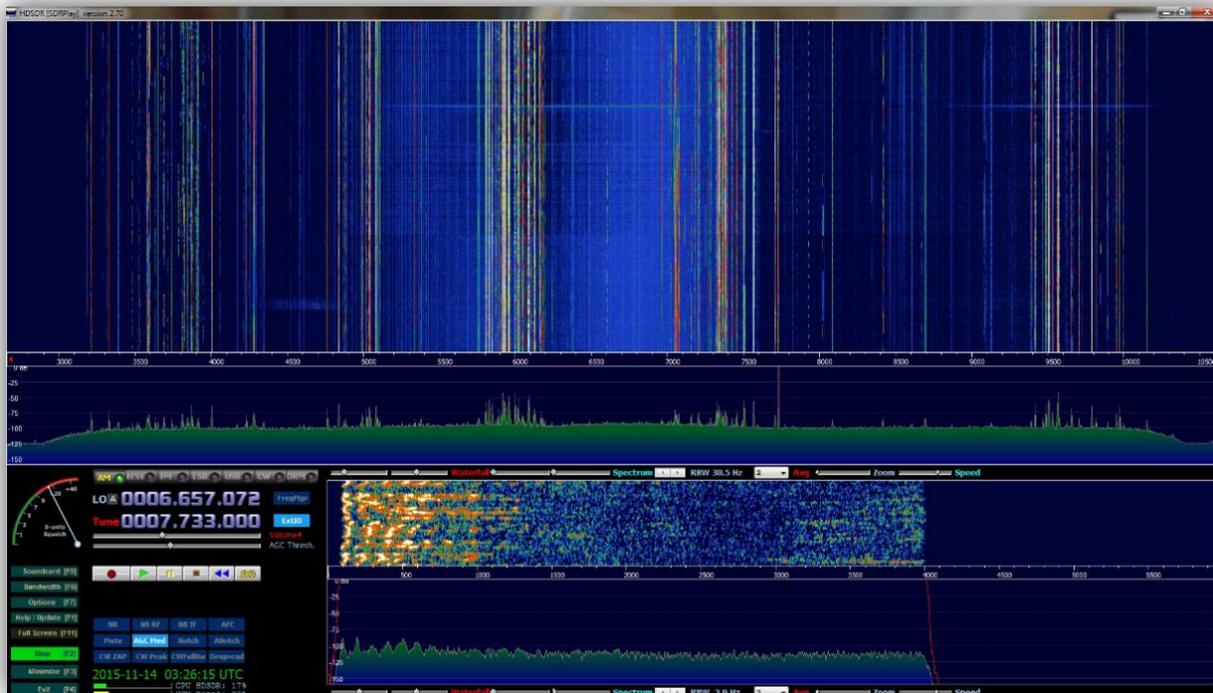


HSDR/SDRPlay RSP How to Guide: Version 2.26.2016

Written By: Mike Ladd mikexeno@aol.com www.mikexeno.com

SDRPlay RSP Independent Facebook Group www.facebook.com/groups/sdrplay

This is not a HSDR Manual. It is only a basic setup/help guide.



The aim of this guide is to help setup the RSP in HSDR as fast as possible. I will also explain most of the key features of the EXT/IO & most of the features available in HSDR.

My instructions are not set in stone. This is the way I have my RSP setup in HSDR. The EXT/IO settings I use are highly optimized for shortwave listening (1.6-30 MHz). The EXT/IO settings I cover are not optimized for VHF/UHF listening (30mhz and above). If you run into any issues you can reach me at the above email address or in the SDRPlay Facebook group.

We will loosely cover the following information:

Soundcard settings/Volume settings/Bandwidth settings/Filter adjustments/Center spike removal
PPM correction/Tuning options/Adding frequencies/Plus, a whole lot more

SDRPlay is actively developing and releasing updated revisions of the EXT/IO along with updated API drivers. Check www.sdrplay.com for the latest EXT/IO and API drivers or visit us in the Facebook group for breaking news. SDRPlay also has a very active Blog & Twitter feed.



What is a SDR receiver:

A SDR is a radio communication receiver where components that have been typically implemented in hardware (e.g. mixers, filters, amplifiers, modulator/demodulator, detectors, etc.) are instead implemented by software run on your desktop, laptop and even your tablet. The software we are using to drive the RSP is HDSDR. All the knobs and dials of a traditional radio are now shown and controlled on the screen



What is the SDRPlay RSP:

The RSP is a USB powered 12bit full coverage SDR that can process a maximum of 8MHz of bandwidth. Personally I feel it's the best SDR you can buy for \$160.00. Keep in mind that any SDR or tabletop shortwave radio is only as good as the antenna you attach to it. If the RSP SDR is your first SDR then I urge you to join us in the SDRPlay Facebook group.



Mike Ladd?

I love everything and anything SDR related. I have been in this hobby of SWLing for about 20 years. I moved to SDR'S from traditional radios when the RF Space SDR-IQ was released in 2007. My shack has seen a huge number of radios come and go. Fast forward to today and my SDR of choice is the RSP.



The SDRPlay Facebook Group:

I can't remember the exact date I joined the group but after talking to Paul Jones (admin and founder of the SDRPlay Facebook group) we became really good friends since we both share many common interests. One thing is for sure... We both love the RSP and we both enjoy helping everyone in the group. Paul and myself are in constant contact with the SDRPlay team. We both try to push the RSP as far as possible from the end-user's perspective.

Why HDSDR:

Actually I use all the major front end software that controls SDRs but HDSDR is extremely powerful and very efficient. Personally I think it is the best app to use for running your RSP. The other front ends can't match the speed and efficiency of HDSDR. The aim of this whole guide is to share my knowledge and save you from making the same mistakes I did. HDSDR has a lot of tricks up its sleeve. Also this is my first attempt at writing any type of how-to document. I apologize in advance for any errors.

RSP Specs:

Frequency Range:

Continuous coverage 100kHz – 2GHz

ADC Characteristics:

Sample frequency 2MSPS – 10.66MSPS

12 bit native ADC

10.4 ENOB

60dB SNR

67dB SFDR

IF Modes:

Zero IF, All IF bandwidths Low IF, IF bandwidths @ 1.536MHz

IF Bandwidths:

200kHz 300kHz 600kHz 1.536MHz 5.0 MHz 6.0 MHz 7.0 MHz 8.0 MHz

Automatically configured bank of front end filters

Low Pass:

12MHz

Band Pass:

12–30MHz 30–60MHz 60–120MHz 120–250MHz 250–420MHz 420–1000MHz

High Pass:

1000MHz

Typical Noise Figures:

12.5dB @ 3MHz

12.0dB @ 10MHz

11.5dB @ 20MHz

12.0dB @ 40MHz

4.5dB @ 100MHz

4.5dB @ 200MHz

5.0dB @ 360MHz

3.5dB @ 600MHz

3.5dB @ 1300MHz

4.0dB @ 1800MHz

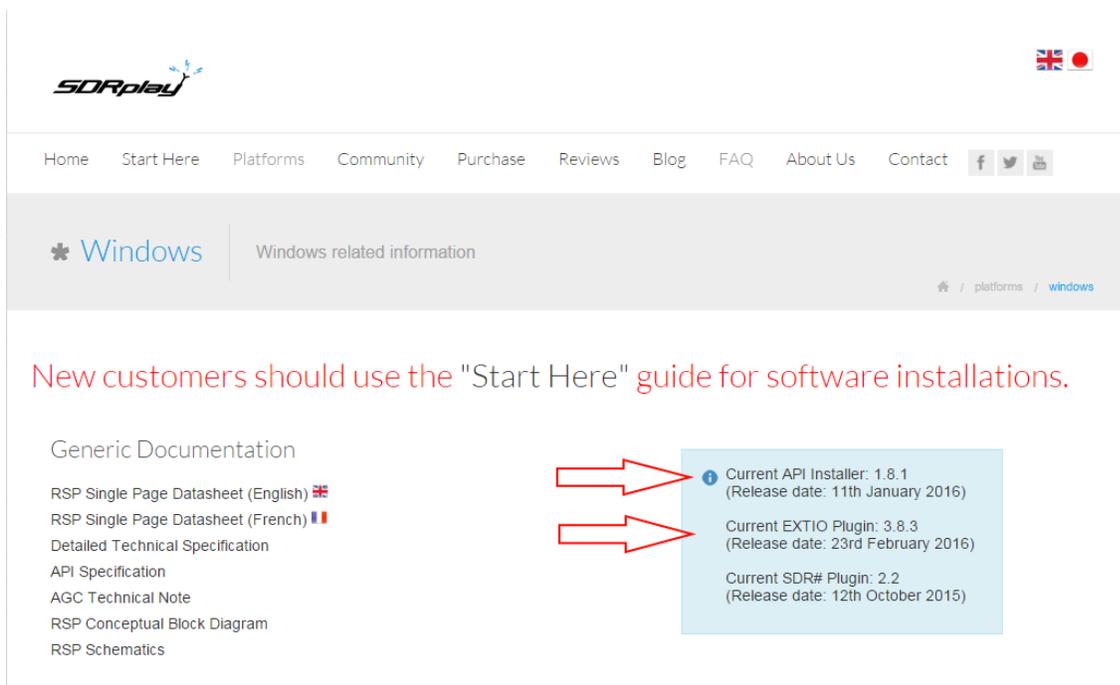
To get the RSP up and running with HSDR. It is a 4 step process.

- 1: Update your computer via Windows Update
- 2: Download and install the API v1.8.1 (Current but could change)
- 3: Download and install HSDR v2.70 (Current but could change)
- 4: Download and install the EXT/IO v3.8.3 (Current but could change)

The very first thing you want to do before you unpack the RSP is run windows update and make sure all "Critical" updates have been downloaded and installed. If your machine has pending updates to install, then please do it before making any physical connection with the RSP.

Now that all the updates are downloaded and applied it is extremely important that you reboot your machine. Now that we got that out of the way let's download the latest 3 files we will need. The API, EXT/IO & finally HSDR.

Download the API & EXT/IO from sdrplay.com, Select platforms and then windows. On the right side of the page you will want to select the following drivers to download. *Current EXTIO* and then *Current API Installer*



The screenshot shows the SDRplay website's 'Windows' section. The navigation bar includes links for Home, Start Here, Platforms, Community, Purchase, Reviews, Blog, FAQ, About Us, and Contact. The 'Windows' section is active, displaying 'Windows related information'. Below this, there is a list of 'Generic Documentation' links: RSP Single Page Datasheet (English), RSP Single Page Datasheet (French), Detailed Technical Specification, API Specification, AGC Technical Note, RSP Conceptual Block Diagram, and RSP Schematics. To the right, a light blue box contains three download links: 'Current API Installer: 1.8.1 (Release date: 11th January 2016)', 'Current EXTIO Plugin: 3.8.3 (Release date: 23rd February 2016)', and 'Current SDR# Plugin: 2.2 (Release date: 12th October 2015)'. Two red arrows point from the 'Generic Documentation' section towards the download links.

New customers should use the "Start Here" guide for software installations.

The EXT/IO: The ExtIO library (ExtIO_SDRplay.dll) was developed to support the Winrad ExtIO standard which allows the software to work with different hardware systems. You can think of any ExtIO as a translator/middleman so when you tell HSDR to select upper sideband (USB), the library translates the request into the appropriate command to make the hardware select USB. If you want to change the gain of the RSP the Ext/IO allows the you to tell the software to issue the command to the RSP and the gain will be raise. In addition to translating the general operation of the receiver, The ExtIO also provides a radio configuration panel. As a result, any SDR software that is ExtIO compatible will be able to use the SDRPlay hardware.



USB Cables: Not all USB cables are created equal. I would strongly suggest you buy a high quality name brand Male A/Male B USB cable with ferrite chokes on both ends. You want to try and keep the cable as short as possible but as far away from the computer as you can get it. I would not use anything more than 10ft.

Tripp Lite makes a great cable that cost under \$10.00. Amazon always has this cable in stock and you can purchase it via the link below. <http://www.amazon.com/dp/B003MQ29B2>



SMA Male



SMA Female

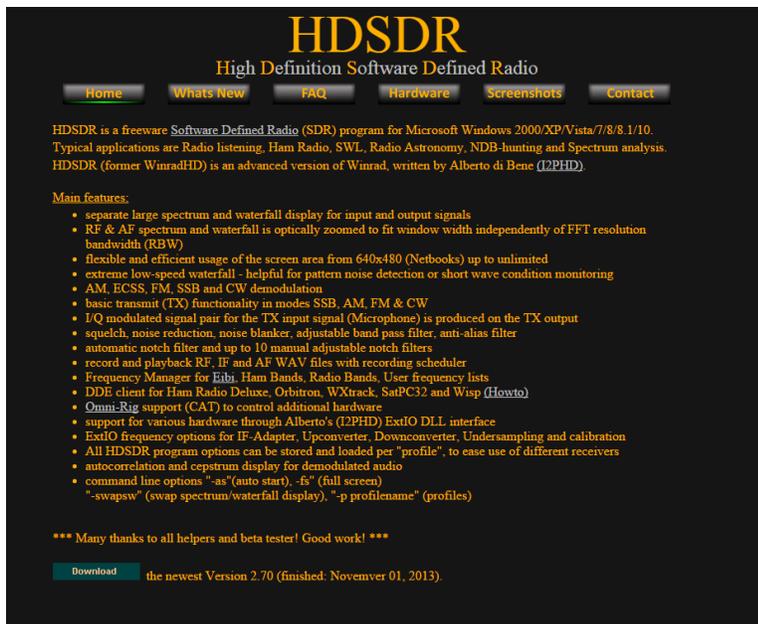
Antennas: Having the proper antenna will really make the difference if you are going to hear local shortwave stations (100 to 500 miles away) or pick up stations that are well over 15,000 miles away. I cannot suggest which one to buy. It would be another e-book in itself.

I would suggest you do a Google search for “random wire antenna” or copy and paste the link below. No matter what antenna you choose the RSP uses a SMA female port so please make sure your antenna coaxial uses a SMA-Male at the end of it. <https://www.google.com/#q=random+wire+antenna>

YOU CAN NOW CONNECTED THE RSP TO YOUR MACHINE VIA THE USB CABLE.

Let's finish up with the API installer. Some people would say to double click the file to install it but I would suggest you right click it and select Run as administrator. After the API installer is complete you should now run windows update again and apply any critical updates the updater finds. If nothing is found, then reboot the machine. If critical updates are available, then download them and reboot the machine.

This might seem like a major P.I.T.A. but this is the best way and the common way I setup all new users on the Facebook group. I have had zero issues or complaints with my style of installation and configuration. Taking the long steps now helps to prevent any possible headaches down the line. Now that the API is installed and the RSP is connected let's Download the EXT/IO.



Downloading HSDR:

Go to <http://www.hdsdr.de> and scroll down to the bottom of the web page. You will find a button that says "Download". After the download is complete you will need to locate the HSDR installer in your download directory which is usually (C:\Users*YOUR USER NAME*\Downloads).

After locating the installer, you want to right click (not the default left click) on the HSDR_installer.exe and select Run as administrator. After the setup is complete you can now install the EXT/IO from SDRPlay.

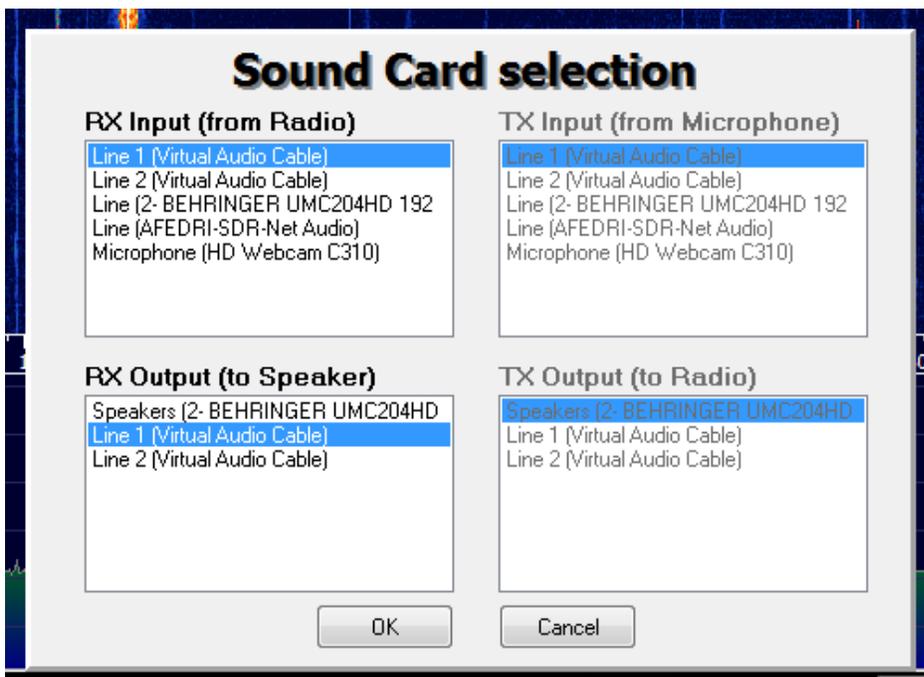
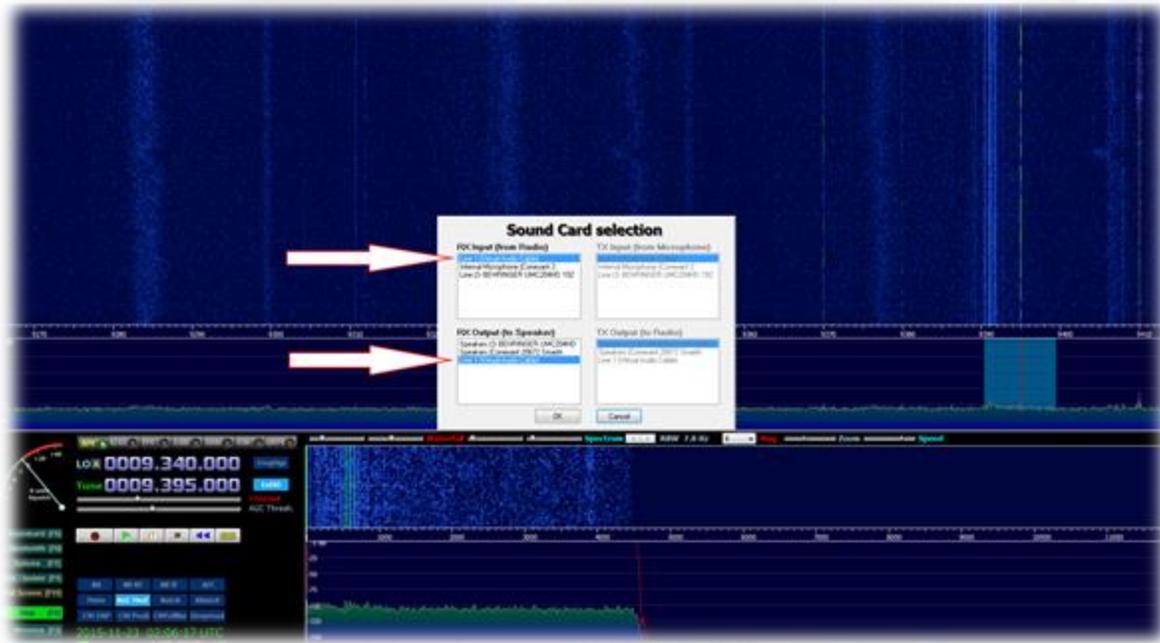
To install the EXT/IO Driver. Double click on the file SDRplay_EXTIO_Installer_v3.7 it will then ask you the location of HSDR. Hit browse and tell the installer to look in the following default locations.

Windows 32bit: C:\Program Files\HSDR Windows 64bit: C:\Program Files (x86)\HSDR

After the three main steps have been completed (API, HSDR & EXTIO) I would recommend rebooting the machine one last time. Soon as your machine completes the reboot then we are ready to start listening to some signals.

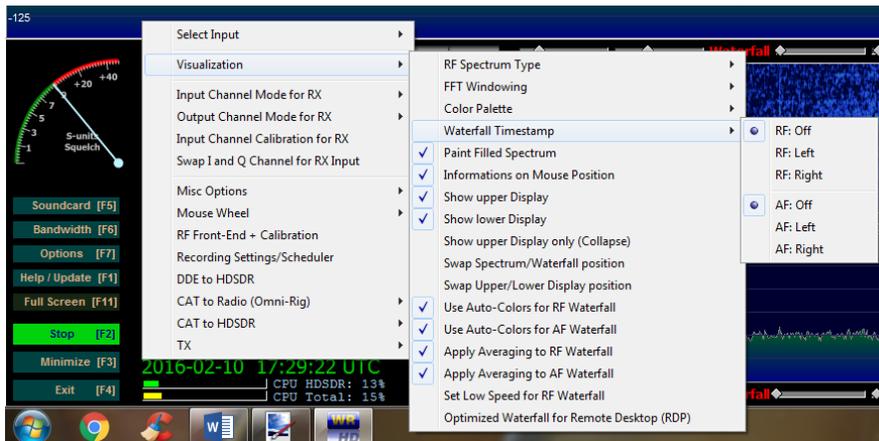
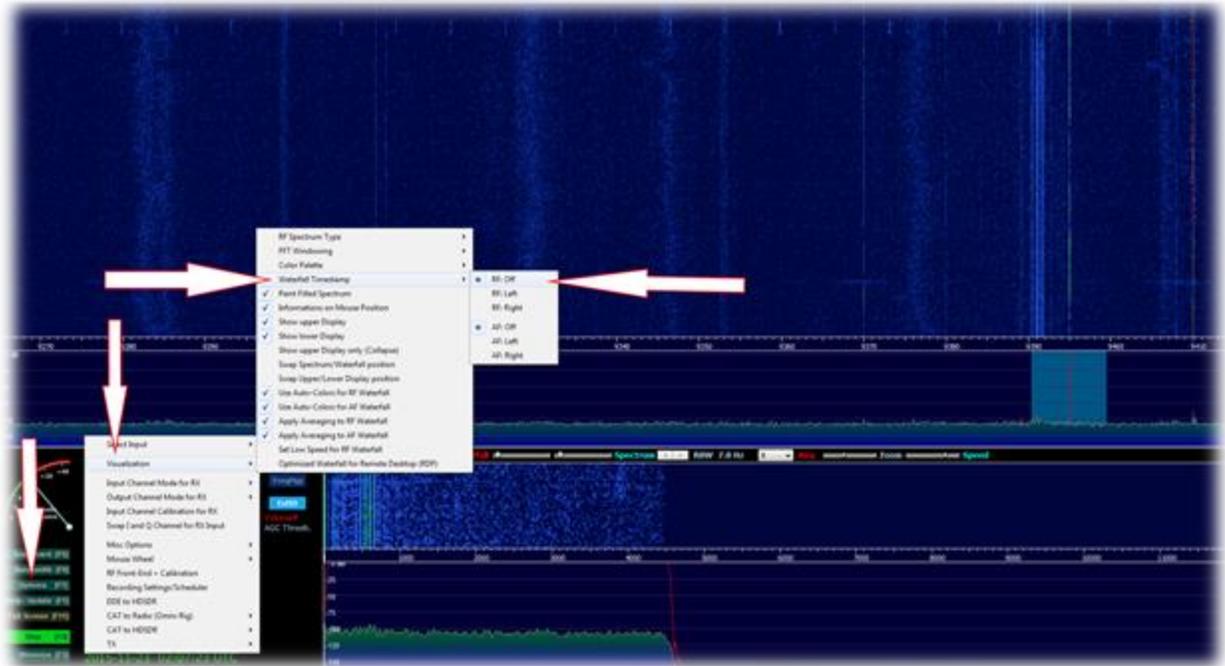
You can now launch HSDR. We will now setup and tune HSDR to run perfectly with the RSP. The main setup process is broken down into 7 parts. Each step will be on a single page.

Step-1 Set your RX input and RX output



This setting tells HDSDR how to use your audio input's and output's. If you are using VAC (Virtual Audio Cable) then select your VAC cables accordingly.

Step-2 Remove the waterfall time stamp



1: Options

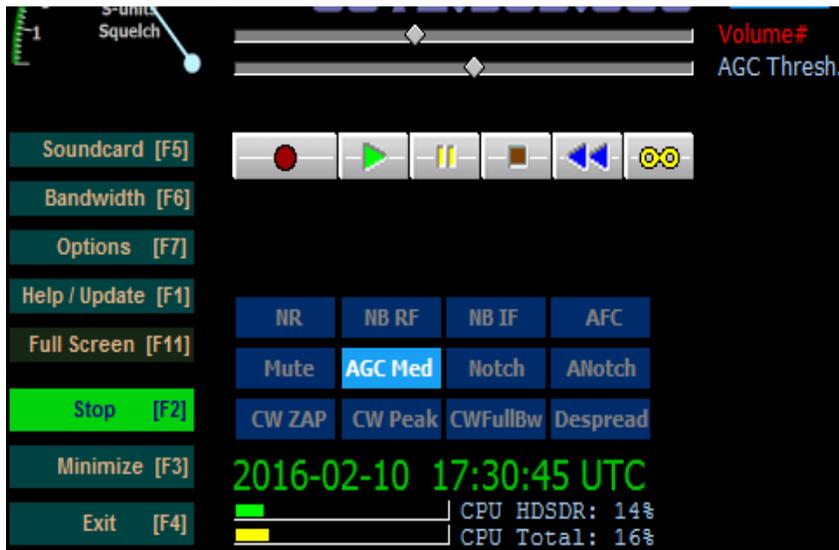
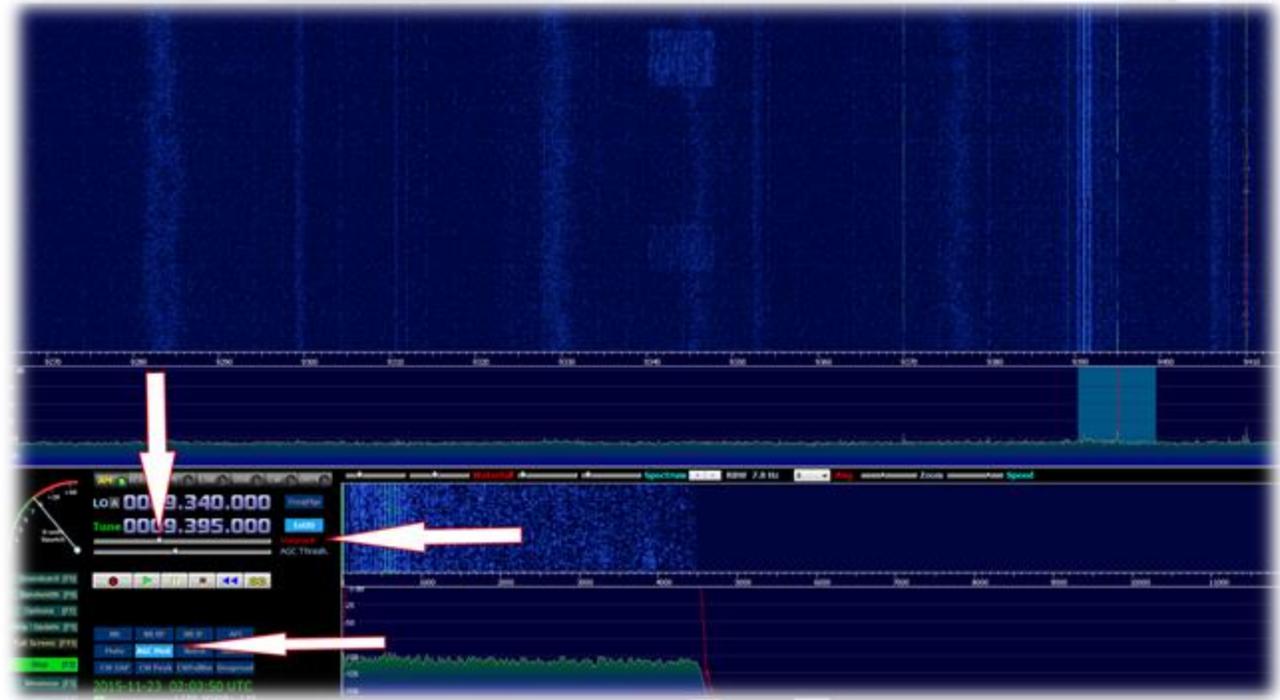
2: Visualization

3: Waterfall Time stamp

4: Select RF: Off

This setting tells HSDR that you do not want a time stamp show on the main waterfall. For general shortwave listening I find this to be a distraction.

Step-3 Set the main volume output and AGC



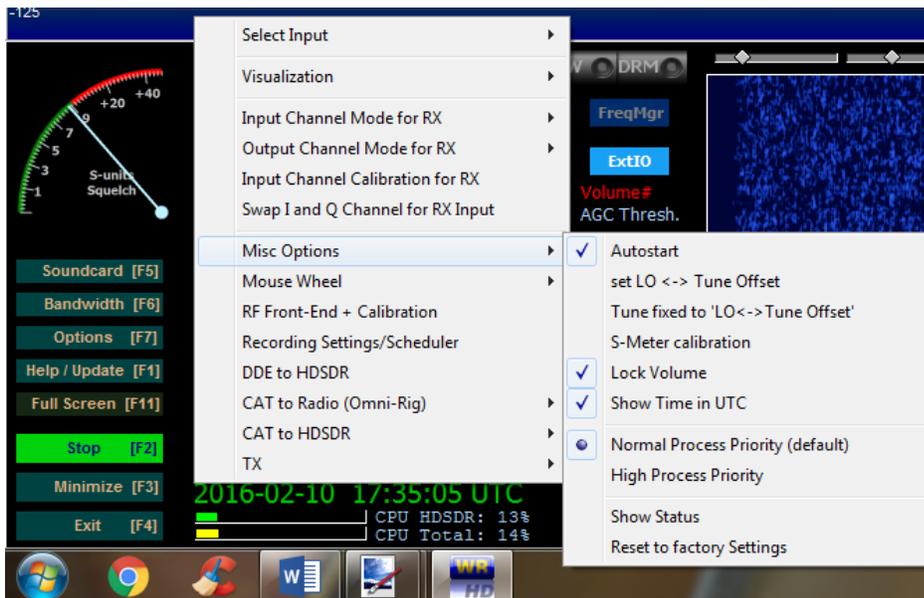
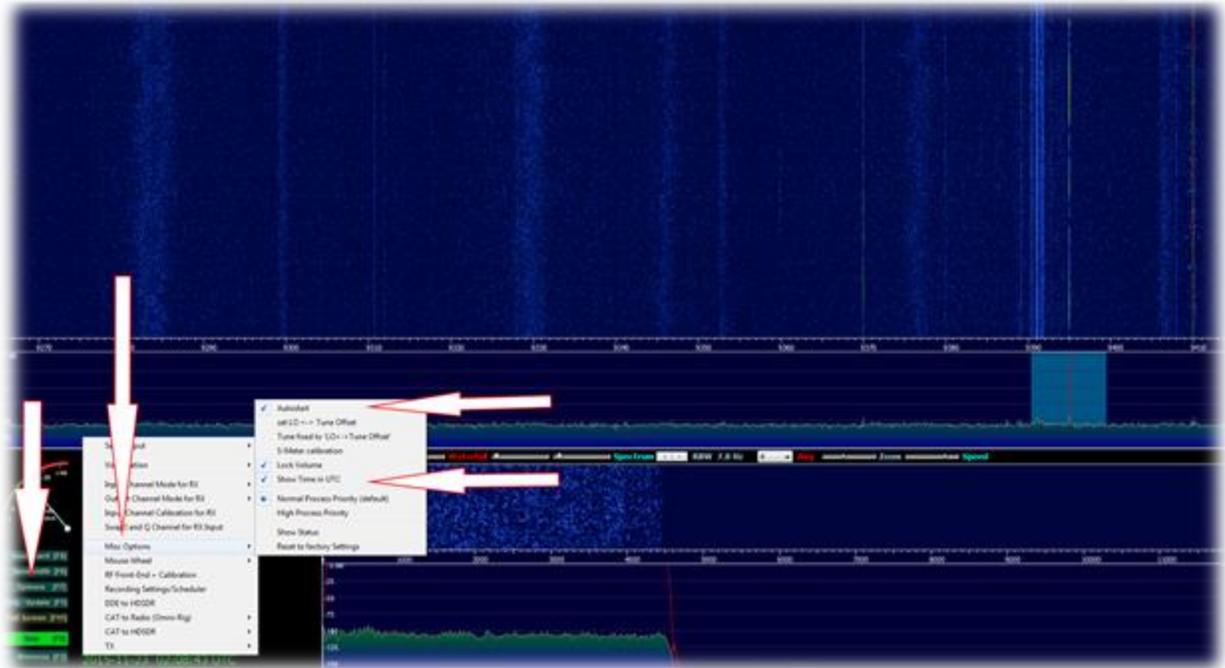
1: Move the volume slider to almost the mid-way point.

2: Right click on Volume to lock it in place (turns red).

3: Hit the AGC button until it reads AGC Med.

This setting tells HSDR how you want to process the automatic gain for audio in the bandpass. I prefer Medium or Slow for most shortwave broadcast listening. If you're going to do any decoding in the HF bands, Select FAST or OFF.

Step-4 Set the clock to UTC and have HSDR auto start



1: Select Options.

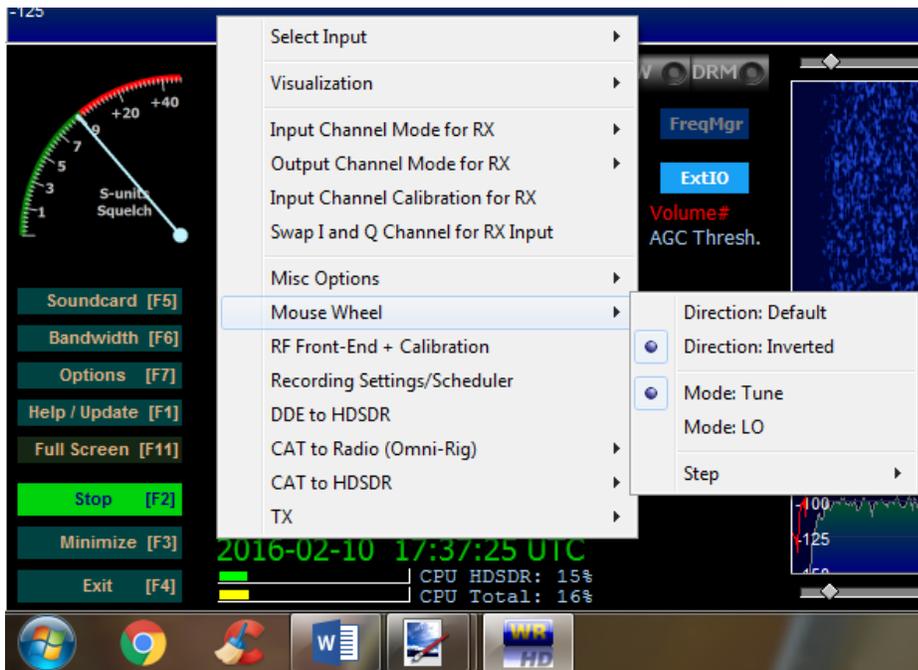
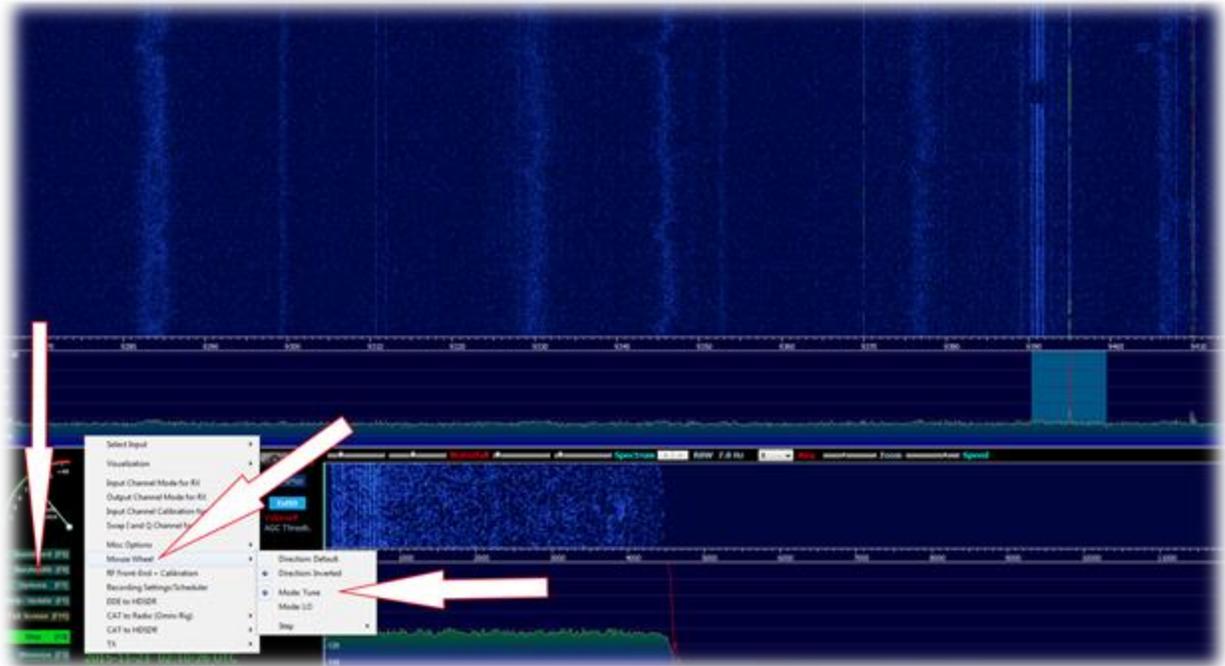
2: Misc. Options.

3: Check auto start.

4: Show Time in UTC.

This setting tells HSDR to start the RSP as soon as you launch HSDR and will also convert the time on the main screen (lower left) from standard time to universal time.

Step-5 Set tuning within the band and not LO



1: Options.

2: Mouse Wheel.

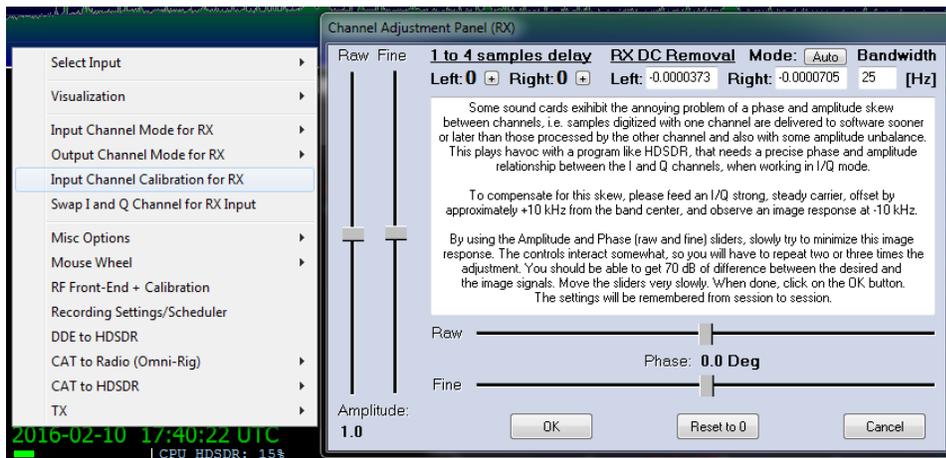
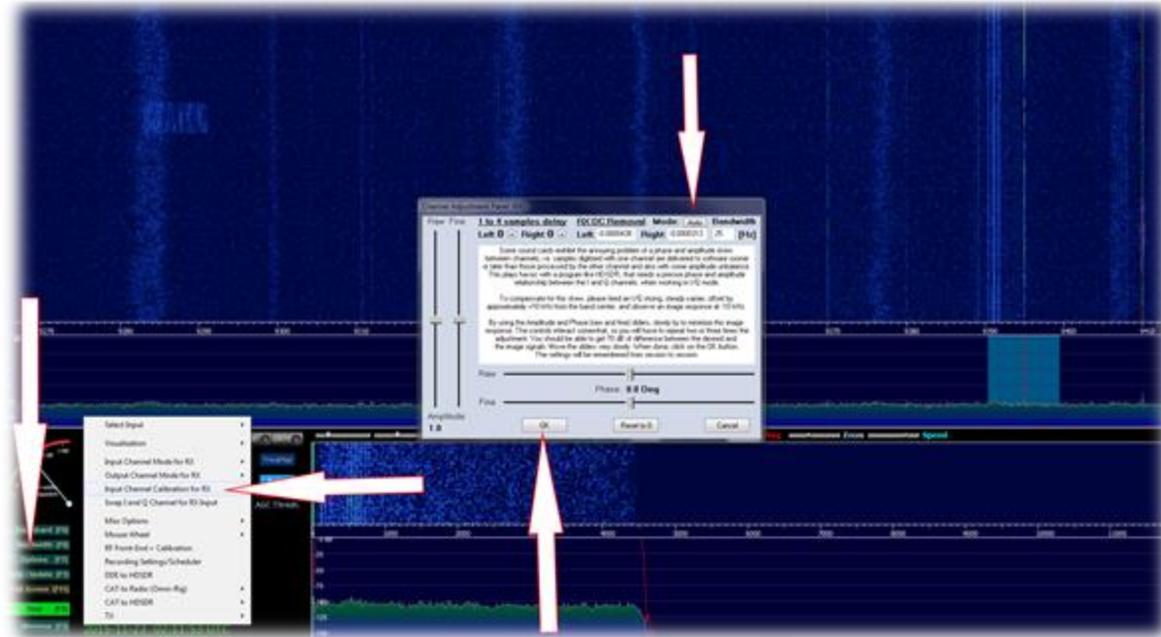
3: Select Mode: Tune.

This setting tells HSDR to tune within the current frequency range selected and operating the RSP in this mode is much smoother via the mouse wheel or click and dragging.

HOW TO VIDEO

<https://www.youtube.com/watch?v=beqoGobfWjk>

Step-6 Remove the center DC spike



1: Options.

2: Input Channel Calibration for RX.

3: Change Mode at the top from Off to Auto.

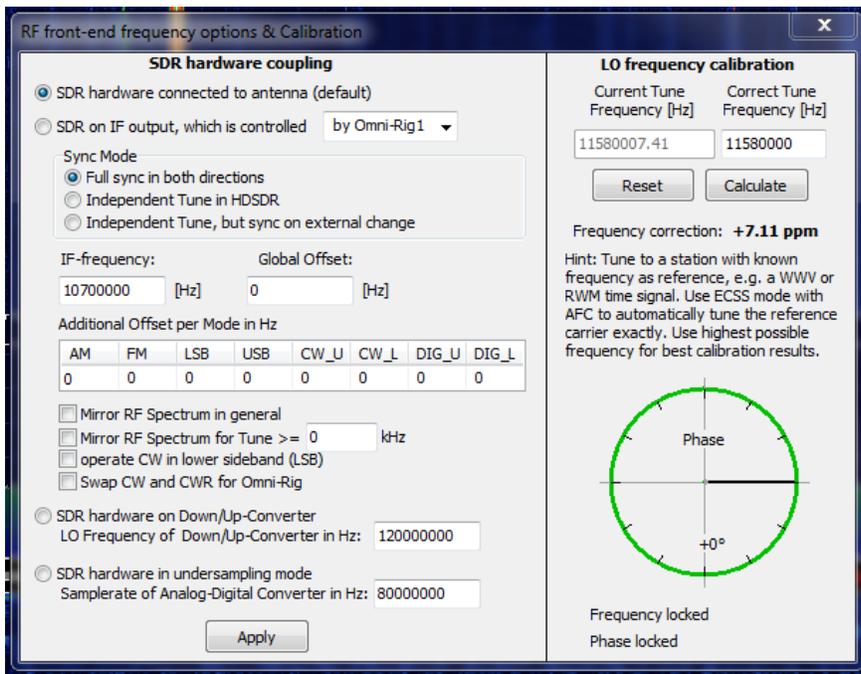
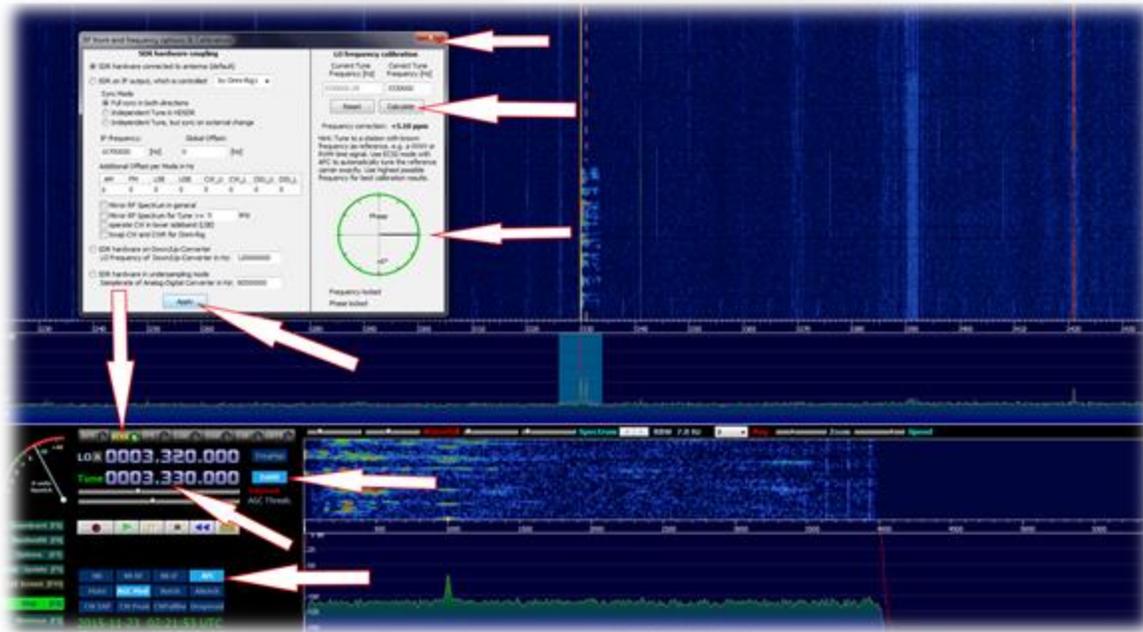
4: Click OK.

This setting tells HSDR to automatically calculate the removal of the center DC spike in the waterfall display.

HOW TO VIDEO

https://www.youtube.com/watch?v=FLcgi9o5z_w

Step-7 (Final) Calibrate the offset of the RSP



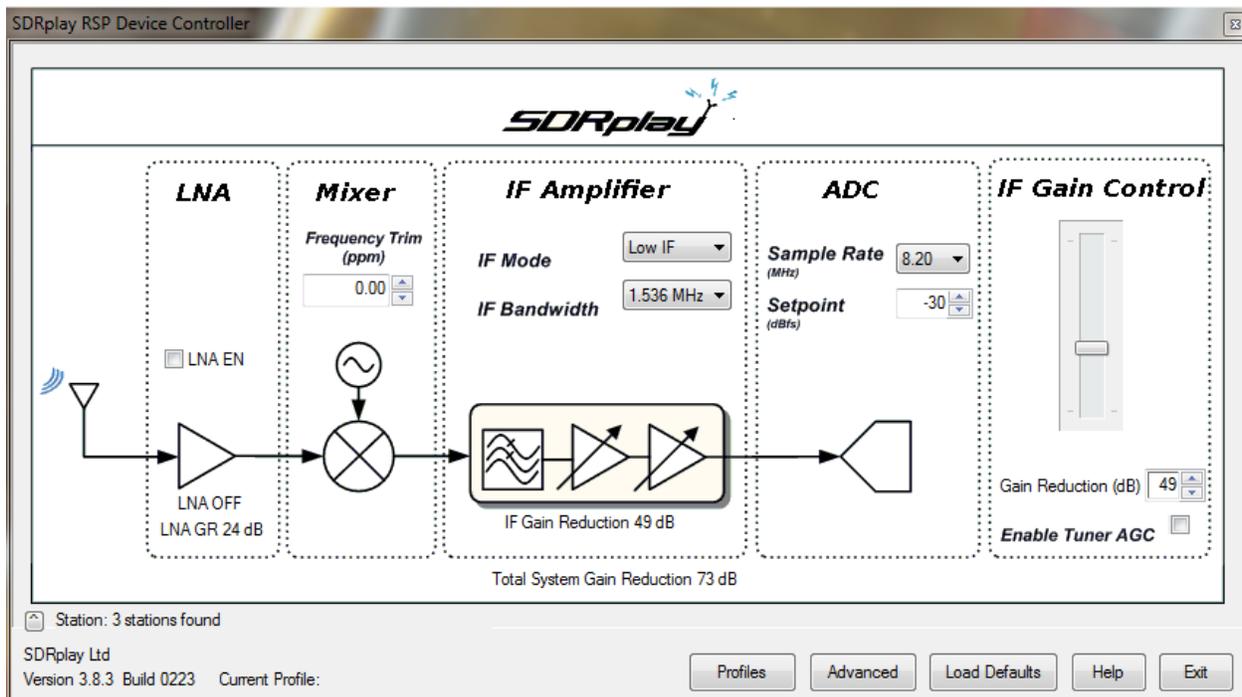
- 1: Tune to the following time stations WWV (5,000 10,000 or 15,000 KHz) or CHU Canada (3330 or 7850)**
- 2: Change the mode to ECSS (To the right of the AM button) and make sure AFC is selected (Turns Blue).**
- 3: Right click on the EXT/IO button. Wait for it to get into 0 or as close to zero Phase (Zero phase in the 3 o'clock position)**
- 4: Click Calculate**
- 5: Hit apply**
- 6: Click the X to close it.**
- 7: Change your mode back to AM.**

This setting tells HSDR how to adjust the offset/frequency correction that almost all SDRs have. If you cannot get the phase arrow in the circle to rest near 0 then do the calibration when HF conditions are better. Ideally you want to calibrate your RSP with the 15 WWV time station

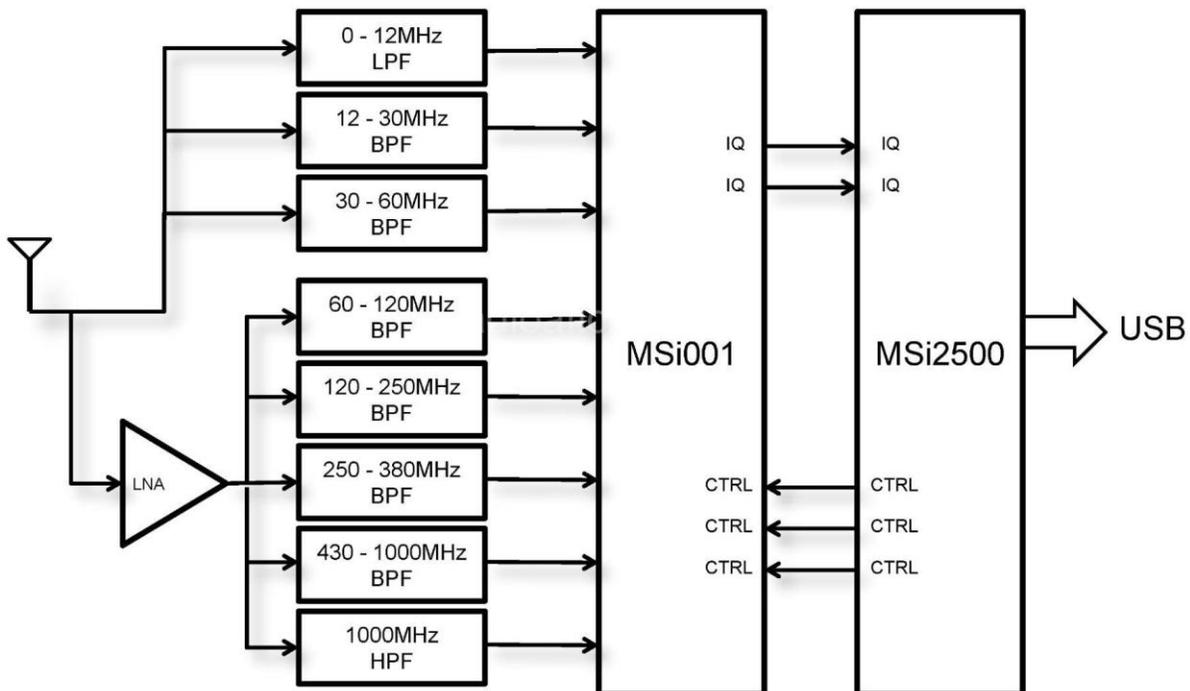
HOW TO VIDEO

<https://www.youtube.com/watch?v=J2C5gBlpkA>

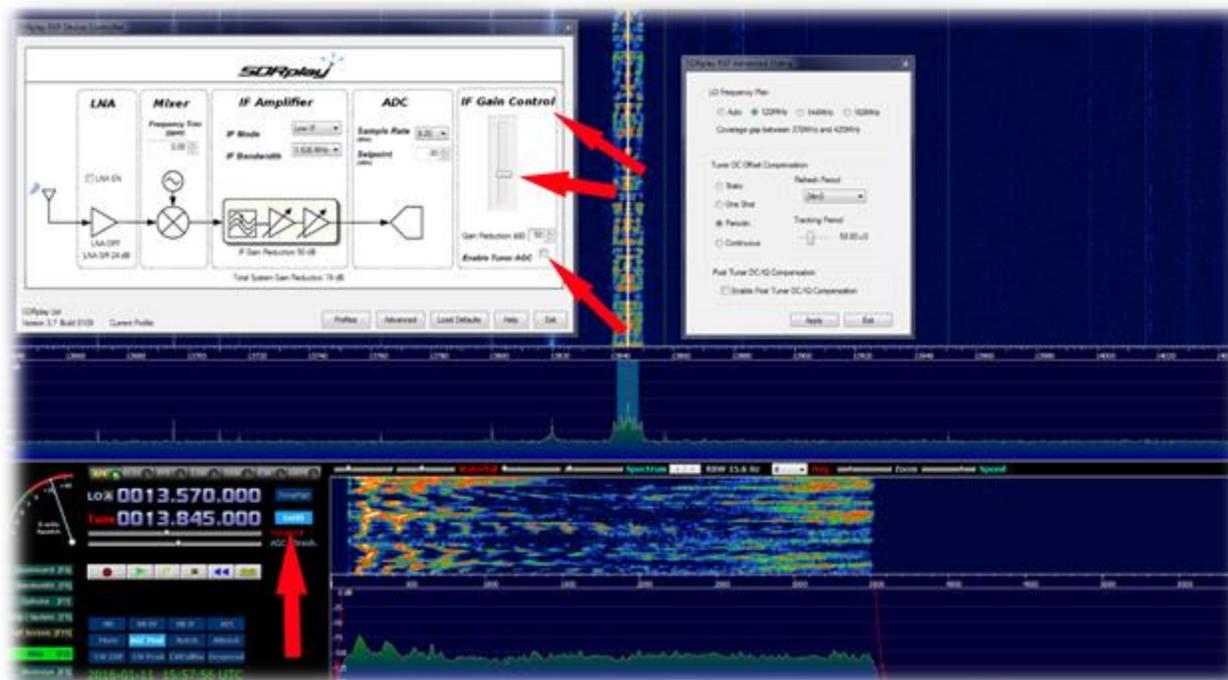
Tweaking the RSP EXT/IO:



Conceptual Block Diagram



SDRPlay EXT/IO Optimization:



EXT/IO panel: Later on in this guide we will go over the other EXT/IO settings. I want to bring you up to speed on how to use HSDR vs confuse you with settings we basically won't touch for HF listening. One very important thing is The RSP receives radio signals over a very wide range. However, when it is compared with other radios or receivers specifically designed for a certain frequency range, its sensitivity, may or may not be inferior within that range. This is because their circuit designs are completely different then the RSP.

Let's setup the EXT/IO provided by SDRPlay. The EXT/IO configuration panel is not a one setting fits all. The most overlooked but least understood setting for any new SDR user is the Gain Control. This important setting is shown in the EXT/IO pop-up window. Knowing the proper number to set the gain is key to getting the best signal to noise ratio manually.

If your scratching your head with all these buzz words, then the easiest way to explain it would be to say we are trying to obtain the best sounding signal with the least amount of noise and or static.

Think of the gain control settings as a valve. Adjusting the gain slider up and down will tell the RSP how much or how little signal to get into the RSP's circuits for processing from your antenna. If you apply to much gain you will have vertical lines all over the waterfall and possibly hear 2 to 3 stations at 1 time. This intermixing of stations is called intermod. Think of intermod as having the valve opened way too much. Now if we lower the gain setting then it will result in to not being able to see or hear any stations at all. Same as shutting a valve.

The EXT/IO by default will enable the AGC. When the Automatic gain control is checked and enabled its job is to try and figure out the best value for the gain and apply it in real time. I personally never enable any type of AGC for HF listening. I suggest you disable it and here is why.

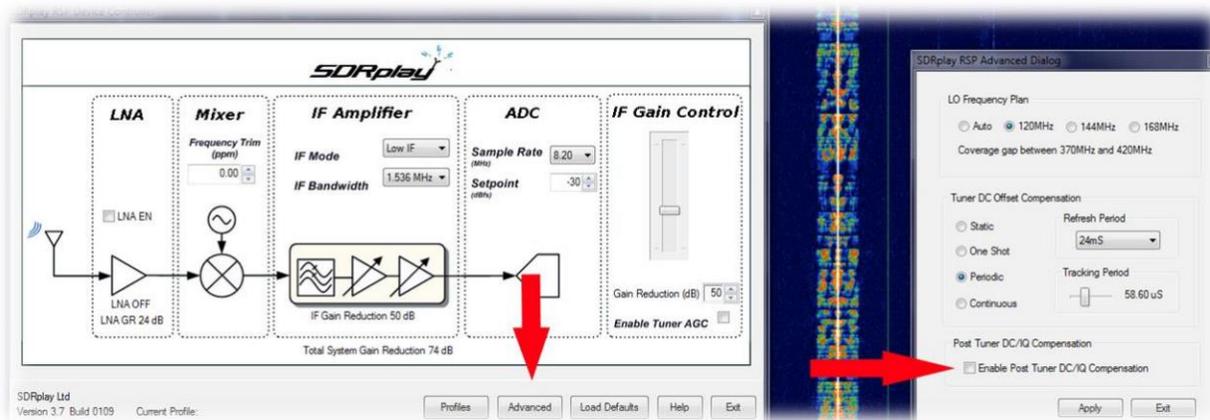
9 times out of 10 AGC is going to raise the noise floor (white noise/static) way too high for HF listening. You can adjust the value at which it triggers which is called the set-point value.

If you really want to use AGC then I strongly suggest a set point in the range of -40 -30. Anything higher than the lowest number (-30) will just trigger the gain to a higher value and we don't want that. Try the AGC option and see how you like it. If you are a DX hunter like myself then I honestly feel that having the AGC on will put you at a huge disadvantage for finding weak and distant stations. To disable the RSP'S AGC click on the EXT/IO button and uncheck the box that says "Enable Tuner AGC".

For HF listening I would suggest the IF Gain in the 60-50 range. A lower number means it will allow more signal into the RSP. A higher number has an opposite effect

The SDRPlay developers enabled what they thought would be the best EXT/IO settings for you. Every time you launch HSDR the stock RSP settings are used. If you make any changes in the EXT/IO then the new settings will be applied every time you run HSDR. I feel that these stock out of the box settings are good but we will get them set even better by making a few changes.

The next setting, I suggest you disable is "Enable Post Tuner DC Compensation". The EXT/IO will tell HSDR what it thinks is the optimal setting to remove the DC center spike. We do not need to enable this setting because we told HSDR to take care of this earlier with STEP-6. To Disable "Enable Post Tuner DC Compensation" click on the EXT/IO button. Select Advanced and uncheck the box that says "Enable Post Tuner DC Compensation" and hit OK and then exit in the main



LO Frequency Plan: This option will tell the RSP internally how to shift the gap which is present in the Mirics processor. The options are as follows.

Auto: You will have continuous coverage without any frequency gap.

120Mhz: A frequency gap between 370Mhz and 420Mhz

144Mhz: A frequency gap between 250Mhz & 255Mhz also 400Mhz & 420Mhz

168Mhz: A frequency gap between 250Mhz & 265Mhz

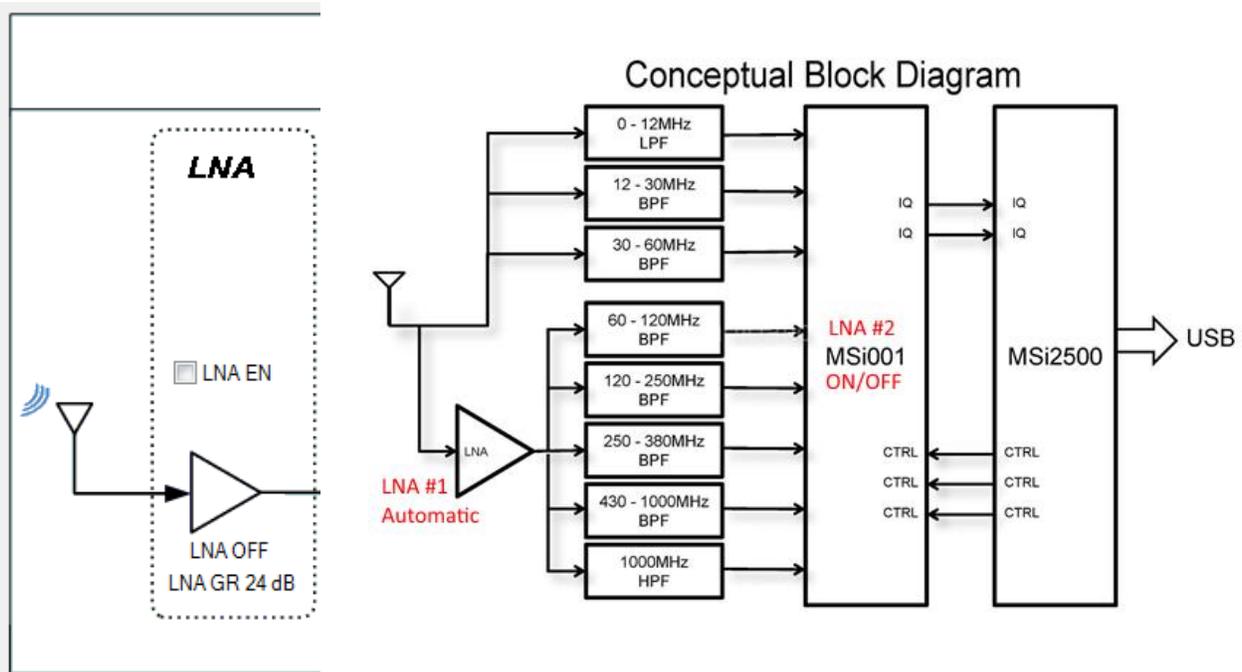
If you are using the RSP for **HF listening**, then I would suggest a lockout of **168Mhz**. This is just a personal preference and not 100% mandatory. If you notice any images or spurious signals, try shifting the LO to what works best for you.

The RSP has two LNA'S

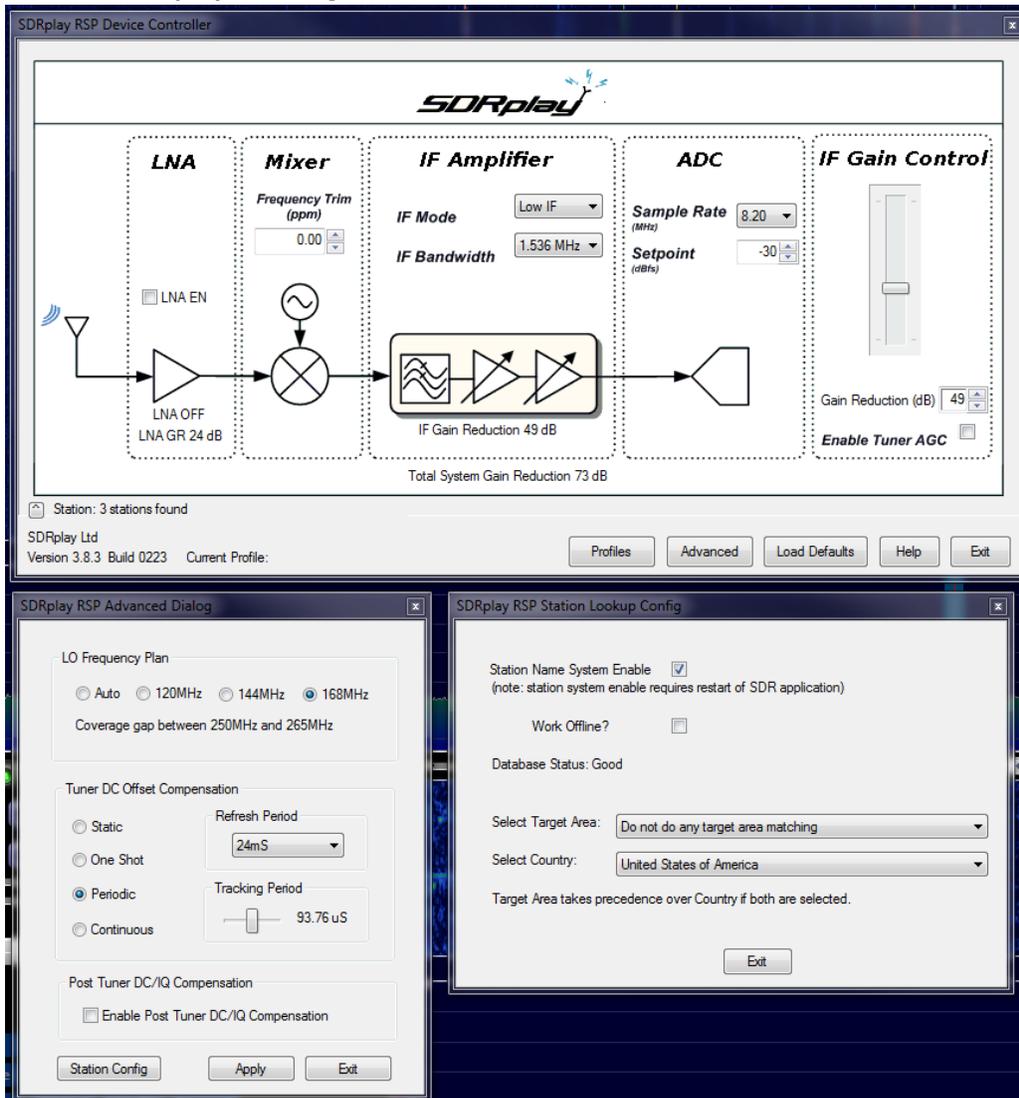
LNA #1 Is automatic as show in the block diagram

LNA #2 (You control) Is built into the MSi001 chip.

User control of LNA #2 is to compensate the losses of the RF switches that switch the frontend filters if need be.



HF Station Display & Configuration:

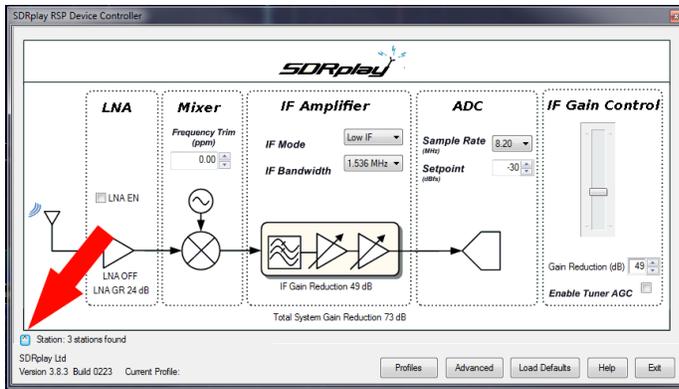


The latest EXT/IO (v3.8.3) now has a HF station lookup/display feature. This is a very powerful feature for HF listening & DX hunting. The EXT/IO does this by downloading the world famous EIBI database. It then parses and display the current tuned station based on your current location and current time. To enable this you will have to do the following.

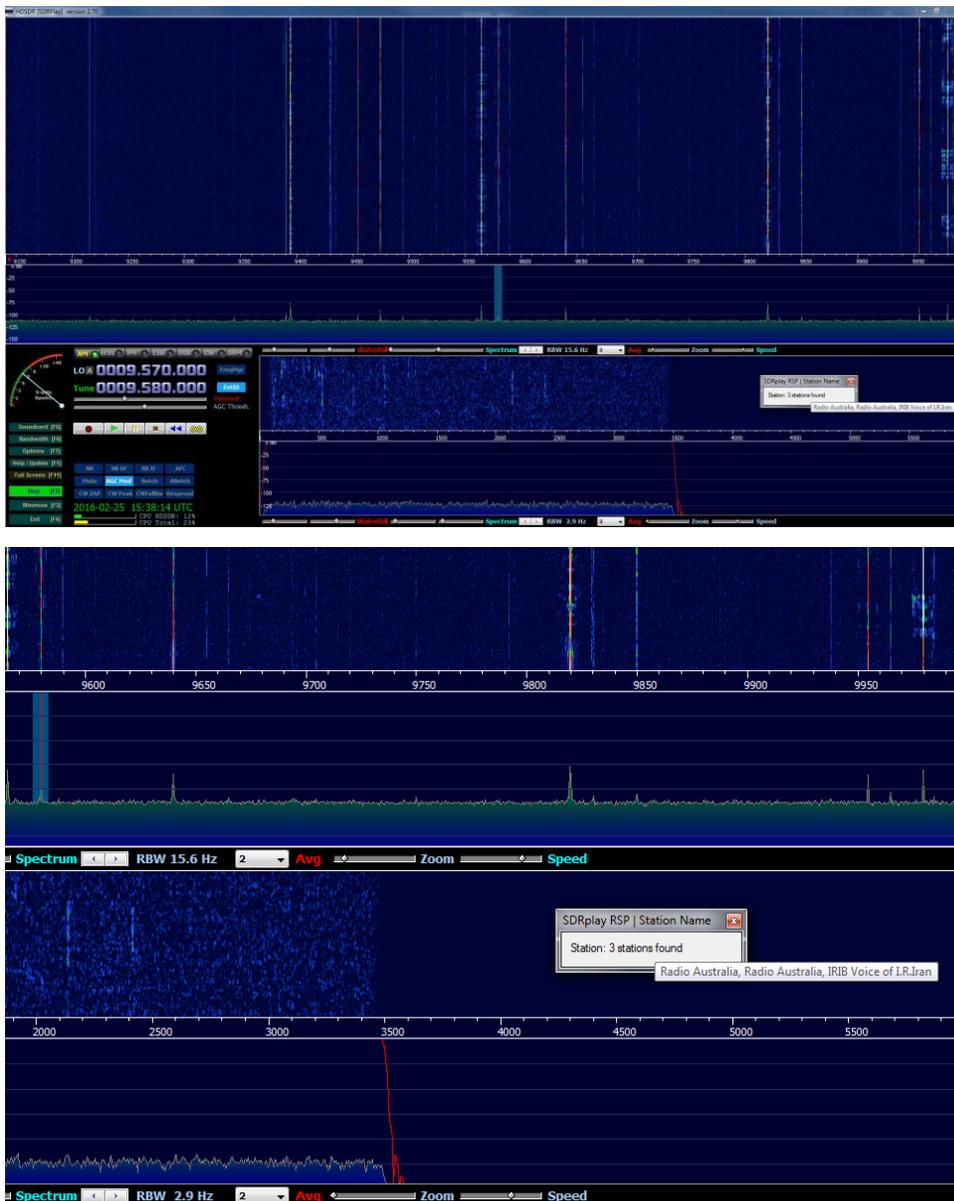
- 1: Click on the EXT/IO button in HSDR or hit the "H" key on your keyboard.
- 2: Select Advance on the lower right section of the RSP EXT/IO display
- 3: Select the Station Config button on the lower left of the RSP EXT/IO Advance dialog

The settings I find to work best for my location is shown in the picture above. After everything is selected for your location you will have to restart HSDR for these settings to take effect.

After HSDR has been restarted you will want to open the EXT/IO and click on the POP-OUT button as show below.

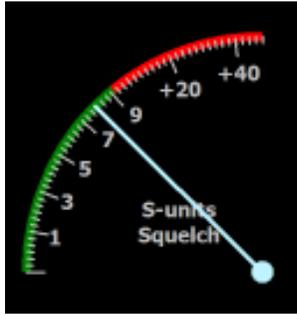


You can now close the EXT/IO and move the mini display window anywhere you like within HDSDR



MISC HSDR Features:

S-Meter Calibration



(Eyeballing It)

- 1: Tune to a station with a known signal strength (NOAA or a loud local FM station)
- 2: In HSDR Click Options -> Misc Options -> S Meter calibration.
- 3: You will be presented with a dialog box which outlines the instructions
- 4: Once you click OK you will see the S meter now read S-Units calibration
- 5: By left clicking you can set the meter to the known reference.
- 6: Right click to finish the S-Meter calibration.
- 7: The meter will now read S-Units Squelch again



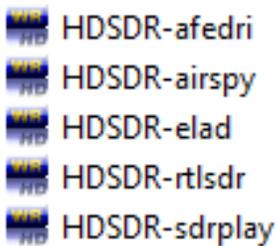
The correct way

You will need a RF Generator set to the following. -73dBm, 50uV into 50 Ohms, S9 .

You would follow the same steps as above but click on s9 in the HSDR meter

The least expensive unit I can find new is the **Tenma 72-585** and they sell for about \$175-\$200 new.

HSDR Profiles.



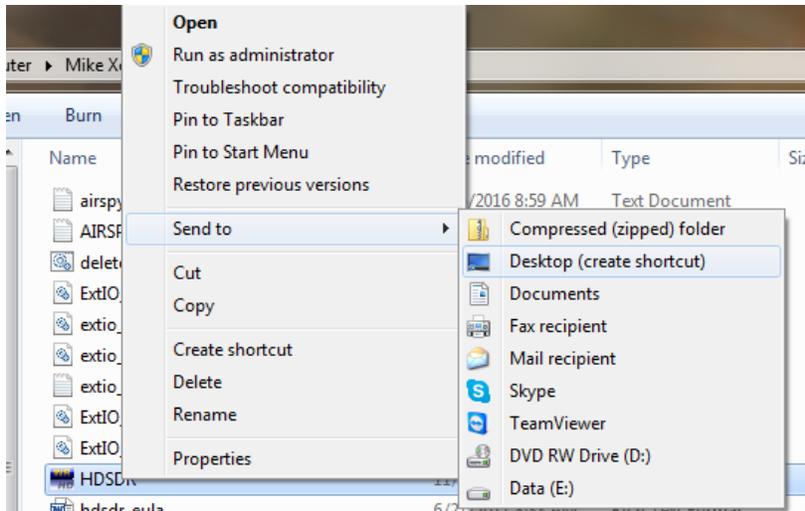
If you own mutable SDR'S or even mutable RSP'S then I would strongly suggest you enable the profiles feature in HSDR. This setting allows you to run independent settings across all your SDRS within HSDR. The only setting that will be shared across all SDRS inside of HSDR is your frequencies that you stored in the frequency manager.

To enable this feature is a multistep process and I will do my best to break it down as simply as possible. Please note that you will have to setup each SDR one time as if it was new. This is a onetime process.

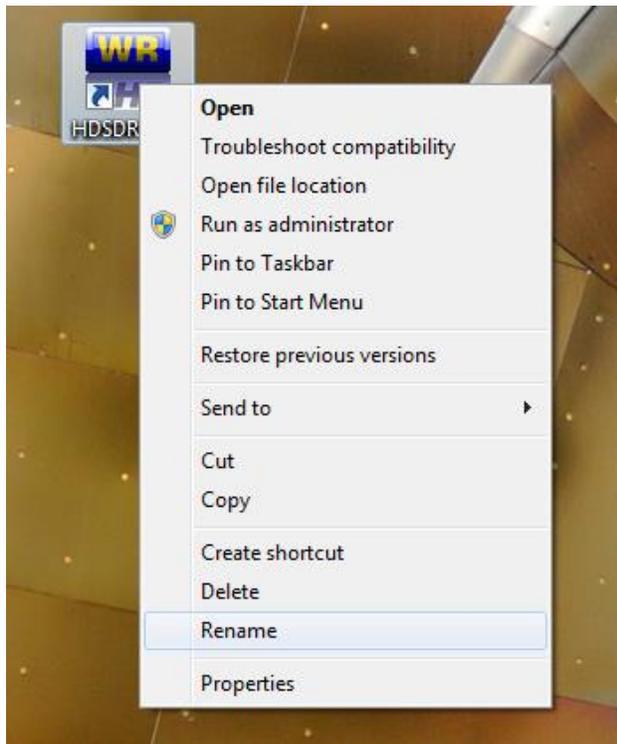
Step 1: Delete all shortcuts & only the shortcuts to HSDR. Either on your desktop & or your start menu.

Step 2: Locate your HSDR main install directory. It is located in the following path.

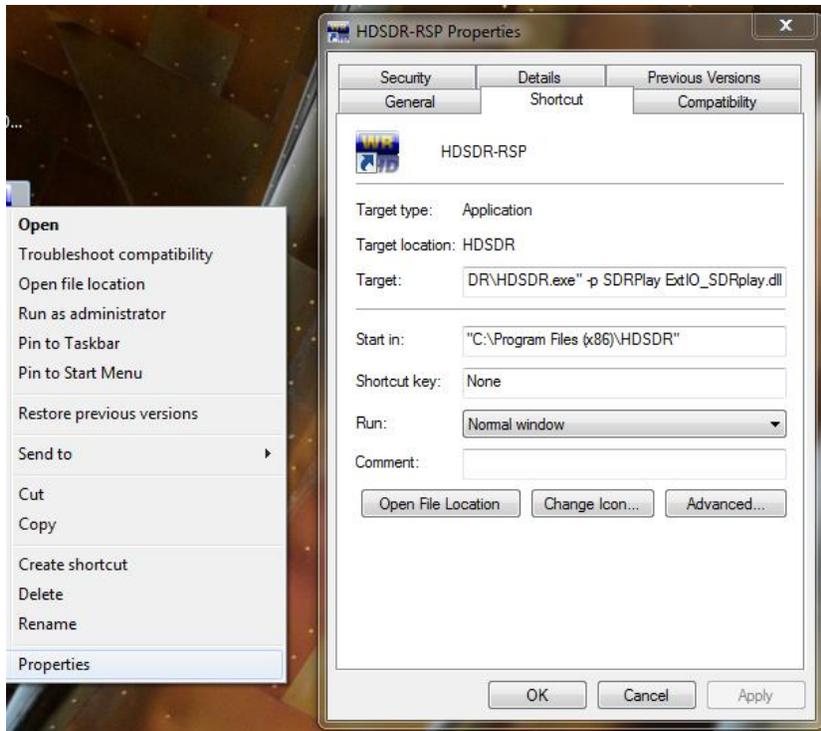
Windows 32bit: C:\Program Files\HSDR Windows 64bit: C:\Program Files (x86)\HSDR



Step 3: Right click on the main HDSDR.EXE icon inside of your Program Files directory. Select Send to and then select Desktop (create shortcut). Do this step for as many SDR'S as you own. If you have 3 SDR'S then create 3 shortcuts on your desktop. For this example, we will only set this up for 2 SDR'S. The first one will be the RSP and the second one will be a RTL 820T2.



Step 4: Rename both shortcuts to separate the SDR names. The first one will be HDSDR-RSP and the second one will be HDSDR-RTL. It can be anything you want but I like to rename the shortcut to reflect what unit I will use.



Step 5: Right click on the first shortcut we just renamed (HSDR-RSP) and select properties. Inside the target box copy and paste the following

```
"C:\Program Files (x86)\HSDR\HSDR.exe" -p SDRPlay ExtIO_SDRplay.dll
```

The -p switch will show you the name of the unit selected on the top left of the HSDR title bar. You can name this anything you like. I chose SDRplay.

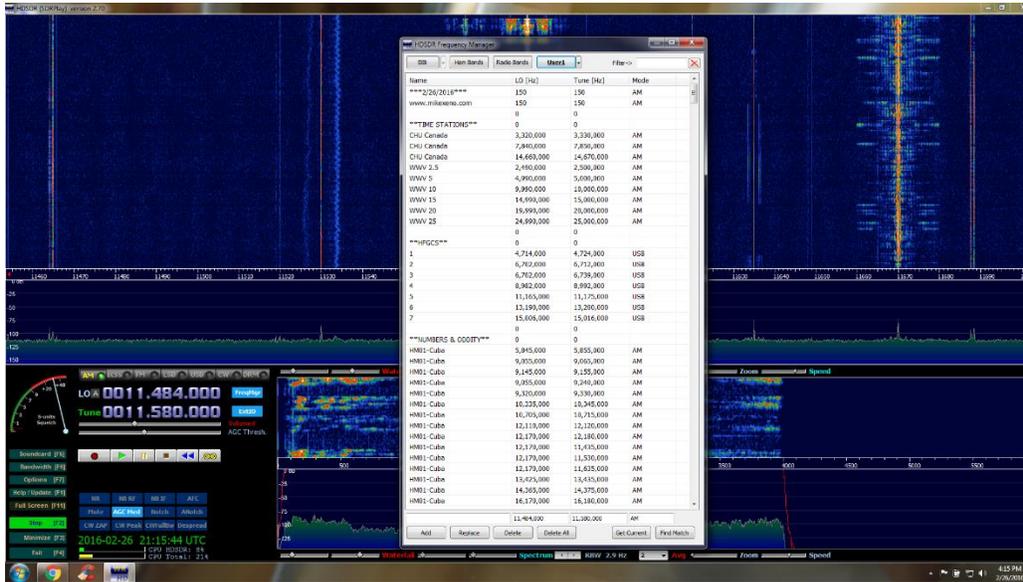
After the name is the .dll file used and this must stay the same. ExtIO_SDRplay.dll

Step 6: Do the same as the above steps for the 2nd HSDR shortcut we renamed as HSDR-RTL but we only need to change 2 things. The -p switch and the ExtIO. Mine looks like this inside of the target area for the second shortcut. "C:\Program Files (x86)\HSDR\HSDR.exe" -p RTLsdr ExtIO_RTL2832.dll

If you want to add a 3rd or a 4th radio just make more shortcuts and replace the target box with the proper information.

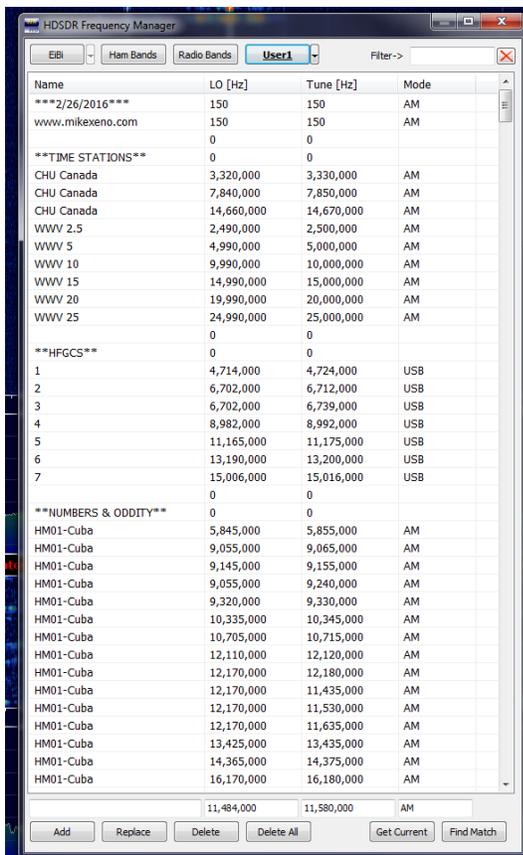
If you click on the main HSDR.EXE then you will need to go through all the settings again for each one of your radios inside of HSDR. DO NOT CLICK the HSDR.EXE if you are using the profile feature.

FREQUENCY LIST:



All RSP owners are able to download my compiled and often updated HF frequency list located at the address below

https://www.dropbox.com/sh/a0ibj9q2ksgrw1/AADEXtGl8UnxBjyPm1MG_vwa?dl=0



Copy the file user.csv over your original user.csv or move yours and replace it with this one. The file belongs in Documents then HSDR then CSV.

After the copy is complete you can pull up the frequency list by clicking the button within HSDR labeled "FreqMgr".

You will have a popup window like the one shown on the left. Click on the button labeled "User1"

You can now browse and click on the names in the list and the RSP will tune to that frequency.

HOW TO VIDEO

<https://youtu.be/G7ltgJbXXao>

HDSDR Keyboard Shortcuts

Function	Keyboard Shortcut
Set LO frequency on tuned frequency (to be considered LO<->Tune Offset)	C
Enter new LO frequency	Ctrl+O or L
Enter new Tune frequency	Ctrl+T or T
Enter new Quick Tune frequency (auto LO)	Ctrl+Q or Q
Fast frequency input	1 - 9
Switch between LO A and B	Ctrl+V
Frequency Manager + Bands	Ctrl+B
Increase LO frequency by visible spectrum bandwidth	Ctrl+PageUp
Decrease LO frequency by visible spectrum bandwidth	Ctrl+PageDown
Select MouseWheelStep	Ctrl+Home or Menu
Increase Tune frequency by MouseWheelStep	Ctrl+Up
Decrease Tune frequency by MouseWheelStep	Ctrl+Down
Increase LO frequency by MouseWheelStep	Ctrl+Right
Decrease LO frequency by MouseWheelStep	Ctrl+Left
Enter new Locut frequency	Shift+L
Enter new Hicut frequency	Shift+H
Increase Locut frequency	Shift+Up
Decrease Locut frequency	Shift+Down
Increase Hicut frequency	Shift+Right
Decrease Hicut frequency	Shift+Left
Switch Mode to AM	Ctrl+A
Switch Mode to CW	Ctrl+C
Switch Mode to DRM	Ctrl+D
Switch Mode to ECSS	Ctrl+E
Switch Mode to FM	Ctrl+F
Switch Mode to LSB	Ctrl+L

Switch Mode to USB	Ctrl+U
NB – Noise Blanker RF	B
NB – Noise Blanker IF	I
NR – Noise Reduction	R
Manual Notch Filter (Beat Cancel)	N
Automatic Notch Filter (Auto Beat Cancel)	A
AGC (fast/mid/slow/off)	G
Mute on/off	M
Volume	+/-
Swap position of Waterfall/Spectrum	S
Swap position of RF/AF Display	Ctrl+S
Save current RF Waterfall to image file (in WAV recording directory)	Ctrl+W
Collapse Mode (only upper Display)	Shift+C
Compact Mode (without RF+AF Display)	Shift+X
Zoom RF Spectrum	Ctrl+'+'
UnZoom RF Spectrum	Ctrl+'-'
Reset RF Spectrum Zoom to full bandwidth	Ctrl+0
Increase RF FFT Resolution Bandwidth (RBW)	Ctrl+'*'
Decrease RF FFT Resolution Bandwidth (RBW)	Ctrl+'/'
Zoom AF Spectrum	Shift+'+'
UnZoom AF Spectrum	Shift+'-'
Reset AF Spectrum Zoom to full bandwidth	Shift+0
Increase AF FFT Resolution Bandwidth (RBW)	Shift+'*'
Decrease AF FFT Resolution Bandwidth (RBW)	Shift+'/'
S-meter calibration: Increase level	Shift+Up
S-meter calibration: Decrease level	Shift+Down
S-meter calibration: Reset level	Shift+Home
AFC	F
Set AFC carrier search range for AM/ECSS modes	Shift+A
CW ZAP	Z
CW Peak	P
CW Despreading	D
Switch between RX and TX	Space

TX mode: Switch CW carrier tone on/off	Return
Rewind WAV file	Shift+W or Shift+Home
Jump to next WAV file (Multipart WAV file only)	Shift+End
Switch WAV file looping	Shift+O
Record WAV file	Shift+R
Play WAV file	Shift+P
Stop Playback/Recording	Shift+S
Pause Playback/Recording	Shift+B or Space
Change WAV step size	Shift+K
Increase WAV file position by 'step size'	Shift+PageUp
Decrease WAV file position by 'step size'	Shift+PageDown
Show GUI of ExtIO-DLL	H
Help / Info / Update check	F1
Start/Stop HSDR	F2
Minimize HSDR	F3
Exit HSDR	F4
Open sound card selection dialog	F5
Open sampling rate dialog	F6
Open Options menu	F7
Full Screen	F11
Boss Key	Pause

HF Propagation:

This should help you with the basics of propagation. This is just a primer to get you started. Reading and understanding propagation charts goes much further than this basic introduction.

Solar Flux ranges from 30-300. A higher number is better.

30-70 Bad

80-90 Low

90-100 Average

100-150 Good

150-300 Ideal

A-Index ranges from 0-400. A lower number is better.

1-5 Ideal

6-8 Average

10-400 Bad

K-Index ranges from 0-9. A lower number is better.

0-1 Ideal

2-3 Good

4-5 Average

5-9 Bad

You have lots of resources on the internet to learn about radio propagation along with semi real-time space weather prediction & charts. One of the sites I would recommend is <http://www.hamuniverse.com/hfbeaconpropagation.html>