SUPPLEMENTAL INFORMATION
RELATIVE TO
APPLICATION FOR LICENSE INFORMATION
RADIO STATION WINK
PINE ISLAND CENTER, FLORIDA

1200 KHZ 50 KW - D 1.0 KW – N (STA 2.2 KW – N) DA-2

This engineering exhibit provides supplemental information with regard to the "Application for License Information" exhibit prepared by the undersigned, dated April 2, 2012, in support of an application for license for the newly constructed daytime directional antenna system of radio station WINK in Pine Island Center, Florida. The pending application, file number BMML20120410AEI, provides information concerning the new daytime directional antenna pattern as well as the STA nighttime directional antenna pattern that is authorized for use by WINK.

Information with regard to the licensed nighttime pattern that is presently superseded by the STA nighttime pattern is provided herein. The directional antenna parameters have been determined in accordance with the requirements of section 73.151(c) of the FCC Rules, using information on the antenna system that was provided in the previous engineering exhibit. Should the STA operating authority expire while the licensed WINK nighttime directional antenna pattern remains in effect, operation may be initiated with it following readjustment of the antenna system to produce antenna monitor parameters within +/- 5 percent ratio and +/- 3 degrees phase of the modeled values shown on the tabulation of the attached item 3(A).

As it is impossible to make field strength measurements on the licensed nighttime directional antenna pattern while WINK operates with the STA nighttime pattern, a waiver of the reference point measurement requirements of 47 CFR 73.151(c)(3) is requested. The measurements may be made and placed in the station's public file following readjustment of the nighttime antenna system from the STA to the licensed operating parameters should that ever become necessary.

Ronald D. Rackley, P.E.
May 15, 2012

Derivation of Operating Parameters for Licensed Nighttime Directional Antenna - WINK

The method of moments model of the array, following verification with the measured individual open circuited base impedances, was utilized for directional antenna calculations. Calculations were made to determine the complex voltage values for sources located at ground level under each tower of the array to produce current moment sums for the towers that, when normalized, equated to the theoretical field parameters of the authorized directional antenna pattern. With these voltage sources, the tower currents were calculated. The currents at the ATU unit outputs, where the antenna monitor samples are taken, were calculated from the method of moments tower currents for directional antenna operation using WCAP circuit modeling with the assumptions that were derived from the single tower measurements on the array and the method of moments calculated tower operating impedances. In each of the following WCAP tabulations, node 2 represents the reference point and node 3 represents the tower feedpoint. Node 0 represents ground potential. The tower operating impedances are represented by complex loads from node 3 to ground (R 3 - 0). It should be noted that the calculated reference point current magnitudes and phases appear in the first and fourth columns following the drive current sources (I 0 -1)). As the current transformers and sampling lines are identical, the antenna monitor ratios and phases corresponding to the theoretical parameters were calculated directly from the modeled reference point currents.

Tower	Modeled Current Pulse	Modeled Current Magnitude @ Toroid (amperes)	Modeled Current Phase @ Toroid (degrees)	Modeled Antenna Monitor Ratio	Modeled Antenna Monitor Phase (degrees)
1	1	4.7350	2.29	1.212	+121.4
2	21	3.9070	-119.090	1.000	0

Tower 1 Licensed Night-DA Base Circuit Analysis

```
WESTBERG CIRCUIT ANALYSIS PROGRAM


 FILE NAME = WINK1DNL.TXT

I   473.5040    0    1    2.2930     .0000     .0000
R     1.0000    1    2     .0000     .0000     .0000
L     4.2170    2    3     .0000     .0000     .0000
C      .0000    3    0     .0000     .0000     .0000
R    17.8650    3    0    3.5207     .0000     .0000
EX     .0000    0    0     .0000     .0000     .0000


 FREQ = 1.200

   NODE       VOLT MAG      VOLT PHASE
     1      18939.6700         64.1141
     2      18720.7200         65.3917
     3       8627.5260         13.2485

                              BRANCH VOLTAGE       BRANCH CURRENT FROM NODE IMPEDANCE  TO NODE IMPEDANCE
                                MAG      PHASE       MAG    PHASE RESISTANCE REACTANCE RESISTANCE REACTANCE
R     1-  2     1.000    473.50     2.293    473.50     2.293     18.89     35.26     17.89     35.26
L     2-  3     4.217  15055.26    92.293    473.50     2.293     17.89     35.26     17.89      3.46
C     3-  0      .000   8627.53    13.248      1.63   103.248       .00  -5305.17       .00       .00
R     3-  0    17.865   8627.53    13.248    473.82     2.100     17.86      3.52       .00       .00
```

Tower 2 Licensed Night-DA Base Circuit Analysis

```
WESTBERG CIRCUIT ANALYSIS PROGRAM


 FILE NAME = WINK2DNL.TXT

I   390.7000    0    1  240.9100     .0000     .0000
R     1.0000    1    2     .0000     .0000     .0000
L     4.1910    2    3     .0000     .0000     .0000
C      .0001    3    0     .0000     .0000     .0000
R    35.8380    3    0   75.0000     .0000     .0000
EX     .0000    0    0     .0000     .0000     .0000


 FREQ = 1.200

   NODE       VOLT MAG      VOLT PHASE
     1      45406.6900         -49.2559
     2      45273.4800         -48.7918
     3      33906.7500         -55.8427

                              BRANCH VOLTAGE       BRANCH CURRENT FROM NODE IMPEDANCE  TO NODE IMPEDANCE
                                MAG      PHASE       MAG    PHASE RESISTANCE REACTANCE RESISTANCE REACTANCE
R     1-  2     1.000    390.70  -119.090    390.70  -119.090     40.07    109.09     39.07    109.09
L     2-  3     4.191  12345.88   -29.090    390.70  -119.090     39.07    109.09     39.07     77.49
C     3-  0      .000  33906.75   -55.843     19.17    34.157       .00  -1768.39       .00       .00
```

Currents are multiplied X 100 for improved resolution.

Method of Moments Model Details for Licensed Nighttime Directional Antenna - WINK

The array of towers was modeled using Expert MININEC Broadcast Professional Version 14.5 with the characteristics that were verified by the individual tower impedance measurements. Calculations were made to determine the complex voltage values for sources located at ground level under each tower of the array to produce current moment sums for the towers that, when normalized, equated to the theoretical field parameters of the authorized directional antenna pattern. The following pages contain details of the method of moments model of the directional antenna pattern.

Towers 3, 4 and 5 of the array, which are inactive in the licensed nighttime pattern, were detuned in the model by terminating them with load reactances at their bases (nodes 21, 31 and 41) as shown in the tabulation. The detuning reactances, +j 531 for tower 3, +j 472 for tower 4 and +j 479 for tower 5, are the opposite sign values of the imaginary components of the method of moments modeled operating impedances for the licensed nighttime directional antenna with field ratios of zero specified for the unused towers. In order to provide the detuning reactance at each tower base through its ATU-to-base circuit model, the detuning inductances are required to be +j 446 for tower 3, +j 387 for tower 4 and +j 401 for tower 5 at their respective ATU output jack reference points.

Tower	Wire	Base Node
1	1	1
2	2	11
3	3	21
4	4	31
5	5	41

It should be noted that voltages and currents shown on the tabulations that are not specified as "rms" values are the corresponding peak values.

C:\MBPRO14.5\WINKDANL 05-15-2012 14:30:13

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = 1.2 MHz

tower	field ratio magnitude	phase (deg)
1	1.	0
2	1.	-123.6
3	0	0
4	0	0
5	0	0

VOLTAGES AND CURRENTS - rms

source node	voltage magnitude	phase (deg)	current magnitude	phase (deg)
1	86.4031	13.2	4.74338	2.
11	340.223	304.1	4.09304	239.6
21	207.978	256.8	.391228	348.3
31	161.63	232.3	.342546	322.5
41	89.5364	268.6	.187079	359.4

Sum of square of source currents = 79.116

Total power = 1,000. watts

NOTE: The array synthesis calculations (above) were performed to solve for the base voltage drives required to produce the specified field parameters, including detuned conditions for towers 3, 4 and 5 which are unused in the nighttime licensed directional antenna pattern. The base impedances were calculated and the model was revised to have voltage drives only for the towers of the nighttime directional antenna pattern, towers 1, and 2 and detuning reactances to ground for towers 3, 4 and 5. The detuning reactances are equal in magnitude and opposite in sign to the reactive components of the operating impedances that were determined using the voltage sources from the array synthesis calculations. The final model does not include voltage sources for towers 3, 4 and 5 because their base voltages are developed across the detuning reactances. The specified detuning reactances represent how the towers are detuned for normal operation. The following information is from the final model.

GEOMETRY
Wire coordinates in degrees; other dimensions in meters
Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.218	10
		0	0	91.1		
2	none	60.	130.	0	.218	10
		60.	130.	93.2		
3	none	120.	130.	0	.218	10
		120.	130.	91.6		
4	none	144.3	100.1	0	.364	10
		144.3	100.1	89.3		
5	none	84.6	218.5	0	.364	10
		84.6	218.5	91.3		

Number of wires = 5
current nodes = 50

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	4	8.93	2	9.32
radius	1	.218	4	.364

ELECTRICAL DESCRIPTION

Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.2	0	1	.0248056	.0258889

Sources

source	node	sector	magnitude	phase	type
1	1	1	122.192	13.2	voltage
2	11	1	481.149	304.1	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	21	0	531.43	0	0	0
2	31	0	471.84	0	0	0
3	41	0	478.55	0	0	0

IMPEDANCE

normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1.2	17.865	3.5207	18.209	11.1	2.8147	-6.4532	-1.1143
source = 2; node 11, sector 1							
1.2	35.957	75.072	83.239	64.4	5.0463	-3.4886	-2.5795

CURRENT rms
Frequency = 1.2 MHz
Input power = 1,000. watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	4.73817	2.1	4.73513	.169618
2	0	0	9.11	4.69792	1.2	4.69686	.0997051
3	0	0	18.22	4.54538	.7	4.54508	.0524211
4	0	0	27.33	4.28635	.2	4.28632	.0143621
5	0	0	36.44	3.92643	359.8	3.9264	-.0156781
6	0	0	45.55	3.47299	359.4	3.47279	-.0376779
7	0	0	54.66	2.93477	359.	2.93432	-.0511731
8	0	0	63.77	2.32111	358.6	2.32045	-.0554902
9	0	0	72.88	1.63998	358.3	1.63923	-.0497983
10	0	0	81.99	.89223	357.9	.891622	-.0329437
END	0	0	91.1	0	0	0	0
GND	-38.5673	-45.9627	0	4.08125	239.7	-2.05954	-3.52348
12	-38.5673	-45.9627	9.32	4.28545	238.1	-2.26438	-3.63836
13	-38.5673	-45.9627	18.64	4.29544	237.2	-2.3276	-3.61014
14	-38.5673	-45.9627	27.96	4.16366	236.5	-2.29716	-3.47262
15	-38.5673	-45.9627	37.28	3.90109	236.	-2.1819	-3.23385
16	-38.5673	-45.9627	46.6	3.51703	235.6	-1.98829	-2.90107
17	-38.5673	-45.9627	55.92	3.02135	235.2	-1.72281	-2.48203
18	-38.5673	-45.9627	65.24	2.42438	235.	-1.39215	-1.98483
19	-38.5673	-45.9627	74.56	1.7351	234.7	-1.00219	-1.4164
20	-38.5673	-45.9627	83.88	.954861	234.5	-.554323	-.777487
END	-38.5673	-45.9627	93.2	0	0	0	0
GND	-77.1345	-91.9253	0	.391426	346.9	.381293	-.0884865
22	-77.1345	-91.9253	9.16	.219307	346.8	.213529	-.0500072
23	-77.1345	-91.9253	18.32	.106567	346.	.103402	-.0257769
24	-77.1345	-91.9253	27.48	.019795	336.	.0180794	-8.06E-03
25	-77.1345	-91.9253	36.64	.0463137	174.8	-.0461202	4.23E-03
26	-77.1345	-91.9253	45.8	.0909783	172.6	-.0902213	.0117124
27	-77.1345	-91.9253	54.96	.11544	172.5	-.114461	.0149991
28	-77.1345	-91.9253	64.12	.11972	172.9	-.118803	.0147895
29	-77.1345	-91.9253	73.28	.103674	173.4	-.102994	.0118577
30	-77.1345	-91.9253	82.44	.0665066	174.	-.0661442	6.93E-03
END	-77.1345	-91.9253	91.6	0	0	0	0
GND	-25.3054	-142.064	0	.342633	322.4	.271499	-.209011
32	-25.3054	-142.064	8.93	.184799	322.4	.146404	-.112768
33	-25.3054	-142.064	17.86	.0880999	322.3	.0696945	-.0538912
34	-25.3054	-142.064	26.79	.014283	320.7	.0110602	-9.04E-03
35	-25.3054	-142.064	35.72	.0404717	143.4	-.0324941	.0241266
36	-25.3054	-142.064	44.65	.0774764	143.2	-.0620065	.0464519
37	-25.3054	-142.064	53.58	.0973265	143.2	-.0778991	.0583453
38	-25.3054	-142.064	62.51	.100367	143.2	-.0803943	.0600861
39	-25.3054	-142.064	71.44	.0867501	143.3	-.0695535	.0518448
40	-25.3054	-142.064	80.37	.0560587	143.4	-.0449879	.0334465
END	-25.3054	-142.064	89.3	0	0	0	0
GND	-66.2086	52.6647	0	.187135	358.6	.187083	-4.42E-03
42	-66.2086	52.6647	9.13	.09884	358.6	.0988091	-2.47E-03
43	-66.2086	52.6647	18.26	.0453138	358.	.0452857	-1.6E-03
44	-66.2086	52.6647	27.39	5.33E-03	346.6	5.18E-03	-1.24E-03
45	-66.2086	52.6647	36.52	.0238232	183.	-.0237898	-1.26E-03
46	-66.2086	52.6647	45.65	.0426446	182.	-.0426175	-1.52E-03
47	-66.2086	52.6647	54.78	.0519758	182.	-.0519427	-1.85E-03
48	-66.2086	52.6647	63.91	.0523741	182.3	-.0523327	-2.08E-03
49	-66.2086	52.6647	73.04	.0443342	182.6	-.0442884	-2.02E-03
50	-66.2086	52.6647	82.17	.0280724	183.	-.0280345	-1.46E-03
END	-66.2086	52.6647	91.3	0	0	0	0