

TECHNICAL EXHIBIT  
APPLICATION FOR MODIFICATION OF  
DTV CONSTRUCTION PERMIT  
STATION WJWN-DT  
FACILITY ID: 58342  
SAN SEBASTIAN, PUERTO RICO

January 15, 2004

CH 39      700 KW      627 M

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SAN SEBASTIAN, PUERTO RICO  
CH 39 700 KW (MAX-DA) 627 M

Technical Narrative

This Technical Exhibit supports an application for modification of DTV construction permit (BMPCDT-20020423AAB) for the digital operation of station WJWN-DT at San Sebastian, Puerto Rico. Station WJWN-DT is currently authorized by construction permit (CP) to operate on channel 39 with a non-directional antenna effective radiated power (ERP) of 1000 kilowatts (kW) and an antenna height above average terrain (HAAT) of 324 meters. This application proposes to modify the WJWN-DT authorized construction permit by changing antenna sites, reducing the ERP, increasing the HAAT and by changing the directional antenna system. No other changes are proposed.

Station WJWN-DT proposes to operate on DTV channel 39 from a transmitter site located at N 18° 09' 00", W 66° 59' 00" (NAD 27). Specifically, it is proposed to reduce the maximum ERP to 700 kW and to side mount a Dielectric TFU-24DSB-M (C) directional antenna on an existing 93-meter tower. The FCC tower registration number is 1237284.

Figure 1 is data for the proposed Dielectric TFU-24DSB-M (C) directional antenna. A graph and tabulation of both the horizontal and vertical antenna patterns are included.

There are no known authorized full service AM stations within 5 kilometers (3 miles) of the WJWN-DT transmitter site. The following is a list of

authorized full service FM and TV stations within 16 kilometers (10 miles) of the proposed DTV site.

<u>Station</u>	<u>Channel</u>	<u>Bearing(°True)</u>	<u>Distance(km)</u>
WAEI-FM, Maricao, PR	241B	296	0.5
WEGM (FM), San German, PR	236B	131	0.2
WIVA-FM, Aguadilla, PR	262B	296	0.5
WNNV (FM), San German, PR	219A	217	11.3
WNOD (FM), Mayaguez, PR	231B	285	0.6
WRRH (FM), Hormigueros, PR	291A	172	0.8
WUKQ-FM, Mayaguez, PR	256B	286	0.6
WIPM-TV, Mayaguez, PR	3	0	0.0
WIPM-DT, Mayaguez, PR	35	0	0.0
WELU(DT), Aguadilla, PR	34	266	0.5
WNJX-TV, Mayaguez, PR	22	0	0.0
WNJX-DT, Mayaguez, PR	23	0	0.0
WOLE-TV, Aguadilla, PR	12	0	0.0
WOLE-DT, Aguadilla, PR	69	0	0.0
WORA-TV, Mayaguez, PR	5	279	0.6
WORA-DT, Mayaguez, PR	29	277	0.6

Although no adverse electromagnetic impact is expected, the applicant recognizes its responsibility to correct problems which are a result of its proposed DTV operation.

The proposed transmitter site is more than 2845 kilometers from the Canadian border. The proposed transmitter site is more than 2088 kilometers from the US/Mexican border area. The closest FCC monitoring station is at Santa Isabel, Puerto Rico, located 66 kilometers to the east. The proposed DTV site is outside the National Radio Quiet Zone (VA/WVA), the closest point being more than 2426 kilometers to the northwest. The closest point of the Table Mountain Radio Quiet Zone (CO) is more than 4393 kilometers to the northwest. The closest radio astronomy site operating on TV channel 37 is at Arecibo, Puerto Rico, located approximately 33 kilometers to the north. These separations are sufficient to not be a concern for coordination purposes, except with respect to the FCC monitoring station at Santa Isabel and the radio astronomy site at Arecibo. Therefore, both facilities will be notified of the proposal.

Figure 2 is a map showing the DTV predicted coverage contours. The map provides the predicted 41 dBu f(50,90) noise-limited contour and 48 dBu f(50,90) city grade contour. The extent of the contours has been calculated using the normal FCC prediction method. The San Sebastian city limits were derived from information contained in the 2000 U.S. Census for Puerto Rico. As shown, the 48 dBu contour encompasses the entire city limits of San Sebastian.

Figure 3 is a DTV channel 39 separation study toward other NTSC and DTV allotments based on a 32 kilometer “buffer”. Although the separation requirements are only applicable to new DTV allotments, they can be used as an indication of which stations have the potential of receiving interference from the proposed channel 39 DTV operation.

An interference analysis has been conducted using the procedures outlined in the FCC’s OET-69 bulletin, which demonstrates that the proposal complies with the interference protection provisions of Section 73.623(c)(2).<sup>1</sup> Interference calculations for the proposed WJWN-DT operation are summarized below with respect to all authorized NTSC, DTV, and Class A facilities.

Protected Station	Facility	Ch.	City	State	FCC Service Population	Proposed Interference Population	
WJPX	LIC	24	SAN JUAN	PR	--	None	--
WELU	APP	32	AGUADILLA	PR	--	None	--
WELU	LIC	32	AGUADILLA	PR	--	None	--
WDWL	LIC	36	BAYAMON	PR	--	None	--
WCVI-TV	LIC	39	CHRISTIANSTED	VI	--	None	--
WCVI-TV	CP	39	CHRISTIANSTED	VI	--	None	--
WMTJ	LIC	40	FAJARDO	PR	--	None	--
WIRS	LIC	42	YAUCO	PR	3,704,811	7454	0.20
WIDP	LIC	46	GUAYAMA	PR	--	None	--

<sup>1</sup> The du Treil, Lundin & Rackley, Inc. DTV interference analysis program is based on the program and procedures outlined by the FCC in the Sixth Report and Order; subsequent Memorandum Opinion and Order; and FCC OET Bulletin No. 69. A nominal grid size resolution of 2 km was employed. An Alpha based processor computer system was employed. The results have been found to be in very close agreement with the results of the FCC implementation of OET Bulletin No. 69.

From the above, it is apparent that the proposed WJWN-DT operation on channel 39 complies with the FCC's 2%/10% interference standard towards all authorized analog and DTV assignments with the exception of the licensed WJWN-TV NTSC operation on channel 38 at San Sebastian (BMLCT-20030516ACI). However, the applicant, as owner of WJWN-TV's NTSC operation, agrees to accept any interference that occurs. Furthermore, WJWN-TV will also be filing an application for construction permit to co-locate its NTSC operation with the proposed WJWN-TV DTV which will eliminate the interference.

The proposed facility has been evaluated in terms of potential radiofrequency electromagnetic field exposure at ground level in accordance with OET Bulletin No. 65, Evaluating Compliance with FCC Specified Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields<sup>2</sup>. The power density at the base of the tower was calculated using the appropriate procedures contained in the Bulletin.

The proposed WJWN-DT antenna will be side-mounted on the existing tower. The antenna center of radiation is located 52 meters above ground level. The calculated power density at 2 meters above ground level (AGL) was calculated using the appropriate equation contained in the Bulletin. The vertical relative field pattern and tabulation for the proposed antenna are shown in Figure 1. The maximum vertical relative field value towards the tower base (-60 to -90 elevation) is less than 0.15. Therefore, using a "worst-case" vertical relative field value of 0.15, the calculated power density at 2 meters above the ground is 0.2105 milliwatts per square centimeter (mW/cm<sup>2</sup>), which is 50% of the Commission's recommended limit of 0.42 mW/cm<sup>2</sup> for channel 39, applicable to uncontrolled exposure areas. Therefore, it appears that the proposed WJWN-TV facility will comply with the FCC's RF emission rules. However, as this is a multi-user site shared, upon completion of construction, measurements will be taken to ensure that the proposed site is in compliance with the FCC's RF emission rules.

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<sup>2</sup> OET Bulletin 65, Second Edition 97-01, August, 1997.

Access to the transmitting site will be restricted and appropriately marked with warning signs. Furthermore, as this is a multi-user site, an agreement will be in effect with the other stations in the event that workers or other authorized personnel enter the restricted area or climb the tower to ensure that appropriate measures will be taken to assure worker safety with respect to radio frequency radiation exposure. Such measures include reducing the average exposure by spreading out the work over a longer period of time, wearing "accepted" RFR protective clothing or scheduling work when the stations are at reduced power or shut down.

It is noted that this technical exhibit only addresses the potential for radiofrequency electromagnetic field exposure. All other aspects of the environmental processing analysis will be provided to the FCC by the tower owner as part of the tower registration process.

If there are questions concerning the technical portion of this application, please contact the office of the undersigned.

W. Jeffrey Reynolds

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(941)326-6000  
[JEFF@DLR.COM](mailto:JEFF@DLR.COM)

January 15, 2004

# Dielectric

Date

15 Jan 2004

Call Letters

Channel 39

Location

Customer

Antenna Type

TFU-24DSB-M (C)

## AZIMUTH PATTERN

RMS Gain at Main Lobe  
Calculated / Measured

1.90 (2.79 dB)

Calculated

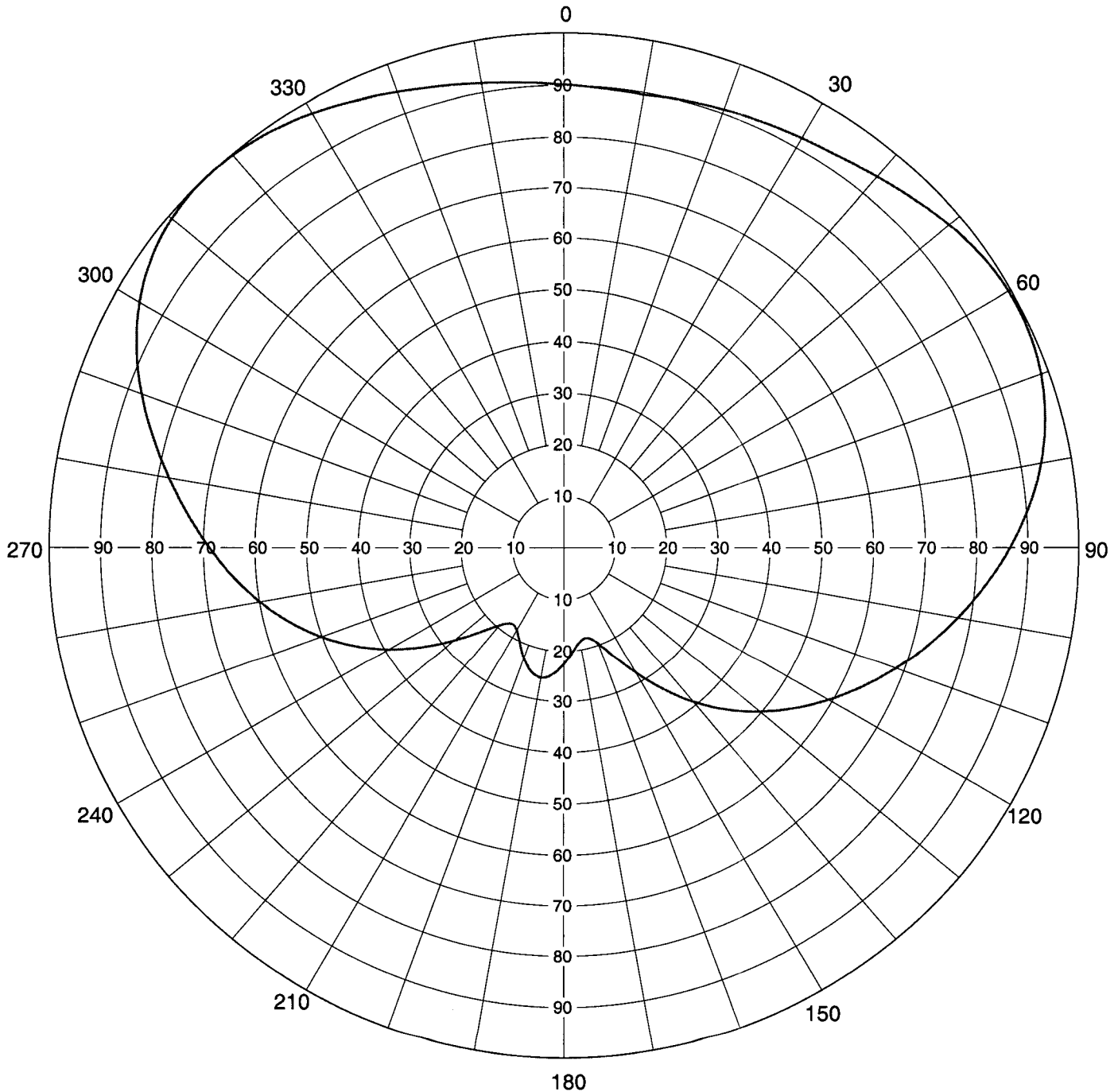
(°)

Frequency

623 MHz

Drawing #

DSB-M



Remarks:





Date **15 Jan 2004**  
 Call Letters Channel **39**  
 Location  
 Customer  
 Antenna Type **TFU-24DSB-M (C)**

### TABULATION OF AZIMUTH PATTERN

Azimuth Pattern Drawing # **DSB-M**

*		*		*		*		*		*		*		*	
Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
0	0.901	45	0.958	90	0.865	135	0.446	180	0.226	225	0.229	270	0.688	315	1.000
1	0.900	46	0.961	91	0.857	136	0.436	181	0.231	226	0.238	271	0.697	316	1.000
2	0.899	47	0.964	92	0.848	137	0.425	182	0.235	227	0.248	272	0.706	317	1.000
3	0.899	48	0.967	93	0.839	138	0.414	183	0.240	228	0.257	273	0.715	318	1.000
4	0.898	49	0.971	94	0.830	139	0.403	184	0.244	229	0.267	274	0.724	319	0.999
5	0.897	50	0.974	95	0.821	140	0.392	185	0.247	230	0.278	275	0.733	320	0.998
6	0.897	51	0.977	96	0.812	141	0.381	186	0.250	231	0.289	276	0.742	321	0.997
7	0.896	52	0.980	97	0.803	142	0.370	187	0.253	232	0.300	277	0.751	322	0.996
8	0.896	53	0.983	98	0.794	143	0.358	188	0.255	233	0.311	278	0.760	323	0.994
9	0.896	54	0.985	99	0.784	144	0.347	189	0.256	234	0.322	279	0.769	324	0.992
10	0.895	55	0.988	100	0.775	145	0.335	190	0.257	235	0.334	280	0.778	325	0.990
11	0.897	56	0.990	101	0.766	146	0.324	191	0.256	236	0.346	281	0.788	326	0.987
12	0.898	57	0.992	102	0.757	147	0.313	192	0.255	237	0.357	282	0.797	327	0.985
13	0.900	58	0.993	103	0.748	148	0.302	193	0.253	238	0.369	283	0.807	328	0.982
14	0.901	59	0.994	104	0.739	149	0.291	194	0.251	239	0.381	284	0.816	329	0.979
15	0.902	60	0.995	105	0.730	150	0.280	195	0.248	240	0.393	285	0.826	330	0.976
16	0.904	61	0.996	106	0.720	151	0.270	196	0.245	241	0.404	286	0.835	331	0.973
17	0.905	62	0.996	107	0.711	152	0.260	197	0.241	242	0.415	287	0.845	332	0.970
18	0.906	63	0.996	108	0.702	153	0.250	198	0.236	243	0.427	288	0.854	333	0.967
19	0.907	64	0.996	109	0.693	154	0.241	199	0.232	244	0.438	289	0.863	334	0.964
20	0.908	65	0.995	110	0.684	155	0.232	200	0.227	245	0.449	290	0.873	335	0.960
21	0.910	66	0.993	111	0.675	156	0.224	201	0.222	246	0.460	291	0.882	336	0.957
22	0.911	67	0.992	112	0.666	157	0.216	202	0.217	247	0.470	292	0.890	337	0.954
23	0.912	68	0.990	113	0.657	158	0.209	203	0.212	248	0.481	293	0.899	338	0.951
24	0.913	69	0.988	114	0.648	159	0.203	204	0.207	249	0.491	294	0.907	339	0.947
25	0.914	70	0.985	115	0.639	160	0.197	205	0.202	250	0.502	295	0.916	340	0.944
26	0.916	71	0.982	116	0.630	161	0.192	206	0.198	251	0.512	296	0.923	341	0.941
27	0.917	72	0.979	117	0.620	162	0.188	207	0.194	252	0.522	297	0.931	342	0.938
28	0.918	73	0.975	118	0.611	163	0.184	208	0.190	253	0.532	298	0.938	343	0.935
29	0.920	74	0.971	119	0.602	164	0.182	209	0.186	254	0.542	299	0.945	344	0.933
30	0.921	75	0.967	120	0.593	165	0.180	210	0.183	255	0.552	300	0.951	345	0.930
31	0.923	76	0.962	121	0.583	166	0.179	211	0.181	256	0.561	301	0.957	346	0.927
32	0.925	77	0.957	122	0.574	167	0.179	212	0.179	257	0.571	302	0.963	347	0.925
33	0.926	78	0.952	123	0.565	168	0.180	213	0.178	258	0.580	303	0.968	348	0.922
34	0.928	79	0.946	124	0.555	169	0.182	214	0.178	259	0.590	304	0.972	349	0.920
35	0.930	80	0.940	125	0.546	170	0.184	215	0.178	260	0.599	305	0.977	350	0.918
36	0.932	81	0.934	126	0.536	171	0.187	216	0.180	261	0.608	306	0.981	351	0.916
37	0.935	82	0.927	127	0.527	172	0.190	217	0.182	262	0.617	307	0.984	352	0.914
38	0.937	83	0.920	128	0.517	173	0.194	218	0.185	263	0.626	308	0.987	353	0.912
39	0.940	84	0.913	129	0.507	174	0.198	219	0.189	264	0.635	309	0.990	354	0.910
40	0.942	85	0.906	130	0.497	175	0.202	220	0.194	265	0.644	310	0.993	355	0.908
41	0.945	86	0.898	131	0.487	176	0.207	221	0.200	266	0.653	311	0.995	356	0.907
42	0.948	87	0.890	132	0.477	177	0.211	222	0.206	267	0.662	312	0.996	357	0.905
43	0.951	88	0.882	133	0.467	178	0.216	223	0.214	268	0.671	313	0.998	358	0.904
44	0.954	89	0.874	134	0.457	179	0.221	224	0.221	269	0.680	314	0.999	359	0.903

Remarks: \* - Degrees True

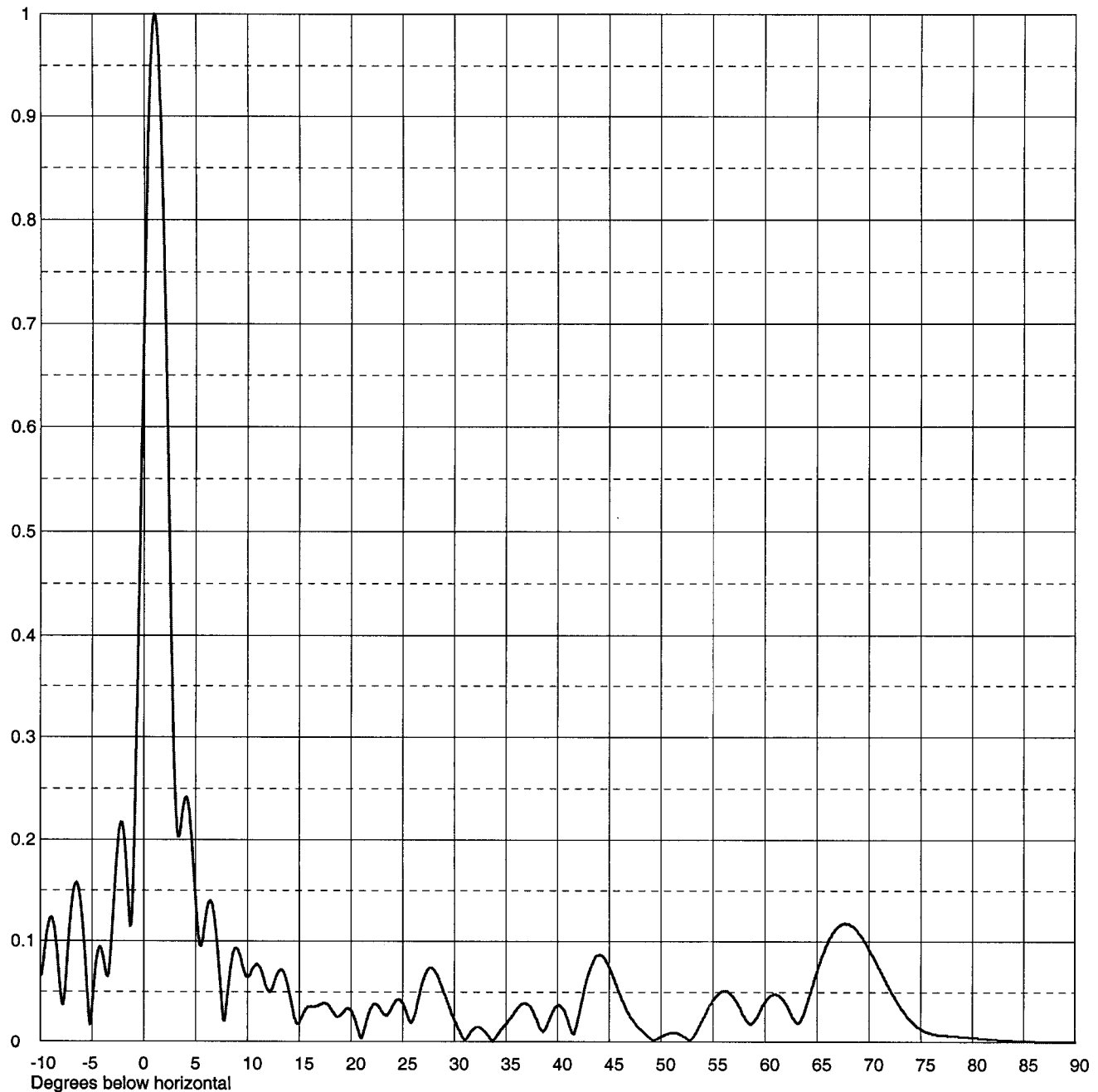
# Dielectric

Date **15 Jan 2004**  
 Call Letters  
 Location  
 Customer  
 Antenna Type **TFU-24DSB-M (C)**

Channel **39**

## ELEVATION PATTERN

RMS Gain at Main Lobe	<b>24.0 (13.80 dB)</b>	Beam Tilt	<b>1.00 Degrees</b>
RMS Gain at Horizontal	<b>11.9 (10.76 dB)</b>	Frequency	<b>623.00 MHz</b>
Calculated / Measured	<b>Calculated</b>	Drawing #	<b>24B240100-90</b>



Remarks:



Date **15 Jan 2004**  
 Call Letters Channel **39**  
 Location  
 Customer  
 Antenna Type **TFU-24DSB-M (C)**

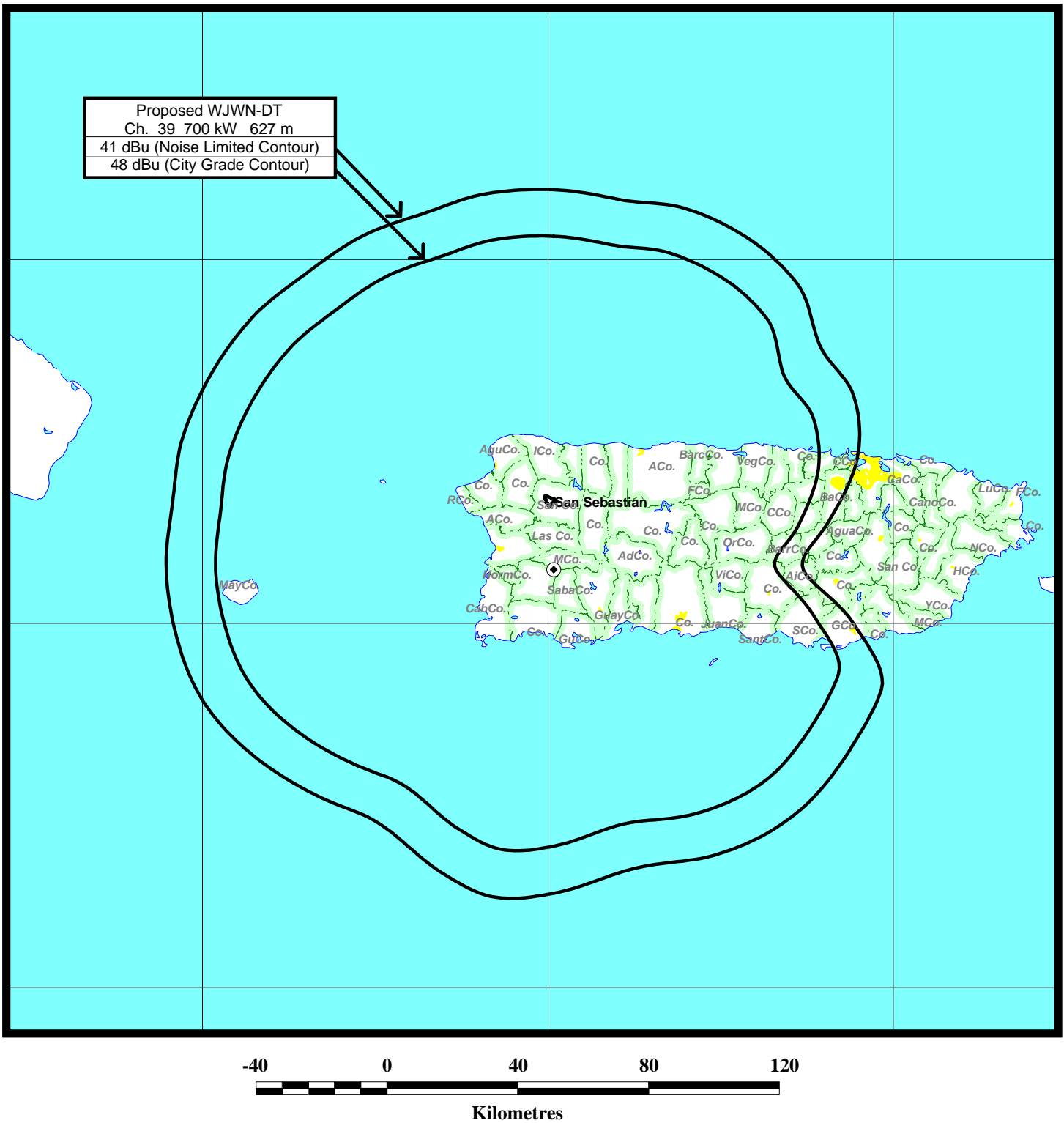
### TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing # **24B240100-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.063	2.4	0.524	10.6	0.075	30.5	0.012	51.0	0.010	71.5	0.063
-9.5	0.099	2.6	0.420	10.8	0.077	31.0	0.002	51.5	0.010	72.0	0.053
-9.0	0.123	2.8	0.327	11.0	0.077	31.5	0.009	52.0	0.008	72.5	0.044
-8.5	0.101	3.0	0.254	11.5	0.066	32.0	0.015	52.5	0.004	73.0	0.036
-8.0	0.045	3.2	0.211	12.0	0.051	32.5	0.016	53.0	0.004	73.5	0.029
-7.5	0.069	3.4	0.203	12.5	0.057	33.0	0.011	53.5	0.013	74.0	0.023
-7.0	0.134	3.6	0.215	13.0	0.070	33.5	0.003	54.0	0.023	74.5	0.018
-6.5	0.158	3.8	0.231	13.5	0.069	34.0	0.005	54.5	0.033	75.0	0.014
-6.0	0.127	4.0	0.241	14.0	0.051	34.5	0.013	55.0	0.042	75.5	0.011
-5.5	0.056	4.2	0.240	14.5	0.026	35.0	0.019	55.5	0.048	76.0	0.010
-5.0	0.035	4.4	0.227	15.0	0.020	35.5	0.025	56.0	0.051	76.5	0.009
-4.5	0.087	4.6	0.203	15.5	0.031	36.0	0.032	56.5	0.050	77.0	0.008
-4.0	0.088	4.8	0.173	16.0	0.035	36.5	0.038	57.0	0.045	77.5	0.008
-3.5	0.065	5.0	0.141	16.5	0.035	37.0	0.038	57.5	0.036	78.0	0.007
-3.0	0.122	5.2	0.112	17.0	0.037	37.5	0.033	58.0	0.027	78.5	0.007
-2.8	0.156	5.4	0.096	17.5	0.039	38.0	0.023	58.5	0.020	79.0	0.006
-2.6	0.186	5.6	0.098	18.0	0.034	38.5	0.012	59.0	0.022	79.5	0.006
-2.4	0.208	5.8	0.111	18.5	0.027	39.0	0.018	59.5	0.031	80.0	0.005
-2.2	0.217	6.0	0.126	19.0	0.028	39.5	0.030	60.0	0.040	80.5	0.005
-2.0	0.212	6.2	0.137	19.5	0.033	40.0	0.037	60.5	0.046	81.0	0.004
-1.8	0.192	6.4	0.140	20.0	0.032	40.5	0.034	61.0	0.048	81.5	0.003
-1.6	0.159	6.6	0.136	20.5	0.019	41.0	0.023	61.5	0.045	82.0	0.003
-1.4	0.124	6.8	0.124	21.0	0.004	41.5	0.009	62.0	0.039	82.5	0.002
-1.2	0.117	7.0	0.105	21.5	0.022	42.0	0.025	62.5	0.029	83.0	0.002
-1.0	0.169	7.2	0.081	22.0	0.035	42.5	0.048	63.0	0.021	83.5	0.002
-0.8	0.259	7.4	0.055	22.5	0.037	43.0	0.068	63.5	0.024	84.0	0.001
-0.6	0.366	7.6	0.030	23.0	0.031	43.5	0.082	64.0	0.037	84.5	0.001
-0.4	0.481	7.8	0.022	23.5	0.028	44.0	0.087	64.5	0.054	85.0	0.001
-0.2	0.595	8.0	0.040	24.0	0.036	44.5	0.084	65.0	0.070	85.5	0.001
0.0	0.704	8.2	0.060	24.5	0.042	45.0	0.075	65.5	0.086	86.0	0.001
0.2	0.802	8.4	0.077	25.0	0.039	45.5	0.062	66.0	0.098	86.5	0.000
0.4	0.884	8.6	0.088	25.5	0.026	46.0	0.049	66.5	0.108	87.0	0.000
0.6	0.946	8.8	0.093	26.0	0.023	46.5	0.037	67.0	0.114	87.5	0.000
0.8	0.985	9.0	0.093	26.5	0.042	47.0	0.027	67.5	0.117	88.0	0.000
1.0	1.000	9.2	0.088	27.0	0.062	47.5	0.020	68.0	0.117	88.5	0.000
1.2	0.990	9.4	0.081	27.5	0.073	48.0	0.014	68.5	0.114	89.0	0.000
1.4	0.956	9.6	0.073	28.0	0.072	48.5	0.009	69.0	0.108	89.5	0.000
1.6	0.899	9.8	0.067	28.5	0.063	49.0	0.004	69.5	0.101	90.0	0.000
1.8	0.823	10.0	0.065	29.0	0.049	49.5	0.003	70.0	0.092		
2.0	0.731	10.2	0.066	29.5	0.036	50.0	0.006	70.5	0.083		
2.2	0.630	10.4	0.071	30.0	0.023	50.5	0.009	71.0	0.073		

Remarks:

Figure 2



## PREDICTED COVERAGE CONTOURS

DTV STATION WJWN-DT  
SAN SEBASTIAN, PUERTO RICO  
CH 39 700 kW (MAX-DA) 627 m

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

Figure 3

**CDBS TV/DTV SEPARATION STUDY**

Job Title: Proposed WJWN-DT, San Sebastian, PR  
 Channel: 39  
 Class:  
 Type: DT

Separation Buffer: 32 km  
 Coordinates: 18-09-00 066-59-00  
 Zone: II

Call Id	City St	File Status	Num	Channel Zone	ERP HAAT	DA Id	Latitude Longitude	Bear	Dist. (km)	Req. min	max
WJPX 58340	SAN JUAN PR LIC C	BLCT 20000821AC	24(Z) II	676.000 582	D 34519	18-16-45 065-51-14	83.0	120.3 23.72	24.1 Clear	96.6	
WELU 26602	AGUADILLA PR LIC C	BLET 19870112KG	32(Z) II	9.330 296	N	18-18-46 067-11-09	310.3	28.0 3.89	24.1 Short	96.6	
WELU 26602	AGUADILLA PR APP C	BPET 20020502AA	32(Z) II	7.100 317	N 43365	18-18-46 067-11-09	310.3	28.0 3.89	24.1 Short	96.6	
WELU 26602	AGUADILLA PR APP C	BPET 19960628KR	32(Z) II	186.000 290	D 24098	18-18-46 067-11-09	310.3	28.0 3.89	24.1 Short	96.6	
WDWL 4110	BAYAMON PR LIC C	BLCT 19910322KF	36(Z) II	9.330 329	N	18-16-40 066-06-38	81.1	93.4 3.20	24.1 Short	96.6	
WJWN-T 58342	SAN SEBASTI PR LIC C	BMLCT 20030516AC	38(Z) II	85.100 332	D 64591	18-19-06 067-10-42					
WJWN-T 58342	SAN SEBASTI PR CP C	BMPCD 20020423AA	39( ) II	1000.000 324	N 43262	18-19-06 067-10-42					
DWJWNT	SAN SEBASTI PR DTV		39( ) II	50.100 332	D	18-19-06 067-10-42					
WCVI-T 83304	CHRISTIANST VI CP C	BPCT 20030508AA	39(Z) II	26.670 134	N 59234	17-44-53 064-43-40	100.3	243.1 1.55	244.6 Short	244.6	
WMTJ 2174	FAJARDO PR LIC C	BLET 19970826KH	40(Z) II	1000.000 839	D 18776	18-18-36 065-47-41	81.7	127.0 20.96	12.0 Clear	106.0	
WIRS 39887	YAUCO PR LIC C	BLCT 19920207KF	42(Z) II	1510.000 852	D 17277	18-10-10 066-34-36	87.1	43.1 18.98	24.1 Short	96.6	
WIDP 18410	GUAYAMA PR LIC C	BLCT 19970509KG	46(Z) II	1480.000 631	D 17487	18-16-44 065-51-10	83.0	120.4 23.84	24.1 Clear	96.6	