

# FS-UAE and MIDI For Bars and Pipes and Other AMIGA midi Software.

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## INTRODUCTION

This Tutorial is dedicated to Alfred Faust and Frode Solheim.  
Thank you both for your innovative software and hard work.  
This is the first draft of this tutorial and will be expanded later on.

## SOFTWARE REQUIREMENTS FOR THIS TUTORIAL

### FS-UAE SOFTWARE

Installing FS-UAE from the FS-UAE web site for:-

1. Ubuntu distributions
2. Debian 9.0 (stretch)

#### UBUNTU

Install from the FS-UAE repository

Link:- <https://fs-uae.net/download#ubuntu>

For **Ubuntu**, run the following commands to install FS-UAE and configure it for automatic updates:

```
sudo apt-add-repository ppa:fengestad/stable
sudo apt-get update
sudo apt-get install fs-uae fs-uae-launcher fs-uae-arcade
```

Alternatively, you can manually [download .deb files](#) instead.

#### Debian 9.0 (stretch)

For **Debian 9.0**, run the following as **root** to install FS-UAE and configure it for automatic updates:

Link:- <https://fs-uae.net/download#debian>

```
echo "deb http://download.opensuse.org/repositories/home:FrodeSolheim:stable/
Debian_9.0/" > /etc/apt/sources.list.d/FrodeSolheim-stable.list
apt-get update
apt-get install fs-uae fs-uae-launcher fs-uae-arcade
```

To avoid security warnings when installing the packages, you can import the key used to sign the packages:

```
wget http://download.opensuse.org/repositories/home:FrodeSolheim:stable/Debian_9.0/
Release.key
apt-key add - < Release.key
```

Alternatively, you can manually [download .deb files](#) instead.

## KX-STUDIO

I advise you to install **KX-Studio** software Repositories.

If you are using **Debian** or **Ubuntu**:-

Use the following KX-Studio software Repositories:-

From the link:- <https://kx.studio/Repositories>

OR

Debian / Ubuntu

All Debian and Ubuntu users can enable our repositories by installing this deb file:  
kxstudio-repos.deb.

You can install it manually by running this:

```
# Install required dependencies if needed
```

```
sudo apt-get install apt-transport-https gpgv
```

```
# Remove legacy repos
```

```
sudo dpkg --purge kxstudio-repos-gcc5
```

```
# Download package file
```

```
wget https://launchpad.net/~kxstudio-debian/+archive/kxstudio/+files/kxstudio-repos_10.0.3_all.deb
```

```
# Install it
```

```
sudo dpkg -i kxstudio-repos_10.0.3_all.deb
```

These packages contain:

Various sources files that activates the separate repositories

GPG keys used for package and repository signing

A post-install script that clears up legacy repository setup

## The following software is essential:-

a2jmidid  
aconnectgui  
aj-snapshot  
alsa-base  
alsa-firmware  
alsa-firmware-loaders  
alsa-oss  
alsa-tools  
alsa-tools-gui  
alsa-utils  
alsamixer  
apulse  
linux-sound-base  
multimedia-jack  
multimedia-midi  
pmidi  
pulseaudio  
python-alsaaudio  
qjackctl  
pulseaudio-module-jack  
audacity  
fs-uae  
fs-uae-arcade  
fs-uae-launcher

To install them all type (or use copy and paste) in a terminal:-

```
sudo apt update
```

```
sudo apt install a2jmidid aconnectgui aj-snapshot alsa-base alsa-firmware alsa-firmware-loaders  
alsa-oss alsa-tools alsa-tools-gui alsa-utils alsamixer apulse linux-sound-base multimedia-jack  
multimedia-midi pmidi pulseaudio python-alsaaudio qjackctl pulseaudio-module-jack audacity fs-  
uae fs-uae-arcade fs-uae-launcher
```

## Recommended Software:-

qtractor  
ardour  
kmidimon  
kmetronome  
lmms  
muse  
musescore  
non-sequencer  
qmidiarp  
qmidinet  
qmidiroute  
qxcdit  
rakarrack  
rosegarden  
seq24  
tymidi

Install with example:-

```
sudo apt install qtractor
```

OR install all at once:-

```
sudo apt install qtractor ardour kmidimon kmetronome lmms muse musescore non-sequencer  
qmidiarp qmidinet qmidiroute qxcdit rakarrack rosegarden seq24 tymidi
```

These software programs are recommended.

There are many other Midi and Audio programs that you can install too, just check them out.

## Linux kernel preparation to create virtual raw midi ports.

Withalsa you can create Virtual midi ports which are like having a virtual raw midi device's like real midi hardware (In FS-UAE they will serve as our Amiga serial midi interfaces).

These differ from the pre installed **"midi through"** virtual software also ports, in that they use raw midi instead of sequence midi.

We create these virtual midi ports by informing the alsakernel software to activate them as module's from the kernel when the system boots.

1. So we need to firstly add a command to the **"/etc/modules"** file with the **"sudo"** command.
2. Then we need to create our own file (using the sudo command) in **"/etc/modprobe.d"** folder, to inform Alsa to define a unique index number to the virtual midi ports.  
This makes it easier to identify those ports when patching them to our real midi hardware.

I'll walk you through the process to do this, with easy commands using terminal command line.

1. To create the virtual midi alsaports we need to edit the **"/etc/modules"** file with your favourite text editor.  
Here are some command line examples using the sudo command in a terminal :-

```
sudo mousepad /etc/modules
sudo leafpad /etc/modules
sudo gedit /etc/modules
```

**Or**

```
using nano direct in the terminal :-
sudo nano /etc/modules
```

Give in your password in the terminal when asked for it and your editor will open the **"/etc/modules"** file.

Add the following line :-

```
snd_virmidi
```

Select save from the editor menu, close the window and that part is completed.

2. Now we need to create a new file in the folder **"/etc/modprobe.d"** to instruct Alsa to give the virtual midi ports a unique index number so its easy to identify for later use.  
I suggest that you use a high index number like "22".

In your favourite editor create the new file from the command line :-

For example we can name the file we want to create **"virtual\_midi\_index.conf"**.

You can name the file anything you want.

Important is that it has the extention ending **".conf"**.

```
sudo mousepad /etc/modprobe.d/virtual_midi_index.conf
```

Or

```
sudo leafpad /etc/modprobe.d/virtual_midi_index.conf
```

Or

```
sudo gedit /etc/modprobe.d/virtual_midi_index.conf
```

Or

```
sudo nano /etc/modprobe.d/virtual_midi_index.conf
```

Give in your password in the terminal when asked for it.  
Your editor will create the file "/etc/modprobe.d/virtual\_midi\_index.conf" file.  
Add the following line :-

```
options snd-virmidi index=22
```

Select save from the editor menu, close the window and that part is completed.

3. Now **reboot** your computer.

### **Checking , after the reboot, if our virtual midi ports have been activated.**

1. Once again open a new terminal and type the command :-

```
amidi -l
```

Check if the following lines appear in the list of midi devices!

```
IO hw:22,0  Virtual Raw MIDI (16 subdevices)
IO hw:22,1  Virtual Raw MIDI (16 subdevices)
IO hw:22,2  Virtual Raw MIDI (16 subdevices)
IO hw:22,3  Virtual Raw MIDI (16 subdevices)
```

If these 4 lines appear in the device list  
you have successfully created these virtual raw midi devices.

If you used the index number **22** then **amidi** will list them as :-  
hw:22,0, hw:22,1, hw:22,2 and hw:22,3.

By defaultalsa creates 4 raw virtual midi devices.

This is especially useful when running Multiple instances of "Bars and Pipes" in FS-UAE.

Which I will explain later in this Tutorial.

This also works for Amiga midi programs like:-"Dr T's software, MusicX, Seqencer One ... etc."

### **Now lets look for our virtual raw midi devices in root directory "/dev/snd/".**

In a terminal type the following commands:-

```
cd /dev/snd/
```

then type:-

```
ls
```

You will get a list of the directory devices in the directory "/dev/snd/".

My print out in the terminal looks like this:-

```
by-id   controlC1 controlC3 hwC1D0  midiC22D2 midiC3D0 pcmC0D0p pcmC1D3p pcmC2D0p seq
by-path controlC2 controlC4 midiC22D0 midiC22D3 midiC4D0 pcmC0D1p pcmC1D7p pcmC3D0c timer
controlC0 controlC22 hwC0D0  midiC22D1 midiC2D0  pcmC0D0c pcmC0D2c pcmC2D0c pcmC3D0p
```

As we gave our our virtual raw midi devices the index number "22" the 4 of them are easy to find.  
They are :- midiC22D0, midiC22D1, midiC22D2 and midiC22D3.

These are the devices that we will assign to our **serial Amiga port** in FS-UAE.

If you are also running **Hatari** these ports can also be used in the midi device settings.

## Patching (routing)

### our real midi hardware to the virtual raw midi ports in Ubuntu

Normally we patch our USB MIDI INTERFACES, using our Linux distribution, that are connected to our real midi hardware like synths, sequencers, groove boxes... Etc.

In Ubuntu, Debian or other Linux distributions there are many programs to patch (route) our newly created virtual midi ports to our real midi hardware connected by our USB MIDI INTERFACES.

Here is a list of possible routing programs, to name a few:-

aconectgui  
qjackctl  
patchage  
catia

These programs have to be installed from the software repository.

I personally like to use **qjackctl patchbay**, because I can name the different hardware midi devices to avoid confusion and they are much easier to recognize and patch.

In addition you can **save** your patchbay routing's and **load** them when needed.

**If you decide to use "qjackctl patchbay" a very detailed tutorial is on the next page.**

 **TIP:-**

To make things easier also **DON'T START** the "jack" server! (explained on the next page)

As we will only use **ALSA MIDI** to patch and route our MIDI devices.

The reason being, that **ALSA midi connections** are much more **reliable** than the jack ones.

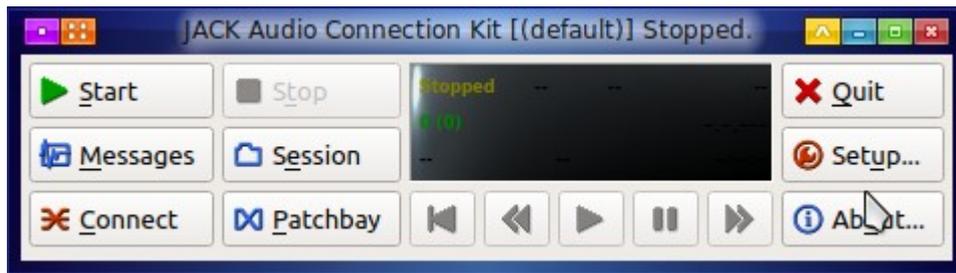
Also ALSA midi connections are much easier to recognize.

We don't need jack real-time as ALSA midi is very reliable and fast.

Especially when using system exclusive data.

## Tutorial using “qjackctl” to patch (route) your Midi Hardware

1. Start “qjackctl”  and the following window will appear.

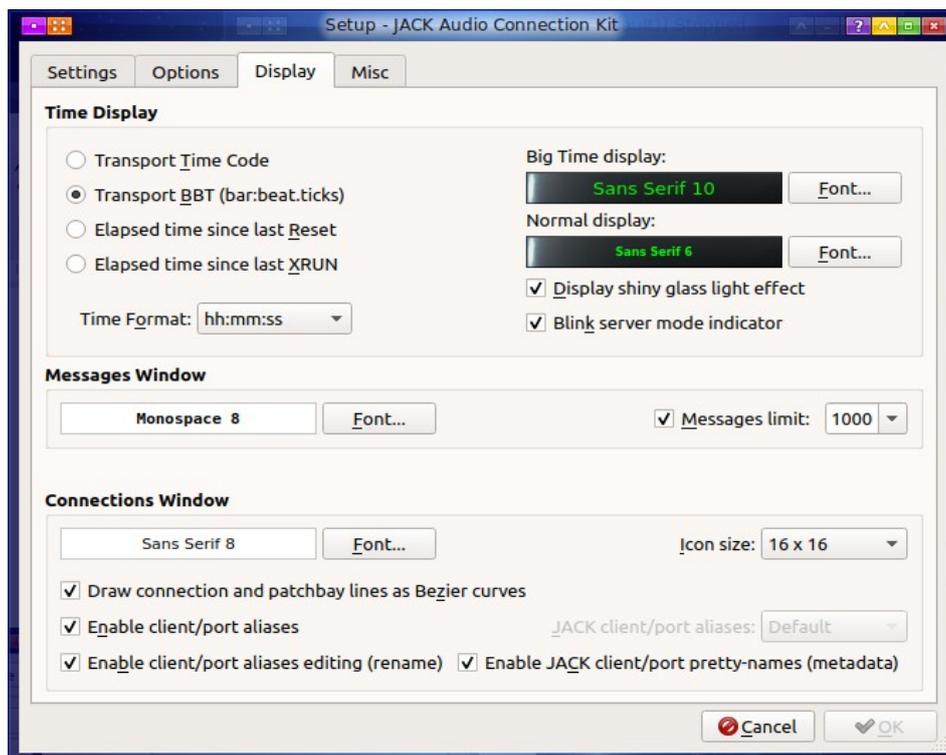


2. DON'T Click on “Start”, if jack starts click on “Stop”!

### Configure these settings by clicking on “Setup”

Look at the picture below and activate the following options:-

1. Click on the TAB “Display”
2. Enable the following options:-
  - a. Draw connection and patchbay lines as Bezier curves
  - b. Enable client/port aliases
  - c. Enable client/port aliases editing (rename)
  - d. Enable JACK client/port pretty-names (metadata)

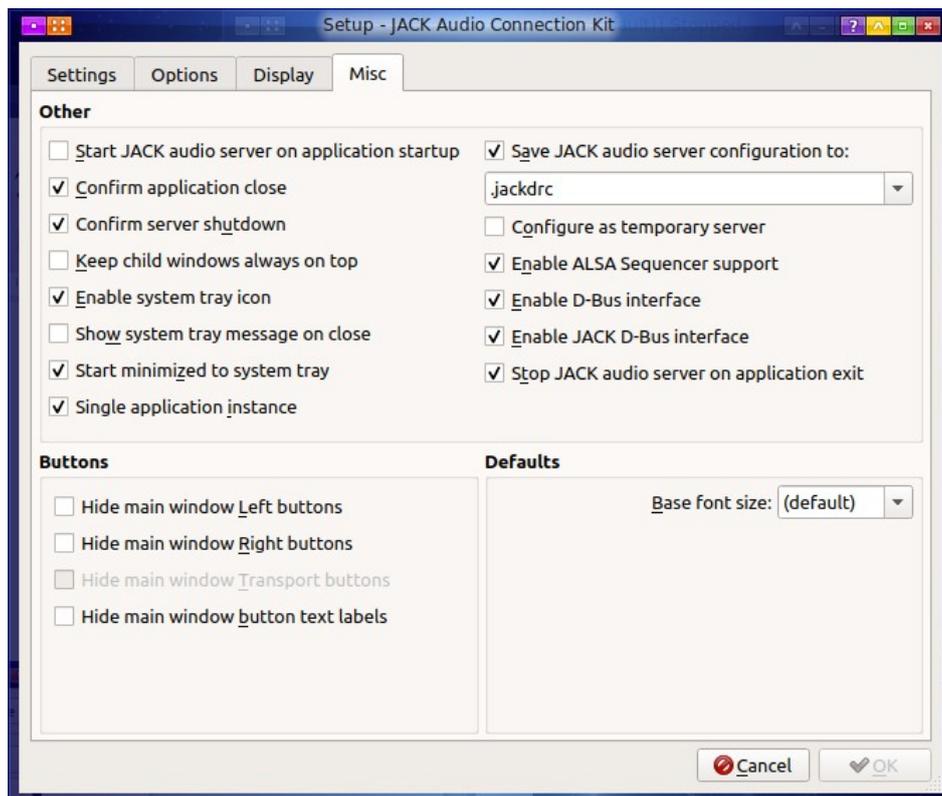


Look at the picture below and activate the following options:-

1. Click on the TAB “Misc”

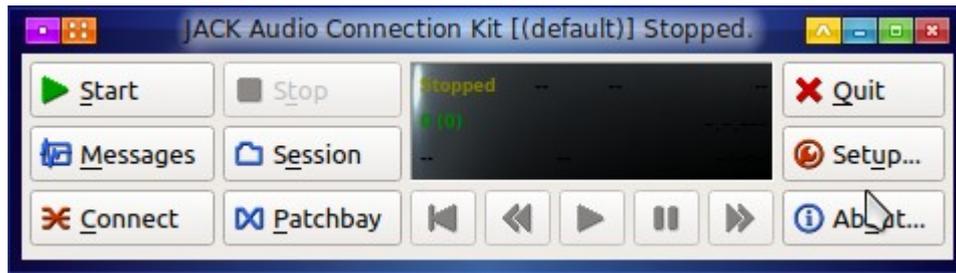
2. Enable the following options:-

- a. Confirm application close
- b. Confirm server shutdown
- c. Enable system tray icon
- d. Start minimized to system tray
- e. Single application instance
- f. Save JACK audio server configuration to: “.jackdrc”
- g. enable ALSA Sequencer support
- e. Enable D-Bus interface
- f. Enable JACK D-Bus interface
- g. Stop JACK audio server on application exit



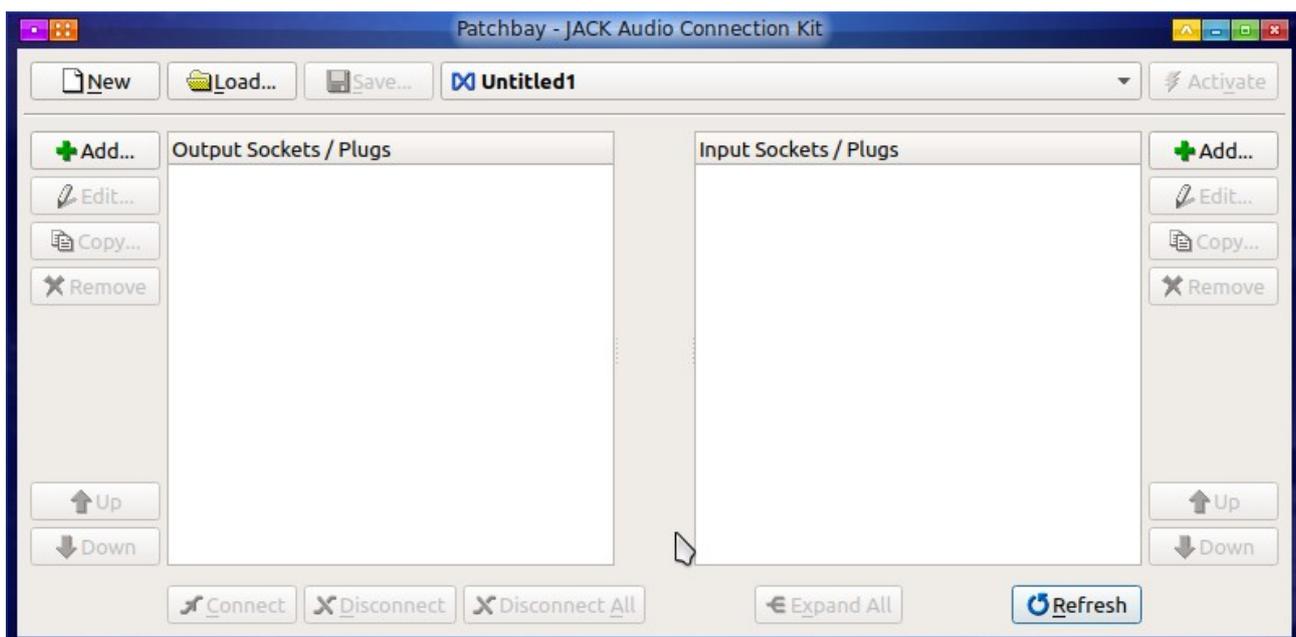
Click on “OK”

## Configure the Patchbay

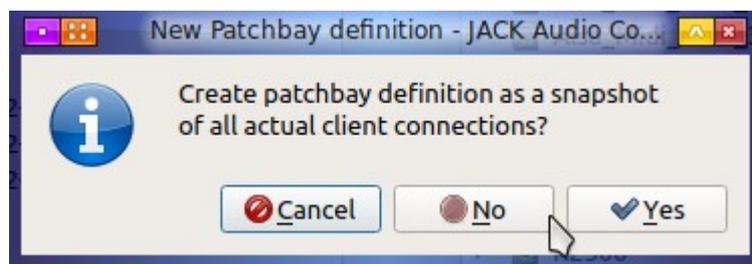


In the main “Qjackctl” window click on the button “**Patchbay**”

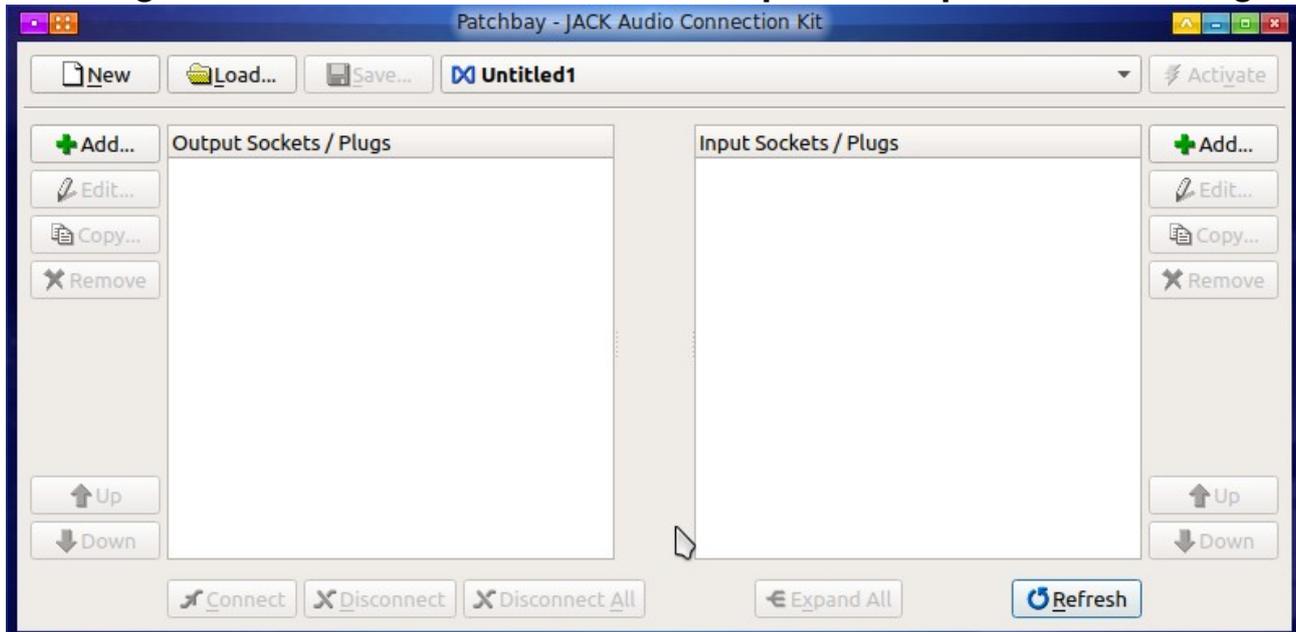
The “Patchbay” window as seen in the picture below appears.



Click on “**New**” and the requester as seen in the picture below appears.  
Click on “**No**”



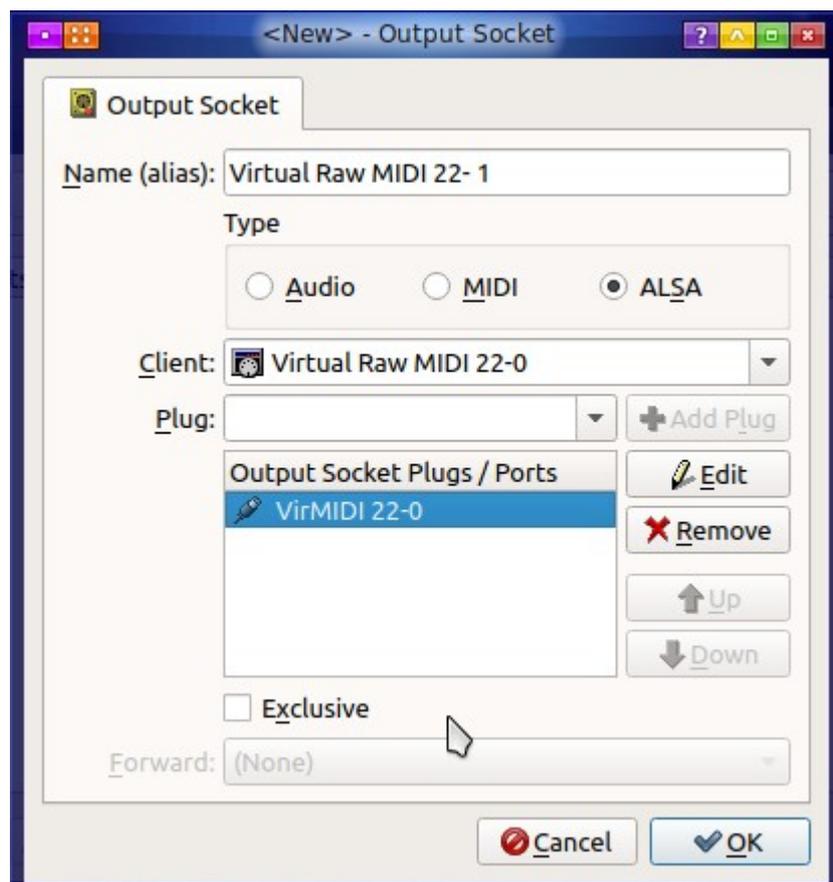
## Adding our Virtual Midi Ports to Both Output and Input Sockets/ Plugs



1. Click on “Add” on the left side to add an Output socket and plug.
2. Click in “Type” ==> “ALSA” radio button.
3. Click on the drop down menu “Client” and choose “Virtual Raw MIDI 22-0”
4. Click on the drop down menu “Plug” and choose “VirMIDI 22-0”
5. Click on “Add Plug” and “VirMIDI 22-0” will appear in the window below
6. Click on “OK”

A New Socket and plug will appear in the “Output socket / plug” window.

Also notice that the “Name (alias)” will automatically be generated “Virtual Raw MIDI 22- 1”



Now do the same procedure on the right side  
to add the “VirMIDI 22-0” plug to the **Input socket and plug**.

Also repeat this procedure for all your 4 “Virtual Raw MIDI devices”.

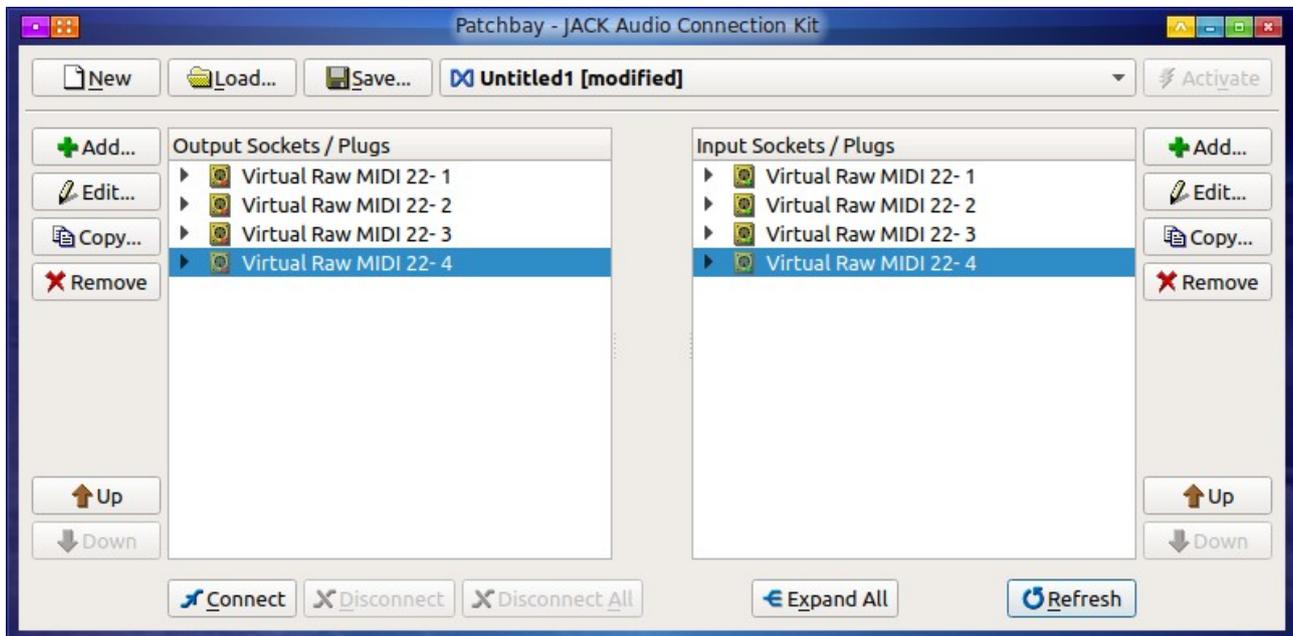
(on both the left and right sides)

Virtual Raw MIDI 22-1”

Virtual Raw MIDI 22-2”

Virtual Raw MIDI 22-3”

You should have the following devices configured as seen in the window picture below.



Lets save this Patchbay in case you make a mistake and have to start again from scratch!

1. Select the button “**Save**” at the top of the patchbay window.
2. In the save file requester select a directory to save the patchbay file to and give the file a name eg. “ALSA\_Vir\_Midi\_Ports.xml”.



**Tip:-**

Make a directory where you can save all your patchbay configurations to.

For Example:-

1. I created a directory in my home folder called “Audio\_Studio”
2. Then I created a directory within that one called “Jack\_Patchbays” and saved all the patchbay configurations into it.

Qjackctl remembers that Directory, so it’s easy to access the different configurations quickly.

## Adding your MIDI equipment that are connected to your USB midi interfaces

Lets add our midi synths, sequencers, racks, groove boxes and other midi devices to our patch bay. I have a USB iConnectMIDI4+ midi interface which has 4 DIN midi i/o ports and 8 USB connectable interfaces.

This is what my setup looks like:-

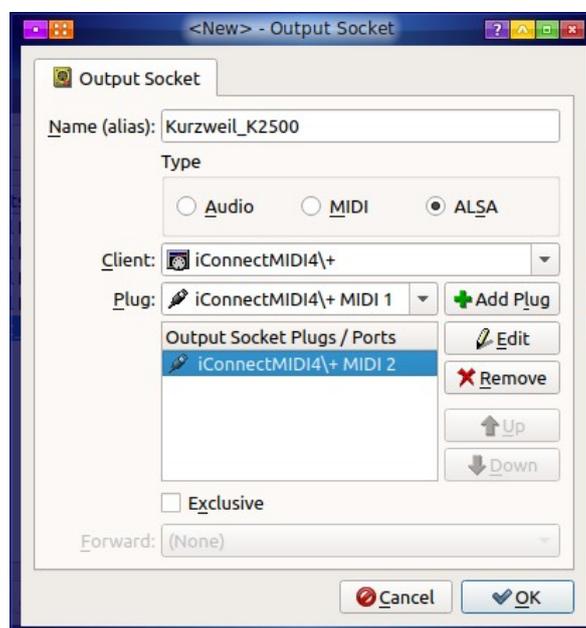
```
Pocket_Record ----->iConnectMIDI4\+ MIDI 1
Kurzweil_K2500 ----->iConnectMIDI4\+ MIDI 2
Yamaha_CS1x ----->iConnectMIDI4\+ MIDI 3
Yamaha_DJX ----->iConnectMIDI4\+ MIDI 4
Yamaha_MX49_Din ----->iConnectMIDI4\+ MIDI 5
Casio_CTX5000 ----->iConnectMIDI4\+ MIDI 6
Korg_Electribe2 ----->iConnectMIDI4\+ MIDI 7
Korg_Electribe2_Sampler ----->iConnectMIDI4\+ MIDI 8
Mist ----->iConnectMIDI4\+ MIDI 9
Kawai_Q80ex1 ----->iConnectMIDI4\+ MIDI 10
Kawai_Q80ex2 ----->iConnectMIDI4\+ MIDI 11
Roland_JDXi_USB ----->iConnectMIDI4\+ MIDI 12
```

To add these Midi devices to my Patchbay I follow the same procedure as I did for the Virtual Midi ports.

For Example:-

To add my **Kurzweil K2500** that is connected to “iConnectMIDI4\+ MIDI 2” I do this:-

1. Click on “**Add**” on the left side to add an Output socket and plug.
2. Click in “**Type**” ==> “**ALSA**” radio button.
3. Click on the drop down menu “**Client**” and I chose “iConnectMIDI4\+”
4. Click on the drop down menu “**Plug**” and I chose “iConnectMIDI4\+ MIDI 2”
5. Click on “**Add Plug**” and “iConnectMIDI4\+ MIDI 2” will appear in the window below
6. Click in the field “**Name (alias)**” and I added my own name “Kurzweil\_K2500”
7. Click on “**OK**”



Now I did the same procedure on the **right side** to add the “Kurzweil\_K2500” plug to the **Input socket and plug**.

Repeat the same procedure for all your MIDI devices connected to different MIDI (USB) interfaces.

 **Tip:-**

**1.**

After each addition to your patchbay “**SAVE**” it to a file called eg. “AllMidi\_Devices\_No\_routings.xml”

After each time you save you will be asked if you want to replace the file “AllMidi\_Devices\_No\_routings.xml”. Select “Replace” and you will be secure.

**2.** Your MIDI USB interfaces will have different names depending on which interfaces you have. You must choose them in the drop down menu “Client”.

Here are a few examples:-

E-MU Systems, I E-MU XMidi1X1

M-Audio MIDISPORT 2x2

Roland UM-ONE

**or**

USB directly connected synths:-

Roland JD-Xi

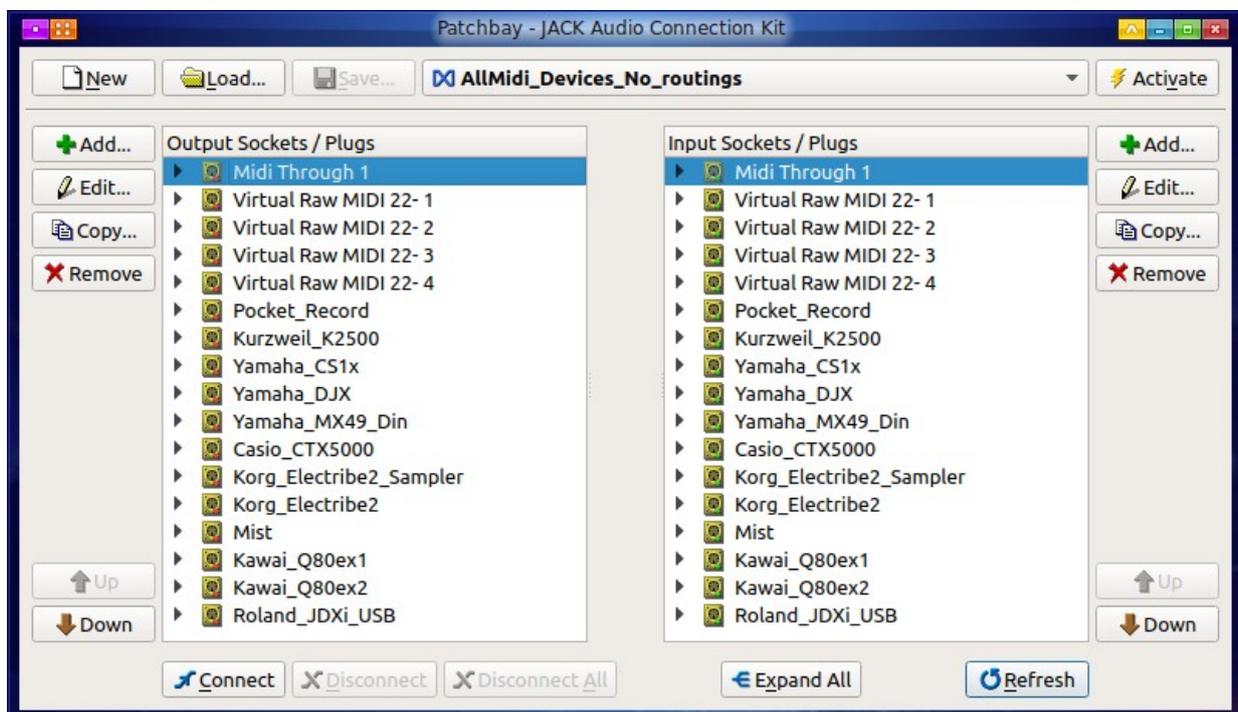
CASIO USB-MIDI

Just to name a few examples.

**3.** If you have an **OLD** “M-Audio MIDISPORT” interface, you have to install the firmware. The **NEW** “MIDISPORT’s” don’t need firmware drivers, as they are standard midi compliant.

Use the following terminal command to install the firmware for older MIDISPORT devices:-  
sudo apt install midisport-firmware

**After configuring all my MIDI devices in the Patchbay, it looks like the window picture below.**



## Connecting our MIDI hardware to our Virtual Midi Ports

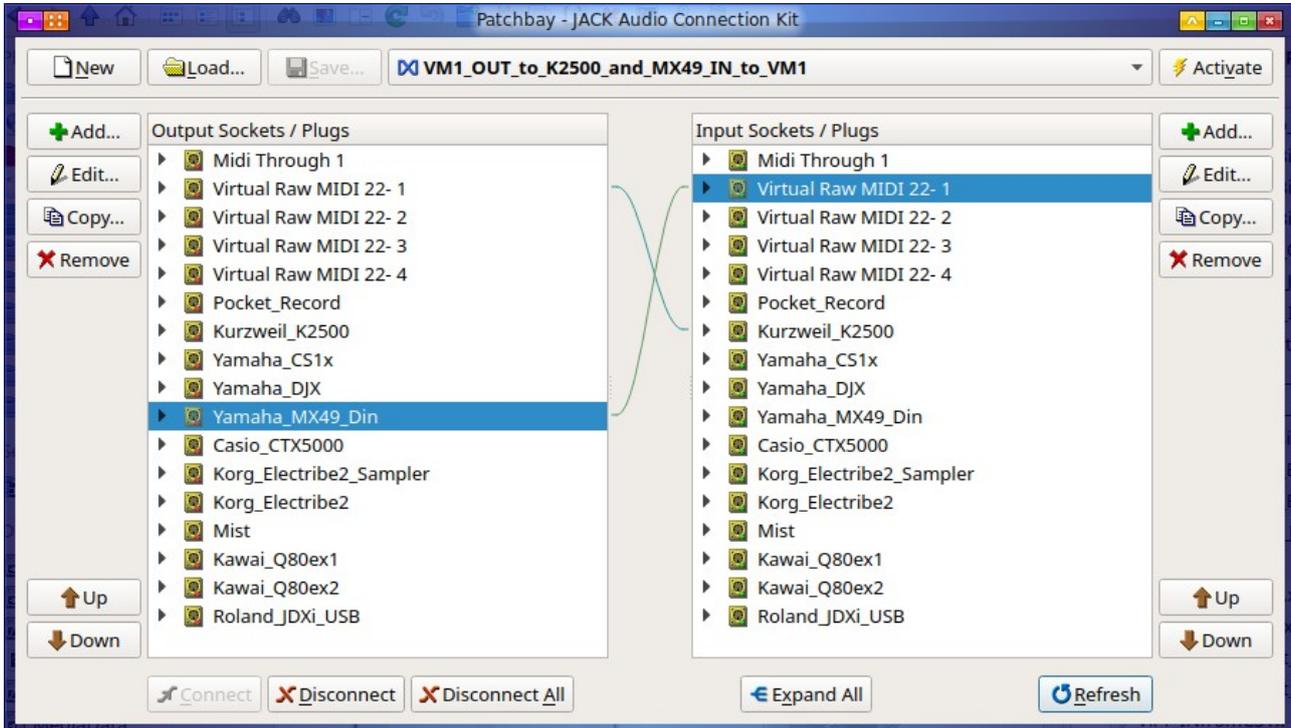
**Before we begin with routing lets make sure we save our non routed PATCHBAY.**

1. **Remember** to save this Patchbay as a fixed Patchbay data as I explained earlier.

For example:- “AllMidi\_Devices\_No\_routings.xml”

2. Also create a **backup copy**

For example:- “AllMidi\_Devices\_No\_routings\_BAK.xml” just in case we make a mistake and overwrite it.



**EXAMPLE:-** Routing my Synths to the “Virtual Raw MIDI 22- 1”

A. Connecting the Yamaha MX49 Output Socket/Plug to

“Virtual Raw MIDI 22- 1” Input Socket/Plug,  
so it feeds MIDI information to Bars and Pipes “midi IN”.

B. Connecting the “Virtual Raw MIDI 22- 1” Output Socket/ Plug to  
the Kurzweil K2500 Input Socket/Plug,  
so it feeds MIDI information to Bars and Pipes “midi OUT”.

1. Click on the “Yamaha\_MX49\_Din” **Output Socket/Plug** to highlight it.
2. Click on the “Virtual Raw MIDI 22- 1” **Input Socket/Plug** to highlight it.
3. Click on the “**Connect**” button at the bottom of the patchbay window and it will draw a connection Bezier curve or line between them.
4. Click on the “Virtual Raw MIDI 22- 1” **Output Socket/Plug** to highlight it.
5. Click on the “Kurzweil\_K2500” **Input Socket/Plug** to highlight it.
6. Click on the “**Connect**” button at the bottom of the patchbay window and it will draw a connection Bezier curve or line between them.

*Now we have connected our devices to our “Virtual Raw MIDI 22- 1” port.*

7. Click on “**Save**” and save these connections as a Patchbay file, giving it a descriptive file name.

*EXAMPLE:- “VM1\_OUT\_to\_K2500\_and\_MX49\_IN\_to\_VM1.xml”*

8. Click on “**Activate**” at the top right corner of the Patchbay window.

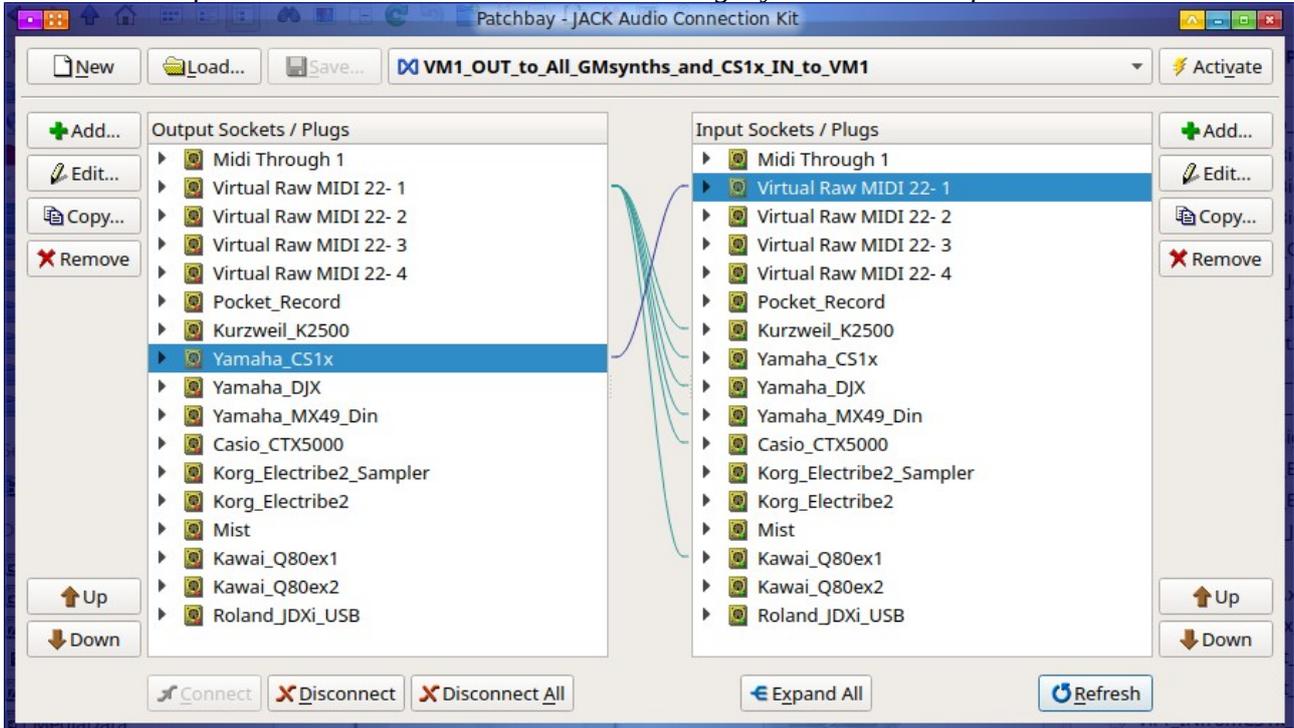
*Now we are ready to set up FS-UAE so “Bars and Pipes” can record and play from these synths.*



Tip:-

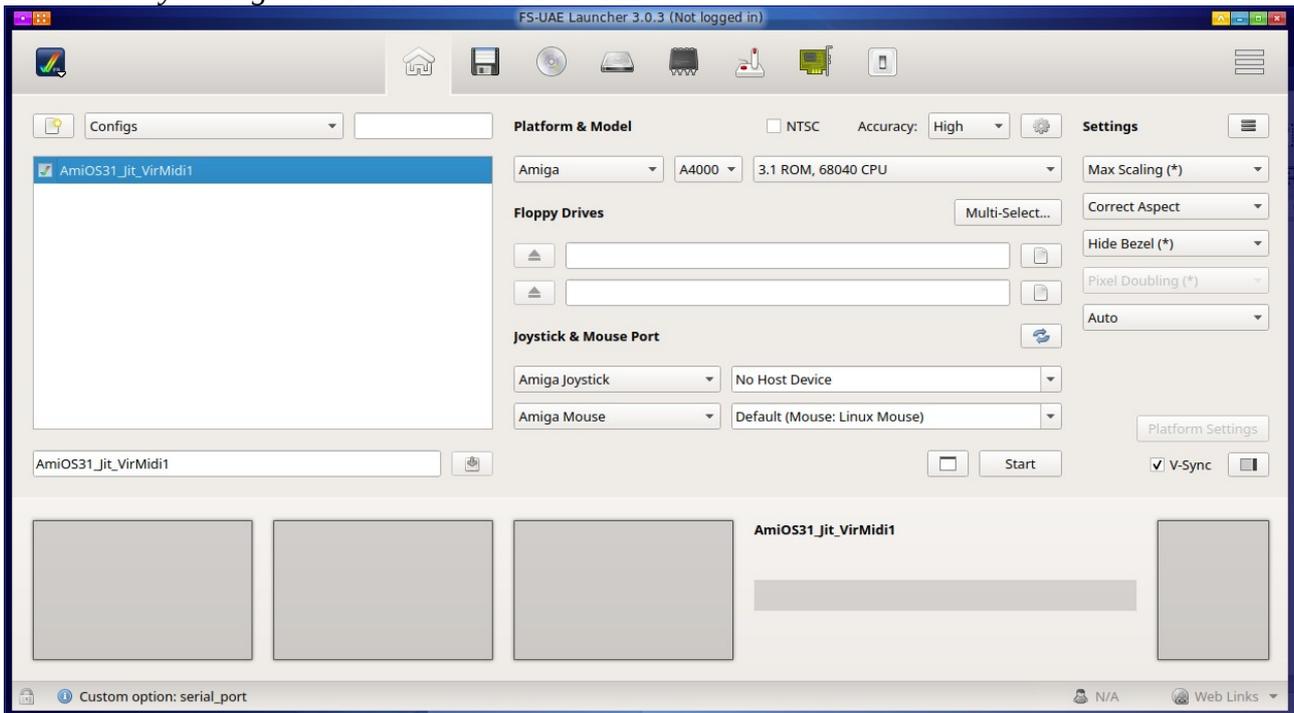
You can connect multiple devices to the “Virtual Raw MIDI 22- 1” using this method.

*Here is an example, where I connected all my GM synths to play simultaneously from “Bars and Pipes **Midi OUT**”. Notice that I will be using my Yamaha CS1x for **Midi IN**”.*



## FS-UAE Midi setup using our “Virtual Raw MIDI 22- 1” port

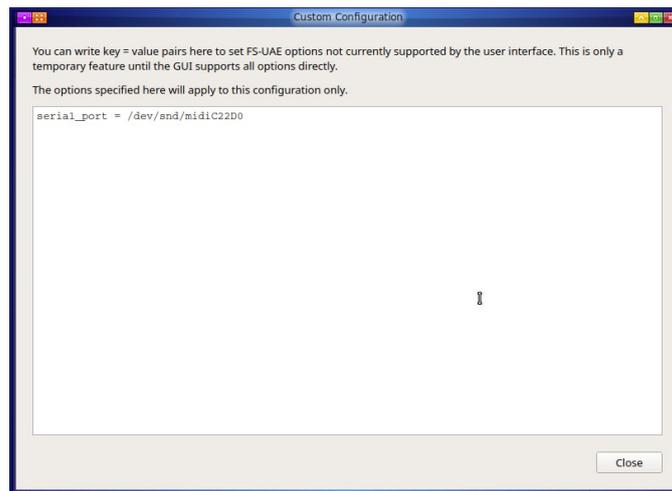
These are my settings that I have used in FS-UAE.



From this “Platform and Model” (Home icon) TAB we set our Amiga serial port option

This is how:-

1. Next to the “Accuracy: High” setting is a button with a gear wheel 
2. Click on this BUTTON.
3. This window below appears.



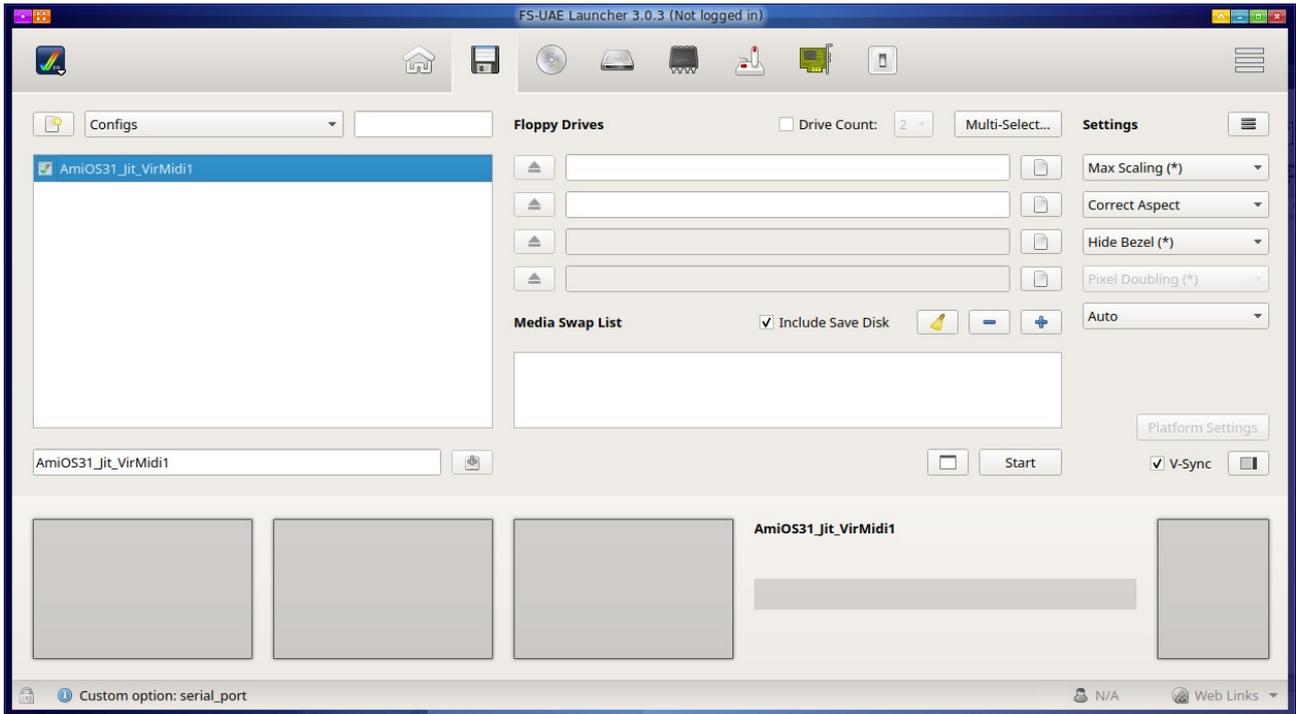
3. Enter the following line:-

```
serial_port = /dev/snd/midiC22D0
```

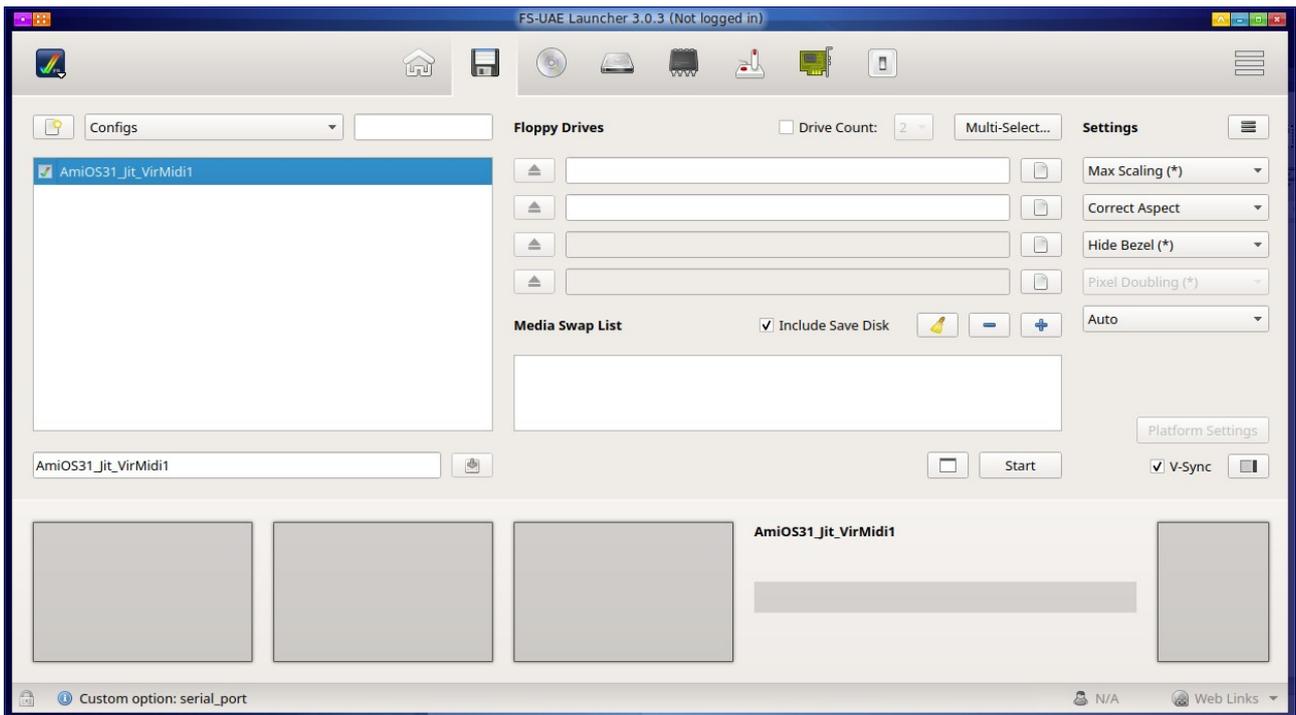
4. Close this window.
5. Save your Config by clicking on the “Save” button 

Now you are ready to use Bars and Pipes. GOOD LUCK!

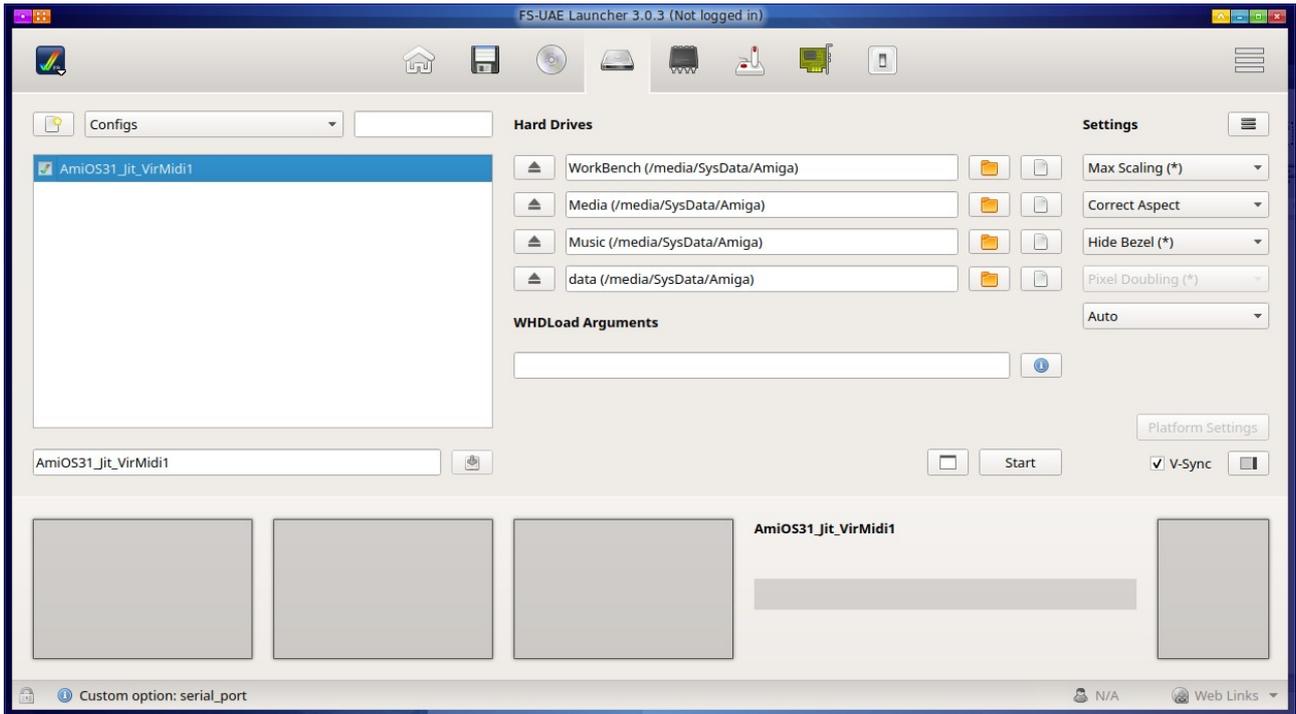
# Floppy



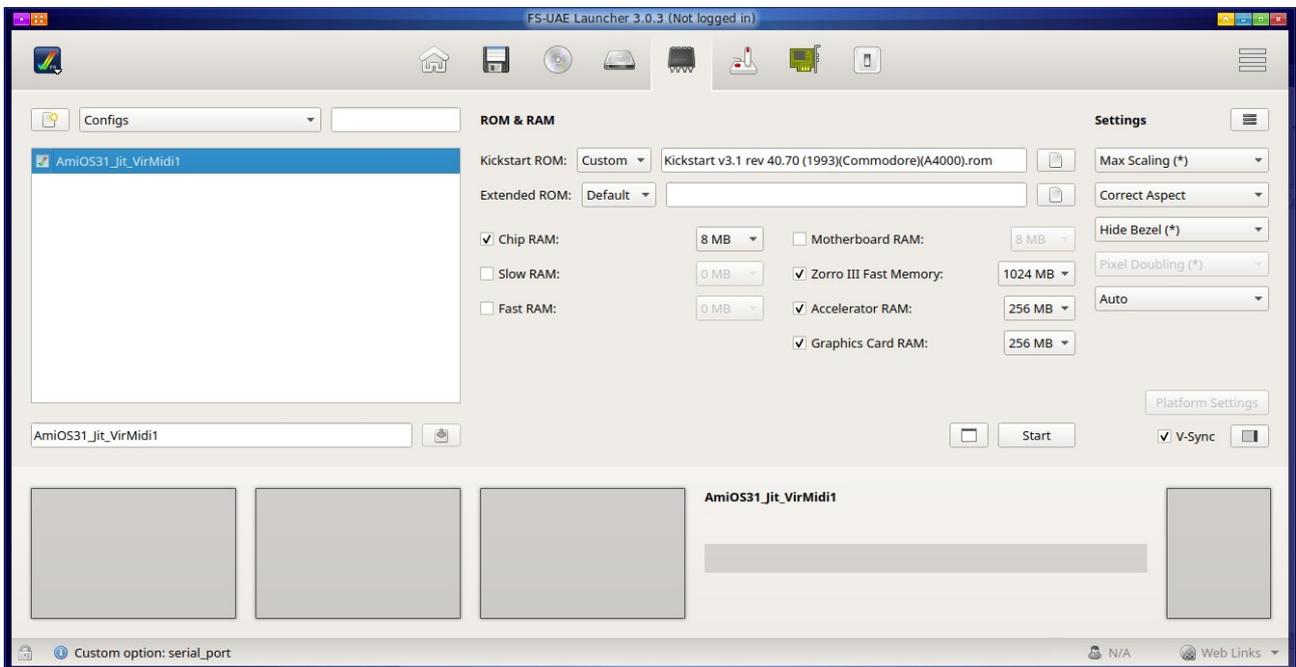
# CD



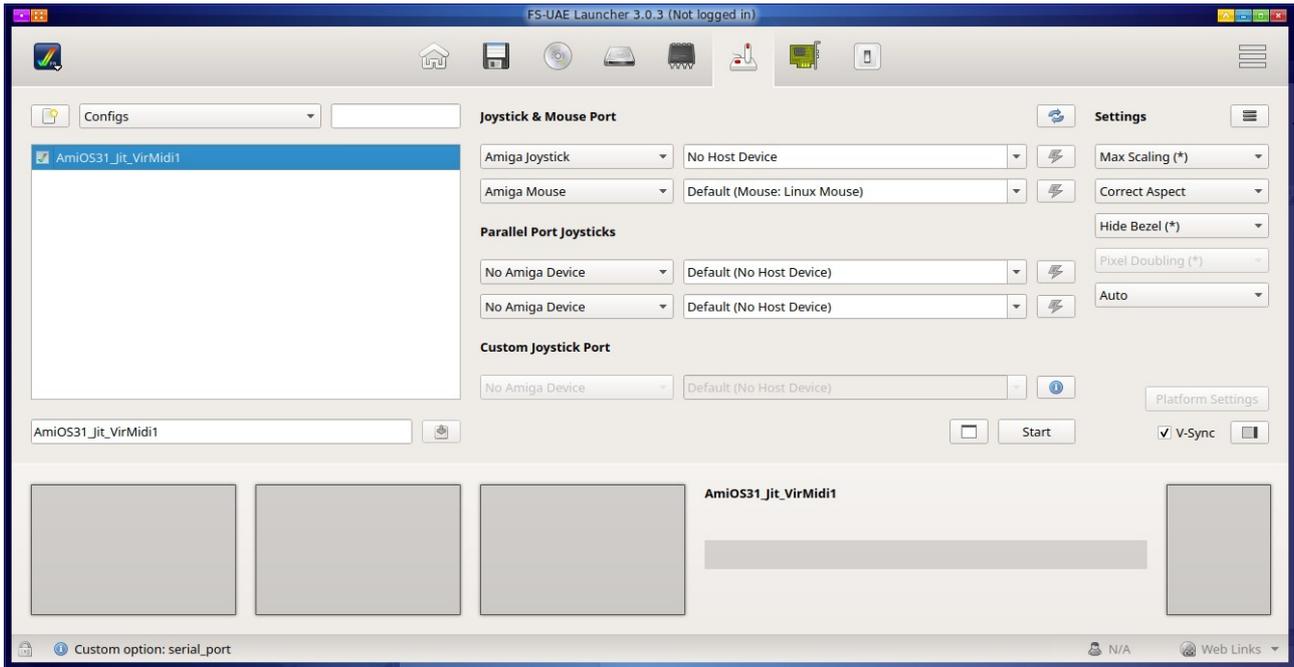
# Hard Drives



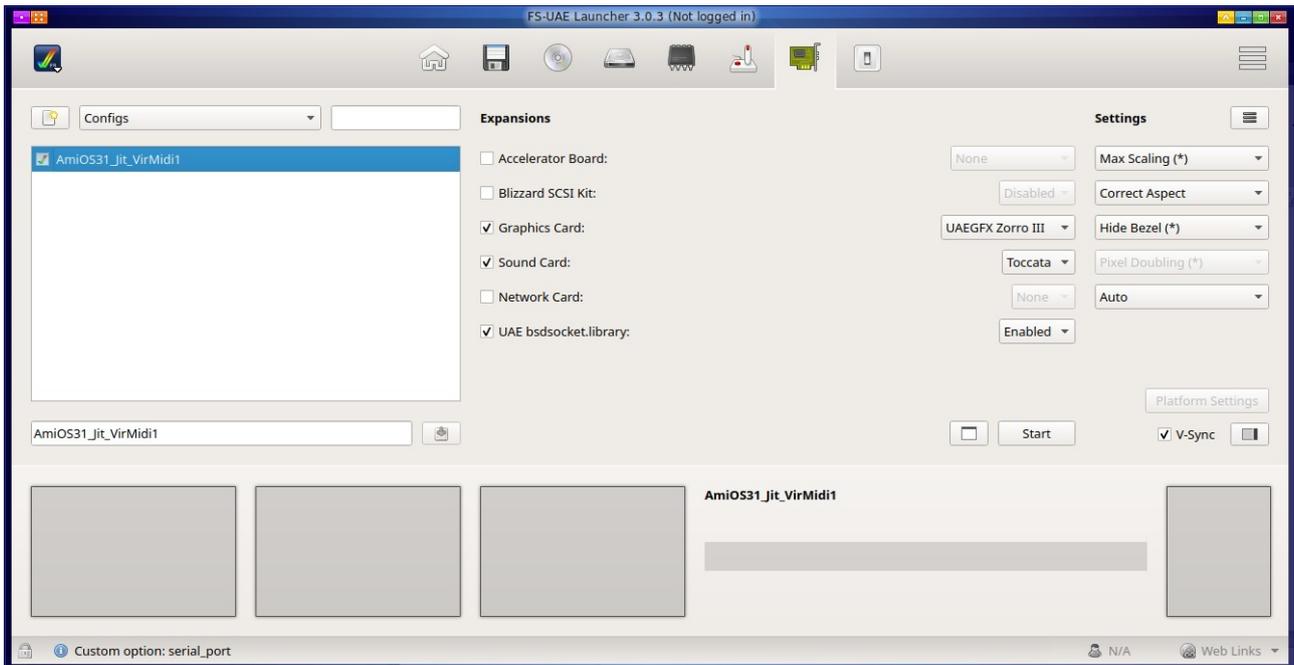
# RAM & ROM



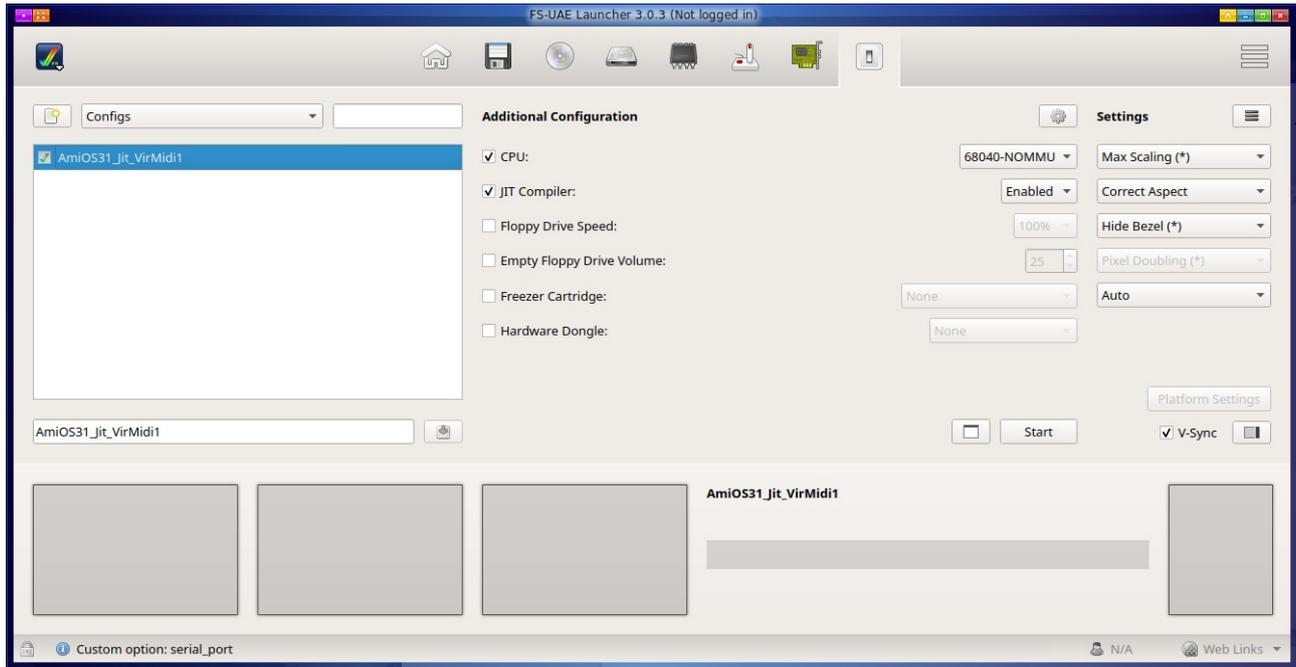
## Joystick & Mouse



## Expansions



## Additional Configuration



## My Bars and Pipes Running in a FS-UAE window on my Ubuntu Studio Desktop

