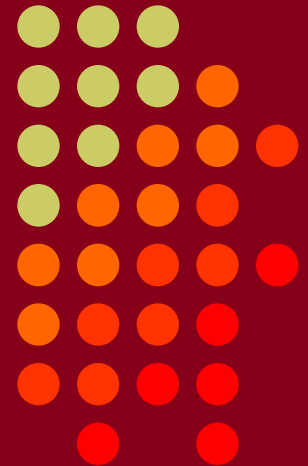


# CW Skimmers, DX Cluster, and the Reverse Beacon Network

Presented by N6TV

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



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

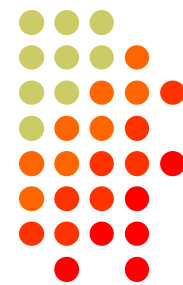
 **ICOM**<sup>®</sup>

# Overview



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

# It all starts with one developer



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



# What is CW Skimmer?



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



# SDR Antenna



## 2. Wideband RX Antenna, 1.8-30 MHz

Pixel Tech.  
Loop  
RF Pro-1B:



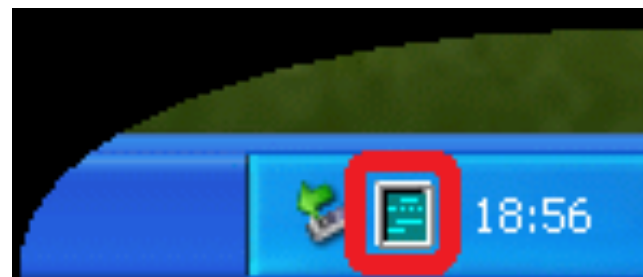
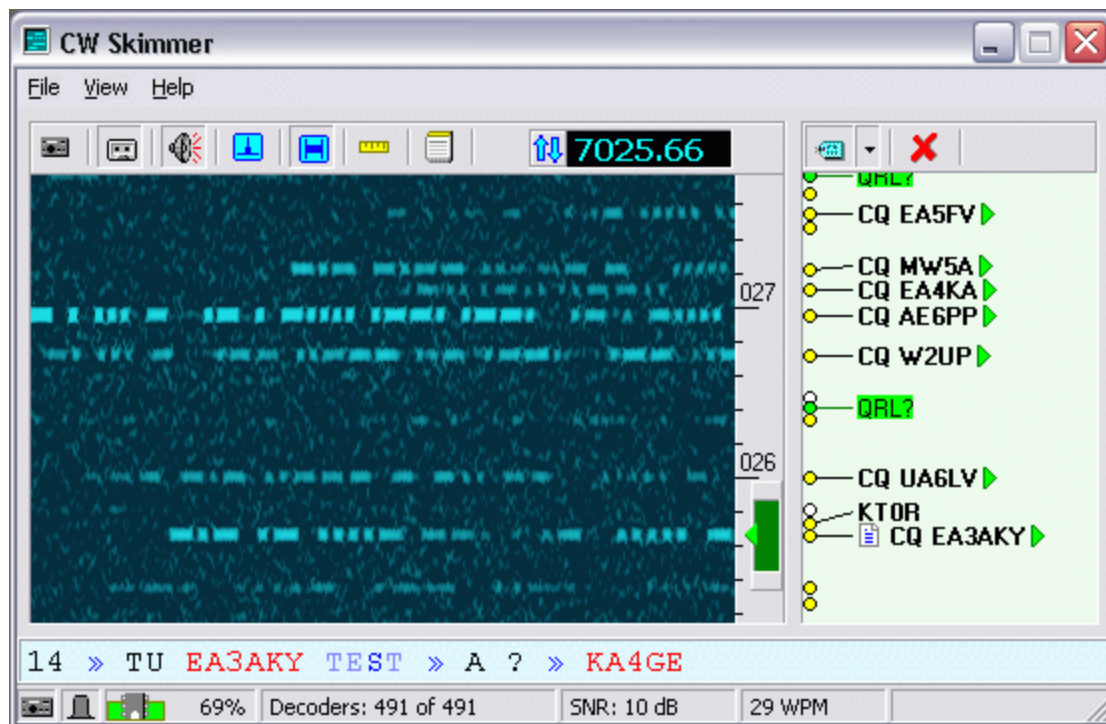
DX Engineering  
Active Horizontal  
ARAH3-1PE:



# Software

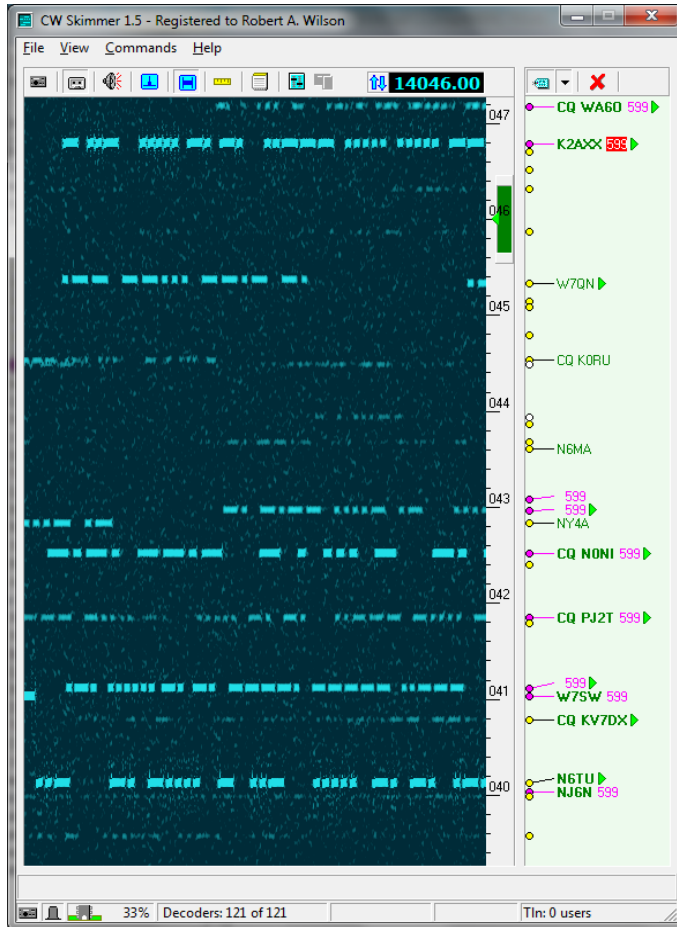


## 3. CW Skimmer or Skimmer Server



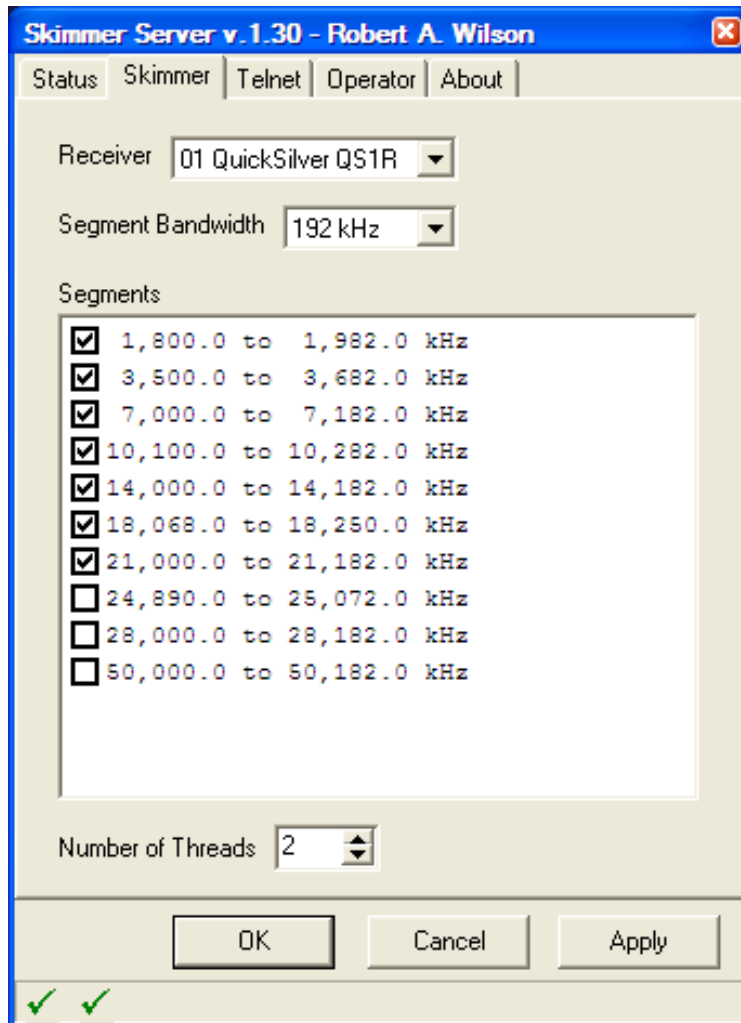


# CW Skimmer by VE3NEA



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

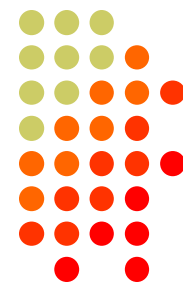
# Skimmer Server by VE3NEA



- Only supports QS1R SDR
- Decodes multiple CW signals in real time
- Monitors *multiple bands* with single SDR
- No Waterfall Display
- 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
    
```

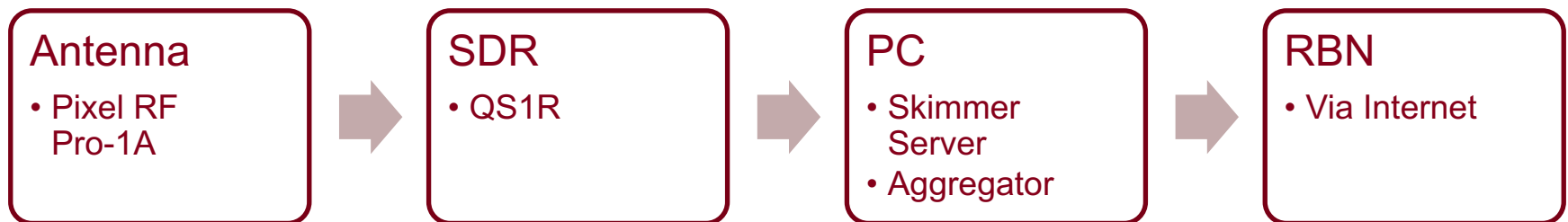
Reports Signal to Noise ratio, CW Speed, CQers

# What is the Reverse Beacon Network (RBN)?



- Uses *any* CW signal as a beacon
- Multiple CW Skimmers world-wide record signal strength (S/N ratio in dB) and CW speed (WPM)
- A free “Aggregator” program forwards CW 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 the RBN server?

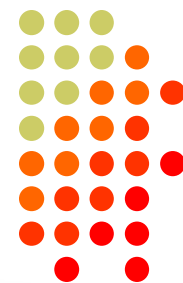


# Acknowledgements



- RBN web site and first aggregator originated by PY1NB (similar to his other web site, [www.dxwatch.com](http://www.dxwatch.com)). Felipe pays all 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 Propagandist”
- 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 the newest RBN Aggregator software



# Nick Sinanis, F5VIH



- Wrote the RBN Spots Analysis Tool





# Pete Smith, N4ZR

- RBN Chief Evangelist
- Skimmertalk Reflector:  
<http://dayton.contesting.com/mailman/listinfo/skimmertalk>



# What can the RBN do for *me*?



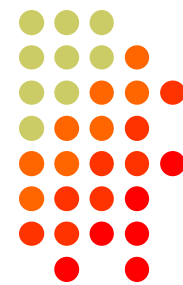
- It can improve your score
  - Fills spots in band map (SOA, Multi-op)
  - Spots *you* very often, if you CQ “properly”
- Entering a contest?
  - Before: Check antenna F/B, signal strength
  - During: See where you are being heard
  - After: Compare signal strength with the competition

# How can I use RBN to improve my score?



- Make sure the Skimmers find *you*
- When permitted, use RBN as **DX Cluster** for CW and RTTY contests
  - Far more spots, with smaller pileups than human-posted Cluster spots
  - Quickly fills up your logging software **band map**
  - Helps you find **clear spots** (between stations you can't hear)
  - Shows where *you* are being heard
    - E.g. at K3LR on 15m: **"Spotted by S50ARX-#"**  
(First EU answered our 15m CQs 25 minutes later)

# How do I CQ “properly”?

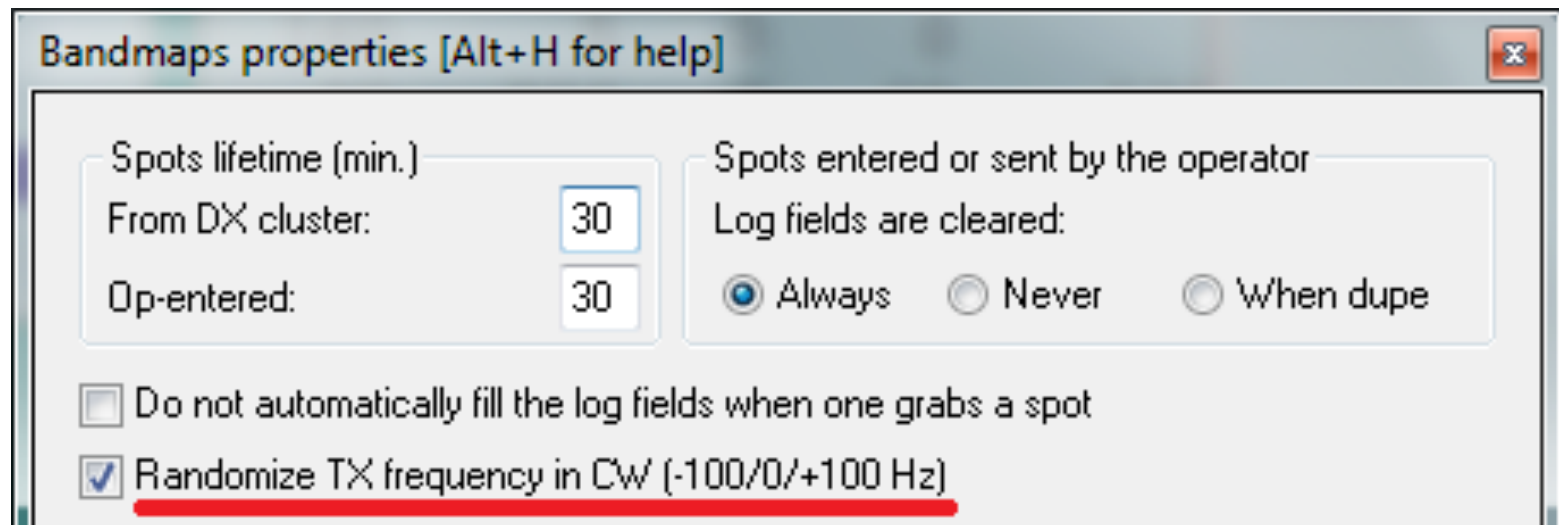


- Send *everything* at the *same consistent speed*
  - Never use *>/<* or *+++/--* to change speed in messages
- Call CQ or TEST and send your call twice
  - CQ N6TV N6TV
  - TEST N6TV N6TV
  - CQ N6TV N6TV TEST
- Use proper spacing (let computer send)
  - Don't send with paddles and rush everything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

# 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?



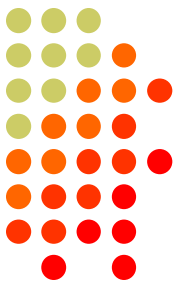
- To test performance, just call CQ on CW, check RBN web site (turn beam, repeat)
- Use RBN web site's "Spots Analysis Tool" to compare your signal to the competition
- Download raw data files for deeper analysis
  - Every RBN spot posted since February, 2009 is archived on the site

# Accessing the RBN (SOA, Multi)



1. telnet.reversebeacon.net port 7000  
(DX Spider software)
2. arcluster.reversebeacon.net port 7000  
(V6 AR-Cluster software)
3. dxc.ve7cc.net port 23  
(CC Cluster software – removes bad spots!)
4. Some clusters combine RBN *and* human spots (VE7CC, W9ZRX, N7TR)
5. <http://www.reversebeacon.net>





# Filtering Spots (old way)

- telnet.reversebeacon.net port 7000
  - 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.reversebeacon.net port 7000
  - set dx filter call=N6TV or (**unique**>1 and (spotterstate=CA or spotterstate=NV or spotterstate=UT))
  - <http://www.ab5k.net/ArcDocsVer6/UserManual/ArcDx.htm>



# Filtering Spots (new way)

- Use **CC User** software by VE7CC to log in to **dxc.ve7cc.net** and program filters with a full-feature Graphical User Interface
- CC Cluster nodes *automatically* reject “unique” (busted) spots
- Tutorial:
  - <http://reversebeacon.blogspot.com/2010/11/using-rbn-telnet-server-brief-tutorial.html>
- Reference:
  - <http://www.bcdxc.org/ve7cc/default.htm#download>

# 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

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



- dxc.ve7cc.net port 23 (CC Cluster, many filtering options, use CC User to set them)
- dxc.w9zrx.net port 7373 (AR Cluster)
- dxc.n7tr.com port 7373 (AR Cluster, but pre-filters to show only spots from Zones 3 and 4)

# 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



← → ↻ 🏠 🌐 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](http://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

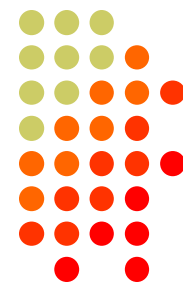
**options:**  
[show/hide](#)

**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
<a href="#">W4AX</a>	<a href="#">HB9TPT</a>	10115.5	CQ	6 dB	19 wpm	<a href="#">0945z 02 Apr</a>
<a href="#">EA4TX</a>	<a href="#">HB9TPT</a>	10115.5	CQ	8 dB	19 wpm	<a href="#">0945z 02 Apr</a>
<a href="#">IK3STG</a>	<a href="#">HB9TPT</a>	10115.5	CQ	17 dB	20 wpm	<a href="#">0945z 02 Apr</a>
<a href="#">K8ND</a>	<a href="#">VE1ZZ</a>	1823.5	CQ	28 dB	19 wpm	<a href="#">0945z 02 Apr</a>
<a href="#">W3OA</a>	<a href="#">VE1ZZ</a>	1823.5	CQ	21 dB	19 wpm	<a href="#">0945z 02 Apr</a>
<a href="#">K1TTT</a>	<a href="#">VE1ZZ</a>	1823.5	CQ	35 dB	19 wpm	<a href="#">0945z 02 Apr</a>
<a href="#">WZ7I</a>	<a href="#">VE1ZZ</a>	1823.5	CQ	36 dB	20 wpm	<a href="#">0945z 02 Apr</a>
<a href="#">KB9AMG</a>	<a href="#">VE1ZZ</a>	1823.5	CQ	14 dB	19 wpm	<a href="#">0945z 02 Apr</a>
<a href="#">RZ3DVP</a>	<a href="#">MS5RAI</a>	10117.5	CQ	12 dB	28 wpm	<a href="#">0945z 02 Apr</a>
<a href="#">KH6LC</a>	<a href="#">LU9DO</a>	14012.0	CQ [LoTW]	28 dB	14 wpm	<a href="#">0945z 02 Apr</a>

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

Atlantic Ocean Pacific Ocean Indian Ocean

POWERED BY Google

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

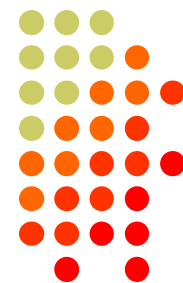
tag new spots:  
since last update

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 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
- ☐ K6ND 3751 spots
- ☐ KA9SWE 657 spots
- ☐ KB9AMG 181 spots
- ☐ KC0VKN 877 spots

▶ Africa

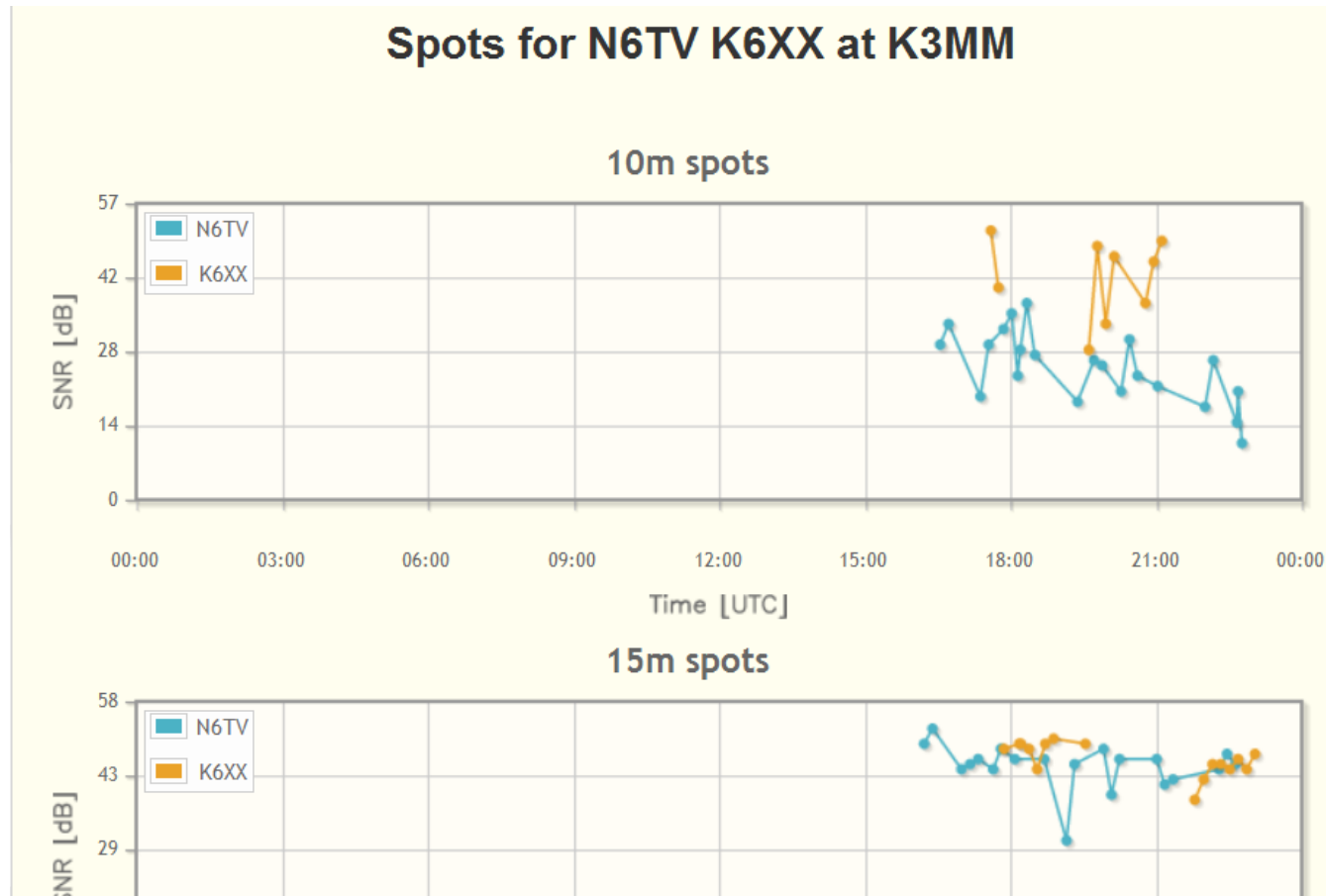
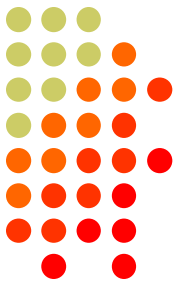
▶ Oceania

3. Enter callsigns to compare

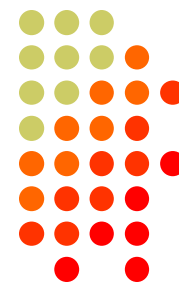
<input type="text" value="X"/>	<input type="checkbox" value="N6TV"/>	N6TV	58 spots
<input type="text" value="X"/>	<input type="checkbox" value="K6XX"/>	K6XX	29 spots

Add

# 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

Data from the RBN can be downloaded for analysis.

Simply use the interface to select the data you want. The zipped files can be downloaded by a single click on the filename.

The data files then can be viewed by opening in Excel. Note, however, that on busy days the amount of data will be large. For example, on Saturday, during the 2010 ARRL DX CW contest, the RBN produced a full daily data set, containing all the data for the day.

The only thing that you share your ideas for analyzing them, as well as any results, with the RBN community. Of course, you will retain full rights for any other publication. Please keep in touch with us.

Click on the year, and then the month, and then the day, to see available data. You can also use the controls below.

collapse all months

2012

January	February	March	April	May	June	July	August	September	October	November	December
01 Wednesday	02 Thursday	03 Friday	04 Saturday	05 Sunday	06 Monday	07 Tuesday	08 Wednesday	09 Thursday	10 Friday	11 Saturday	12 Sunday
13 Monday	14 Tuesday	15 Wednesday	16 Thursday	17 Friday	18 Saturday	19 Sunday	20 Monday	21 Tuesday	22 Wednesday	23 Thursday	24 Friday
25 Saturday	26 Sunday	27 Monday	28 Tuesday	29 Wednesday	30 Thursday	31 Friday					

1.8/3.5/7MHz

14/21/28MHz

10/18/24MHz

1089KBytes

20120201.zip

20120202.zip

20120203.zip

Dayton 2014

# 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
NC7J,K,NA,7020,40m,N0NI,K,NA,CQ,27,2014-02-15 00:00:00,27,CW
NC7J,K,NA,7000.9,40m,W1VE,K,NA,CQ,14,2014-02-15 00:00:00,35,CW
```

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

2012: 3,163,126 (18.3 spots per second)

2013: 5,743,545 (33.2 spots per second) – up 81.5%

## ARRL DX CW:

2013: 3,937,108 (82,023 spots per hour)

2014: 4,146,399 (86,383 spots per hour) – up 5.3%



# What's the Average CW Speed?



- 2013 CQ WW CW: 30.6 WPM
- 2014 ARRL DX CW: 29.6 WPM
- How did I calculate these statistics?
- Simple one line Unix/Cygwin command:

```
grep -e ",CW *$" 2013112?.csv | gawk -F,  
'{sum+=$12} END { print "2013 CQ WW CW Spots =  
",NR; print "Avg Speed = ",sum/NR}'
```

# 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

# What's New?



- NCDXF and other HF Beacons can be spotted on RBN (see RBN blog)
- CW Skimmer 1.83 Released
- Aggregator v3.0 Released



# For more information

- <http://www.reversebeacon.net>
- <http://www.bcdxc.org/ve7cc/default.htm#download>
- <http://www.dxatlas.com/CwSkimmer>
- <http://www.dxatlas.com/SkimServer>
- <http://www.srl-llc.com/> (QS1R SDR)
- <http://microtelecom.it/perseus/> (Perseus SDR)
- <http://www.pixelsatradio.com/product/shortwave-magnetic-loop-antenna/> (RF Pro-1B loop antenna)
- <http://www.dxengineering.com/parts/dxe-ar3-1pe> (ARAH3-1PE horizontal antenna)

# For more information



- <http://www.pvrc.org/~n4zr/rbn.pdf>
- <http://reversebeacon.blogspot.com>
- <http://www.ve7cc.net/>
- <http://www.qrz.com/db/n6tv>

# Questions?

