

# Setup Instructions for RF-Seismograph Software for Linux and Raspberry Pi 3

## Note:

Before attempting this, the sound card has to be configured and working. Depending on what sound hat is used, these instructions vary. Please follow the manufactures instruction for the driver installation and confirm that it is working properly before continuing. Any sound card will work that has a line level input. A good sound card can make all the difference. The minimum ADC bit count is 16 at the data rate of 48kHz.

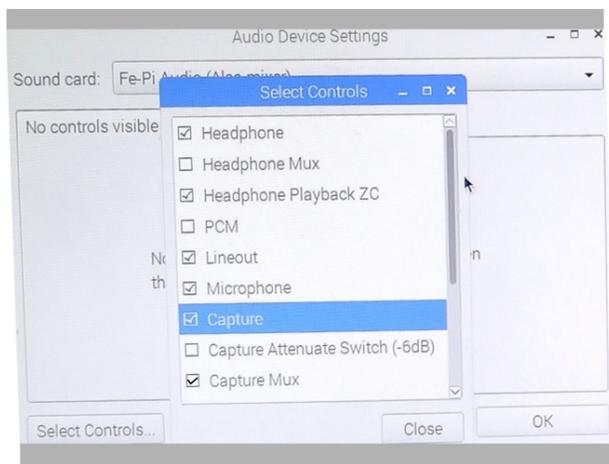
## Recommended Sound Card

The sound-card used for the prototype is the **Fe-Pi Audio V 1.4**. It is a very versatile sound-card which has a lot of options such as a 2W PA for the MDSR audio output, headset with mic input plug.

**Find instructions on the Fe-Pi website:** <https://fe-pi.com/p/support-and-setup>

## Setting up the Audio Volume Controls on Pi

After the audio card has been installed the volume controls have to be enabled manually.



In Raspbian click on the Raspberry Icon at the top left, select Preferences and then Audio Device Settings. Set the Fe-Pi Device that is listed besides the bcm2835 ALSA as the default device. To gain access the volume controls press the “Select Controls” button and then select the controls as shown in the picture left. Set all the “Capture“ devices to max for the RF-Seismograph setup. Turn the Microphone control all the way down. After selecting “Capture Max” a new tap will appear called

“Options”. In this tab select line input as the capture MUX.

This only has to be done once and for the next time it will remember the settings and the selected controls will be visible. **Note:** The RF-Seismograph will always use the default audio device.

## **Set up Raspberry Pi so that it will run Java jar files (Loading RTE)**

**Note:** the Raspberry Pi has to be connected to the internet

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(if there is not enough space consider deleting some of the bundled software on Raspbian, such as Wolfram, Office and Google Chrome. Check the web on how this is done using the command line interface.)

**NOTE:** the **sudo** command invokes the super user privileges and is required for most commands.

**Install Java RTE the fast way:**

```
$sudo apt-get install openjdk-8-jre
```

```
$sudo apt-get install openjdk-8-jdk
```

```
$sudo apt-get update
```

**Verify with the commands with -version option.**

```
$ java -version
```

```
$ javac -version
```

**Download MDSR\_SA software from MDSR ftp server**

Open a command line, go to the Pi directory

```
//to download the MDSR_SA archive
```

```
$ wget http://www3.telus.net/public/bc237/MDSR/MDSR_SA_Archive.tar
```

```
$tar -xvf MDSR_SA_Archive.tar //to extract the MDSR_SA files in the MDSR_SA
```

To change directory type **cd /MDSR\_SA.**

```
$sudo chmod +x SpectrumAnalyzerLG.jar //make file executable for large screens
```

```
$sudo chmod +x SpectrumAnalyzerSM.jar //make file executable for small screens
```

To run the SpectrumAnalyzerXX.jar in the directory it's in: **/home/pi/MDSR\_SA/**.

Type “**\$java -jar SpectrumAnalyzerXX.jar**” (XX is either LG or SM)

### **Desktop Shortcut to start the RF-Seismograph from the desktop**

In the MDSR\_SA folder there is a shortcut file called MDSR\_SA that has an oscilloscope icon. This file can be copied and placed on the desktop to easily start the RF-Seismograph by double clicking it. This short cut is set to large screens, in order to change it to small screen change last two letters from LG to SM in the line that starts with Exec.

### **How to set up the Serial device for the CAT Control interface:**

Connect USB to serial converter,  
Open command line editor and type  
    **\$Dmesg | grep tty**

Return should state that the ttyUSBx is now attached to the RPB Pi.

### **Installation Instructions for flrig on Raspberry Pi**

Before installing flrig the X11 and FLTK libraries have to be installed.

**\$sudo apt-get install libx11-dev**

Download the FLTK tar from: <http://www.fltk.org>

[fltk-1.3.4-2-source.tar.gz](http://www.fltk.org/fltk-1.3.4-2-source.tar.gz) //unzip and place in the Pi directory

use the cd command to go to the folder containing the  
Install FLTK by running the following commands:

```
$ sed -i -e '/cat./d' documentation/Makefile    &&  
> ./configure --prefix=/usr \\  
> --enable-shared &&  
$ sudo make
```

will take about 10 min

```
$ sudo make docdir=/usr/share/doc/fltk-1.3.4 install
```

Will take about 5 min

## Installing fl rig

<http://www.w1hkj.com/> download FL Rig 1.3.39.tar.gz. After download the file will be in the "Download" directory. To unzip, double click the file in the file editor. As destination give the Pi directory.

Open a command line:

1. `cd' to the directory containing the package's source ( fe: /Pi/ FL Rig 1.3.39/)  
**\$sudo ./configure**

Might take a while, while running, it prints some messages telling which features it is checking for.

2. Compile the package.

**\$sudo make** //this will take about 30 min

3. Type to install the programs and any data files and documentation.

**\$ sudo make install** //this will take about 2 min

The executable is in the **FL Rig 1.3.39/data** directory and called Flrig. If you are using the file browser double clicking will launch the program. By copying and pasting this file to the desktop you can launch the program by double clicking on the desktop.