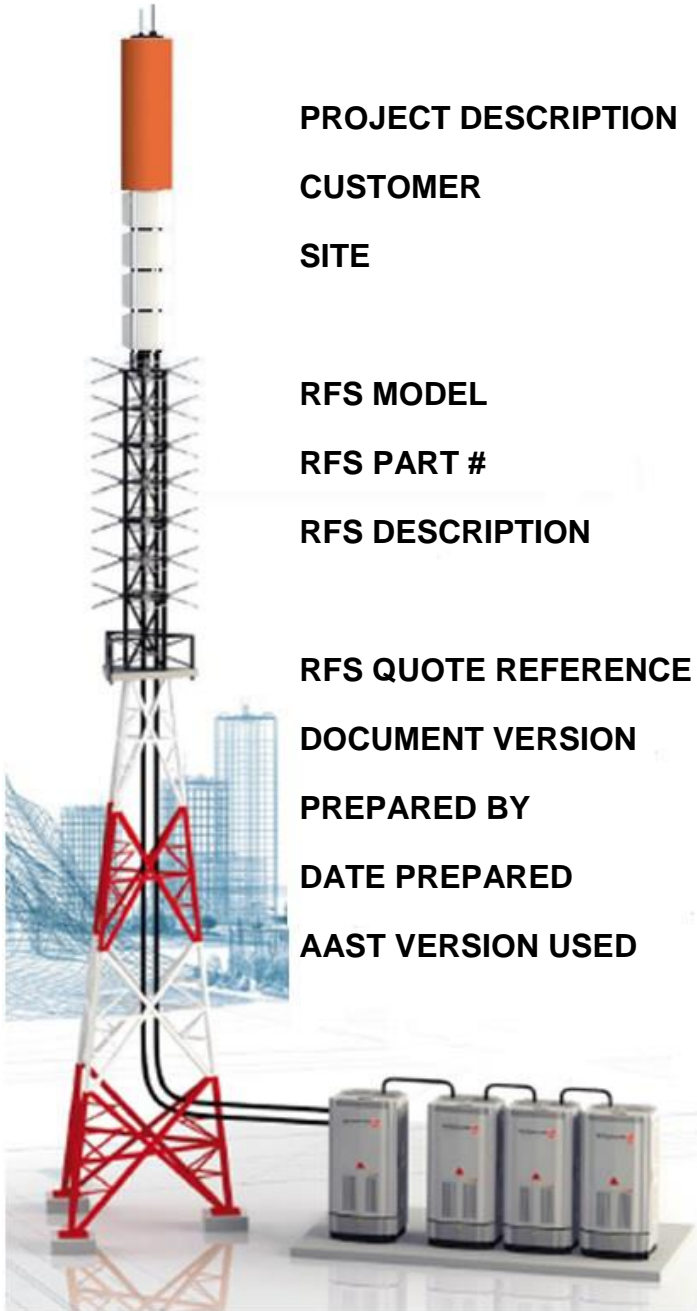


The new wave in broadcast solutions

Antennas



TECHNICAL PROPOSAL



PROJECT DESCRIPTION	TV Spectrum Repack
CUSTOMER	Station KAZD-DT
SITE	Lake Dallas, Texas
RFS MODEL	SBB-EPD-24C170
RFS PART #	05.70276.002
RFS DESCRIPTION	SBB-Epol Broadband Slot Antenna
RFS QUOTE REFERENCE	17007
DOCUMENT VERSION	3.1
PREPARED BY	Nick Wymant & David Zack
DATE PREPARED	July 23, 2018
AAST VERSION USED	1.0.13.0

TV & RADIO | IN-BUILDING | WIRELESS | IN-TUNNEL | HF & DEFENSE | MICROWAVE | MOBILE RADIO



A new wave in TV and Radio Solutions

Because no two networks are the same, Radio Frequency Systems is primed and ready to provide the widest possible range of options for you.

RFS broadcast antennas are recognized throughout the broadcast industry for their quality and broadband performance. As the only supplier who can offer end-to-end passive broadcast solutions, RFS provides RF systems from the output of the transmitter, to the antennas. This provides a single point of accountability with a fully integrated solution and a complete system warranty.

We offer a vast portfolio of premium performance antenna solutions for television, radio and HF.

Broadband panel arrays

With all polarization options available, RFS broadband panel arrays support Bands I, II (87.5-108MHz), III (174-240MHz), IV and V (470-860MHz). Each array can be tailored for specific coverage and power-handling capability.

Top mount antennas

We offer a range of lightweight and low profile antennas (including super turnstile slot, dipole, and collinear antennas) that support single or multi-channel services

Side mount antennas

Providing a range of polarization and power options, RFS' side mount antennas are an ideal alternative for television and radio applications where the tower cannot support a top mounted antenna.

New technologies

Whichever broadcast band is in use for fixed or mobile television or radio broadcast, we're fully conversant with all global broadcasting standards and emerging digital technologies, including: Television (analogue and digital) – DVB-T, DVB-T2, ATSC, ISDB-T, DMB-T/H, PAL, NTSC, etc. Radio (analogue and digital) – FM, DAB, DAB+, HD Radio, CDR, etc

HELIFLEX® – the original and still the best

Our world-renowned HELIFLEX® air-dielectric coaxial transmission line is installed easily and quickly, providing maximum strength and reliability.

HELIFLEX® is available in a wide range of sizes (3/8-inch to 9-inch diameter) and ensures a completely sealed feeder system, without the need for joining flanges or suspension hanger systems..

HELIFLEX®'s electrical performance is unsurpassed, delivering consistently low VSWR across the entire broadcast band, and low attenuation performance. It is also one of the few flexible feeder cables that can support the high-power requirements of multiple broadcast services.

> Why RFS

Product	Best-in-class technical performance	Future proof	Bespoke/ standard designs	Cyclone rated	Low wind load	Rugged construction
VHF TV Band I	✓		✓		✓	✓
VHF FM Radio Band II	✓	✓	✓	✓	✓	✓
VHF TV Band III	✓	✓	✓	✓	✓	✓
UHF Band IV/V	✓	✓	✓	✓	✓	✓

TV & RADIO | IN-BUILDING | WIRELESS | IN-TUNNEL | HF & DEFENSE | MICROWAVE | MOBILE RADIO



ANTENNA PROPOSAL-MODEL SBB-EPD-24C170

POWER DIVIDER NETWORK DATA

VSWR Tuner	Included
Cable Test Section	Not Included
Power Dividers	1 X 2 WAY POWER DIVIDER (PD61E2E41) 2 X 3 WAY POWER DIVIDER (PD41E3E31)
Branch feeder cables	HCA300-50J (26.25 ft /each.)



ANTENNA SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

Antenna Model	SBB-EPD-24C170
Frequency Range	470 - 700 MHz
Operating Channels	CH US 31 (575.00 MHz) CH US 39 (623.00 MHz)
Polarization	Elliptical
Number of Slots	24
Azimuth Pattern	Wide Cardioid-C170
Impedance	50 Ohm
VSWR	<1.15:1 (Return Loss > 23.1 dB)
Input Power Rating	1 x 60 kW Into full antenna system
Input Connector Size	1 x 6-1/8" EIA
Input Connector Location	Antenna Center (approx.)
Antenna Gain	Refer tables
Beam Tilt	0.75 degrees
Null Fill	Refer Elevation Pattern
Note: Beam tilt and Null fill can be modified, if required	

MECHANICAL SPECIFICATIONS

Antenna Mounting	Side Mount
Operating Temperature	-40°F to 104°F
Height (aperture) (H)	53.48 ft
Diameter (D)	1.25 ft
Center of Radiation (COR) above base	26.74 ft
Weight	2,095 lbs
Effective Projected Area (EPA=CaAa)	33 ft²

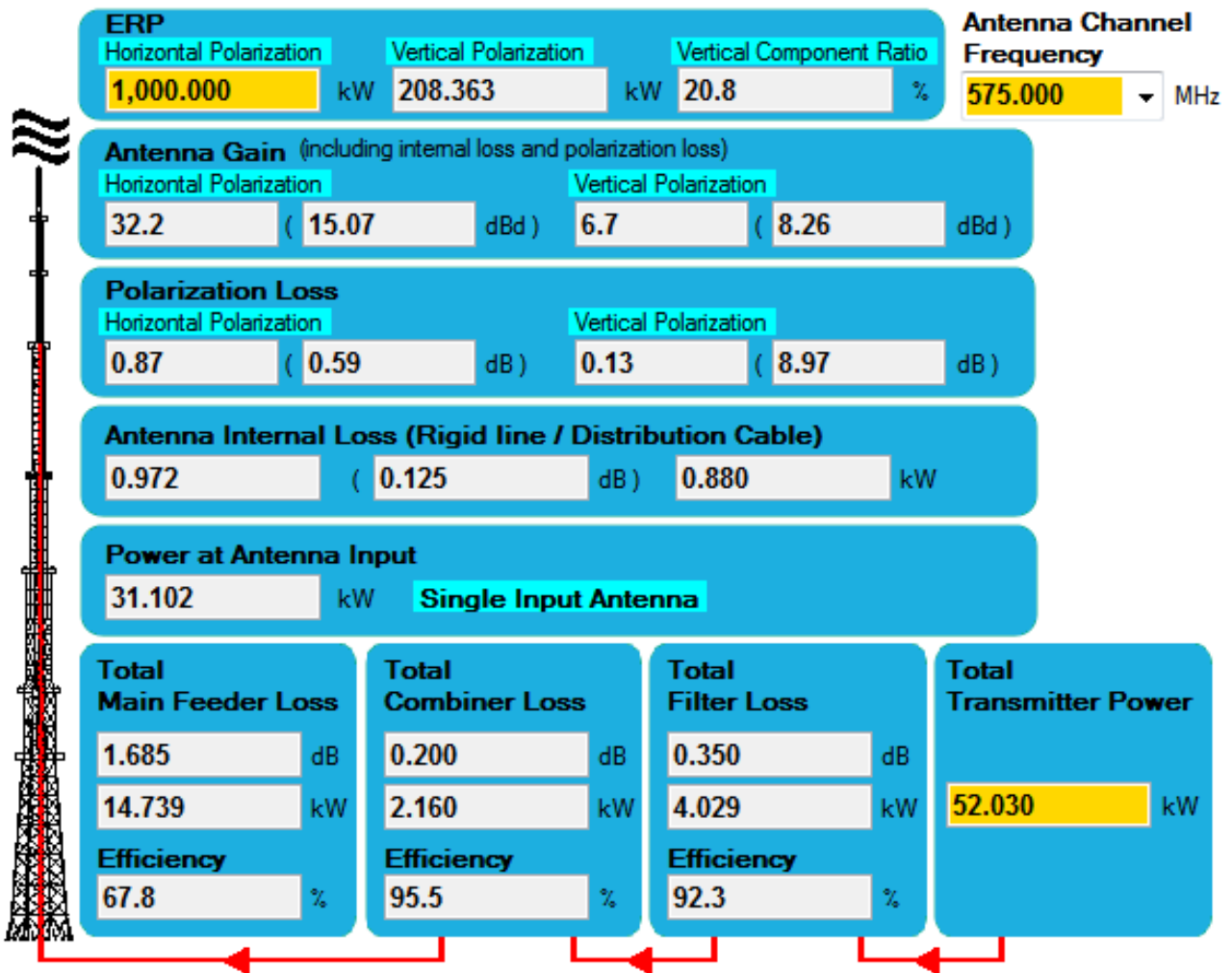
Note: Calculated weight and effective projected area (EPA) is based on preliminary antenna design and assumed site conditions. EPA is calculated using $Ca=0.6$ from ANSI/TIA-222-G, Table 2.8 based on supercritical flow. Contact a qualified structural consultant to confirm this applies to your installation. More accurate weight and EPA for the specific antenna design will be provided at the time of quotation. Site specific operating temperature (lowest monthly mean) will be considered for the antenna structural steel materials qualification in accordance with TIA-222-G standard.

Factory Test Data

Factory Tests	VSWR, Phasing, Pressurization, VRP (calc. from phasing). ISO 9001 Quality testing
---------------	---

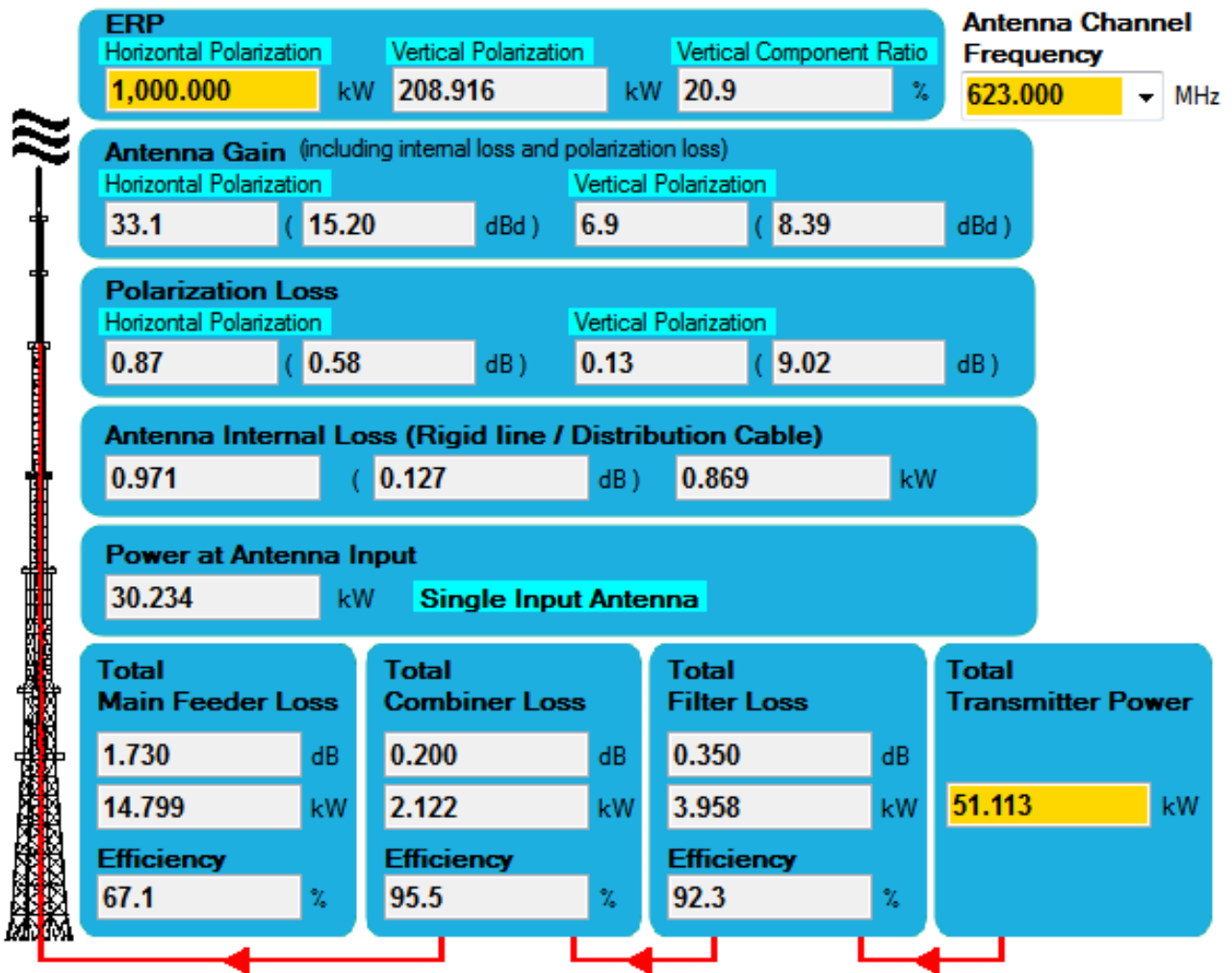
SYSTEM SUMMARY

ANTENNA MODEL: SBB-EPD-24C170



SYSTEM SUMMARY

ANTENNA MODEL: SBB-EPD-24C170





SYSTEM SUMMARY

ANTENNA MODEL: SBB-EPD-24C170

Antenna

Channel	US 31	US 39
Frequency (MHz)	575.00 MHz	623.00 MHz
ERP	Hpol: 1,000.00 kW (30.00 dBk) Vpol: 208.36 kW (23.19 dBk)	Hpol: 1,000.00 kW (30.00 dBk) Vpol: 208.92 kW (23.20 dBk)
Peak Directivity	Hpol: 37.9 (15.79 dBd) Vpol: 54.4 (17.35 dBd)	Hpol: 38.9 (15.90 dBd) Vpol: 56.8 (17.55 dBd)
Polarization Loss	Hpol: 0.87 (0.59 dB) Vpol: 0.13 (8.97 dB)	Hpol: 0.87 (0.58 dB) Vpol: 0.13 (9.02 dB)
Antenna Internal Loss	0.97 (0.12 dB)	0.97 (0.13 dB)
Antenna Gain	Hpol: 32.2 (15.07 dBd) Vpol: 6.7 (8.26 dBd)	Hpol: 33.1 (15.20 dBd) Vpol: 6.9 (8.39 dBd)
Power at Antenna Input	31.10 kW (14.93 dBk)	30.23 kW (14.80 dBk)

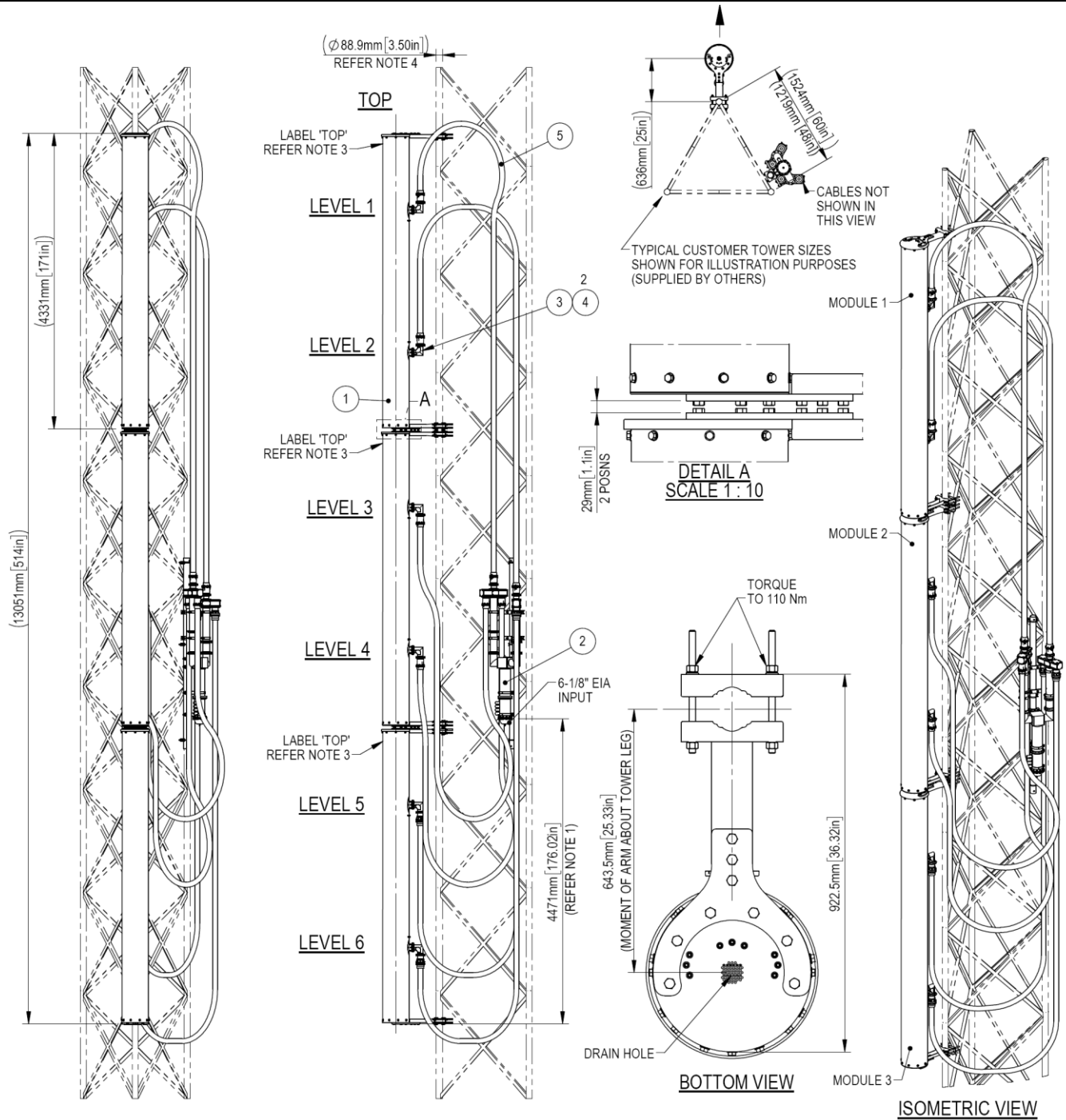
Transmission Line (Feeder upgrade is required)

Type	6 1/8" 50 Ohm Rigid Line	6 1/8" 50 Ohm Rigid Line
Impedance	50 ohm	50 ohm
Length	1,400.00 ft	1,400.00 ft
Attenuation	1.68 dB	1.73 dB
Efficiency	67.8 %	67.1 %

Transmitter

Filter Loss	0.92 (0.35 dB)	0.92 (0.35 dB)
Combiner Loss	0.95 (0.20 dB)	0.95 (0.20 dB)
Power Required	52.03 kW (17.16 dBk)	51.11 kW (17.09 dBk)

Note: CH39 is pre repack channel. CH31 is post repack channel. Both channels will not be operating simultaneously into the antenna.



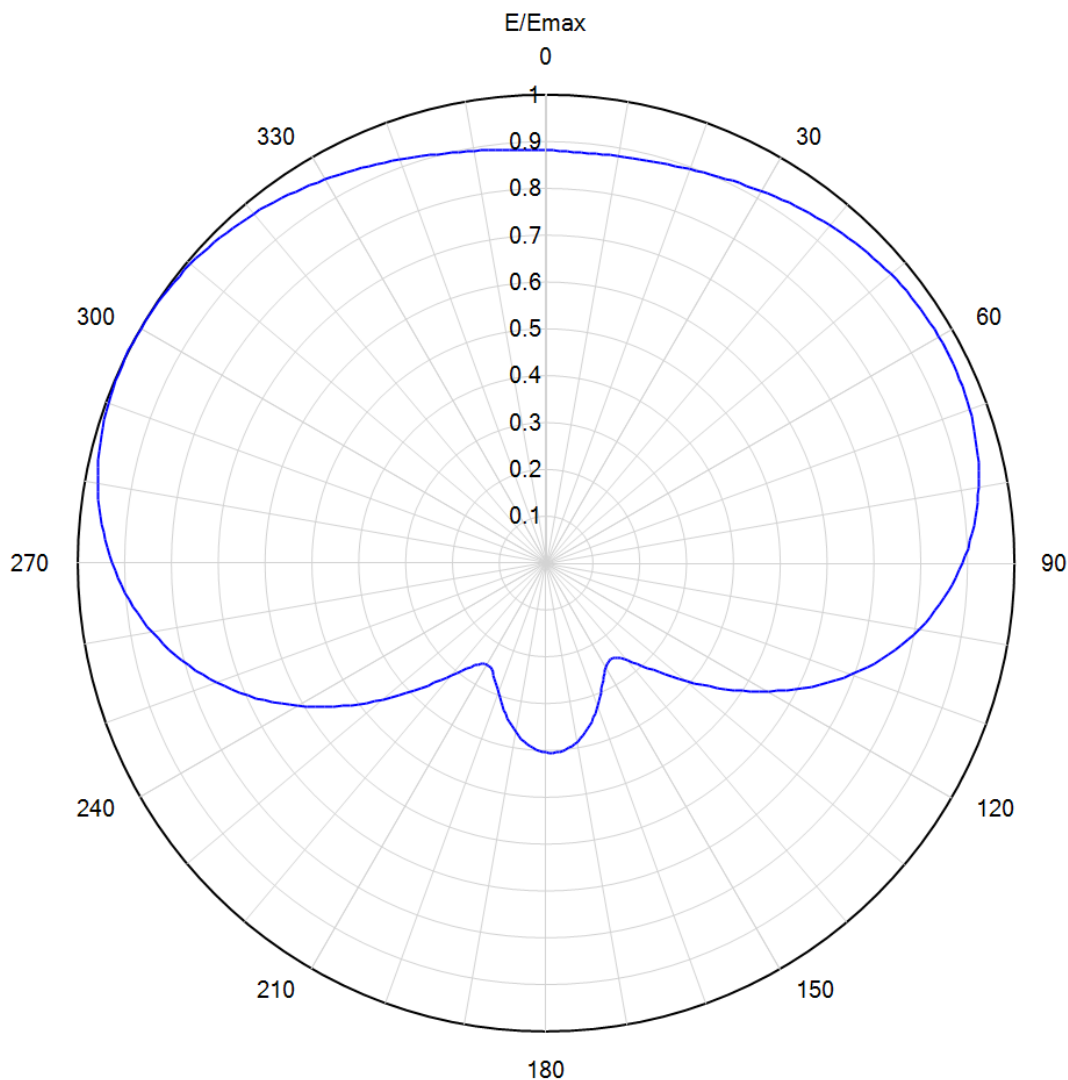
NOTES:

1. PD LOCATION SHOWN IN APPROXIMATE POSITION. TO BE DETERMINED BY CUSTOMER AND LIMITED BY CABLE LENGTH.
2. REFER SHEET 2 FOR SCHEMATIC, POWER DISTRIBUTION & PHASING DIAGRAM. DIAGRAMS ARE BEAM TILT SPECIFIC.
3. ENSURE CORRECT MODULE ORIENTATION, REFER TOP LABEL POSITION.
4. ANTENNA BRACKETS DESIGNED TO INTERFACE WITH 80-150 [3"-6"] NB POLES.
5. CABLE CLAMPS (ITEM 6) AND ANGLE ADAPTOR (ITEM 7) ARE SUPPLIED FOR CABLE SUPPORT. FOLLOW CABLE RECOMMENDATIONS FOR SUPPORT SPACING.

05.70276.002	SBB-EPD-24C170 0.75° BT ANTENNA	0.75°
RFS PART No.	DESCRIPTION	BEAM TILT (BT)



Azimuth Pattern



Model: SBB-EPD-24C170
Location: Lake Dallas, Texas
Customer: Station KAZD-DT
Date: July 22, 2018
Rotation Angle: 0 degrees

Polarization: Horizontal
Frequency: 575.00 MHz
Directivity: 1.7 (2.30 dB)
Elevation Angle: 0.75 degrees
Horizontal Unit Pattern:
File = SBB_EP_AZ_HP_Normal_585.pat

Note: Pattern Tolerance +/-5% of Emax



Model: **SBB-EPD-24C170**
Location: **Lake Dallas, Texas**
Customer: **Station KAZD-DT**
Date: **July 22, 2018**

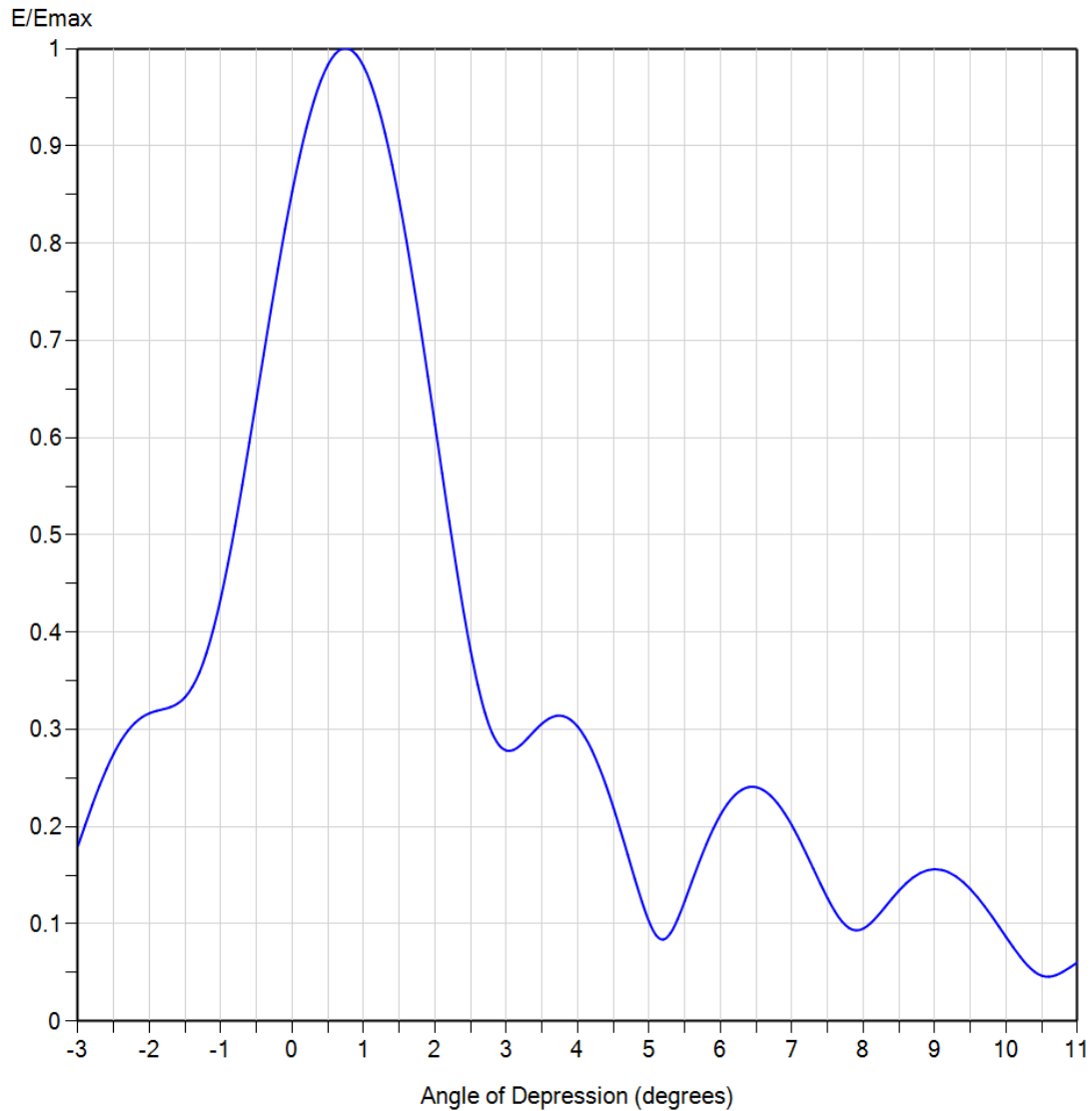
Polarization: **Horizontal**
Frequency (MHz): **575.00**
Directivity: **1.7 (2.30 dB)**
Elevation Angle: **0.75 degrees**
Rotation Angle: **0 degrees**

TABULATED AZIMUTH PATTERN

Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field
0	0.881	45	0.952	90	0.889	135	0.323	180	0.404	225	0.378	270	0.926	315	0.983
1	0.881	46	0.954	91	0.883	136	0.311	181	0.403	226	0.393	271	0.932	316	0.981
2	0.880	47	0.956	92	0.876	137	0.300	182	0.401	227	0.408	272	0.937	317	0.979
3	0.880	48	0.957	93	0.869	138	0.290	183	0.399	228	0.423	273	0.943	318	0.977
4	0.880	49	0.959	94	0.861	139	0.280	184	0.396	229	0.438	274	0.948	319	0.975
5	0.880	50	0.960	95	0.854	140	0.272	185	0.392	230	0.454	275	0.952	320	0.973
6	0.880	51	0.962	96	0.846	141	0.265	186	0.388	231	0.470	276	0.957	321	0.970
7	0.880	52	0.963	97	0.837	142	0.259	187	0.384	232	0.486	277	0.961	322	0.968
8	0.881	53	0.964	98	0.828	143	0.254	188	0.379	233	0.501	278	0.965	323	0.965
9	0.881	54	0.965	99	0.819	144	0.251	189	0.374	234	0.517	279	0.968	324	0.962
10	0.882	55	0.966	100	0.810	145	0.248	190	0.368	235	0.533	280	0.972	325	0.960
11	0.883	56	0.966	101	0.800	146	0.248	191	0.362	236	0.549	281	0.975	326	0.957
12	0.883	57	0.967	102	0.789	147	0.248	192	0.355	237	0.564	282	0.978	327	0.954
13	0.885	58	0.967	103	0.779	148	0.250	193	0.349	238	0.580	283	0.981	328	0.951
14	0.886	59	0.968	104	0.768	149	0.252	194	0.341	239	0.595	284	0.983	329	0.948
15	0.887	60	0.968	105	0.756	150	0.256	195	0.334	240	0.610	285	0.986	330	0.945
16	0.888	61	0.968	106	0.745	151	0.260	196	0.327	241	0.625	286	0.988	331	0.942
17	0.890	62	0.968	107	0.733	152	0.266	197	0.319	242	0.640	287	0.990	332	0.939
18	0.891	63	0.968	108	0.720	153	0.272	198	0.312	243	0.654	288	0.992	333	0.936
19	0.893	64	0.967	109	0.707	154	0.278	199	0.304	244	0.669	289	0.993	334	0.933
20	0.895	65	0.967	110	0.694	155	0.285	200	0.297	245	0.683	290	0.995	335	0.931
21	0.897	66	0.966	111	0.681	156	0.293	201	0.289	246	0.696	291	0.996	336	0.928
22	0.899	67	0.965	112	0.667	157	0.300	202	0.283	247	0.710	292	0.997	337	0.925
23	0.901	68	0.964	113	0.653	158	0.308	203	0.276	248	0.723	293	0.998	338	0.922
24	0.903	69	0.963	114	0.639	159	0.316	204	0.270	249	0.735	294	0.999	339	0.919
25	0.905	70	0.962	115	0.624	160	0.323	205	0.265	250	0.748	295	0.999	340	0.916
26	0.908	71	0.960	116	0.610	161	0.331	206	0.260	251	0.760	296	1.000	341	0.914
27	0.910	72	0.959	117	0.594	162	0.338	207	0.256	252	0.772	297	1.000	342	0.911
28	0.912	73	0.957	118	0.579	163	0.346	208	0.253	253	0.783	298	1.000	343	0.908
29	0.915	74	0.955	119	0.564	164	0.353	209	0.252	254	0.794	299	1.000	344	0.906
30	0.917	75	0.952	120	0.548	165	0.359	210	0.251	255	0.805	300	1.000	345	0.904
31	0.920	76	0.950	121	0.533	166	0.366	211	0.252	256	0.815	301	1.000	346	0.901
32	0.922	77	0.947	122	0.517	167	0.372	212	0.254	257	0.825	302	0.999	347	0.899
33	0.925	78	0.944	123	0.501	168	0.377	213	0.257	258	0.835	303	0.999	348	0.897
34	0.927	79	0.941	124	0.485	169	0.382	214	0.261	259	0.844	304	0.998	349	0.895
35	0.930	80	0.938	125	0.469	170	0.387	215	0.267	260	0.853	305	0.997	350	0.893
36	0.932	81	0.934	126	0.454	171	0.391	216	0.274	261	0.862	306	0.996	351	0.891
37	0.935	82	0.930	127	0.438	172	0.395	217	0.282	262	0.870	307	0.995	352	0.890
38	0.937	83	0.926	128	0.422	173	0.398	218	0.291	263	0.878	308	0.994	353	0.888
39	0.939	84	0.922	129	0.407	174	0.400	219	0.302	264	0.886	309	0.993	354	0.887
40	0.942	85	0.917	130	0.392	175	0.403	220	0.313	265	0.894	310	0.992	355	0.886
41	0.944	86	0.912	131	0.377	176	0.404	221	0.324	266	0.901	311	0.990	356	0.884
42	0.946	87	0.907	132	0.363	177	0.405	222	0.337	267	0.908	312	0.989	357	0.883
43	0.948	88	0.901	133	0.349	178	0.405	223	0.350	268	0.914	313	0.987	358	0.882
44	0.950	89	0.895	134	0.336	179	0.405	224	0.364	269	0.920	314	0.985	359	0.882



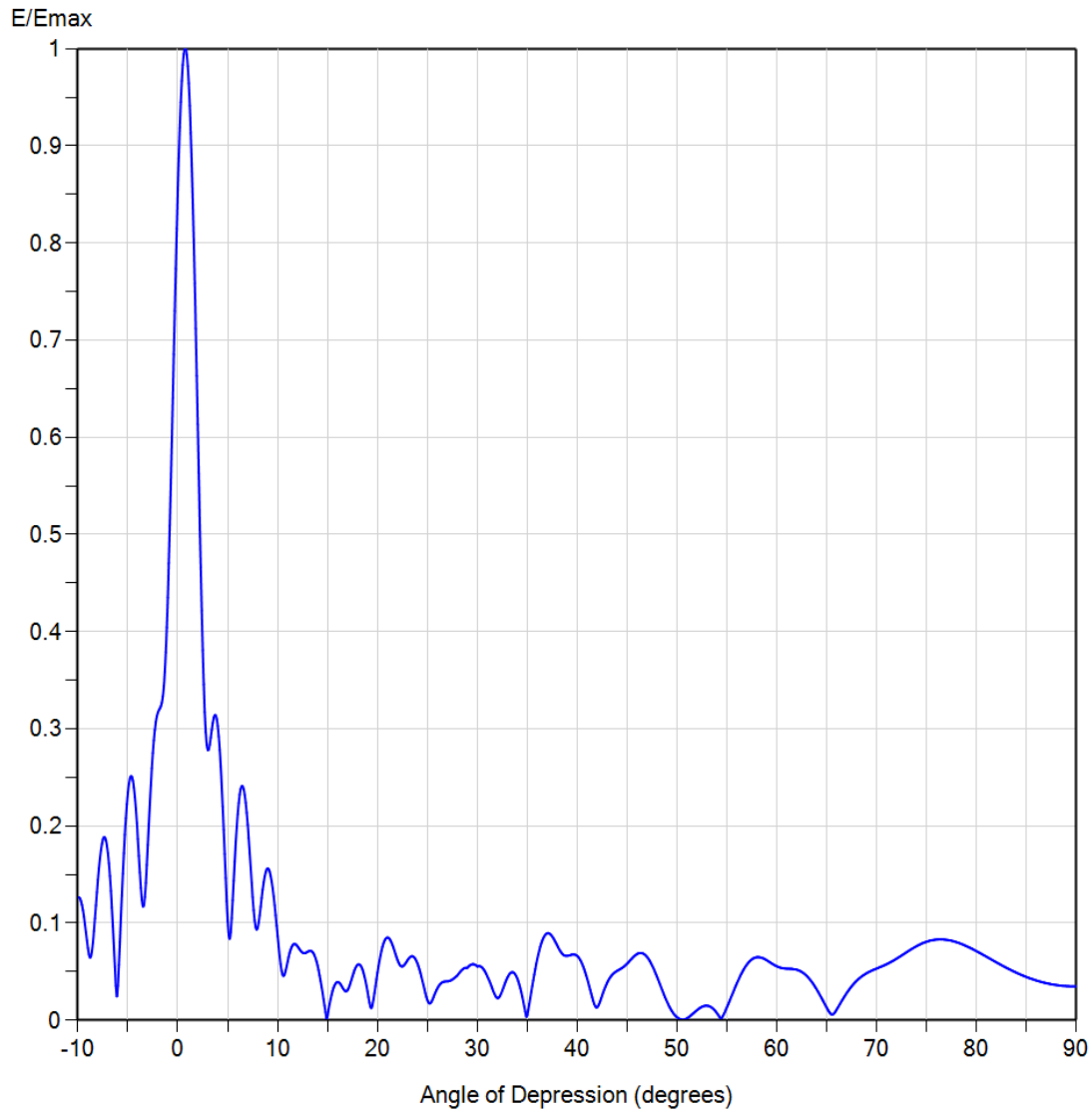
Elevation Pattern



Model:	SBB-EPD-24C170	Frequency:	575.00 MHz
Polarization:	<u>Horizontal</u>	Directivity (Main Lobe):	22.3 (13.48 dBd)
Location:	Lake Dallas, Texas	Directivity (At Horizon):	16.2 (12.10 dBd)
Customer:	Station KAZD-DT	Beam Tilt:	0.75 degrees
Date:	July 22, 2018	Azimuth Angle:	298 degrees



Elevation Pattern



Model:	SBB-EPD-24C170	Frequency:	575.00 MHz
Polarization:	<u>Horizontal</u>	Directivity (Main Lobe):	22.3 (13.48 dBd)
Location:	Lake Dallas, Texas	Directivity (At Horizon):	16.2 (12.10 dBd)
Customer:	Station KAZD-DT	Beam Tilt:	0.75 degrees
Date:	July 22, 2018	Azimuth Angle:	298 degrees



Model: **SBB-EPD-24C170**
Location: **Lake Dallas, Texas**
Customer: **Station KAZD-DT**
Date: **July 22, 2018**

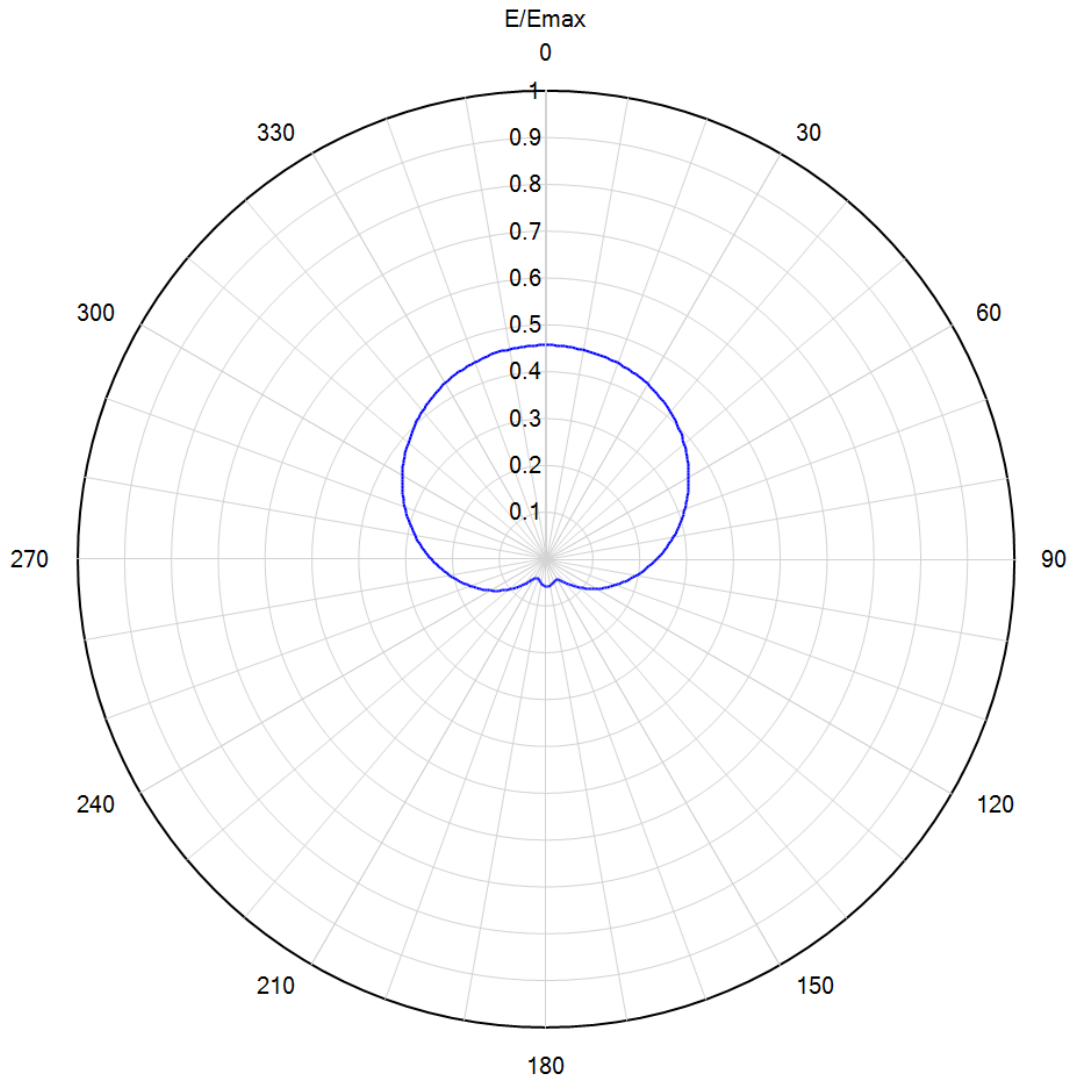
Polarization: **Horizontal**
Frequency (MHz): **575.00**
Directivity (Main Lobe): **22.3 (13.48 dB)**
Directivity (At Horizon): **16.2 (12.10 dB)**
Beam Tilt: **0.75 degrees**

TABULATED ELEVATION PATTERN

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.126	2.4	0.421	10.6	0.046	30.5	0.054	51.0	0.002	71.5	0.060
-9.5	0.113	2.6	0.346	10.8	0.051	31.0	0.045	51.5	0.006	72.0	0.063
-9.0	0.074	2.8	0.296	11.0	0.060	31.5	0.033	52.0	0.010	72.5	0.067
-8.5	0.080	3.0	0.278	11.5	0.077	32.0	0.023	52.5	0.014	73.0	0.070
-8.0	0.144	3.2	0.284	12.0	0.076	32.5	0.030	53.0	0.015	73.5	0.073
-7.5	0.186	3.4	0.299	12.5	0.070	33.0	0.044	53.5	0.013	74.0	0.076
-7.0	0.172	3.6	0.311	13.0	0.070	33.5	0.049	54.0	0.007	74.5	0.079
-6.5	0.097	3.8	0.314	13.5	0.070	34.0	0.043	54.5	0.003	75.0	0.081
-6.0	0.036	4.0	0.303	14.0	0.056	34.5	0.024	55.0	0.013	75.5	0.082
-5.5	0.151	4.2	0.278	14.5	0.028	35.0	0.005	55.5	0.026	76.0	0.083
-5.0	0.234	4.4	0.242	15.0	0.005	35.5	0.035	56.0	0.038	76.5	0.083
-4.5	0.247	4.6	0.196	15.5	0.030	36.0	0.063	56.5	0.049	77.0	0.083
-4.0	0.187	4.8	0.146	16.0	0.039	36.5	0.082	57.0	0.057	77.5	0.082
-3.5	0.117	5.0	0.102	16.5	0.034	37.0	0.090	57.5	0.063	78.0	0.080
-3.0	0.180	5.2	0.084	17.0	0.031	37.5	0.086	58.0	0.065	78.5	0.078
-2.8	0.222	5.4	0.105	17.5	0.045	38.0	0.077	58.5	0.064	79.0	0.076
-2.6	0.260	5.6	0.143	18.0	0.057	38.5	0.068	59.0	0.062	79.5	0.074
-2.4	0.288	5.8	0.182	18.5	0.052	39.0	0.066	59.5	0.058	80.0	0.071
-2.2	0.307	6.0	0.212	19.0	0.030	39.5	0.068	60.0	0.055	80.5	0.068
-2.0	0.317	6.2	0.232	19.5	0.016	40.0	0.066	60.5	0.054	81.0	0.065
-1.8	0.321	6.4	0.241	20.0	0.049	40.5	0.058	61.0	0.053	81.5	0.062
-1.6	0.327	6.6	0.238	20.5	0.076	41.0	0.043	61.5	0.053	82.0	0.059
-1.4	0.343	6.8	0.224	21.0	0.085	41.5	0.024	62.0	0.052	82.5	0.057
-1.2	0.379	7.0	0.201	21.5	0.078	42.0	0.013	62.5	0.050	83.0	0.054
-1.0	0.435	7.2	0.172	22.0	0.062	42.5	0.025	63.0	0.045	83.5	0.051
-0.8	0.509	7.4	0.141	22.5	0.055	43.0	0.039	63.5	0.039	84.0	0.049
-0.6	0.595	7.6	0.113	23.0	0.062	43.5	0.047	64.0	0.031	84.5	0.047
-0.4	0.685	7.8	0.096	23.5	0.066	44.0	0.051	64.5	0.022	85.0	0.044
-0.2	0.773	8.0	0.095	24.0	0.059	44.5	0.054	65.0	0.013	85.5	0.043
0.0	0.853	8.2	0.108	24.5	0.041	45.0	0.058	65.5	0.006	86.0	0.041
0.2	0.919	8.4	0.126	25.0	0.021	45.5	0.064	66.0	0.011	86.5	0.039
0.4	0.967	8.6	0.142	25.5	0.021	46.0	0.068	66.5	0.020	87.0	0.038
0.6	0.995	8.8	0.152	26.0	0.033	46.5	0.069	67.0	0.028	87.5	0.037
0.8	1.000	9.0	0.156	26.5	0.039	47.0	0.065	67.5	0.035	88.0	0.036
1.0	0.982	9.2	0.153	27.0	0.040	47.5	0.056	68.0	0.041	88.5	0.036
1.2	0.941	9.4	0.143	27.5	0.042	48.0	0.045	68.5	0.045	89.0	0.035
1.4	0.881	9.6	0.127	28.0	0.046	48.5	0.031	69.0	0.048	89.5	0.035
1.6	0.803	9.8	0.108	28.5	0.052	49.0	0.019	69.5	0.051	90.0	0.035
1.8	0.712	10.0	0.087	29.0	0.054	49.5	0.009	70.0	0.053		
2.0	0.614	10.2	0.066	29.5	0.058	50.0	0.003	70.5	0.055		
2.2	0.514	10.4	0.051	30.0	0.055	50.5	0.000	71.0	0.058		



Azimuth Pattern



Model: SBB-EPD-24C170
Location: Lake Dallas, Texas
Customer: Station KAZD-DT
Date: July 22, 2018
Rotation Angle: 0 degrees

Polarization: Vertical
Frequency: 575.00 MHz
Directivity: 2.5 (4.02 dB)
Elevation Angle: 0.75 degrees
Horizontal Unit Pattern:
File = SBB_EP_AZ_VP_Normal_585.pat

Note: Pattern Tolerance +/-5% of Emax



Model: **SBB-EPD-24C170**
Location: **Lake Dallas, Texas**
Customer: **Station KAZD-DT**
Date: **July 22, 2018**

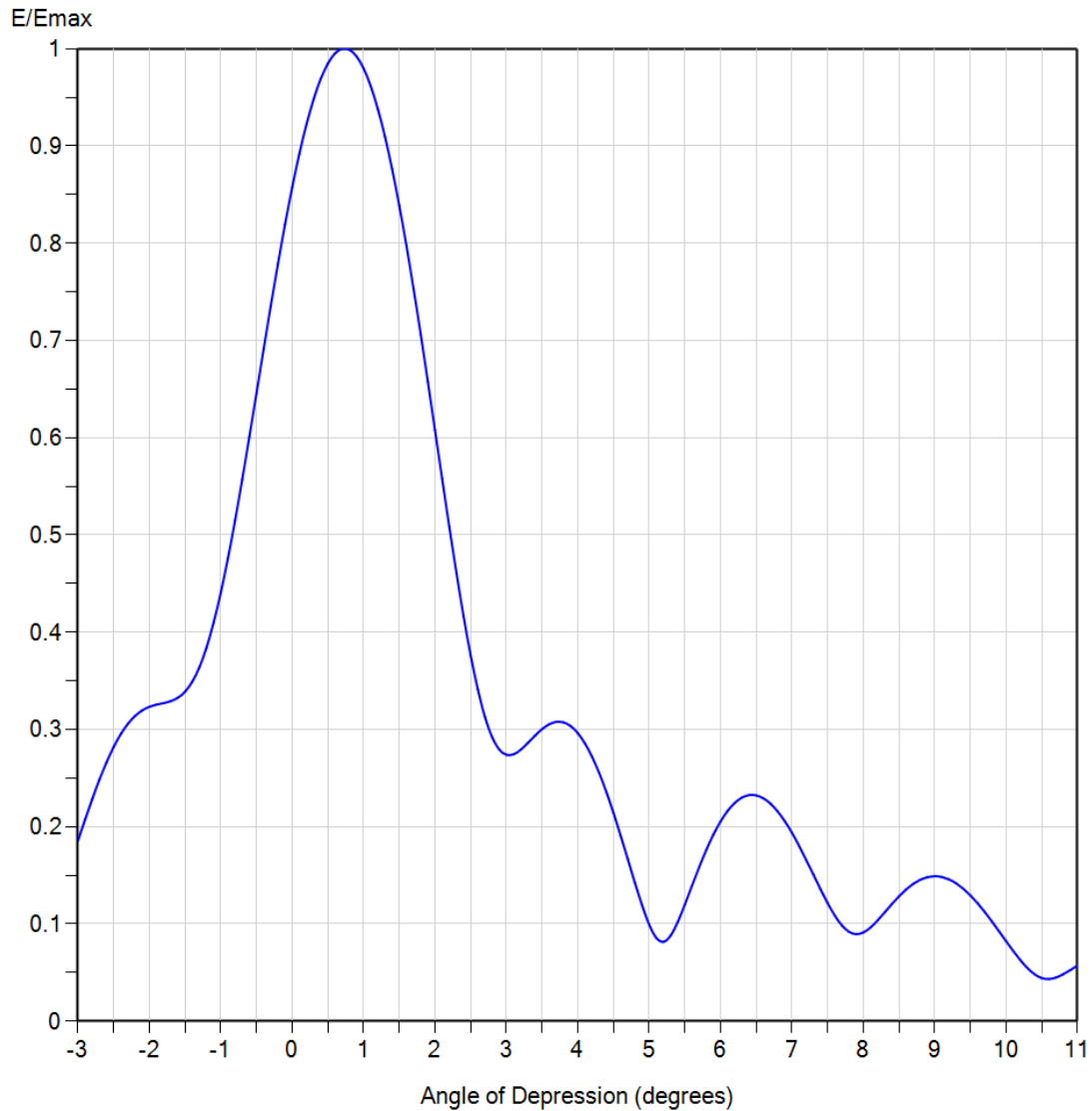
Polarization: **Vertical**
Frequency (MHz): **575.00**
Directivity: **2.5 (4.02 dB)**
Elevation Angle: **0.75 degrees**
Rotation Angle: **0 degrees**

TABULATED AZIMUTH PATTERN

Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field
0	1.000	45	0.874	90	0.518	135	0.177	180	0.129	225	0.184	270	0.537	315	0.874
1	1.000	46	0.868	91	0.510	136	0.171	181	0.129	226	0.191	271	0.545	316	0.879
2	0.999	47	0.862	92	0.501	137	0.165	182	0.128	227	0.199	272	0.554	317	0.885
3	0.999	48	0.856	93	0.492	138	0.159	183	0.127	228	0.206	273	0.562	318	0.890
4	0.999	49	0.850	94	0.483	139	0.153	184	0.126	229	0.213	274	0.571	319	0.896
5	0.998	50	0.843	95	0.475	140	0.148	185	0.125	230	0.221	275	0.579	320	0.901
6	0.997	51	0.836	96	0.466	141	0.143	186	0.124	231	0.228	276	0.588	321	0.906
7	0.996	52	0.830	97	0.457	142	0.138	187	0.123	232	0.236	277	0.596	322	0.912
8	0.996	53	0.823	98	0.449	143	0.134	188	0.121	233	0.243	278	0.605	323	0.917
9	0.995	54	0.816	99	0.440	144	0.129	189	0.120	234	0.251	279	0.613	324	0.921
10	0.993	55	0.809	100	0.432	145	0.126	190	0.118	235	0.258	280	0.622	325	0.926
11	0.992	56	0.802	101	0.424	146	0.122	191	0.116	236	0.266	281	0.630	326	0.931
12	0.991	57	0.794	102	0.415	147	0.119	192	0.115	237	0.273	282	0.638	327	0.935
13	0.989	58	0.787	103	0.407	148	0.116	193	0.113	238	0.281	283	0.646	328	0.939
14	0.988	59	0.779	104	0.399	149	0.114	194	0.111	239	0.289	284	0.655	329	0.944
15	0.986	60	0.772	105	0.391	150	0.112	195	0.109	240	0.296	285	0.663	330	0.948
16	0.985	61	0.764	106	0.383	151	0.111	196	0.107	241	0.304	286	0.671	331	0.951
17	0.983	62	0.757	107	0.375	152	0.110	197	0.106	242	0.311	287	0.679	332	0.955
18	0.981	63	0.749	108	0.367	153	0.109	198	0.104	243	0.319	288	0.687	333	0.959
19	0.979	64	0.741	109	0.359	154	0.109	199	0.103	244	0.327	289	0.695	334	0.962
20	0.976	65	0.733	110	0.352	155	0.109	200	0.101	245	0.334	290	0.703	335	0.965
21	0.974	66	0.725	111	0.344	156	0.109	201	0.100	246	0.342	291	0.710	336	0.968
22	0.971	67	0.717	112	0.336	157	0.110	202	0.099	247	0.350	292	0.718	337	0.971
23	0.969	68	0.709	113	0.329	158	0.110	203	0.099	248	0.357	293	0.726	338	0.974
24	0.966	69	0.700	114	0.322	159	0.111	204	0.098	249	0.365	294	0.733	339	0.977
25	0.963	70	0.692	115	0.314	160	0.112	205	0.099	250	0.373	295	0.741	340	0.979
26	0.960	71	0.684	116	0.307	161	0.114	206	0.099	251	0.381	296	0.748	341	0.981
27	0.957	72	0.675	117	0.300	162	0.115	207	0.100	252	0.389	297	0.755	342	0.983
28	0.954	73	0.667	118	0.293	163	0.116	208	0.102	253	0.396	298	0.763	343	0.985
29	0.950	74	0.658	119	0.285	164	0.118	209	0.103	254	0.404	299	0.770	344	0.987
30	0.947	75	0.650	120	0.278	165	0.119	210	0.106	255	0.412	300	0.777	345	0.989
31	0.943	76	0.641	121	0.271	166	0.120	211	0.109	256	0.420	301	0.784	346	0.991
32	0.939	77	0.633	122	0.264	167	0.122	212	0.112	257	0.428	302	0.791	347	0.992
33	0.935	78	0.624	123	0.257	168	0.123	213	0.115	258	0.436	303	0.798	348	0.993
34	0.931	79	0.615	124	0.250	169	0.124	214	0.120	259	0.445	304	0.804	349	0.995
35	0.926	80	0.607	125	0.243	170	0.125	215	0.124	260	0.453	305	0.811	350	0.996
36	0.922	81	0.598	126	0.236	171	0.126	216	0.129	261	0.461	306	0.818	351	0.997
37	0.917	82	0.589	127	0.230	172	0.127	217	0.134	262	0.469	307	0.824	352	0.997
38	0.912	83	0.580	128	0.223	173	0.128	218	0.140	263	0.478	308	0.831	353	0.998
39	0.907	84	0.571	129	0.216	174	0.129	219	0.145	264	0.486	309	0.837	354	0.999
40	0.902	85	0.562	130	0.209	175	0.129	220	0.151	265	0.494	310	0.843	355	0.999
41	0.897	86	0.554	131	0.203	176	0.129	221	0.158	266	0.503	311	0.850	356	1.000
42	0.892	87	0.545	132	0.196	177	0.130	222	0.164	267	0.511	312	0.856	357	1.000
43	0.886	88	0.536	133	0.189	178	0.130	223	0.171	268	0.520	313	0.862	358	1.000
44	0.880	89	0.527	134	0.183	179	0.129	224	0.177	269	0.528	314	0.868	359	1.000



Elevation Pattern

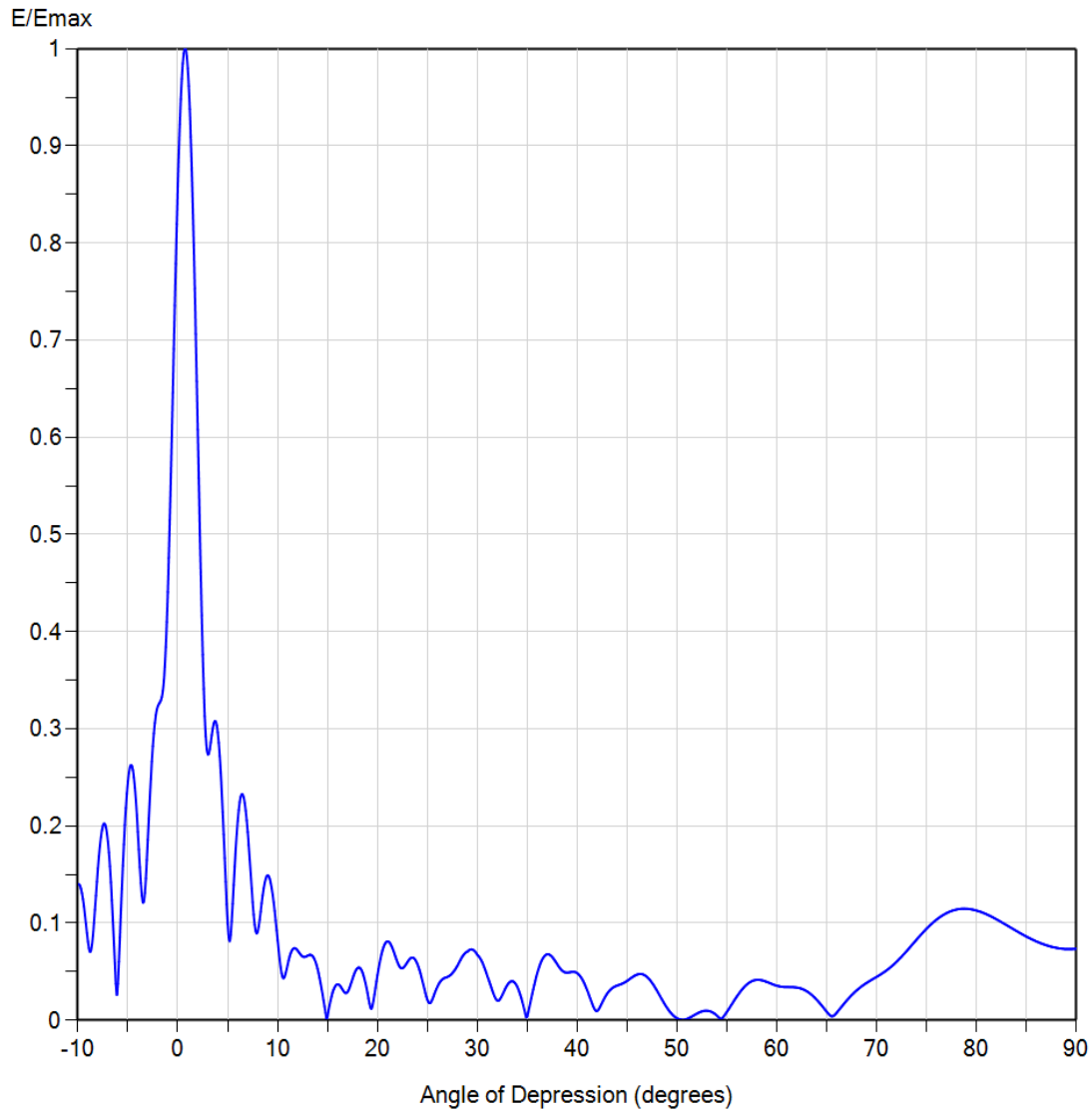


Model: SBB-EPD-24C170
Polarization: Vertical
Location: Lake Dallas, Texas
Customer: Station KAZD-DT
Date: July 22, 2018

Frequency: 575.00 MHz
Directivity (Main Lobe): 21.5 (13.33 dBd)
Directivity (At Horizon): 15.8 (12.00 dBd)
Beam Tilt: 0.75 degrees
Azimuth Angle: 359 degrees



Elevation Pattern



Model:	SBB-EPD-24C170	Frequency:	575.00 MHz
Polarization:	<u>Vertical</u>	Directivity (Main Lobe):	21.5 (13.33 dBd)
Location:	Lake Dallas, Texas	Directivity (At Horizon):	15.8 (12.00 dBd)
Customer:	Station KAZD-DT	Beam Tilt:	0.75 degrees
Date:	July 22, 2018	Azimuth Angle:	359 degrees



Model: **SBB-EPD-24C170**
Location: **Lake Dallas, Texas**
Customer: **Station KAZD-DT**
Date: **July 22, 2018**

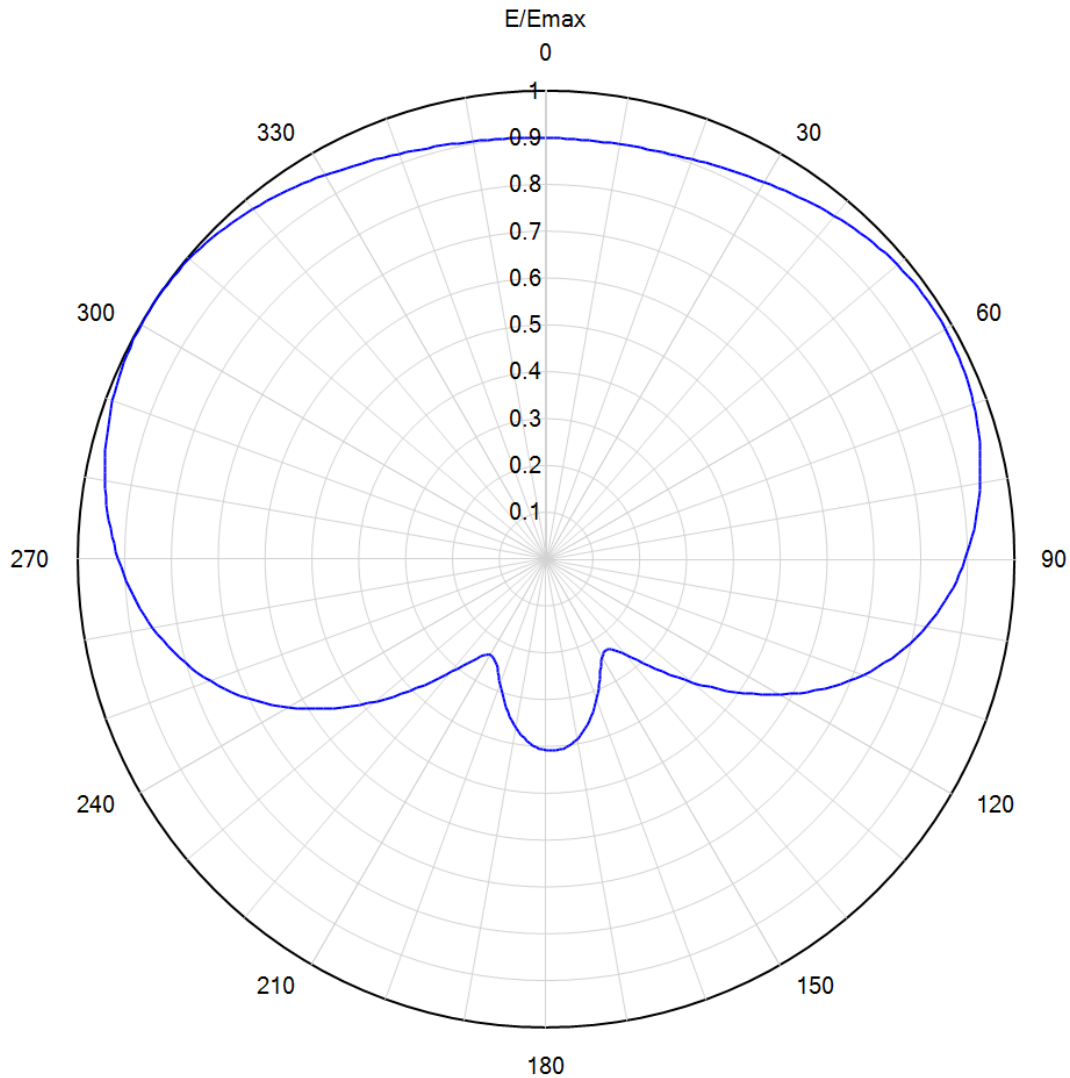
Polarization: **Vertical**
Frequency (MHz): **575.00**
Directivity (Main Lobe): **21.5 (13.33 dB)**
Directivity (At Horizon): **15.8 (12.00 dB)**
Beam Tilt: **0.75 degrees**

TABULATED ELEVATION PATTERN

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.140	2.4	0.417	10.6	0.043	30.5	0.059	51.0	0.001	71.5	0.056
-9.5	0.125	2.6	0.341	10.8	0.048	31.0	0.046	51.5	0.004	72.0	0.060
-9.0	0.081	2.8	0.292	11.0	0.057	31.5	0.031	52.0	0.007	72.5	0.066
-8.5	0.087	3.0	0.274	11.5	0.073	32.0	0.020	52.5	0.009	73.0	0.071
-8.0	0.156	3.2	0.279	12.0	0.072	32.5	0.026	53.0	0.010	73.5	0.077
-7.5	0.200	3.4	0.294	12.5	0.066	33.0	0.036	53.5	0.008	74.0	0.083
-7.0	0.184	3.6	0.305	13.0	0.066	33.5	0.040	54.0	0.005	74.5	0.089
-6.5	0.103	3.8	0.307	13.5	0.066	34.0	0.034	54.5	0.002	75.0	0.094
-6.0	0.038	4.0	0.296	14.0	0.053	34.5	0.019	55.0	0.009	75.5	0.099
-5.5	0.159	4.2	0.272	14.5	0.026	35.0	0.004	55.5	0.017	76.0	0.104
-5.0	0.246	4.4	0.236	15.0	0.004	35.5	0.027	56.0	0.025	76.5	0.107
-4.5	0.257	4.6	0.191	15.5	0.028	36.0	0.048	56.5	0.032	77.0	0.110
-4.0	0.194	4.8	0.142	16.0	0.037	36.5	0.063	57.0	0.037	77.5	0.113
-3.5	0.121	5.0	0.099	16.5	0.032	37.0	0.068	57.5	0.040	78.0	0.114
-3.0	0.186	5.2	0.082	17.0	0.029	37.5	0.065	58.0	0.042	78.5	0.115
-2.8	0.229	5.4	0.102	17.5	0.043	38.0	0.058	58.5	0.041	79.0	0.115
-2.6	0.266	5.6	0.139	18.0	0.054	38.5	0.051	59.0	0.039	79.5	0.114
-2.4	0.295	5.8	0.176	18.5	0.049	39.0	0.049	59.5	0.037	80.0	0.113
-2.2	0.314	6.0	0.205	19.0	0.028	39.5	0.050	60.0	0.035	80.5	0.111
-2.0	0.323	6.2	0.225	19.5	0.015	40.0	0.048	60.5	0.034	81.0	0.109
-1.8	0.327	6.4	0.232	20.0	0.046	40.5	0.042	61.0	0.034	81.5	0.107
-1.6	0.333	6.6	0.229	20.5	0.072	41.0	0.031	61.5	0.034	82.0	0.104
-1.4	0.349	6.8	0.216	21.0	0.081	41.5	0.017	62.0	0.034	82.5	0.101
-1.2	0.384	7.0	0.194	21.5	0.074	42.0	0.009	62.5	0.032	83.0	0.098
-1.0	0.441	7.2	0.166	22.0	0.060	42.5	0.018	63.0	0.030	83.5	0.095
-0.8	0.515	7.4	0.136	22.5	0.053	43.0	0.027	63.5	0.026	84.0	0.092
-0.6	0.601	7.6	0.109	23.0	0.060	43.5	0.033	64.0	0.021	84.5	0.089
-0.4	0.691	7.8	0.092	23.5	0.064	44.0	0.036	64.5	0.015	85.0	0.086
-0.2	0.779	8.0	0.091	24.0	0.058	44.5	0.038	65.0	0.009	85.5	0.083
0.0	0.858	8.2	0.103	24.5	0.041	45.0	0.040	65.5	0.004	86.0	0.081
0.2	0.922	8.4	0.120	25.0	0.021	45.5	0.044	66.0	0.008	86.5	0.079
0.4	0.969	8.6	0.135	25.5	0.022	46.0	0.047	66.5	0.014	87.0	0.077
0.6	0.995	8.8	0.145	26.0	0.034	46.5	0.047	67.0	0.020	87.5	0.076
0.8	0.999	9.0	0.149	26.5	0.042	47.0	0.044	67.5	0.026	88.0	0.074
1.0	0.980	9.2	0.146	27.0	0.045	47.5	0.038	68.0	0.031	88.5	0.074
1.2	0.938	9.4	0.136	27.5	0.048	48.0	0.030	68.5	0.035	89.0	0.073
1.4	0.876	9.6	0.121	28.0	0.056	48.5	0.021	69.0	0.038	89.5	0.073
1.6	0.798	9.8	0.103	28.5	0.065	49.0	0.013	69.5	0.042	90.0	0.074
1.8	0.706	10.0	0.082	29.0	0.071	49.5	0.006	70.0	0.045		
2.0	0.608	10.2	0.063	29.5	0.073	50.0	0.002	70.5	0.048		
2.2	0.509	10.4	0.048	30.0	0.067	50.5	0.000	71.0	0.051		



Azimuth Pattern



Model: SBB-EPD-24C170
Location: Lake Dallas, Texas
Customer: Station KAZD-DT
Date: July 22, 2018
Rotation Angle: 0 degrees

Polarization: Horizontal
Frequency: 623.00 MHz
Directivity: 1.7 (2.23 dB)
Elevation Angle: 0.75 degrees
Horizontal Unit Pattern:
File = SBB_EP_AZ_HP_Normal_631.pat

Note: Pattern Tolerance +/-5% of Emax



Model: **SBB-EPD-24C170**
Location: **Lake Dallas, Texas**
Customer: **Station KAZD-DT**
Date: **July 22, 2018**

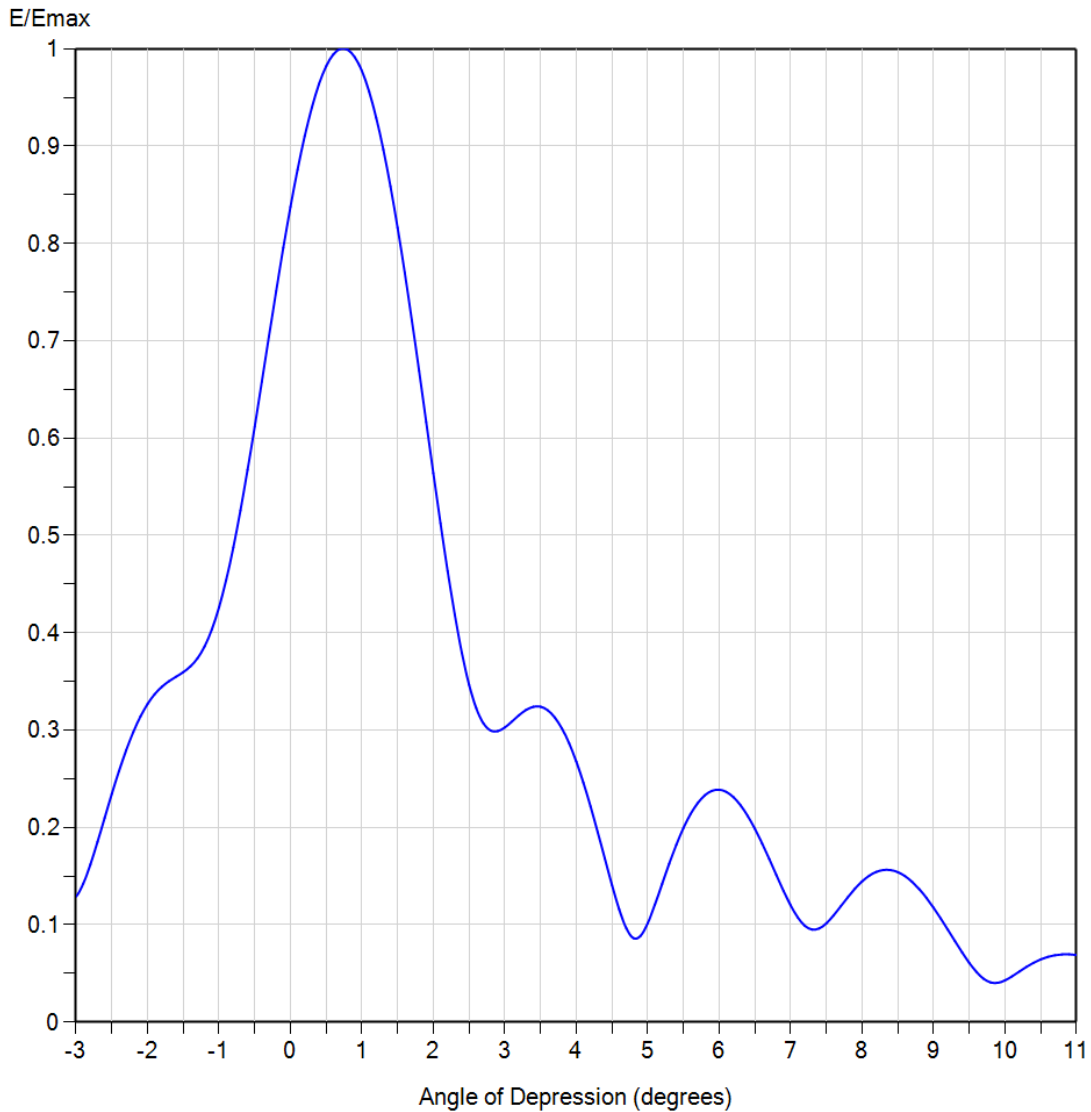
Polarization: **Horizontal**
Frequency (MHz): **623.00**
Directivity: **1.7 (2.23 dB)**
Elevation Angle: **0.75 degrees**
Rotation Angle: **0 degrees**

TABULATED AZIMUTH PATTERN

Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field
0	0.899	45	0.969	90	0.895	135	0.331	180	0.409	225	0.390	270	0.913	315	0.987
1	0.899	46	0.971	91	0.889	136	0.317	181	0.407	226	0.406	271	0.918	316	0.985
2	0.898	47	0.973	92	0.883	137	0.303	182	0.405	227	0.423	272	0.923	317	0.983
3	0.898	48	0.975	93	0.877	138	0.291	183	0.403	228	0.439	273	0.928	318	0.980
4	0.898	49	0.977	94	0.871	139	0.279	184	0.399	229	0.456	274	0.932	319	0.978
5	0.898	50	0.979	95	0.864	140	0.268	185	0.395	230	0.473	275	0.937	320	0.975
6	0.898	51	0.980	96	0.857	141	0.259	186	0.391	231	0.490	276	0.941	321	0.972
7	0.898	52	0.981	97	0.850	142	0.251	187	0.386	232	0.506	277	0.945	322	0.970
8	0.899	53	0.982	98	0.842	143	0.244	188	0.380	233	0.523	278	0.949	323	0.967
9	0.899	54	0.983	99	0.834	144	0.239	189	0.374	234	0.540	279	0.953	324	0.964
10	0.899	55	0.984	100	0.826	145	0.235	190	0.367	235	0.556	280	0.956	325	0.961
11	0.900	56	0.984	101	0.817	146	0.233	191	0.360	236	0.572	281	0.960	326	0.958
12	0.900	57	0.985	102	0.808	147	0.233	192	0.353	237	0.588	282	0.963	327	0.955
13	0.901	58	0.985	103	0.799	148	0.234	193	0.345	238	0.603	283	0.967	328	0.952
14	0.902	59	0.985	104	0.789	149	0.236	194	0.337	239	0.619	284	0.970	329	0.949
15	0.903	60	0.984	105	0.779	150	0.240	195	0.328	240	0.634	285	0.973	330	0.946
16	0.904	61	0.984	106	0.768	151	0.245	196	0.320	241	0.648	286	0.975	331	0.943
17	0.905	62	0.983	107	0.757	152	0.251	197	0.311	242	0.663	287	0.978	332	0.940
18	0.906	63	0.982	108	0.746	153	0.257	198	0.303	243	0.676	288	0.981	333	0.938
19	0.907	64	0.981	109	0.734	154	0.265	199	0.294	244	0.690	289	0.983	334	0.935
20	0.909	65	0.980	110	0.722	155	0.273	200	0.286	245	0.703	290	0.985	335	0.932
21	0.910	66	0.979	111	0.709	156	0.281	201	0.277	246	0.716	291	0.987	336	0.930
22	0.912	67	0.977	112	0.696	157	0.289	202	0.270	247	0.728	292	0.989	337	0.927
23	0.914	68	0.975	113	0.683	158	0.298	203	0.262	248	0.740	293	0.991	338	0.925
24	0.916	69	0.973	114	0.669	159	0.307	204	0.255	249	0.751	294	0.993	339	0.923
25	0.918	70	0.971	115	0.655	160	0.316	205	0.250	250	0.762	295	0.994	340	0.921
26	0.920	71	0.969	116	0.640	161	0.325	206	0.245	251	0.773	296	0.996	341	0.918
27	0.922	72	0.966	117	0.625	162	0.333	207	0.241	252	0.783	297	0.997	342	0.917
28	0.924	73	0.964	118	0.610	163	0.341	208	0.238	253	0.793	298	0.998	343	0.915
29	0.927	74	0.961	119	0.594	164	0.350	209	0.236	254	0.802	299	0.999	344	0.913
30	0.929	75	0.958	120	0.578	165	0.357	210	0.237	255	0.812	300	0.999	345	0.911
31	0.932	76	0.955	121	0.562	166	0.364	211	0.238	256	0.820	301	1.000	346	0.910
32	0.934	77	0.952	122	0.546	167	0.371	212	0.241	257	0.829	302	1.000	347	0.909
33	0.937	78	0.949	123	0.529	168	0.378	213	0.246	258	0.837	303	1.000	348	0.907
34	0.940	79	0.945	124	0.512	169	0.384	214	0.252	259	0.845	304	1.000	349	0.906
35	0.943	80	0.941	125	0.495	170	0.389	215	0.259	260	0.852	305	1.000	350	0.905
36	0.946	81	0.937	126	0.478	171	0.394	216	0.268	261	0.859	306	0.999	351	0.904
37	0.948	82	0.933	127	0.461	172	0.398	217	0.278	262	0.866	307	0.999	352	0.903
38	0.951	83	0.929	128	0.444	173	0.401	218	0.289	263	0.873	308	0.998	353	0.902
39	0.954	84	0.925	129	0.427	174	0.404	219	0.302	264	0.879	309	0.997	354	0.902
40	0.957	85	0.920	130	0.410	175	0.407	220	0.315	265	0.885	310	0.996	355	0.901
41	0.959	86	0.916	131	0.394	176	0.408	221	0.329	266	0.891	311	0.994	356	0.900
42	0.962	87	0.911	132	0.378	177	0.410	222	0.343	267	0.897	312	0.993	357	0.900
43	0.964	88	0.906	133	0.362	178	0.410	223	0.358	268	0.903	313	0.991	358	0.899
44	0.967	89	0.900	134	0.346	179	0.410	224	0.374	269	0.908	314	0.989	359	0.899



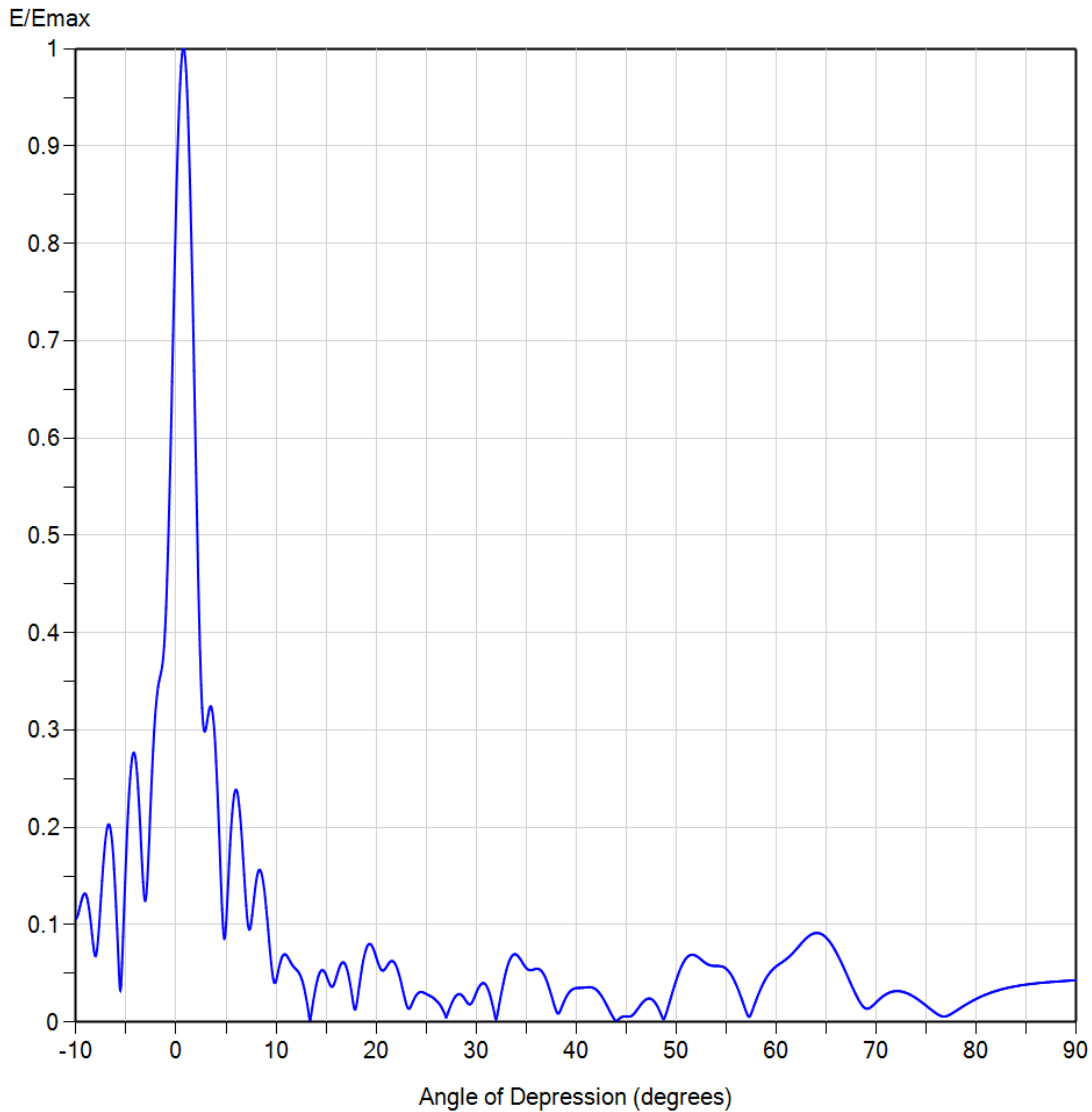
Elevation Pattern



Model:	SBB-EPD-24C170	Frequency:	623.00 MHz
Polarization:	<u>Horizontal</u>	Directivity (Main Lobe):	23.3 (13.68 dBd)
Location:	Lake Dallas, Texas	Directivity (At Horizon):	16.4 (12.14 dBd)
Customer:	Station KAZD-DT	Beam Tilt:	0.75 degrees
Date:	July 22, 2018	Azimuth Angle:	303 degrees



Elevation Pattern



Model:	SBB-EPD-24C170	Frequency:	623.00 MHz
Polarization:	<u>Horizontal</u>	Directivity (Main Lobe):	23.3 (13.68 dBd)
Location:	Lake Dallas, Texas	Directivity (At Horizon):	16.4 (12.14 dBd)
Customer:	Station KAZD-DT	Beam Tilt:	0.75 degrees
Date:	July 22, 2018	Azimuth Angle:	303 degrees



Model: **SBB-EPD-24C170**
Location: **Lake Dallas, Texas**
Customer: **Station KAZD-DT**
Date: **July 22, 2018**

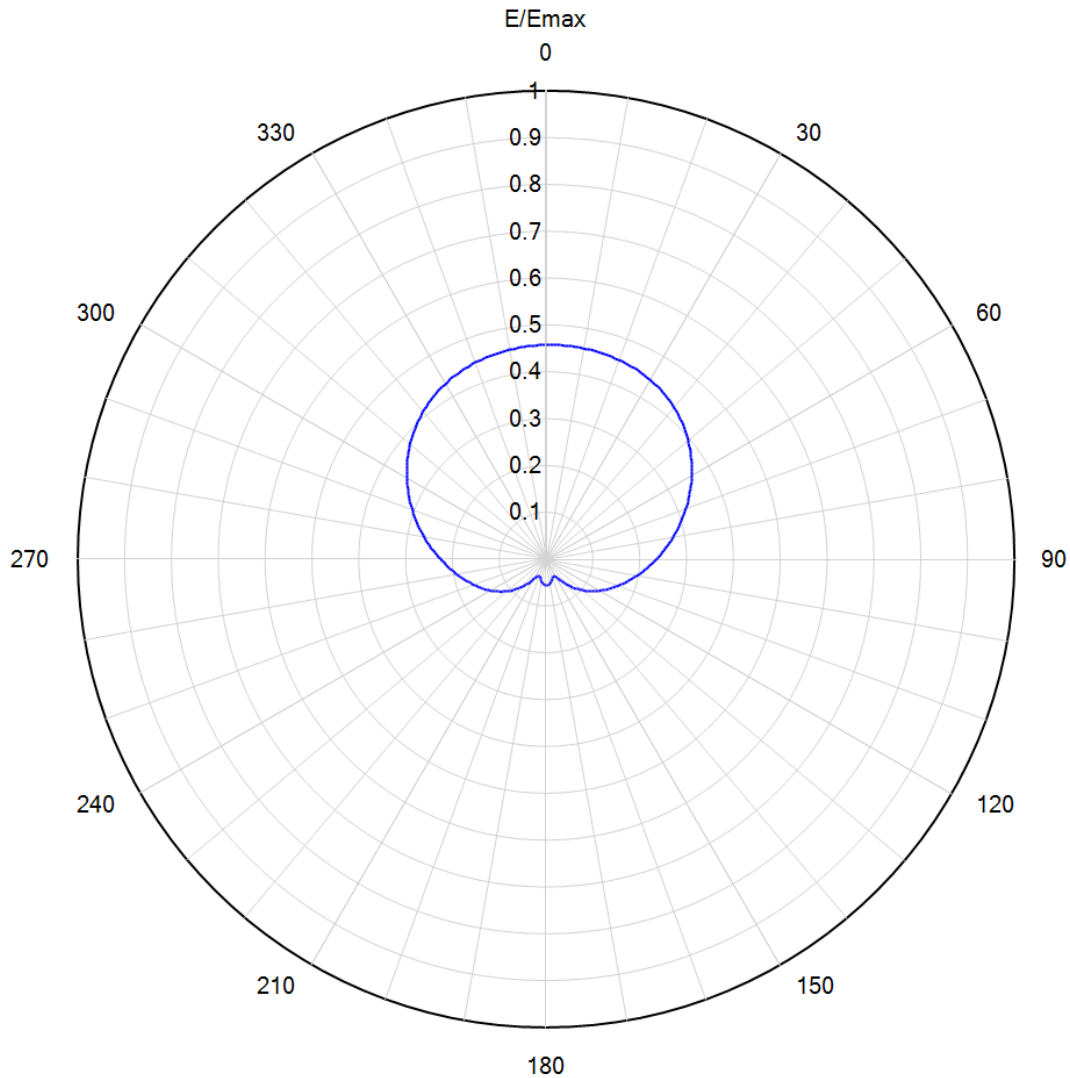
Polarization: **Horizontal**
Frequency (MHz): **623.00**
Directivity (Main Lobe): **23.3 (13.68 dB)**
Directivity (At Horizon): **16.4 (12.14 dB)**
Beam Tilt: **0.75 degrees**

TABULATED ELEVATION PATTERN

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.106	2.4	0.379	10.6	0.067	30.5	0.039	51.0	0.066	71.5	0.031
-9.5	0.123	2.6	0.323	10.8	0.069	31.0	0.038	51.5	0.069	72.0	0.032
-9.0	0.131	2.8	0.300	11.0	0.069	31.5	0.023	52.0	0.068	72.5	0.031
-8.5	0.099	3.0	0.303	11.5	0.060	32.0	0.003	52.5	0.064	73.0	0.030
-8.0	0.069	3.2	0.315	12.0	0.054	32.5	0.029	53.0	0.060	73.5	0.027
-7.5	0.130	3.4	0.324	12.5	0.046	33.0	0.053	53.5	0.058	74.0	0.024
-7.0	0.193	3.6	0.320	13.0	0.024	33.5	0.067	54.0	0.058	74.5	0.021
-6.5	0.194	3.8	0.302	13.5	0.008	34.0	0.069	54.5	0.057	75.0	0.017
-6.0	0.119	4.0	0.268	14.0	0.038	34.5	0.063	55.0	0.055	75.5	0.013
-5.5	0.038	4.2	0.221	14.5	0.053	35.0	0.056	55.5	0.048	76.0	0.009
-5.0	0.169	4.4	0.168	15.0	0.048	35.5	0.053	56.0	0.038	76.5	0.006
-4.5	0.263	4.6	0.116	15.5	0.037	36.0	0.055	56.5	0.025	77.0	0.006
-4.0	0.266	4.8	0.086	16.0	0.045	36.5	0.053	57.0	0.010	77.5	0.008
-3.5	0.183	5.0	0.102	16.5	0.060	37.0	0.044	57.5	0.009	78.0	0.012
-3.0	0.129	5.2	0.142	17.0	0.057	37.5	0.028	58.0	0.023	78.5	0.015
-2.8	0.162	5.4	0.182	17.5	0.033	38.0	0.011	58.5	0.036	79.0	0.018
-2.6	0.210	5.6	0.214	18.0	0.016	38.5	0.014	59.0	0.045	79.5	0.021
-2.4	0.258	5.8	0.233	18.5	0.051	39.0	0.026	59.5	0.052	80.0	0.024
-2.2	0.298	6.0	0.239	19.0	0.075	39.5	0.033	60.0	0.057	80.5	0.026
-2.0	0.327	6.2	0.231	19.5	0.079	40.0	0.035	60.5	0.061	81.0	0.028
-1.8	0.345	6.4	0.212	20.0	0.067	40.5	0.035	61.0	0.065	81.5	0.030
-1.6	0.355	6.6	0.184	20.5	0.054	41.0	0.036	61.5	0.069	82.0	0.032
-1.4	0.365	6.8	0.151	21.0	0.056	41.5	0.036	62.0	0.075	82.5	0.034
-1.2	0.386	7.0	0.120	21.5	0.063	42.0	0.033	62.5	0.081	83.0	0.035
-1.0	0.426	7.2	0.099	22.0	0.058	42.5	0.027	63.0	0.086	83.5	0.036
-0.8	0.488	7.4	0.096	22.5	0.040	43.0	0.018	63.5	0.090	84.0	0.037
-0.6	0.567	7.6	0.109	23.0	0.019	43.5	0.008	64.0	0.091	84.5	0.038
-0.4	0.658	7.8	0.128	23.5	0.017	44.0	0.000	64.5	0.090	85.0	0.039
-0.2	0.751	8.0	0.145	24.0	0.027	44.5	0.005	65.0	0.086	85.5	0.039
0.0	0.838	8.2	0.154	24.5	0.031	45.0	0.006	65.5	0.080	86.0	0.040
0.2	0.910	8.4	0.156	25.0	0.029	45.5	0.006	66.0	0.071	86.5	0.040
0.4	0.964	8.6	0.150	25.5	0.026	46.0	0.011	66.5	0.061	87.0	0.041
0.6	0.994	8.8	0.137	26.0	0.022	46.5	0.018	67.0	0.050	87.5	0.041
0.8	0.999	9.0	0.118	26.5	0.016	47.0	0.023	67.5	0.038	88.0	0.042
1.0	0.977	9.2	0.095	27.0	0.005	47.5	0.024	68.0	0.027	88.5	0.042
1.2	0.929	9.4	0.072	27.5	0.018	48.0	0.018	68.5	0.018	89.0	0.042
1.4	0.859	9.6	0.052	28.0	0.027	48.5	0.007	69.0	0.014	89.5	0.043
1.6	0.770	9.8	0.041	28.5	0.028	49.0	0.009	69.5	0.016	90.0	0.043
1.8	0.669	10.0	0.043	29.0	0.021	49.5	0.026	70.0	0.020		
2.0	0.564	10.2	0.052	29.5	0.019	50.0	0.043	70.5	0.025		
2.2	0.463	10.4	0.061	30.0	0.030	50.5	0.057	71.0	0.029		



Azimuth Pattern



Model: SBB-EPD-24C170
Location: Lake Dallas, Texas
Customer: Station KAZD-DT
Date: July 22, 2018
Rotation Angle: 0 degrees

Polarization: Vertical
Frequency: 623.00 MHz
Directivity: 2.5 (4.04 dB)
Elevation Angle: 0.75 degrees
Horizontal Unit Pattern:
File = SBB_EP_AZ_VP_Normal_631.pat

Note: Pattern Tolerance +/-5% of Emax



Model: **SBB-EPD-24C170**
Location: **Lake Dallas, Texas**
Customer: **Station KAZD-DT**
Date: **July 22, 2018**

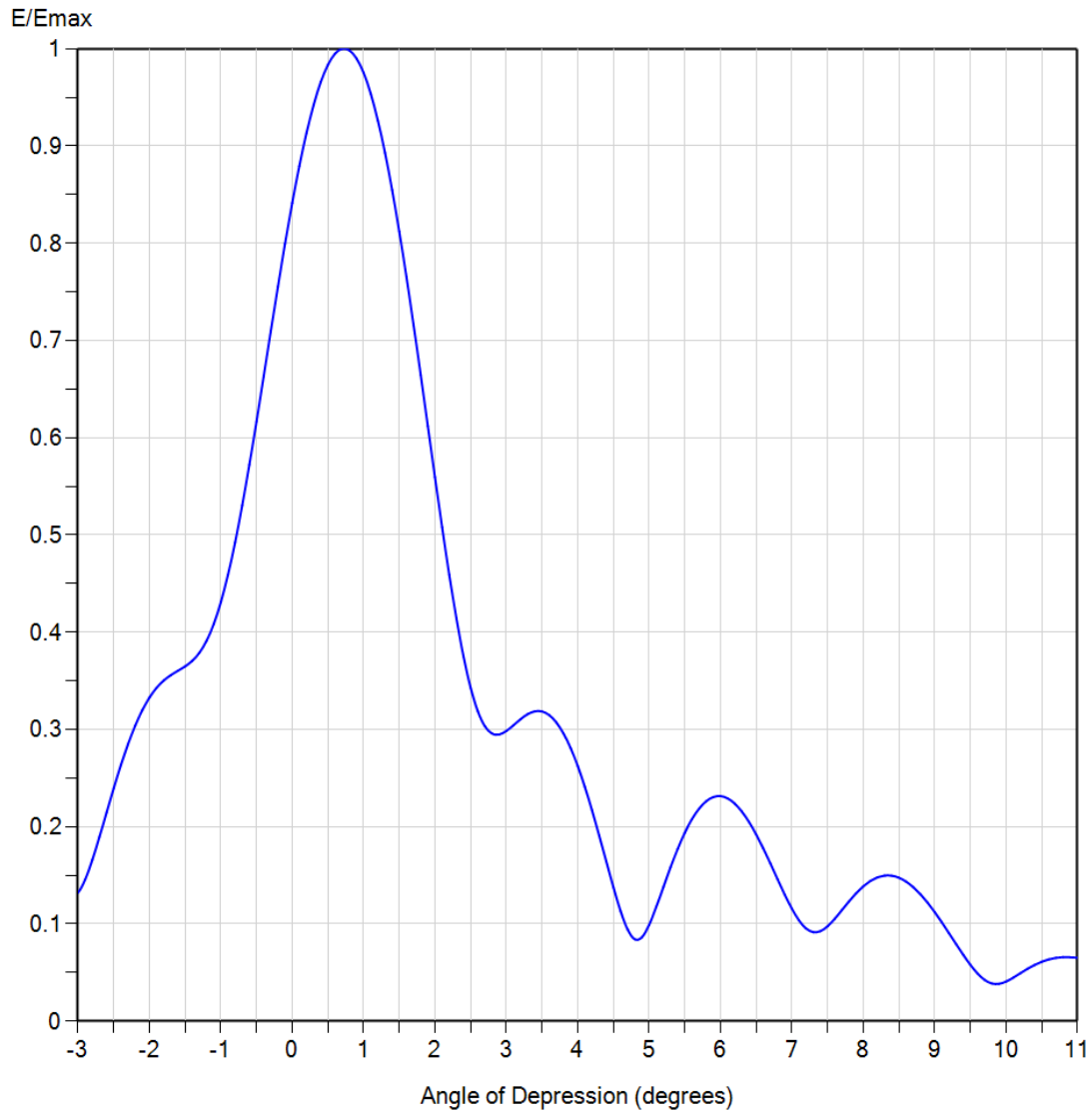
Polarization: **Vertical**
Frequency (MHz): **623.00**
Directivity: **2.5 (4.04 dB)**
Elevation Angle: **0.75 degrees**
Rotation Angle: **0 degrees**

TABULATED AZIMUTH PATTERN

Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field	Angl	Field
0	0.999	45	0.899	90	0.517	135	0.194	180	0.125	225	0.200	270	0.494	315	0.864
1	0.999	46	0.893	91	0.508	136	0.187	181	0.125	226	0.207	271	0.502	316	0.871
2	1.000	47	0.886	92	0.500	137	0.180	182	0.124	227	0.214	272	0.510	317	0.877
3	1.000	48	0.879	93	0.492	138	0.173	183	0.123	228	0.221	273	0.518	318	0.884
4	1.000	49	0.873	94	0.484	139	0.166	184	0.122	229	0.228	274	0.526	319	0.890
5	1.000	50	0.865	95	0.475	140	0.159	185	0.120	230	0.235	275	0.534	320	0.896
6	1.000	51	0.858	96	0.467	141	0.152	186	0.119	231	0.241	276	0.542	321	0.901
7	1.000	52	0.851	97	0.459	142	0.146	187	0.117	232	0.248	277	0.551	322	0.907
8	1.000	53	0.843	98	0.451	143	0.139	188	0.115	233	0.255	278	0.559	323	0.912
9	0.999	54	0.835	99	0.443	144	0.133	189	0.112	234	0.261	279	0.568	324	0.917
10	0.999	55	0.827	100	0.436	145	0.126	190	0.110	235	0.267	280	0.576	325	0.922
11	0.999	56	0.819	101	0.428	146	0.121	191	0.108	236	0.273	281	0.585	326	0.927
12	0.998	57	0.811	102	0.420	147	0.115	192	0.105	237	0.279	282	0.594	327	0.931
13	0.997	58	0.803	103	0.413	148	0.110	193	0.102	238	0.286	283	0.602	328	0.936
14	0.997	59	0.795	104	0.405	149	0.105	194	0.100	239	0.291	284	0.611	329	0.940
15	0.996	60	0.786	105	0.398	150	0.101	195	0.097	240	0.297	285	0.620	330	0.944
16	0.995	61	0.777	106	0.390	151	0.097	196	0.095	241	0.303	286	0.629	331	0.948
17	0.994	62	0.769	107	0.383	152	0.094	197	0.092	242	0.309	287	0.637	332	0.952
18	0.993	63	0.760	108	0.376	153	0.092	198	0.090	243	0.315	288	0.646	333	0.955
19	0.992	64	0.751	109	0.369	154	0.090	199	0.088	244	0.321	289	0.655	334	0.958
20	0.990	65	0.742	110	0.362	155	0.089	200	0.087	245	0.326	290	0.664	335	0.962
21	0.989	66	0.733	111	0.355	156	0.089	201	0.086	246	0.332	291	0.673	336	0.965
22	0.987	67	0.724	112	0.348	157	0.089	202	0.086	247	0.338	292	0.681	337	0.967
23	0.985	68	0.715	113	0.341	158	0.089	203	0.086	248	0.344	293	0.690	338	0.970
24	0.983	69	0.706	114	0.334	159	0.091	204	0.086	249	0.350	294	0.699	339	0.973
25	0.981	70	0.696	115	0.327	160	0.092	205	0.088	250	0.356	295	0.707	340	0.975
26	0.979	71	0.687	116	0.321	161	0.094	206	0.090	251	0.362	296	0.716	341	0.977
27	0.977	72	0.678	117	0.314	162	0.096	207	0.092	252	0.368	297	0.725	342	0.979
28	0.974	73	0.669	118	0.308	163	0.099	208	0.096	253	0.374	298	0.733	343	0.981
29	0.971	74	0.660	119	0.301	164	0.101	209	0.099	254	0.380	299	0.742	344	0.983
30	0.968	75	0.650	120	0.295	165	0.104	210	0.104	255	0.387	300	0.750	345	0.985
31	0.965	76	0.641	121	0.288	166	0.106	211	0.109	256	0.393	301	0.758	346	0.986
32	0.962	77	0.632	122	0.282	167	0.109	212	0.114	257	0.399	302	0.767	347	0.988
33	0.958	78	0.623	123	0.275	168	0.111	213	0.119	258	0.406	303	0.775	348	0.989
34	0.955	79	0.614	124	0.269	169	0.113	214	0.125	259	0.413	304	0.783	349	0.991
35	0.951	80	0.605	125	0.262	170	0.116	215	0.131	260	0.420	305	0.791	350	0.992
36	0.946	81	0.596	126	0.256	171	0.118	216	0.138	261	0.427	306	0.799	351	0.993
37	0.942	82	0.587	127	0.249	172	0.119	217	0.144	262	0.434	307	0.807	352	0.994
38	0.937	83	0.578	128	0.242	173	0.121	218	0.151	263	0.441	308	0.814	353	0.995
39	0.933	84	0.569	129	0.236	174	0.122	219	0.158	264	0.448	309	0.822	354	0.996
40	0.927	85	0.560	130	0.229	175	0.124	220	0.165	265	0.455	310	0.829	355	0.997
41	0.922	86	0.551	131	0.222	176	0.124	221	0.172	266	0.463	311	0.837	356	0.997
42	0.917	87	0.543	132	0.215	177	0.125	222	0.179	267	0.470	312	0.844	357	0.998
43	0.911	88	0.534	133	0.208	178	0.125	223	0.186	268	0.478	313	0.851	358	0.998
44	0.905	89	0.525	134	0.201	179	0.125	224	0.193	269	0.486	314	0.858	359	0.999



Elevation Pattern

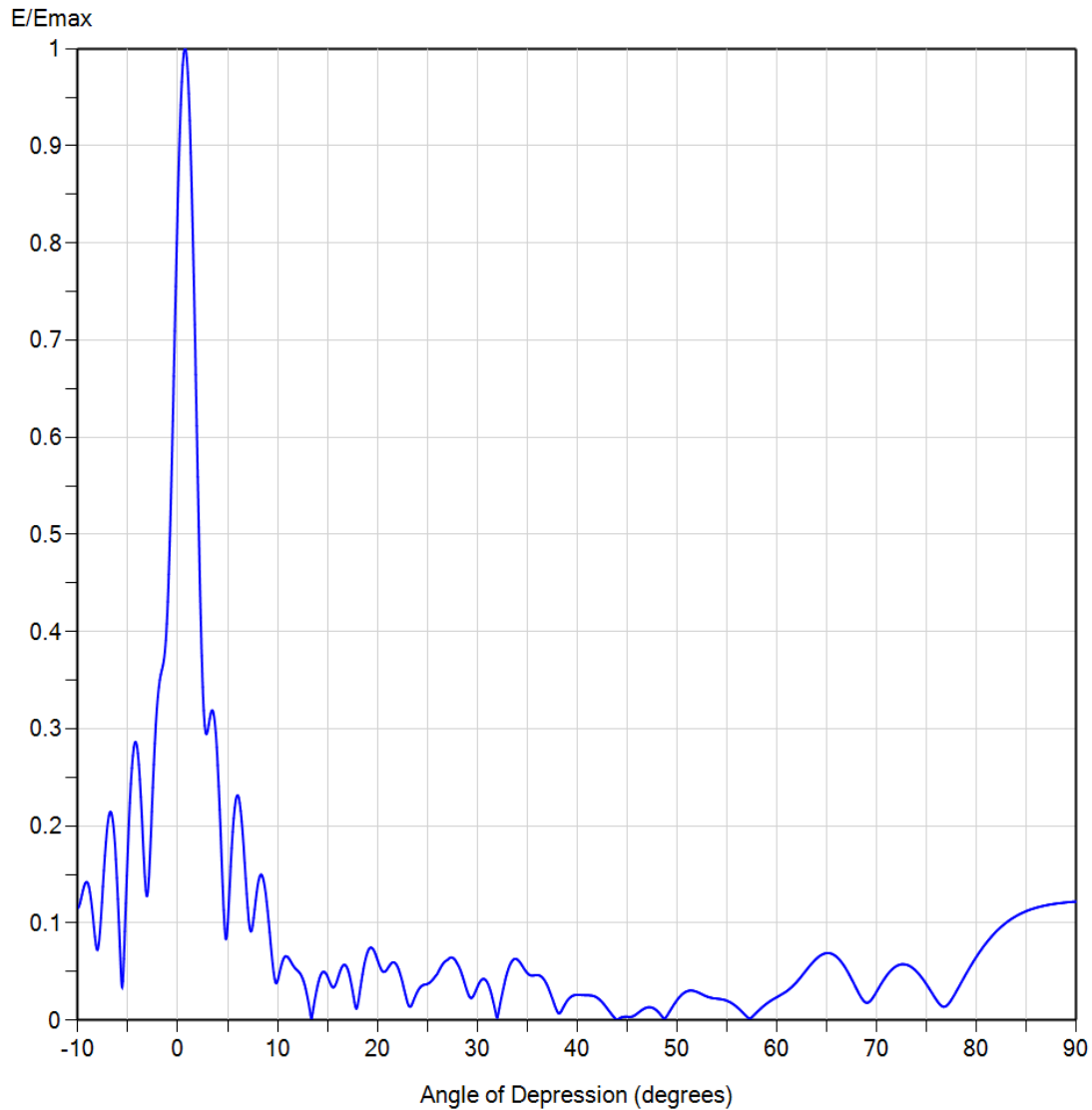


Model: SBB-EPD-24C170
Polarization: Vertical
Location: Lake Dallas, Texas
Customer: Station KAZD-DT
Date: July 22, 2018

Frequency: 623.00 MHz
Directivity (Main Lobe): 22.4 (13.50 dBd)
Directivity (At Horizon): 15.9 (12.00 dBd)
Beam Tilt: 0.75 degrees
Azimuth Angle: 5 degrees



Elevation Pattern



Model:	SBB-EPD-24C170	Frequency:	623.00 MHz
Polarization:	<u>Vertical</u>	Directivity (Main Lobe):	22.4 (13.50 dBd)
Location:	Lake Dallas, Texas	Directivity (At Horizon):	15.9 (12.00 dBd)
Customer:	Station KAZD-DT	Beam Tilt:	0.75 degrees
Date:	July 22, 2018	Azimuth Angle:	5 degrees



Model: **SBB-EPD-24C170**
Location: **Lake Dallas, Texas**
Customer: **Station KAZD-DT**
Date: **July 22, 2018**

Polarization: **Vertical**
Frequency (MHz): **623.00**
Directivity (Main Lobe): **22.4 (13.50 dB)**
Directivity (At Horizon): **15.9 (12.00 dB)**
Beam Tilt: **0.75 degrees**

TABULATED ELEVATION PATTERN

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.115	2.4	0.375	10.6	0.063	30.5	0.042	51.0	0.030	71.5	0.052
-9.5	0.133	2.6	0.319	10.8	0.066	31.0	0.039	51.5	0.030	72.0	0.056
-9.0	0.141	2.8	0.296	11.0	0.065	31.5	0.023	52.0	0.029	72.5	0.058
-8.5	0.106	3.0	0.298	11.5	0.057	32.0	0.003	52.5	0.027	73.0	0.057
-8.0	0.073	3.2	0.311	12.0	0.051	32.5	0.028	53.0	0.024	73.5	0.054
-7.5	0.138	3.4	0.319	12.5	0.043	33.0	0.049	53.5	0.023	74.0	0.050
-7.0	0.204	3.6	0.315	13.0	0.023	33.5	0.061	54.0	0.022	74.5	0.044
-6.5	0.205	3.8	0.296	13.5	0.007	34.0	0.063	54.5	0.021	75.0	0.037
-6.0	0.125	4.0	0.262	14.0	0.035	34.5	0.056	55.0	0.020	75.5	0.029
-5.5	0.040	4.2	0.217	14.5	0.049	35.0	0.049	55.5	0.017	76.0	0.021
-5.0	0.176	4.4	0.164	15.0	0.045	35.5	0.046	56.0	0.013	76.5	0.015
-4.5	0.272	4.6	0.113	15.5	0.034	36.0	0.046	56.5	0.009	77.0	0.015
-4.0	0.275	4.8	0.084	16.0	0.042	36.5	0.044	57.0	0.004	77.5	0.021
-3.5	0.188	5.0	0.099	16.5	0.056	37.0	0.036	57.5	0.003	78.0	0.030
-3.0	0.132	5.2	0.138	17.0	0.053	37.5	0.023	58.0	0.008	78.5	0.039
-2.8	0.166	5.4	0.177	17.5	0.030	38.0	0.009	58.5	0.013	79.0	0.049
-2.6	0.215	5.6	0.208	18.0	0.015	38.5	0.011	59.0	0.017	79.5	0.057
-2.4	0.263	5.8	0.226	18.5	0.047	39.0	0.020	59.5	0.021	80.0	0.066
-2.2	0.304	6.0	0.231	19.0	0.070	39.5	0.025	60.0	0.024	80.5	0.073
-2.0	0.333	6.2	0.224	19.5	0.074	40.0	0.026	60.5	0.027	81.0	0.080
-1.8	0.350	6.4	0.205	20.0	0.062	40.5	0.026	61.0	0.030	81.5	0.086
-1.6	0.360	6.6	0.177	20.5	0.050	41.0	0.026	61.5	0.034	82.0	0.092
-1.4	0.371	6.8	0.146	21.0	0.053	41.5	0.025	62.0	0.040	82.5	0.096
-1.2	0.391	7.0	0.116	21.5	0.059	42.0	0.023	62.5	0.046	83.0	0.101
-1.0	0.431	7.2	0.095	22.0	0.055	42.5	0.019	63.0	0.052	83.5	0.104
-0.8	0.492	7.4	0.093	22.5	0.039	43.0	0.012	63.5	0.058	84.0	0.107
-0.6	0.572	7.6	0.105	23.0	0.018	43.5	0.005	64.0	0.064	84.5	0.110
-0.4	0.663	7.8	0.123	23.5	0.017	44.0	0.000	64.5	0.067	85.0	0.112
-0.2	0.755	8.0	0.139	24.0	0.029	44.5	0.003	65.0	0.069	85.5	0.114
0.0	0.841	8.2	0.148	24.5	0.036	45.0	0.004	65.5	0.068	86.0	0.116
0.2	0.913	8.4	0.150	25.0	0.037	45.5	0.004	66.0	0.065	86.5	0.117
0.4	0.966	8.6	0.143	25.5	0.041	46.0	0.007	66.5	0.059	87.0	0.118
0.6	0.995	8.8	0.131	26.0	0.048	46.5	0.011	67.0	0.051	87.5	0.119
0.8	0.998	9.0	0.112	26.5	0.057	47.0	0.013	67.5	0.042	88.0	0.120
1.0	0.975	9.2	0.091	27.0	0.062	47.5	0.013	68.0	0.032	88.5	0.121
1.2	0.926	9.4	0.068	27.5	0.064	48.0	0.010	68.5	0.022	89.0	0.121
1.4	0.855	9.6	0.049	28.0	0.058	48.5	0.004	69.0	0.018	89.5	0.122
1.6	0.765	9.8	0.039	28.5	0.046	49.0	0.005	69.5	0.022	90.0	0.122
1.8	0.664	10.0	0.041	29.0	0.029	49.5	0.013	70.0	0.030		
2.0	0.559	10.2	0.049	29.5	0.023	50.0	0.021	70.5	0.038		
2.2	0.459	10.4	0.058	30.0	0.034	50.5	0.027	71.0	0.046		



NORTH AMERICA

United States of America

200 Pondview Drive
Meriden, Connecticut 06450, USA
Tel: +1 203 630 3311
BroadcastTechSupport@rfsworld.com

ASIA PACIFIC

Australia

36 Garden Street
Kilsyth, Victoria 3137, Australia
Tel: +61 3 9751 8400
sales.aps@rfsworld.com

People Republic of China

299 Rongle Road(E), Songjiang
201613, Shanghai, P.R. China
Tel: +86 21 3773 8888
sales.apn@rfsworld.com

LATIN AMERICA

Brazil

Rua Marcelino Pinto Teixeira, 481
CEP 06816-000 Embu - Sao Paulo, Brazil
Tel: +55 11 4785 6000
sales.latam@rfsworld.com

EUROPE

France

Centre de Villarceaux, Route de Villejust
Bâtiment Newton E, 91620 Nozay, France
Tel: +33 (0) 2 40 45 95 45
sales.europe@rfsworld.com

Germany

Kabelkamp 20
30179 Hannover, Germany
Tel: +49 511 676 2000
sales.europe@rfsworld.com

United Kingdom

9, Haddenham Business Park
Pegasus Way, Haddenham,
Aylesbury, Bucks, HP17 8LJ
United Kingdom
Tel: +44 1844 2949 00
rfs.uk@rfsworld.com