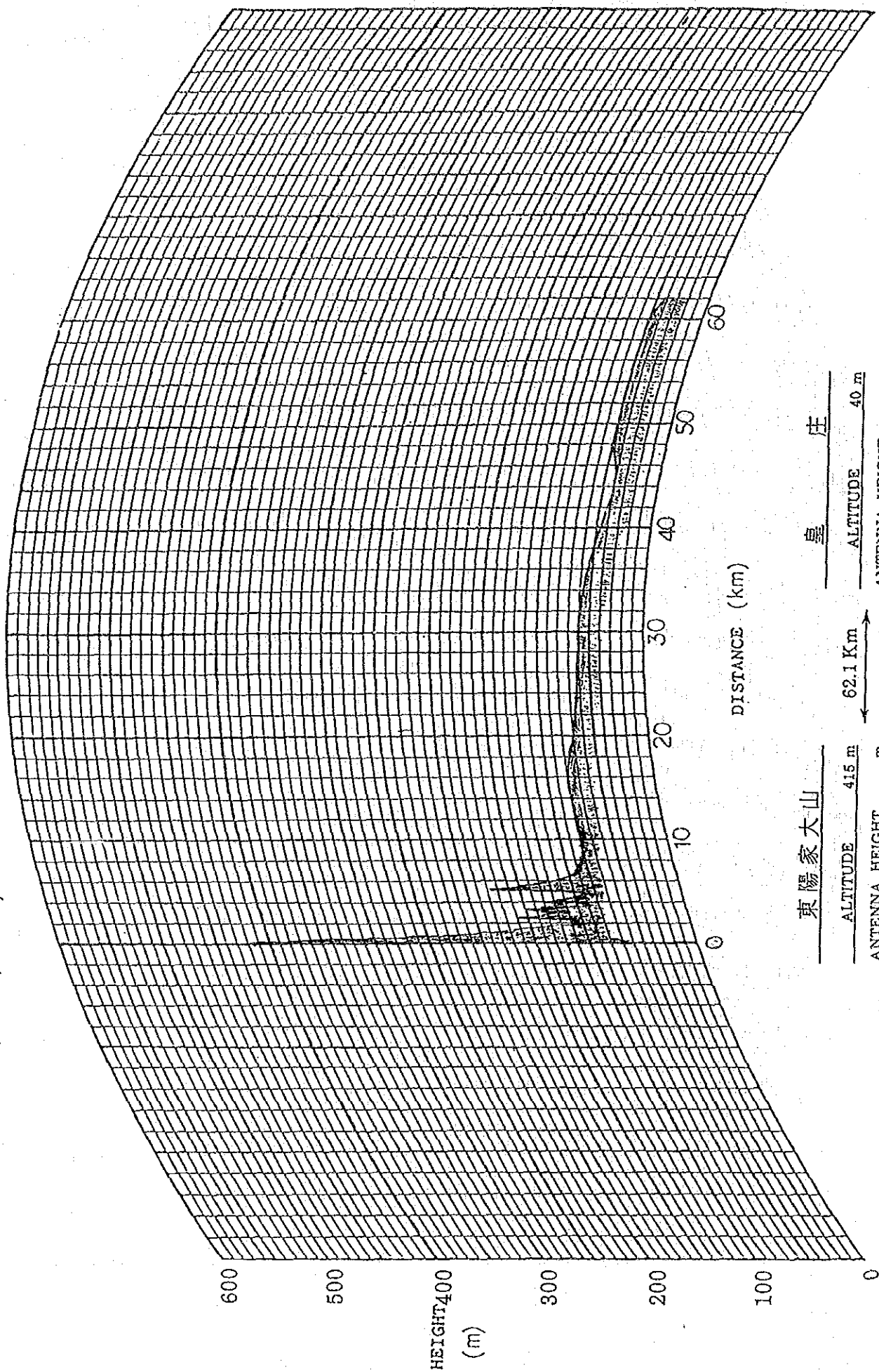
TERRAIN PROFILE

Scale; G Type 120km/600m
(600km/150m; 240km/2400m)



TERRAIN PROFILE

Scale; G Type 120km/600m
(600km/150m; 240km/2400m)

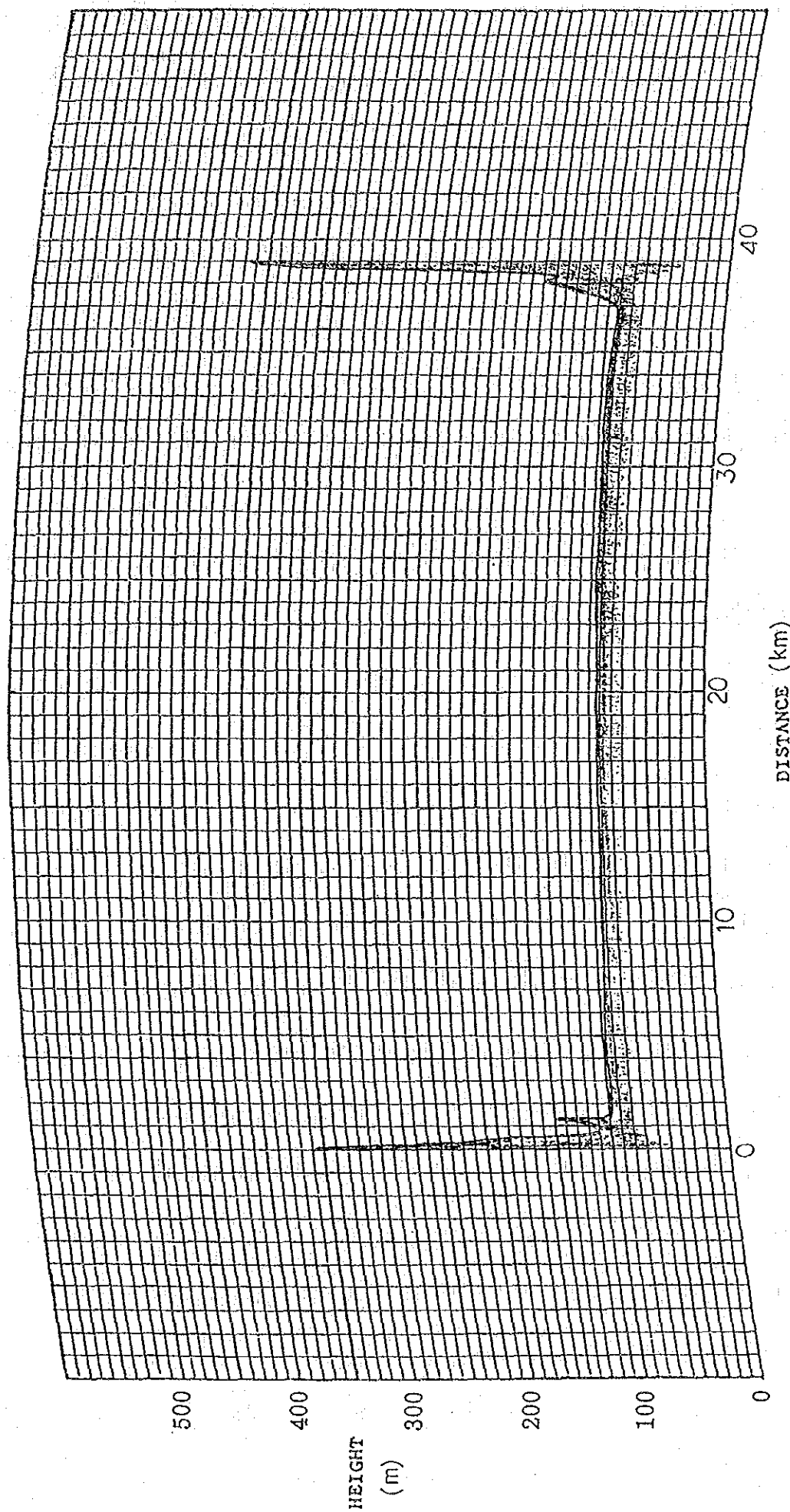


東陽家大山		皇庄	
ALTITUDE	415 m	ALTITUDE	40 m
ANTENNA HEIGHT	m	ANTENNA HEIGHT	m

62.1 Km

Scale; E Type 60km/600m
(30km/150m; 120km/2400m)

TERRAIN PROFILE



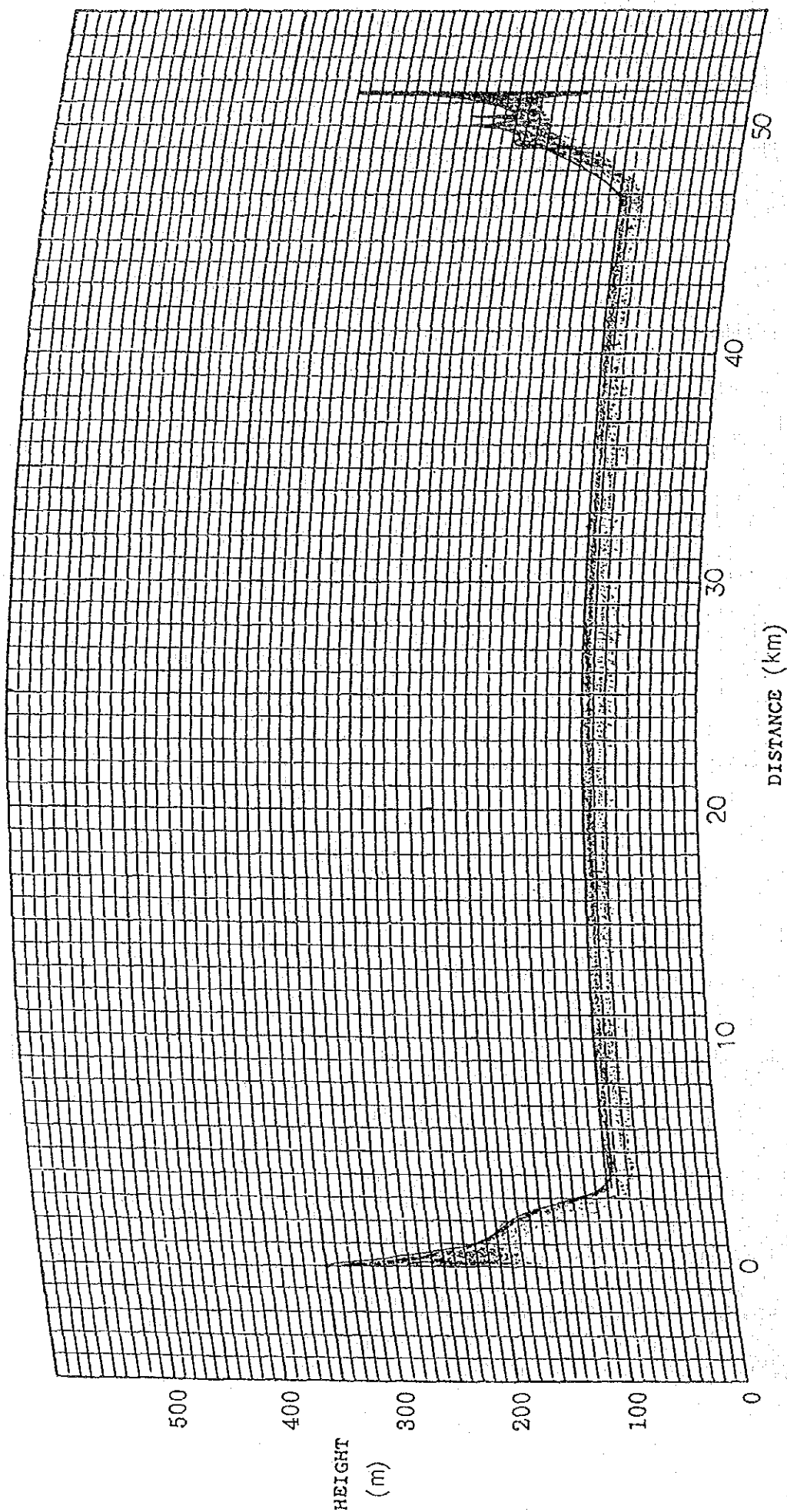
東 通 山	東 陽 家 大 山
ALTITUDE 360 m	ALTITUDE 415 m
ANTENNA HEIGHT m	ANTENNA HEIGHT m
39.15 Km	

$K=4/3$

Scale; E Type 60km/600m

(30km/150m; 120km/2400m)

TERRAIN PROFILE



下東遍山

ALTITUDE 350 m
ANTENNA HEIGHT m

北沖山

ALTITUDE 338.4 m
ANTENNA HEIGHT m

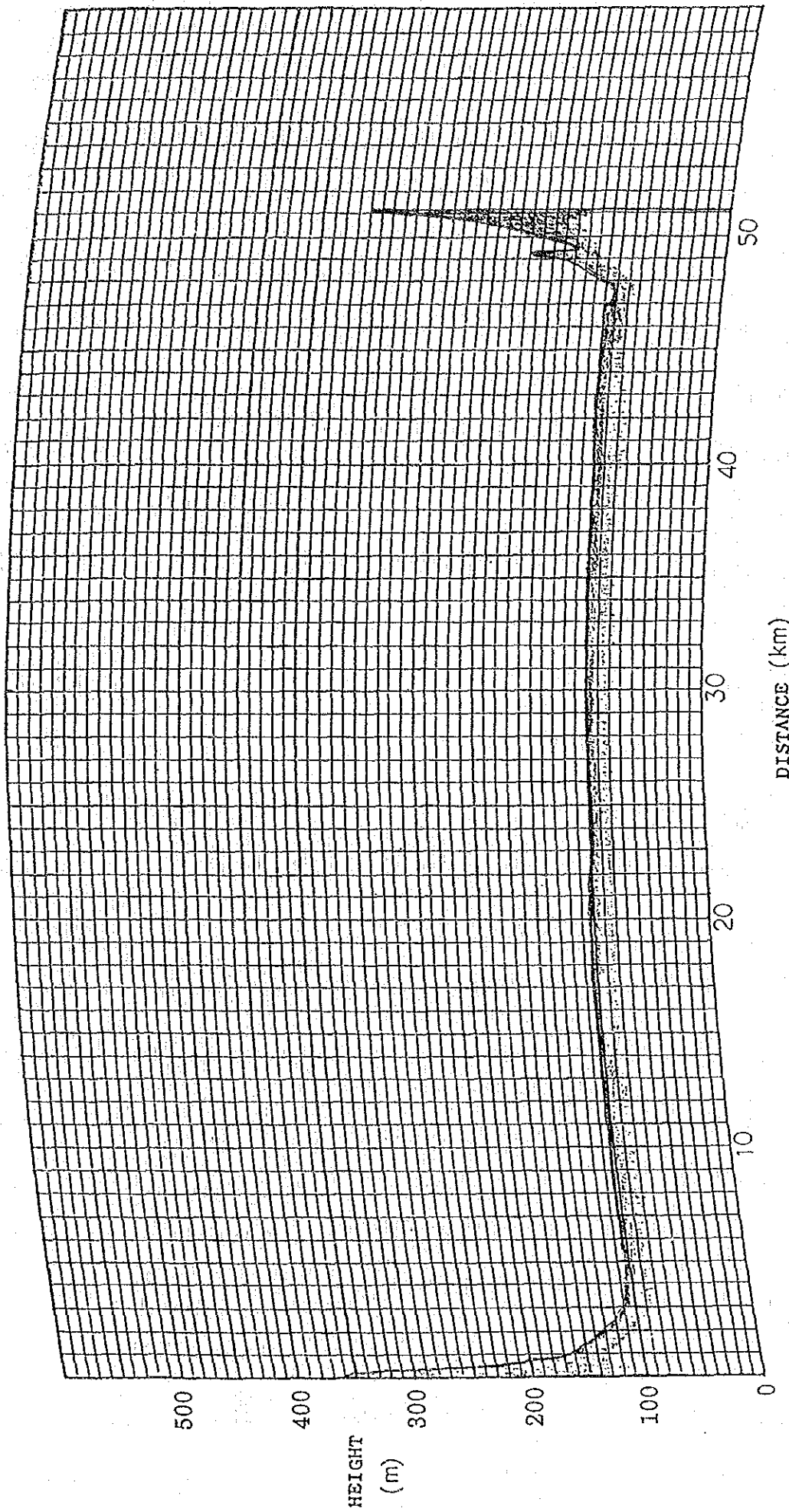
51.5 Km

K=4/3

Scale; E Type 60km/500m

(30km/150m; 120km/2400m)

TERRAIN PROFILE



東 邊 山		何 山	
ALTITUDE	360 m	ALTITUDE	310 m
ANTENNA HEIGHT	m	ANTENNA HEIGHT	m

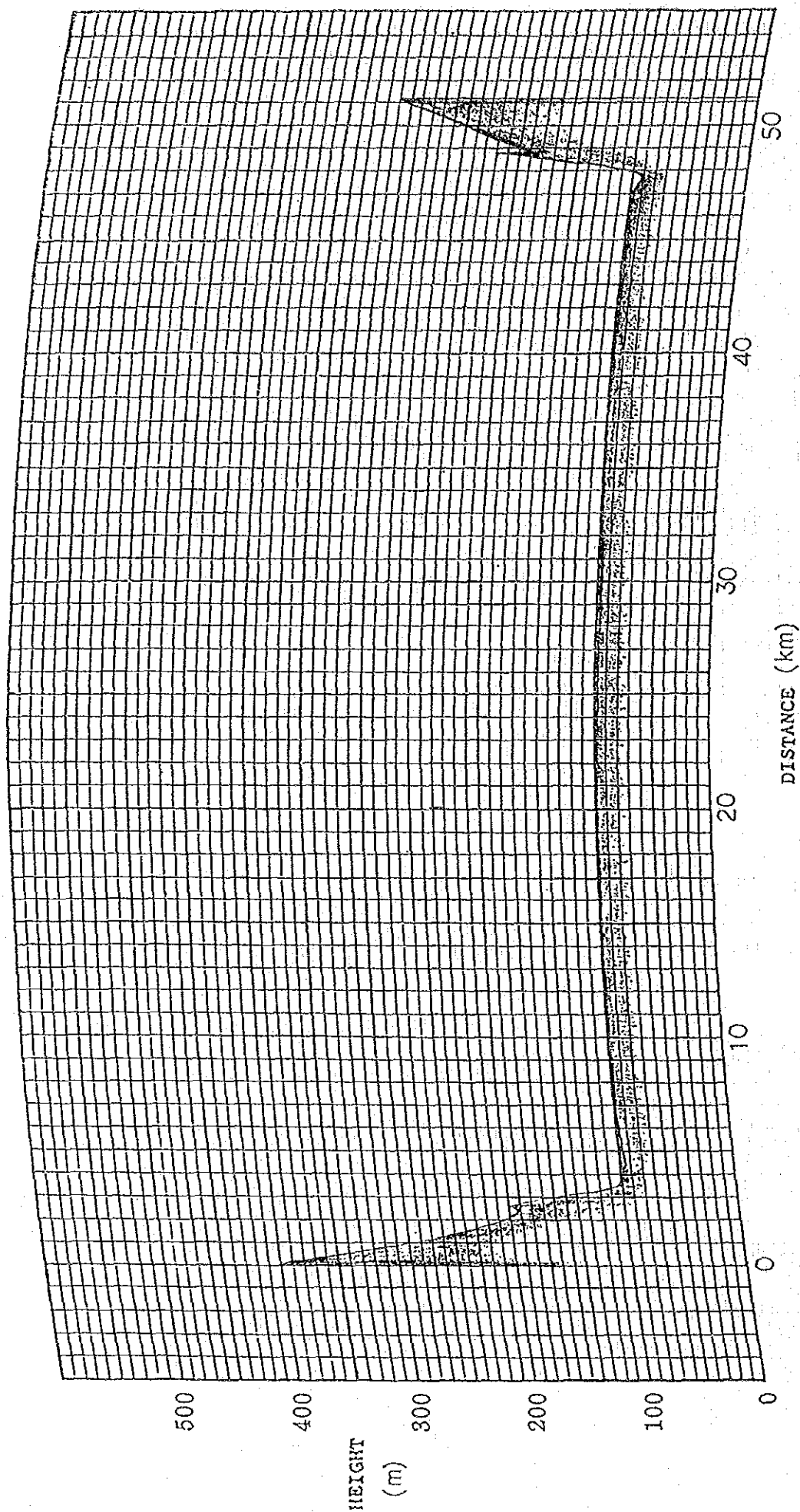
51.15 Km

$K=4/3$

Scale; E Type $\sqrt{60\text{km}/800\text{m}}$

(30km/150m; 120km/2400m)

TERRAIN PROFILE



下東通山		何山	
ALTITUDE	350 m	ALTITUDE	310 m
ANTENNA HEIGHT	m	ANTENNA HEIGHT	m

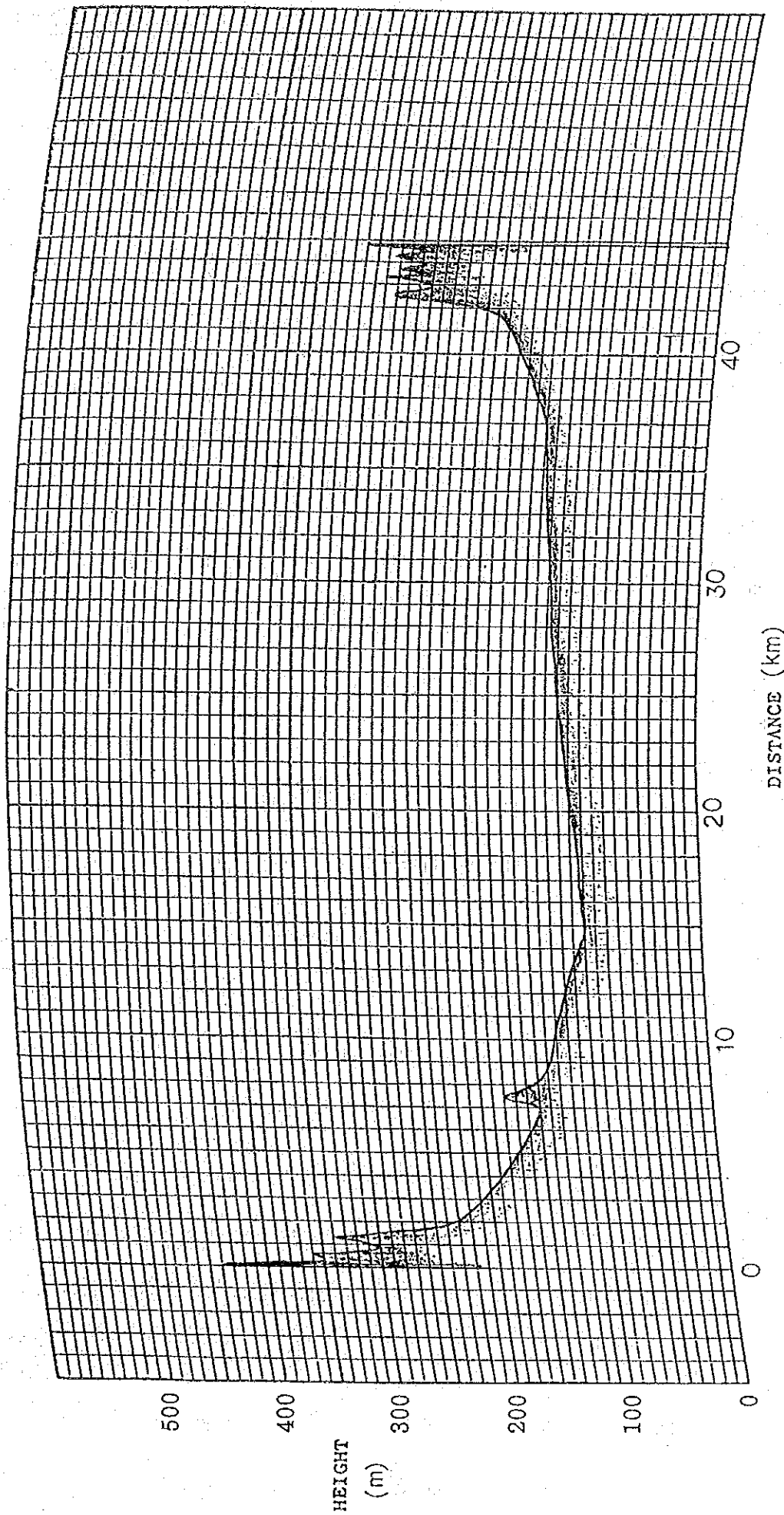
51.2 Km

$K = 4/3$

Scale; E Type 60km/600m.

(30km/150m; 120km/2400m)

TERRAIN PROFILE



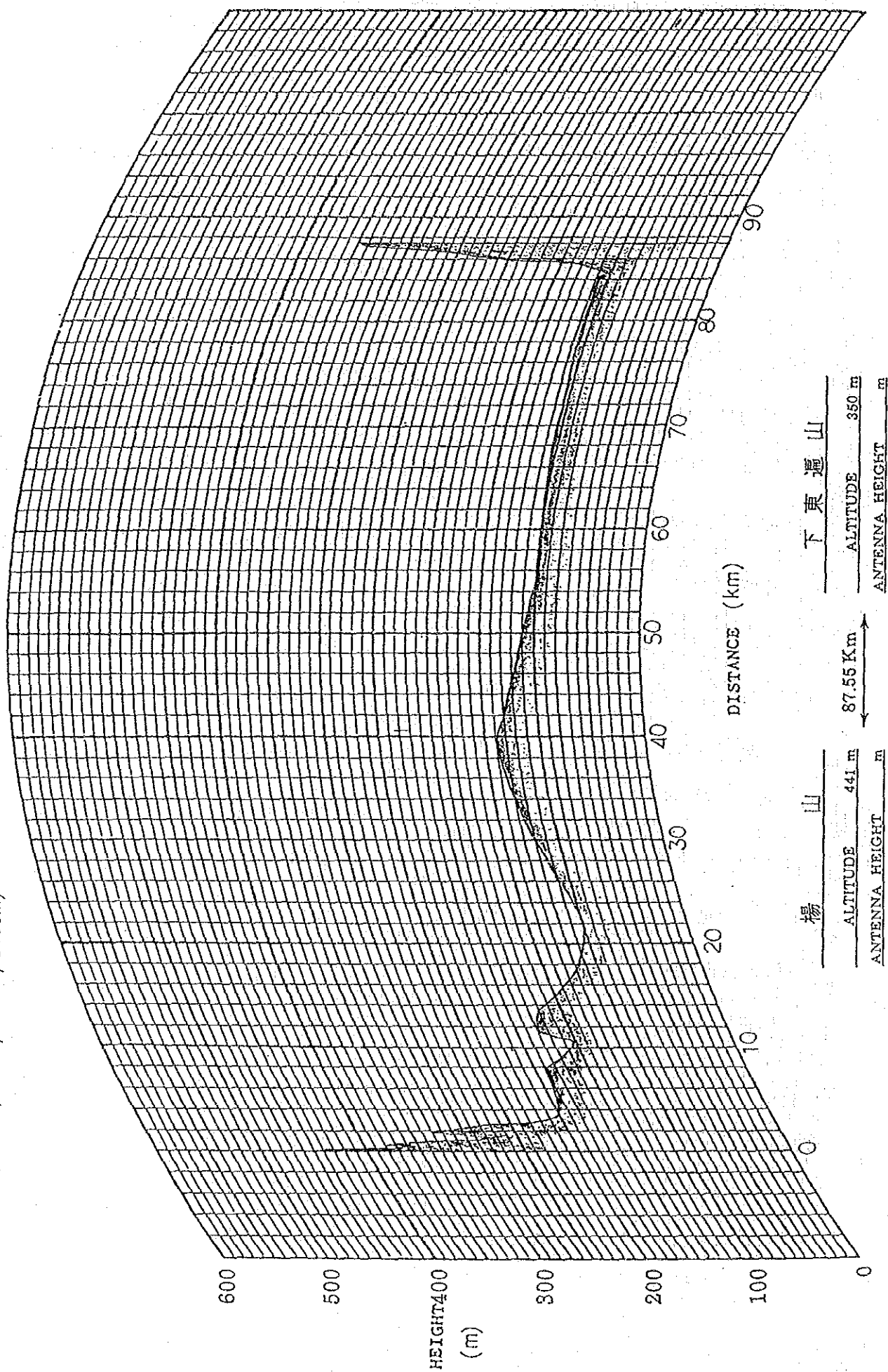
楊	山	何	山
ALTITUDE	441 m	ALTITUDE	310 m
ANTENNA HEIGHT	m	ANTENNA HEIGHT	m

44.8 Km

K=4/3

TERRAIN PROFILE

Scale; G Type 120km/600m
(600km/150m; 240km/2400m)



第2編 多重通信回線設計計算書

第2編 多重通信回線設計計算書

1.	湖北省水利局	—	長江水利委員会	.....	B2-1
2.	長江水利委員会	—	漢川中継局	.....	B2-1
3.	漢川中継局	—	杜家台管理所	.....	B2-2
4.	杜家台管理所	—	天門市中継局	.....	B2-2
5.	天門市中継局	—	潜江水文局	.....	B2-3
6.	潜江水文局	—	沙洋水文局	.....	B2-3
7.	沙洋水文局	—	柴湖水文局	.....	B2-4
8.	柴湖水文局	—	皇庄水文局	.....	B2-4
9.	皇庄水文局	—	陽家大山中継局	.....	B2-5
10.	陽家大山中継局	—	東遍山中継局	.....	B2-5
11.	東遍山中継局	—	襄樊水文局	.....	B2-6
12.	東遍山中継局	—	北冲山中継局	.....	B2-6
13.	北冲山中継局	—	楊山中継局	.....	B2-7
14.	楊山中継局	—	丹江口水門総局	.....	B2-7
15.	丹江口水門総局	—	丹江口ダム管理所	.....	B2-8
16.	漢川中継局	—	天門市中継局	.....	B2-9
17.	天門市中継局	—	転頂山中継局	.....	B2-9
18.	転頂山中継局	—	皇庄水文局	.....	B2-10
19.	皇庄水文局	—	大洪山中継局	.....	B2-10
20.	大洪山中継局	—	東遍山中継局	.....	B2-11
21.	東遍山中継局	—	楊山中継局	.....	B2-11

Radio Path Calculation for
2000 MHz Band PCM-QPSK Digital Radio Link

No. 1

Span			a 湖北省 水利局	b 長江 水利委员会	a 長江 水利委员会	b 漢川中継局
Altitude			20 m	24 m	24 m	90 m
Antenna height			50 m	115 m	115 m	45 m
Radio path length			7.5 Km		44.7 Km	
Path type			Plain C= 1.0		Plain C= 1.0	
Feeder Type			WF-H50-7 70 m	WF-H50-7 60 m	WF-H50-13 85 m	WF-H50-13 65 m
Sub Coaxial Cable			8D-2W 1.0 m	8D-2W 1.0 m	8D-2W 1.0 m	8D-2W 1.0 m
Antenna Type			1.2mφ GPA	1.2mφ GPA	4.0mφ GPA	4.0mφ GPA
Model of Equipment			PSK-2MB-2GHz 0.2 W (ATT 0 dB)		PSK-2MB-2GHz (S/D) 1 W (ATT 0 dB)	
1	Feeder Loss	a dB	-5.2		-4.5	
		b dB	-4.6		-3.6	
2	Duplexer Loss	T dB	-3.0		-3.0	
		R dB	-3.5		-3.5	
3	RF Hybrid Loss		0.0		0.0	
4	Antenna Gain	a dB	26.0		35.8	
		b dB	26.0		35.8	
5	Reflector Gain	A dB				
		B dB				
6	Free Space Loss	A dB	-116.0	d1= 7.5 Km	-131.5	d1= 44.7 Km
		B dB		d2= Km		d2= Km
		C dB		d3= Km		d3= Km
7	Azimuth Loss of Reflector	A dB				
		B dB				
8	Azimuth Loss of Antenna					
9	Loss of Splitting Power					
10	Shadow Loss	A dB		d1=		d1=
		B dB		d2= h1=		d2= h1=
11	Additional Loss	A dB				
		B dB				
		C dB				
12	Span Loss	Loss dB	-132.2		-146.1	
		Gain dB	52.0		71.6	
		Total dB	-80.2		-74.5	
13	Transmitting Power			0.2 W (ATT 0 dB)		1 W (ATT 0 dB)
		dBm	23.0		30.0	
14	Receiving Power		-57.2		-44.5	
15	Receiver Noise			F= 3.0 dB B= 1.1 MHz		F= 3.0 dB B= 1.1 MHz
		dBm	-110.5		-110.5	
16	C/N in median		53.3		66.0	
17	Interference		50.0	Presumed	50.0	Presumed
18	City Noise		46.8	Presumed	58.6	Presumed
19	Others		60.0		60.0	
20	Variable Factor Total		44.4		49.0	
21	C/N for Variable Factor		14.4	BER = 1 E-3	14.4	BER = 1 E-3
22	Fading Margin		30.0		34.6	
23	Pr			Pr= 2.7E-06		Pr= 1.4E-03
24	Pre Considering Reflection			Pre= 2.7E-06		Pre= 4.2E-02
25	Diversity Improvement			Isd= 1.0E+00	S/D	Isd= 5.0E+01
26	Outage Time Due to Fading	%		Pm= 2.7E-07		Pm= 2.9E-05
27	Outage Margin			27.8		15.2

Radio Path Calculation for
2000 MHz Band PCM-QPSK Digital Radio Link

No. 2

Span			a 漢川中繼局	b 杜家台管理所	a 杜家台管理所	b 天門市中繼局
Altitude			90 m	42 m	42 m	30 m
Antenna height			35 m	55 m	80 m	80 m
Radio path length			44.2 Km		44.2 Km	
Path type			Plain C= 1.0		Plain C= 1.0	
Feeder Type			WF-H50-13 55 m	WF-H50-13 75 m	WF-H50-13 100 m	WF-H50-13 100 m
Sub Coaxial Cable			8D-2W 1.0 m	8D-2W 1.0 m	8D-2W 1.0 m	8D-2W 1.0 m
Antenna Type			4.0m ϕ GPA	4.0m ϕ GPA	4.0m ϕ GPA	4.0m ϕ GPA
Model of Equipment			PSK-2MB-2GHz (S/D) 1 W (ATT 0 dB)		PSK-2MB-2GHz (S/D) 1 W (ATT 0 dB)	
1	Feeder Loss	a dB	-3.1		-5.2	
		b dB	-4.1		-5.2	
2	Duplexer Loss	T dB	-3.0		-3.0	
		R dB	-3.5		-3.5	
3	RF Hybrid Loss		0.0		0.0	
4	Antenna Gain	a dB	35.8		35.8	
		b dB	35.8		35.8	
5	Reflector Gain	A dB				
		B dB				
6	Free Space Loss	A dB	-131.4	d1= 44.2 Km	-131.4	d1= 44.2 Km
		B dB		d2= Km		d2= Km
		C dB		d3= Km		d3= Km
7	Azimuth Loss of Reflector	A dB				
		B dB				
8	Azimuth Loss of Antenna					
9	Loss of Splitting Power					
10	Shadow Loss	A dB		d1= h1=		d1= h1=
		B dB		d2= h2=		d2= h2=
11	Additional Loss	A dB				
		B dB				
		C dB				
12	Span Loss	Loss dB	-145.1		-148.3	
		Gain dB	71.6		71.6	
		Total dB	-73.5		-76.7	
13	Transmitting Power			1 W (ATT 0 dB)		1 W (ATT 0 dB)
		dBm	30.0		30.0	
14	Receiving Power		-43.5		-46.7	
		dBm				
15	Receiver Noise			F= 3.0 dB B= 1.1 MHz		F= 3.0 dB B= 1.1 MHz
		dBm	-110.5		-110.5	
16	C/N in median		67.0		63.8	
		dB				
17	Interference		50.0	Presumed	50.0	Presumed
		dB				
18	City Noise		60.1	Presumed	58.0	Presumed
		dB				
19	Others		60.0		60.0	
		dB				
20	Variable Factor Total		49.1		48.9	
		dB				
21	C/N for Variable Factor		14.4	BER = 1 E-3	14.4	BER = 1 E-3
		dB				
22	Fading Margin		34.7		34.5	
		dB				
23	Pr			Pr= 1.3E-03		Pr= 1.3E-03
24	Pre Considering Reflection			Pre= 2.3E-02		Pre= 3.1E-02
25	Diversity Improvement		S/D	Isd= 5.0E+01	S/D	Isd= 5.0E+01
26	Outage Time Due to Fading	%		Pm= 1.5E-05		Pm= 2.2E-05
27	Outage Margin	dB		17.9		16.4

Radio Path Calculation for
2000 MHz Band PCM-QPSK Digital Radio Link

No. 3

Span				a 天門市中繼局	b 潛江水文局	a 潛江水文局	b 沙洋水文局
Altitude				30 m	35 m	35 m	40 m
Antenna height				80 m	80 m	80 m	80 m
Radio path length				38.5 Km		40.2 Km	
Path type				Plain C= 1.0		Plain C= 1.0	
Feeder Type				WF-H50-13	WF-H50-13	WF-H50-13	WF-H50-13
Sub Coaxial Cable				100 m	100 m	100 m	100 m
Antenna Type				8D-2W	8D-2W	8D-2W	8D-2W
Model of Equipment				1.0 m	1.0 m	1.0 m	1.0 m
				4.0m ϕ GPA	4.0m ϕ GPA	4.0m ϕ GPA	4.0m ϕ GPA
				PSK-2MB-2GHz (S/D)		PSK-2MB-2GHz (S/D)	
				1 W		1 W	
				(ATT 0 dB)		(ATT 0 dB)	
1	Feeder Loss	a	dB	-5.2		-5.2	
		b	dB	-5.2		-5.2	
2	Duplexer Loss	T	dB	-3.0		-3.0	
		R	dB	-3.5		-3.5	
3	RF Hybrid Loss		dB	0.0		0.0	
4	Antenna Gain	a	dB	35.8		35.8	
		b	dB	35.8		35.8	
5	Reflector Gain	A	dB				
		B	dB				
6	Free Space Loss	A	dB	-130.2	d1= 38.5 Km	-130.5	d1= 40.2 Km
		B	dB		d2= Km		d2= Km
		C	dB		d3= Km		d3= Km
7	Azimuth Loss of Reflector	A	dB				
		B	dB				
8	Azimuth Loss of Antenna		dB				
9	Loss of Splitting Power		dB				
10	Shadow Loss	A	dB		d1= h1=		d1= h1=
		B	dB		d2= h2=		d2= h2=
11	Additional Loss	A	dB				
		B	dB				
		C	dB				
12	Span Loss	Loss	dB	-147.1		-147.4	
		Gain	dB	71.6		71.6	
		Total	dB	-75.5		-75.8	
13	Transmitting Power		dBm	30.0	(ATT 1 W 0 dB)	30.0	(ATT 1 W 0 dB)
14	Receiving Power		dBm	-45.5		-45.8	
15	Receiver Noise		dBm	-110.5	F= 3.0 dB B= 1.1 MHz	-110.5	F= 3.0 dB B= 1.1 MHz
16	C/N in median		dB	65.0		64.7	
17	Interference		dB	50.0	Presumed	50.0	Presumed
18	City Noise		dB	59.2	Presumed	58.9	Presumed
19	Others		dB	60.0		60.0	
20	Variable Factor Total		dB	49.0		49.0	
21	C/N for Variable Factor		dB	14.4	BER = 1 E-3	14.4	BER = 1 E-3
22	Fading Margin		dB	34.6		34.6	
23	Pr				Pr= 8.1E-04		Pr= 9.5E-04
24	Pre Considering Reflection				Pre= 2.2E-02		Pre= 2.8E-02
25	Diversity Improvement			S/D	Isd= 5.0E+01	S/D	Isd= 5.0E+01
26	Outage Time Due to Fading	%			Pm= 1.5E-05		Pm= 2.0E-05
27	Outage Margin	dB			17.4		16.5

Span			a 沙洋水文局	b 柴湖水文局	a 柴湖水文局	b 皇庄水文局
Altitude			40 m	40 m	40 m	40 m
Antenna height			80 m	70 m	50 m	80 m
Radio path length			32.3 Km		21.6 Km	
Path type			Plain C= 1.0		Plain C= 1.0	
Feeder Type			WF-H50-13 100 m	WF-H50-13 90 m	WF-H50-13 70 m	WF-H50-13 100 m
Sub Coaxial Cable			8D-2W 1.0 m	8D-2W 1.0 m	8D-2W 1.0 m	8D-2W 1.0 m
Antenna Type			3.0m ϕ GPA	3.0m ϕ GPA	3.0m ϕ GPA	3.0m ϕ GPA
Model of Equipment			PSK-2MB-2GHz (S/D) 1 W (ATT 0 dB)		PSK-2MB-2GHz 1 W (ATT 0 dB)	
1	Feeder Loss	a dB	-5.2		-3.8	
		b dB	-4.7		-5.2	
2	Duplexer Loss	T dB	-3.0		-3.0	
		R dB	-3.5		-3.5	
3	RF Hybrid Loss		0.0		0.0	
4	Antenna Gain	a dB	33.3		33.3	
		b dB	33.3		33.3	
5	Reflector Gain	A dB				
		B dB				
6	Free Space Loss	A dB	-128.6	d1= 32.3 Km	-125.2	d1= 21.6 Km
		B dB		d2= Km		d2= Km
		C dB		d3= Km		d3= Km
7	Azimuth Loss of Reflector	A dB				
		B dB				
8	Azimuth Loss of Antenna					
9	Loss of Splitting Power					
10	Shadow Loss	A dB		d1= h1=		d1= h1=
		B dB		d2= h2=		d2= h2=
11	Additional Loss	A dB				
		B dB				
		C dB				
12	Span Loss	Loss dB	-145.1		-140.7	
		Gain dB	66.6		66.6	
		Total dB	-78.5		-74.1	
13	Transmitting Power			1 W (ATT 0 dB)		1 W (ATT 0 dB)
		dBm	30.0		30.0	
14	Receiving Power		-48.5		-44.1	
15	Receiver Noise			F= 3.0 dB B= 1.1 MHz		F= 3.0 dB B= 1.1 MHz
		dBm	-110.5		-110.5	
16	C/N in median		62.0		66.4	
17	Interference		50.0	Presumed	50.0	Presumed
18	City Noise		55.8	Presumed	60.6	Presumed
19	Others		60.0		60.0	
20	Variable Factor Total		48.5		49.2	
21	C/N for Variable Factor		14.4	BER = 1 E-3	14.4	BER = 1 E-3
22	Fading Margin		34.1		34.8	
23	Pr			Pr= 4.4E-04		Pr= 1.1E-04
24	Pre Considering Reflection			Pre= 1.4E-02		Pre= 7.4E-04
25	Diversity Improvement		S/D	Isd= 5.0E+01		Isd= 4.8E+01
26	Outage Time Due to Fading	%		Pm= 1.1E-05		Pm= 5.1E-07
27	Outage Margin	dB		18.1		29.6

Span			a 皇庄水文局	b 陽家大山 中繼局	a 陽家大山 中繼局	b 東遍山中繼局
Altitude			40 m	447 m	447 m	360 m
Antenna height			60 m	35 m	35 m	35 m
Radio path length			60.3 Km		38.9 Km	
Path type			Plain C= 1.0		Plain C= 1.0	
Feeder Type			WF-H50-13	WF-H50-13	WF-H50-13	WF-H50-13
Sub Coaxial Cable			80 m	55 m	40 m	40 m
Antenna Type			8D-2W	8D-2W	8D-2W	8D-2W
Model of Equipment			1.0 m	1.0 m	1.0 m	1.0 m
			4.0m ϕ GPA	4.0m ϕ GPA	4.0m ϕ GPA	4.0m ϕ GPA
			PSK-2MB-2GHz (S/D)		PSK-2MB-2GHz	
			1 W		1 W	
			(ATT 0 dB)		(ATT 0 dB)	
1	Feeder Loss	a	dB	-4.3	-2.4	
		b	dB	-3.1	-2.4	
2	Duplexer Loss	T	dB	-3.0	-3.0	
		R	dB	-3.5	-3.5	
3	RF Hybrid Loss		dB	0.0	0.0	
4	Antenna Gain	a	dB	35.8	35.8	
		b	dB	35.8	35.8	
5	Reflector Gain	A	dB			
		B	dB			
6	Free Space Loss	A	dB	-134.1	d1= 60.3 Km	-130.3
		B	dB		d2= Km	d1= 38.9 Km
		C	dB		d3= Km	d2= Km
7	Azimuth Loss of Reflector	A	dB			
		B	dB			
8	Azimuth Loss of Antenna		dB			
9	Loss of Splitting Power		dB			
10	Shadow Loss	A	dB		d1= h1=	d1= h1=
		B	dB		d2= h2=	d2= h2=
11	Additional Loss	A	dB			
		B	dB			
		C	dB			
12	Span Loss	Loss	dB	-148.0	-141.6	
		Gain	dB	71.6	71.6	
		Total	dB	-76.4	-70.0	
13	Transmitting Power		dBm	30.0	30.0	1 W
				(ATT 0 dB)	(ATT 0 dB)	
14	Receiving Power		dBm	-46.4	-40.0	
15	Receiver Noise		dBm	-110.5	-110.5	F= 3.0 dB
						B= 1.1 MHz
16	C/N in median		dB	64.1	70.5	
17	Interference		dB	50.0	50.0	Presumed
18	City Noise		dB	56.3	61.9	Presumed
19	Others		dB	60.0	60.0	
20	Variable Factor Total		dB	48.6	49.3	
21	C/N for Variable Factor		dB	14.4	14.4	BER = 1 E-3
22	Fading Margin		dB	34.2	34.9	
23	Pr			Pr= 3.9E-03	Pr= 8.4E-04	
24	Pre Considering Reflection			Pre= 1.9E-01	Pre= 2.7E-03	
25	Diversity Improvement		S/D	Isd= 5.0E+01	Isd= 5.0E+01	
26	Outage Time Due to Fading	%		Pm= 1.5E-04	Pm= 1.7E-06	
27	Outage Margin	dB		9.5	26.9	

Span			a	b	a	b
			東遍山中継局 褒樊水文局		東遍山中継局 北冲山中継局	
Altitude			360 m	80 m	360 m	339 m
Antenna height			30 m	35 m	35 m	35 m
Radio path length			4.7 Km		51.5 Km	
Path type			Plain C= 1.0		Plain C= 1.0	
Feeder Type			WF-H50-7	WF-H50-7	WF-H50-13	WF-H50-13
Sub Coaxial Cable			50 m	55 m	55 m	55 m
Antenna Type			8D-2W	8D-2W	8D-2W	8D-2W
Model of Equipment			1.0 m	1.0 m	1.0 m	1.0 m
			1.2m ϕ GPA	1.2m ϕ GPA	4.0m ϕ GPA	4.0m ϕ GPA
			PSK-2MB-2GHz	PSK-2MB-2GHz	PSK-2MB-2GHz (S/D)	PSK-2MB-2GHz (S/D)
			0.2 W	0.2 W	1 W	1 W
			(ATT 0 dB)	(ATT 0 dB)	(ATT 0 dB)	(ATT 0 dB)
1	Feeder Loss	a dB	-3.9		-3.1	
		b dB	-4.2		-3.1	
2	Duplexer Loss	T dB	-3.0		-3.0	
		R dB	-3.5		-3.5	
3	RF Hybrid Loss		0.0		0.0	
4	Antenna Gain	a dB	26.0		35.8	
		b dB	26.0		35.8	
5	Reflector Gain	A dB				
		B dB				
6	Free Space Loss	A dB	-111.9	d1= 4.7 Km	-132.7	d1= 51.5 Km
		B dB		d2= Km		d2= Km
		C dB		d3= Km		d3= Km
7	Azimuth Loss of Reflector	A dB				
		B dB				
8	Azimuth Loss of Antenna					
9	Loss of Splitting Power					
10	Shadow Loss	A dB		d1= h1=		d1= h1=
		B dB		d2= h2=		d2= h2=
11	Additional Loss	A dB				
		B dB				
		C dB				
12	Span Loss	loss dB	-126.5		-145.5	
		Gain dB	52.0		71.6	
		Total dB	-74.5		-73.9	
13	Transmitting Power			0.2 W		1 W
				(ATT 0 dB)		(ATT 0 dB)
14	Receiving Power					
15	Receiver Noise			F= 3.0 dB		F= 3.0 dB
				B= 1.1 MHz		B= 1.1 MHz
16	C/N in median					
17	Interference					
18	City Noise					
19	Others					
20	Variable Factor Total					
21	C/N for Variable Factor					
22	Fading Margin					
23	Pr			Pr= 5.2E-07		Pr= 2.3E-03
24	Pre Considering Reflection			Pre= 5.2E-07		Pre= 8.2E-02
25	Diversity Improvement			Isd= 1.0E+00	S/D	Isd= 5.0E+01
26	Outage Time Due to Fading	%		Pm= 2.6E-08		Pm= 5.6E-05
27	Outage Margin					

Radio Path Calculation for
2000 MHz Band PCM-QPSK Digital Radio Link

No. 7

Span			a b 北冲山中継局 楊山中継局		a b 楊山中継局 丹江口 水門総局	
Altitude			339 m	441 m	441 m	90 m
Antenna height			35 m	35 m	18 m	30 m
Radio path length			44.5 Km		7 Km	
Path type			Plain C= 1		Plain C= 1	
Feeder Type			WF-H50-13	WF-H50-13	WF-H50-7	WF-H50-7
Sub Coaxial Cable			30 m	30 m	40 m	50 m
Antenna Type			8D-2W	8D-2W	8D-2W	8D-2W
Model of Equipment			1.0 m	1.0 m	1.0 m	1.0 m
			4.0mφ GPA	4.0mφ GPA	1.2mφ GPA	1.2mφ GPA
			PSK-2MB-2GHz	PSK-2MB-2GHz	PSK-2MB-2GHz	PSK-2MB-2GHz
			1 W	0.2 W	0.2 W	0.2 W
			(ATT 0 dB)	(ATT 0 dB)	(ATT 0 dB)	(ATT 0 dB)
1	Feeder Loss	a dB	-2.0		-3.2	
		b dB	-2.0		-3.9	
2	Duplexer Loss	T dB	-3.0		-3.0	
		R dB	-3.5		-3.5	
3	RF Hybrid Loss		0.0		0.0	
4	Antenna Gain	a dB	35.8		26.0	
		b dB	35.8		26.0	
5	Reflector Gain	A dB				
		B dB				
6	Free Space Loss	A dB	-131.4	d1= 44.5 Km	-115.4	d1= 7 Km
		B dB		d2= Km		d2= Km
		C dB		d3= Km		d3= Km
7	Azimuth Loss of Reflector	A dB				
		B dB				
8	Azimuth Loss of Antenna					
9	Loss of Splitting Power					
10	Shadow Loss	A dB		d1= h1=		d1= h1=
		B dB		d2= h2=		d2= h2=
11	Additional Loss	A dB				
		B dB				
		C dB				
12	Span Loss	Loss dB	-141.9		-129.0	
		Gain dB	71.6		52.0	
		Total dB	-70.3		-77.0	
13	Transmitting Power			1 W		0.2 W
				(ATT 0 dB)		(ATT 0 dB)
14	Receiving Power					
15	Receiver Noise			F= 3.0 dB		F= 3.0 dB
				B= 1.1 MHz		B= 1.1 MHz
16	C/N in median					
17	Interference					
18	City Noise					
19	Others					
20	Variable Factor Total					
21	C/N for Variable Factor			BER = 1 E-3		BER = 1 E-3
22	Fading Margin					
23	Pr			Pr= 1.4E-03		Pr= 2.1E-06
24	Pre Considering Reflection			Pre= 1.4E-03		Pre= 2.1E-06
25	Diversity Improvement			Isd= 5.0E+01		Isd= 1.0E+00
26	Outage Time Due to Fading			Pm= 9.4E-07		Pm= 1.4E-07
27	Outage Margin			30.1		30.3

Radio Path Calculation for
2000 MHz Band PCM-QPSK Digital Radio Link

No. 8

Span			a 丹江口 水門総局	b 丹江口ダム 管理所	a	b
Altitude			90 m	120 m	m	m
Antenna height			40 m	40 m	m	m
Radio path length			3 Km		Km	
Path type			Plain C= 1		C=	
Feeder Type			WF-H50-7 60 m	WF-H50-7 60 m	m	m
Sub Coaxial Cable			8D-2W 1.0 m	8D-2W 1.0 m	8D-2W 1.0 m	8D-2W 1.0 m
Antenna Type			1.2mφ GPA			
Model of Equipment			PSK-2MB-2GHz 0.2 W (ATT 0 dB)		W (ATT 0 dB)	
1	Feeder Loss	a dB	-4.6			
		b dB	-4.6			
2	Duplexer Loss	T dB	-3.0			
		R dB	-3.5			
3	RF Hybrid Loss		0.0			
4	Antenna Gain	a dB	26.0			
		b dB	26.0			
5	Reflector Gain	A dB				
		B dB				
6	Free Space Loss	A dB	-108.0	d1= 3 Km	d1= Km	
		B dB		d2= Km	d2= Km	
		C dB		d3= Km	d3= Km	
7	Azimuth Loss of Reflector	A dB				
		B dB				
8	Azimuth Loss of Antenna					
9	Loss of Splitting Power					
10	Shadow Loss	A dB		d1= h1=	d1= h1=	
		B dB		d2= h2=	d2= h2=	
11	Additional Loss	A dB				
		B dB				
		C dB				
12	Span Loss	Loss dB	-123.6			
		Gain dB	52.0			
		Total dB	-71.6			
13	Transmitting Power			0.2 W (ATT 0 dB)		W (ATT 0 dB)
14	Receiving Power					
15	Receiver Noise			F= 3.0 dB B= 1.1 MHz		F= dB B= MHz
16	C/N in median					
17	Interference			Presumed		Presumed
18	City Noise			Presumed		Presumed
19	Others					
20	Variable Factor Total					
21	C/N for Variable Factor			BER = 1 E-3		BER = 1 E-3
22	Fading Margin					
23	Pr			Pr= 1.1E-07		Pr= 0.0E+00
24	Pre Considering Reflection			Pre= 1.1E-07		Pre=
25	Diversity Improvement			Isd= 1.0E+00		Isd=
26	Outage Time Due to Fading	%		Pm= 4.3E-09		Pm=
27	Outage Margin			41.8		

Span			a	b	a	b
			漢川中繼局	天門市中繼局	天門市中繼局	轉頂山中繼局
Altitude			90 m	30 m	30 m	470 m
Antenna height			90 m	90 m	45 m	35 m
Radio path length			62.2 Km		50.4 Km	
Path type			Plain C= 1.0		Plain C= 1.0	
Feeder Type			WF-H50-13	WF-H50-13	WF-H50-13	WF-H50-13
Sub Coaxial Cable			110 m	110 m	65 m	55 m
Antenna Type			8D-2W	8D-2W	8D-2W	8D-2W
Model of Equipment			1.0 m	1.0 m	1.0 m	1.0 m
			4.0m ϕ GPA	4.0m ϕ GPA	4.0m ϕ GPA	4.0m ϕ GPA
			PSK-2MB-2GHz (S/D)		PSK-2MB-2GHz (S/D)	
			1 W		1 W	
			(ATT 0 dB)		(ATT 0 dB)	
1	Feeder Loss	a dB	-5.7		-3.6	
		b dB	-5.7		-3.1	
2	Duplexer Loss	T dB	-3.0		-3.0	
		R dB	-3.5		-3.5	
3	RF Hybrid Loss		0.0		0.0	
4	Antenna Gain	a dB	35.8		35.8	
		b dB	35.8		35.8	
5	Reflector Gain	A dB				
		B dB				
6	Free Space Loss	A dB	-134.3	d1= 62.2 Km	-132.5	d1= 50.4 Km
		B dB		d2= Km		d2= Km
		C dB		d3= Km		d3= Km
7	Azimuth Loss of Reflector	A dB				
		B dB				
8	Azimuth Loss of Antenna					
9	Loss of Splitting Power					
10	Shadow Loss	A dB		d1=		d1=
		B dB		d2= h1=		d2= h1=
11	Additional Loss	A dB				
		B dB				
		C dB				
12	Span Loss	Loss dB	-152.2		-145.7	
		Gain dB	71.6		71.6	
		Total dB	-80.6		-74.1	
13	Transmitting Power			1 W		1 W
			30.0	(ATT 0 dB)	30.0	(ATT 0 dB)
14	Receiving Power		-50.6		-44.1	
15	Receiver Noise			F= 3.0 dB		F= 3.0 dB
				B= 1.1 MHz		B= 1.1 MHz
16	C/N in median		59.9		66.4	
17	Interference		50.0	Presumed	50.0	Presumed
18	City Noise		54.6	Presumed	58.5	Presumed
19	Others		60.0		60.0	
20	Variable Factor Total		48.1		49.0	
21	C/N for Variable Factor		14.4	BER = 1 E-3	14.4	BER = 1 E-3
22	Fading Margin		33.7		34.6	
23	Pr			Pr= 4.4E-03		Pr= 2.1E-03
24	Pre Considering Reflection			Pre= 5.5E-02		Pre= 1.1E-01
25	Diversity Improvement		S/D	Isd= 3.9E+01	S/D	Isd= 3.5E+01
26	Outage Time Due to Fading	%		Pm= 6.0E-05		Pm= 1.1E-04
27	Outage Margin			13.5		10.0

Radio Path Calculation for
2000 MHz Band PCM-QPSK Digital Radio Link

No. 10

Span			a 轉頂山中繼局	b 皇庄水文局	a 皇庄水文局	b 大洪山中繼局
Altitude			470 m	40 m	40 m	1049 m
Antenna height			35 m	50 m	50 m	80 m
Radio path length			34.2 Km		51.4 Km	
Path type			Plain C= 1.0		Plain C= 1.0	
Feeder Type			WF-H50-13	WF-H50-13	WF-H50-13	WF-H50-13
Sub Coaxial Cable			55 m	70 m	70 m	100 m
Antenna Type			8D-2W	8D-2W	8D-2W	8D-2W
Model of Equipment			1.0 m	1.0 m	1.0 m	1.0 m
			3.0m ϕ GPA	3.0m ϕ GPA	4.0m ϕ GPA	4.0m ϕ GPA
			PSK-2MB-2GHz (S/D)		PSK-2MB-2GHz (S/D)	
			1 W		1 W	
			(ATT 0 dB)		(ATT 0 dB)	
1	Feeder Loss	a dB	-3.1		-3.8	
		b dB	-3.8		-5.2	
2	Duplexer Loss	T dB	-3.0		-3.0	
		R dB	-3.5		-3.5	
3	RF Hybrid Loss		0.0		0.0	
4	Antenna Gain	a dB	33.3		35.8	
		b dB	33.3		35.8	
5	Reflector Gain	A dB				
		B dB				
6	Free Space Loss	A dB	-129.1	d1= 34.2 Km	-132.7	d1= 51.4 Km
		B dB		d2= Km		d2= Km
		C dB		d3= Km		d3= Km
7	Azimuth Loss of Reflector	A dB				
		B dB				
8	Azimuth Loss of Antenna					
9	Loss of Splitting Power					
10	Shadow Loss	A dB		d1= h1=		d1= h1=
		B dB		d2= h2=		d2= h2=
11	Additional Loss	A dB				
		B dB				
		C dB				
12	Span Loss	Loss dB	-142.6		-148.2	
		Gain dB	66.6		71.6	
		Total dB	-76.0		-76.6	
13	Transmitting Power			1 W		1 W
				(ATT 0 dB)		(ATT 0 dB)
14	Receiving Power					
15	Receiver Noise			F= 3.0 dB		F= 3.0 dB
				B= 1.1 MHz		B= 1.1 MHz
16	C/N in median					
17	Interference					
18	City Noise					
19	Others					
20	Variable Factor Total					
21	C/N for Variable Factor					
22	Fading Margin					
23	Pr			Pr= 5.4E-04		Pr= 2.2E-03
24	Pre Considering Reflection			Pre= 6.7E-03		Pre= 2.7E-03
25	Diversity Improvement			S/D Isd= 5.0E+01		S/D Isd= 4.8E+01
26	Outage Time Due to Fading	%		Pm= 4.9E-06		Pm= 2.1E-06
27	Outage Margin					

Span			a 大洪山中継局	b 東遍山中継局	a 東遍山中継局	b 楊山中継局
Altitude			1049 m	360 m	360 m	441 m
Antenna height			35 m	30 m	25 m	30 m
Radio path length			96 Km		87.5 Km	
Path type			Plain C= 1.0		Plain C= 1.0	
Feeder Type			WF-H50-13	WF-H50-13	WF-H50-13	WF-H50-13
Sub Coaxial Cable			55 m	50 m	100 m	100 m
Antenna Type			8D-2W	8D-2W	8D-2W	8D-2W
Model of Equipment			1.0 m	1.0 m	1.0 m	1.0 m
			4.0mφ GPA	4.0mφ GPA	4.0mφ GPA	4.0mφ GPA
			PSK-2MB-2GHz (S/D)		PSK-2MB-2GHz (S/D)	
			1 W		1 W	
			(ATT 0 dB)		(ATT 0 dB)	
1	Feeder Loss	a dB	-3.1		-5.2	
		b dB	-2.9		-5.2	
2	Duplexer Loss	T dB	-3.0		-3.0	
		R dB	-3.5		-3.5	
3	RF Hybrid Loss		0.0		0.0	
4	Antenna Gain	a dB	35.8		35.8	
		b dB	35.8		35.8	
5	Reflector Gain	A dB				
		B dB				
6	Free Space Loss	A dB	-138.1	d1= 96 Km	-137.3	d1= 87.5 Km
		B dB		d2= Km		d2= Km
		C dB		d3= Km		d3= Km
7	Azimuth Loss of Reflector	A dB				
		B dB				
8	Azimuth Loss of Antenna					
9	Loss of Splitting Power					
10	Shadow Loss	A dB		d1= h1=		d1= h1=
		B dB		d2= h2=		d2= h2=
11	Additional Loss	A dB				
		B dB				
		C dB				
12	Span Loss	Loss dB	-150.6		-154.2	
		Gain dB	71.6		71.6	
		Total dB	-79.0		-82.6	
13	Transmitting Power			1 W		1 W
			30.0	(ATT 0 dB)	30.0	(ATT 0 dB)
14	Receiving Power		-49.0		-52.6	
15	Receiver Noise			F= 3.0 dB		F= 3.0 dB
				B= 1.1 MHz		B= 1.1 MHz
16	C/N in median		-110.5		-110.5	
17	Interference		61.5		57.9	
18	City Noise		50.0	Presumed	50.0	Presumed
19	Others		53.4	Presumed	52.1	Presumed
20	Variable Factor Total		60.0		60.0	
21	C/N for Variable Factor		47.9		47.3	
22	Fading Margin		14.4	BER = 1 E-3	14.4	BER = 1 E-3
23	Pr		33.5		32.9	
24	Pre Considering Reflection			Pr= 2.0E-02		Pr= 1.4E-02
25	Diversity Improvement			Pre= 5.1E-02		Pre= 2.5E-01
26	Outage Time Due to Fading		S/D	Isd= 2.2E+01	S/D	Isd= 1.6E+01
27	Outage Margin			Pm= 1.0E-04		Pm= 8.2E-04
				13.0		3.6

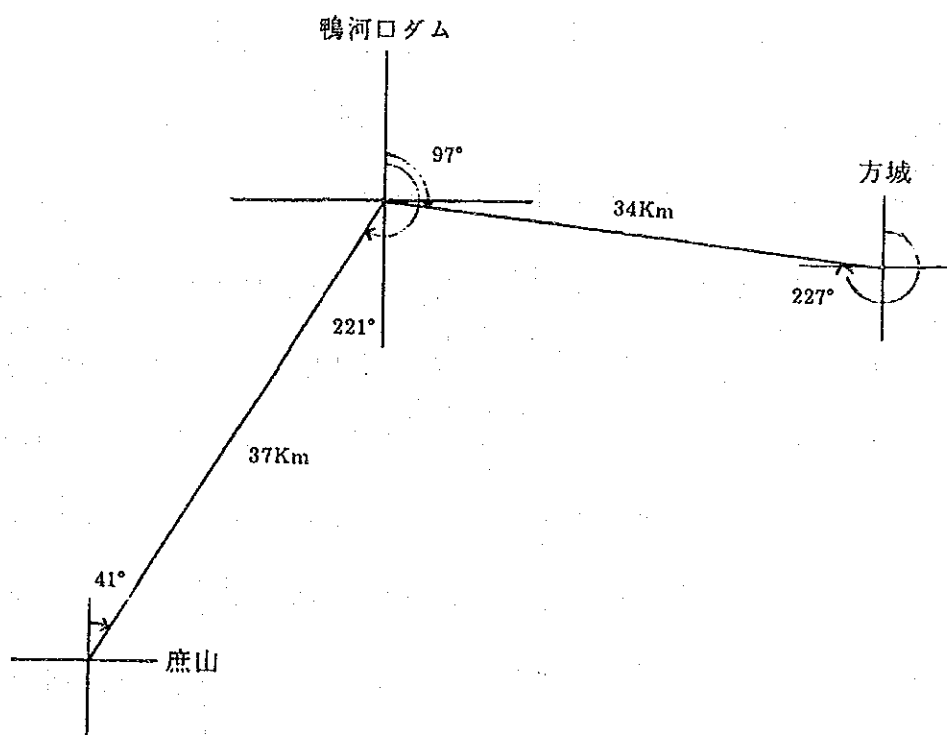
第3編 VHF/UHF通信回線各局空中線位置図

第3編 VHF/UHF通信回線各局空中線位置図

1.	鴨川口ダム	—	方城	.....	B3-1
	鴨川口ダム	—	庶山	.....	B3-1
2.	庶山	—	石門	.....	B3-2
	庶山	—	鴨川口ダム	.....	B3-2
	庶山	—	社旗	.....	B3-2
	庶山	—	南陽	.....	B3-2
	庶山	—	邓县	.....	B3-2
	庶山	—	赵湾	.....	B3-2
3.	方山	—	后会	.....	B3-3
	方山	—	楊山	.....	B3-3
4.	邓县	—	庶山	.....	B3-4
	邓县	—	急灘	.....	B3-4
	邓县	—	楊山	.....	B3-4
	邓县	—	半店	.....	B3-4
5.	楊山	—	方山	.....	B3-5
	楊山	—	邓县	.....	B3-5
	楊山	—	林扒	.....	B3-5
	楊山	—	谷城	.....	B3-5
	楊山	—	黄家港	.....	B3-5
	楊山	—	大韭山	.....	B3-5
	楊山	—	摩天嶺	.....	B3-5
	楊山	—	竜王廟	.....	B3-5
6.	摩天嶺	—	楊山	.....	B3-6
	摩天嶺	—	开峰峪	.....	B3-6
	摩天嶺	—	保康	.....	B3-6
	摩天嶺	—	東蒿	.....	B3-6
	摩天嶺	—	青峰	.....	B3-6
	摩天嶺	—	余家河	.....	B3-6

7.	大蕓山	— 楊山	.....	B3-7
	大蕓山	— 胡家渡	.....	B3-7
8.	東蒿	— 摩天嶺	.....	B3-8
	東蒿	— 陽日灣	.....	B3-8
	東蒿	— 西蒿坪	.....	B3-8
9.	東遍山	— 新店舖	.....	B3-9
	東遍山	— 黑清河	.....	B3-9
	東遍山	— 唐梓山	.....	B3-9
	東遍山	— 玃灣	.....	B3-9
	東遍山	— 羅崗	.....	B3-9
	東遍山	— 石河	.....	B3-9
	東遍山	— 黃茅山	.....	B3-9
	東遍山	— 西排子江	.....	B3-9
10.	唐梓山	— 唐河	.....	B3-10
	唐梓山	— 平氏	.....	B3-10
	唐梓山	— 大張庄	.....	B3-10
	唐梓山	— 東遍山	.....	B3-10
	唐梓山	— 郭灘	.....	B3-10
11.	唐河	— 饒良	.....	B3-11
	唐河	— 泌陽	.....	B3-11
	唐河	— 唐河	.....	B3-11
	唐河	— 唐梓山	.....	B3-11
12.	陽家大山	— 宣城	.....	B3-12
	陽家大山	— 雷河	.....	B3-12
	陽家大山	— 小南河	.....	B3-12
	陽家大山	— 中繼	.....	B3-12
	陽家大山	— 武鎮	.....	B3-12
13.	中繼	— 陽家大山	.....	B3-13
	中繼	— 李廟	.....	B3-13

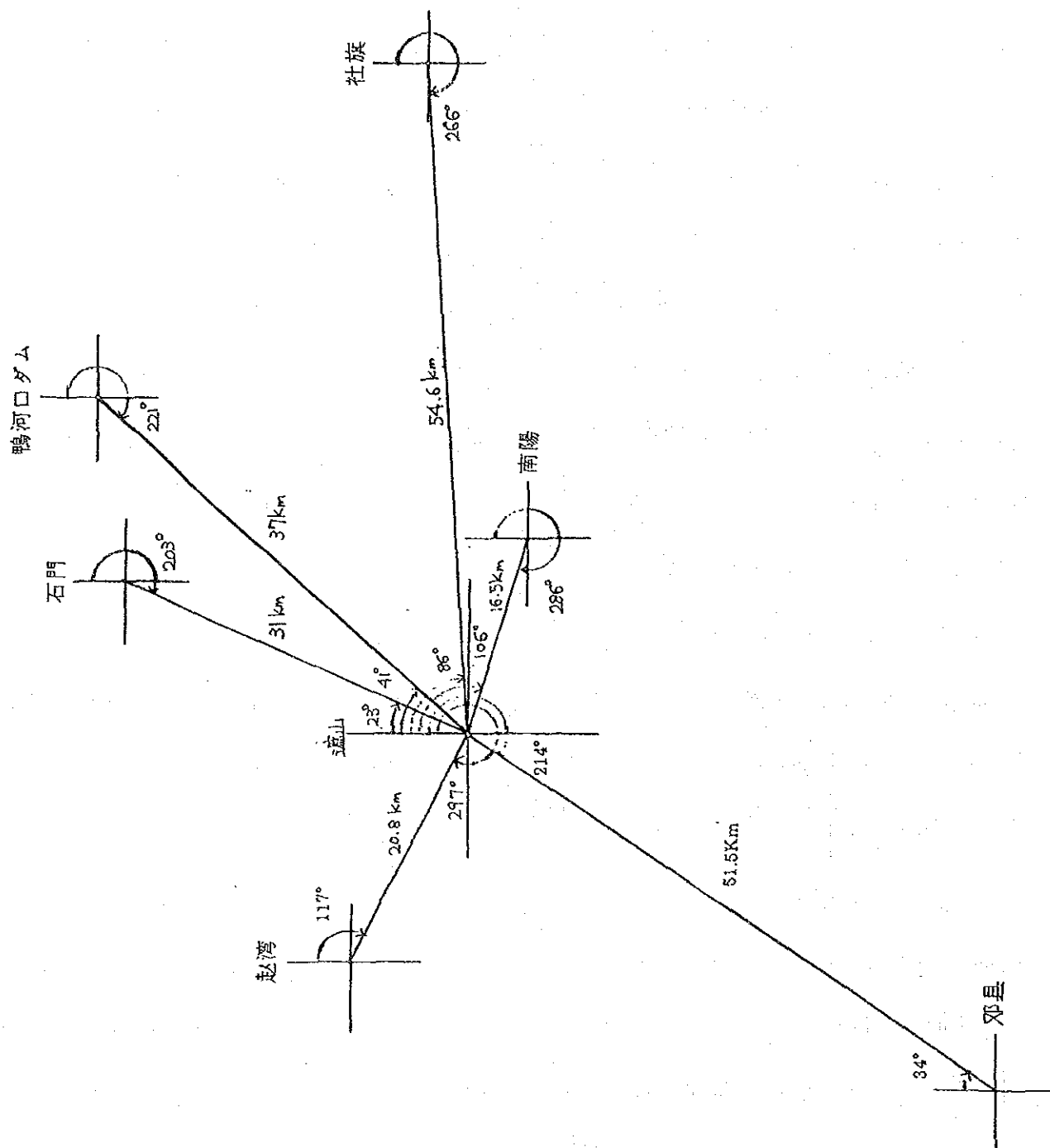
14.	皇庄	—	大洪山	.....	B3-14
	皇庄	—	温峡口	.....	B3-14
	皇庄	—	钟祥县	.....	B3-14
	皇庄	—	双河	.....	B3-14
15.	大洪山	—	華陽	.....	B3-15
	大洪山	—	資山	.....	B3-15
	大洪山	—	清澤	.....	B3-15
	大洪山	—	飛虎峡	.....	B3-15
	大洪山	—	皇庄	.....	B3-15
16.	沙洋	—	荊門市漢江	.....	B3-16
	沙洋	—	荊州地区漢江	.....	B3-16
	沙洋	—	荊門市	.....	B3-16
17.	潜江	—	岳口	.....	B3-17
	潜江	—	東荊河	.....	B3-17
	潜江	—	潜江市防共指揮部	.....	B3-17
	潜江	—	澤口	.....	B3-17
18.	杜家台ゲート	—	仙桃	.....	B3-18
	杜家台ゲート	—	仙桃市	.....	B3-18
19.	汉川	—	孝感	.....	B3-19
	汉川	—	汉川	.....	B3-19
	汉川	—	汉川県防共指揮部	.....	B3-19
	汉川	—	汉川県防共指揮部	.....	B3-19
	汉川	—	汉陽	.....	B3-19
	汉川	—	汉南区	.....	B3-19
20.	長江水利委員会	—	湖北省	.....	B3-20
	長江水利委員会	—	武汉市水利局		B3-20
	長江水利委員会	—	武汉市防共指揮部		B3-20
	長江水利委員会	—	汉口		B3-20



回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

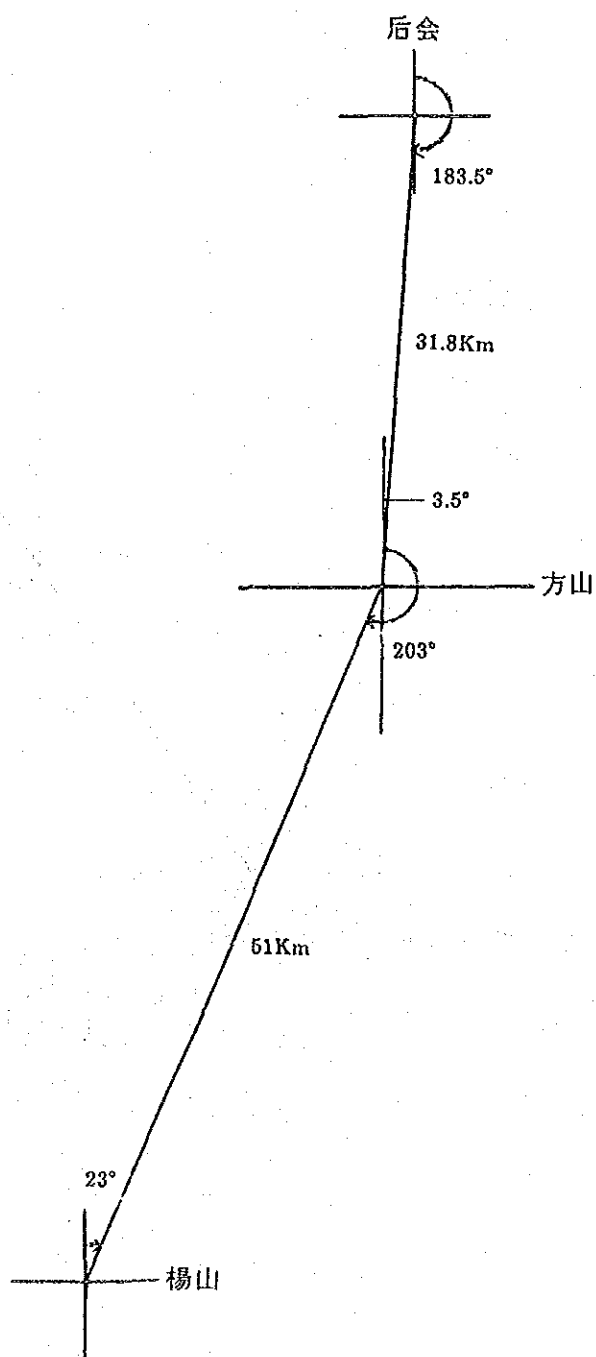
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

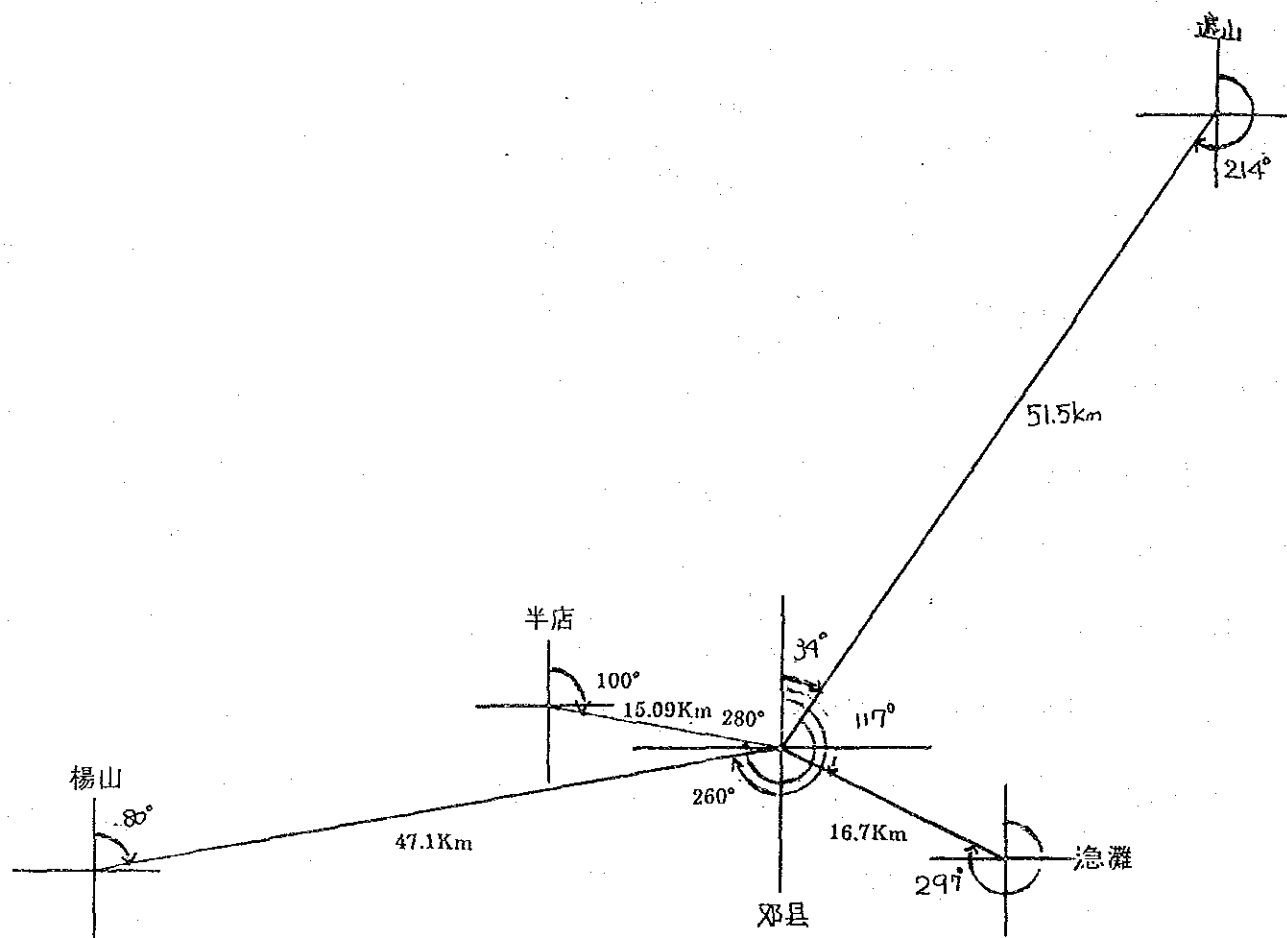
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

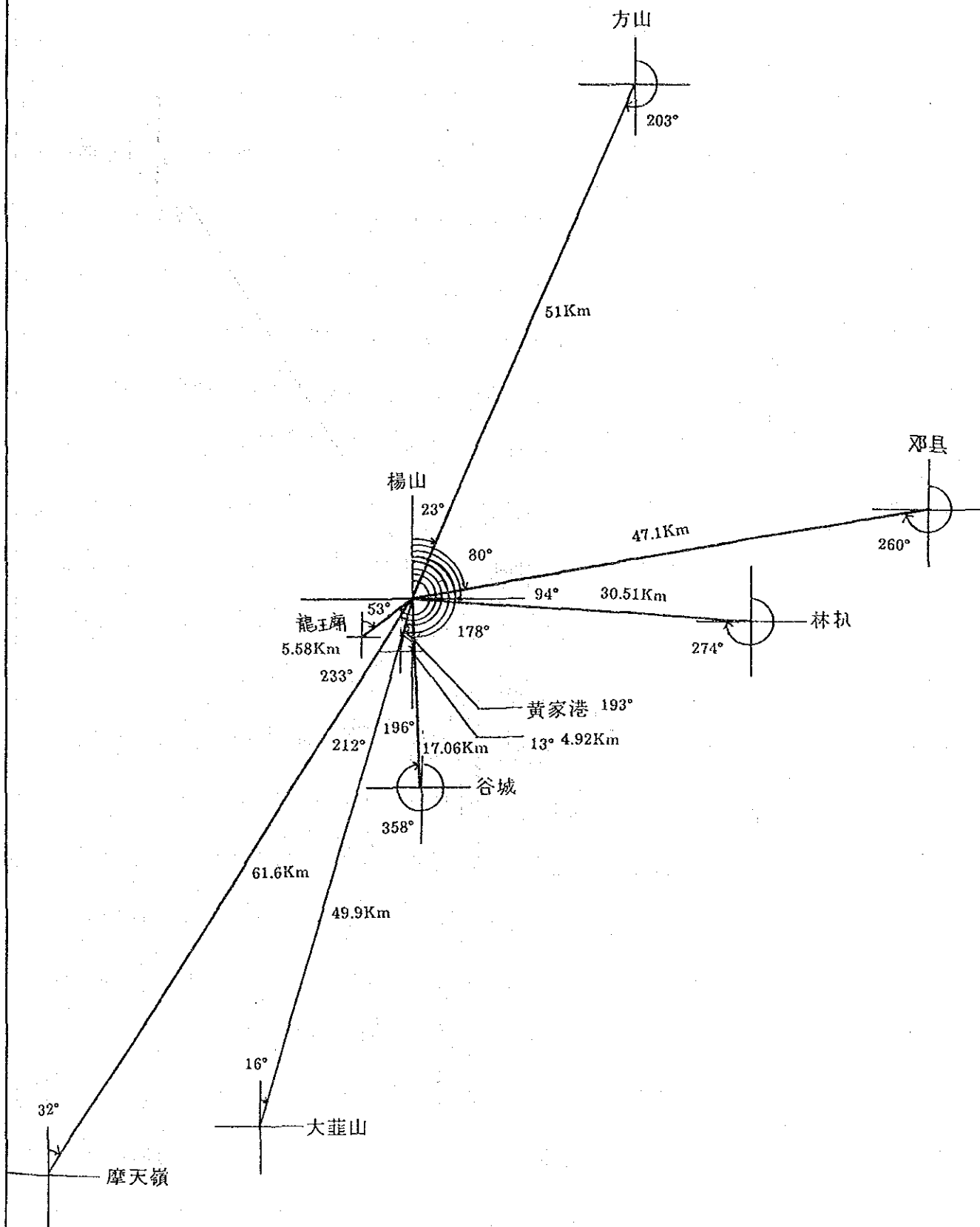
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

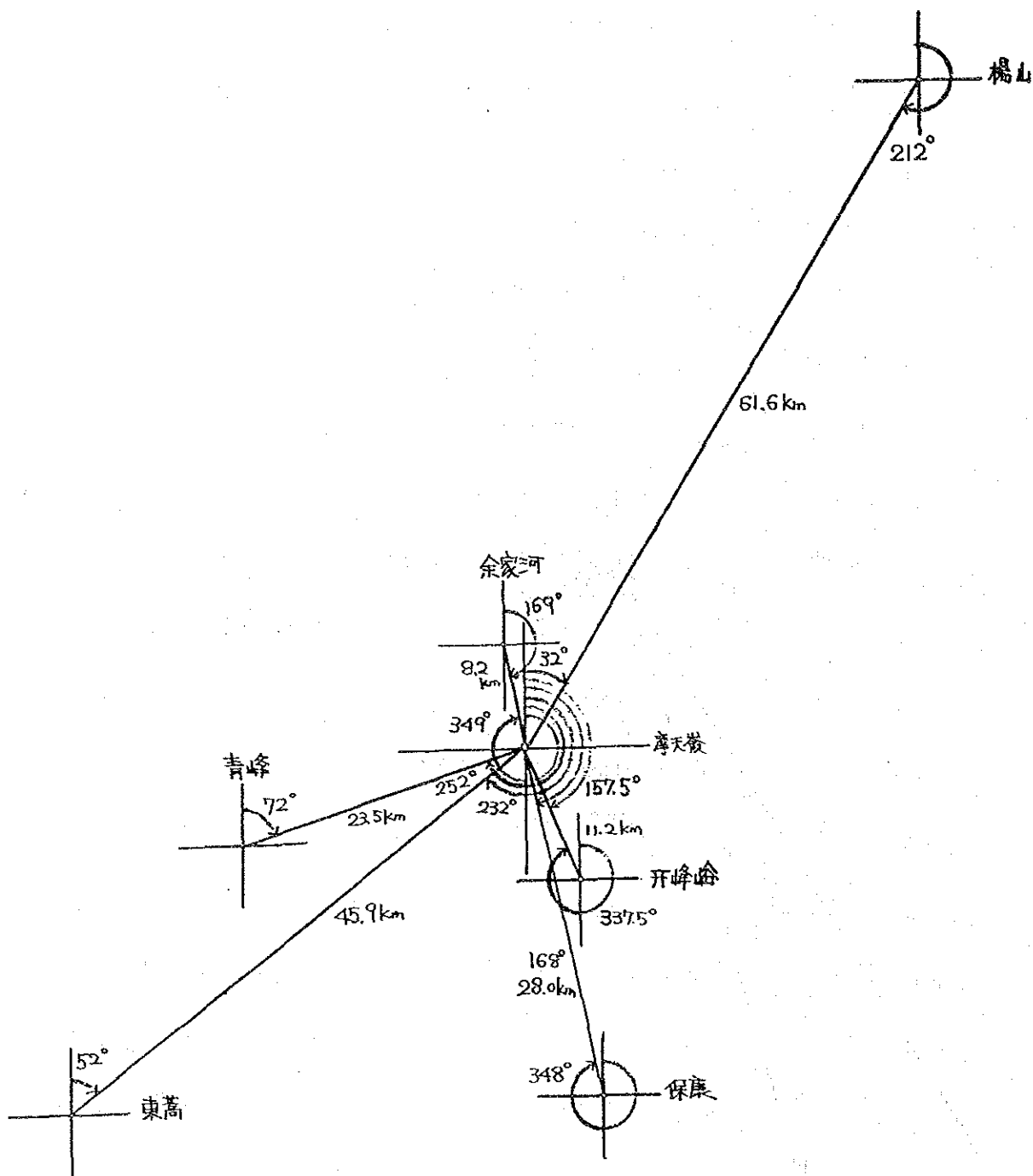
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

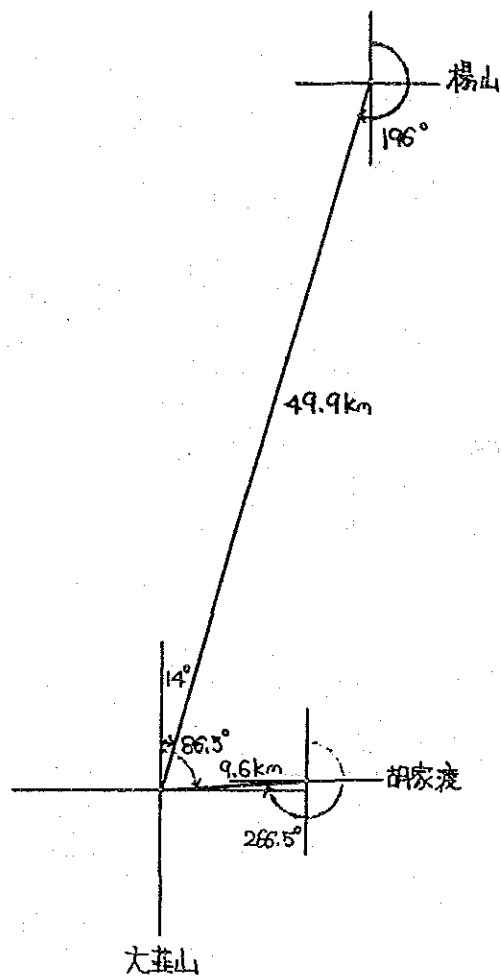
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回線系統圖 (空中線位置圖)

漢江中下流区間洪水予警報

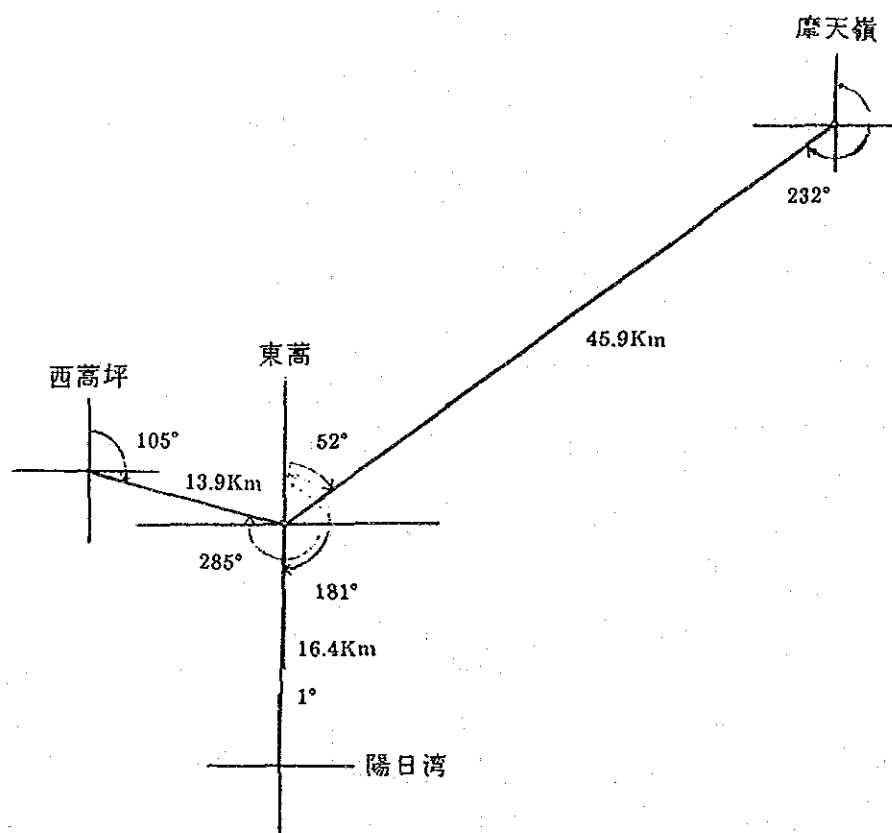
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

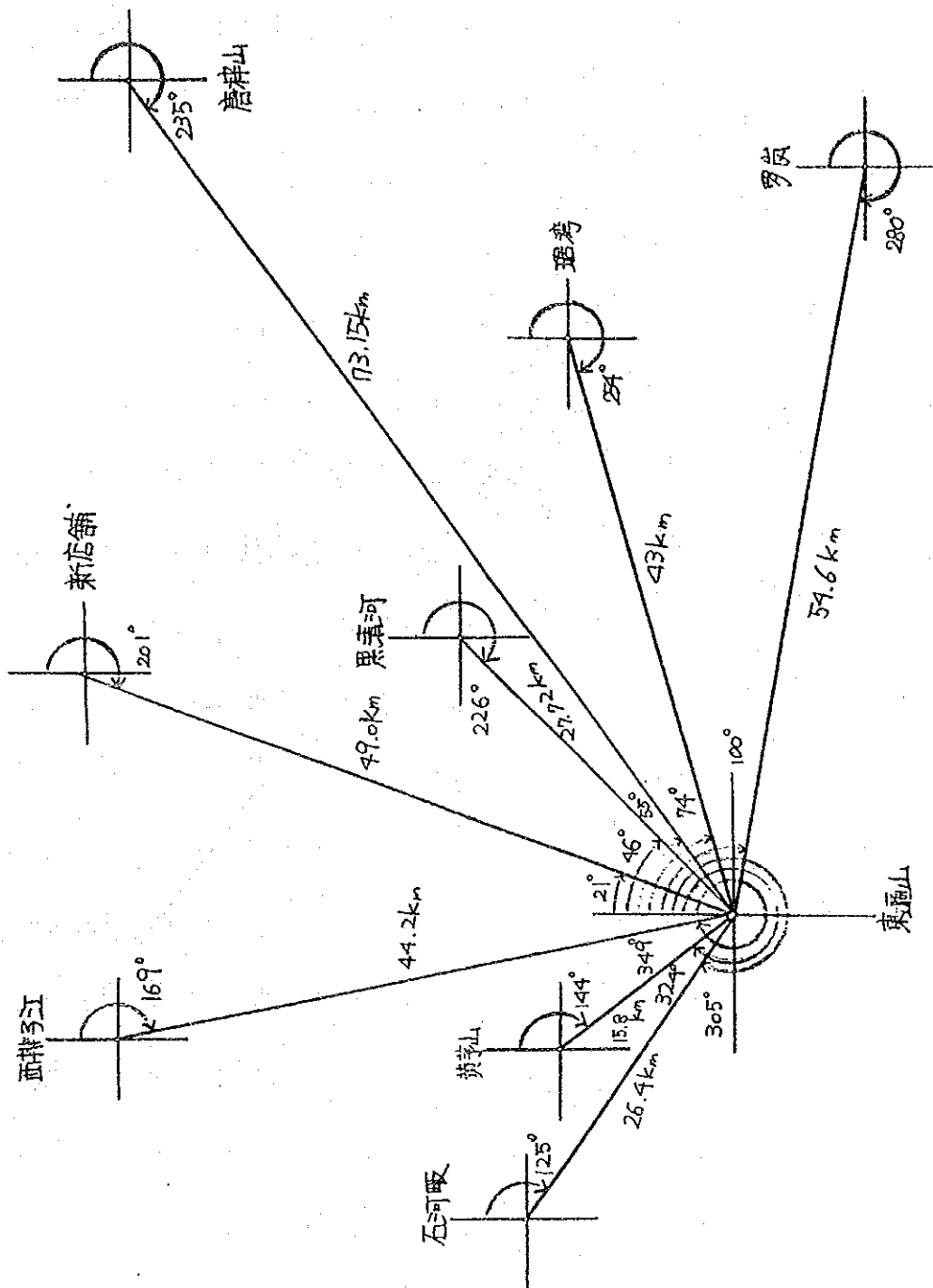
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

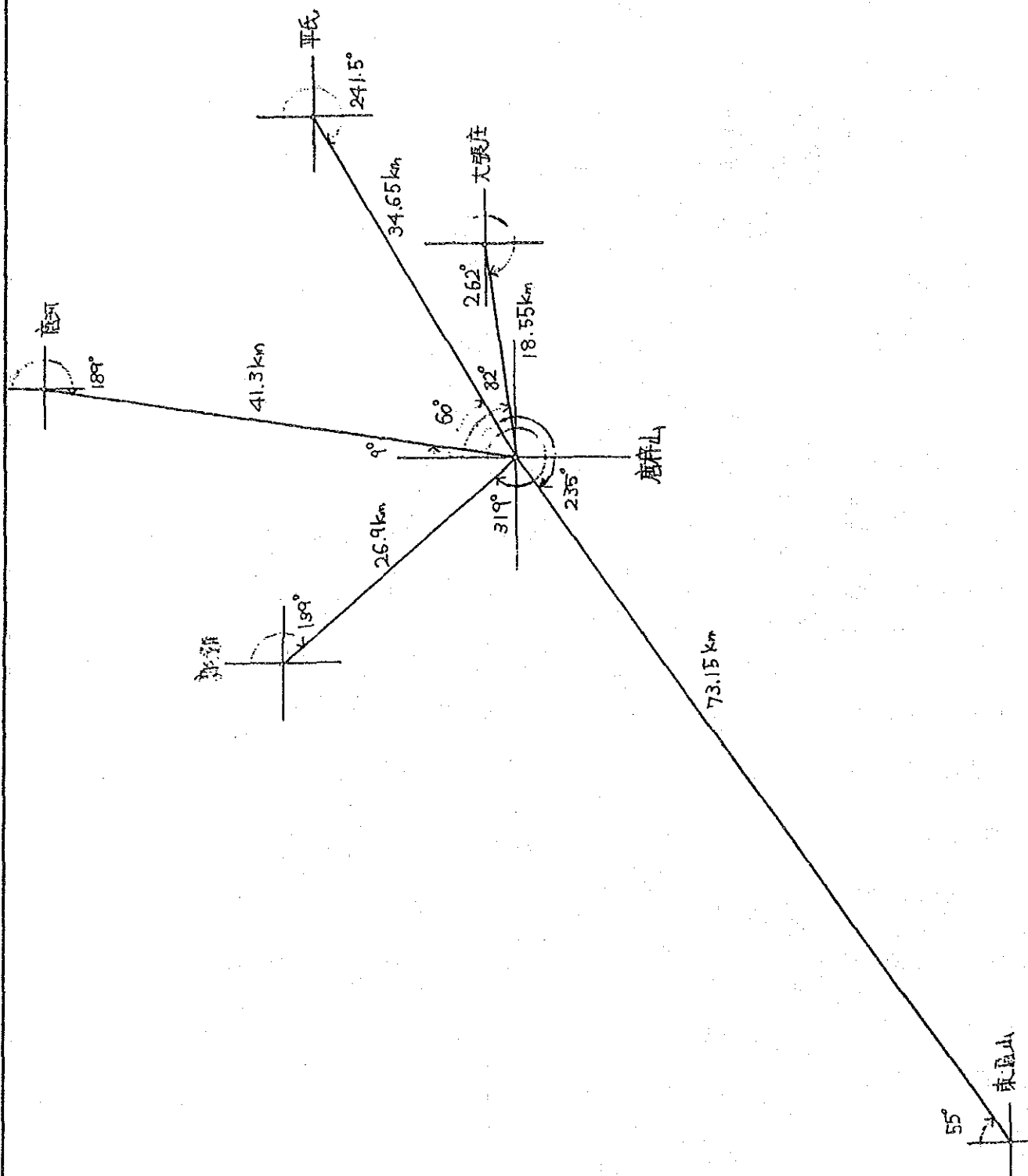
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

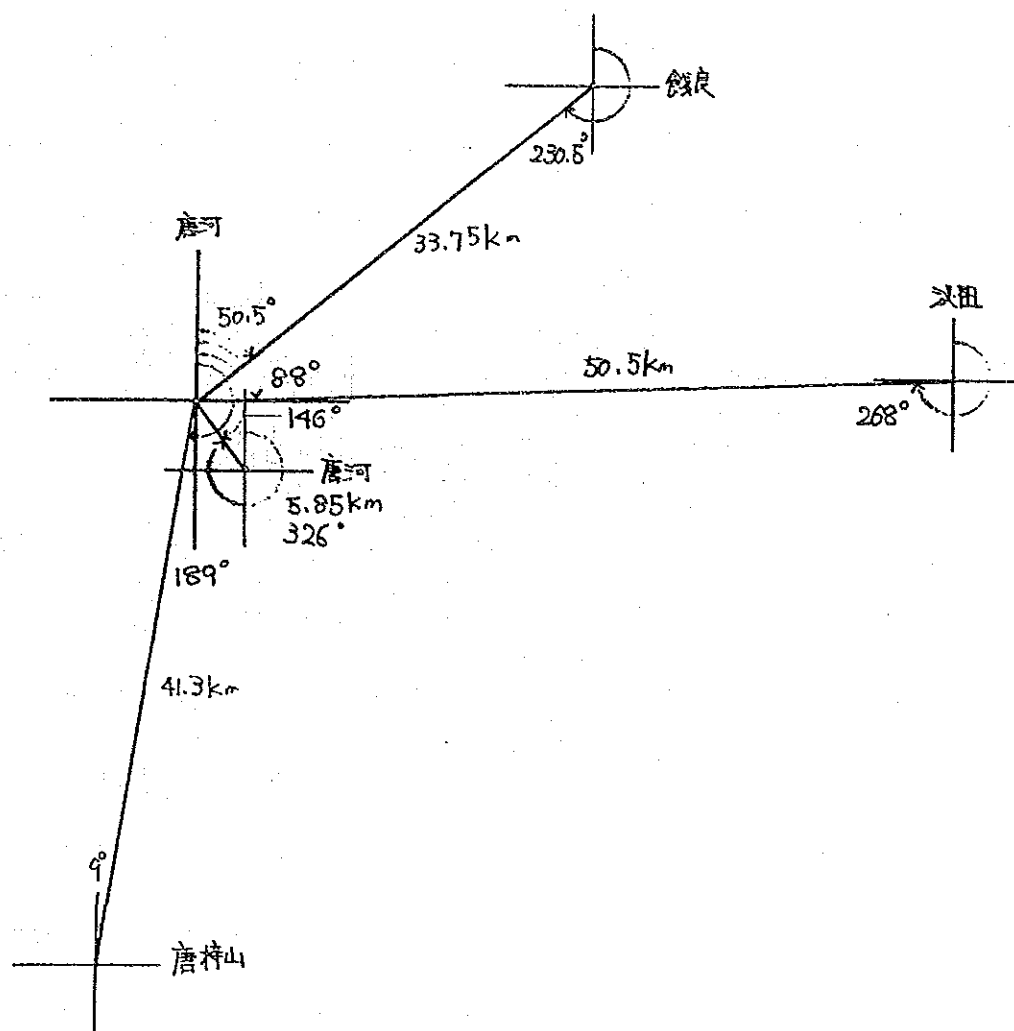
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

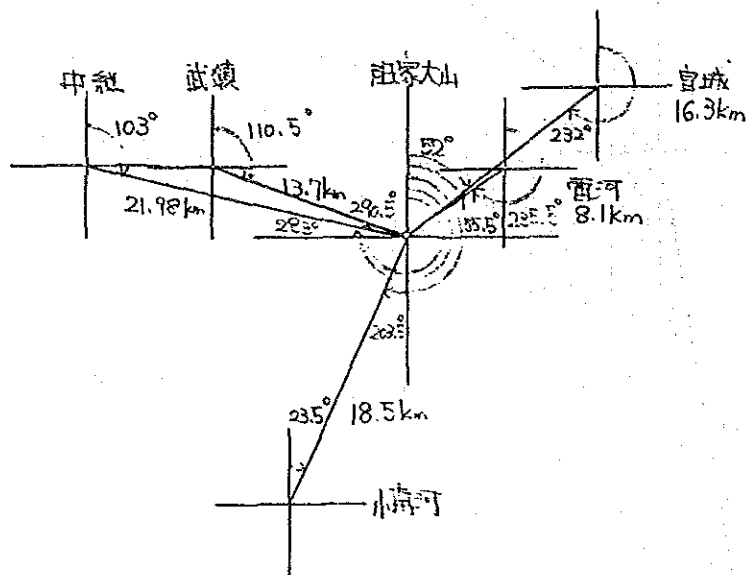
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

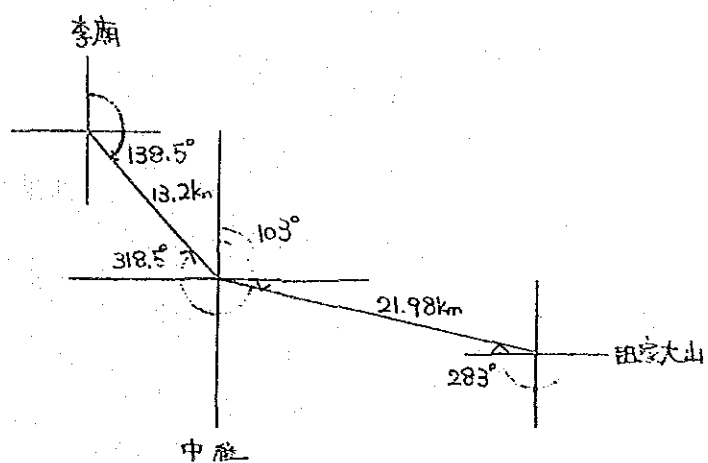
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

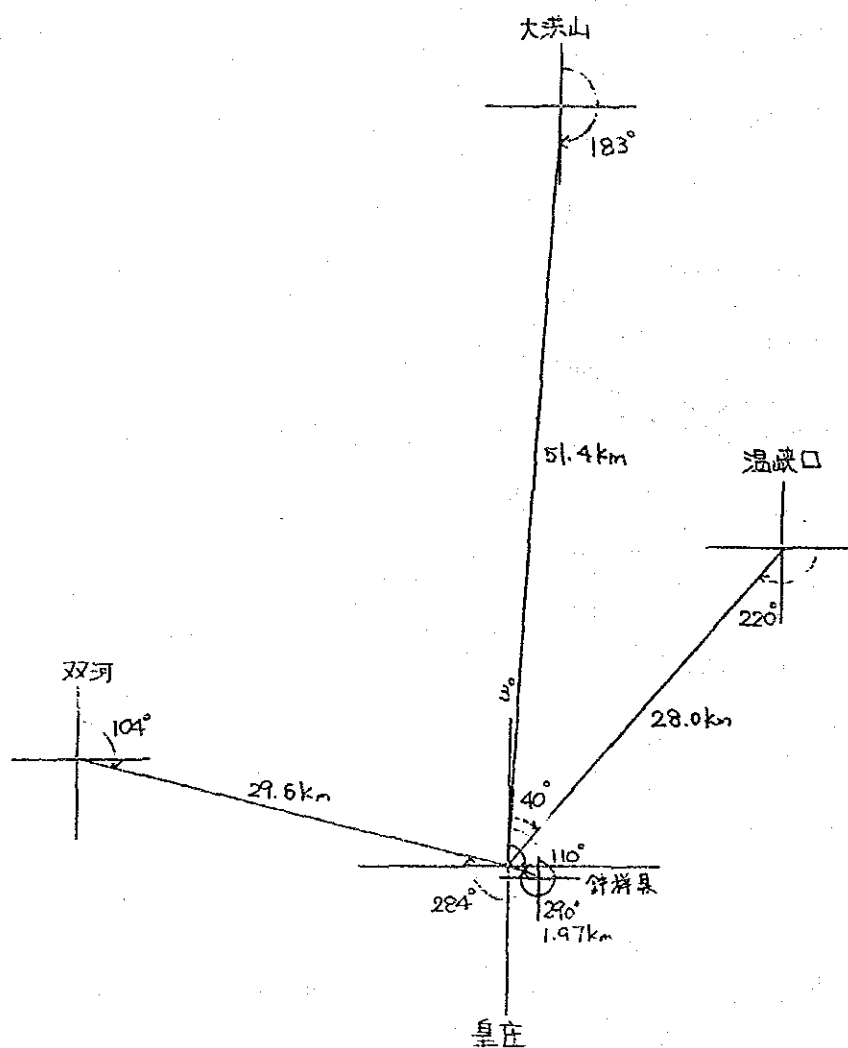
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

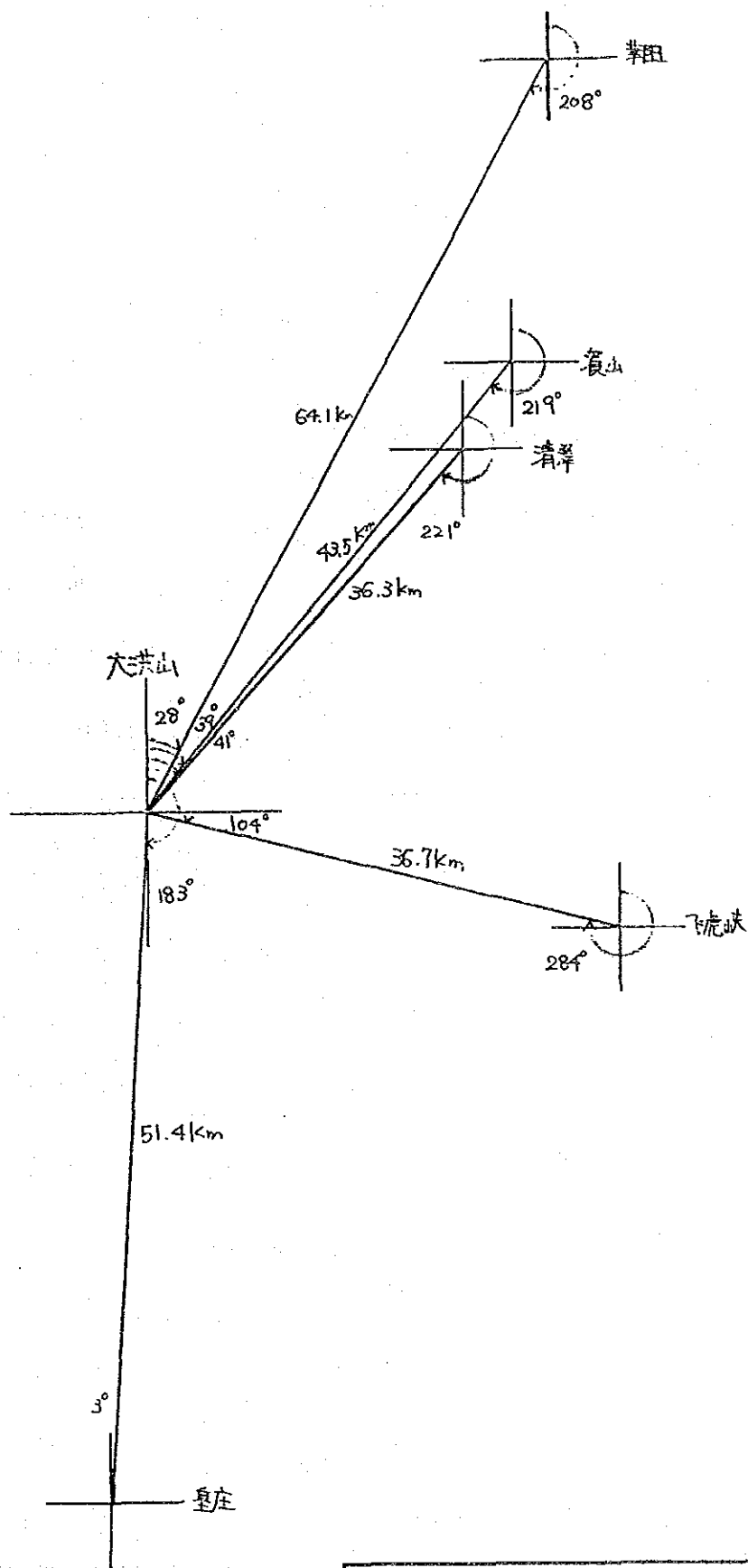
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

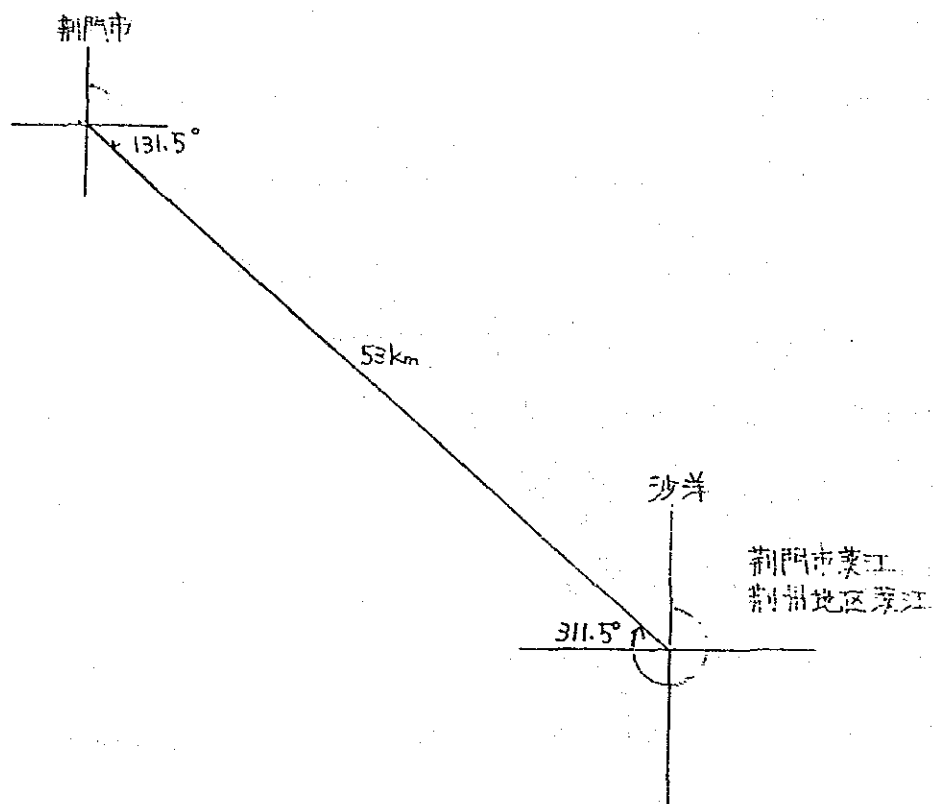
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

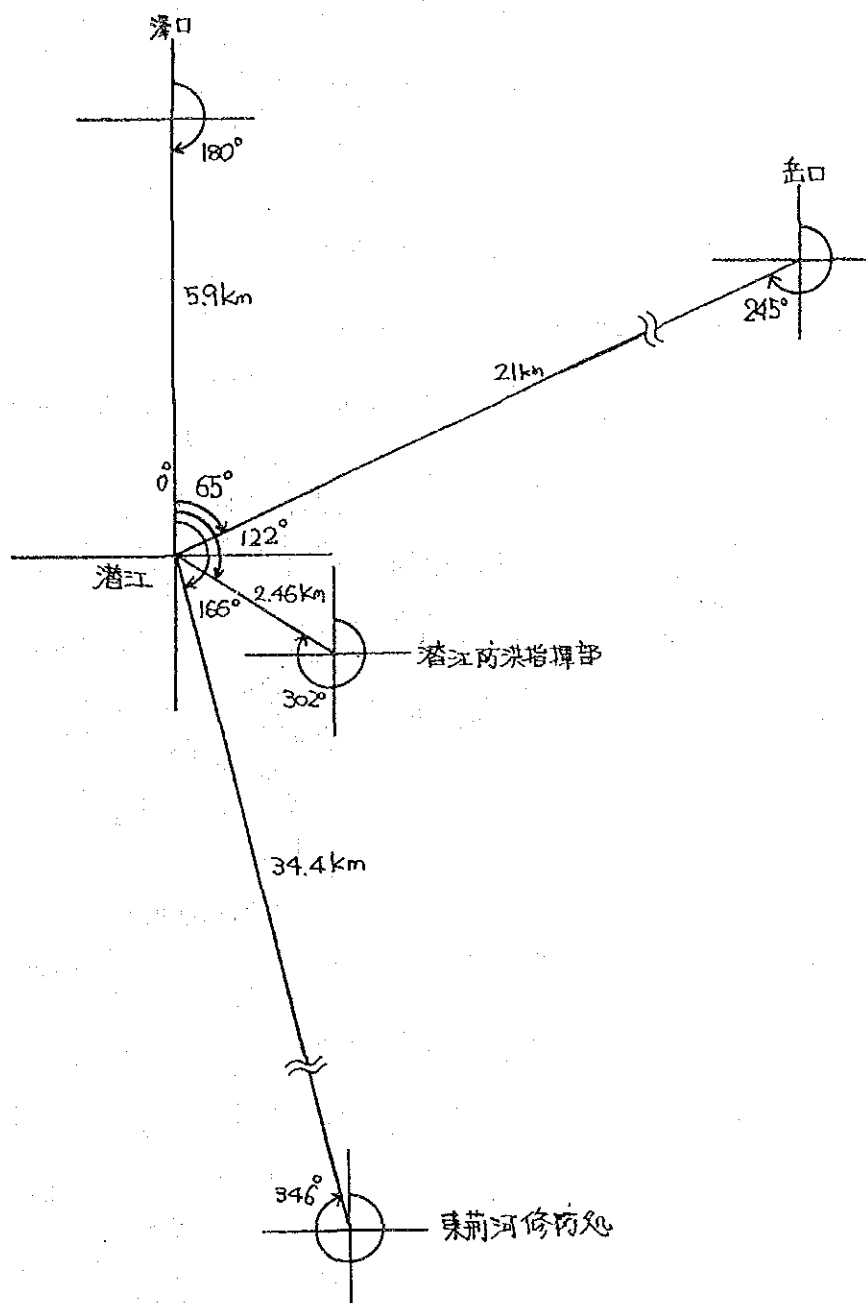
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

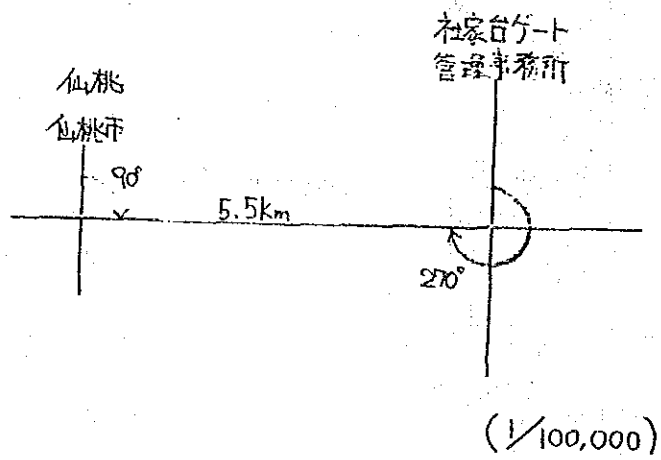
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回線系統圖 (空中線位置圖)

漢江中下流区間洪水予警報

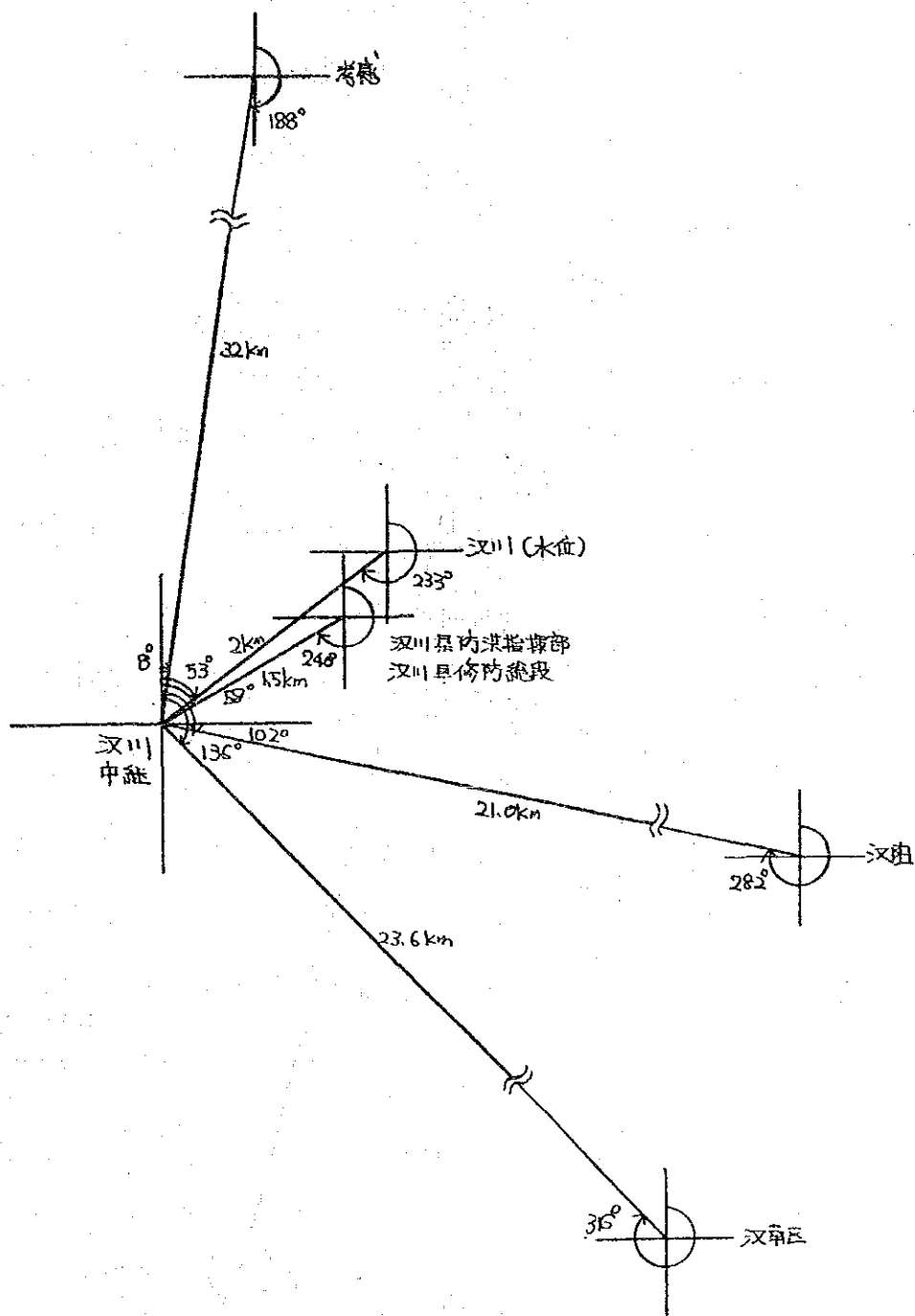
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

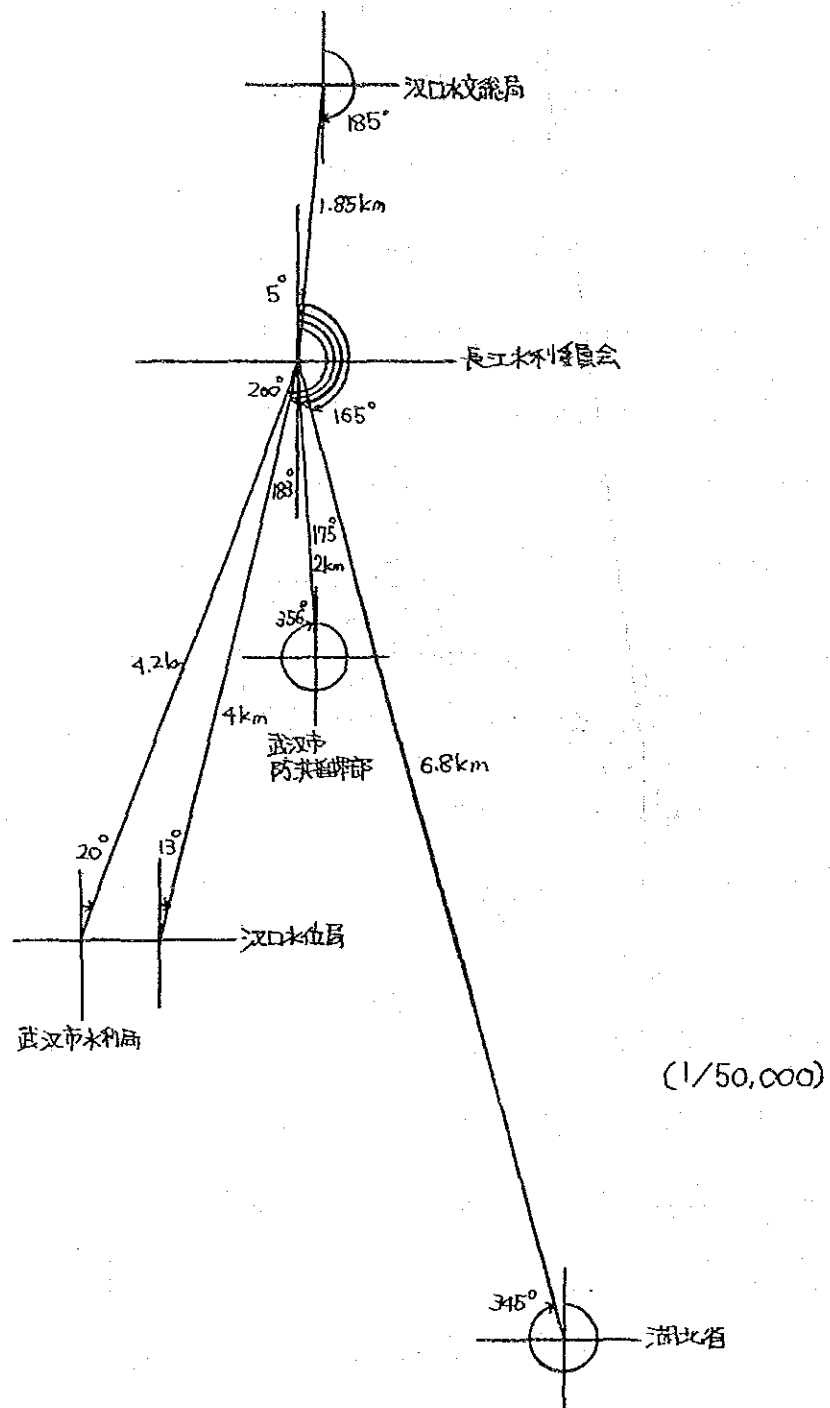
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回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

JAPAN INTERNATIONAL COOPERATION AGENCY



回線系統図 (空中線位置図)

漢江中下流区間洪水予警報

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