

Modulation – Demodulation Software Radio

MDSR –LIF Overview Document

MDSR V3.1

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MDSR/DADP Support and discussion Group:
<http://groups.yahoo.com/group/mdsr/>

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How to configure and use the LIF – MDSR V3.1

Introduction:

This document brings all the resources and existing documents to the attention of the radio amateur who is interested in adding an IF sound card interface to an existing transceiver. All the documentation will be stored at the <http://users.skynet.be/myspace/mdsr> website for retrieval and easy access; in the download section. All documents that are available are in PDF format and can be freely distributed and posted on the Internet.

This document also includes the instructions on how to set up the MDSR, and how to use **FL-digi**, **Dream** and **VLAN** in conjunction with the MDSR software.

This allows the demodulation of a vast variety of digital modulation protocols including DRM.

Building the LIF Kit

The LIF-2016 is the SMD version of the LI-2014 and both units have identical in and outputs. The only thing that is different is the size. The LIF-2016 can also be ordered for 450kHz IF. The LIF-2016 does not work with the up-converter BiLIF-2011. All listed models of radios are supported.

Use this document: "**Installation Manual LIF-2016.pdf**"

The LIF-2014 is the through hole version of the LIF-2016 and can be purchased as a kit. The document that describes the process is "**Digital Demodulation Project V2-43.pdf**"

last updated on *Dec 22, 2016*.

Revision details: In this update some part values were changed to provide better filtering for lower noise level. The supply voltage was changed to from 5V to 8V. Both these changes were recommended by John Sisler (KJ6ZL).

Updating the previous kits to V2.43: Kits that have been purchased before this revision can be updated to the latest version. Instructions on how to perform an upgrade can be found in the "**Upgrade Instructions for LIF201x.pdf**" document.

The LIF down converter can also be used on transceivers with a 9 MHz IF. The document "**Digital Demodulation Project V2-42 9MHz.pdf**" describes how the LIF has to be built to be able to handle the 9 MHz IF. This document also incorporates a modified parts list.

Installing a LIF port into the transceiver

The list of transceivers that are capable of supporting the LIF – MDSR interface is growing. Lots of work has been done by the HAM community and it is documented on the MDSRadio Yahoo user group (<http://groups.yahoo.com/group/mdsradio/>). 8 radios have been modified and documented by the MDSR Team.

- **Installing a LIF port in the IC703.pdf**
- **Installing a LIF port in the IC7000.pdf**
- **Installing a LIF port the FT857 - 897.pdf**
- **Installing a LIF port in the FT817.pdf**
- **12kHz port output Kenwood TS-2000.pdf**
- **Installing LIF port in a Yaesu FT-950 .pdf**

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- [Installing LIF port in a IC-756.pdf](#)

Receivers

- [Installing LIF port in a Panasonic RF4900/RF4800.pdf](#)

Available in our [support group](#) only: IC-7100, IC-735, IC-746, IC-706, FT-736, TS-850 and more.

Connecting the LIF Port to the Computer

The 12 kHz LIF output is directly connected to the “left” line input of the sound card. If there is no line input, the mic. input can be used. Set the amplification setting in “Audio Settings” to -20dB to avoid overdriving the MDSR in this case.

Note: The line input channel can be set to the “right” input channel in the “Audio Settings” window. For LIF – RX operation, both line inputs can be connected.

How to install the MDSR on a Windows Computer

Introduction

Setting up the MDSR software on the computer is easy and automated and in most cases the MDSR-SA and the MDSR demodulator will work almost immediately after installation. Setting up the baseband audio devices is a bit more complicated because there are so many different sound devices out there and every manufacturer has a different driver.

Please read the following discussion about the setup of the sound devices to help with the right configuration of computer system to get the most out of the MDSR.

Important: Turn “System Sounds” to off during the use of the MDSR software.

Setting up the Sound Devices for MDSR

For RX the MDSR will work with almost any full duplex sound-card, but in order to meet the FCC requirement of -32dB spurious emissions for TX operation a high grade sound card is needed. The sound card that was tested and will meet the requirements is the M-Audio Audiophile M2496, M-Audio Delta44 and Realtek ASUS integrated motherboard sound device. The RCA input and output connectors on the M2496 card provide excellent ground and RF rejection. This audio card also provides 24bit input - output resolution and low lag times (latency) for RX and TX. A baseband audio mixer output is part of the default setup.

The ASUS Xonar Essence PCI-e and the Xonar U7 USB have also been tested with excellent results. These audio devices do not provide a workable audio bus, so it is required to jumper the audio cards together by the use of short audio cables.

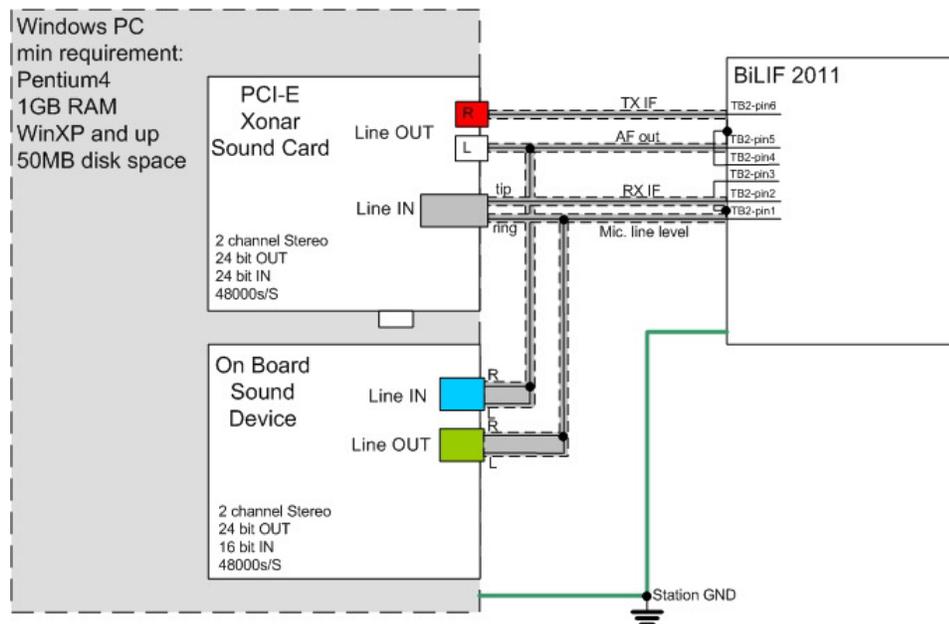
Separating IF and Baseband Audio System

Not all sound cards have a mixed audio output like the M-Audio card or the ASUS RealTek on-board device, which other applications can share. In this case another separate soundcard can be used for base band applications (fldigi, WSPR, VLAN, JT65 a. o.). The MDSR audio output can be fed into the line input of the second audio card and the line output of the baseband card can be fed to the modulation (mic. line level) input of the MDSR input card.

By wiring up two soundcards as shown below the IF and the baseband is handled by individual sound devices. This has the advantage that the setup for the additional allocations like WSPR and JT-65 software becomes very simple. Just the way the software developers are envisioning they will be set up. The audio input settings are set to the baseband audio device. This strategy has to be used for the ASUS XONAR PCI-E card as well, because the drivers does not work properly when the “Stereo Mix” bus is used.

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This is the wiring setup that will be used for the BiLIF setup. It is a bit more work to create the audio connection cable between the BiLIF and the two soundcards in the computer, but the setup of the software is simpler and robust.



Note: It is highly recommended that the ASUS XONAR PCI-E sound card be used for LIF and later BiLIF operations. This card provides full 24bit input and output resolution and provides superb RX audio quality.

Testing also has been completed on the 24bit out – 16bit in, RealTek audio device that can be found on ASUS and other motherboards for RX-TX operation. The RealTek device passed the FCC spurious emission test and the 16bit line in ADC is adequate for RX.

Note: Some soundcards create a “division by 0” error when the IF level is below a certain threshold and an annoying system ping can be heard. In this case turn off the “System Sound” in the audio control panel and the ping will be muted.

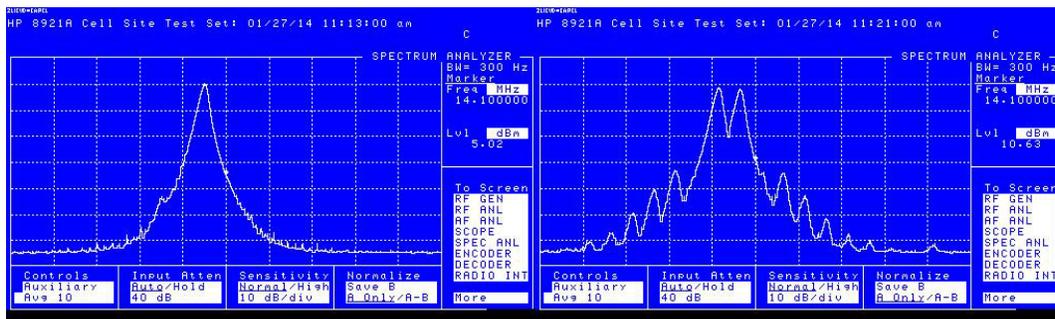
Realtek Audio cards allow the setup of a “Stereo Mix” input that can be shared among different programs. The input can be set to listen to the demodulation output of the MDSR (speaker out) and then provide the baseband audio for all the additional software (fldigi, WSPR, JT65, VLAN). The audio input (capture) device for all baseband programs is “Stereo Mix”. All other devices such as the MDSR-SA and the DRM demodulator which need IF audio, the input will be “Line In”.

Note: The sound card has to be set up as a standard stereo sound device in Windows. All audio enhancements and effects have to be disabled.

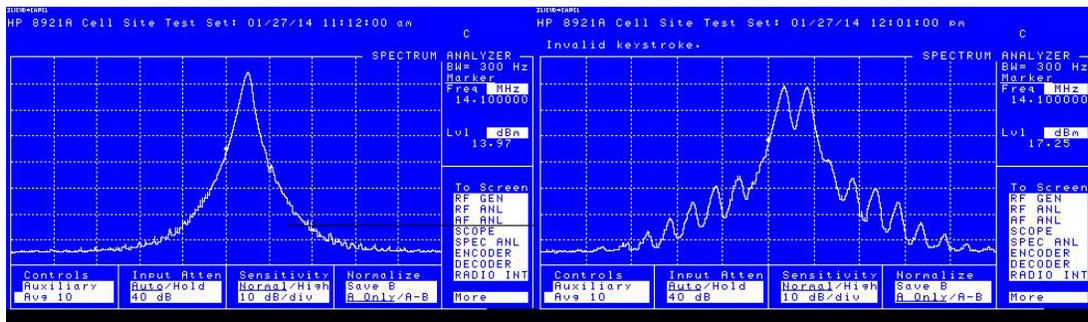
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Spectral purity and IMD plots for the MDSR, BiLIF and Transmitter

The output spectrum from a transmitter connected to the MDSR shows the clean and superior performance of the digital filters employed by the MDSR system. The 1kHz LSB modulation (left) has absolutely no unwanted side band. The IMD products (right) are within specs of the FFC requirement.



Another advantage of the digital filters is that both sides (USB, LSB) are completely symmetric. This performance was achieved with an onboard ASUS sound chip made by Realtek. This sound interface provides 24 bit output and only 16bit input resolution.



20MHz span (2kHz/div), 10dB increments

Conclusion:

All the data is indicating that today's sound adaptors have very high level of performance. Not only are they very cost effective, but also very well suited for the use as a DAC/ADC in IF-SDR systems, just as the provided spectral plots confirm.

The standard sound card has an input limit of 16bit. This is still very acceptable for most applications, but the additional dynamic range of a 24bit input ADC will yield even better performance. The now discontinued M-Audio cards (M44, M2496) were extremely impressive.

At the moment we are testing the ASUS Xonar Essence STX PCI-E1 and we will post the results on the Yahoo user group.

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Use the following installation program and follow instructions.

[MDSR-Win32-SetupV3-1.exe](#) to upgrade the MDSR from a lower version to V3.0

[MDSR-Win32-SetupV3-1-Full.exe](#) for a new installation

This setup includes all documentation files in pdf format.

The file can be obtained by clicking the above links or from the MDSRadio website at:

<http://users.skynet.be/myspace/mdsr>

At the end of the installation program, the Java run-time environment has to be installed if it is not already present on the computer. The installation program automates this process but depending on the OS might fail. If the RTE process fails it can be downloaded separately from Java.com.

Installing on Win10, Win8, Win7 and Vista

The MDSR software will run on these operating systems using the Java Run Time environment as long as the operating system specific Java RTE 64 bit version or 32bit is installed on the computer. The new Synth engine for audio processing does not depend on Windows anymore and can therefore run on any OS with the RTE installed.

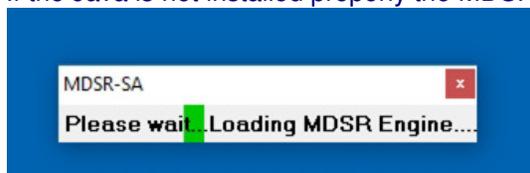
Note: only the MDSR is 100% Java, OmniRIG and MDSR-SA still require Windows.

Trouble Shooting the Installation Process

Depending on your system setup and OS the installation process can fail. In this case all the needed applications can be installed manually.

Missing Java RTE

If the Java is not installed properly the MDSR graphic user interface will not launch. When the MDSR-SA starts up it also will start the java MDSR. The process starts with a launch bar graph similar to the one on the left. Depending on the speed of the computer this will take about 30s. If the application does not start and only the bar graph is visible Java was not installed properly. To install Java go to C:\MDSR\Apps and double click on the JavaSetup executable and complete the process. Once Java is installed the MDSR should start with the MDSR-SA properly.



Other Java Errors:

In a few cases of the MDSR installations we had an error that was not allowing the MDSR software to write any information to the hard drive. This has the symptoms that the MDSR always starts up with the default settings or the upgrade message keeps on repeating.

The cause is not exactly defined but some user reported to have two Java RTE running in the background. Make sure to remove all the Java RTEs from the computer using the uninstall process and then reinstall the latest Java from the Java.com.

Support Applications

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In the \\MDSR\Apps folder are all the applications setup files that are required to run the MDSR software.

- 1.) Dream Setup for DRM demodulation V1. It can be upgraded to V2 but V2 is not a free.
- 2.) Java Setup - as discussed previously. If Java is already on the computer skip the installation by un-checking the Java install during setup procedure
- 3.) OmniRig Setup is required for the CAT control and needs to be installed
- 4.) Setup fldigi is required for ASCII demodulation. This application is launched when the ASCII button is pressed. If the application is missing or the path has changed pressing the ASCII button will bring up an error message and then provide a file browser to locate the application (usually found in the C:\Program Files (x86) folder). Once it is selected press the "open" button and a ASCII.pth file is created that contains the path to fldigi.exe.

To confirm that it works press USB first and then ASCII button which will now launch the application.

- 5.) vlc 2.0.6 win32 will install the VLC audio and video player. It is used by the MDSR for remote audio connections via the internet during remote desktop operation. Do not upgrade it, because only this specific version works for the auto streaming setup command issued by the MDSR remote function.

If you upgraded you have to uninstall the newer version and reinstall this one.

Other Operating Systems with Java RTE

The MDSR can run on any OS with Java RTE installed. The MDSR software will run (modulate – demodulate) without the CAT interface provided by OmniRIG and without the spectrum analyzer. This is still experimental and if you are interested in testing the MDSR on different OSs, please contact the MDSR group for further discussions.

How to Configure the MDSR with the LIF Interface

Introduction

The MDSR software has many features, and can be configured in many different ways. Here is an overall discussion of how RX part of the MDSR can be set up for best performance and usability.

At this point the LIF kit has to be built and the LIF port is connected to the IF input of the LIF2012 kit. The 12kHz output is connected to the line input of the sound card and the MDSR software installed and running. The IF spectrum is displayed on the MDSR spectrum analyzer. The CAT interface is connected to the computer; after pressing "Start", the frequency display matches the readout on the radio.

Note: If there is no red dotted line click on the "wrench" icon, select "Spectrum Mode" and checkmark "Full Spectrum".

Note: The color scheme on the SA can be changed. Check the SA manual.

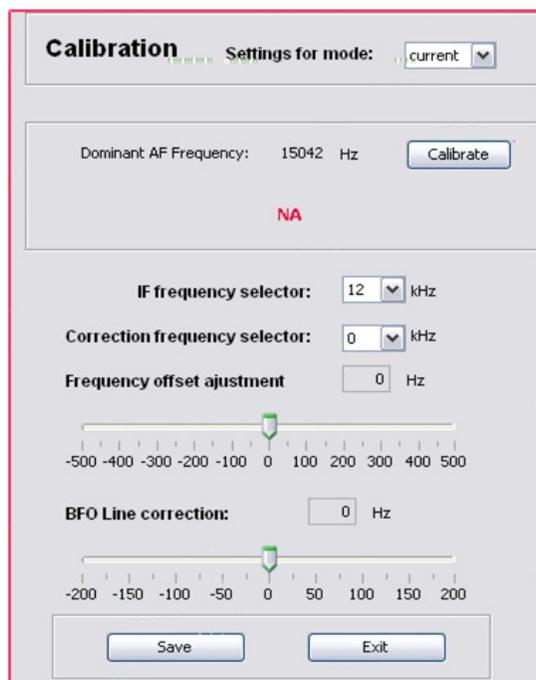
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After tuning in a local AM station the SA (spectrum analyzer) will display the following spectrum as seen above. The audio in the speaker will be crackling or there will just be noise.

Calibration of the BFO

Open the calibration window from the MDSR user interface. Go to “Setup” and then select “Calibration”. Now the following screen should be visible.



This shows that the calibration is currently set for “current” mode. This is the mode used for all operations except if the auto setup is set to “Lock to TXCR”. In this process all modes will be calibrated. It is important that the carrier frequency of the broadcast station be accurately known. The frequency display on the transceiver has to match the frequency of the broadcast signal.

Note: some transceivers change frequency when the mode is changed; always return the frequency back to the RX frequency.

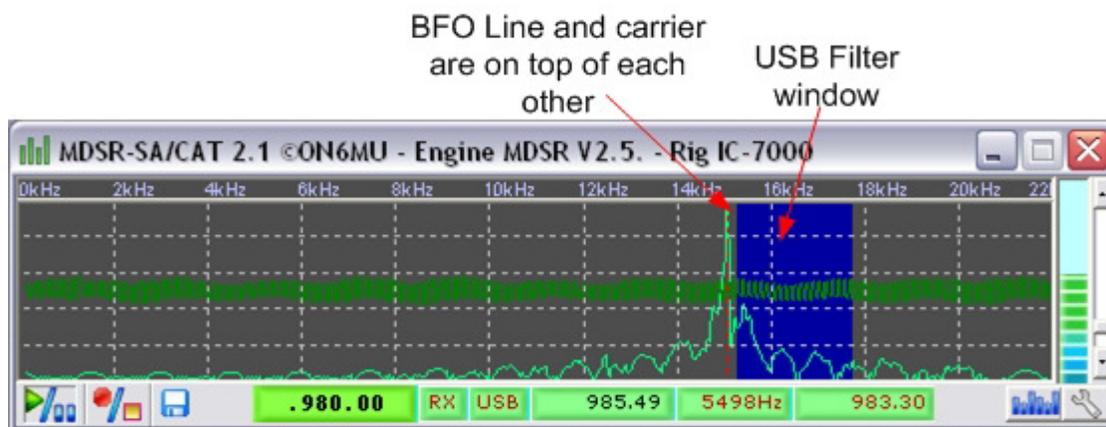
- Press the “Calibrate” button. Now the dominant frequency will be detected and the BFO will be set up automatically for “current” mode.

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Now the BFO line moved close to the carrier

- Fine-tune the BFO line position – right on top of the carrier – with the “BFO Line Correction” slider (set to 0 beat). Press “Save” and exit the calibration window.
- In the main window, press the “USB” button. The radio broadcast should be heard clearly in the computer speaker or headset. In the event that the audio is distorted and excessively loud, the input gain can be reduced in the “Audio Settings”.



To set the individual modes for “Lock to TXCR” operation, set the MDSR “Auto Setup” to “Lock to TXCR” and open the “Calibration” window again. In “Settings for Mode” select one mode at a time and repeat the previous procedure.

Note: As the different modes in the MDSR are selected the transceiver changes modes with the MDSR. They are locked together.

Note: “Lock to TXCR” can not be used with the BiLIF (RX-TX) setup and the transceiver has to stay in one mode at all times. Modes are only switched in the MDSR software.

Calibration of the LIF Filter Passband

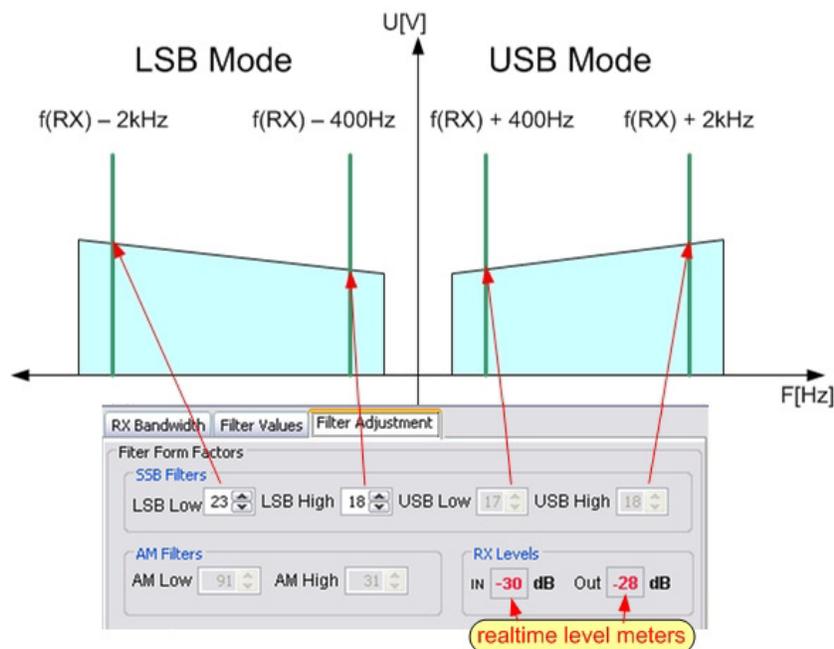
Introduction

The calibration of the LIF filter passband ensures that the USB mode and the LSB mode are exactly the same and have a flat response for most accurate reproduction of the received signal. To make this process easy, ‘in-put’ and ‘output’ level meters have been added to the “RX-Parameter” window.

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Filter Form Factors: The Filter Form Factor adjusts the filter slope gain; this affects how the RX audio sounds. The most accurate representation of the received audio is achieved if the filter is adjusted for a flat response through the audio range 300 -2400Hz.

Each voice mode has its own selection which allows the filters to be adjusted separately, and can be tailored to the IF output of each transceiver specifically. The goal is to have USB and LSB sound exactly the same.



The filter slope settings are changed in real time on the filter, and any change will affect the audio quality of the RX audio.

Adjustment Procedure (carrier method):

A steady signal source is needed to adjust the filters. In case an RF signal generator is unavailable a local AM station carrier can also be used or a 2nd transceiver transmitting into a dummy load at lowest power level.264

- Insert a S9 RF carrier (approx. -60dBm) into the receiver, (or a stable AM station)
- Set the MDSR to LSB mode, tune to zero beat – carrier is aligned with the BFO line.
- Open the RX Parameters by pressing the “RX Control” button - tab to “Filter Adjustment”.
- Set the P1 pot on the LIF2012 PCB to display a -10db signal on “IN” level meter.
- Tune the receiver so that the carrier is -2kHz from the BFO line
- Adjust “LSB Low” (values 200 – 800) until the “OUT” level meter displays -10dB.
- Tune the receiver so that the carrier is -400Hz from the BFO line
- Adjust “LSB High” (values 200 – 800) until the “OUT” level meter displays -10dB.
- Repeat several times.
- Press the “Save” button in the RX-Parameter window to store the settings.
- Set the MDSR to USB mode by pressing the “USB” button in the main window.
- Tune the receiver so that the carrier is +400Hz from the BFO line
- Adjust “USB Low” (values 200 – 800) until the “OUT” level meter displays -10dB.
- Tune the receiver so that the carrier is +2kHz from the BFO line
- Adjust “USB High” (values 200 – 800) until the “OUT” level meter displays -10dB.
- Repeat several times.

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- Press the “Save” button in the RX-Parameter window to store the settings.
- click on the “Disk” Icon on the SA, go to the “Profile Manager” and create a backup of all the settings

If the filter settings are done correctly, the USB and LSB modes will sound exactly the same while receiving an AM station.

Note: If a -10dB level can not be achieved or is too loud repeat the calibration procedure with a -20db level. Important is to make the two sidebands as close in volume as possible. Also check the input IF gain level by pressing F5 if the filters do not show the proper level within the appropriate filter values.

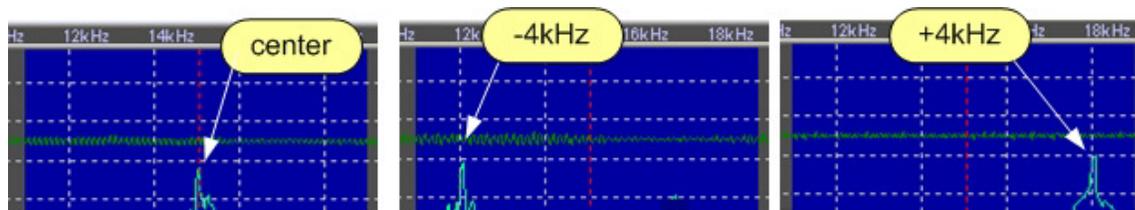
Caution: The filter values have to be in the 200 to 800 range. Settings below 200 will have a negative impact on the filter selectivity.

Calibration of the LIF Filter Passband for AM

Introduction

The AM demodulator used in the MDSR is a synchronous AM detector. Instead of using the BFO to demodulate the IF the incoming IF is amplified and then limited to create a synchronous carrier that feeds the mixer input. In the event that the signal is too weak and a synchronous carrier cannot be generated, the modulator switches on the BFO for DSB reception.

The MDSR has a separate filter setting for the AM reception and the sync. threshold has to be calibrated.



Calibration Procedure:

- set the MDSR to AM and tune in a non fading AM station (peak at center)
- Open the RX Parameters by pressing the “RX Control” button - tab to “Filter Adjustment”.
- Set the input of the receiver to display a -30db signal level on “IN” level meter.
- move the carrier off by -4kHz and then adjust AM Low up or down until the AM Sync indicator flashes (if the setting is too high it will go off and if it is too low it will stay on)
- move the carrier off by +4kHz and then adjust AM High up or down until the AM Sync indicator flashes (if the setting is too high it will go off and if it is too low it will stay on)
- click on the “Disk” Icon of the SA, go to the “Profile Manager” and create a backup of all the settings

Using Dream to demodulate DRM mode

Introduction

The Dream V1.5 DRM demodulator is included since the MDSR-Win32-SetupV2-51.exe and is also in the [MDSR-Win32-SetupV3.0-Full.exe](#) setup file. Clicking on the DRM button will launch the Dream application and if there is a DRM signal available it will decode it and broadcast through the soundcard speakers.

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Note: This version of DRM crashes on exit, but otherwise is perfectly functional. It can be upgraded to a newer version if so desired. Unfortunately there is a license requirement from DRM for the upgrade.

Setup:

The soundcard input and output for the Dream software should be at all default settings.

Evaluation Dialog:

In the evaluation dialog, the connection quality and the status of the decoding process can be observed.

Note: To decode a DRM signal, the signal strength needs to be high and the S/N ratio has to be at least above 12dB

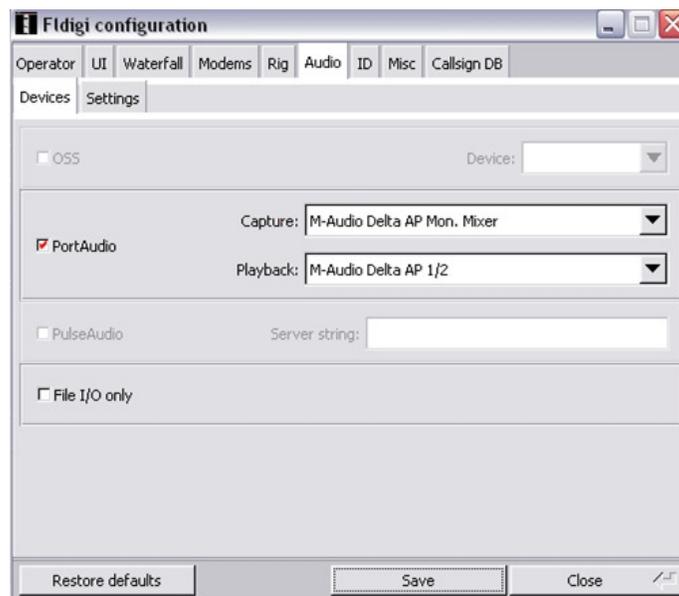
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Using fldigi to demodulate digital modes

Introduction

Fldigi is probably one of the most versatile shareware programs for the demodulation and modulation of all types of digital transmissions, including the decoding of CW. Depending on the sound-card that is used, the setup of **fldigi** is simple.

Once it is installed, click on “Configure”, select “Sound Card” and then select the “Audio” tab. Under devices check “Audio Port”. In the Capture field select the output of the sound card you are using. If you use a M-Audio 2496 the configuration window will look like the one below.



Once the right audio channel has been selected the waterfall display will change color, indicating the presence of a signal. Further adjustments to best suit your setup will have to be made in fldigi. Refer to the fldigi help menu for further information.

Note: Some audio cards will require a jumper cable from the audio output to a second sound card's line input. No audio connection cable is needed for the RX MDSR setup.

Using WSPR to receive and update WSPRnet database

Introduction

WSPR (Whisper) is a propagation inspection tool that allows the user to receive and then update the WSPR database with the received signals. This process is commonly referred to as spotting. WSPR software is easy to use and integrated seamlessly into the MDSR setup for either RX or later when the system is upgraded to the BiLiF, for RX-TX operation. The uploaded spotting data can be viewed on the <http://wspnet.org/drupal/wspnet/map> website.

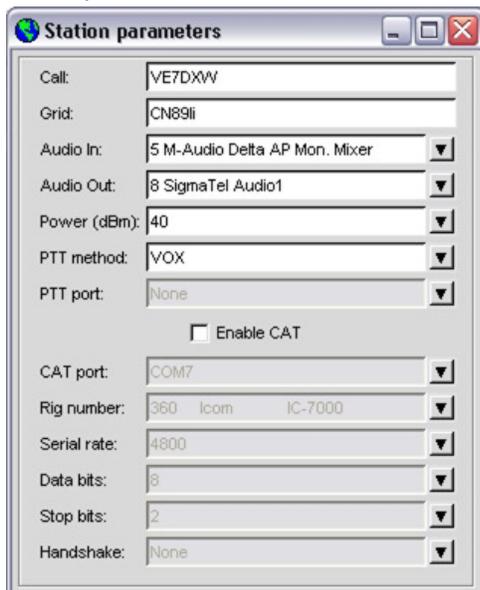
Note: to see your own station, make sure the right band is selected (below map) when viewing the website

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Download the WSPR V2.11 setup from; follow instruction to install program on the computer.
<http://physics.princeton.edu/pulsar/K1JT/wspr.html>

Configuration of WSPR for RX operation

Once the program is installed on the computer, launch it by double clicking the WSPR icon on the desktop. It will start two new windows, a DOS window and a WSPR user interface. Both windows are necessary, the DOS window can be minimized. To open the setup window, as seen on the left, click on “Setup” menu selection and then “Station Parameters F2”.



Call: enter the call sign of your station
Grid: enter the grid square of your location (this can be found on the QRZ webpage by querying your call sign in the “Details” tab.

Audio In: select the audio device that is connected to the LIF interface. If an M-Audio Delta card is used, set as “M-Audio Delta AP Mon. Mixer”.

Audio Out: not required for RX operation

Power (dBm): output power of your RIG, should not exceed 10W. (10W = +40dBm, 5W = +37dBm, 2.5W = +34dBm, 1W = +30dBm, 0.5W = +27dBm)

PTT method: not required for RX – set to VOX

PTT Port: set to none

Enable CAT: not selected, do not use CAT

Note: It is important that all the setting are accurate, because all the data is uploaded to a propagation database for data analysis.

WSPR user interface

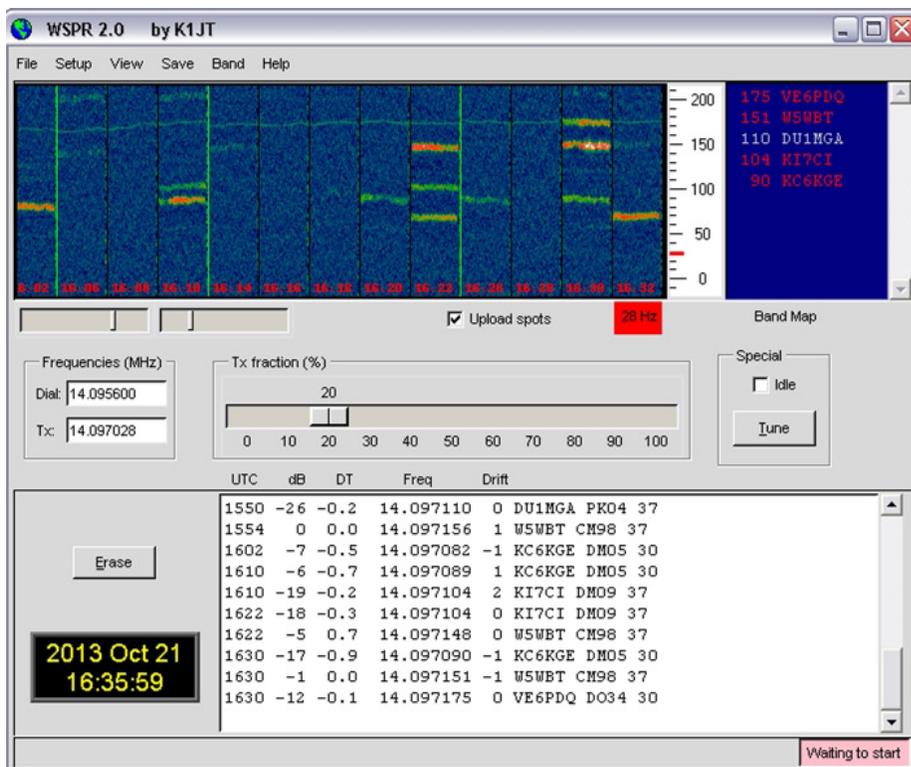
Instructions on how to configure and use WSPR in more detail can be found at:

http://physics.princeton.edu/pulsar/K1JT/WSPR_2.0_User.pdf

- The MDSR has to be running and the MDSR-SA will display incoming signals.
- The WSPR process has a 2 min cycle where data is received or transmitted. The cycles are timed with the computer clock, so it is important that the clock is synced to a time server (see the above manual for more detail).
- Set the TX-Fraction slider to 0% for RX only operation.
- In the menu bar select “Band” and then the band you want to operate in.
- Set the radio manually exactly to the frequency displayed in the “Dial” field
- To start the process, unselect the idle checkmark.
- To upload spots to the WSPR website, including your call sign, checkmark upload spots.
Note: the computer needs to be connected to the Internet for this

Now the WSPR system starts to work It will look something like the window below in about 30min. Do not panic if there is no immediate change. If the waterfall window stays blank, check your selected soundcard in “Setup” – “Station Parameters”.

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Viewing the call sign and the connection on the website

Go to the following website: <http://wspnnet.org/drupal/wspnnet/map>

Zoom in on your location. If everything worked you will see your callsign on the globe.

- Use the slider on the left to zoom in and out
- Use the mouse, displayed as a hand, to move the map.
- When the mouse hovers over a call sign, left clicking, will bring up further details
- To refresh the map click the "Update" button. The map will update automatically every 10 min.
- See all the options and selections on the bottom of the website. If values are changed here, the update button has to be pressed.

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Setting up “jt65-hf-hb9hqx-edition”

Introduction

There are several JT-65 programs out there and 2 of them were tested with the MDSR RX-TX engine with great success. “jt65hf V109” works great, but has a rather rough user interface. The second program is the updated version by HB9HQX and it has much better functionality and some additional features. Both work, but only the “jt65-hf-hb9hqx-edition” is described in this document.

Download the “jt65-hf-hb9hqx-edition” from the web and install the software on the computer.

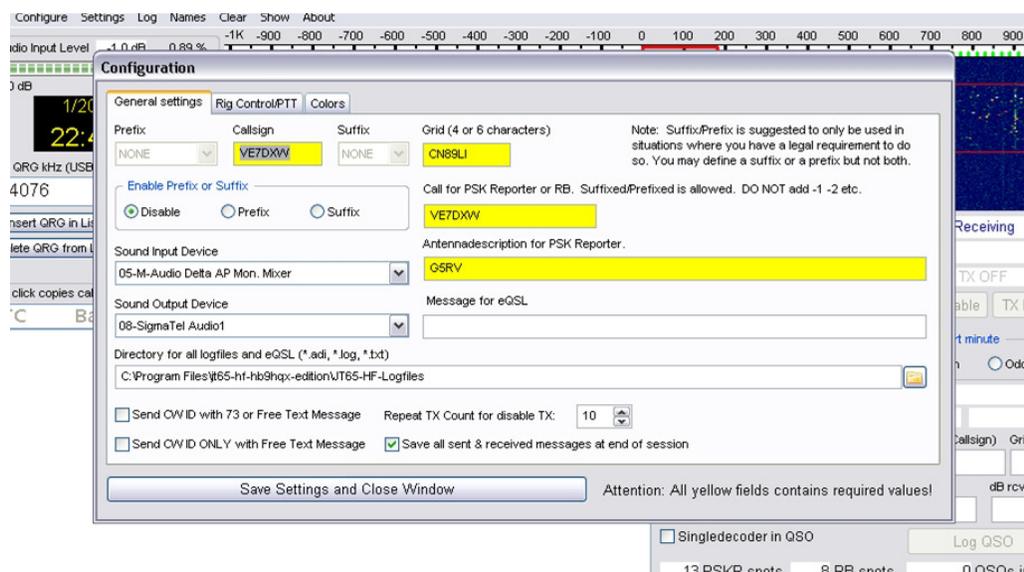
<http://sourceforge.net/projects/jt65hfhb9hqxedi/>

Note: If you are using Vista, Win7 or Win8 install this software in a C:\JT65 folder. This avoids windows security causing write errors to the log files.

After the program installs click on settings and configure the user parameters and the audio input and output (when using an M Audio Delta sound card the setting will look like the one below). The audio output can not be configured on the same sound device as the input for MDSR operation.

IF you are using the MDSR for TX:

A second card (lower quality – 24 or 16bit audio) output is looped via an audio cable into the modulation input (mono – other input is used for the IF) of the soundcard used by MDSR. Do not configure a COM port. PTT is done via the VOX in the MDSR. There is no frequency CAT support for the transceiver from this software unless a port splitting software is used.



Running the JT-65 Software

After the configuration the JT-65 software is ready for operation. Please check the provided documentation which frequencies are used for JT-65. The mode is always USB. The RX and TX cycles take one minute each and operation is quite slow, but all stations use low power and it is surprising how far these signals can be received. Each QSO will take about 3 cycles, where users exchange location, signal strength and a friendly 73. There is also a possibility to send free text, but it is limited to 12 characters for each transmission.

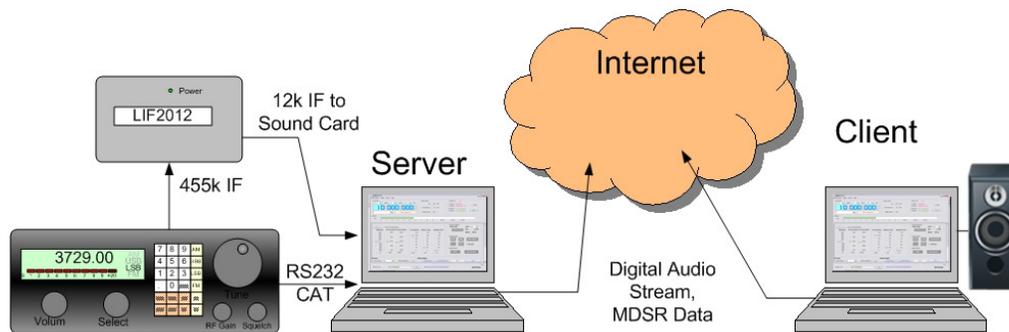
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Setting up MDSR Remote Server and Client

Introduction

The MDSR remote server/client allows two computers running MDSR to be connected together via an Internet connection. The MDSR Server is connected to the transceiver and redirects all the settings from the client, which then updates the radio via CAT control.

Note: The automatic audio connection between V-LAN does not work with Win8 OS and had to be set up manually.



Server setup:

The MDSR setup that directly connects to the transceiver has to be set up as “Server”. Once the server is set up and started it will send a digital audio stream, and it also will listen to the TCP port for a handshake signal. (Note: the handshake is very specific; there is no concern to get viruses via the MDSR network port). After the server is configured and the “Station ID” tab has been filled in press “Save” to permanently store the information on the hard-drive.

The image below shows the server setup of the MDSR test platform, right after the “Remote”

set-up window is opened. All the port settings are default and do not need to be changed, unless there is a device conflict. The displayed IP address is the server’s own address and has to be replicated on the client. (Note: if the IP address shown is a private IP the server is visible only on the local network – if the device needs to be accessed outside of the local network “Port Forwarding” has to be enabled on the router). The delay time can be selected to provide the most stable connection between server and client.

The text area at the bottom shows the network adaptors that are present on this computer and identifies the local host address as 192.168.1.64.

Setup of the VLC audio stream:

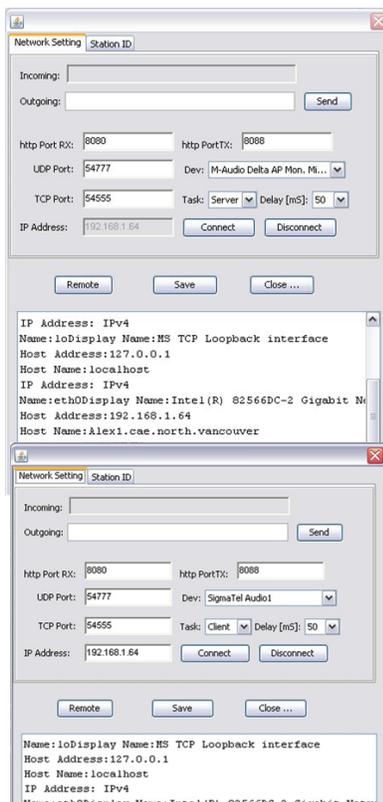
The VLC streamer is setup and starts automatically once the “Connect” button has been pressed. In order for the correct audio channel to be streamed to the “Client”, the “Dev” selector box has to show the audio device that outputs the demodulated audio (on the MDSR test platform, this is: M-Audio Delta Mon, Mixer). Select the correct device from the list by clicking on the down arrow left of the field.

Setup of the MDSR “Client”:

The image on the left shows the “Client” set-up that connects to the above configured “Server”. Except for two fields the setup is identical. The “Dev” setting is different because it uses different hardware and the “Task” is now set to “Client”.

Connection Procedure (Server Side):

Press the “Connect” button on the “Server”. The “Incoming Message” states “Waiting for Connection...” and the VLC Streamer starts. If it works correctly the timer on the left side will increase as time proceeds.



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If the VLC player displays an error select a different audio device.

Connection Procedure (Client Side):

Press the “Connect” button on the “Client”. Now the message changes on the “Server” to “You are connected to the MDSR Client”. The “Client” incoming message changes to “You are connected to the MDSR Server”.

Using Text messaging between “Client” and “Server”:

At this stage it is possible to communicate via text-messaging to the other computer. Type a message into the outgoing text field and press the send button. The message disappears and is sent to the other computer’s “Incoming” field.

Taking control of the “Server” MDSR with the “Client MDSR:

By pressing the remote button on the “Client” the data exchange between the “Server” and “Client” starts. This can be seen in the “Incoming” and “Outgoing” fields as well as in the big text field on the bottom. At the same time the VLC listener will start and connect to the streamer on the server. It will take about 5 to 10s for the audio to be heard over the speaker. If VLC displays a timeout message, this means that the audio streamer on the server has a problem or did not start.

Once the remote connection has been initialized, the “Station ID” area is updated and shows the call sign and the location of the connected station. The “Data” indicator will flash indicating active data exchange between “Server” and “Client”.

Depending on the quality of the network connection there is some lag in the audio coming out of the client. The audio quality is comparable to MP3s streaming mono at 64kB/s.

Note: Once the remote process has commenced, the “Remote” window can be closed without disconnecting the data connection.

Disconnecting the “Client” from the “Server”:

There are multiples ways the connection between the “Server” and the “Client” can be broken.

- Disconnect the “Client” from the “Server” location.
 - Press the “Disconnect” button on the main window
 - Press the “Disconnect “ button on the remote window

Note: In both instances a message is sent to the “Client” and the MDSR on the client will be returned back to the standalone mode. To turn off the “Server” press “Disconnect” again. In order for the “Client” to connect again, the “Server” has to be restarted manually by pressing “Connect”.
- Disconnect the “Client” from the “Client” location.
 - Press the “Disconnect” button on the main window
 - Press the “Disconnect “ button on the remote window

Note: In both instances a message is sent to the “Server” and the MDSR on the client will be restored to the standalone mode. After 10 sec. the “Server” will reset and another “Client” can connect to it.

Attention: Never shut down the “Client” or the “Server” without severing the network connection first. If the network is terminated dirty, the MDSR “Client” is not restored to the stand-alone mode and it will retain the settings of the “Server”.

If this happens restart the “Client”, wait for a few seconds, and shut down the “Client” again. Now the “Client” will start up with the local stand-alone settings. If the settings have not been restored by this point, open the “Profile Manager” and restore the last good profile.

Conclusion

This completes the overview and setup instruction document. We hope you where able to set up the MDSR software and can now enjoy the best RX audio ever received by

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your transceiver. Tell your friends about MDSR and how it improved your RX audio quality.

73

The MDSR development team

To order the PCB kit including all parts or for more information please go to;
<http://users.skynet.be/myspace/mdsr>