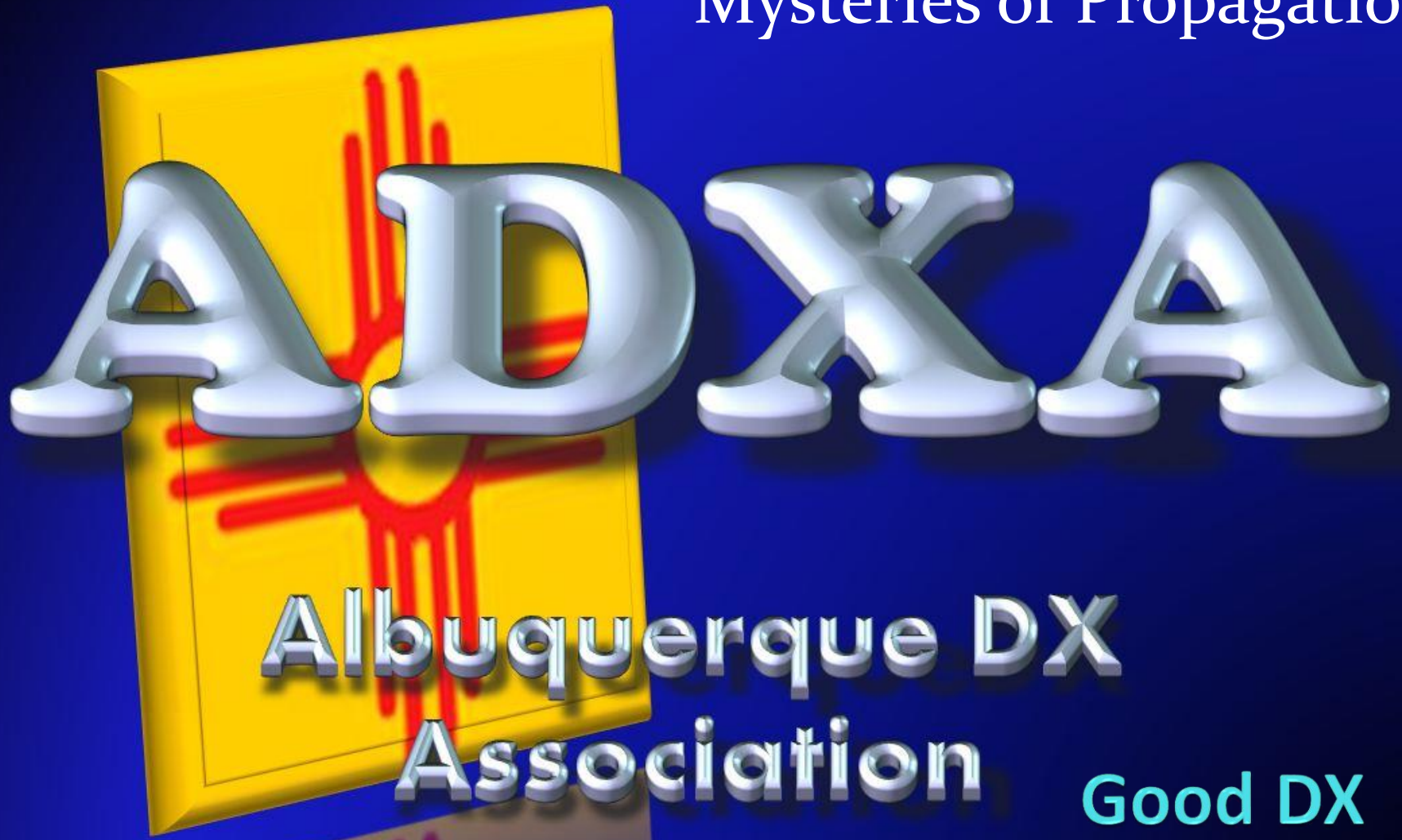
Mysteries of Propagation



Good DX

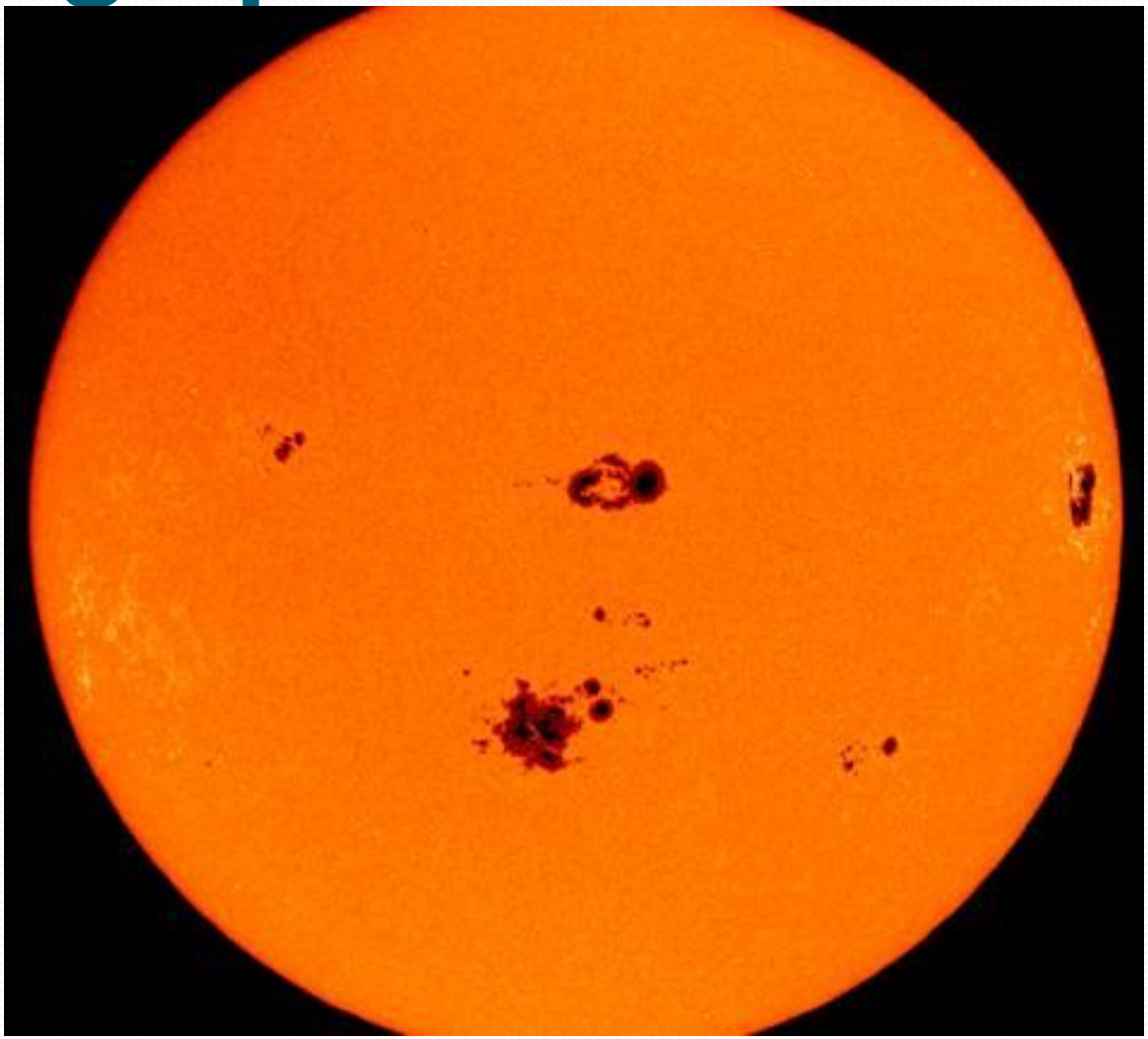
Good Luck in the Contest!

http://groups.yahoo.com/group/adxa/

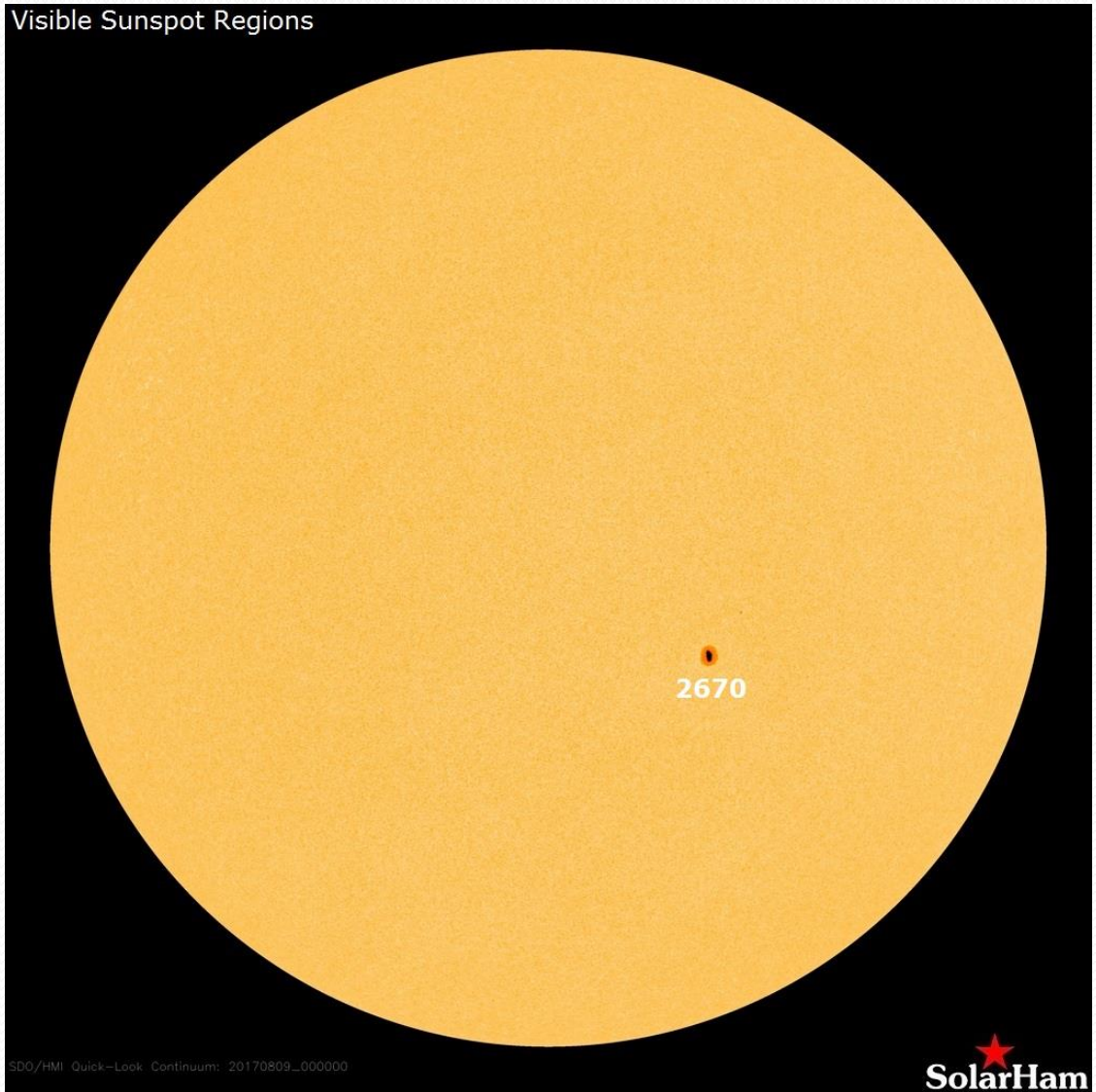
Mysteries of Propagation

- The Ionosphere
- Solar Cycles
- The Good, Bad, and Ugly
- Propagation Probabilities
- Useful Tools

Photograph from NASA 2013



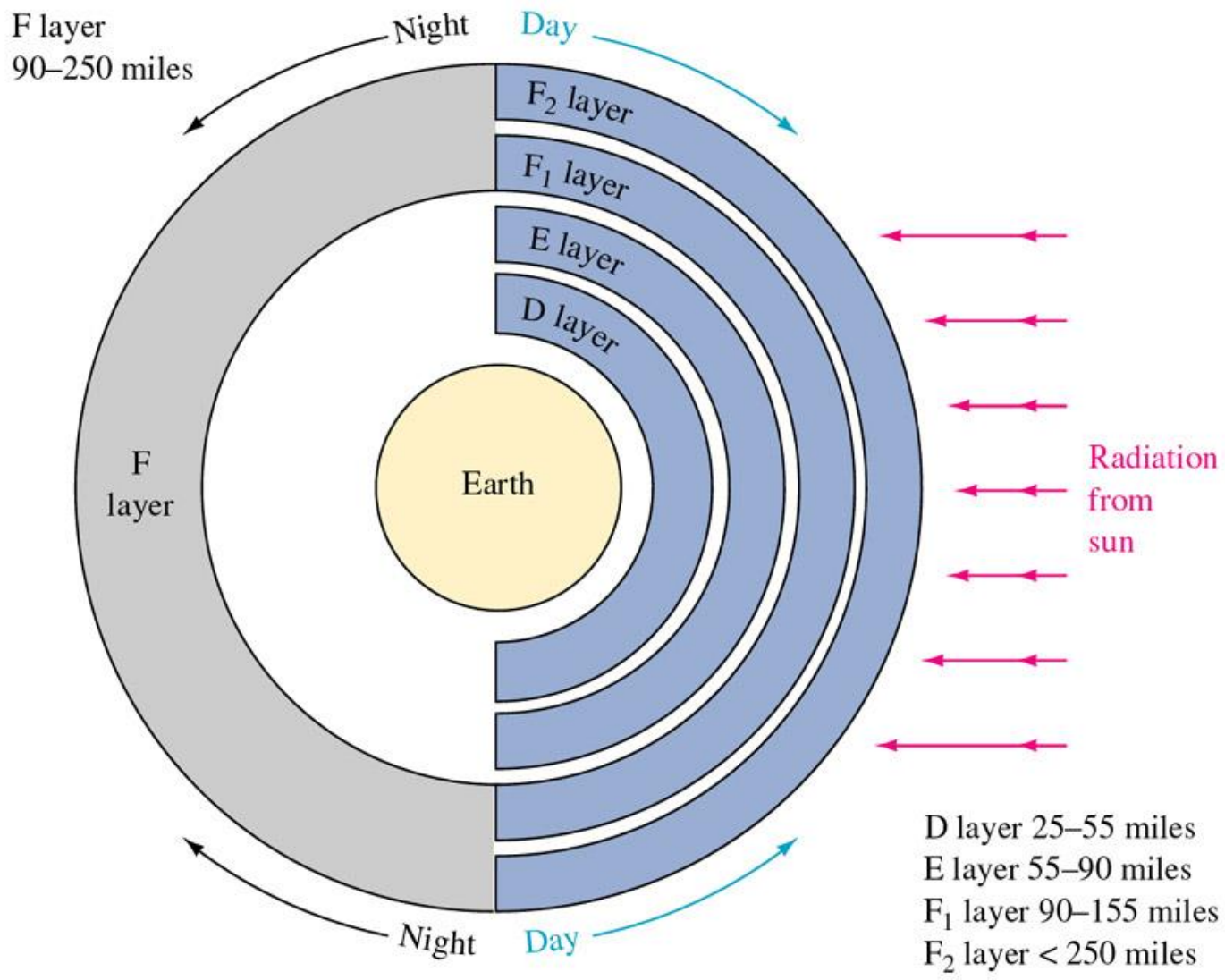
This Week's Solar Image



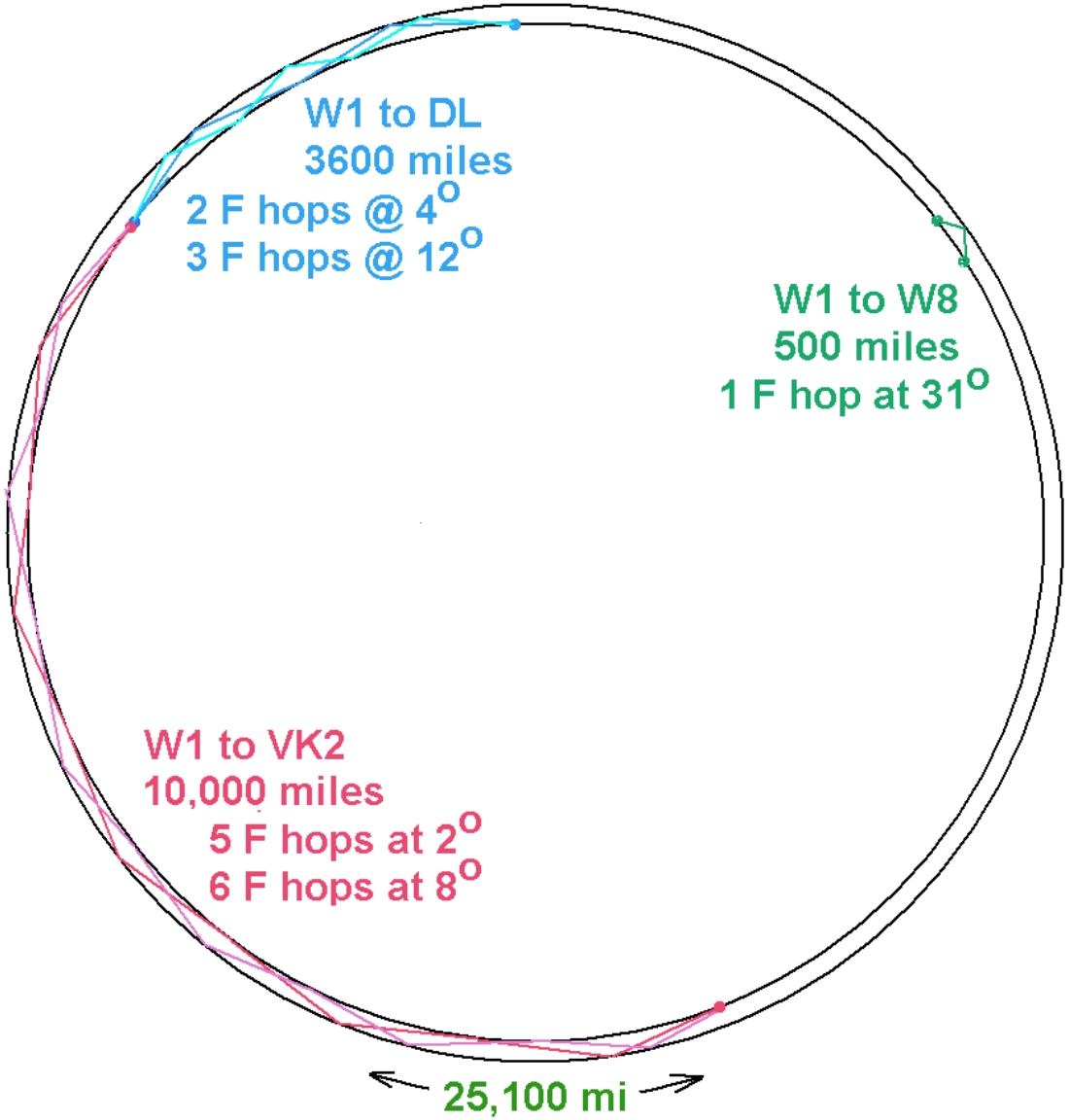
The Ionosphere

- Layers
- Refraction, NOT Reflection
- Absorption
- Combining
- Higher F-Layer is Better
- Lower Antenna Take-Off is Better

Ionospheric Layers



More to Scale



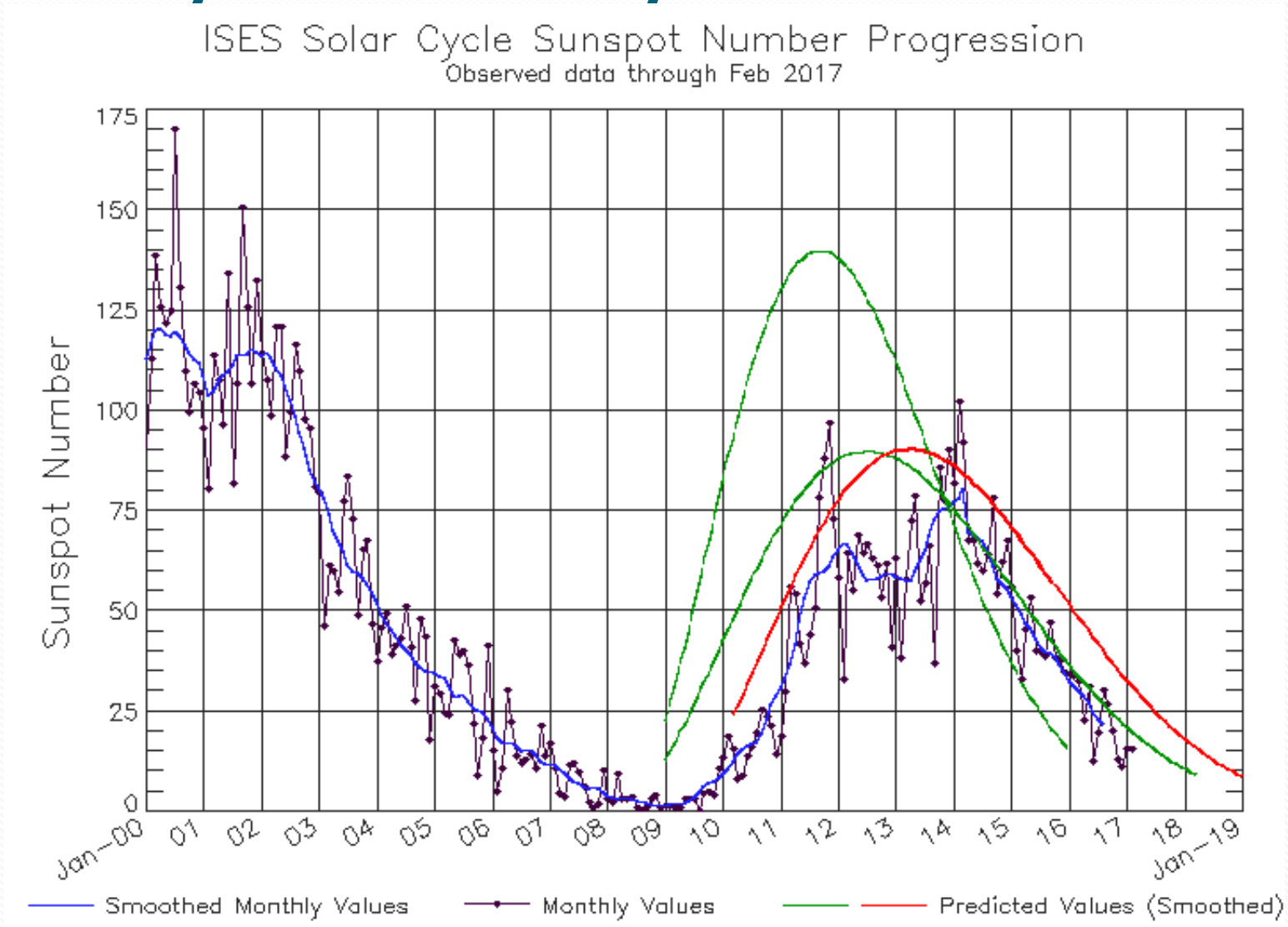
Take-Off Angle Important Points

- DX
  - Typically Low: 0° – 30°
  - Need High Yagis (at Least λ/2, 1 λ Better) or Verticals (Gain a Plus)
- Local
  - Typically Higher: 20° - 90°
  - Lower Horizontally Polarized Dipoles
- An antenna *can be too high!*

Solar Cycles

- 22-Year
- 11-Year
- Earth's Equinoxes
- 27-Day (What Comes Around)

Today's Solar Cycle



The Good, Bad, and Ugly

- Solar Flux
- Solar Storms
  Geomagnetic Field
  Coronal High Speed Streams
- Coronal Mass Ejections
  Cycles 24/25

"Simplified "Chart

http://bandconditions.com/PROP.htm

- SOLAR FLUX
- 50 - 159 = POOR
- 160 - 200 = SO SO
- 201 - 300 = GREAT
- K INDEX - TODAY (1X)
- 9 - 4 = STORM
- 3 - 0 = CALM
- A INDEX - LAST 24 HOURS (8X)
- 400 - 16 = STORM
- 15 - 0 = CALM

Propagation Probabilities

- Your Mileage May Very
- Like Stock Picks?
- History May or May Not Repeat Itself
- 27 Day Cycle (Repetition)

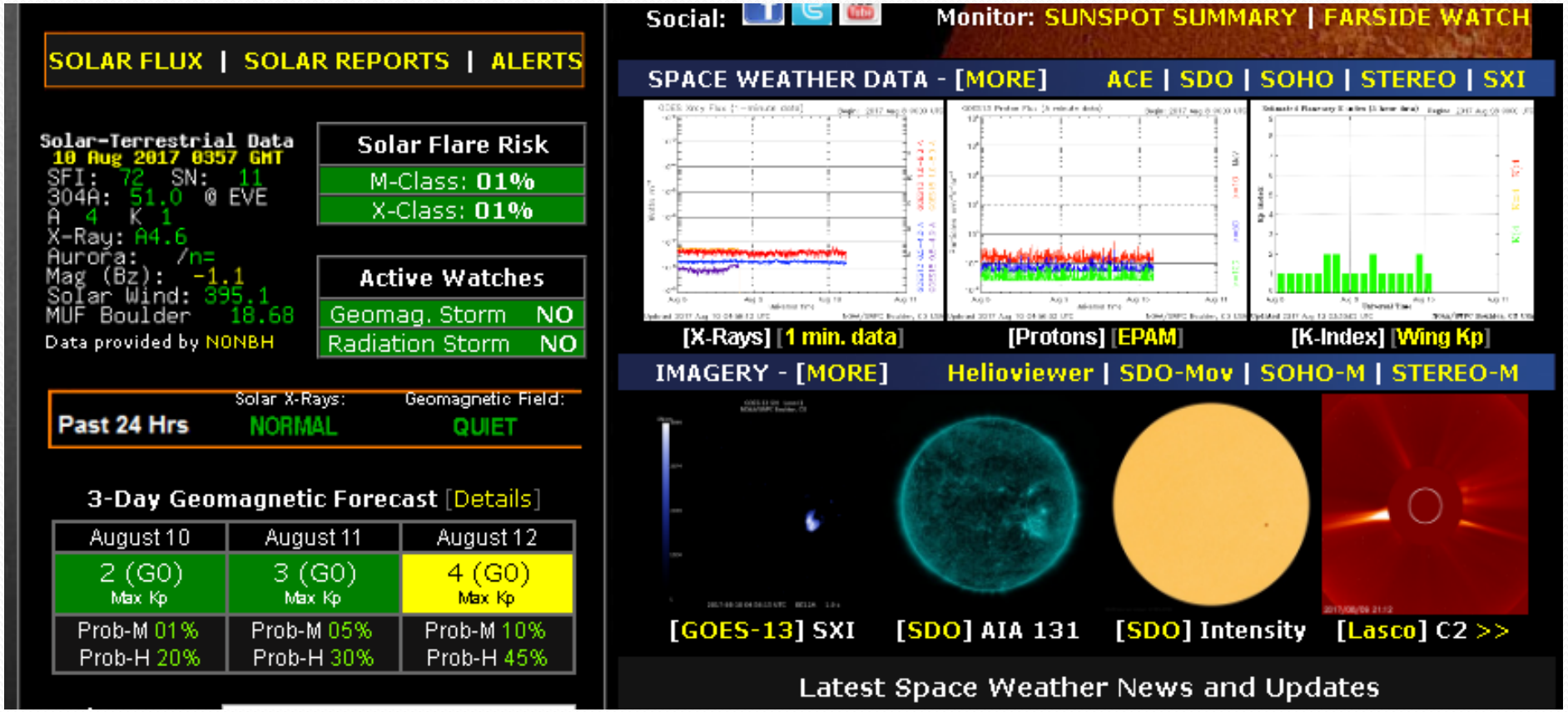
ARRL Propagation Bulletin 4 Aug

"Geomagnetic field will be:
Quiet on August 8-10, 15, 25-26, 29-30
Mostly quiet on August 11, 16, 27
Quiet to unsettled August 7, 14, 21, 23-24, 28
Quiet to active on August 6, 12-13, 17-20, 22
Active to disturbed on August 4-5"

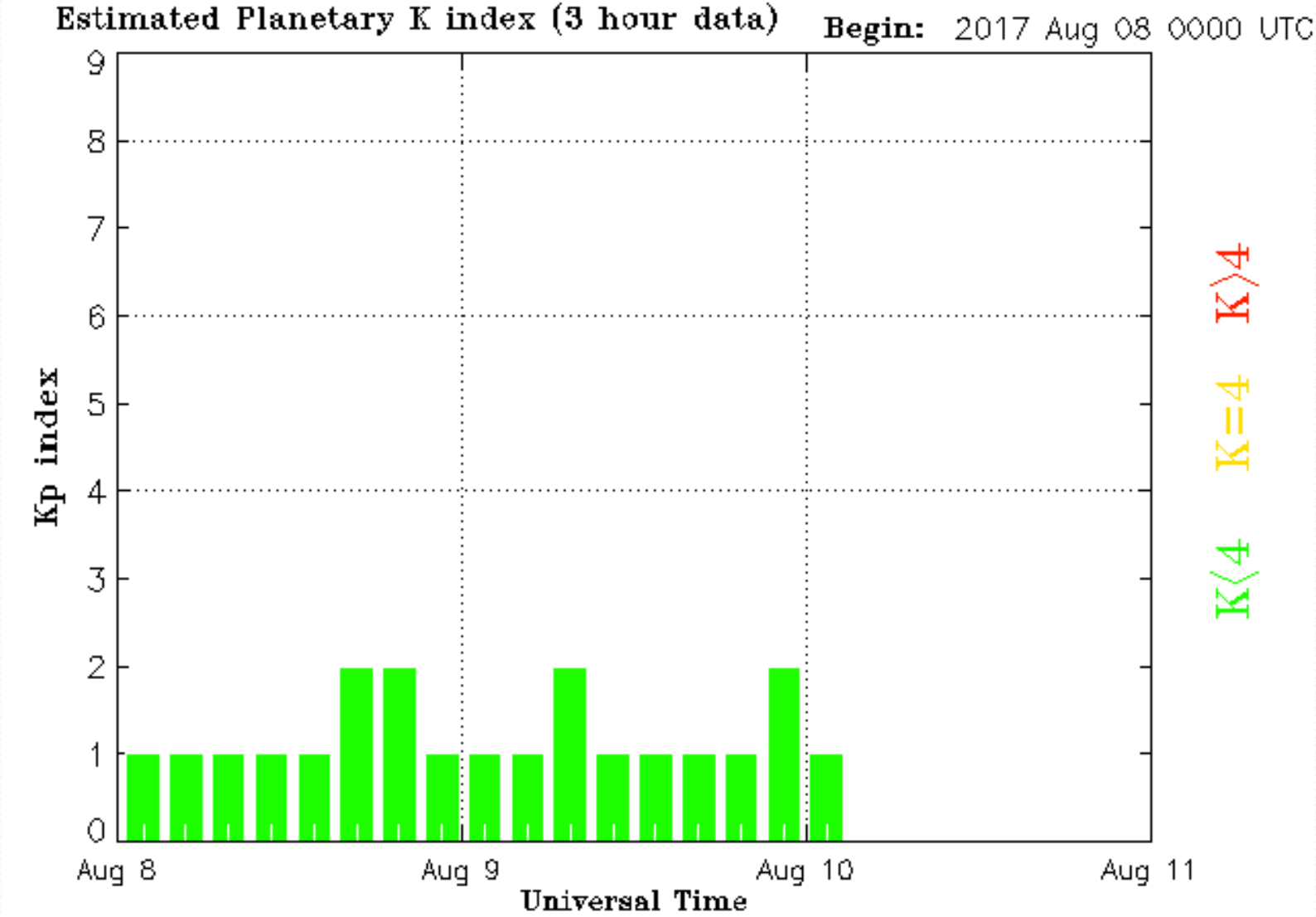
So Much for the NAQP-CW Contest 5 Aug!

I am Already Disturbed!

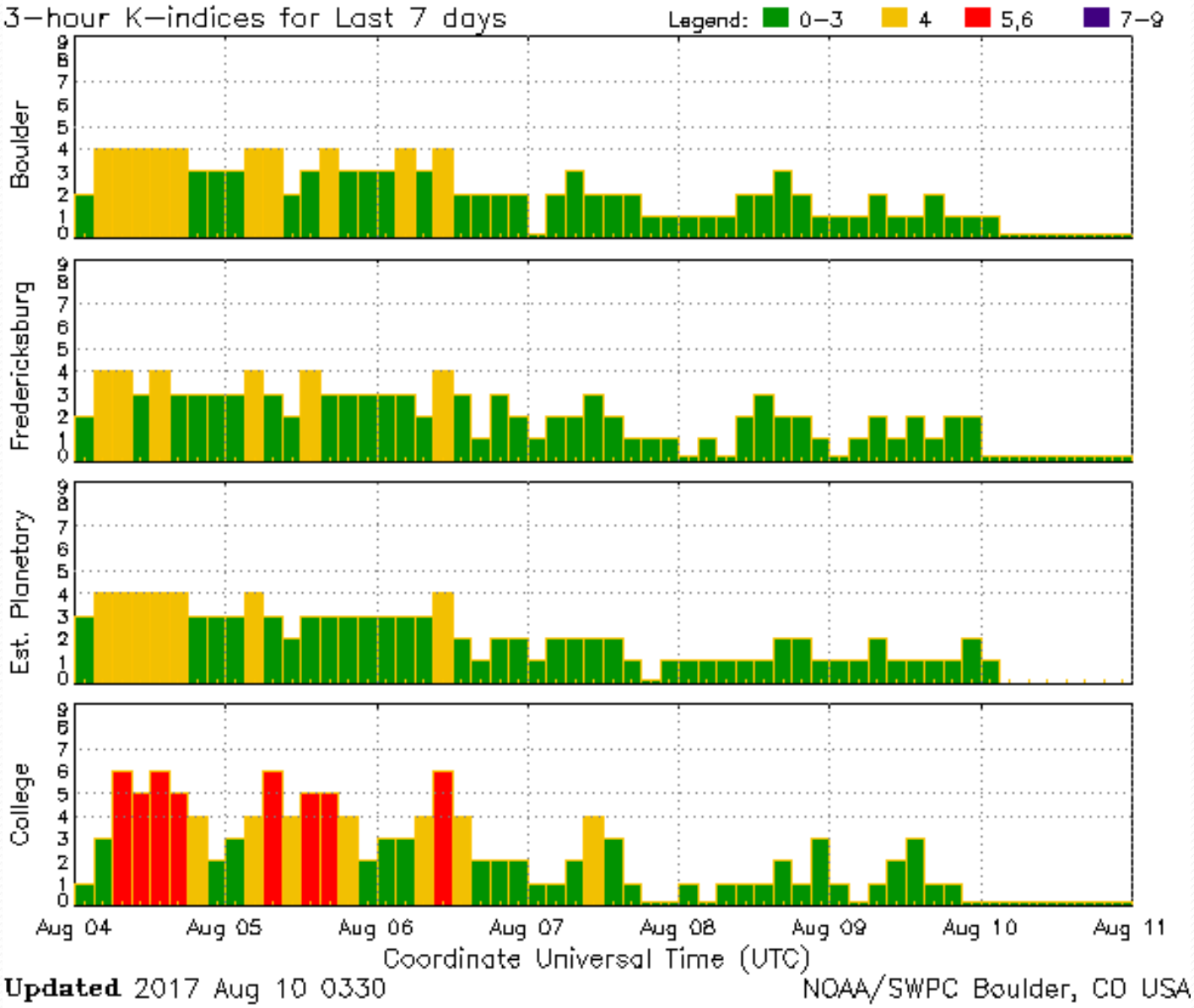
Solarham.net



Solarham.net



Solarham.net



Useful Tools

- VOACAP
- W6EL
- Reverse Beacon Network
- DXMaps

VOACAP.com

- Free, Great Tool!
- Wonderful for Planning
- Simple to Use
- A Wealth of Information
- Customize to Your Needs TX & RX

Rio Rancho to Tucumcari

Configure for Your Needs

Transmitter Site

QTH:	<< Select a location >>	
Name:	K8TE	Loc calc
Latitude:	35.2500	[-90..90]
Longitude:	-106.6400	[-180..180]
TX antenna:	Dipole @ 10M (33ft)	
TX power:	100 W	
TX mode:	CW	
Specials:	Swap TX-RX	Short-path
Current point:	Set Home	Unset Home

Receiver Site

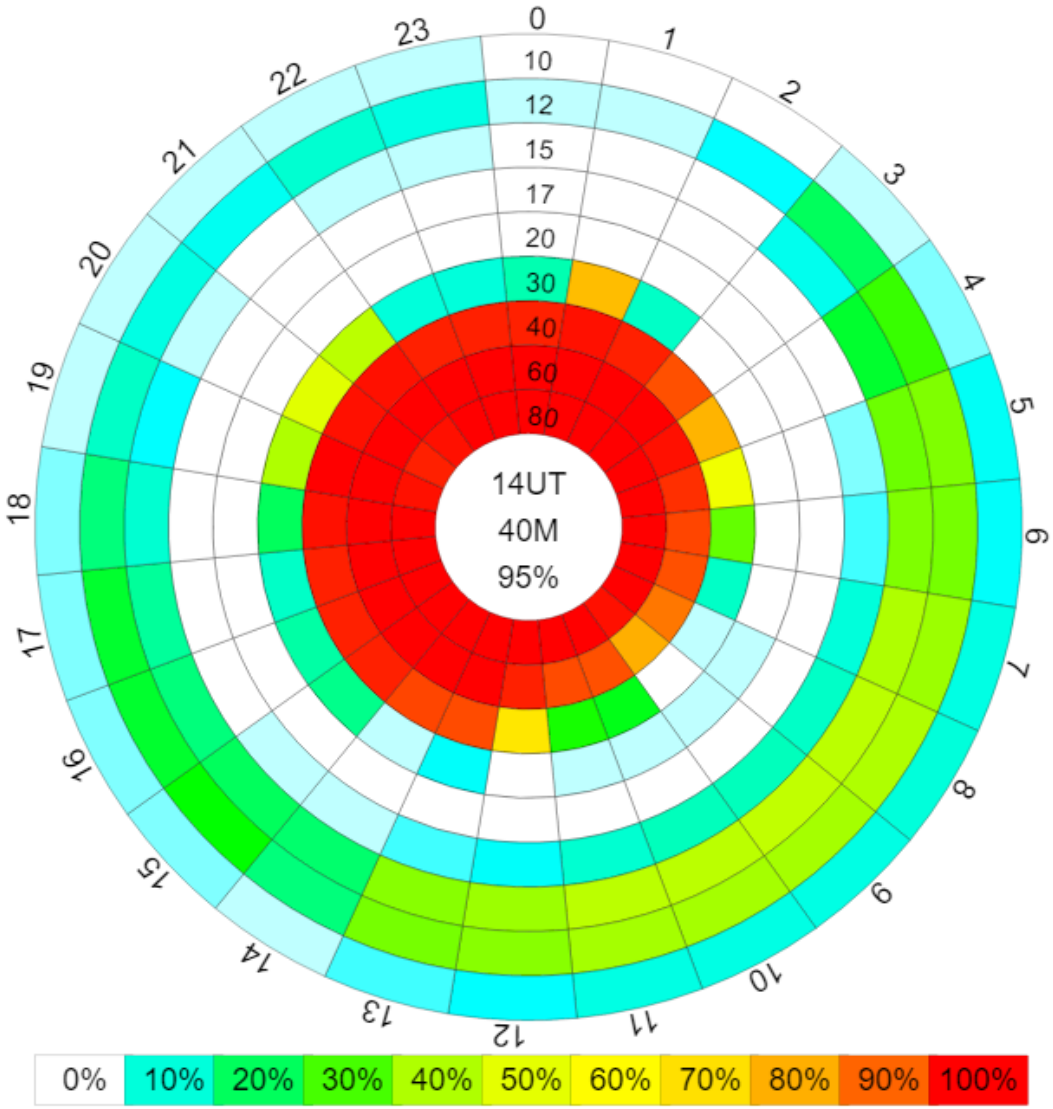
QTH:	W Santa Fe NM	
Name:	WA5EMA	Loc calc
Latitude:	35.1700	[-90..90]
Longitude:	-103.70	[-180..180]
RX antenna:	Dipole @ 10M (33ft)	

The circular chart above shows predictions for all HF amateur radio bands. Hover the mouse over the chart for details. For predictions with more frequency coverage, click the "Run prediction!" button.

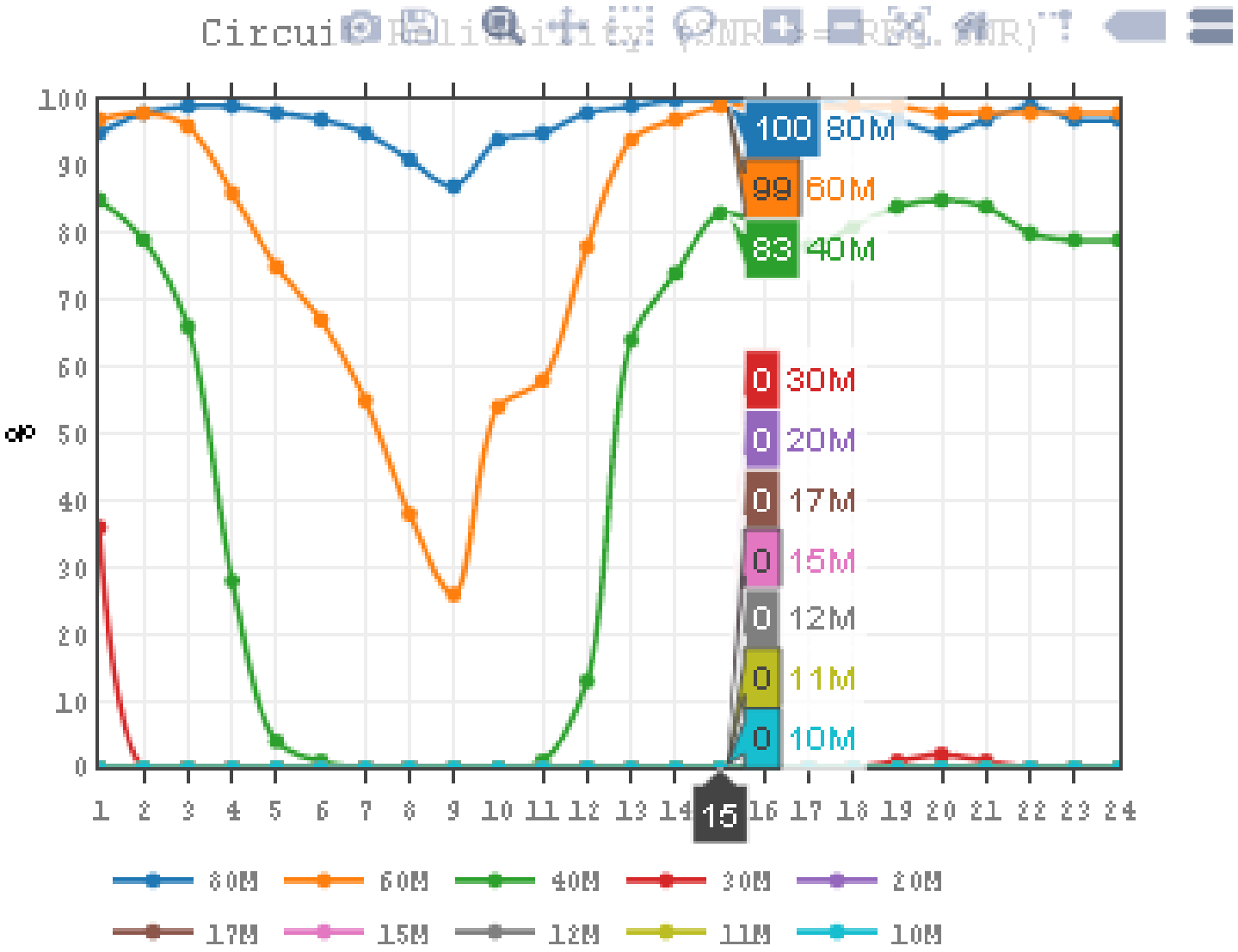
Run prediction!

Probabilities Results

Outer Circle UTC
Inner Circles—Bands
Innermost Circle Results
Red=Highest %
While=0%

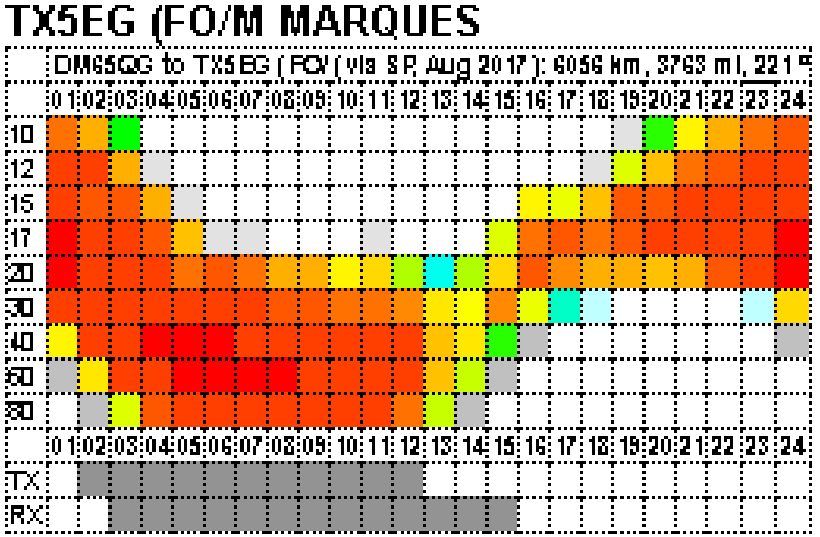


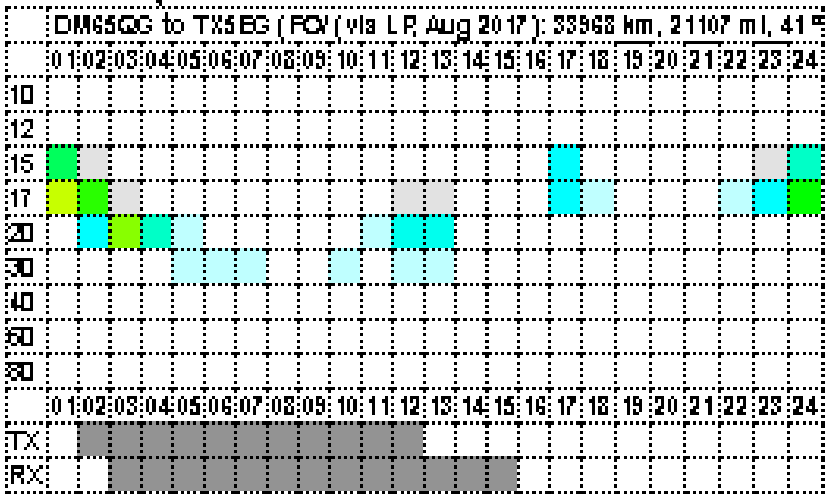
New Chart


Circui
100
90
80
70
60
50
40
30
20
10
0
dB
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
100 80M
99 60M
83 40M
0 30M
0 20M
0 17M
0 15M
0 12M
0 11M
0 10M
80M 60M 40M 30M 20M
17M 15M 12M 11M 10M

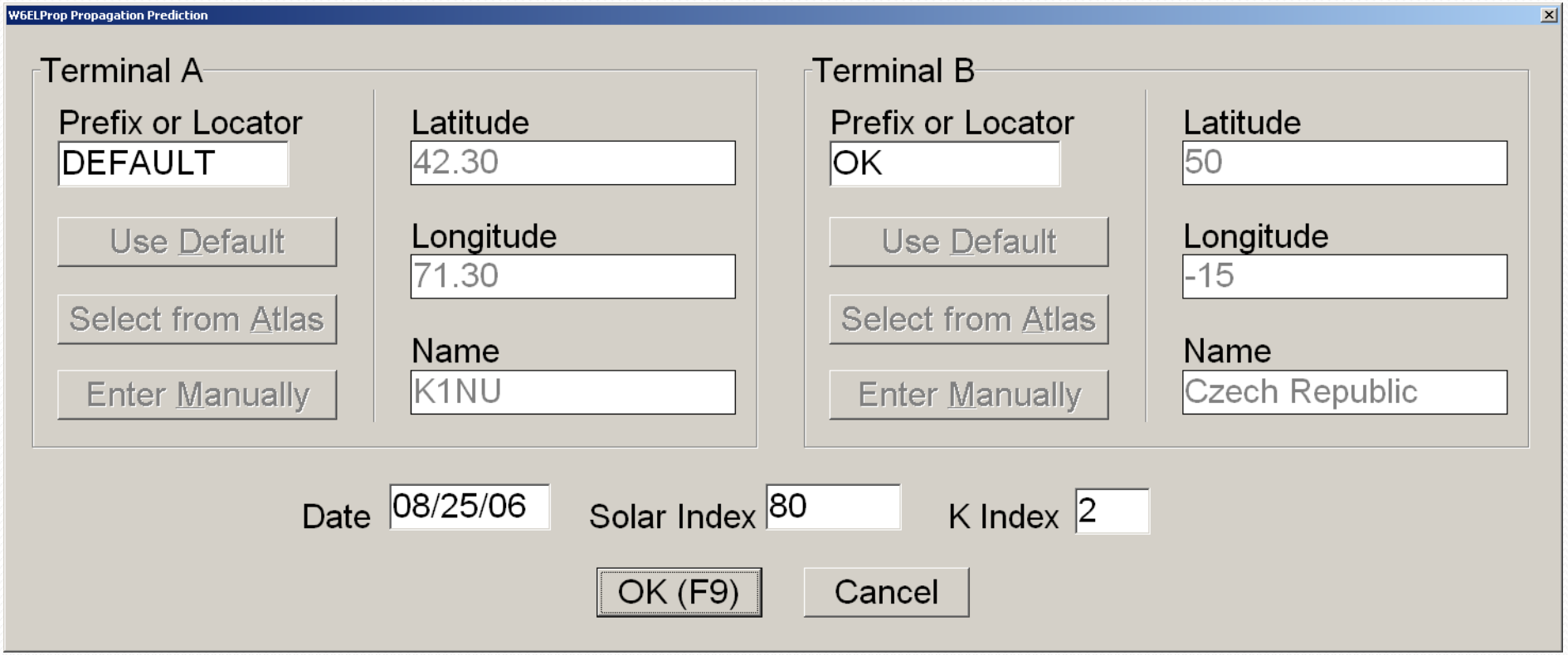
VOACAP DXpeditions Charts

French Polynesia
Now Through 5 Sep





W6ELprop


W6ELProp Propagation Prediction
Terminal A
Prefix or Locator
DEFAULT
Use Default
Select from Atlas
Enter Manually
Latitude
42.30
Longitude
71.30
Name
K1NU
Terminal B
Prefix or Locator
OK
Use Default
Select from Atlas
Enter Manually
Latitude
50
Longitude
-15
Name
Czech Republic
Date
08/25/06
Solar Index
80
K Index
2
OK (F9)
Cancel

W6ELprop Output

W6ELProp Short-Path Prediction for 08/25/2006

File Info Maps Graphs Advanced

TERMINAL A: 42.30 N 71.30 W K1NU Sunrise/Set: 1008/2327 UTC Bearing to B: 50.0 deg
TERMINAL B: 50.00 N 15.00 E Czech Republic Sunrise/Set: 0410/1754 UTC Bearing to A: 298.2 deg
SSN: 24.0 Flux: 80.0 K: 2 Path Length: 6326 km

SIGNAL LEVELS IN dB ABOVE 0.5 µV

UTC	MUF	3.6 MHz	7.1 MHz	10.1 MHz	14.1 MHz	18.1 MHz	21.2 MHz	24.9 MHz	28.3 MHz
0830	11.8		-1 D	20 A					
0900	12.9		-4 C	7 D					
0930	13.9		-8 B	5 D	22 D	33 D			
1000	14.8			5 A	21 D	32 D			
1030	14.9			1 C	20 B	31 D			
1100	15.4			-1 B	19 D	31 D			
1130	16.0			-2 B	18 D	30 D			
1200	16.5			-4 A	17 C	30 D			
1230	17.0			-5 A	17 C	30 C			
1300	17.4			-5 A	16 C	29 C	30 D		
1330	17.8			-6 A	16 B	29 C	30 D		
1400	18.2			-6 A	16 B	29 B	30 D		
1430	18.5			-6 A	16 B	29 B	30 D		
1500	18.8			-6 A	16 A	29 B	30 D		
1530	19.0			-5 A	17 A	29 B	30 D		
1600	19.1			-4 A	17 A	30 B	30 D		
1630	19.3			-3 A	18 A	30 B	31 D		
1700	19.4			-2 A	18 A	30 B	31 D		
1730	19.5			0 A	19 A	31 B	31 D		
1800	19.5			2 A	20 A	32 A	32 D		

Availabilities A: 75 - 100% B: 50 - 75% C: 25 - 50% D: 1 - 25%
Signal levels suppressed if below -10 dB relative to 0.5 µV or if predicted availability is zero

Show Long Path | Show Signal-to-Noise Ratios | Close

Press F1 for Help

Reverse Beacon Network

- Network of World-Wide Stations
- Listening to Entire (CW/RTTY) Bands
- Reports What They Hear When & How Well
- Near Real Time Spots
- Presented in Spot Search, Data, or Map
- RBN & Beacons for Propagation Study

K8TE Spots Sorted by Antennas

- W2LB Farmington NY
- KM3T Amherst NH
- NY3A Glen Rock PA
- W7HR Port Orchard WA
- KO7SS Tucson AZ
- K9TM Sylvania OH
- Red=Lowest RX Signals
- Green=Highest RX Signals
- OCF=80m Off Center-Fed Dipole
- FAN=40m/20m/10m Fan Dipole

K8TE 40m Spots March 2016

de	dx	freq	snr	time
W2LB	K8TE	OCF	15 dB	1424z 13 Mar
W2LB	K8TE	OCF	15 dB	1425z 13 Mar
W2LB	K8TE	OCF	21 dB	1425z 13 Mar
W2LB	K8TE	OCF	22 dB	1426z 13 Mar
KM3T	K8TE	OCF	8 dB	1425z 13 Mar
JS1JRZ	K8TE	OCF	7 dB	1425z 13 Mar
NY3A	K8TE	OCF	13 dB	1425z 13 Mar
W7HR	K8TE	OCF	38 dB	1424z 13 Mar
W7HR	K8TE	OCF	41 dB	1425z 13 Mar
W7HR	K8TE	OCF	42 dB	1426z 13 Mar
W2LB	K8TE	FAN	13 dB	1425z 13 Mar
W2LB	K8TE	FAN	18 dB	1425z 13 Mar
W2LB	K8TE	FAN	13 dB	1425z 13 Mar
W2LB	K8TE	FAN	18 dB	1426z 13 Mar

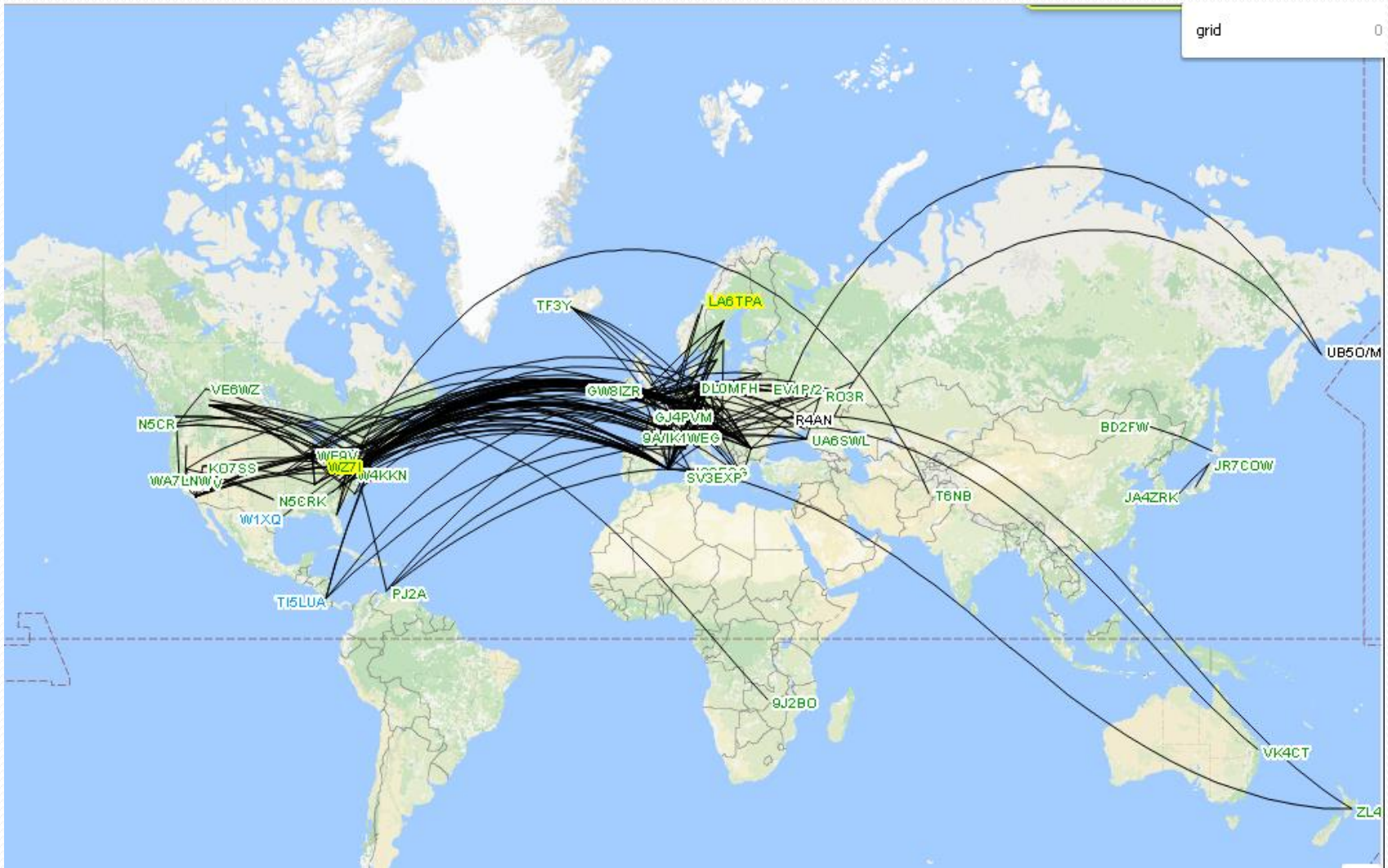
RBN Antenna Comparisons

- Sorted by
- Date
- Time
- Re-Sort By
- Frequency
- Sub Antenna Name
- Compare Antennas at Each “de” QTH
- Look Up Spotting RX at QRZ

DXMaps.com

- Real Time Spots
- Display on Globe or Piece of It
- Pick a Band—HF, VHF & Up
- Chose Propagation Mode
  Aurora, Aurora-E, Back Scatter, EME, etc.
- Updates Automatically
- Post Your Own Spots
- Many, Many Options
- RTFM!

40 Meters 0500 UTC Thursday



Myths

- High K-Index/A-Index—No Propagation
  No! Life (and Propagation) Continues
  Sometimes, Especially Afterwards, Even Better!
- "Band is Dead"
  Nobody is Calling CQ—Call CQ!
  Check DXMaps or Other Clusters
- VOACAP Shows a Good Path
  Propagation Probabilities May Not Equal Reality
  Often Distant End RFI Prevents QSO's
  Frequently Poor Antennas Prevent QSO's

What Does It All Mean?

- Know Band Openings and Plan Around Them
  - Primary Paths for Rate
  - Hunt for Multipliers on All Paths
- Use Tool Before And During the Contest
  - Fine-tune Your Strategy Identify Openings
  - Use Real-time Monitors
- DX: Get Yagis as High As Possible
  - Use Verticals as Back-Up/2nd Choice
- Local: Low Dipoles
  Other High-angle Radiators

Questions?

- No "Dumb" Questions
- Less-than-Bright Answers Possible

References

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- http://www.reversebeacon.net/
- https://www.dxmaps.com/spots/mapg.php