APPENDIX

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

30 m F(50,50)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 30.0 RX 1.0
EFF HTS (m) TX 30.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 50.0 % LOCATIONS - 50.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	110.5	65.3	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	118.1	57.6	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	123.1	52.6	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	127.1	48.7	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	130.4	45.3	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	137.4	38.3	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	143.3	32.5	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	148.6	27.2	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	152.9	22.9	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	156.4	19.4	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	159.7	16.0	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	162.9	12.9	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	165.9	9.9	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	168.8	7.0	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	171.6	4.1	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	174.5	1.3	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	177.3	-1.6	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	180.1	-4.4	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	182.9	-7.1	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	185.6	-9.8	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	188.3	-12.5	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	190.9	-15.1	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	192.3	-16.6	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	192.9	-17.1	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	193.4	-17.6	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	193.9	-18.1	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	194.4	-18.6	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	194.9	-19.1	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	195.4	-19.6	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	195.9	-20.1	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	196.4	-20.6	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	196.9	-21.1	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	197.4	-21.6	0.0	0.0	0.0	0.0	0.0	0

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

70 m F(50,50)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 70.0 RX 1.0
EFF HTS (m) TX 70.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 50.0 % LOCATIONS - 50.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	104.9	70.9	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	112.2	63.6	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	117.0	58.8	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	120.8	55.0	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	124.0	51.8	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	130.7	45.0	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	136.4	39.4	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	141.5	34.3	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	146.2	29.6	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	150.7	25.1	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	154.8	20.9	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	158.1	17.6	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	161.3	14.5	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	164.4	11.4	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	167.4	8.4	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	170.2	5.5	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	173.1	2.7	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	175.9	-0.2	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	178.8	-3.0	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	181.6	-5.8	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	184.3	-8.6	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	187.0	-11.3	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	189.8	-14.0	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	192.4	-16.7	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	192.9	-17.2	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	193.4	-17.7	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	193.9	-18.2	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	194.4	-18.6	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	194.9	-19.1	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	195.3	-19.6	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	195.8	-20.1	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	196.3	-20.5	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	196.8	-21.0	0.0	0.0	0.0	0.0	0.0	0

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

150 m F(50,50)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 150.0 RX 1.0
EFF HTS (m) TX 150.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 50.0 % LOCATIONS - 50.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	99.3	76.5	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	106.4	69.4	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	111.1	64.7	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	114.7	61.1	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	117.7	58.0	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	124.1	51.7	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	129.4	46.4	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	134.1	41.6	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	138.5	37.3	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	142.6	33.1	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	146.5	29.2	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	150.3	25.4	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	154.0	21.8	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	157.5	18.2	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	160.7	15.1	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	163.7	12.0	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	166.7	9.0	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	169.6	6.1	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	172.5	3.3	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	175.3	0.4	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	178.1	-2.4	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	181.0	-5.2	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	183.8	-8.0	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	186.5	-10.8	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	189.3	-13.5	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	192.0	-16.2	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	193.4	-17.6	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	193.9	-18.1	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	194.3	-18.6	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	194.8	-19.0	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	195.2	-19.5	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	195.7	-19.9	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	196.1	-20.4	0.0	0.0	0.0	0.0	0.0	0

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

300 m F(50,50)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 300.0 RX 1.0
EFF HTS (m) TX 300.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 50.0 % LOCATIONS - 50.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	97.8	77.9	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	103.9	71.9	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	107.4	68.4	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	109.9	65.9	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	111.8	63.9	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	115.3	60.4	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	120.1	55.6	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	124.7	51.1	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	128.9	46.8	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	132.9	42.9	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	136.6	39.1	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	140.2	35.5	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	143.8	32.0	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	147.2	28.6	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	150.5	25.3	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	153.8	22.0	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	156.9	18.8	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	160.1	15.7	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	163.1	12.6	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	166.1	9.7	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	169.0	6.8	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	171.9	3.9	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	174.7	1.0	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	177.6	-1.8	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	180.3	-4.6	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	183.1	-7.4	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	185.9	-10.2	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	188.7	-12.9	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	191.4	-15.6	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	194.1	-18.4	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	194.6	-18.8	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	195.0	-19.3	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	195.4	-19.7	0.0	0.0	0.0	0.0	0.0	0

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

600 m F(50,50)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 600.0 RX 1.0
EFF HTS (m) TX 600.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 50.0 % LOCATIONS - 50.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	97.8	77.9	0.0	0.0	0.0	0.0	0.0	3
4.00	103.9	103.9	71.9	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	107.4	68.4	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	109.9	65.9	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	111.8	63.9	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	115.3	60.4	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	117.8	57.9	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	119.7	56.0	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	121.3	54.4	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	122.6	53.1	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	123.8	52.0	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	126.5	49.2	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	130.0	45.8	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	133.3	42.4	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	136.6	39.2	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	139.8	36.0	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	142.9	32.8	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	146.0	29.7	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	149.1	26.7	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	152.1	23.6	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	155.1	20.7	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	158.0	17.7	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	161.0	14.8	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	163.8	11.9	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	166.7	9.0	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	169.6	6.1	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	172.5	3.3	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	175.3	0.4	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	178.1	-2.4	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	180.9	-5.2	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	183.7	-8.0	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	186.5	-10.7	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	189.2	-13.5	0.0	0.0	0.0	0.0	0.0	0

******* WARNING *******
A COMBINATION OF PARAMETERS IS OUT OF RANGE.
RESULTS ARE PROBABLY INVALID.

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

1000 m F(50,50)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 1000.0 RX 1.0
EFF HTS (m) TX 1000.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 50.0 % LOCATIONS - 50.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	97.8	77.9	0.0	0.0	0.0	0.0	0.0	3
4.00	103.9	103.9	71.9	0.0	0.0	0.0	0.0	0.0	3
6.00	107.4	107.4	68.4	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	109.9	65.9	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	111.8	63.9	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	115.3	60.4	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	117.8	57.9	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	119.8	56.0	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	121.3	54.4	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	122.7	53.1	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	123.8	52.0	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	124.8	50.9	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	125.7	50.0	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	126.5	49.2	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	127.3	48.5	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	127.9	47.8	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	128.5	47.2	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	131.5	44.2	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	134.6	41.1	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	137.7	38.0	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	140.7	35.0	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	143.8	32.0	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	146.7	29.0	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	149.7	26.1	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	152.6	23.2	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	155.5	20.3	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	158.4	17.4	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	161.3	14.5	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	164.1	11.7	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	166.9	8.8	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	169.8	6.0	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	172.6	3.1	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	175.5	0.3	0.0	0.0	0.0	0.0	0.0	0

******* WARNING *******
A COMBINATION OF PARAMETERS IS OUT OF RANGE.
RESULTS ARE PROBABLY INVALID.

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

30 m F(50,10)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 30.0 RX 1.0
EFF HTS (m) TX 30.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 50.0 % LOCATIONS - 10.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	110.4	65.3	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	118.0	57.7	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	122.9	52.8	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	126.7	49.1	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	129.8	45.9	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	136.1	39.7	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	141.0	34.7	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	145.2	30.6	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	148.2	27.5	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	150.5	25.2	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	152.6	23.2	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	154.6	21.2	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	156.5	19.3	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	158.4	17.3	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	160.7	15.1	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	163.3	12.5	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	165.9	9.9	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	168.5	7.3	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	171.1	4.7	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	173.7	2.1	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	176.3	-0.5	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	178.9	-3.2	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	180.3	-4.6	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	180.9	-5.2	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	181.5	-5.8	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	182.1	-6.4	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	182.7	-7.0	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	183.4	-7.6	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	184.0	-8.2	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	184.6	-8.9	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	185.3	-9.5	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	185.9	-10.2	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	186.6	-10.8	0.0	0.0	0.0	0.0	0.0	0

ARTHUR K. PETERS
CONSULTING ENGINEERS

70 m F(50,10)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 70.0 RX 1.0
EFF HTS (m) TX 70.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 50.0 % LOCATIONS - 10.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk)						ERROR <<dBk
			0.0	-99.9	-99.9	-99.9	-99.9	-99.9	
2.00	97.8	104.9	70.9	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	112.1	63.6	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	116.9	58.9	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	120.5	55.2	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	123.6	52.2	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	129.8	46.0	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	134.8	41.0	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	139.0	36.7	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	142.8	32.9	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	146.3	29.5	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	149.4	26.3	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	151.7	24.1	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	153.9	21.9	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	156.0	19.8	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	158.0	17.7	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	160.1	15.6	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	162.3	13.5	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	164.8	10.9	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	167.4	8.4	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	170.0	5.8	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	172.6	3.2	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	175.2	0.6	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	177.8	-2.1	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	180.4	-4.7	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	180.9	-5.2	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	181.5	-5.7	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	182.0	-6.3	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	182.6	-6.8	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	183.2	-7.4	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	183.7	-8.0	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	184.4	-8.6	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	185.0	-9.2	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	185.6	-9.8	0.0	0.0	0.0	0.0	0.0	0

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

150 m F(50,10)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 150.0 RX 1.0
EFF HTS (m) TX 150.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 50.0 % LOCATIONS - 10.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	99.2	76.5	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	106.4	69.4	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	111.0	64.8	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	114.5	61.3	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	117.5	58.3	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	123.5	52.3	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	128.3	47.4	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	132.5	43.3	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	136.2	39.6	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	139.6	36.2	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	142.7	33.1	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	145.6	30.1	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	148.5	27.3	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	151.2	24.6	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	153.5	22.3	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	155.8	20.0	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	158.0	17.8	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	160.2	15.6	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	162.4	13.3	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	164.7	11.1	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	167.1	8.6	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	169.7	6.1	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	172.2	3.5	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	174.8	0.9	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	177.4	-1.7	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	180.1	-4.3	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	181.4	-5.7	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	181.9	-6.1	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	182.4	-6.6	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	182.9	-7.1	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	183.4	-7.6	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	183.9	-8.2	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	184.5	-8.7	0.0	0.0	0.0	0.0	0.0	0

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

300 m F(50,10)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 300.0 RX 1.0
EFF HTS (m) TX 300.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 50.0 % LOCATIONS - 10.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk)						ERROR <<dBk
			0.0	-99.9	-99.9	-99.9	-99.9	-99.9	
2.00	97.8	97.8	77.9	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	103.8	71.9	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	107.3	68.4	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	109.8	66.0	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	111.6	64.1	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	115.0	60.8	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	119.4	56.3	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	123.6	52.1	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	127.4	48.4	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	130.8	45.0	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	134.0	41.8	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	137.0	38.7	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	139.9	35.9	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	142.6	33.1	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	145.3	30.5	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	147.9	27.9	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	150.4	25.4	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	152.9	22.9	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	155.3	20.5	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	157.6	18.1	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	159.9	15.8	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	162.3	13.5	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	164.6	11.1	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	167.0	8.8	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	169.4	6.3	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	171.9	3.8	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	174.5	1.3	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	177.0	-1.3	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	179.6	-3.9	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	182.2	-6.5	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	182.6	-6.9	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	183.0	-7.3	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	183.5	-7.7	0.0	0.0	0.0	0.0	0.0	0

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

600 m F(50,10)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 600.0 RX 1.0
EFF HTS (m) TX 600.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 50.0 % LOCATIONS - 10.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	97.8	77.9	0.0	0.0	0.0	0.0	0.0	3
4.00	103.9	103.8	71.9	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	107.3	68.4	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	109.8	65.9	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	111.7	64.0	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	115.1	60.7	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	117.4	58.3	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	119.2	56.6	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	120.6	55.2	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	121.7	54.0	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	122.7	53.1	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	124.5	51.2	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	127.5	48.3	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	130.4	45.4	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	133.1	42.6	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	135.8	39.9	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	138.5	37.3	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	141.0	34.7	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	143.6	32.2	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	146.1	29.7	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	148.5	27.2	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	150.9	24.8	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	153.3	22.4	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	155.7	20.0	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	158.2	17.6	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	160.6	15.2	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	163.0	12.8	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	165.4	10.3	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	167.9	7.9	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	170.4	5.4	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	172.8	2.9	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	175.3	0.5	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	177.8	-2.1	0.0	0.0	0.0	0.0	0.0	0

******* WARNING *******
A COMBINATION OF PARAMETERS IS OUT OF RANGE.
RESULTS ARE PROBABLY INVALID.

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

1000 m F(50,10)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 1000.0 RX 1.0
EFF HTS (m) TX 1000.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 50.0 % LOCATIONS - 10.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	97.8	77.9	0.0	0.0	0.0	0.0	0.0	3
4.00	103.9	103.8	71.9	0.0	0.0	0.0	0.0	0.0	3
6.00	107.4	107.4	68.4	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	109.8	65.9	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	111.7	64.0	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	115.2	60.6	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	117.6	58.2	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	119.4	56.4	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	120.8	55.0	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	122.0	53.8	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	123.0	52.8	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	123.8	51.9	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	124.6	51.2	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	125.3	50.5	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	125.9	49.9	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	126.5	49.3	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	127.0	48.8	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	128.3	47.4	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	130.6	45.1	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	133.3	42.5	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	135.9	39.9	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	138.4	37.3	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	141.0	34.8	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	143.5	32.3	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	146.0	29.8	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	148.5	27.3	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	150.9	24.8	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	153.4	22.4	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	155.8	19.9	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	158.3	17.5	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	160.7	15.0	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	163.2	12.5	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	165.7	10.0	0.0	0.0	0.0	0.0	0.0	0

******* WARNING *******
A COMBINATION OF PARAMETERS IS OUT OF RANGE.
RESULTS ARE PROBABLY INVALID.

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

30 m F(90,90)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 30.0 RX 1.0
EFF HTS (m) TX 30.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 90.0 % LOCATIONS - 90.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	122.6	53.2	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	130.4	45.4	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	135.5	40.2	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	139.6	36.1	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	143.2	32.6	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	150.7	25.1	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	157.2	18.6	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	163.2	12.6	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	168.2	7.6	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	172.5	3.2	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	176.7	-0.9	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	180.6	-4.9	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	184.5	-8.7	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	188.1	-12.4	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	191.6	-15.8	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	194.8	-19.0	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	197.9	-22.2	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	201.0	-25.3	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	204.0	-28.3	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	207.0	-31.3	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	209.9	-34.2	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	212.8	-37.1	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	214.4	-38.7	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	215.1	-39.4	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	215.8	-40.1	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	216.4	-40.7	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	217.0	-41.3	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	217.6	-41.9	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	218.1	-42.4	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	218.7	-42.9	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	219.1	-43.4	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	219.6	-43.8	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	220.0	-44.3	0.0	0.0	0.0	0.0	0.0	0

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

70 m F(90,90)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 70.0 RX 1.0
EFF HTS (m) TX 70.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 90.0 % LOCATIONS - 90.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	117.0	58.7	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	124.4	51.3	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	129.4	46.4	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	133.3	42.5	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	136.6	39.2	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	143.7	32.1	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	149.8	25.9	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	155.5	20.3	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	160.8	15.0	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	165.9	9.9	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	170.7	5.1	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	174.6	1.1	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	178.5	-2.7	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	182.2	-6.5	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	185.9	-10.1	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	189.4	-13.6	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	192.9	-17.1	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	196.1	-20.3	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	199.2	-23.5	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	202.3	-26.6	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	205.4	-29.6	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	208.4	-32.6	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	211.3	-35.6	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	214.2	-38.5	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	215.0	-39.2	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	215.6	-39.9	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	216.3	-40.5	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	216.9	-41.2	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	217.5	-41.7	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	218.0	-42.3	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	218.6	-42.8	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	219.1	-43.3	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	219.5	-43.8	0.0	0.0	0.0	0.0	0.0	0

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

150 m F(90,90)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 150.0 RX 1.0
EFF HTS (m) TX 150.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 90.0 % LOCATIONS - 90.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	111.4	64.4	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	118.6	57.1	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	123.4	52.4	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	127.1	48.7	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	130.3	45.5	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	136.9	38.9	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	142.5	33.2	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	147.6	28.1	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	152.4	23.3	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	157.0	18.7	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	161.4	14.3	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	165.7	10.0	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	169.9	5.8	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	174.0	1.8	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	177.7	-2.0	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	181.3	-5.5	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	184.8	-9.1	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	188.3	-12.5	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	191.7	-15.9	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	195.0	-19.2	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	198.2	-22.5	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	201.4	-25.6	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	204.5	-28.7	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	207.5	-31.7	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	210.5	-34.8	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	213.5	-37.7	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	215.2	-39.4	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	215.9	-40.1	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	216.5	-40.7	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	217.1	-41.4	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	217.7	-42.0	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	218.3	-42.5	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	218.8	-43.0	0.0	0.0	0.0	0.0	0.0	0

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

300 m F(90,90)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 300.0 RX 1.0
EFF HTS (m) TX 300.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 90.0 % LOCATIONS - 90.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	110.0	65.8	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	116.1	59.7	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	119.7	56.1	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	122.2	53.5	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	124.3	51.5	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	128.0	47.8	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	133.0	42.7	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	137.9	37.9	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	142.4	33.4	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	146.7	29.1	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	150.8	25.0	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	154.8	21.0	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	158.7	17.1	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	162.5	13.2	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	166.3	9.5	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	169.9	5.8	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	173.6	2.2	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	177.2	-1.4	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	180.6	-4.9	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	184.0	-8.3	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	187.4	-11.6	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	190.7	-14.9	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	193.9	-18.2	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	197.2	-21.4	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	200.3	-24.6	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	203.4	-27.7	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	206.5	-30.8	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	209.6	-33.8	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	212.6	-36.8	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	215.6	-39.8	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	216.3	-40.5	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	216.9	-41.2	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	217.6	-41.8	0.0	0.0	0.0	0.0	0.0	0

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

600 m F(90,90)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 600.0 RX 1.0
EFF HTS (m) TX 600.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 90.0 % LOCATIONS - 90.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	110.0	65.8	0.0	0.0	0.0	0.0	0.0	3
4.00	103.9	116.1	59.7	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	119.7	56.1	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	122.2	53.5	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	124.2	51.5	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	127.9	47.9	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	130.5	45.2	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	132.7	43.1	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	134.4	41.3	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	136.0	39.8	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	137.3	38.4	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	140.4	35.4	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	144.1	31.7	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	147.7	28.0	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	151.3	24.5	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	154.8	20.9	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	158.3	17.5	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	161.7	14.0	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	165.1	10.7	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	168.4	7.3	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	171.8	4.0	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	175.0	0.7	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	178.3	-2.5	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	181.5	-5.8	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	184.8	-9.0	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	188.0	-12.2	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	191.2	-15.4	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	194.3	-18.6	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	197.5	-21.7	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	200.6	-24.8	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	203.7	-27.9	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	206.8	-31.0	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	209.8	-34.1	0.0	0.0	0.0	0.0	0.0	0

******* WARNING *******
A COMBINATION OF PARAMETERS IS OUT OF RANGE.
RESULTS ARE PROBABLY INVALID.

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

1000 m F(90,90)

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 1000.0 RX 1.0
EFF HTS (m) TX 1000.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 90.0 % LOCATIONS - 90.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 50.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	110.0	65.8	0.0	0.0	0.0	0.0	0.0	3
4.00	103.9	116.1	59.7	0.0	0.0	0.0	0.0	0.0	3
6.00	107.4	119.7	56.1	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	122.2	53.6	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	124.2	51.6	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	127.8	47.9	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	130.5	45.3	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	132.5	43.2	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	134.3	41.5	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	135.7	40.0	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	137.1	38.7	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	138.3	37.5	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	139.4	36.4	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	140.4	35.4	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	141.3	34.4	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	142.2	33.5	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	143.1	32.7	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	146.4	29.4	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	149.7	26.0	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	153.1	22.7	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	156.4	19.4	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	159.6	16.1	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	162.9	12.9	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	166.1	9.7	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	169.3	6.5	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	172.5	3.3	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	175.6	0.1	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	178.8	-3.0	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	181.9	-6.1	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	185.0	-9.3	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	188.1	-12.4	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	191.3	-15.5	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	194.4	-18.6	0.0	0.0	0.0	0.0	0.0	0

******* WARNING *******
A COMBINATION OF PARAMETERS IS OUT OF RANGE.
RESULTS ARE PROBABLY INVALID.

DOCKET 96-18
REPLY COMMENTS

ARTHUR K. PETERS
CONSULTING ENGINEERS

30 m F(90,90) with 90% Confidence

FREQ (MHz) 930 VERTICAL POLARIZATION
ANT HTS (m) TX 30.0 RX 1.0
EFF HTS (m) TX 30.00 RX 1.00
TX SITING RANDOM RX SITING RANDOM
DEL H (m) 50 NO 320 NS 320
K 1.38492

BROADCAST SERVICE - 90.0 % LOCATIONS - 90.0 % TIME
CONFIDENCE IS SITUATION VARIABILITY AND IS 90.0 %

DIST km	Lfs dB	Ltot dB	Isotropic Field Strength (dBu) at ERP (dBk) 0.0	-99.9	-99.9	-99.9	-99.9	-99.9	ERROR <<dBk
2.00	97.8	133.1	42.6	0.0	0.0	0.0	0.0	0.0	0
4.00	103.9	140.8	35.0	0.0	0.0	0.0	0.0	0.0	0
6.00	107.4	145.8	30.0	0.0	0.0	0.0	0.0	0.0	0
8.00	109.9	149.7	26.0	0.0	0.0	0.0	0.0	0.0	0
10.00	111.8	153.1	22.6	0.0	0.0	0.0	0.0	0.0	0
15.00	115.3	160.3	15.4	0.0	0.0	0.0	0.0	0.0	0
20.00	117.8	166.6	9.2	0.0	0.0	0.0	0.0	0.0	0
25.00	119.8	172.4	3.4	0.0	0.0	0.0	0.0	0.0	0
30.00	121.4	177.2	-1.5	0.0	0.0	0.0	0.0	0.0	0
35.00	122.7	181.4	-5.7	0.0	0.0	0.0	0.0	0.0	0
40.00	123.9	185.5	-9.7	0.0	0.0	0.0	0.0	0.0	0
45.00	124.9	189.4	-13.6	0.0	0.0	0.0	0.0	0.0	0
50.00	125.8	193.1	-17.4	0.0	0.0	0.0	0.0	0.0	0
55.00	126.6	196.8	-21.0	0.0	0.0	0.0	0.0	0.0	0
60.00	127.4	200.2	-24.5	0.0	0.0	0.0	0.0	0.0	0
65.00	128.1	203.5	-27.7	0.0	0.0	0.0	0.0	0.0	0
70.00	128.7	206.6	-30.9	0.0	0.0	0.0	0.0	0.0	0
75.00	129.3	209.7	-33.9	0.0	0.0	0.0	0.0	0.0	0
80.00	129.9	212.7	-37.0	0.0	0.0	0.0	0.0	0.0	0
85.00	130.4	215.7	-40.0	0.0	0.0	0.0	0.0	0.0	0
90.00	130.9	218.7	-42.9	0.0	0.0	0.0	0.0	0.0	0
95.00	131.4	221.5	-45.8	0.0	0.0	0.0	0.0	0.0	0
100.00	131.8	223.2	-47.4	0.0	0.0	0.0	0.0	0.0	0
105.00	132.2	223.9	-48.1	0.0	0.0	0.0	0.0	0.0	0
110.00	132.6	224.6	-48.8	0.0	0.0	0.0	0.0	0.0	0
115.00	133.0	225.2	-49.4	0.0	0.0	0.0	0.0	0.0	0
120.00	133.4	225.8	-50.0	0.0	0.0	0.0	0.0	0.0	0
125.00	133.8	226.3	-50.6	0.0	0.0	0.0	0.0	0.0	0
130.00	134.1	226.9	-51.1	0.0	0.0	0.0	0.0	0.0	0
135.00	134.4	227.4	-51.6	0.0	0.0	0.0	0.0	0.0	0
140.00	134.7	227.8	-52.1	0.0	0.0	0.0	0.0	0.0	0
145.00	135.0	228.3	-52.5	0.0	0.0	0.0	0.0	0.0	0
150.00	135.3	228.7	-52.9	0.0	0.0	0.0	0.0	0.0	0

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SERVICE AND INTERFERENCE CONTOUR LEVEL DERIVATION

Several variables must be established and assumptions made before a determination of the signal level required for service and the signal level which defines interference are obtained. For example, we have assumed that the short-term fading signal follows a log normal distribution and has a standard deviation of 8 dB. This standard deviation is relatively common and used by many workers. It could possibly be lowered slightly but that would not be a conservative position.

We have assumed a paging receiver threshold field strength of 10 µV/m which corresponds to a field of 20 dBu. We have also assumed that a 90% paging reliability is mandatory within the service contour. This corresponds to 90% of the locations 90% of the time. A carrier-to-interference minimum acceptance ratio (A) is assumed to be 11 dB which yields a Frequency Shift Keying (FSK) bit error rate of approximately 10^{-3}.

To determine a ratio between desired and undesired signals we have followed the Bullington statistical combination of factors enumerated in Carey.

The C/I ratio R becomes

$$R = A + K\,(L_d^2 + L_u^2 + T_u^2)^{1/2} \qquad (1)$$

K (90%)	=	1
L_d (90%)	=	1.282 x 8 = 10.3 dB
L_u (10%)	=	-1.282 x 8 = -10.3 dB

T_u was derived by obtaining the maximum difference between the NBS F(50,50) and F(50,10) curves. As mentioned earlier, the T_u factor is distance-dependent but has an interesting characteristic in that for each antenna height, the value of T_u reaches a maximum value at some given distance. All of the maximum values for all the antenna heights are nearly equal; but occur at different distances. In our case, T_u is found to be 12 dB at a distance of between 90 and 100 kilometres for an antenna height of 30 metres. At an antenna height of 300 metres, the maximum difference is also 12 dB, but occurs at a much greater distance. (For the interested reader, these characteristics are plotted in Figures 10 and 26 of FCC Report R6602.) The 12 dB value may also be obtained from the tabular data (see Appendix) by subtracting the NBS F(50,50) value at 30 metres at 100 kilometres from the value of the F(50,10) curve at the same distance and

height. Using 12 dB as a fixed value (not distance sensitive) is conservative. Signal variability increases with distance, so assuming an interferor's variability is at its maximum for all distances is conservative with respect to interference protection. Moreover, T_u = 12 dB is reasonable.

The factors L_u and L_d are included to provide assurances that the desired signal is 90% reliable and that the undesired signal is that signal level which occurs less than or equal to 10% of the time. Obviously, if the interfering signal occurred more than 10% of the time then the desired signal could not obtain 90% reliability. Placing the factors in equation (1) yields a desired-to-undesired ratio of

$$D/U = 29.9 \text{ dB} = 11 + 1((10.3)^2 + (-10.3)^2 + (12)^2)^{1/2} \approx 30 \text{ dB}$$

We assumed a desired-to-undesired ratio of 30 dB. Currently the FCC uses a ratio of 26 dB at 450 MHz. The value of 30 dB at 930 MHz appears reasonable.

The signal level at the limit of the reliable service area can be derived in any number of ways, some of which are quite esoteric. However, a relatively simple method is to determine the difference between the NBS F(50,50) curves and the desired F(90,90) curves. This gives a factor which moves the reliability from 50% to 90%. The NBS program was again used to compute the difference in dB at a radius of 50 kilometres. F(50,50) and F(90,90) values are tabulated in the Appendix. At 50 kilometres with an antenna height of 30 metres an F(50,50) field strength of 9.9 dBu is obtained as is an F(90,90) value of -8.7 dBu. The difference in these values is 18.6 dB. We have used 19 dB as the factor by which the receiver threshold must be increased in order to be assured of a 90% reliability. An antenna height of 30 metres was used because the difference between F(50,50) and F(50,90) decreases with antenna height. Thus, the conservative value occurs at 30 metres. 50 kilometres was selected by determining, using the NBS program, the distance to the 30 metres F(50,10) contour at the maximum power, 3500 Watts. The maximum power was adjusted by 9 dB which is the difference between F(90,90) data at 50% confidence and 90% confidence. This yields a distance of 40 kilometres, which was conservatively rounded up to 50 kilometres. This convoluted approach was taken to ensure that a reliable definition of the service contour is selected. Confidence in this context means that in 90% of all paging systems, a signal level which is 19 dB greater than a receiver's threshold will correctly decode its message 90% of the time at 90% of all locations within the defined service contour. Adding 19 dB to the receiver threshold of 20 dBu yields a service contour value of 39 dBu.

If our desired-to-undesired signal ratio, as derived above, is subtracted from 39 dBu, the interfering signal level at the 39 dBu contour must be no greater than

with two height ranges. The final versions of the formulas produce these service and interference equations:

For Antenna Heights Less than 200 metres:

$$\text{Service Contour Distance} = 0.666 \times H^{(0.445)} \times ERP^{(0.219)}$$

$$\text{Interference Contour Distance} = 11.114 \times H^{(0.217)} \times ERP^{(0.109)}$$

For Antenna Heights equal to or greater than 200 metres:

$$\text{Service Contour Distance} = 0.404 \times H^{(0.605)} \times ERP^{(0.166)}$$

$$\text{Interference Contour Distance} = 4.415 \times H^{(0.411)} \times ERP^{(0.091)}$$

Where H = metres and ERP = Watts

CONCLUSIONS

If the FCC adopted the NBS curves as implemented by Hufford, they would obtain, for the first time, a method to analytically determine field strengths for a large range of situations. Even if the FCC adopted a single situation by which to compute the curves, the work done here could be of great assistance to the efficient utilization of staff time. The time required to compute a set of curves using Hufford's implementation, in a computer which runs at 50 MHz, is virtually instantaneous. That is, once the input is finished the actual computations require a very short time.

The formulae derived here appear to be reasonable in our experience. Some factors in this analysis might need modification. For example, our use of the receiver threshold field strength of 10 μV/m is one area which could require modification. The use of a 11 dB acceptance ratio yielding an FSK BER of 10^{-3} could be modified as required. Any changes in the assumptions regarding service contour and interference contour values should be met with a review of the formula fits to the NBS curves.

There is a natural tendency for engineers to "twiddle" once they gain access to a program which is as diverse as Hufford's implementation of Technical Note 101. If the FCC adopts this proposal, it would be well advised to carefully define each of the input parameters when used for official purposes. This is easily done as the number of parameters is not great and can be easily specified without ambiguity. For example, one could use only continental temperate climates for official