ELECTRONICS RESEARCH, INC. ERI®

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone (812) 925-6000 Fax (812) 925-4030 http://www.eriinc.com/

Directional Antenna System for WNCW, Spindale, North Carolina

February 13, 2018

Electronics Research Inc. is providing a custom fabricated antenna system that is specially designed to meet the FCC requirements and the general needs of radio station WNCW.

The antenna is the ERI model 1192-1CP-DA configuration. The circular polarized system consists of one bay using one driven circular polarized radiating element. The antenna was mounted off the North 274 degrees East tower face with bracketry to provide an antenna orientation of North 240 degrees East. The antenna was tested on a 60" PiRod tower, which is the structure the station plans to use to support the array. All tests were performed on a frequency of 88.7 megahertz, which is the center of the FM broadcast channel assigned to WNCW.

Pattern measurements were made on a sixty-acre antenna pattern range that is owned and operated by Electronics Research, Inc. The tests were performed under the direction of Thomas B. Silliman, president of Electronics Research, Inc. Mr. Silliman has the Bachelor of Electrical Engineering and the Master of Electrical Engineering degrees from Cornell University and is a registered professional engineer in the states of Indiana, Maryland and Minnesota.

Directional Antenna System
For
WNCW, Spindale, North Carolina

(Continued)

DESCRIPTION OF THE TEST PROCEDURE

The test antenna consisted of a full-scale model of the complete circular polarized system. The elements and brackets that were used in this test are electrically equivalent to those that will be supplied with the antenna.

The power distribution and phase relationship to the antenna elements was adjusted in order to achieve the directional radiation patterns for both horizontal and vertical polarization components.

The proof-of-performance was accomplished using a 60" PiRod tower with identical dimension and configuration including all braces, ladders, conduits, coaxial lines and other appurtenances that are included in the actual aperture at which the antenna will be installed. The structure was erected vertically on a turntable mounted on a non-metallic building with the antenna centered vertically on the structure, making the center of radiation of the test approximately 30 feet above ground. The turntable is equipped with a motor drive and a US Digital angle position indicator. The resolution of this angle position indicator is one-hundredth of a degree.

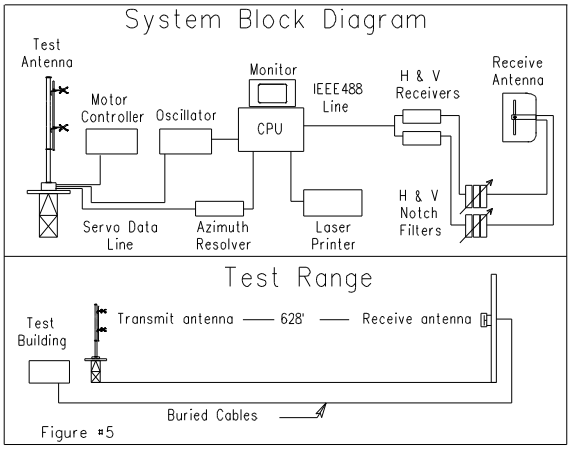

Figure #5

The antenna under test was operated in the transmitting mode and fed from a HP8657D signal generator. The frequency of the signal source was set at 88.7 MHz and was constantly monitored by a Rohde & Schwarz ESVD measuring receiver.

A broadband horizontal and vertical dipole system, located approximately 628 feet from the test antenna, was used to receive the emitted test signals. The dipole system was mounted at the same height above terrain as the center of the antenna under test. The signals received by the dipole system were fed to the test building by way of two buried Heliax cables to a Rohde & Schwarz measuring receiver.

(Continued)

This data was interfaced to a laser jet printer by means of a computer system. Relative field strength was plotted as a function of azimuth.

The measurements were performed by rotating the test antenna in a counter-clockwise direction and plotting the received signal on polar co-ordinated graph paper in a clockwise direction. Both horizontal and vertical components were recorded separately.

CONCLUSIONS

The circular polarized system consists of one bay using one driven circular polarized radiating element. The power distribution and phase relationship will be fixed when the antenna is manufactured. Proper maintenance of the elements should be all that is required to maintain the pattern in adjustment.

The 1192-1CP-DA array is to be mounted off the North 274 degrees East tower face of the 60" PiRod tower at a bearing of North 240 degrees East. Blue prints provided with the antenna will show the proper antenna orientation alignment. The antenna alignment procedure should be directed by a licensed surveyor as prescribed by the FCC.

Figure #1 represents the measured individual horizontal and vertical components, the composite maximum of either the horizontal or vertical component at any azimuth and the FCC filed envelope pattern. The horizontal plane relative field list for the composite pattern and the individual H & V components are shown as Figure #1 & 1A respectively. The actual measured pattern does not exceed the authorized FCC composite pattern at any azimuth. A calculated vertical plane relative field pattern is shown on Figure #3 attached. The power in the maximum will reach 17.000 kilowatts (12.304 dBk).

The RMS of the vertically polarized horizontal plane component does not exceed the RMS of the horizontally polarized horizontal plane component.

The composite horizontal and vertical maximum relative field pattern obtained from the measured data as shown on Figure #1 has an RMS that is greater that 85% of the filed composite pattern.

The clear vertical length of the structure required to support the antenna is 20.

(Continued)

The directional antenna should not be mounted on the top of an antenna tower that includes a top-mounted platform larger than the cross-sectional area of the tower in the horizontal plane. No obstructions other than those that are specified by the blue prints supplied with the antenna are to be mounted within 75 ft. horizontally of the system. The vertical distance to the nearest obstruction should be a minimum of 10 ft. from the directional antenna. Metallic guy wires should be a minimum distance of forty feet horizontally from the antenna.

ELECTRONICS RESEARCH, INC.

ERI® Horizontal Plane Relative Field Pattern

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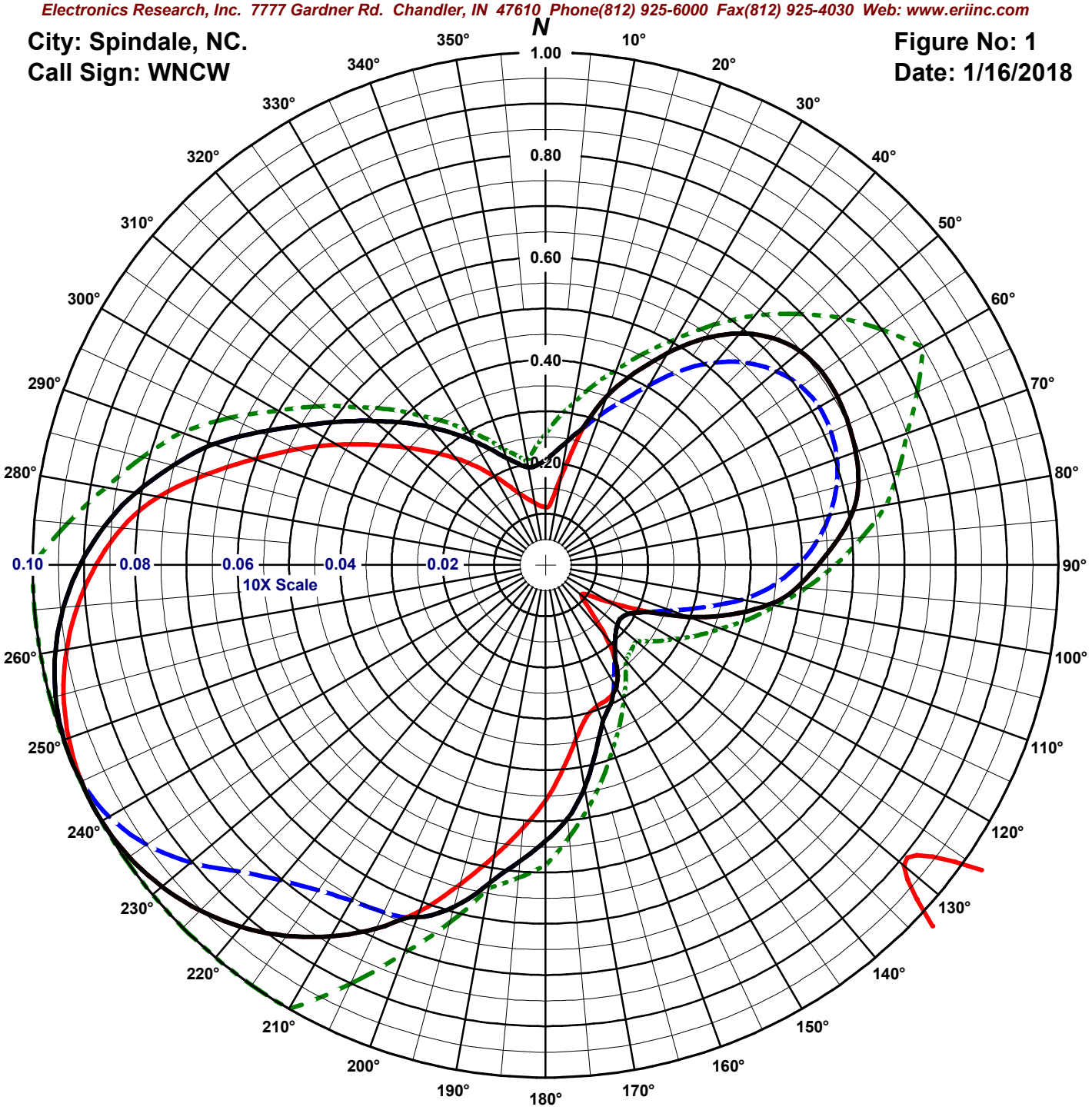
City: Spindale, NC.
Call Sign: WNCW

Figure No: 1
Date: 1/16/2018



Antenna Orientation: 240° True

Frequency: 88.7 MHz
Antenna Type: 1192-1CP-DA

Antenna Mounting: Custom
Tower Type: 60" PiRod tower

HORIZONTAL	VERTICAL	COMPOSITE	FCC ENVELOPE
RMS: .576	RMS: .574	RMS: .598	RMS: .65
Maximum: 1 @ 242°	Maximum: 1 @ 248°	Maximum: 1 @ 242°	Maximum: 1 @ 210°
Minimum: .091 @ 129°	Minimum: .18 @ 126°	Minimum: .18 @ 126°	Minimum: .204 @ 350°

Measured patterns of the horizontal and vertical components. The composite pattern shows the maximum of either the H or V azimuth values. This patterns is greater than 85% of the FCC filed composite pattern BPED-20180208ABS.

ERI® Horizontal Plane Relative Field Pattern

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone(812) 925-6000 Fax(812) 925-4030 Web: www.eriinc.com

Figure# 1 **Date: 1/16/2018**
Station: WNCW **Antenna: 1192-1CP-DA**
Location: Spindale, NC. **Antenna Orientation: 240° True**
Frequency: 88.7 MHz **Number of Bays: 1**

Azimuth	Envelope			Polarization	Azimuth	Envelope			Polarization
	Field	kW	dBk	Maximum		Field	kW	dBk	Maximum
0°	0.205	0.713	-1.469	Vertical	180°	0.539	4.934	6.932	Vertical
5°	0.222	0.835	-0.782	Vertical	185°	0.581	5.741	7.590	Vertical
10°	0.245	1.020	0.084	Vertical	190°	0.631	6.761	8.300	Vertical
15°	0.275	1.282	1.077	Vertical	195°	0.691	8.116	9.094	Vertical
20°	0.350	2.087	3.195	Horizontal	200°	0.731	9.096	9.588	Vertical
25°	0.414	2.915	4.647	Horizontal	205°	0.782	10.406	10.173	Horizontal
30°	0.478	3.877	5.885	Horizontal	210°	0.837	11.901	10.756	Horizontal
35°	0.539	4.937	6.935	Horizontal	215°	0.883	13.259	11.225	Horizontal
40°	0.589	5.902	7.710	Horizontal	220°	0.922	14.447	11.598	Horizontal
45°	0.626	6.658	8.233	Horizontal	225°	0.953	15.434	11.885	Horizontal
50°	0.648	7.146	8.541	Horizontal	230°	0.976	16.196	12.094	Horizontal
55°	0.657	7.343	8.659	Horizontal	235°	0.992	16.714	12.231	Horizontal
60°	0.657	7.335	8.654	Horizontal	240°	0.999	16.976	12.298	Horizontal
65°	0.652	7.226	8.589	Horizontal	245°	0.998	16.944	12.290	Horizontal
70°	0.644	7.043	8.478	Horizontal	250°	0.999	16.959	12.294	Vertical
75°	0.632	6.785	8.315	Horizontal	255°	0.989	16.626	12.208	Vertical
80°	0.609	6.305	7.997	Horizontal	260°	0.970	16.004	12.042	Vertical
85°	0.572	5.567	7.457	Horizontal	265°	0.943	15.121	11.796	Vertical
90°	0.532	4.807	6.819	Horizontal	270°	0.907	13.999	11.461	Vertical
95°	0.493	4.134	6.164	Horizontal	275°	0.863	12.669	11.028	Vertical
100°	0.444	3.351	5.252	Horizontal	280°	0.811	11.187	10.487	Vertical
105°	0.374	2.372	3.752	Horizontal	285°	0.751	9.588	9.817	Vertical
110°	0.296	1.489	1.730	Horizontal	290°	0.689	8.073	9.070	Vertical
115°	0.217	0.800	-0.969	Vertical	295°	0.614	6.407	8.066	Vertical
120°	0.190	0.615	-2.112	Vertical	300°	0.545	5.043	7.027	Vertical
125°	0.180	0.551	-2.586	Vertical	305°	0.487	4.037	6.061	Vertical
130°	0.183	0.567	-2.460	Vertical	310°	0.437	3.245	5.113	Vertical
135°	0.193	0.635	-1.973	Vertical	315°	0.392	2.615	4.175	Vertical
140°	0.211	0.754	-1.227	Vertical	320°	0.352	2.101	3.225	Vertical
145°	0.242	0.997	-0.012	Horizontal	325°	0.313	1.665	2.214	Vertical
150°	0.276	1.294	1.121	Horizontal	330°	0.278	1.317	1.195	Vertical
155°	0.300	1.530	1.848	Vertical	335°	0.248	1.041	0.176	Vertical
160°	0.327	1.818	2.596	Vertical	340°	0.222	0.839	-0.763	Vertical
165°	0.378	2.429	3.854	Vertical	345°	0.205	0.711	-1.480	Vertical
170°	0.440	3.299	5.183	Vertical	350°	0.193	0.636	-1.967	Vertical
175°	0.497	4.191	6.223	Vertical	355°	0.195	0.646	-1.900	Vertical

Horizontal Polarization:
Maximum: 1.324 (1.219 dB)
Horizontal Plane: 1.324 (1.219 dB)
Maximum ERP: 17.000 kW

Vertical Polarization:
Maximum: 1.324 (1.219 dB)
Horizontal Plane: 1.324 (1.219 dB)
Maximum ERP: 17.000 kW

Total Input Power: 12.839 kW
Reference: WNCW1M.FIG
This list shows the the maximum azimuth values of either the horizontal or vertical components.

ERI® Horizontal Plane Relative Field Pattern

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Figure# 1A **Date: 1/16/2018**
Station: WNCW **Antenna: 1192-1CP-DA**
Location: Spindale, NC. **Antenna Orientation: 240° True**
Frequency: 88.7 MHz **Number of Bays: 1**

Azimuth	Horizontal			Vertical			Azimuth	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	0.113	0.216	-6.664	0.205	0.713	-1.469	180°	0.460	3.593	5.554	0.539	4.934	6.932
5°	0.122	0.255	-5.934	0.222	0.835	-0.782	185°	0.516	4.531	6.562	0.581	5.741	7.590
10°	0.174	0.514	-2.887	0.245	1.020	0.084	190°	0.577	5.668	7.534	0.631	6.761	8.300
15°	0.268	1.224	0.878	0.275	1.282	1.077	195°	0.646	7.086	8.504	0.691	8.116	9.094
20°	0.350	2.087	3.195	0.311	1.641	2.151	200°	0.719	8.794	9.442	0.731	9.096	9.588
25°	0.414	2.915	4.647	0.353	2.121	3.266	205°	0.782	10.406	10.173	0.747	9.498	9.776
30°	0.478	3.877	5.885	0.405	2.787	4.452	210°	0.837	11.901	10.756	0.756	9.723	9.878
35°	0.539	4.937	6.935	0.464	3.653	5.627	215°	0.883	13.259	11.225	0.774	10.191	10.082
40°	0.589	5.902	7.710	0.516	4.520	6.551	220°	0.922	14.447	11.598	0.803	10.970	10.402
45°	0.626	6.658	8.233	0.557	5.278	7.225	225°	0.953	15.434	11.885	0.846	12.164	10.851
50°	0.648	7.146	8.541	0.588	5.876	7.690	230°	0.976	16.196	12.094	0.903	13.858	11.417
55°	0.657	7.343	8.659	0.608	6.276	7.977	235°	0.992	16.714	12.231	0.950	15.348	11.861
60°	0.657	7.335	8.654	0.616	6.456	8.100	240°	0.999	16.976	12.298	0.982	16.397	12.148
65°	0.652	7.226	8.589	0.614	6.418	8.074	245°	0.998	16.944	12.290	0.998	16.932	12.287
70°	0.644	7.043	8.478	0.605	6.212	7.932	250°	0.989	16.636	12.211	0.999	16.959	12.294
75°	0.632	6.785	8.315	0.587	5.864	7.682	255°	0.972	16.076	12.062	0.989	16.626	12.208
80°	0.609	6.305	7.997	0.563	5.387	7.314	260°	0.948	15.278	11.841	0.970	16.004	12.042
85°	0.572	5.567	7.457	0.531	4.800	6.813	265°	0.916	14.262	11.542	0.943	15.121	11.796
90°	0.532	4.807	6.819	0.493	4.126	6.155	270°	0.876	13.053	11.157	0.907	13.999	11.461
95°	0.493	4.134	6.164	0.447	3.393	5.306	275°	0.829	11.680	10.675	0.863	12.669	11.028
100°	0.444	3.351	5.252	0.389	2.570	4.100	280°	0.766	9.972	9.988	0.811	11.187	10.487
105°	0.374	2.372	3.752	0.320	1.738	2.400	285°	0.684	7.953	9.005	0.751	9.588	9.817
110°	0.296	1.489	1.730	0.260	1.152	0.616	290°	0.604	6.208	7.930	0.689	8.073	9.070
115°	0.213	0.768	-1.144	0.217	0.800	-0.969	295°	0.534	4.844	6.852	0.614	6.407	8.066
120°	0.146	0.361	-4.427	0.190	0.615	-2.112	300°	0.470	3.749	5.740	0.545	5.043	7.027
125°	0.104	0.183	-7.380	0.180	0.551	-2.586	305°	0.409	2.837	4.529	0.487	4.037	6.061
130°	0.091	0.142	-8.487	0.183	0.567	-2.460	310°	0.356	2.155	3.335	0.437	3.245	5.113
135°	0.120	0.246	-6.091	0.193	0.635	-1.973	315°	0.311	1.645	2.162	0.392	2.615	4.175
140°	0.184	0.576	-2.392	0.211	0.754	-1.227	320°	0.272	1.253	0.981	0.352	2.101	3.225
145°	0.242	0.997	-0.012	0.235	0.936	-0.288	325°	0.234	0.933	-0.303	0.313	1.665	2.214
150°	0.276	1.294	1.121	0.267	1.214	0.843	330°	0.200	0.682	-1.662	0.278	1.317	1.195
155°	0.288	1.415	1.506	0.300	1.530	1.848	335°	0.171	0.498	-3.025	0.248	1.041	0.176
160°	0.293	1.464	1.655	0.327	1.818	2.596	340°	0.147	0.369	-4.333	0.222	0.839	-0.763
165°	0.308	1.615	2.082	0.378	2.429	3.854	345°	0.133	0.303	-5.192	0.205	0.711	-1.480
170°	0.344	2.011	3.034	0.440	3.299	5.183	350°	0.123	0.257	-5.897	0.193	0.636	-1.967
175°	0.398	2.699	4.312	0.497	4.191	6.223	355°	0.116	0.229	-6.401	0.195	0.646	-1.900

Horizontal Polarization:
Maximum: 1.324 (1.219 dB)
Horizontal Plane: 1.324 (1.219 dB)
Maximum ERP: 17.000 kW

Vertical Polarization:
Maximum: 1.324 (1.219 dB)
Horizontal Plane: 1.324 (1.219 dB)
Maximum ERP: 17.000 kW

Total Input Power: 12.839 kW
Reference: WNCW1M.FIG
This list shows the azimuth values for the horizontal and vertical components.

Vertical Plane Relative Field Pattern

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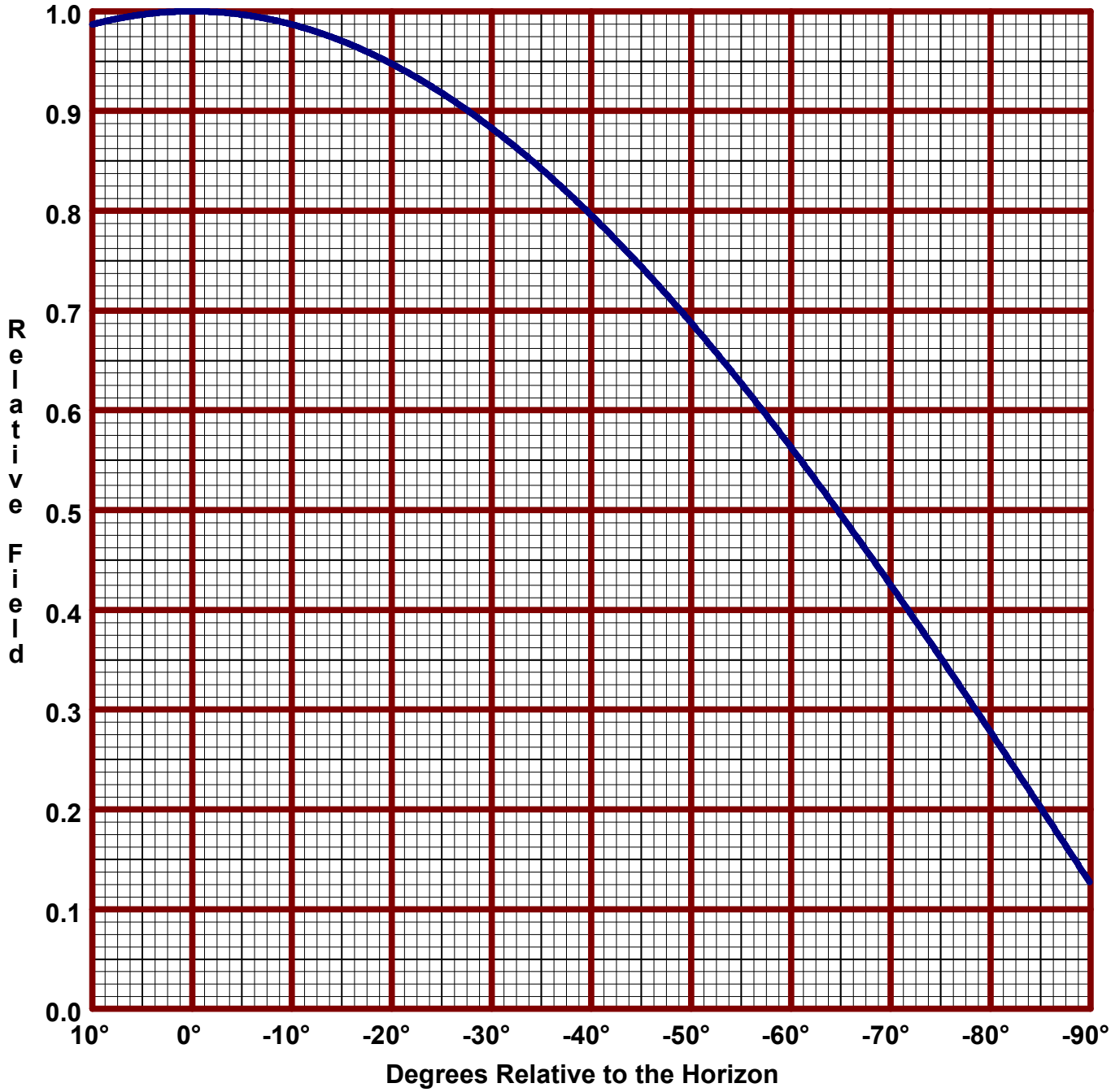
Figure No: 3
Call Sign: WNCW
Location: Spindale, NC.
Frequency: 88.7 MHz
Antenna: 1 bay 1192-1CP-DA

Date: 1/16/2018
H/V Power Ratio: 1
1 Wave-length Spacing
0° Beam Tilt
0% First Null Fill



Horizontal Polarization:
Maximum: 1.324 (1.219 dB)
Horizontal Plane: 1.324 (1.219 dB)
Maximum ERP: 17.000 kW

Vertical Polarization:
Maximum: 1.324 (1.219 dB)
Horizontal Plane: 1.324 (1.219 dB)
Maximum ERP: 17.000 kW

Directional Antenna System
for
WNCW, Spindale, North Carolina

(Continued)

ANTENNA SPECIFICATIONS

Antenna Type:	1192-2CP-DA
Frequency:	88.7 MHz
Number of Bays:	One

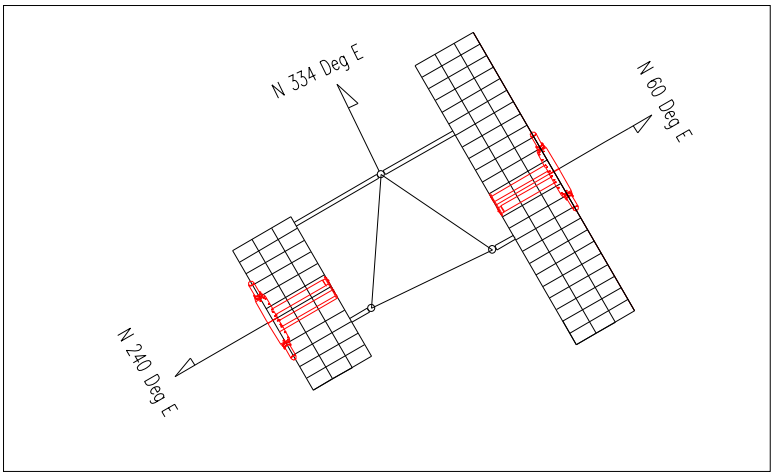
MECHANICAL SPECIFICATIONS

Mounting:	Custom
System length:	12 ft
Aperture length required:	20 ft
Orientation:	240° true

Input flange to the antenna 3 1/8” female.

ELECTRICAL SPECIFICATIONS
(For directional use)

Maximum horizontal ERP:	17.000 kW (12.304 dBk)
Horizontal maximum power gain:	1.324 (1.219 dB)
Maximum vertical ERP:	17.000 kW (12.304 dBk)
Vertical maximum power gain:	1.324 (1.219 dB)
Total input power:	12.839 kW (11.085 dBk)



NOTES:

1. ALL RED BANDS DESIGNATE SIDE TO BE MOUNTED DOWNWARD.
2. ALL FEED HARNESS CONNECTIONS ARE LABELED TO ENSURE PROPER INSTALLATION.
3. ALL FEED HARNESS CONNECTIONS REQUIRE AN O-RING AND GREASE.
4. ALL POWER DIVIDER ELBOWS MAY BE SWIVELED TO BETTER COORDINATE AND MOUNT CABLES
5. ASSEMBLE ANTENNA SYSTEM BY MATING CORRESPONDING COLORS & NUMBERS.
6. CABLES SHOWN HEREON ARE FOR ILLUSTRATION PURPOSES ONLY AND CAN BE MOVED AS NECESSARY TO PROPERLY SECURE TO TOWER MEMBERS AS NEEDED UTILIZING ITEMS #14 & 15 FASTEN CABLES EVERY 3'.
7. ELEVATION TO BE DETERMINED BY THE CUSTOMER/OWNER.

GALVANIZED HARDWARE NOTES:

1. IT IS ERI'S INTENTION THAT A NUT LOCKING DEVICE BE PROVIDED ON ALL BOLTED CONNECTIONS, UNLESS OTHERWISE SPECIFIED.
2. FLAT WASHERS ARE NOT REQUIRED ON CONNECTIONS WITH STANDARD HOLES, BUT MAY BE PROVIDED AND INSTALLED TO ACCOUNT FOR BOLT ASSEMBLY TOLERANCES TO PREVENT NUT JAMMING IN CASE THE BOLT SHANK PROTRUDES OUTSIDE OF THE CONNECTED PLIES. ASTM F436 FLAT WASHERS ARE REQUIRED FOR ALL CONNECTIONS WITH OVERSIZED OR SHORT-SLOTTED HOLES. STRUCTURAL STEEL GRADE PLATE WASHERS OR A CONTINUOUS BAR NOT LESS THAN 5/16" THICK SHALL BE USED FOR ALL CONNECTIONS WITH LONG-SLOTTED HOLES.
3. UNLESS OTHERWISE NOTED, ALL BOLTED CONNECTIONS SHALL INITIALLY BE BROUGHT TO A SNUG-TIGHT CONDITION WHERE JOINT TIGHTNESS IS ATTAINED WITH A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH TO BRING THE PLIES INTO FIRM CONTACT. A SYSTEMATIC APPROACH SHALL BE USED TO BRING THE JOINT INTO A SNUG-TIGHT CONDITION STARTING WITH THE MOST RIGID PART OF THE JOINT AND PROCEEDING TOWARD THE FREE EDGES.
4. FOR FINAL TIGHTENING, ERI RECOMMENDS AN ADDITIONAL 1/3 TURN BE APPLIED TO ALL BOLTS UP TO Ø3/4" OR TORQUED AN ADDITIONAL 150 FT-LBS FOR BOLTS OVER Ø3/4", UNLESS OTHERWISE NOTED. FINAL TIGHTENING OF ALL BOLTS SHOULD BE COMPLETED AFTER FINAL CONSTRUCTION OF THE STRUCTURE/ASSEMBLY. PLEASE NOTE, SPECIAL ATTENTION SHALL BE GIVEN TO TIGHTENING OF 1/2"-DIAMETER A325 BOLTS, U-BOLTS, AND THREADED RODS AS TO PREVENT STRIPPING THE THREADS FROM OVER-TIGHTENING.

STAINLESS STEEL HARDWARE NOTES:

1. TORQUE 5/16" = 18 LBS-FT
2. TORQUE 3/8" = 28 LBS-FT
3. TORQUE 1/2"= 50-55 LBS-FT

ITEM	QTY	PART NUMBER	DESCRIPTION
15	1	31670-1E	ROUND MEMBER ADAPTOR 1" TO 2" OD
14	1	42396A-2	HANGER KIT 1-5/8" HELIAX EW44 STANDARD (PKG OF 10)
13	2	RLA100-21	1-5/8" HARDWARE KIT
12	60	UB1011-0487GA	5/8-11 x 4-7/8" C-C GALV. U-BOLT W/NUT LW&FW
11	2	HJ7-50A	1-5/8" 50 OHM STANDARD AIR HELIAX, (15' OVER ENDS LENGTH)
10	4	H7FB-110-S	CONNECTOR 1-5/8" GAS PASS AIR HELIAX
9	1	PD35670	POWER DIVIDER
8	8	35670-BT11	POWER DIVIDER MNT. BRKT.
7	3	35670-BT10	POWER DIVIDER MAIN MNT.
6	2	35670-BT5	ANTENNA MOUNT BRACKET
5	4	35670-BT4	ANTENNA MOUNT BRACKET
4	4	35670-BT2	ANTENNA MOUNT BRACKET
3	2	35670-BT1	ANTENNA MOUNT BRACKET
2	1	IA35670-1B	12' BASKET/ANTENNA ASSEMBLY
1	1	IA35670-1A	6' BASKET/ANTENNA ASSEMBLY

BILL OF MATERIAL

PROJECT NO.	35670/1	
ERI APPROVAL	NAME	DATE
DRAWN BY	gerald	2/8/2018
DRAFTING		
DESIGN MGR.	K. SCHARP	4/5/2018
ENG.		
MANUF.		
EXT. APPROVAL	T. SCHARF	4/5/2018
SUPERSEDES PART NO.		
FILE NAME: IA35670-1.dwg		

ELECTRONICS RESEARCH INC.
ESTABLISHED 1943
7777 GARDNER Rd.
CHANDLER, IN
47610-9219
PHONE: (812) 925-6000
FAX: (812) 925-4030

TITLE:
1192-1CP-DA INSTALLATION DETAILS
SPINDALE, NC
WNCW - FM STATION 88.7 MHz

SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	IA35670-1	

SCALE :	WEIGHT:	SHEET:
1 / 50	N/A	1 OF 9

AISC CERTIFIED FABRICATOR

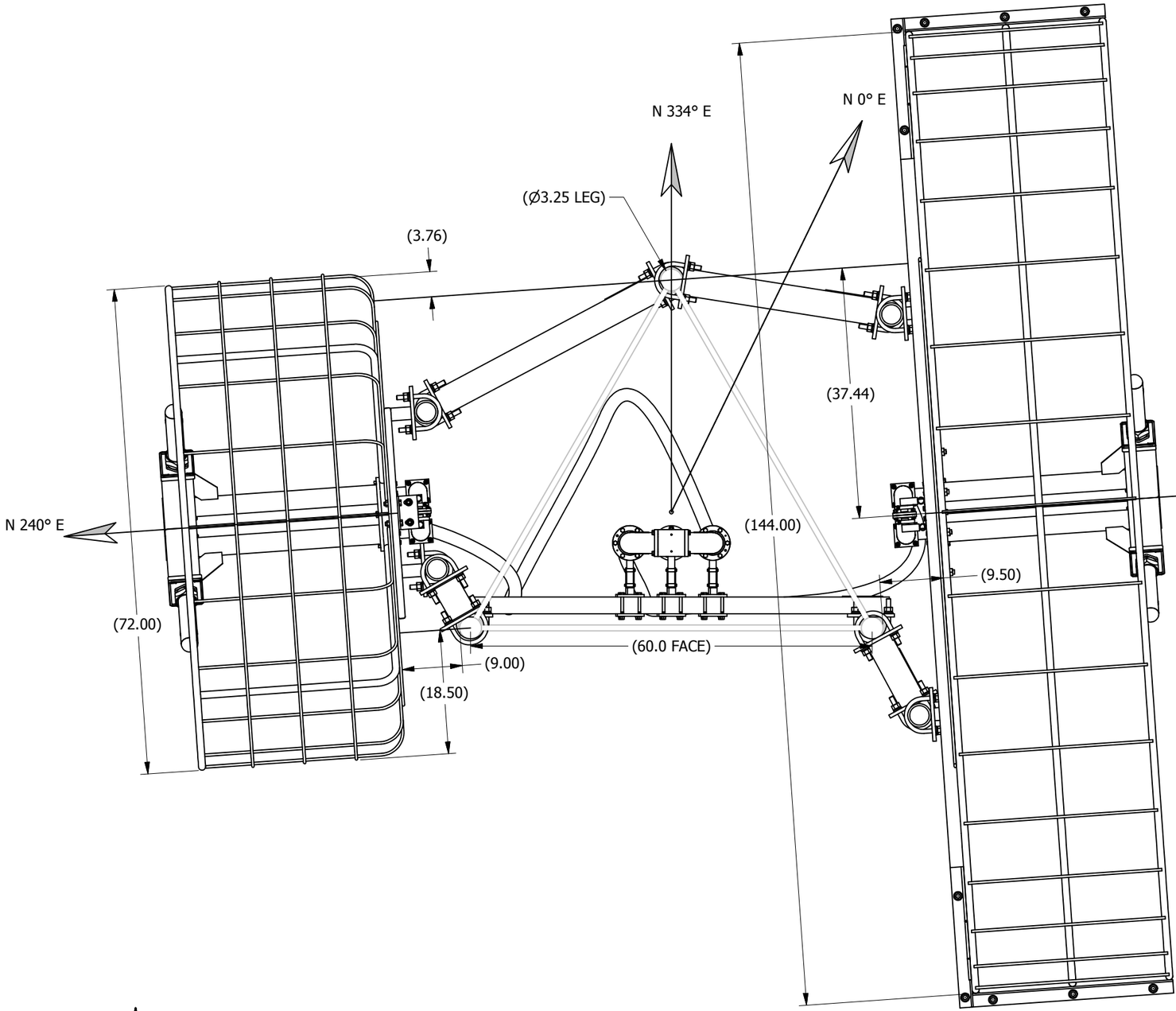
THIRD ANGLE PROJECTION

MATERIAL

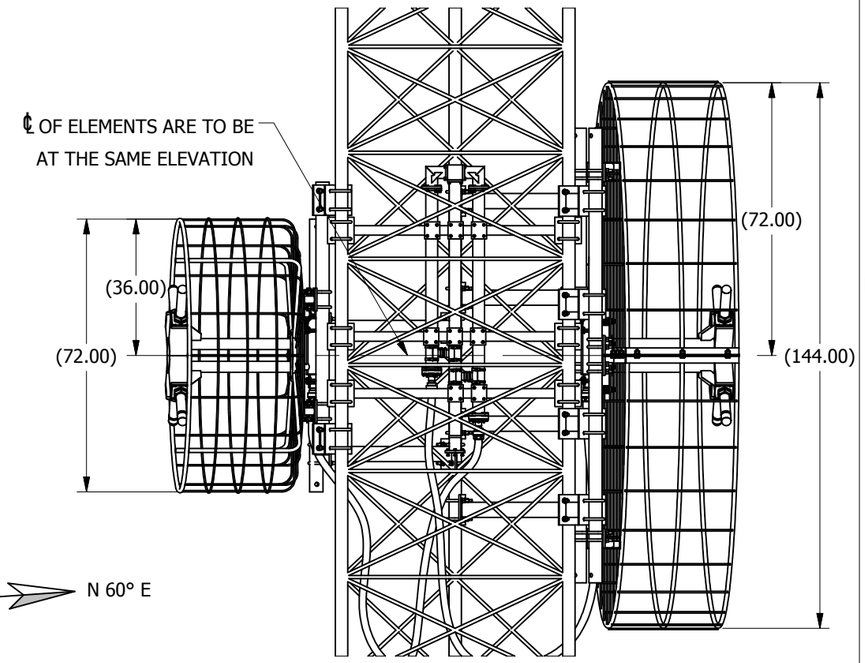
FINISH

TOLERANCES
OVERALL-NOT CUMULATIVE
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES AND APPLICABLE AT 20°C (68°F)
INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994

1 PLACE DECIMAL ± .1
2 PLACE DECIMAL ± .03
3 PLACE DECIMAL ± .010
ANGULAR ± .5°
FRACTIONAL ± 1/16"



SIDE VIEW



SIDE VIEW

AISC CERTIFIED FABRICATOR

THIRD ANGLE PROJECTION

MATERIAL

FINISH

TOLERANCES
OVERALL-NOT CUMULATIVE
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES AND APPLICABLE AT 20°C (68°F)
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FRACTIONAL ± 1/16"

PROJECT NO.	35670/1	
ERI APPROVAL	NAME	DATE
DRAWN BY	gerald	2/8/2018
DRAFTING		
DESIGN MGR.	K. SCHARP	4/5/2018
ENG.		
MANUF.		
EXT. APPROVAL	T. SCHARF	4/5/2018
SUPERSEDES PART NO.		
FILE NAME: IA35670-1.dwg		

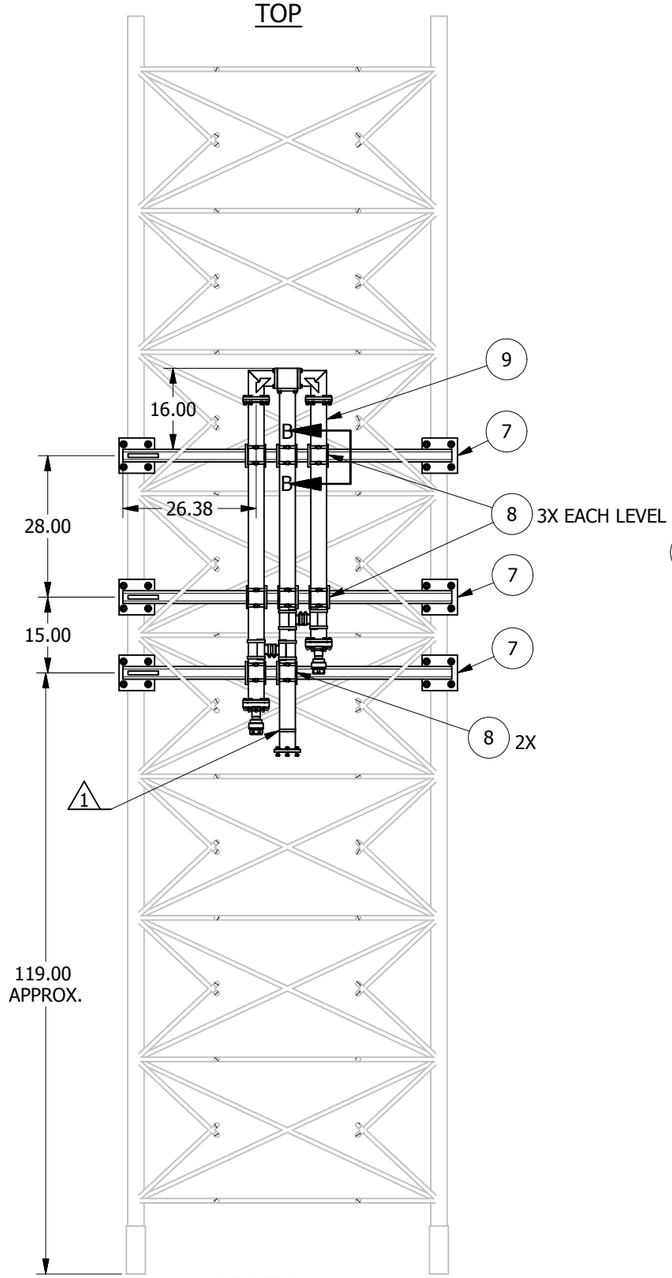
ELECTRONICS RESEARCH INC.
ESTABLISHED 1943
7777 GARDNER Rd.
CHANDLER, IN
47610-9219
PHONE: (812) 925-6000
FAX: (812) 925-4030

TITLE:
1192-1CP-DA INSTALLATION DETAILS
SPINDALE, NC
WNCW - FM STATION 88.7 MHz

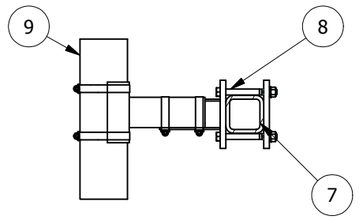
SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	IA35670-1	

SCALE :	WEIGHT:	SHEET:
1 / 50	N/A	2 OF 9

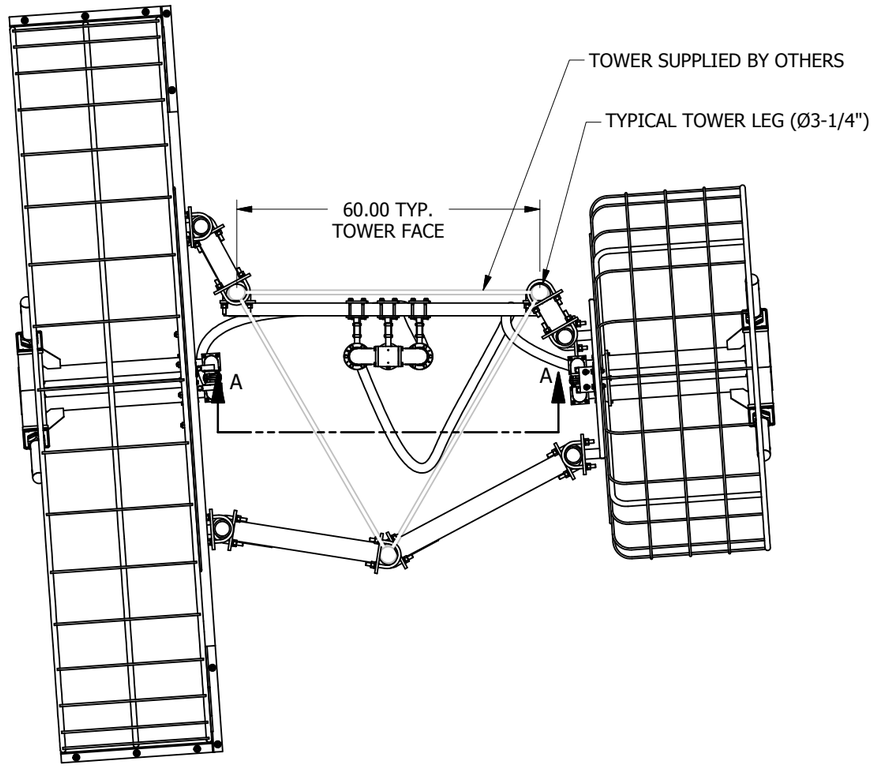
TOP



SECTION A-A
ITEMS REMOVED FOR CLARITY



SECTION B-B



TOP VIEW

THIRD ANGLE PROJECTION

MATERIAL

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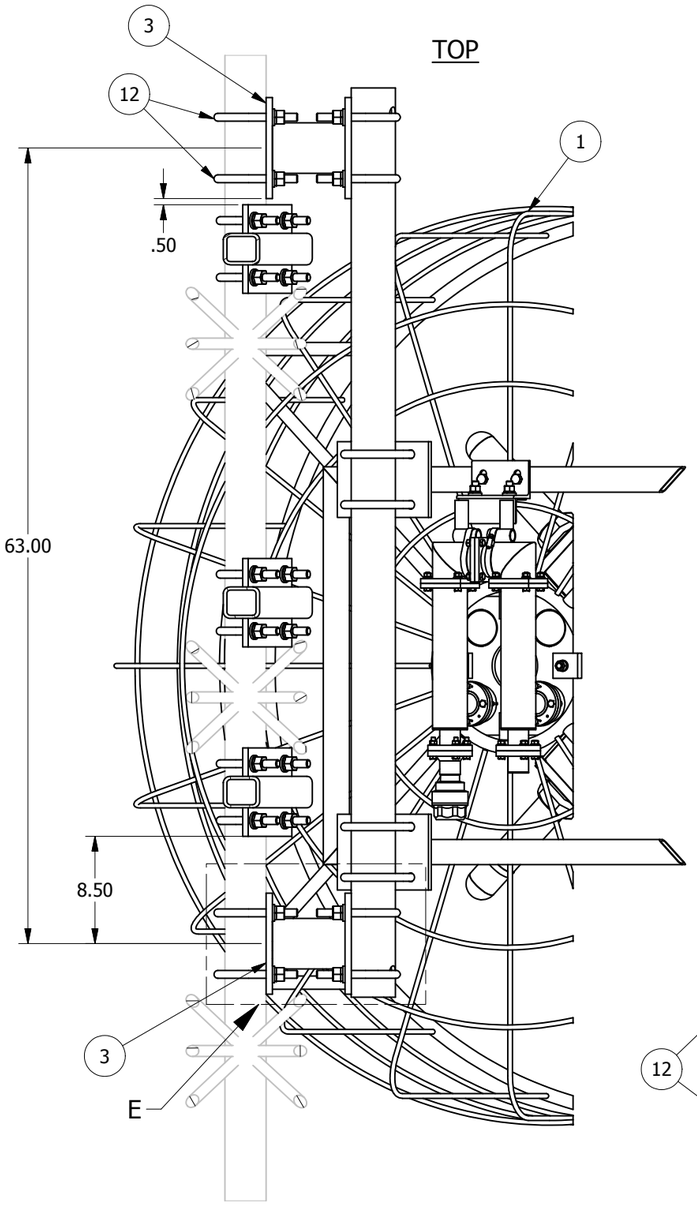
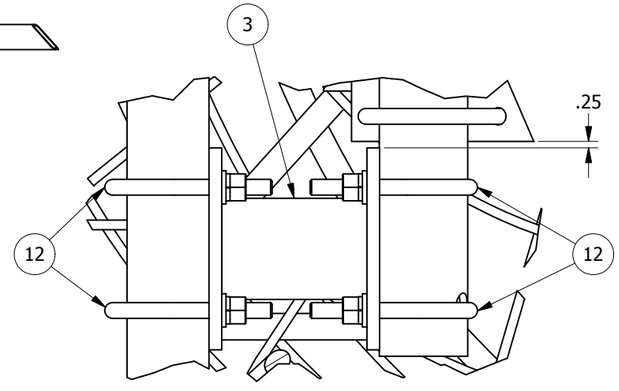
B	OZNS1	IA35670-1	

SCALE :	WEIGHT:	SHEET:
1 / 50	N/A	3 OF 9

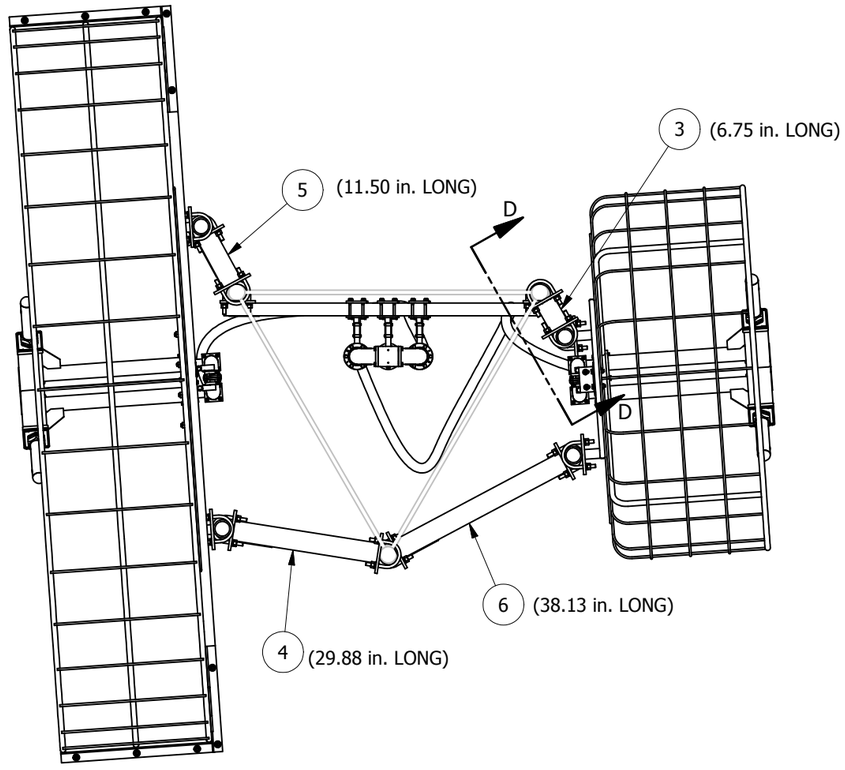


TOP

SECTION D-D
ITEMS REMOVED FOR CLARITY



DETAIL E



TOP VIEW

THIRD ANGLE PROJECTION

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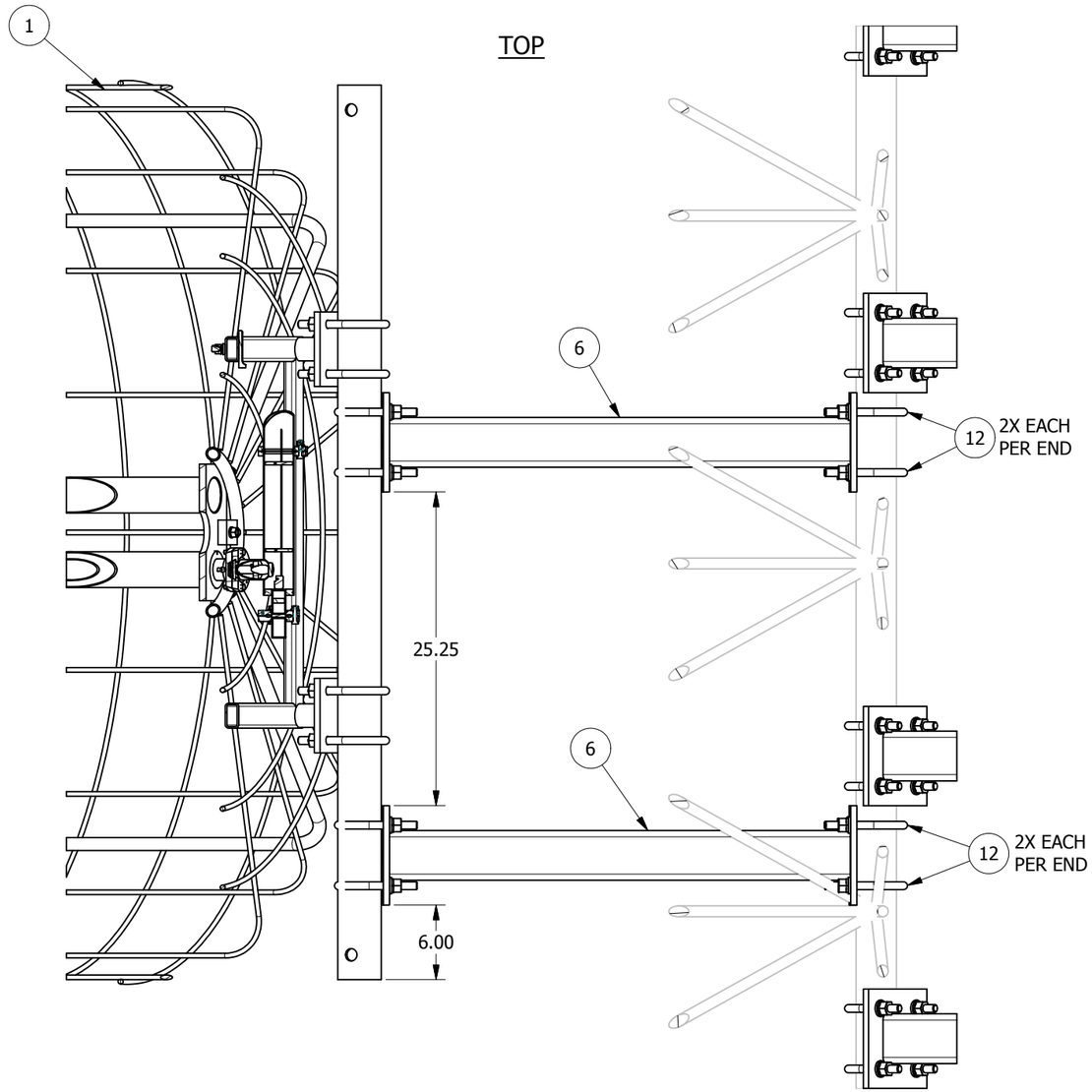
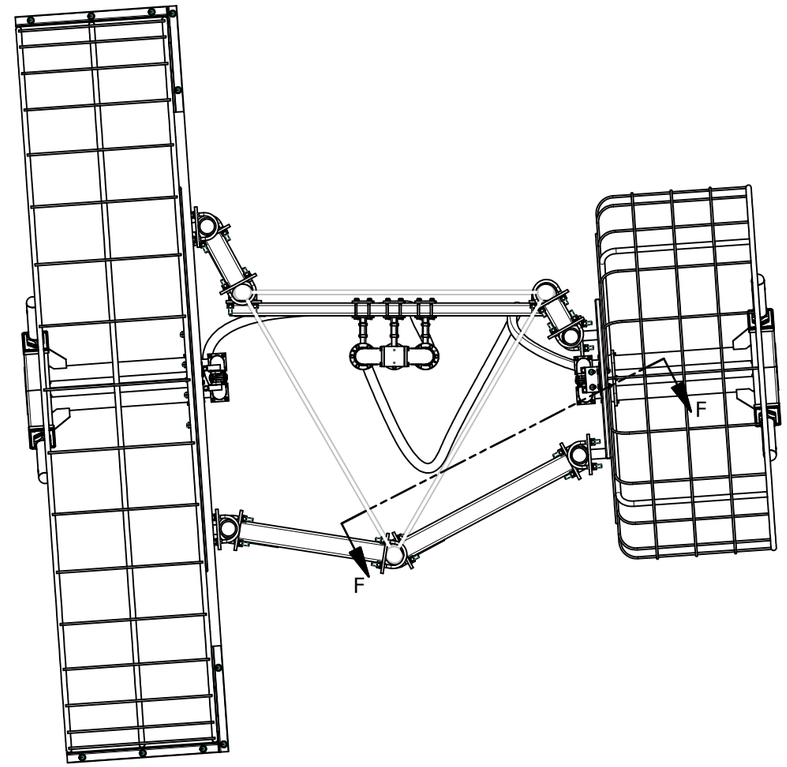
B	OZNS1	IA35670-1	

SCALE :	WEIGHT:	SHEET:
1 / 50	N/A	4 OF 9



SECTION F-F



TOP VIEW

THIRD ANGLE PROJECTION

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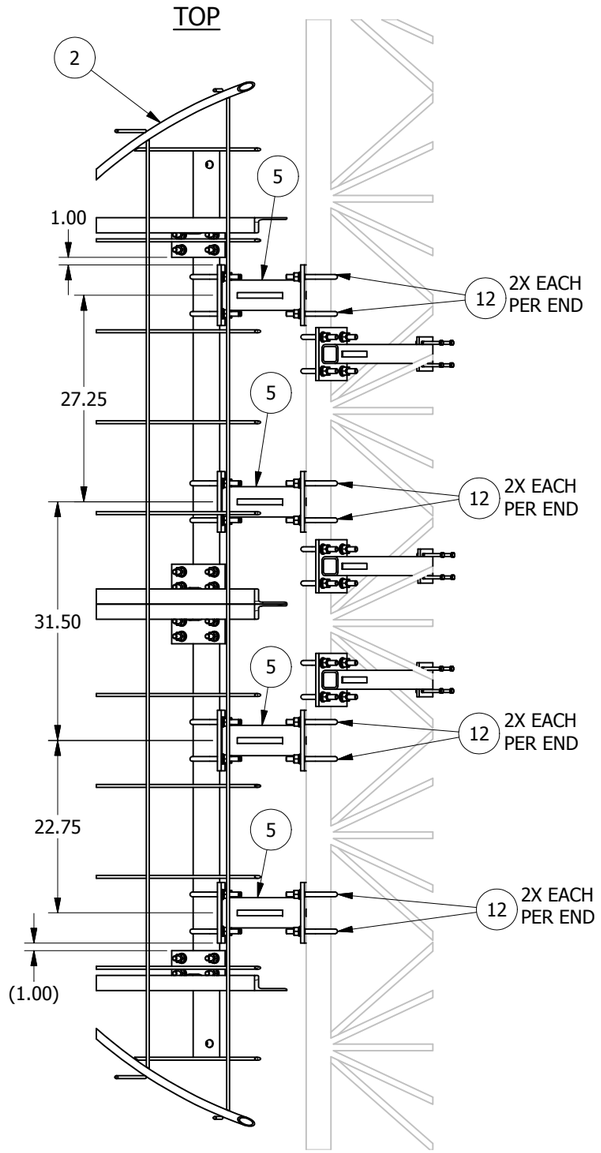
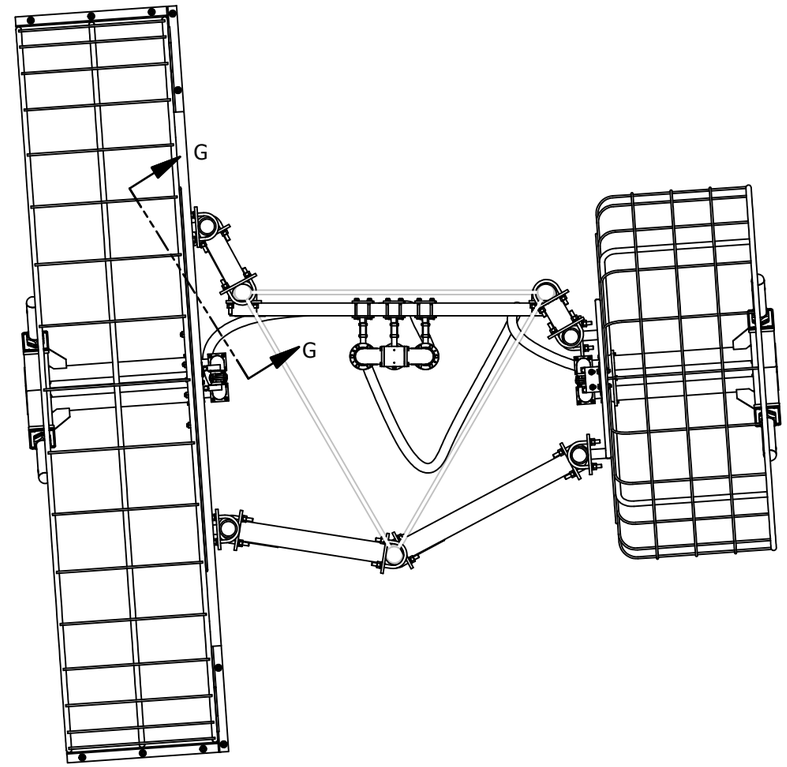
SCALE :	WEIGHT:	SHEET:
1 / 50	N/A	5 OF 9



SECTION G-G



TOP VIEW

THIRD ANGLE PROJECTION

MATERIAL

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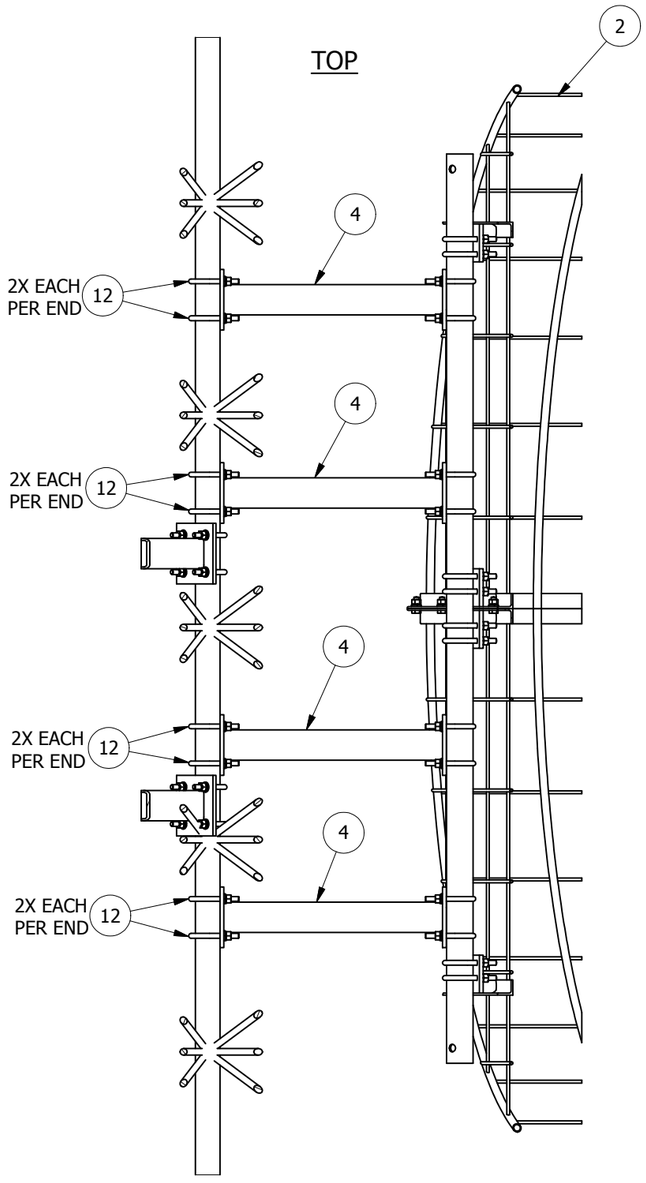
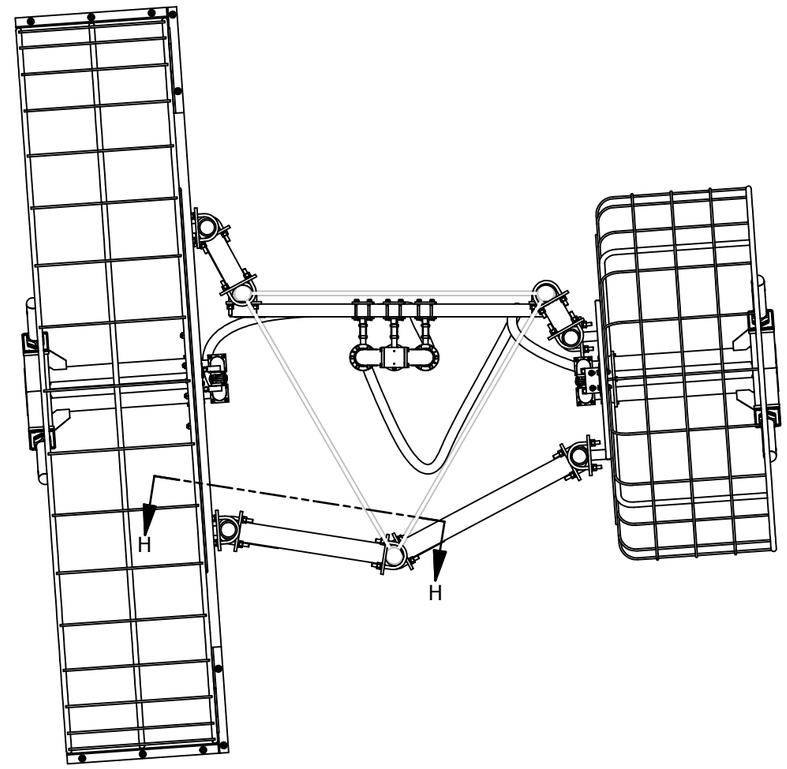
SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	IA35670-1	

SCALE :	WEIGHT:	SHEET:
1 / 50	N/A	6 OF 9



SECTION H-H



TOP VIEW

THIRD ANGLE PROJECTION

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SCALE :	WEIGHT:	SHEET:
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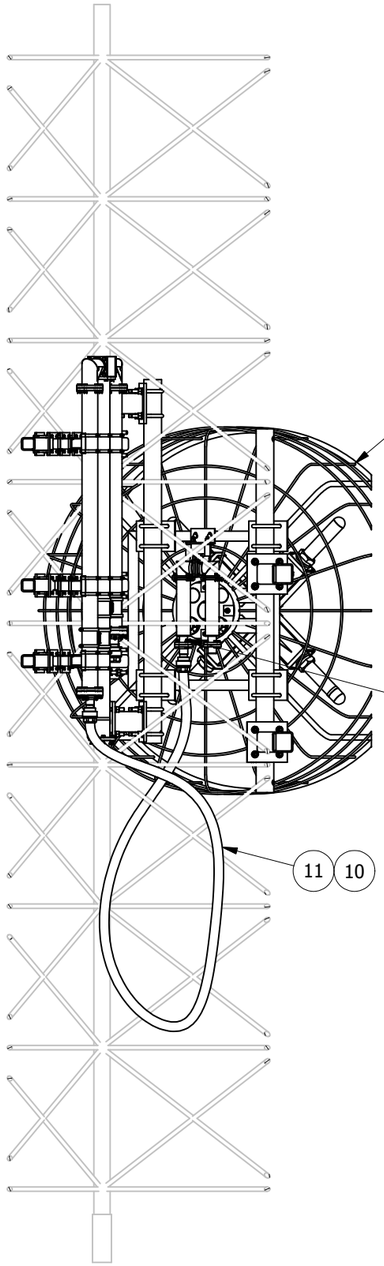
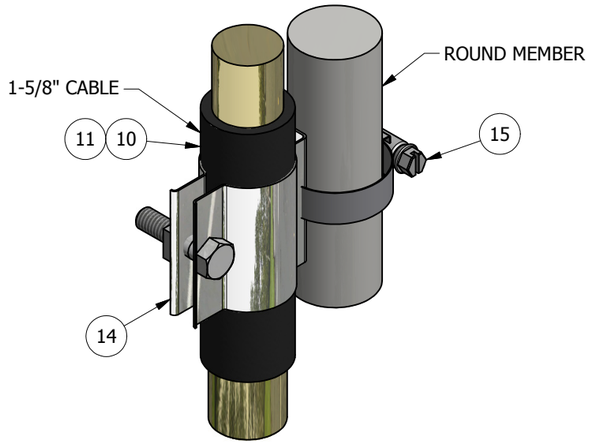
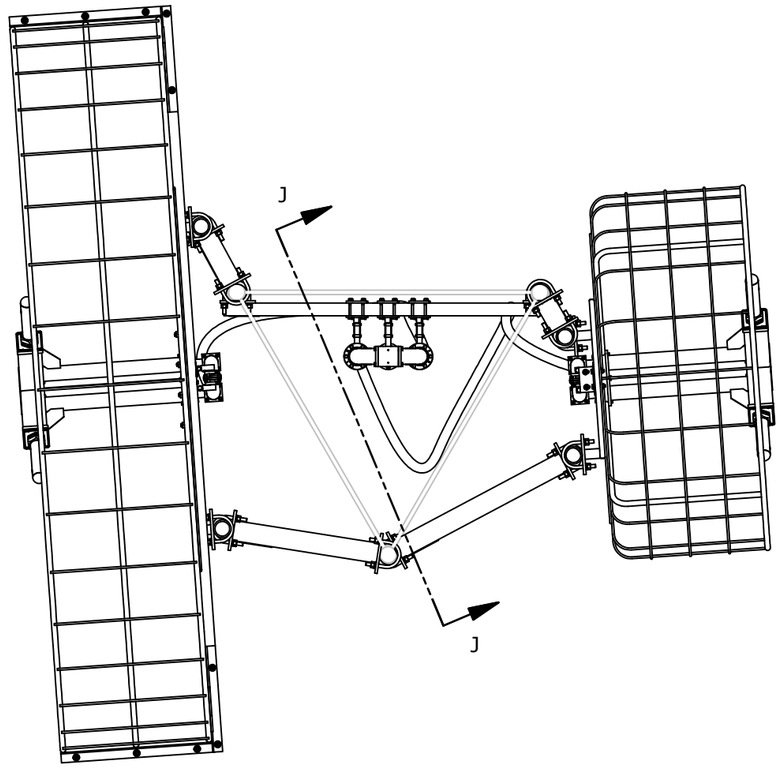


SECTION J-J



CABLE SUPPORT DETAIL
ATTACH EVERY 3'



TOP VIEW

THIRD ANGLE PROJECTION

MATERIAL

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SCALE :	WEIGHT:	SHEET:
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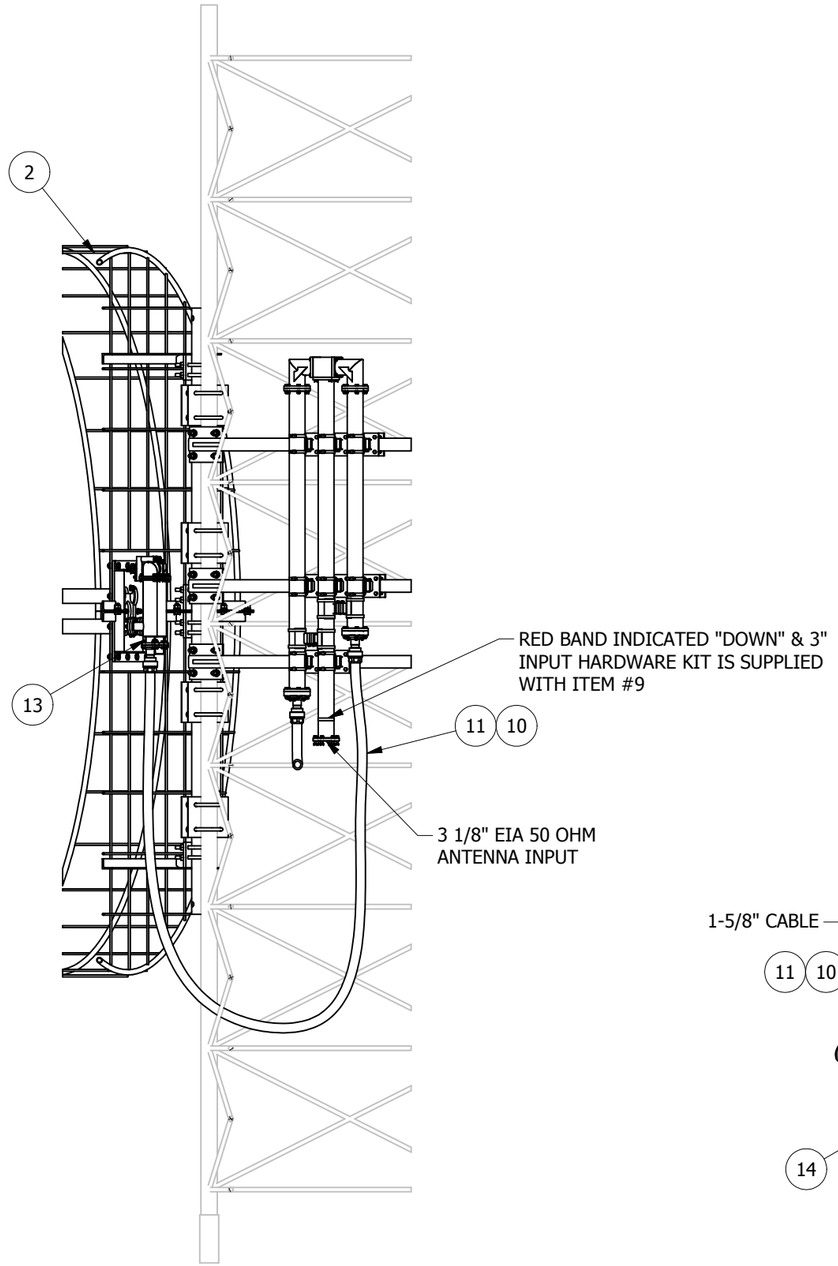

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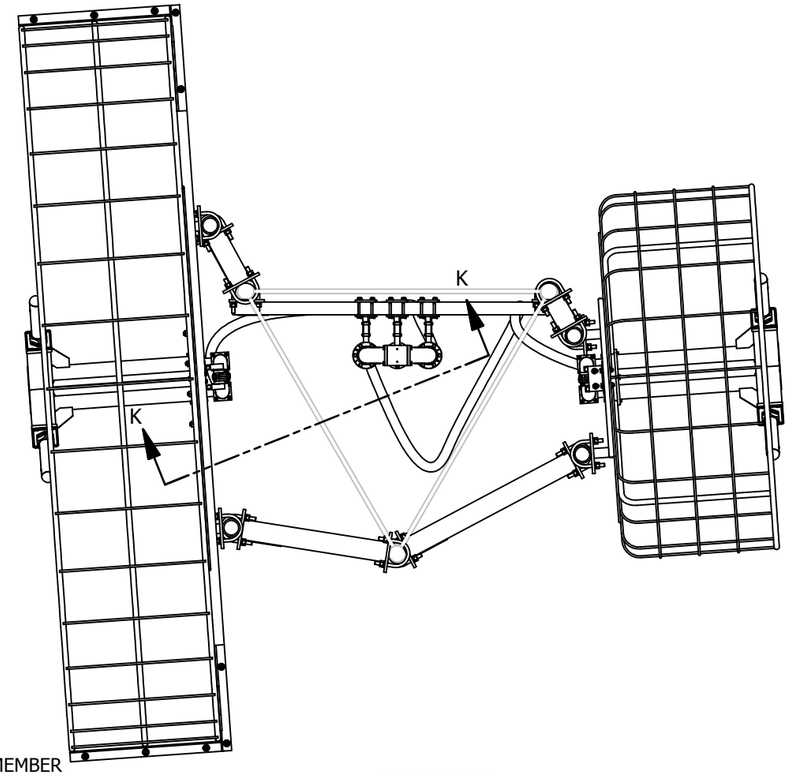
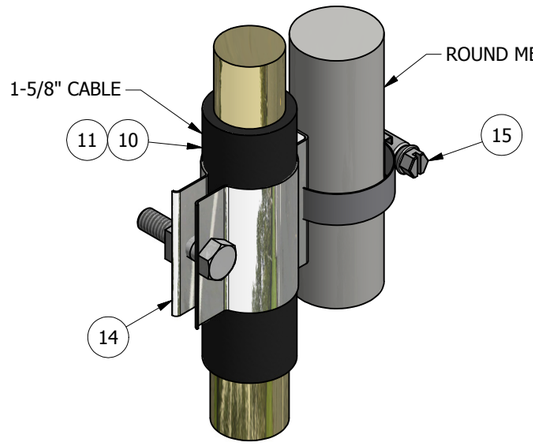


TOP VIEW



CABLE SUPPORT DETAIL

THIRD ANGLE PROJECTION

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