LARCAN USA INC.

Lafayette, CO

The following is what was presented By Dr. Bryon St. Claire during the three workshop/seminars presented in Oregon on November 4th, 5th & 6th.

Drawn for BROADCASTING by Jack Schmidt

"Harry, are you sure the phone company isn't into cable yet."

Broadcasting Jul 18 1988

REVISED FCC MINOR CHANGE RULES

Relaxed definition of “Minor Change” effective October 1, 2000.

New definition will allow increases in coverage through higher power, greater height or modified antenna pattern.

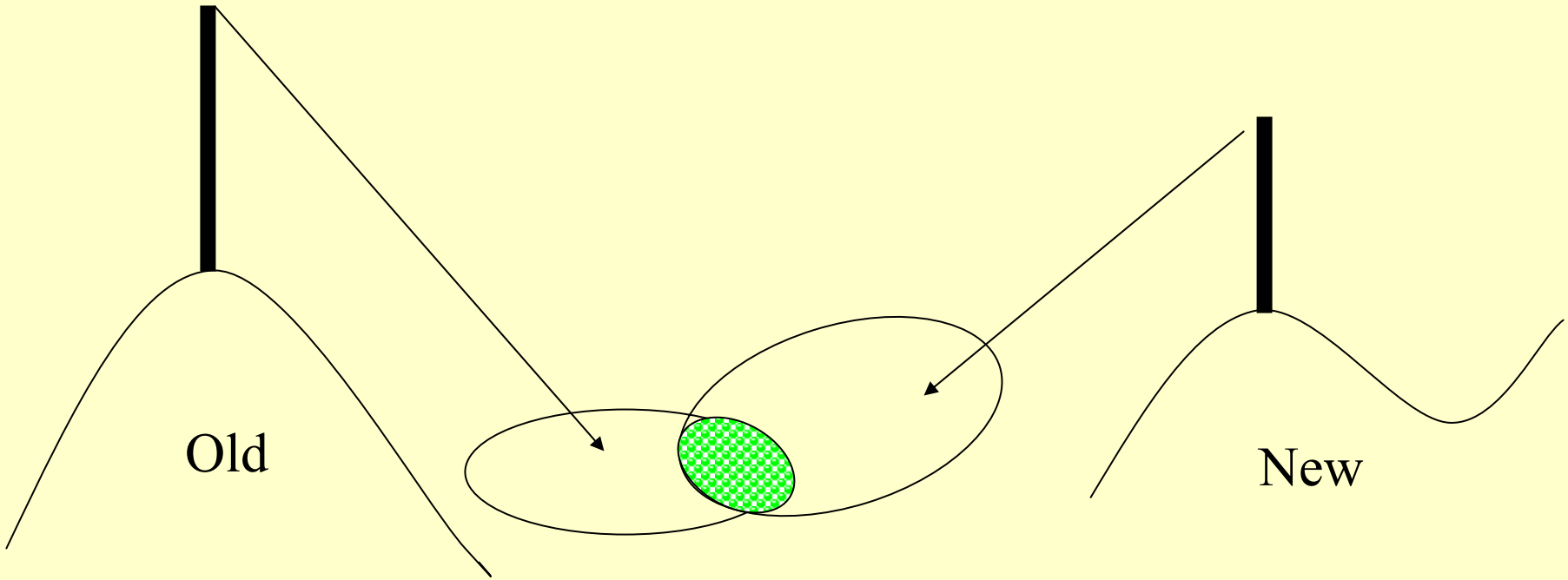
Also changes in location are included if there is at least a minimal overlap of the old and new protected contours.

Must meet interference criteria to protect other stations.

Minor change applications can be filed at any time without waiting for a “filing window”.

The new definition will apply to all LPTV stations and translators.

Contour Overlap



Low VHF (Ch 2-6) 62dBµ

High VHF (Ch 7-13) 68 dBµ

UHF 74dBµ

POWER LIMITS

LPTV AND TRANSLATOR STATIONS

	VHF	UHF
OLD	10 WATT TRANSMITTER	1000 WATT TRANSMITTER
NEW	3000 WATTS ERP	150 kW ERP

Transmitter Power

ERP = Transmitter Power x line efficiency x antenna gain
Transmitter Power = ERP / (line efficiency x antenna gain)

VHF ERP = 3.0kW Assume line efficiency = 0.85

	Gain	Transmitter Power	Transmitter Size
Omni pattern 6 Bay Slot	7.1	0.497kW	500 Watt
Wide Cardoid 6 Bay Slot	12.1	0.291kW	300 Watt

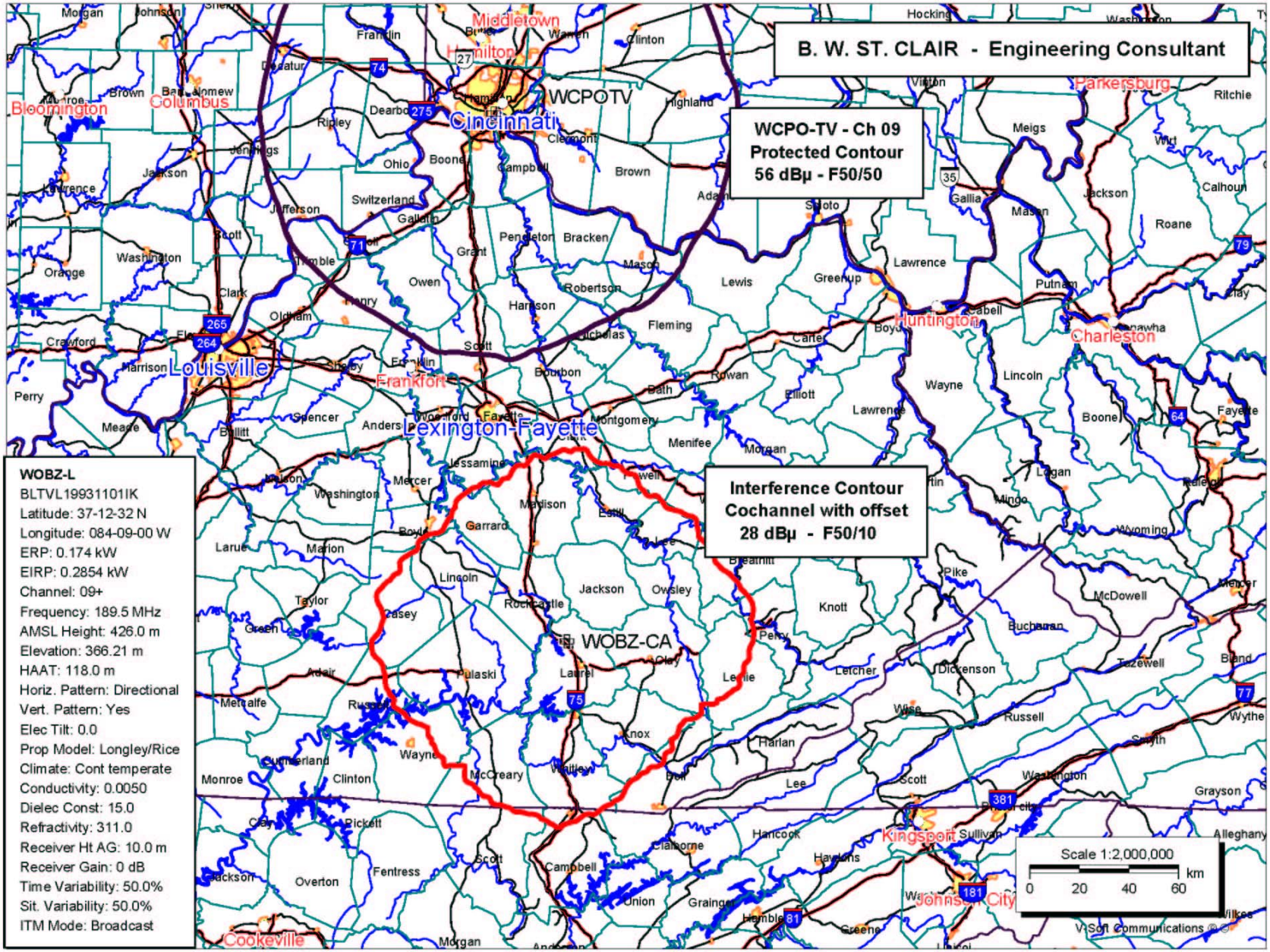
UHF ERP = 150kW Assume line efficiency = 0.70

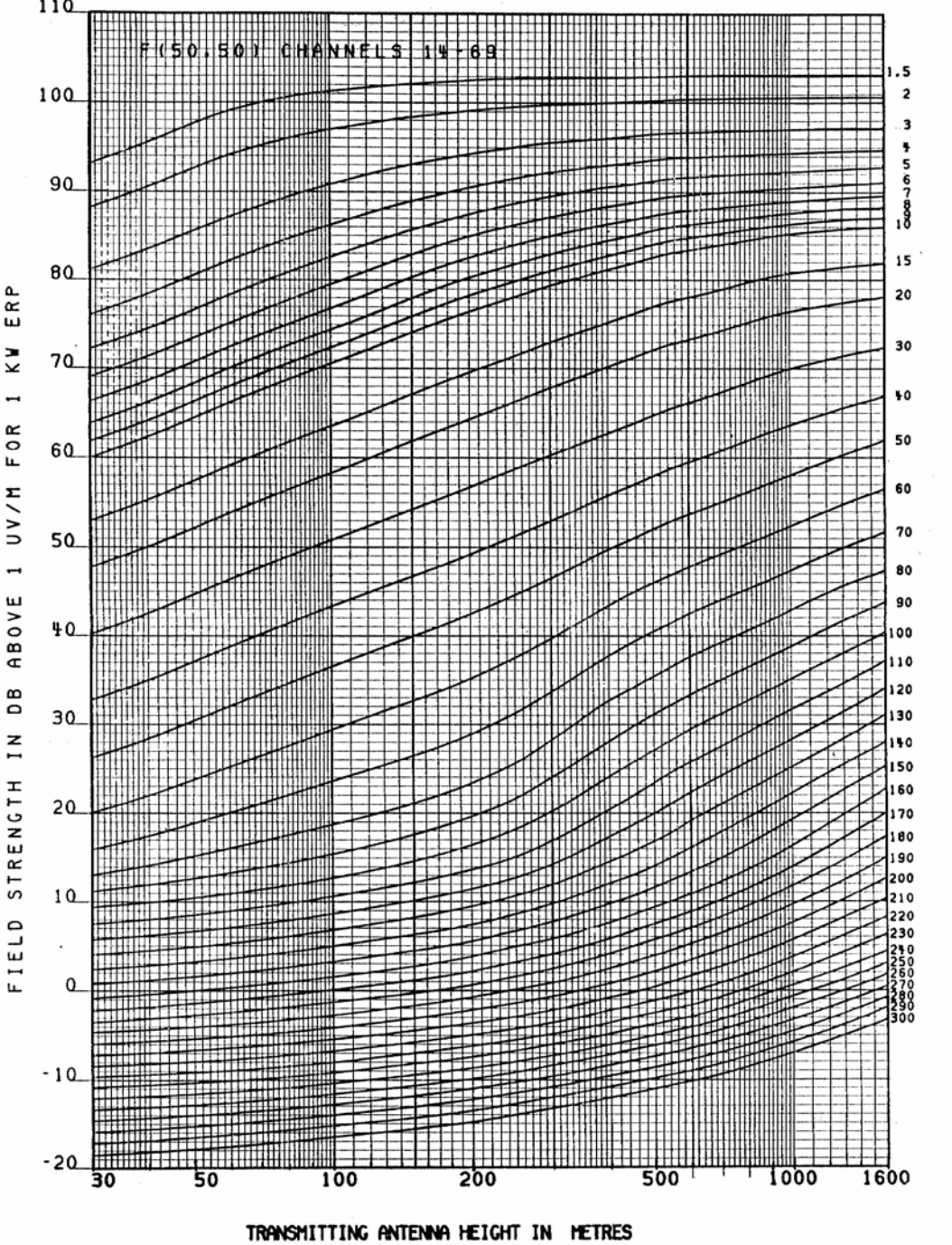
	Gain	Transmitter Power	Transmitter Size
Omni (Omnoid) 16 Bay Slot	28.2	7.6kW	7.5 or 8.0kW
Medium Cardoid 16 Bay Slot	42.14	5.1kW	5.0kW

Table III

INTERFERENCE PROTECTION - FIELD STRENGTH RATIOS

Proposed LPTV Is:	Regular TV		Existing LPTV	
	VHF (protected within Grade B contour)	UHF (protected within Grade B contour)	VHF (within protected contour as defined)	UHF (within protected contour as defined)
Co - channel	-45dB. or –28dB with off-set (interference based on F (50, 10) chart			
	Note – all values below based onF (50,50) chart			
Lower adjacent	+6dB	+15dB	+6dB	+15dB
Upper adjacent	+12dB	+15dB	+12dB	+15dB
7 channels below	N/A	N/A	N/A	~~0dB~~
14 channels above	N/A	+23dB	N/A	~~+23dB~~
15 channels above	N/A	+6dB	N/A	+6dB

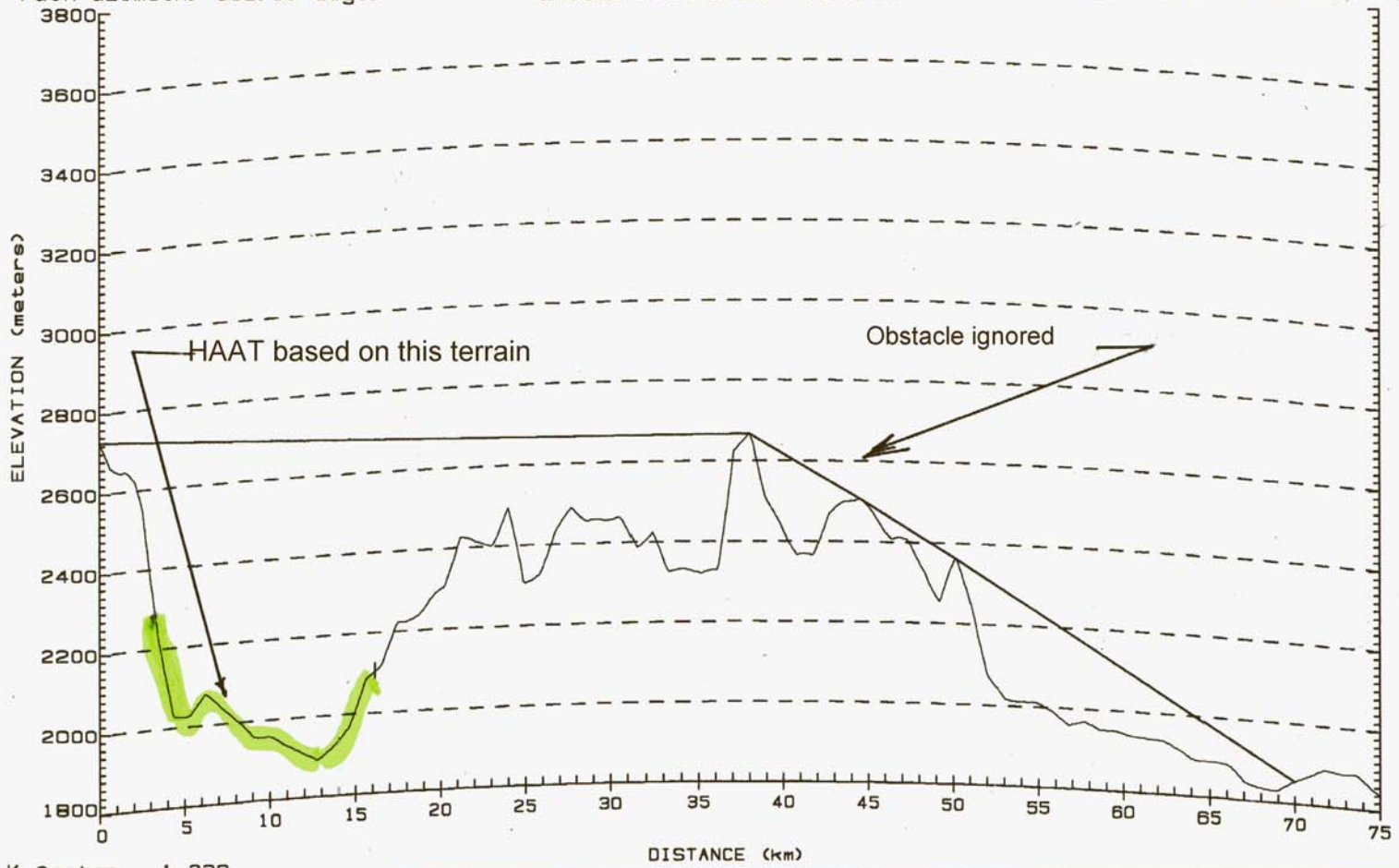

B. W. ST. CLAIR - Engineering Consultant
WCPO-TV - Ch 09
Protected Contour
56 dBµ - F50/50
Interference Contour
Cochannel with offset
28 dBµ - F50/10
WCPOTV
WOBZ-CA
WOBZ-L
BLTVL19931101IK
Latitude: 37-12-32 N
Longitude: 084-09-00 W
ERP: 0.174 kW
EIRP: 0.2854 kW
Channel: 09+
Frequency: 189.5 MHz
AMSL Height: 426.0 m
Elevation: 366.21 m
HAAT: 118.0 m
Horiz. Pattern: Directional
Vert. Pattern: Yes
Elec Tilt: 0.0
Prop Model: Longley/Rice
Climate: Cont temperate
Conductivity: 0.0050
Dielec Const: 15.0
Refractivity: 311.0
Receiver Ht AG: 10.0 m
Receiver Gain: 0 dB
Time Variability: 50.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast
Scale 1:2,000,000
0 20 40 60 km
V-Soft Communications
Cincinnati
Louisville
Lexington-Fayette
Frankfort
Huntington
Charleston
Parkersburg
Middletown
Hamilton
Columbus
Bloomington
Kingsport
Johnson City
Cookeville


F(50,50) CHANNELS 14-69
FIELD STRENGTH IN DB ABOVE 1 UV/M FOR 1 KW ERP
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
30
50
100
200
500
1000
1600
TRANSMITTING ANTENNA HEIGHT IN METRES
1.5
2
3
4
5
6
7
8
9
10
15
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300

Site:
N 38 44 41 W 104 51 48
Ant. Elev. (AMSL): 2727.0 m
Path azimuth: 352.00 degs.

Frequency: 741.3 MHz
Path Length: 70.0 km
Total Path Loss: 168.3 dB
Excess Path Loss: 41.5 dB

Site:
N 39 24 45 W 104 59 5
Ant. Elev. (AMSL): 1856.5 m
Path azimuth: 171.93 degs.



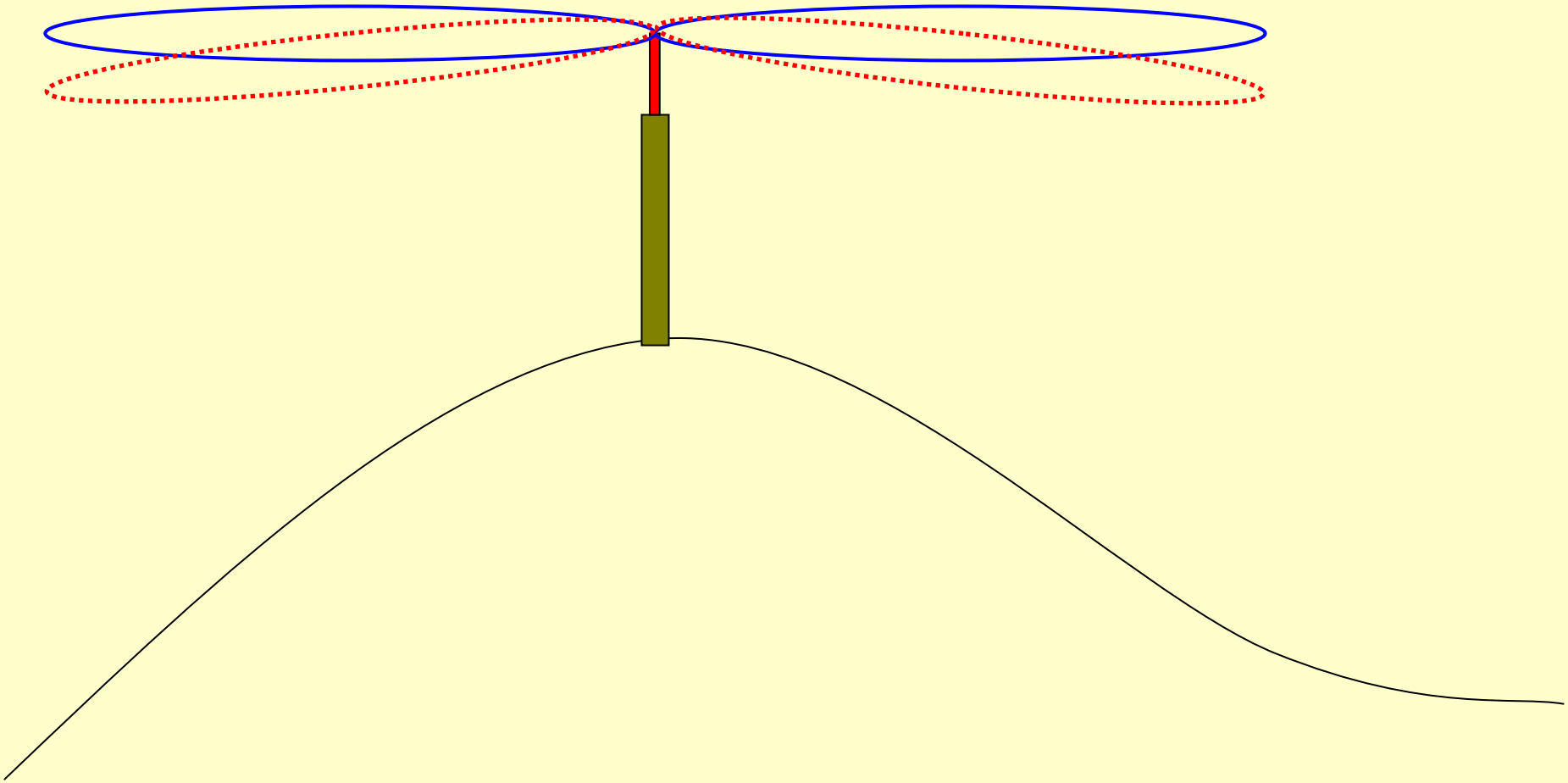
K factor: 1.330

30 Second Database
Rain loss: .0 dB
Urban loss: .0 dB
Foliage loss: .0 dB

B. W. St. Clair
Engineering Consultant
HIGH & LP TV / MICROWAVE

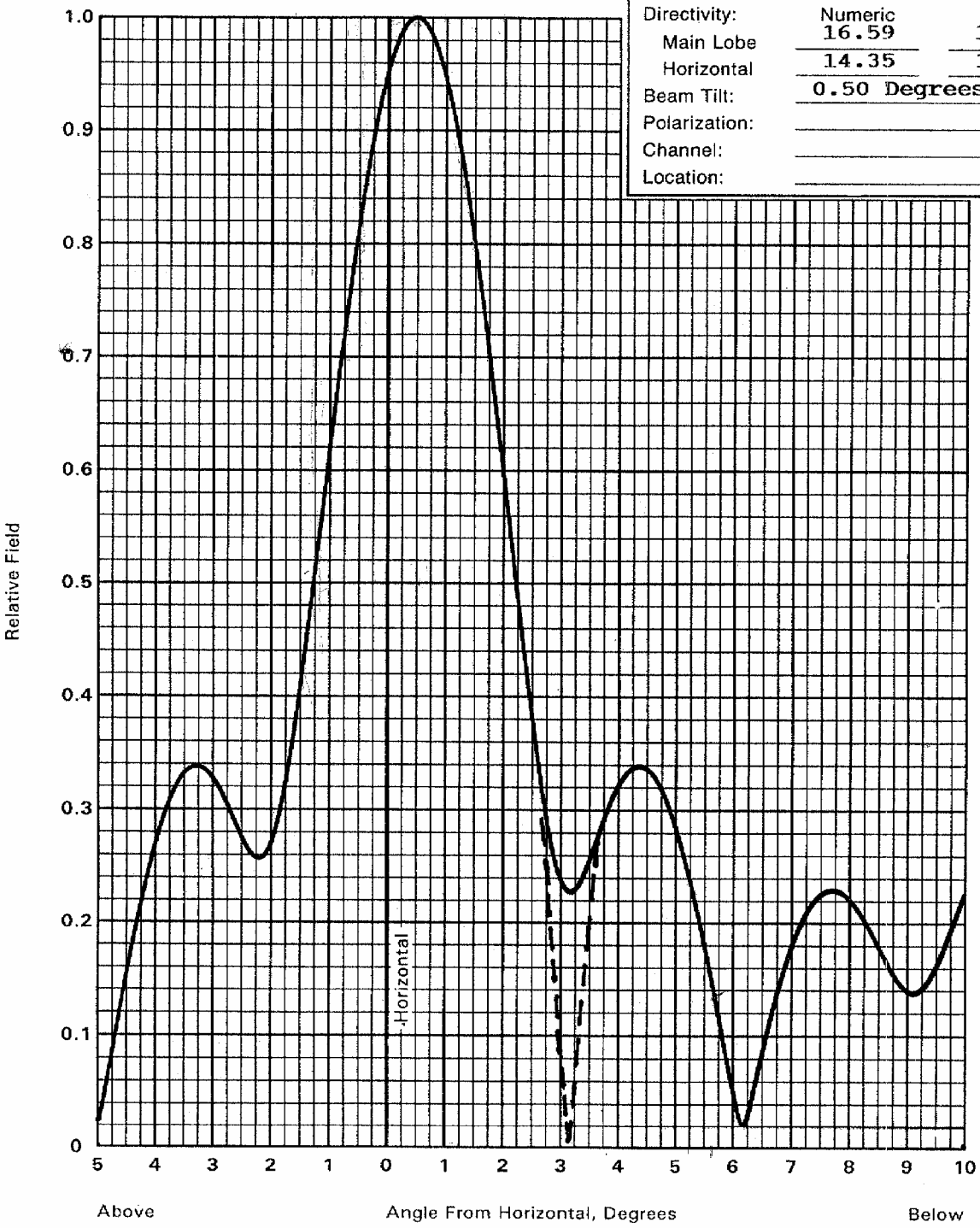
2355 Ranch Drive
Westminster, CO 80234
303-465-5742

ANTENNA DOWNTILT

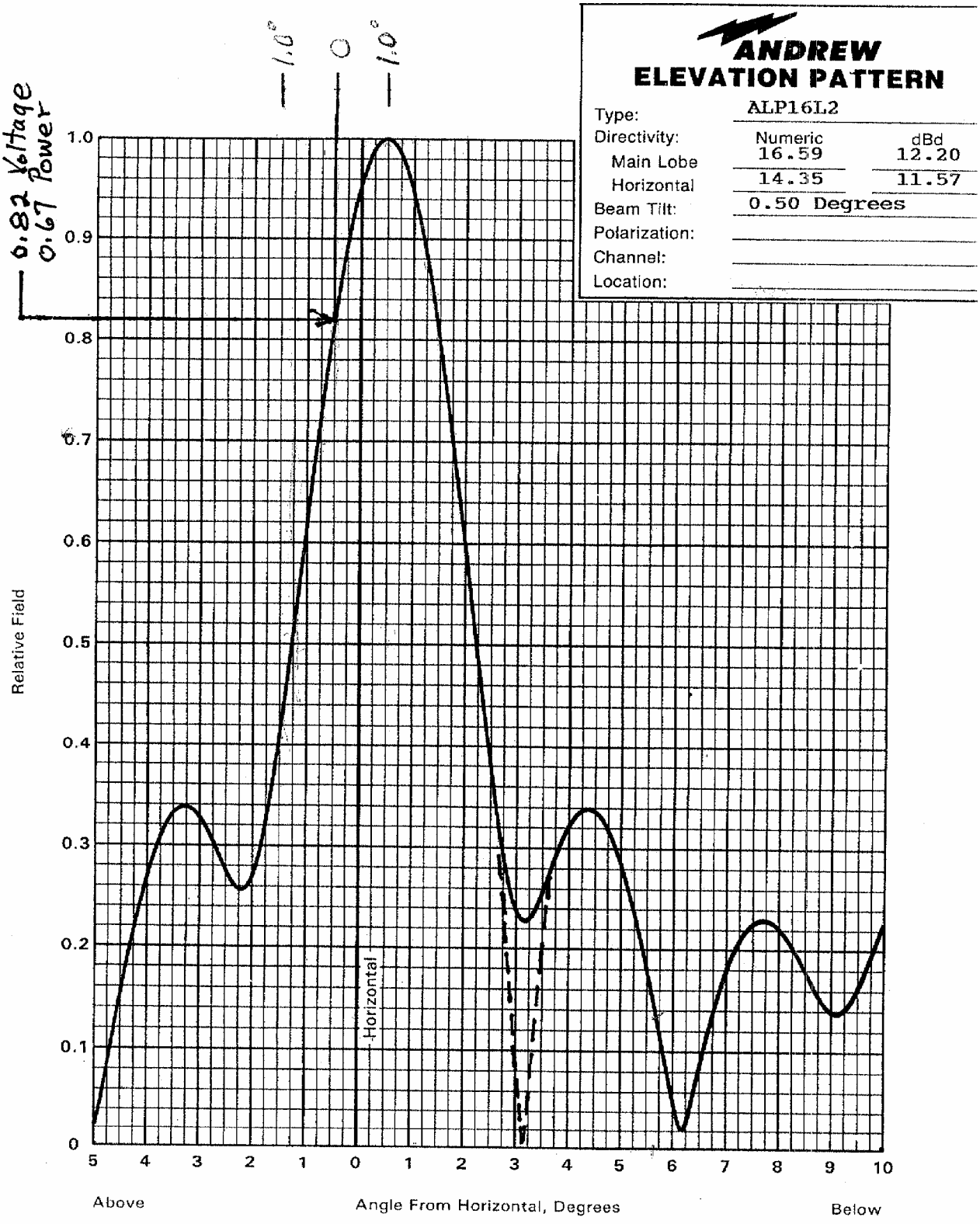


ANDREW
ELEVATION PATTERN

Type:	ALP16L2	
Directivity:	Numeric	dBd
Main Lobe	16.59	12.20
Horizontal	14.35	11.57
Beam Tilt:	0.50 Degrees	
Polarization:		
Channel:		
Location:		



ANDREW CORPORATION
10500 W. 153rd Street
Orland Park, Illinois U.S.A. 60462



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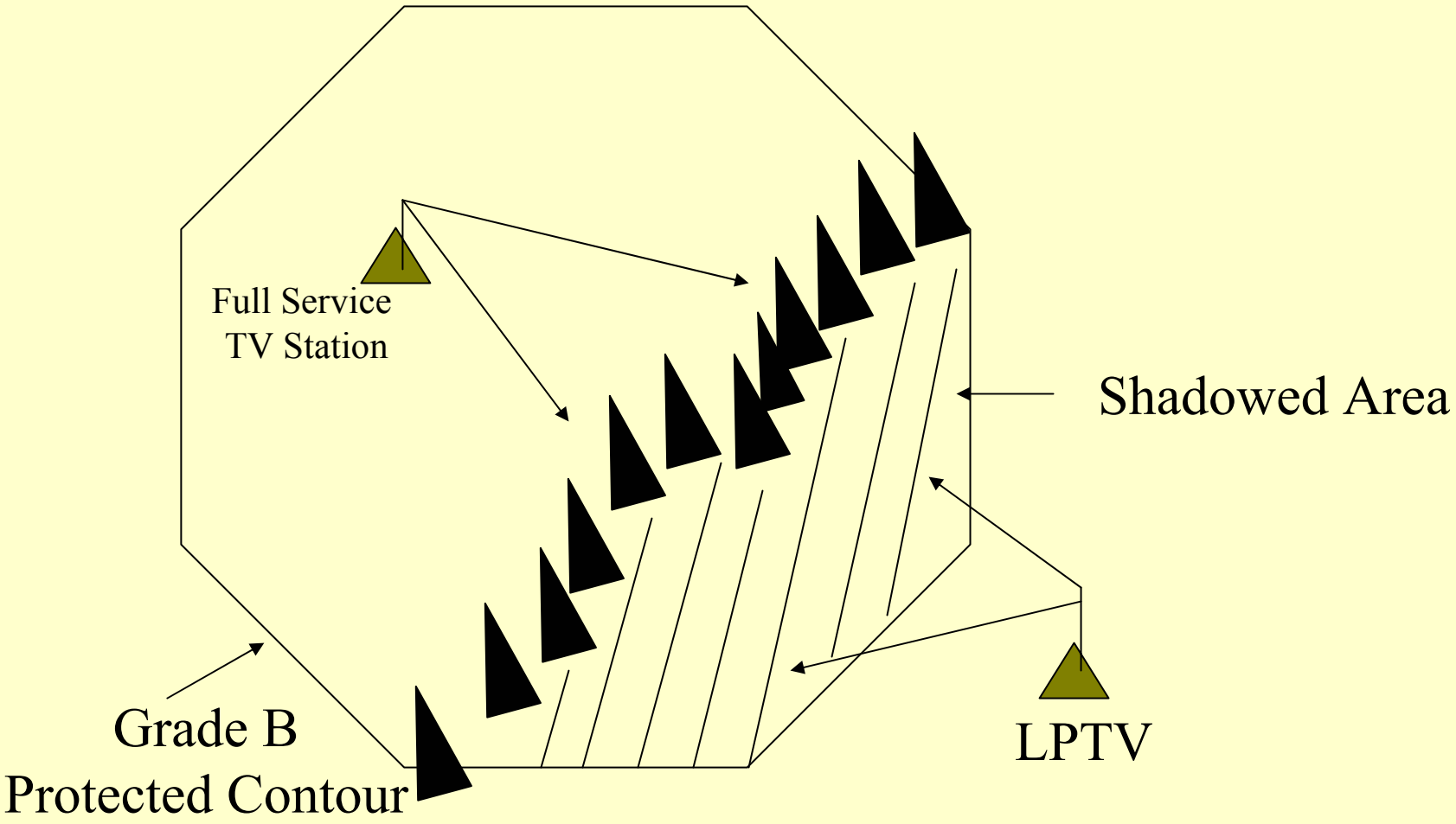
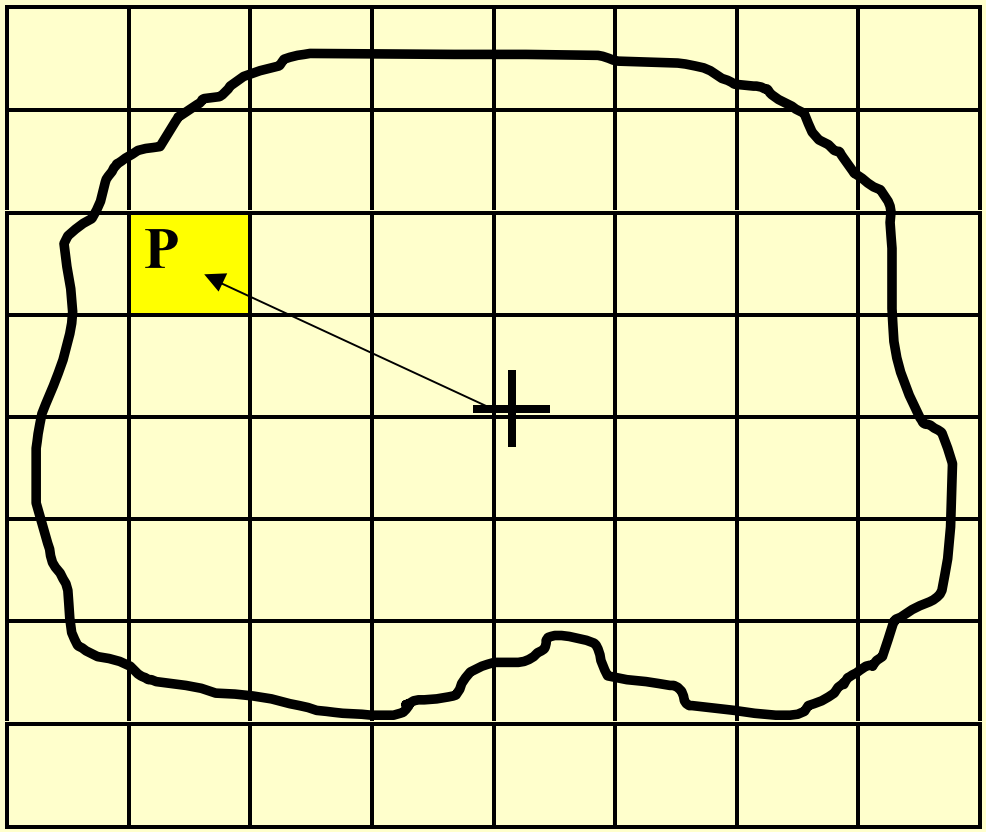
Protect Actual Rather Than Predicted Coverage Area When Signal Blocked



Check cells for Longley-Rice field strength greater than noise limited value

L-R (50,90)p
$\geq$ 41dBμ



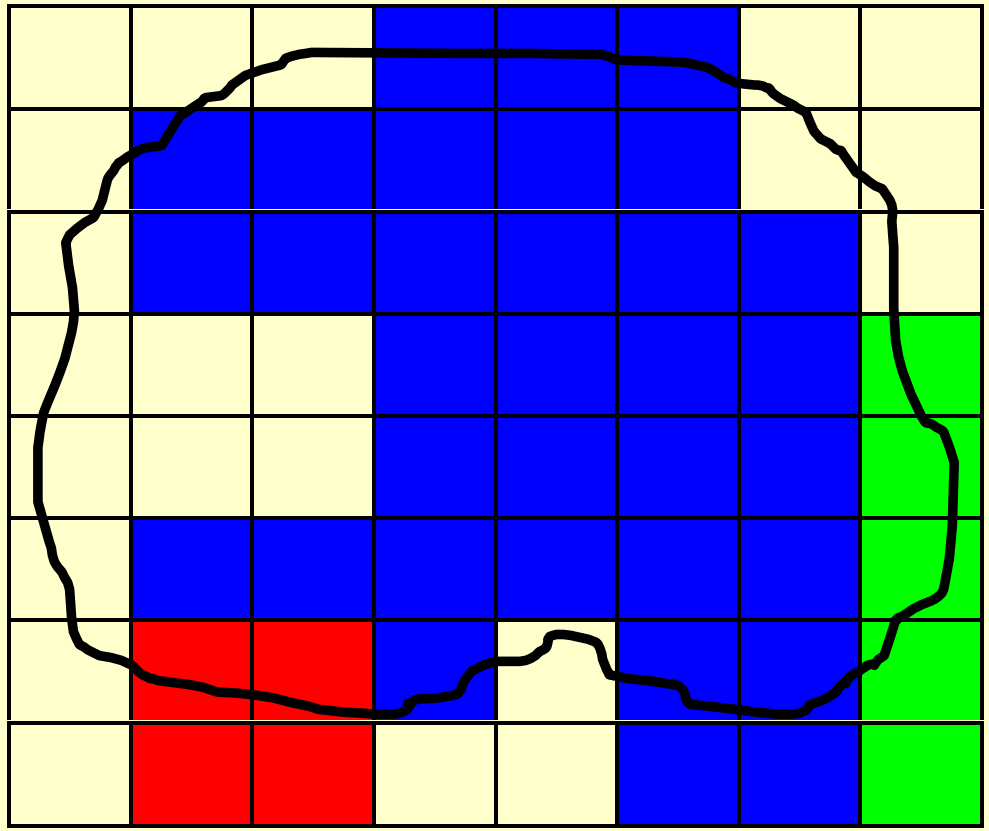
DTV Service

shadowed

NTSC Int

DTV Int

DTV Service



V-Soft Communications Population Report

WNIN.C (09+) Evansville, IN
TV Incoming Interference Study
Signal Resolution: 1.5 km
Consider NTSC Taboo: Yes
KWX error points are considered to
     be interference free coverage.
# of radials computed for contours: 36
LR Profile Spacing Increment: 0.1 km
Interference considered within the
reference station's 56 dBu FCC countour.
Using NTSC lptv/translators D/U rules.
Threshold for reception: 56

Study Date: 5/28/02
TV Database Date: 05-15-02

Population Database: 2000 US Census (PL)

Percentages calculated using a baseline population of 818,129.

Stations which cause interference:

Call Letters	H Units	Population	%	Area (sq. km)
WISH-D (09)	0	37343	4.564	1146.74
WOBZ-L.C (09+)	0	511	0.062	23.93
KETC (09Z)	0	39460	4.823	2108.26
WCPOTV (09Z)	0	18077	2.210	935.31

Masking Summary:

	Total Interference		Unique Interference	
Call Letters	Population	%	Population	%
WISH-D (09)	37343	4.564	7252	0.886
WOBZ-L.C (09+)	511	0.062	38	0.005
KETC (09Z)	39460	4.823	17780	2.173
WCPOTV (09Z)	18077	2.210	5252	0.642

Stations considered which do not cause interference:

WUWT-C (09+)

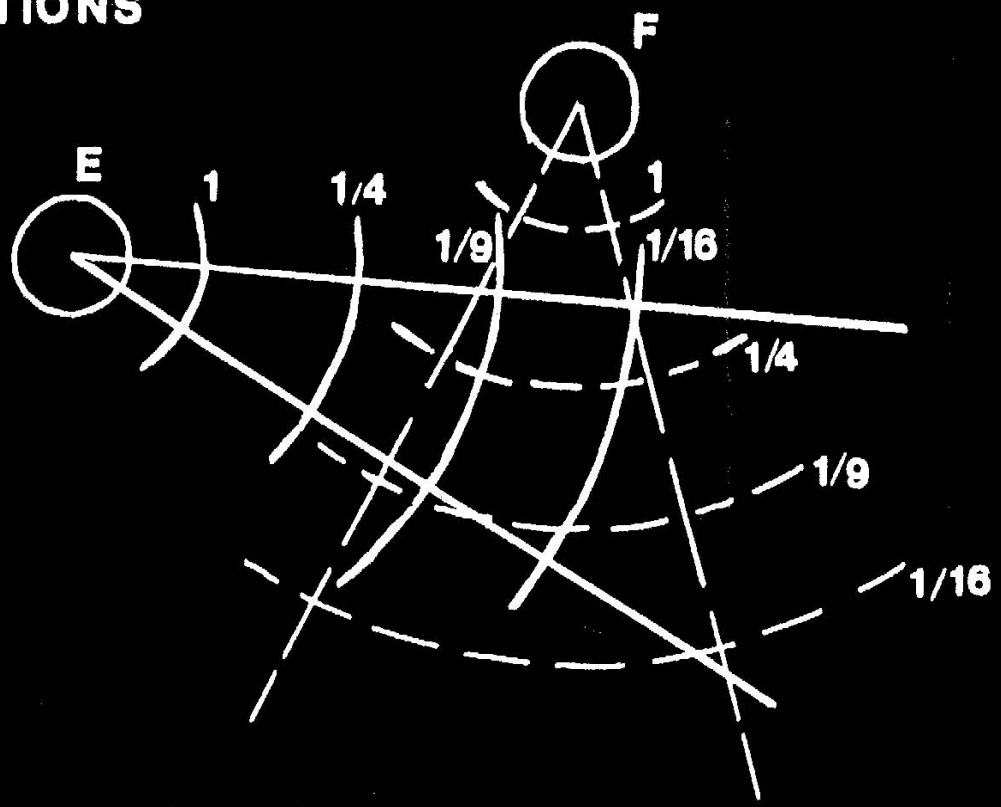
Call Letters	City	State	Dist	Bear
WISH-D (09)	Indianapolis	IN	230.9	23.2
WOBZ-L.C (09+)	East Bernstadt, Etc	KY	288.6	106.4
KETC (09Z)	St. Louis	MO	279.4	282.4
WCPOTV (09Z)	Cincinnati	OH	272.7	61.5
WUWT-C (09+)	Union City	TN	231.7	223.1

Totals for WNIN.C (09+)

Calculation Area Population:	839,618	(28725.5 sq. km)
Not Affected by Terrain Loss:	818,129	(27060.6 sq. km)
Total NTSC Interference:	53,763	(2878.5 sq. km)
DTV Only Interference:	7,252	(266.4 sq. km)
Total DTV Interference:	37,343	(1146.7 sq. km)
Interfered Population:	61,015	(3144.9 sq. km)
Interference Free:	757,114	(23915.7 sq. km)
Percent Interference:	7.46	
Terrain Blocked Population:	21,489	(1664.8 sq. km)
Contour Area Population:	839,145	

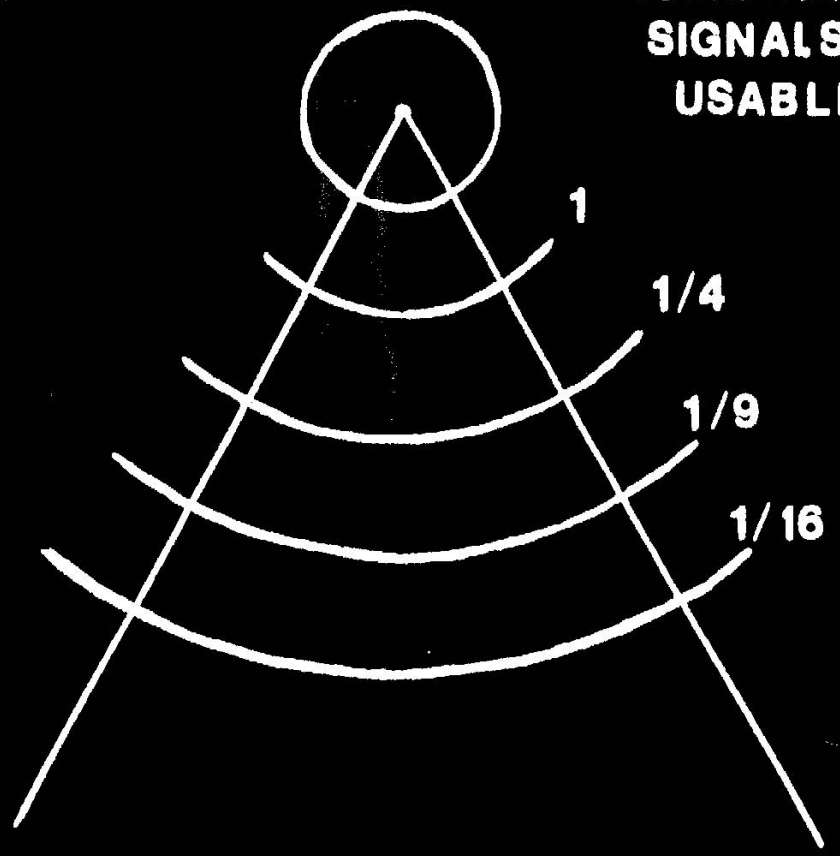
TLC

E & F TRANSMITTERS AT SEPARATE LOCATIONS

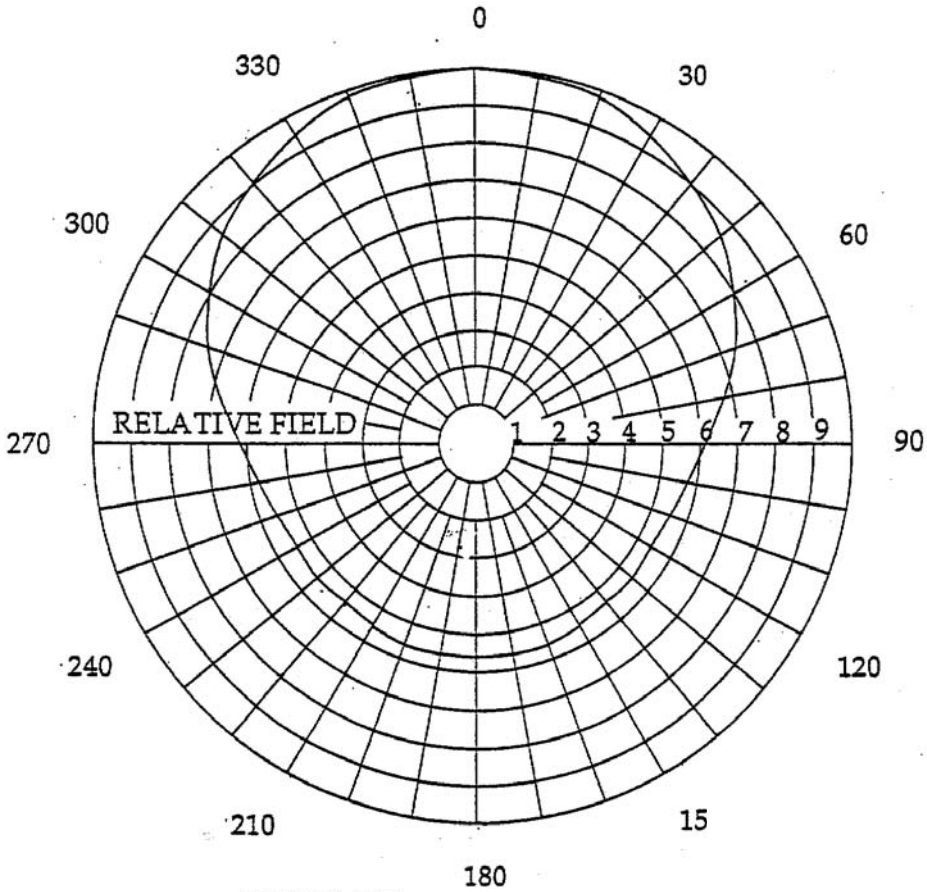


CO-LOCATED TRANSMITTERS

ESSENTIALLY EQUAL SIGNALS AT ALL USABLE LOCATIONS



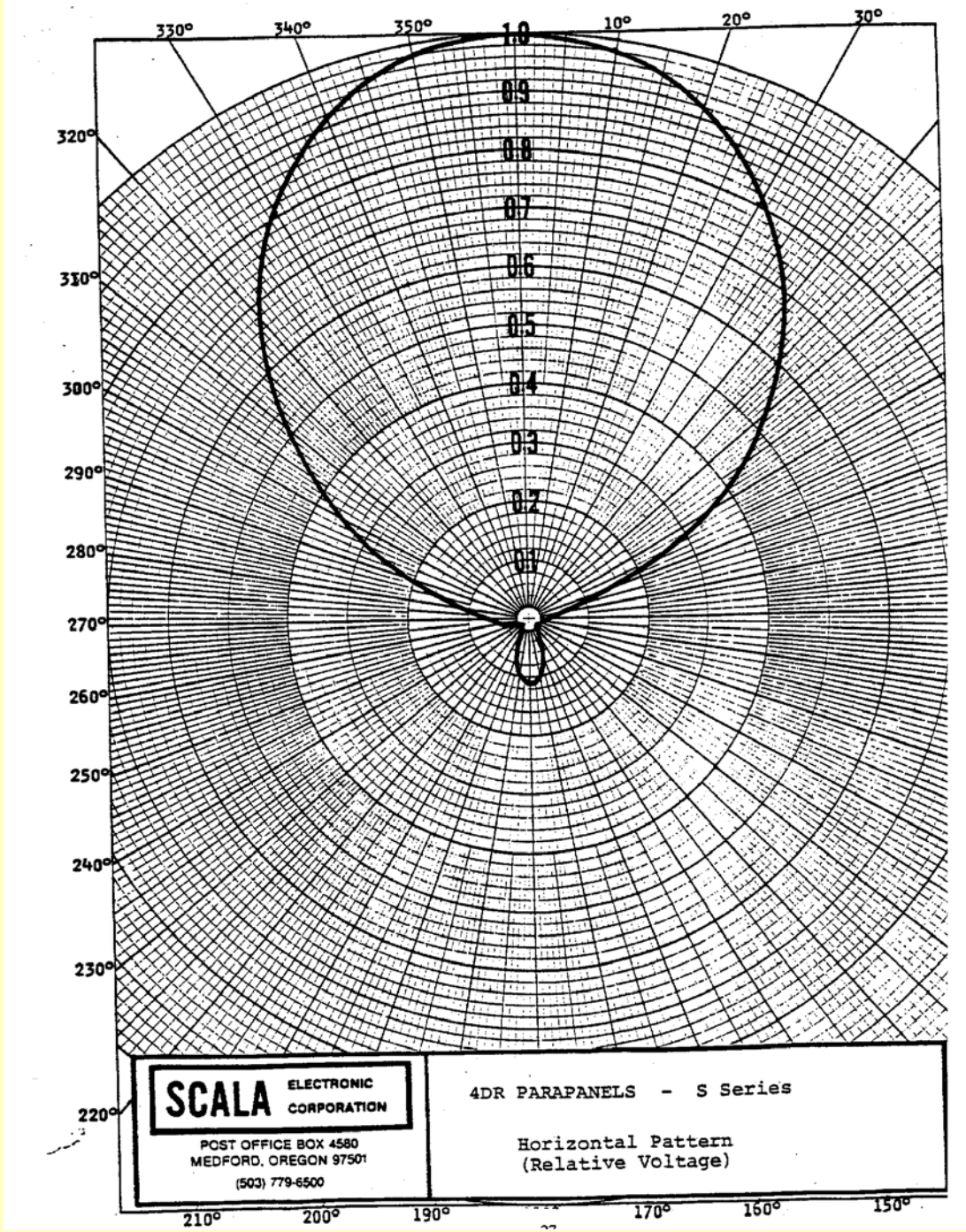
PATTERN E

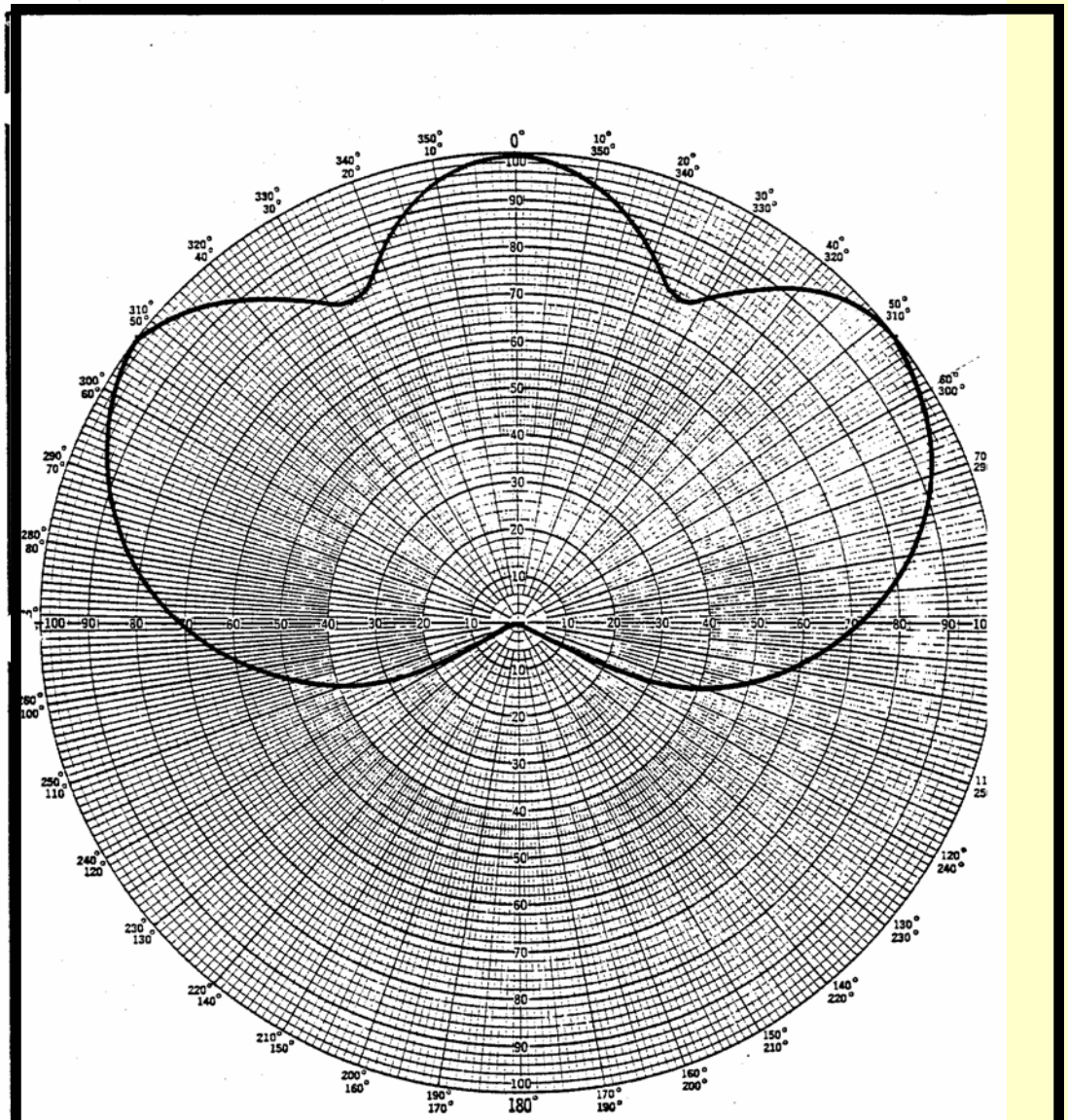


MODEL NO.	POWER GAI
AC04E-0	10.0 (10.0dB)
AC08E-0	20.0 (13.0dB)
AC016E-0	40.0 (16.0dB)
AC024E-0	60.0 (17.8dB)
AC032E-0	80.0 (19.0dB)

ANTENNA CONCEPT

AZIMUTH DIR.: OMNI


330°
340°
350°
10°
20°
30°
320°
310°
300°
290°
280°
270°
260°
250°
240°
230°
220°
210°
200°
190°
170°
160°
150°
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
SCALA ELECTRONIC CORPORATION
POST OFFICE BOX 4580
MEDFORD, OREGON 97501
(503) 779-6500
4DR PARAPANELS - S Series
Horizontal Pattern
(Relative Voltage)

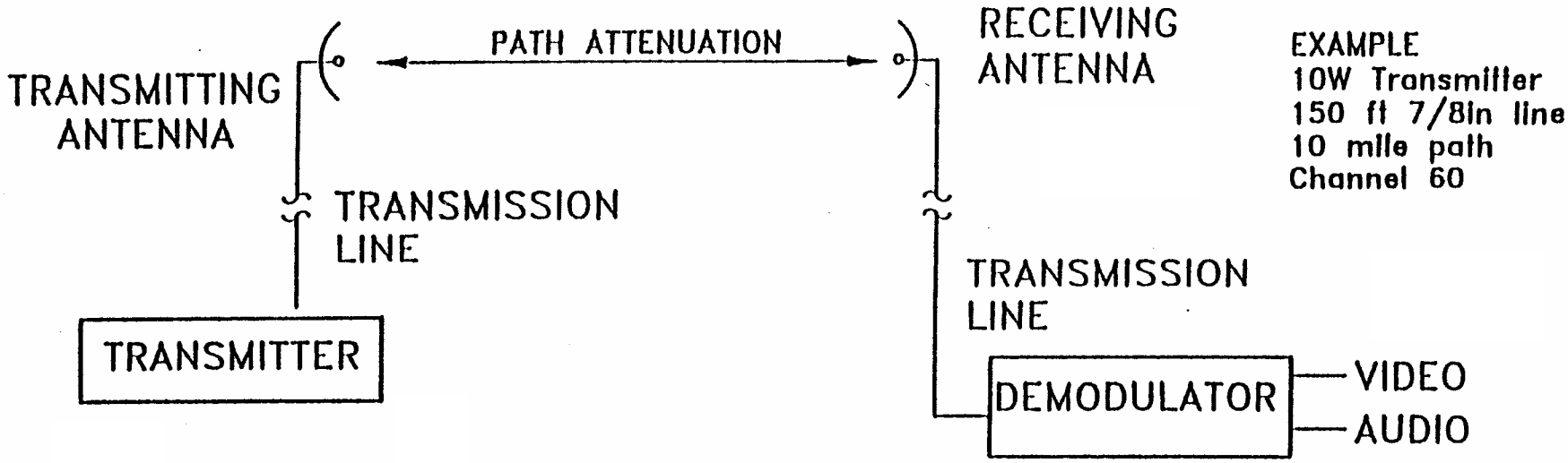


SCALA ELECTRONIC CORPORATION

POST OFFICE BOX 4580
MEDFORD, OREGON 97501
(503) 779-6500

4DR PARAPANELS - 2HW Series

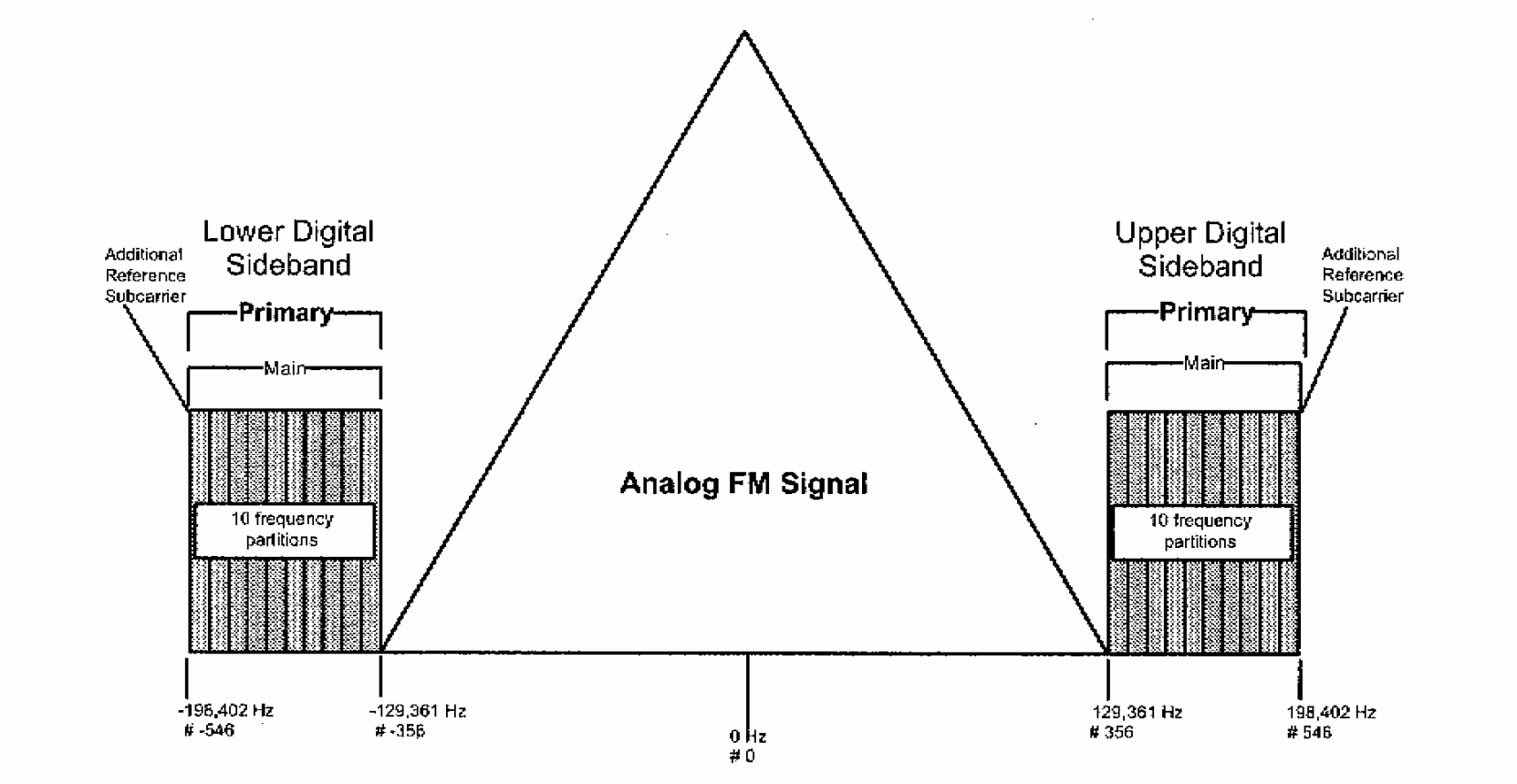
Horizontal Pattern
(Relative Voltage)



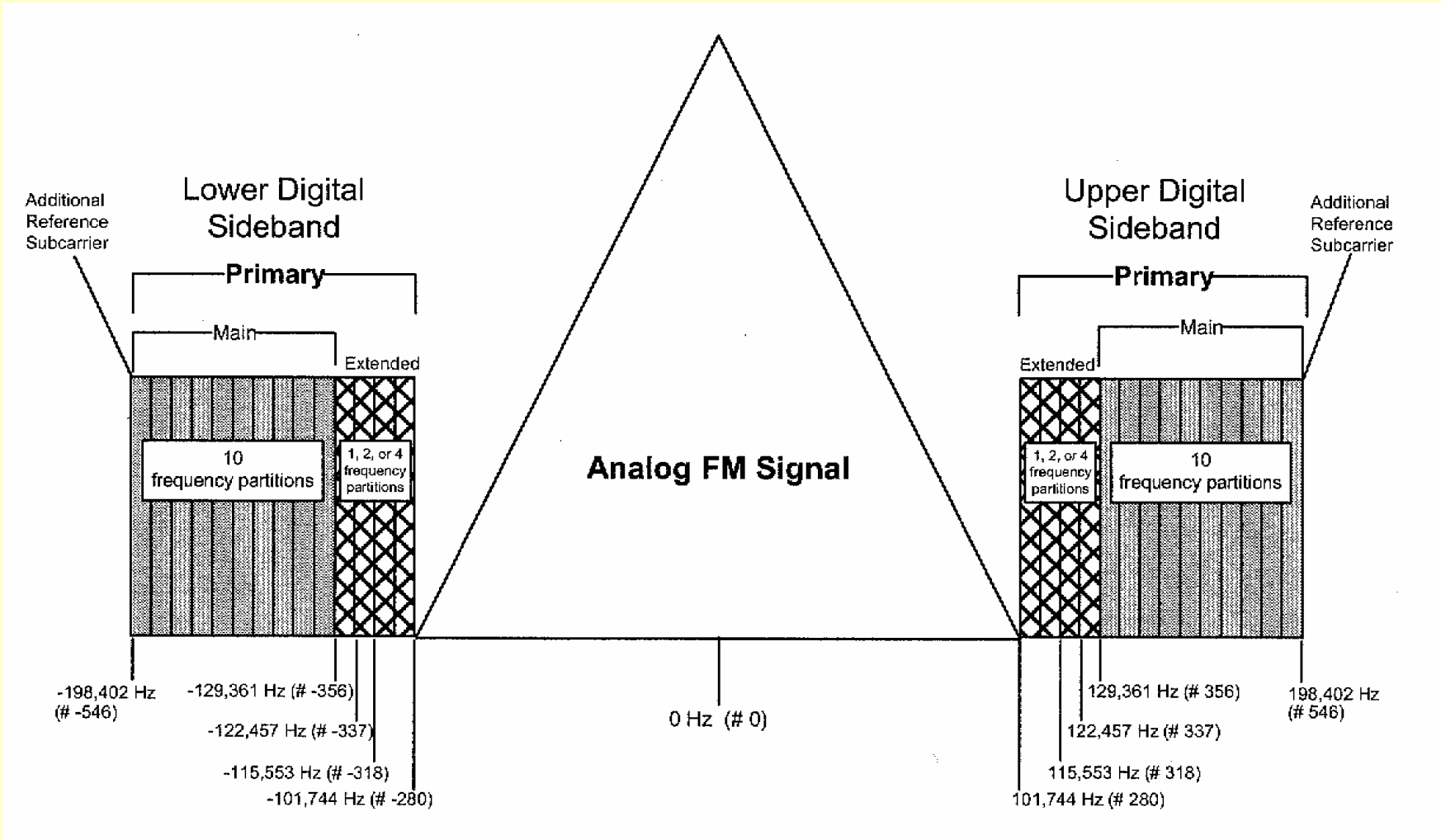
	(+)		(-)
TRANSMITTER POWER 10w.....	10.0 dBW		
TRANSMITTING LINE 150FT @ 1.1dB/100ft.....		.....	1.7
TRANSMITTING ANTENNA GAIN (SCALA PR450U)...	17.0		
CORRECTION: DIPOLE/ ISOTROPIC	2.15		
PATH ATTENUATION*.....		.....	114.1
RECEIVING ANTENNA GAIN.....	17.0		
CORRECTION: DIPOLE/ISOTROPIC.....	2.15		
	+48.3		-115.8
			48.3
		Net	-67.5dBW
		Minimum Acceptable	-79.0dBW
		Margin	11.5dB

*Path Attenuation between Isotropic Antennas
A=20log f(MHz)+20log d(miles)+36.6

Digital Radio Spectrum



MPS	Main Program Service
PDS	Personal Data Service
SIS	Station Identification Service
AAS	Auxiliary Application Service



MPS	Main Program Service
PDS	Personal Data Service
SIS	Station Identification Service
AAS	Auxiliary Application Service

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LARCAN- USA

This workshop/seminar was presented by LARCAN-USA in association with

Larry Bloomfield who can be contacted at:

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