Using Propagation Predictions for HF DXing

A Presentation at The International DX Convention

Visalia, CA

Saturday, April 17, 2010

By Dean Straw, N6BV

2000/09/22 09:36 UT

1

Some Propagation-Prediction Tools

- *VOACAP*

- *VOAAREA*

- *Ham CAP* by VE3NEA

- *W6ELProp* by W6EL

- N6BV prediction tables

VOACAP

• *VOACAP* is considered the "gold standard" of HF propagation-prediction programs, but it is difficult to use.

VOACAP

• *VOACAP* is considered the "gold standard" of HF propagation-prediction programs, but it is difficult to use.

• *VOACAP* is for point-to-point predictions (one transmitter site to one receiver site).

VOACAP

• *VOACAP* is considered the "gold standard" of HF propagation-prediction programs, but it is difficult to use.

• *VOACAP* is for point-to-point predictions (one transmitter site to one receiver site).

• *VOACAP* produces lengthy tabular printouts that require a lot of interpretation and massaging.

Typical *VOACAP* Tabular Output

```
Oct    1994            SSN = 100.                    Minimum Angle= 0.100 degrees
SAN FRANCISCO       LONDON                 AZIMUTHS          N. MI.      KM
37.78 N  122.42 W – 51.50 N    0.17 W      32.64  316.78    4651.1    8613.2
XMTR  2–30 + 10.0 dBi[samples\SAMPLE.00     ] Az= 52.9 OFFaz=339.7   1.500kW
RCVR  2–30 + 10.0 dBi[samples\SAMPLE.00     ] Az=234.9 OFFaz= 81.9
3 MHz NOISE = –163.6 dBW     REQ. REL = 50%    REQ. SNR = 43.0 dB


SUMMARY    6 MODES   FREQ =  14.1 MHZ  UT =  15.0
                                                              Most REL
              3.F2      4.F2      4. E      5.F2      5.F2      5. E      3.F2
TIME DEL.    29.87     30.41     29.17     31.76     31.89     29.37     29.87
ANGLE         4.57     10.22      1.72     17.85     18.35      5.06      4.57
VIR. HITE   287.27    297.20    125.30    353.16    362.42    137.00    287.27
TRAN.LOSS   149.88    158.17    602.22    184.45    187.14   1037.71    149.88
T. GAIN      10.00     10.00     10.00     10.00     10.00     10.00     10.00
R. GAIN      10.00     10.00     10.00     10.00     10.00     10.00     10.00
ABSORB        6.48      5.03      7.01      3.57      3.50      6.37
FS. LOSS    134.47    134.63    134.27    135.01    135.04    134.33
FIELD ST.     2.07     -6.22   -450.28    -32.51    -35.20   -885.77      2.67
SIG. POW.  -118.12   -126.41   -570.46   -152.69   -155.38  -1005.95   -117.52
SNR          51.41     43.12   -400.93     16.84     14.15   -836.42     52.01
MODE PROB     0.95      0.77      0.01      0.39      0.39      0.00      0.95
R. PWRG    1000.00   1000.00   1000.00   1000.00   1000.00   1000.00     -9.01
RELIABIL      0.70      0.50      0.00      0.10      0.07      0.00      0.71
```

Mode ←

Elev. angle ←

Signal power, dBW ↗

SNR, in 1 Hz BW ←

Mode probability ↗

"Method 25": "All modes table," for one frequency, for each hour -- the output file is huge (about 250 kB = 28 printed pages)

6

VOACAP
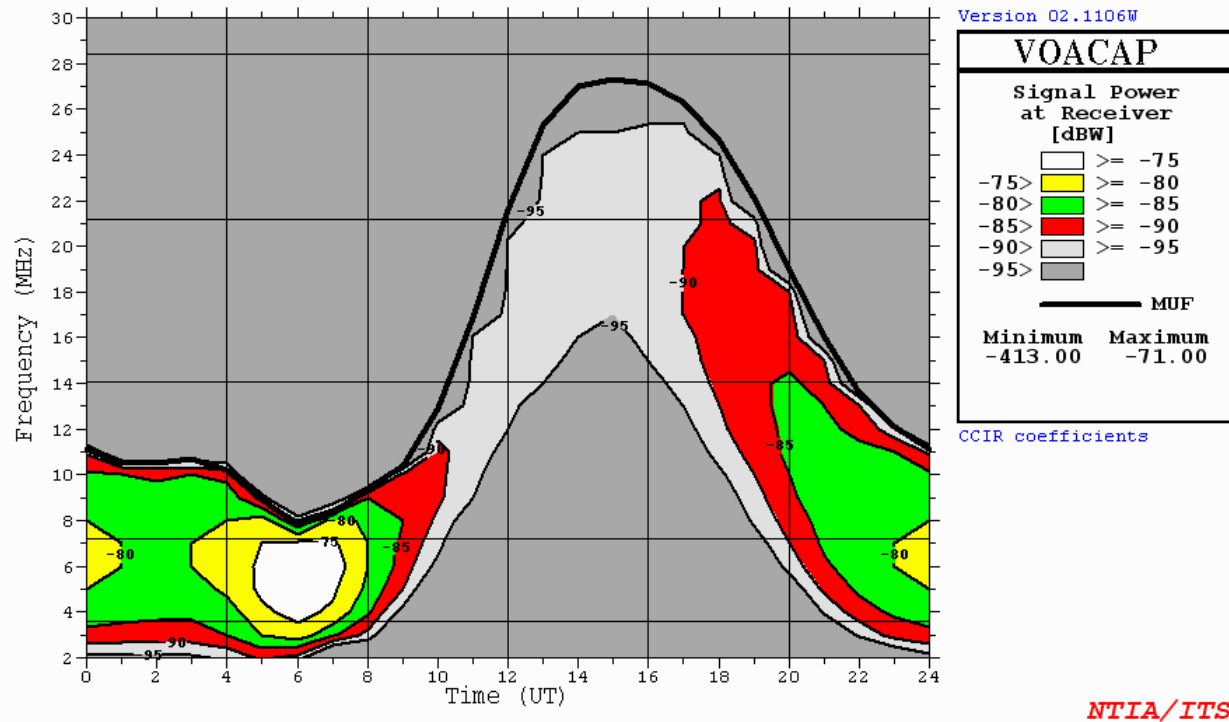
• *VOACAP* is considered the "gold standard" of HF propagation-prediction programs, but it is difficult to use.

• *VOACAP* is for point-to-point predictions (one transmitter site to one receiver site).

• *VOACAP* produces lengthy tabular printouts that require a lot of interpretation and massaging.

• *VOACAP* can produce colorful graphs, although these aren't really useful for DX planning.

VOACAP Graphs?

This graph looks pretty, but it doesn't really give that much useful information for planning.

VOAAREA

- *VOAAREA* uses the *VOACAP* engine to produce area-wide coverage from a single transmitting site for a single frequency.

SAN FRANCISCO [Dipole @ 7] 1.5kW 80deg 02ut 3.800MHz Nov 10ssn

SDBW

Tx location to grid of Rx

AREADATA\DEFAULT\SF4.V19
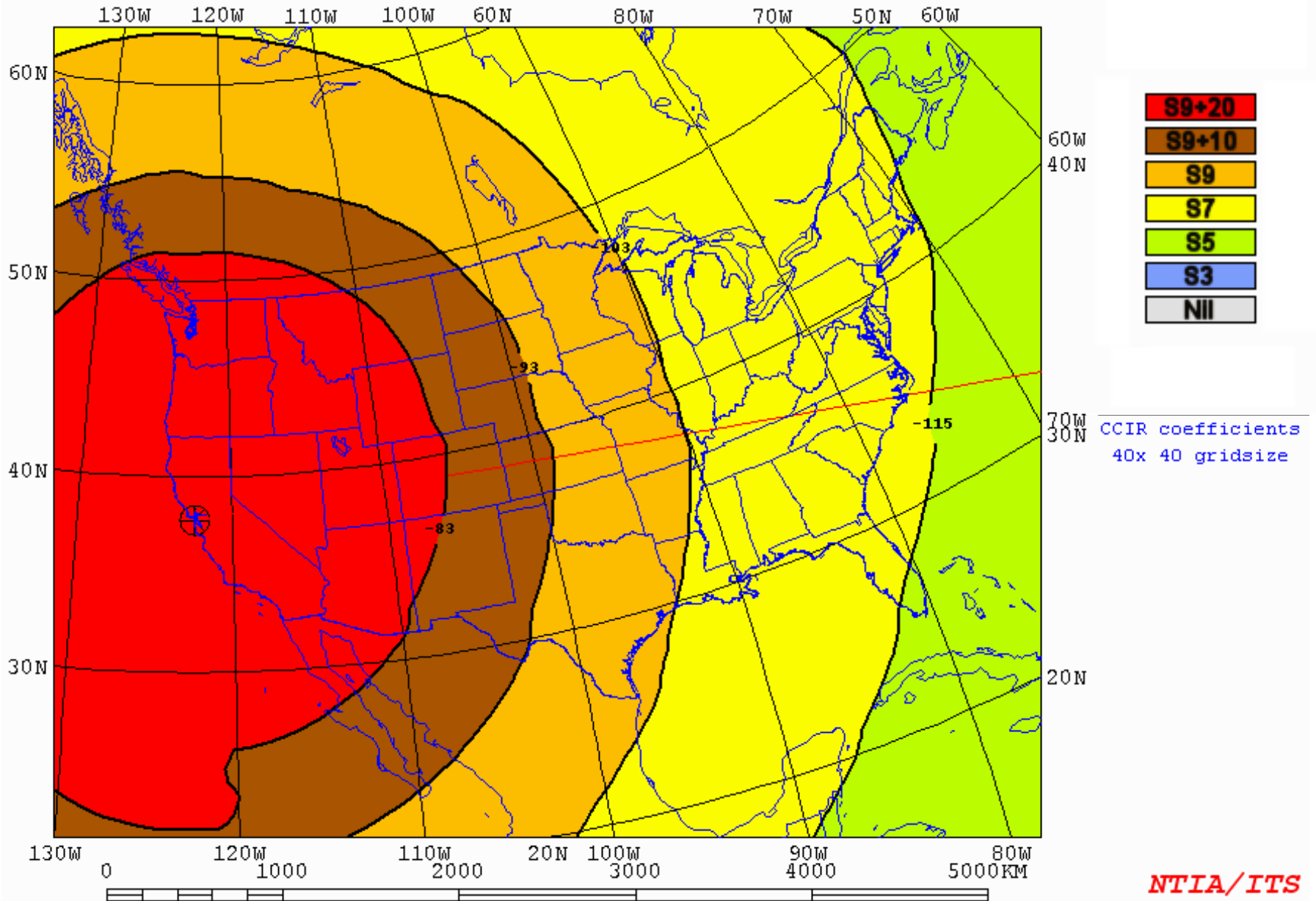
| S9+20 |
| S9+10 |
| S9 |
| S7 |
| S5 |
| S3 |
| NII |

CCIR coefficients
40x 40 gridsize

NTIA/ITS

VOAAREA

• *VOAAREA* uses the *VOACAP* engine to produce area-wide coverage from a single transmitting site for a single frequency.

• *VOAAREA* charts are arguably the most intuitive presentation of propagation data — but only for a single frequency and a single UTC time.

VOAAREA

• *VOAAREA* uses the *VOACAP* engine to produce area-wide coverage from a single transmitting site for a single frequency.

• *VOAAREA* charts are arguably the most intuitive presentation of propagation data — but only for a single frequency and a single UTC time.

• This makes it difficult to get the *big picture*, unless charts for several frequencies are combined in a montage, good for one hour at a time. A series of these makes a sort of "movie" to use while operating.
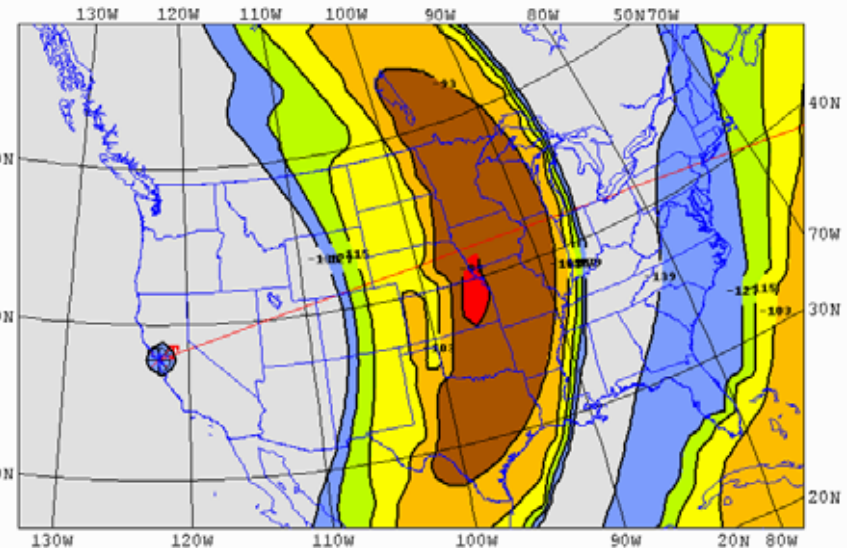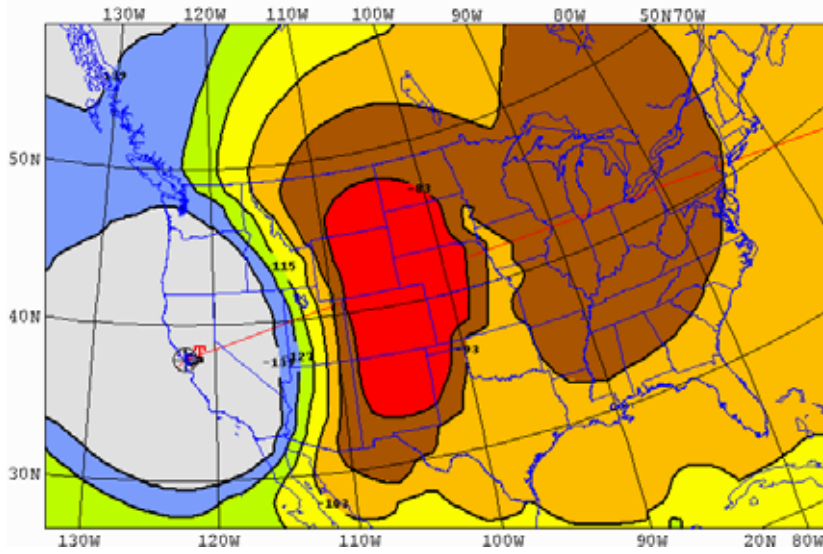
20 m

15 m
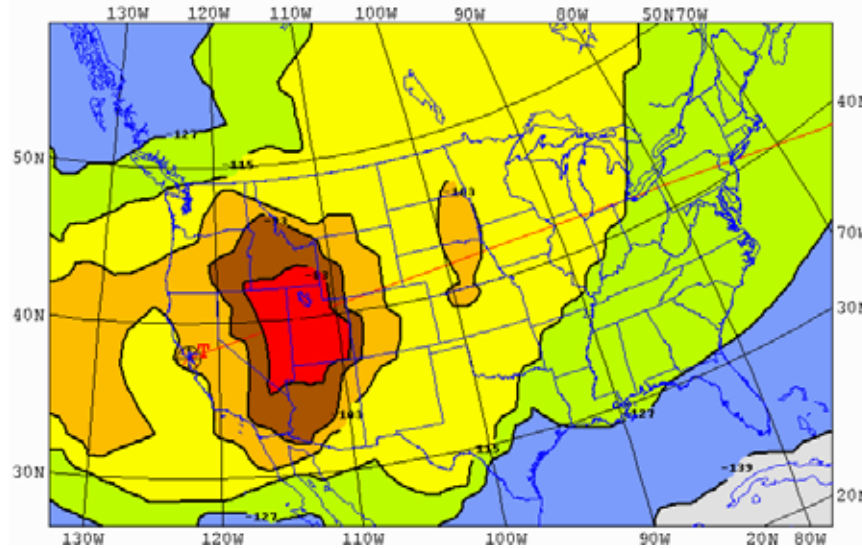
21 UTC
(13 Local)

40 m

A movie of area-chart montages

13

20 m

15 m

22 UTC

40 m

14

20 m

15 m

23 UTC

40 m

20 m

15 m

40 m
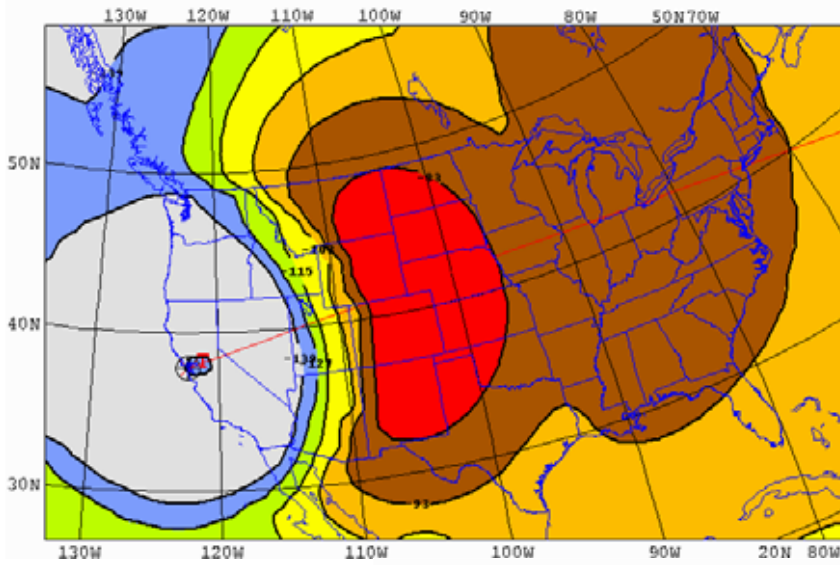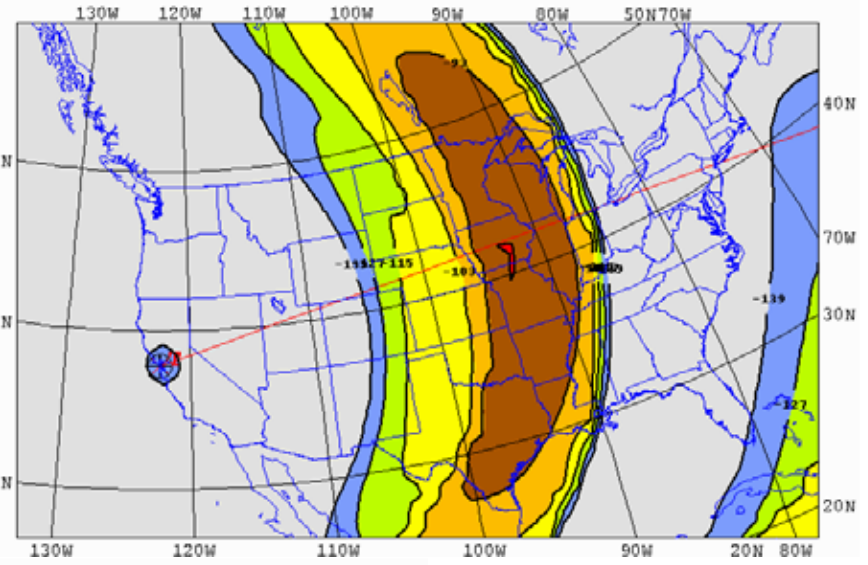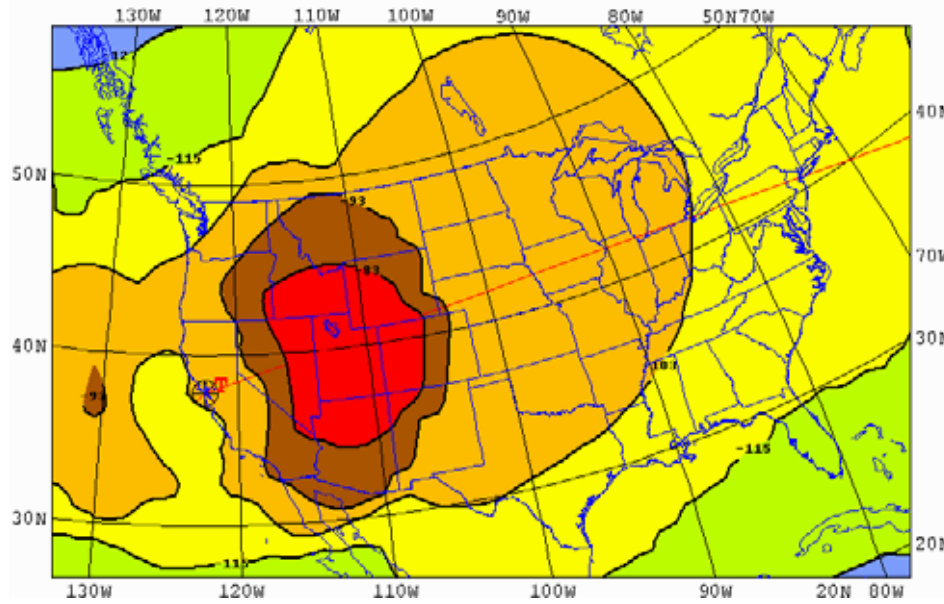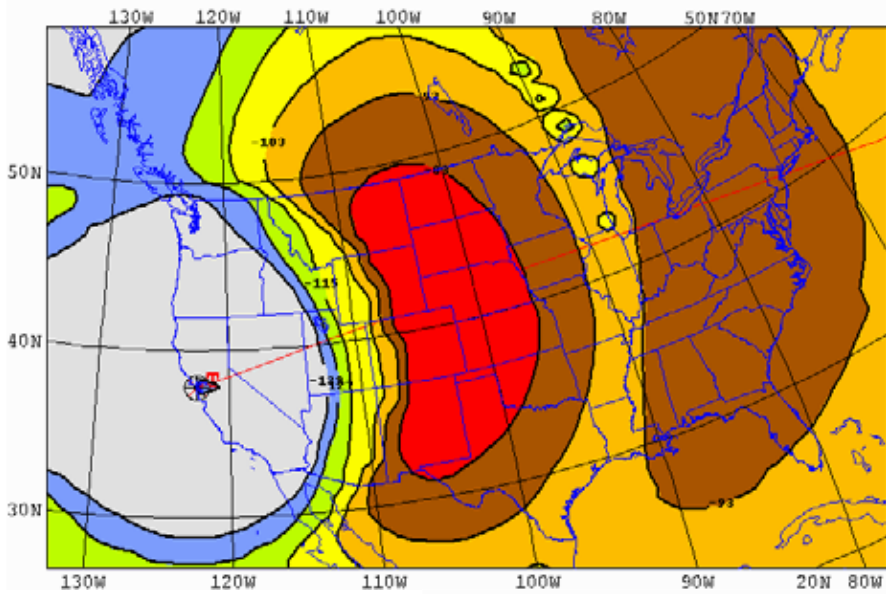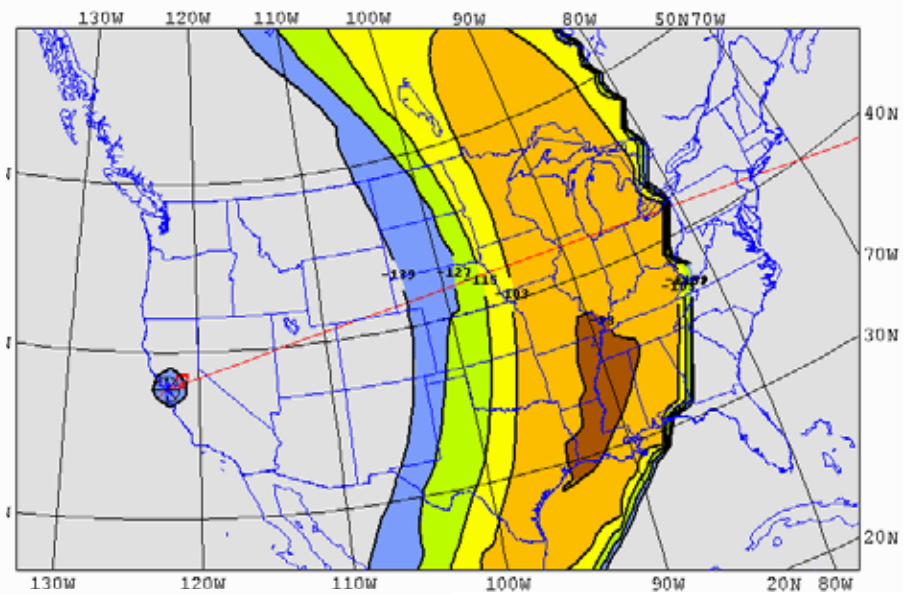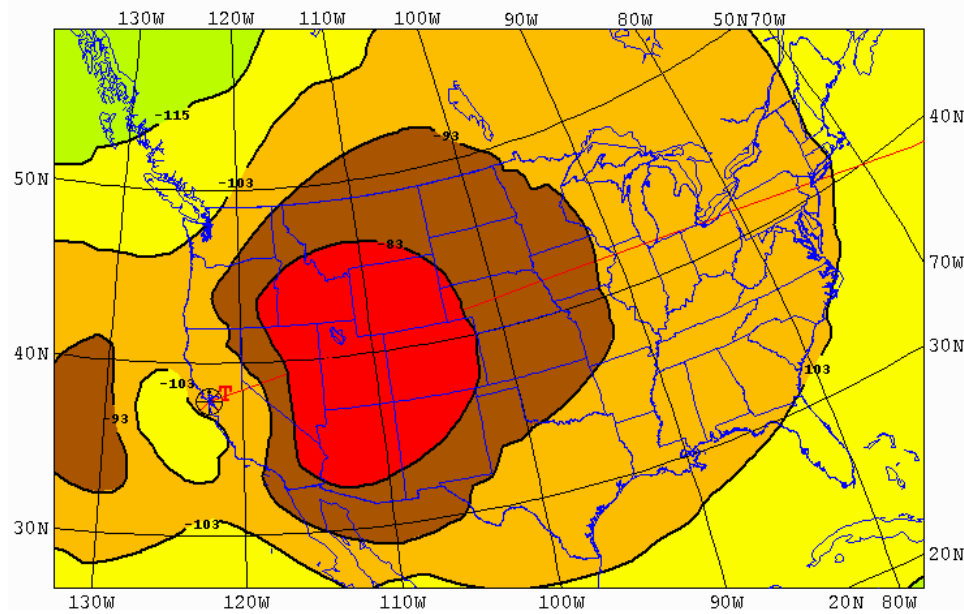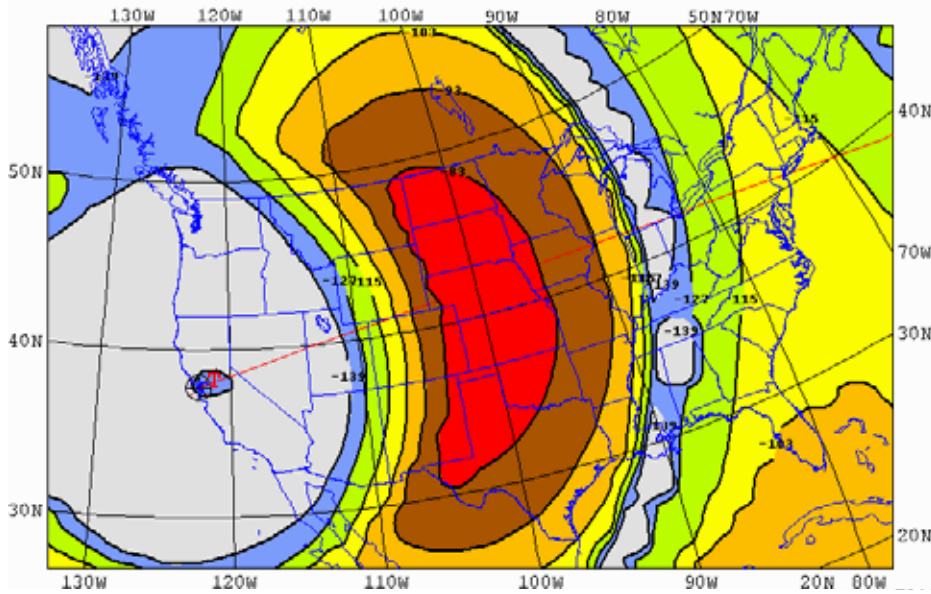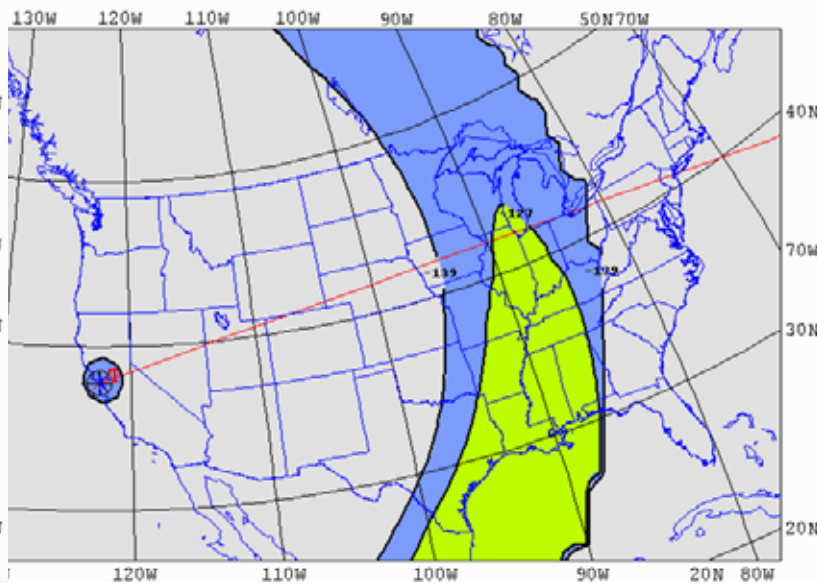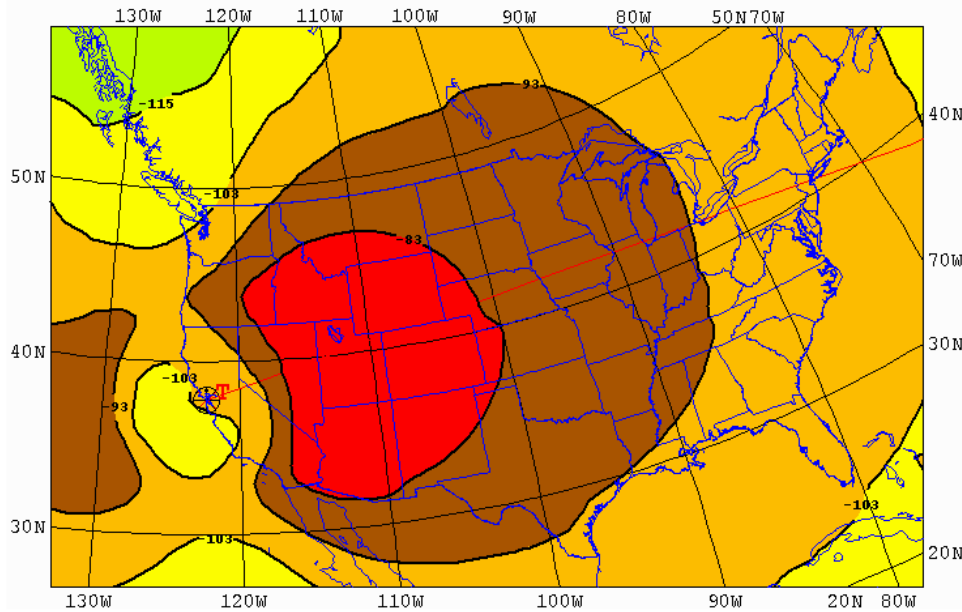
00 UTC + 20 more slides

By 00 UTC be on 40 or be hosed!

16
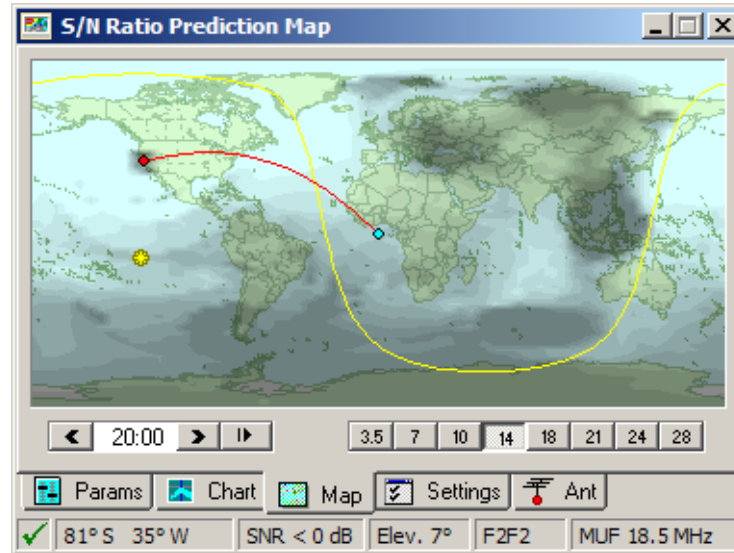
Ham CAP

Ham CAP shows worldwide SNR (dB/1Hz) for a single UTC and a single frequency. Map is rather small, unless it is displayed using *DX Atlas*. You can read SNR by moving mouse cursor, which isn't useful for big-picture planning.

Azimuthal Geographic View
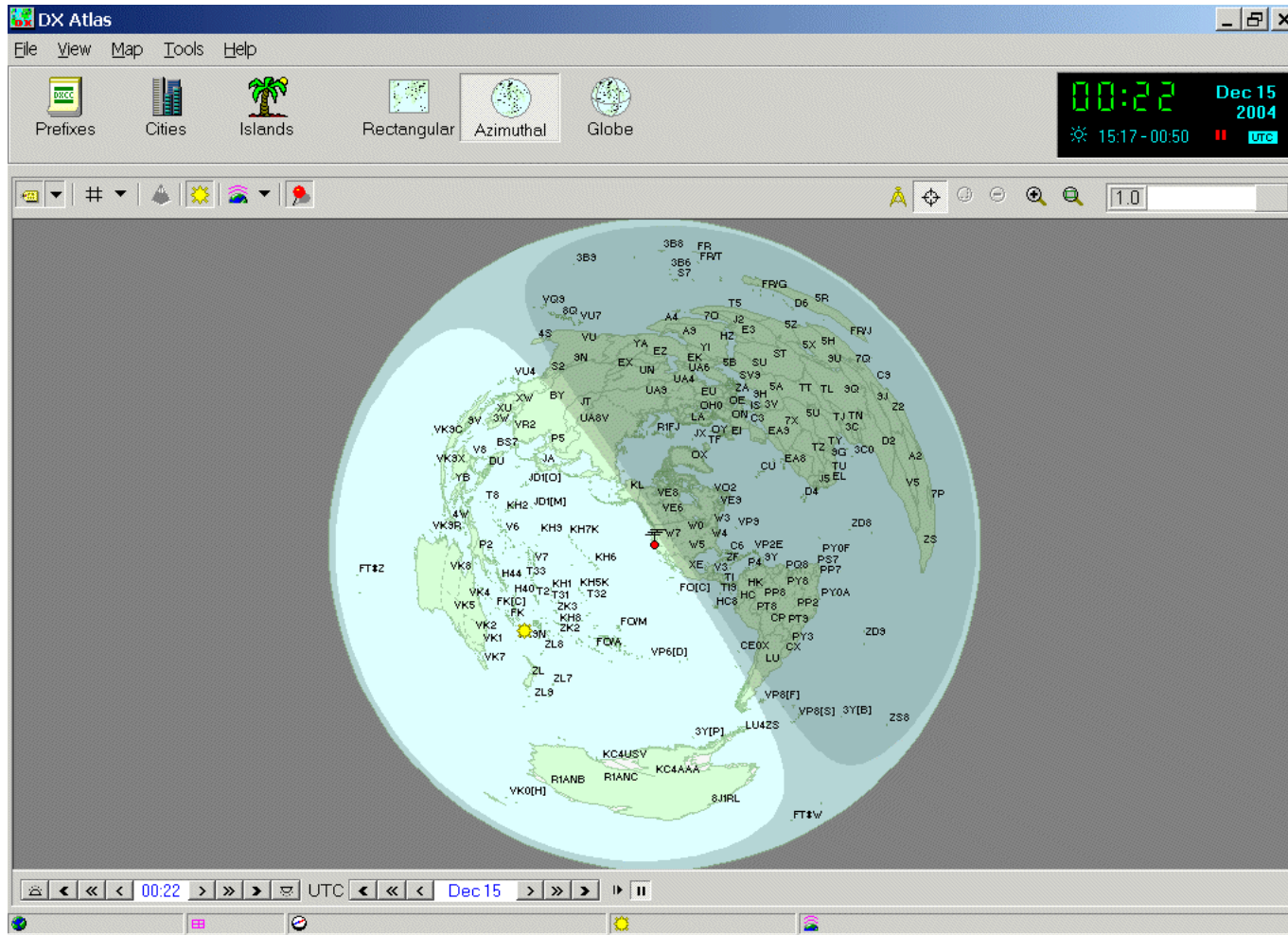
SP: 320°, 8,396 mi

LP: 140°, 16,461 mi

DX Atlas is a fine program that shows exactly what to expect from experience — the best chance on 20 m is at W6 sunset, morning in VU4.   18

W6ELProp
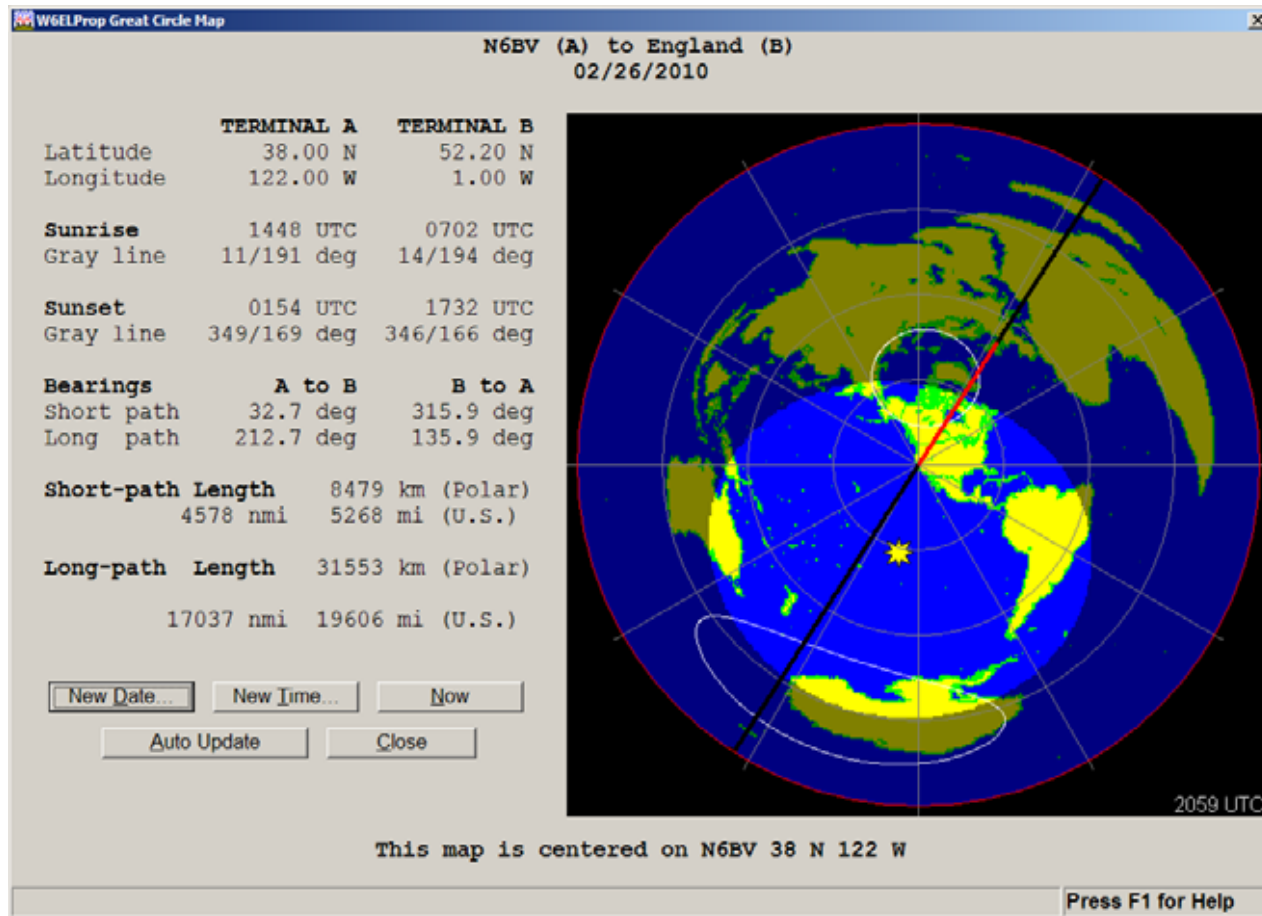
W6ELProp is useful, especially for showing grayline situations for low-band communications.

N6BV Prediction Tables

• These prediction tables were from *The ARRL Antenna Book.*

N6BV Prediction Tables

• These prediction tables were from *The ARRL Antenna Book.*

• The newest versions cover 240+ transmitting QTHs around the world.

New N6BV Prediction Tables

240+ transmitting QTHs around the world.

N6BV Prediction Tables

• These prediction tables were from *The ARRL Antenna Book.*

• The newest versions cover 240+ transmitting QTHs around the world.

• There are two different sets of tables:

   • Summary (each page shows five contest bands for 24 hours to seven general areas around the world)

N6BV Prediction Tables

• These prediction tables were from *The ARRL Antenna Book.*

• The newest versions cover 240+ transmitting QTHs around the world.

• There are two different sets of tables:

  • Summary (each page shows five contest bands for 24 hours to seven general areas around the world)

  • Detailed (each page shows one band over 24 hours, for 40 zones all around the world).

Summary Prediction Tables

Oct., CA (San Francisco), for SSN = Low, Sigs in S-Units. By N6BV, ARRL.

UTC	80 Meters EU	FE	SA	AF	AS	OC	NA	40 Meters EU	FE	SA	AF	AS	OC	NA	20 Meters EU	FE	SA	AF	AS	OC	NA	15 Meters EU	FE	SA	AF	AS	OC	NA	10 Meters EU	FE	SA	AF	AS	OC	NA	UTC
0	1	-	2	1	-	-	9+	6	-	8	6	1	2	9+	4	8	9+	8	8	9+	9+	-	9	9+	9	8	9+	9+	-	5	9	1*	-	7	9	0
1	4	-	5	4	-	-	9+	7	-	9	8	2	6	9+	5	8	9+	9	8	9+	9+	-	8	9	4*	8	9+	9+	-	4	5*	-	5*	8	6	1
2	5	-	7	6	-	3	9+	7	1	9	7	2	8	9+	4	8	9+	9	8	9+	9+	-	8	9	3*	6*	9+	9	-	1	1*	-	2*	7	6	2
3	8	-	8	8	-	7	9+	8	1	9	8	2	9	9+	2	8	9	7	8	9+	9+	1*	7	4*	6*	6*	9	8	-	-	1*	-	2*	6	7	3
4	8	-	8	8	-	9	9+	8	3	9	7	1	9+	9+	2	8	9	6*	7	9+	9+	4*	4	2*	6*	3*	8	8	-	-	-	-	-	-	7	4
5	8	-	8	8	-	9	9+	9	5	9	8	1	9+	9+	1*	8	9	5*	4	9	9	1*	-	-	3*	1*	6	8	-	-	-	-	-	-	7	5
6	8	2	8	8	-	9+	9+	9	7	9	8	1	9+	9+	1*	5	9	4	1*	9	9	-	-	-	1*	-	2	8	-	-	-	-	-	-	7	6
7	6	5	8	6	-	9+	9+	9	8	9	8	4	9+	9+	1	1	9	5	-	9+	9+	-	-	-	-	-	-	8	-	-	-	-	-	-	7	7
8	4	7	8	2	1	9+	9+	6	9	9	6	5	9+	9+	-	1*	9	5	-	9	9+	-	-	4	-	-	-	8	-	-	-	-	-	-	7	8
9	1	8	8	-	2	9+	9+	5	9	9	5	6	9+	9+	-	1*	9	1	-	9	9+	-	-	3	-	-	-	8	-	-	-	-	-	-	7	9
10	-	9	9	-	3	9+	9+	5	9	9	2	7	9+	9+	-	2	9	1*	1*	9	9+	-	-	1	-	-	-	8	-	-	-	-	-	-	7	10
11	-	9	9	-	6	9+	9+	4	9	9	1	8	9+	9+	-	2	7	3*	1*	9+	9	-	-	-	-	-	-	8	-	-	-	-	-	-	7	11
12	-	9	6	-	8	9+	9+	3	9	9	-	9	9+	9+	-	3	5	2*	1*	9+	8	-	-	-	-	-	-	8	-	-	-	-	-	-	7	12
13	-	9	2	-	7	9+	9+	3	9	8	-	9	9+	9+	-	1*	9	4	1*	9	9+	-	-	2	-	-	-	8	-	-	-	-	-	-	7	13
14	-	8	-	-	7	9	9+	5	9	4	2	8	9	9+	6	-	9+	7*	4*	8	9+	-	4*	9	3	2*	2*	9	-	-	-	-	-	-	7	14
15	-	7	-	-	4	9	9+	2	9	1	-	8	9	9+	7	3	9	7*	6	8	9+	5*	2*	9+	8*	7*	2*	9+	-	5*	8	-	3*	4*	8	15
16	-	4	-	-	1	6	9+	1	8	-	-	5	9	9+	8	9	9	9	7	9+	9+	5	2*	9+	8	7*	6	9+	2*	5*	8	4*	6*	2*	9	16
17	-	1	-	-	-	2	9+	1	7	-	1	4	8	9+	8	9	7	7	7	9+	9+	7	7	9	8	5*	5	9+	5*	3*	8	6*	4*	-	9	17
18	-	-	-	-	-	-	9+	-	4	-	-	2	5	9+	7	8	5	7	7	9+	9+	7	8	9	9	4*	9	9+	3*	-	8	5*	2*	8	9	18
19	-	-	-	-	-	-	9+	-	1	-	-	1	1	9+	7	8	6	6	5	9	9+	4	2*	9	8	2*	9+	9+	-	-	9	6*	2*	7	9+	19
20	-	-	-	-	-	-	9+	-	-	-	-	-	-	9+	8	8	7	7	4	9	9+	1*	4	9	9	2*	9+	9+	-	-	9	6	-	6	9+	20
21	-	-	-	-	-	-	9+	-	-	-	-	-	-	9+	6	8	8	7	4	9	9+	1*	8	9+	9	2*	9	9+	-	-	9	4*	-	9	9+	21
22	-	-	-	-	-	-	9+	1	-	1	1	-	-	9+	4	8	9	8	7	9	9+	-	8	9+	9	2*	9	9+	-	-	9	4*	-	9	9+	22
23	-	-	-	-	-	-	9+	5	-	5	4	2	-	9+	4	8	9+	9	8	9	9+	-	9	9+	9	5	9+	9+	-	4	9	2*	-	4	9+	23

Five contest bands, 24 hours, 7 areas around the world.

Summary Prediction Tables

- Seven general areas are covered:
  - EU = Europe
  - FE = Far East
  - SA = South America
  - AF = Africa
  - AS = south Asia
  - OC = Oceania
  - NA = North America

Summary Prediction Tables

- Seven general areas are covered:
    - EU = Europe
    - FE = Far East
    - SA = South America
    - AF = Africa
    - AS = south Asia
    - OC = Oceania
    - NA = North America
- The strongest signals in each area are displayed, including long-path signals (*).

Summary Prediction Tables

- Seven general areas are covered:
    - EU = Europe
    - FE = Far East
    - SA = South America
    - AF = Africa
    - AS = south Asia
    - OC = Oceania
    - NA = North America
- The strongest signals in each area are displayed, including long-path signals (*).
- Summary tables are useful for planning for all-band operations, such as DXpeditions.

Solar Activity in Prediction Tables

• Six levels of SSN (Smoothed Sunspot Number) or SF (Solar Flux):

- • VL = Very Low (SSN: 0 to 20)
- • LO = Low (SSN: 21 to 40)
- • ME = Medium (SSN: 41 to 60)
- • HI = High (SSN: 61 to 100)
- • VH = Very High (SSN: 101 to 150)
- • UH = Ultra High (SSN≥151)

New Detailed Prediction Tables

20 Meters: Oct., CA (San Francisco), for SSN = Low, Sigs in S-Units. By N6BV, ARRL.

UTC -->

Zone	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
KL7 = 01	9+	9+	9+	9+	9+	8	4	1	1	1	1	-	-	-	-	7	9+	9+	9+	9+	9+	9+	9+	9+
VO2 = 02	9	7	1	-	-	-	-	-	-	1*	-	1*	1*	-	9	9	9	9	7	9	9	9	9	9+
W6 = 03	5	6	7	8	8	8	8	8	8	8	8	8	8	8	7	7	6	6	6	5	5	5	6	5
W9 = 04	9+	9+	9+	9	5	4	2	5	7	6	1	1*	1*	7	9+	9+	9+	9+	9+	9+	9+	9	9+	9+
W3 = 05	9+	9	2	9	7	7	8	8	9	8	2	1	7	-	9	9+	9	9	9	9	9	9	9+	9+
XE1 = 06	9+	9+	9+	9+	9	9	9	9+	9+	9+	9+	9	8	9+	9+	9+	9+	9	9	9	9	9	9+	9+
TI = 07	9+	9+	9	4	1	1	1	5	7	6	1	-	-	9	9+	9	9	7	5	5	6	7	9	9+
VP2 = 08	9+	9	4	1	-	-	1	4	3	-	-	-	1	9	9	8	8	4	4	6	7	8	9	9+
P4 = 09	9+	9	6	2	1	1	2	6	6	1	-	-	1	9	9	9	8	4	4	4	6	7	9	9
HC = 10	9+	9+	9+	8	5	5	7	6	6	2	-	-	2	9	9	8	6	3	2	2	4	6	8	9
PY1 = 11	9	9	9	9	8	8	8	9	9	9	8	4	5	5	2	1	-	-	-	2	1	3	4	8
CE = 12	9	9	9	9	9	9	9	9	9	9	9	7	5	8	7	5	2	1	1	-	1	5	4	8
LU = 13	9	9	9	9	9	9	9	9	9	9	9	6	5	7	5	2	1	-	-	-	2	2	2	8
G = 14	2	2	2	1	-	1*	1*	-	-	-	-	-	-	-	5	7	8	8	7	7	8	6	2	4
I = 15	4	5	4	2	1*	1*	1	1	-	-	-	-	-	-	6	7	8	8	6	7	6	4	4	4
UA3 = 16	4	2	2	2	2	1*	-	-	-	-	-	-	-	-	1	7	8	7	6	5	4	4	2	1
UN = 17	2	7	8	7	5	1	-	-	-	-	-	-	-	-	1*	3	7	6	4	2	1	1	-	-
UA9 = 18	8	8	8	8	5	1	-	-	-	-	-	-	-	-	1*	1*	-	-	-	-	-	-	-	4
UA0 = 19	8	8	8	8	8	6	5	-	-	-	-	-	-	-	-	2	1	1	5	5	7	8	8	8
4X = 20	6	6	6	6	1	1*	2*	-	-	-	-	-	-	-	5	6	7	7	7	6	5	5	5	6
HZ = 21	5	5	6	7	2	2*	1*	-	-	-	-	1*	1*	-	4*	6	7	7	6	5	4	4	5	5
VU = 22	6	7	7	6	3	-	-	-	-	-	1*	1*	-	1*	1*	1*	7	7	7	3	3	2	1	1
JT = 23	8	8	8	7	7	4	-	-	-	-	-	1*	-	1*	-	1*	2	1	-	-	1	4	7	8
VR2 = 24	8	5	5	5	5	5	2	-	1*	-	1*	1	-	-	-	3	9	9	8	6	2	6	5	7
JA1 = 25	7	7	8	8	8	8	2	-	-	-	-	-	-	-	-	-	3	1	2	8	8	7	8	7
HS = 26	6	6	5	2	2	2	-	-	-	1*	1*	1*	1*	1*	-	-	8	8	8	6	1	-	2	6
DU = 27	4	3	3	3	4	5	4	1	1*	1	1	2	4	1	-	5	9	9	8	5	4	5	5	5
YB = 28	8	3	1	1	-	1	2	1	-	1	2	2	3	1	-	3	8	8	8	6	1	1	3	2
VK6 = 29	2*	2*	1*	1	1	2	4	4	4	5	7	8	8	7	4	8	8	8	6	3	2	1	-	1*
VK3 = 30	-	1	2	4	6	8	8	7	7	7	8	9	8	7	5	8	8	4	1	5	2	-	1*	-
KH6 = 31	9+	9+	9+	9+	9+	8	2	9+	9	9	9	9+	9+	9	8	-	9+	9+	9+	9	9	9	9	9
KH8 = 32	6	8	9	9	9	9	9	9	9	8	9	9	9	8	7	5	4	9	8	6	6	4	4	5
CN = 33	3	3	6	5	1	1*	1*	1	1	-	-	-	-	3	6	6	9	7	6	6	7	7	7	4
SU = 34	7	7	7	7	1	1*	2*	1*	-	-	-	-	-	-	2	6	7	7	6	6	6	5	6	7
6W = 35	8	9	9	7	4	4	4	5	5	1	-	-	-	4	3	2	3	4	4	5	6	7	8	9
D2 = 36	8	8	8	6	3	2	1	2	1	-	-	-	-	1	-	4*	8	4	4	5	5	5	7	8
5Z = 37	8	8	6	4	3*	2*	2*	1*	-	-	-	-	1*	1*	5	7*	6*	7	2	3	3	5	7	8
ZS6 = 38	8	8	8	4	2	3*	2*	1	1	-	-	-	2*	2*	2*	6*	6*	6*	4*	1	3	4	8	7
FR = 39	8	7	8	6	6*	5*	3*	1*	-	-	1*	3*	2*	2*	7*	7	7	7	7	5	5	6	7	8
FJL = 40	9	9	8	7	1	-	-	-	-	-	1*	-	-	1*	2	8	8	8	8	8	8	9	9	9
Zone	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23

UTC -->   * = Longpath

Expected signal levels using 1500 W and 12 dBi isotropic antennas.

Page for 20-meter band, 24 hours, 40 zones around the world.

Why Signal Strength Instead of SNR?

• *VOACAP* developers recommend use of SNR, but I show signal strength, in S-units.

Why Signal Strength Instead of SNR?

• *VOACAP* developers recommend use of SNR, but I show signal strength, in S-units.

• Especially on the lower bands, the SNR is determined largely by powerline type of noise and by thunderstorm activity.

Why Signal Strength Instead of SNR?

• *VOACAP* developers recommend use of SNR, but I show signal strength, in S-units.

• Especially on the lower bands, the SNR is determined largely by powerline type of noise and by thunderstorm activity.

• Assuming low powerline noise, there are those rare nights when there is no thunderstorm noise and an S5 signal on 80 meters sounds like it is S9!

Why Signal Strength Instead of SNR?

• *VOACAP* developers recommend use of SNR, but I show signal strength, in S-units.

• Especially on the lower bands, the SNR is determined largely by powerline type of noise and by thunderstorm activity.

• Assuming low powerline noise, there are those rare nights when there is no thunderstorm noise and an S5 signal on 80 meters sounds like it is S9!

• However, if thunderstorm QRN is S9, you know you can't hear an S5 signal.

New Detailed Prediction Tables

• One band per page, all 24 hours, all 40 zones around the world.

New Detailed Prediction Tables

• One band per page, all 24 hours, all 40 zones around the world.

• From a particular transmitting QTH you can determine when a band is open to various areas of the world.

New Detailed Prediction Tables

• One band per page, all 24 hours, all 40 zones around the world.

• From a particular transmitting QTH you can determine when a band is open to various areas of the world.

• So-called "WARC bands" (30, 17 and 12 meters) have been added to 160, 80, 40, 20, 15 and 10 meter bands found in earlier sets of tables.

New Detailed Prediction Tables

30 Meters: Oct., CA (San Francisco), for SSN = Low, Sigs in S-Units. By N6BV, ARRL.

Zone		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
KL7 =	01	9	9	9	9+	9+	9+	9	9	9	9	9	9	9	8	9	9+	9	9	9	8	8	8	8	9
VO2 =	02	8	8	8	7	5	4	4	4	3	-	-	-	3	8	8	6	5	3	2	3	5	6	7	8
W6 =	03	9	8	8	5	5	5	5	5	5	5	5	5	5	5	5	5	8	9	8	9	9	9	9	9
W9 =	04	9+	9+	9+	9+	9+	9	9+	9+	9+	9+	9	9	9	9+	9+	9	8	7	5	5	7	8	8	9
W3 =	05	9	9	9	6	4	5	5	5	6	4	9	9	2	9	8	8	7	5	4	4	5	7	8	8
XB1 =	06	9	9	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9	8	6	5	2	4	5	7	8
TI =	07	8	9	9	9	9	9	9	9	9	9	9	6	9	9	8	5	2	1	-	-	-	1	5	7
VP2 =	08	9	9	9	8	9	9	9	9	9	9	8	8	8	8	5	1	1	-	-	-	-	1	6	7
P4 =	09	8	9	9	9	9	9	9	9	9	9	8	8	8	8	6	2	1	-	-	-	-	2	6	7
HC =	10	8	8	9	9	9	9	9	9	9	8	5	4	8	8	5	2	-	-	-	-	-	-	2	7
PY1 =	11	5	7	7	7	8	8	7	8	7	6	5	5	1	-	-	-	-	-	-	-	-	-	1	2
CE =	12	5	7	8	8	8	8	8	9	9	8	8	8	6	5	1	-	-	-	-	-	-	-	-	2
LU =	13	5	7	7	8	8	8	8	8	8	7	7	7	5	1	-	-	-	-	-	-	-	-	-	2
G =	14	6	6	7	7	5	5	5	5	6	5	3	1	2	4	3	5	2	1	1	1	2	2	5	6
I =	15	6	7	7	6	5	5	7	7	6	5	2	1	2	2	2	4	4	1	1	-	1	2	4	5
UA3 =	16	5	5	5	5	6	6	6	5	4	4	3	2	2	5	6	5	4	4	2	2	3	4	5	5
UN =	17	4	2	3	3	1	2	2	1	1	2	3	4	4	4	6	7	7	5	4	2	1	1	2	3
UA9 =	18	4	7	5	5	4	4	4	2	2	3	4	3	3	4	6	6	5	4	2	1	1	1	2	2
UA0 =	19	3	3	4	5	6	7	7	7	7	8	8	8	8	7	7	8	8	7	6	4	3	2	1	2
4X =	20	6	6	6	6	5	5	4	3	2	1	1	1	1	2	2	5	2	1	1	1	-	1	3	5
HZ =	21	5	5	4	4	5	2	1	-	-	-	-	-	1	3	4	4	2	2	1	-	1	1	2	4
VU =	22	2	2	2	1	1	-	-	-	-	-	1	4	4	5	5	5	6	3	2	1	-	1	1	2
JT =	23	2	3	4	4	3	3	4	4	4	5	5	5	5	5	6	8	7	6	5	3	2	2	2	2
VR2 =	24	-	-	-	-	-	1	2	4	5	6	8	8	8	8	7	8	8	7	5	4	2	1	-	1
JA1 =	25	1	1	2	3	5	6	7	6	7	7	7	8	8	6	5	8	8	7	6	5	2	1	-	1
HS =	26	-	-	-	-	-	-	-	-	2	3	5	6	6	6	6	7	6	5	4	2	1	-	-	-
DU =	27	-	-	-	-	-	-	2	5	6	7	8	8	8	8	8	8	7	5	3	1	-	-	-	-
YB =	28	1*	-	-	-	-	-	-	-	3	5	7	8	8	7	7	6	5	3	1	-	-	-	-	-
VK6 =	29	-	-	-	-	-	-	-	1	4	6	7	8	8	8	8	7	6	2	1	-	-	-	-	-
VK3 =	30	-	-	-	-	-	2	4	7	8	8	8	9	9	8	8	7	6	3	1	-	-	-	-	-
KH6 =	31	7	8	9	9	9+	9+	9	8	7	7	8	9	9	7	5	9	9	9	8	6	3	2	2	3
KH8 =	32	-	1	3	6	8	8	9	9	9	9	9	9	8	8	7	7	5	2	-	-	-	-	-	-
CN =	33	6	7	8	8	8	7	5	7	7	6	3	1	1	1	1	-	-	-	1	1	1	1	2	6
SU =	34	7	6	6	6	6	5	5	3	2	1	1	-	1	2	1	6	1	2	1	-	-	1	3	5
6W =	35	7	8	8	8	8	8	8	8	8	7	5	2	1	-	-	-	-	-	-	-	-	1	4	6
D2 =	36	5	6	6	7	7	6	5	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3
5Z =	37	4	5	4	5	5	3	1	-	-	-	-	-	-	1*	2*	6	1*	1	1	-	-	-	1	2
ZS6 =	38	5	6	6	7	7	5	3	1	-	-	-	-	-	-	1*	1*	2*	-	-	-	-	-	-	2
FR =	39	5	3	2	1	1	-	-	-	-	-	-	-	2	2	2	3	1	-	-	-	-	-	1	1
FJL =	40	6	6	5	6	7	5	3	2	2	2	2	1	1	2	7	7	6	6	5	5	2	5	4	5
Zone		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23

UTC -->   * = Longpath

Expected signal levels using 1500 W and 6 dBi isotropic antennas.

Example of new 30-meter table

New Prediction Tables

• The antennas used in *VOACAP* to predict signal levels are isotropics, with gain. They emulate the antennas used in older tables (100' dipoles for 80/40, 3L20 @100', 4L15, 4L10 @60').

New Prediction Tables

• The antennas used in *VOACAP* to predict signal levels are isotropics, with gain. They emulate the antennas used in older tables (100' dipoles for 80/40, 3L20 @100', 4L15, 4L10 @60').

• These antennas cover all the way down to 1° elevation, simulating a mountain-top location.

New Prediction Tables

• The antennas used in *VOACAP* to predict signal levels are isotropics, with gain. They emulate the antennas used in older tables (100' dipoles for 80/40, 3L20 @100', 4L15, 4L10 @60').

• These antennas cover all the way down to 1° elevation, simulating a mountain-top location.

• The long-path algorithm has been improved compared to the older tables, allowing many weak long-path signals to show.

New Prediction Tables

• Some have questioned why I chose "superstations" on mountain tops, with 1500 W of transmit power.

New Prediction Tables

• Some have questioned why I chose "superstations" on mountain tops, with 1500 W of transmit power.

• They ask, "What about us little guns with 100 W and a dipole up 30 feet?"

New Prediction Tables

• Some have questioned why I chose "superstations" on mountain tops, with 1500 W of transmit power.

• They ask, "What about us little guns with 100 W and a dipole up 30 feet?"

• If I did tailor the predictions specifically for the little gun, many of the weaker signals shown in the tables would simply disappear.

New Prediction Tables

• Some have questioned why I chose "superstations" on mountain tops, with 1500 W of transmit power.

• They ask, "What about us little guns with 100 W and a dipole up 30 feet?"

• If I did tailor the predictions specifically for the little gun, many of the weaker signals shown in the tables would simply disappear.

• And with nothing showing, you wouldn't have any idea that propagation is even possible.

Rules for Little-Gun Predictions

1. Subtract 2 S units for a dipole at 100 feet instead of a Yagi (for 20 meters and above)

Rules for Little-Gun Predictions

1. Subtract 2 S units for a dipole at 100 feet instead of a Yagi (for 20 meters and above)

2. Subtract 3 S units for a dipole at 50 feet instead of a Yagi at 100 feet (for 20 meters and above)

Rules for Little-Gun Predictions

1. Subtract 2 S units for a dipole at 100 feet instead of a Yagi (for 20 meters and above)

2. Subtract 3 S units for a dipole at 50 feet instead of a Yagi at 100 feet (for 20 meters and above)

3. Subtract 1 S unit for a dipole at 50 feet rather than a dipole at 100 feet (160 to 30 meters)

Rules for Little-Gun Predictions

1. Subtract 2 S units for a dipole at 100 feet instead of a Yagi (for 20 meters and above)

2. Subtract 3 S units for a dipole at 50 feet instead of a Yagi at 100 feet (for 20 meters and above)

3. Subtract 1 S unit for a dipole at 50 feet rather than a dipole at 100 feet (160 to 30 meters)

4. Subtract 3 S units for 100 W rather than 1500 W (all bands)

Rules for Little-Gun Predictions

1. Subtract 2 S units for a dipole at 100 feet instead of a Yagi (for 20 meters and above)

2. Subtract 3 S units for a dipole at 50 feet instead of a Yagi at 100 feet (for 20 meters and above)

3. Subtract 1 S unit for a dipole at 50 feet rather than a dipole at 100 feet (160 to 30 meters)

4. Subtract 3 S units for 100 W rather than 1500 W (all bands)

5. Subtract 6 S units for 5 W rather than 1500 W (all bands).

Rules for Little-Gun Predictions

1. Subtract 2 S units for a dipole at 100 feet instead of a Yagi (for 20 meters and above)

2. Subtract 3 S units for a dipole at 50 feet instead of a Yagi at 100 feet (for 20 meters and above)

3. Subtract 1 S unit for a dipole at 50 feet rather than a dipole at 100 feet (160 to 30 meters)

4. Subtract 3 S units for 100 W rather than 1500 W (all bands)

5. Subtract 6 S units for 5 W rather than 1500 W (all bands).

6. These are for both ends of a circuit, RX and TX.

Example, 20 Meters, W6 to Zone 15

20 Meters: Oct., CA (San Francisco), for SSN = Low, Sigs in S-Units. By N6BV, ARRL.

Zone		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
KL7 =	01	9+	9+	9+	9+	9+	8	4	1	1	1	1	-	-	-	-	7	9+	9+	9+	9+	9+	9+	9+	9+
VO2 =	02	9	7	1	-	-	-	-	-	-	1*	-	1*	1*	-	9	9	9	9	7	9	9	9	9	9+
W6 =	03	5	6	7	8	8	8	8	8	8	8	8	8	8	8	7	7	6	6	6	5	5	5	6	5
W9 =	04	9+	9+	9+	9	5	4	2	5	7	6	1	1*	1*	7	9+	9+	9+	9+	9+	9+	9+	9	9+	9+
W3 =	05	9+	9	2	9	7	7	8	8	9	8	2	1	7	-	9	9+	9	9	9	9	9	9	9+	9+
XE1 =	06	9+	9+	9+	9+	9	9	9	9+	9+	9+	9+	9	8	9+	9+	9+	9+	9	9	9	9	9	9+	9+
TI =	07	9+	9+	9	4	1	1	1	5	7	6	1	-	-	9	9+	9	9	7	5	5	6	7	9	9+
VP2 =	08	9+	9	4	1	-	-	1	4	3	-	-	-	1	9	9	8	8	4	4	6	7	8	9	9+
P4 =	09	9+	9	6	2	1	1	2	6	6	1	-	-	1	9	9	9	8	4	4	4	6	7	9	9
HC =	10	9+	9+	9+	8	5	5	7	6	6	2	-	-	2	9	9	8	6	3	2	2	4	6	8	9
PY1 =	11	9	9	9	9	8	8	8	9	9	9	8	4	5	5	2	1	-	-	-	2	1	3	4	8
CE =	12	9	9	9	9	9	9	9	9	9	9	9	7	5	8	7	5	2	1	1	-	1	5	4	8
LU =	13	9	9	9	9	9	-	9	9	9	9	9	6	5	7	5	2	1	-	-	-	2	2	2	8
G =	14	2	2	2	2	1	-	1*	1*	-	-	-	-	-	-	5	7	8	8	7	7	8	6	2	4
I =	15	4	5	4	2	1*	1*	1	1	-	-	-	-	-	-	6	7	8	8	6	7	6	4	4	4
UA3 =	16	4	2	2	2	2	1*	-	-	-	-	-	-	-	-	1	8	8	7	6	5	4	4	2	1
UN =	17	2	7	8	7	5	1	-	-	-	-	-	-	-	-	1*	3	7	6	4	2	1	1	-	-
UA9 =	18	8	8	8	8	5	1	-	-	-	-	-	-	-	-	1*	1*	-	-	-	-	-	-	-	4
UA0 =	19	8	8	8	8	8	6	5	-	-	-	-	-	-	-	-	2	1	1	5	5	7	8	8	8
4X =	20	6	6	6	6	1	1*	2*	-	-	-	-	-	-	-	5	6	7	7	7	6	5	5	5	6
HZ =	21	5	5	6	7	2	2*	1*	-	-	-	-	1*	1*	-	4*	6	7	7	6	5	4	4	5	5
VU =	22	6	7	7	6	3	-	-	-	-	-	1*	1*	-	1*	1*	1*	7	7	7	3	3	2	1	1
JT =	23	8	8	8	7	7	4	-	-	-	-	-	1*	-	1*	-	1*	2	1	-	-	1	4	7	8
VR2 =	24	8	5	5	5	5	5	2	-	1*	-	1*	1	-	-	-	3	9	9	8	6	2	6	5	7
JA1 =	25	7	7	8	8	8	8	2	-	-	-	-	-	-	-	-	-	3	1	2	8	8	7	8	7
HS =	26	6	6	5	2	2	2	-	-	-	1*	1*	1*	1*	1*	-	-	8	8	8	6	1	-	2	6
DU =	27	4	3	3	3	4	5	4	1	1*	1	1	2	4	1	-	5	9	9	8	5	4	5	5	5
YB =	28	8	3	1	1	-	1	2	1	-	1	2	2	3	1	-	3	8	8	8	6	1	1	3	2
VK6 =	29	2*	2*	1*	1	1	2	4	4	4	5	7	8	8	7	4	8	8	8	6	3	2	1	-	1*
VK3 =	30	-	1	2	4	6	8	8	7	7	7	8	9	8	7	5	8	8	4	1	5	2	-	1*	-
KH6 =	31	9+	9+	9+	9+	9+	8	2	9+	9	9	9	9+	9+	9	8	-	9+	9+	9+	9	9	9	9	9
KH8 =	32	6	8	9	9	9	9	9	9	9	8	9	9	9	8	7	5	4	9	8	6	6	4	4	5
CN =	33	3	3	6	5	1	1*	1*	1	1	-	-	-	-	3	6	6	9	7	6	6	7	7	7	4
SU =	34	7	7	7	7	1	1*	2*	1*	-	-	-	-	-	-	2	6	7	7	6	6	6	5	6	7
6W =	35	8	9	9	7	4	4	4	5	5	1	-	-	-	4	3	2	3	4	4	5	6	7	8	9
D2 =	36	8	8	8	6	3	2	1	2	1	-	-	-	-	1	-	4*	8	4	4	5	5	5	7	8
5Z =	37	8	8	6	4	3*	2*	2*	1*	-	-	-	-	1*	1*	5	7*	6*	7	2	3	3	5	7	8
ZS6 =	38	8	8	8	4	2	3*	2*	1	1	-	-	-	2*	2*	2*	6*	6*	6*	4*	1	3	4	8	7
FR =	39	8	7	8	6	6*	5*	3*	1*	-	-	1*	3*	2*	2*	7*	7	7	7	7	5	5	6	7	8
FJL =	40	9	9	8	7	1	-	-	-	-	-	-	1*	-	-	1*	2	8	8	8	8	8	8	9	9
Zone		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23

UTC -->   * = Longpath

Expected signal levels using 1500 W and 12 dBi isotropic antennas.

20 meters into Zone 15 at 15 UTC October, W6.

Example, 20 Meters, W6 to Zone 15

• W6, San Francisco, on 20 meters for Low SSN level, month of October, to Italy, Zone 15, 15 UTC.

Example, 20 Meters, W6 to Zone 15

• W6, San Francisco, on 20 meters for Low SSN level, month of October, to Italy, Zone 15, 15 UTC.

• From the table, signal for "big-gun" station is S7.

Example, 20 Meters, W6 to Zone 15

• W6, San Francisco, on 20 meters for Low SSN level, month of October, to Italy, Zone 15, 15 UTC.

• From the table, signal for "big-gun" station is S7.

• Now, assume a smaller 20-meter station: a dipole @50 feet, 100 W instead of 3L20 @100', 1500 W.

S7 – 3 (dipole 50') – 3 (100 W) = S1. This won't make you stand out in a pileup…

55

Example, 20 Meters, W6 to Zone 15

- Another example, this time for 3L20 @100', 5 W:

  S7 − 6 = S1, showing that QRP is challenging! But you knew that already.

Planning for a DXpedition

Hello, test… is this brain working?

Planning for Contesting and DXing

- Solar Cycle 24 is finally ramping up. Hooray!

Planning for Contesting and DXing

- Solar Cycle 24 is finally ramping up. Hooray!

- Are you the hunter or are you the hunted?

Planning for Contesting and DXing

• Solar Cycle 24 is finally ramping up. Hooray!

• Are you the hunter or are you the hunted?

• For both hunter and hunted, how do we use propagation predictions to plan for *where* to be and *when* to be there?

Planning for Contesting and DXing

• Solar Cycle 24 is finally ramping up. Hooray!

• Are you the hunter or are you the hunted?

• For both hunter and hunted, how do we use propagation predictions to plan for *where* to be and *when* to be there?

• I'm going to use last year's Glorioso DXpedition as an example.

Running "Rate"

• Effective running into Europe takes a signal level of at least S8 from most DX locations.

Running "Rate"

• Effective running into Europe takes a signal level of at least S8 from most DX locations.

• Why? Because European pileups quickly degenerate into chaos when they can't easily hear the DX station above all the Europeans calling (and calling, and calling…).

Running "Rate"

• Effective running into Europe takes a signal level of at least S8 from most DX locations.

• Why? Because European pileups quickly degenerate into chaos when they can't easily hear the DX station above all the Europeans calling (and calling, and calling…).

• "Packet pileups" on CW can really slow the rate down — everybody's on *exactly* the same frequency (except for the smart ones, who tune off several hundred Hz and then call).

Running "Rate"

• Operating split-frequency may work, provided that the tuner-uppers and the traffic cops don't hamper operations…

Band Planning Strategies

• The three main geographic areas with the largest ham populations are the USA, Europe and Japan.

Band Planning Strategies

• The three main geographic areas with the largest ham populations are the USA, Europe and Japan.

• First, determine which paths are going to be most difficult. This usually involves distance and whether the signal has to cross polar auroral regions.

FT5GA to W6

DX Atlas
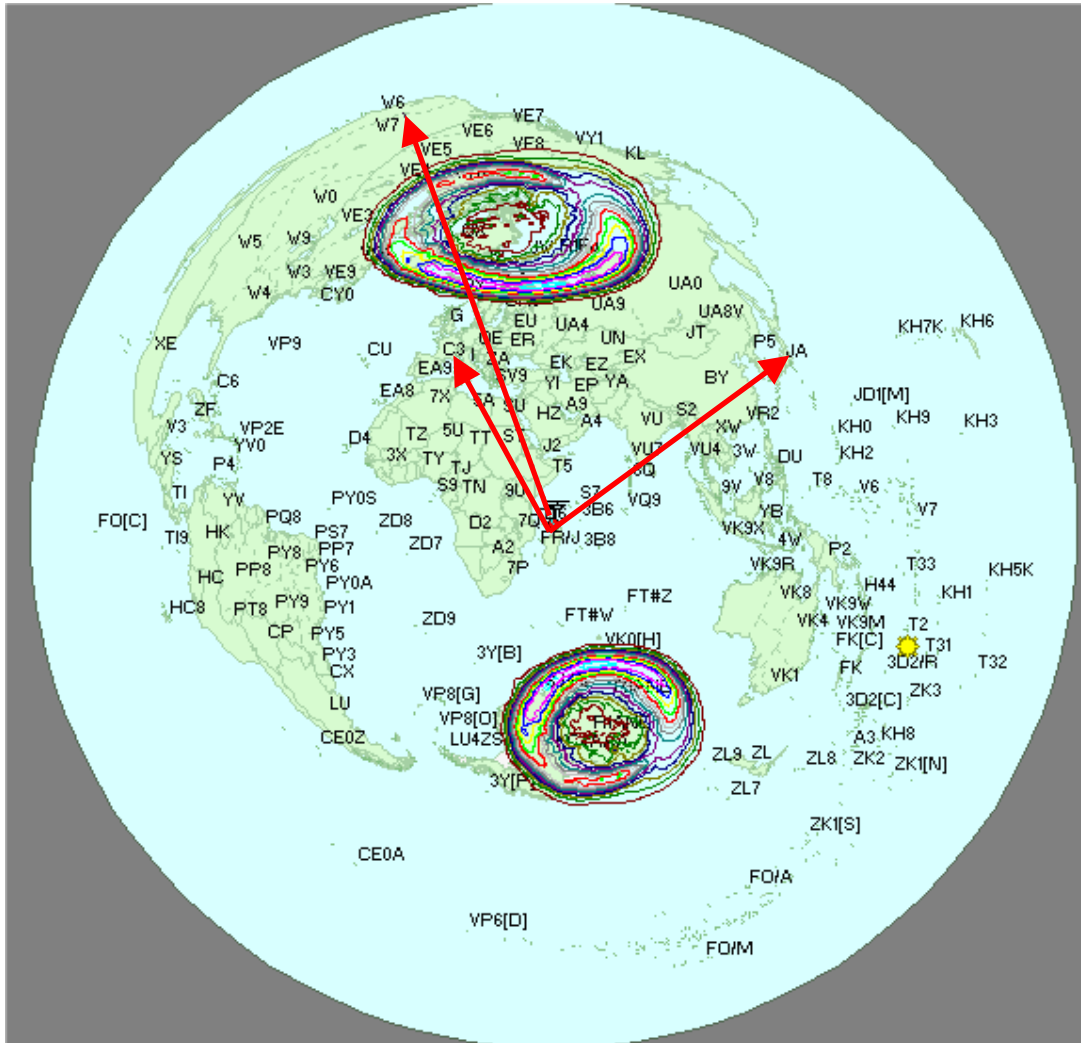
Paths to W6 crosses the auroral ovals for both short and long paths to W6.

Paths to Europe and Japan are shorter and easier paths.

Paths to Europe and USA about the same azimuth… Pileup city from Europe.

FT5GA to W6

• The path from Glorioso to California is challenging in the best of times, and even worse at sunspot minimum.

FT5GA to W6

• The path from Glorioso to California is challenging in the best of times, and even worse at sunspot minimum.

• The choice of operating times and frequencies is important to make W6 QSOs.

FT5GA to W6

• The path from Glorioso to California is challenging in the best of times, and even worse at sunspot minimum.

• The choice of operating times and frequencies is important to make W6 QSOs.

• The DXpedition operator must forcefully ask other areas to stand by, so he/she can work the small window of opportunity to W6 (or any other selected area of the world).

Worldwide Band Planning Strategies

Sep., Glorioso, for SSN = Very Low, Sigs in S-Units. By N6BV, ARRL.

UTC	80 EU	FE	SA	AF	AS	OC	NA	40 EU	FE	SA	AF	AS	OC	NA	20 EU	FE	SA	AF	AS	OC	NA	15 EU	FE	SA	AF	AS	OC	NA	10 EU	FE	SA	AF	AS	OC	NA	UTC
0	8	6	8	8	9	3	6	8	8	8	7	9	6	7	7	2	3	8	4	-	9	-	-	-	-	-	-	2	-	-	-	-	-	-	-	0
1	8	2	8	9	9+	-	6	8	7	8	8	9	4	7	6	3	-	8	2	2	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
2	5	-	8	9	8	-	5	8	4	8	9	9	2	7	4	9	2*	5	8	7	6	-	6	1*	-	2	5	-	-	-	-	-	-	-	-	2
3	2	-	3	9	5	-	1	7	-	8	9	8	-	7	8	9	2*	6	9+	8	7	-	9	5*	-	8	9	5*	-	-	-	-	-	-	-	3
4	-	-	2	7	1	-	-	5	-	7	9	6	-	4	9	8	7	8	9+	8	7	-	9	5*	2*	9+	8	-	-	7	-	-	1	6	-	4
5	-	-	-	9	-	-	-	1	-	5	8	2	-	2	9	6	8	-	9	8	6	3	9	3	7	8	8*	-	-	7	-	-	2	8	-	5
6	-	-	-	5	-	-	-	-	-	2	9	-	-	-	8	6	7	1	9	6	5	9	9	6	8	9	7	-	-	8	-	4	1	6	-	6
7	-	-	-	1	-	-	-	-	-	-	9	-	-	-	5	6	5	9	6	6	3	9	9	1	9	9	9	-	-	9	-	8	1	1*	-	7
8	-	-	-	-	-	-	-	-	-	-	8	-	-	-	2	6	6	9	7	7	-	8	9	-	9	9	9	-	-	9	-	8	2	4	-	8
9	-	-	-	-	-	-	-	-	-	-	6	-	-	-	2	8	3	8	7	7	-	8	9	8	-	9	9	-	-	9	-	8	2	8	-	9
10	-	-	-	-	-	-	-	-	-	-	7	-	-	-	2	8	4	7	8	8	1	8	9	8	9	9	9	-	1	9	-	8	3	5	-	10
11	-	-	-	2	-	-	-	-	-	-	9	-	1	-	4	9	3	8	9	8	1	9	9	8	-	9+	9	-	1	9	2	8	7	7	-	11
12	-	-	-	8	-	-	-	-	4	-	2	4	5	-	6	9+	4	9	9+	9	2	9	9+	9	9	9+	9	1	3	8	2*	9	8	6	-	12
13	-	1	-	1	2	2	-	1	7	-	4	8	7	-	8	9+	8	9	9+	9	8	9+	9+	8	9+	9+	9	4	5	9	4*	9	9	4	-	13
14	-	4	-	1	5	6	-	4	9	-	7	9	8	2	9	9+	5	9+	9+	9	6	9+	9+	8	9+	9+	9	6	6	8	4*	9	7	1	-	14
15	1	8	-	5	7	8	-	5	9	-	8	9	9	5	9	9+	5	9+	9+	9	6*	9+	9+	8	9+	9+	9	6	7	6	8	9	5	-	-	15
16	4	9	-	7	8	9	-	7	9	-	9	9	9	6	9	9+	6	9+	9+	9	6	9	9+	8	9+	9	8	5	8	1	8	9	-	-	1	16
17	4	9	-	9	9	9	-	8	9	-	9	9	9	6	9	9+	8	9+	9+	9	6	9	9	8	9+	5	5	6	8	-	8	9	-	-	2	17
18	6	9	-	9	9	9	-	8	9	4	9	9+	9	3	9	9	8	9+	9+	9	8	9	2	8	9+	-	5*	6	2	-	8	8	-	1*	4	18
19	8	9	-	9	9	9	-	9	9	7	7	9+	9	3	9	9	8	9+	9+	9	8	8	-	9	-	-	8	7	-	-	8	8	-	1	6	19
20	8	9	2	9	9	9	-	9	9	7	8	9+	9	5	9	7	8	9+	9+	7	9	3	-	9	9	-	5	7	-	-	6	7	-	1*	7	20
21	8	9	4	9	9	9	1	9	9	8	9	9+	9	6	9	7	9	9+	6	5	9	-	-	7	7	-	5*	8	-	-	-	-	-	-	1	21
22	8	9	5	9	9	9	2	9	9	8	9	9+	9	7	8	9	8	9	4	6	9	-	1	-	-	-	-	2	-	-	-	-	-	-	-	22
23	8	8	9	9	9+	7	5	9	8	9	9	9+	8	7	8	8	1	7	8	4	8	-	-	-	-	-	-	2	-	-	-	-	-	-	-	23

XE1, not W6

The DXpedition's "big picture" first: Start at the highest frequency band.

W6 10-Meter Planning Strategies

10 Meters: Sep., Glorioso, for SSN = Very Low, Sigs in S-Units. By N6BV, ARRL.

UTC -->

Zone	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
KL7 = 01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VO2 = 02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W6 = 03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W9 = 04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W3 = 05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-
XE1 = 06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	4	6	7	-	-	-
TI = 07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	5	5	2	1	-	-	-	-
VP2 = 08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	8	8	8	8	8	6	-	-	-
P4 = 09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	6	7	6	5	4	1	-	-	-
HC = 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-
PY1 = 11	-	-	-	-	-	-	-	-	-	-	-	2	2*	4*	4*	4*	2*	1*	-	-	-	-	-	-
CE = 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2*	5*	5*	4*	1*	-	-	-	-	-
LU = 13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2*	5*	5*	2*	1*	-	-	-	-	-
G = 14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	3	2	-	-	-	-	-
I = 15	-	-	-	-	-	-	-	-	-	-	-	1	3	5	6	7	8	8	1	-	-	-	-	-
UA3 = 16	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-
UN = 17	-	-	-	-	1	2	-	-	-	-	-	1	4	-	5	-	-	-	-	-	-	-	-	-
UA9 = 18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
UA0 = 19	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-
4X = 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HZ = 21	-	-	-	-	-	-	-	-	-	-	1	7	8	9	-	-	-	-	-	-	-	-	-	-
VU = 22	-	-	-	-	-	-	-	-	-	-	-	1	2	5	7	5	-	-	-	-	-	-	-	-
JT = 23	-	-	-	-	1	1	1	1	2	2	3	3	2	-	1	-	-	-	-	-	-	-	-	-
VR2 = 24	-	-	-	-	-	-	1	6	8	7	8	9	8	6	-	-	-	-	-	-	-	-	-	-
JA1 = 25	-	-	-	-	7	7	8	8	8	8	7	5	-	-	-	-	-	-	-	-	-	-	-	-
HS = 26	-	-	-	-	-	-	-	-	-	-	-	4	7	9	8	6	1	-	-	-	-	-	-	-
DU = 27	-	-	-	-	-	-	-	-	4	8	5	7	6	4	1	-	-	-	-	-	-	-	-	-
YB = 28	-	-	-	-	2	6	8	9	9	9	9	4	2*	3*	-	-	-	-	-	-	-	-	-	-
VK6 = 29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VK3 = 30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KH6 = 31	-	-	-	-	6	8	6	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
KH8 = 32	-	-	-	-	-	-	3*	1*	1*	-	-	-	-	-	-	-	-	-	1*	1*	1*	-	-	-
CN = 33	-	-	-	-	-	-	-	-	-	-	3	8	9	9	9	9	9	9	8	1	-	-	-	-
SU = 34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6W = 35	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	3	5	8	8	7	-	-	-
D2 = 36	-	-	-	-	-	-	4	8	8	8	8	8	8	9	9	9	9	8	6	1	1	-	-	-
5Z = 37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
ZS6 = 38	-	-	-	-	-	-	-	-	-	-	-	1*	1*	1*	1*	2*	-	-	-	-	-	-	-	-
FR = 39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FJL = 40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zone	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23

UTC -->   * = Longpath

Expected signal levels using 1500 W and 14 dBi isotropic antennas.

No chance for W6 on 10 meters.

W6 15-Meter Planning Strategies

15 Meters: Sep., Glorioso, for SSN = Very Low, Sigs in S-Units. By N6BV, ARRL.

Zone		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
KL7 =	01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VO2 =	02	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	5	6	6	4	-	-
W6 =	03	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1*	-	-	1	-	-	-	-	2
W9 =	04	2	-	-	-	-	-	-	-	-	-	-	-	-	1	3	4	3	2	5	5	5	6	2	-
W3 =	05	1	-	-	-	-	-	-	-	-	-	-	-	1	4	5	5	5	5	6	6	7	8	1	-
XE1 =	06	-	-	-	5*	-	-	-	-	-	-	-	-	-	4	6	6	5	6	6	7	6	7	-	-
TI =	07	-	-	1*	1*	-	2	2	1	-	-	-	-	5	7	7*	5	6	6	7	7	7	4	-	-
VP2 =	08	-	-	-	-	-	2	-	-	-	-	5	6	7	5*	4	5	7	8	8	9	9	7	-	-
P4 =	09	-	-	-	-	-	3	1	-	-	-	1	6	6	4	5	7	6	7	8	8	8	5	-	-
HC =	10	-	-	1*	5*	4*	2	6	-	-	-	-	6	8	7	6	8	7	7	6	2	2	-	-	-
PY1 =	11	-	-	1*	4*	1*	1*	-	-	-	8	8	8	9	8	8	8	8	6	3*	4*	1*	-	-	-
CE =	12	-	-	1*	5*	5*	3*	-	-	-	-	-	1	6	6	7	6	5	3*	2*	2*	1*	-	-	-
LU =	13	-	-	1*	5*	2*	-	-	-	-	-	-	5	7	7	8	8	7	6	2*	2*	1*	-	-	-
G =	14	-	-	-	-	-	-	1	5	6	7	7	8	8	8	8	8	8	9	8	8	3	-	-	-
I =	15	-	-	-	-	-	-	9	9	8	8	8	9	9	9+	9+	9+	9	9	9	1	-	-	-	-
UA3 =	16	-	-	-	-	-	3	5	6	6	8	8	7	8	7	7	7	6	7	6	1	-	-	-	-
UN =	17	-	-	-	5	9	8	9	9	8	9	9	9	9+	9+	9	7	-	-	-	-	-	-	-	-
UA9 =	18	-	-	-	4	9	8	8	8	8	8	8	8	8	8	8	6	5	2	-	-	-	-	-	-
UA0 =	19	-	-	5	9	8	8	8	8	8	8	8	8	8	7	5	4	2	-	-	-	-	-	1	-
4X =	20	-	-	-	-	-	9	4	-	-	5	3	6	8	9+	9+	9+	9+	9+	9	7	1	-	-	-
HZ =	21	-	-	-	-	1	2	2*	8	9	7	7	1	5	8	9+	9+	9	5	-	-	-	-	-	-
VU =	22	-	-	-	5	9+	5	2	2	9	9	9	9+	9+	9+	9+	9+	9	-	-	-	-	-	-	-
JT =	23	-	-	2	8	9	8	9	9	8	9	8	9	9	9	8	5	3	1	-	-	-	-	-	-
VR2 =	24	-	-	4	9	8	8	9	9	8	8	9	9	9	9	9	5	1	2	-	-	-	-	-	-
JA1 =	25	-	-	6	8	8	7	7	8	8	8	8	9	8	4	2	1	-	1	1	-	-	-	-	-
HS =	26	-	-	2	9	9	5	4	5	6	9	9	9	9+	9+	9+	9+	9+	9	2	-	-	-	-	-
DU =	27	-	-	5	9	7	6	7	9	9	9	9	9	9	9	9	9	8	5	1	-	-	-	-	-
YB =	28	-	-	1	9	9	9	8	8	9	9	9	9	9+	8	6*	2*	-	-	-	-	-	-	-	-
VK6 =	29	-	-	-	-	8	6	5	4	5	6	5	1	-	-	-	-	-	-	-	-	-	-	-	-
VK3 =	30	-	-	-	1	2	4	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1*	-	-
KH6 =	31	-	-	2	6	6	6	7	6	-	-	-	-	-	-	-	-	-	4*	1	8	5	-	-	-
KH8 =	32	-	-	-	1	6	8*	6*	5*	3*	2*	1*	-	-	-	-	-	-	2*	5*	5*	5*	5*	-	-
CN =	33	-	-	-	-	-	-	6	8	7	7	6	8	9	9	9	9	9	9	9+	9	9	5	-	-
SU =	34	-	-	-	-	-	7	4	-	-	-	5	6	8	9+	9+	9+	9+	9+	9+	8	4	-	-	-
6W =	35	-	-	-	-	-	-	-	4	8	8	6	5	6	8	8	9	9	9	9	9	9	7	-	-
D2 =	36	-	-	-	-	-	-	-	1	1	-	-	-	2	3	4	4	3	2	-	-	9+	-	-	-
5Z =	37	-	-	-	-	-	4*	8	9	9	9+	9	9+	9	9	9	8	9	9	9+	9+	9	-	-	-
ZS6 =	38	-	-	-	-	-	6	9+	9+	9+	9+	9	9	9+	9+	9	8	9	7	1	-	-	-	-	-
FR =	39	-	-	-	-	2*	-	1	1	2	1	-	2	1*	1*	-	2	1	-	-	-	-	-	-	-
FJL =	40	-	-	-	-	-	-	1	4	4	4	5	4	4	1	-	2	1	-	-	-	-	-	-	-
Zone		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23

UTC -->   * = Longpath

Expected signal levels using 1500 W and 14 dBi isotropic antennas.

Only a small chance for W6 at 23 UTC

W6 17-Meter Planning Strategies

17 Meters: Sep., Glorioso, for SSN = Very Low, Sigs in S-Units. By N6BV, ARRL.

UTC -->

Zone		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
KL7 =	01	-	-	2	3	2	4*	-	-	-	-	-	-	-	-	-	-	2*	-	-	-	-	-	-	4
VO2 =	02	-	-	-	-	-	-	-	-	-	-	-	3	6	6	7	7	7	7	8	8	8	8	3	-
W6 =	03	4	-	-	-	5*	4*	-	-	-	-	-	-	-	-	-	5*	1	3	5	1	2	2	4	5
W9 =	04	6	3	-	-	-	-	-	-	-	-	-	-	2	6	5	6	6	6	7	7	7	8	8	4
W3 =	05	5	1	-	-	-	-	-	-	-	-	-	2	6	5	6	6	7	7	7	8	8	9	7	1
XE1 =	06	-	-	1*	5*	2	1	1	1	-	-	-	-	4	3	5*	5*	4	6	6	7	6	8	-	-
TI =	07	-	-	1*	4*	-	6	6	3	-	-	-	3	1	3	6*	5	5	5	5	5	8	8	-	-
VP2 =	08	-	-	1*	-	-	7	1	-	-	-	4	4	5	5	6	5	7	8	8	9	9	9	-	-
P4 =	09	-	-	1*	-	-	7	4	-	-	-	5	4	5	5	5	6	6	7	8	8	9	8	-	-
HC =	10	-	-	1*	4*	4*	9	7	-	-	-	-	4	3	5	6*	6	6	6	7	7	7	4	-	-
PY1 =	11	-	-	1*	2*	2*	1*	1*	-	2	8	7	8	7	7	8	8	9	9	6	2*	2*	-	-	-
CE =	12	-	-	2*	5*	5*	3*	1*	-	-	-	1	6	6	5	6	7	6	4	1*	2*	1*	1*	-	-
LU =	13	-	-	2*	4*	3*	3*	1*	-	-	2	5	6	6	6	8	8	8	8	5	1*	1*	-	-	-
G =	14	-	1	-	-	-	-	7	8	7	7	7	8	8	8	9	9	9	9	9	9	8	4	1	-
I =	15	-	-	-	-	-	8	8	8	6	7	8	8	9	9	9+	9	9+	9	8	7	1	-	-	-
UA3 =	16	1	-	-	2	5	8	8	8	7	7	8	8	8	9	9	9	8	9	8	7	4	2	2	2
UN =	17	-	-	1	-	9	8	9	8	8	8	9	9	9+	9+	9+	5	1	-	-	-	-	-	-	-
UA9 =	18	-	-	4	9	9	8	7	8	8	8	8	8	9	9	9	9	8	7	5	3	1	-	-	-
UA0 =	19	-	-	7	8	8	7	7	8	5	6	8	9	9	9	9	8	8	6	5	1	-	1	5	4
4X =	20	-	-	-	-	-	9	9	9	6	5	9	9	9	9+	9+	9+	9+	9+	9+	9+	8	2	-	1
HZ =	21	-	-	-	-	-	9+	9	7	9	9	6	9	7	9	9+	9+	9+	9+	9+	8	6	2	-	-
VU =	22	-	-	2	9+	9+	8	7	6	9	9	9	9+	9+	9+	9+	9+	9+	9	5	1	-	-	-	-
JT =	23	-	-	6	9	8	7	6	9	7	8	8	9	9	9	9	8	8	6	5	4	1	-	-	2
VR2 =	24	-	-	8	9	9	9	8	8	6	7	8	9	9	9	9	9	8	8	7	4	-	-	-	-
JA1 =	25	-	1	8	7	6	7	7	4	5	6	7	9	9	8	7	6	5	6	7	4	-	-	2	2
HS =	26	-	-	6	9	9	8	8	8	8	8	9	9+	9+	9+	9+	9+	9+	9+	9	1	-	-	-	-
DU =	27	-	-	8	9	8	7	9	8	8	8	9	9	9	9	9	9+	9	9	8	4	-	-	-	-
YB =	28	-	-	5	9	9	8	8	8	9	9	9	9+	9+	9+	9	7	2	-	-	-	-	-	-	-
VK6 =	29	-	-	2	5	8	8	7	8	7	8	8	8	4	1	-	-	-	-	-	-	-	-	1*	-
VK3 =	30	-	-	1	8	8	8	8	7	6	5	1	-	-	-	-	-	-	-	-	-	-	2*	-	-
KH6 =	31	-	-	5	5	5	7*	5*	5	1	-	-	-	-	-	-	-	3*	2*	6	9	8	2	-	-
KH8 =	32	-	-	-	6	6	6	7	5	2	1*	1	2	2	3	1	-	-	2*	2*	2*	4*	3*	-	-
CN =	33	1	3	-	-	-	-	5	6	7	6	6	6	8	8	9	9	9	9+	9+	9+	9	9	3	-
SU =	34	-	-	-	-	6	9	9	6	4	7	9	9	9+	9+	9+	9+	9+	9+	9+	9+	9+	4	-	1
6W =	35	-	-	-	-	-	-	-	-	8	8	8	7	9	9	9	8	9	9	9	9	9	9	-	-
D2 =	36	-	-	-	-	-	-	8	9+	9	9	9	9	9+	9+	9+	9+	9+	9+	8	6	3	-	1	-
5Z =	37	-	-	-	-	-	-	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	2	-	-
ZS6 =	38	-	-	-	-	-	-	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9	8	4	1	-	-	-
FR =	39	-	-	-	-	-	3*	7	9	9	9	9	9	9	8	5	1	8	6	3	1	-	-	-	-
FJL =	40	-	-	-	-	-	1*	4	7	7	7	6	7	7	8	8	7	8	6	5	3	-	-	-	-
Zone		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23

UTC -->   * = Longpath

Expected signal levels using 1500 W and 14 dBi isotropic antennas.

Best chance for W6 at 23 UTC or long path at 05 UTC

W6 20-Meter Planning Strategies

20 Meters: Sep., Glorioso, for SSN = Very Low, Sigs in S-Units. By N6BV, ARRL.

Zone		UTC --> 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
KL7 =	01	5	2	6	7	6	6	2	1	-	-	-	-	-	1	3	3	4	4	4	4	-	-	2	7
VO2 =	02	2	-	4	-	-	-	-	-	-	-	1	1	1	2	2	4	5	6	8	8	9	9	9	7
W6 =	03	7	5	4	7	6*	5*	2*	-	-	-	-	1*	1*	-	1	6*	6	6	5	5	5	5	7	8
W9 =	04	9	8	5	2	-	-	-	-	-	-	-	1	2	7	3*	3*	2	4	5	6	8	8	8	8
W3 =	05	8	7	2	5	2	-	-	-	-	-	-	-	1	8	1	1	2	3	5	6	8	8	8	8
XE1 =	06	2	1	3*	2*	7	5	5	3	-	-	-	-	-	6	6	5*	3*	1*	1	1	3	5	6	-
TI =	07	1	-	1*	2*	4	7	6	5	-	-	-	-	-	8	4*	3*	1	1	2	3	5	6	6	-
VP2 =	08	3	-	2*	-	7	8	5	-	-	1	-	-	1*	1	1	1	3	5	7	8	8	9	8	-
P4 =	09	1	-	1*	1*	4	8	7	-	-	-	1	-	2*	1	1	1	1	3	5	6	8	8	7	-
HC =	10	1	-	1*	1*	1*	8	5	5	-	-	1	-	-	4*	3*	1	1	2	3	4	7	8	5	-
PY1 =	11	1	-	-	-	-	-	-	-	6	3	4	3	4	3	5	5	6	8	9	8	8	8	4	-
CE =	12	-	-	2*	1*	1*	1*	1*	-	-	-	2	1	2*	2*	2	3	2	5	4	1	-	1	1	-
LU =	13	-	-	1*	-	1*	-	-	-	2	3	2	1	1	2	2	4	5	6	7	4	5	6	4	1
G =	14	7	6	4	2	-	6	7	5	2	1	1	1	3	6	7	9	9	9	9	9	9	9	8	7
I =	15	4	2	-	-	4	9	8	5	2	2	2	3	6	8	9	9	9	9	9	9	8	6	5	5
UA3 =	16	6	1	2	8	9	8	8	4	2	2	2	4	6	8	9	9	9	9	9	9	8	8	8	8
UN =	17	-	-	6	9	8	6	5	5	4	5	6	8	9	9	9	9	8	1	-	-	-	1	2	-
UA9 =	18	4	1	8	8	6	6	2	2	2	2	4	7	8	9	9	9	9	9	9	8	8	6	4	3
UA0 =	19	2	3	6	4	2	1	-	1	1	2	3	6	8	8	9	9	9	9	8	7	6	7	9	8
4X =	20	4	-	-	5	9	8	7	5	4	7	7	8	9	9	9+	9+	9+	9+	9+	9+	9+	9+	8	7
HZ =	21	-	-	-	8	9+	9	9	6	5	5	5	8	9	9+	9+	9+	9+	9+	9+	9+	9+	6	1	4
VU =	22	-	-	8	9+	9	7	6	4	7	7	8	9	9+	9+	9+	9+	9+	9+	9+	9	8	6	4	-
JT =	23	2	2	8	8	5	6	1	1	1	2	4	7	8	9	9	9	9	9	9	9	8	6	4	8
VR2 =	24	1	2	7	7	6	3	3	2	1	1	4	7	8	9	9	9	9	9	9	9	7	2	-	3
JA1 =	25	1	3	5	3	1	-	-	1	1	2	4	6	8	9	9	9	9	9	9	8	6	6	9	7
HS =	26	-	1	9	9	8	6	6	6	6	8	8	9	9	9+	9+	9+	9+	9+	9	9	7	5	-	-
DU =	27	-	2	7	6	6	4	4	4	4	5	6	8	9	9	9	9	9	9	9	9	6	1*	-	4
YB =	28	-	-	8	9	7	5	4	5	5	6	8	9	9+	9+	9+	9+	9	9	4	-	-	-	-	-
VK6 =	29	-	-	7	8	7	6	6	6	6	6	8	8	8	8	4	1	1	-	1	1	1	1	1*	-
VK3 =	30	-	-	5	7	8	7	6	6	7	7	7	5	6	4	1	1	1	7	3	-	1*	5	6	2
KH6 =	31	-	-	2	6	6	6*	5*	2*	2	-	1	1	2	4	3	-	1*	1	8	8	7	4	-	-
KH8 =	32	-	-	1	7	7	8	3*	3	3	3	4	6	7	8	8	8	1	1*	4	-	1*	2	2	-
CN =	33	8	8	4	-	-	-	7	4	2	1	-	1	3	5	7	8	9	9	9	9	9	9	9	6
SU =	34	5	-	-	2	9	8	7	5	5	4	7	8	9	9	9+	9+	9+	9+	9+	9+	9+	9+	8	7
6W =	35	6	2	1*	1	1*	-	1	7	5	6	3	4	4	5	6	7	9	9	9	9	9	9+	6	2
D2 =	36	4	-	1*	1*	8	9+	9+	9	9	8	7	8	9	9	9+	9+	9+	9+	9+	9+	9+	6	9	1
5Z =	37	4	4	5	6	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	5	4
ZS6 =	38	-	-	-	-	9	9+	9+	9+	8	8	7	6	9+	9+	9+	9+	9+	9+	9+	9	9	8	4	-
FR =	39	-	-	-	-	9	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9	8	6	3	1	-	-
FJL =	40	-	-	-	-	5	7	5	2	3	2	2	5	7	8	9	9	9	9	8	5	2	-	-	-
Zone		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23

UTC -->   * = Longpath

Expected signal levels using 1500 W and 12 dBi isotropic antennas.

Long path to W6 is intriguing at 04 UTC

W6 30-Meter Planning Strategies

30 Meters: Sep., Glorioso, for SSN = Very Low, Sigs in S-Units. By N6BV, ARRL.

Zone		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
KL7 =	01	4	4	4	6	1*	-	-	-	-	-	-	-	1	4	5	6	6	6	6	6	6	5	3	3
VO2 =	02	8	8	7	6	2	-	-	-	-	-	-	-	-	-	-	-	-	1	2	4	6	7	7	7
W6 =	03	4	4	4	4	5	1	-	-	-	-	-	-	-	2*	5	2	1	-	-	-	-	-	-	1
W9 =	04	5	8	7	7	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	7	5
W3 =	05	6	7	6	7	6	2	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3	5	6	6
XE1 =	06	5	6	2	4	5	4	1	-	-	-	-	-	-	1*	2*	1*	-	-	-	-	-	1	1	4
TI =	07	5	4	1	2	6	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	4	4	5
VP2 =	08	7	5	1	3	6	5	2	-	-	-	-	-	-	-	-	-	-	-	1	2	5	6	7	7
P4 =	09	6	4	-	2	6	5	2	1	-	-	-	-	-	-	-	-	-	-	-	1	4	6	6	6
HC =	10	5	3	-	1	6	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2	4	5	6
PY1 =	11	6	4	1	2	5	4	-	2	-	-	-	-	-	-	-	-	1	3	6	8	8	8	8	7
CE =	12	6	4	1	4	4	5	3	1	-	-	-	-	-	-	-	-	-	-	1	2	4	5	6	5
LU =	13	6	3	-	3	3	3	3	1	-	-	-	-	-	-	-	-	-	1	2	5	7	7	8	7
G =	14	8	8	7	7	7	4	1	-	-	-	-	-	-	-	2	4	5	7	8	8	8	8	8	8
I =	15	6	8	7	6	7	5	1	-	-	-	-	-	-	1	4	6	7	8	8	8	8	8	7	7
UA3 =	16	8	6	6	7	5	2	-	-	-	-	-	-	1	3	5	7	8	8	8	8	8	8	8	8
UN =	17	7	4	6	6	2	-	-	-	-	-	-	1	5	6	8	8	8	8	7	7	7	7	8	7
UA9 =	18	7	6	5	3	-	-	-	-	-	-	-	-	2	7	7	8	8	8	8	8	8	8	8	7
UA0 =	19	4	2	1	-	-	-	-	-	-	-	-	-	2	7	7	8	8	8	8	8	8	8	7	5
4X =	20	9	6	3	8	6	4	2	1	-	-	-	1	3	6	8	8	9	9	9	9	9	9	9	9
HZ =	21	7	3	7	9	8	5	4	1	1	-	1	2	5	9	9	9	9+	9+	9+	9+	9+	9	9	9
VU =	22	2	5	8	7	4	1	-	-	-	-	1	3	7	8	9	9	9	9	9	9	9	9	9	5
JT =	23	6	5	5	1	-	-	-	-	-	-	-	4	8	8	8	9	9	8	8	8	8	8	8	8
VR2 =	24	4	5	4	1	-	-	-	-	-	-	1	5	7	8	9	8	8	9	9	8	6	2	6	
JA1 =	25	3	1	-	-	-	-	-	-	-	-	1	5	7	8	8	8	9	9	8	8	8	7	5	
HS =	26	3	6	6	4	2	1	1	1	1	1	2	4	6	8	9	9	9	9	9	9	8	8	4	-
DU =	27	2	4	2	-	-	-	-	-	-	-	-	2	5	7	7	8	9	9	9	9	8	5	4	7
YB =	28	-	3	5	3	1	-	-	-	-	-	1	4	7	9	9	9	9	9	9	8	8	7	4	4
VK6 =	29	1	1	5	3	1	1	-	-	-	1	2	5	7	7	7	7	7	8	7	6	6	8	4	5
VK3 =	30	1	1	3	1	1	-	-	-	-	1	4	5	6	8	8	8	8	8	6	7	8	8	6	
KH6 =	31	-	-	-	-	2*	-	-	-	-	-	-	-	4	6	7	6	4	6	6	4	1	-	-	-
KH8 =	32	-	-	-	1*	-	-	-	-	-	-	-	1	5	6	8	8	7	5	7	4	3	1	-	-
CN =	33	8	8	7	4	3	4	1	-	-	-	-	-	-	1	3	5	7	8	8	9	9	9	9	8
SU =	34	9	6	2	8	6	3	3	1	-	-	-	1	3	6	8	8	9	9	9	9	9	9	9	9
6W =	35	8	7	3	5	1	-	4	1	-	-	-	-	-	1	2	5	5	7	8	8	9	8	7	
D2 =	36	9	7	2	6	2	9	8	6	2	1	-	1	4	7	8	9	9	9	9	9	9	9	5	9
5Z =	37	9	9	9	9	9+	9+	9+	9+	9	9	9	9	9+	9+	9+	9+	9+	9+	9+	9+	9+	9+	9	9
ZS6 =	38	6	-	-	6	9+	9+	9	7	6	5	2	4	7	9	9+	9+	9+	9+	9+	9+	9+	9+	9	8
FR =	39	-	-	-	8	9+	9+	9+	9+	9	9	9	9+	9+	9+	9+	9+	9+	9+	9+	9+	9	9	8	6
FJL =	40	3	4	5	5	5	1	-	-	-	-	-	-	1	5	5	6	7	8	7	8	8	7	4	3
Zone		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23

UTC -->   * = Longpath

Expected signal levels using 1500 W and 6 dBi isotropic antennas.

Best chance for W6 at 14 UTC, if JAs standby

DX Contest Planning?

• It should be obvious that these propagation-prediction tools are also useful for DX Contest planning.

DX Contest Planning?

• It should be obvious that these propagation-prediction tools are also useful for DX Contest planning.

• Here's a worksheet I generated before a single-operator, all-band CQWW CW DX contest in a low sunspot year.

Contest Band-Planning Strategies
Single-Operator, All-Band, SO2R

UTC	160	80	40	20	15	10	Comments
	W6 BAND PLAN, LOW SSN, NOVEMBER						
0			SA	JA,AF,OC,SA	JA, OC	JA, OC	Run JA, tune Radio 2 on 10/20m
1			EU, SA	EU,JA,SA,OC	JA, OC	OC	Run JA, tune Radio 2 on 20m
2	SA		EU, SA	EU,JA,SA,OC	JA		Run EU, tune Radio 2 on 15m
3	SA	EU, SA. AF	EU, SA	SA			Run EU, tune Radio 2 on 20/80m
4	SA	EU, SA. AF	EU, SA	SA			Run EU, tune Radio 2 on 160/80/20m
5	SA, OC	EU, SA. AF	EU, SA	SA			Run EU, tune Radio 2 on 160/80/20m
6	SA, OC	EU, SA. AF	EU, JA, SA	SA			Run EU, tune Radio 2 on 160/80/20m
7	SA, OC	JA, SA	EU, JA, SA	SA, OC			Run EU, tune Radio 2 on 160/80/20m
8	SA, OC	JA, SA	JA, EU, SA	SA, OC			Run JA, tune Radio 2 on 160/80/20m
9	SA, OC	JA, SA	JA, EU, SA	SA			Run JA, tune Radio 2 on 160/80/20m
10	SA, OC	JA, SA	JA	SA			Run JA, tune Radio 2 on 160/80/20m
11	SA, OC	JA, SA	JA	SA, OC			Run JA, tune Radio 2 on 160/80/20m
12	SA, OC	JA	JA	OC			Run JA, tune Radio 2 on 160/80/20m
13	SA, OC	JA	JA	SA, OC			Run JA, tune Radio 2 on 160/80/20m
14	JA	JA	JA	SA, AF			Run JA, tune Radio 2 on 160/80/20m
15	JA	JA	JA	EU,AF,AS,OC	EU, OC	SA	Run EU, tune Radio 2 on 40/15/80m
16				EU,AF,AS,OC	EU, OC	SA, AF	Run EU, tune Radio 2 on 15/10m
17				Everybody	OC	SA, AF	Run EU, tune Radio 2 on 15/10m
18				Everybody	OC	SA, AF	Run EU, tune Radio 2 on 15/10m
19				Everybody	OC	OC, SA, AF	Run EU, tune Radio 2 on 15/10m
20				JA,SA,AF,OC	JA, OC	SA, AF, OC	Run JA, tune Radio 2 on 20/10m
21				JA,SA,AF,OC	JA, OC	SA, AF	Run JA, tune Radio 2 on 20/10m
22				JA,SA,AF,OC	JA, OC	SA	Run JA, tune Radio 2 on 20/10m
23				JA,SA,AF,OC	JA, OC	JA, SA	Run JA, tune Radio 2 on 20/10m
	Yellow Highlighting = May be Possible to Run Rate!						

- Reducing all the data to a plan

Planning vs Operating!

• Planning is important because it alerts you to possible openings you might never have experienced before, especially at a new QTH.

Planning vs Operating!

• Planning is important because it alerts you to possible openings you might never have experienced before, especially at a new QTH.

• However, propagation is always changing and predictions are exactly that: *predictions*.

Planning vs Operating!

• Planning is important because it alerts you to possible openings you might never have experienced before, especially at a new QTH.

• However, propagation is always changing and predictions are exactly that: *predictions*.

• Being aware of what is *actually* happening on the bands is what separates the also-rans from the winners!