Meteorscatter VHF Communications

Adapted and Presented to ***The SFDXA***
6 March 2019 by Randy Shirley, N4QV

Meteorscatter VHF Communications

A presentation and shared evening with the:

Halifax Amateur Radio Club

April 17, 2013

Roger Sturtevant, VE1SKY

Propagation

Amateur Radio

- traditionally uses *groundwaves* or *skywaves* to propagate communication.

But, there is more...

Typical HF Propagation

F2 Sporadic E Backscatter

Transequatorial Propagation (TEP)

Multihop Sporadic E or F2

Chordal

Typical VHF Propagation

F2 Sporadic E Multihop Backscatter

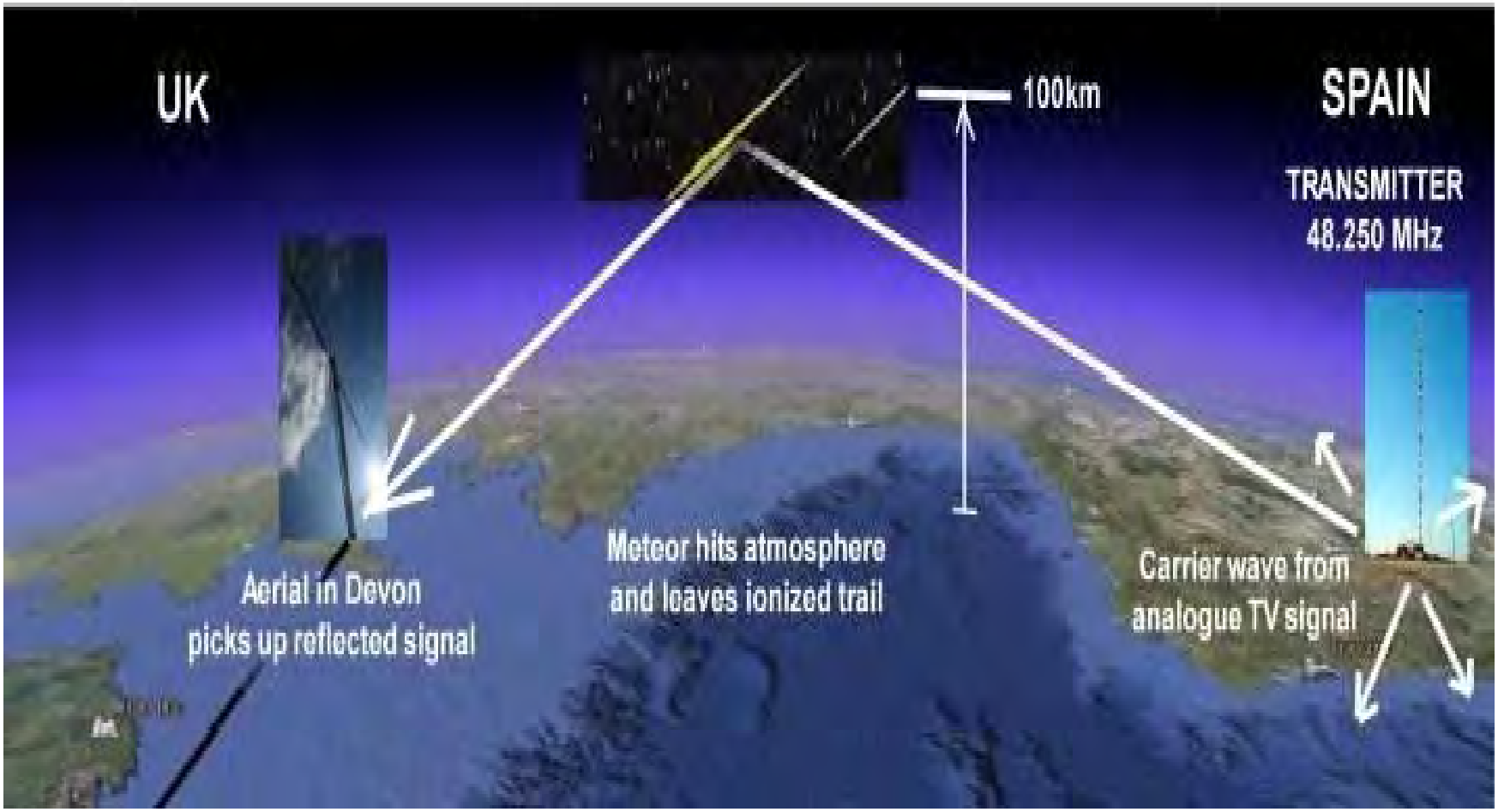
Transequatorial Propagation (TEP) Aurora

Tropospheric Ducting Rainscatter EME

Ionospheric Scatter and even Airplanescatter

METEORSCATTER

VHF Meteor Reflection



What Gear Do I Need ?

Any rig with 6 or 2m:
IC-73Just about any computer
Rigblaster or other Interface
Horizontal beam 4+ elements

Gear & Accessories

40-1300 MHz Log Periodic

Yaesu FT 847

small amp

Station VE1SKY

Optional Stuff

* preamps
* antenna arrays or stacks
* long yagis at 35+ ft
* transverters
* kilowatt amplifiers
* expensive radios

Modes and Power

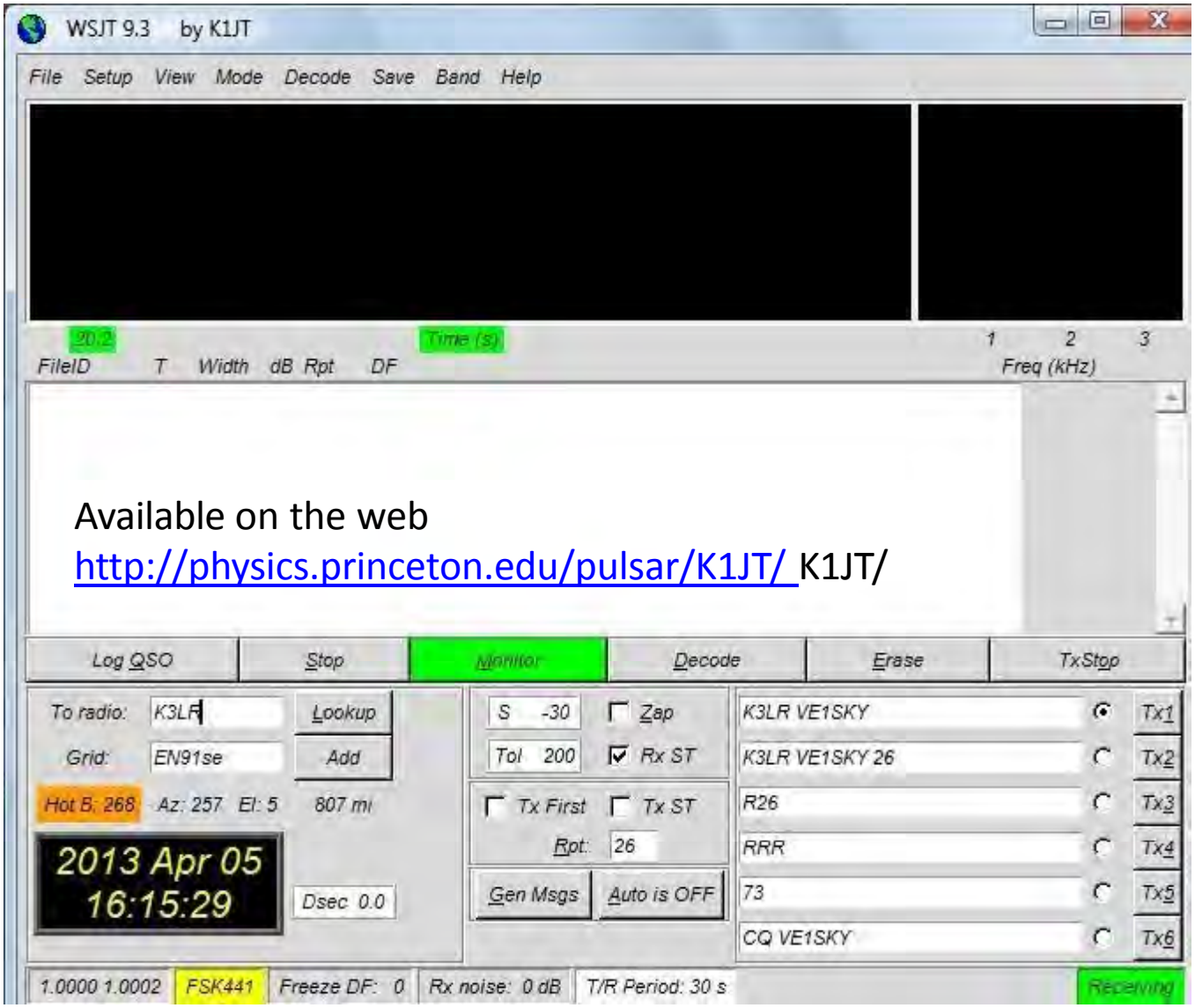
High Speed CW SSB

WSJT Modes – FSK441 or MSK441
– the standard for working rox

PSK2K (FEC, multiple QSOs, auto mode)

*100 watts is fine for most QSOs

What About Software?

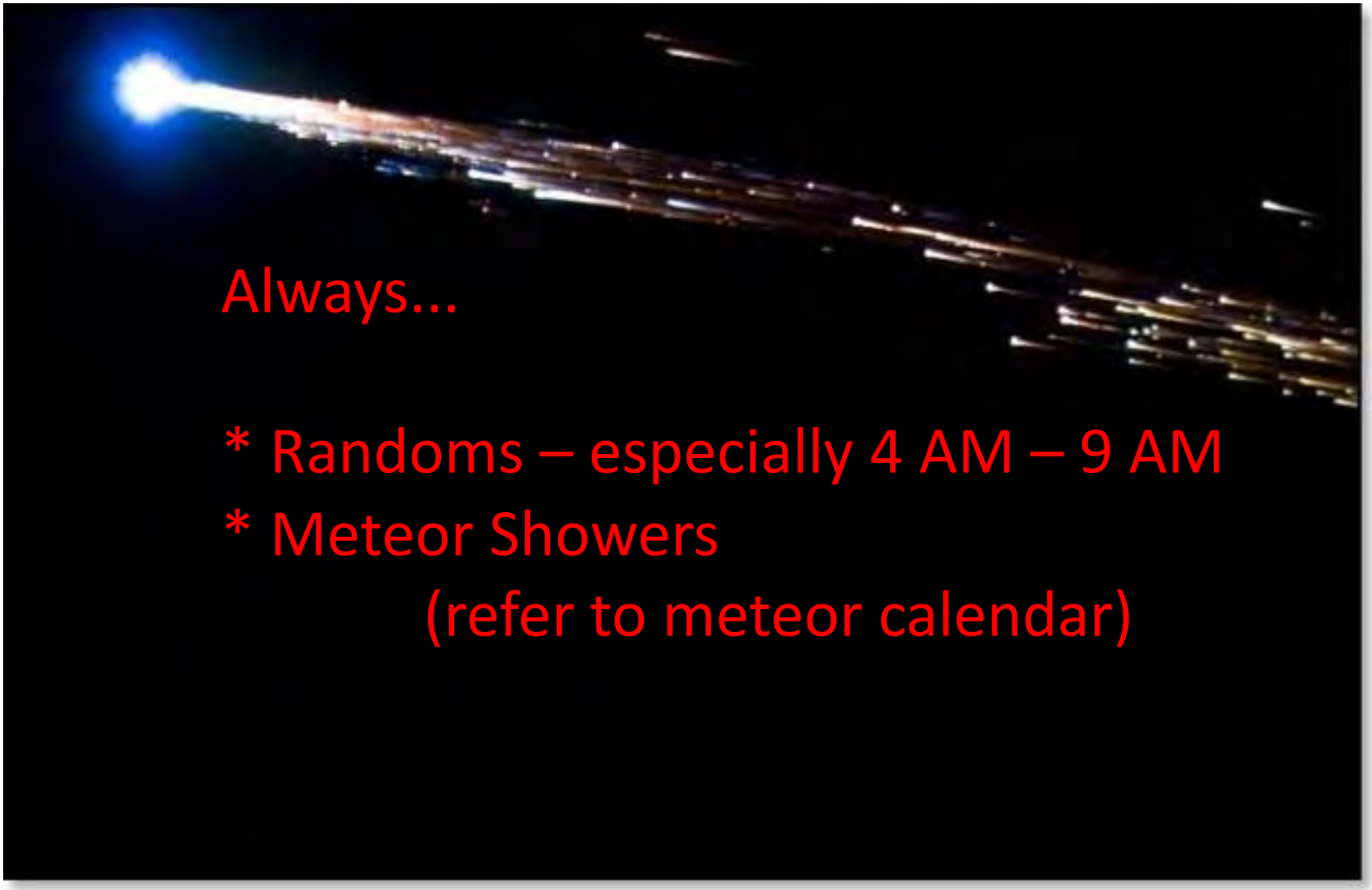


Available on the web
http://physics.princeton.edu/pulsar/K1JT/ K1JT/

WSJT

Weak Signal by Joe Taylor, K1JT

When are there meteors to work?



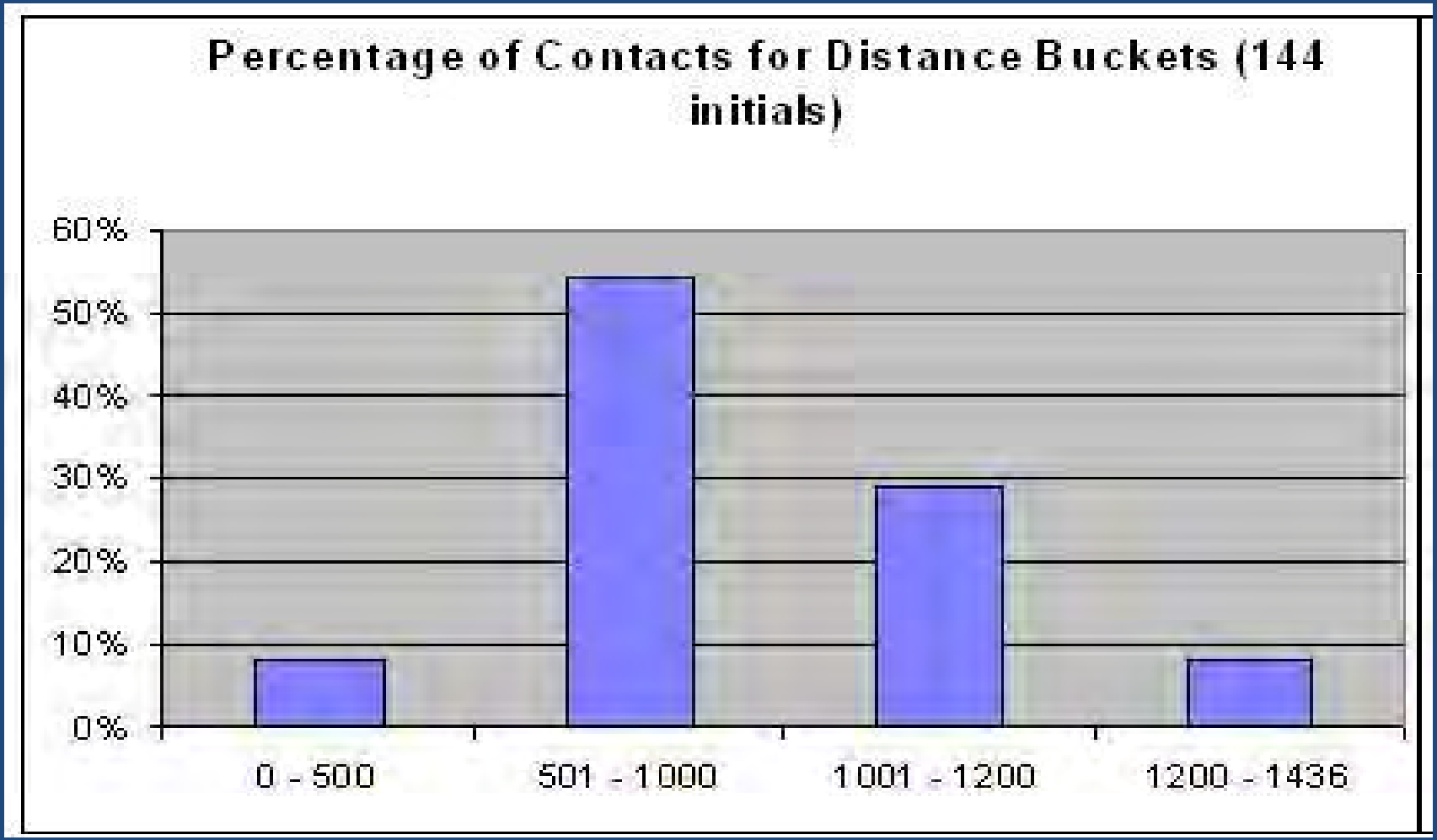
Major Annual Meteor Showers

The Major Showers

1. Quadrantids (early January)
2. Lyrids (mid to late April)
3. Eta Aquarids (early May)
4. Delta Aquarids (late July)
5. Perseids (mid August)
6. Orionids (mid to late October)
7. Leonids (mid November)
8. Geminids (mid December)

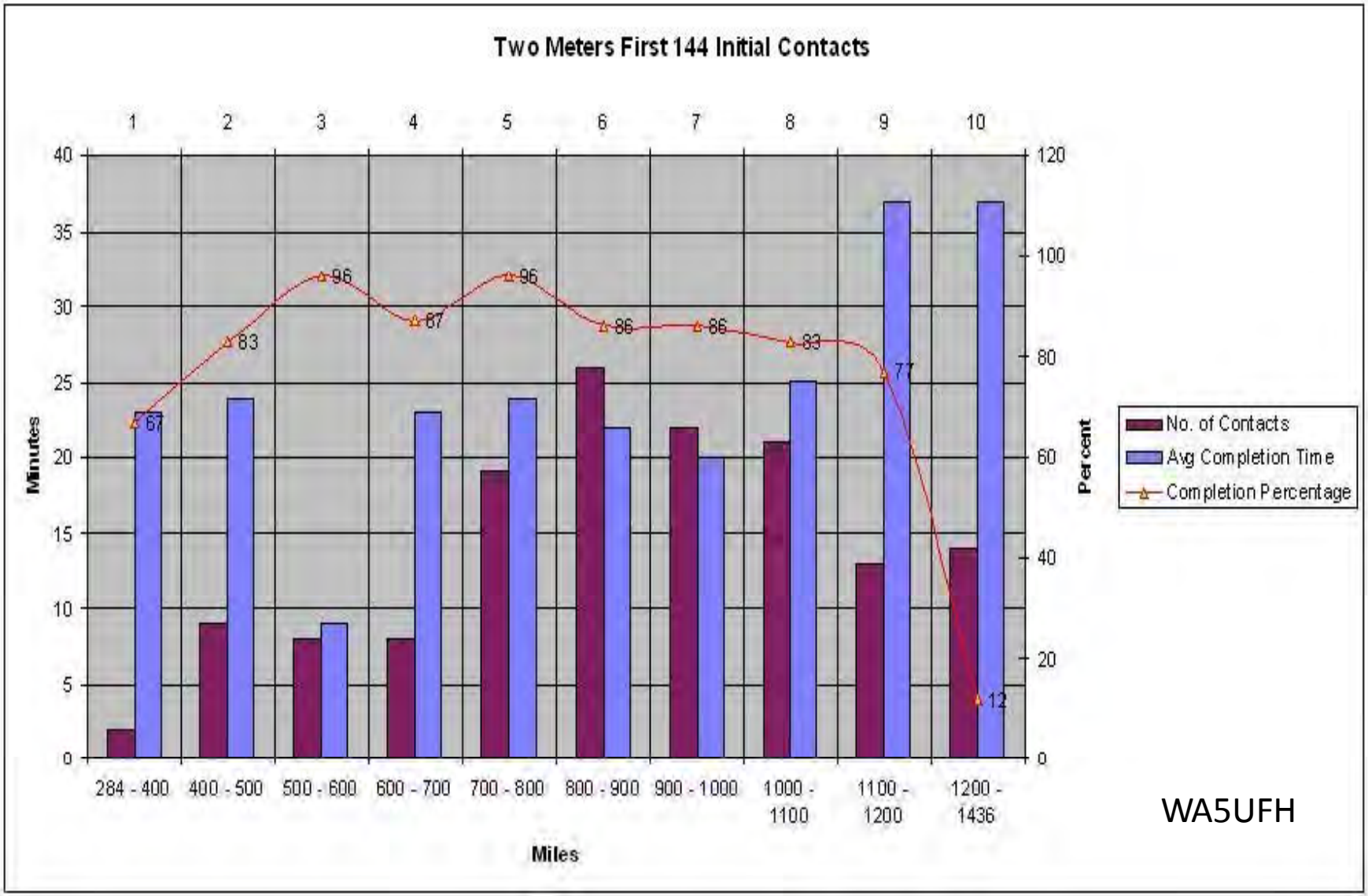
and about 25 minor showers

Summary of DX "Sweet Spots"



WA5UFH

QSO Distance and QSO Time



WA5UFH

Bands and Calling Frequencies

28 MHz to 432 MHz (6m, 1.25m, 2m best)

Meteor Scatter Calling Frequencies

50.260 “CQ 263 VE1RGB”

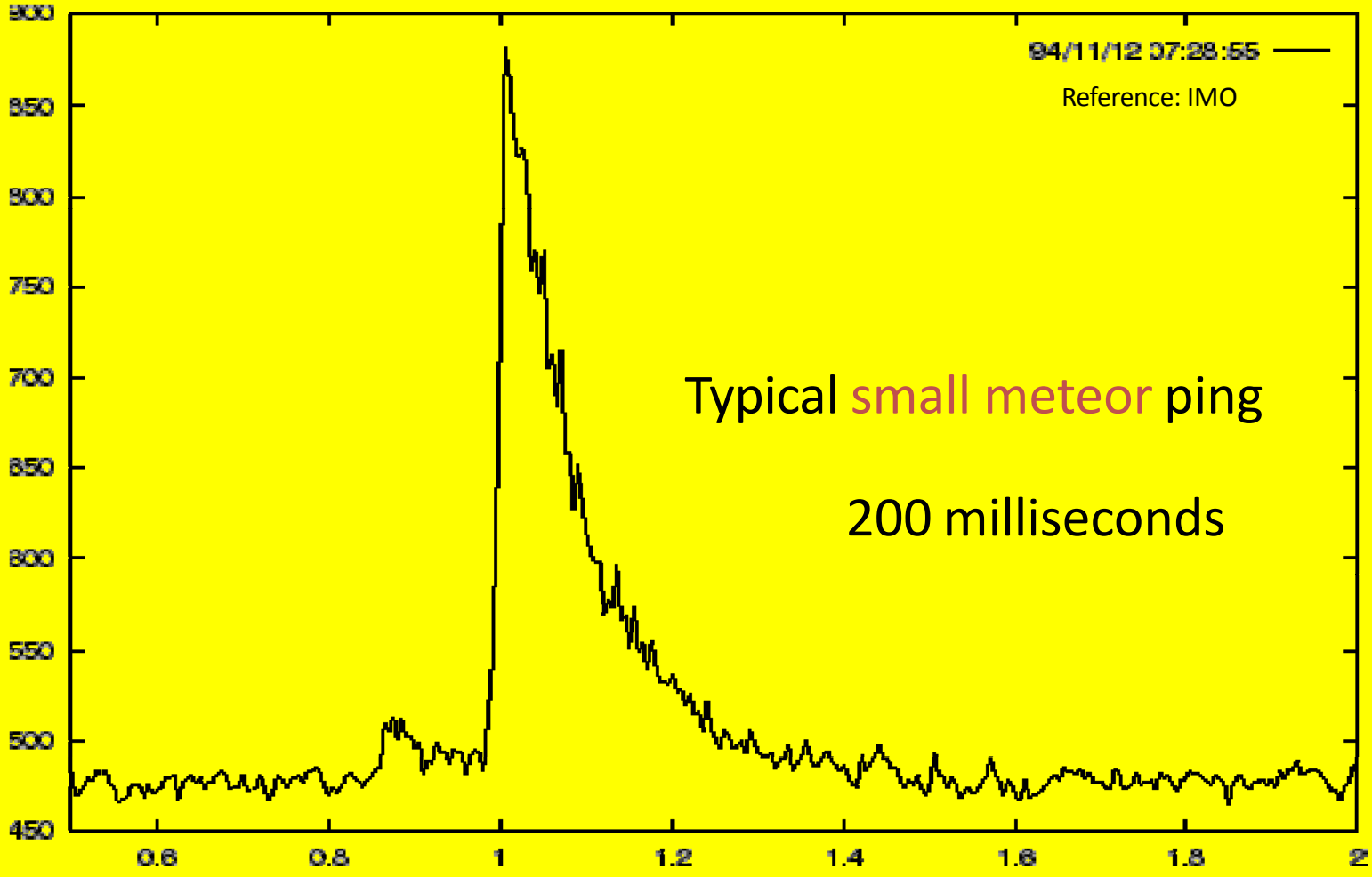
222.085 “CQ 090 VE1QD”

144.140 “CQ 137 VE1DHD”

* CQ split frequency on calling frequency

Rox = Dust & Blue Whizzers

Most Meteors are dust-sized (underdense) particles

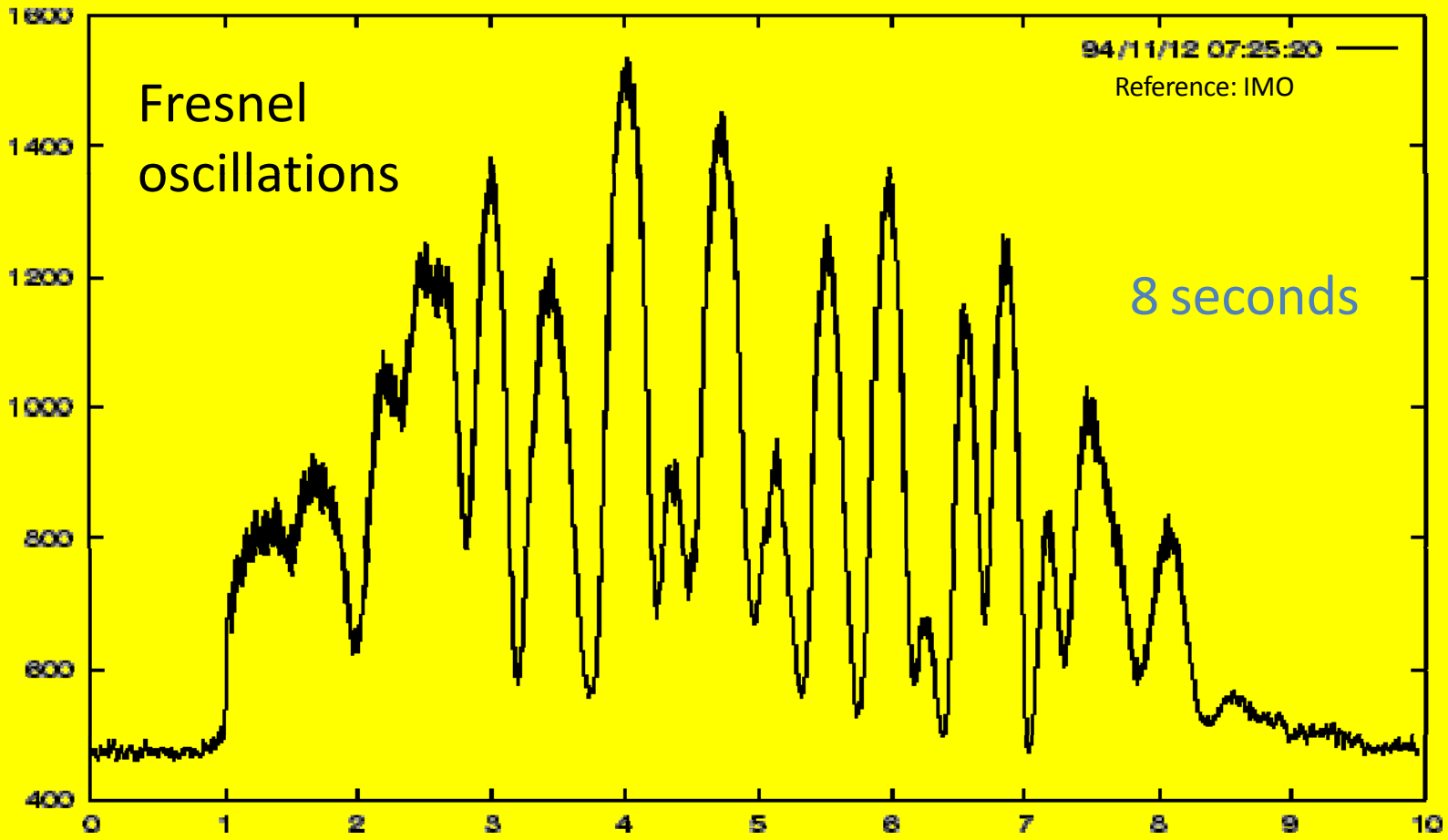


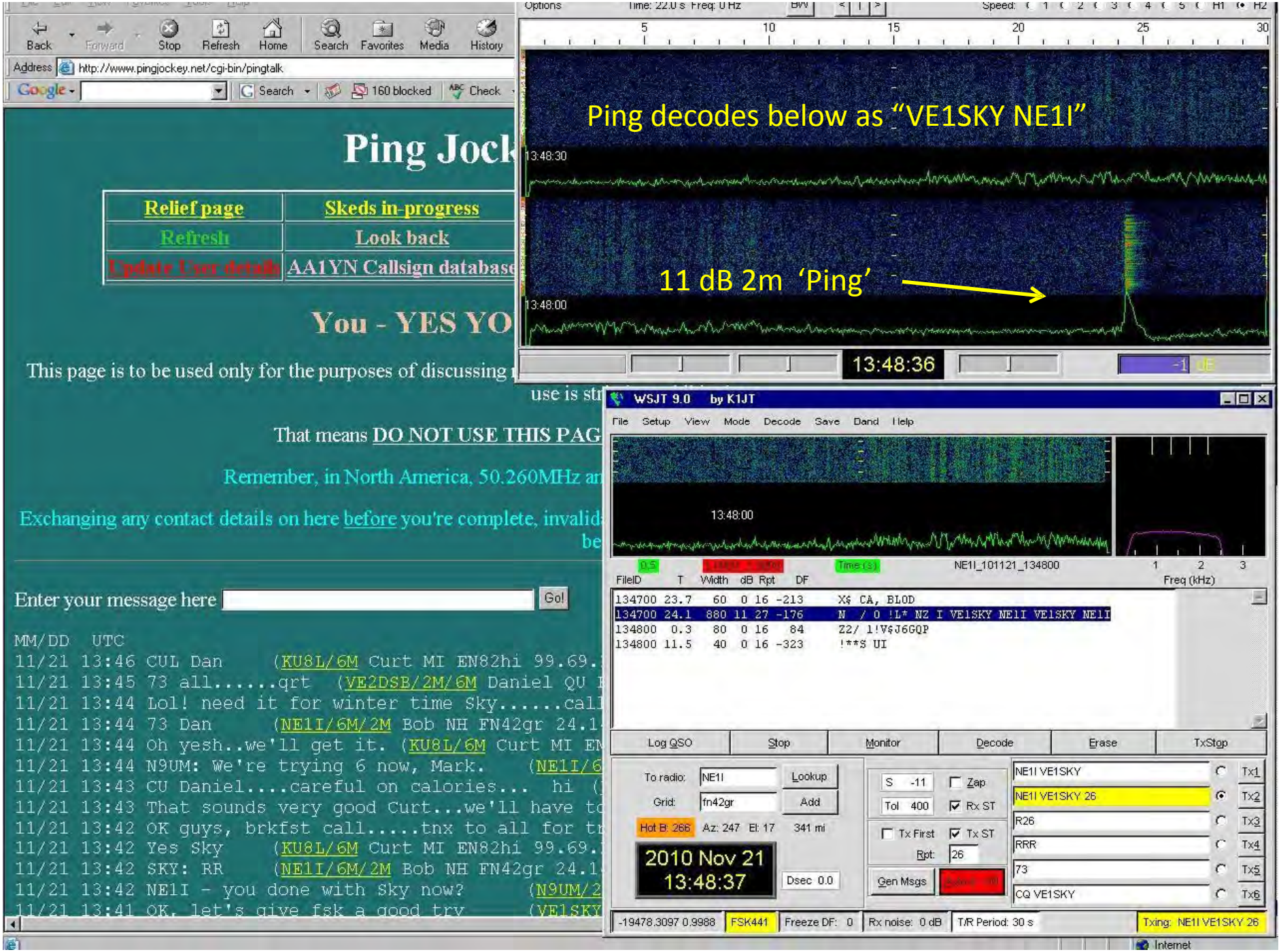
Typical small meteor ping

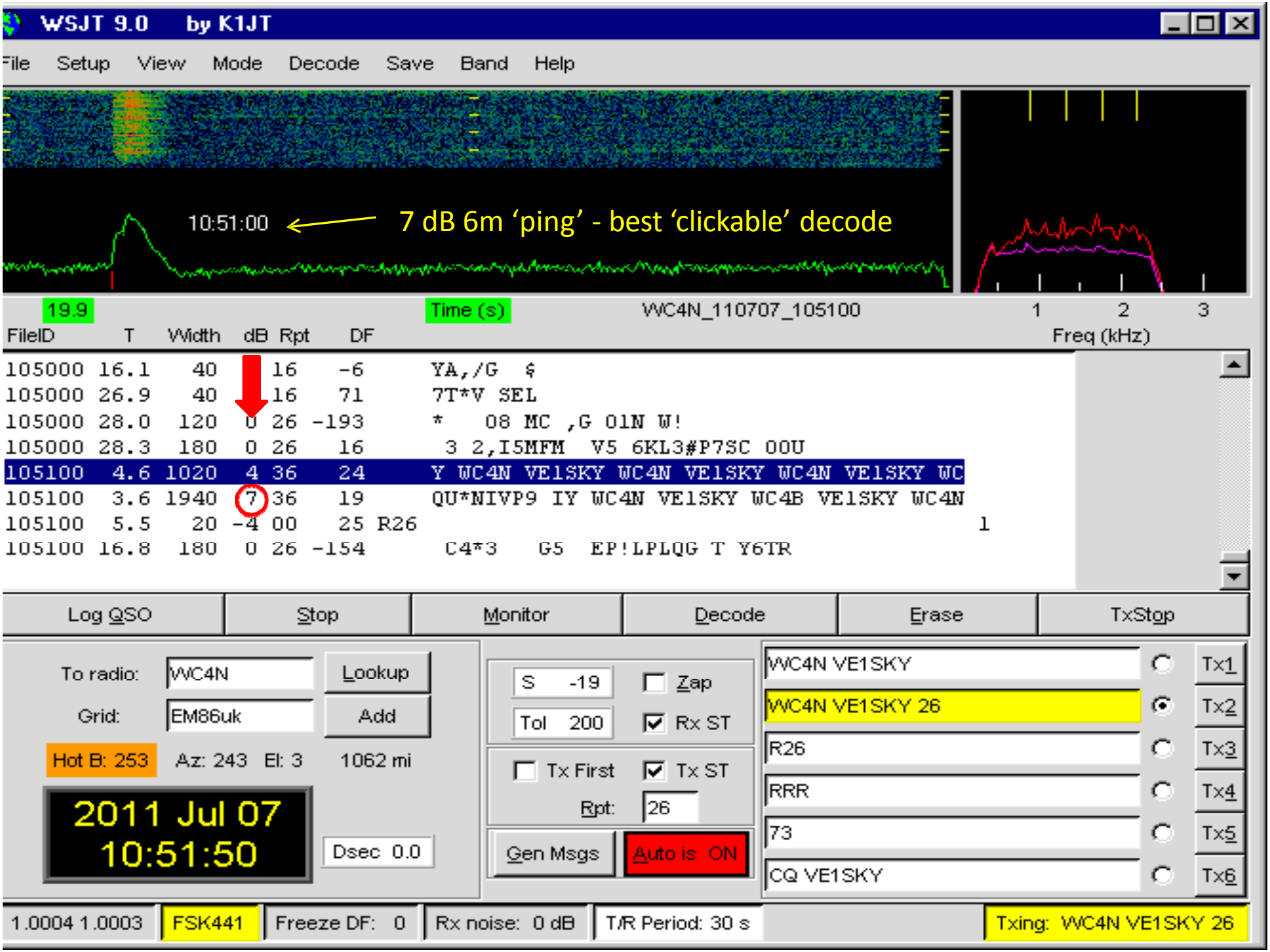
200 milliseconds

Rox = Dust & Blue Whizzers

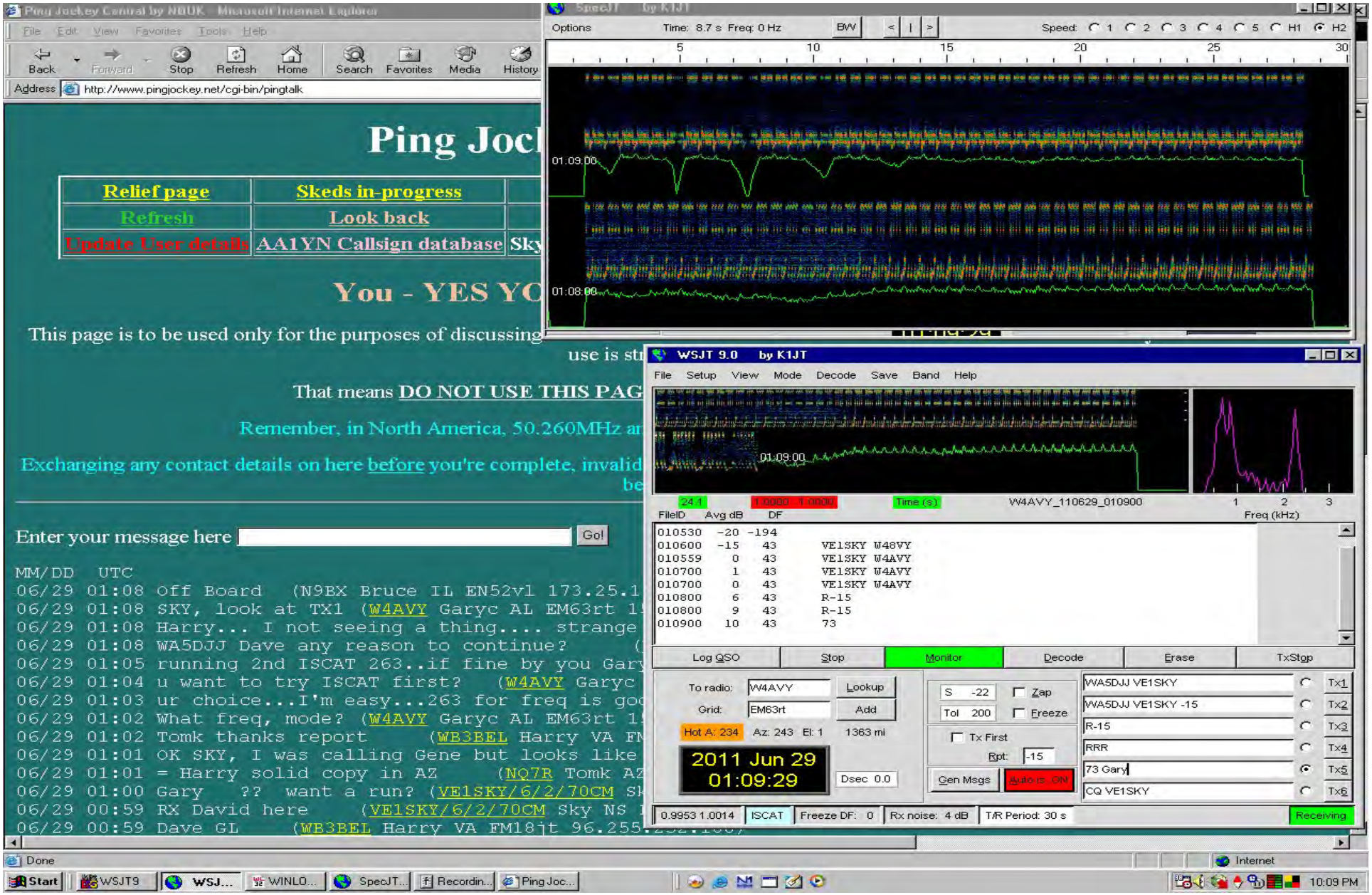
Blue Whizzers support SSB/CW (overdense reflections)




Ping decodes below as "VE1SKY NE1I"
11 dB 2m 'Ping'
13:48:30
13:48:00
13:48:36
Ping Jock
Relief page
Skeds in-progress
Refresh
Look back
Update User details
AA1YN Callsign database
You - YES YO
This page is to be used only for the purposes of discussing
That means DO NOT USE THIS PAG
Remember, in North America, 50.260MHz an
Exchanging any contact details on here before you're complete, invalid
Enter your message here
Go!
MM/DD UTC
11/21 13:46 CUL Dan (KU8L/6M Curt MI EN82hi 99.69.
11/21 13:45 73 all.....qrt (VE2DSB/2M/6M Daniel QU
11/21 13:44 Lol! need it for winter time Sky.....call
11/21 13:44 73 Dan (NE1I/6M/2M Bob NH FN42gr 24.1
11/21 13:44 Oh yesh..we'll get it. (KU8L/6M Curt MI EN
11/21 13:44 N9UM: We're trying 6 now, Mark. (NE1I/6
11/21 13:43 CU Daniel....careful on calories... hi
11/21 13:43 That sounds very good Curt...we'll have to
11/21 13:42 OK guys, brkfst call.....tnx to all for tr
11/21 13:42 Yes Sky (KU8L/6M Curt MI EN82hi 99.69.
11/21 13:42 SKY: RR (NE1I/6M/2M Bob NH FN42gr 24.1
11/21 13:42 NE1I - you done with Sky now? (N9UM/2
11/21 13:41 OK, let's give fsk a good try (VE1SKY
WSJT 9.0 by K1JT
File Setup View Mode Decode Save Band Help
13:48:00
NE1I_101121_134800
FileID T Width dB Rpt DF
134700 23.7 60 0 16 -213 X$ CA, BLOD
134700 24.1 880 11 27 -176 N / 0 !L* NZ I VE1SKY NE1I VE1SKY NE1I
134800 0.3 80 0 16 84 Z2/ 1!V$J6GQP
134800 11.5 40 0 16 -323 !**S UI
Freq (kHz)
Log QSO
Stop
Monitor
Decode
Erase
TxStop
To radio: NE1I
Lookup
Grid: fn42gr
Add
Hot B: 266 Az: 247 El: 17 341 mi
2010 Nov 21
13:48:37
Dsec 0.0
S -11
Zap
Tol 400
Rx ST
Tx First
Tx ST
Rpt: 26
Gen Msgs
NE1I VE1SKY
NE1I VE1SKY 26
R26
RRR
73
CQ VE1SKY
Tx1
Tx2
Tx3
Tx4
Tx5
Tx6
-19478.3097 0.9988
FSK441
Freeze DF: 0
Rx noise: 0 dB
T/R Period: 30 s
Txing: NE1I VE1SKY 26
Internet


WSJT 9.0 by K1JT
File Setup View Mode Decode Save Band Help
10:51:00
7 dB 6m 'ping' - best 'clickable' decode
19.9
Time (s)
WC4N_110707_105100
1 2 3
Freq (kHz)
FileID T Width dB Rpt DF
105000 16.1 40 16 -6 YA,/G $
105000 26.9 40 16 71 7T*V SEL
105000 28.0 120 0 26 -193 * 08 MC ,G 01N W!
105000 28.3 180 0 26 16 3 2,I5MFM V5 6KL3#P7SC 00U
105100 4.6 1020 4 36 24 Y WC4N VE1SKY WC4N VE1SKY WC4N VE1SKY WC
105100 3.6 1940 7 36 19 QU*NIVP9 IY WC4N VE1SKY WC4B VE1SKY WC4N
105100 5.5 20 -4 00 25 R26 1
105100 16.8 180 0 26 -154 C4*3 G5 EP!LPLQG T Y6TR
Log QSO
Stop
Monitor
Decode
Erase
TxStop
To radio: WC4N
Lookup
Grid: EM86uk
Add
Hot B: 253
Az: 243 El: 3
1062 mi
2011 Jul 07
10:51:50
Dsec 0.0
S -19
Zap
Tol 200
Rx ST
Tx First
Tx ST
Rpt: 26
Gen Msgs
Auto is ON
WC4N VE1SKY
WC4N VE1SKY 26
R26
RRR
73
CQ VE1SKY
Tx1
Tx2
Tx3
Tx4
Tx5
Tx6
1.0004 1.0003
FSK441
Freeze DF: 0
Rx noise: 0 dB
T/R Period: 30 s
Txing: WC4N VE1SKY 26

QSO with W4AVY – 6m Es – not meteors

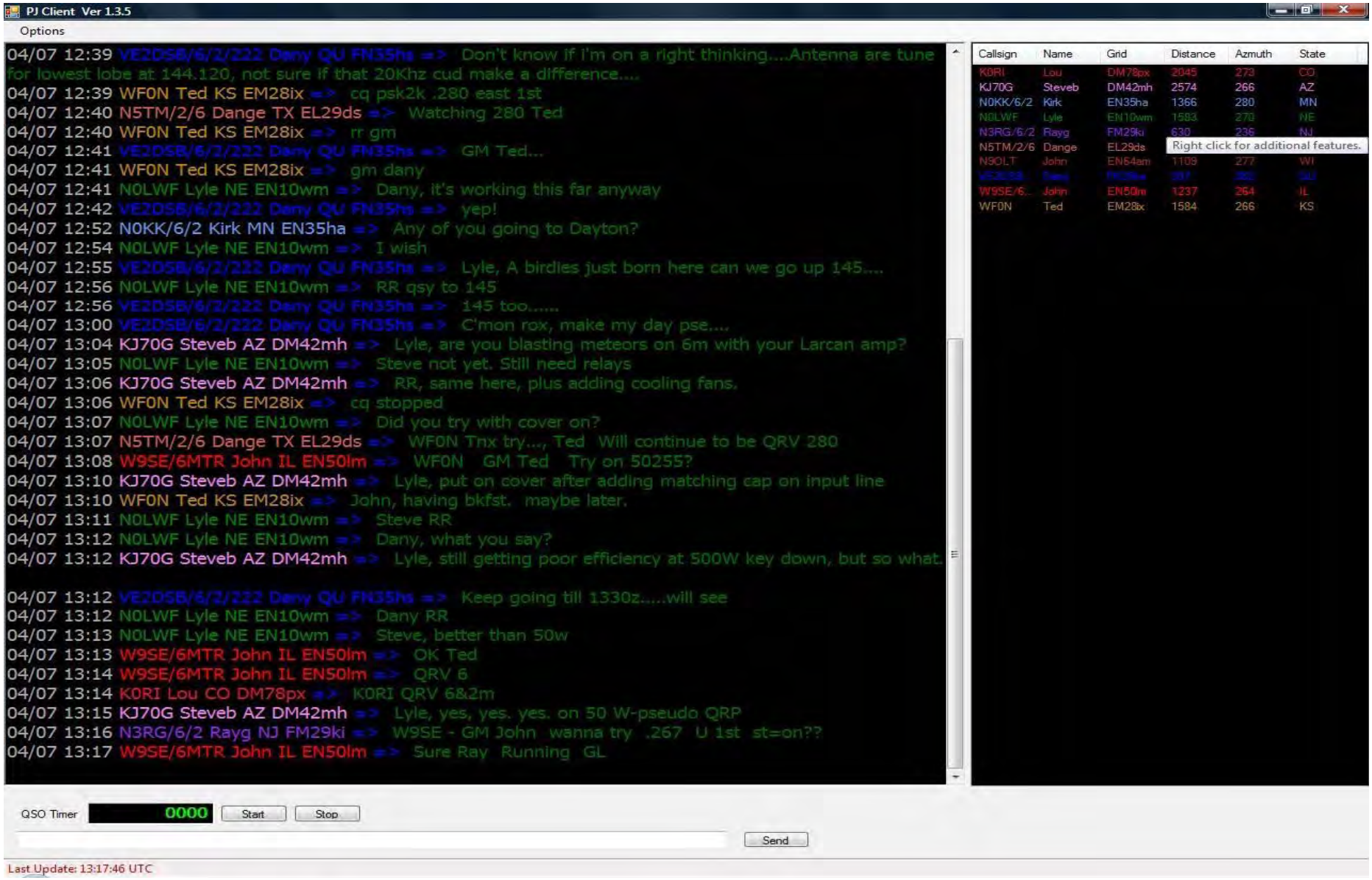


Let's "Experience" Meteorscatter

"Are you Experienced?"

J. H. 1967

Ping Jockey & PJ Client



Distance Records

Verified Meteorscatter Records

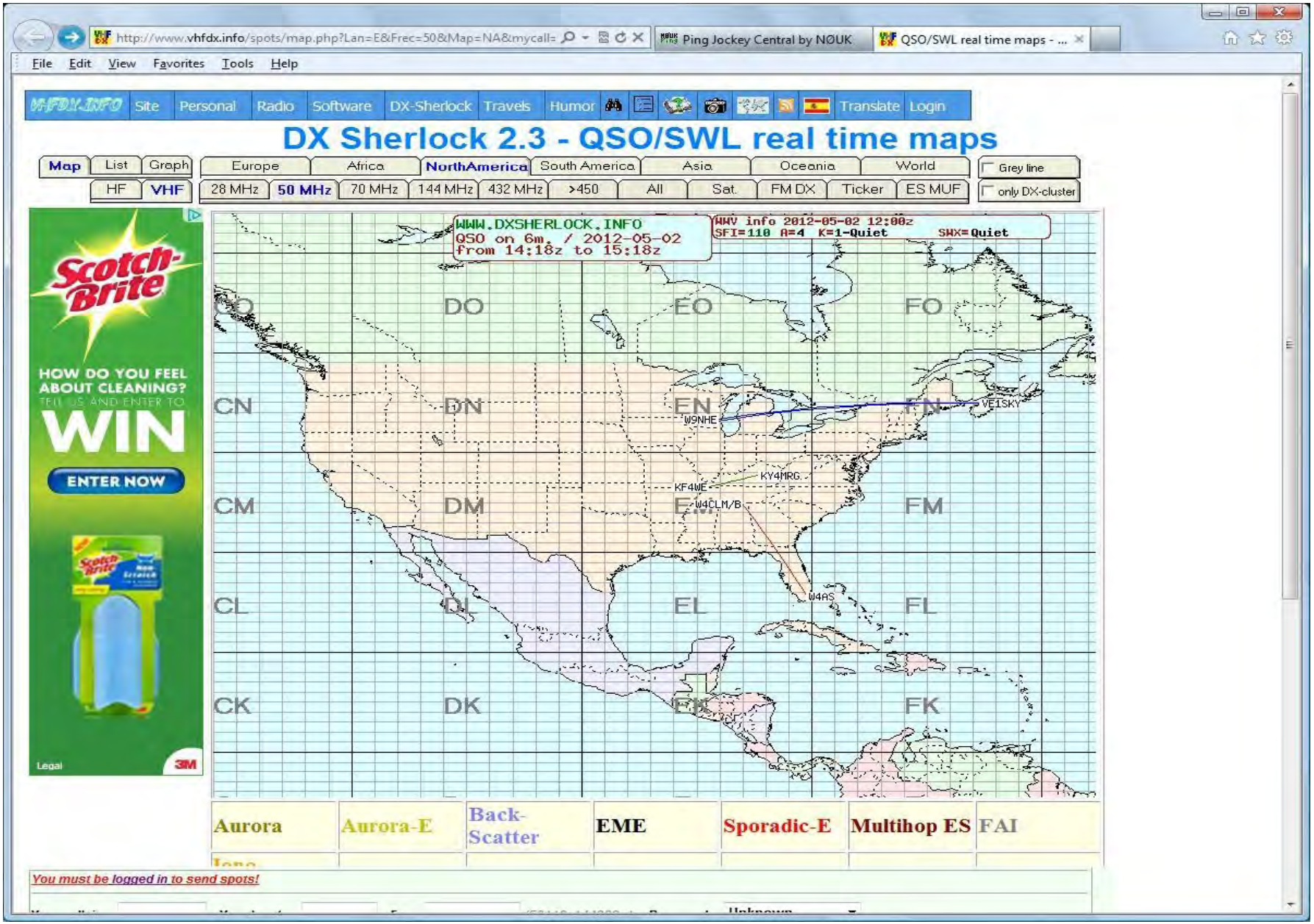
222 MHz ND0B & W5UWB 222 MHz 1353 mi / 2177 km
Dec 10, 2012 03:22 Geminids Shower

144 MHz K2DRH & N6RMJ 144MHz 1572 mi / 2530 km
Aug 13, 2009 06:50 Perseids Shower

50 MHz VE3CDX/W7 & N8JX 50MHz 1627 mi / 2618 km
May 16, 2008 15:22 eta Aquarids Shower

WSJTGROUP www.meteorscatter.org

Real-time Spots: DXMap & ON4KST



Casual & Contest Meteorscatter

* Can make VHF QSOs anytime

  * When bands are dead
    QSOs & multipliers can be worked

* All Band & VHF Contests encourage MS

- Assistance: eg, Ping Jockey, DXMaps helps casual and contest QSOs
- * Log more grids & VHF DX

* Awards VUCC, FFMA, WSJT 10K

Working Rox is great over a morning coffee!

Sources & References

WSJTGROUP Website www.meteorscatter.org/
K1JT Website http://physics.princeton.edu/pulsar/K1JT/

DX Maps http://www.dxmaps.com
ON4KST http://www.on4kst.com/chat/start.php

Ping Jockey http://www.pingjockey.net/

PJ Client http://chat.n5tm.com/downloads/
VIRGO meteor tracker http://dl1dbc.net/Meteorscatter/
International Meteor Organization http://imo.net/

Make More Miles VHF site http://www.qsl.net/dk3xt/

CQ VHF & CQ magazines
QST, “The World Above 50 MHz”

Questions?

What's a bolide?

Can I ragchew in these modes?

How many amateurs do meteorscatter?

How do I get started?

What is a good "run rate" in meteorscatter modes?

What makes a for a good radio meteor?

Thank You!