



Jampro Antennas Technical Proposal

5 Bay 4 Around Circularly Polarised Lambda Antenna, Channel 4, WNGH.

Technical Proposal

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1.)Gain Table 13kW ERP Per Plane.

GAIN TABLE

WNGH

Lambda Antenna Channel 4

Channel No.	4	4
Frequency MHz	69	69
Analogue or Digital (A or D)	D	D
Polarisation Plane	HP	VP
No. of Tiers	5	5
Vertical Aperture m	17.4	17.4
Vertical Aperture Wavelengths	4.00	4.00
Intrinsic Gain dB	6.38	6.38
Polarisation Loss dB	3.01	3.01
Null Fill Loss dB	0.14	0.14
Harness Loss dB	0.27	0.27
Mean Gain per plane dB	2.96	2.96
Antenna Max Gain per plane at Horizontal dB	2.95	2.95
Antenna Max Gain per plane dB	2.96	2.96
Transmitter Power kW	6.58	6.58
Mean ERP per plane kW	13.0	13.0
Max ERP per plane at Horizontal kW	13.0	13.0
Max ERP per plane kW	13.0	13.0
At Elevation Angle deg.	0.5	0.5

0.8 Lambda Bay Spacing

Engineer Chris R

31 Oct 2018

Des. No. 531831108 Chris Randall v8.1.1



2.) Safety Factor Full Power Half Antenna

SAFETY FACTOR TABLE

WNGH

Lambda Antenna Channel 4

Channel No.	4	TOTAL	RATING	SAFETY
Frequency MHz	69		{2}	FACTOR
Analogue or Digital (A or D)	D			
DTV Peak/Mean Power	7			
Transmitter Power kW	6.58			
FOR RATING PURPOSES				
Transmitter Power kW {1}	13.2			

[1] 3dB Coupler 6" - 4 1/8 F - 4 1/8 F - 4 1/8 F - 4 1/8 F Gm C24693/310				
Mean Power kW	6.58	6.58	118.32	17.98
Peak Volts kV	2.15	2.15	9.00	4.19
[2] Power Divider S1.5Exit EQUAL S1.B25248/305 1 5/8 - 7/8 50 - 50 Ohm				
Mean Power kW	3.29	3.29	21.18	6.44
Peak Volts kV	1.52	1.52	4.94	3.26
[3] Cable 1/2" Foam 15m 50 Ohm				
Mean Power kW	0.658	0.658	4.75	7.22
Peak Volts kV	0.679	0.679	1.95	2.87
[4] Panel S3.Dipole S3.C25328/10 7/8 50 Ohm				
Mean Power kW	0.618	0.618	6.48	10.48
Peak Volts kV	0.658	0.658	2.55	3.88

{1} Transmitter Power into whole antenna for power and voltage rating purposes

{2} Rating at Component Mean Power Frequency (approx. 69 MHz)

Ambient Temperature = 40deg.C

[see Key Diagram for Component Locations]

0.8 Lambda Bay Spacing

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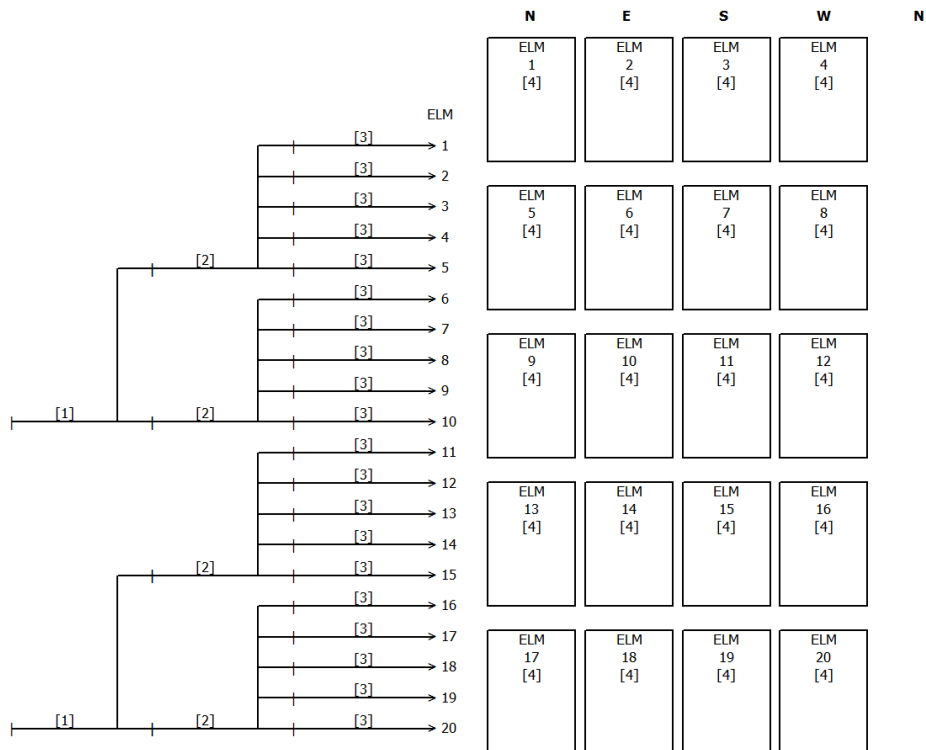


3.)Key Diagram

KEY DIAGRAM

WNGH

Lambda Antenna Channel 4



[1] 3dB Coupler 6" - 4 1/8 F - 4 1/8 F - 4 1/8 F - 4 1/8 F Gm C24693/310

[2] Power Divider S1.5Exit EQUAL S1.B25248/305 1 5/8 - 7/8 50 - 50 Ohm

[3] Cable 1/2" Foam 15m 50 Ohm

[4] Panel S3.Dipole S3.C25328/10 7/8 50 Ohm

0.8 Lambda Bay Spacing

Engineer Chris R

31 Oct 2018

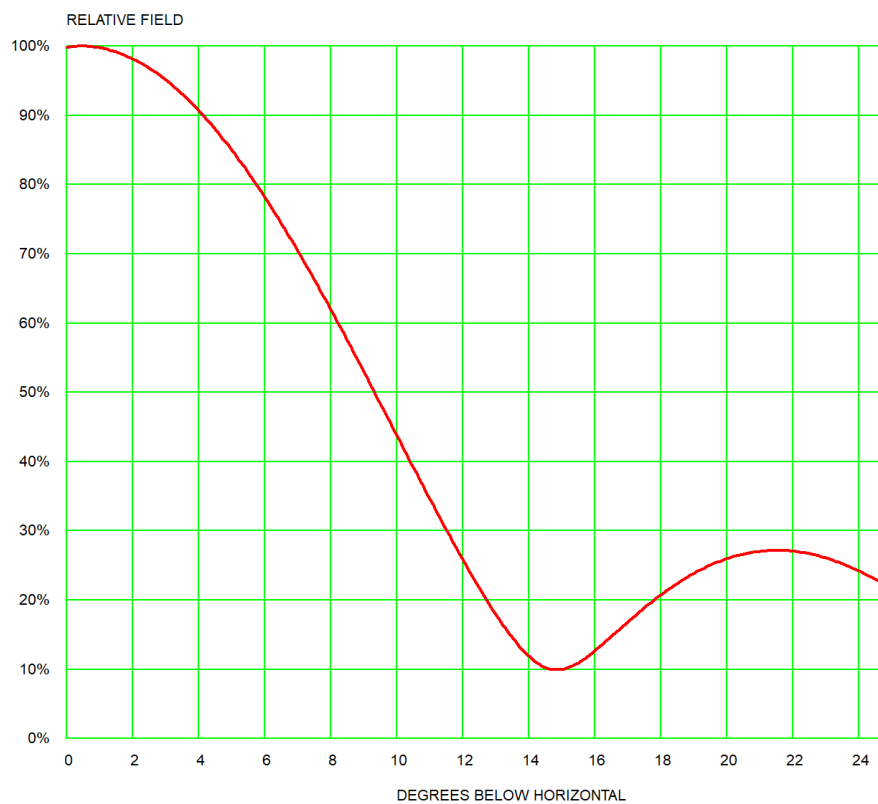
Des. No. 510331108 Chris Randall v8.1.1



5.)Vertical Radiation Patterns Full Antenna

VERTICAL RADIATION PATTERN

Station **WNGH**
Frequency **69 MHz**
Type **Lambda Antenna Channel 4**



Beam Tilt **.5 deg**

Null Fill 10%

0.8 Lambda Bay Spacing

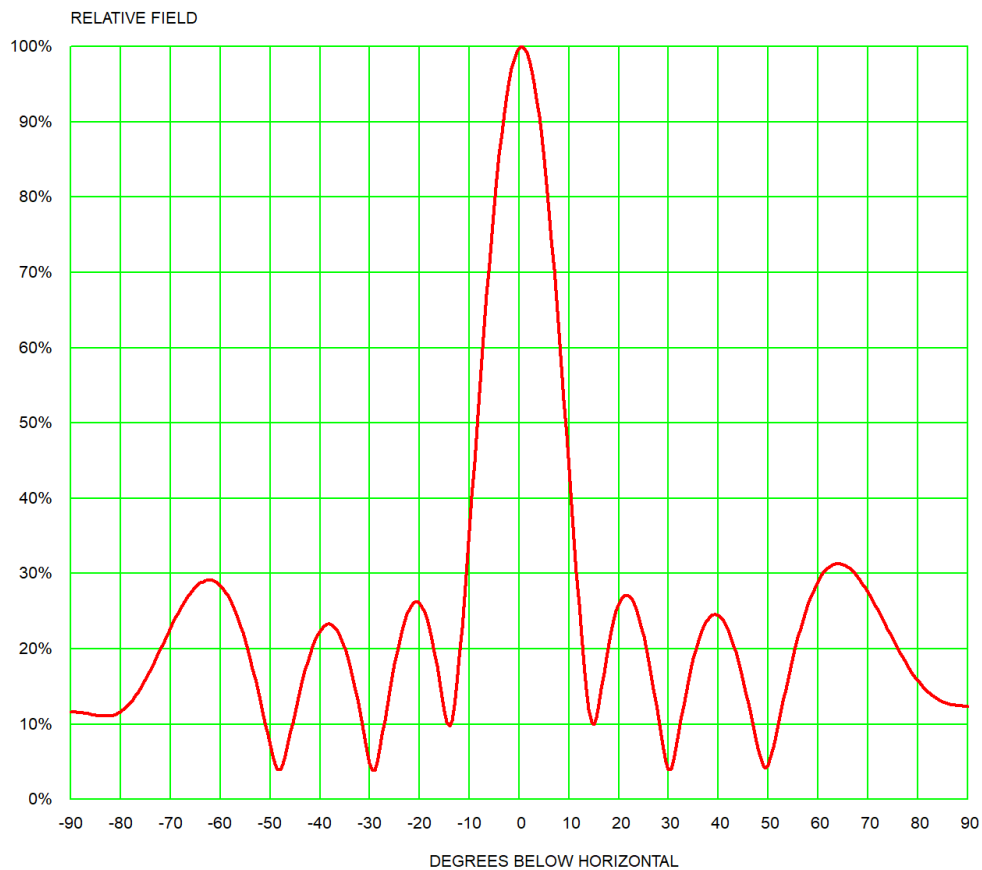
Engineer **Chris R** Date **1 Nov 2018**

Pat. No. 367601118 Chris Randall v8.1.1



VERTICAL RADIATION PATTERN

Station **WNGH**
Frequency **69 MHz**
Type ***Lambda Antenna Channel 4***



Beam Tilt **.5 deg**

Null Fill 10%

0.8 Lambda Bay Spacing

Engineer **Chris R** Date **1 Nov 2018**

Pat. No. 368301118 Chris Randall v8.1.1



Ang	Amp	dB
-90	11.61	-18.7
-89	11.58	-18.7
-88	11.52	-18.8
-87	11.42	-18.8
-86	11.3	-18.9
-85	11.17	-19
-84	11.08	-19.1
-83	11.05	-19.1
-82	11.11	-19.1
-81	11.3	-18.9
-80	11.66	-18.7
-79	12.19	-18.3
-78	12.9	-17.8
-77	13.78	-17.2
-76	14.83	-16.6
-75	16	-15.9
-74	17.28	-15.2
-73	18.64	-14.6
-72	20.03	-14
-71	21.43	-13.4
-70	22.8	-12.8
-69	24.12	-12.4
-68	25.35	-11.9
-67	26.46	-11.5
-66	27.42	-11.2
-65	28.19	-11
-64	28.76	-10.8
-63	29.09	-10.7
-62	29.15	-10.7
-61	28.94	-10.8
-60	28.42	-10.9
-59	27.59	-11.2
-58	26.44	-11.6
-57	24.96	-12.1
-56	23.16	-12.7
-55	21.05	-13.5
-54	18.65	-14.6
-53	16	-15.9
-52	13.14	-17.6
-51	10.15	-19.9
-50	7.18	-22.9
-49	4.67	-26.6
-48	4	-28
-47	5.86	-24.6
-46	8.69	-21.2
-45	11.65	-18.7


Ang	Amp	dB
-44	14.5	-16.8
-43	17.08	-15.4
-42	19.3	-14.3
-41	21.1	-13.5
-40	22.39	-13
-39	23.13	-12.7
-38	23.28	-12.7
-37	22.81	-12.8
-36	21.72	-13.3
-35	20.01	-14
-34	17.71	-15
-33	14.89	-16.5
-32	11.63	-18.7
-31	8.11	-21.8
-30	4.83	-26.3
-29	3.87	-28.2
-28	6.67	-23.5
-27	10.53	-19.6
-26	14.42	-16.8
-25	18.02	-14.9
-24	21.15	-13.5
-23	23.65	-12.5
-22	25.37	-11.9
-21	26.21	-11.6
-20	26.08	-11.7
-19	24.92	-12.1
-18	22.72	-12.9
-17	19.57	-14.2
-16	15.67	-16.1
-15	11.69	-18.6
-14	9.71	-20.3
-13	12.5	-18.1
-12	18.92	-14.5
-11	26.96	-11.4
-10	35.76	-8.93
-9	44.88	-6.96
-8	54.02	-5.35
-7	62.89	-4.03
-6	71.27	-2.94
-5	78.91	-2.06
-4	85.61	-1.35
-3	91.19	-0.8
-2	95.49	-0.4
-1	98.41	-0.14
0	99.85	-0.01
1	99.77	-0.02

Ang	Amp	dB
2	98.19	-0.16
3	95.13	-0.43
4	90.69	-0.85
5	84.99	-1.41
6	78.17	-2.14
7	70.42	-3.05
8	61.95	-4.16
9	52.99	-5.52
10	43.8	-7.17
11	34.64	-9.21
12	25.86	-11.7
13	17.93	-14.9
14	11.9	-18.5
15	9.98	-20
16	12.64	-18
17	16.8	-15.5
18	20.73	-13.7
19	23.85	-12.5
20	25.97	-11.7
21	27.04	-11.4
22	27.06	-11.4
23	26.1	-11.7
24	24.25	-12.3
25	21.61	-13.3
26	18.34	-14.7
27	14.58	-16.7
28	10.56	-19.5
29	6.61	-23.6
30	3.94	-28.1
31	5.27	-25.6
32	8.75	-21.2
33	12.41	-18.1
34	15.79	-16
35	18.72	-14.6
36	21.11	-13.5
37	22.91	-12.8
38	24.07	-12.4
39	24.58	-12.2
40	24.47	-12.2
41	23.74	-12.5
42	22.44	-13
43	20.62	-13.7
44	18.35	-14.7
45	15.71	-16.1
46	12.79	-17.9
47	9.71	-20.3

Ang	Amp	dB
48	6.72	-23.5
49	4.47	-27
50	4.57	-26.8
51	6.92	-23.2
52	9.95	-20
53	13.08	-17.7
54	16.11	-15.9
55	18.95	-14.4
56	21.54	-13.3
57	23.86	-12.4
58	25.87	-11.7
59	27.57	-11.2
60	28.95	-10.8
61	30	-10.5
62	30.74	-10.2
63	31.18	-10.1
64	31.34	-10.1
65	31.23	-10.1
66	30.87	-10.2
67	30.31	-10.4
68	29.55	-10.6
69	28.63	-10.9
70	27.57	-11.2
71	26.42	-11.6
72	25.19	-12
73	23.91	-12.4
74	22.62	-12.9
75	21.33	-13.4
76	20.08	-13.9
77	18.88	-14.5
78	17.76	-15
79	16.74	-15.5
80	15.82	-16
81	15.02	-16.5
82	14.35	-16.9
83	13.79	-17.2
84	13.35	-17.5
85	13.01	-17.7
86	12.76	-17.9
87	12.58	-18
88	12.46	-18.1
89	12.4	-18.1
90	12.38	-18.1



7.)Gain Summary

		6340 Sky Creek Dr., FAX (916) 383-1182	Sacramento, CA 95828 Web www.Jampro.com
Tel: (916)383-1177			
<h3>System Gain-Loss Calculator Summary Sheet:</h3>			
Description	Values*		
Frequency	69MHz		
Effective Radiated Power Per Polarisation	13.00 kW		
Antenna Mean Gain (Total)	5.97 dBd	3.95 times	
Required Antenna Input Power Per Polarisation	5.17 dBk	3.29 kW	
Coax System Length	0.0 feet	0 Meters	
Coax Loss Per 100 Meters	0.000 dB		
Total Coax Losses	0.00 dB	0.00 kW	
Coax Efficiency:	100.00%		
Mask Filter Losses	0.00 dB	0.00 kW	
Other Losses	0.00 dB	0.00 kW	
Total System Losses	0.00 dB	0.00 kW	
Required Transmitter Output Total	8.18 dBk	6.58 kW	
Company Name WNGH			
Info Line: 5-bay Lambda Antenna (0.8 lambda)			
Bay Spacing / Overall Height 3.478m / 17.5m			
Coax Type: TBA			
Date: 31th October 2018			
Note: *Values are rounded to two places. Information is provide as an estimate only. Jampro accepts no responsibility for accuracy. Please verify these figures with your consulting engineer.			