

Meteorscatter VHF Communications



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...

Add a little operating zip with...

Sporadic E

Aurora

Tropospheric ducting

Ionosscatter

Transequatorial Propagation (TEP)

Rainscatter

Backscatter

F2

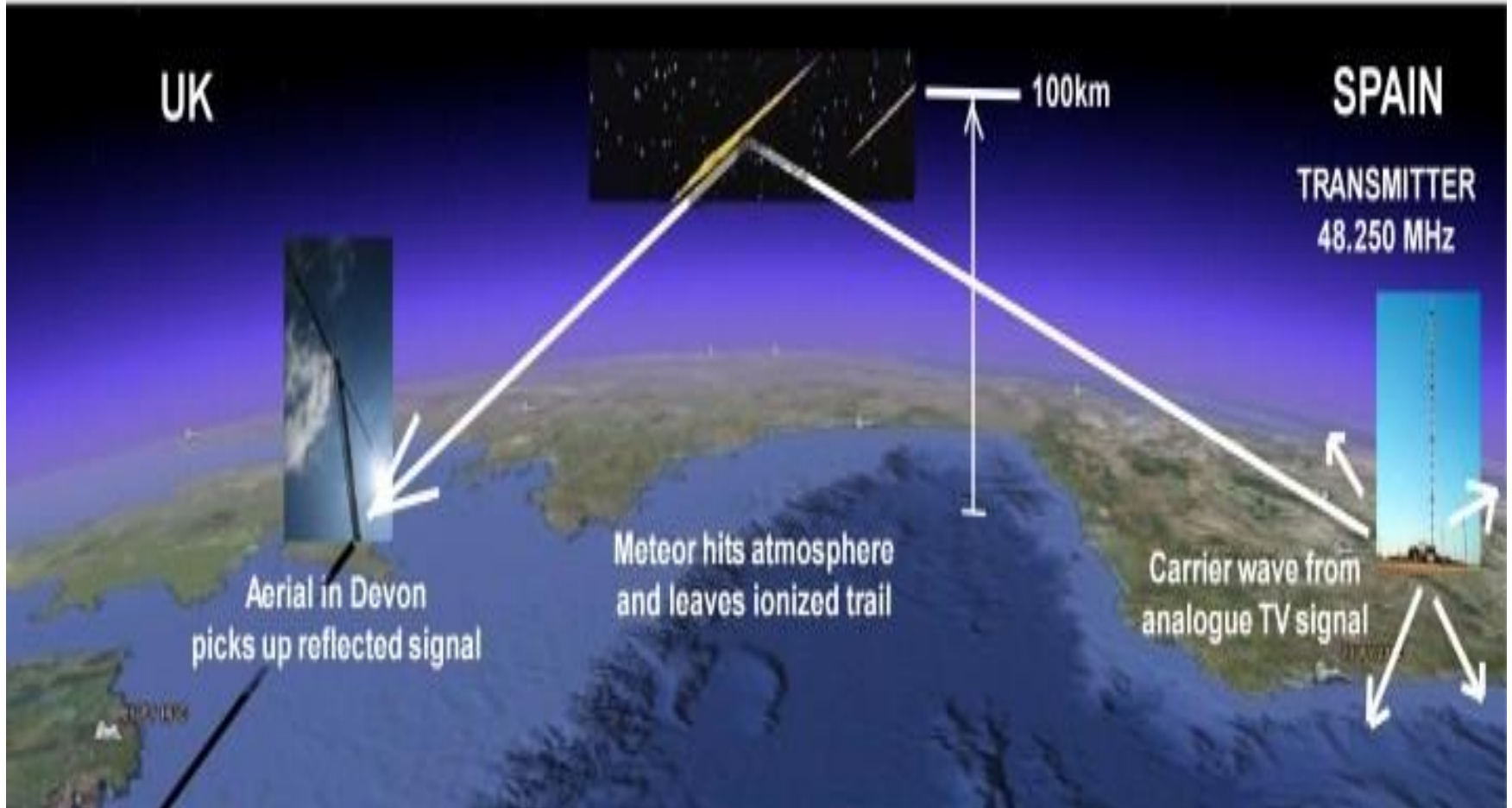
Multihop

METEORSCATTER

EME

and even Airplanescatter

VHF Meteor Reflection



What Gear Do I Need ?



Any rig with 6 or 2m: IC-736

Just about any computer

Rigblaster or other Interface

Horizontal beam 4 or more elements

Gear & Accessories



40-1300 MHz Log
Periodic

Station VE1SKY



Yaesu FT 847



small amp



Optional Stuff

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

Modes and Power

High Speed CW

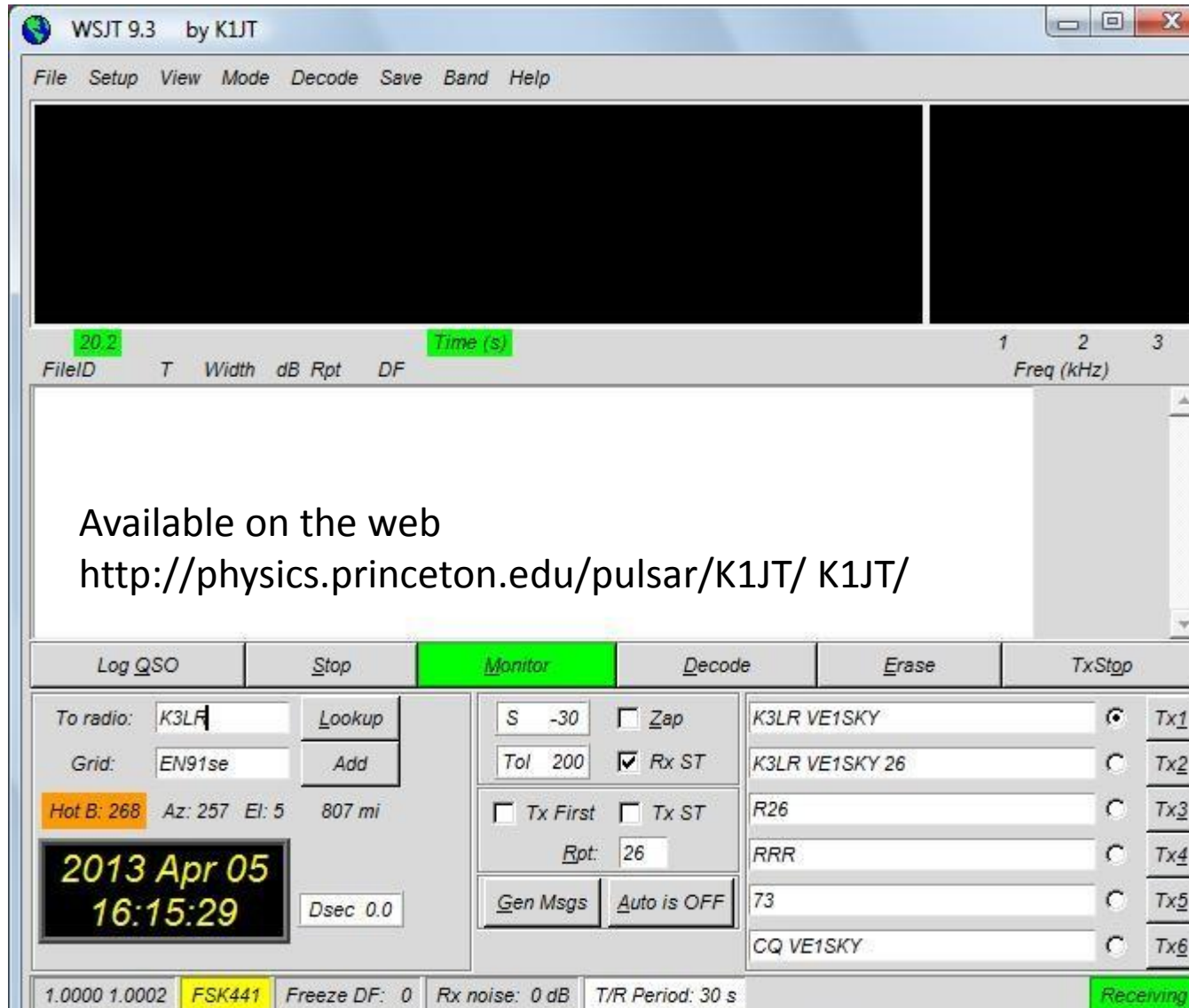
SSB

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

PSK2K (FEC, multiple QSOs, auto mode)

*100 watts is fine for most QSOs

What About Software?



WSJT

Weak Signal
by Joe Taylor,
K1JT

Available on the web

<http://physics.princeton.edu/pulsar/K1JT/> K1JT/

When are there meteors to work?



Always...

- * Randoms – especially 4 AM – 9 AM

- * Meteor Showers
(refer to meteor calendar)

Major Annual Meteor Showers

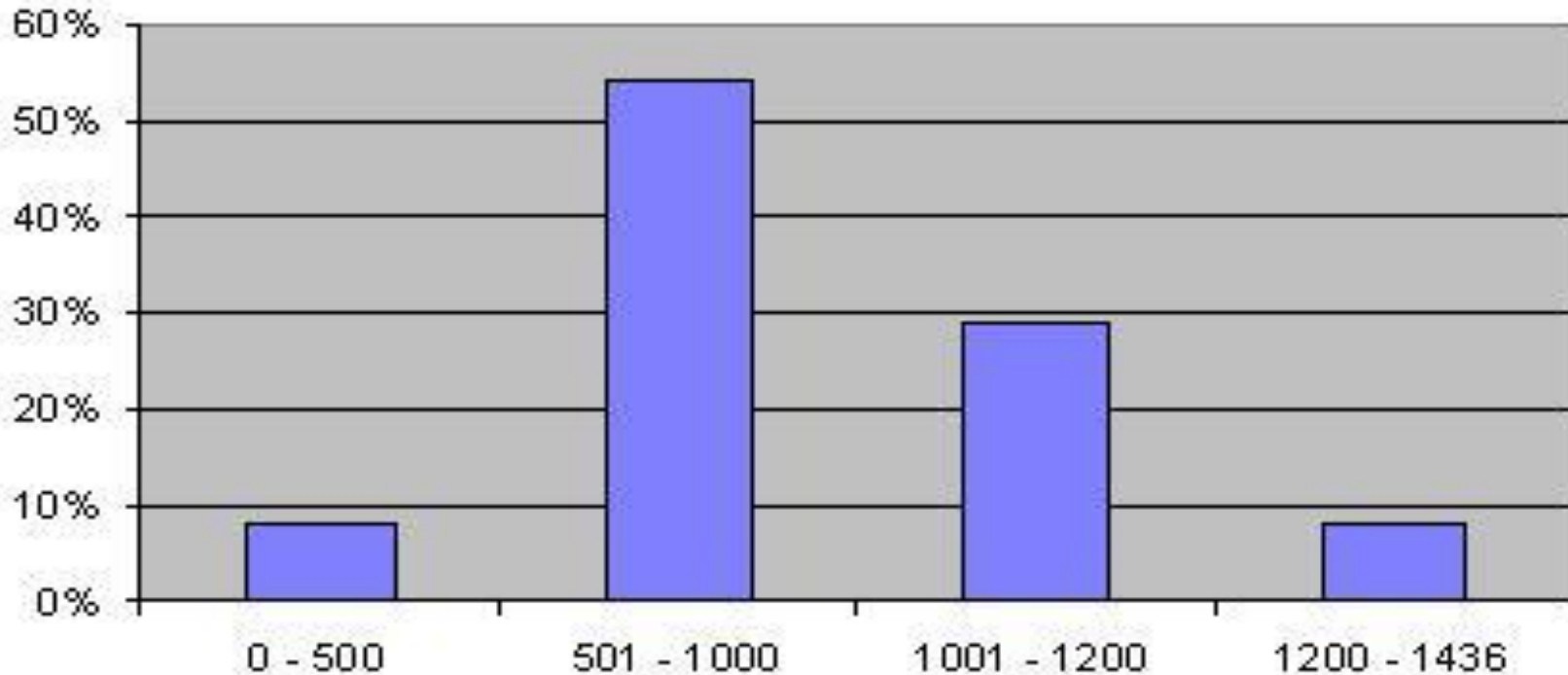
The Major Showers

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)

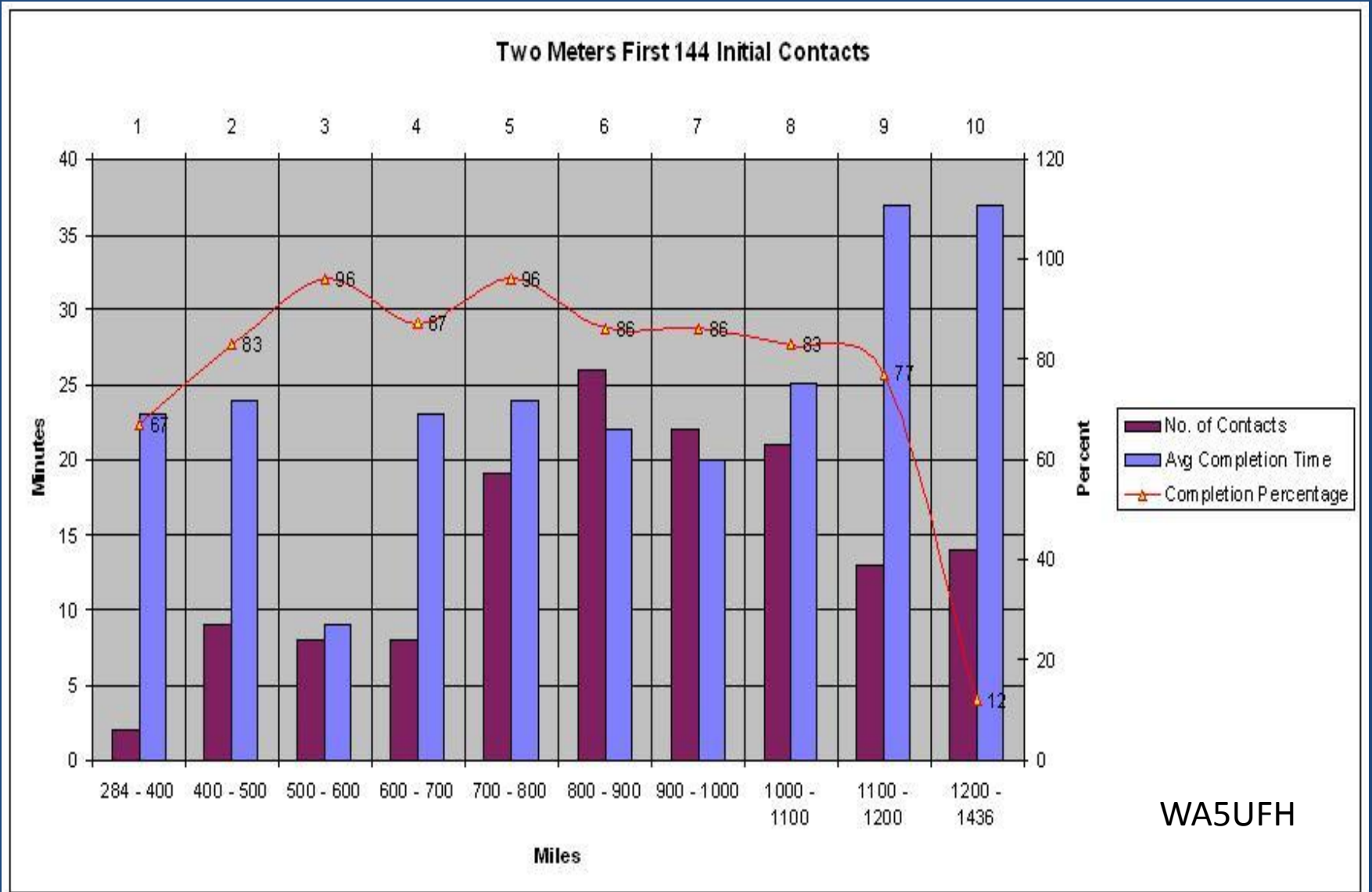
and about 25 minor showers

Summary of DX "Sweet Spots"

Percentage of Contacts for Distance Buckets (144 initials)



QSO Distance and QSO Time



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”

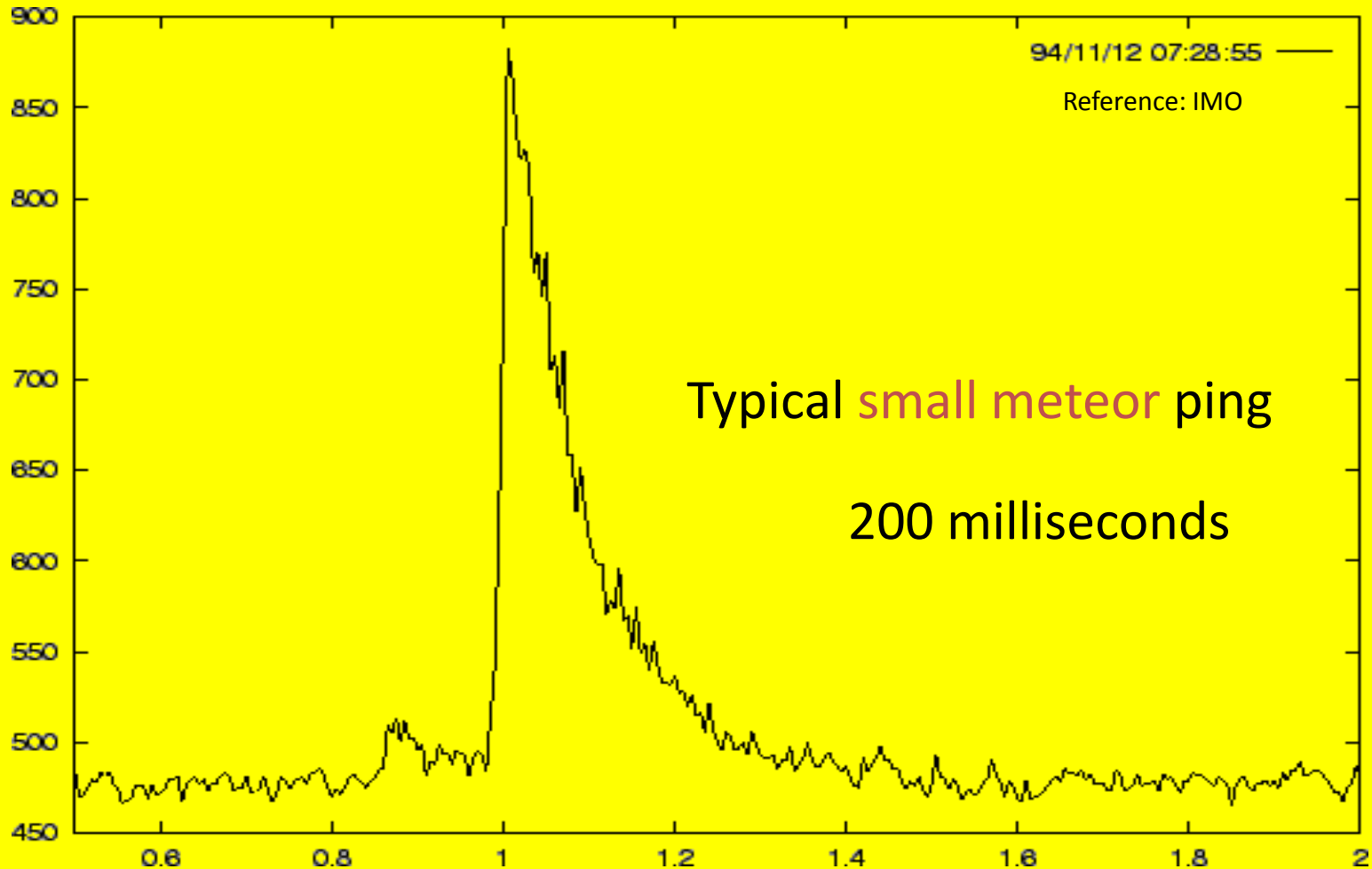
144.140 “CQ 137 VE1DHD”



* CQ split frequency
on calling frequency

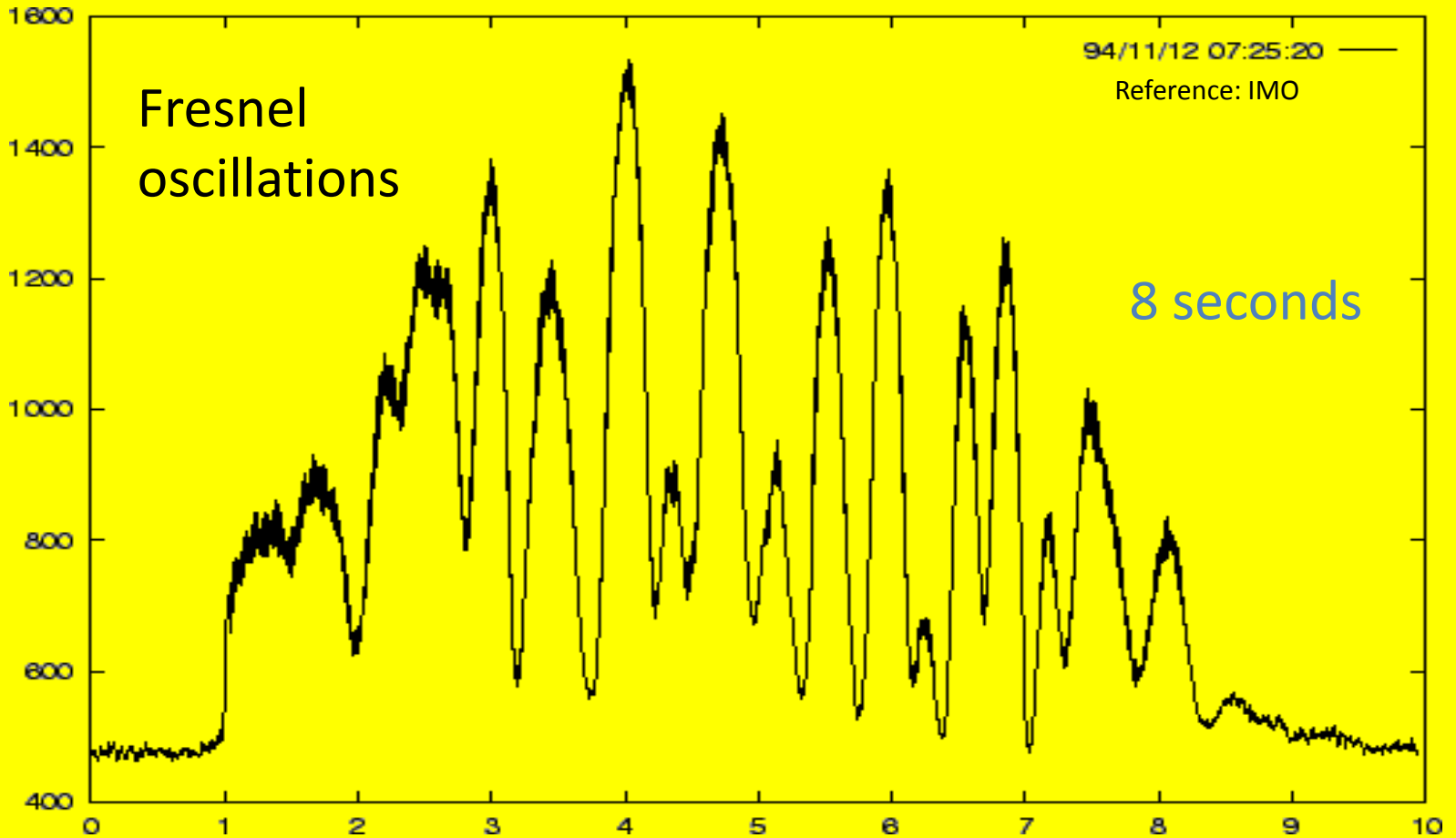
Rox = Dust & Blue Whizzers

Most Meteors are dust-sized (underdense) particles



Rox = Dust & Blue Whizzers

Blue Whizzers support SSB/CW (overdense reflections)



Options Time: 22.0 s Freq: 0 Hz BW: < | > Speed: 0 1 2 3 4 5 Hz H1 H2

Back Forward Stop Refresh Home Search Favorites Media History

Address <http://www.pingjockey.net/cgi-bin/pingtalk>

Google Search 160 blocked ABC Check

Ping Jockey

Relief page	Skeds in-progress
Refresh	Look back
Update User details	AA1YN Callsign database

You - YES YOU

This page is to be used only for the purposes of discussing... use is str... That means **DO NOT USE THIS PAGE** Remember, in North America, 50.260MHz and Exchanging any contact details on here before you're complete, invalid be

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 P)

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 EN82hi 99.69.)

11/21 13:44 N9UM: We're trying 6 now, Mark. ([NE1I/6M](#) Curt MI EN82hi 99.69.)

11/21 13:43 CU Daniel....careful on calories... hi (

11/21 13:43 That sounds very good Curt...we'll have to

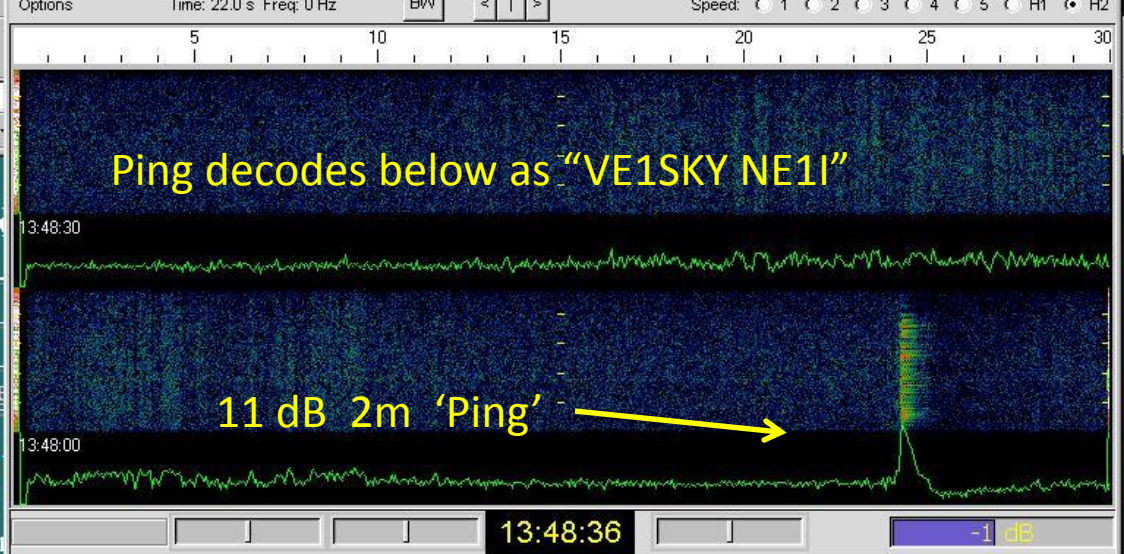
11/21 13:42 OK guys, brkfst call.....tnx to all for tr

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

FileID	T	Width	dB	Rpt	DF	Decode
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	ZZ/ 1!V\$J6GQP
134800	11.5	40	0	16	-323	!*\$S UI

Log QSO Stop Monitor Decode Erase TxStop

To radio: NE1I Lookup

Grid: fn42gr Add

Hot B: 266 Az: 247 Et: 17 341 mi

2010 Nov 21 13:48:37 Dsec 0.0

Gen Msgs Auto is OR

Rx noise: 0 dB T/R Period: 30 s Txing: NE1I VE1SKY 26



19.9 Time (s) WC4N_110707_105100

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
105100	16.8	180	0	26	-154	C4*3 G5 EP!LPLQG T Y6TR

Log QSO Stop Monitor Decode Erase TxStop

To radio:
 Grid:

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:

- WC4N VE1SKY Tx1
- WC4N VE1SKY 26 Tx2
- R26 Tx3
- RRR Tx4
- 73 Tx5
- CQ VE1SKY Tx6

ISCAT Mode Meteor Decode

The screenshot displays the WSJT 9.0 software interface. At the top, the title bar reads "WSJT 9.0 by K1JT". Below the title bar is a menu bar with options: File, Setup, View, Mode, Decode, Save, Band, Help. The main window is divided into several sections:

- Top Left:** A waterfall plot showing a meteor trail. A green line graph below it shows the signal strength over time. The time is 03:01:00.
- Top Right:** A frequency spectrum plot showing a peak at approximately 1.5 MHz.
- Middle:** A table of decode results. The selected entry is highlighted in blue.
- Bottom Left:** Control panels for "To radio" (K2MO), "Grid" (FN30jv), and "Hot A" (223). A large digital display shows the date "2011 Jul 14" and time "03:02:25".
- Bottom Center:** Control panels for "S" (-21), "Tol" (200), "Tx First", "Rpt" (-15), "Gen Msgs", and "Auto is ON".
- Bottom Right:** A list of decoded messages with radio buttons for Tx1 through Tx6. The selected message is "K2MO VE1SKY -15".
- Bottom Bar:** A status bar showing "1.0008 0.999", "ISCAT" (circled in red), "Freeze DF: 0", "Rx noise: -1 dB", "T/R Period: 30 s", and "Receiving".

A red arrow points from the text "ISCAT reports use dB" to the "ISCAT" button in the bottom bar.

FileID	Avg dB	DF	Decode
025659	-13	22	AISWDDDDJP?OPPTA??CXQSY4MYLF
025800	-12	-43	IQ1/EJTOKHOUK28K2HIRQ0
025800	-12	-43	IQ1/EJTOKHOUK28K2HIRQ0
025800	-12	22	VE1SKY K2MO/-1
025900	-19	22	RRR
030000	-20	65	
030100	-2	22	RRR
030100	-7	22	RRR

ISCAT reports use dB

1.0008 0.999 ISCAT Freeze DF: 0 Rx noise: -1 dB T/R Period: 30 s Receiving

QSO with W4AVY – 6m Es – not meteors

Ping Jockey Central by NØUK - Microsoft Internet Explorer

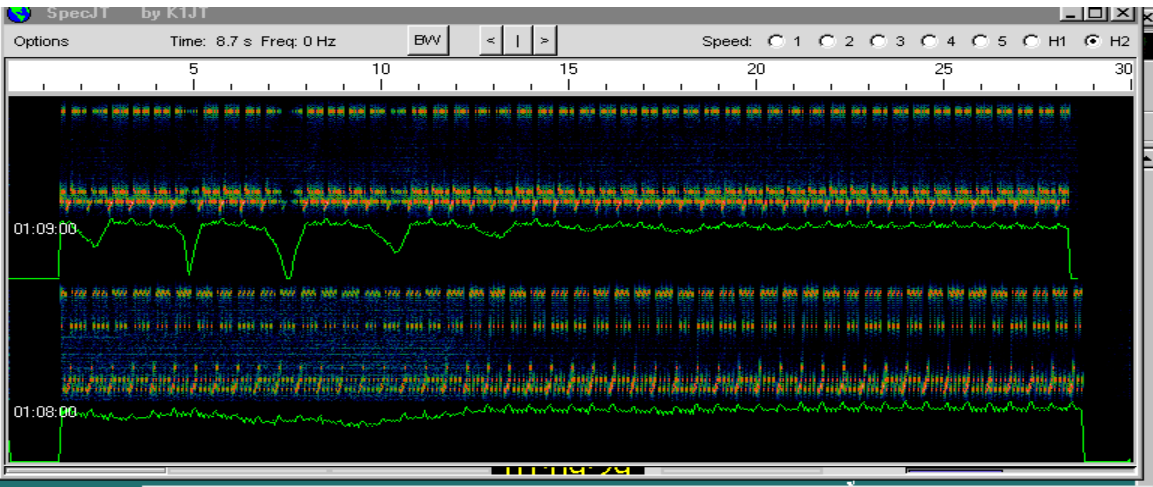
Address: <http://www.pingjockey.net/cgi-bin/pingtalk>

Ping Jockey

Relief page	Skeds in-progress
Refresh	Look back
Update User details	AA1YN Callsign database

You - YES YOU

This page is to be used only for the purposes of discussing



use is still

That means **DO NOT USE THIS PAGE**

Remember, in North America, 50.260MHz and

Exchanging any contact details on here before you're complete, invalid

WSJT 9.0 by K1JT

FileID Avg dB DF

010530	-20	-194	
010600	-15	43	VE1SKY W48VY
010559	0	43	VE1SKY W4AVY
010700	1	43	VE1SKY W4AVY
010700	0	43	VE1SKY W4AVY
010800	6	43	R-15
010800	9	43	R-15
010900	10	43	73

Log QSO Stop Monitor Decode Erase TxStp

To radio: W4AVY Grid: EM63rt Hot A: 234 Az: 243 El: 1 1363 mi Dsec: 0.0

2011 Jun 29 01:09:29

0.9953 1.0014 ISCAT Freeze DF: 0 Rx noise: 4 dB T/R Period: 30 s

Receiving

Enter your message here Go!

MM/DD UTC

06/29 01:08 Off Board (N9BX Bruce IL EN52v1 173.25.1

06/29 01:08 SKY, look at TX1 (W4AVY Garyc AL EM63rt 1

06/29 01:08 Harry... I not seeing a thing... strange

06/29 01:08 WA5DJJ Dave any reason to continue?

06/29 01:05 running 2nd ISCAT 263...if fine by you Gary

06/29 01:04 u want to try ISCAT first? (W4AVY Garyc

06/29 01:03 ur choice...I'm easy...263 for freq is good

06/29 01:02 What freq, mode? (W4AVY Garyc AL EM63rt 1

06/29 01:02 Tomk thanks report (WB3BEL Harry VA FM

06/29 01:01 OK SKY, I was calling Gene but looks like

06/29 01:01 = Harry solid copy in AZ (NØ7R Tomk AZ

06/29 01:00 Gary ?? want a run? (VE1SKY/6/2/70CM SK

06/29 00:59 RX David here (VE1SKY/6/2/70CM Sky NS

06/29 00:59 Dave GL (WB3BEL Harry VA FM18jt 96.255.252.100/

Let's "Experience" Meteorscatter

"Are you Experienced?"

J. H. 1967

METEORSCATTER QSO (ISCAT MODE) VE1SKY/K2MO

https://www.youtube.com/watch?v=Aq_kd_Lm-nl

METEORSCATTER QSO (FSK441 MODE)
W4IMD/K2MO

<https://www.youtube.com/watch?v=YBc-kukmN88>

ISCAT WEAK SIGNAL TEST

<https://www.youtube.com/watch?v=wKZjjVW0mkk>

Ping Jockey & PJ Client

PJ Client Ver 1.3.5

Options

```
04/07 12:39 VE2DSB/6/2/222 Dany QU FN35hs => Don't know if i'm on a right thinking....Antenna are tune
for lowest lobe at 144.120, not sure if that 20Khz cud make a difference....
04/07 12:39 WF0N Ted KS EM28ix => cq psk2k .280 east 1st
04/07 12:40 N5TM/2/6 Dange TX EL29ds => Watching 280 Ted
04/07 12:40 WF0N Ted KS EM28ix => rr gm
04/07 12:41 VE2DSB/6/2/222 Dany QU FN35hs => GM Ted...
04/07 12:41 WF0N Ted KS EM28ix => gm dany
04/07 12:41 N0LWF Lyle NE EN10wm => Dany, it's working this far anyway
04/07 12:42 VE2DSB/6/2/222 Dany QU FN35hs => yep!
04/07 12:52 N0KK/6/2 Kirk MN EN35ha => Any of you going to Dayton?
04/07 12:54 N0LWF Lyle NE EN10wm => I wish
04/07 12:55 VE2DSB/6/2/222 Dany QU FN35hs => Lyle, A birdies just born here can we go up 145....
04/07 12:56 N0LWF Lyle NE EN10wm => RR qsy to 145
04/07 12:56 VE2DSB/6/2/222 Dany QU FN35hs => 145 too.....
04/07 13:00 VE2DSB/6/2/222 Dany QU FN35hs => C'mon rox, make my day pse....
04/07 13:04 KJ70G Steveb AZ DM42mh => Lyle, are you blasting meteors on 6m with your Larcan amp?
04/07 13:05 N0LWF Lyle NE EN10wm => Steve not yet. Still need relays
04/07 13:06 KJ70G Steveb AZ DM42mh => RR, same here, plus adding cooling fans.
04/07 13:06 WF0N Ted KS EM28ix => cq stopped
04/07 13:07 N0LWF Lyle NE EN10wm => Did you try with cover on?
04/07 13:07 N5TM/2/6 Dange TX EL29ds => WF0N Tnx try..., Ted Will continue to be QRV 280
04/07 13:08 W9SE/6MTR John IL EN50lm => WF0N GM Ted Try on 50255?
04/07 13:10 KJ70G Steveb AZ DM42mh => Lyle, put on cover after adding matching cap on input line
04/07 13:10 WF0N Ted KS EM28ix => John, having bkfst. maybe later.
04/07 13:11 N0LWF Lyle NE EN10wm => Steve RR
04/07 13:12 N0LWF Lyle NE EN10wm => Dany, what you say?
04/07 13:12 KJ70G Steveb AZ DM42mh => Lyle, still getting poor efficiency at 500W key down, but so what.

04/07 13:12 VE2DSB/6/2/222 Dany QU FN35hs => Keep going till 1330z.....will see
04/07 13:12 N0LWF Lyle NE EN10wm => Dany RR
04/07 13:13 N0LWF Lyle NE EN10wm => Steve, better than 50w
04/07 13:13 W9SE/6MTR John IL EN50lm => OK Ted
04/07 13:14 W9SE/6MTR John IL EN50lm => QRV 6
04/07 13:14 K0RI Lou CO DM78px => K0RI QRV 6&2m
04/07 13:15 KJ70G Steveb AZ DM42mh => Lyle, yes, yes. yes. on 50 W-pseudo QRP
04/07 13:16 N3RG/6/2 Rayg NJ FM29ki => W9SE - GM John wanna try .267 U 1st st=on??
04/07 13:17 W9SE/6MTR John IL EN50lm => Sure Ray Running GL
```

Callsign	Name	Grid	Distance	Azimuth	State
K0RI	Lou	DM78px	2045	273	CO
KJ70G	Steveb	DM42mh	2574	266	AZ
N0KK/6/2	Kirk	EN35ha	1366	280	MN
N0LWF	Lyle	EN10wm	1583	270	NE
N3RG/6/2	Rayg	FM29ki	630	236	NJ
N5TM/2/6	Dange	EL29ds			
N9OLT	John	EN64am	1109	277	WI
VE2DSB/6/2/222	Dany	FN35hs	397	282	ON
W9SE/6/2	John	EN50lm	1237	264	IL
WF0N	Ted	EM28ix	1584	266	KS

Right click for additional features.

QSO Timer **0000**

Last Update: 13:17:46 UTC

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

Real-time Spots: DXMap & ON4KST

Browser address bar: <http://www.vhfdx.info/spots/map.php?Lan=E&Frec=50&Map=NA&mycall=>

Navigation: File Edit View Favorites Tools Help

Site: [VHFDX.INFO](#) | Personal | Radio | Software | DX-Sherlock | Travels | Humor | Translate | Login


DX Sherlock 2.3 - QSO/SWL real time maps

Map | List | Graph

Region: Europe | Africa | **North America** | South America | Asia | Oceania | World

Frequency: HF | **VHF** | 28 MHz | **50 MHz** | 70 MHz | 144 MHz | 432 MHz | >450 | All | Sat. | FM DX | Ticker | ES MUF

Options: Grey line | only DX-cluster

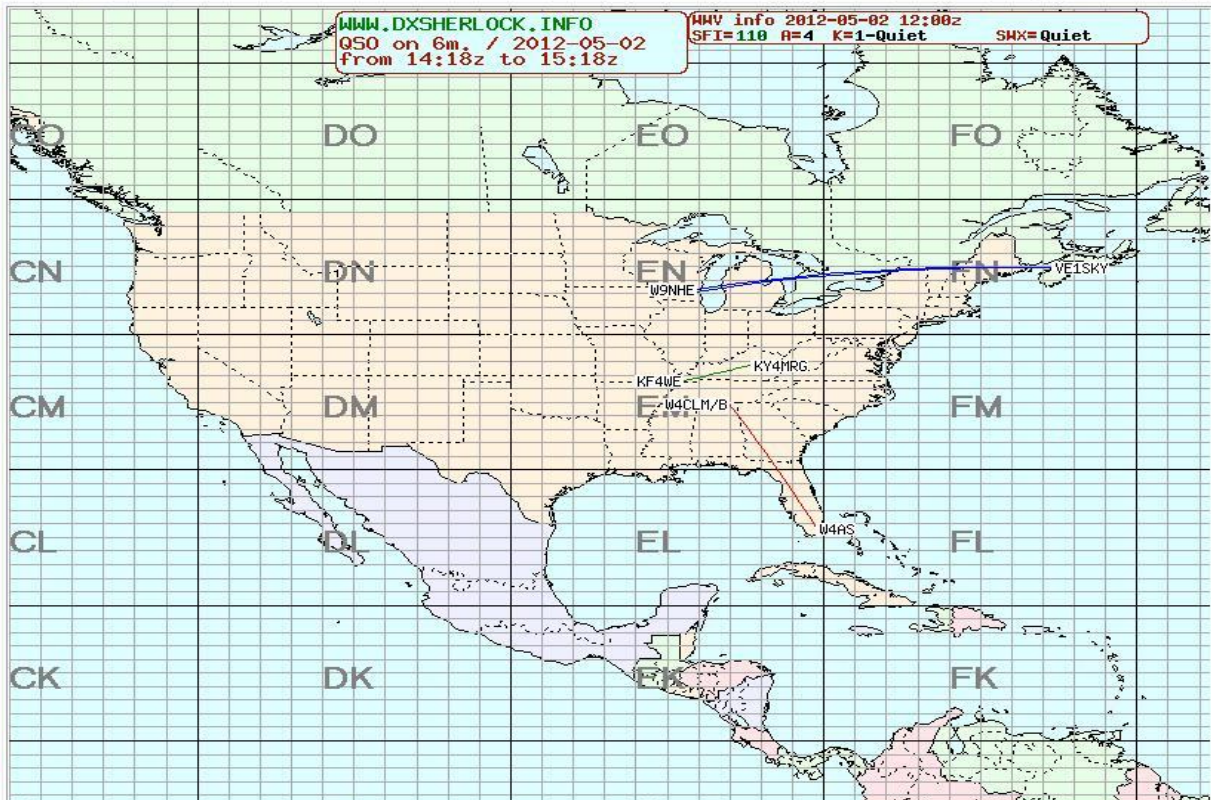


Scotch-Brite

HOW DO YOU FEEL ABOUT CLEANING?
TELL US AND ENTER TO
WIN

ENTER NOW

Legal 3M



Map call signs: DO, EO, FO, CN, DN, EN, DM, FM, CL, EL, FL, CK, DK, FK

Spot information:

- WWW.DXSHERLOCK.INFO
QSO on 6m / 2012-05-02
from 14:18z to 15:18z
- WV info 2012-05-02 12:00z
SFI=110 A=4 K=1-Quiet SHX=Quiet
- WONHE
- KY4MRG
- KF4WE
- W4CLM/B
- W4AS
- WEISKY

Legend:

- Aurora
- Aurora-E
- Back-Scatter
- EME
- Sporadic-E
- Multihop ES
- FAI

You must be logged in to send spots!

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 Central <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!