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**Engineering Statement
Application for Minor Modification of
Digital TV Translator Station K48MP-D
Channel 48 at Corvallis, OR
July 2015**

This Engineering Statement has been prepared on behalf of Sander Operating Co. III LLC dba KGW Television, in connection with an application for minor modification of digital TV translator station K48MP-D at Corvallis, Oregon. It is proposed to relocate K48MP-D to an adjacent tower, with a change in antenna pattern and ERP.

I. Allocation Study

Study has been made of all cochannel and adjacent-channel facilities in the vicinity of the proposed operation, including a detailed Longley-Rice interference study to demonstrate that the proposed operation will not cause interference to any facilities with which contour overlap exists. This study was performed using the SunDTV program from V-Soft Communications and a 1 km grid spacing. The SunDTV program identically duplicates the FCC's OET-69 processing program.

The results of this study indicate that the proposed facility will cause 34.3% population interference to an unbuilt construction permit BDISDTT-20140507ADL for K45CV on Channel 47 (digital). However, this will represent a decrease in interference caused to the K45CV construction permit, since the study does not consider existing interference from the licensed K48MP-D facility, which causes interference to 48.7% of the K45CV permit population.

Therefore, the proposed facility will not create additional interference and is believed to satisfy the requirements of §74.793 for protection of other broadcast stations.

Interference study results for proposed facility

Summary Study

Percent allowed new interference: 0.500
Percent allowed new interference to non Class A LPTV: 2.000
Census data selected 2000
Data Base Selected
./data_files/pt_tvdb.sff

WARNING WARNING WARNING

The following list of station records has been excluded from the analysis due to the fact that they have the same state, city and channel as the proposed station - This could cause the program to not find a potential fail situation

You can force the program to include these records by setting the state of the proposed record to ZZ and re-running the analysis

K48MP-D 48 CORVALLIS OR BLDTT 20111031ADB

TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 07-20-2015 Time: 18:34:16

Record Selected for Analysis

K48MP-D USERRECORD-01 CORVALLIS OR US
Channel 48 ERP 10. kW HAAT 310. m RCAMSL 00444 m STRINGENT MASK
Latitude 044-30-20 Longitude 0122-57-38
Status APP Zone 2 Border Site number: 01
Dir Antenna Make usr Model USRPAT01 Beam tilt N Ref Azimuth 310.
Last update Cutoff date Docket
Comments
Applicant

Cell Size for Service Analysis 1.0 km/side

Distance Increments for Longley-Rice Analysis 1.00 km

Not full service station

Service Class = LD

Maximum height/power limits not checked

Site number	1			
Azimuth	ERP	HAAT	51.0 dBu F(50,90)	
(Deg)	(kW)	(m)	(km)	
0.0	2.025	355.5	47.4	
45.0	0.030	337.9	23.1	
90.0	0.025	311.6	21.5	
135.0	0.132	120.2	20.2	
180.0	0.064	257.0	24.3	
225.0	0.049	358.5	26.0	
270.0	3.364	368.8	50.9	
315.0	9.702	371.4	56.7	

Contour Overlap to Proposed Station

Contour Overlap Evaluation to Proposed Station Complete

NO LANDMOBILE SPACING VIOLATIONS FOUND

Checks to Site Number 01

Proposed facility OK to FCC Monitoring Stations

Proposed facility OK toward West Virginia quiet zone

Proposed facility OK toward Table Mountain

Proposed facility is beyond the Canadian coordination distance

Proposed facility is beyond the Mexican coordination distance

Proposed station is OK toward AM broadcast stations

Start of Interference Analysis

Channel	Call	City/State	ARN
48	K48MP-D	CORVALLIS OR	USERRECORD01

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
33	K33AG	BEND OR	138.1	LIC	BLTTL	-19871223ID
40	DK40EG	TILLAMOOK OR	100.5	LIC	BLTT	-19960130JA
41	KBND-LP	BEND OR	138.0	LIC	BLTT	-20041025AEO
45	K45CV	CORVALLIS OR	0.1	LIC	BLTT	-19930604IG
47	K45CV	CORVALLIS OR	0.1	CP	BDISDTT	-20140507ADL
47	K47AV-D	COTTAGE GROVE OR	81.1	LIC	BLDTT	-20120229ABU
47	KUNP-LD	PORTLAND OR	114.1	LIC	BLDTL	-20120413ABM
47	K47LM-D	PRINEVILLE, ETC. OR	159.4	LIC	BLDTT	-20100511ACM
47	K47CD-D	ROCKAWAY BEACH OR	157.6	LIC	BLDTT	-20120525ACO
47	K47HT	ROSEBURG OR	148.7	LIC	BLTTL	-20030129ALF
48	K48GO-D	CAVE JUNCTION OR	256.1	LIC	BLDTL	-20110128ACT
48	K48KC-D	COTTAGE GROVE OR	81.1	LIC	BLDTT	-20090330AAO
48	K48GC-D	FLORENCE OR	107.7	LIC	BLDTL	-20120612AAX
48	K48DZ-D	HERMISTON OR	330.3	LIC	BLDTL	-20110817AAL
48	K48HV-D	KLAMATH FALLS OR	288.2	LIC	BLDTL	-20100928AAC
48	KFBI-LD	MEDFORD OR	245.9	LIC	BLDTL	-20091016ABK
48	KOPB-TV	PORTLAND OR	111.4	LIC	BLEDT	-20121120ACJ
48	K48MA-D	RAINIER OR	184.4	LIC	BLDTT	-20110825AAY
48	NEW	ROSEBURG OR	148.7	APP	BNPDTL	-20091014AFE
48	DK48BY	QUINCY WA	397.0	APP	BDFCDTT	-20120216ADZ
48	DK48BY	QUINCY WA	397.0	APP	BSTA	-20140929ASW
48	KING-TV	SEATTLE WA	350.7	LIC	BLCDDT	-19981026KE
48	NEW	YAKIMA WA	305.2	APP	BNPDTL	-20090825BIN
49	K49KT-D	BEND OR	161.3	LIC	BLDTL	-20101004AAQ
49	K49DM-D	COOS BAY OR	164.0	LIC	BLDTL	-20090226AAO
49	KAMK-LD	EUGENE OR	57.2	LIC	BLDTL	-20120126AFX
49	KWVT-LD	SALEM OR	114.3	LIC	BLDTL	-20110208ADU

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Study of this proposal found the following interference problem(s):

The following station failed the de minimis interference criteria.

48D OR CORVALLIS USERRECORD01
ERP 10.00 kW HAAT 310.0 m RCAMSL 444.0 m
Antenna usr USRPAT01

Due to interference to the following station and scenario: 1
47D OR CORVALLIS BDISDTT 20140507ADL
ERP 5.00 kW HAAT 464.0 m RCAMSL 464.0 m
Antenna CDB 00000000118489

Percent new interference from proposal: 34.3154 to BDISDTT 20140507ADL

Interference study results for licensed facility

Summary Study

Percent allowed new interference: 0.500
Percent allowed new interference to non Class A LPTV: 2.000
Census data selected 2000
Data Base Selected
./data_files/pt_tvdb.sff
TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 07-21-2015 Time: 12:24:20

Record Selected for Analysis

K48MP-D BLDTT -20111031ADB CORVALLIS OR US
Channel 48 ERP 5.5 kW HAAT 448 m RCAMSL 00448 m STRINGENT MASK
Latitude 044-30-18 Longitude 0122-57-32
Status LIC Zone Border Site number: 01
Dir Antenna Make CDB Model 00000000098641 Beam tilt N Ref Azimuth 0.0
Last update 00000000 Cutoff date 00000000 Docket
Comments
Applicant SANDER OPERATING CO. III LLC D/B/A K

Cell Size for Service Analysis 1.0 km/side

Distance Increments for Longley-Rice Analysis 1.00 km

Not full service station
Service Class = LD
Maximum height/power limits not checked

Site number	1		
Azimuth	ERP	HAAT	51.0 dBu F(50,90)
(Deg)	(kW)	(m)	(km)
0.0	4.839	359.4	52.4
45.0	4.391	341.0	51.0
90.0	5.347	314.8	50.7
135.0	0.755	124.8	29.7
180.0	0.017	257.8	17.7
225.0	0.755	362.4	41.9
270.0	5.347	372.6	53.5
315.0	4.386	375.0	52.6

Database HAAT does not agree with computed HAAT
Database HAAT: 448 Computed HAAT: 313

Contour Overlap to Proposed Station

Contour Overlap Evaluation to Proposed Station Complete

NO LANDMOBILE SPACING VIOLATIONS FOUND

Checks to Site Number 01

Proposed facility OK to FCC Monitoring Stations

Proposed facility OK toward West Virginia quiet zone

Proposed facility OK toward Table Mountain

Proposed facility is beyond the Canadian coordination distance

Proposed facility is beyond the Mexican coordination distance

Proposed station is OK toward AM broadcast stations

Start of Interference Analysis

Channel	Proposed Station Call	City/State	ARN	
48	K48MP-D	CORVALLIS OR	BLDTT	20111031ADB

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
33	K33AG	BEND OR	138.0	LIC	BLTTL	-19871223ID
40	DK40EG	TILLAMOOK OR	100.6	LIC	BLTT	-19960130JA
41	KBND-LP	BEND OR	137.8	LIC	BLTT	-20041025AEO
45	K45CV	CORVALLIS OR	0.0	LIC	BLTT	-19930604IG
47	K45CV	CORVALLIS OR	0.0	CP	BDISDTT	-20140507ADL
47	K47AV-D	COTTAGE GROVE OR	81.1	LIC	BLDTT	-20120229ABU
47	KUNP-LD	PORTLAND OR	114.1	LIC	BLDTL	-20120413ABM
47	K47LM-D	PRINEVILLE, ETC. OR	159.2	LIC	BLDTT	-20100511ACM
47	K47CD-D	ROCKAWAY BEACH OR	157.7	LIC	BLDTT	-20120525ACO
47	K47HT	ROSEBURG OR	148.7	LIC	BLTTL	-20030129ALF
48	K48GO-D	CAVE JUNCTION OR	256.1	LIC	BLDTL	-20110128ACT
48	K48KC-D	COTTAGE GROVE OR	81.1	LIC	BLDTT	-20090330AAO
48	K48GC-D	FLORENCE OR	107.8	LIC	BLDTL	-20120612AAX
48	K48DZ-D	HERMISTON OR	330.2	LIC	BLDTL	-20110817AAL
48	K48HV-D	KLAMATH FALLS OR	288.1	LIC	BLDTL	-20100928AAC
48	KFBI-LD	MEDFORD OR	245.9	LIC	BLDTL	-20091016ABK
48	KOPB-TV	PORTLAND OR	111.4	LIC	BLEDT	-20121120ACJ
48	K48MA-D	RAINIER OR	184.5	LIC	BLDTT	-20110825AAY
48	NEW	ROSEBURG OR	148.7	APP	BNPDTL	-20091014AFE
48	DK48BY	QUINCY WA	396.9	APP	BSTA	-20140929ASW
48	DK48BY	QUINCY WA	396.9	APP	BDFCDTT	-20120216ADZ
48	KING-TV	SEATTLE WA	350.7	LIC	BLCDD	-19981026KE
48	NEW	YAKIMA WA	305.2	APP	BNPDTL	-20090825BIN
49	K49KT-D	BEND OR	161.2	LIC	BLDTL	-20101004AAQ
49	K49DM-D	COOS BAY OR	164.1	LIC	BLDTL	-20090226AAO
49	KAMK-LD	EUGENE OR	57.1	LIC	BLDTL	-20120126AFX
49	KWVT-LD	SALEM OR	114.3	LIC	BLDTL	-20110208ADU
49	K49MZ-D	CENTERVILLE WA	207.0	CP	BNPDTL	-20100513ADZ

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Study of this proposal found the following interference problem(s):

The following station failed the de minimis interference criteria.

48D OR CORVALLIS BLDTT 20111031ADB
ERP 5.50 kW HAAT 448.0 m RCAMSL 448.0 m
Antenna CDB 00000000098641

Due to interference to the following station and scenario: 1

47D OR CORVALLIS BDISDTT 20140507ADL
ERP 5.00 kW HAAT 464.0 m RCAMSL 464.0 m
Antenna CDB 00000000118489

Percent new interference from proposal: 48.6897 to BDISDTT 20140507ADL

II. RF Exposure Study

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

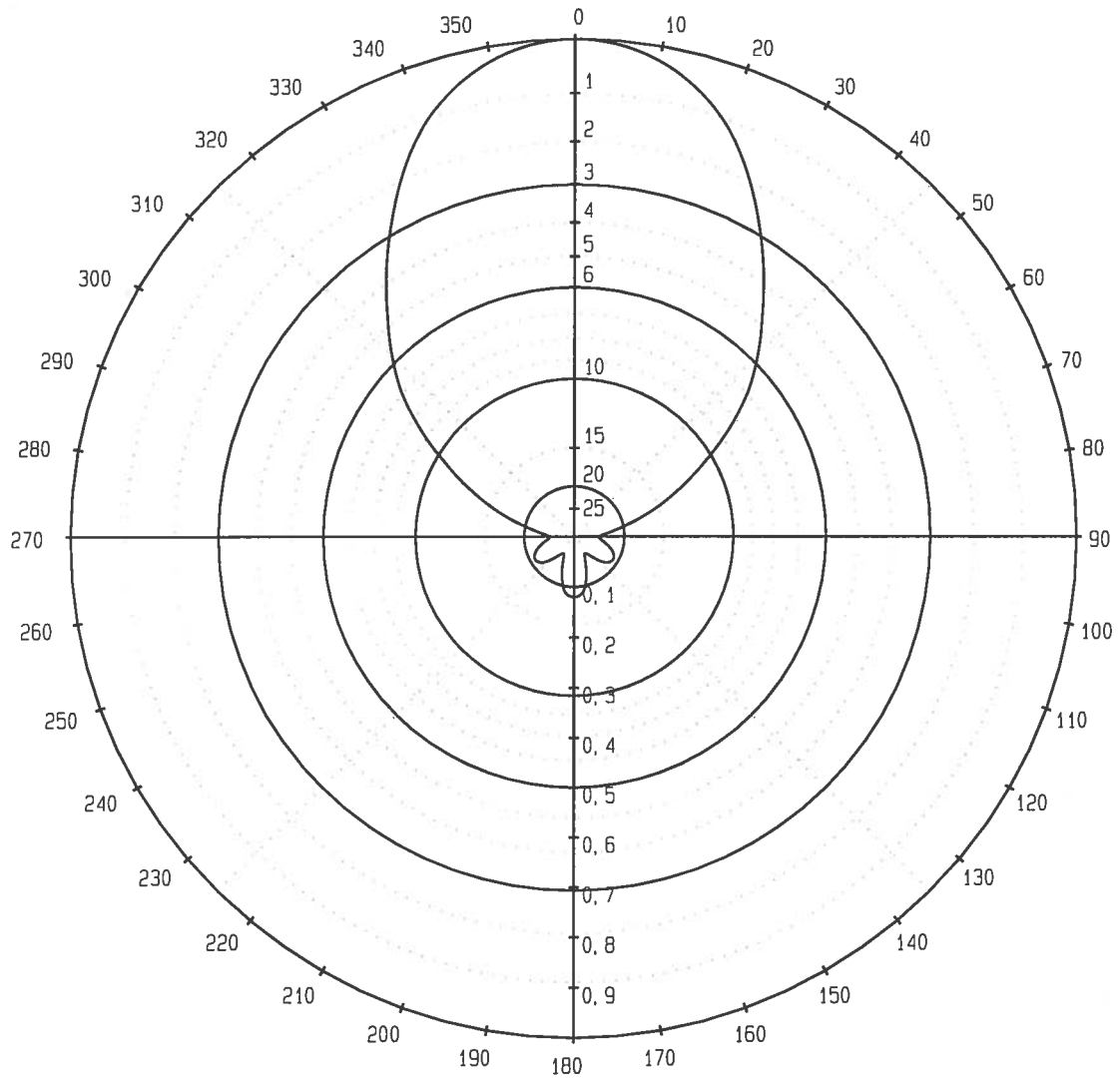
Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (27 meters below the antenna radiation center). The worst case power density levels occur at depression angles between 40 and 90 degrees below the horizontal. The calculations in this report assume a worst-case relative field value of 0.250 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized Kathrein K723417 panel antenna array proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 625 watts at depression angles between 40 and 90 degrees below the horizontal. Assuming this power and the shortest distance between the antenna radiation center and 2 meters above ground level (i.e. straight down), the highest calculated power density from the proposed antenna alone occurs at the base of the antenna support structure. At this point the power density is calculated to be 28.6 $\mu W/cm^2$, which is 6.4% of 449 $\mu W/cm^2$ (the FCC maximum at the Channel 48 frequency for uncontrolled environments).

Pursuant to OET Bulletin No. 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced on the antenna tower, including reduction in power or discontinuance of operation before any maintenance work is undertaken. The permittee/licensee in coordination with other users of the site must reduce power or cease

operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.

July 22, 2015

Erik C. Swanson, P.E.



frequency in MHz 675.250
down-tilt in .0
max / mean in dB 7.15

Hammett & Edison

S C A L A Medford Oregon MB 20.7.15 15:54	3 x 1 K723147 Panel Array Channel-48	Typ Nr.
		Bl.:

simulation with typical exactness of +/- 8% of max signal

Azimuth Radiation Pattern in % and dB at downtilt: .0

f = 675.250MHz

azimuth	%	dB	azimuth	%	dB
0	100.0	.0	180	12.0	-18.4
5	99.3	-.1	185	11.8	-18.6
10	97.0	-.3	190	11.0	-19.2
15	93.3	-.6	195	9.1	-20.8
20	88.0	-1.1	200	7.0	-23.1
25	80.9	-1.8	205	5.2	-25.7
30	73.0	-2.7	210	4.0	-28.0
35	65.4	-3.7	215	4.1	-27.7
40	58.0	-4.7	220	5.0	-26.0
45	51.5	-5.8	225	6.5	-23.7
50	45.0	-6.9	230	8.0	-21.9
55	37.4	-8.5	235	8.7	-21.2
60	30.0	-10.5	240	9.0	-20.9
65	23.6	-12.5	245	8.7	-21.2
70	18.0	-14.9	250	8.0	-21.9
75	13.0	-17.7	255	7.0	-23.1
80	9.0	-20.9	260	6.0	-24.4
85	6.4	-23.9	265	5.1	-25.8
90	5.0	-26.0	270	5.0	-26.0
95	5.1	-25.8	275	6.4	-23.9
100	6.0	-24.4	280	9.0	-20.9
105	7.0	-23.1	285	13.0	-17.7
110	8.0	-21.9	290	18.0	-14.9
115	8.7	-21.2	295	23.6	-12.5
120	9.0	-20.9	300	30.0	-10.5
125	8.7	-21.2	305	37.4	-8.5
130	8.0	-21.9	310	45.0	-6.9
135	6.5	-23.7	315	51.5	-5.8
140	5.0	-26.0	320	58.0	-4.7
145	4.1	-27.7	325	65.4	-3.7
150	4.0	-28.0	330	73.0	-2.7
155	5.2	-25.7	335	80.9	-1.8
160	7.0	-23.1	340	88.0	-1.1
165	9.1	-20.8	345	93.2	-.6
170	11.0	-19.2	350	97.0	-.3
175	11.8	-18.6	355	99.3	-.1
180	12.0	-18.4	360	100.0	.0

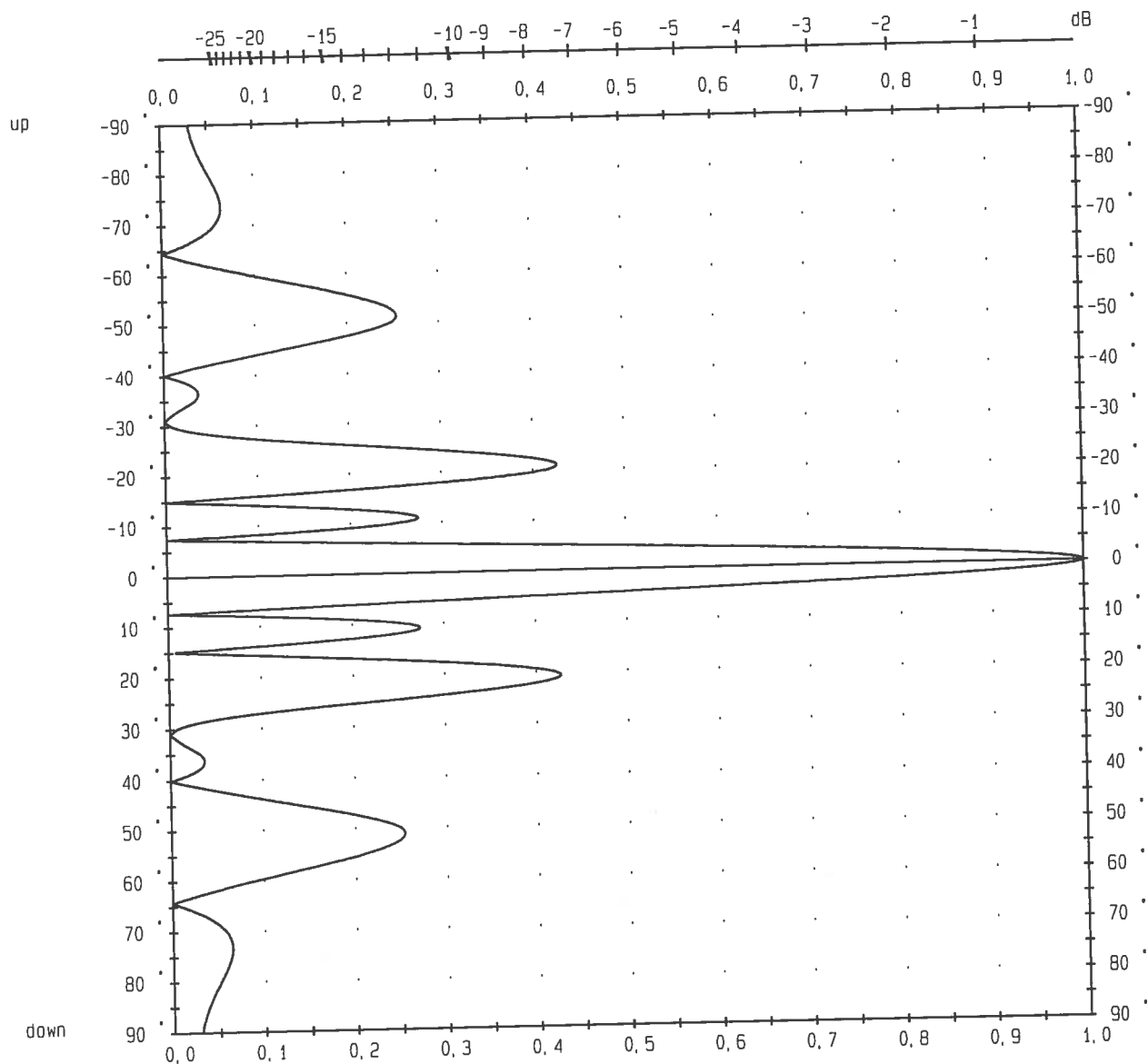
maximum fieldstrength was found at:

azimuth 0.

downtilt 0.

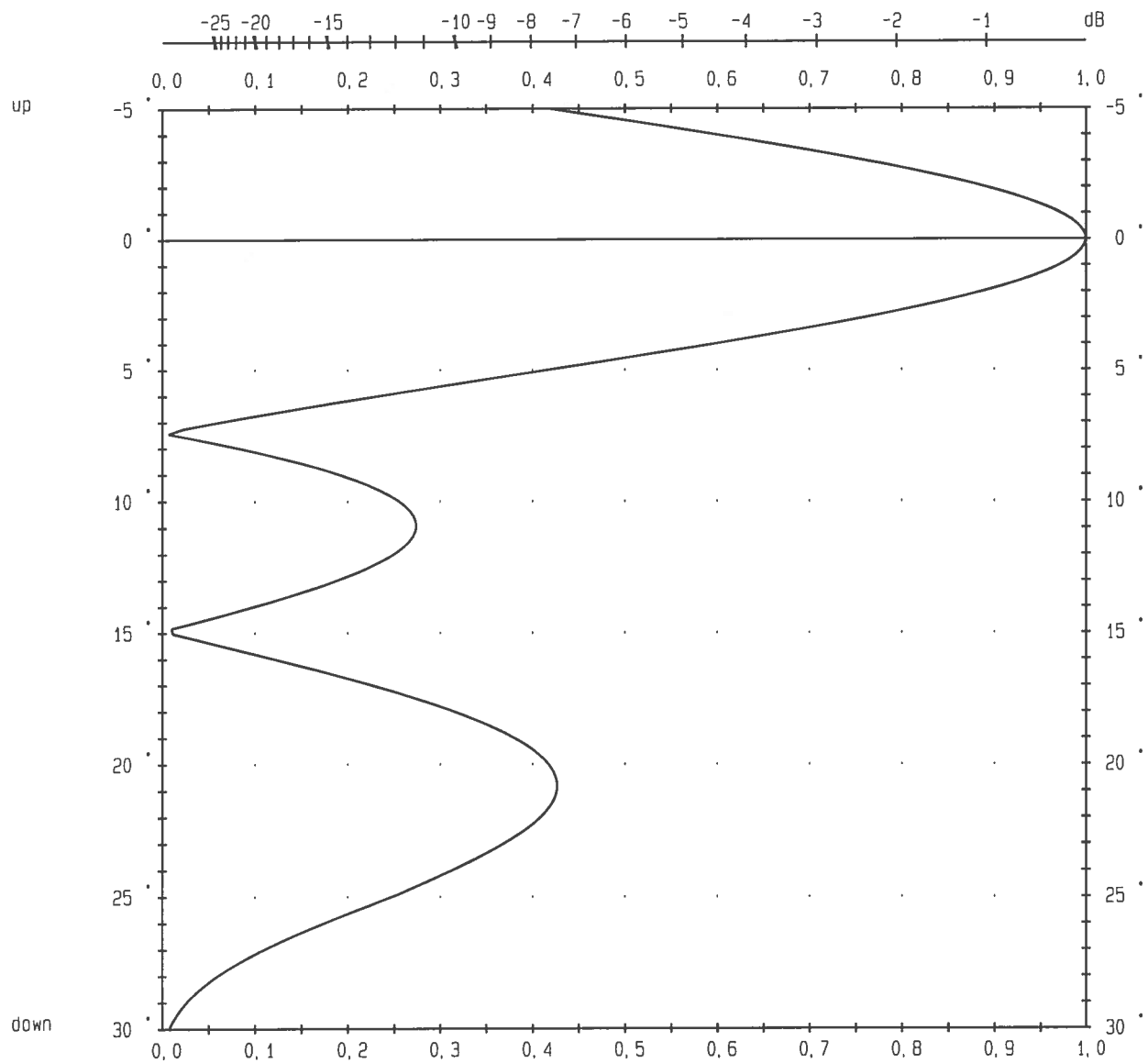
Hammett & Edison

S C A L A Medford Oregon	3 x 1 K723147 Panel Array Channel-48	Typ Nr.
		81.:
MB 20.7.15 15:54		



Hammett & Edison

SCALA Medford Oregon MB 20.7.15 15:54	3 x 1 K723147 Panel Array Channel-48	Typ Nr.
		Bl.:



frequency in MHz 675.250
 azimuth in ° .0
 omni-dir in dBd

Hammett & Edison

SCALA Medford Oregon	3 x 1 K723147 Panel Array	Typ Nr.
MB 20.7.15 15.56	Channel-48	B1..

Dimensions and Feeding of Antenna System

antenna type: t. panel o 4 dipole panel 470-860 MHZ

operating f in MHz : 675.250 .000 .000 .000 .000
operating channels : 48 0 0 0 0
database f in MHz : 470
max. azimuth angle 180 max. declination 90 cable design frequency: 675.250 MHz
compensation in % : .00 .00 .00 .00 .00

bay height v-feed power|cab-ph|fix-ph panel|azipos|azidir| radius| tanoff | radoff | tilt| power|cab-ph|fix-ph
3 2300 1.0| 0| 0 1| .0| .0| 165.0| .0| .0| .0| 1.0| 0| 0
bay height v-feed power|cab-ph|fix-ph panel|azipos|azidir| radius| tanoff | radoff | tilt| power|cab-ph|fix-ph
2 1150 1.0| 0| 0 1| .0| .0| 165.0| .0| .0| .0| 1.0| 0| 0
bay height v-feed power|cab-ph|fix-ph panel|azipos|azidir| radius| tanoff | radoff | tilt| power|cab-ph|fix-ph
1 0 1.0| 0| 0 1| .0| .0| 165.0| .0| .0| .0| 1.0| 0| 0

Directivity from HRP and zoomed VRP

operating f in MHz : 675.250 .000 .000 .000 .000
operating channel : 48 0 0 0 0
HRP max/mean in dB : 7.15 .00 .00 .00 .00
VRP omnidir in dB : 8.26 .00 .00 .00 .00
directivity in dB : 15.41 .00 .00 .00 .00
harness losses : .00 .00 .00 .00 .00
gain in dB : 15.41 .00 .00 .00 .00

allow +-0.5 dB tolerance for pattern variations

harness parameters at cable design frequency:

bay feeder : .0 m áAAα@L@ (a = .00 dB)
antenna cable: .0 m áAAα@L@ (a = .00 dB)

15.41 dBd
- 0.20 dB HARNESS LOSS
15.21 dBd PEAK ARRAY GAIN

Hammett & Edison

SCALA Medford Oregon	3 x 1 K723147 Panel Array	Typ Nr.
MB 20.7.15 15:54	Channel-48	81.: