Using FT#StartUp v 1.0 Dick Williams, W3OA May 13, 2020

The purpose of FT#StartUp is to expedite setting up multiple instances of WSJT-X in order to send FT4 and FT8 spots to Aggregator and ultimately the Reverse Beacon Network. This replaces FT8StartUp and supports using one or two SDRs or both halves of a Red Pitaya 122.88-16.

Preliminaries:

- Set up Skimmer Server to run with CWSL_Tee and cover your chosen bands, up to eight if your SDR supports that many. Wes, WZ7I, describes how to do this in a blog post at <u>http://reversebeacon.blogspot.com/2013/03/magic-with-qs1r-twoapps-at-once.html</u>. If you will be using two SDRs or both halves of a Red Pitaya 122.88-16 setup a second instance of Skimmer Server in a similar manner.
- 2. Install WSJT-X v2.0.0 or a later version. Do not use release candidates. If an instance of WSJT-X is not running on the same computer as Aggregator you will need to change the IP address in WSJT-X's File/Settings/UDP Server/UDP Server: box to either a broadcast address (ending in .255) or the address of the Aggregator computer.
- 3. Install virtual audio cables, at least one for each band you want to cover. The program I used for virtual audio cables came from <u>http://software.muzychenko.net/eng/vac.htm</u>. The screen shot below shows the settings I use to setup 32 Virtual Audio Cables on a Windows 10 computer. Pay particular attention to the SR and BPS ranges. For Windows 7 you should set the BPS range to 24 .. 24.

| - | | | | | | | | | | | | | | | | | | _ |
|--|---------|-----------------|----------------|--------------|---|--|-----------|-----------|-----------|------------|-----------|--------------|-------------|---------|-------------|--------------|-------------|---|
| VI | rtual A | Audio Cable Co | ntrol Panel | | | | | | | | | | | | | _ | . , | < |
| Driver parameters Cable parameters Connected source in | | | | | | | | | | | | | | | | | | |
| Cabl | es 3 | 2 ÷ Set | Clients | 431 | | | | | i unia | trange | | | | _ | Connected | u source iii | ics | |
| | | | Streams | 39 | SR 48000 | SR 48000 ▼ 48000 ▼ BPS 32 ▼ 32 ▼ NC 1 ▼ 1 ▼ | | | | | | | | | | | S/PDIF | |
| | Worker | r threads | limer res. mcs | 1000 | | | | | | | | | | | | | | |
| 110 | n to [| Auto 👻 | | | Max inst 20 💌 Ms per int 2 💌 Stream fmt limit Cable range 🔍 Clock corr ratio 100.0000000 🗧 🗌 Volume control | | | | | | | | | | | | | |
| | | | Log level | 7 🔻 | | | | | | | | | | | | | | |
| Pr | io | Auto 👻 | - | | | Stream buffer watermark control | | | | | | | | | | | | |
| | | | | Set | | | | | | | | | | | | | Auto - | |
| | | | | | I Enabled | I Enabled Low 100 ms High 1200 ms Max wait 1000 ms Use PortCls Stream buff | | | | | | | | | | | | |
| | | _ | | | | | | _ | | - | | | - | | | - | 1 | |
| | | R | eset counters | Restart | Info | Info Capture port Auto VR Render port Auto VR Set | | | | | | | | | | | et counters | |
| | | | | | | | | - | | | | | | | | | | |
| Cable | MS | SR range | BPS range | NC range | Stm fmt limit | St buf | Vol ctl | Ch mix | PortCls | WM ctl | Curren | nt format | Rc stms | Pb stms | Signal | Oflows | UFlows | ~ |
| 1 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | ExtPCM/48 | 3000/32/1(4) | 0 | 1 | | | | |
| 2 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | ExtPCM/48 | 8000/32/1(4) | 1 | 1 | 11111111111 | | | |
| 3 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | ExtPCM/48 | 8000/32/1(4) | 1 | 1 | | | | |
| 4 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | ExtPCM/48 | 8000/32/1(4) | 1 | 1 | | | | |
| 5 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | ExtPCM/48 | 8000/32/1(4) | 1 | 1 | | | | |
| 6 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | ExtPCM/48 | 3000/32/1(4) | 1 | 1 | | | | |
| 7 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | ExtPCM/48 | 3000/32/1(4) | 1 | 1 | | | | |
| 8 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | ExtPCM/48 | 8000/32/1(4) | 1 | 1 | | | | |
| 9 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | ExtPCM/48 | 3000/32/1(4) | 1 | 1 | | | | |
| 10 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | ExtPCM/48 | 3000/32/1(4) | 1 | 1 | | | | |
| 11 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | | | | | | | | |
| 12 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | | | | | | | | |
| 13 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | | | | | | | | |
| 14 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | | | | | | | | |
| 15 | 2 | 480004800 | 0 3232 | 11 | Cable range | Auto | Off | Off | Off | Off | | | | | | | | ~ |
| 10.12 | 10:16: | 07.122 Cable 1, | capture stream | 550: termina | ated. Life: 00:27 | 7:32, run | : 00:27:3 | 32, frame | s: 787101 | 11, SR: 4 | 7636 | | | | | | | 7 |
| | | | | | | | | | | | | | | | 1.1 | | | 1 |
| Save | log | Clear log | | | | | | | System | timer res, | mcs 997 | Restart Au | udio Engine | Abo | ut H | Help | Exit | |

- 4. Wes also advises that if you are running Windows 7 you need to add an additional step. Go to the Control Panel, Hardware and Sound, Sound, Manage audio devices. Click on the Playback tab, select "Line 1, Virtual Audio Cable". Then Click on Properties, Advanced, and from the pulldown menu select "1 channel, 24 bit, 48000 Hz (Studio Quality)", and then "OK". Repeat this for each VAC. Then repeat this process for the Recording tab of each of the Virtual Audio Cables."
- Obtain and store CWSL_SSBWave.exe in a known location. I suggest the <u>C:\WSJT</u> folder. Get CWSL-SSBWave.exe from <u>https://drive.google.com/drive/folders/1HkElLN0IeAfsdKb728PnnUXi1u6tFVCf</u>
- 6. Store FT#StartUp.exe in a location that is not protected by Windows.

| FT#StartUp | v1.0 | | | | | | | | | | | - 0 |
|---------------------------|--------------------------|-------------------------|--------------------------------------|-------------------------------------|----------------------------|--------------|----------------------|--|--|--|-----------------------|---------------|
| | ocation of | weit ava. | C:\WSIT\wetv\ | hin/welty ava | | Danma | | | | | | |
| | Location of | wajt.exe. | Example: C:\ | WSJT\wsjtx\bin\wsjt.exe | | Browse | Close Wide C | Graph Window an | d minimize WSJT-X | main window when starting all rigs in use. will remain open | Start Al | Rigs in Use |
| Folder for | WSJT-X A | pp Data: | C:\Users\dickw\ | AppData\Local | | Browse | | | and making stated | minement open. | | |
| | | | Example: C:\ | Users\W3OA\AppData\Local | | | "Kill All Rigs" | then "Start All Ri | qs In Use" at 2:00 a | m (local) every day. | Kill | All Rigs |
| cation of CW | SL_SSBW | ave.exe: | C:\WSJT\CWSL | _SSBWave.exe | | Browse | | | - | | | |
| | | | Example: C:\ | WSJT\CWSL_Wave.exe | | | | | | | | |
| First SDR Par | amaters | | | | | | Second SDR | R Parameters | | | | |
| Location of SkimServ.ini: | | C:\Users\dickw\ | AppData\Roaming\Afreet\Products\Skim | irv\SkimSrv.ini | Browse | Location of | SkimServ2.ini: | :\Users\dickw\App | Data\Roaming\Afreet\Products\SkimSrv2\Sk | imSrv2.ini | Browse | |
| | | | Example: C:\l | Jsers\W3OA\AppData\Roaming\Afreet\P | roducts\SkimSrv\SkimSrv.ir | ni | | | Example: C:\User | s\W3OA\AppData\Roaming\Afreet\Products | \SkimSrv2\SkimSrv2.ir | 1 |
| Select ti Clicking | he Rig Moi this Refre | des below sh button. | before Refresh | FT4/8 Frequencies | | | Select t Clicking | the Rig Modes be g this Refresh but | low before Re | fresh FT4/8 Frequencies | | |
| Rig Number | r Use? | Mode | Frequency | Virtual Audio Cable | UDP Port | | Rig Number U | lse? Mode | Frequency | Virtual Audio Cable | UDP Port | |
| 1 | F | T4 ~ | 21.140 ~ | Line 1 (Virtual Audio Cable) | ~ 2201 | Start Rig 1 | 101 🛛 | FT4 ~ | 3.575 🗸 | Line 17 (Virtual Audio Cable) | 2301 | Start Rig 101 |
| 2 | F | T4 ~ | 24.919 ~ | Line 2 (Virtual Audio Cable) | ~ 2202 | Start Rig 2 | 102 🗄 | FT4 ~ | 7.0475 ~ | Line 18 (Virtual Audio Cable) | , 2302 | Start Rig 102 |
| 3 | ⊡ F | T4 ~ | 28.180 🗸 | Line 3 (Virtual Audio Cable) | ~ 2203 | Start Rig 3 | 103 🗄 | FT4 ~ | 10.140 ~ | Line 19 (Virtual Audio Cable) | 2303 | Start Rig 103 |
| 4 | F | T4 ~ | 50.318 🗸 | Line 4 (Virtual Audio Cable) | ~ 2204 | Start Rig 4 | 104 🗄 | FT4 ~ | 14.080 ~ | Line 20 (Virtual Audio Cable) | 2304 | Start Rig 104 |
| 5 | ₽ F | T8 ~ | 21.074 ~ | Line 5 (Virtual Audio Cable) | ~ 2205 | Start Rig 5 | 105 🛛 | FT4 ~ | 18.104 ~ | Line 21 (Virtual Audio Cable) ~ | 2305 | Start Rig105 |
| 6 | ⊠ F | T8 ~ | 24.915 🗸 | Line 6 (Virtual Audio Cable) | ~ 2206 | Start Rig 6 | 106 🗄 | FT8 ~ | 1.840 ~ | Line 22 (Virtual Audio Cable) | 2306 | Start Rig 106 |
| 7 | F | T8 ~ | 28.074 ~ | Line 7 (Virtual Audio Cable) | ~ 2207 | Start Rig 7 | 107 🗄 | FT8 ~ | 3.573 🗸 | Line 23 (Virtual Audio Cable) ~ | 2307 | Start Rig 107 |
| 8 | ⊠ F | T8 ~ | 50.313 🗸 | Line 8 (Virtual Audio Cable) | ~ 2208 | Start Rig 8 | 108 🗟 | FT8 ~ | 5.357 ~ | Line 24 (Virtual Audio Cable) ~ | 2308 | Start Rig 108 |
| 9 | F | T8 ~ | 50.323 ~ | Line 9 (Virtual Audio Cable) | ~ 2209 | Start Rig 9 | 109 🗟 | FT8 ~ | 7.074 ~ | Line 25 (Virtual Audio Cable) | 2309 | Start Rig 109 |
| 10 | | T8 ~ | 21.074 ~ | Line 10 (Virtual Audio Cable) | ~ 2210 | Start Rig 10 | 110 | FT8 ~ | 10.136 ~ | Line 26 (Virtual Audio Cable) | , 2310 | Start Rig 110 |
| 11 | | T8 ~ | 21.074 ~ | Line 11 (Virtual Audio Cable) | ~ 2211 | Start Rig 11 | 111 🗄 | FT8 ~ | 14.074 🗸 | Line 27 (Virtual Audio Cable) | 2311 | Start Rig 111 |
| 12 | F | T8 ~ | 21.074 🗸 | Line 12 (Virtual Audio Cable) | ~ 2212 | Start Rig 12 | 112 | FT8 V | 18.100 ~ | Line 28 (Virtual Audio Cable) ~ | 2312 | Start Rig 112 |
| 13 | F | T8 ~ | 21.074 🗸 | Line 13 (Virtual Audio Cable) | ~ 2213 | Start Rig 13 | 113 | FT8 ~ | 1.840 ~ | Line 29 (Virtual Audio Cable) | 2313 | Start Rig 113 |
| 14 | F | T8 ~ | 21.074 🗸 | Line 14 (Virtual Audio Cable) | ~ 2214 | Start Rig 14 | 114 | FT8 ~ | 1.840 ~ | Line 30 (Virtual Audio Cable) ~ | 2314 | Start Rig 114 |
| 15 | Ē | T8 ~ | 21.074 🗸 | Line 15 (Virtual Audio Cable) | ~ 2215 | Start Rig 15 | 115 | FT8 ~ | 1.840 ~ | Line 31 (Virtual Audio Cable) | 2315 | Start Rig 115 |
| 16 | | T8 ~ | 21.074 ~ | Line 16 (Virtual Audio Cable) | ~ 2216 | Start Rig 16 | 116 | FT8 ~ | 1.840 ~ | Line 32 (Virtual Audio Cable) | 2316 | Start Rig 116 |

Operation:

- Start FT#StartUp. You should see a window as shown above. The input boxes will be empty. Each of the rows marked "Rig Number" 1 through 116 will contain the parameters FT#StartUp will use to start one instance of WSJT-X. Rigs 1 through 16 will use the first SDR, 101 through 116 will use the second SDR.
- 2. Use the "Browse" buttons in the top four rows to specify the file locations the program needs to operate. If you installed Skimmer Server and WSJT-X in their default locations the "Browse" buttons should open their File Dialogue in the correct location. Note that the first, third, and fourth rows ask for the relevant .exe. The second row asks for a folder. See the examples under each row. If you

will be using just one SDR you can leave the "Location of SkimServ2.ini" box blank.

- 3. Decide which Rigs you want to use and for each one select between FT4 and FT8 using the combo box for that Rig.
- 4. Click the left "Refresh FT4/8 Frequencies" button. If using two SDRs also click the right "Refresh FT4/8 Frequencies" button. FT#StartUp will read the SkimServ.ini file you specified to determine which FT4 and FT8 standard frequencies your SDR is covering and place those frequencies in each of the "Frequency" combo boxes.
- 5. Fill in the parameters for the "Rig Number 1" line to indicate how you want the first WSJT-X instance to operate. Use the combo boxes to select the frequency and the Virtual Audio Cable. The "UDP Port" specifies the port WSJT-X will use to send messages to Aggregator. Each port number must be unique, not used by any other application on this computer. Enter the same port number on Aggregator's "FT#" tab (see the next page for more information on setting up Aggregator).
- 6. Now Click the "Start Rig 1" button. FT#StartUp will start an instance of WSJT-X and CWSL_SSBWave. The CWSL_SSBWave window will be minimized. You should see the WSJT-X windows open up and operate normally. The mode, frequency, input soundcard and UDP server port should match the values you specified for Rig 1.
- 7. It's not necessary to make any changes in the WSJT-X windows but you may want to. For example you may want to enable PSK Reporter spotting (remember to set your callsign and grid for this option).
- 8. Repeat steps 5 through 7 for any additional rigs you want to set up.
- 9. Click the "Kill All Rigs" button to kill all the program instances FT#StartUp has started.
- 10. The "Start All Rigs In Use" button provides a convenient method to start multiple rigs. It will start all the rigs that have a check in the "Use?" check box. Give it a try.
- 11. There is another check box called "Close Wide Graph and Minimize other windows on Rig Start". It does what it says and is provided to minimize use of system resources. The first WSJT-X window is left open because my experience led me to believe this improved decoding during long periods of unattended operation.
- 12.Putting a check in the "Kill All Rigs then Start All Rigs" box will cause FT#StartUp to do what it says at 2:00 am local time every day. This is provided to overcome an apparent bug in some versions of CWSL_SSBWave which can cause WSJT-X to stop decoding signals after long operating periods.

Automate Start Up: FT#StartUp will accept a command line argument, "-autostart", that causes it to simulate a user clicking the "Start All Rigs In Use" button when it starts.

Adding Frequency Options: FT#StartUp populates the entries in its "Frequency" combo boxes from the items in FTStartUp.ini shown below. You can add additional items to these two lists and they will appear as options when you click the "Refresh FT4/8 Frequencies" buttons. Each list should be on one continuous line, (no line breaks).

[FT8 Standard Frequencies] Frequencies=1.840,3.573,5.357,7.074,10.136,14.074,18.100,21.074,24.915,28.074,50.313,70.100 [FT4 Standard Frequencies] Frequencies=3.575,7.0475,10.140,14.080,18.104,21.140,24.919,28.180,50.318

Aggregator:

- 1. Version 6.0 has a new tab, "FT#", added specifically to receive FT4 and FT8 spots via UDP messages. The text in the upper left corner explains how to use this feature.
- 2. Your entries in the "Port Number" boxes here should match your entries in the "UDP Port" boxes in FT#StartUp.
- 3. Note that the intent was to add FT4 and FT8 spots to a node already skimming for CW or RTTY spots. Consequently, a connection using the Primary Skimmer Connection on the "Connections Tab" is still required.

| itatus | | Spot Fil | ters C | onnection | s Patt3Ch.lst | ini Fil | es | Skimmer 7 | Fraffic C | ombined Ski | mmers | Secondary | Skimme | s RTTYS | kimServ | FT# | Associate Pgms | |
|--|---|--|--|---|--|--|--|---|--|-------------------------------------|---------------------|-----------|--|---|--|---|---|--|
| Aggre The t Place Enter Aggre Vake Aggre | egator able b "Src # the p egator se 1.0 e all th egator egator | can monito below sets t " columns eck in the ' ort number will apply a for a well o e needed o treats mes treats CQ r | or up to 33 in the paramete show the So "Use?" box if that source is a calibration f calibred rece changes to a sages that st message rec | stances of ins to use for urce Numb f you want is using for factor you factor you actor you at with "C eived withi | WSJT-X for FT4 or each instance per Aggregor use: Aggregator to ac sending UDP me specify to the dia meters and then o Q" or are in the f n 10 minutes of th | and FT or "sources to ident coept spo essages. I frequen slick the i omat "ca he last Cl | B spots ce''. ify the its from Each cy WS "Apply all call Q mess | s via their UI source of sp that source should use JT-X report: Changes'' & report'' as C sage from th | DP message pots it proce e. a unique po s. button. CQ message nat call as a | es. esses. ort. s. dup. | Apply Cha | anges | 37 38 36 38 36 38 37 38 37 38 37 37 37 | CQ W9JA CQ HA7TM CQ N5HHS CQ DL1JE CQ W7HD CQ N1UL CQ WF5E CQ EASWI CQ N1FTP CQ F5NBQ DY4DG N5 DY4DG N5 CQ K3ABE CQ K9ZW | EN43 cor JN97 cc EL29 cc K JO60 s DM42 cor EL95 cor IM99 cc FN32 cc JN05 cc BSA R-06 FN20 cc EN64 cor | nsidered onsidered spot gen nsidered onsidered onsidered onsidered onsidered onsidered onsidered | d a dup ed a dup ed a dup erated d a dup d a dup ed a dup ed a dup ed a dup lered a dup ef a dup d a dup | |
| irc # | Use? | Port Number | Calibration Factor | Dial Freq | Day Time Last Msg. | Src # | Use? | Port Number | Calibration Factor | Dial Freq | Day Tim Last Msg | e j. | Src Use # | ? Port Number | Calibratio Factor | on Dial Freq | Day Time Last Msg. | |
| 11 | | 2201 | 1.000 | 21140 | | 22 | | 2212 | 1,000 | | | | 33 🗹 | 2307 | 1.000 | 3573 | 3 13 12:50:59Z | |
| 2 | | 2202 | 1,000 | 24919 | 13 9:55:13Z | 23 | | 2213 | 1,000 | | | | 34 🗹 | 2308 | 1,000 | 5357 | 7 13 13:11:14Z | |
| 3 | | 2203 | 1,000 | 28180 | 12 15:46:28Z | 24 | | 2214 | 1,000 | | | | 35 🗹 | 2309 | 1,000 | 7074 | 13 13:13:29Z | |
| 4 | | 2204 | 1.000 | 50318 | | 25 | | 2215 | 1,000 | | | | 36 🖂 | 2310 | 1,000 | 1013 | 6 13 13:13:29Z | |
| 5 | | 2205 | 1,000 | 21074 | 13 13:06:44Z | 26 | | 2216 | 1,000 | | | | 37 🗹 | 2311 | 1,000 | 1407 | 4 13 13:13:30Z | |
| 6 | | 2206 | 1,000 | 24915 | 13 13:09:59Z | 27 | | 2301 | 1,000 | 3575 | 13 11:47: | 13Z | 38 🗹 | 2312 | 1,000 | 1810 | 0 13 13:13:30Z | |
| 7 | | 2207 | 1,000 | 28074 | 13 2:23:44Z | 28 | | 2302 | 1,000 | 7047 | 13 13:10: | 13Z | 39 🗌 | 2313 | 1,000 | | | |
| 8 | | 2208 | 1,000 | 50313 | 13 11:32:45Z | 29 | | 2303 | 1,000 | 10140 | 13 12:50: | 43Z | 40 🗌 | 2314 | 1,000 | | | |
| Ð | | 2209 | 1,000 | 50323 | 12 21:43:14Z | 30 | | 2304 | 1,000 | 14080 | 13 13:13: | 28Z | 41 🗌 | 2315 | 1,000 | | | |
|) | | 2210 | 1,000 | | | 31 | | 2305 | 1,000 | 18104 | 13 13:13: | 21Z | 42 🗌 | 2316 | 1,000 | | | |
| | | 2211 | 1.000 | | | 32 | | 2306 | 1.000 | 1840 | 13 11:03: | 29Z | 43 🗆 | 2317 | 1.000 | | | |