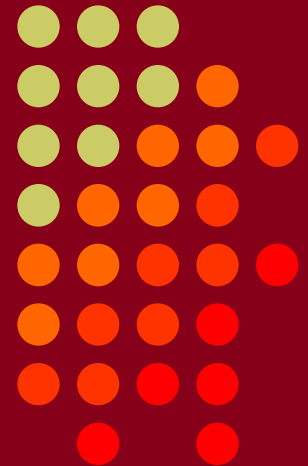


# CW and RTTY Skimmer and the Reverse Beacon Network

Presented by N6TV

[n6tv@arrl.net](mailto:n6tv@arrl.net)



• **CTU** •  
**CONTEST**  
UNIVERSITY

 **ICOM**<sup>®</sup>

# Overview



- What is CW Skimmer and RTTY Skimmer?
- What is the Reverse Beacon Network?
- How does it work?
- What can the RBN do for *me*?
- How can I use it?
- How can I help?
- What's new?

# It all starts with one developer

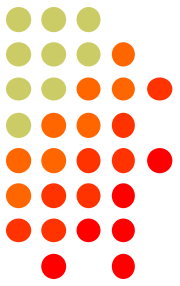


- Alex Shovkoplyas, **VE3NEA**  
(b. 1965, ex-UR5EMI, in Canada since 1998)

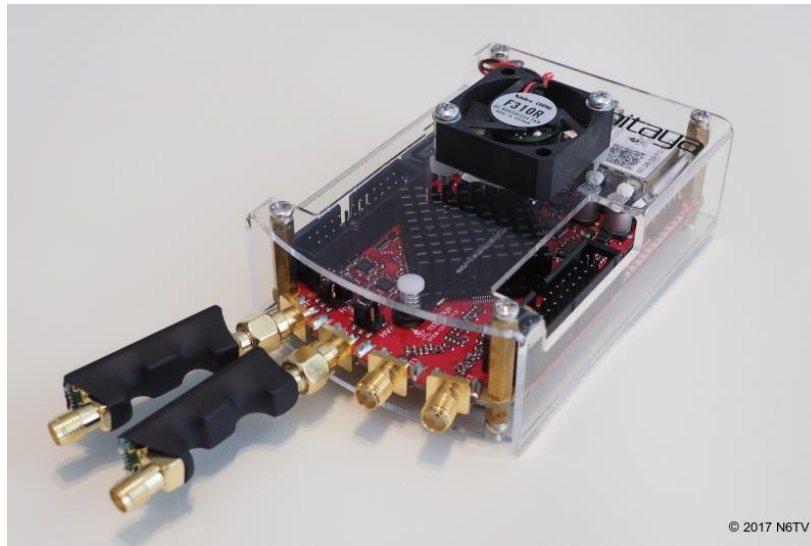


- Honored as RAC *Radio Amateur of the Year* for 2014

# What is CW Skimmer?



## 1. Hardware: PC + Software Defined Radio (SDR)



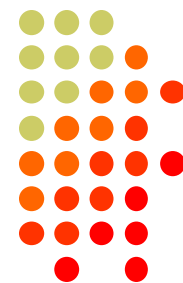
# SDR Antenna



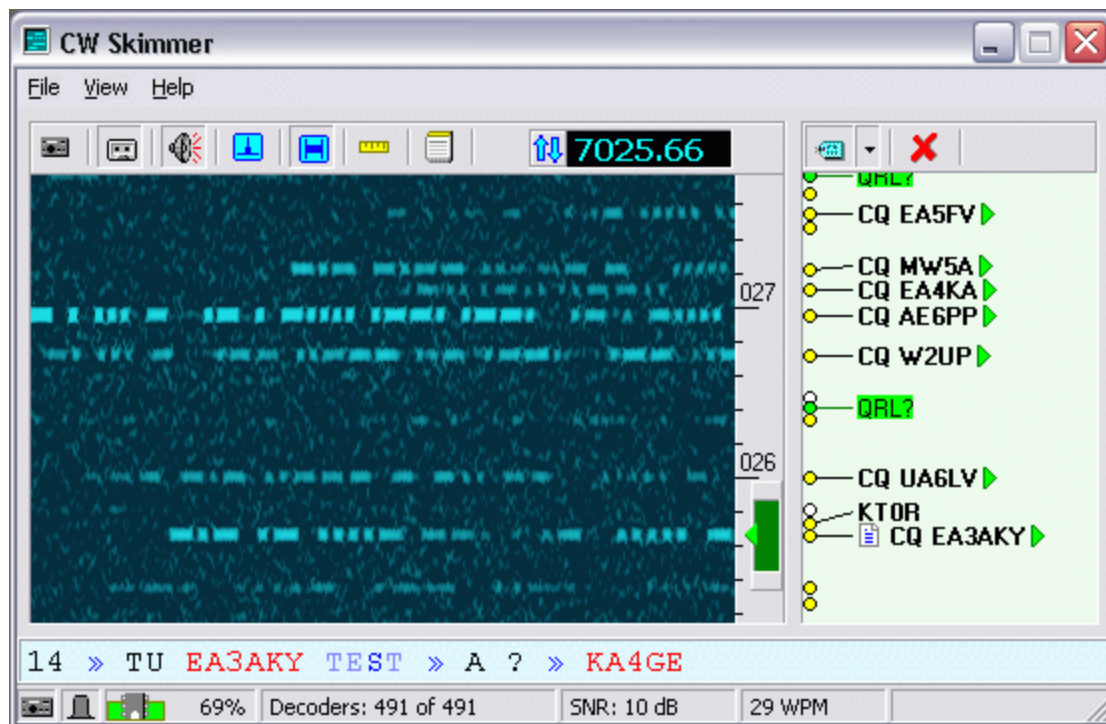
2. Wideband RX Antenna, 1.8-30 MHz, e.g. DX Engineering ARAH3-1P Active Dipole or DXE (formerly Pixel) Magnetic Loop RF-PRO-1B®:



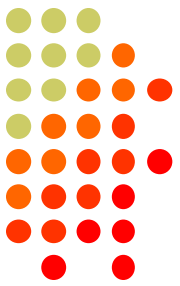
# Software



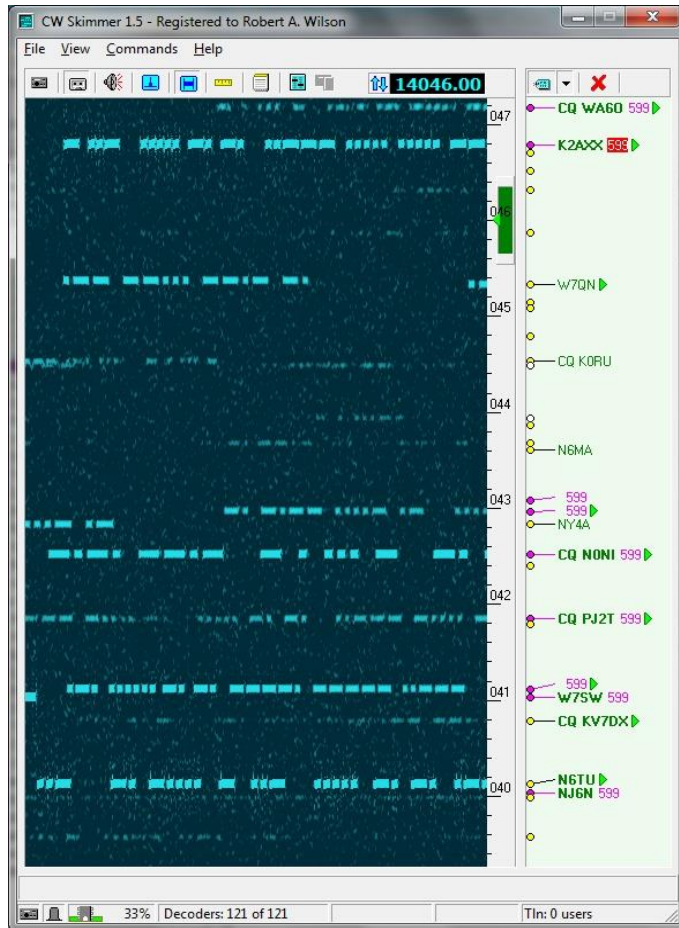
## 3. CW (or RTTY) Skimmer or Skimmer Server







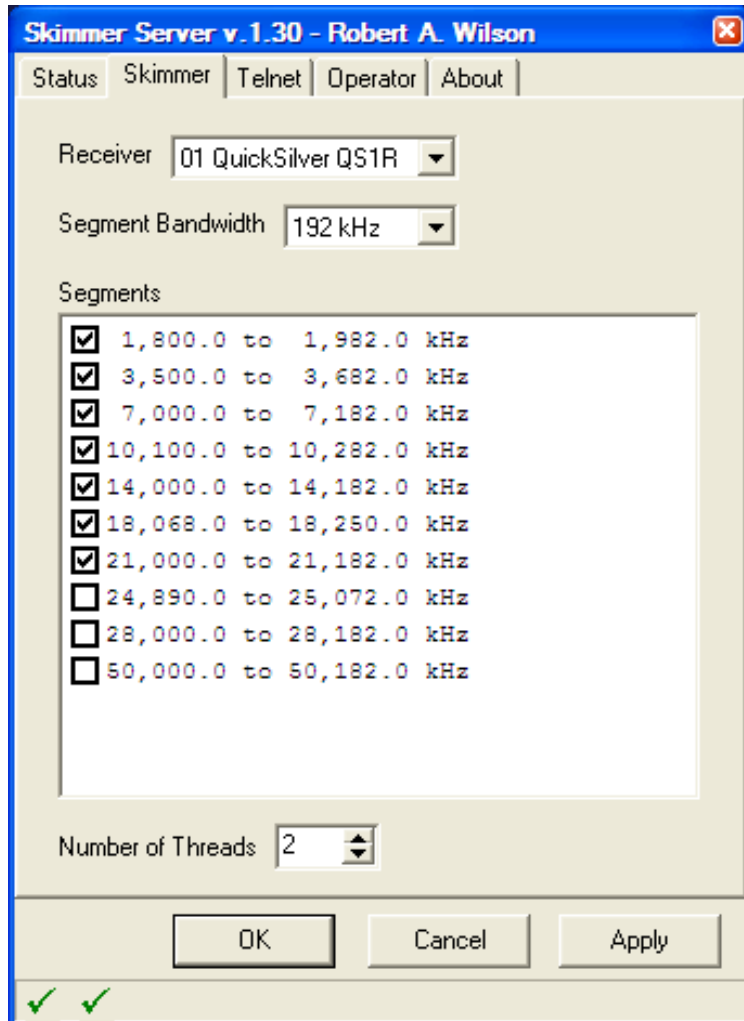
# CW Skimmer by VE3NEA



- Works with many SDRs
- Decodes *multiple* CW signals in real time
- Can monitor *entire* CW band (one at a time)
- Waterfall Display
- Band Scope
- Uses MASTER.DTA
- Telnet Server (emulates a DX Cluster)



# Skimmer Server by VE3NEA

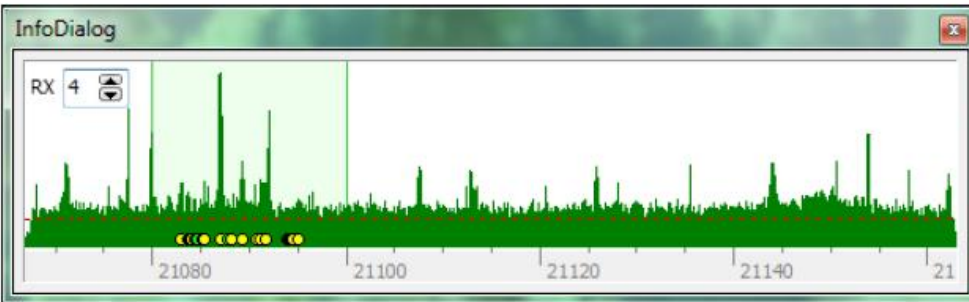
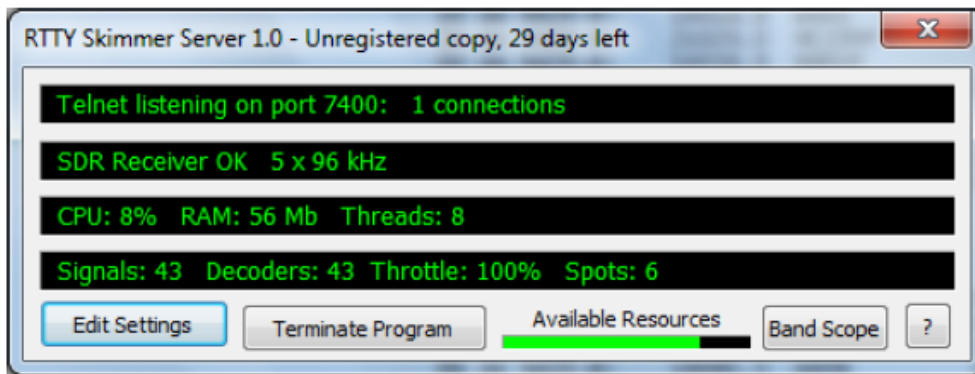


- Natively supports *only* the QS1R SDR (no longer made)
- Supports Red Pitaya running free SDR receiver software
- Decodes multiple CW signals in real time
- **Monitors *up to 8 bands at once with a single SDR***
- No Waterfall Display
- No Band Scope
- No MASTER.DTA
- Telnet Server





# RTTY Skimmer Server



- Natively supports only the QS1R SDR (no longer made)
- Supports Red Pitaya running free SDR receiver software
- Decodes multiple **RTTY** signals in real time
- **Monitors up to 8 bands with single SDR**
- Requires high-end CPU
- Limited Band Scope
- No MASTER.DTA
- Telnet Server



# Telnet server (localhost port 7300)

- Emulates a DX Cluster Node

```
DX de N6TV-#: 14058.7 WR7HE 24 dB 31 WPM CQ 2350
DX de N6TV-#: 14029.6 NM7D 29 dB 25 WPM CQ 2350
DX de N6TV-#: 14059.5 YW4D 35 dB 31 WPM CQ 2350
DX de N6TV-#: 14022.6 J39BS 11 dB 25 WPM CQ 2350
DX de N6TV-#: 14066.8 NF6A 38 dB 30 WPM CQ 2350
DX de N6TV-#: 14054.4 N5UM 26 dB 28 WPM CQ 2350
DX de N6TV-#: 14021.2 NN5J 35 dB 31 WPM CQ 2350
DX de N6TV-#: 14061.4 WX5S 12 dB 28 WPM CQ 2350
DX de N6TV-#: 14064.2 WQ5L 15 dB 28 WPM CQ 2350
DX de N6TV-#: 14032.2 UE7XF 18 dB 27 WPM 2350
DX de N6TV-#: 14042.9 NT5C 45 dB 31 WPM 2350
DX de N6TV-#: 14032.2 UE7XF 18 dB 27 WPM CQ 2350
DX de N6TV-#: 14039.2 EA3FP 15 dB 31 WPM CQ 2350
DX de N6TV-#: 14052.5 W0YR 20 dB 28 WPM CQ 2350
DX de N6TV-#: 14022.9 AB7E 32 dB 25 WPM CQ 2350
DX de N6TV-#: 14028.4 WH6R 7 dB 29 WPM 2350
DX de N6TV-#: 14065.6 KH7B 25 dB 29 WPM CQ 2350
To ALL de SKIMMER <0952Z> : Clicked on "UE7XF" at 14032.2
DX de N6TV-#: 14069.6 KF6T 13 dB 28 WPM CQ 2350
DX de N6TV-#: 14069.1 NK0M 25 dB 28 WPM CQ 2350
To ALL de SKIMMER <0952Z> : Clicked on "" at 14031.4
DX de N6TV-#: 14035.5 KF8GE 12 dB 26 WPM 2350
DX de N6TV-#: 14028.4 WH6R 7 dB 29 WPM CQ 2350
DX de N6TV-#: 14036.1 NZ1U 16 dB 28 WPM CQ 2350
DX de N6TV-#: 14062.7 N4QS 11 dB 29 WPM CQ 2350
DX de N6TV-#: 14045.1 YU1FM 20 dB 32 WPM CQ 2350
DX de N6TV-#: 14059.6 YW4D 35 dB 31 WPM 2350
```

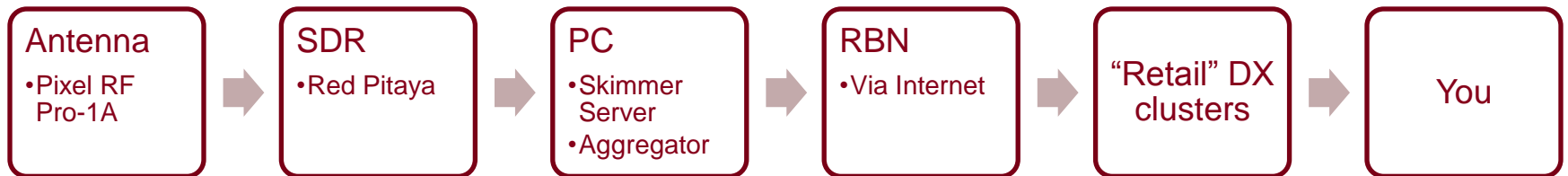
Reports Signal to Noise ratio, CW Speed, CQers

# What is the Reverse Beacon Network (RBN)?

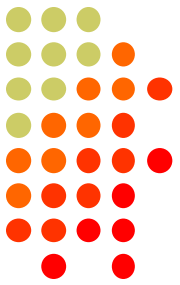


- Uses *any* CW or RTTY signal as a beacon
- Multiple Skimmers world-wide record signal strength (S/N ratio in dB) and CW speed (WPM)
- A free “Aggregator” program forwards Skimmer spots to a central server
- Central server distributes spots via web page and public telnet servers
- You don't need to have an SDR to use it

# How do spots get to you?



# Acknowledgements



- RBN web site and first aggregator originated by PY1NB (similar to his other web site, [www.dxwatch.com](http://www.dxwatch.com)). Felipe pays most of the bills.
- Lots of code by W3OA (aggregator), F5VIH (Spots analysis tool)
- CW Skimmer evangelized and tested by N4ZR (also publishes [RBN blog](#)) – “RBN Chief Evangelist”
- Telnet server support by K5TR, W2QO, KM3T

# Felipe Ceglia, PY1NB

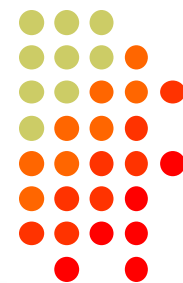


- Created and maintains the Reverse Beacon Network
- Hosts dxwatch.com and reversebeacon.net





# Dick Williams, W3OA



- Created and maintains the current RBN Aggregator software



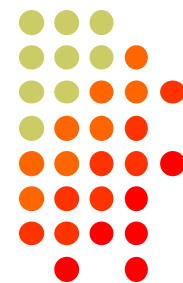
# Nick Sinanis, F5VIH



- Wrote the RBN Spots Analysis Tool



# Pete Smith, N4ZR



- RBN Chief Evangelist
- Presenter at Contest Forum this Saturday
- Skimmertalk Reflector:  
<http://dayton.contesting.com/mailman/listinfo/skimmertalk>
- Groups.IO Group: RBN-OPS  
<https://groups.io/g/RBN-OPS>  
(187+ members)



# What can the RBN do for *me*?



- It can improve your score
  - Fills spots in band map (SOA, Multi-op)
  - Spots *you* (very often, *if* you call CQ *properly*)
- Entering a contest?
  - Before: Check antenna F/B, signal strength
  - During: See where you are being heard, view skimmer-generated propagation maps
  - After: Compare signal strength with the competition

# How can I use RBN to improve my score?



- Make sure the Skimmers find and spot *you*
- Access RBN via your favorite **DX Cluster**, for CW and RTTY contests (when allowed)
- RBN will post far more spots than DXers
  - With smaller pileups, less competition
- RBN quickly fills the **band map** in your logging software
- RBN helps locate **clear spots** to call CQ (between stations that you may not hear)

# How can I use RBN to improve my score (cont'd):



- The RBN reveals band openings, shows where *you* are being heard
- At K3LR, sunrise on 15m:  
“Spotted by S50ARX-#”
- First EU answered our 15m CQs 25 minutes later



# How do I CQ “properly”?



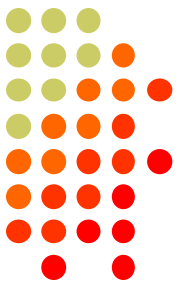
- Send *everything* at the *same consistent speed*
  - Never use  $>/<$  or  $+++/-$  to change speed in messages
- Call CQ or TEST and send your call twice
  - CQ N6TV N6TV
  - TEST N6TV N6TV
  - CQ N6TV N6TV TEST
- Use proper spacing (let computer send)
  - Don't send with paddles and *rush-everything-together*
- Change your freq. *slightly* to get spotted again

# What counts as “CQ”?

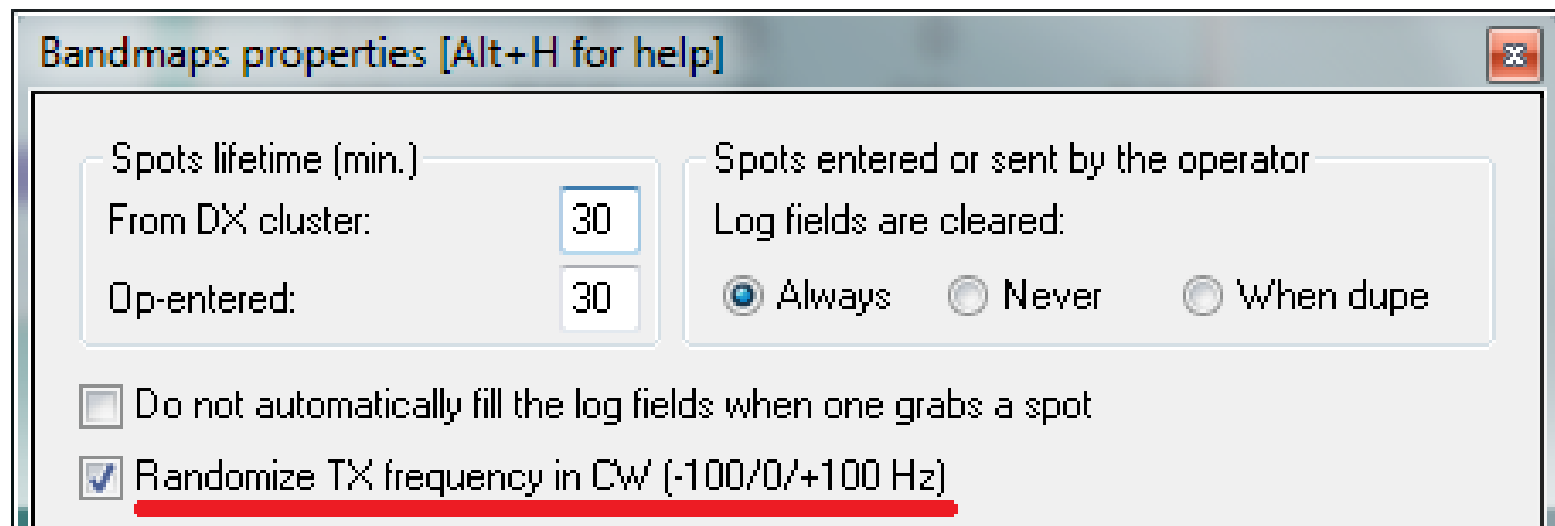


- Originally just: “CQ”, “TEST”, and “QRZ”
- VE3NEA Added: “FD”, “SS”, “NA” and “UP”
- Examples:
  - P5DX P5DX UP
  - SS N6TV N6TV
  - NA N6TV N6TV
  - FD N6TV N6TV FD
- Short calls like “W1F” should always be sent twice to help Skimmer identify it quickly

# How to improve your chances in a Skimmer-generated pileup



- Use XIT or the “randomize TX” feature of your logging program to **call a bit off frequency**.



# How do I use the RBN to Check My Antennas?



- To test performance, just call CQ on CW or RTTY, check RBN web site (turn beam, repeat)
- Use RBN web site's "Spots Analysis Tool" to compare your signal to the competition
- Download raw data files for deeper analysis
  - Every RBN spot posted since February, 2009 is archived on the RBN web site

# Accessing the RBN (SOA, Multi)



1. Many DX clusters combine RBN and human spots using AR-Cluster V6 (see [www.dxcluster.info](http://www.dxcluster.info) for address listing).
  - Some ARC V6 clusters offer CT1BOH spot quality filters (flags busts, uniques)
2. dxc.ve7cc.net port 23  
CC Cluster software – removes many bad spots (uniques) and dupes

# Filtering Spots (old way)



- DXSpider

- `accept/spots by_zone 1,3,4,6,7,31` and not by WZ7I or call N6TV
- [http://www.dxcluster.org/main/filtering\\_en.html#toc1](http://www.dxcluster.org/main/filtering_en.html#toc1)

- ARCluster V6

- set dx filter `call=N6TV` or (`unique>1` and (`spotterstate=CA` or `spotterstate=NV` or `spotterstate=UT`))
- <http://www.n8noe.us/ARC.html>





# Filtering Spots (new way)

- Use **CC User** software by VE7CC to log in to **dxc.ve7cc.net** port **23**
- CC User sets filters with a full-feature, Graphical User Interface (GUI)
- CC Cluster nodes *automatically* reject “unique” (busted) spots, eliminates dupes
- New **AR-Cluster Client** by AB5K
- Updated Tutorial:
  - <http://reversebeacon.blogspot.com/2013/12/a-new-tutorial-on-using-rbn.html>

# CC User Filter Dialogs



Settings Country State Bands Locals = 11 DX WwV = 4 Login Msg Ann = 5 Wx Mail

filter7 reject not by\_dxcc @ VE7CC-1

<input type="checkbox"/> 4U1U	<input type="checkbox"/> FO/c	<input type="checkbox"/> J8	<input type="checkbox"/> TG	<input type="checkbox"/> VP5
<input type="checkbox"/> 6Y	<input type="checkbox"/> FP	<input checked="" type="checkbox"/> K	<input type="checkbox"/> TI	<input type="checkbox"/> VP9
<input type="checkbox"/> 8P	<input type="checkbox"/> HH	<input type="checkbox"/> KG4	<input type="checkbox"/> TI9	<input type="checkbox"/> XE
<input type="checkbox"/> C6	<input type="checkbox"/> HI	<input type="checkbox"/> KL	<input type="checkbox"/> V2	<input type="checkbox"/> XF4
<input type="checkbox"/> CM	<input type="checkbox"/> HK0/a	<input type="checkbox"/> KP1	<input type="checkbox"/> V3	<input type="checkbox"/> YN
<input type="checkbox"/> CY0	<input type="checkbox"/> HP	<input type="checkbox"/> KP2	<input type="checkbox"/> V4	<input type="checkbox"/> YS
<input type="checkbox"/> CY9	<input type="checkbox"/> HR	<input type="checkbox"/> KP4	<input checked="" type="checkbox"/> VE	<input type="checkbox"/> YV0
<input type="checkbox"/> FG	<input type="checkbox"/> J3	<input type="checkbox"/> KP5	<input type="checkbox"/> VP2E	<input type="checkbox"/> ZF
<input type="checkbox"/> FJ	<input type="checkbox"/> J6	<input type="checkbox"/> OX	<input type="checkbox"/> VP2M	
<input type="checkbox"/> FM	<input type="checkbox"/> J7	<input type="checkbox"/> PJ7	<input type="checkbox"/> VP2V	

NA 2  
EU  
AF  
AS  
SA  
OC

Filter Type  
DX Origination  
Announce  
DX Country

Pass Reject

Ask Cluster Tell Cluster Set Clear

Settings Country State Bands Locals = 40 DX = 9 WwV L

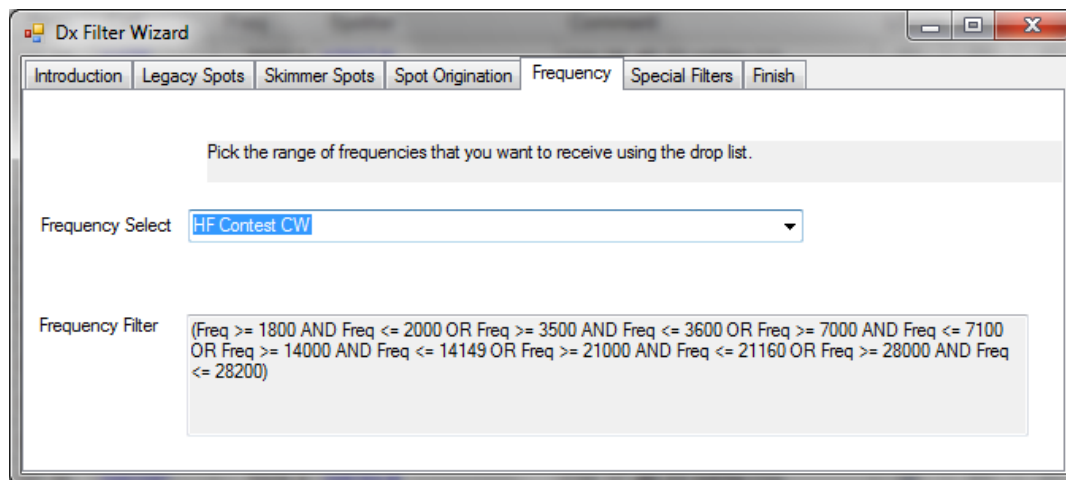
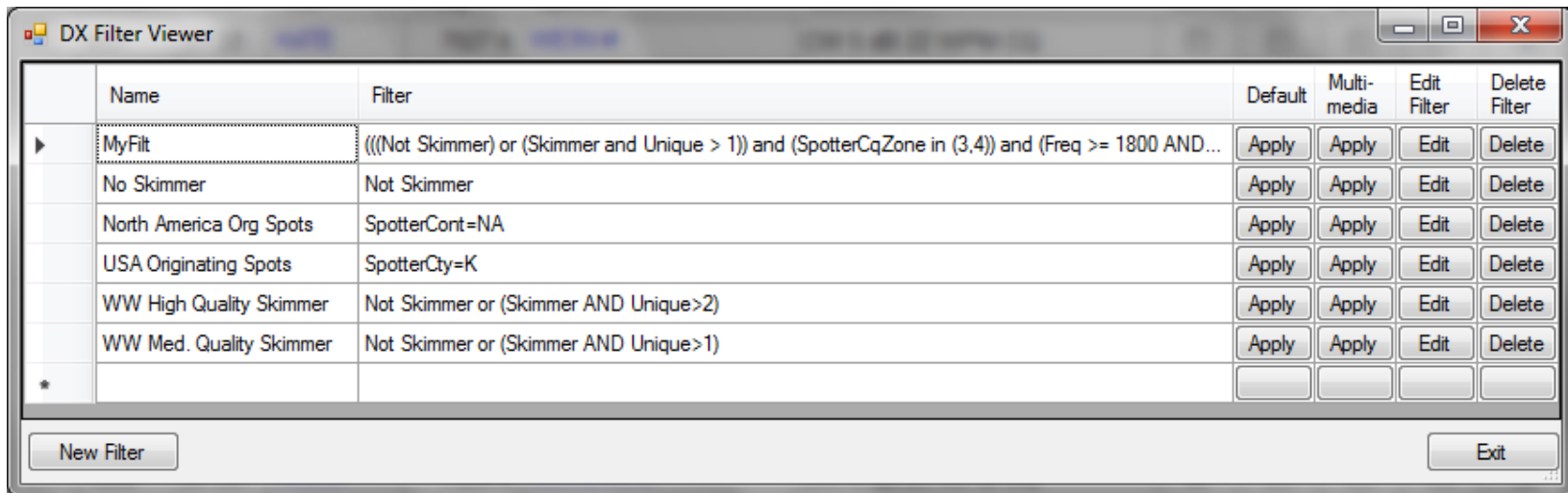
States and Provinces

W1	W2	W3	W4	W5	W6	W7	W8	W9	W0	VE	
<input type="checkbox"/> CT	<input type="checkbox"/> NJ	<input type="checkbox"/> DC	<input type="checkbox"/> AL	<input type="checkbox"/> AR	<input type="checkbox"/> CA	<input checked="" type="checkbox"/> AZ	<input type="checkbox"/> MI	<input type="checkbox"/> IN	<input type="checkbox"/> CO	<input type="checkbox"/> NB	<input checked="" type="checkbox"/> SK
<input type="checkbox"/> MA	<input type="checkbox"/> NY	<input type="checkbox"/> DE	<input type="checkbox"/> GA	<input type="checkbox"/> LA		<input checked="" type="checkbox"/> ID	<input type="checkbox"/> OH	<input type="checkbox"/> IL	<input type="checkbox"/> IA	<input type="checkbox"/> NS	<input checked="" type="checkbox"/> AB
<input type="checkbox"/> ME		<input type="checkbox"/> MD	<input type="checkbox"/> KY	<input type="checkbox"/> MS		<input checked="" type="checkbox"/> MT	<input type="checkbox"/> WV	<input type="checkbox"/> WI	<input type="checkbox"/> KS	<input type="checkbox"/> PE	<input checked="" type="checkbox"/> BC
<input type="checkbox"/> NH		<input type="checkbox"/> PA	<input type="checkbox"/> NC	<input type="checkbox"/> NM		<input checked="" type="checkbox"/> NV			<input type="checkbox"/> MN	<input type="checkbox"/> NL	<input type="checkbox"/> NT
<input type="checkbox"/> RI			<input type="checkbox"/> FL	<input type="checkbox"/> OK		<input checked="" type="checkbox"/> OR			<input type="checkbox"/> MO	<input type="checkbox"/> QC	<input type="checkbox"/> NU
<input type="checkbox"/> VT			<input type="checkbox"/> SC	<input type="checkbox"/> TX		<input checked="" type="checkbox"/> WA			<input type="checkbox"/> NE	<input type="checkbox"/> ON	<input type="checkbox"/> YT
			<input type="checkbox"/> TN			<input checked="" type="checkbox"/> WY			<input type="checkbox"/> ND	<input type="checkbox"/> MB	
			<input type="checkbox"/> VA			<input checked="" type="checkbox"/> UT			<input type="checkbox"/> SD		

Ask Cluster Tell Cluster Clear

# AR-Cluster Client by AB5K

[www.n8noe.us/ARC.html](http://www.n8noe.us/ARC.html)



# Many nodes combine RBN and “legacy” (human) spots



- dxc.ve7cc.net port 23 (CC Cluster, many filtering options, use CC User to set them)
- dxc.w9pa.net port 7373 (AR Cluster)  
`set dx extension skimmerquality`
- dxc.n7tr.com port 7373 (AR Cluster, but pre-filters to show only spots from Zones 3 and 4)

# Real-time propagation maps



- <http://www.dxmaps.com>
- Click “HF” and band of interest
- Leave page open, it refreshes automatically



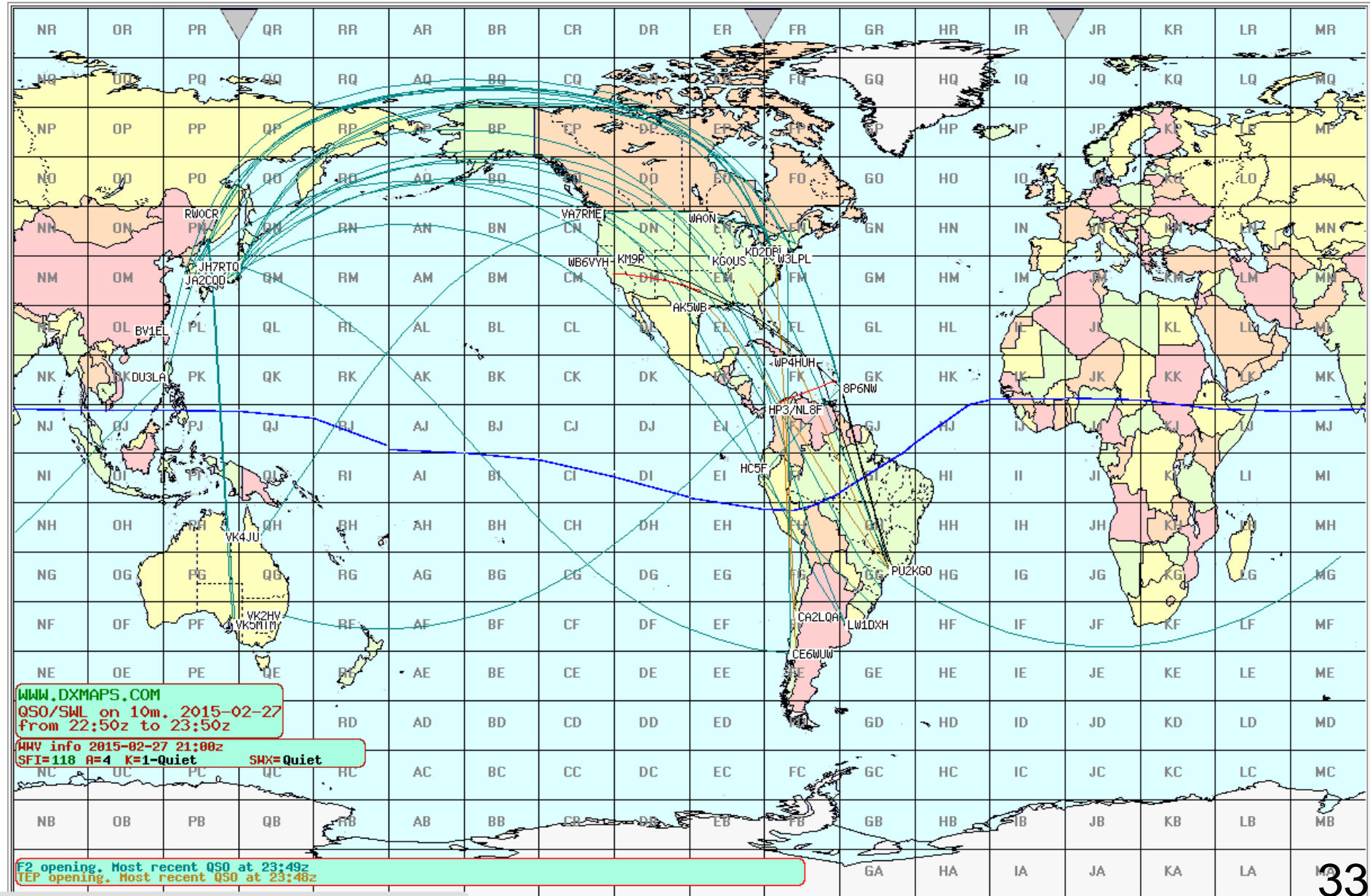


# DXMAPS 2.6 - QSO/SWL real time maps

**Map** List Graph  
**LF - HF** VHF & up

Europe Africa North America South America Asia Oceania **World**  
2200 m 600 m 160 m 80 m 60 m 40 m 30 m 20 m 17 m 15 m 12 m **10 m** All bands

☐ Grey line  
☒ **Only DX-Cluster**

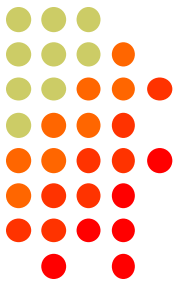




WWW.DXMAPS.COM  
QSO/SWL on 10m, 2015-02-27  
from 22:50z to 23:50z  
MUV info 2015-02-27 21:00z  
SFI=118 A=4 K=1-Quiet SMX=Quiet  
F2 opening. Most recent QSO at 23:49z  
E2 opening. Most recent QSO at 23:48z

# Using [www.reversebeacon.net](http://www.reversebeacon.net)



- Great for post-contest analysis
- Plot signal strengths
- Raw data files can be downloaded / analyzed
  - Millions of spots archived



www.reversebeacon.net

REVERSE BEACON NETWORK

callsign lookup:

welcome **main** dx spots skimmers downloads about contact us

## Welcome to the reverse beacon network!

The Reverse Beacon Network is a revolutionary new idea. Instead of beacons actively transmitting signals, the RBN is a network of stations listening to the bands and reporting what stations they hear, when and how well.

If you already know all this, skip directly to the [main page](#).

So why should you care? Well, to begin with, you can see band openings in near-real time on an animated map. You can call a quick CQ, and see which reverse beacons hear you, and how strong you are. [Try It!](#)

But the real breakthrough is in the database of past "spots". You can instantly find out what stations, from a given country or zone, have been heard, at what times and on what frequencies. You can see when you've been spotted, who spotted you, and how loud you were. [Try It!](#)

### Check out our blog!

[Aggregator 2.1 - new insight for Skimmer ops](#)

The newest Aggregator, Version 2.1, is now available, after extensive beta testing. This post explains the new features of this release, tab by tab. First of all, there is an entirely new tab titled "Skimmer Traffic." Here's what it looks like...

#### statistics:

we have 70 skimmers online

we have 115 visitors online

#### skimmers online:

9V1RM - 20m,15m,17m

AB1HL -

10m,20m,30m,80m,40m,17m

DJ9IE - 40m

DK8NE - 6m

DK9IP - 30m,80m,40m

DL0LBS -

DL2CC - 20m,30m,80m,40m

DL3KR -

DR1A - 20m 30m 80m 40m

# www.reversebeacon.net main



← → ↻ ⬆️ www.reversebeacon.net/main.php

## REVERSE BEACON NETWORK callsign

welcome main dx spots skimmers downloads about contact us

[show/hide my last filters](#)

no filter selected, showing all spots rows to show: 50

[search spot by callsign](#)

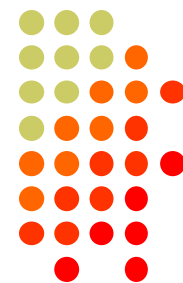
de	dx	freq	cq/dx	snr	speed	time
W4AX	🇨🇦 HB9TPT	10115.5	CQ	6 dB	19 wpm	0945z 02 Apr
EA4TX	🇨🇦 HB9TPT	10115.5	CQ	8 dB	19 wpm	0945z 02 Apr
IK3STG	🇨🇦 HB9TPT	10115.5	CQ	17 dB	20 wpm	0945z 02 Apr
K8ND	🇨🇦 VE1ZZ	1823.5	CQ	28 dB	19 wpm	0945z 02 Apr
W3OA	🇨🇦 VE1ZZ	1823.5	CQ	21 dB	19 wpm	0945z 02 Apr
K1TTT	🇨🇦 VE1ZZ	1823.5	CQ	35 dB	19 wpm	0945z 02 Apr
WZ7I	🇨🇦 VE1ZZ	1823.5	CQ	36 dB	20 wpm	0945z 02 Apr
KB9AMG	🇨🇦 VE1ZZ	1823.5	CQ	14 dB	19 wpm	0945z 02 Apr
RZ3DVP	✉️ MS5RAI	10117.5	CQ	12 dB	28 wpm	0945z 02 Apr
KH6LC	🇦🇷 LU9DO	14012.0	CQ [LoTW]	28 dB	14 wpm	0945z 02 Apr

**options:**  
[show/hide](#)

**news**  
[RBN blog: stay tuned!](#)  
we have 67 skimmers online  
we have 147 visitors online

**skimmers online:**  
9V1RM - 10m,17m,12m,15m  
AB1HL - 20m,30m,40m,17m  
DJ9IE - 40m  
DK1MAX -  
DK8NE - 6m  
DK9IP -  
20m,30m,40m,17m,12m,15m  
DL0LBS -  
DL2CC - 20m,30m,40m,17m,15m

# Where was I heard?



← → ↻ 🏠 [www.reversebeacon.net/dxsd1/dxsd1.php?f=0&c=N6TV&t=dx](http://www.reversebeacon.net/dxsd1/dxsd1.php?f=0&c=N6TV&t=dx)

## REVERSE BEACON NETWORK

[welcome](#) [main](#) [dx spots](#) [skimmers](#) [downloads](#) [about](#) [contact us](#)

[show/hide my last filters](#)

showing spots for DX call: N6TV rows to show: 50

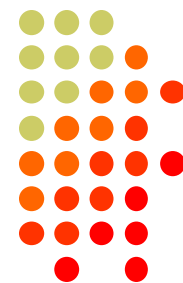
[search spot by callsign](#)

search callsign:  ☒ DX ☐ DE

wildcard \* allowed

de	dx	freq	cq/dx	snr	speed	time
<a href="#">WZ7I</a>	<a href="#">N6TV</a>	28019.0	CQ [LoTW]	19 dB	25 wpm	<a href="#">2021z 01 Apr</a>
<a href="#">K1TTT</a>	<a href="#">N6TV</a>	28019.1	CQ [LoTW]	18 dB	24 wpm	<a href="#">2017z 01 Apr</a>
<a href="#">S50ARX</a>	<a href="#">N6TV</a>	28019.0	CQ [LoTW]	12 dB	25 wpm	<a href="#">2017z 01 Apr</a>

# Plot spots on a map



REVERSE BEACON NETWORK

callsign

welcome

main

dx spots

skimmers

downloads

about

contact us

show/hide my last filters

no filter selected, showing all spots

rows to show: 50

search spot by callsign

de	dx	freq	cq/dx	snr	speed	time
W4AX	HB9TPT	10115.5	CQ	6 dB	19 wpm	0945z 02 Apr
EA4TX	HB9TPT	10115.5	CQ	8 dB	19 wpm	0945z 02 Apr
IK3STG	HB9TPT	10115.5	CQ	17 dB	20 wpm	0945z 02 Apr
K8ND	VE1ZZ	1823.5	CQ	28 dB	19 wpm	0945z 02 Apr
W3OA	VE1ZZ	1823.5	CQ	21 dB	19 wpm	0945z 02 Apr
K1TTT	VE1ZZ	1823.5	CQ	35 dB	19 wpm	0945z 02 Apr
WZ7I	VE1ZZ	1823.5	CQ	36 dB	20 wpm	0945z 02 Apr
KB9AMG	VE1ZZ	1823.5	CQ	14 dB	19 wpm	0945z 02 Apr
RZ3DVP	MS5RAI	10117.5	CQ	12 dB	28 wpm	0945z 02 Apr
KH6LC	LU9DO	14012.0	CQ [LoTW]	28 dB	14 wpm	0945z 02 Apr

options:

show/hide

news

RBN blog: stay tuned!

we have 67 skimmers online

we have 147 visitors online

skimmers online:

9V1RM - 10m,17m,12m,15m

AB1HL - 20m,30m,40m,17m

DJ9IE - 40m

DK1MAX -

DK8NE - 6m

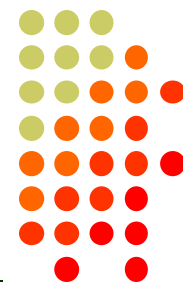
DK9IP -

20m,30m,40m,17m,12m,15m

DL0LBS -

DL2CC - 20m,30m,40m,17m,15m

# Which bands are open at *my* QTH?



**REVERSE BEACON NETWORK** callsign

welcome main dx spots skimmers downloads about contact us

Map Satellite Hybrid

North America South America Europe Africa Asia Australia

Pacific Ocean Atlantic Ocean Indian Ocean

POWERED BY Google

/ 160m / 80m / 40m / 30m / 20m / 17m / 15m / 12m / 10m / 6m / 2m

world wide / zoom to US / zoom to Europe / zoom to North Atlantic

show/hide my last filters

showing spots for spotter call: N6TV

search spot by callsign

rows to show: 50

de dx freq cq/dx snr speed time

options:  
[show/hide](#)

language:  
english

spots format:  
dxwatch

☒ tracking mode on  
☒ show flags  
☒ show lotw users

tag new spots:  
since last update

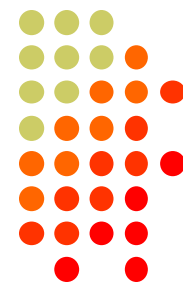
map (beta version):  
☒ show with grayline  
☐ show  
☐ hide

spots lifetime:  
10 minutes

watch list:  
no watchlist



# Spots analysis tool



REVERSE BEACON NETWORK

welcome main **dx spots** skimmers downloads about contact us

download raw data

**Welcome to the Reverse Beacon Network!**

The Reverse Beacon Network (RBN) is a network of amateur radio operators who share their spot data. Instead of beacons actively transmitting signals, the RBN is a network of operators who listen on the bands and reporting what stations they hear, when and how well.

If you already know what you want to search for, you can use the **spot search** tool to analyze and compare spots.

create your filter!

HF >

VHF+ >

HF

VHF+

HF/CW

Check out our blog!


[Aggregator 2.1 - new insight for Skimmer ops](#)

The newest Aggregator, Version 2.1, is now available after extensive beta testing. This



# Pick a Date, a Skimmer, add callsigns to compare



1. Select a comparison date 

MM/DD/YY

2. Select a Reverse Beacon


▶ Europe

▼ North America

- ☐ AA4VV 354 spots
- ☐ K1TTT 5318 spots
- ☒ K3MM 6926 spots
- ☐ K8ND 3751 spots
- ☐ KA9SWE 657 spots
- ☐ KB9AMG 181 spots
- ☐ KC0VKN 877 spots

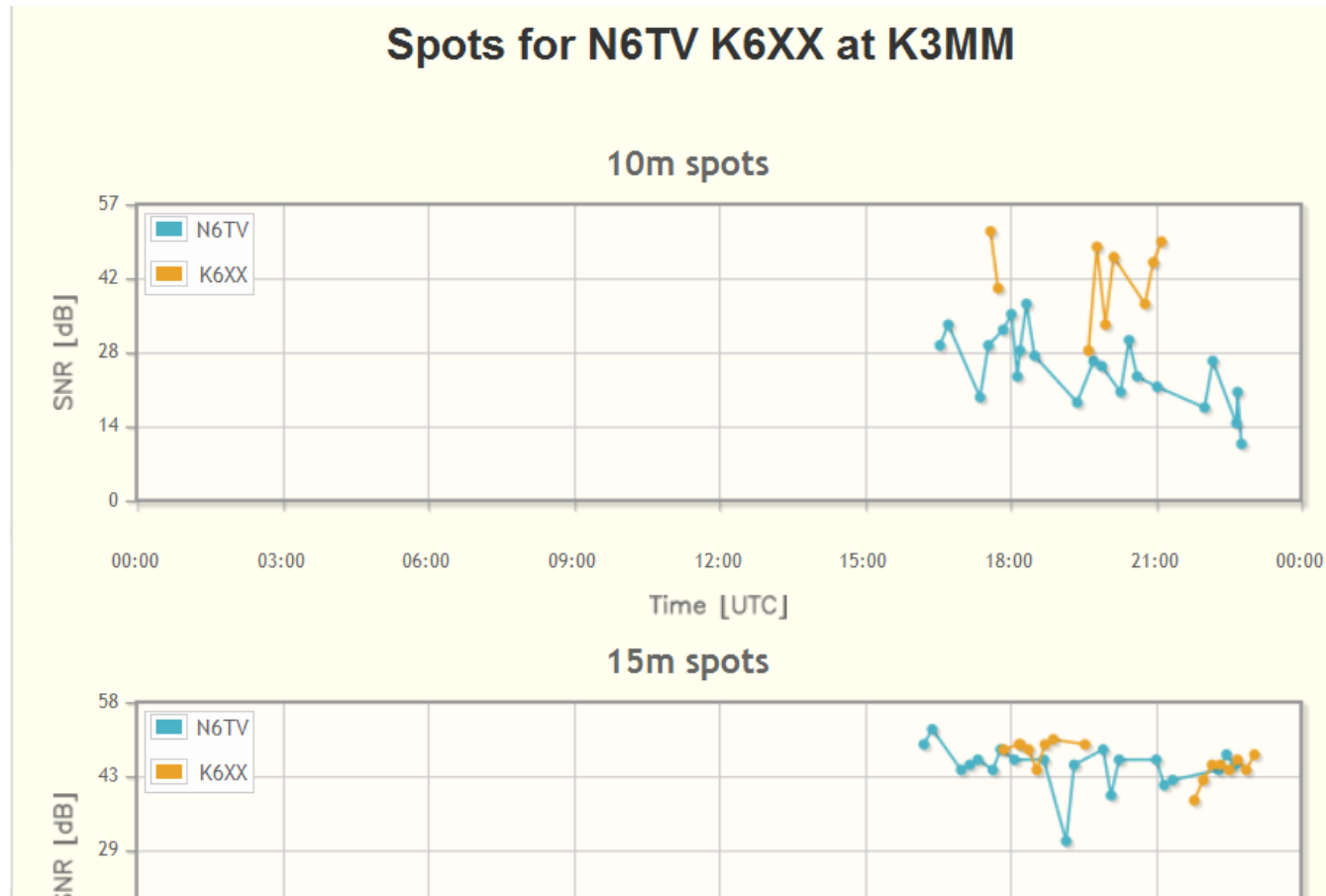
▶ Africa

▶ Oceania

3. Enter callsigns to compare 

<input type="text" value="X"/>	<input type="text" value="N6TV"/>	58 spots
<input type="text" value="X"/>	<input type="text" value="K6XX"/>	29 spots

# And the winner is ... K6XX!



# Raw data downloads



REVERSE BEACON NETWORK

welcome main dx spots skimmers downloads about contact us

download raw data

### Raw data downloads

spots analysis tool

spot search

create your filter!

HF >

VHF+ >

HF

VHF+

HF/CW

HF/SSB

VHF+/CW

VHF+/SSB

1.8/3.5/7MHz

14/21/28MHz

10/18/24MHz

1089KBytes

20120201.zip

20120202.zip

20120203.zip

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20120205.zip

20120206.zip

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20121231.zip

# Raw data is text file, Comma Separated Values



```
callsign,de_pfx,de_cont,freq,band,dx,dx_pfx,dx_cont,mode,db,date,speed,tx_mode  
JE1SGH,JA,AS,28032.6,10m,K6UW,K,NA,CQ,29,2014-02-15 00:00:00,32,CW  
XV4Y,3W,AS,14041.1,20m,PT5T,PY,SA,CQ,22,2014-02-15 00:00:00,28,CW  
XV4Y,3W,AS,14021,20m,PX2F,PY,SA,CQ,23,2014-02-15 00:00:00,23,CW  
NC7J,K,NA,28005.5,10m,N2IC,K,NA,CQ,11,2014-02-15 00:00:00,33,CW
```

- Total World-Wide RBN CW spots, CQ WW:

2013: 5,743,545 (33.2 spots per second)

2014: 6,200,340 (35.9) – up 8.0%

2015: 7,085,553 (41.0) – up 14.0%

2016: 6,060,130 (35.1) – down 14.5%

2017: 7,004,509 (40.5) – up 15.6%

- ARRL DX CW:

2014: 4,146,399 (86,383 spots per hour)

2015: 5,537,017 (115,354) – up 33.5%

2016: 3,924,585 (81,762) – down 29.1%

2017: 4,285,719 (89,286) – up 9.2%

2018: 4,474,188 (93,212) – up 4.4%

# What's the Average CW Speed of a Spot?



- CQ WW CW:

2013:	30.6 WPM
2014:	30.8
2015:	30.7
2016:	30.8
2017:	30.8

- ARRL DX CW:

2014:	29.6 WPM
2015:	30.1
2016:	29.9
2017:	29.6
2018:	29.4



# RTTY Skimmer Stats

- CQ World-Wide RTTY (48 hours):

2015: 922,311 (5.3 spots per second)

2016: 994,212 (5.8) – up 7.8%

2017: 1,154,444 (6.7) – up 16.1%

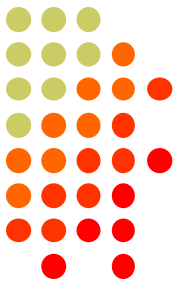
- ARRL January RTTY Roundup (30 hours):

2016: 457,033 (15,234 spots per hour)

2017: 470,377 (15,679) – up 2.9%

2018: 566,063 (18,869) – up 20.3%

# How can I help?



- Set up an SDR, feed Skimmer Spots to the RBN, using the Aggregator program
  - More skimmers needed in Asia/Africa/South America
- Call a bit off frequency (Win-test and N1MM both provide automatic randomization if desired)

# What's New?



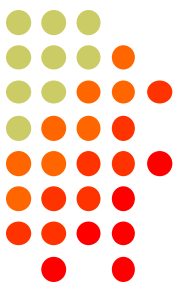
- NCDXF and other HF Beacons can be spotted on RBN
  - [reversebeacon.blogspot.com/2014/02/ncdxf-beacon-spotting-redux.html](http://reversebeacon.blogspot.com/2014/02/ncdxf-beacon-spotting-redux.html)
- CW Skimmer 2.0
- CW Skimmer Server 1.6
- RTTY Skimmer Server 1.3
- Aggregator v4.4
- Skimmer Server using Red Pitaya on 8 bands





# For more information

- <http://www.reversebeacon.net>
- <http://www.dxmaps.com>
- <http://www.bcdxc.org/ve7cc/default.htm#download>
- <http://www.dxatlas.com/CwSkimmer>
- <http://www.dxatlas.com/SkimServer>
- <http://microtelecom.it/perseus/> (Perseus SDR)
- <https://redpitaya.com/> (Red Pitaya)
- <http://hamsci.org/n6tv-red-pitaya-combine-cw-rtty-skimmer-hdsdr>



# For more information

- <http://www.dxengineering.com/parts/ins-rf-pro-1b> (RF Pro-1B loop antenna)
- <http://www.dxengineering.com/parts/dxe-ar3-1p> (Active Broadband Dipole antenna)
- <http://www.pvrc.org/~n4zr/rbn.pdf>
- <http://reversebeacon.blogspot.com/2013/12/a-new-tutorial-on-using-rbn.html>
- <http://reversebeacon.blogspot.com>
- <http://www.ve7cc.net/>
- <http://www.qrz.com/db/n6tv>

# Questions?

