LEIBOWITZ & ASSOCIATES, P.A.

MATTHEW L. LEIBOWITZ
JOSEPH A. BELISLE

SUITE 880
4400 BISCAYNE BOULEVARD
MIAMI, FLORIDA 33137

TELEPHONE (305) 530-1322
TELECOPIER (305) 530-9417
E-MAIL jabelisle@broadlaw.com

April 9, 2012

Via Federal Express

Federal Communications Commission c/o U.S.Bank
Government Lockbox #979089, SL-MO-C2-GL
1005 Convention Plaza
St. Louis, MO 63101
(Attention: FCC Government Lockbox)

Re: Station WINK, Pine Island Center, FL
Facility ID No. 48329
Application for License and Request for Program Test Authority

Ladies and Gentlemen:

Transmitted on behalf of Fort Myers Broadcasting Company please find an original plus two copies of an FCC Form 302-AM seeking a license for Station WINK(AM), Pine Island Center, Florida. Also enclosed is an FCC Form 159 and a check payable to the Federal Communications commission in the amount of $1,365.00 for the fees associated with this application. Fort Myers Broadcasting Company is also requesting program test authority to operate Station WINK with the facilities specified in the license application.

Sincerely yours,

Joseph A. Belisle
Counsel for
Fort Myers Broadcasting Company

cc: Mr. Charles N. Miller
Mr. Wayne Simons (for the Public File)

Federal Communications Commission
Washington, D. C. 20554

Approved by OMB
3060-0627
Expires 01/31/98

FOR FCC USE ONLY

FCC 302-AM
APPLICATION FOR AM BROADCAST STATION LICENSE

(Please read instructions before filling out form.)

FOR COMMISSION USE ONLY
FILE NO. BMML-20120410AEI

SECTION I - APPLICANT FEE INFORMATION

1. PAYOR NAME (Last, First, Middle Initial)

Fort Myers Broadcasting Company

MAILING ADDRESS (Line 1) (Maximum 35 characters)
2824 Palm Beach Boulevard

MAILING ADDRESS (Line 2) (Maximum 35 characters)

CITY	STATE OR COUNTRY (if foreign address)	ZIP CODE
Fort Myers	FL	33916

TELEPHONE NUMBER (include area code)	CALL LETTERS	OTHER FCC IDENTIFIER (If applicable)
239-334-1111	WINK	

2. A. Is a fee submitted with this application? [✓] Yes [ ] No

B. If No, indicate reason for fee exemption (see 47 C.F.R. Section

[ ] Governmental Entity [ ] Noncommercial educational licensee [ ] Other (Please explain):

C. If Yes, provide the following information:

Enter in Column (A) the correct Fee Type Code for the service you are applying for. Fee Type Codes may be found in the "Mass Media Services Fee Filing Guide." Column (B) lists the Fee Multiple applicable for this application. Enter fee amount due in Column (C).

(A) FEE TYPE CODE	(B) FEE MULTIPLE	(C) FEE DUE FOR FEE TYPE CODE IN COLUMN (A)	FOR FCC USE ONLY
M M R	0 0 0 1	$ 635.00	

To be used only when you are requesting concurrent actions which result in a requirement to list more than one Fee Type Code.

(A)	(B)	(C)	FOR FCC USE ONLY
M O R	0 0 0 1	$ 730.00	

ADD ALL AMOUNTS SHOWN IN COLUMN C, AND ENTER THE TOTAL HERE. THIS AMOUNT SHOULD EQUAL YOUR ENCLOSED REMITTANCE.

TOTAL AMOUNT REMITTED WITH THIS APPLICATION	FOR FCC USE ONLY
$ 1,365.00	

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT Fort Myers Broadcasting Company		
MAILING ADDRESS 2824 Palm Beach Boulevard		
CITY Fort Myers	STATE FL	ZIP CODE 33916

2. This application is for:

[✓] Commercial [ ] Noncommercial

[✓] AM Directional [ ] AM Non-Directional

Call letters	Community of License	Construction Permit File No.	Modification of Construction Permit File No(s).	Expiration Date of Last Construction Permit
WINK	Pine Island Center, FL	BP-20081103ACC		April 16, 2012

3. Is the station now operating pursuant to automatic program test authority in accordance with 47 C.F.R. Section 73.1620?

If No, explain in an Exhibit.

[ ] Yes [✓] No

Exhibit No. II-3

4. Have all the terms, conditions, and obligations set forth in the above described construction permit been fully met?

If No, state exceptions in an Exhibit.

[✓] Yes [ ] No

Exhibit No.

5. Apart from the changes already reported, has any cause or circumstance arisen since the grant of the underlying construction permit which would result in any statement or representation contained in the construction permit application to be now incorrect?

If Yes, explain in an Exhibit.

[ ] Yes [✓] No

Exhibit No.

6. Has the permittee filed its Ownership Report (FCC Form 323) or ownership certification in accordance with 47 C.F.R. Section 73.3615(b)?

If No, explain in an Exhibit.

[ ] Yes [ ] No

[✓] Does not apply

Exhibit No.

7. Has an adverse finding been made or an adverse final action been taken by any court or administrative body with respect to the applicant or parties to the application in a civil or criminal proceeding, brought under the provisions of any law relating to the following: any felony; mass media related antitrust or unfair competition; fraudulent statements to another governmental unit; or discrimination?

[ ] Yes [✓] No

If the answer is Yes, attach as an Exhibit a full disclosure of the persons and matters involved, including an identification of the court or administrative body and the proceeding (by dates and file numbers), and the disposition of the litigation. Where the requisite information has been earlier disclosed in connection with another application or as required by 47 U.S.C. Section 1.65(c), the applicant need only provide: (i) an identification of that previous submission by reference to the file number in the case of an application, the call letters of the station regarding which the application or Section 1.65 information was filed, and the date of filing; and (ii) the disposition of the previously reported matter.

Exhibit No.

8. Does the applicant, or any party to the application, have a petition on file to migrate to the expanded band (1605-1705 kHz) or a permit or license either in the existing band or expanded band that is held in combination (pursuant to the 5 year holding period allowed) with the AM facility proposed to be modified herein?

☐ Yes ☑ No

If Yes, provide particulars as an Exhibit.

Exhibit No.

The APPLICANT hereby waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because use of the same, whether by license or otherwise, and requests and authorization in accordance with this application. (See Section 304 of the Communications Act of 1934, as amended).

The APPLICANT acknowledges that all the statements made in this application and attached exhibits are considered material representations and that all the exhibits are a material part hereof and are incorporated herein as set out in full in

CERTIFICATION

1. By checking Yes, the applicant certifies, that, in the case of an individual applicant, he or she is not subject to a denial of federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. Section 862, or, in the case of a non-individual applicant (e.g., corporation, partnership or other unincorporated association), no party to the application is subject to a denial of federal benefits that includes FCC benefits pursuant to that section. For the definition of a "party" for these purposes, see 47 C.F.R. Section 1.2002(b).

☑ Yes ☐ No

2. I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith.

Name	Signature	
Wayne Simons	[signature]	
Title	**Date**	**Telephone Number**
Vice President	4/5/2012	239-338-4325

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION

FCC NOTICE TO INDIVIDUALS REQUIRED BY THE PRIVACY ACT AND THE PAPERWORK REDUCTION ACT

The solicitation of personal information requested in this application is authorized by the Communications Act of 1934, as amended. The Commission will use the information provided in this form to determine whether grant of the application is in the public interest. In reaching that determination, or for law enforcement purposes, it may become necessary to refer personal information contained in this form to another government agency. In addition, all information provided in this form will be available for public inspection. If information requested on the form is not provided, the application may be returned without action having been taken upon it or its processing may be delayed while a request is made to provide the missing information. Your response is required to obtain the requested authorization.

Public reporting burden for this collection of information is estimated to average 639 hours and 53 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, can be sent to the Federal Communications Commission, Records Management Branch, Paperwork Reduction Project (3060-0627), Washington, D. C. 20554. Do NOT send completed forms to this address.

THE FOREGOING NOTICE IS REQUIRED BY THE PRIVACY ACT OF 1974, P.L. 93-579, DECEMBER 31, 1974, 5 U.S.C. 552a(e)(3), AND THE PAPERWORK REDUCTION ACT OF 1980, P.L. 96-511, DECEMBER 11, 1980, 44 U.S.C. 3507.

Fort Myers Broadcasting Company
Station WINK
Pine Island Center, Florida
April 2012 License Application

Exhibit No. II-3

Request for Program Test Authority

Station WINK is not operating under automatic program test authority because it has a directional antenna system. The engineering statement from Ronald D. Rackley P.E. of duTreil, Lundin & Rackley Inc. included within this application demonstrates compliance with all applicable technical requirements for licensing WINK's newly-constructed facilities. Therefore the applicant requests grant of program test authority.

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

APRIL 2, 2012

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

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

Table of Contents

<u>Executive Summary - WINK</u>

This engineering exhibit supports an application for license for the newly constructed daytime directional antenna system of radio station WINK in Pine Island Center, Florida. WINK is presently licensed to operate fulltime on 1200 kilohertz with 10 kilowatts in the daytime and 1 kilowatt at night, employing different directional antenna patterns day and night. WINK operates with 2.2 kilowatts and a directional antenna at night to overcome Cuban interference under a "Special Temporary Authorization" ("STA"). Construction Permit BP-20081103ACC authorizes operation daytime with 50 kilowatts and a new directional antenna system. The nighttime licensed and STA directional antenna patterns remain unchanged.

The new towers and ground system for the daytime directional antenna system have been constructed in accordance with the terms of the construction permit and specifications that were provided in the application for construction permit. New directional antenna phasing and coupling equipment has been installed for both the new daytime and previously existing nighttime STA directional antenna systems and it has been adjusted to produce the authorized directional antenna patterns.

Tower 2 supports an STL receiving antenna near its top. A coaxial transmission line that is bonded to tower potential connects the antenna to an isocoupler at the base of the tower, through which the signal is carried on to receiving equipment.

Information is provided herein demonstrating that the directional antenna parameters for both the new daytime and existing nighttime STA patterns have been determined in accordance with the requirements of section 73.151(c) of the FCC Rules. The antenna system has been adjusted to produce antenna monitor parameters within +/- 5 percent in ratio and +/- 3 degrees in phase of the modeled values, as required by the Rules.

Information regarding direct measurement of power and radiofrequency radiation protection measures at the site is also included herein.

Program test authority for the nighttime directional antenna is hereby requested.

Ronald D. Rackley

Ronald D. Rackley, P.E.
April 2, 2012

Analysis of Tower Impedance Measurements to Verify Method of Moments Model – WINK

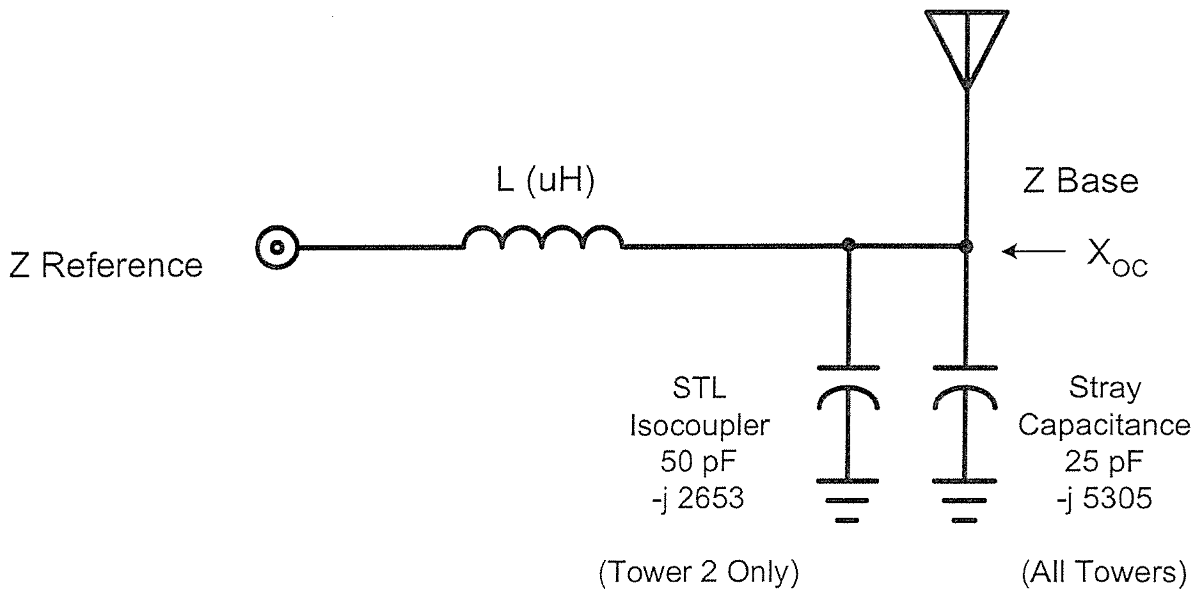
Tower base impedance measurements were made at the final J-plugs within the antenna tuning units ("ATUs") using a Hewlett-Packard 8751A network analyzer and a Tunwall Radio directional coupler in a calibrated measurement system. The other towers were all open circuited at the same points where impedance measurements were made for them (the "reference points") for each of the measurements.

The reference point at each tower is adjacent to the sampling transformer of the antenna monitor system at the output of the ATU enclosure. The current passes directly from that point over conductors through the enclosure insulator and on to the tower above the base insulator. There are no adjustable shunt components following the sampling transformers. An assumed value for the sum of the base insulator and base region stray capacitances across the ATU output was employed in the base circuit calculations for each tower. In addition, an assumed capacitance representing the STL isocoupler across the base of tower 2 was included in the analysis. The static drain coils across the five tower bases have high impedances that do not require consideration, as evidenced by the fact that satisfactory analysis was possible with typical base shunt capacitances and all other assumptions well within the range limitations of the FCC Rules. Circuit calculations were performed to relate the method of moments modeled impedances of the tower feedpoints to the ATU output measurement (reference) points as shown on the following pages. The Xoc shown for each tower, which was calculated for the assumed base conditions, was used in the method of moments model as a load at ground level for the open circuited case.

In addition to the page showing the schematic of the assumed circuit and tabulation of calculated values, pages showing the results of calculations using the WCAP network analysis program from Westberg Consulting are provided. WCAP performs such calculations using nodal analysis, as do other modern circuit analysis programs such as the commonly available ones based on SPICE software.

In each of the WCAP tabulations, node 2 represents the ATU output reference point and node 3 represents the tower feedpoint. Node 0 represents ground potential. The numerals in the file names shown on the tabulations correspond to the tower numbers. It should be noted that the calculated reference point impedances appear under the "TO NODE IMPEDANCE" columns of the WCAP tabulations, following the phantom 1.0 ohm resistors (R 1 - 2) that were included in series with the drive current sources (I 0 -1)) to provide calculation points for the impedances. The tower base impedances from the method of moments model are represented by complex loads from node 3 to ground (R 3 - 0). The shunt capacitances shown for the towers on the schematic were used for the calculations, although they only appear to the nearest 0.0001 microfarad on the WCAP printout due to rounding.

The modeled and measured base impedances at the ATU output jacks with the other towers open circuited at their filter unit output jacks agree within +/- 2 ohms and +/- 4 percent for resistance and reactance, as required by the FCC Rules.



TOWER	L (uH)	X_L	X_{OC}	Z Base (Modeled)	Z Reference (Modeled)	Z Reference (Measured)
1 (NW)	4.217	+ j 31.8	- j 5305	39.2 +j 24.2	39.6 +j 55.8	39.7 +j 55.8
2 (C)	4.191	+ j 31.6	- j 1769	41.1 +j 33.3	42.7 +j 64.6	43.0 +j 64.5
3 (SE)	4.854	+ j 36.6	- j 5305	40.2 +j 26.2	40.6 +j 62.6	40.5 +j 62.6
4 (NE)	6.114	+ j 46.1	- j 5305	38.6 +j 15.6	38.9 +j 61.5	38.8 +j 61.5
5 (SW)	5.106	+ j 38.5	- j 5305	41.8 +j 26.2	42.2 +j 64.5	42.2 +j 64.5

ANALYSIS OF TOWER IMPEDANCE MEASUREMENTS TO VERIFY METHOD OF MOMENTS MODEL

RADIO STATION WINK
PINE ISLAND CENTER, FLORIDA
1200 KHZ 50 KW-D 1.0 KW-N (STA 2.2 KW-N) DA-2

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

Tower 1 Individually Driven Base Circuit Analysis

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wink1oc.txt

I	1.0000	0	1	.0000	.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	39.2280	3	0	24.1710	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.200

NODE	VOLT MAG	VOLT PHASE
1	68.9851	53.9617
2	68.4016	54.6390
3	46.2864	31.2144

			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1- 2	1.000	1.00	.000	1.00	.000	40.59	55.78	39.59	55.78
L	2- 3	4.217	31.80	90.000	1.00	.000	39.59	55.78	39.59	23.99
C	3- 0	.000	46.29	31.214	.01	121.214	.00	-5305.17	.00	.00
R	3- 0	39.228	46.29	31.214	1.00	-.426	39.23	24.17	.00	.00

Tower 2 Individually Driven Base Circuit Analysis

FILE NAME = wink2oc.txt

I	1.0000	0	1	.0000	.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	41.1190	3	0	33.3200	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.200

NODE	VOLT MAG	VOLT PHASE
1	77.9433	55.9076
2	77.3872	56.5208
3	53.9256	37.6613

			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1- 2	1.000	1.00	.000	1.00	.000	43.69	64.55	42.69	64.55
L	2- 3	4.191	31.60	90.000	1.00	.000	42.69	64.55	42.69	32.95
C	3- 0	.000	53.93	37.661	.03	127.661	.00	-1768.39	.00	.00
R	3- 0	41.119	53.93	37.661	1.02	-1.358	41.12	33.32	.00	.00

Tower 3 Individually Driven Base Circuit Analysis

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wink3oc.txt

I	1.0000	0	1	.0000	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	4.8540	2	3	.0000	.0000	.0000
C	.0000	3	0	.0000	.0000	.0000
R	40.2210	3	0	26.1550	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.200

NODE	VOLT MAG	VOLT PHASE
1	75.1499	56.3717
2	74.6007	57.0113
3	48.2135	32.5987

			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1- 2	1.000	1.00	.000	1.00	.000	41.62	62.57	40.62	62.57
L	2- 3	4.854	36.60	90.000	1.00	.000	40.62	62.57	40.62	25.98
C	3- 0	.000	48.21	32.599	.01	122.599	.00	-5305.17	.00	.00
R	3- 0	40.221	48.21	32.599	1.00	-.437	40.22	26.15	.00	.00

Tower 4 Individually Driven Base Circuit Analysis

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wink4oc.txt

I	1.0000	0	1	.0000	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	6.1140	2	3	.0000	.0000	.0000
C	.0000	3	0	.0000	.0000	.0000
R	38.6210	3	0	15.6160	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.200

NODE	VOLT MAG	VOLT PHASE
1	73.2613	57.0500
2	72.7223	57.7112
3	41.7805	21.5971

			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1- 2	1.000	1.00	.000	1.00	.000	39.85	61.48	38.85	61.48
L	2- 3	6.114	46.10	90.000	1.00	.000	38.85	61.48	38.85	15.38
C	3- 0	.000	41.78	21.597	.01	111.597	.00	-5305.17	.00	.00
R	3- 0	38.621	41.78	21.597	1.00	-.418	38.62	15.62	.00	.00

Tower 5 Individually Driven Base Circuit Analysis

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wink5oc.txt

I	1.0000	0	1	.0000	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	5.1060	2	3	.0000	.0000	.0000
C	.0000	3	0	.0000	.0000	.0000
R	41.8260	3	0	26.2250	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.200

NODE	VOLT MAG	VOLT PHASE
1	77.6684	56.1704
2	77.1162	56.7876
3	49.6113	31.6339

			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1- 2	1.000	1.00	.000	1.00	.000	43.24	64.52	42.24	64.52
L	2- 3	5.106	38.50	90.000	1.00	.000	42.24	64.52	42.24	26.02
C	3- 0	.000	49.61	31.634	.01	121.634	.00	-5305.17	.00	.00
R	3- 0	41.826	49.61	31.634	1.00	-.454	41.83	26.23	.00	.00

Derivation of Operating Parameters for Daytime 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	16.4224	+7.46	0.528	-1.4
3	21	22.9532	+148.50	0.738	+139.6
4	31	31.1189	+8.89	1.000	0.0
5	41	18.8488	+99.41	0.606	+90.5

Tower 1 Day-DA Base Circuit Analysis

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wink1dad.txt

I	1642.2500	0	1	7.4600	.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	69.9530	3	0	45.5910	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.200

NODE	VOLT MAG	VOLT PHASE
1	173103.5000	54.2579
2	171983.4000	54.6567
3	138301.4000	39.7918

				BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
				MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1-	2	1.000	1642.24	7.460	1642.24	7.460	72.16	76.84	71.16	76.84
L	2-	3	4.217	52216.04	97.460	1642.25	7.460	71.16	76.84	71.16	45.04
C	3-	0	.000	138301.40	39.792	26.07	129.792	.00	-5305.17	.00	.00
R	3-	0	69.953	138301.40	39.792	1656.34	6.698	69.95	45.59	.00	.00

Tower 3 Day-DA Base Circuit Analysis

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wink3dad.txt

I	2295.3200	0	1	148.5000	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	4.8540	2	3	.0000	.0000	.0000
C	.0000	3	0	.0000	.0000	.0000
R	-27.8790	3	0	17.3950	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.200

NODE	VOLT MAG	VOLT PHASE
1	138441.0000	-94.8409
2	139486.0000	-93.9983
3	75672.8600	-63.1599

				BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
				MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1-	2	1.000	2295.32	148.500	2295.32	148.500	-27.06	53.90	-28.06	53.90
L	2-	3	4.854	84004.82	-121.500	2295.32	148.500	-28.06	53.90	-28.06	17.30
C	3-	0	.000	75672.86	-63.160	14.26	26.840	.00	-5305.17	.00	.00
R	3-	0	-27.879	75672.86	-63.160	2302.84	148.802	-27.88	17.39	.00	.00

Currents are multiplied X 100 for improved resolution.

Tower 4 Day-DA Base Circuit Analysis

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wink4dad.txt

I	3111.8900	0	1	8.8900	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	6.1140	2	3	.0000	.0000	.0000
C	.0000	3	0	.0000	.0000	.0000
R	36.2300	3	0	16.4610	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.200

NODE	VOLT MAG	VOLT PHASE
1	226371.7000	67.9009
2	224785.3000	68.5809
3	124217.7000	32.9320

			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1- 2	1.000	3111.89	8.890	3111.89	8.890	37.45	62.36	36.45	62.36
L	2- 3	6.114	143453.40	98.890	3111.89	8.890	36.45	62.36	36.45	16.26
C	3- 0	.000	124217.70	32.932	23.41	122.932	.00	-5305.17	.00	.00
R	3- 0	36.230	124217.70	32.932	3121.50	8.498	36.23	16.46	.00	.00

Tower 5 Day-DA Base Circuit Analysis

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wink5dad.txt

I	1884.8800	0	1	99.4100	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	5.1060	2	3	.0000	.0000	.0000
C	.0000	3	0	.0000	.0000	.0000
R	28.8350	3	0	12.2410	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.200

NODE	VOLT MAG	VOLT PHASE
1	110862.6000	158.7789
2	109914.2000	159.6244
3	59180.8600	122.1000

			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1- 2	1.000	1884.88	99.410	1884.88	99.410	29.97	50.61	28.97	50.61
L	2- 3	5.106	72564.74	-170.590	1884.88	99.410	28.97	50.61	28.97	12.11
C	3- 0	.000	59180.86	122.100	11.16	-147.900	.00	-5305.17	.00	.00
R	3- 0	28.835	59180.86	122.100	1889.21	99.098	28.83	12.24	.00	.00

Currents are multiplied X 100 for improved resolution.

Derivation of Operating Parameters for 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	4.9806	1.40	0.568	+121.1
2	21	8.7728	-119.71	1.000	0
3	31	4.0936	112.07	0.467	-128.2

Tower 1 Night-DA Base Circuit Analysis

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wink1dan.txt

I	498.0560	0	1	1.4030	.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	9.5281	3	0	-.6231	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.200

NODE	VOLT MAG	VOLT PHASE
1	16378.7500	72.7355
2	16226.2000	74.4018
3	4755.0980	-2.4414

			BRANCH VOLTAGE MAG	BRANCH VOLTAGE PHASE	BRANCH CURRENT MAG	BRANCH CURRENT PHASE	FROM NODE IMPEDANCE RESISTANCE	FROM NODE IMPEDANCE REACTANCE	TO NODE IMPEDANCE RESISTANCE	TO NODE IMPEDANCE REACTANCE
R	1- 2	1.000	498.06	1.403	498.06	1.403	10.53	31.16	9.53	31.16
L	2- 3	4.217	15835.91	91.403	498.06	1.403	9.53	31.16	9.53	-.64
C	3- 0	.000	4755.10	-2.441	.90	87.559	.00	-5305.17	.00	.00
R	3- 0	9.528	4755.10	-2.441	498.00	1.300	9.53	-.62	.00	.00

Tower 2 Night-DA Base Circuit Analysis

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wink2dan.txt

I	877.2790	0	1	240.2940	.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	26.9260	3	0	42.5190	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.200

NODE	VOLT MAG	VOLT PHASE
1	70401.8200	-51.0912
2	70086.7000	-50.4234
3	45233.6300	-62.9447

			BRANCH VOLTAGE MAG	BRANCH VOLTAGE PHASE	BRANCH CURRENT MAG	BRANCH CURRENT PHASE	FROM NODE IMPEDANCE RESISTANCE	FROM NODE IMPEDANCE REACTANCE	TO NODE IMPEDANCE RESISTANCE	TO NODE IMPEDANCE REACTANCE
R	1- 2	1.000	877.28	-119.706	877.28	-119.706	29.26	74.72	28.26	74.72
L	2- 3	4.191	27721.49	-29.706	877.28	-119.706	28.26	74.72	28.26	43.13
C	3- 0	.000	45233.63	-62.945	25.58	27.055	.00	-1768.39	.00	.00
R	3- 0	26.926	45233.63	-62.945	898.78	-120.600	26.93	42.52	.00	.00

Currents are multiplied X 100 for improved resolution.

Tower 3 Night-DA Base Circuit Analysis

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = wink3dan.txt

I	409.3620	0	1	112.0660	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	4.8540	2	3	.0000	.0000	.0000
C	.0000	3	0	.0000	.0000	.0000
R	-12.1450	3	0	99.6620	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.200

NODE	VOLT MAG	VOLT PHASE
1	56748.3600	-153.1280
2	56784.1300	-152.7164
3	41886.4100	-150.8524

			BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
			MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1- 2	1.000	409.36	112.066	409.36	112.066	-11.61	138.14	-12.61	138.14
L	2- 3	4.854	14981.95	-157.934	409.36	112.066	-12.61	138.14	-12.61	101.54
C	3- 0	.000	41886.41	-150.852	7.90	-60.852	.00	-5305.17	.00	.00
R	3- 0	-12.145	41886.41	-150.852	417.20	112.200	-12.15	99.66	.00	.00

Currents are multiplied X 100 for improved resolution.

Method of Moments Model Details for Towers Driven Individually – WINK

The array of towers was modeled using Expert MININEC Broadcast Professional Version 14.5. One wire was used to represent each tower. The tower geometry was specified using the geographic coordinate system. Each tower was modeled using 10 wire segments. Towers 1, 2 and 3 are physically 85.6 degrees in electrical height and their segment length is 8.56 electrical degrees. Towers 4 and 5 are physically 83.5 degrees in electrical height and their segment length is 8.35 electrical degrees.

The individual tower characteristics were adjusted to provide a match of their modeled impedances, when presented to a circuit model which included branches representing the shunt capacitances and feedline hookup inductances, with the base impedances that were measured at the output jacks of the filter units while the other towers of the array were open circuited. The method of moments model assumed loads at ground level having the reactances that were calculated for them using the base circuit models for the open circuited towers of the array.

Each tower's modeled height relative to its physical height falls within the required range of 75 to 125 percent and each modeled radius falls within the required range of 80 percent to 150 percent of the radius of a circle having a circumference equal to the sum of the widths of the tower sides. The array consists of triangular uniform cross section towers. Towers 1, 2 and 3 have a face width of 18 inches and towers 4 and 5 have a face width 0f 30 inches.

TOWER	Physical Height (degrees)	Modeled Height (degrees)	Modeled Percent of Height	Modeled Radius (meters)	Percent Equivalent Radius
1	85.6	91.1	106.4	0.218	100
2	85.6	93.2	108.9	0.218	100
3	85.6	91.6	107.0	0.218	100
4	83.5	89.3	106.9	0.364	100
5	83.5	91.3	109.3	0.364	100

The following pages show the details of the method of moments models for the individually driven towers. The numerals in the file names shown on the tabulations correspond to the tower numbers.

Tower 1 Driven Individually

C:\MBPRO14.5\WINK1OC 03-29-2012 05:31:42

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	39.228	24.171	46.077	31.6	1.8021	-10.865	-.3713

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

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

ELECTRICAL DESCRIPTION

Frequencies (MHz)

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

Sources

source	node	sector	magnitude	phase	type
1	1	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	11	0	-1,769.	0	0	0
2	21	0	-5,305.	0	0	0
3	31	0	-5,305.	0	0	0
4	41	0	-5,305.	0	0	0

Tower 2 Driven Individually

C:\MBPRO14.5\WINK2OC 03-29-2012 05:35:15

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 11, sector 1							
1.2	41.119	33.32	52.924	39.	2.1028	-8.9851	-.5865

C:\MBPRO14.5\WGCL2OC 05-25-2011 07:51:38

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)

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

Sources

source	node	sector	magnitude	phase	type
1	11	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-5,305.	0	0	0
2	21	0	-5,305.	0	0	0
3	31	0	-5,305.	0	0	0
4	41	0	-5,305.	0	0	0

Tower 3 Driven Individually

C:\MBPRO14.5\WINK3OC 03-29-2012 05:37:35

IMPEDANCE

normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 21, sector 1							
1.2	40.221	26.155	47.978	33.	1.846	-10.537	-.40179

C:\MBPRO14.5\WGCL3OC 05-25-2011 07:54:23

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

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

ELECTRICAL DESCRIPTION

Frequencies (MHz)

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

Sources

source	node	sector	magnitude	phase	type
1	21	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-5,305.	0	0	0
2	11	0	-1,769.	0	0	0
3	31	0	-5,305.	0	0	0
4	41	0	-5,305.	0	0	0

Tower 4 Driven Individually

C:\MBPRO14.5\WINK4OC 03-29-2012 05:39:29

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 31, sector 1							
1.2	38.621	15.616	41.658	22.	1.5469	-13.362	-.205

C:\MBPRO14.5\WGCL4OC 05-25-2011 07:56:53

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

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

ELECTRICAL DESCRIPTION
Frequencies (MHz)

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

Sources

source	node	sector	magnitude	phase	type
1	31	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-5,305.	0	0	0
2	11	0	-1,769.	0	0	0
3	21	0	-5,305.	0	0	0
4	41	0	-5,305.	0	0	0

Tower 5 Driven Individually

C:\MBPRO14.5\WINK5OC 03-29-2012 05:41:25

IMPEDANCE
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 41, sector 1							
1.2	41.826	26.225	49.367	32.1	1.8076	-10.823	-.37506

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)

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

Sources

source	node	sector	magnitude	phase	type
1	41	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	0	-5,305.	0	0	0
2	11	0	-1,769.	0	0	0
3	21	0	-5,305.	0	0	0
4	31	0	-5,305.	0	0	0

Method of Moments Model Details for Daytime 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.

Tower 2 of the array, which is not used by the daytime pattern, was detuned by terminating it with a load reactance at its base (node 11) as shown in the tabulation. The detuning reactance, +j 546, is the opposite sign value of the imaginary component of the method of moments modeled operating impedance for the daytime directional antenna with a field ratio of zero specified for the unused tower. In order to provide +j 546 ohms at the tower base through its ATU-to-base circuit model, the detuning inductance was adjusted to +j 386 for tower 2 at its ATU output jack reference point.

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\WINKDAD 03-29-2012 07:02:20

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = 1.2 MHz

tower	field ratio magnitude	phase (deg)
1	1.	0
2	0	0
3	1.318	151.5
4	1.762	4.3
5	1.08	95.5

VOLTAGES AND CURRENTS - rms

source node	voltage magnitude	phase (deg)	current magnitude	phase (deg)
1	1,383.05	39.8	16.5826	6.7
11	995.649	15.8	1.82405	107.
21	756.746	296.8	23.0164	148.8
31	1,242.21	32.9	31.227	8.5
41	591.816	122.1	18.8924	99.1

Sum of square of source currents = 4,280.21

Total power = 50,000. watts

NOTE: The array synthesis calculations (above) were performed to solve for the base voltage drives required to produce the specified field parameters, including the detuned condition for tower 2 which is unused in the daytime. The base impedances were calculated and the model was revised to have voltage drives only for the towers of the daytime directional antenna pattern, towers 1, 3, 4 and 5, and a detuning reactance to ground for tower 2. The detuning reactance is equal in magnitude and opposite in sign to the reactive component of the operating impedance that was determined using the voltage sources from the array synthesis calculations. The final model does not include a voltage source for tower 2 because its base voltage is developed across the detuning reactance. The specified detuning reactance represents how the tower was 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)

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

Sources

source	node	sector	magnitude	phase	type
1	1	1	1,955.93	39.8	voltage
2	21	1	1,070.2	296.8	voltage
3	31	1	1,756.75	32.9	voltage
4	41	1	836.954	122.1	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	11	0	545.72	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	69.953	45.591	83.498	33.1	2.267	-8.2275	-.70785
source = 2; node 21, sector 1							
1.2	-27.879	17.395	32.861	148.	****	****	****
source = 3; node 31, sector 1							
1.2	36.23	16.461	39.794	24.4	1.6471	-12.236	-.26763
source = 4; node 41, sector 1							
1.2	28.835	12.241	31.325	23.	1.8838	-10.272	-.42837

CURRENT rms
Frequency = 1.2 MHz
Input power = 50,000. watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	16.5634	6.7	16.4501	1.93419
2	0	0	9.11	17.0062	3.6	16.9731	1.06128
3	0	0	18.22	16.842	1.7	16.8346	.496514
4	0	0	27.33	16.191	.2	16.1909	.0669718
5	0	0	36.44	15.0811	359.1	15.0791	−.248322
6	0	0	45.55	13.5394	358.1	13.5317	−.457248
7	0	0	54.66	11.5975	357.2	11.5837	−.564375
8	0	0	63.77	9.28885	356.5	9.27112	−.573537
9	0	0	72.88	6.64174	355.8	6.62379	−.487942
10	0	0	81.99	3.65527	355.2	3.64228	−.307935
END	0	0	91.1	0	0	0	0
GND	-38.5673	-45.9627	0	1.82441	105.9	−.499657	1.75466
12	-38.5673	-45.9627	9.32	.99515	105.8	−.270505	.95768
13	-38.5673	-45.9627	18.64	.460838	104.9	−.118359	.445379
14	-38.5673	-45.9627	27.96	.0602595	89.4	6.22E-04	.0602563
15	-38.5673	-45.9627	37.28	.236193	292.6	.0906727	−.218095
16	-38.5673	-45.9627	46.6	.426732	290.9	.152335	−.398615
17	-38.5673	-45.9627	55.92	.521527	290.8	.185127	−.487563
18	-38.5673	-45.9627	65.24	.525622	291.	.188359	−.490713
19	-38.5673	-45.9627	74.56	.443702	291.3	.161299	−.413345
20	-38.5673	-45.9627	83.88	.277841	291.7	.102577	−.258212
END	-38.5673	-45.9627	93.2	0	0	0	0
GND	-77.1345	-91.9253	0	23.0284	148.8	-19.6896	11.9425
22	-77.1345	-91.9253	9.16	23.0922	150.	-20.0058	11.5333
23	-77.1345	-91.9253	18.32	22.504	150.8	-19.6491	10.9701
24	-77.1345	-91.9253	27.48	21.3427	151.4	-18.7451	10.2045
25	-77.1345	-91.9253	36.64	19.6424	151.9	-17.3325	9.24171
26	-77.1345	-91.9253	45.8	17.4424	152.3	-15.45	8.09524
27	-77.1345	-91.9253	54.96	14.7887	152.7	-13.1413	6.78316
28	-77.1345	-91.9253	64.12	11.7301	153.	-10.4518	5.325
29	-77.1345	-91.9253	73.28	8.30877	153.3	-7.42082	3.73726
30	-77.1345	-91.9253	82.44	4.53036	153.5	-4.05478	2.02062
END	-77.1345	-91.9253	91.6	0	0	0	0
GND	-25.3054	-142.064	0	31.215	8.5	30.8749	4.59517
32	-25.3054	-142.064	8.93	31.3725	6.5	31.1708	3.55126
33	-25.3054	-142.064	17.86	30.6261	5.3	30.4932	2.85077
34	-25.3054	-142.064	26.79	29.1101	4.4	29.0232	2.24821
35	-25.3054	-142.064	35.72	26.8669	3.7	26.8117	1.72108
36	-25.3054	-142.064	44.65	23.944	3.	23.9107	1.26325
37	-25.3054	-142.064	53.58	20.3958	2.5	20.3771	.873756
38	-25.3054	-142.064	62.51	16.2784	1.9	16.269	.552936
39	-25.3054	-142.064	71.44	11.6349	1.5	11.631	.301132
40	-25.3054	-142.064	80.37	6.45449	1.	6.45341	.118163
END	-25.3054	-142.064	89.3	0	0	0	0
GND	-66.2086	52.6647	0	18.8921	99.1	-2.98717	18.6545
42	-66.2086	52.6647	9.13	18.9107	97.5	-2.46733	18.7491
43	-66.2086	52.6647	18.26	18.4141	96.5	-2.09198	18.2949
44	-66.2086	52.6647	27.39	17.4664	95.7	-1.74449	17.3791
45	-66.2086	52.6647	36.52	16.0919	95.1	-1.41659	16.0294
46	-66.2086	52.6647	45.65	14.3188	94.4	-1.10884	14.2758
47	-66.2086	52.6647	54.78	12.1795	93.9	-.824825	12.1515
48	-66.2086	52.6647	63.91	9.70734	93.4	-.56911	9.69064
49	-66.2086	52.6647	73.04	6.92822	92.9	-.346129	6.91957
50	-66.2086	52.6647	82.17	3.83636	92.4	-.159183	3.83305
END	-66.2086	52.6647	91.3	0	0	0	0

Method of Moments Model Details for 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 4 and 5 of the array, which are not used by the nighttime pattern, were detuned by terminating them with load reactances at their bases (nodes 31 and 41) as shown in the tabulation. The detuning reactances, +j 466 for tower 4 and +j 480 for tower 5, are the opposite sign values of the imaginary components of the method of moments modeled operating impedances for the 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 were adjusted to +j 382 for tower 4 and +j 402 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\WINKDAN 03-30-2012 14:10:41

MEDIUM WAVE ARRAY SYNTHESIS FROM FIELD RATIOS

Frequency = 1.2 MHz

tower	field ratio magnitude	phase (deg)
1	1.	0
2	1.998	-123.3
3	1.	-246.5
4	0	0
5	0	0

VOLTAGES AND CURRENTS - rms

source node	voltage magnitude	phase (deg)	current magnitude	phase (deg)
1	47.5579	357.6	4.97932	1.3
11	452.4	297.1	8.98671	239.4
21	418.924	209.1	4.17067	112.2
31	232.122	186.6	.497829	277.2
41	76.1038	240.5	.15838	332.

Sum of square of source currents = 246.444

Total power = 2,200. 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 4 and 5 which are unused in the nighttime. 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, 2 and 3 and detuning reactances to ground for towers 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 4 and 5 because their base voltages are developed across the detuning reactances. The specified detuning reactances represent how the towers were 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)

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

Sources

source	node	sector	magnitude	phase	type
1	1	1	67.257	357.6	voltage
2	11	1	639.79	297.1	voltage
3	21	1	592.447	209.1	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	31	0	466.24	0	0	0
2	41	0	480.35	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	9.5281	-.62308	9.5485	356.3	5.2485	-3.3508	-2.6945
source = 2; node 11, sector 1							
1.2	26.926	42.519	50.328	57.7	3.4484	-5.1865	-1.5673
source = 3; node 21, sector 1							
1.2	-12.145	99.662	100.4	96.9	****	****	****

CURRENT rms
Frequency = 1.2 MHz
Input power = 2,200. watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	4.97996	1.3	4.97859	.116585
2	0	0	9.11	4.92025	.9	4.91966	.0759741
3	0	0	18.22	4.74818	.6	4.74795	.0461301
4	0	0	27.33	4.46683	.3	4.46678	.0197823
5	0	0	36.44	4.08208	360.	4.08208	-3.22E-03
6	0	0	45.55	3.60196	359.6	3.60189	-.0221336
7	0	0	54.66	3.03613	359.3	3.03592	-.0357285
8	0	0	63.77	2.39494	359.	2.39456	-.0424993
9	0	0	72.88	1.68743	358.6	1.68694	-.0407167
10	0	0	81.99	.915325	358.2	.914886	-.0283533
END	0	0	91.1	0	0	0	0
GND	-38.5673	-45.9627	0	8.98781	239.4	-4.56916	-7.73973
12	-38.5673	-45.9627	9.32	9.19762	238.2	-4.84455	-7.81835
13	-38.5673	-45.9627	18.64	9.07631	237.5	-4.88179	-7.65164
14	-38.5673	-45.9627	27.96	8.69227	236.9	-4.75048	-7.27933
15	-38.5673	-45.9627	37.28	8.06389	236.4	-4.46463	-6.71516
16	-38.5673	-45.9627	46.6	7.20896	236.	-4.03543	-5.97364
17	-38.5673	-45.9627	55.92	6.14741	235.6	-3.47441	-5.07141
18	-38.5673	-45.9627	65.24	4.90029	235.2	-2.7935	-4.02606
19	-38.5673	-45.9627	74.56	3.48591	234.9	-2.00296	-2.85302
20	-38.5673	-45.9627	83.88	1.9075	234.6	-1.10422	-1.5554
END	-38.5673	-45.9627	93.2	0	0	0	0
GND	-77.1345	-91.9253	0	4.17197	112.2	-1.57312	3.86402
22	-77.1345	-91.9253	9.16	4.45886	112.7	-1.71979	4.11385
23	-77.1345	-91.9253	18.32	4.51374	113.	-1.76498	4.15436
24	-77.1345	-91.9253	27.48	4.40767	113.3	-1.74297	4.04841
25	-77.1345	-91.9253	36.64	4.15433	113.5	-1.65953	3.80847
26	-77.1345	-91.9253	45.8	3.76424	113.8	-1.51839	3.44442
27	-77.1345	-91.9253	54.96	3.24812	114.	-1.32298	2.96648
28	-77.1345	-91.9253	64.12	2.61699	114.3	-1.07651	2.38532
29	-77.1345	-91.9253	73.28	1.88026	114.6	-.781361	1.71023
30	-77.1345	-91.9253	82.44	1.03893	114.8	-.436291	.942877
END	-77.1345	-91.9253	91.6	0	0	0	0
GND	-25.3054	-142.064	0	.497936	276.7	.0579673	-.49455
32	-25.3054	-142.064	8.93	.270931	276.6	.0313034	-.269117
33	-25.3054	-142.064	17.86	.131048	276.3	.0143309	-.130262
34	-25.3054	-142.064	26.79	.0235302	271.8	7.41E-04	-.0235185
35	-25.3054	-142.064	35.72	.0572321	100.	-9.95E-03	.0563613
36	-25.3054	-142.064	44.65	.112468	99.1	-.01772	.111063
37	-25.3054	-142.064	53.58	.142891	99.	-.0223688	.14113
38	-25.3054	-142.064	62.51	.148603	99.1	-.0235728	.146721
39	-25.3054	-142.064	71.44	.12939	99.3	-.020933	.127685
40	-25.3054	-142.064	80.37	.0841829	99.5	-.0139142	.0830251
END	-25.3054	-142.064	89.3	0	0	0	0
GND	-66.2086	52.6647	0	.158702	330.7	.138457	-.077562
42	-66.2086	52.6647	9.13	.0835819	330.6	.0728166	-.0410327
43	-66.2086	52.6647	18.26	.0381428	329.5	.0328702	-.01935
44	-66.2086	52.6647	27.39	4.52E-03	308.2	2.8E-03	-3.56E-03
45	-66.2086	52.6647	36.52	.0204547	158.7	-.0190585	7.43E-03
46	-66.2086	52.6647	45.65	.0362651	157.	-.0333731	.0141912
47	-66.2086	52.6647	54.78	.044052	157.	-.0405486	.017216
48	-66.2086	52.6647	63.91	.0443026	157.5	-.0409189	.0169811
49	-66.2086	52.6647	73.04	.0374548	158.1	-.0347563	.0139592
50	-66.2086	52.6647	82.17	.0237001	158.9	-.0221088	8.54E-03
END	-66.2086	52.6647	91.3	0	0	0	0

Sampling System Measurements – WINK

Impedance measurements were made of the antenna monitor sampling system using a Hewlett-Packard 8751A network analyzer and a Tunwall Radio directional coupler in a calibrated measurement system. The measurements were made looking into the antenna monitor ends of the sampling lines for two conditions – with them open circuited at their tower ends and with them connected to the sampling devices at the tower bases.

The following table shows the frequencies above and below the carrier frequency where resonance – zero reactance corresponding with low resistance – was found. As the length of a distortionless transmission line is 180 electrical degrees at the difference frequency between adjacent frequencies of resonance, and frequencies of resonance occur at odd multiples of 90 degrees electrical length, the sampling line length at the resonant frequency below carrier frequency – which is the closest one to the carrier frequency in terms of the ratio of frequencies – was found to be 270 electrical degrees. The electrical lengths at carrier frequency appearing in the table below were calculated by ratioing the frequencies.

Tower	Sampling Line Open-Circuited Resonance Below 1200 kHz (kHz)	Sampling Line Open-Circuited Resonance Above 1200 kHz (kHz)	Sampling Line Calculated Electrical Length at 1200 kHz (degrees)	1200 kHz Measured Impedance with Toroid Connected (Ohms)
1	1172.75	1958.38	276.3	51.1 – j 2.1
2	1172.55	1958.00	276.3	51.2 – j 2.2
3	1172.70	1959.13	276.3	51.2 – j 2.1
4	1173.25	1959.50	276.2	51.1 – j 2.2
5	1172.45	1958.38	276.3	51.1 – j 2.2

The sampling line lengths meet the requirement that they be equal in length within 1 electrical degree.

The characteristic impedance was calculated using the following formula, where $R_1 + j X_1$ and $R_2 + j X_2$ are the measured impedances at the +45 and –45 degree offset frequencies, respectively:

$$Zo = ((R_1^2 + X_1^2)^{1/2} \bullet (R_2^2 + X_2^2)^{1/2})^{1/2}$$

Tower	-45 Degree Offset Frequency (kHz)	-45 Degree Measured Impedance (Ohms)	+45 Degree Offset Frequency (kHz)	+45 Degree Measured Impedance (Ohms)	Calculated Characteristic Impedance (Ohms)
1	977.29	3.41 –j 50.20	1368.21	5.50 +j 50.06	50.3
2	977.13	3.43 –j 50.24	1367.98	5.54 +j 50.11	50.4
3	977.25	3.49 –j 49.90	1368.15	5.60 +j 50.07	50.4
4	977.71	3.42 –j 50.25	1368.79	5.52 +j 50.07	50.4
5	977.04	3.45 –j 50.21	1367.86	5.54 +j 50.04	50.3

The sampling line measured characteristic impedances meet the requirement that they be equal within 2 ohms.

The toroidal transformers were calibrated by measuring their outputs with a common reference signal using a Hewlett-Packard 8751A network analyzer in a calibrated measurement system. They were placed side-by-side with a conductor carrying the reference signal passing through them and their outputs were fed into the A and B receiver inputs of the analyzer which was configured to measure the relative ratios and phases of their output voltages. The following results were found for carrier frequency, 1200 kilohertz:

Tower	Toroid Ratio	Toroid Phase (Degrees)
1	Reference	Reference
2	1.001	-0.048
3	1.001	-0.116
4	1.001	-0.162
5	1.002	-0.200

Delta type TCT-1 toroidal transformers are rated for absolute magnitude accuracy of +/- 2% and absolute phase accuracy of +/- 3 degrees. As the maximum measured transformer-to-transformer variations among the four were no more than 0.2 percent and 0.2 degree, they provide far more accurate relative indications than could be the case within their rated accuracies.

Reference Field Strength Measurements – WINK

Reference field strength measurements were made at three locations along each radial at an azimuth specified for monitoring by the existing (old) STA for the nighttime pattern, at 290.0 and 330.0 degrees true, and at the azimuths specified for monitoring on the construction permit for the new daytime directional antenna at 96.5, 185.0 and 289.0 degrees true. Additionally, measurements were made on major lobe radials at 7.0 degrees true for the daytime pattern and at 130.0 degrees true for the nighttime pattern. The measured field strengths, descriptions and GPS coordinates for the reference measurement points are shown on the following pages.

Reference Field Strength Measurements

WINK DA-D

Radial (Deg.)	Point	Dist. (Km)	Field (mV/m)	Coordinates (NAD 27) N	Coordinates (NAD 27) W	Description
7	1	2.97	1380	26-44-26.3	82-02-30.9	Burnt Store Road and Durden Parkway
	2	5.09	760	26-45-34.6	82-02-21.4	Burnt Store Road and Charlee Road
	3	5.41	560	26-45-44.5	82-02-18.7	Burnt Store Road and Islamorada Boulevard
96.5	1	2.93	94	26-42-40.5	82-00-58.1	Jacaranda Parkway and NW 20th Place
	2	3.03	121	26-42-39.1	82-00-54.6	Jacaranda Parkway and NW 20th Avenue
	3	3.49	121	26-42-38.3	82-00-38.0	Jacaranda Parkway and NW 18th Avenue
185	1	3.59	175	26-40-55.2	82-02-54.3	3605 Gulfstream Parkway
	2	4.45	140	26-40-27.6	82-02-57.8	Yucatan Parkway and NW 36th Place
	3	5.28	108	26-40-01.0	82-02-59.5	Tropicana Parkway and NW 38th Avenue
289	1	1.12	580	26-43-02.8	82-03-22.0	Old Burnt Store Road
	2	1.43	425	26-43-06.0	82-03-32.6	NW 34th Terrace and NW 42nd Avenue
	3	1.86	310	26-43-10.5	82-03-47.4	NW 35th Street and NW 44th Place

Reference Field Strength Measurements

WINK DA-N

Radial (Deg.)	Point	Dist. (Km)	Field (mV/m)	Coordinates (NAD 27)		Description
				N	W	
130	1	1.87	370	26-42-12.9	82-01-51.9	NW 27th Street and 28th Avenue
	2	2.01	340	26-42-09.5	82-01-47.7	2703 NW 26th Terrace
	3	2.41	290	26-42-00.7	82-01-37.0	2530 NW 26th Avenue
290	1	1.10	15.0	26-43-03.2	82-03-21.0	Old Burnt Store Road and NW 34th Street
	2	1.39	11.2	26-43-06.2	82-03-30.9	NW 42nd Avenue and NW 34th Terrace
	3	1.96	8.0	26-43-12.3	82-03-48.8	NW 44th Place and 35th Street
330	1	1.96	9.5	26-43-45.8	82-03-18.7	Old Burnt Store Road and NW 39th Street
	2	2.11	9.0	26-43-50.2	82-03-21.6	Old Burnt Store Road and NW 39th Lane
	3	2.47	8.1	26-44-00.0	82-03-28.7	NW 40th Lane and NW 42nd Avenue

All of the field strength observations were made on March 30, 2012 by Mr. James Johnson. The Potomac Instruments FIM-21 field strength meter used for the measurements, serial number 782, was most recently calibrated by its manufacturer on November 19, 2010.

Direct Measurement of Power - WINK

Common point impedance measurements were made using the permanently installed Delta Electronics CPB-1A Common Point Bridge. The bridge is located in the circuit adjacent to the common point current meter that is used to determine operating power. The bridge readings were confirmed by comparison with those made by a calibrated network analyzer measurement system employing a Hewlett-Packard 8751A vector network analyzer and a Tunwall Radio directional coupler. The common point impedance was adjusted to 50.0 – j 6.0 ohms for both directional patterns. The reactance was set to – j 6.0 to compensate for series inductance in the circuit between the transmitter and the common point in the phasor cabinet, including the main-auxiliary transmitter switching contactor, in order to provide a non-reactive load for the transmitter's output port at carrier frequency.

Section 73.51(b)(1) of the FCC Rules specifies that the authorized antenna input power of a directional antenna for up to 5.0 kilowatts nominal power shall be increased by 8 percent above the nominal power. For the 2.2 kilowatt STA nighttime pattern, the common point current was calculated for 2,376 watts antenna input power.

Section 73.51(b)(2) of the FCC Rules specifies that the authorized antenna input power of a directional antenna for greater than 5.0 kilowatts nominal power shall be increased by 5.3 percent above the nominal power. For the 50 kilowatt daytime pattern, the common point current was calculated for 52,650 watts antenna input power.

Antenna Monitor and Sampling Lines - WINK

The antenna monitor is a Potomac Instruments model AM-1901. The sampling devices are Delta Electronics Type TCT-1 shielded toroidal transformers located at the ATU output reference points. The TCT-1 transformers have a sensitivity of 0.5 volt per ampere of RF current. The toroids are connected through equal length ½ inch foam heliax sampling lines to the antenna monitor. The outdoor portions of the sampling lines are buried underground.

The antenna monitor is new. As it was calibrated by its manufacturer prior to installation, no calibration measurements are necessary for this proof of performance.

Radio Frequency Radiation Considerations - WINK

The operation of WINK will not result in the exposure of workers or the general public to levels of radio frequency radiation in excess of the limits specified in 47 CFR 1.1310. Fences have been installed about the tower bases to restrict access beyond the distances necessary to prevent electric and magnetic field exposure above the required levels.

The fence sizes were determined with reference to Table 2 of Supplement A to FCC OET Bulletin 65 (Edition 97-01). According to Table 2, the predicted "Distance for Compliance with FCC limits" at 1200 kilohertz, for 10 kilowatts fed into a single tower 0.25 wavelength in height, is 2 meters and the distance for 50 kilowatts is 4 meters. The following table shows the operating powers of towers 1, 3, 4 and 5 in daytime directional mode and the power of tower 2 in nondirectional test mode along with the interpolated distances for each value of power and the radius values for which the fences restrict access. The nighttime mode power levels are lower than those shown in all cases.

Tower	Power (KW)	Interpolated Distance (Meters)	Interpolated Distance (Feet)	Fence Restriction (Feet)
1 (NW)	19.1	2.5	8.2	10
2 (C)	12.5	2.1	6.9	8
3 (SE)	14.7	2.2	7.2	8
4 (NE)	35.2	3.3	10.8	13
5 (SW)	10.3	2.0	6.6	8

The fences limit access to areas with fields that exceed the requirements of the Rules for all possible modes of operation. If it is necessary for workers to be inside them for extended periods of time, the station may switch to nondirectional operation with tower 2 to de-activate towers 1, 3, 4 and 5, switch to daytime directional mode to de-activate tower 2, or temporarily terminate operation. The WINK facility is, therefore, in full compliance with the FCC's requirements with regard to radio frequency radiation exposure.

Summary of Certified Array Geometry - WINK

The tower locations based on the relative distances in feet and azimuths (referenced to True North) provided in the Tower Location Certification of Appendix A were compared to the relative distances and azimuths of the array elements specified on the construction permit. The Certified and specified values were converted to the rectangular coordinate system to facilitate calculating the individual tower specified-to-certified distances, which were then converted to the polar coordinate system to determine their magnitudes. This tabulation shows those distances and other information that is relevant to their determination.

Tower	Specified Array Geometry			Post-Construction Certification*		Distance From Specified Base Location	
	Spacing (Deg.)	Spacing (Feet)	Azimuth (Deg. T.)	Spacing (Feet)	Azimuth (Deg. T.)	(Feet)	(Deg.)
1	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
2	60.0	136.61	130.0	136.56	130.03	0.09	0.04
3	120.0	273.21	130.0	272.69	130.06	0.59	0.26
4	144.3	328.54	100.1	328.28	100.08	0.28	0.12
5	84.6	192.62	218.5	192.36	218.56	0.33	0.14

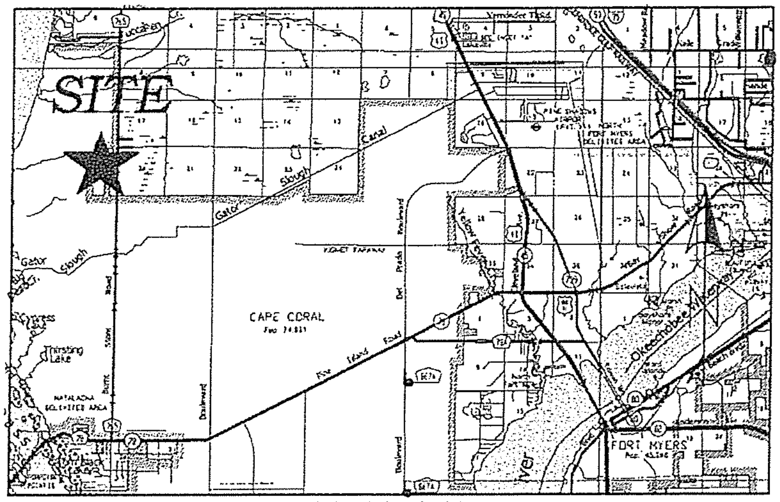
* As built tower locations from March 26, 2012 Tower Location Certification prepared by Robert G. Amann, Professional Surveyor & Mapper of Cooner & Associates, Inc.

Appendix A

Certified Post Construction Array Geometry

AS-BUILT SURVEY

RADIO TOWERS
LYING IN A PORTION OF
SECTION 19, TOWNSHIP 43 SOUTH, RANGE 23 EAST
LEE COUNTY, FLORIDA



VICINITY MAP
(NOT TO SCALE)

ABBREVIATIONS

FT. = FOOT
INC. = INCORPORATED
LB = LICENSED BUSINESS
NAD = NORTH AMERICAN DATUM
NO. = NUMBER
REV. = REVISION

NOTES:

1. THE CERTIFICATE OF AUTHORIZATION NUMBER OF COONER & ASSOCIATES, INC. IS LB-0006773.
2. NO ABSTRACT OF TITLE OR TITLE INSURANCE COMMITMENT WAS REVIEWED AS PART OF THIS SURVEY.
3. THIS SURVEY IS SUBJECT TO ANY FACTS THAT MAY BE DISCLOSED BY A FULL AND ACCURATE TITLE SEARCH.
4. IMPROVEMENTS ON OR ADJACENT TO THE SUBJECT PARCEL HAVE NOT BEEN LOCATED EXCEPT AS SHOWN.
5. THERE ARE NO VISIBLE ENCROACHMENTS OTHER THAN THOSE SHOWN.
6. THIS SURVEY DOES NOT MAKE ANY REPRESENTATIONS AS TO ZONING OR DEVELOPMENT RESTRICTIONS ON THE SUBJECT PARCEL.
7. THIS SURVEY DOES NOT REFLECT CHEMICAL CHARACTERISTICS OF THE SURVEYED PARCEL.
8. ALL NOTED RECORDING REFERENCES ARE FROM THE PUBLIC RECORDS OF LEE COUNTY.
9. BEARINGS SHOWN ON THIS SURVEY MAP ARE BASED ON FIELD LOCATED LATITUDE AND LONGITUDE POSITIONS, NAD 83/90 ADJUSTMENT
10. ALL DISTANCES ARE IN FEET AND DECIMALS THEREOF UNLESS OTHERWISE NOTED.
11. DIMENSIONS SHOWN ARE CALCULATED FROM FIELD TIES UNLESS NOTED.
12. DATE OF LAST FIELD WORK: 3-22-12; FIELD BOOK 341, PAGES 7-9.
13. THIS SURVEY MAP AND REPORT OR THE COPIES THEREOF ARE NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER. OTHERWISE THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY.
14. NO ENVIRONMENTAL AUDIT OR JURISDICTIONAL DELINEATION WAS MADE AS PART OF THIS SURVEY.
15. ANY ADJOINING DEED CITES ARE FOR "INFORMATIONAL PURPOSES ONLY"; NO SURVEY WAS MADE OF ADJOINING LANDS.
16. ADDITIONS OR DELETIONS TO SURVEY MAPS OR REPORTS BY OTHER THAN THE SIGNING PARTY OR PARTIES IS PROHIBITED WITHOUT WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES.
17. THE PURPOSE OF THIS AS-BUILT SURVEY IS TO SHOW THE RELATIONSHIP BETWEEN THE NEWLY CONSTRUCTED RADIO TOWERS AND THE EXISTING RADIO TOWERS.

ROBERT G. AMANN, JR.
PROFESSIONAL SURVEYOR & MAPPER
FLORIDA CERTIFICATE NO. 5573
(FOR THE FIRM LB 6773)
THIS 26 DAY OF MAR, 2012

■ 5670 ZIP DRIVE
FORT MYERS, FLORIDA 33905
TELEPHONE: 239.277.0722
FAX: 239.277.7179

COONER & ASSOCIATES, INC.
SURVEYING AND MAPPING
WWW.COONER.COM

☐ 2351 RADEN DRIVE
LAND O'LAKES, FLORIDA 34639
TELEPHONE: 813.909.2693
FAX: 813.909.2841

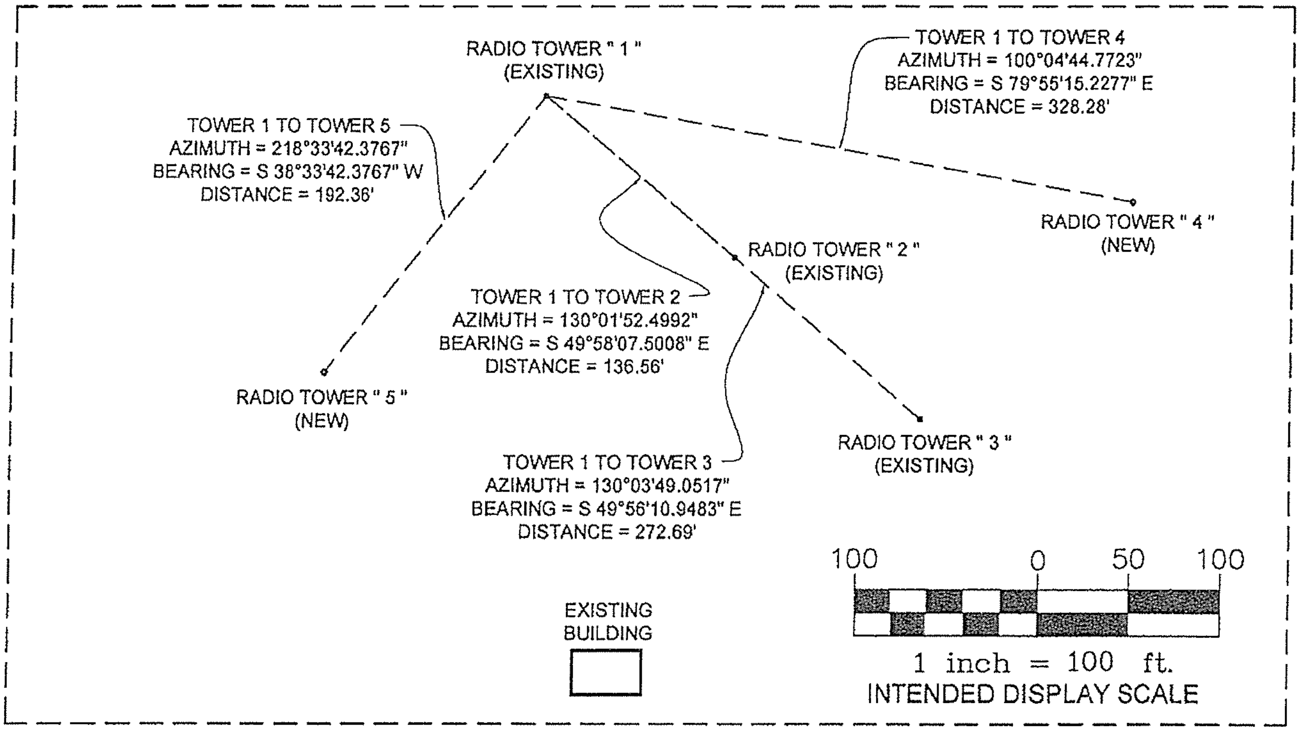
AS-BUILT SURVEY RADIO TOWERS SECTION 19, TOWNSHIP 43 SOUTH, RANGE 23 EAST LEE COUNTY, FLORIDA	COUNTY:	LEE	DWG DATE:	3-28-12	FORT MYERS BROADCASTING COMPANY	1 OF 2
	PROJECT NO.:	120303	DRAWN BY:	R.J.O.		
	DRAWING NO.:	TOWER ASB	CHECKED BY:	R.G.A.		
	REVISION:		REV. DATE:			

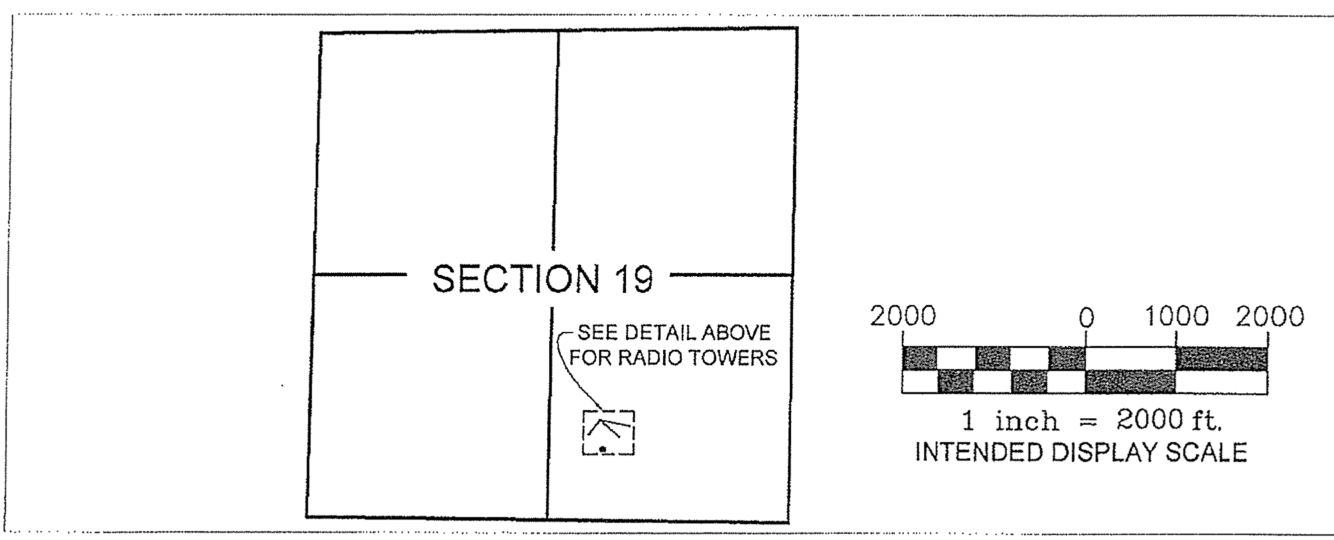
AS-BUILT SURVEY

RADIO TOWERS
LYING IN A PORTION OF
SECTION 19, TOWNSHIP 43 SOUTH, RANGE 23 EAST
LEE COUNTY, FLORIDA

"TRUE NORTH"

" DETAIL "





5670 Zip Drive
Fort Myers, Florida 33905
Telephone: 239.277.0722
Fax: 239.277.7179

COONER & ASSOCIATES, INC.
Surveying and Mapping
www.cooner.com

2351 Raden Drive
Land O'Lakes, Florida 34639
Telephone: 813.909.2693
Fax: 813.909.2841

AS-BUILT SURVEY RADIO TOWERS SECTION 19, TOWNSHIP 43 SOUTH, RANGE 23 EAST LEE COUNTY, FLORIDA	COUNTY: LEE PROJECT NO.: 120303 DRAWING NO.: TOWER ASB REVISION:	DWG DATE: 3-26-12 DRAWN BY: R.J.O. CHECKED BY: R.G.A. REV. DATE:	FORT MYERS BROADCASTING COMPANY

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant
FORT MYERS BROADCASTING COMPANY (NEW DAY-DA PATTERN AND READJUSTMENT OF STA NIGHT-DA PATTERN)

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)

☑ Station License ☐ Direct Measurement of Power

1. Facilities authorized in construction permit

Call Sign	File No. of Construction Permit (if applicable)	Frequency (kHz)	Hours of Operation	Power in kilowatts Night	Power in kilowatts Day
WINK	N/A	1200	UNLIIMITED	2.2	50.0

2. Station location

State	City or Town
FLORIDA	PINE ISLAND CENTER

3. Transmitter location

State	County	City or Town	Street address (or other identification)
FL	LEE	CAPE CORAL	3435 JANIS ROAD

4. Main studio location

State	County	City or Town	Street address (or other identification)
FL	LEE	FORT MYERS	2824 PALM BEACH BOULEVARD

5. Remote control point location (specify only if authorized directional antenna)

State	County	City or Town	Street address (or other identification)
FL	LEE	FORT MYERS	2824 PALM BEACH BOULEVARD

6. Has type-approved stereo generating equipment been installed? ☐ Yes ☑ No

7. Does the sampling system meet the requirements of 47 C.F.R. Section 73.68? ☑ Yes ☐ No

☐ Not Applicable

Attach as an Exhibit a detailed description of the sampling system as installed.

Exhibit No.
TECH EXHIBIT

8. Operating constants:

RF common point or antenna current (in amperes) without modulation for night system	RF common point or antenna current (in amperes) without modulation for day system
6.89	32.45

Measured antenna or common point resistance (in ohms) at operating frequency Night	Day	Measured antenna or common point reactance (in ohms) at operating frequency Night	Day
50.0	50.0	-j6.0	-j6.0

Antenna indications for directional operation

Towers	Antenna monitor Phase reading(s) in degrees		Antenna monitor sample current ratio(s)		Antenna base currents	
	Night	Day	Night	Day	Night	Day
1 (NW)	+ 121.1	- 1.4	0.568	0.528	N/A	N/A
2 (C)	0.0	N/A	1.000	N/A	N/A	N/A
3 (SE)	- 128.2	+ 139.6	0.467	0.738	N/A	N/A
4 (NE)	N/A	0.0	N/A	1.000	N/A	N/A
5 (SW)	N/A	+ 90.5	N/A	0.606	N/A	N/A
					-	

Manufacturer and type of antenna monitor: POTOMAC INSTRUMENTS AM-1901

9. Description of antenna system ((f directional antenna is used, the information requested below should be given for each element of the array. Use separate sheets if necessary.)

Type Radiator	Overall height in meters of radiator above base insulator, or above base, if grounded.	Overall height in meters above ground (without obstruction lighting)	Overall height in meters above ground (include obstruction lighting)	If antenna is either top loaded or sectionalized, describe fully in an Exhibit.
UNIFORM CROSS-SECTION, GUYED	1, 2, 3 - 59.4; 4, 5 - 57.9	1, 2, 3 - 60.3; 4, 5 - 58.8	1, 2, 3 - 60.3; 4, 5 - 58.8	Exhibit No. N/A

Excitation ☑ Series ☐ Shunt

Geographic coordinates to nearest second. For directional antenna give coordinates of center of array. For single vertical radiator give tower location.

North Latitude 26 ° 42 ' 52 "	West Longitude 82 ° 02 ' 46 "

If not fully described above, attach as an Exhibit further details and dimensions including any other antenna mounted on tower and associated isolation circuits. — Exhibit No. TECH EXHIBIT

Also, if necessary for a complete description, attach as an Exhibit a sketch of the details and dimensions of ground system. — Exhibit No. N/A

10. In what respect, if any, does the apparatus constructed differ from that described in the application for construction permit or in the permit?

NONE WITH REGARD TO CONSTRUCTION. COMPUTER MODELED PROOFS RUN TO SATISFY CP CONDITIONS 4 AND 5, AS PERMITTED BY NEW FCC RULES.

11. Give reasons for the change in antenna or common point resistance.

NEW CONSTRUCTION

I certify that I represent the applicant in the capacity indicated below and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief.

Name (Please Print or Type) RONALD D. RACKLEY, P.E.	Signature (Ronald D. Rackley
Address (include ZIP Code) DUTREIL, LUNDIN & RACKLEY, INC. 201 FLETCHER AVENUE SARASOTA, FL 34237	Date 4/02/2012 Telephone No. (Include Area Code) 941-329-6000

☐ Technical Director ☑ Registered Professional Engineer

☐ Chief Operator ☐ Technical Consultant

☐ Other (specify)