

Desktop Casting with *JACK* and *ffmpeg*

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Notes:

- The script *install.script* will install the software needed to run this application. It will also adjust some settings in your */etc* files. See *install.script* for details. See also the file *GeneralInstall.script* at the top level of the distribution directory. It installs software needed by all versions.
- Video rendering will be more efficient if you have a supported video card (such as Nvidia) along with drivers that include the *libvdpau* (Video Decode and presentation API for Unix) library.
- JACK Audio is not compatible with all audio sources. For example, most browsers do not send audio to JACK. In some audio packages, you will need to enable JACK output. The players *VLC*, *MPV*, *MIXXX* and *SMPLAYER* are examples of these.
- When JACK is running, Pulse Audio is disabled. To restore Pulse Audio, re-boot. Pulse Audio sources will **not** play until you reboot.
- JACK is a system that connects sound sources to sound targets. These connections are stored in an *XML* file. The graphical tool *QjackCtl* can be used to build this xml file. Editing and activating this file can be frustrating. It is important that the connections in *QjackCtl* be correct. Missing or misplaced connections will result in no, bad, or distorted sound.
- There are several configuration files you need to be aware of.

QjackCtl stores its configuration file in *~/.config/rncbc.org/QjackCtl.conf*

JACK connections are stored in: *~/.config/jack*

The distribution contains sample files.

- You **MUST** check that *QjackCtl.conf* points to this location. To do so, you must edit the QjackCtl setup. To edit QjackCtl, open QjackCtl (it's link should be in Sound & Video) and click Setup. A setup window will appear. Under the options tab, check Activate Patchbay persistence. Click the box to the right with the three dots and navigate to your *~/config/jack/jack1.xml* file.

Note: In the popup file navigator, hidden files are not shown by default. To see hidden files (those starting with a *.*), in the navigation window that pops up, right click and enable hidden files. Select the *.config* directory and then the appropriate directory and finally the file *jack1.xml* directory.

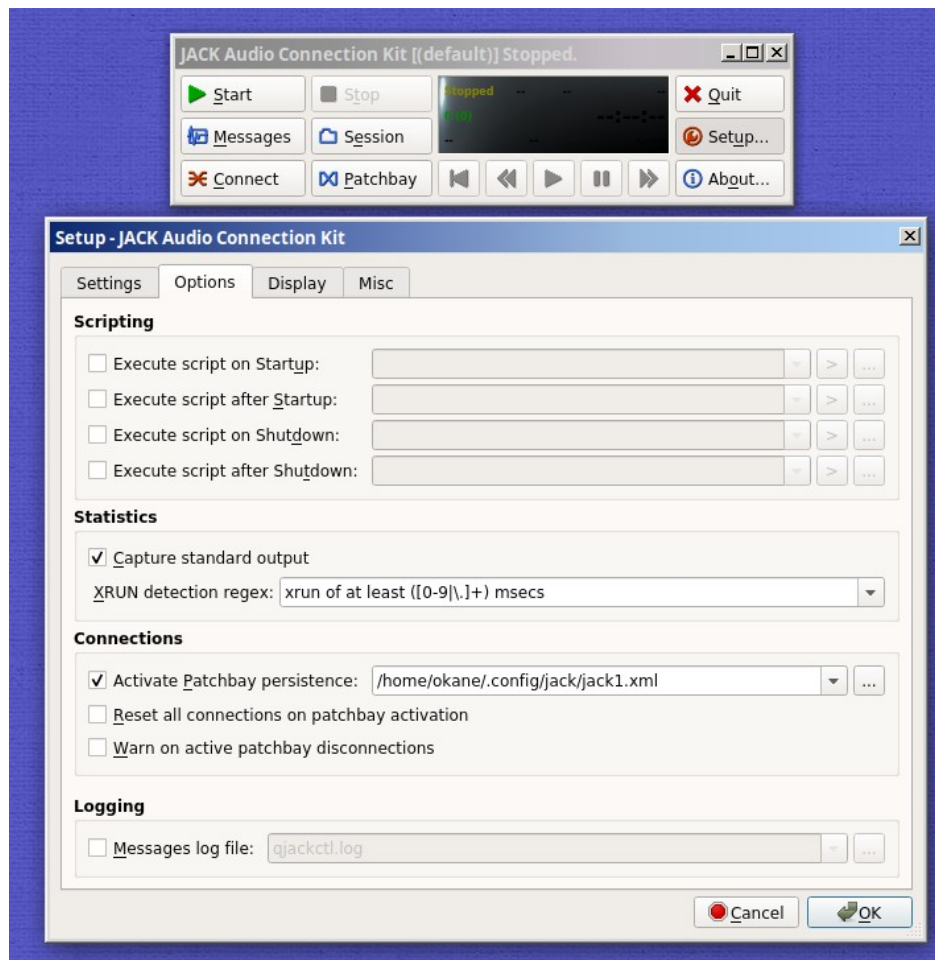


Figure 1 QjackCtl Settings

Click OK and exit QjackCtl. Don't try click *Start* as the JACK demon is not yet running.

A copy of my *jack1.xml* is included in the distro and will be copied to your *~/config/jack* directory when you run the install script. This file assumes a minimal configuration and you may need to edit it in the *PatchBay* once JACK has started.

- You initiate casting by running of the scripts:

```
startStudio.script
startDesktopStudio.script
startOneCameraStudio.script
startTwoCameraStudio.scrip
```

However, before doing so, you will need to edit the file:

AutoPlay/Encoders/include/serverKeys

to insert your casting key and your casting server's URL. The URLs for iVlog and vaughnLive are already present. The areas for the casting keys are shown as asterisks. Note the Bash variable STREAM which selects which to use. Set it accordingly.

You may also want to change other entries in the script to reflect your situation. The script is set to cast your entire screen. A background 1920x1080 image is provided if you want to obscure the contents of your desktop.

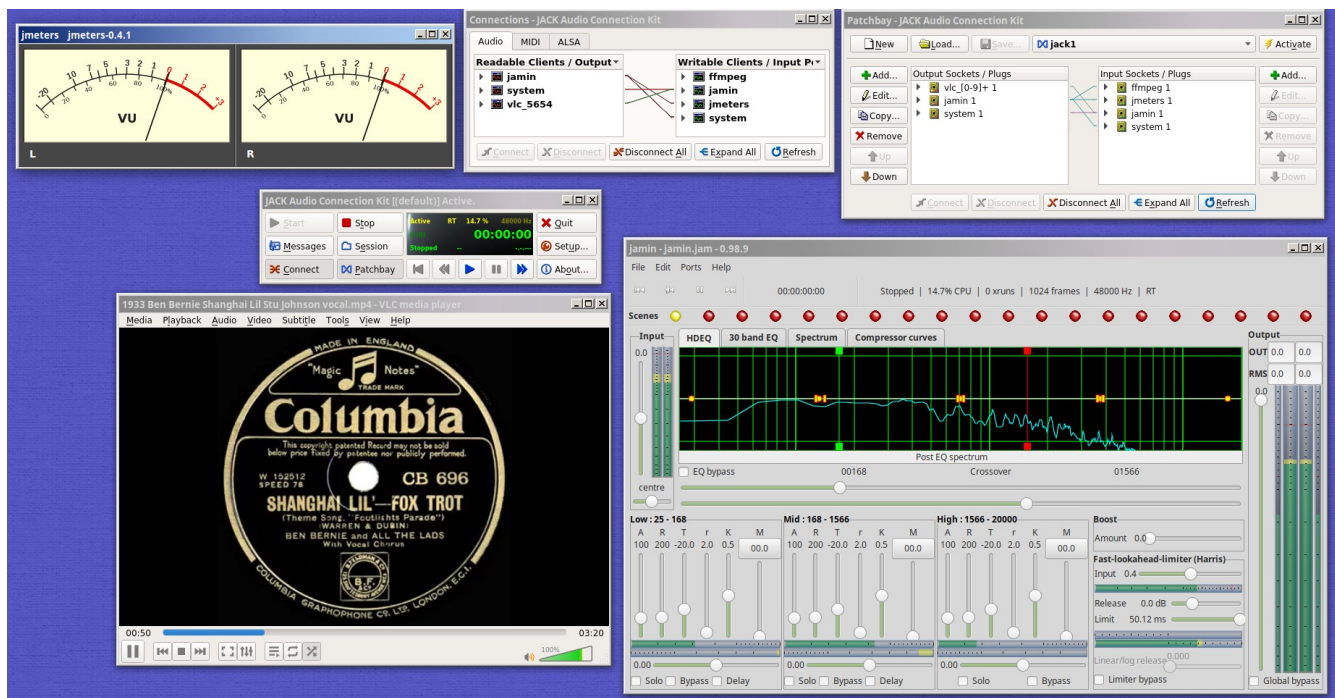


Figure 2 Desktop

- Figure 2 Shows (after some rearrangement) what your desktop will look like when running. Seen are the following:

The JACK Audio Mastering interface (jamin) which provides audio compression, equalization, and limiting.

The VU meters showing volume levels after jamin processing.

An instance of the VLC player.

The Jack Audio Connection Kit (QjackCtl).

The Qjackctl connections window.

The QjackCtl PatchBay window.

- Not shown is the minimized terminal window which initiated the windows. The terminal window, after starting the other software, initiates *ffmpeg* and attempts to contact the server. Generally speaking, you must be logged into the server for the server to accept your *ffmpeg* connection. This login should be from another computer, not the encoding machine (the one running *ffmpeg*).
- If you want to experiment with the configuration without activating *ffmpeg*, edit the appropriate script file and place a Bash exit command on the line before the *ffmpeg* line. If you do this, all the software will activate except *ffmpeg*. Note that, as a result, *ffmpeg* will not be an available JACK connection output line item.
- Both the Connections window and the PatchBay window are raised by the main QjackCtl window (the smallest window shown in Figure 2 with the small green numeric display).
- The Connections window shows the currently running connections. The PatchBay window allows you to make connections and then activate and save them. When activated, connections, if valid, will appear in the Connections window. The PatchBay window will also store the xml file describing the desired connections.
- The Connections and PatchBay windows can be raised by clicking on the Connect or PatchBay buttons on the main QjackCtl window.
- The Connections and PatchBay window are divided horizontally into an area or output sockets (left column) and input sockets (right column). The names of the input or output sockets may be slightly different between the two windows. The *vlc* player usually has a number included in its name.
- In Figure 2, the following connections in PatchBay are evident:

Output from *vlc* is routed to the jamin input.

Output from system (the microphone or line-in on your machine) is also routed as input to *jamin*.

The output from *jamin* (left column) is routed to *ffmpeg*, *jmeter*s, and *system*.

In short, the audio sources, *vlc* and your microphone are sent to *jamin* for processing. The resulting audio is sent to *ffmpeg* for encoding, system for your speakers and/of headphone, and *jmetrics* for display.

- If you open the Edit option on *vlc*, you will see that it's connection is listed as Exclusive (checkbox). This causes it to stay connected to *jamin* and not wander to other input sockets. The name *system* on the left side means a system source - your microphone or line-in in this case. The name *system* on the right side means a system target - your speakers in this case. These are numbered as there can be several sources and targets on a machine.

In simple terms, *vlc* and your microphone are inputs to *jamin*. The program *jamin* processes the audio and sends it to *ffmpeg*, the meters and the system speakers.

Problems You May Encounter

- You will note that the actual Connections window does not show a connection to *ffmpeg*. Activating the PatchBay connection will fix that.
- Be certain that you change your player settings, *vlc* for example, to use JACK (and not pulse). Reboot to be certain that the change is accepted and that there are no Pulse connections blocking Alsa.
- When you configure QjackCtl, be careful of the following
 - Output (especially microphone) being sent to two targets. This will result in an echo.
 - Output not being sent to the correct target thus resulting in no sound.
- The *jamin* configuration can easily become corrupted or incorrectly loaded. Check the positions of the compressors sliders. If most are set to zero, the *jamin* configuration is wrong. This is especially true of the compressor settings. If the compressor settings are wrong, the audio will be grossly distorted.

Try clicking on File | Open | default.jam. This should reload the configuration.

Alternatively, terminate *jamin* and restart it.

If all else fails, try deleting the files:

```
~/ .jamin/default.jam
```

Restart *jamin* and under File, click Save (this creates *defaults.jam*).

Otherwise, reset the compressors settings as follows:

A	100
R	200
T	-20.0
r	2.0
K	0.5
M	0.0

Then click save as above.

Compressor settings are complicated and there are reference documents on the internet that can help.

- If you want to use *Mixxx*, you will need to configure *Mixxx* for JACK output (the JACK demon should be running before you do this).
- If your microphone does not work, check that it is not muted (use Pulse Volume Control or the Speaker icon in your tray).
- Before starting the software, reboot in order to clean out any Pulse jobs that may be blocking Alsa. After using JACK, if you want to return to Pulse, reboot.
- You might try changing *autospawn = yes* in */etc/pulse/client.conf* to *autospawn = no* (see above). Reboot. You need to change this back to *yes* when you return to Pulse mode.

Jack connections are tricky. They will wait until you're not looking and then scramble....