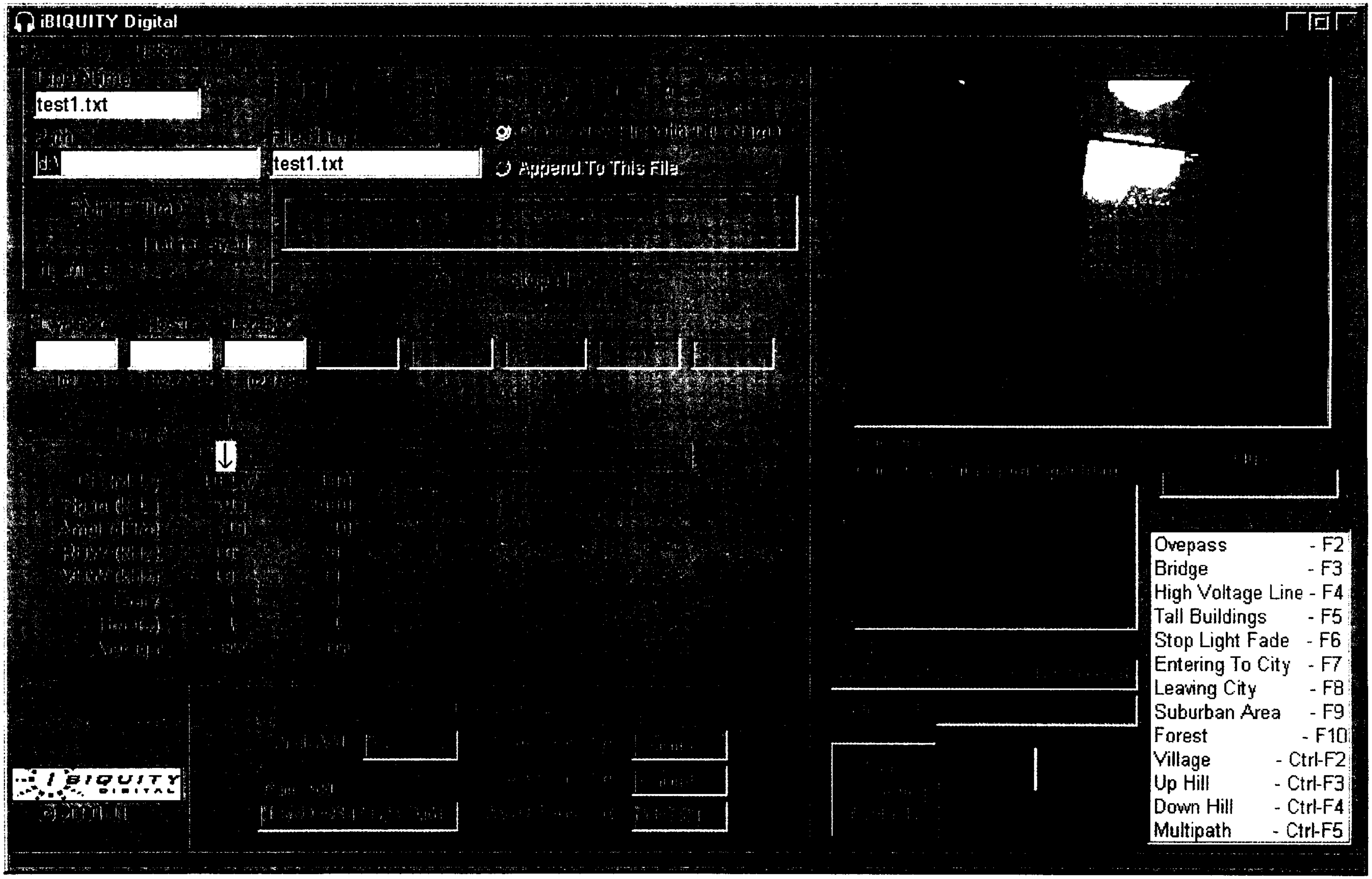
F

Attachment B: *TakeATest* (TAT1v1) Control Screen Image



Attachment C: *TakeATest* Usage Notes

The test team should add to this section any notes that will prove helpful in continued and future testing.

Entry Date	Version of *TakeATest*	Topic	Description	Resolution
16 March, 2001	TAT1v01	Reference Level Setting during Record	If two "-" ("minus sign") are entered with the reference level, the analyzer will not operate properly.	Do not enter more than one "-" before the numerical value of the Reference Level
16 March, 2001	TAT1v01	Reference Level Setting during Record	Entering a new spectrum analyzer reference level during measurements may cause loss of camera network link.	If the camera network link is lost, left-click the mouse over the camera view frame to recover.
16 March, 2001	TAT1v01	Spectrum Analyzer Input Attenuation	If manually set to a low value, e.g., 0 dB, the analyzer's reference level will not be settable over its full range.	Always set the spectrum analyzer input attenuation to "auto" mode before starting and using TAT1v01 or earlier.
16 March, 2001	TAT1v01	Antenna Network Gain Setting	Antenna network has changed since original van configuration	Nominal antenna network gain is now 5 dB (S/A path gain relative to receiver path gains)
16 March, 2001	TAT2v2	New Release	Version 2.2 includes auto reference level adjustment, set to auto mode for spectrum analyzer input attenuation, station database, distance-to-station display	
1 April, 2001	TAT2v2	Auto Reference Level Feature	Auto Reference level feature may fail to stabilize in certain signal conditions, notably at very low signal levels where operation is near analyzer noise floor. This may also occur in the presence of strong	Manually adjust spectrum analyzer reference during tests. Since data recording is suspended while test set up window is open, operator should make reference level adjustments as quickly as possible and close test set

			signals if input attenuation is set to manual mode.	up window immediately to resume data recording.

Attachment D: Antenna Distribution Networks

Figures D1, D2, D3 and D4 are the block diagrams of the three topologies of antenna distribution network used on the mobile test platform during FM IBOC tests.

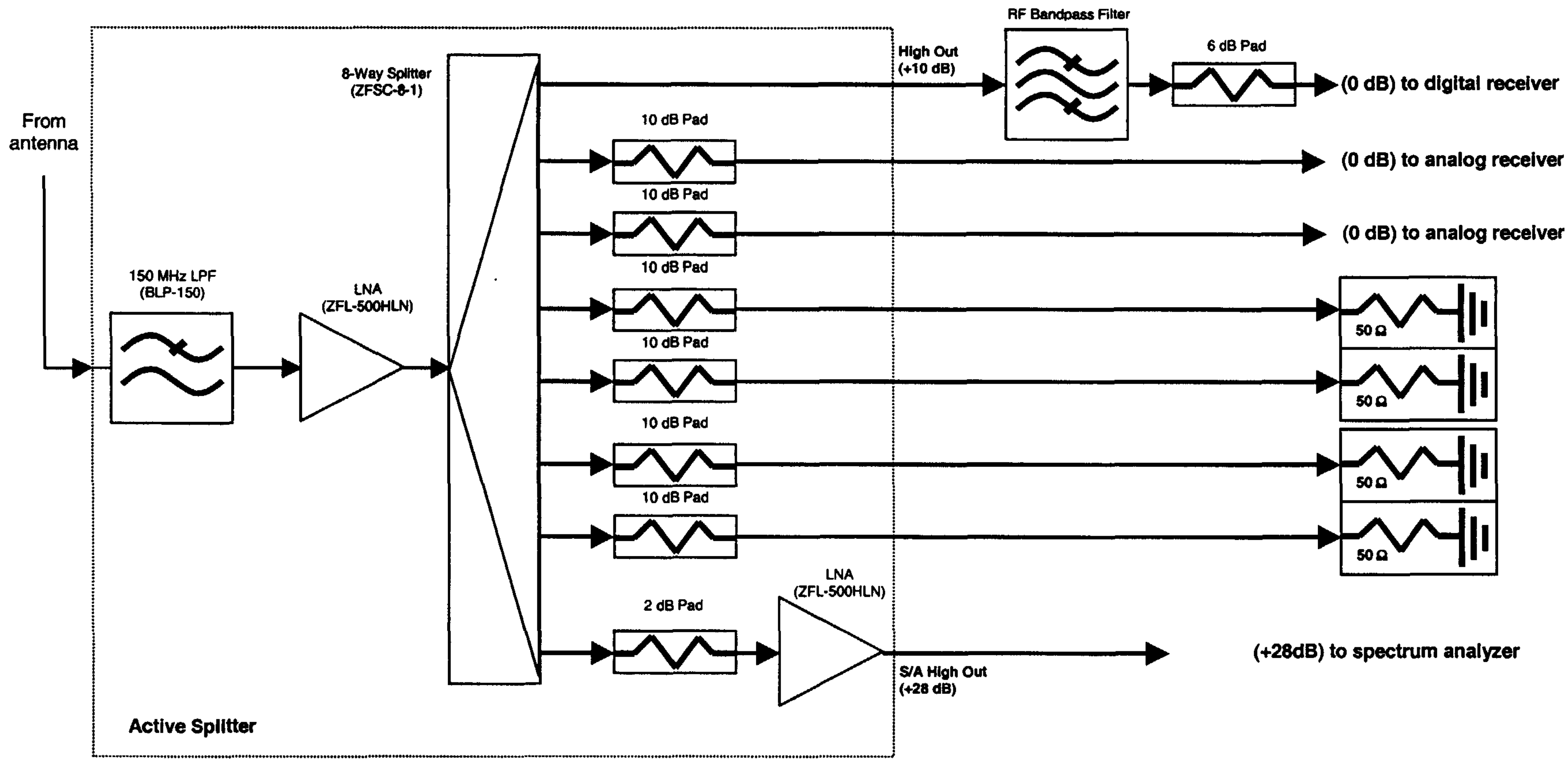


Figure D1: Active Antenna Distribution Network Type AAN1

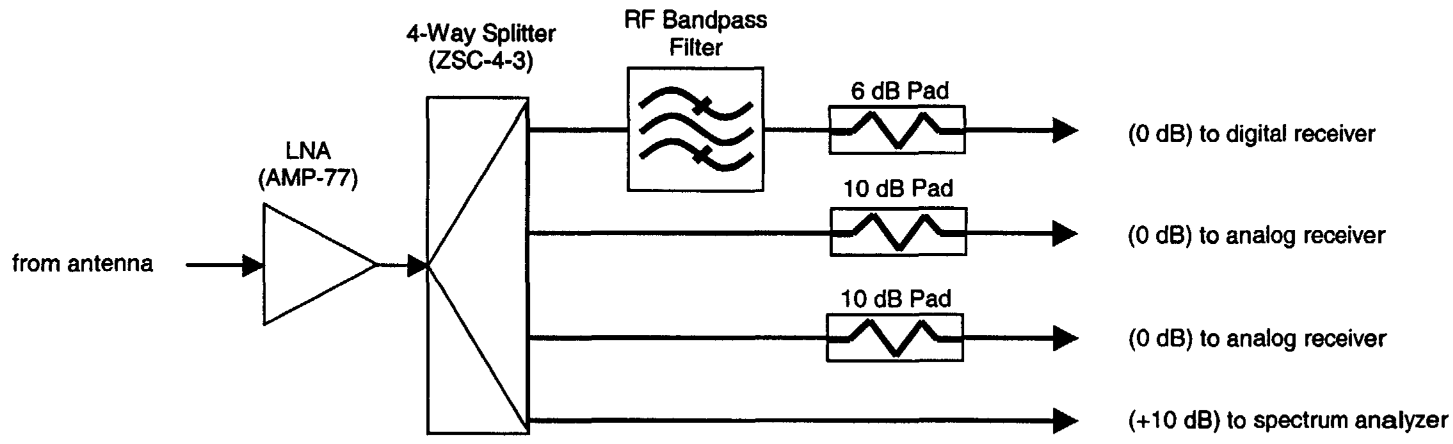


Figure D2: Active Antenna Distribution Network Type AAN2

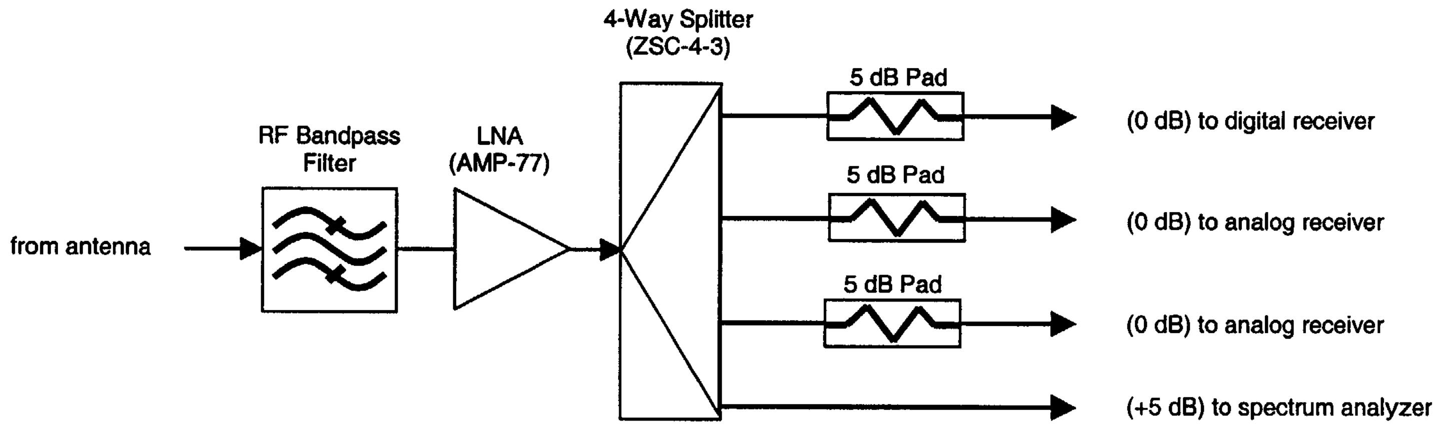


Figure D3: Active Antenna Distribution Network Type AAN3

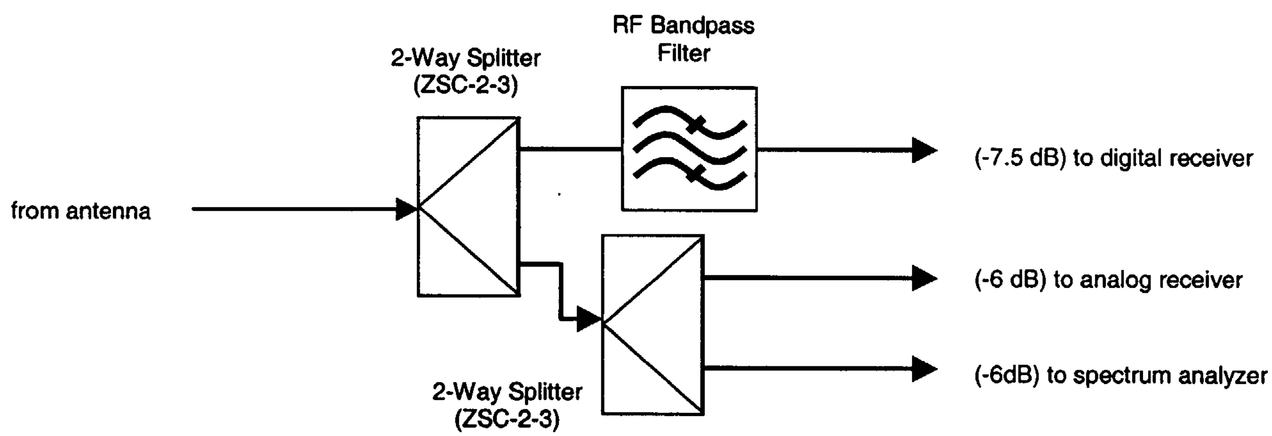


Figure D4: Passive Antenna Distribution Network Type PAN1

Attachment D: EMI Remediation Notes

While there are many reasons and many solutions to eliminating EMI, the choices of remediation in the field are usually few. These include

- removal and/or replacement of the offender with a better behaved equivalent
- addition of ferrite EMI suppression devices on interface and power cables
- better shielding and grounding of device cases
- insertion of in-line EMI suppression filters on interface and power cables
- changes in placement of equipment
- changes to equipment operational and/or interface modes that will shut-down or alter internal clock or oscillator generation.

The order in which the above approaches are listed represents the more likely and effective solutions. It is often very helpful to have an experienced RF engineer on hand to assist in EMI reduction procedures.

Three more important points on this topic:

- Every test segment will require dedicated EMI testing, as an interferer will not affect every part of the FM band equally. It is not sufficient to check another, nearby FM channel for interference and assume the same situation will exist on the test segment's desired channel.
- Do not overlook the test receivers as possible sources of interference.
- Monitoring for interference in a receiver's IF signal path is the easiest and most sensitive way to observe EMI. However, detection of interference at IF is not a positive indication of EMI, as other interference mechanisms such as intermodulation and front-end spurious responses may produce similar effects.

Not all EMI problems can be solved easily. Some solutions may require creative or radical changes to the test configuration. Be prepared to face this situation. What work for one test segment may not work for another. Again, having an experienced RF engineer on hand to help evaluate and solve EMI issues may be critical to success.

Attachment E: Station Characterization Spreadsheet

BIQUITY

Analog + Digital Total Power Measurement

Date: 03/12/01

Time: 10:00 - 1300

Spectrum Analyzer Parameters

		Msmt #	Amplitude	Units	Freq.	Units	Span	Units	RBW	Units	Video Avg	# Video Avgs	VBW	Units	Mkr Freq.	Units	Noise Marker
Date/Time: 3/12/01 - 1000 to 1300	Analog + DAB Total Power	1		dBm	93.5	MHz	500	kHz	300	kHz	ON	50	1	kHz	93.500	MHz	OFF
		2		dBm	93.5	MHz	500	kHz	1	MHz	ON	50	1	kHz	93.500	MHz	OFF
	DAB Lower Sideband	3		dBm/Hz	93.5	MHz	500	kHz	1	kHz	ON	50	1	kHz	93.335	MHz	ON
	DAB Upper Sideband			dBm/Hz	93.5	MHz	500	kHz	1	kHz	ON	50	1	kHz	93.665	MHz	ON
	Analog Only (NoDAB) Total	4		dBm	93.5	MHz	500	kHz	300	kHz	ON	50	1	kHz	93.500	MHz	OFF
	Power	5		dBm	93.5	MHz	500	kHz	1	MHz	ON	50	1	kHz	93.500	MHz	OFF
	Occupied Spectrum - No DAB	6		dBm	93.5	MHz	500	kHz	1	kHz	ON	100	1	kHz	93.500	MHz	OFF
	Occupied Spectrum - No DAB	7		dBm	93.5	MHz	500	kHz	1	kHz	OFF-Max Hold A 150 sec		1	kHz	93.500	MHz	OFF
	Tx Occupied Narrow - No DAB	8		dBm	93.5	MHz	500	kHz	1	kHz	ON	5	30	Hz	93.500	MHz	OFF
	Tx Occupied Wide - No DAB	9		dBm	93.5	MHz	2	MHz	1	kHz	ON	5	100	Hz	93.500	MHz	OFF
	Tx Occupied Wide w/DAB	10		dBm	93.5	MHz	2	MHz	1	kHz	ON	5	100	Hz	93.500	MHz	OFF
	Tx Occupied Narrow w/DAB	11		dBm	93.5	MHz	500	kHz	1	kHz	ON	5	30	Hz	93.500	MHz	OFF
Date/Time	Analog + DAB Total Power	12		dBm	93.5	MHz	500	kHz	300	kHz	ON	50	1	kHz	93.500	MHz	OFF
		13		dBm	93.5	MHz	500	kHz	1	MHz	ON	50	1	kHz	93.500	MHz	OFF
	DAB Lower Sideband	14		dBm/Hz	93.5	MHz	500	kHz	1	kHz	ON	50	1	kHz	93.335	MHz	ON
	DAB Upper Sideband			dBm/Hz	93.5	MHz	500	kHz	1	kHz	ON	50	1	kHz	93.665	MHz	ON

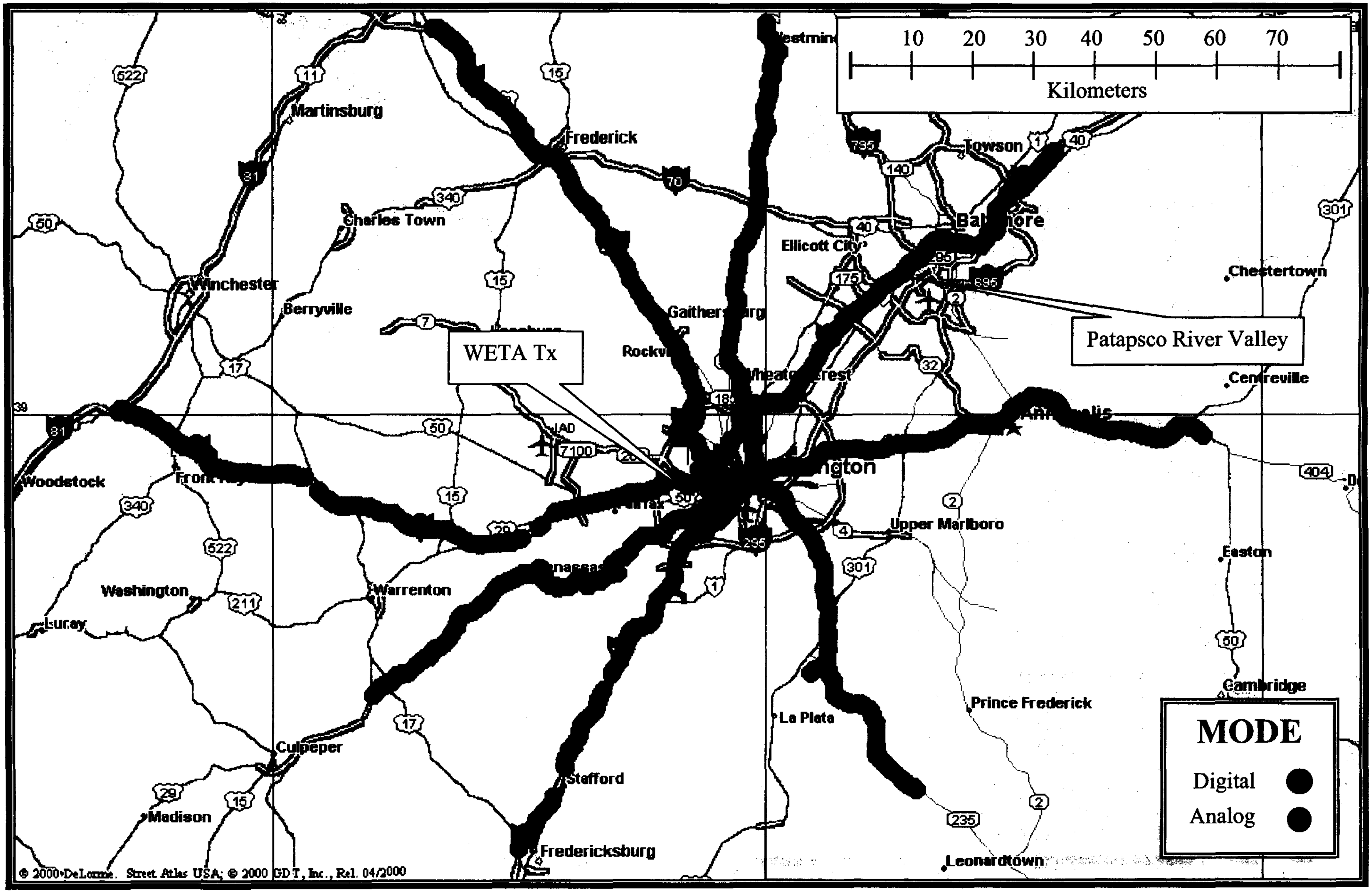
		Amplitude	Units	Formula	
Transmitter Measurements	Analog + DAB Power (Total)		mW	= [10 ^ (Amplitude dBm/10)]	At 300 kHz RBW Transmitter Sample
	Analog Power Only mW - Measured		mW	= [10 ^ (Amplitude dBm/10)]	
	DAB Power mW (Lower)		mW	= [10 ^ (Amplitude dBm/10)] X 70,000	
	DAB Power mW (Upper)		mW	= [10 ^ (Amplitude dBm/10)] X 70,000	
	DAB Power mW (Total)		mW	= [DAB Power dBm (Lower)] + [DAB Power dBm (Upper)]	
	Analog Only mW (Total) - Calculated		mW	= [Analog + DAB Power] - [DAB Power Total]	
	DAB (Total) / Analog Ratio		dB	= 10 Log ([DAB Power mW (Total)] / [Analog Only mW (Total)])	
	Analog + DAB Power (Total)		mW	= [10 ^ (Amplitude dBm/10)]	At 1 MHz RBW Transmitter Sample
	Analog Power Only mW (Total)		mW	= [10 ^ (Amplitude dBm/10)]	
	DAB Power mW (Lower)		mW	= [10 ^ (Amplitude dBm/10)] X 70,000	
	DAB Power mW (Upper)		mW	= [10 ^ (Amplitude dBm/10)] X 70,000	
	DAB Power mW (Total)		mW	= [DAB Power dBm (Lower)] + [DAB Power dBm (Upper)]	
	Analog Only mW (Total)		mW	= [Analog + DAB Power] - [DAB Power Total]	
	DAB (Total) / Analog Ratio		dB	= 10 Log ([DAB Power mW (Total)] / [Analog Only mW (Total)])	
Field Measurements	Analog + DAB Power (Total)		mW	= [10 ^ (Amplitude dBm/10)]	At 300 kHz RBW
	DAB Power mW (Lower)		mW	= [10 ^ (Amplitude dBm/10)] X 70,000	
	DAB Power mW (Upper)		mW	= [10 ^ (Amplitude dBm/10)] X 70,000	
	DAB Power mW (Total)		mW	= [DAB Power dBm (Lower)] + [DAB Power dBm (Upper)]	
	Analog Only mW (Total) - Calculated		mW	= [Analog + DAB Power] - [DAB Power Total]	
	DAB (Total) / Analog Ratio		dB	= 10 Log ([DAB Power mW (Total)] / [Analog Only mW (Total)])	
	Analog + DAB Power (Total)		mW	= [10 ^ (Amplitude dBm/10)]	At 1 MHz RBW Field Sample
	DAB Power mW (Lower)		mW	= [10 ^ (Amplitude dBm/10)] X 70,000	
	DAB Power mW (Upper)		mW	= [10 ^ (Amplitude dBm/10)] X 70,000	
	DAB Power mW (Total)		mW	= [DAB Power dBm (Lower)] + [DAB Power dBm (Upper)]	
	Analog Only mW (Total)		mW	= [Analog + DAB Power] - [DAB Power Total]	
	DAB (Total) / Analog Ratio		dB	= 10 Log ([DAB Power mW (Total)] / [Analog Only mW (Total)])	

Attachment F: Field Test Radio Assignments

Ref.	Radio	iBiquity Identification	Model Number	Serial Number	Characterization?	Van Assignment	Audio Channel Assignments
1	Digital	Dev13	-	-	Yes – iBiquity Lab	Van 2 – west coast	Left – 7 Right – 8
2	Delphi-Delco	IBQ01	PN 09394139	89DDSTM103490263	Yes – R. McCutcheon	Van 2 – west coast	Left – 1 Right - 2
3	Pioneer	IBQ EIA #17	KEH-1900	-	Yes – R. McCutcheon	Van 2 – west coast	Left – 3 Right - 4
4	Digital	Dev35	-	-	Yes – iBiquity Lab	Van 1 – east coast	Left – 1 Right - 2
5	Delphi-Delco	IBQ03	PN 09394139	-	Yes – R. McCutcheon	Van 1 – east coast	Left – 3 Right - 4
6	Pioneer	IBQ EIA # 19	KEH-1900	-	Yes – R. McCutcheon	Van 1 – east coast	Left – 5 Right - 6
7	Technics	IBQ08	SA-EX110	GXOEA49056	Yes – R. McCutcheon	Van 1 – east coast	Left – 1 note 8 Right - 2
8	Sony	IBQ011	CFD-S22	SO1-0616690-E	Yes – R. McCutcheon	Van 1 – east coast	Left – 7 Right - 8

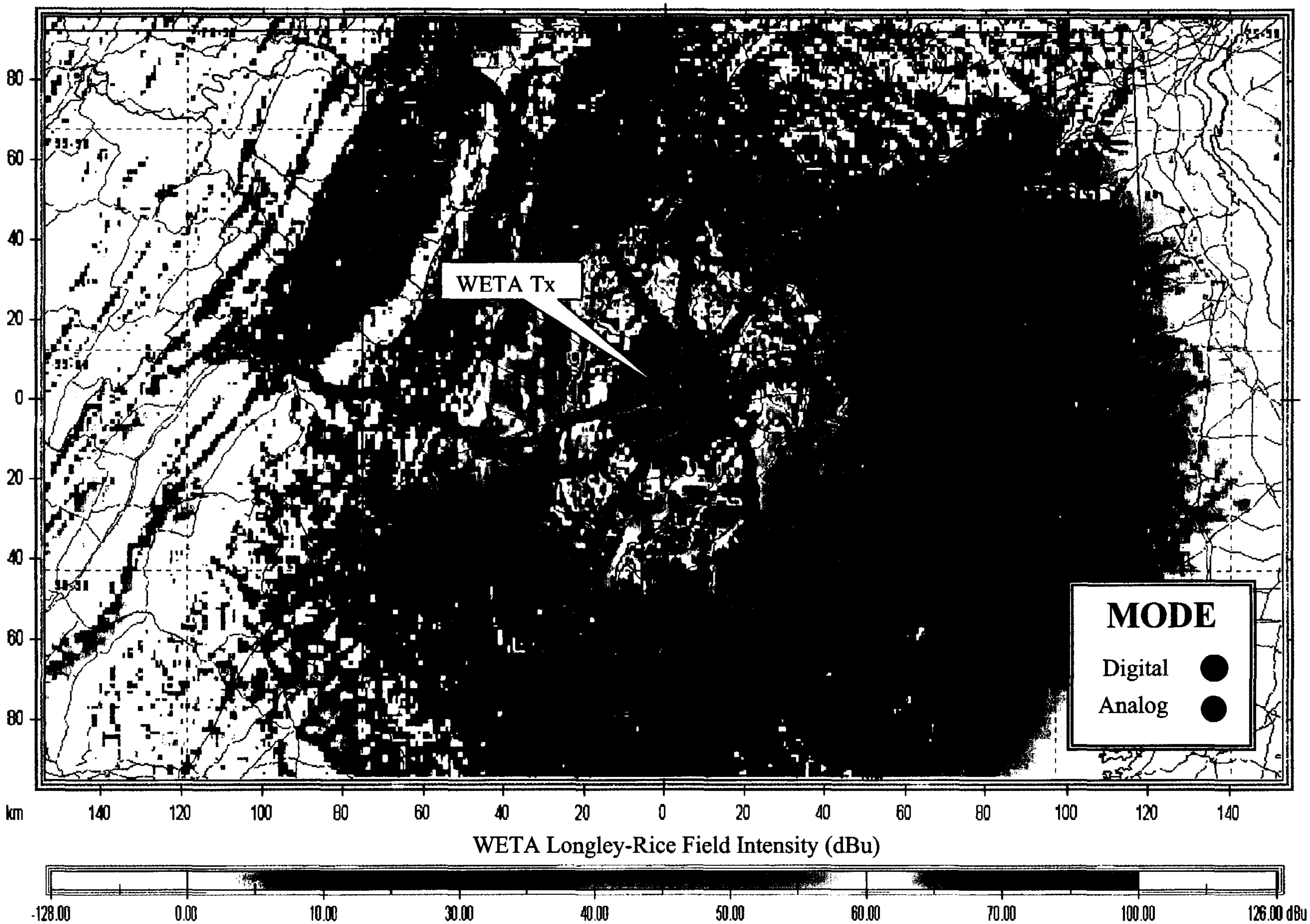
[8] For compatibility testing only, the Technics Receiver takes the place of the digital receiver for audio channel assignment.

WETA Performance – All Radials / Street Map



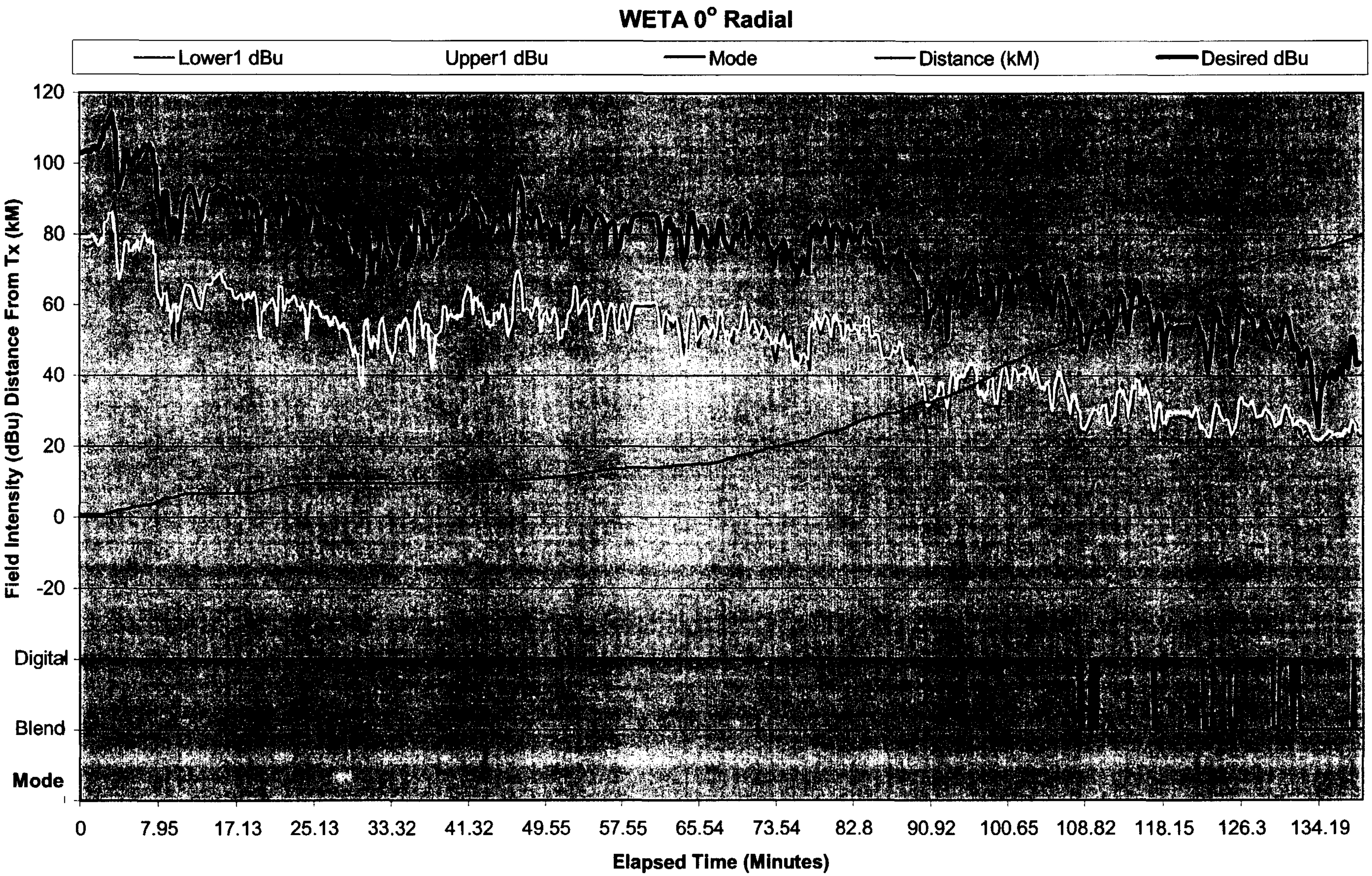
WETA Performance – All Radials / Field Intensity

(Longley-Rice Predicted - dBu)



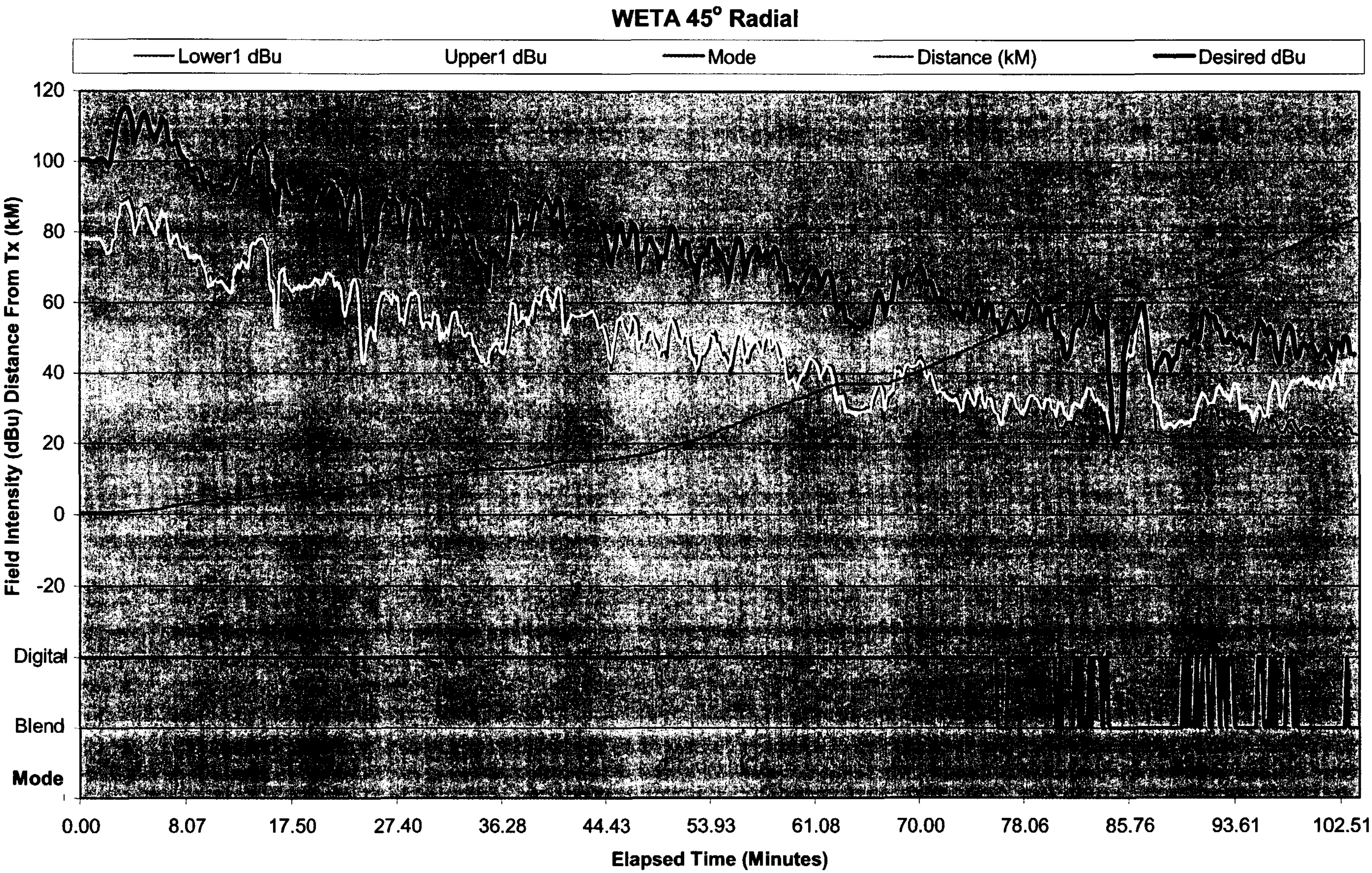
WETA Performance - 0° Radial / Field Intensity

(Desired + 1st Adjacent)



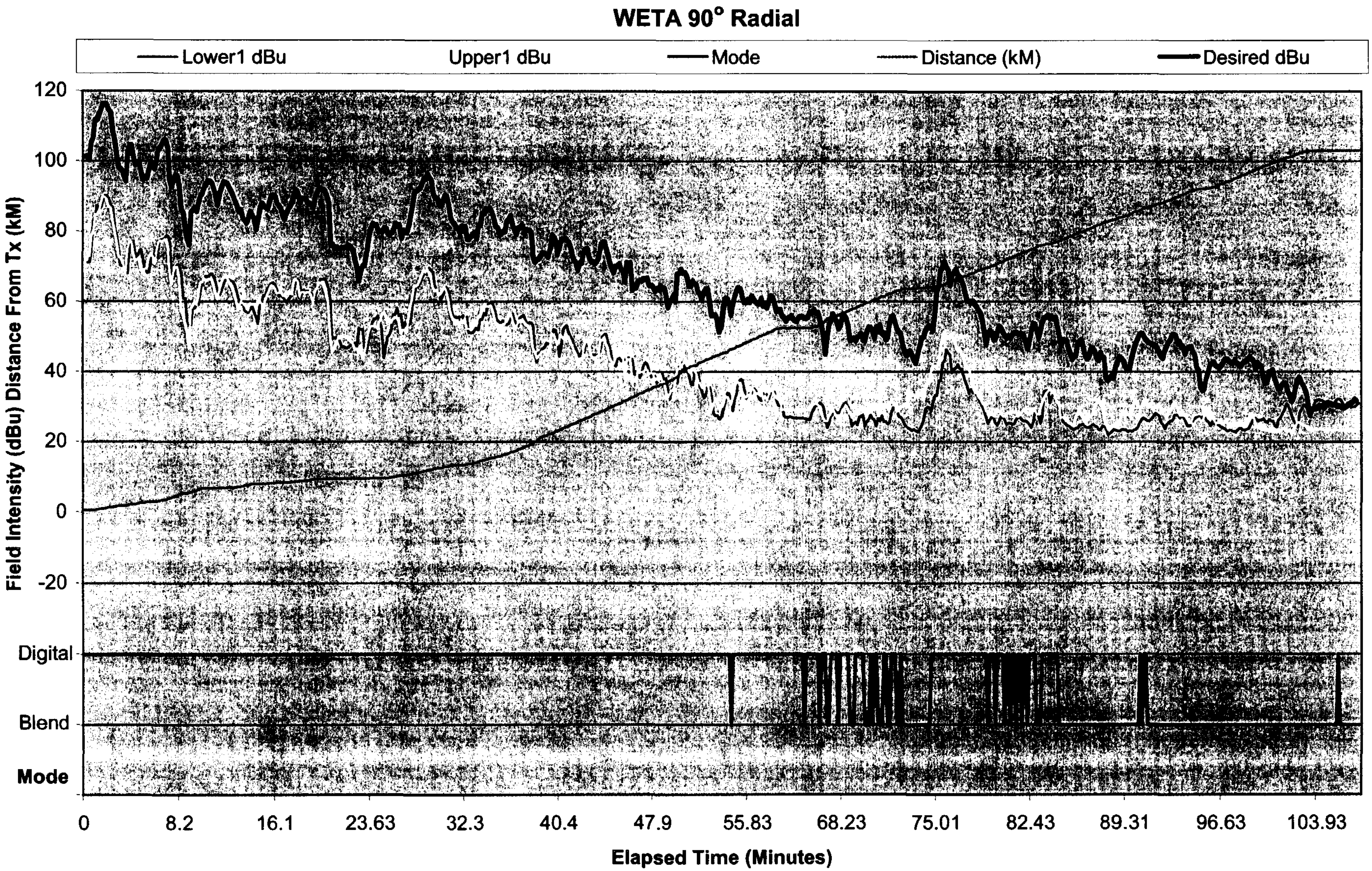
WETA Performance - 45° Radial / Field Intensity

(Desired + 1st Adjacent)



WETA Performance - 90° Radial / Field Intensity

(Desired + 1st Adjacent)



WETA Performance - 135° Radial / Field Intensity

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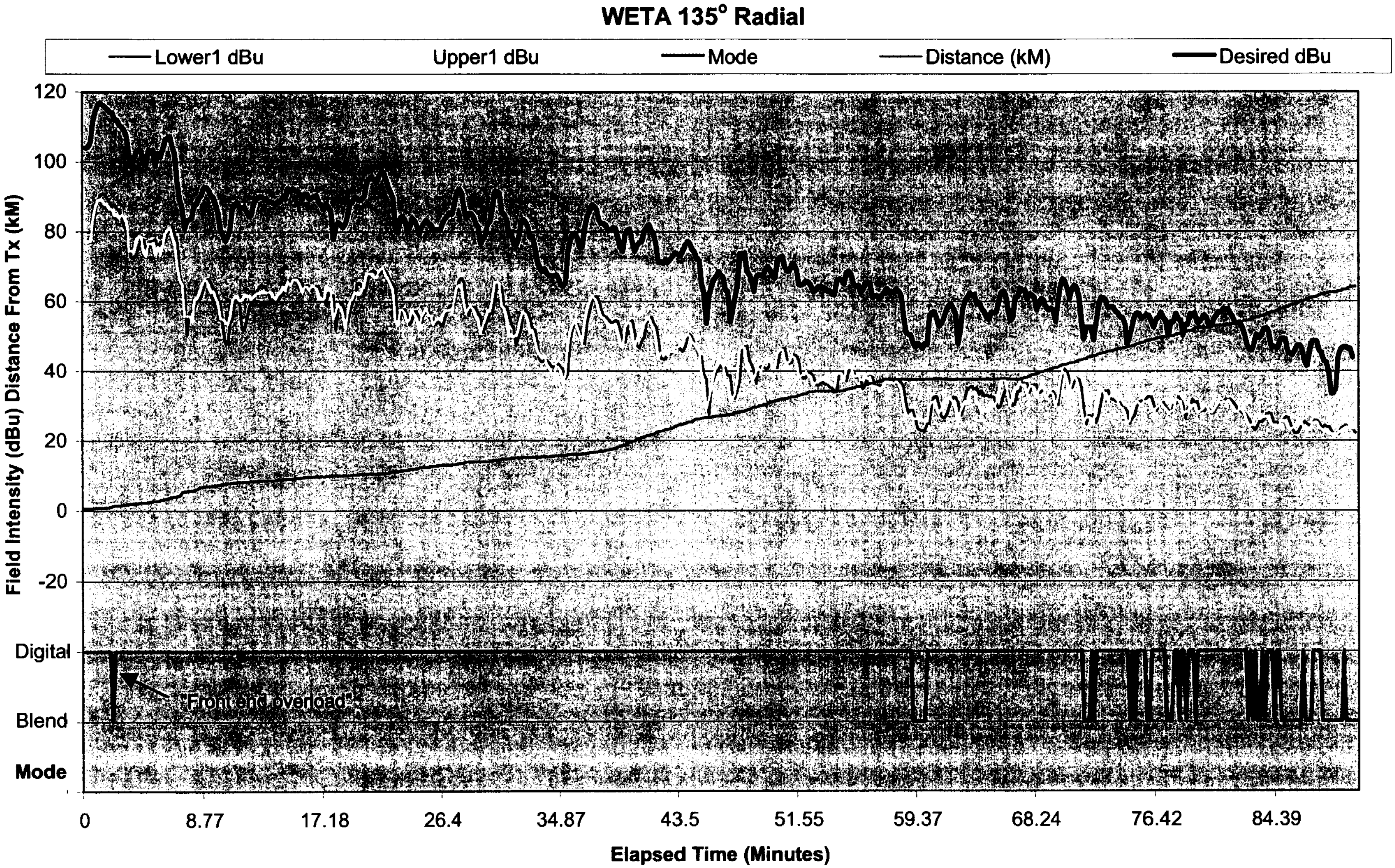
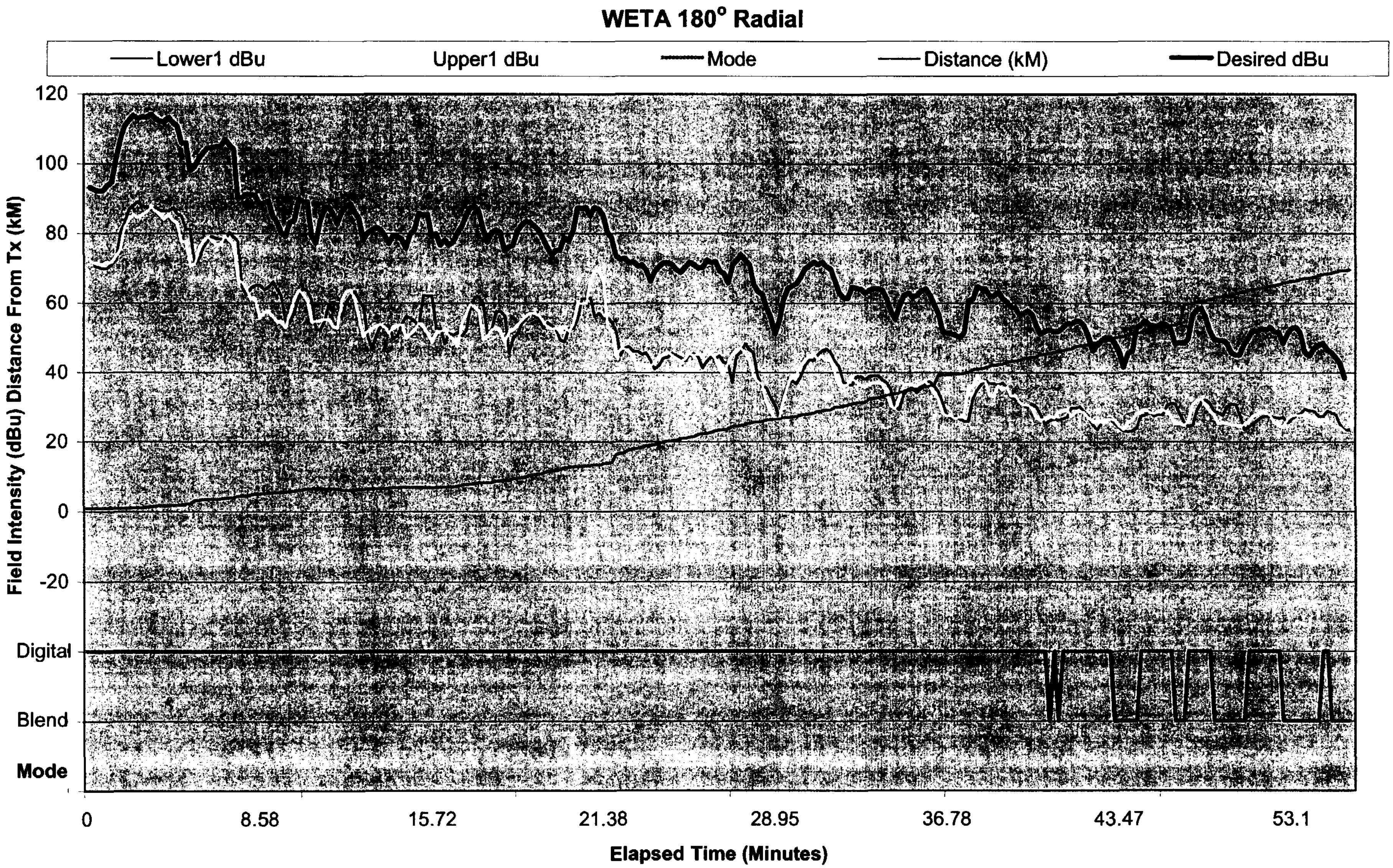


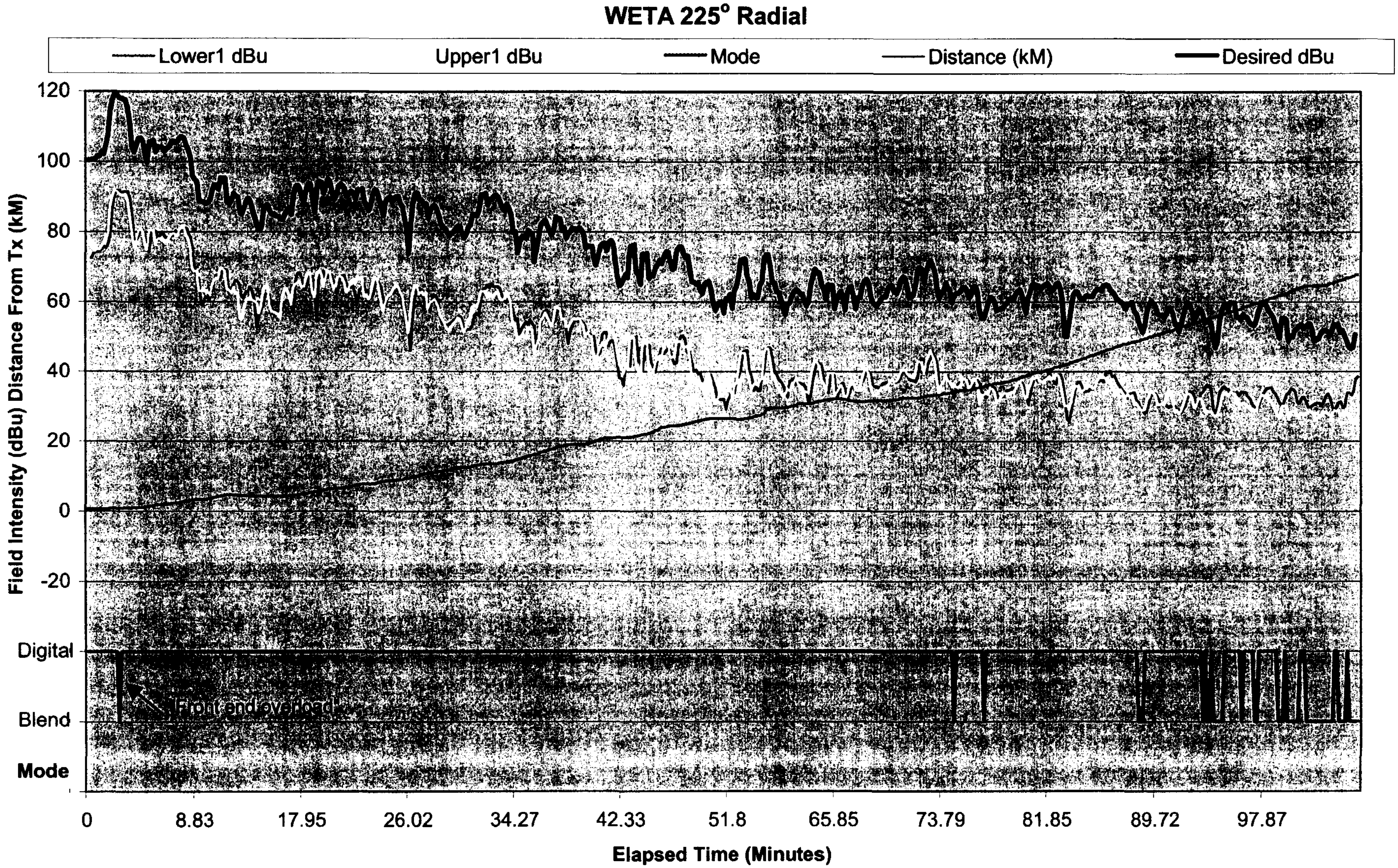
WETA Performance - 180° Radial / Field Intensity

(Desired + 1st Adjacent)



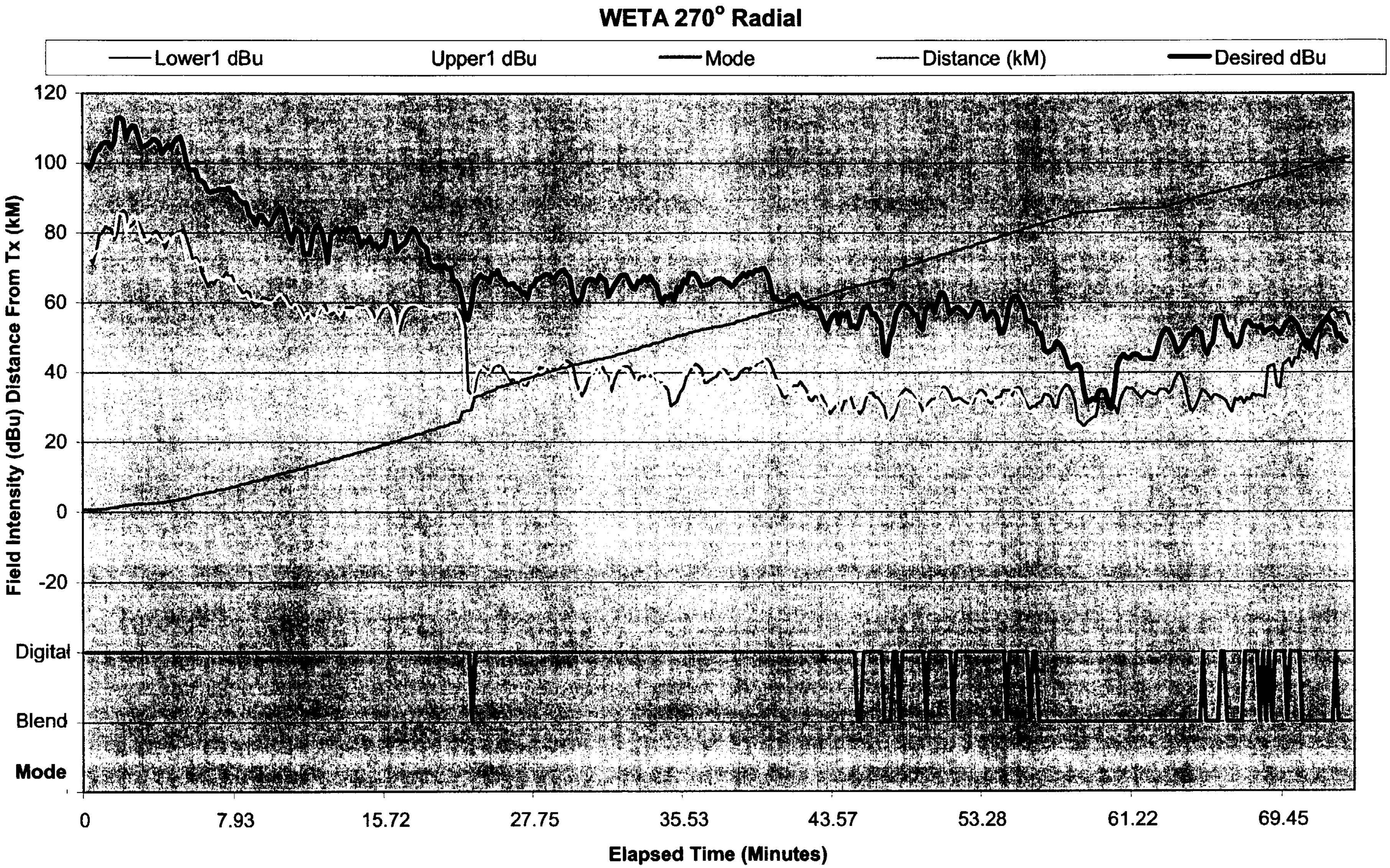
WETA Performance - 225° Radial / Field Intensity

(Desired + 1st Adjacent)



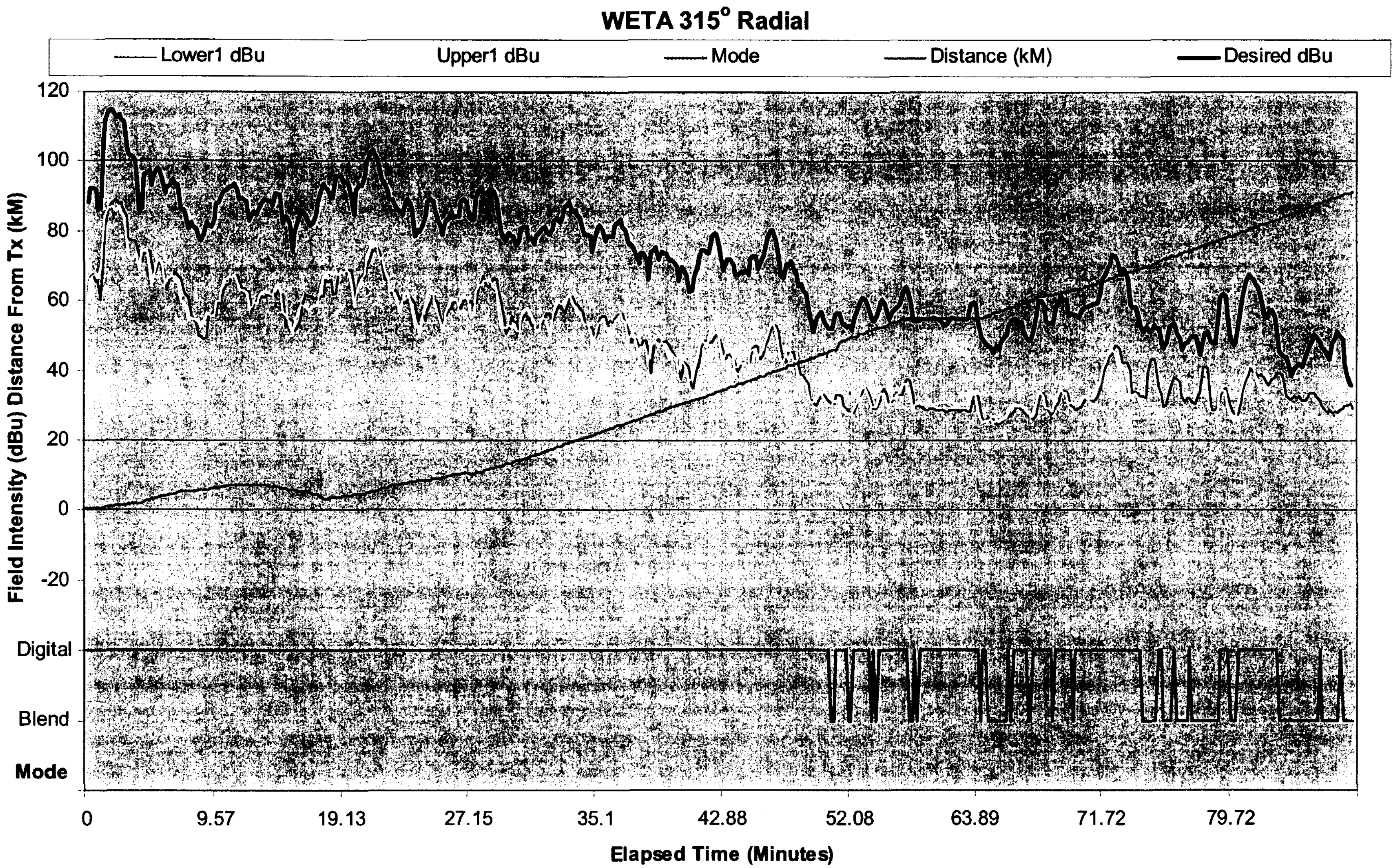
WETA Performance - 270° Radial / Field Intensity

(Desired + 1st Adjacent)



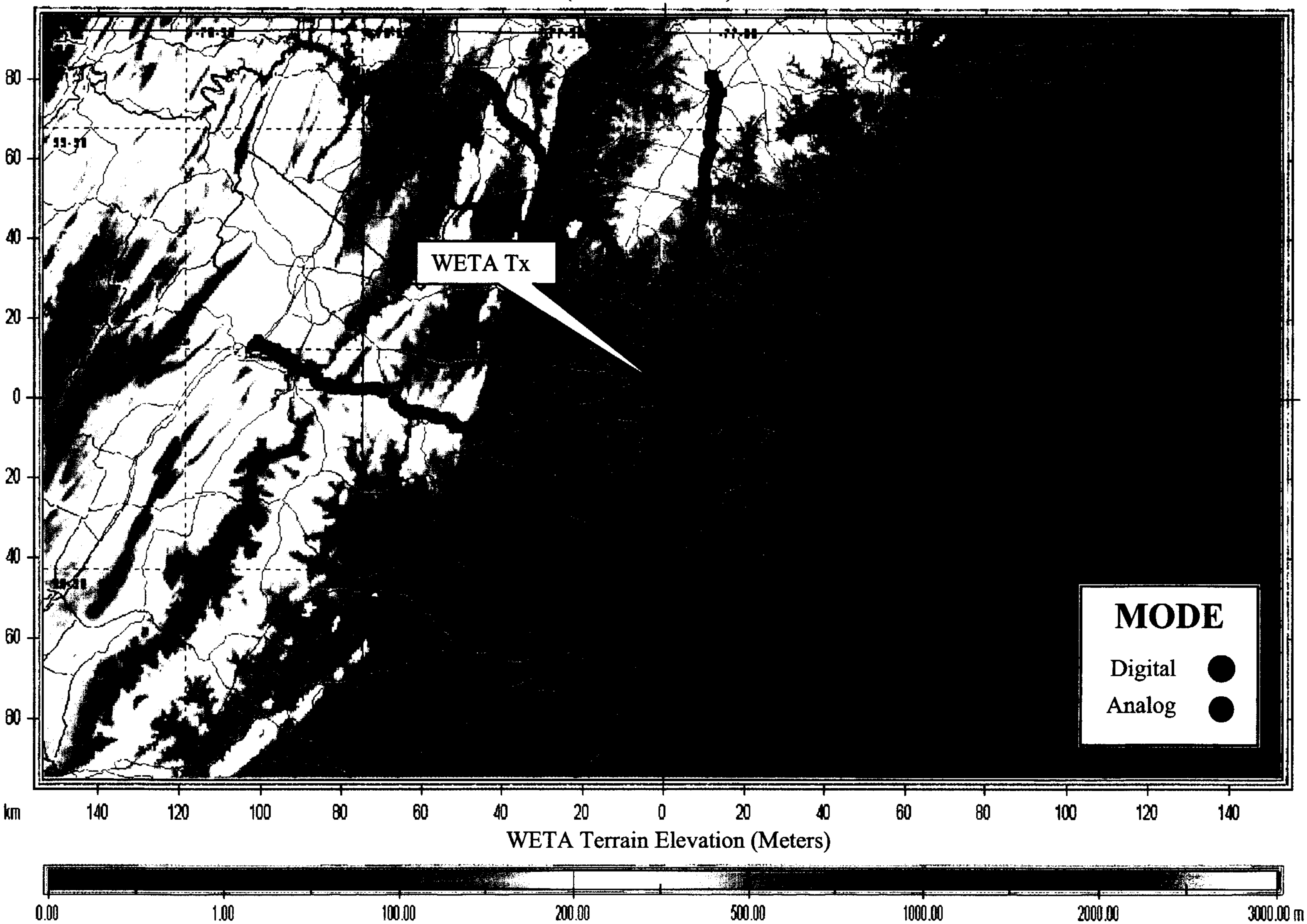
WETA Performance - 315° Radial / Field Intensity

(Desired + 1st Adjacent)



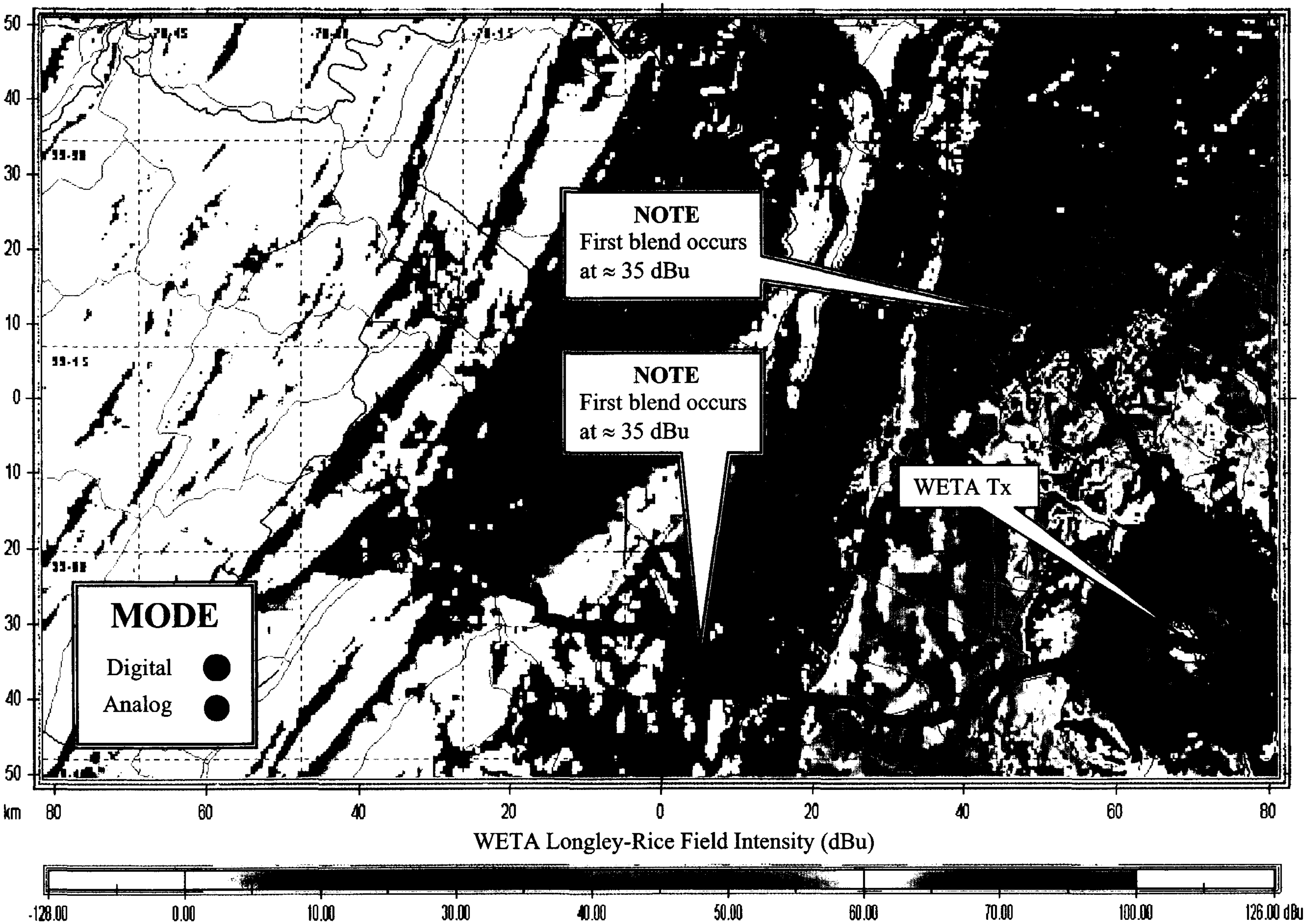
WETA Performance – All Radials / Terrain Elevation

(Meters – AMSL)



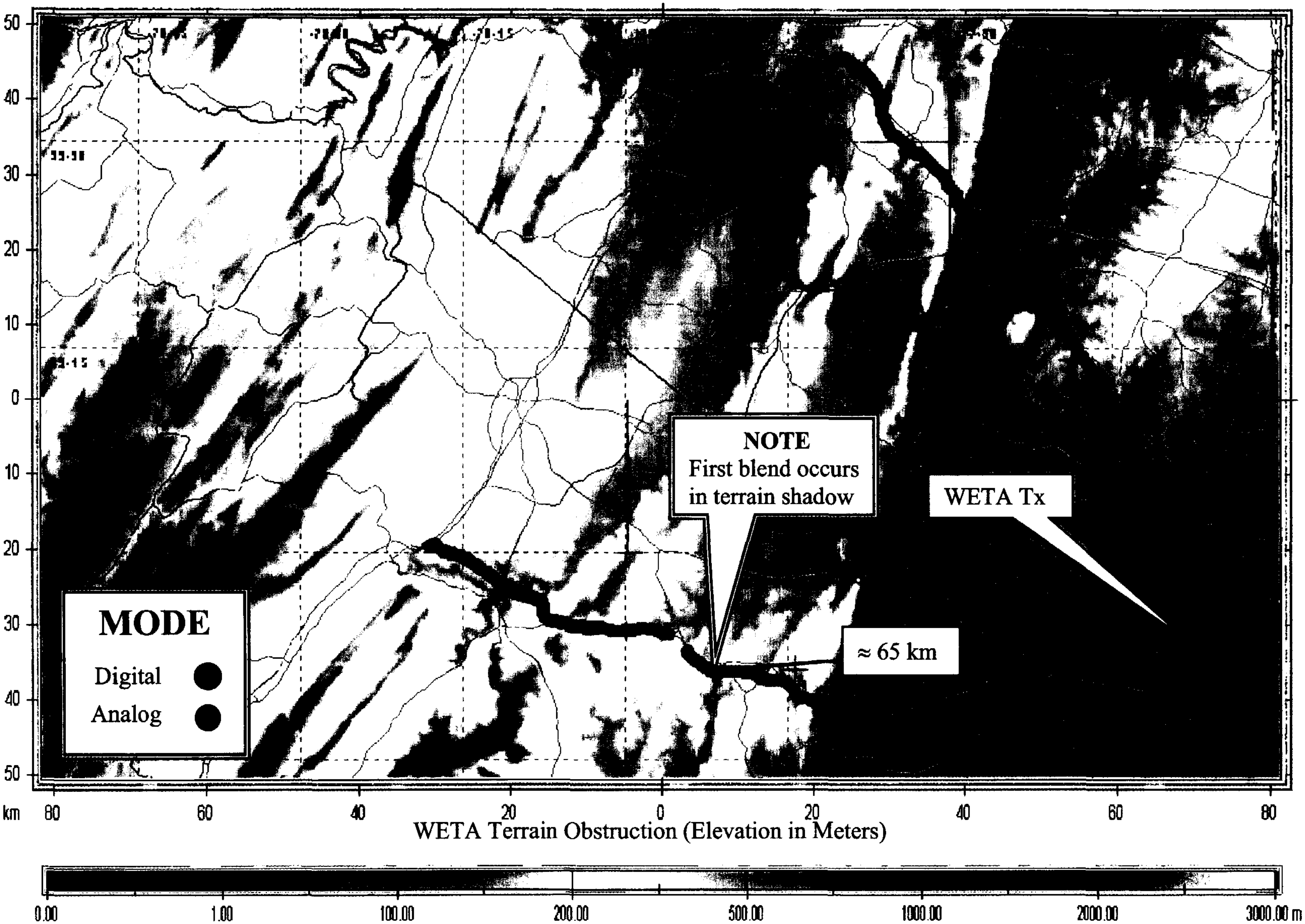
WETA Performance – 270° & 315° Radials / Field Intensity

(Longley-Rice Predicted - (dBu))

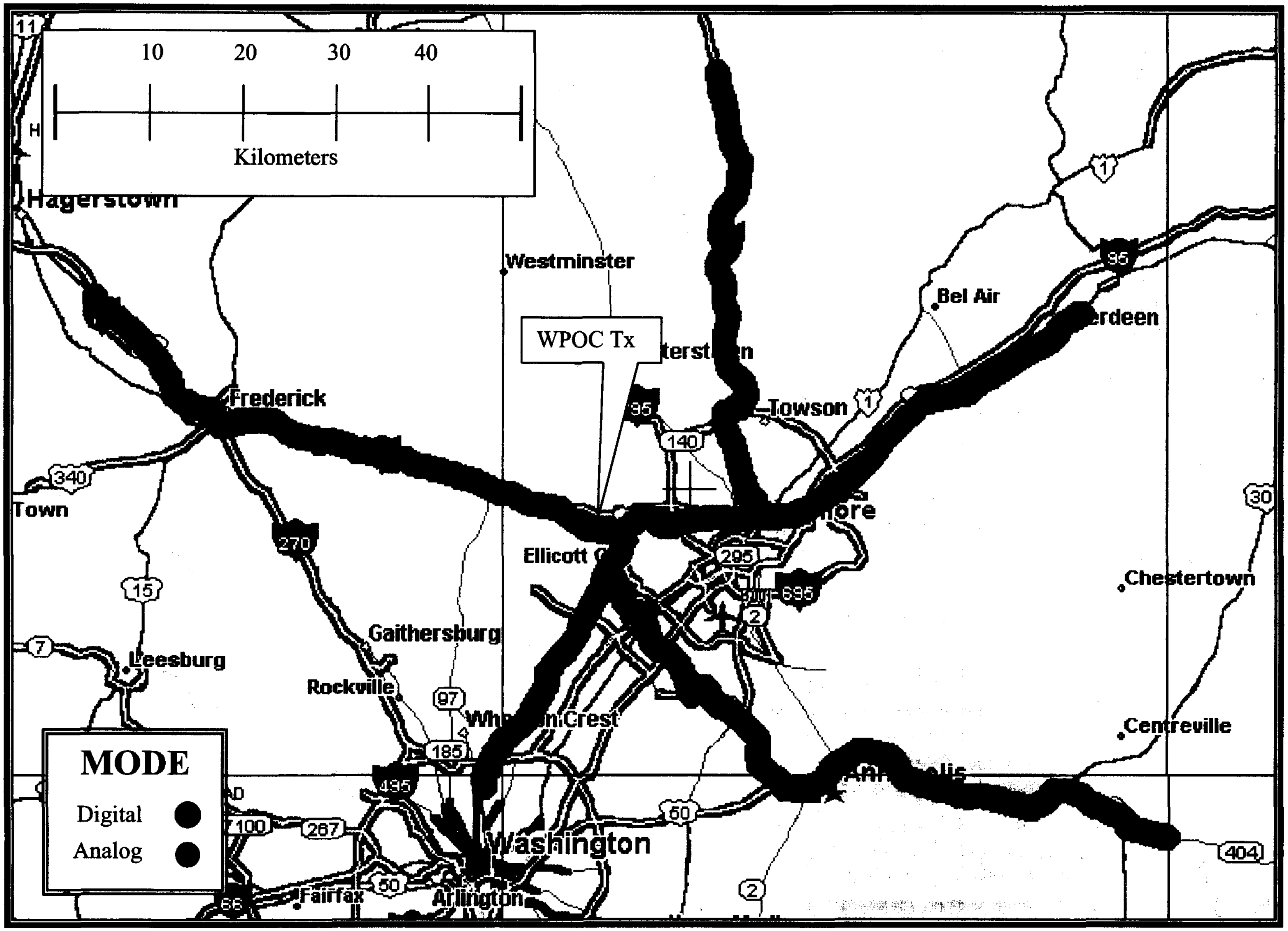


WETA Performance – 270° & 315° Radials / Terrain Elevation

(Meters - AMSL)

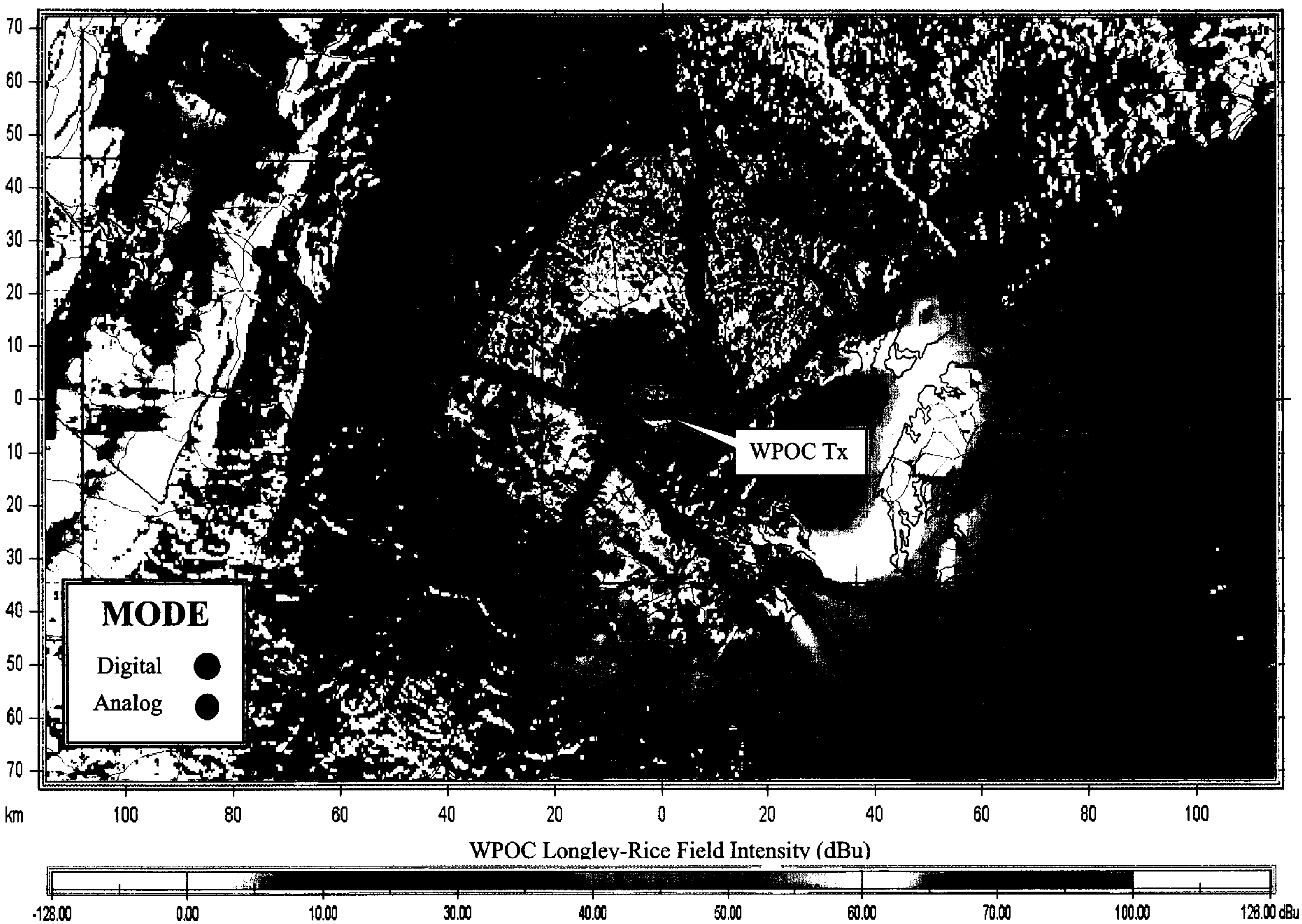


WPOC Performance – All Radials / Street Map



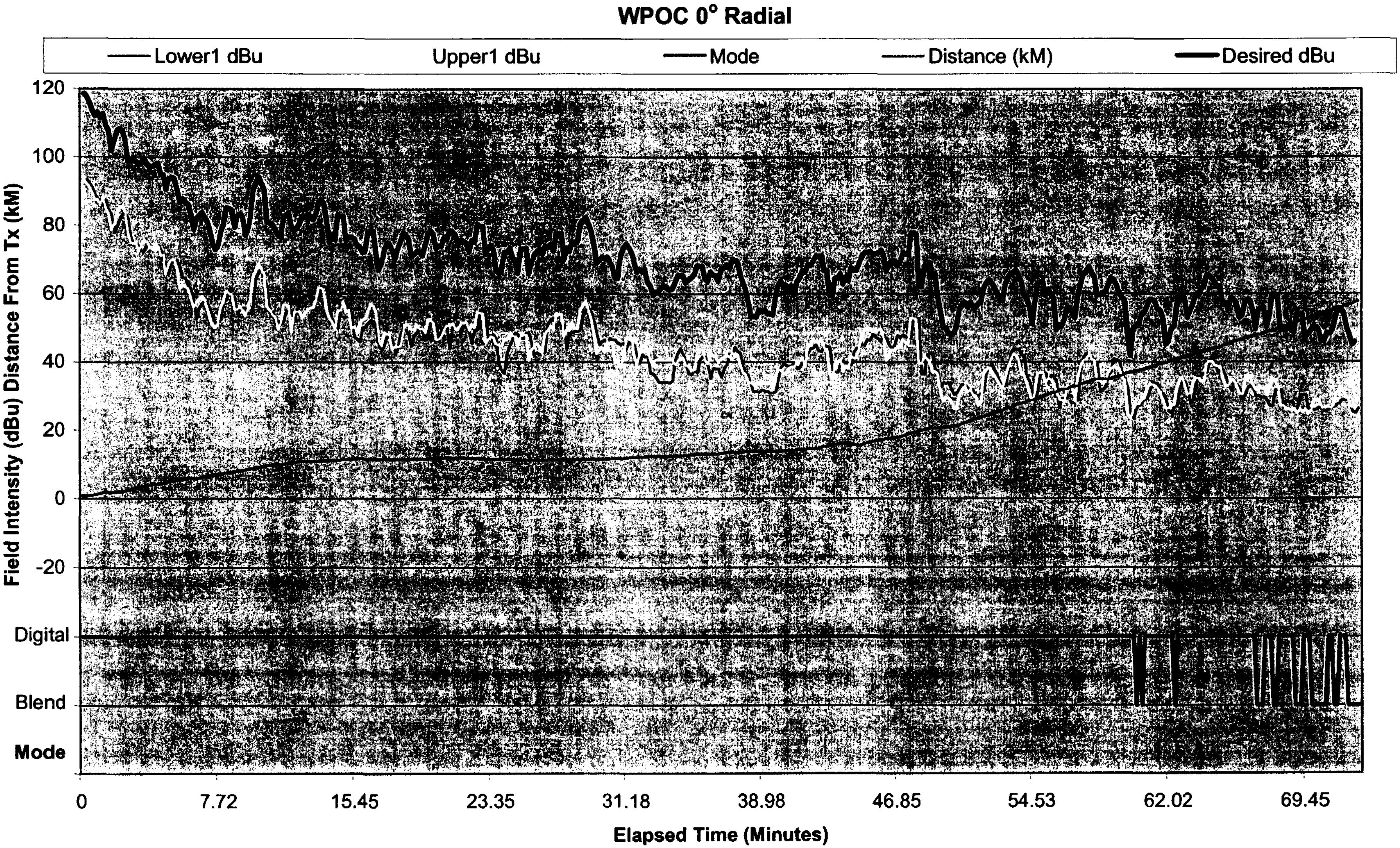
WPOC Performance – All Radials / Field Intensity

(Longley-Rice Predicted - dBu)



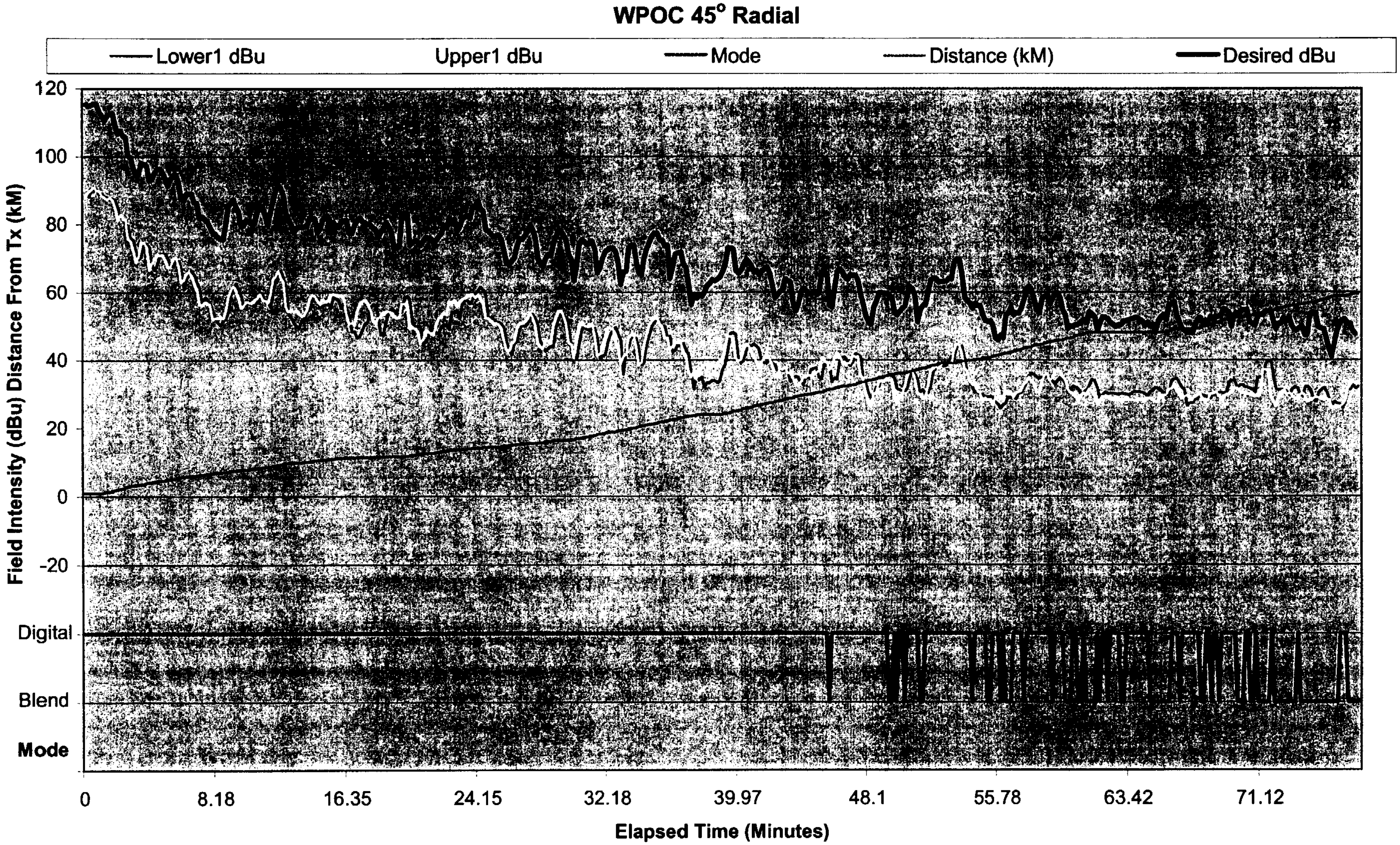
WPOC Performance - 0° Radial / Field Intensity

(Desired + 1st Adjacent)



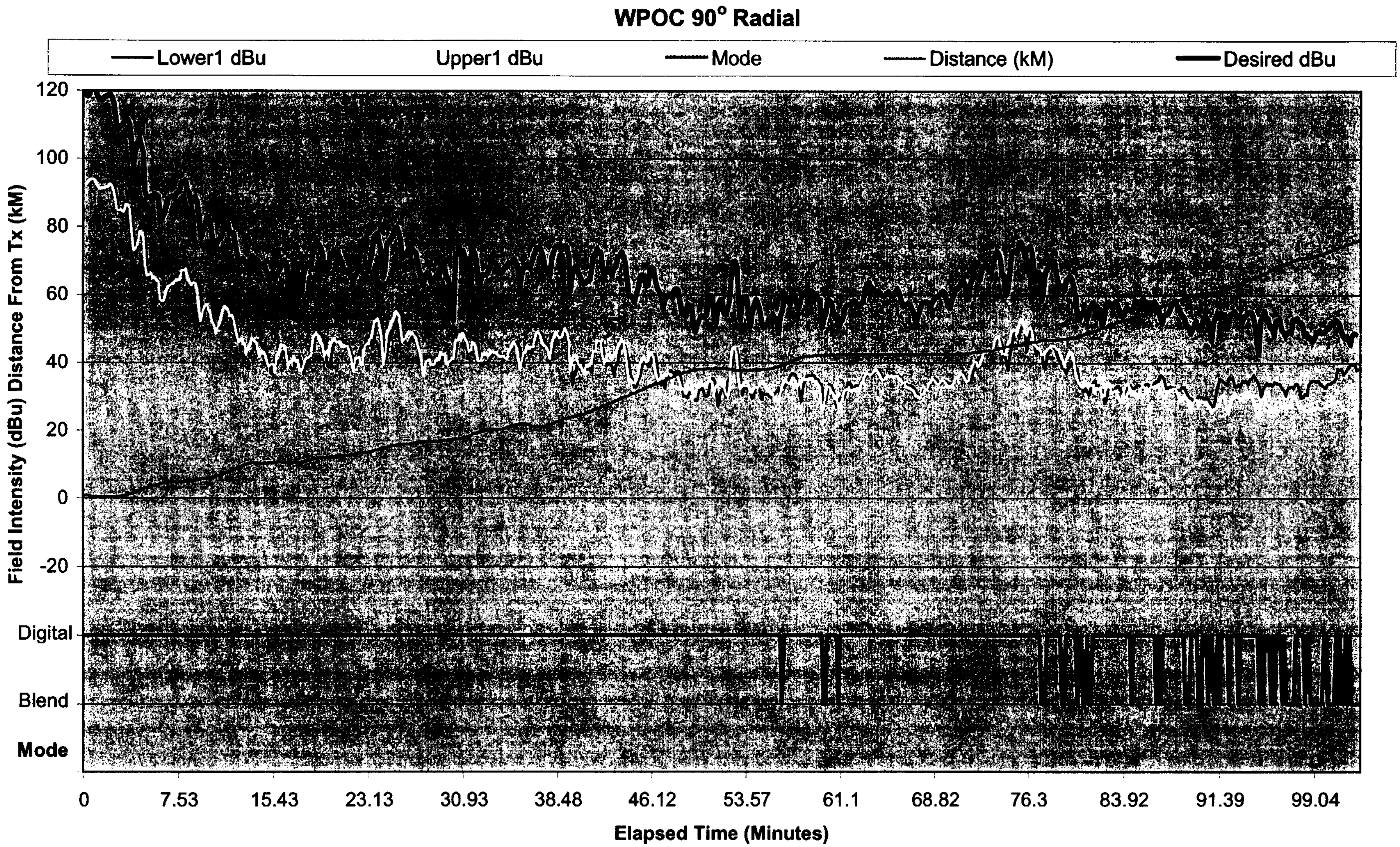
WPOC Performance - 45° Radial / Field Intensity

(Desired + 1st Adjacent)



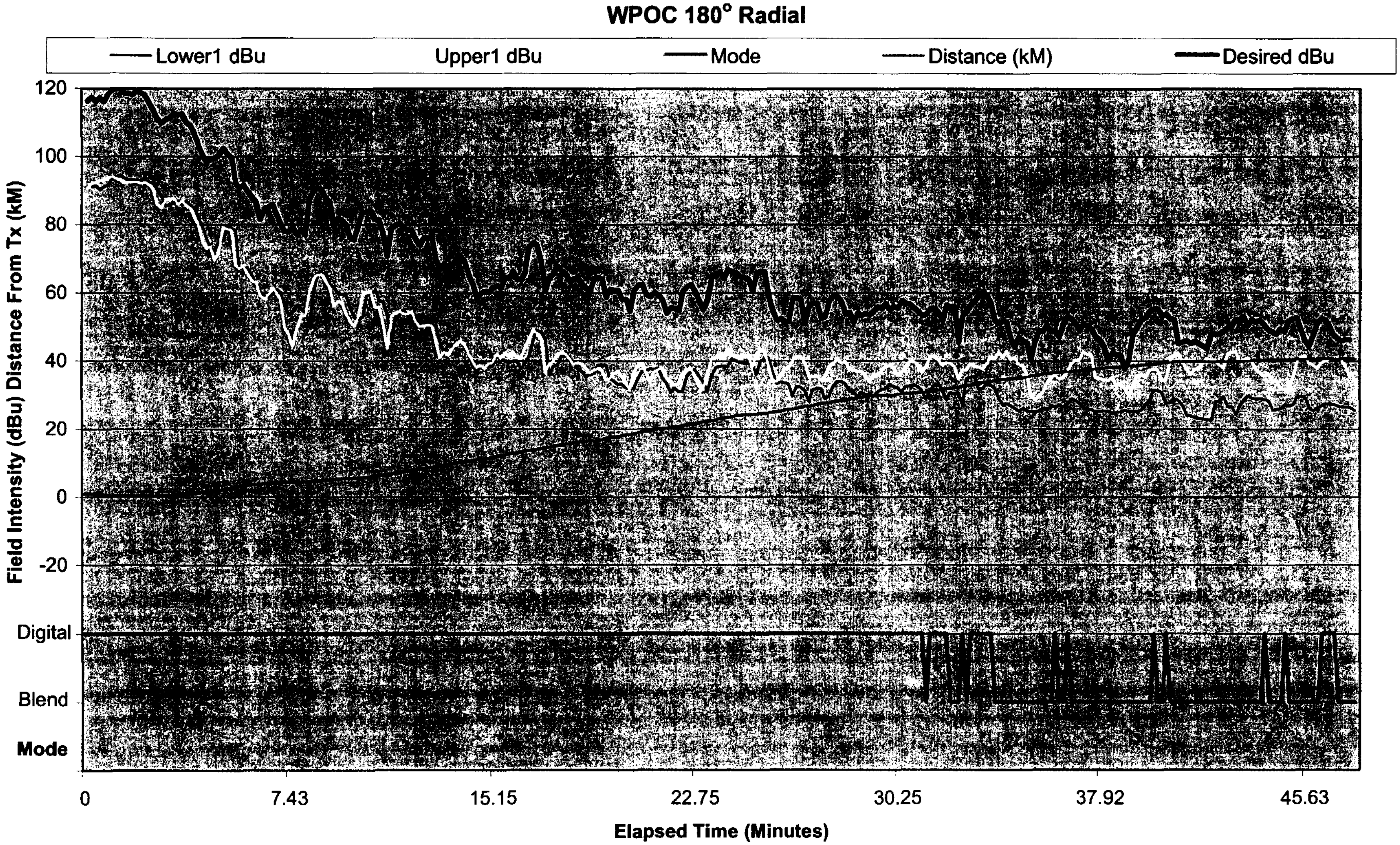
WPOC Performance - 90° Radial / Field Intensity

(Desired + 1st Adjacent)



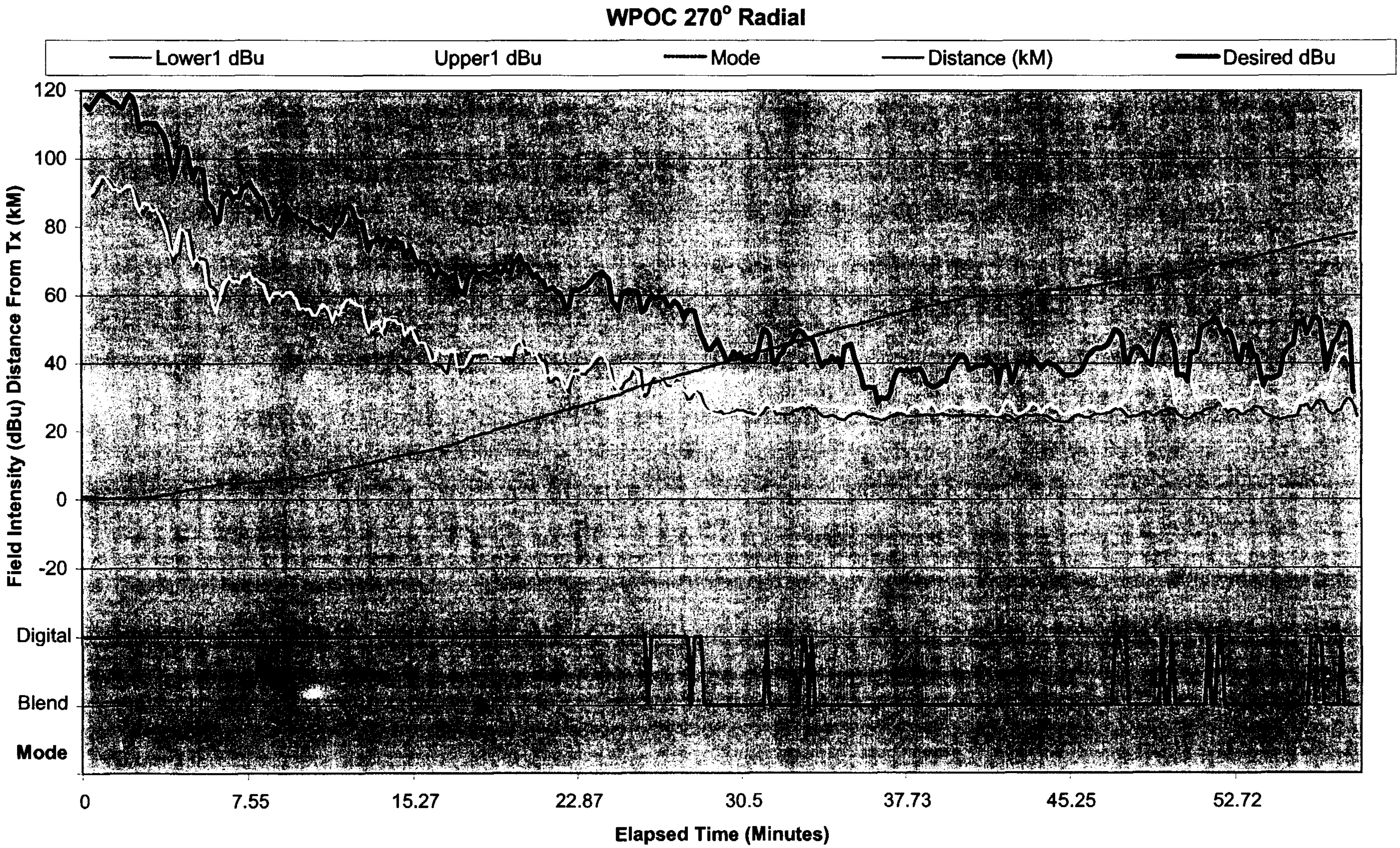
WPOC Performance - 180° Radial / Field Intensity

(Desired + 1st Adjacent)



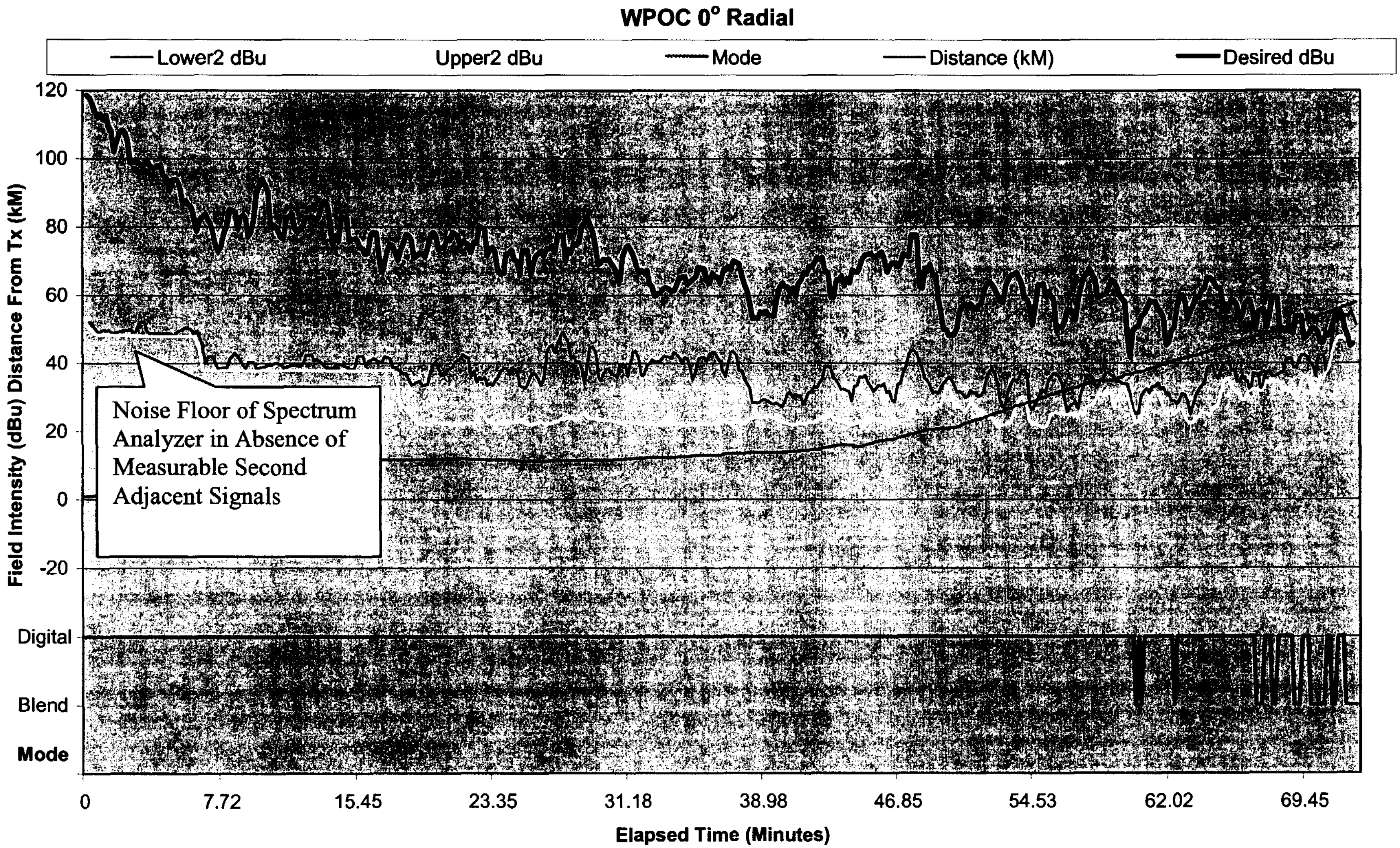
WPOC Performance - 270° Radial / Field Intensity

(Desired + 1st Adjacent)



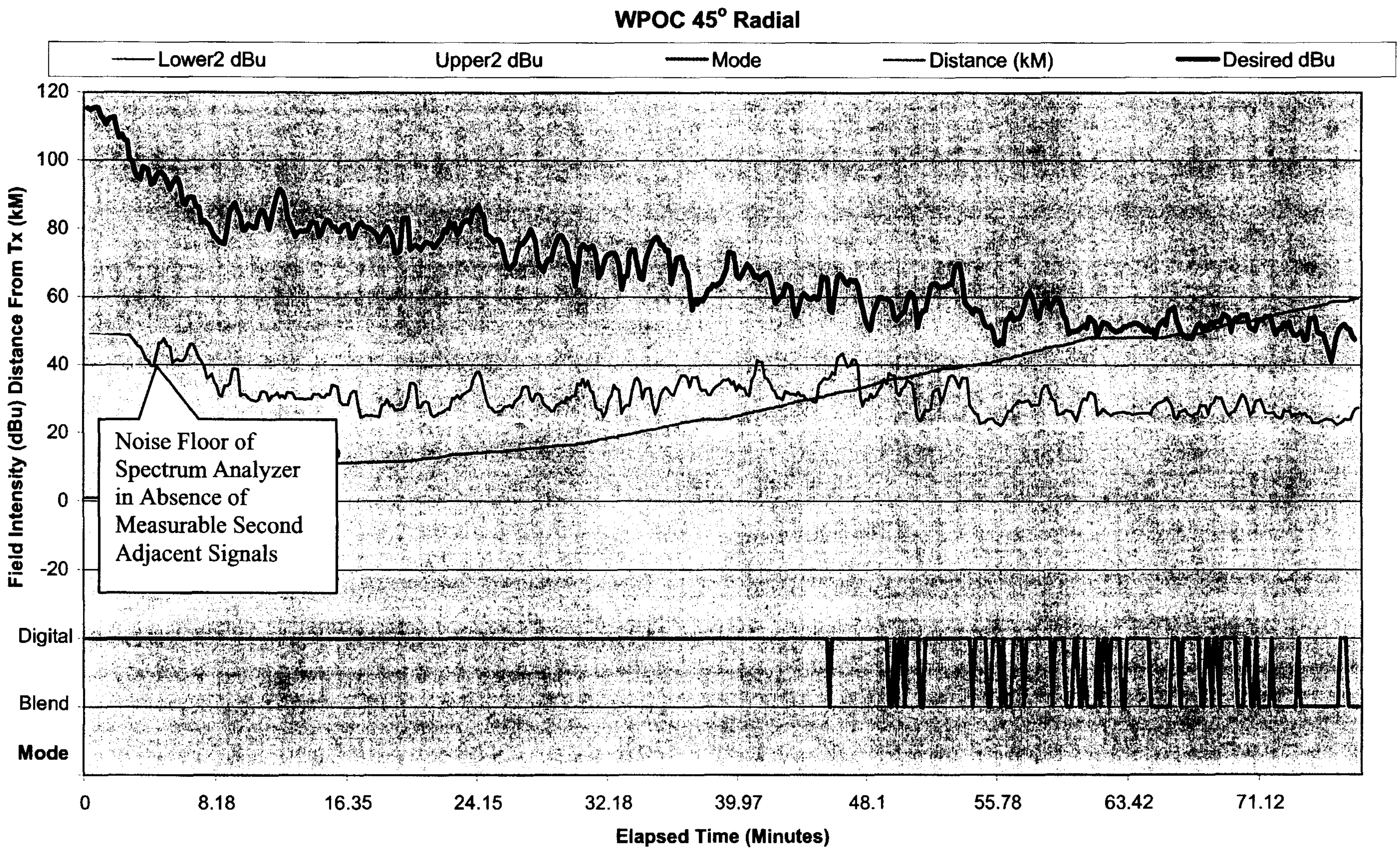
WPOC Performance - 0° Radial / Field Intensity

(Desired + 2nd Adjacent)



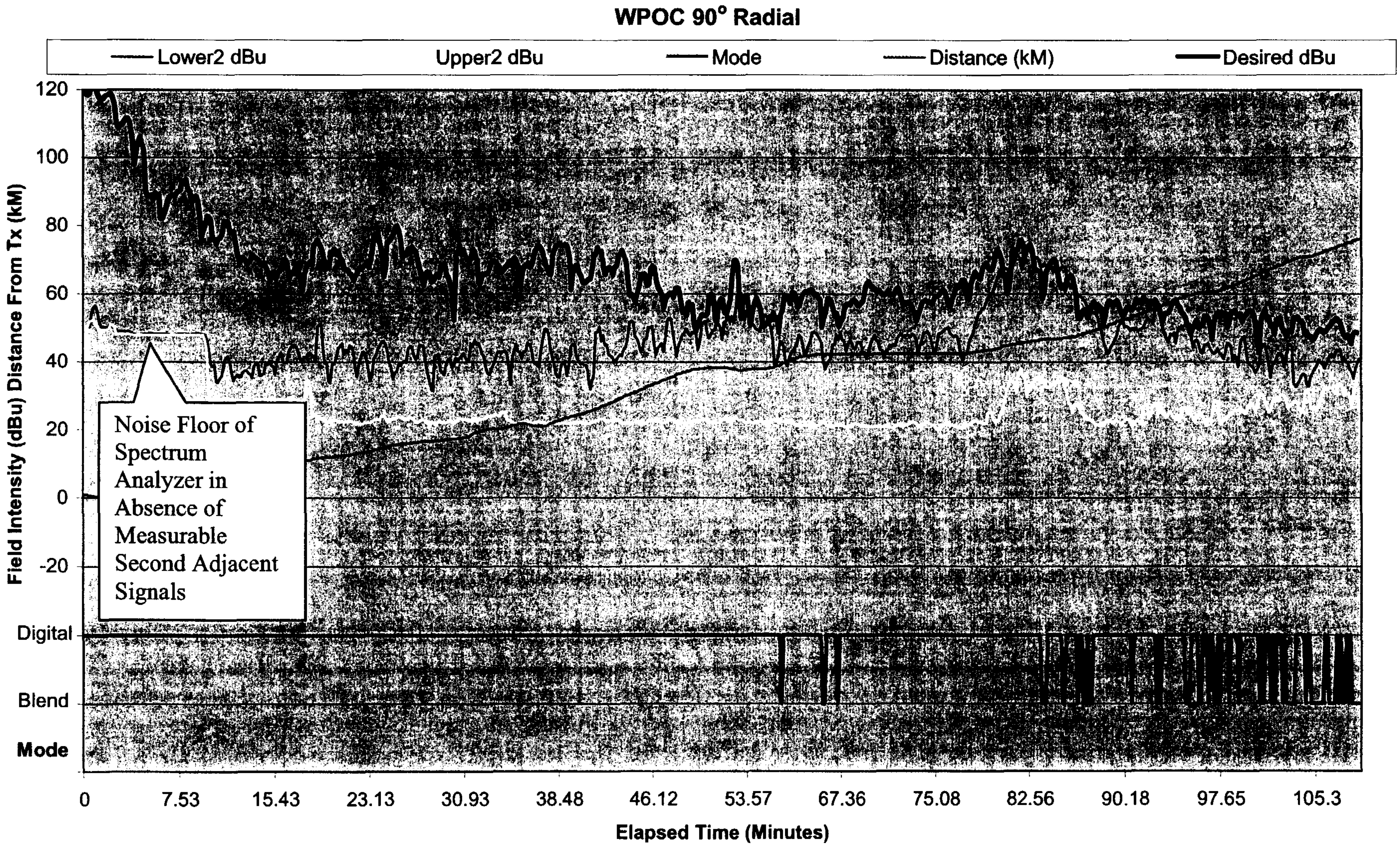
WPOC Performance - 45° Radial / Field Intensity

(Desired + 2nd Adjacent)



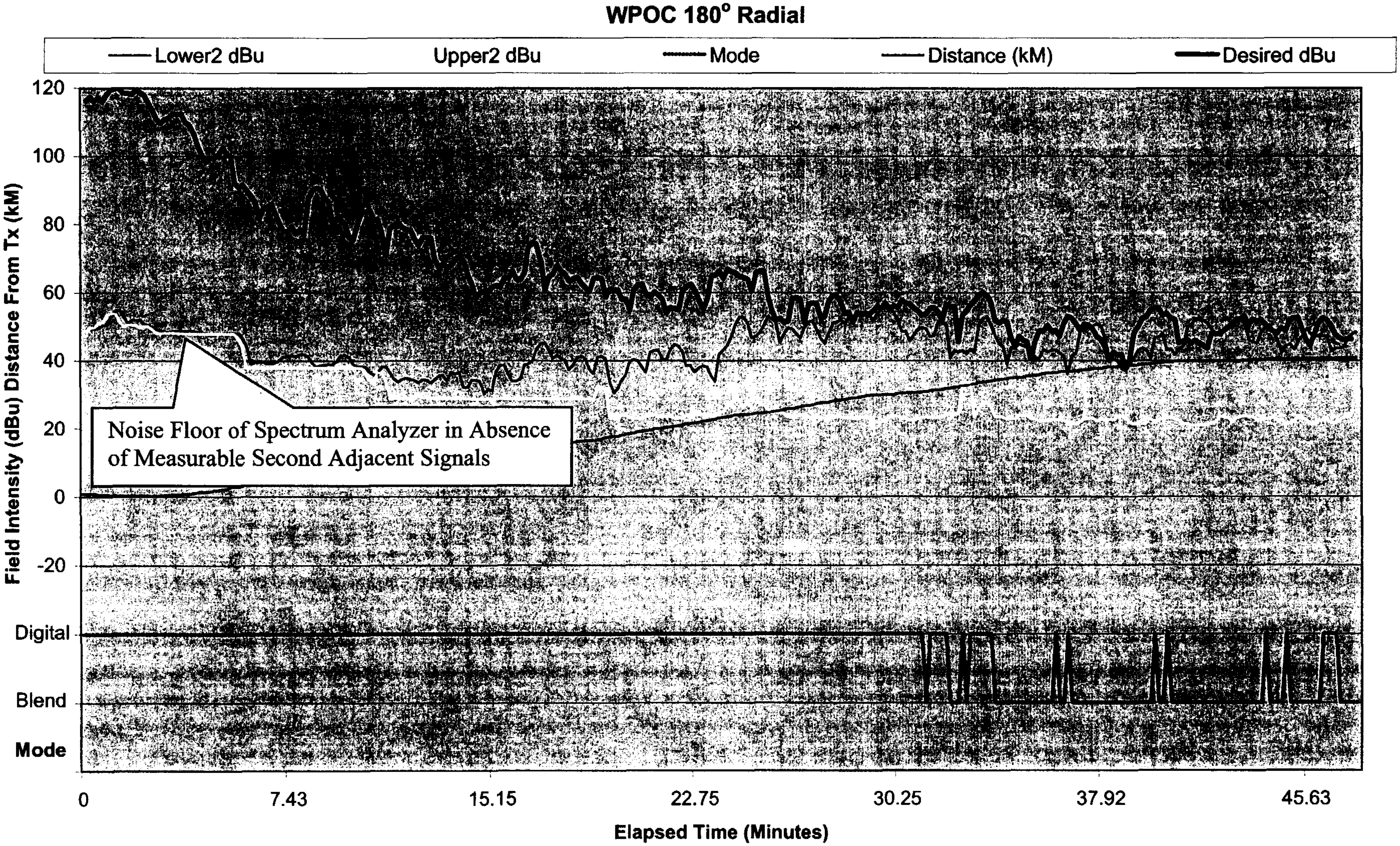
WPOC Performance - 90° Radial / Field Intensity

(Desired + 2nd Adjacent)



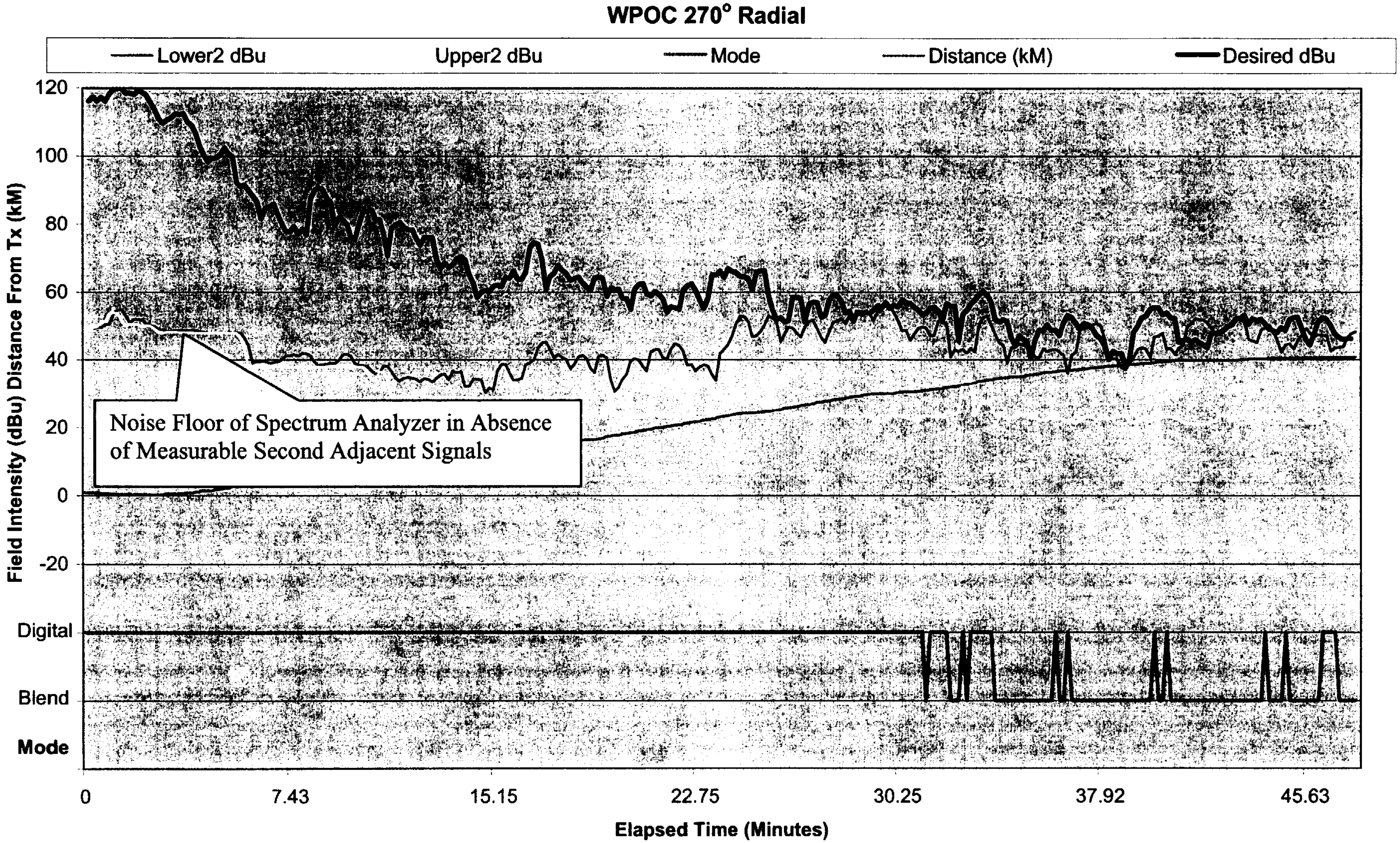
WPOC Performance - 180° Radial / Field Intensity

(Desired + 2nd Adjacent)



WPOC Performance - 270° Radial / Field Intensity

(Desired + 2nd Adjacent)



WPOC Performance – All Radials / Terrain Elevation

(Meters – AMSL)