Are Your Antennas Ready for the Worst?

&

Are You Ready for 2012

Richard Wood

Resonant Results Ltd

Just the Facts

More Facts


7 DAY FORECAST
9
abc
TUE
WED
THU
FRI
SAT
SUN
MON
30%
20%
10%
20%
20%
20%
20%
103
80
105
79
104
78
100
77
101
77
99
75
1100
77

Having A Bad Day?

Is this Day Over Yet?

Hang In There

At Least We Do Not Have This Problem

Today's Presentation

- Preparing for the Worst
- Back Up Equipment and Sites
- AM Antennas
- FM Antennas and Deicers
- Ice Shields
- TV Antenna Systems

17 Cells Sites Destroyed

Governor Jay Nixon's office said that at least 17 cell towers were toppled.

This 200-foot American Tower Corporation self supporting tower fell into a devastated complex that witnessed no fatalities after a tornado with wind speeds above 200 mph tore through Joplin.

FCC recommends, NAB praises broadcasting during Irene

Julius Genachowski, Chairman of the FCC, offered comments on the state of electronic communications in regard to Hurricane Irene, and the NAB's Gordon Smith applauded the efforts of its constituents. In a reminder on how to communicate during a natural disaster, Genachowski recommended radio and television for important news alerts.

Although cable service was disrupted in many locations, only a small handful of broadcast stations were forced off air.

8/24/11

A earthquake in Virginia, registering 5.9, gave another look at why radio & TV can do what most other media cannot: reports were that for up to an hour and a half, cell phones were unusable throughout the region due to overload.

FCC Statement

From a 2008 FCC report to Congress:

"The commercial communications infrastructure is typically designed and deployed to reliability and resiliency specifications that are less rigorous than emergency responder infrastructure. Hence, commercial infrastructure is more likely to be compromised in a large scale disaster."

Email from Sales:
Will we be back up for the remote this afternoon?

Preparing

- Have a Plan that all the staff knows about.
- People
- Places
- Things: Today's Focus

Before an Outage Occurs ask the following:

- Does the Station have business interruption insurance?
- What is the deductible, in time, on the policy?

AC Generators

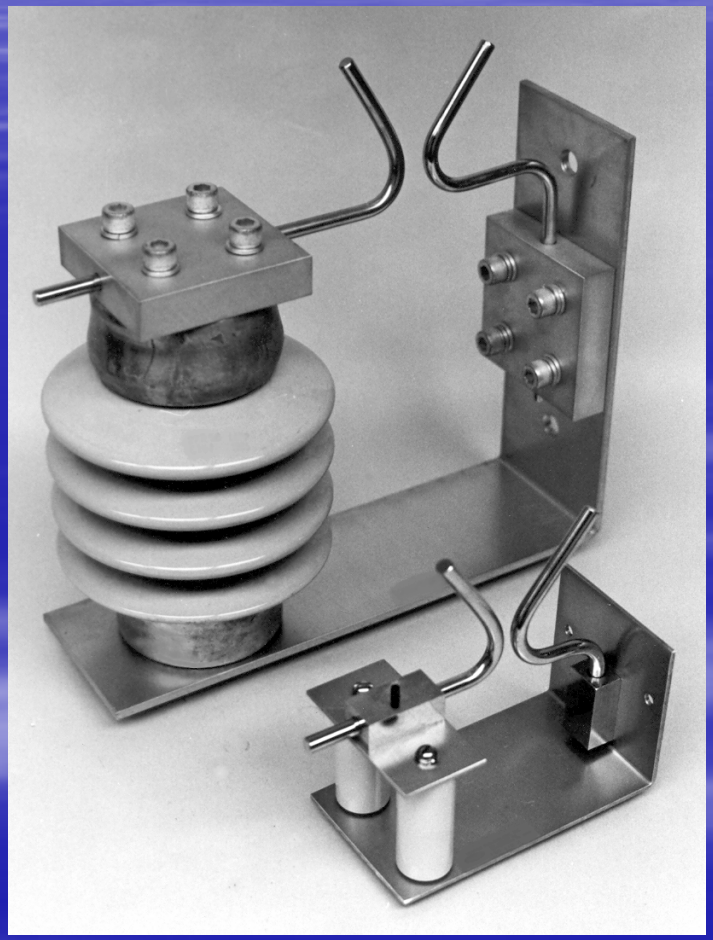
Rental Generators

AM Antennas

Tower Base Spark Gap

AM Radio Tower

AM Radio ATU Protection



Austin AM Radio Guy Cables

Static Drains

Resistor

Inductor

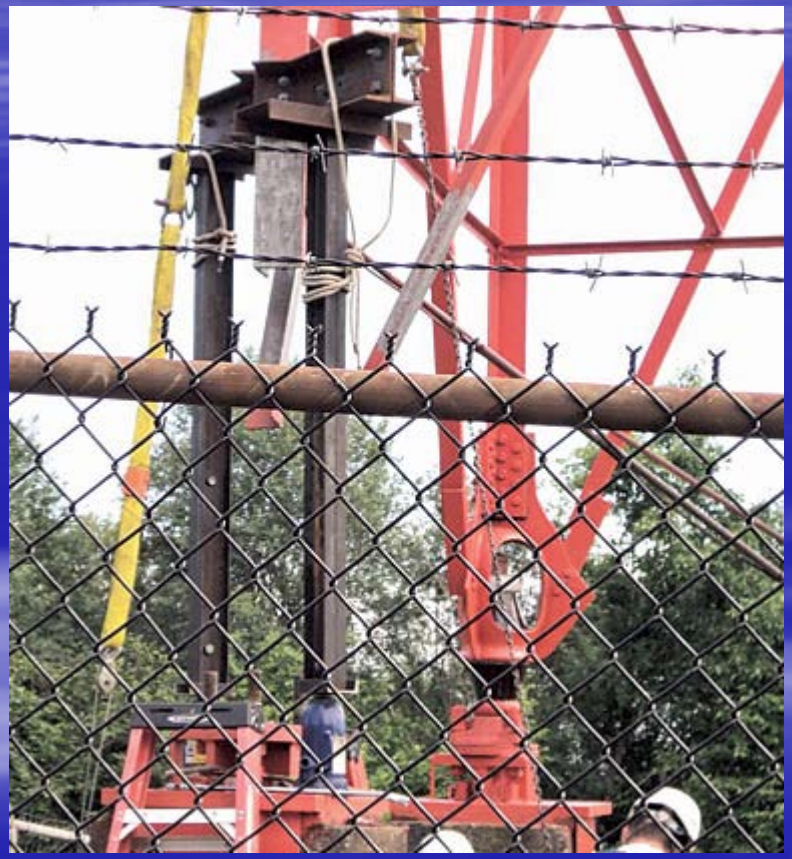
Tower Inspections

Emergency Standby Antenna

- Nott Ltd
- Phasetek Inc
- Kintronics Labs

- Have the poles up and the antenna in a mouse proof box.

Base Insulator Replacement



AM Tower Failures

More Towers Down

You will be overwhelmed with questions.

- How could it happen?
- What caused the tower to come down?
- When will you be back on the air?
- Was it the Wind?
- Was it the Ice?
- Was it the airplane in the pile on the ground?

WOW!! What a Mess!!

We will be back on the air as soon as possible!

FM Antennas

- Backup antennas are good if they are periodically tested.
- Multiple station systems should have a spare broadband single bay in stock.
- Proper pressurization and monitoring.
- Line adaptors to Type ‘N’ should be on site.
- Emergency Tower plan.
- Antenna Deicers.

WOLX Iced Up

Antenna Anti Sway Bars

Pressurization

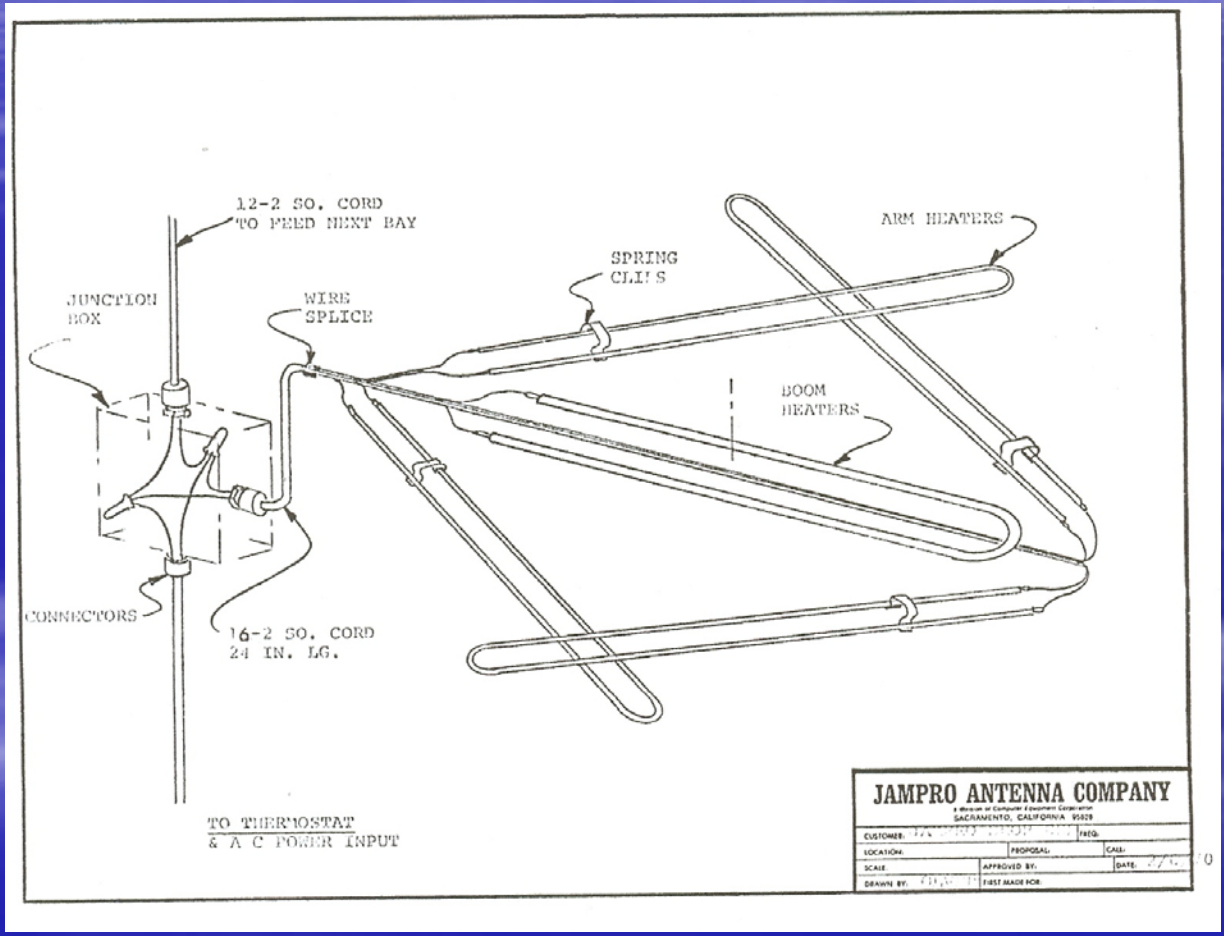
Pressure Monitoring


FM
TUNING

Having the Right Adaptor on Site

Emergency Cell Towers work for FM too.

Antenna Deicers



Shively Antenna Deicers

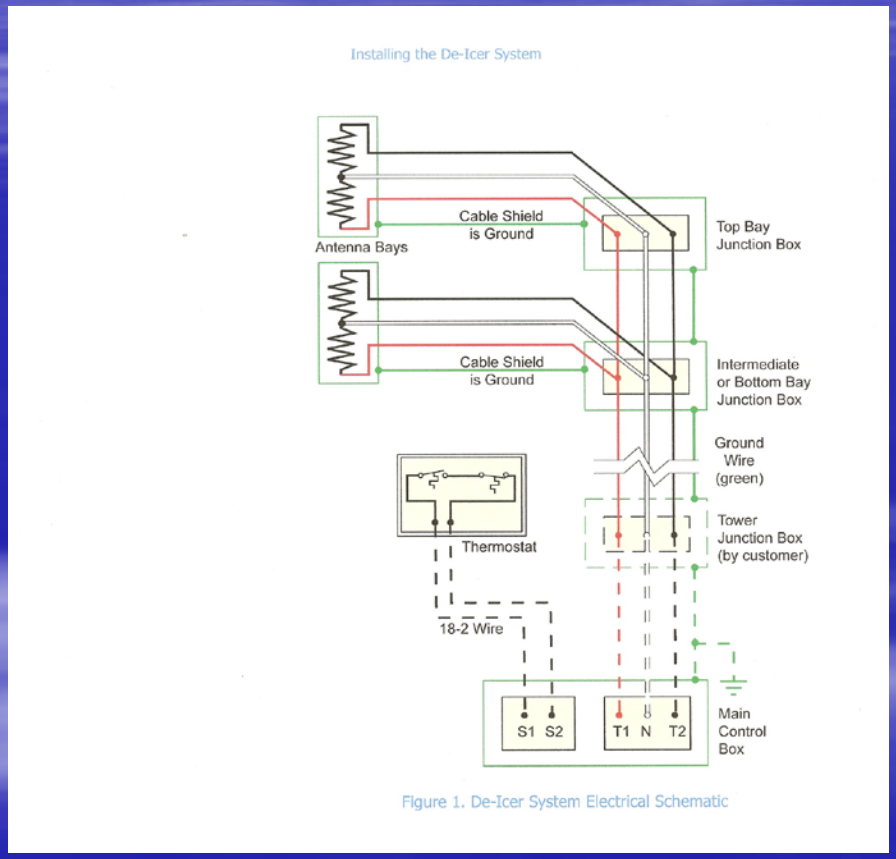


Figure 1. De-Icer System Electrical Schematic

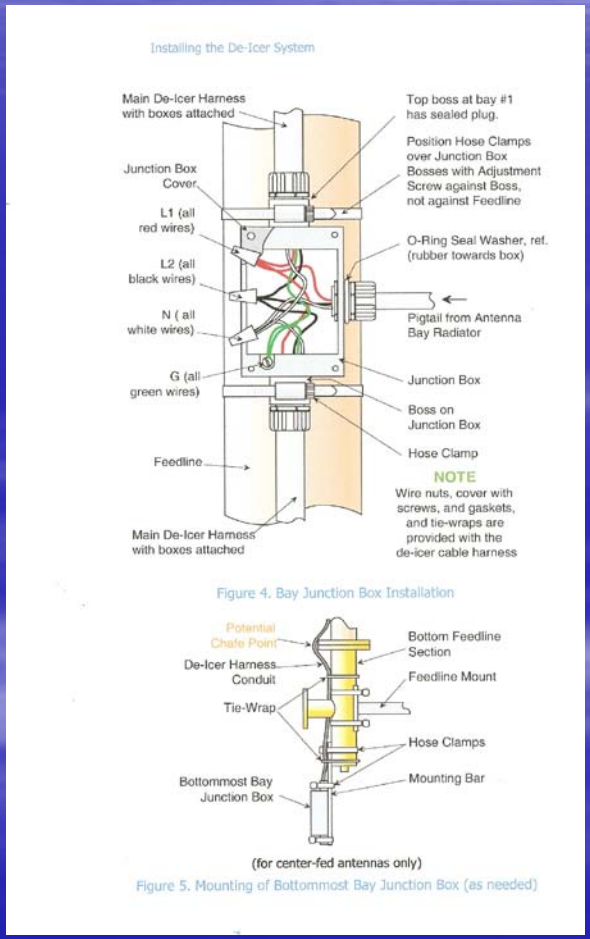


Figure 5. Mounting of Bottommost Bay Junction Box (as needed)

Table 4. Approximate Heater Leg Current Draw (amperes) and Control Box Applications

Antenna Size	Control Box Model	6602 or 6602B	6812 or 6812B	6813	6600	6814	6810
1-Bay	94068 -G501	0.7	0.7	1.2	2.0	2.0	2.1
2-Bay		1.3	1.3	2.4	4.0	4.0	4.3
3-Bay		2.0	2.0	3.6	6.0	6.0	6.4
4-Bay		2.6	2.6	4.8	8.0	8.0	8.6
5-Bay		3.3	3.3	6.0	10.0	10.0	10.7
6-Bay		4.0	4.0	7.2	12.0	12.0	12.9
7-Bay		4.6	4.6	8.4	14.0	14.0	15.0
8-Bay		5.3	5.3	9.6	16.0	16.0	17.1
10-Bay		6.6	6.6	12.0	20.0	20.0	21.4
12-Bay		7.9	7.9	14.4	24.0	24.0	25.7
	-G502						
	-G503						

NOTE

De-icers for some antenna arrays over 12 bays will require two separate circuits, each with its own control box serving half the bays.

Table 3. Approximate Heater Leg Resistance, Ω

Antenna Model	6602 or 6602B	6812 or 6812B	6813	6600	6814	6810
1-Bay	182	182	100	60	60	56
2-Bay	91	91	50	30	30	28
3-Bay	61	61	33	20	20	19
4-Bay	46	46	25	15	15	14
5-Bay	36	36	20	12	12	11
6-Bay	30	30	17	10	10	9
7-Bay	26	26	14	9	9	8
8-Bay	23	23	13	8	8	7
10-Bay	18	18	10	6	6	6
12-Bay	15	15	8	5	5	5

Sample
Maintenance Log

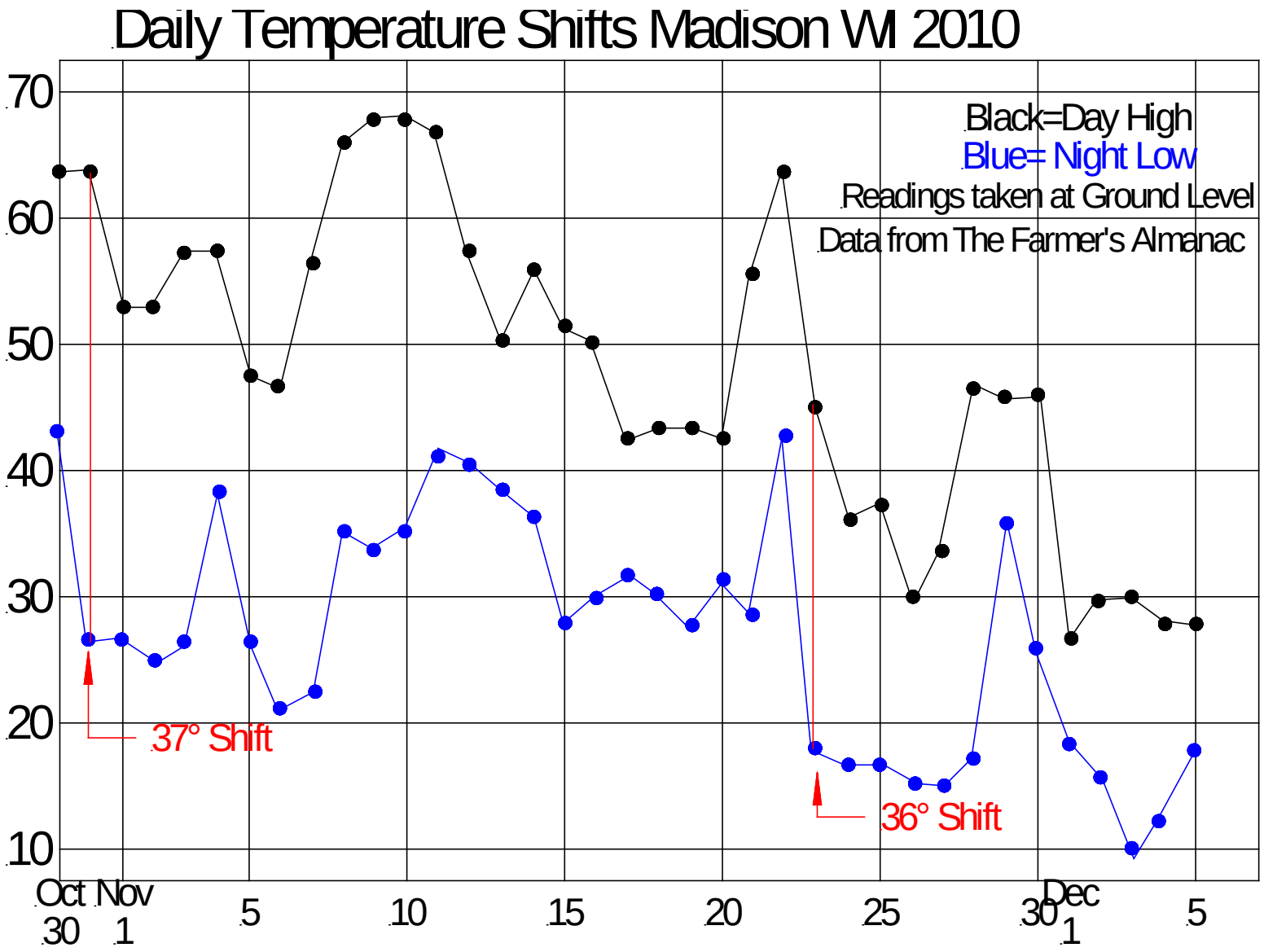
DATE	Heater Leg Resistance to Ground, Ω		Heater Leg Current Draw, amps		OBSERVATIONS Visual Inspection; Hardware Checked; Tower Repairs Accomplished; etc.
	T1	T2	N - T1	N - T2	

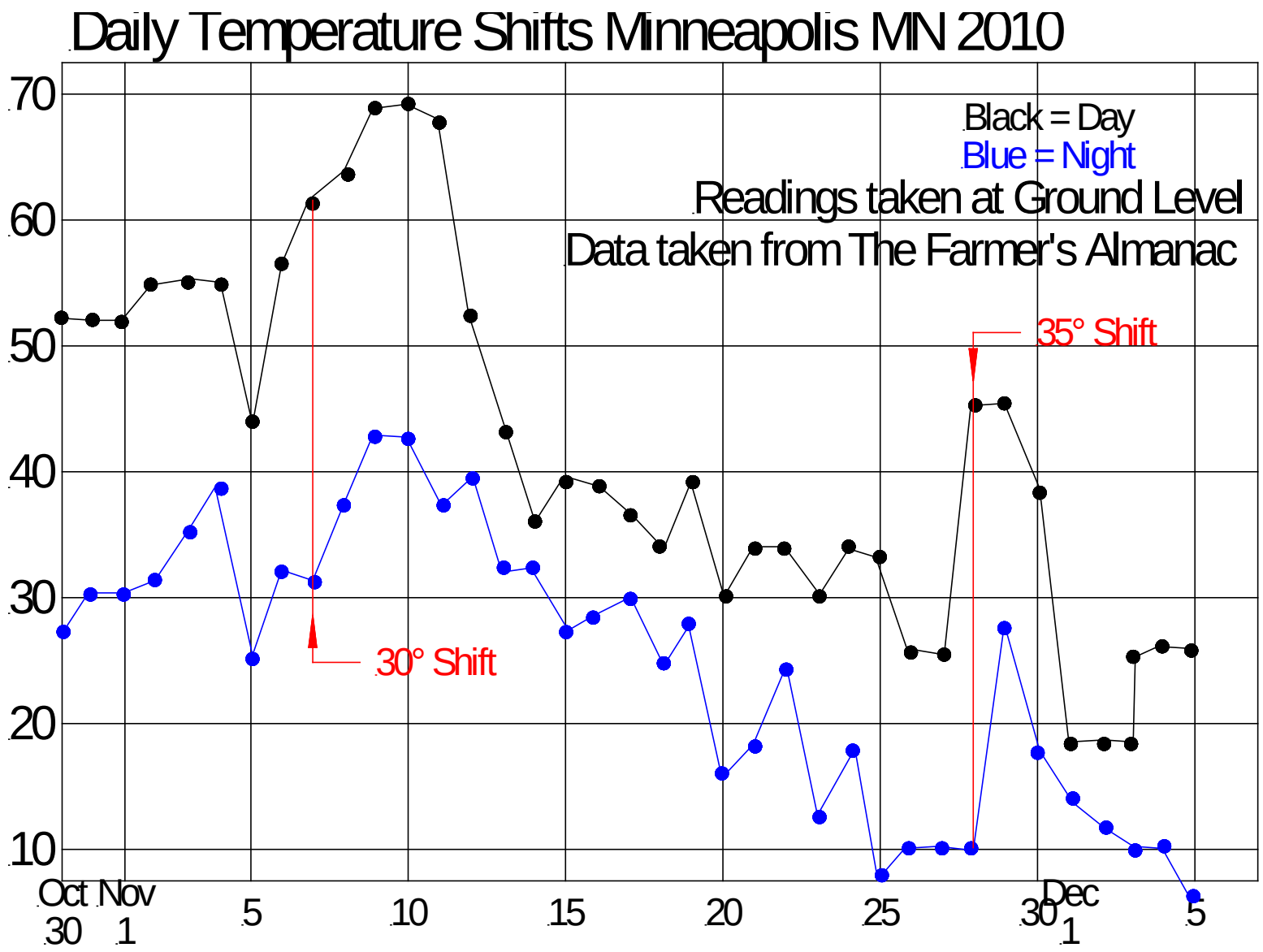
Sleet Sensor

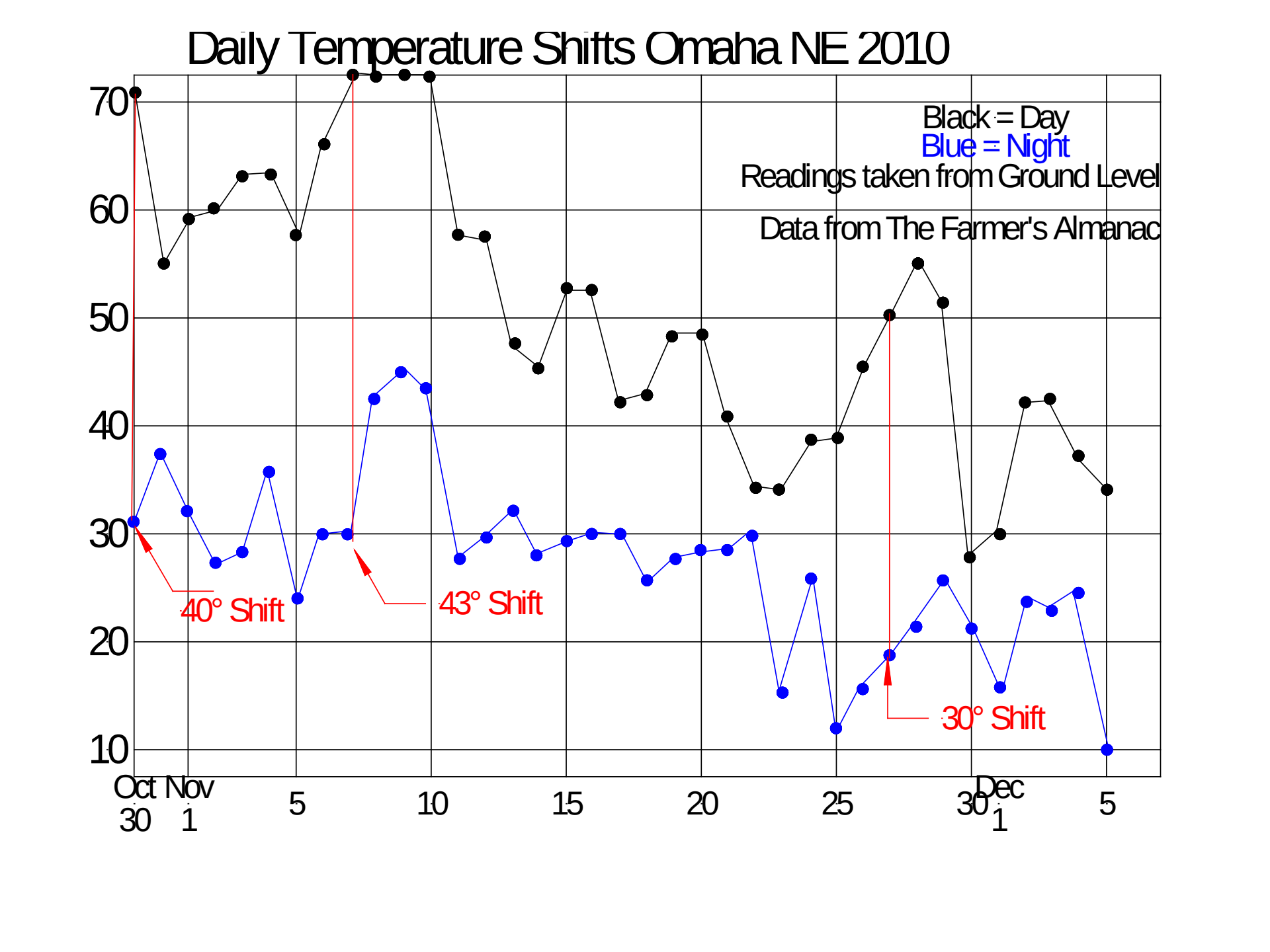
Ice Shields

Leg Mounted Antennas

Rigid Line Consideration

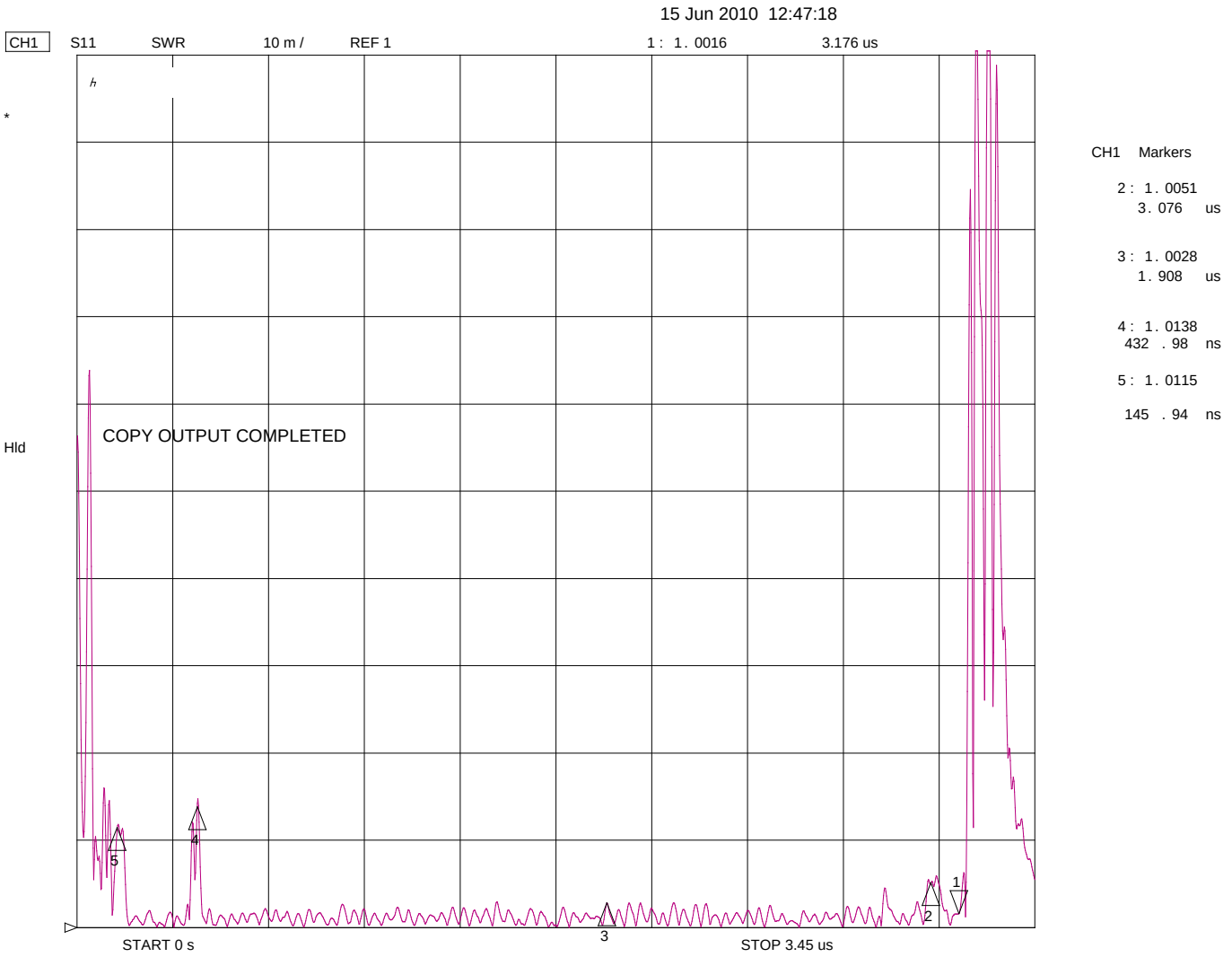

Daily Temperature Shifts Madison WI 2010
Black=Day High
Blue= Night Low
Readings taken at Ground Level
Data from The Farmer's Almanac
37° Shift
36° Shift
70
60
50
40
30
20
10
Oct 30
Nov 1
5
10
15
20
25
30
Dec 1
5


Daily Temperature Shifts Minneapolis MN 2010
Black = Day
Blue = Night
Readings taken at Ground Level
Data taken from The Farmer's Almanac
35° Shift
30° Shift
70
60
50
40
30
20
10
Oct 30
Nov 1
5
10
15
20
25
30
Dec 1
5

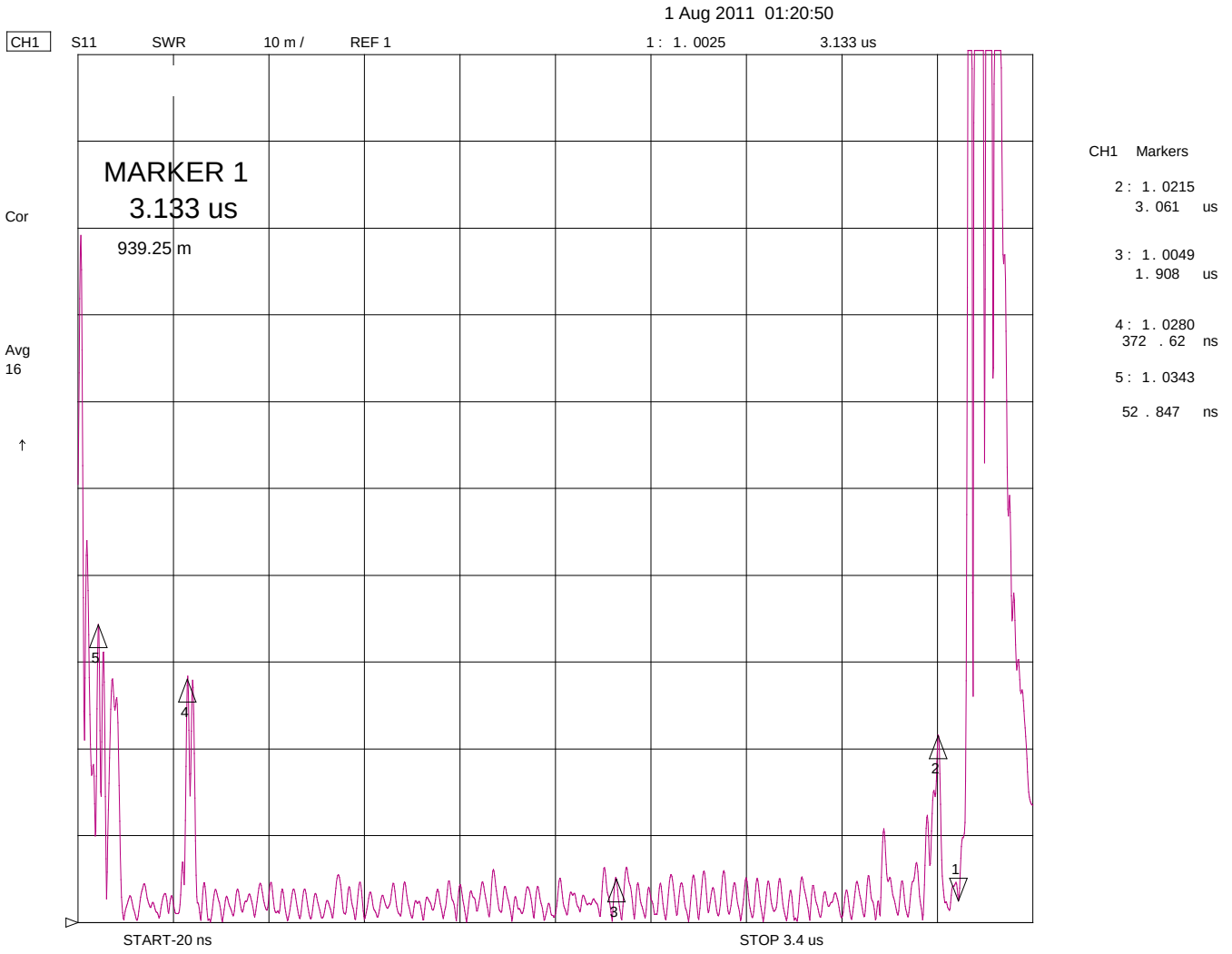

Daily Temperature Shifts Omaha NE 2010
Black = Day
Blue = Night
Readings taken from Ground Level
Data from The Farmer's Almanac
40° Shift
43° Shift
30° Shift
70
60
50
40
30
20
10
Oct 30
Nov 1
5
10
15
20
25
30
Dec 1
5

Watch Band Spring

2006 Time Domain



2011 Time Domain



Final Points

OCAS Inc

Tower Avoidance System

Mike Rowe

Dirty Jobs' Mike Rowe (left) and Great Plains Towers' president Kevin Reski along with the filming and erection crews

Thank You

Richard Wood

Resonant Results, Ltd

Antenna Sweep Testing
&
Troubleshooting