

SDRSharp & RTL2832 based USB SDR Radio Installation Procedure for Windows Seven 64 bit, or 32bit Operating System

Installing the software for SDR radios can be more of a challenge than assembling the relatively few pieces of hardware required. This article is a tutorial for installing SDRSharp and RTL driver on the Windows Seven 64 bit Operating System. It has been previously reported that SDRSharpe has been successfully installed on Windows Seven 32 bit, but what about Windows Seven 64bit?

Many of the screen shots in this article are taken on a system running Windows XP Professional. But this article is about installing SDRSharpe on Windows Seven 64 bit. Why did I leave these photos from XP rather than re-doing all of them on the Windows Seven 64bit system?

To make a point... The procedure, and the same SDRSharp Software AND the RTL USB driver code that ran on XP Pro runs on Windows Seven 64 bit with no change.

Lessons Learned from the Windows XP install experience and the Windows Seven 64bit Installation....

The "install" process for the SDR software and drivers is not a full blown Windows install process, but a simple ".bat" file execution with the end result that all required files for running SDRSharpe, including the RTL driver will be loaded into one subdirectory. No Windows registry entries are made, nor are driver files installed in the Windows\system32, Windows\sysWOW64, or other windows operating system driver directories.

My installation of SDRSharpe on Windows Seven 64 bit has a bit of history. The machine that I did a clean drive install of Windows Seven 64 bit, was in fact the same Intel Core2 Quad Processor machine with 4GB of RAM, that I had previously been running Windows XP Pro and had also installed and run SDRSharpe on.

Knowing what is briefly summarized above about the SDR "install" process, and will be described in detail in the remainder of this article, I merely saved the SDR Subdirectory and files that were created during the original installation on my old XP C: hard drive, and copied those same directories onto the new Windows Seven 64bit C: hard drive image.

After that, I ran the "zadig.exe" file which comes with the SDR download package, to associate the RTL USB driver located in the above copied subdirectories to the generic WINUSB Application Programming Interface in the new Windows Seven 64bit OS Installation. The install at this point is now complete and SDRSharpe is ready to run on your new Windows Seven 64bit system.

Do not plug in the SDR dongle until you have completed the above sequence. Otherwise, Windows Seven 64 bit plug and play will see the dongle and install a driver for it. But it will not be the driver you want to use. If this has already occurred, simply go into the Device Manager, and uninstall any drivers that may have been installed before you run the Zadig.exe program.

When you have successfully completed the installation, if you happen to go into the Windows Seven device and printer window, you will see the dongle device, that is the RTL2838UHIDIR device. It will also have the exclamation symbol as shown below indicating there is a driver problem or no driver present issue. Ignore this and don't try to "fix" it.



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The remainder of this article is the same as I wrote for installing SDRSharp on Windows XP Professional. It is here to give you more detailed information about the SDRSharp install process, which will be exactly the same for Windows Seven 64 bit, or Windows Seven 32 bit for that matter.

It is also written on the premise that you will use the “automated” SDRSharp install process, available for download at this link:

<http://www.sdrsharp.com/downloads/sdr-install.zip>

Prerequisites:

This article applies to the SDR-USB dongle that uses the RTL2832 chipset. As you can imagine, each different chipset requires specific drivers for them. So, make sure you are using an SDR dongle with the RTL2832 chipset.

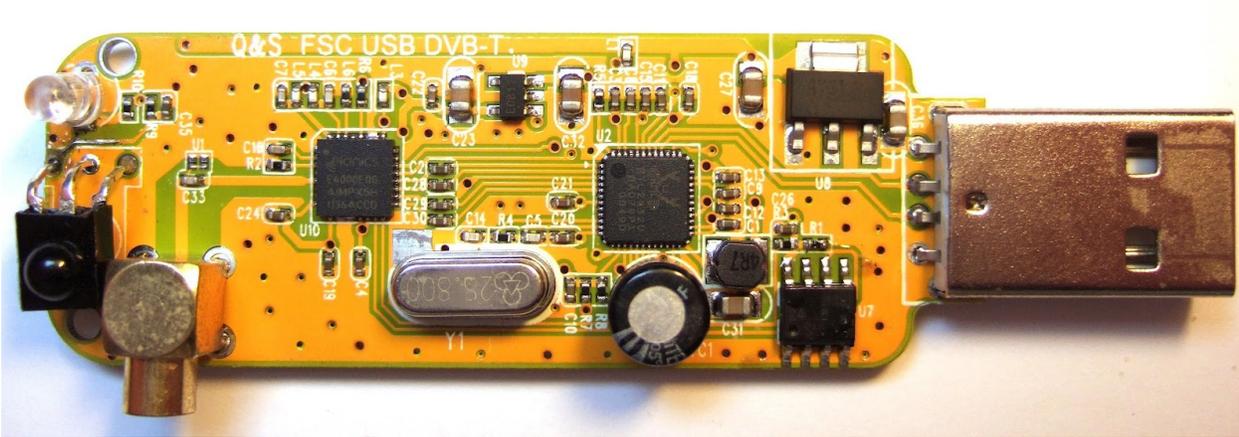


Photo courtesy, Vlad, KK4MRE

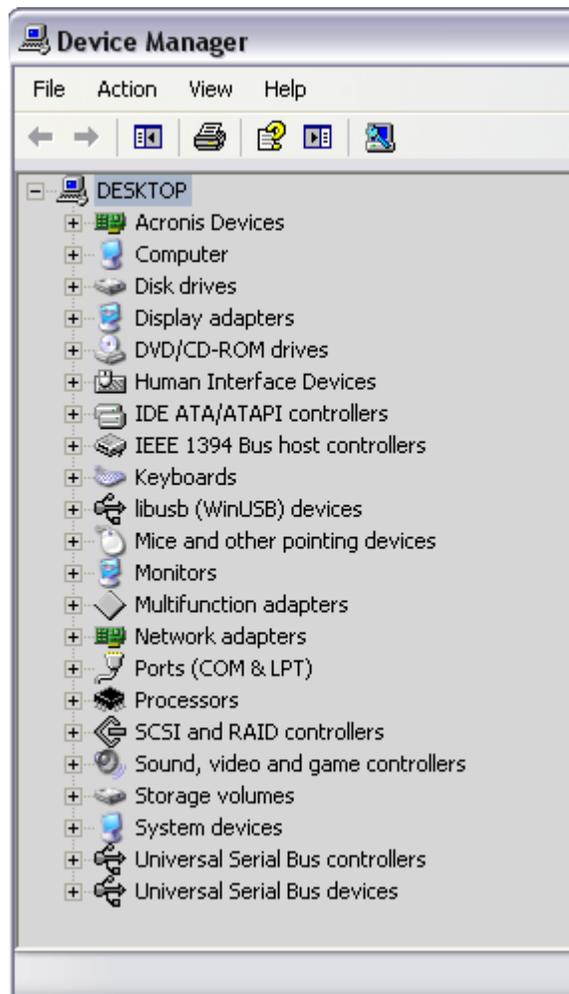
The complete Newsky TV28T V2 USB DVB RTL2832 based USB dongle



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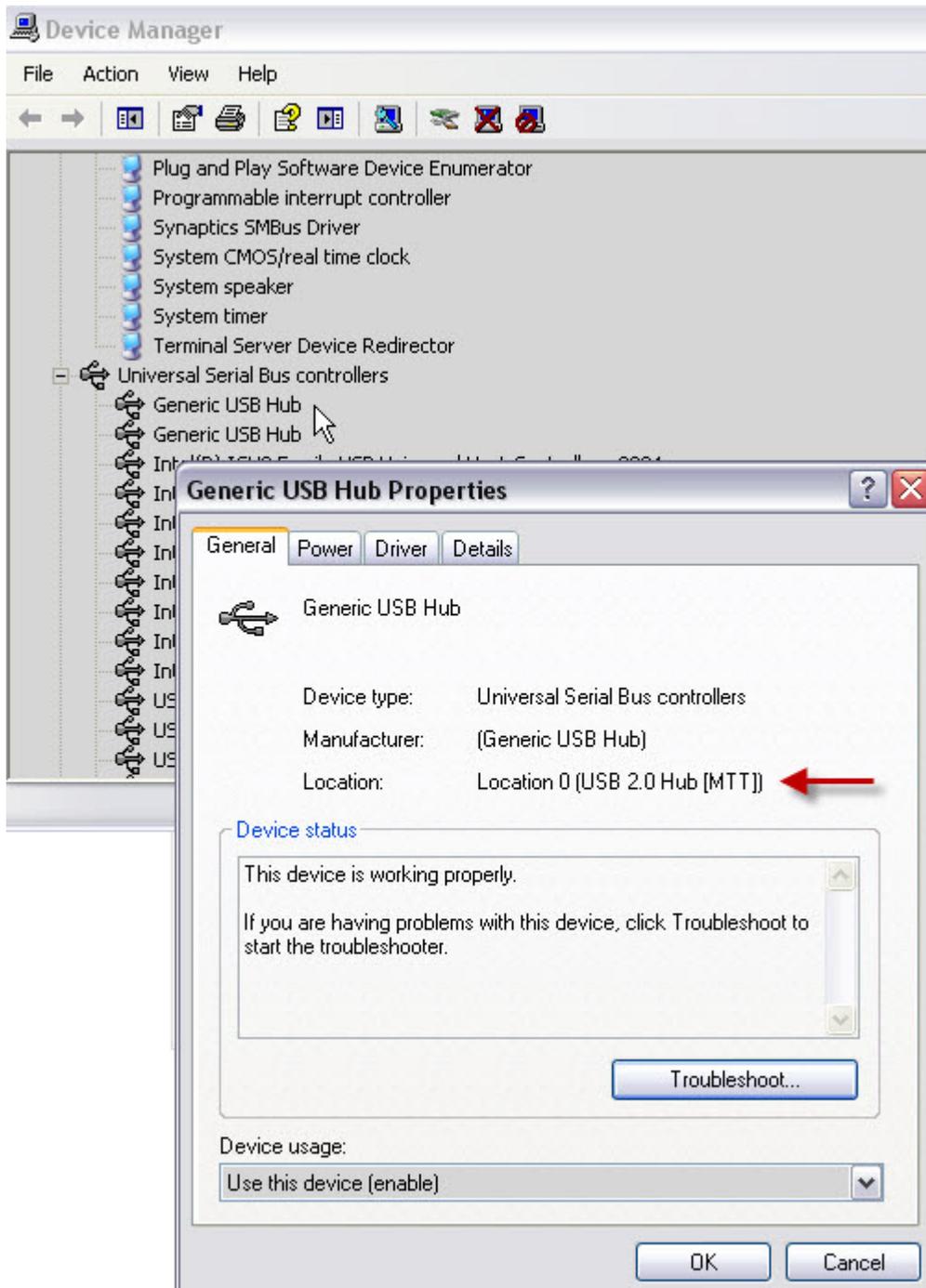
If you have a machine capable of running Windows Seven 64bit, it is highly likely you have a recent enough hardware system that has at a minimum USB 2.0 or later USB hardware.

If still unsure about the version of USB hardware in your computer, open the Control Panel, click on the "System" Icon, then the "hardware" tab and then the "Device Manager" button and then click on the "Universal Serial Bus Controllers" as shown below.



You'll need to examine the properties of the USB controllers by clicking on the (+) to expand the list and then start right clicking on the items to see their Properties. If you have USB 2.0 you will see wording to that effect as shown by the red arrow below.. From what I've read, the USB device names may be somewhat different on various computers. Where mine indicates "Generic USB Hub" you may see words to the effect of "Enhanced USB Controller", "USB Root Controller", etc, but there should be "USB 2.0" wording in the properties if you have USB 2.0

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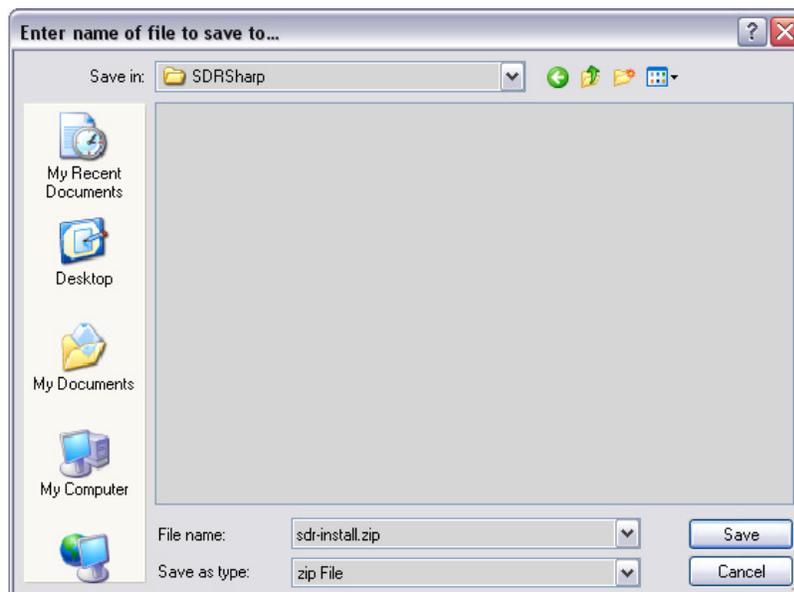
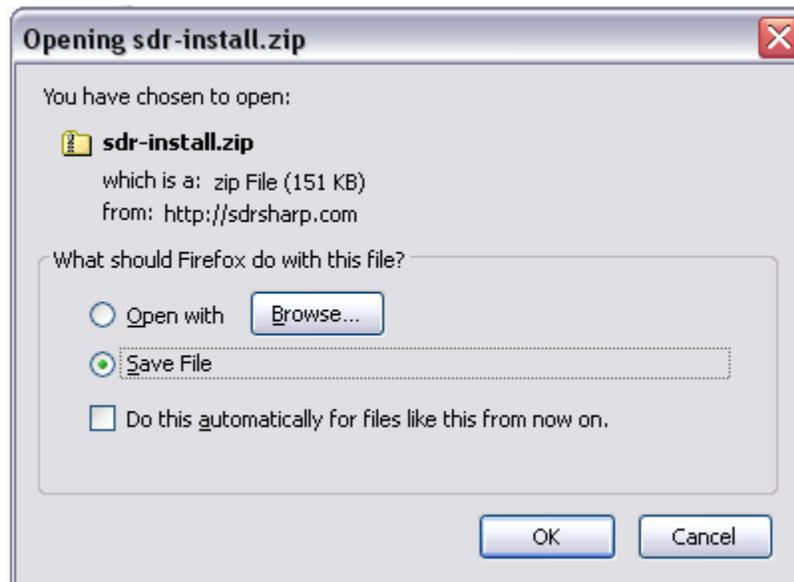
After having made sure the prerequisites are met for installation, we are now ready to proceed with the software installation.

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Create a subdirectory where you want all SDR related software to reside. For example, I have all my SDR files in the C:\SDRSharp subdirectory. The next step is to download the software for the automated install from the following link:

<http://www.sdrsharp.com/downloads/sdr-install.zip>

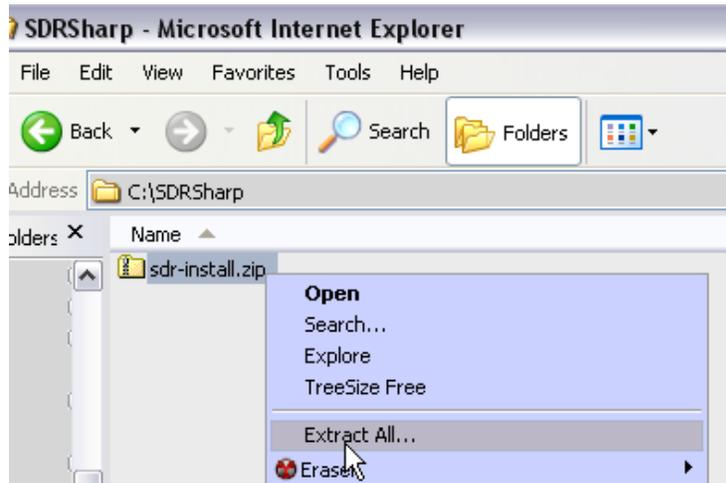
When you click on the above link, the following screen may appear, or depending upon your browser settings, the download may start automatically and place the files into the directory your browser options are set to. I prefer downloading and always specifying the directory as shown below.



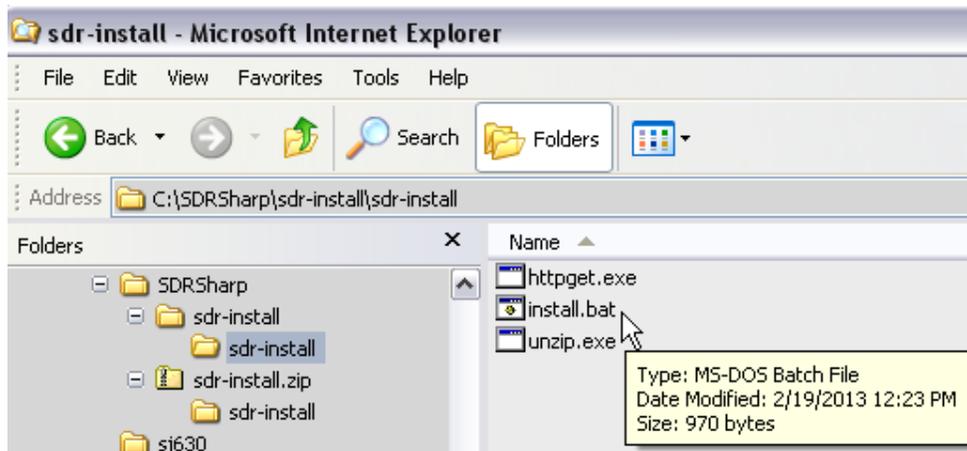
In any event, make sure the files are downloaded in the directory you prefer. Using my example, the file “sdr-install.zip”, a compressed zip file will be downloaded into the C:\SDRSharp subdirectory.

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Next, right click on the “sdr-install.zip” file to extract the included files.



After you have extracted the files, your file subdirectory structure will appear as follows, with 3 files in the “C:\SDRSharp\sdr-install\sdr-install” directory as shown below.



Your next step will be to click on the “install.bat” to perform the “install” process. You will likely get a pop up screen as follows, depending on your system security settings. Click on “Run” to execute the file.

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The "install" process for the SDR software and drivers is not a full blown Windows install process but a simple ".bat" file execution with the end result that all required files for running SDRSharp will be one subdirectory,

No Windows registry entries are made, nor driver files are installed in the Windows\system32 driver or other windows operating system areas.

Here are the contents of the install.bat file and an explanation of what it does:

```
1  @echo off
2
3  mkdir src
4
5  echo Downloading SDR# ...
6  httpget http://sdrsharp.com/downloads/sdr-nightly.zip src\sdr-nightly.zip
7
8  echo Downloading SDR#'s RTLSDR Plugin ...
9  httpget http://sdrsharp.com/downloads/sdr-nightly-rtlsdr.zip src\sdr-nightly-rtlsdr.zip
10
11 echo Downloading RTLSDR Driver
12 httpget http://sdr.osmocom.org/trac/raw-attachment/wiki/rtl-sdr/RelWithDebInfo.zip src\RelWithDebInfo.zip
13
14 echo Downloading Zadig
15 httpget http://sdrsharp.com/downloads/zadig.zip src\zadig.zip
16
17 mkdir tmp
18
19 unzip -o src\sdr-nightly.zip -d sdrsharp
20
21 unzip -o src\sdr-nightly-rtlsdr.zip -d tmp
22 move tmp\SDRSharp.RTLSDR.dll sdrsharp
23 move tmp\msvcr100.dll sdrsharp
24 move tmp\libusb-1.0.dll sdrsharp
25 move tmp\libusb0.dll sdrsharp
26 move /Y tmp\config\SDRSharp.exe.config sdrsharp
27
28 unzip -o src\RelWithDebInfo.zip -d tmp
29 move tmp\rtl-sdr-release\x32\rtlsdr.dll sdrsharp
30
31 unzip -o src\zadig.zip -d tmp
32 move tmp\zadig.exe sdrsharp
33
34 rmdir src /S /Q
35 rmdir tmp /S /Q
36
```

Temp directory for downloads

Download latest SDR Sharp Application

Download latest RDLSDR plugin for SDR App

Download latest RTLSDR Driver

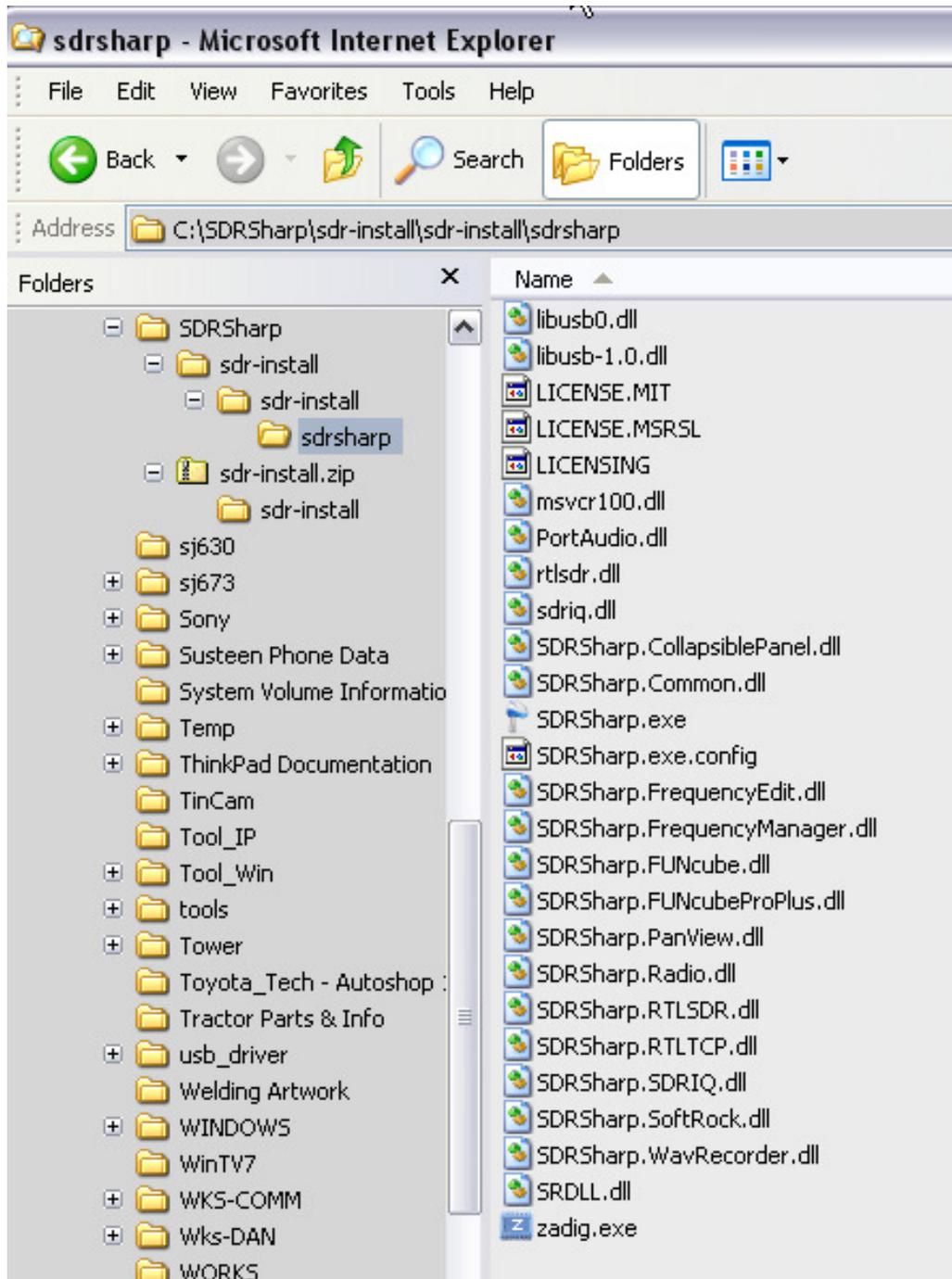
Download Zadag Application that must be executed to tell Windows Operating System to associate RTLSDR Driver with WINUSB, a standard generic Windows USB API (or Application Program Interface). This is the interface the SDR Application will use to talk to the SDR USB dongle.

Make sure all these files are in the subdirectory you are using to run SDRSharpe.exe from

Erase temporary subdirectories used for install

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After you have executed the “install.bat” batch file, the SDRSharp software, including the SDR-RTL plug-in .dll and the RTL drivers will all be installed in the SDRSharp subdirectory as follows:



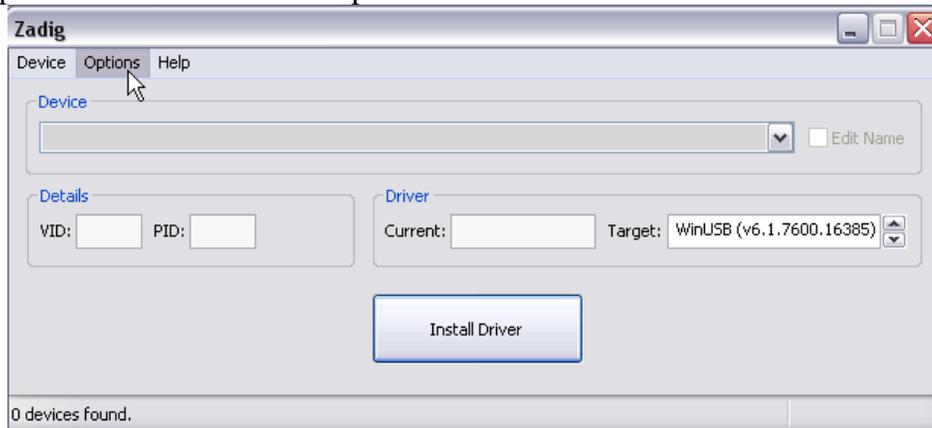
One final step is needed before you are ready to run the SDRSharp Software. At this point, the Windows Operating System knows nothing about this software. You now need to run the “zadig.exe” file shown above to associate the RTL driver with the generic “WINUSB” Application Programming Interface that is a part of your windows operating system. This step is necessary for the SDRSharp application to be able to “see” your SDR USB dongle.

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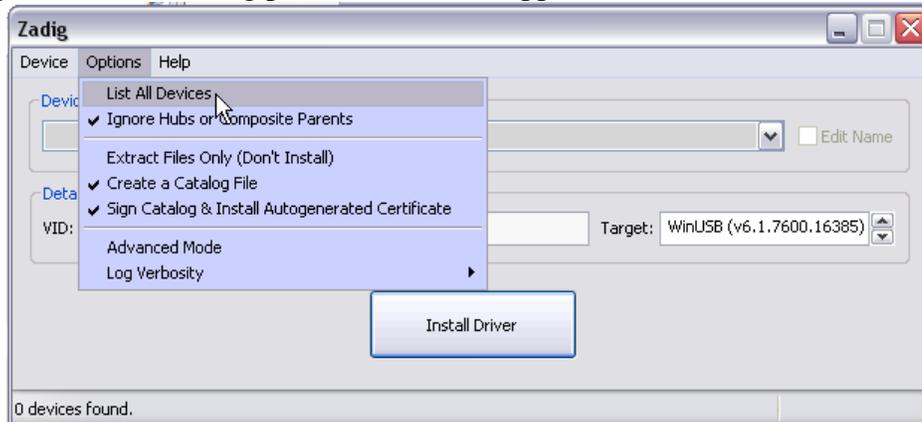
Next plug the USB SDR dongle into the USB port on your computer that you plan to leave the dongle permanently in. This process associates a specific port on your computer, with the RTL driver, and with the WINUSB API. **If you remove the dongle and plug it into another USB port on your computer, you will have to repeat the process below.**

After you have plugged the SDR dongle into your computer, a Windows popup screen may occur, trying to find and install a driver for the dongle. **Cancel this operation**, and instead run the Zadig application as shown below.

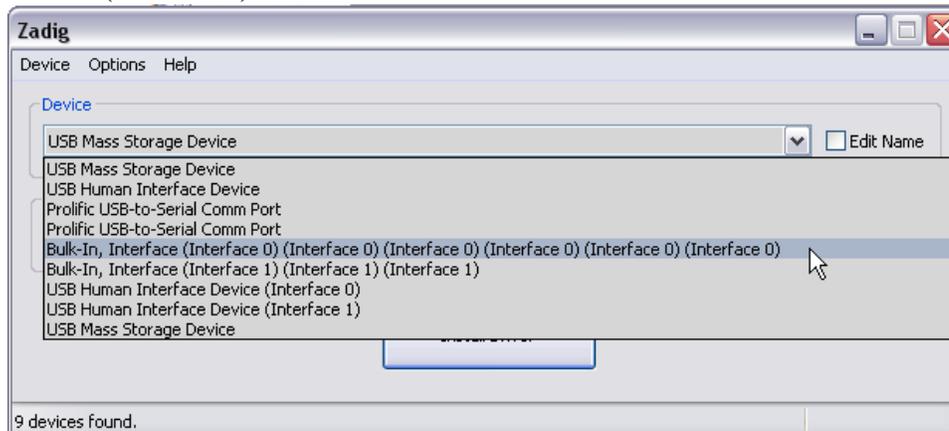
Start the Zadig Application and click on the Options subcommand shown below



After clicking on options, the following pull down list will appear. Choose “List all Devices”

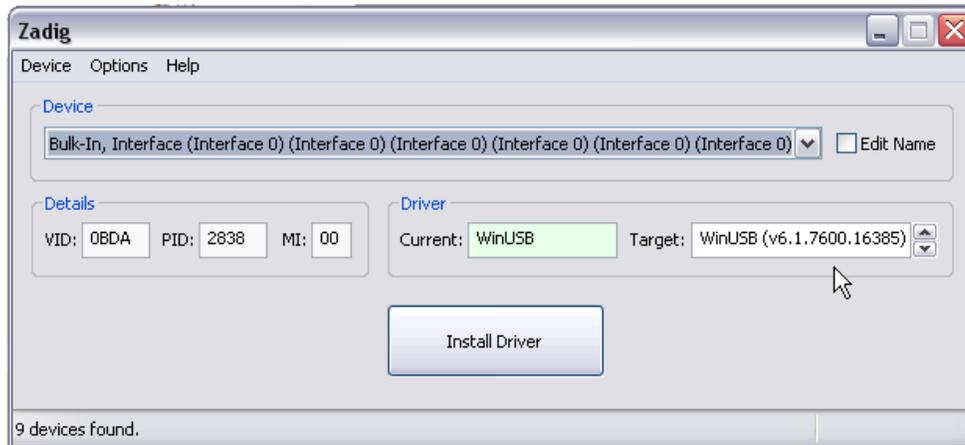


Select “Bulk-In, Interface (Interface0) similar to as shown below.

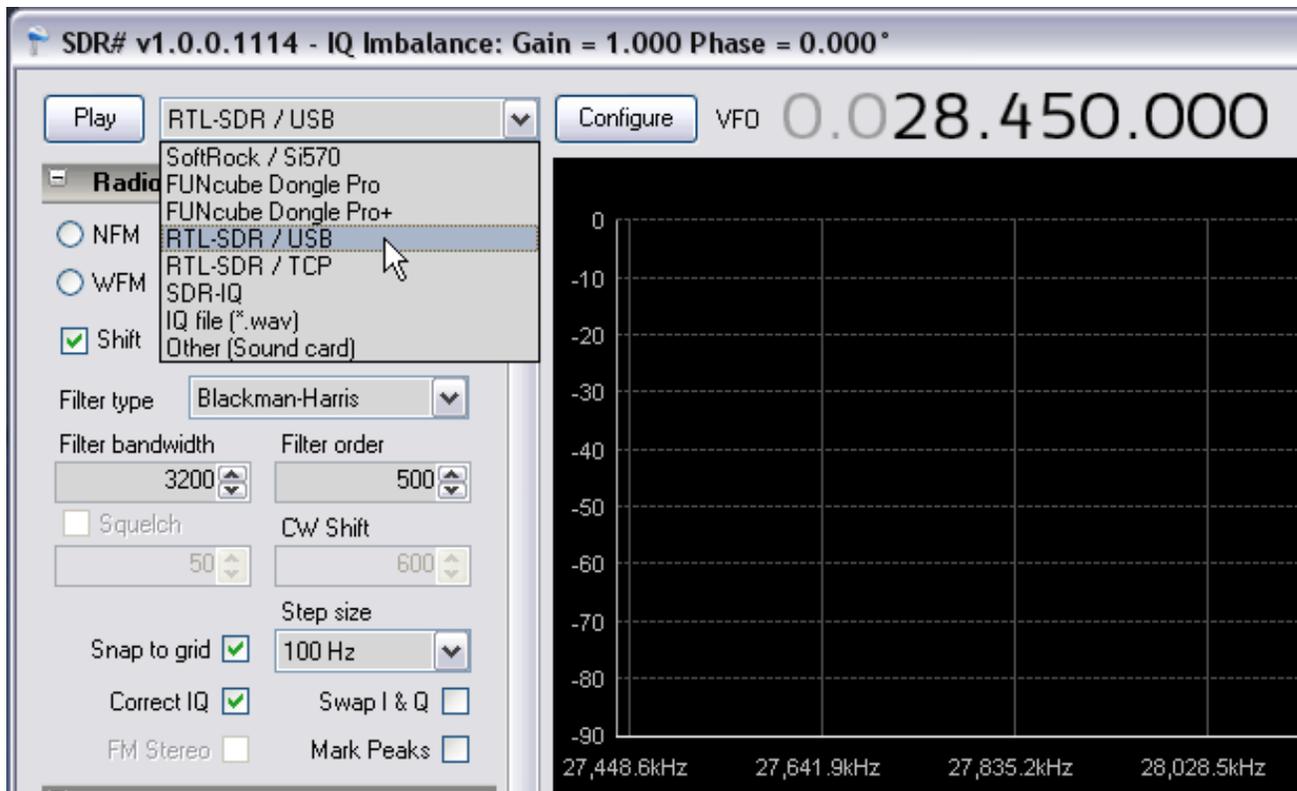


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Make sure the "Target" field contains "WinUSB" and then click on the "Install Driver" button.



After the above Zadig application is complete you should be able to start the SDRSharp.exe application and see the "RTL-SDR / USB" Device in the play list as shown below. Select "RTL-SDR / USB" and then click "Play".



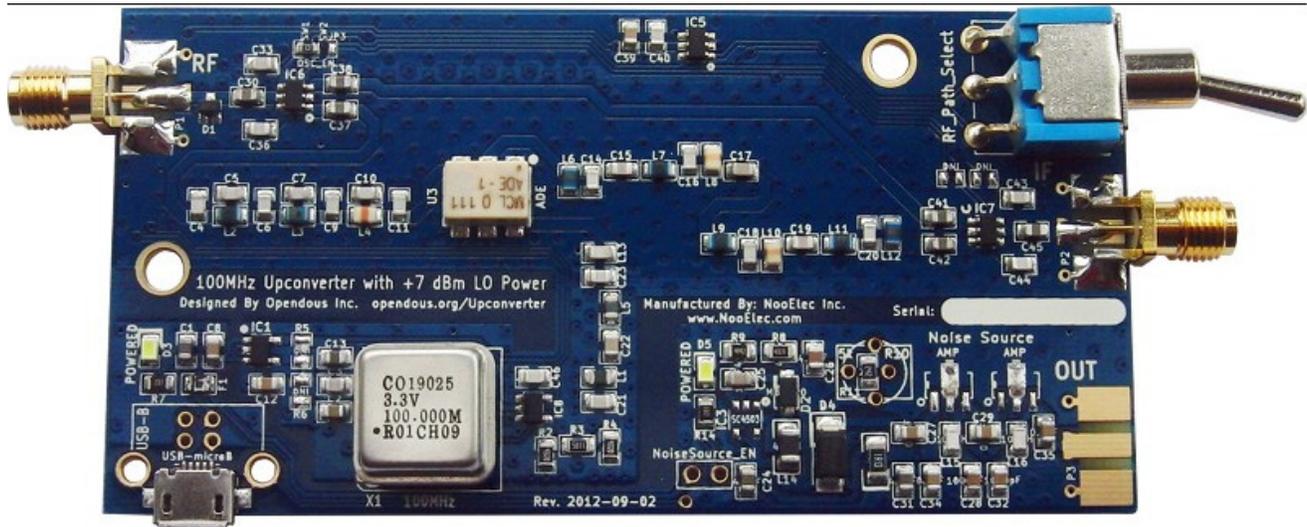
Lastly you will want to click on the "Configure" button to the right and use the slider to set the RF Gain. The SDR sensitivity is very high, especially when combined with the NooElec up converter card shown below.

The amount of RF gain needed will depend on the frequencies being listened to. For example, using the NooElec converter on the HF bands, only about 3db gain is needed on 80M. As you progress up the bands to 10M, I find about 45db gain is needed.

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Source for the NooElec Up Converter:

<http://www.nooelec.com/store/software-defined-radio/ham-it-up-v1-0-rf-upconverter-for-software-defined-radio.html> - .USO_GPK86Jo



More photos of the NooElec converter are available here. <http://code.google.com/p/opendous/wiki/Upconverter>

Source for the TV28T v2 DVB-T USB Stick (R820T) w/ Antenna and Remote Control

<http://www.nooelec.com/store/software-defined-radio/sdr-receivers/tv28tv2.html> - .USO-wPK86Jo

Summary:

It is my hopeful expectation that with detailed knowledge of the install process for the SDRSharp and RTL drivers, you will be able to install and troubleshoot any problems you have with your own installation.

Please join the NCOCRA-SDR group at: <mailto:NCOCRA-SDR-subscribe@yahoogroups.com>

and share your own experience.

As the saying goes, sometime back I couldn't spell SDR. I certainly won't claim to be an "expurt", but I am glad to share with you what I've learned to date and look forward to you sharing your experience.

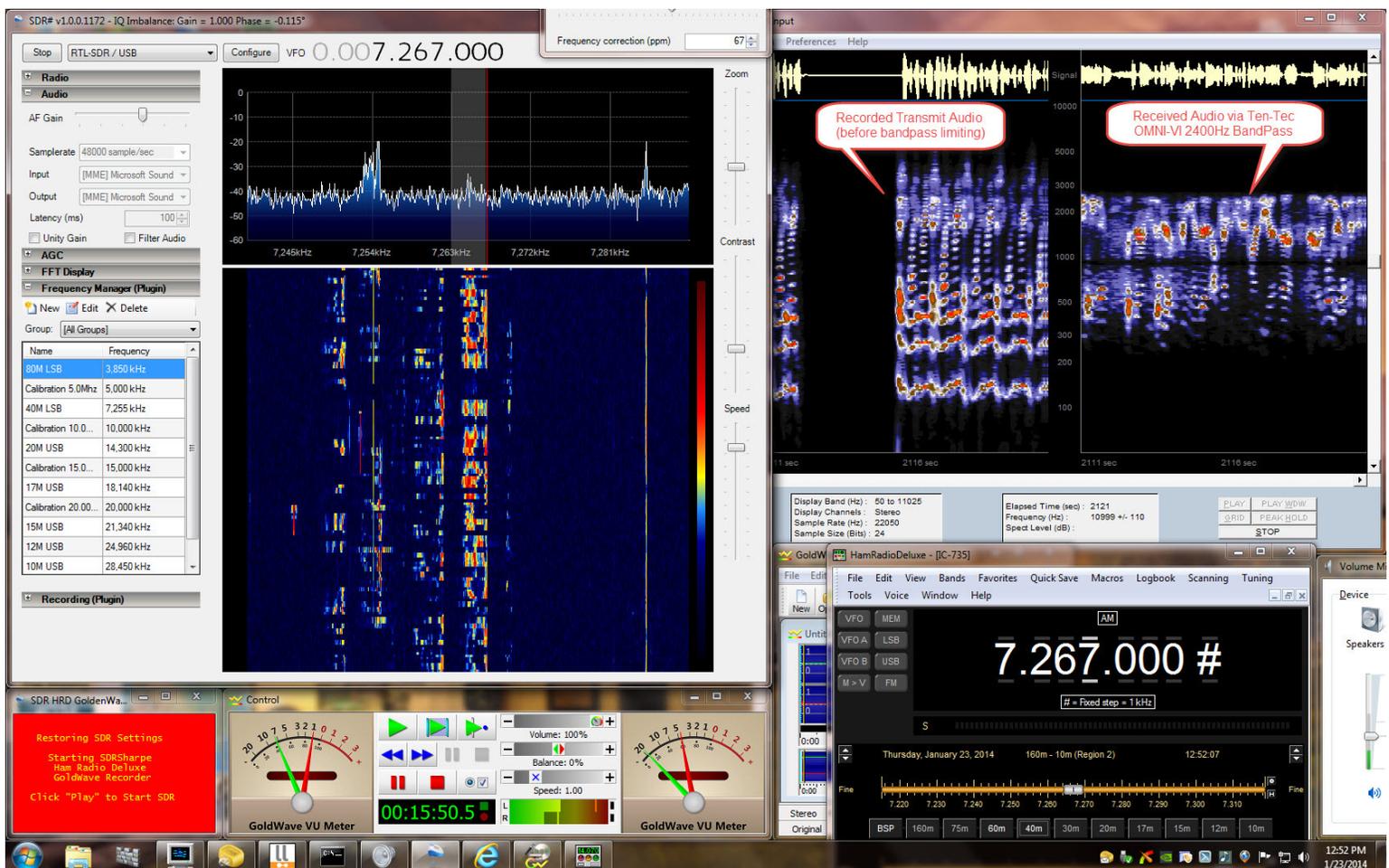
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Screen Shot of Windows Seven 64 bit Desktop with Ham Radio Applications Active

I created an Icon and small .CMD file to start the ham radio related applications. Those are SDRSharpe; Spectrogram 16, an audio spectrum analyzer: GoldenWave Audio Recorder with VOX capability, Ham Radio Deluxe, for controlling my Ten-Tec OMNI VI; and in the background, Internet Explorer with QRZ.COM as the homepage.

Another ham helped me get my transmit audio optimized by recording me over the air and sending me the mp3 file that I could listen to as various microphone equalizer settings were tried. I have since set my computer & audio software up to be able to return the favor. The Spectrogram screen shows both transmit and received audio that will be recorded by the GoldenWave VOX Recorder Software. I can also record audio from the SDR application with a much wider receive bandpass set (typically 5000Hz) to see if there is audio (and wasted RF energy) being transmitted outside of the typical receiver audio pass band. An outboard switch allows every thing described here to be used on VHF/UHF or HF.

These applications have also been of great value when the repeaters I maintain were suspected of having a technical problem, or in the few cases we've had a misbehaving operator warranting attention.

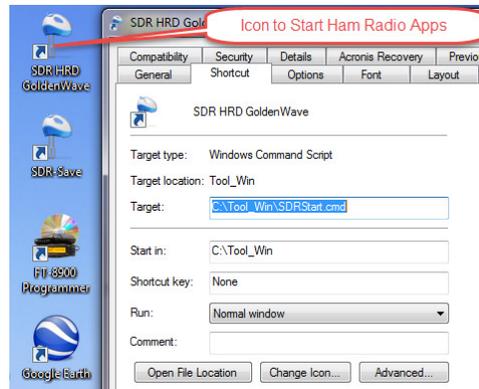


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To make it easier to start and close my ham radio applications by simply clicking on one Desktop Icon, I use the command file shown below.

Consistent size, location, and layering of the application windows is done by a neat little application called **Actual Window Guard** available here. <http://www.actualtools.com/windowguard/>

Icon to Start Favorite Ham Radio Applications



Command File that starts and closes Ham Radio Applications

```
1 @echo off
2 REM: To Ensure Clean Startup, Close any prior instances of the following programs
3 c:\windows\system32\taskkill.exe /F /IM SDRSharp.exe
4 c:\windows\system32\taskkill.exe /F /IM GoldWave.exe
5 c:\windows\system32\taskkill.exe /F /IM HamRadioDeluxe.exe
6 c:\windows\system32\taskkill.exe /F /IM iexplore.exe
7 c:\windows\system32\taskkill.exe /IM SndVol.exe
8 REM: Copy Saved SDR Config Files to Ensure Favorite Settings Active on startup
9 copy /Y "C:\SDR\sdr-install\sdr-install\settings\frequencies.XML" "C:\SDR\sdr-install\sdr-install\sdrsharp\frequencies.XML"
10 copy /Y "C:\SDR\sdr-install\sdr-install\settings\SDRSharp.exe.Config" "C:\SDR\sdr-install\sdr-install\sdrsharp\SDRSharp.exe.Config.XML"
11 cls
12 @Echo:
13 @Echo:
14 Echo Restoring SDR Settings
15 @Echo:
16 Echo Starting SDRSharpe
17 Echo Ham Radio Deluxe
18 Echo GoldWave Recorder
19 @Echo:
20 Echo Click "Play" to Start SDR
21 @Echo:
22 REM: Start Applications in Desired Order
23 start c:\Tool_Lnk\SndVol.LNK
24 start C:\Tool_Lnk\SDRSharp.LNK
25 c:\tool_win\doze.exe 8 > NUL
26 start C:\Tool_Lnk\IE-QRZ.LNK
27 start C:\Tool_Lnk\GoldWave.LNK
28 c:\tool_win\doze.exe 3 > NUL
29 start /WAIT C:\Tool_Lnk\HRD.LNK
30 REM: When Ham Radio Deluxe Closed, Force close all other applications
31 c:\windows\system32\taskkill.exe /IM SDRSharp.exe
32 c:\windows\system32\taskkill.exe /IM GoldWave.exe
33 c:\windows\system32\taskkill.exe /F /IM iexplore.exe
34
```