NN4ZZ CwSkimmer and SDR-Bridge setup – A quick start guide

Revision History

```
14-Jun-2014 - added Telnet screen
11-Aug-2014 - added additional notes about SmartCat and DAX control panel
20-Jan-2015 - update version numbers and added troubleshooting notes
21-Jan-2015 - Added troubleshooting note about BLIND mode
 6-Feb-2015 - Added "contents", added screen shots, reorganized
 9-Feb-2015 - Added notes about the Reverse Beacon Network
15-Feb-2015 - update SDR-Bridge version, additional troubleshooting notes
15-Mar-2015 – Added SDR-Bridge setup screen, note on skimmer audio tab
17-Mar-2015 – Added notes for SSDR V1.4 changes
11-Apr-2015 – Added "output sample rate" error note
18-Feb-2016 – Added new version info and more troubleshooting tips
25-Mar-2017 – Added CW Skimmer Left/right channel troubleshooting tip
 7-Jun-2017 - Added RBN setup notes from Andy / KU7T
 6-Dec-2018 – Added flow diagram
18-Feb-2020 – Added channel bandwidth troubleshooting tip
19-Feb-2020 – Added weak decoding outside band troubleshooting tip
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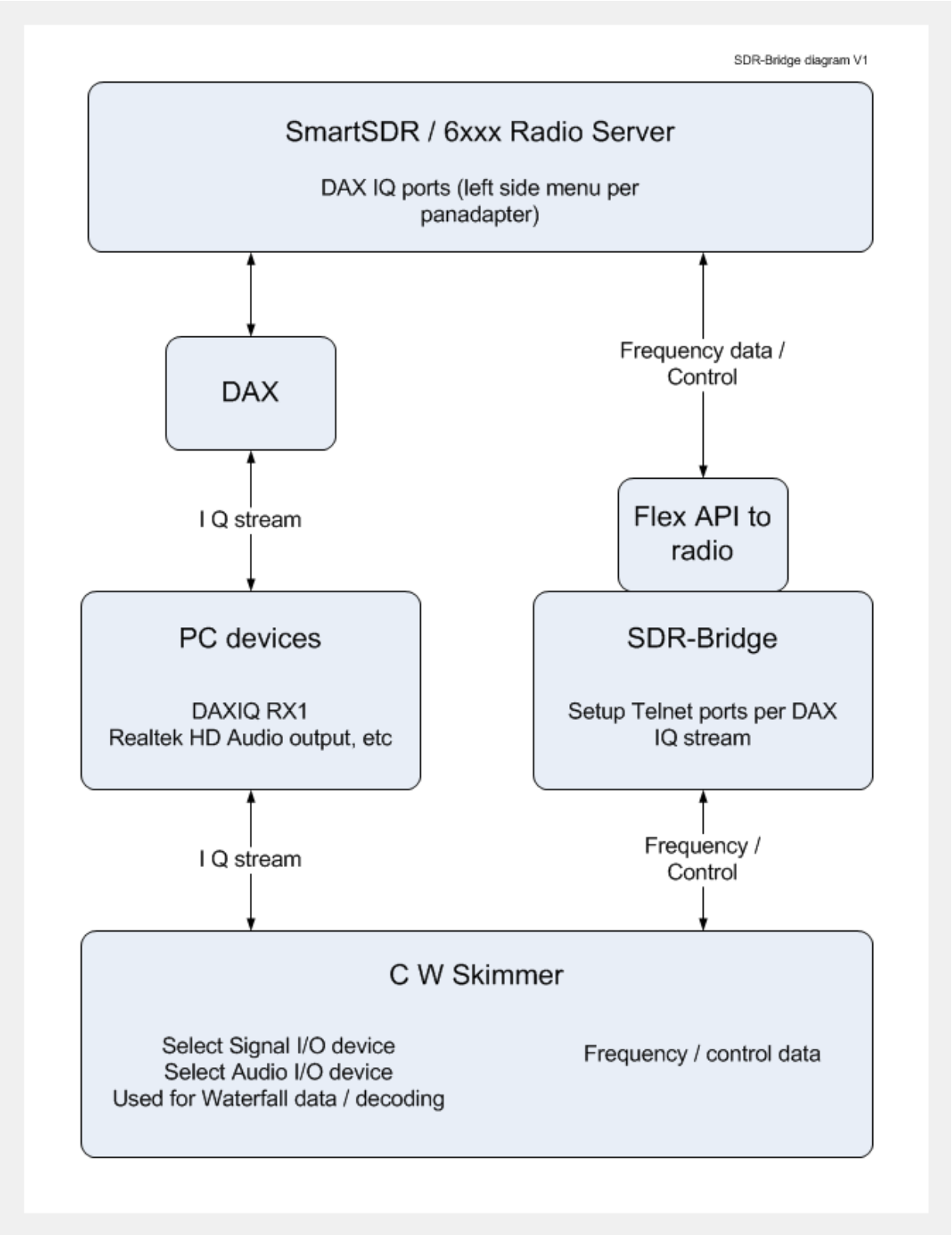
Document Overview

This goal for this document is to help you get started with the CW Skimmer and SDR-Bridge setup. The capabilities of each program are extensive, this document will not attempt to address all of them. It is recommended that you start by getting just one instance of CW skimmer running with SDR-Bridge and then explore the possibilities and capabilities of each program. The setup is not difficult but there are a number of minor things than can cause problems. In addition to the recommended settings for each program, there is a troubleshooting section that can help if you run into difficulty.

Regards, Al / NN4ZZ - email: Al (at) nn4zz (dot) com

Simplified data flow diagram

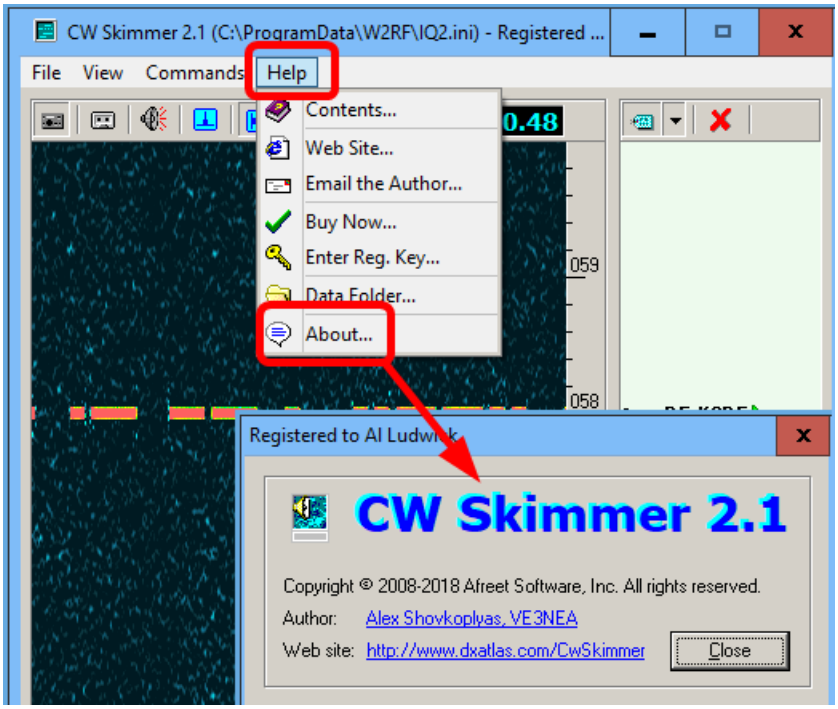


Version information for SDR-Bridge, DAX control panel and CWSkimmer.

- CW Skimmer – Version 1.8.3 or later (currently 2.1)
- SDR-Bridge – Version 1.5.0 or later (currently 1.6.4)
- SmartSDR - Version 1.3.8.126 or later
- DAX Control - Version 1.3.8.126 or later

CwSkimmer

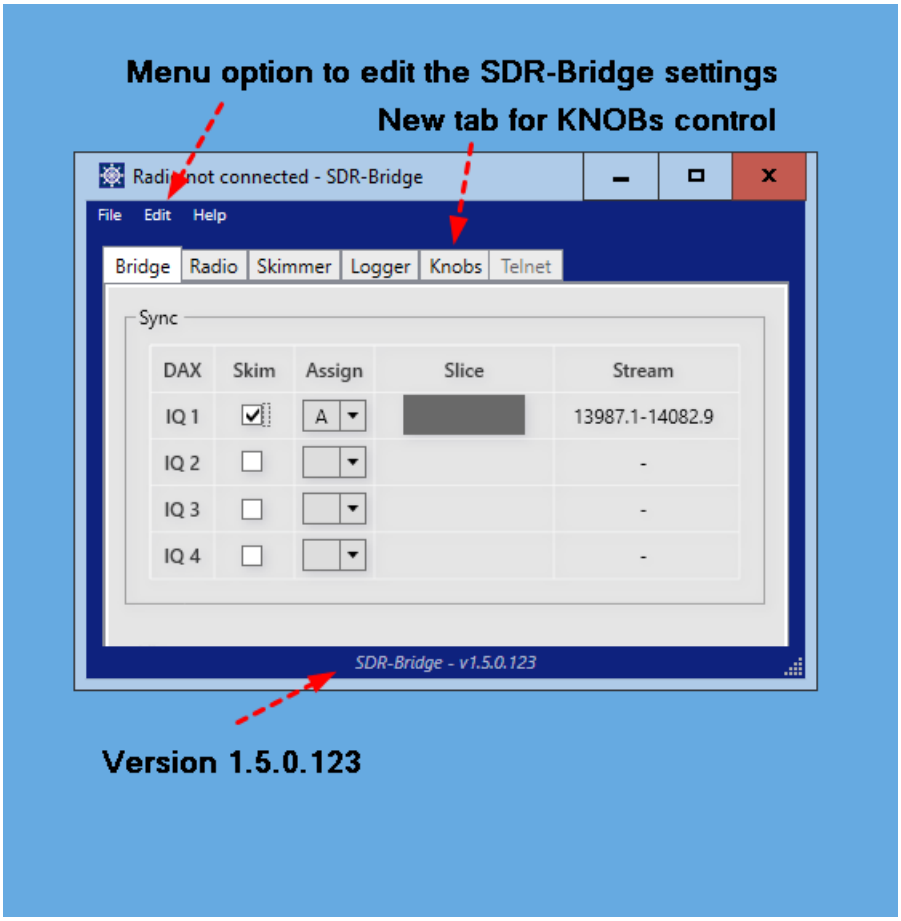
Down load and install the latest version of CwSkimmer into the default directory.



SDR-Bridge

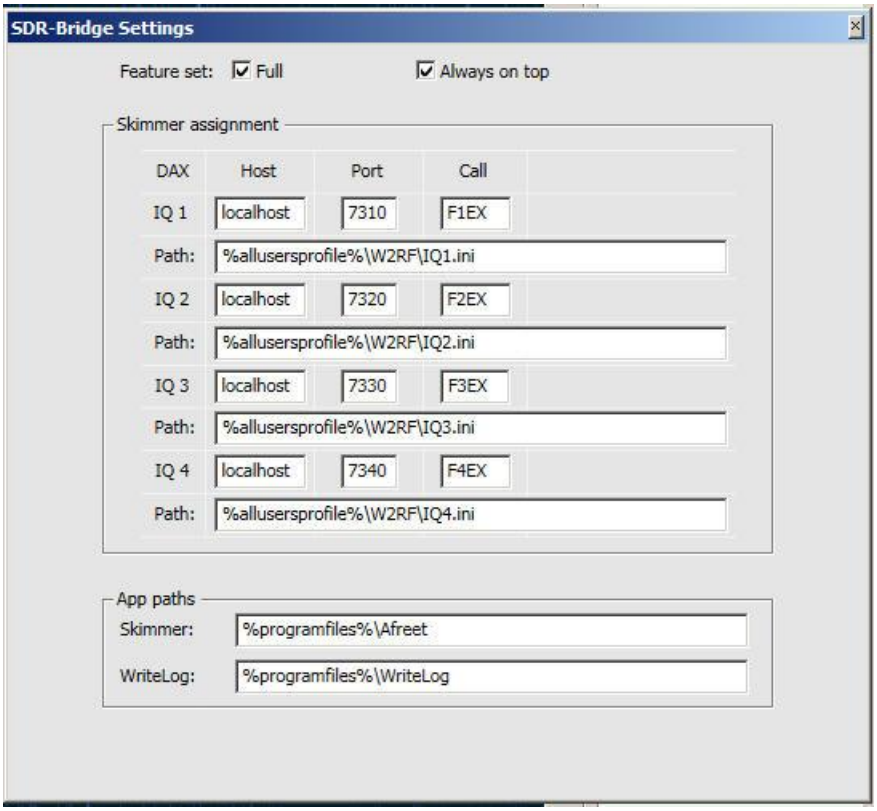
Down load and install SDR-Bridge from:

http://www.qrv.com/sdrbridge.html



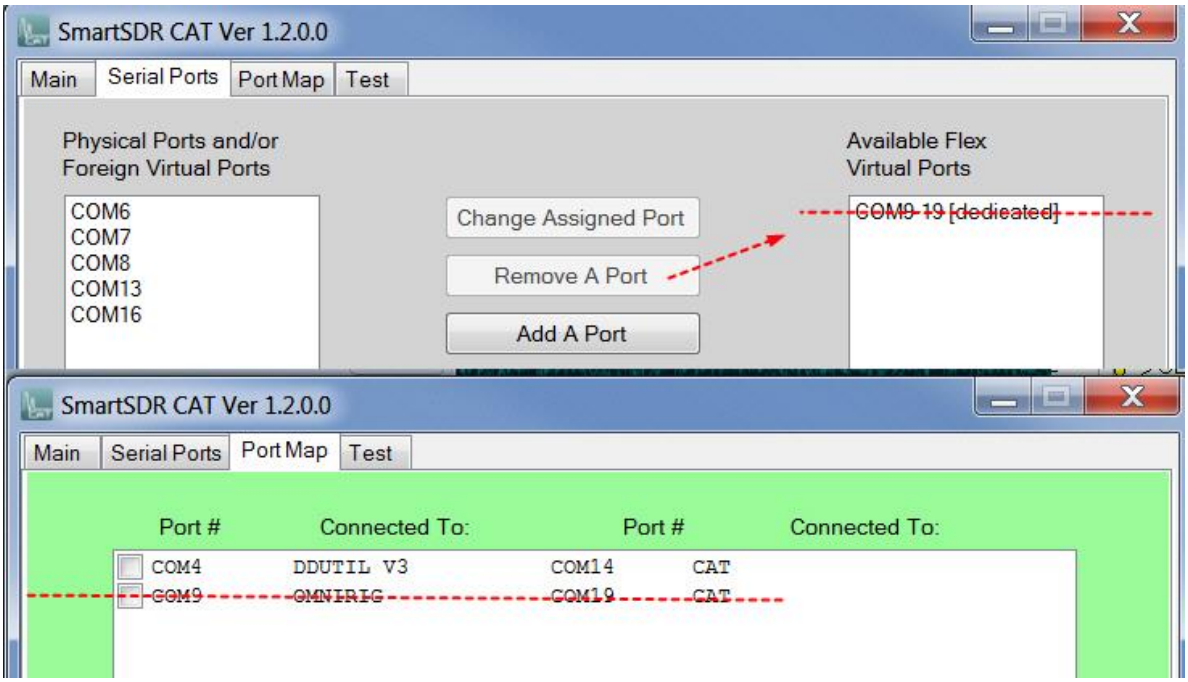
Note: The Telnet port in CW Skimmer must match the port shown here. For example IQ1 is 7310. See the CW Skimmer telnet port setup later in the document. NOTE: If you are using to feed the Reverse Beacon Network, see the notes starting on page 28 regarding the ports and call setup

If you need to reset the values in this screen to the defaults, the process is described in the troubleshooting section.



SmartCat

SmartCat is not needed any longer for CW Skimmer when using SDR-Bridge. If you previously used it before SDR-Bridge, it is no longer necessary to setup a dedicated port for OmniRig. SDR-Bridge connects directly to the radio. If you have a port setup, you can delete it. In fact you don't even have to start SSDR SmartCAT unless you need it for another reason.



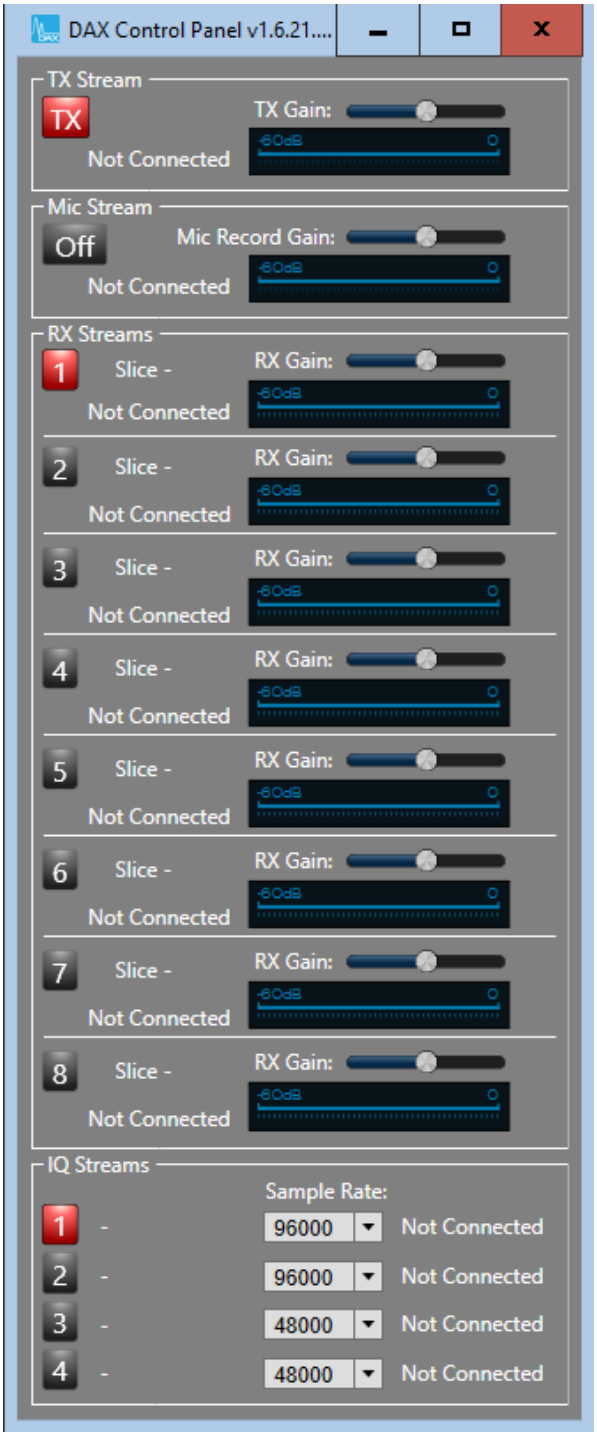
SmartSDR

Set the DAXIQ channel.

Note: The DAX settings in the SLICE are not used for CW Skimmer, only the DAX IQ setting on the left side of the SSDR screen is used.

DAX control panel

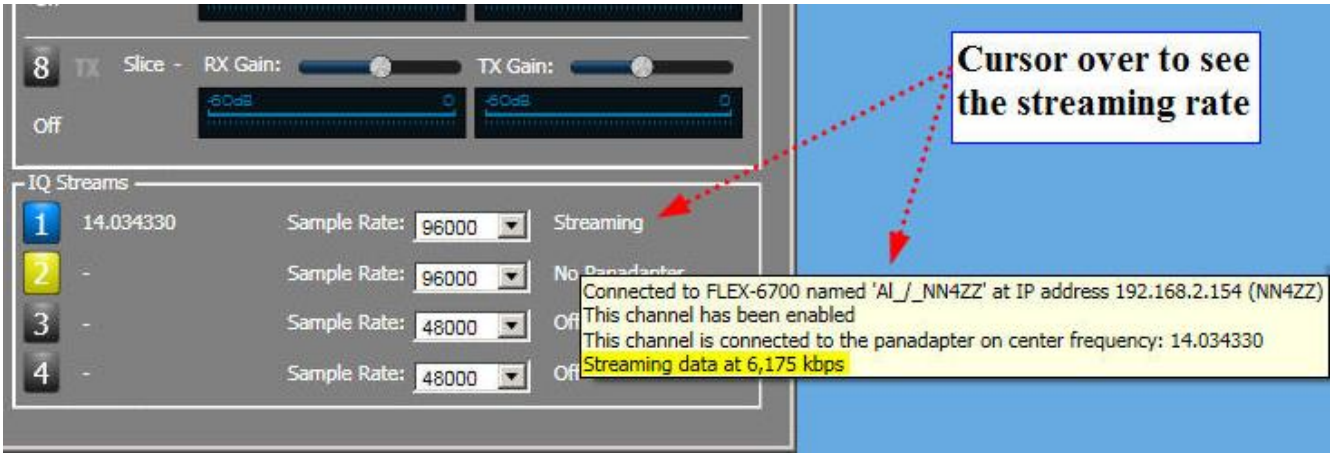
The control panel should look like this:



The only DAX setup needed for CW Skimmer is the IQ stream. To enable the DAXIQ channel, click the button for the channel you are using to ENABLE the channel, it should turn BLUE. Set the Sample rate to 96000. Note: if you are using CWS to feed the Reverse Beacon Network see notes starting on page 28 about the sampling rate.

Note about the FREQUENCY displayed in the DAX control panel. It is the center frequency of the PANADAPTER, **not** the frequency of the slice receiver.

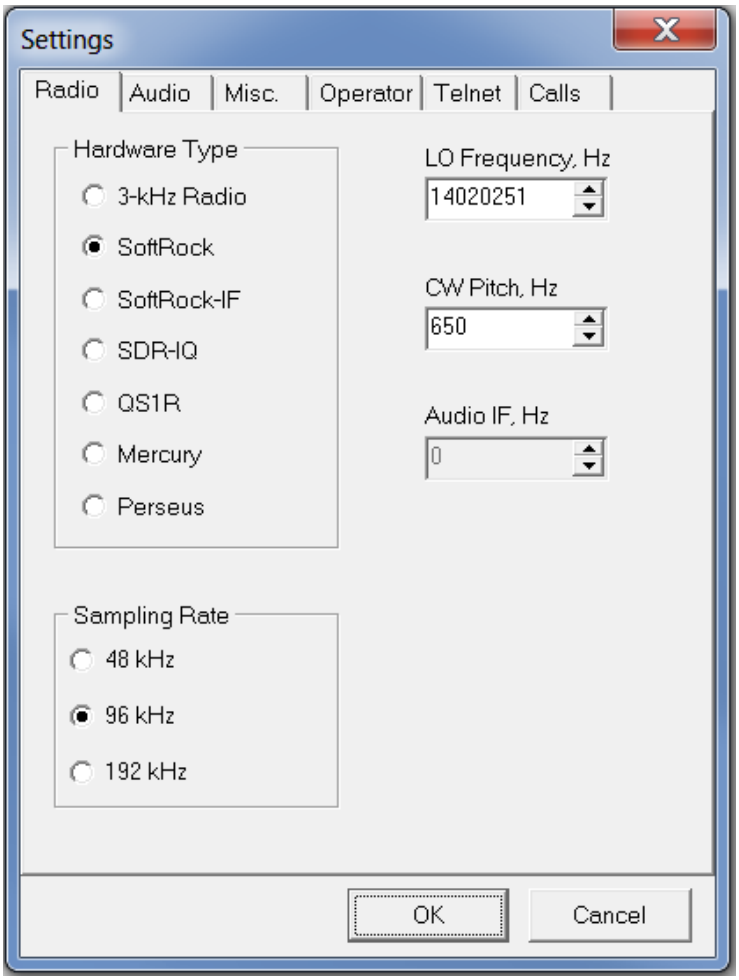
Starting in DAX V1.4 the RATE:value is replace with the word "Streaming" when running. You can see the rate by hovering the cursor.



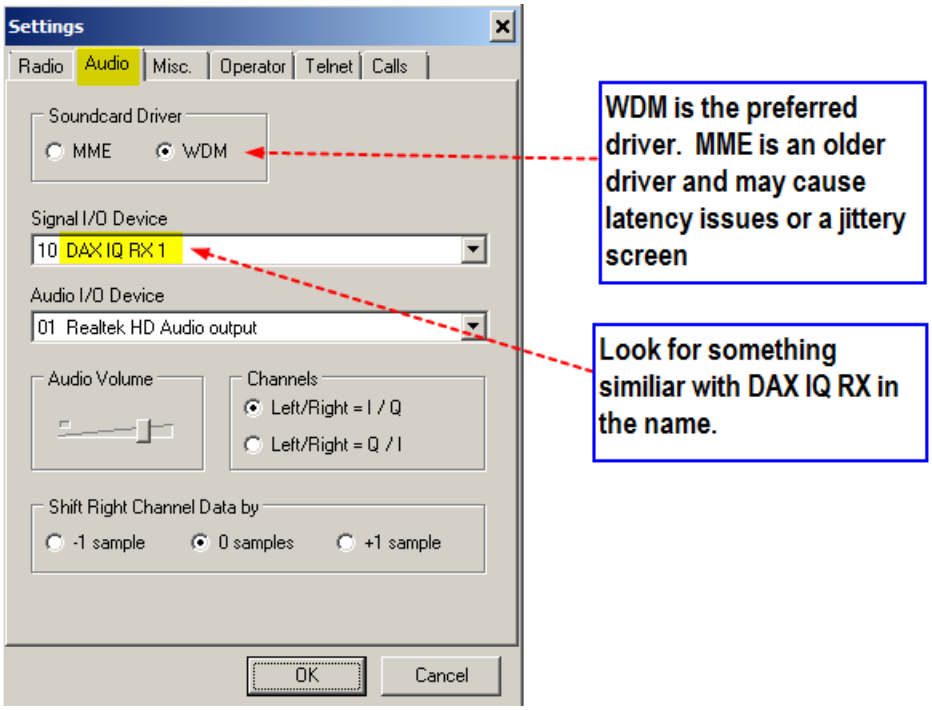
CW Skimmer Setup

Radio – SoftRock, Sampling 96KHZ, CW Pitch to match SmartSDR

RADIO Tab

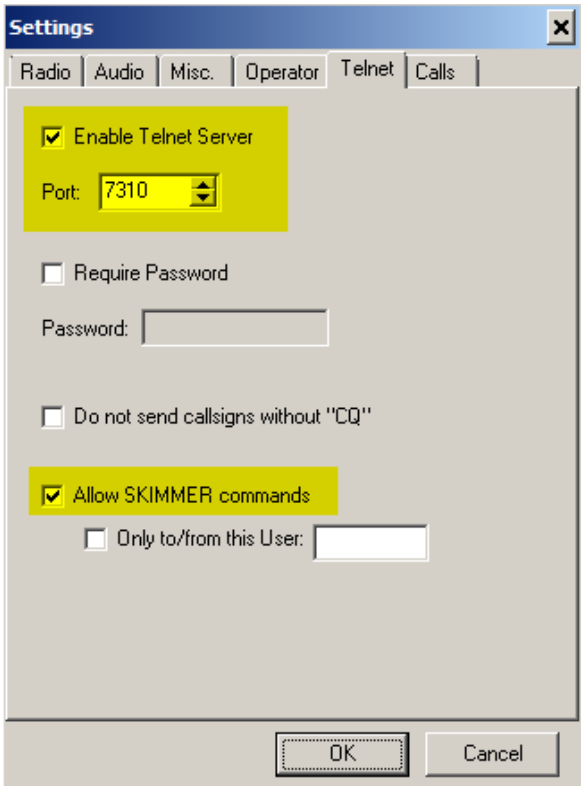


Audio settings – your DAX IQ device may be named slightly different.



Note: Do NOT set the Audio I/O device to the same device as the Signal I/O device. This will cause issues. It should be set to one of your PC audio playback devices.

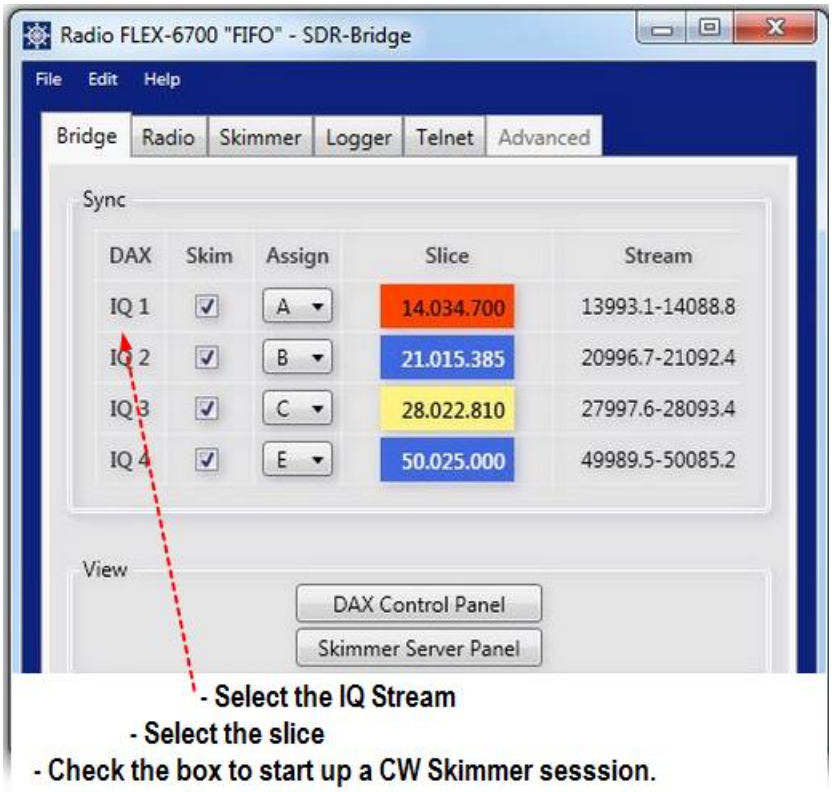
Telnet screen



Using SDR-Bridge

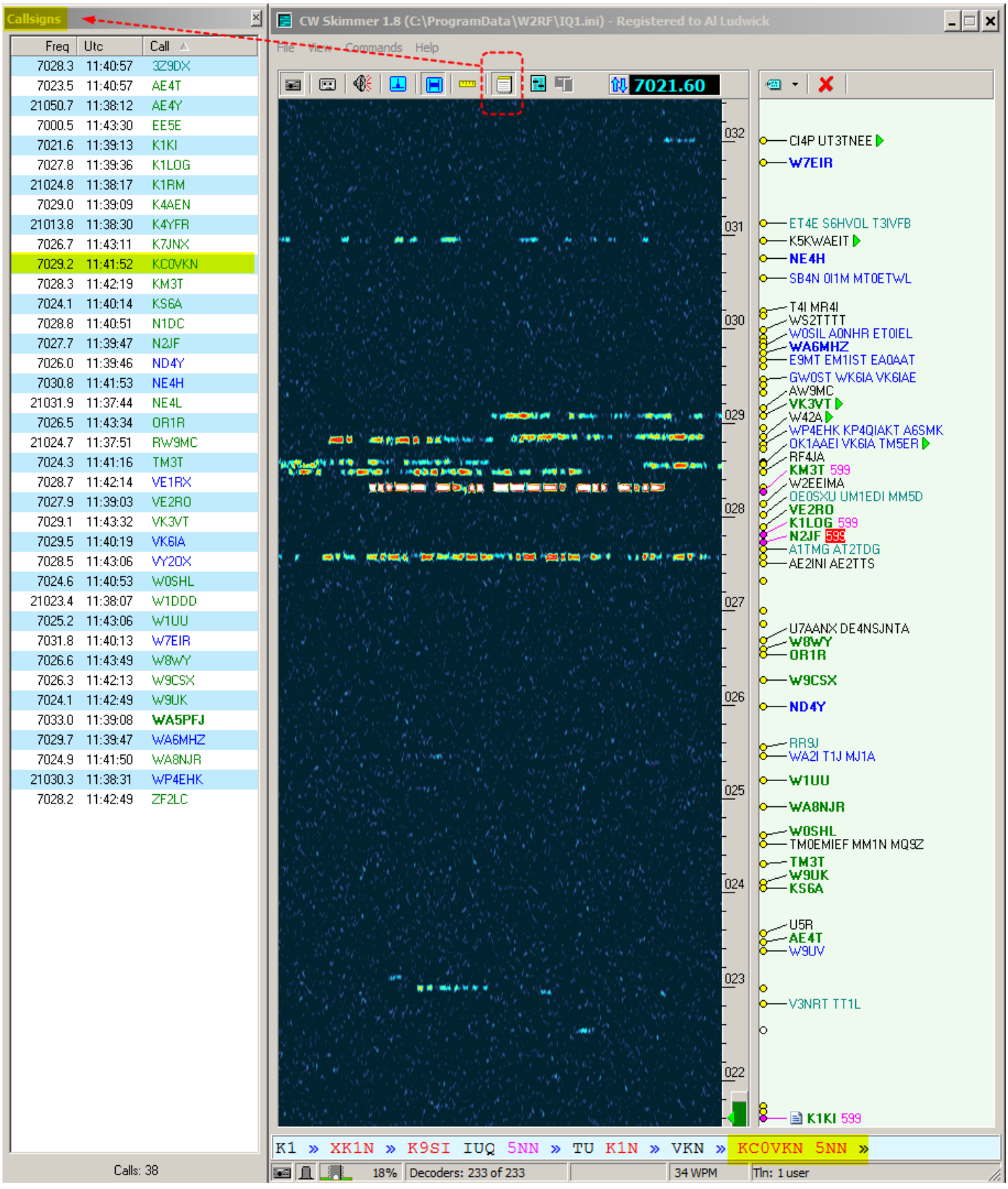
Snapshot shows 4 CW skimmers set up. Start your testing with just one.

Select IQ1, select a slice (e.g. Slice A), check the SKIM box to start up a skimmer session.



NOTE: There are options on the Radio and Skimmer tabs that affect how the program operates. Also starting V1.1.1 there are options you can set by RIGHT clicking on the frequency. To get started you can just use the defaults. Review the official SDR-Bridge doumentation to see what works best for the way you operate.

CW Skimmer screen during K1N DXPedition.



Troubleshooting notes:

- Verify the versions of SDR-Bridge, CW Skimmer, and DAX control panel. It is easy to get an older copy loaded that will probably not work. It's also easy to launch an older copy since you may have multiple versions on your PC.

- Don't start up CW Skimmer from a shortcut. Let SDR-Bridge start up CW Skimmer when it starts. Otherwise you can have multiple copies and some confusion.

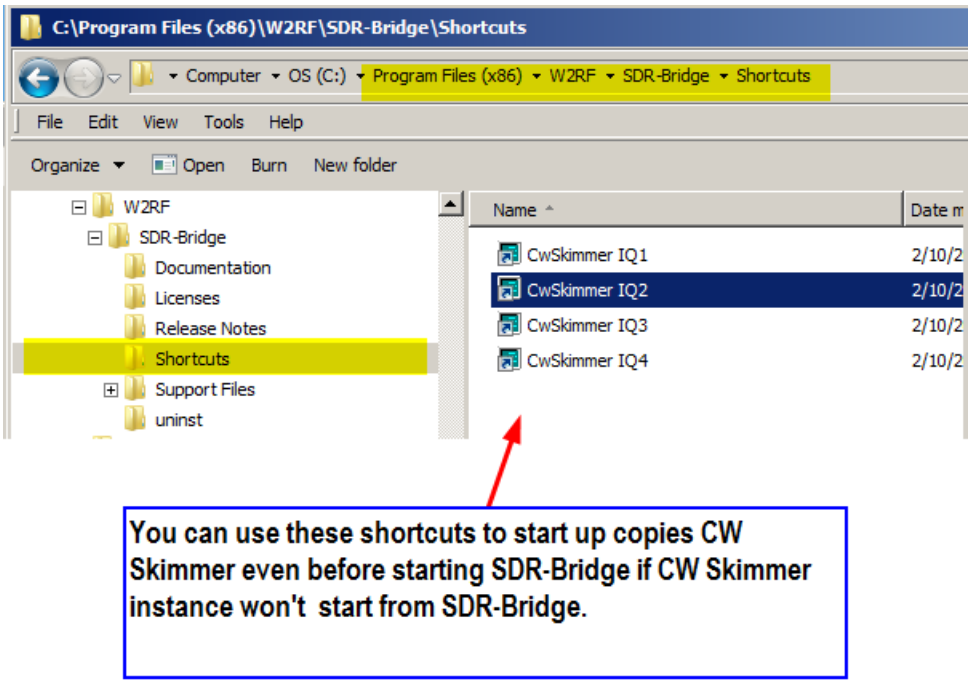
- If there is no data being sent to CW Skimmer, check to be sure the DAX IQ channel is set.

- Sometimes the CW Skimmer instance needs to be manually closed and re-opened to start working. It may even be hard to close (give errors) and have to be stopped with the task manager. Usually after closing the skimmer it will start up normally from the check box in SDR-Bridge.

- Win 10 users – it has been reported in one case SDR-Bridge and CWS were working fine but stopped transferring IQ data on just one of the IQ channels. After much checking no cause was found but a PC reboot corrected the issue.
- If rebooting doesn't fix the flaky channel problem, another option is to change to another channel. For example if you are using DAXIQ1 then try 2 or 3. You have to set that in 3 places. Select the DAXIQ channel in the SSDR screen, enable the channel in the DAX control panel, Activate the skimmer with the slice desired in the IQ option on the SDR-Bridge "Bridge" tab.

- Sometimes CW Skimmer will not start from the check box in SSDR. Or the skimmer may come up with a black screen or otherwise error out. In this case you can manually start one (or more instances) of CW Skimmer before launching SDR-Bridge by using one of the shortcuts provided here:

  By using one of the shortcuts Ed provides it will start up using the correct IQx.ini file. Here is where they are located. You can copy and paste them to the desktop for quick access.



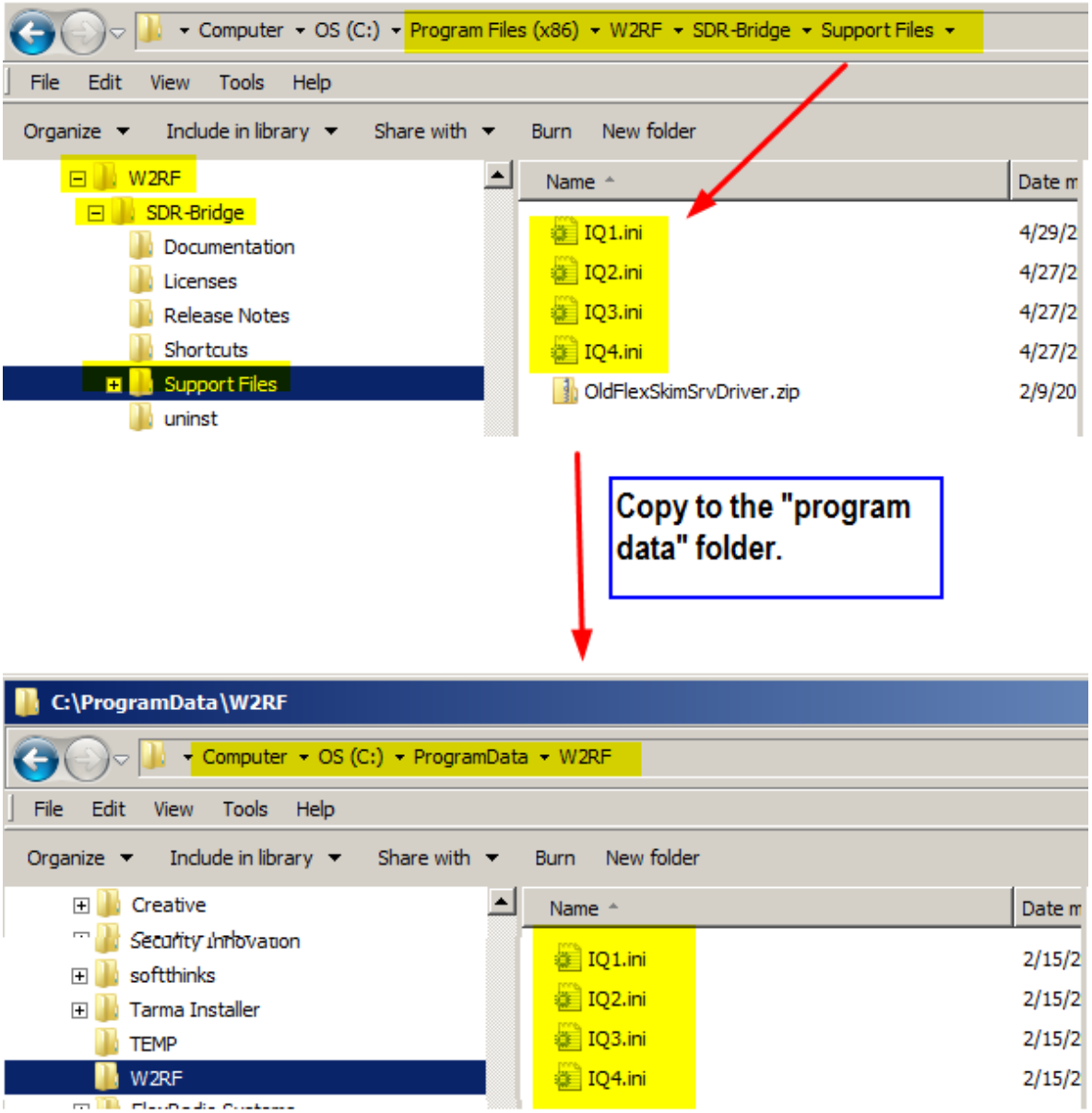
- If skimmer is up but not displaying the calls and other data, be sure to check the TELNET settings tab on CW Skimmer. Be sure they match the telnet settings in SDR-Bridge. Also check program versions.

- If the SDR-Bridge settings are wrong, or get set wrong, you can reset them to the defaults by doing the following. To restore default settings, delete the contents of [user]\appdata\local\w2rf.

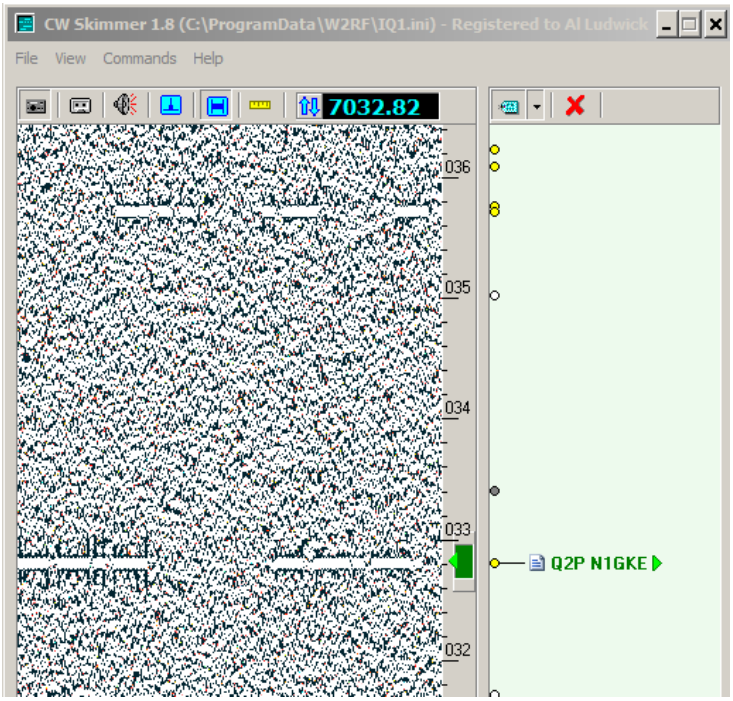
- If the skimmer frequency is slightly off from the slice receiver, check to see if your CW Skimmer CW Pitch matches the pitch setting in SmartSDR. Be aware that Skimmer currently may be off a bit due to the granularity for synching. This will be corrected in a future version of CW Skimmer.

- Sometime the Skimmer does not display the same frequency data as your slice receiver. You can often re-synch them by shaking the slice receiver. (click and hold in the panadapter and move side to side)

- Sometime the Skimmer .ini file get corrupted by changing settings. If you suspect this is the problem you can overwrite them with a fresh copy the Ed provides. See the snapshot below to show where to get the fresh copy and where to paste it to overwrite the corrupted copy.

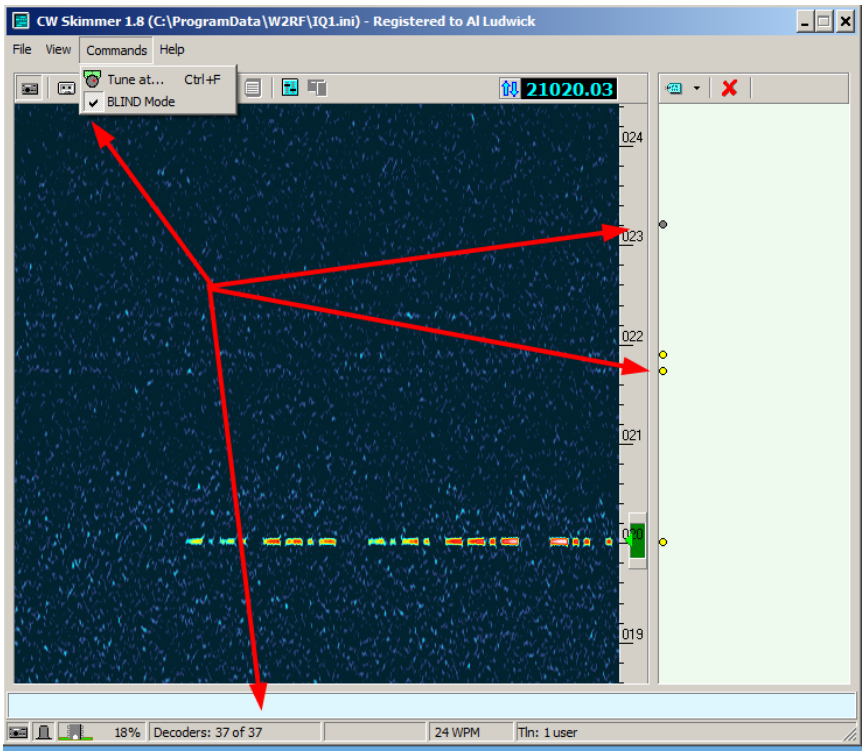

Computer ▸ OS (C:) ▸ Program Files (x86) ▸ W2RF ▸ SDR-Bridge ▸ Support Files
File Edit View Tools Help
Organize Include in library Share with Burn New folder
W2RF
SDR-Bridge
Documentation
Licenses
Release Notes
Shortcuts
Support Files
uninst
Name
Date m
IQ1.ini 4/29/2
IQ2.ini 4/27/2
IQ3.ini 4/27/2
IQ4.ini 4/27/2
OldFlexSkimSrvDriver.zip 2/9/20
Copy to the "program data" folder.
C:\ProgramData\W2RF
Computer ▸ OS (C:) ▸ ProgramData ▸ W2RF
File Edit View Tools Help
Organize Include in library Share with Burn New folder
Creative
softthinks
Tarma Installer
TEMP
W2RF
Name
Date m
IQ1.ini 2/15/2
IQ2.ini 2/15/2
IQ3.ini 2/15/2
IQ4.ini 2/15/2

- If CW Skimmer is displaying but it looks bad, check to verify that the sample rate in the DAX Control panel isn't set to 48,000.

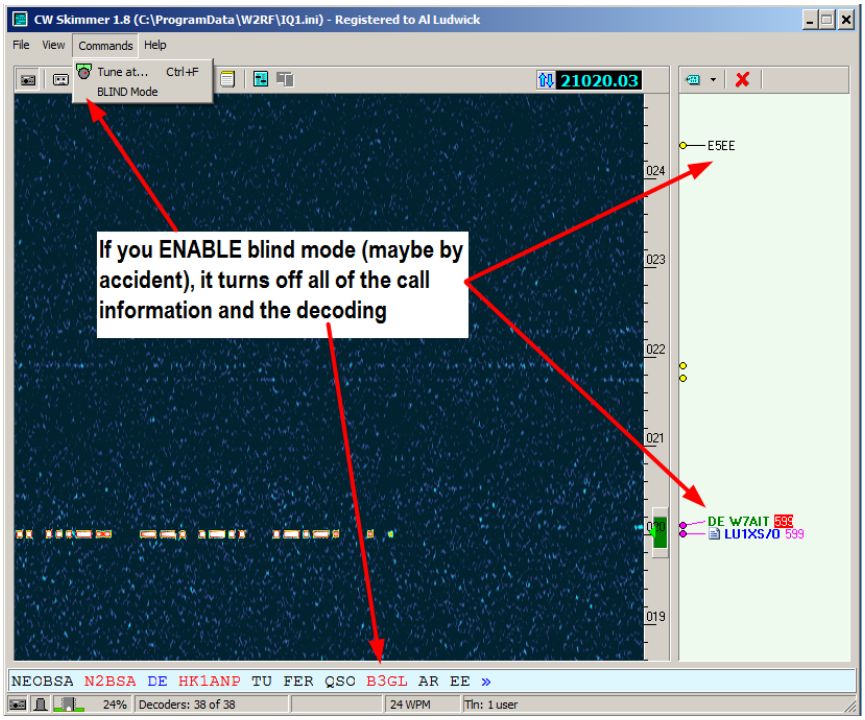


- If your CW Skimmer screen doesn't show the call information or decoded text you may have accidently ENABLED BLIND mode. You will see the frequency displayed, the code steam, and the "dots" but NO text.

BLIND MODE = ON

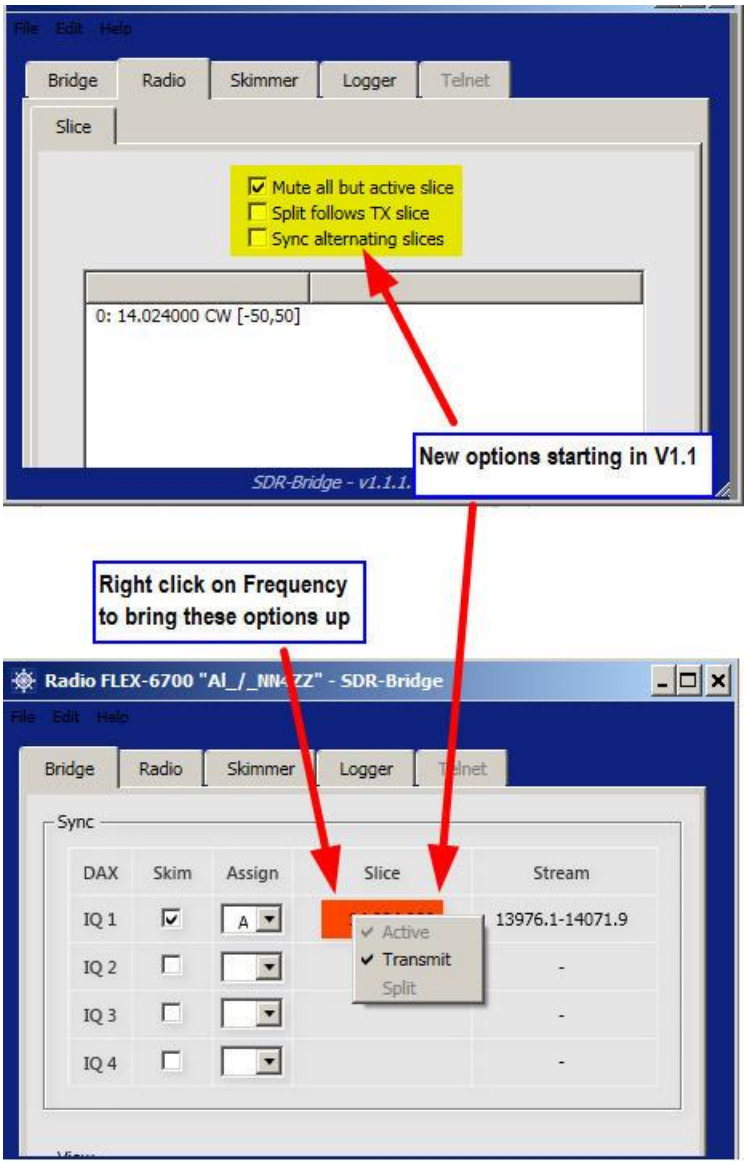


BLIND MODE = OFF

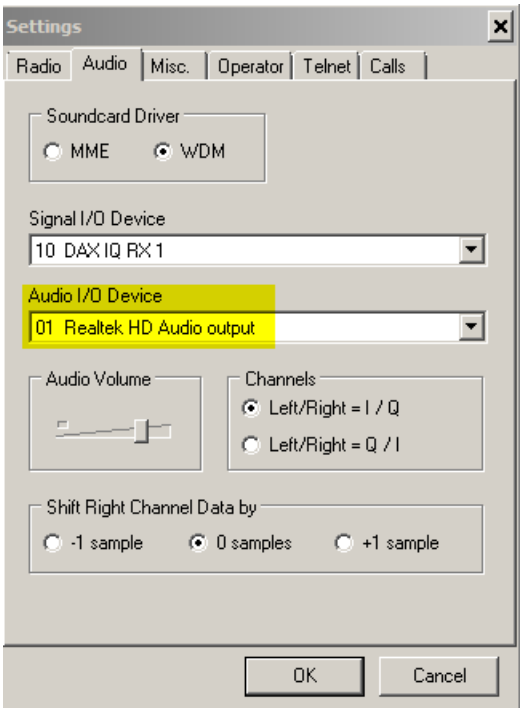


- There are some new options for working split on SDR-Bridge starting in V1.1.1. If you notice some things like muting or TX Active working differently, take a look at the new options to see if you need to makes changes for your operating style.

The changes are on the BRIDGE tab and the RADIO tab.



- When CW Skimmer starts up you get this continuously repeating error: **Output sample rate out of range.**
  Check the CW Skimmer **Audio I/O Device** on the Audio tab of the CW Skimmer settings. It should **NOT** be set to the same device as listed in the **Signal I/O Device.** Typically it is set to your audio output device but you may have to try some other settings.



- Several users of CW Skimmer have reported that the following error message appears on program startup:

  "Access violation at address 00404DD3 in module CwSkimmer.exe. Read of address 00000000."

  The error occurs only on those systems where the Skimmer was installed using a regular user account on Windows, with standard privileges. The installer has to put some executable files in the Program Files folder, and some data files in the user data folder. Since the regular users are not allowed to write to Program Files, the installer runs as Administrator. As a result, the data files are placed in the administrator's data folder, not in the user's folder. This is how MS designed their security system, and this cannot be bypassed.

  To fix the problem, log in as Administrator and copy the data files from admin's folder to your user's folder. For example, if your admin name is AlexAdmin, and your regular user name is AlexUser, then you copy all files from this directory

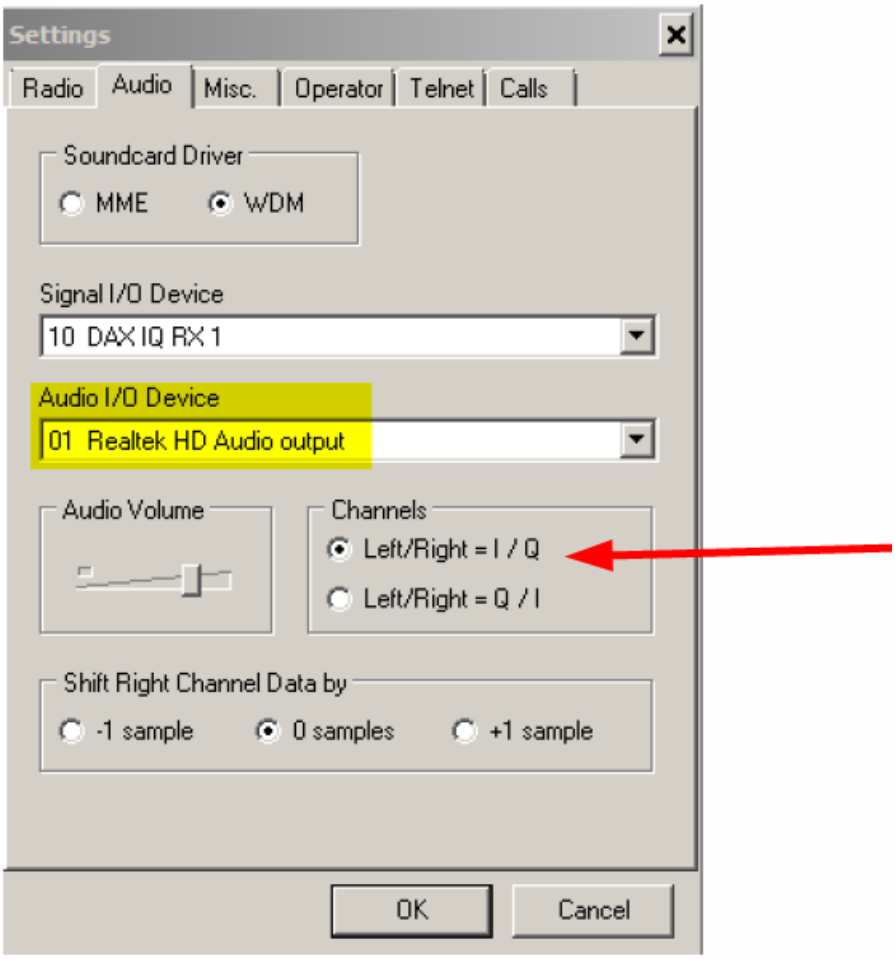
  C:\Users\AlexAdmin\AppData\Roaming\Afreet\Reference

  to this one:

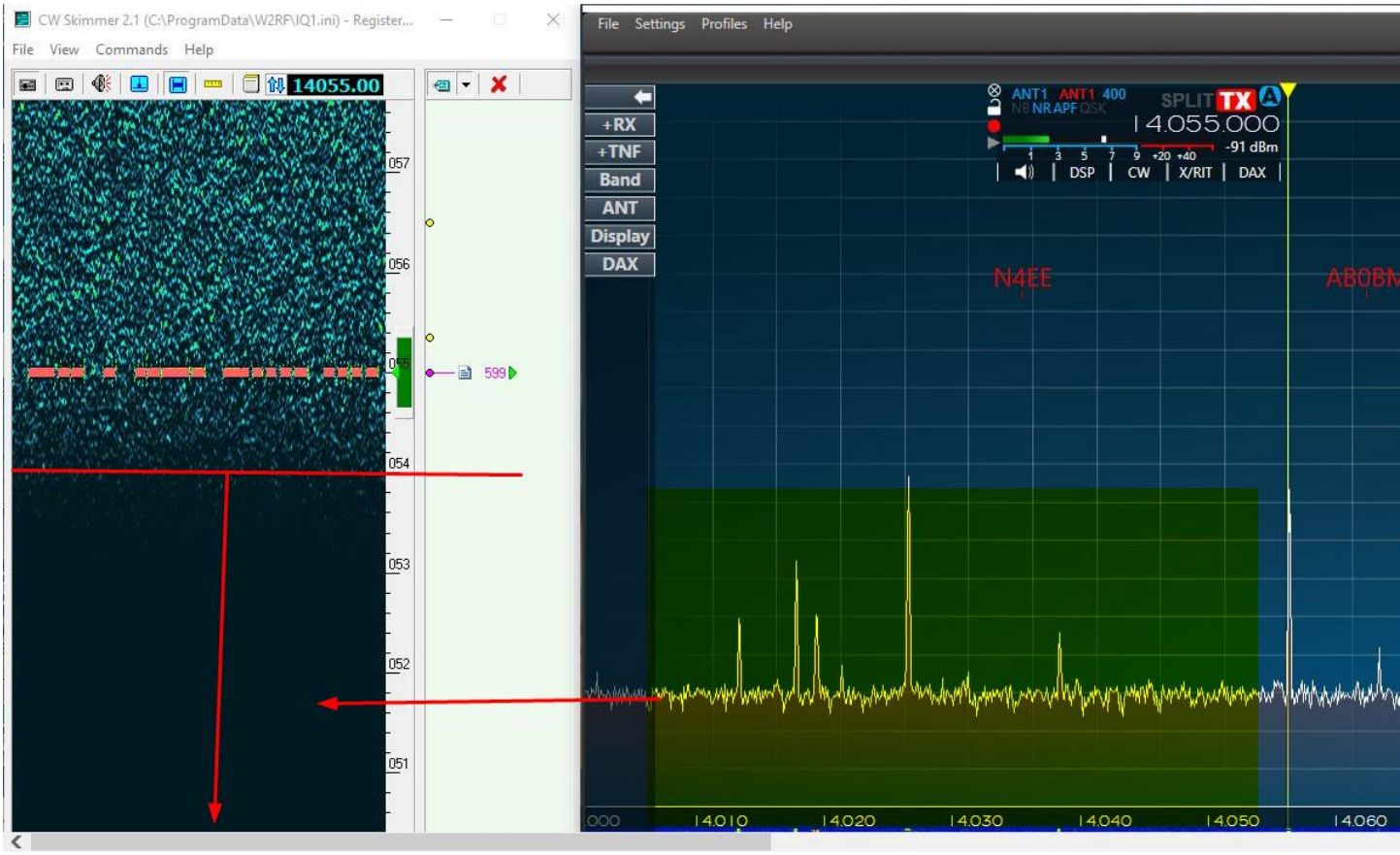
  C:\Users\AlexUser\AppData\Roaming\Afreet\Reference

Chuck / W9WLX reported this issue. All frequencies sync and follow--the slice receiver, SDR Bridge and the TX frequency on CW Skimmer. If I set the TX frequency on skimmer to the center frequency of the DAX IQ stream, it works as expected. However, if I change the slice frequency, off the center stream frequency, it shifts in the opposite direction. For example, if my center stream frequency is 7.020 and I double click on a station at 7.022 on the Skimmer waterfall, the slice receiver will follow and go to 7.022, however the station is really at 7.018.

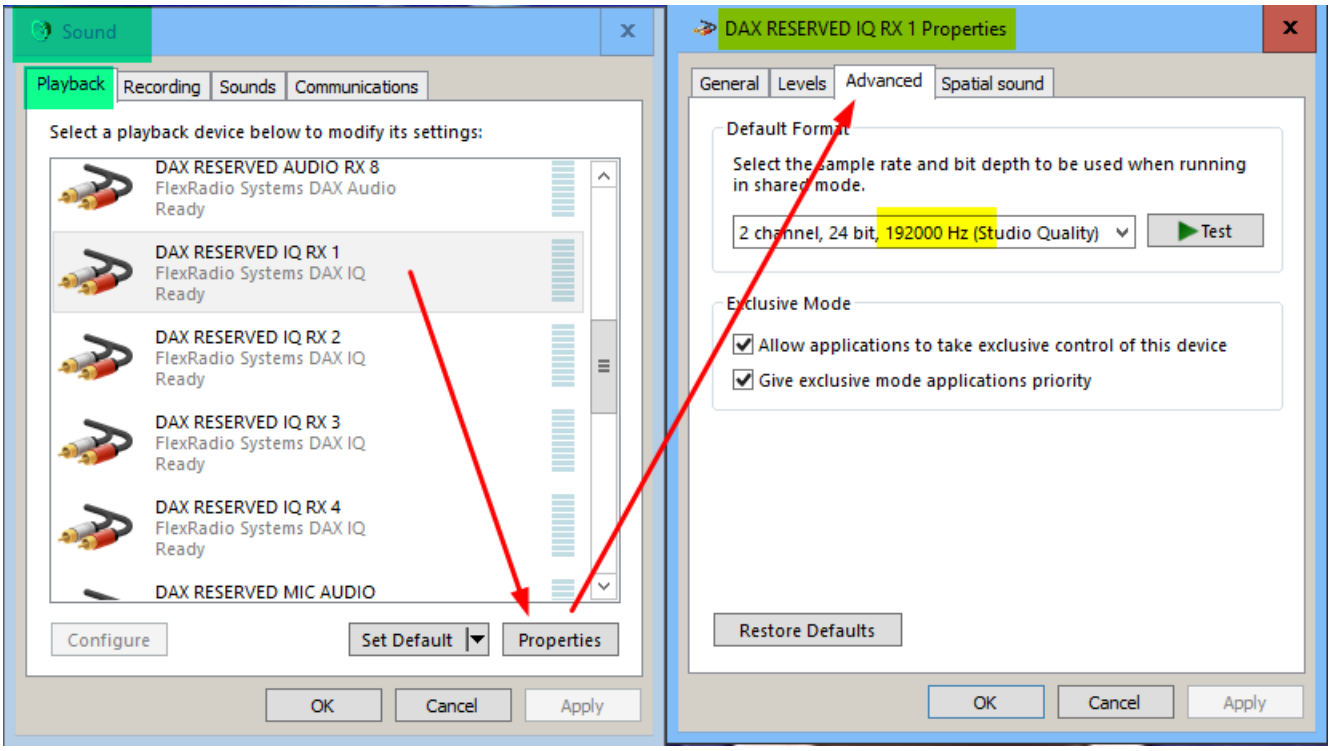
The problem was the "left / right" channel was set up incorrectly in the CQ Skimmer Audio panel. It should be set to I / Q.



George / K3GBB reported the skimmer display was not showing the full bandwidth shown on the SSDR screen. Note in the snapshot below signals below 14.054 do not display on the skimmer screen.

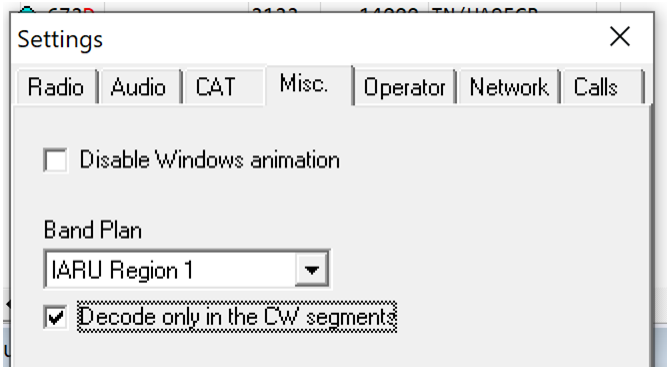


The problem was the DAXIQ bandwidth setting in Windows. It shoud be 192000 hz and was set to a lower value. Open the Sound Control Panel. For the active DAX IQ and RESERVED DAX IQ devices make sure BOTH are set to 192khz.


Sound
Playback
Recording
Sounds
Communications
Select a playback device below to modify its settings:
DAX RESERVED AUDIO RX 8
FlexRadio Systems DAX Audio
Ready
DAX RESERVED IQ RX 1
FlexRadio Systems DAX IQ
Ready
DAX RESERVED IQ RX 2
FlexRadio Systems DAX IQ
Ready
DAX RESERVED IQ RX 3
FlexRadio Systems DAX IQ
Ready
DAX RESERVED IQ RX 4
FlexRadio Systems DAX IQ
Ready
DAX RESERVED MIC AUDIO
Configure
Set Default
Properties
OK
Cancel
Apply
DAX RESERVED IQ RX 1 Properties
General
Levels
Advanced
Spatial sound
Default Format
Select the sample rate and bit depth to be used when running in shared mode.
2 channel, 24 bit, 192000 Hz (Studio Quality)
Test
Exclusive Mode
Allow applications to take exclusive control of this device
Give exclusive mode applications priority
Restore Defaults
OK
Cancel
Apply

Problem – Skimmer shows some spots that looks like dupliates. This issue noted by Ed / W2RF -- This problem happens when users have DAX IQ channels that are covering out of band frequencies. This happens most often with 192khz, but can happen with others if the center of the panadapter is near the band edge. The Flex produces very weak images outside the band, especially in WIDE mode. However CW Skimmer is sensitive enough to pick them up. So you get out of band spots, that look like duplicates of an in band spot. (So the symptom looks a lot like a wrong sample rate setting, but it isn't.)

There are several things you can do to avoid this.
1 - One is to have calls verified by the master dta file, but it only contains the calls of contesters.
2 - Another helpful thing is to make sure the noise blanker is on. It's the first blue icon on the option bar. (I also always make sure the key click filter, the second blue icon, is on.)
3 - But the best solution is to select a band plan and tell it to only skim in band:



Finally, since there is some tailoring of the INI file, once they get everything the way they want it users might find it useful to back them up from Program Data/W2RF.

Reverse Beacon Network – works with SDR-Bridge

If you aren't familiar with the Reverse Beacon Network see the link on the next page for a short history.

The aggregator software

This software receives spots from CW Skimmer or Skimmer Server's telnet port, and sends the spots to the Reverse Beacon Network.

---

rbn_aggregator_v3.0.exe

Microsoft .NET framework version 4 must be installed

For more information about using the RBN aggregator, please read:
Using Aggregator 10.pdf

The following notes provided by Tom WQ5O and he reports that is it working fine.

- Load the SDR-Bridge first, and setup 4 slices. Then started the aggregator. In the Secondary Skimmer box in the aggregator insure the ports in the aggregator match the ports for the different slices in Bridge. Click "connect skimmer" for each slice and it will connect. The primary skimmer also connected when I started aggregator.
- You have to check the DAX control panel to insure you're running 96K for the IQs. A - 96K, IQ1; B - 96K, IQ2, etc.
- There is a place in the aggregator to add your call sign for each skimmer so that it'll show correctly in the RBnetwork. It also seems to adjust the frequency offset automatically when you get the entire thing set up.

It's not hard to set up but there are several steps that you have to make sure are correct or the skimmers won't display the correct info. The DAX IQs have to match the correct slices in the different skimmers. The DAX IQs have to be set at 96K or the skimmers won't display the correct info.

They SDR-Bridge and Reverse Beacon Aggregator work well together from what I see. I had 4 skimmers running yesterday most of the day and they produced a lot of traffic for the RBN.

Here is a screen shot of the RBN and some additional information on the RBN

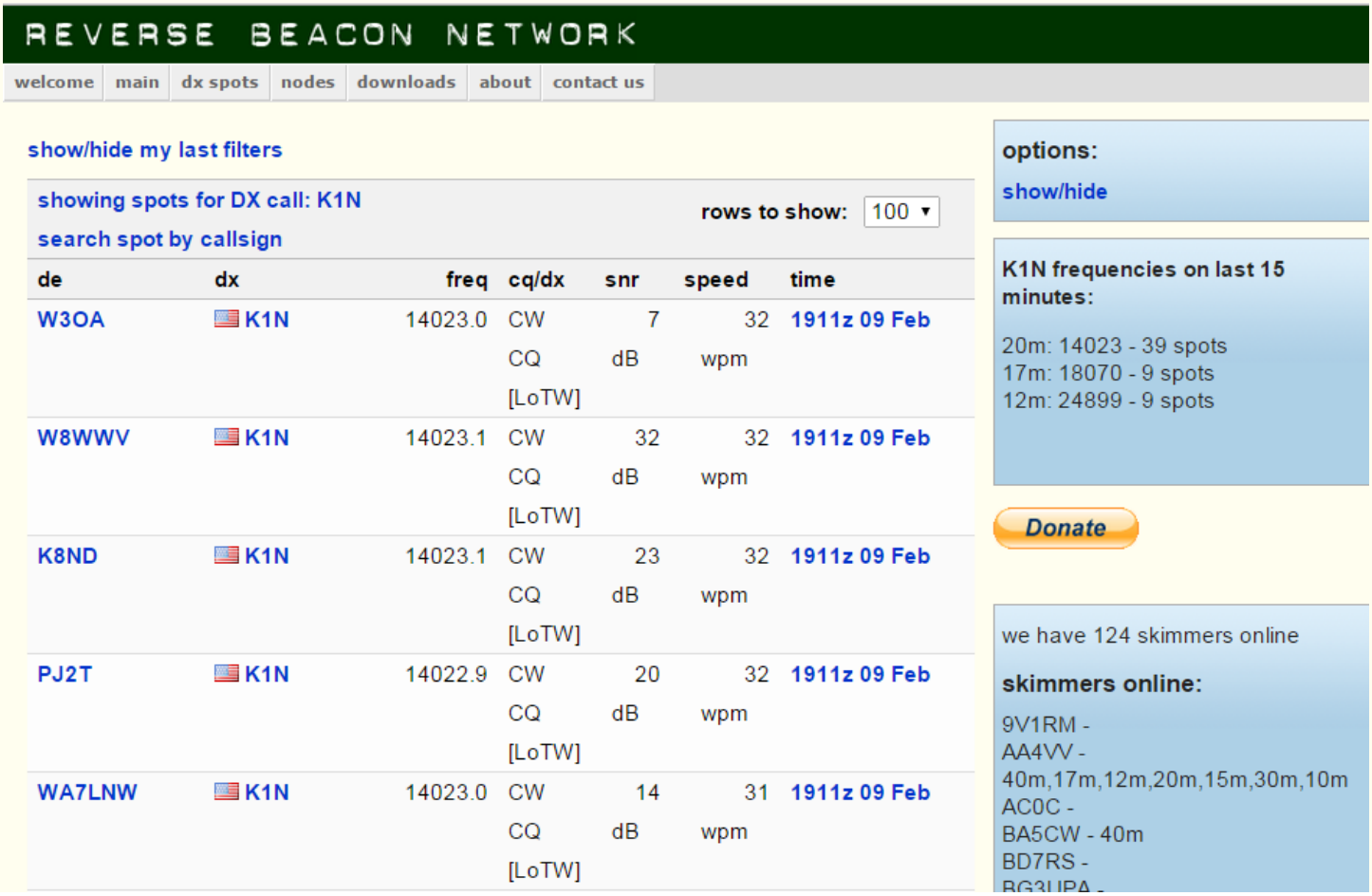
Click link for the WELCOME page of the Reverse Beacon Network

http://www.reversebeacon.net/index.php

Click link for a short history of the Reverse Beacon Network.

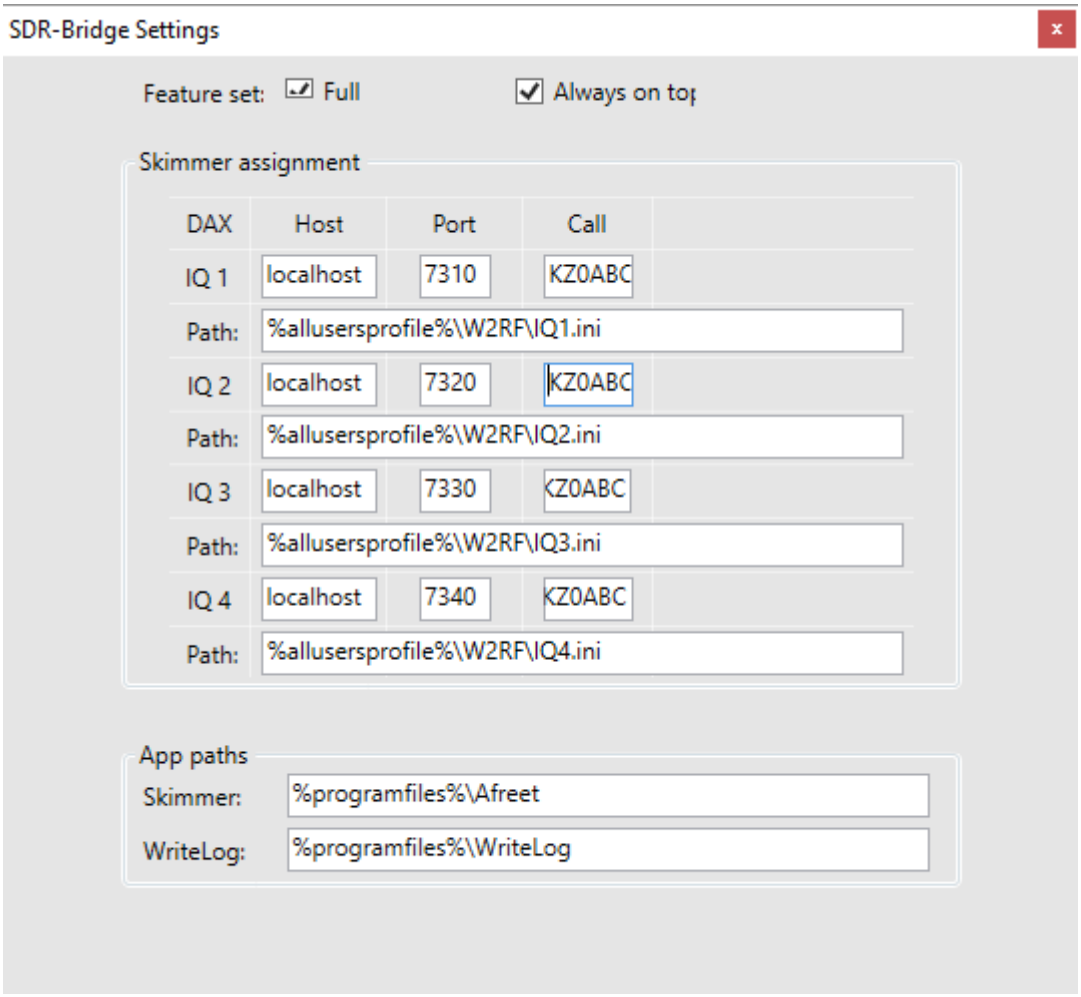
http://www.reversebeacon.net/pages/A+Short+History+12

Typical DX screen with a filter applied for the recent K1N DXpedition.

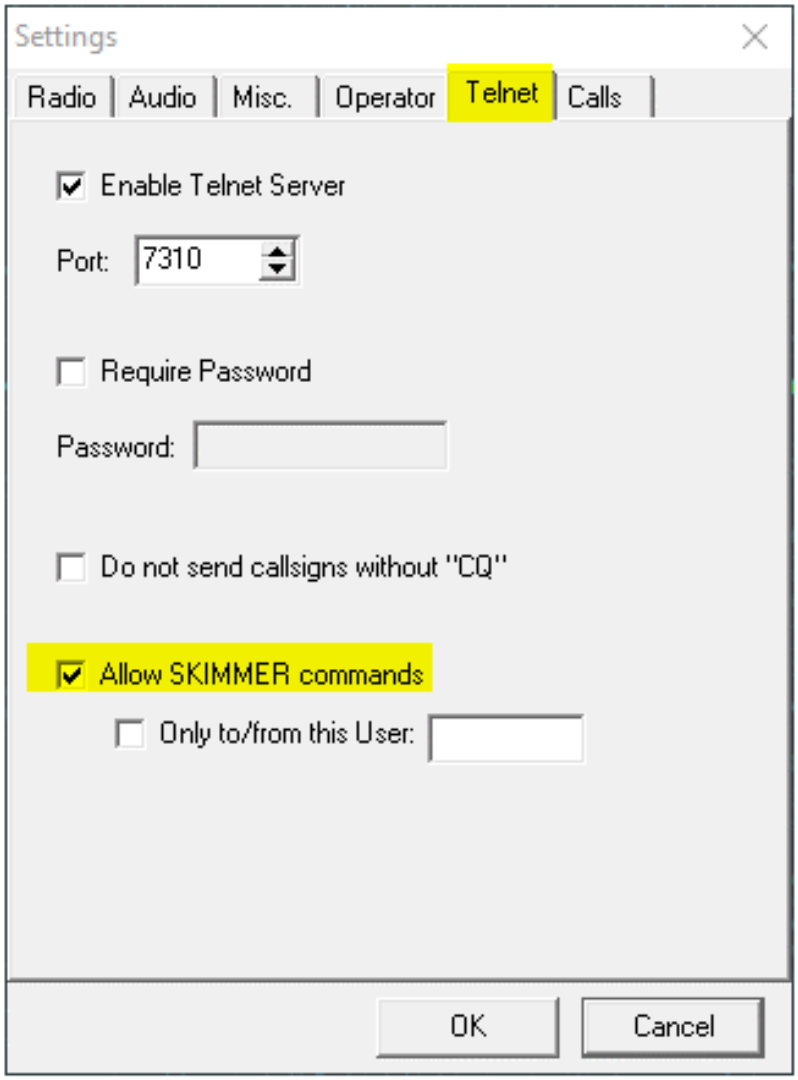


These RBN setup notes below were provided by Andy / KU7T

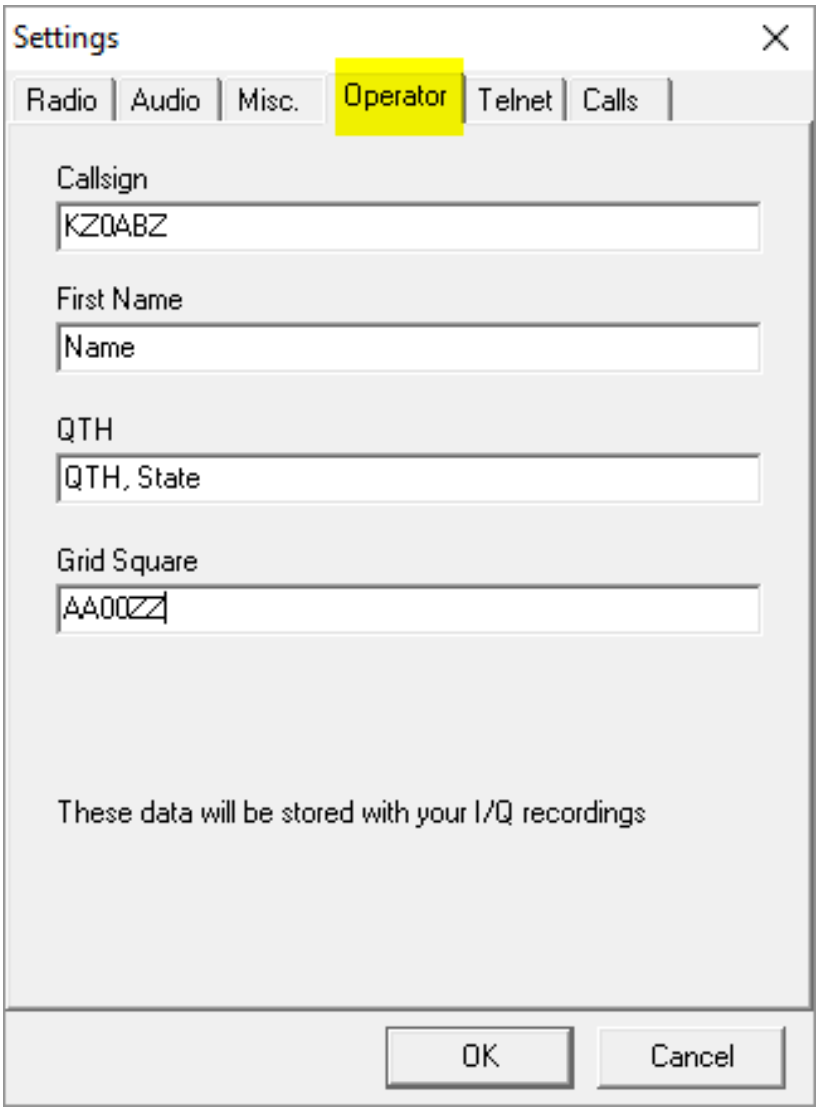
The host and port settings in SDRBridge need to point to the CWSkimmer port. If you do run both the bridge and CWSkimmer on the same PC, then the settings should be “localhost” and “some port”. That port needs to match. The call in the SDRBridge can be anything, **but it cannot have any special characters in it**. For example do not use KU7T-1. Suggestion is to use your legal licensed call.



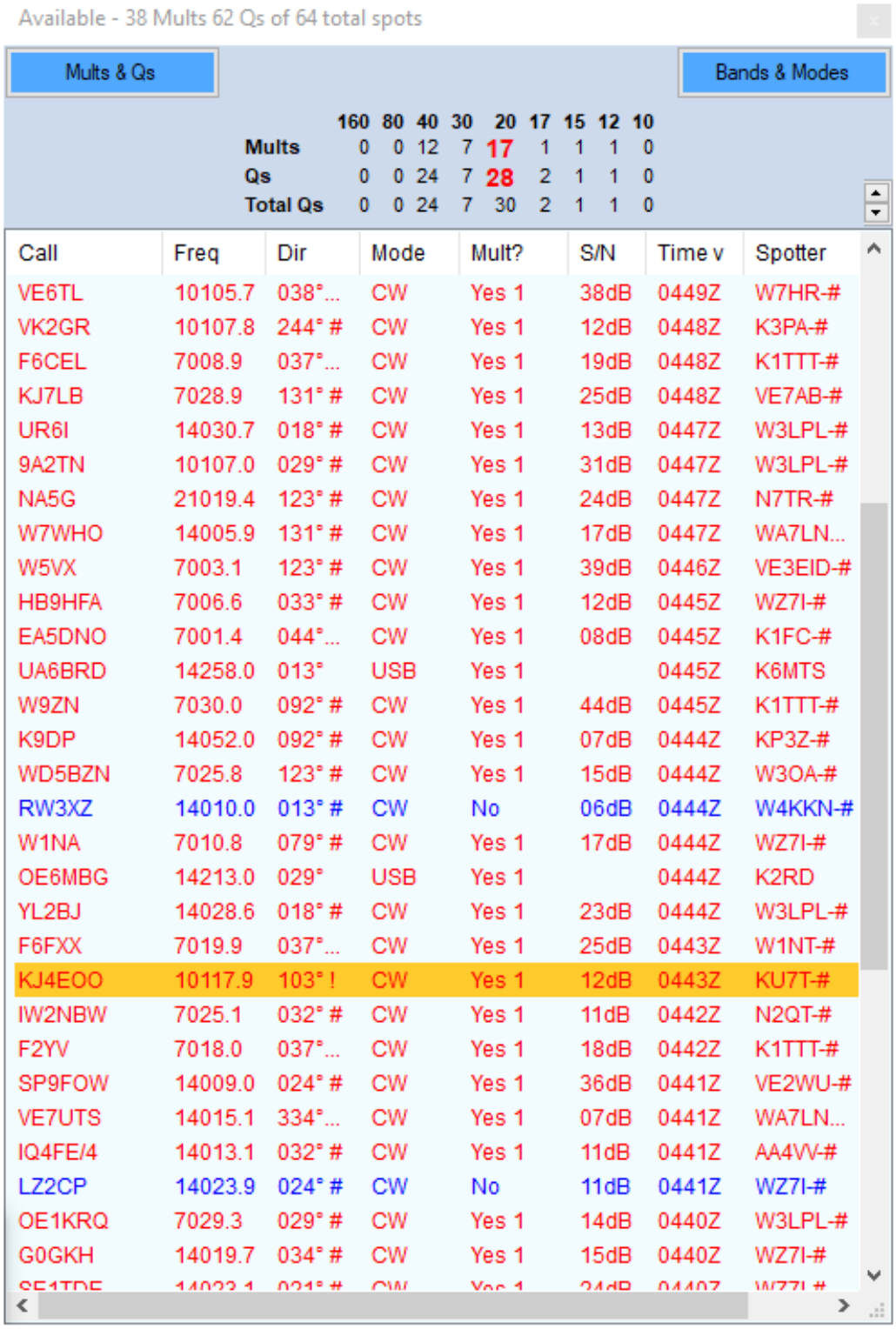
In CWSkimmer, “Allow skimmer commands” needs to be checked.



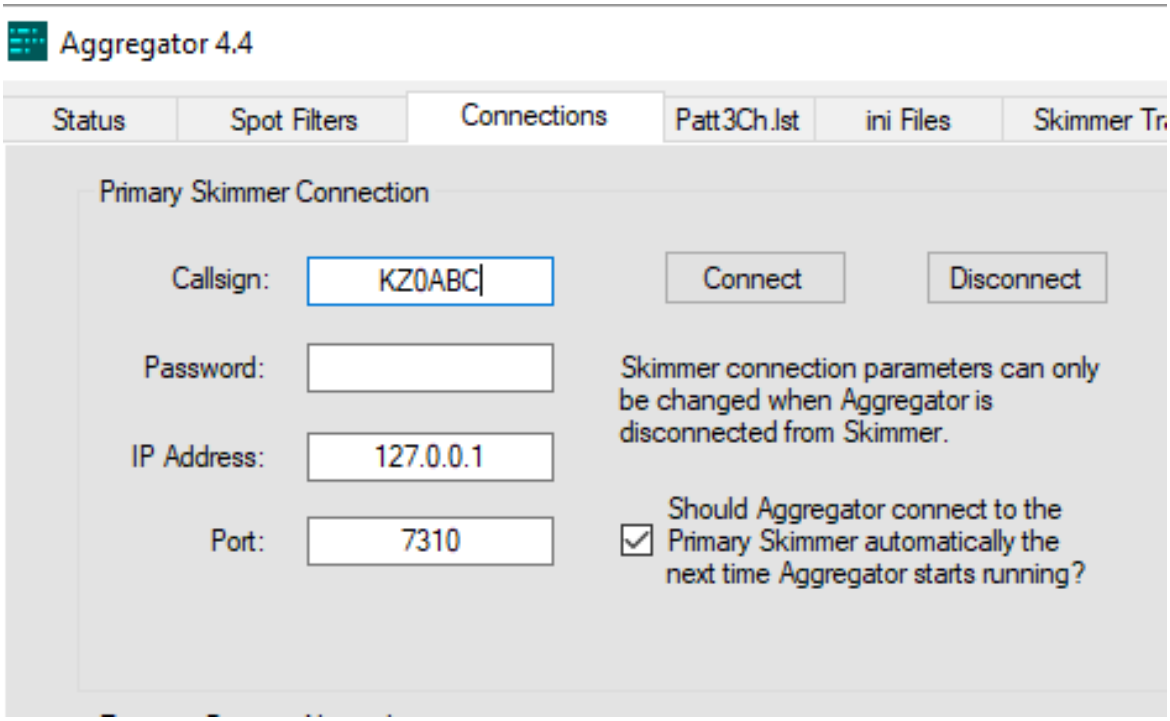
The call sign in the CW skimmer dialog will be the call sign of the station that the spots will be originating. In most cases, this will also be your own valid call sign. (In some rare cases, you may want to add a /call area, i.e. KU7T/7, if there is already another skimmer online with the base call sign.)



By doing this, you can recognize your own spots in your logging software.

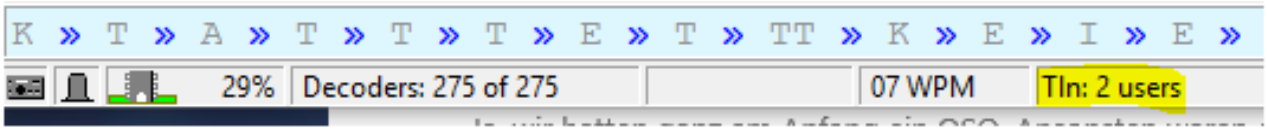


(optional) You can also send your local spots to the RBN network for others to use. In this case you use the RBN aggregator to send the spots out, and then connect to your favorite cluster node which would then get you the spots back (with all the others). If you wanted to do that, you need to download the latest RBN aggregator software from www.reversebeacon.net, and configure it to connect to your local CW Skimmer. One or multiple (up to 8 skimmers are supported). In order to do that, the Aggregators setting must point to the CW Skimmer, IP Address and Port. The call sign again must be your legal call sign.



(optional) If you want to feed your logger with your locally skimmed spots AND a public cluster (but not send your spots to RBN), you need to combine these two feeds. A suggested tool is K1TTT's WintelnetX tool. You can think of it as a Y "connection" for cluster feeds. For example, you could connect to both VE7CC AND your local CW Skimmer feed, and output it on a local port. That port you would then connect your favorite logging program to it. (see screen shot above).

A good help for troubleshooting: In the status bar at the lower right corner of CW Skimmer you can see how many telnet users are connected. There must be at least 1 telnet user for SDRBridge. If you do not see 1 connected for the bridge, the settings in the bridge do not match. In case of you using RBN Aggregator (option 3), a second user will be connected for it. Or, if you just use the spots locally (option 3) you should also see a second user connected to it. There is no limit of how many telnet clients can connect to the CW Skimmer.



Note: It is also possible to both combine the feeds and send to RBN (options 2 and 3). In that case, a contester may have an advantage of getting the raw local spots without any filtering or delay from the RBN network. In that example, 3 telnet users would be connected.

SAMPLING RATE: I am able to run with 192khz sample rate, and therefore have more band coverage. As long as DAX and CW Skimmer are set to it, works fine. This is good because it seems the center frequency could be arbitrarily at the beginning of the band, i.e. 7.012, and if using 96 would only give me coverage to about 7.012 + 48. With 192, the whole band is covered…