



Building an AM Directional Array



FROM COW PIE TO CONTOUR



The Building of an AM Directional Array

Method of Moments Design

On Going Certification of Operation (MOM)

Destructing the old Site













Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
2601 Meacham Boulevard
Fort Worth, TX 76137

Aeronautical Study No.
2012-AGL-849-OE

Issued Date: 02/24/2012

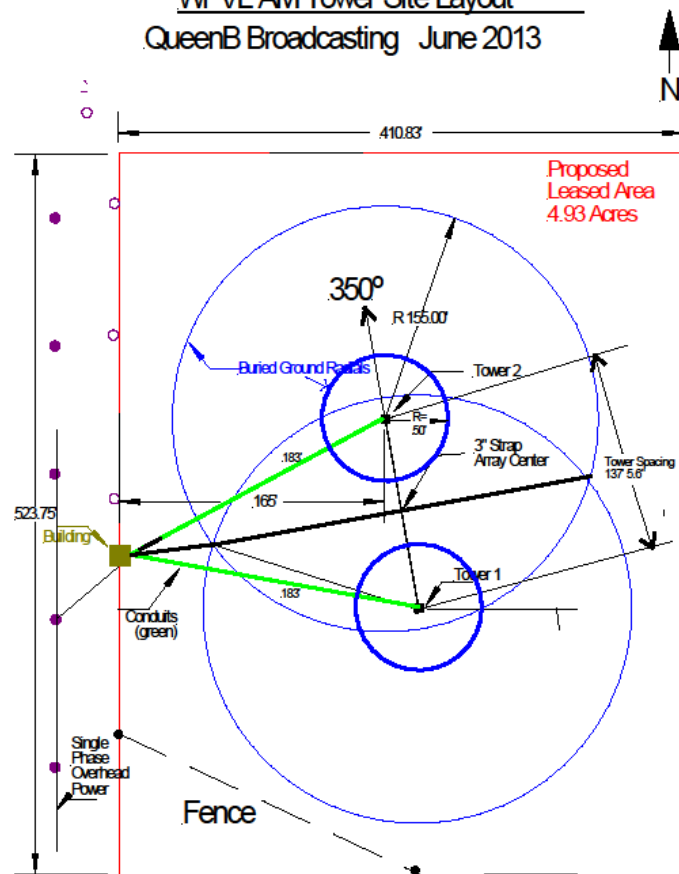
Leonard Charles, C.E.
QueenB Radio Wisconsin, Inc.
7025 Raymond Road
Madison, WI 53719

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Antenna Tower WPVL TOWER 1
Location:	Platteville, WI
Latitude:	42-45-19.55N NAD 83
Longitude:	90-30-20.61W
Heights:	906 feet site elevation (SE) 193 feet above ground level (AGL) 1099 feet above mean sea level (AMSL)

WPVL AM Tower Site Layout
QueenB Broadcasting June 2013



























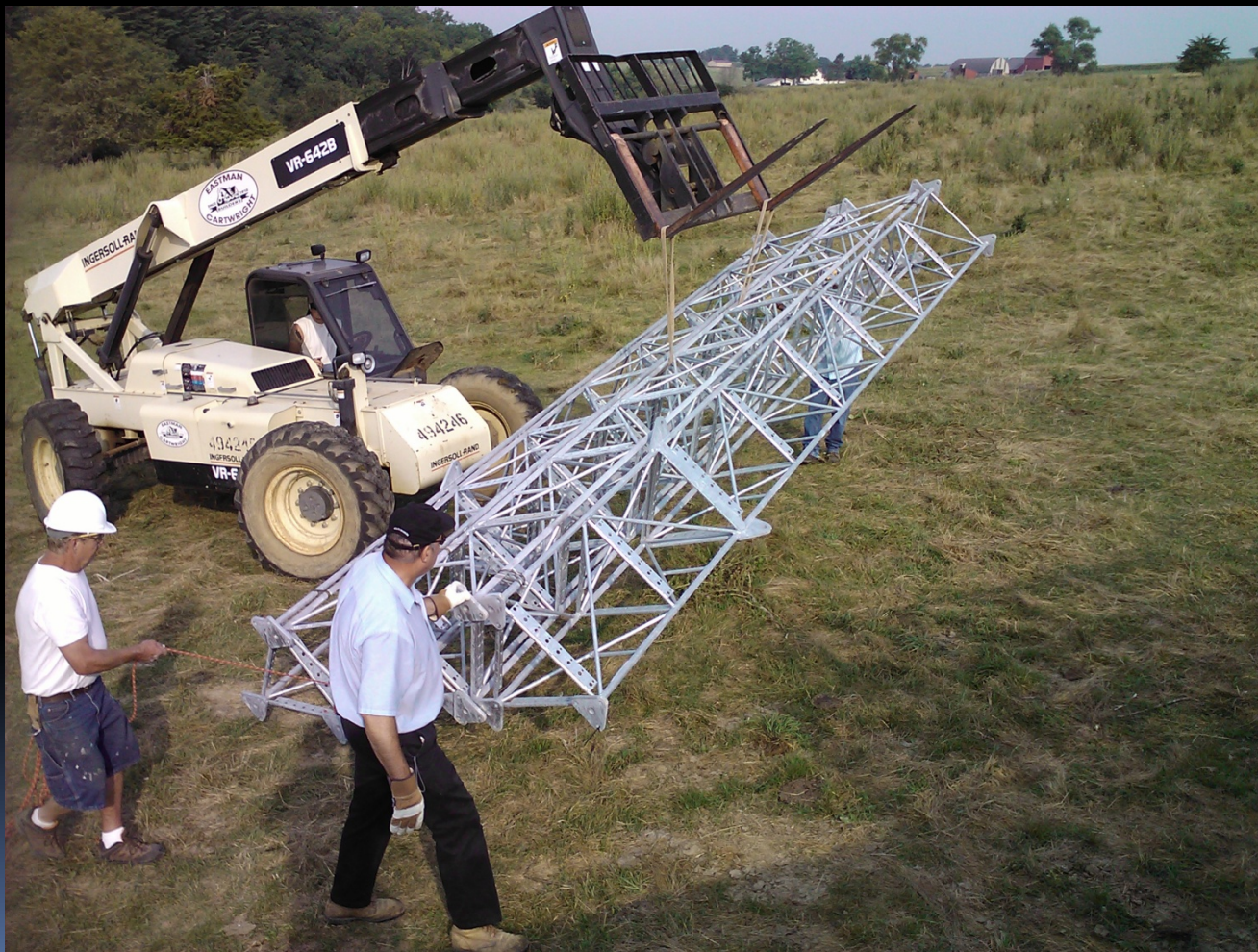




















































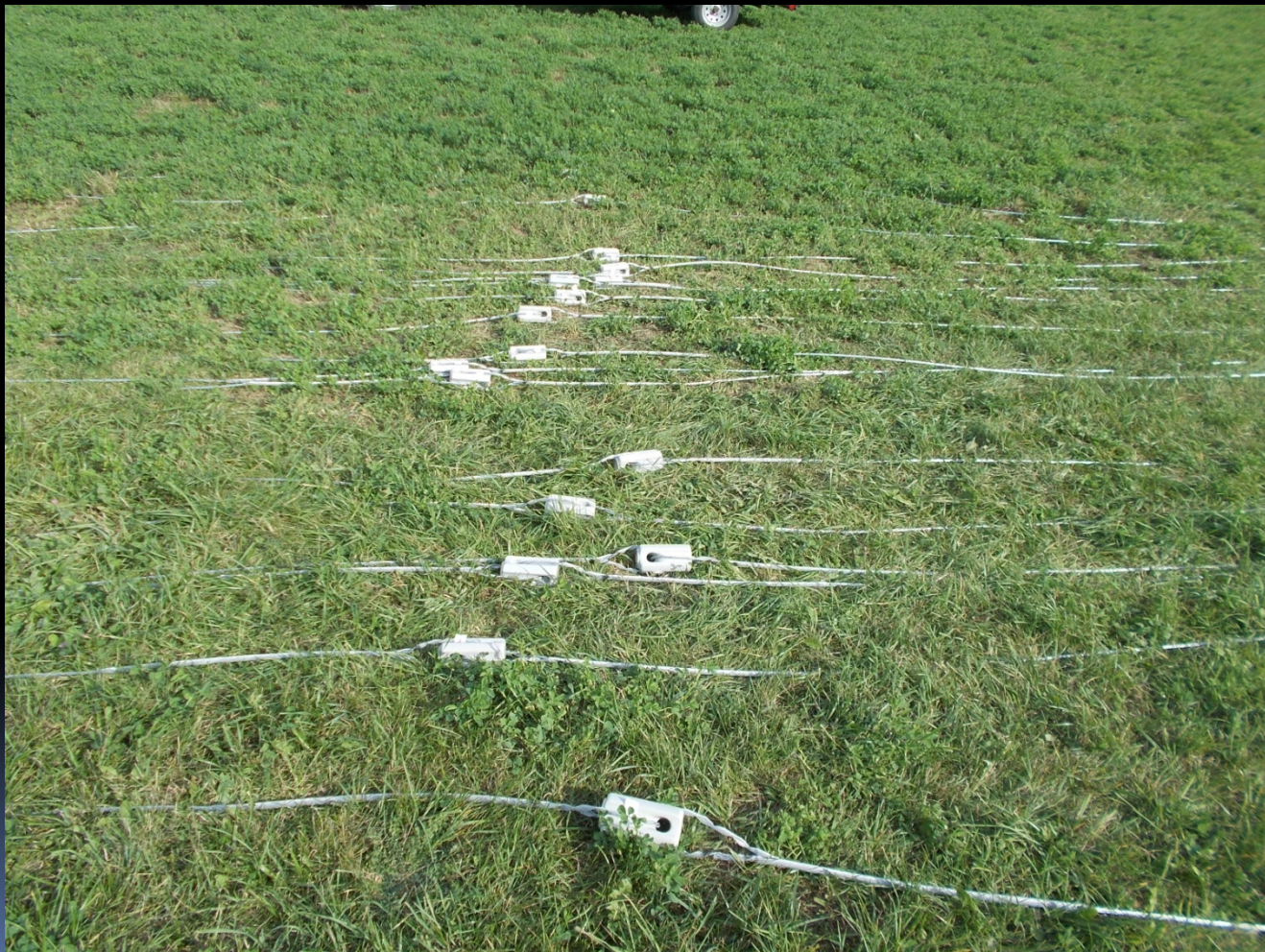


























Bill

Clayton

Tyrone

John



























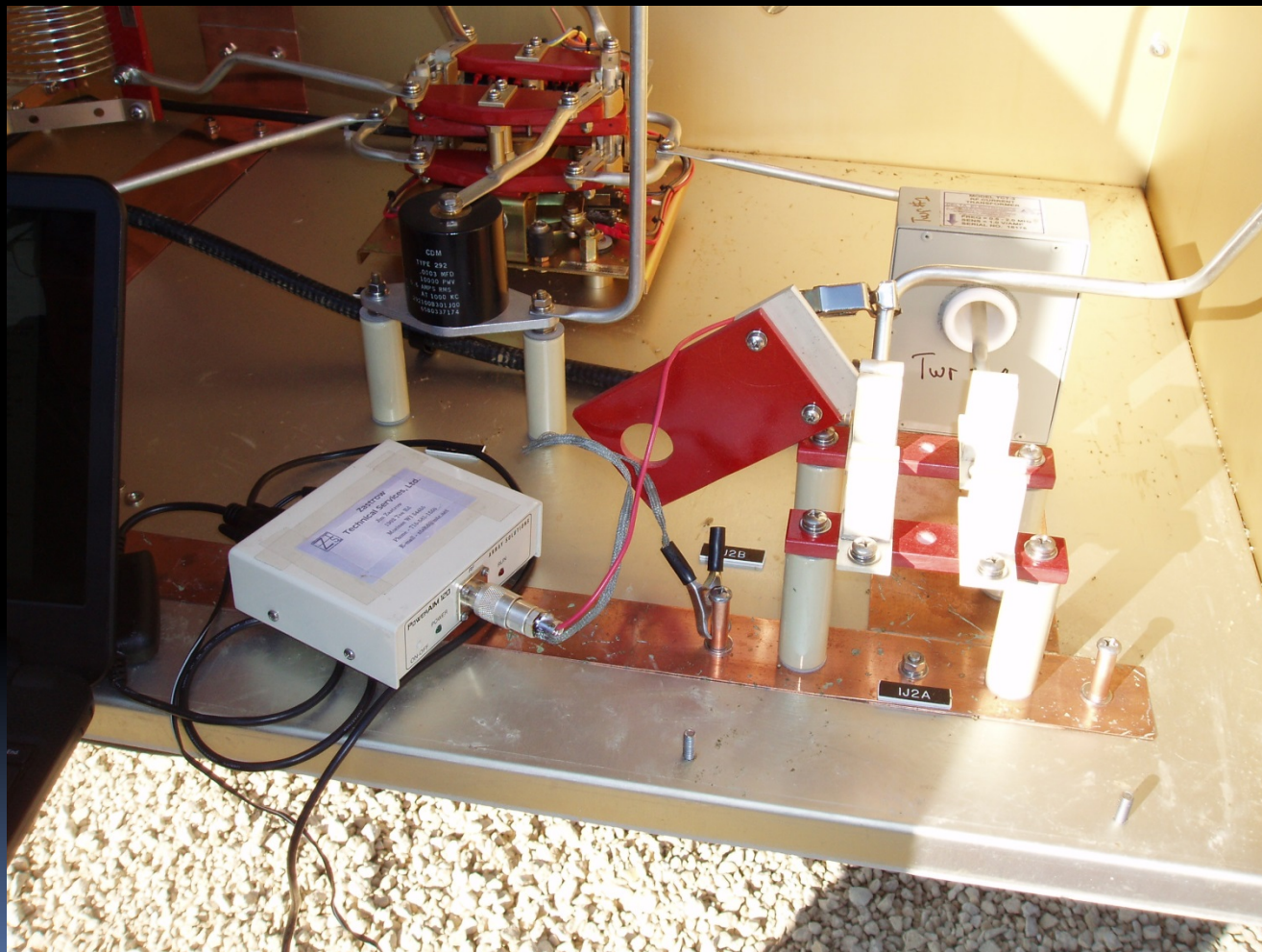






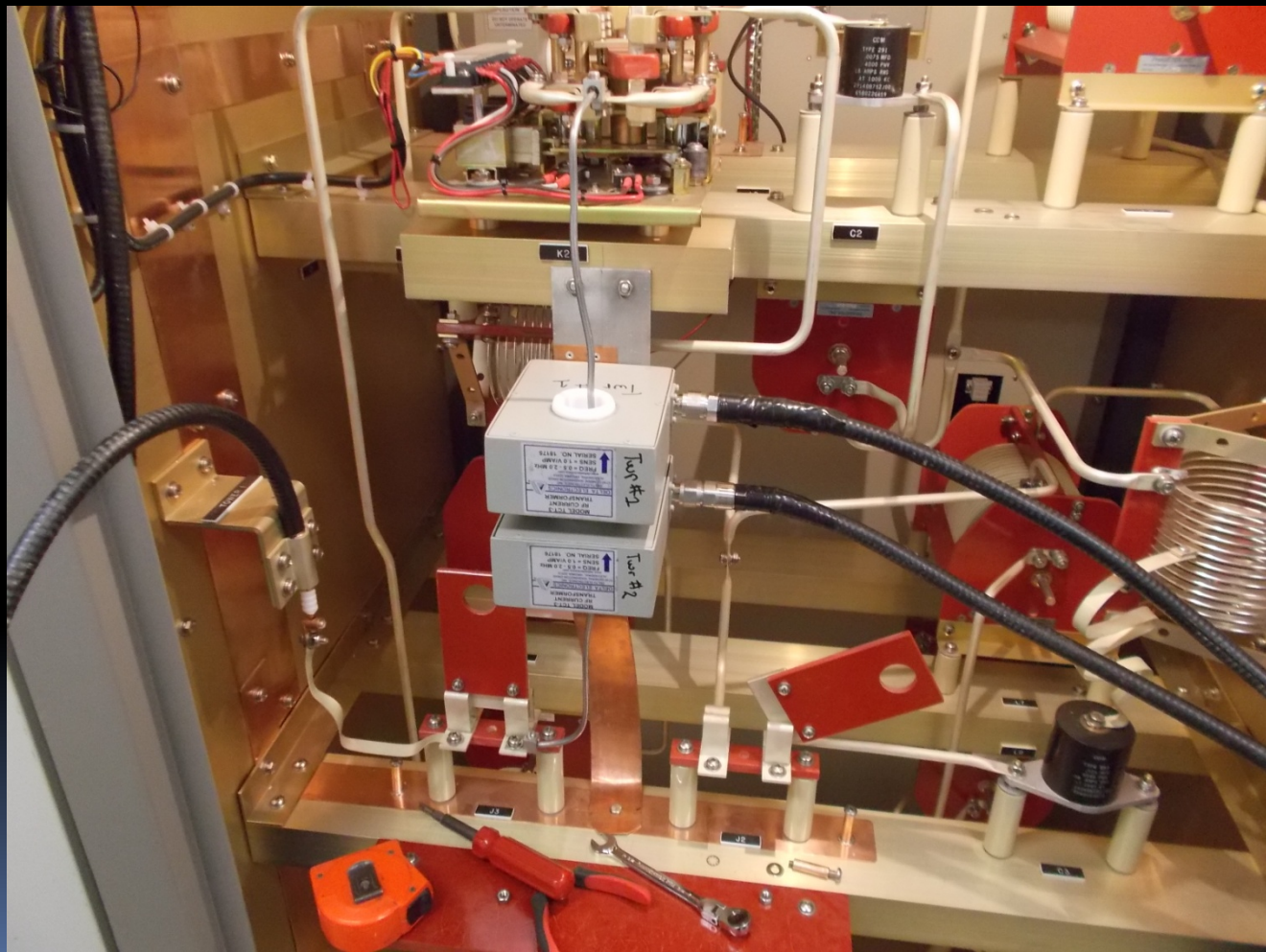












BE Nautel

TOWER

1

RATIO
AMPL
TEST

1.000

PHASE
DEG

+

00.0

LOCAL
EXT

DAY
NIGHT
3RD

PATT



POTOMAC INSTRUMENTS
ANTENNA MONITOR
FCC ID: IJ3PI190

Mod Monitor Input Select



BE Nautel

WN UP



TOWER

2

● RATIO
AMPL
TEST

1.000

PHASE
DEG

+ 00.1

LOCAL
EXT

DAY
● NIGHT
3RD

PATT



POTOMAC INSTRUMENTS
ANTENNA MONITOR 1901
FCC ID: IJ3PI1900

BE Nautel

TOWER 1

RATIO
AMPL
TEST

3.55

PHASE
DEG

+ 00.0

LOCAL
EXT

DAY
NIGHT
3RD

PATT



POTOMAC INSTR
ANTENNA MONIT
FCC ID: U3P

BE Nautel

TOWER

2

RATIO

● AMPL
TEST

3.55

PHASE
DEG

+ 00.1

LOCAL ●
EXT

DAY
● NIGHT
3RD

PATT




POTOMAC INSTRUMENTS
ANTENNA MONITOR
FCC ID: IJ3PI190





POWER


2

 RATIO
AMPL
TEST

.440

PHASE
DEG

-144.9

LOCAL
EXT 

DAY
NIGH
3RD



















WPVL AM

Day Pattern



Tower 2

46.4%

85%

42%

58%



Tower 1

76%

35%

76%

46%

Night Pattern



Tower 2

35%

85%

55%

34%

51%

25%

42%

34%

46%

76%



Tower 1

85%

34%

34%

34%

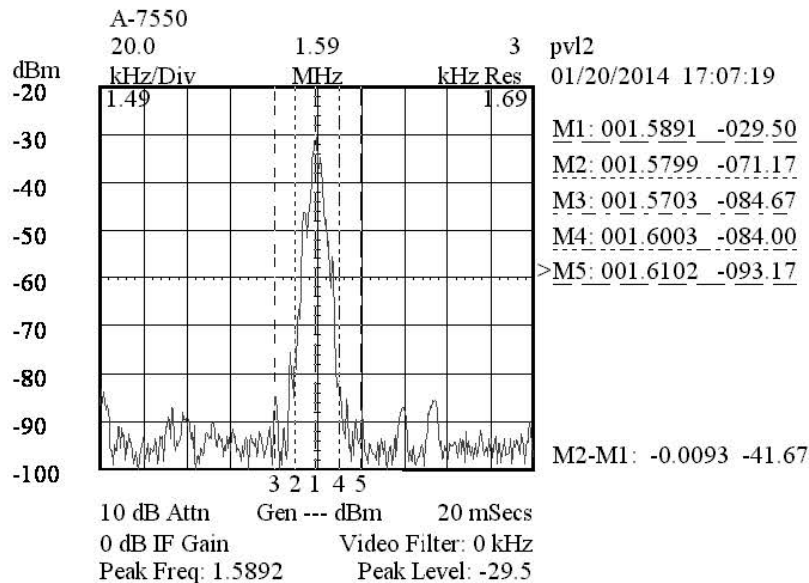
42%

46%

Blue = E Field


Green = H Field

WPVL Night Resonant Results, Ltd



+/- 10.2 to 20 kHz Span
M1: Fundamental Frequency
M2: -10.2 kHz = -41.67 db
M3: - 20 kHz= -55.17 db
M4: +10.2 kHz= -54.5 db
M5: +20 kHz= -63.67 db

Specification = minimum -25 db




Method of Moments Modeling

After Tower/Ground System/ATU construction:



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 - Determines the electrical length and characteristic impedance
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 - Verify Sample Current Transformers
 - Side by side they should read unity ratio and zero phase
- 



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- Post Construction Certification of Tower Locations by Surveyor
 - Confirm distance between towers and azimuth from tower 1 to 2
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 - Setting Array Operating Parameters
 - Adjust phasor to achieve calculated parameters of MOM model
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 - Confirm distance between towers and azimuth from tower 1 to 2
 - Setting Array Operating Parameters
 - Adjust phasor to achieve calculated parameters of MOM model
 - Reference Field Strength Measurements
 - Measure pattern maxima and minima directions
 - Night pattern only
 - 3 per radial (we did 5 in case any were determined corrupt)
- 



Maintaining Method of Moments Certification

Every Two Years:

- Verify the ATU current transformers still match side by side
 - Verify the sample lines resonant frequency and characteristic impedance
 - Take Field measurements at the same locations as on license application
 - All resulting documentation goes into the station Public File
- 



Destructing the old site













