MIXW4 - HELP

Versie 1.4.2

Release

version 3117

----- 11 Jan 2022 -----

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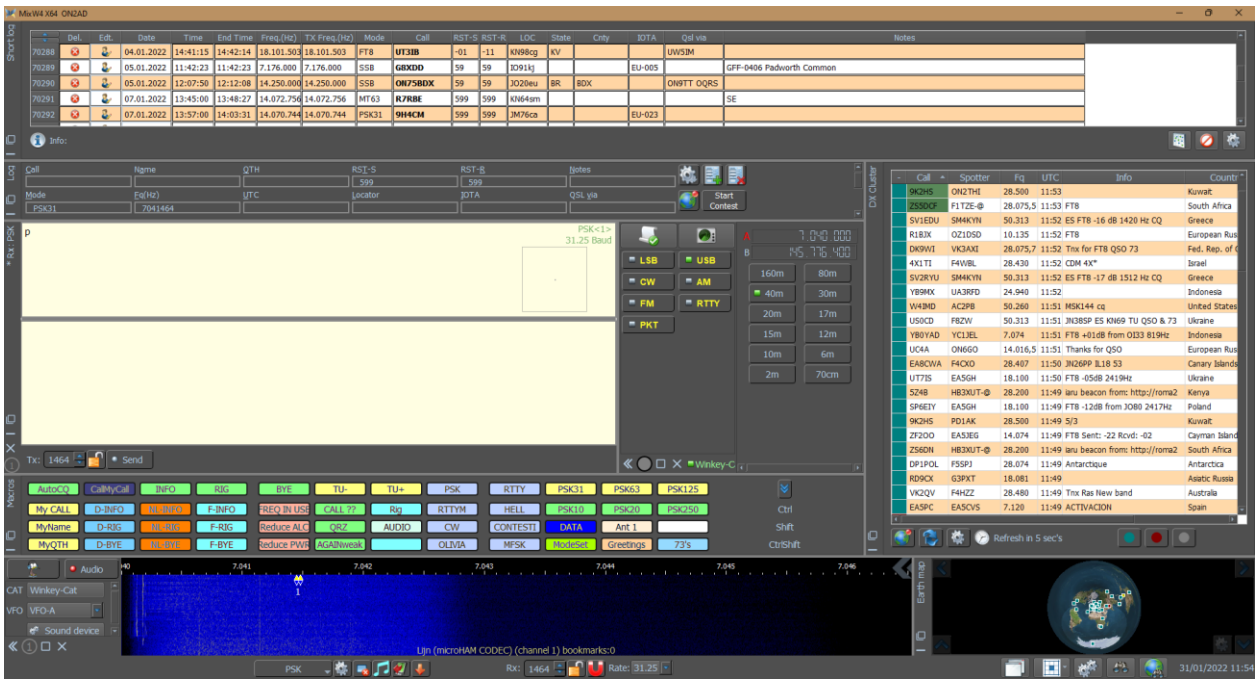
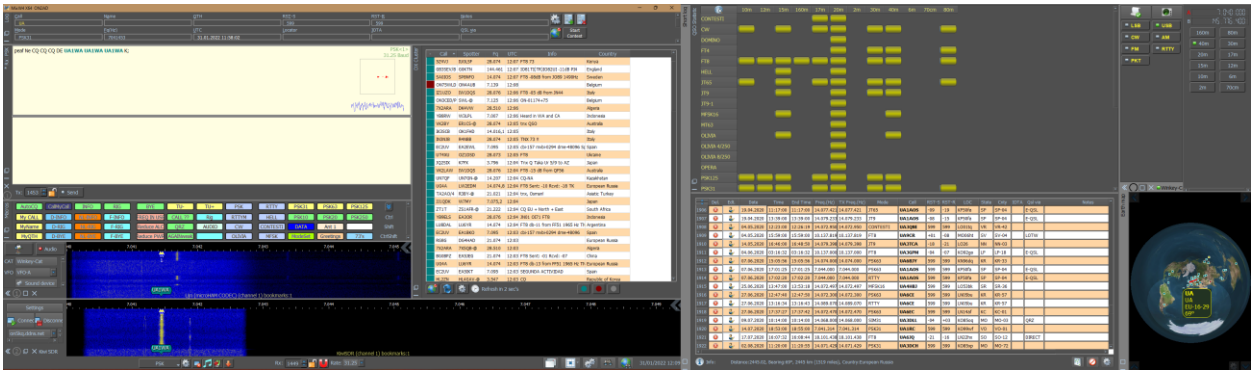
MixW4 on one display

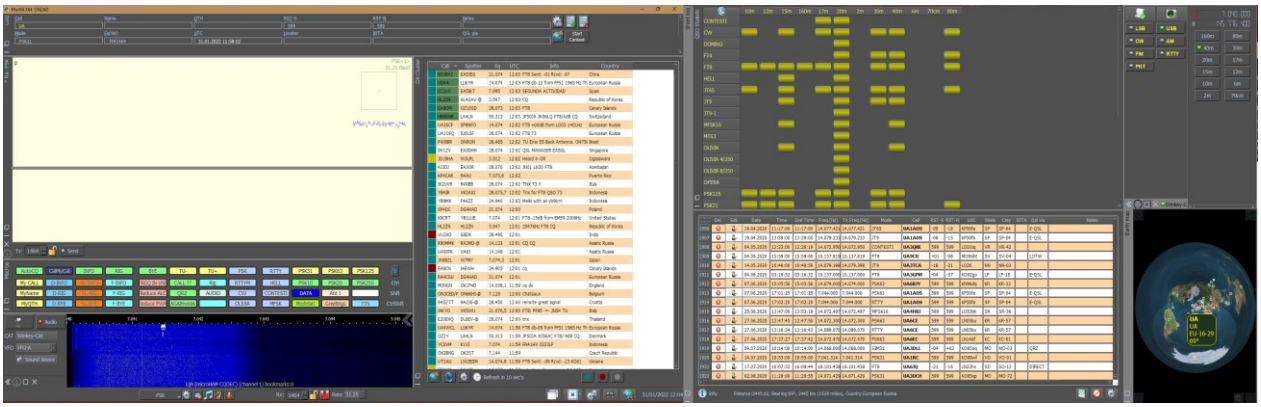


MixW4 on two display's

With KiwiSDR and statistics



Without KiwiSDR and with statistics



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Introduction

MixW stands for a mixture of different modes.

In 1992, Nick Fedoseev (UT2UZ) wrote an MSDos program for RTTY. In 1998 he then wrote a multimode program MixWin, the last version of which was MixW1.45. Denis Nechitailov (UR8US) joined Nick to produce MixW2 in 2002. This included the panoramic spectral screen developed by Skip Teller (KH6TY) used in DigiPan. MixW3 was introduced in 2011 and MixW3.2.105 is the latest version.

In 2016 Rig Expert Ukraine took over the support and development of MixW. Denis is their CEO and Nick acts as a consultant.

MixW4 is the latest development.
It is a cross-platform version of MixW that is intended to run under Windows, Linux, and Mac operating systems.

> Read the manual first before installing the program and before using MixW4

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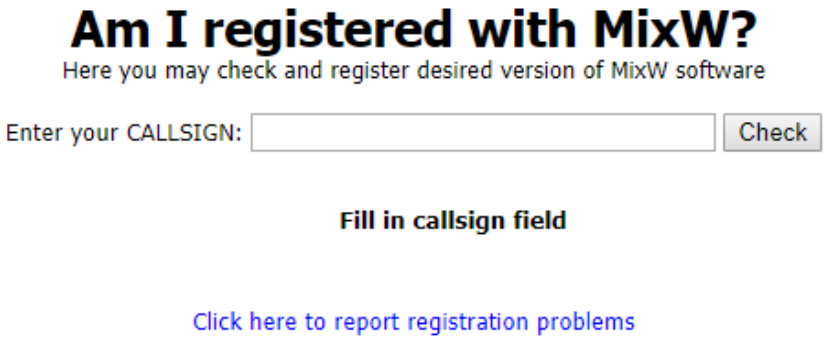
Info MixW and registration

You can use MixW for free for 15 days.
After the free use expires, you must register the program. After the free use expires, all features of the program will remain available.

To optimize your purchase, go to the MixW Personalized Services page, where you enter your call sign to select the best options when purchasing.

Users who are already registered for earlier versions of the program can purchase updates to new versions at a discount.
To check the registration of your call sign, click on the link: MixW check registration page

If you have changed a call sign or want to add your other call sign, send an email to: MixW Team
with an indication of your old call sign for which the registration has been issued or call letters to be added.
Add, replacing the call sign is free.



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System requirements

2 GHz-processor
2 GB RAM
500 MB of free space on the hard drive
Screen resolutions from 1920 × 1200
Windows 7, Windows 8 of Windows 10

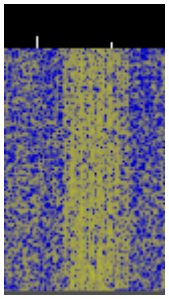
Strange signals and noise.

I use two 23 Inch IPS LED monitors from LG and on some frequencies I see a strange signal in the waterfall and I hear a monotonous noise (sound) in my speakers.

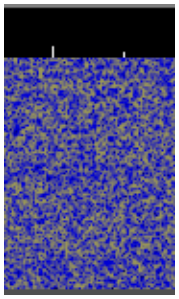
Further investigation tells me that if I turn off the monitors, the noise is gone.

So open the advanced display settings in Windows or open the resolution settings of your graphics card and adjust the refresh rate for 1 or more screens until the interference is gone.

Monitor noise



Noise free



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Program installation

Before you start a replacement installation, make sure you have saved all MixW related files that have changed since the last installation.

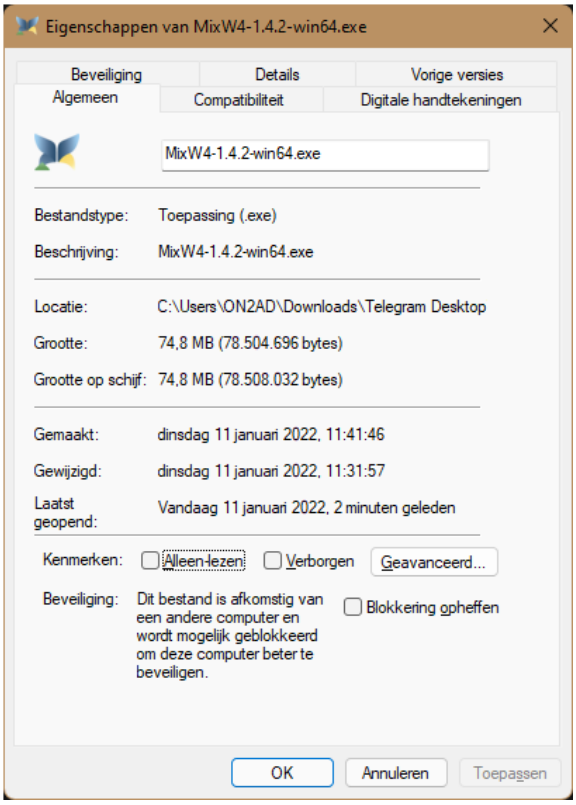
Download or latest MixW4 version file from:
https://rigexpert.com/products/software/mixw-4/downloads/
After these files are downloaded, they must be unblocked
Start the Windows Explorer and find this file in the Download folder

Download version n.n.n. x64 - 64 bit version. (n.n.n. are the version number)
Download version n.n.n. x86 - 32 bit version. (n.n.n. are the version number)

After these files are downloaded, they must be unblocked
Select the file with the right mouse button

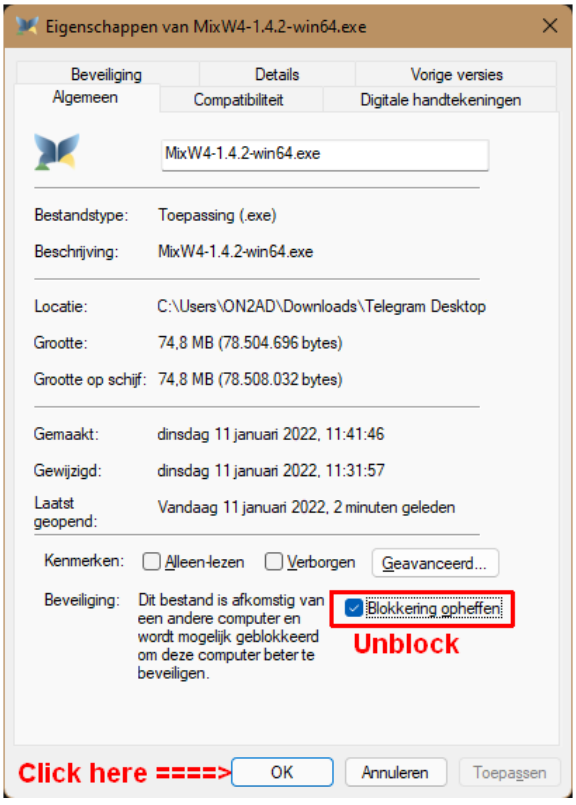
Now with the left mouse button, click Properties

Select properties from the drop-down menu.
If a button marked with Unblock is visible on the General menu, this file is blocked.



Click the Unblock button on the left mouse, and then click OK to unblock the file

Double-click MixW4-1.3.0.exe or higher version.



A blocked file can be identified by opening Windows Explorer, selecting the file, and right-clicking it

Important:
There are two versions of MixW4.
A 32 bit and a 64 bit version.
Install the version that suits your OS (Operation System)

MixW4 install

Before you install MixW, you need to know where to place it.

There are 2 possibilities:

1. Use of the default settings.
   If you choose this, remember the default settings that appear in the two choice screens.

2. Choose the names and locations of the folders you will use for program and data files.

Note:
Do not install the program files (binary files) and the Data files in one and the same folder

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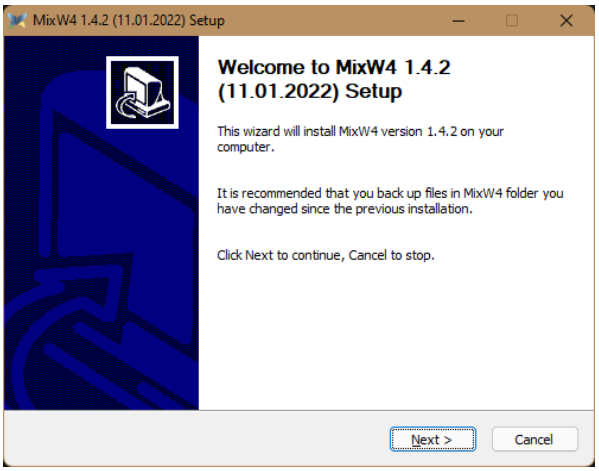
MixW4 default installation

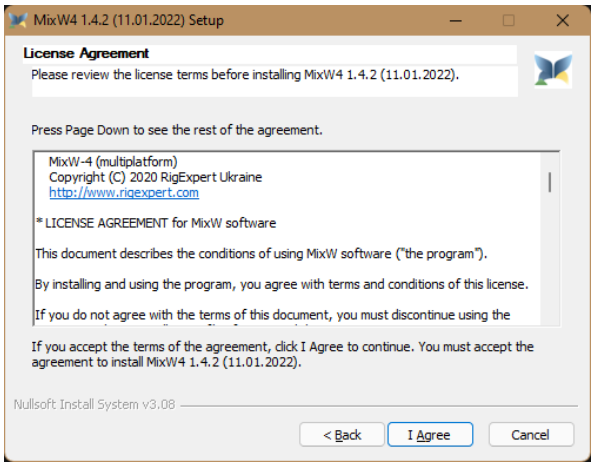
After installation, you will find the files in the folder

C:\Program Files (x86)\MixW Software\MixW4 **for the 32 bits version**
C:\Program Files\MixW Software\MixW4\ **for the 64 bits version**

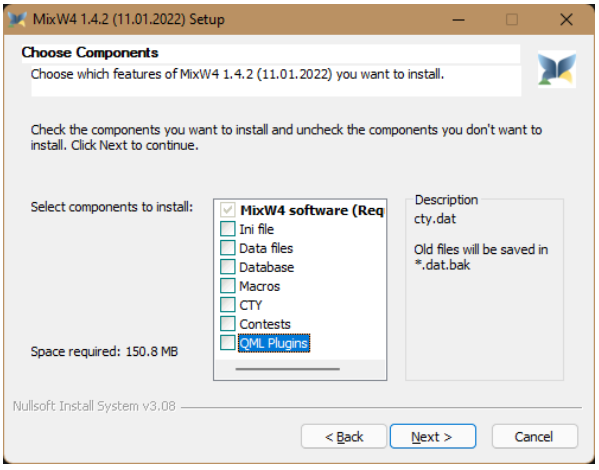
I have install the 64 bits version



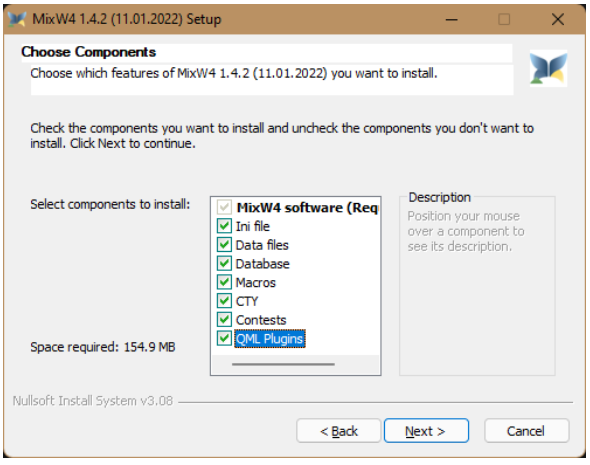
Click Next



Click I Agree

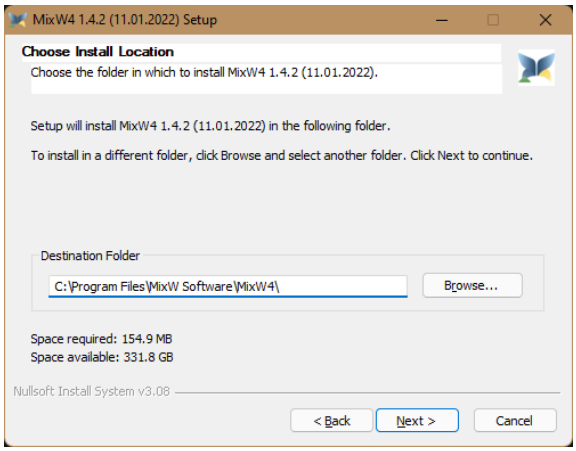


Click Next

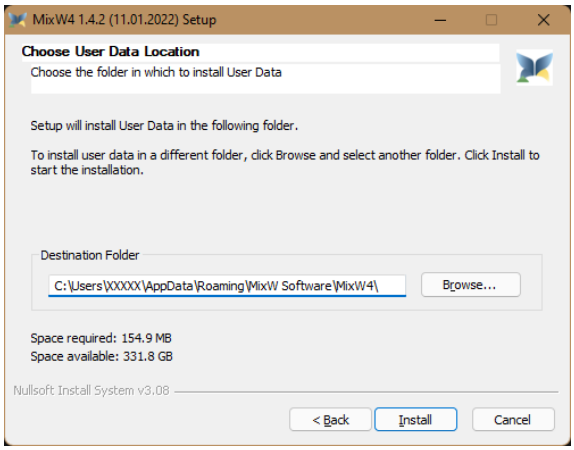


Click Next

Note:
If you want to put a new version of MixW over an older version, check that needs to be changed or modified



Click Next and MixW4 is installed in the:
C:\Program Files\MixW Software\MixW4\ folder



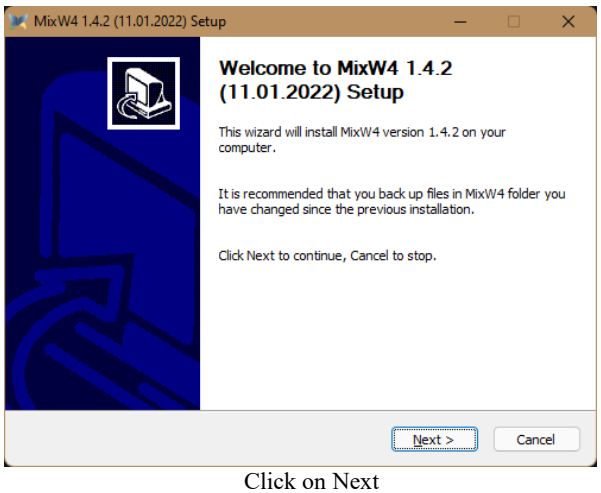
Click Install and MixW4 is installed in the:
C:\Users\XXXXX\AppData\Roaming\MixW Software\MixW4\ folder
XXXXX for example, stands for your computer name:
C:\Users\ON2AD\AppData\Roaming\MixW Software\MixW4\
or
C:\Users\Patrick\AppData\Roaming\MixW Software\MixW4\
or ….

Actions after first start.

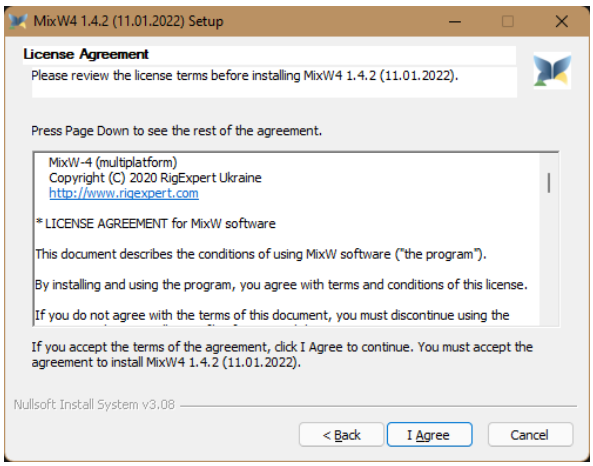
The first time MixW4 is started, certain actions take place.
a. Your call sign must be filled in Personal Data personal information before you can send.
b. A Soundcard must be selected.
c. If necessary, a previous version of a MixW log can be imported.
d. The CAT must be configured and the PTT method entered into the CAT information.
e. The waterfall may need to be adjusted for correct display.
f. Make sure the band limits in the Band map are correct for your license terms

MixW install in two different folders

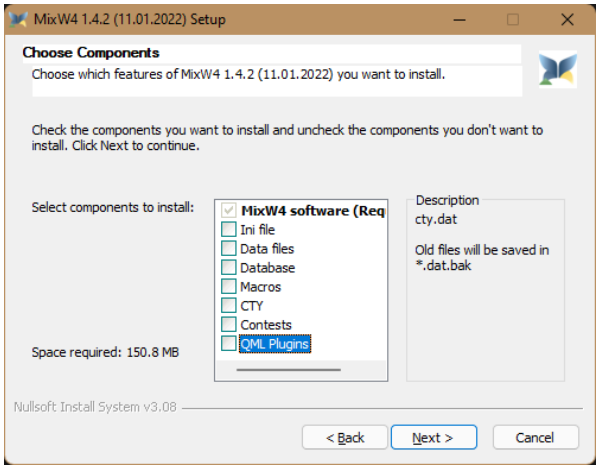
You wish to install MixW4 in two different folders of your choice.
So, 1 folder for the program and 1 separate folder for the files, then proceed as follows.
Example you wish to install the program in C:\HAM\MixW4 and the files in D:\HAM\MixW4-Files.



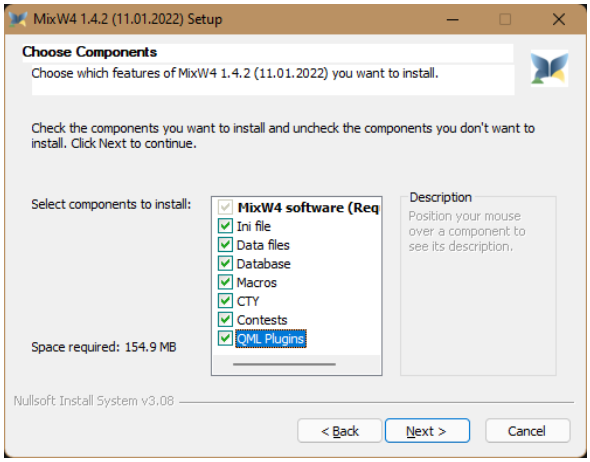
Click on Next



Click on I Agree

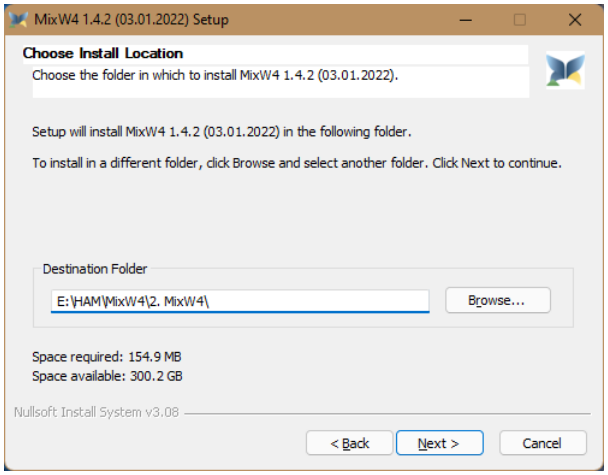


Click on Next



Click on Next

Note:
If you want to put a new version of MixW over an older version, check that needs to be changed or modified

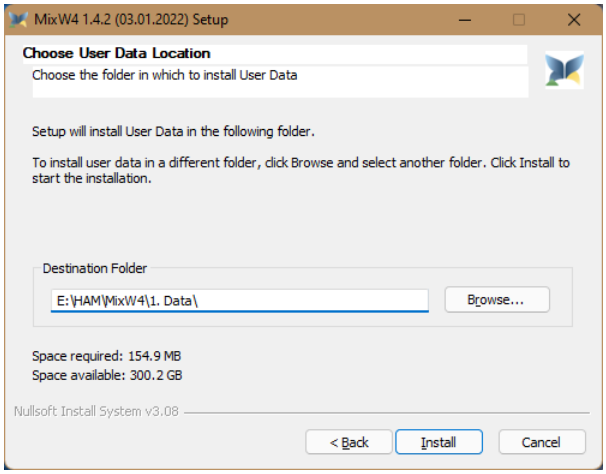


Click Browse and select the folder where you want to install MixW4.

Click Next and MixW4 is installed in the:
E:\HAM\MixW4\2. MixW4\

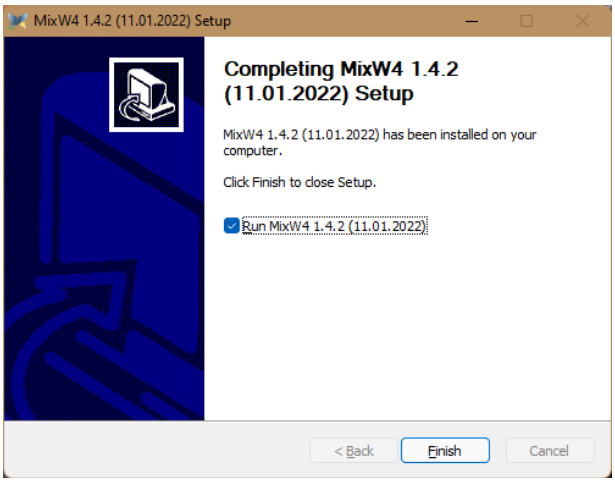
Click on Install

And enable Run MixW4 xxxxx(date) and click Finish om MixW4 te starten



Click Browse and select the folder you want to install the User Datas in.
Click Install and MixW4 is installed in the:

E:\HAM\MixW4\1. Data\



Actions after first start.

The first time MixW4 is started, certain actions take place.

a. Your call sign must be filled in Personal Data personal information before you can send.
b. A Soundcard must be selected.
c. If necessary, a previous version of a MixW log can be imported.
d. The CAT must be configured and the PTT method entered into the CAT information.
e. The waterfall may need to be adjusted for correct display.
f. Make sure the band limits in the Band map are correct for your license terms.

Upgrade installation.

Before starting a replacement installation make sure you have saved any files that have been changed since the last installation.

If you are satisfied with the old installation layout save this layout using the Save/Load/Restore layout option and restore it once the new MixW4 installation is working correctly.

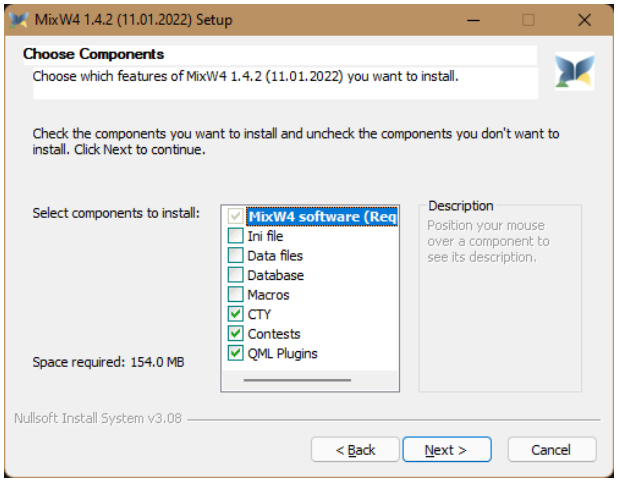
There are 4 different upgrade methods:

1. Use the new MixW4 release to overwrite the current installation. Follow the Upgrade installation steps below.
2. Create new installation folders without uninstalling MixW4. For this method follow the First time installation steps.
3. Uninstall Mixw4 and reinstall the new version using the same data folder name. Follow the Upgrade installation steps below.
4. Uninstall MixW4 and install MixW4 as if it is a first time installation. For this method follow the First time installation steps. Upgrade installation steps Run the downloaded file.

See MixW4 default installation or see MixW install in two different folders

Except:

Only select the CTY, Contests and the QML Plugins



Transceiver to PC

Interface

Interfacing your transceiver and PC to work with MixW can be handled many ways. The minimum is an audio path between the transceiver and computer soundcard.
To make full use of the MixW4 transceiver controls a suitable interface, either USB or COM port, is required.
You can configure your system to switch between TX and RX in four ways.

1. MixW is configured to operate a push-to-talk (PTT) switch via a voltage to the DTR or RTS pins of a com port, the same port can also be used for serial communication with the radio (CAT operation) if desired.
2. MixW is configured to send transmit and receive commands to the radio via CAT control, without using the PTT circuit (your radio must support PTT by CAT command).
3. Use the VOX circuit in your transceiver to switch it into transmit when it hears the audio sent by the computer, and back to receive when the audio stops. MixW only has control over the data transmission
4. Operate the radio transmit/receive manually. MixW has no control over this operation.
   CAT control is not needed for this method.

Note:

1. A number of modern transceivers have a built in USB port to allow both CAT and audio signals to be exchanged with a PC USB port.
2. There are a number of commercially constructed interfaces available to enable CAT control and PTT operation of most modern transceivers. A number of these interfaces also contain separate built in sound cards.
3. Also available are units that allow COM ports to be derived from PC USB ports.
4. A number of circuit diagrams are available on the internet to allow personal construction of an interface.

Important Note:
Your microphone must be disconnected from the radio (or otherwise switched out of the circuit) to avoid inadvertently transmitting voice signals in the digital bands.
When using VOX, Non-MixW computer sounds (such as the Windows start up chime) can also trigger the VOX circuit and key the transceiver.
There are up to 5 different settings that can affect the operation of the transceiver from MixW4:

1. Windows - Audio, COM Ports settings.
2. MixW4 - Audio, CAT, Macros, COM Ports settings, Mode settings.

3. Control interface - this is for non USB<>USB connected transceivers.
   Audio (maybe), COM Ports settings, Control lines.
4. Audio - this is for non USB<>USB connected transceivers.
   Audio maybe included in your Control interface.
5. Transceiver - Audio, COM Ports settings, Control lines and Menu settings.

For your MixW4 - transceiver connection to work correctly all required parts have to be configured correctly.
A problem identified using MixW2 and MixW3 with a long USB cable was low voltage at Control interface units relying on power from the USB port.
The solution was to break the USB connection into two cables and use a powered USB hub between the cables.
Whilst attempting to configure the interface you have installed you may need to use Windows Device Manager to verify COM ports or Audio ports.
To activate Device Manager execute C:\Windows\System32\devmgmt.msc.
I have created a desktop icon but you could also use {Windows Key}+R or use a Command prompt by running cmd.exe to execute the command to start Device Manager.

Whilst configuring the transceiver to CAT interface ensure you have your transceiver manual, any documentation associated with your CAT interface hardware and the CAT settings of this manual available.
The required settings have to all be correctly set.

(top

Start MixW4

MixW4 can be started in a variety of ways:

This section covers the initial start of a Mixw session in windows.
Command line parameters:
-log Create a debug log in the {data_root} folder.

There are a number of ways to start Mixw4:
1. Click a MixW icon on the desktop (Shortcut) (this is probably the most popular method).
2. Start MixW via a batch file.
3. Use the Start Menu Run facility.
4. In a CMD window, type a MixW command line.
5. Use Windows/File Explorer to select and click the executable file.
   No parameter can be used in this start-up method

MixW4 will use the information in the MixW4.ini file, the multipan.db3 database and the Windows registry.

WARNING: If you try to change the registry and make an error, Windows may become unusable.

Apart from using the Windows/File Explorer method, a command line will need to be set.
This has the form as:
{Path to MixW executable} \ MixW4.exe optional parameters

If you are using the Start Menu Run facility or starting MixW using an Cmd window, the command line must be entered each time.

A batch file requires a file operation to find the MixW Start rule.
Right-click the icon and select properties to find the command line in a desktop icon.
To find the command line in a desktop icon right click on the icon and select properties. In the Properties window select the Shortcut tab and on the line
Target: is a text line with the mixw startup command line.

First Start

Certain actions must take place the first time MixW4 starts after installation.
1. Your call sign (Callsign) must be filled in Personal data before you can send it.
2. A sound card must be selected.
3. The CAT must be configured if required or the PTT method must be input to the CAT information.
4. The waterfall may need to be adjusted for correct reproduction.
5. Check the band limits in the Band map are correct for your licence conditions.
6. If this installation is overwriting a previous installation the log maybe retained. If this is a new installation there will be no log available. An option is offered to import a MixW log from a previous MixW3 version. If this option is not used a log import maybe achieved using the Log search tools later.

Make a copy from the next Data files.
The reason for this copy is, if you happen to make a mistake installing the Data files you can still transfer the copied data files.

a. Make a backup of your logbook, possibly via an ADIF file

b. Al your macros listed in the Macros folder.
c. The subfolder Macros in the Contest folder, contains all your Contest macros.
d. All the files that have the extension ". layout", because in it are the data of how you easily created your preset MixW4 layouts VB: 1.Normal.layout, FT8.layout etc...
e. The CatList.json because otherwise the Catxxxx.json as described below does not work.
f. The Catxxxx.json file because it contains your CAT settings that work in the previous version, also contain your own created CAT commands such as antenna 1 or antenna 2, turn the monitor on and off (this serves to hear the transmitted signals via your transmitter)

These files can be found as:

aa. CatKenwood.json for Kenwood transceivers.
ab. CatYaesu.json for Yaesu transceiver
ac. CatIcom.json for Icom transceivers
ad. CatFlexRadio.json for Flex transceivers
ae. etc...

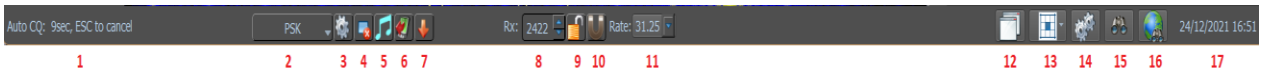
g. The Kiwisdr.ini when she is up to date.
h. The Bands.ini if you have adapted it to your ITU region 1, 2 or 3 or to the restrictions of the license.

(top)

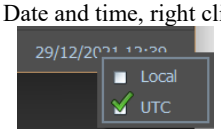
MixW dialog bar

After starting MixW, a window appears including the MixW dialog bar.

The MixW dialog bar is an extremely useful tool, gives many simple and useful functions without having to search too much in other settings.
It may differ from content according to the type of mode used.
This example is for PSK31



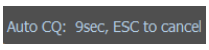
1. Info from AutoCQ, Brightness, Contrast and KiwiSDR (see 1 Info).
2. The type of mode used (Mode choice drop-down menu)
3. Mode settings
4. RX screen cleaning
5. Tune, a tune will transmitted
6. Show/hide the TX screen
7. Save audio history (40 sec) Right click to browse files
8. Display of the RX (Audio) frequency in Hz
9. Enable/disable the fixed RX frequency (hold the RX frequency) (A red pin appears above the Rx cursor in the waterfall))
10. Snap on-off (captures the signal)
11. Mode baud rate
12. Show/hide screens (views)
13. Save and layout Restore (save and restore the layout)
14. Settings
15. Log
16. Show Statistics
17. Date and time, right click on this field to allow switch between Local and UTC time.



More info for some buttons:

1 Info

Auto CQ: Running...	Auto CQ timer (visible only if the <AUTOCQ> macro is active
Brightness 106	Waterfall brightness level.
Contrast 21	Waterfall contrast level.
Host not found	Kiwi server not found.



3 Mode settings

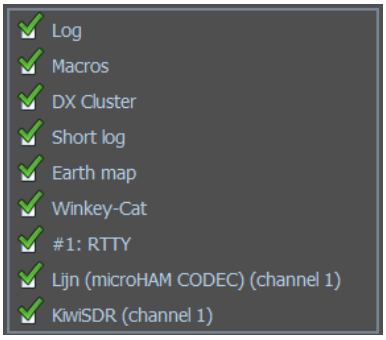
(top

Here one can do different settings per mode, see also ModeSet

12 Show/Hide views

Here you can check what one wishes to use and whether should be visible in MixW

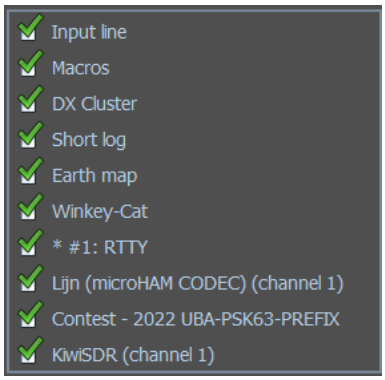
Log: input to log
Macros: Macro bar.
DX Cluster:
Short log and QSO Statistics:
Earth Map:
CAT settings: Current transceiver file.
Each active mode has a separate Rx window:
Soundcard: (waterfall spectrum): audio input channel.
KiwiSDR: Waterfall (channel 1).



12 Show/Hide views in Contest mode

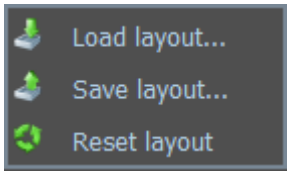
Here you can check what one wishes to use and whether should be visible in MixW in contest modus.

Input line: input to log.
Macros: Macro bar.
DX Cluster:
Short log and QSO Statistics:
Earth Map:
CAT settings: Current transceiver file.
Each active mode has a separate Rx window:
Soundcard: (waterfall spectrum): audio input channel.
Contest: the current contest running.
KiwiSDR: Waterfall (channel 1).



13 Save and Restore layout (save and restore the layout)

Load layout - restore a previously saved screen layout.
Save layout - save the current screen layout to a file.
Reset layout - set the screen to a preset layout.



(top)

Difference in dialog bar by mode

AM- dialog bar

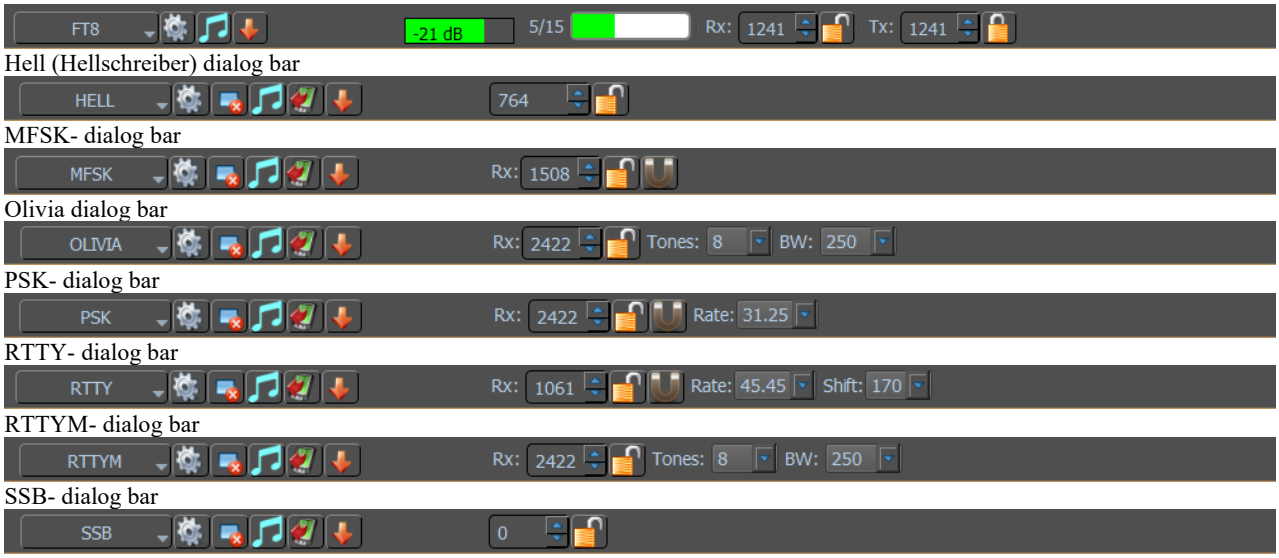
Contestia- dialog bar

CW- dialog bar

FM- dialog bar

FT4- dialog bar

FT8 dialog bar



Hell (Hellschreiber) dialog bar

MFSK- dialog bar

Olivia dialog bar

PSK- dialog bar

RTTY- dialog bar

RTTYM- dialog bar

SSB- dialog bar

(top)

Pinning or Removing Symbols from screens

This symbol indicates that this screen is shifting or returning

This symbol indicates that you are using the first waterfall

This symbol allows you to lock a screen and not insert it. See More info

The X symbol removes the screen

Select base color for symbol of the waterfall

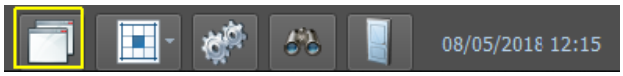
This symbol hides a screen

This symbol allows you to insert a screen
See More info

CAT is ON

CAT is OFF

If you hide a screen, click the Show/Hide button to restore that screen.



If you want a deleted screen back, right-click the waterfall and in New RX view select a mode

More info

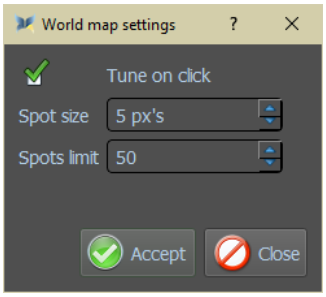
Click on this control to start the resizing process for this window. The icon will change to a single square. Position the mouse cursor just below the window title, hold the left mouse button down and drag the window away from its docked position. As the window moves the title bar background will change to a light grey colour. The window is now ready for resizing. Use the mouse to manipulate the borders to your required size.

To redock the window click on the single square control. This will now revert to its docked state. Using the mouse move the window to its desired position. A blank area will appear in the main MixW4 window indicating where the docking will take place. Release the mouse button and the window will slide into place. There maybe difficulty in getting the window to position exactly as required. Try undocking the window again and moving it so part of the window is outside the main window then sliding it in. You may find a compromise has to be reached.

Earth map

By clicking on this wheel symbol opens a new screen:

Tune on click if ticked displays call details from DXCluster selection
In **Spot size**, select the size of the spots (small squares)
In the **Spots limit**, you set the number of spots to appear on the globe
If you move the mouse over such a spot you will see the spotted call sign and the land.



(top)

DX Cluster and the World Map.

If you click on a call sign in the DX Cluster, the transmitter jumps to the frequency of the clicked call sign and in the globe a line of the selected call sign now appears to your QTH.
You can also see the following info:

1. The Callsign
2. The DXCC
3. The Continent
4. The direction in which the antenna is best directed.

(top)

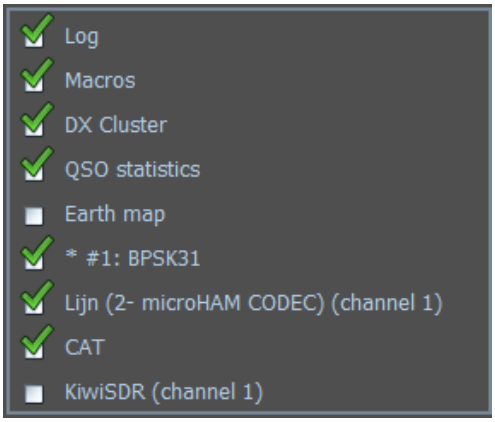
Main menu items

1. Show/ hide the views
2. Save and Restore layout
3. Settings
4. Show QSO Log
5. Date
6. Time in UTC

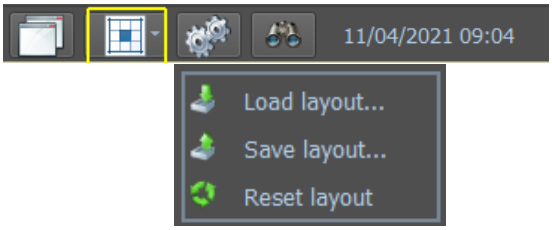
Show/hide views

By clicking on it, the view window opens.
Everything you check will be visible on your MixW display.

Here's a look.
The Log
The Macros
The DX Cluster
The QSO statistics
Earth Map
Two RX screens with PSK31 as sub mode and the spectrum (waterfall) with the type of sound card CODEC
Mode the mode used
Spectrum: Contains the sound card setting
CAT settings
KiwiSDR spectrum: This open a new spectrum (waterfall)



If you click on this, you will enter the menu to load a custom-made layout either to save a certain layout or to return to the reset layout by clicking on the Reset Layout.
This is an extremely useful menu.



By clicking on this you can get into the Config Dialog menu

By clicking here, you come into the Logbook screen

(top)

Configuration

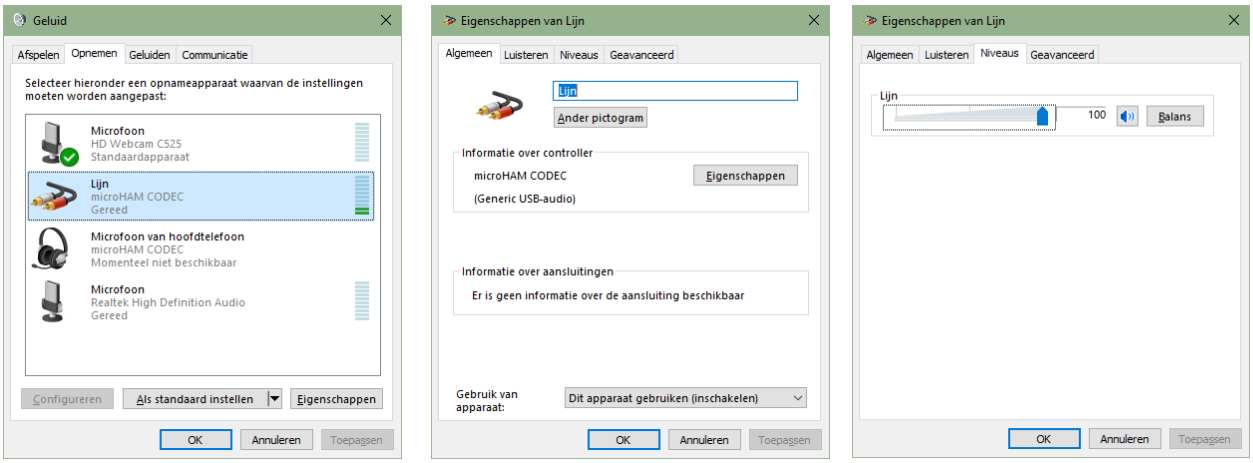
Basic Setup

Connect the transceiver to the computer:
The interface between your transceiver and the computer to work with MixW can be handled in many ways. A bidirectional audio pad must be present between the transceiver and the computer's sound card and the transceiver. You can configure MixW to switch between TX and RX in four ways.

1. Use a push-to-talk (PTT) switch via a voltage to the DTR or RTS pins of a com port, the same port can also be used for serial radio communication (CAT control),
2. Use sent and reception commandos to the radio through the serial port to the CAT, without using the PTT circuit (your radio must support PTT by CAT).
3. Use the VOX circuit in your radio to let it transmit when it hears the audio sent by the computer and receives it back to when the sound stops.
4. Control the radio send/receive manual

Note: Several commercially constructed interfaces are available to enable CAT control and PTT control of most modern transceivers. Some of these interfaces also include separate built-in sound cards. There are also units available that can deduce COM ports from PC USB ports.
Several switching schemes are available on the Internet to enable a personal construction of an interface.
Important note: Your microphone must be disconnected from the radio (or otherwise switched off the circuit) to prevent unintentional sending of voice signals in the digital bands. When using VOX, non-MixW computer sounds (such as the Windows boot sound) can also activate the VOX circuit and enable the transceiver.
It is extremely important to adjust your sound and output level. Set this up via the Windows Start button, Configuration, and Sound, or you have a sound device with physically operated level controls.

Set audio RX levels:

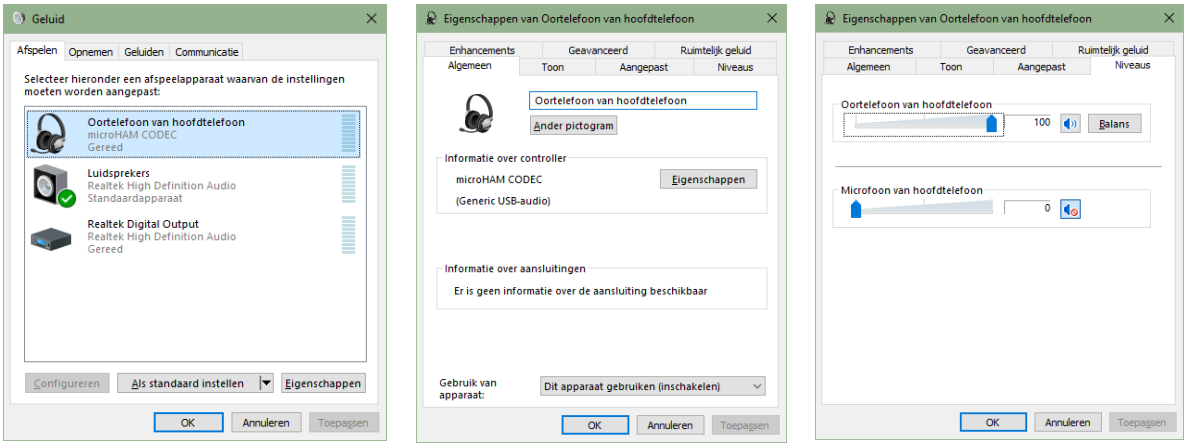


Depending on your setup, you can adjust the Mic or Line-in control. The best way to set these levels is to roughly align your transceiver with digital mode activity and then click on the strongest signal in the waterfall display to lead MixW to that QSO. If MixW does not lock in the signal right away, you can tune it with your transceiver or click the signal in the waterfall display again.

Adjust the input level on the microphone or line inputs until the background noise shows a dark to light blue color and the actual signals (or strong noise) are a light green color. Strong signals on the tuning screen will be yellow or orange. It is especially important not to transfer your sound card input. If you overstep these inputs, your reception will deteriorate, and you will receive inaccurate IMD results. Adjusting for the minimum shooting levels, while still being a good view, is the best starting point. You may need to weaken the signal between the transceiver and the sound card, especially if you are using the Mic input of your sound card. This can be done with a simple voltage divider circuit.
If you do not see any reception activity at all on MixW's displays, make sure your microphone or line-in control is not muted (Mute - "Mute") Mute is a check box near the input slider you are using. These options depend on your sound card drivers. Also check all your connections. It is also possible that the sound card will be oversteered, and you will have to weaken the input signal.
After these settings are optimized, you can try to receive some QSO's to get an idea of the right levels.

Setting audio TX levels:

To send digital signals, you often need to connect the output of the sound card via a separation transformer or 100:1 weakener) to the transmitter microphone, AFSK or audio input.
With the interface connected and your transceiver connected to a dummy load, you can now set the audio output level of your computer sound card to match your transceiver's input circuit.
It is extremely important to adjust your noise levels. This is done by clicking the Windows Start button, Configuration, and Sound, or you have a sound device with physically accessible level controls.

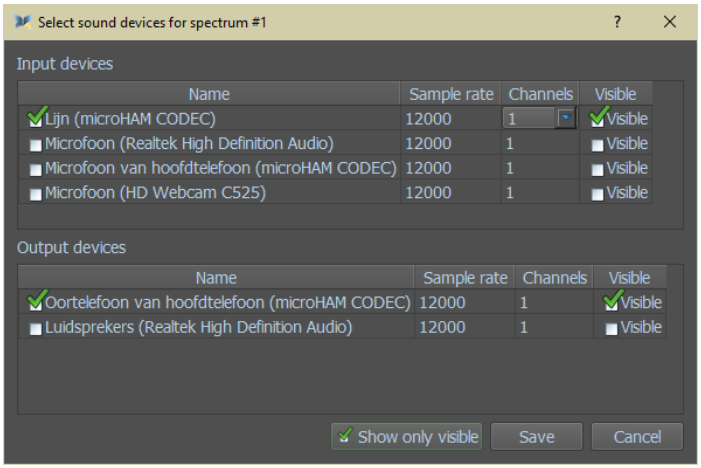


Soundcard

ATTENTION: When using the KiwiSDR as a second waterfall, the sample rate should be set at 12000

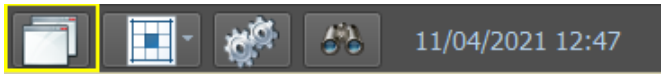
Click on “Sound device”

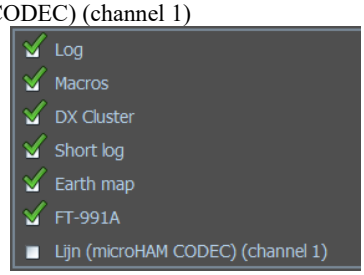
The following window will open.
Select your sound card setting
It is recommended to set your sampling rate (Sample rate) to 12000.
And possibly set the correct channel (Channels).



After changing the data click on Save

If you happen to have deleted your waterfall and you want to find it and your sound card settings back, click on the Show/Hide button and then tick your sound card. Here it is the line (microHAM CODEC) (channel 1)





ALC

These audio output adjustments are best performed when your transceiver is connected to a dummy load. This eliminates either QRM or damage due to incorrect output levels of your equipment.

Set your transceiver's Mic amplification control (if you use the microphone input) slightly above the minimum setting and make sure your device's VU meter (or indicator) is set to monitor the "ALC." Your VOX threshold setting (if you use VOX) needs to be adjusted as you normally do for your other modes. Set the VOX delay too LONG to avoid the possibility of failure. VOX should be on if you plan to activate your TX/RX function with it. If you do not use VOX or an optional PTT circuit, you can perform these tests by manually enabling the transmission when you send MixW.

NOTE: MixW will not be in shipping mode until you have configured your personal information.
First, select PSK31 mode by selecting PSK31 mode. Set MixW to transmit by clicking the Send in RX window. The "Send" becomes "Stop" and MixW sends an inactive PSK31 signal. To return to reception mode, click the "Stop" box in the RX window.

Please note: Does not ship for long periods during the making of these adjustments. If you find that your adjustments take a while, let your device rest for a while in reception mode between adjustments.

The adjustments. Slowly increase the volume control fader on the mixer as you look at the ALC meter. Once you see a positive value on the ALC meter, reset the volume control slider until the ALC is at (or slightly below) zero. It is VERY important that you do NOT have AN ALC value.

Now check the reading for your power meter. It will probably be about 50% of your maximum power. Remember that most digital modes perform a 100% (constant) down (duty) cycle key.
Many devices cannot transmit continuously with 100% power. Depending on the mode you are using, you may want to lower your transmitter's output power even beyond the zero-ALC value.

If you are using VOX transmission circuits and the VOX is not turned on by the time your volume is set halfway up the slider, increase the device's Mic amplification slightly and try again. If VOX doesn't seem to set to a sufficiently low noise level, you may need to set the levels by manually setting the device and then setting the sliders to optimize your audio signal (you should see your ALC indicator move again, and then back to zero), reset your VOX circuit to get back to that input level.

The optimal setting when using a no-weakening interface will usually make your sound card output (Volume and Wave Control settings) very low and your Mic amplification slightly lower than your standard for SSB operations. If you find that you cannot control the audio with these controls in reasonable ranges, you will probably need to add a weakening between the sound card output and the microphone input of the device. You can also try using the audio input of your accessory jack (if your device is equipped).

This can avoid your Mic preamp circuit and be a better choice for signal comparison.
After you optimize these settings, write down the positions of your device controls and the Windows Volume and Recording mixer positions.

Additional sound cards are available that can be connected to the ports (internal and external) of the control computer or via USB or FireWire ports.
The use of an additional card for digital operation means that the computer's internal sound card does not need to be adjusted. Several external sound cards have level controls that can be easily controlled.

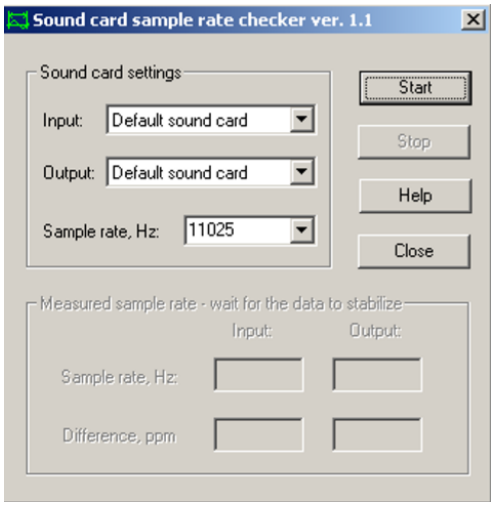
Note: The ALC value can vary between different bands. If the ALC value changes (especially if the ALC level is raised) if a new band is selected, the output level of the sound card must be adjusted to lower the ALC value to zero or lower.

Sound card calibration

Calibration of sound cards is essential for good practices and techniques in digital modes. In SSTV mode, photos may not be square, and work in keyboard modes. The QSO (pictured) can walk up and down with an uncalibrated sound card. This of course also happens when the station that is being operated has an incorrectly calibrated sound card. It is recommended that newer sound cards set the sample frequency to 12000 (see Soundcard)

CheckSR.exe sound card calibration program:

(Will introduced when the mode SSTV is released)
To calibrate the sound card: locate the program CheckSR.exe in the MixW program folder double-click the CheckSR program to start the Sound Card Calibration.



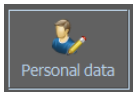
Select the correct sound card for both input and output. Change the sample frequency to the value you selected in the sound card configuration. Click Start. Run the program until there is hardly any movement on the difference PPM. This will take 30 minutes or more. If you have the time, let it run for an hour or more to get the most accurate measurements. Click Stop, and then copy the difference PPM for input and output. Click Close. In MixW, under Configure, click Sound Device Settings. Copy the results from CheckSR to Clock Adjustment ppm. The input value goes to RX and Output to TX. Click OK

Calibration is now complete.
It is advisable to check the settings of the sound card every 6 months.

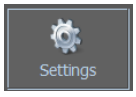
(top setup) (top)

MixW Setup

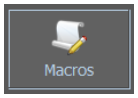
Displays the information about the program (About).



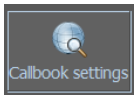
Enter your personal information and channel information. (Personal data)



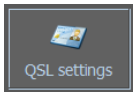
Displays the Settings (Settings) dialog box.



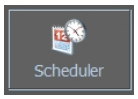
Edit/create Macro. Import and convert MixW2/3 macros.



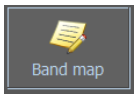
User/password for Callbook settings.



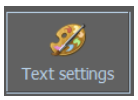
User ID/password for QSL settings.



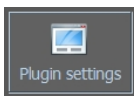
Plan timed actions and/or reminders. Scheduler



Adjust the frequency bands. Band map



Select different colors for text/background. Text settings



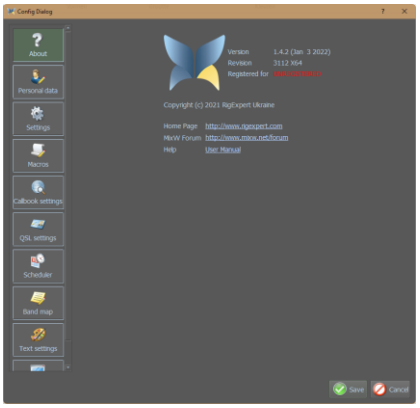
Select some of the Plugins

(top setup) (top)

About

For a detailed configuration of the MixW4 program, open the Settings window.

The Config dialogue allows you to configure the basic MixW4 settings in detail.
The first tab shows the basic information about the program version, mode: demonstration or full registration, a link to the home page, forum, and help file.



(top setup) (top)

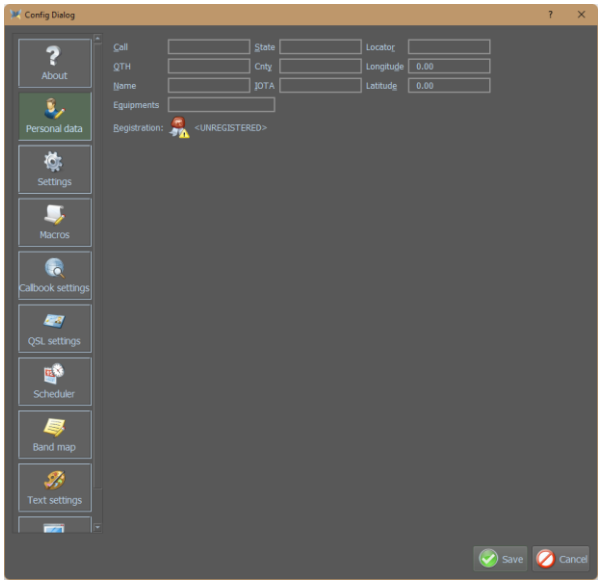
Personal data:

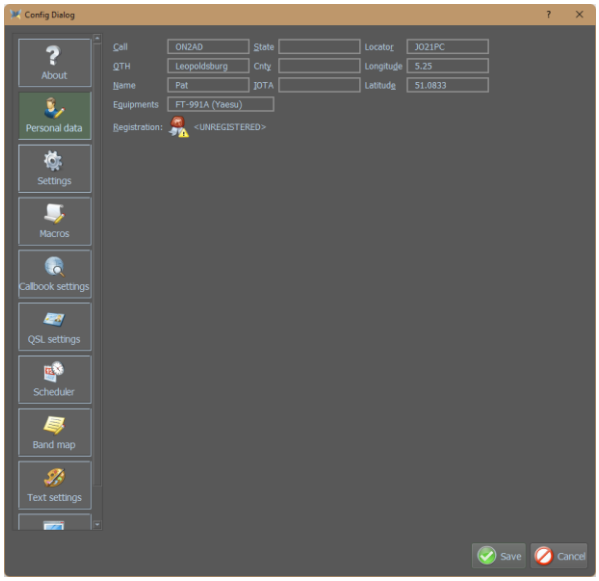
After installation, MixW starts, fill in the basic information such as, Call, QTH, Name, State, Cnty, IOTA, Locator and your transceiver, Antenna, etc... in Equipment's.

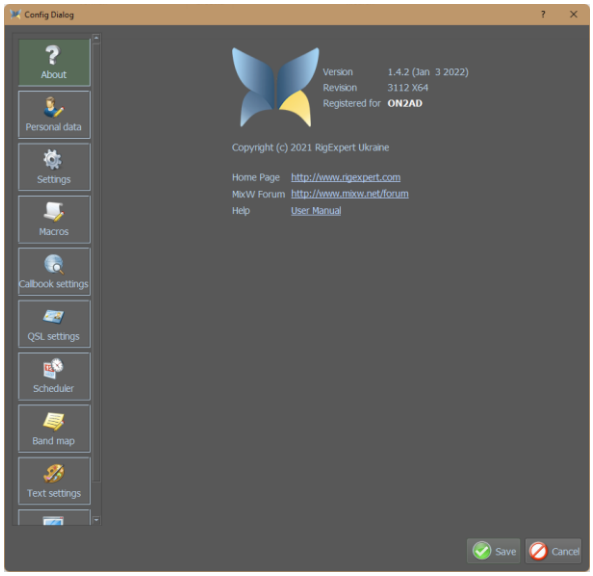
In the "Equipment's" field: The TRX, this because this field is referenced in the macro <MYEQUIPT>

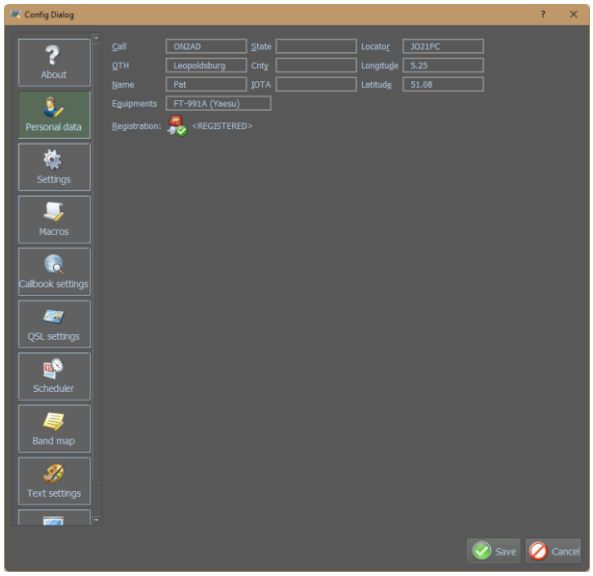
Latitude/ Longitude/ Locator.
If you fill in the Latitude and Longitude MixW4 does not fill in your Maidenhead locator for you. However, if you know your Maidenhead locator and you fill this field in, MixW4 will fill in Latitude and Longitude values for the centre of your grid square.
Note: If your location is South of the Equator your Latitude value will be negative.
If your location is West of the Greenwich Meridian the Longitude value will be negative

Click on Save, close MixW and restart MixW







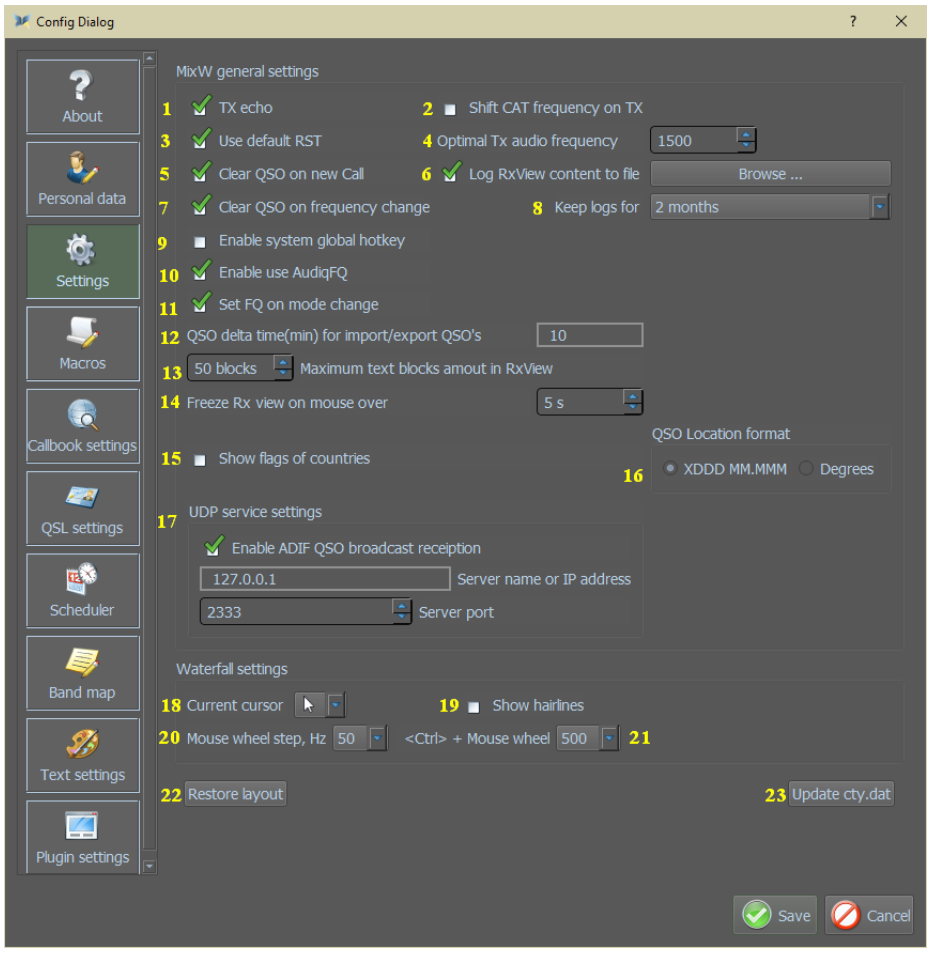


After restarting MixW and if you have a valid key (Key) for MixW4, you will see the following image with
Registred for: *your Callsign*
In the example

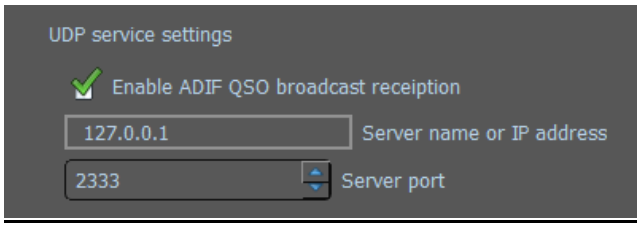
Registered for **ON2AD**

And in this screen:
Registration: <REGISTERED>

(top setup) (top)



1. View the text in the reception window. (RX screen)
2. Shift CAT frequency on TX.
3. Standard report.
4. Optimal Tx audio frequency setup.
5. Erase all QSO data when creating a new Call.
6. Log RxView contents in the file, choose where to save the received texts. The default file name is MixW4.Rxn.yyyy.mm.dd.txt. The data is saved in folder {data_home\RxLog}
7. Erase all QSO data when changing frequency.
8. Keep the RxView log for a period of time
9. Enable global shortcut system. When clicking on the Esc key, MixW4 comes to the fore.
10. Display in bar and save frequency in log with the audio frequency.
11. Change the Frequency by change the mode.
12. Setting the time for import/export QSOs. After uploading data from the eQSL service, using the same QSO data, there may be a problem due to time mismatch in your log and in the sender's log. This setting allows you to mark eQSL in your log as received (if the time difference is within the specified limit). Or he will suggest that you make this QSL as new if the time difference is greater than the specified limit. (All other parameters (type of connection, date) coincide).
13. The RxView can contain a lot of data, which can lead to delay. 1 block is a text between <CR> <LF> characters. Standard 50 blocks in RxView equals 50 paragraphs
14. Set the time here that the Rx view freezes when you move the mouse over it.
15. Display the flags or names of the countries in your log
16. Select XDDD MM.MMM or degrees for the location format.
17. UDP service: This allows QSOs to be automatically logged into MixW4 with another program. To do this, the correct parameters such as the Server name or IP address and the Server port must be set. See example of the setting in WSJT-X and MixW4 below.
18. Select the shape of the cursor on the waterfall.
19. Additional tuning lines in the waterfall.
20. Mouse wheel step in Hz from 1 - 100 Hz.
21. Mouse wheel step + CTRL in Hz from 10 - 1000 Hz.
22. Set the MixW4 screen layout to its original settings.
    This has the same effect as the Main Menu - Save/Load/Restore screen layout - Reset layout.
23. Update cty.dat, this is an update to the cty.dat file.

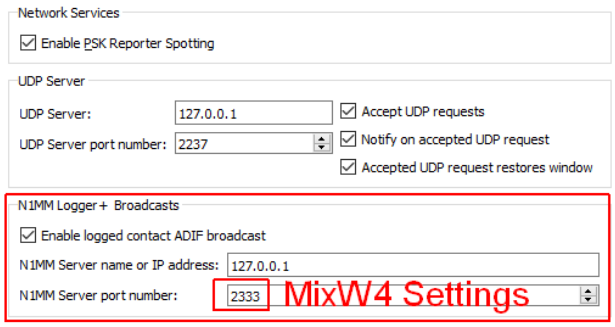


MixW4 setting:

Server name of IP-Address =
127.0.0.1 also called localhost

The local host is the location of your own system in your computer network.
See:
https://nl.wikipedia.org/wiki/Localhost
The Server port used here is **2333**.

WSJT-X settings



Again, the TCP Server will enter the same info as in the MixW4 setting.

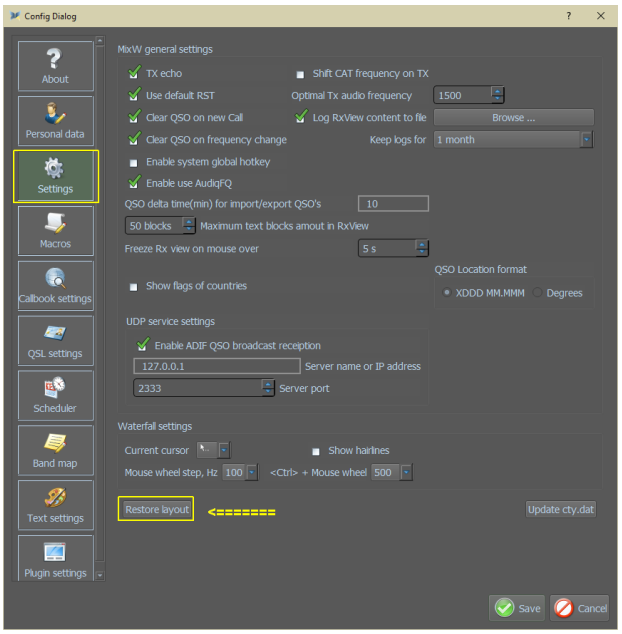
The TCP port is also the same as in MixW4.

(top setup) (top)

Restore MixW to default setting

The procedure: Click on the Settings

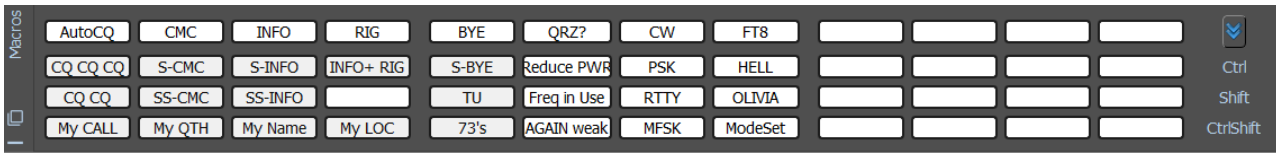
Click Settings Click Restore layout



(top setup) (top)

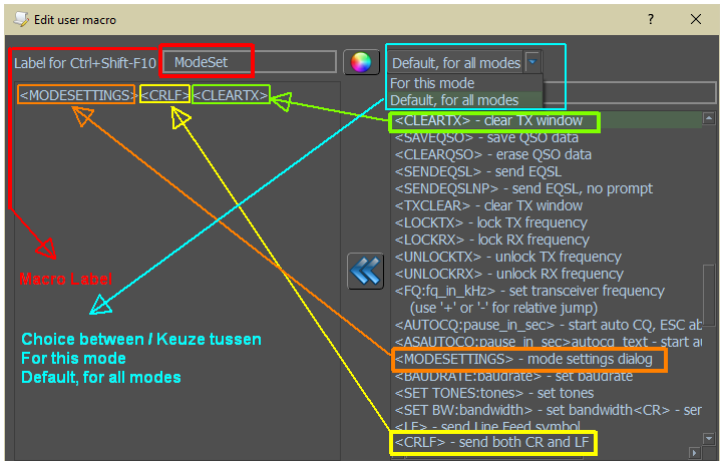
Macros configure

MixW4 Macros provide a method to help control the functionality of MixW, your CAT equipped transceiver and to reduce the need of repetitive typing. There are 48 locations available for macros but these may be changed by selection of different operating modes or contests. The default storage location for non-contest macros is {data_root}\Macros. The default storage location for contest macros is {data_root}\Contests\Macros. MixW4 is delivered with a basic set of macros.



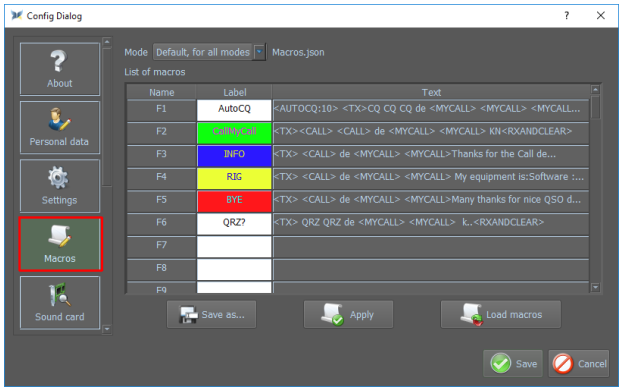
As delivered they are displayed in 4 rows of 12. Any macro can be executed by positioning the mouse cursor over the macro location and left clicking or by using a combination of the Ctrl and Shift keys to select the row the macro is in and using the relevant Function key.
In the delivered macros by pressing Ctrl+Shift+F5 the Mode settings dialogue window is displayed.
The control reduces the number of macro rows displayed from 4 to 1.
The row displayed can be controlled by the Ctrl and Shift keys.
The display can be restored by clicking on the control.

There are 4 methods for configuring your macros.



Method 1: Via the Macro bar:
In the Macro bar, with the right mouse, click a macro field, and the Edit user macro window appears.

Method 2: Import and convert macros from a previous MixW release.
Click the Settings menu then Macros, and then click Load macros, and then select the macros from an earlier version



Method 3: Click Settings/Macros.
And click on a macro field that you want to customize.

Method 4: Edit (with care) the relevant .json file in the {data_root} \ Macros folder

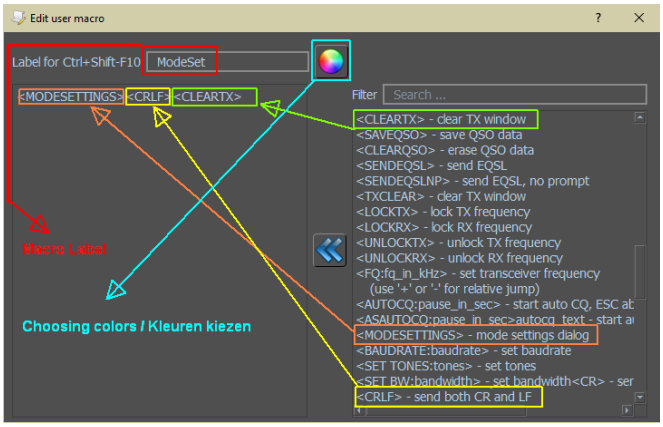
Note:
For method 4, make sure to backup your Macros

ModeSet macro example

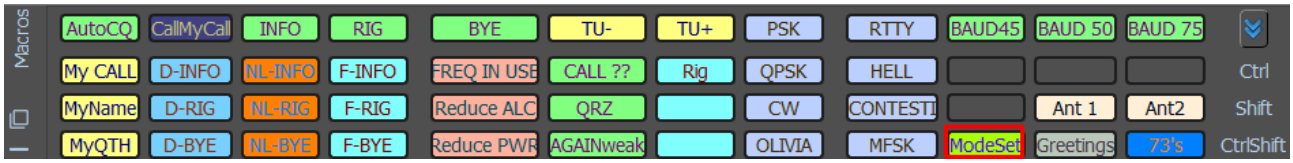
Creating a macro is quite easy and as an example we are going to create the Macro "ModeSet". This macro we will use a lot in the settings of the different modes. With this macro, we can then adjust all the settings of a particular mode.
On Settings, click Macros and scroll down until you see the Ctrl-Shift+F10 in
double-click the left column on the Ctrl+Shift+F10 displays next screen

In “Label for Ctrl+Shift+F10” type je ModeSet
In the field below comes <MODESETTINGS><CR><LF><CLEARTX>
These commands are in the right column and by clicking on them and clicking on the double blue arrows you bring the commands into the left field
See image below:

Adjust the color of the macro by clicking on the coloured sphere and choose the color you want to use. Then click SAVE, and then click Apply and save Now you see a Macro “Modeset”

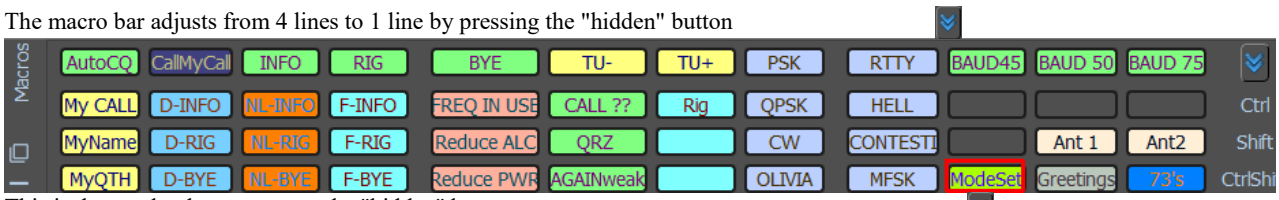


If this macro for all Modi count, then do not tick anything in "For this mode" otherwise though



Customize macro bar

The macro bar adjusts from 4 lines to 1 line by pressing the "hidden" button



This is the result when you press the "hidden" button.

By pressing the "hidden" button again, you get the four lines back

(top)

Each macro rule has 12 macros ranging from the F1 to F12 function keys.

Press F1 then the “AutoCQ” macro is activated etc... for the other function keys

Ctrl: Press de Ctrl+F1 then the “My Call” macro is executed etc... for the other function keys

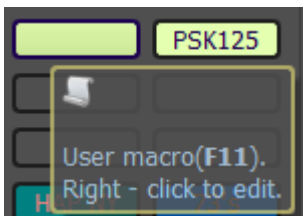
Shift: Press the Shift+F1 then the “MyName” macro is executed etc... for the other function keys

Ctrl+Shift: Press the CTRL+Shift+F1 then the “MyQTH” macro is executed etc... for the other function keys

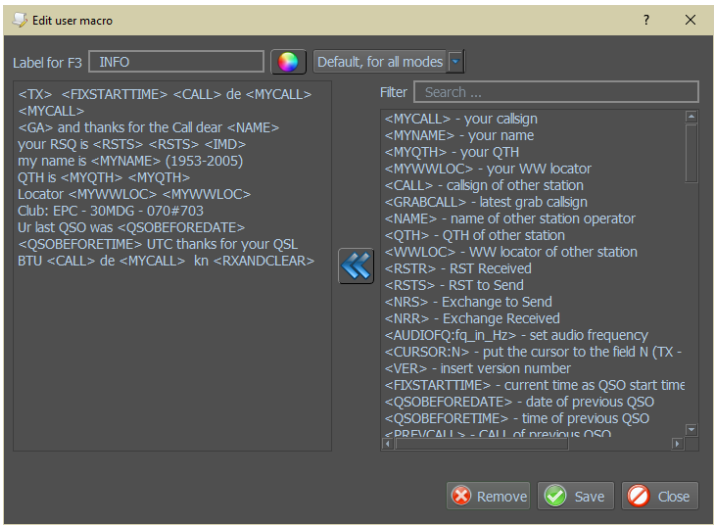
Ctrl+Shift: Press the CTRL+Shift+F8 then the mode “Olivia” macro is activated etc... for the other function keys

This of course for the macros in the example above.

But you can also do it more easily by placing your mouse on an empty macro field and right-clicking. To customize an existing macro by right clicking that macro.
If you clicked on an empty macro, you will get the next screen



If you use an existing macro as in the example, the
macro "INFO" right clicked you get to see next screen.



Edit Macros.json file

MixW4 macros have the facility to call one macro name from another macro.

eg <TX><GA> <NAME> <F7> we have a storm coming. BTU <CALL> de <MYCALL><RXANDCLEAR>
- Sending weather information.

Using the normal macro edit (above) each macro has the name of the key number as the macro name.

The only way to assign these macros their name is to manually edit the raw macro data.

As delivered the first few lines of Macros.json are:

```
[
   {
      "Macros_1": {
         "color": "#ffffff",
         "label": "AutoCQ",
         "name": "",
         "text": "<AUTOCQ:10><TX>\nCQ CQ de <MYCALL> <MYCALL> <MYCALL> k<RXANDCLEAR>"
      }
   },
   {
      "Macros_2": {
         "color": "#00ff00",
         "label": "CallMyCall",
         "name": "",
         "text": "<TX>\n<CALL> <CALL> de <MYCALL> <MYCALL> KN<RXANDCLEAR>\n "
      }
```

There is no name associated with these macros.

This is the first macro with a name inserted:

```
[
   {
      "Macros_1": {
         "color": "#ffffff",
         "label": "AutoCQ",
         "name": "F1",
         "text": "<AUTOCQ:10><TX>\nCQ CQ de <MYCALL> <MYCALL> <MYCALL> k<RXANDCLEAR>"
      }
```

It is normal practice to use the function key name as the macro name, but the name can be any combination of letters and numbers.

This is useful if you want to use the contest Intelligent macros in non-contest mode.
As you gain experience with using MixW4 you may identify areas where use of these Intelligent macros will be advantageous for you.
However, you will have to sacrifice up to 7 of the 48 macros to make full use of the facilities.

This is an example of a pair of macros Colin, 2E0BPP use.

Colin, 2E0BPP use a CQ macro but can call this from an AUTOCQ macro as well.

```
[
   {
      "Macros_1": {
         "color": "#90601f",
         "label": "CQ",
         "name": "F1",
         "text": "<TX>\nCQ CQ de <MYCALL> <MYCALL><CRLF>cq de 2e0bpp cq pse k<RXANDCLEAR>"
 }
},
{
      "Macros_41": {
         "color": "#ff00ff",
         "label": "ACQ",
         "name": "Ctrl-Shift-F5",
         "text": "<AUTOCQ:10> <F1>"
 }
```

When running from the AUTOCQ macro it must be ended with the Escape key.

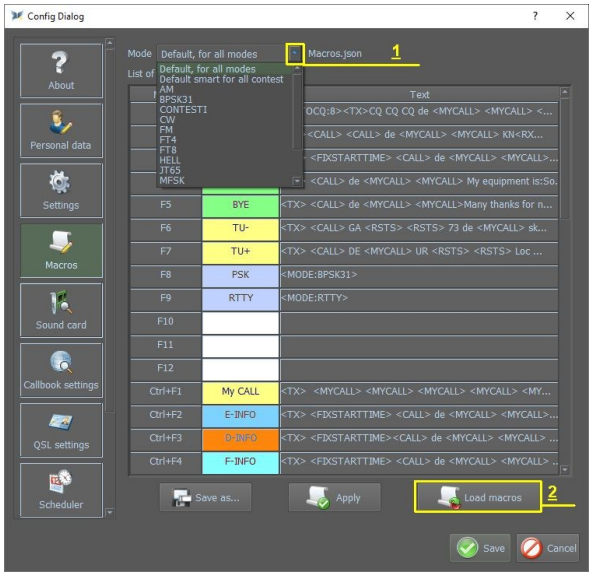
(top)

Import macros from an earlier release

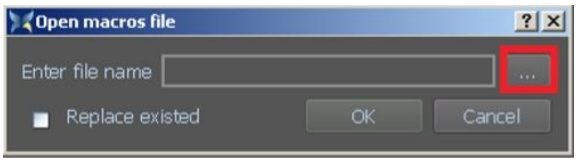
Before you start importing, specify which macro file you want to import and make sure the files in the previous version have the .mc extension. To import the MixMacros.ini file, it must be renamed MixMacros.mc.

In the Config window dialog box, select the Macros tab. On this screen, click (1) and select from this list the macro string you want to update.

Click Load macros (2) now, and a file selection window appears.

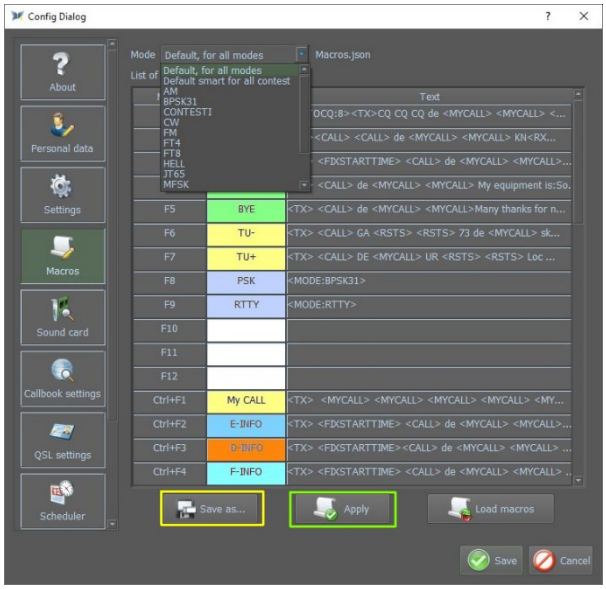


The converted macros are now displayed. If you are happy, click Apply, and the current macro saved Click save as... and give this macro a different name and then save it.
Repeat the import macros for other files you want to import.
Click Save as soon as you complete your entry.



Click to open the file selection filter

Once the file is selected, click OK in the message window.



(top)

Macros text

<MYCALL>	-	Inserts your call sign as configured in Personal Information
<MYNAME>	-	Inserts your name as configured in Personal Information
<MYQTH>	-	Inserts your QTH as configured in Personal Information
<MYWWLOC>	-	Inserts your locator as configured in Personal Information
<MYEQUIPT>	-	Inserts your equipment as configured in Personal Information
<CALL>	-	Inserts the call sign of the counter station into the log
<ACALL>	-	This macro is similar to <CALL>, but you can switch calls directly. It is certainly ideal for CW. The meaning is that by entering multiple characters it is already possible to start the TX and in addition to enter the callsign, MixW4 knows that if the characters are entered after starting the TX, they will be transferred. See <ACALL> macro
<CCALL>	-	Have a similar function as the <ACALL> see <CCALL> macro
<ABSGRABCALL>	-	Get next call from the received data. Overwrites any current selection
<GRABCALL>	-	Last call sign
<NAME>	-	Adds the operators name of the counter station to the log
<QTH>	-	Adds the counter station's QTH to the log
<WWLOC>	-	Inserts the locator of the counter station
<RSTS>	-	Inserts the sent RST
<RSTR>	-	Inserts the received RST
<NRS>	-	Inserts the Exchange to be sent
<NRR>	-	Inserts the received Exchange
<PREVCALL>	-	Inserts previous Call
<PREVRSTS>	-	Insert Previous sent RST (inserts previous RST sent)
<PREVRSTR>	-	Insert Previously received RST
<PREVNRS>	-	Adds previous Exchange to send
<PREVNRR>	-	Add previous Exchange received
<VER>	-	Insert version number
<TIME>	-	Inserts the current UTC time
<DATE>	-	Inserts the current date
<QSOBEFOREDATE>	-	Inserts the previous QSO for this band and mode date
<QSOBEFORETIME>	-	Inserts the previous QSO for this band and mode time
<GA>	-	Inserts GM, GA or GE depending on the counter station time
<MODE>	-	Insert current mode
<MHZ>	-	Inserts the current frequency in MHz
<KHZ>	-	Inserts the current frequency in kHz
<QSONR>	-	Inserts the QSO number
<QSONR:MODE>	-	Inserts the QSO number of this mode
<QSONR:BAND>	-	Inserts the band's QSO number
<NOTES>	-	Inserts the Notes field as in the log
<CR>	-	Insert Carriage Return
<CRLF>	-	Insert Carriage Return and Linefeed
<LF>	-	Insert linefeed
<FILE>	-	Insert file contents (file selection dialog opens)
<FILE:filename>	-	Insert contents of filename. Filename must be a full path to the file

Program control macros

<TX>	-	Switch from RX to TX
<RX>	-	Switch to RX when you are in TX
<RXANDCLEAR>	-	Switch to RX and clear the TX window
<FIXSTARTTIME>	-	Set the current time as QSO start time in the log
<MODE:>	-	Set the mode to MixW mode
<CLEARRXWINDOW>	-	Clear RX window
<CLEARRX>	-	Clear RX data
<CLEARTXWINDOW>	-	Delete TX window
<CLEARTX>	-	Delete TX data
<SAVEQSO>	-	Save QSO data. Make sure this macro comes before macro 'Clear'
<CLEARQSO>	-	Delete the QSO data
<SENDEQSL>	-	Send current QSO to eQSL. Ask for password. This macro must precede a <SAVEQSO> or any 'Clear' macro.
<SENDEQSLNP>	-	Send QSO to eQSL without prompt. Same restrictions as <SENDEQSL>
<TXCLEAR>	-	Delete TX data
<FQ:fq_in_khz>	-	Sets the transceiver frequency (use '+' or '-' for relative jump)
<AUTOCQ:pause_in_secs>	-	Auto CQ in xx seconds, stop with the ESC key

<ASAUTOCQ:pause_in_secs>	-	Autocq_text, start auto CQ with a text, stop with the ESC key.
<MODESETTINGS>	-	Displays the Mode Settings dialog box
<LOCKTX>	-	Lock the transmission frequency
<LOCKRX>	-	Lock the receive frequency
<UNLOCKTX>	-	Unlock the transmit frequency
<UNLOCKRX>	-	Unlock the receive frequency
<CURSOR:n>	- - - - -	Move the cursor to login input position n. Values of n: 1 - Call, 2 - Name, 3 - QTH, 4 - RST-S, 5 - RST-R 6 - Fq, 7 - Notes, 8 - Mode, 9 - NRR, 10 - Locator 11 - IOTA, 12 - ???, 13 - QSL via
<CURSOR:TX>	-	Move the Cursor to the TX window
<AUDIOFQ:fq_in_Hz>	-	Set the audio frequency.
<AFCON>	-	Enables AFC
<AFCOFF>	-	Disables AFC
<SENDSPOT>	-	Send a spot to the DX cluster when the DX cluster is open
<SAVE_WAVE>	-	Save the last 30 seconds in a WAV file
<PLG:plugin_name>	-	Run plugin by the name

CAT control macros

<CATCMD: text_command>	-	Send an alphanumeric command to the CAT port
<CATCMDHEX: hex_command>	-	Send hex command to the CAT port ("0A 3F 56 084 or" 0A3F56084 "

Mode control macros

CW mode macros

<WPM>	-	CW key speed
<CPM>	-	CW key speed
<WPM:n>	-	CW set speed in WPM (use '+'or '-' for relative jump)
<CPM:n>	-	CW set speed in CPM (use '+'or '-' for relative jump)
There is a delay after the speed change macros have been executed before the updated speed is used.		

Contestia, Olivia & RTTYM mode macros

<SET BW:bandwidth>	-	Sets the bandwidth
<SET TONES:tones>	-	Sets the tones

PSK & RTTY mode macros

<BAUDRATE: baudrate>	-	Sets the baud rate

RTTY mode macros

<SHIFT:shift>	-	Stel frequentieverschuiving in voor RTTY

Contest macros

<S/P:>	-	toggles between Search and Pounce and Run modes.
<SP0>	-	disable Search and Pounce mode (run mode on).
<SP1>	-	enable Search and Pounce modes.
<SP:0>	-	is equal to <SP0>
<SP:1>	-	is equal to <SP1>
<OnSP0>	-	is equal to <SP0>
<OnSP1>	-	is equal to <SP1>
<INT>	-	The action depends on the S&P or Run mode and the contents of the CALL and NRR fields
<INTQRL>	-	Call in S&P mode if Call is empty
<INTDE>	-	Call in S&P mode with a new Call but NRR empty

<INTQSL>	-	Call in S&P mode with a new Call and NRR completed
<INTCQ>	-	Call in Run mode when Call is empty
<INTGA>	-	Call in Run mode with a new Call but NRR empty
<INTQB4>	-	Call in Run mode with a previous QSO Call
<INTQRZ>	-	Call in Run mode with a new Call and NRR complete
<INTCALLQRZ>	-	Call in Run mode with a new Call and NRR complete
<INTAGNCALL>	-	Request Callsign again
<INTAGNNR>	-	Request the Exchange again
<CONTESTCMD:text_json>	-	JSON command in contest mode
<CONTESTCMDF:>	-	Choose a JSON file in contest mode
<CONTESTCMDF:file_name>	-	Open a JSON file in contest mode

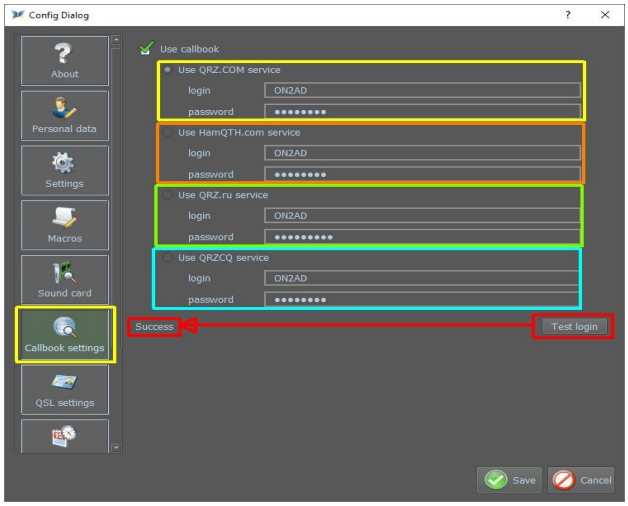
Not yet in the list of macro commands

(top setup) (top)

Callbook settings:

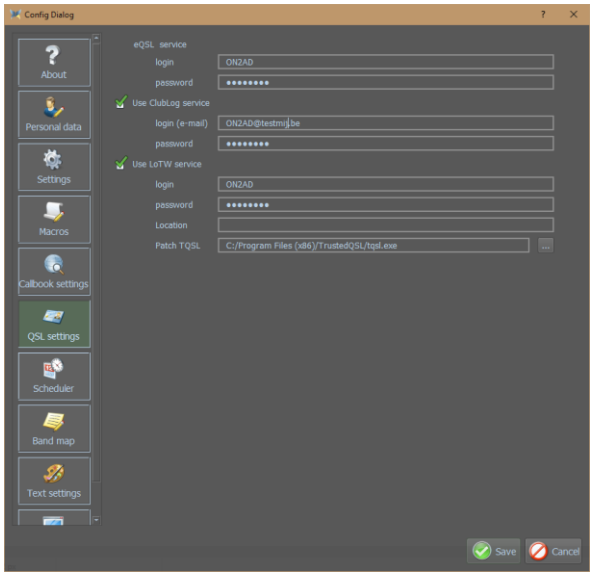
If you look up the information from a call sign (Call) through a Callbook and want it to be automatically entered into your log fields, go to the Callbook Settings tab. In the example you can see how to do it for QRZ.com. In the fields, you must enter your call sign, which is registered on QRZ.com and the password of your account of this service. Similar for HAMQTH.com, QRZ.ru and QRZCQ

Click on "Test login" to see if your Login and password have been entered correctly.



(top setup) (top)

QSL setting:

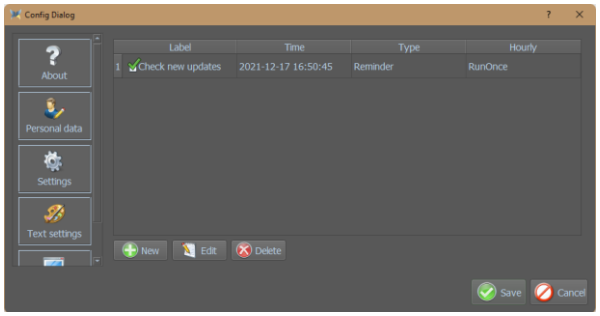


If you want to download QSOs to eQSL, login will include your call sign (Call), and in password you enter the eQSL password.

To use Clublog, enter your email address and password

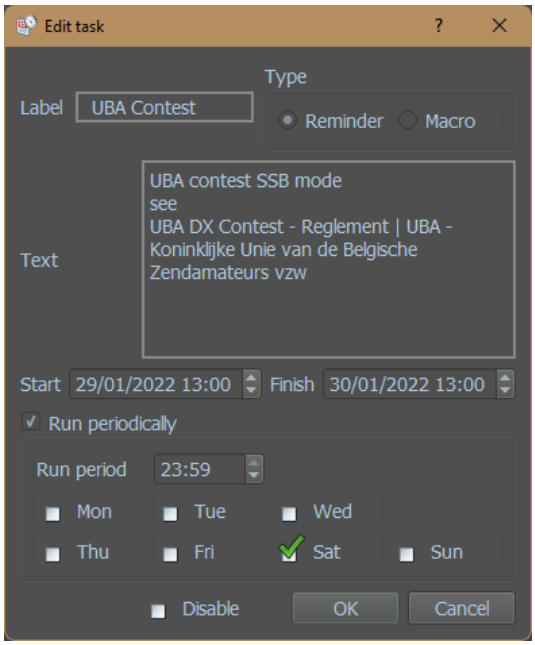
(top setup) (top)

Scheduler

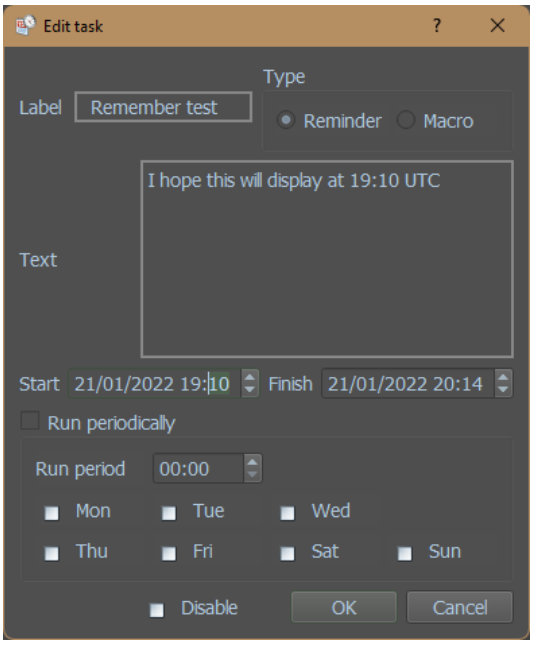


The Scheduler allows the MixW4 operator to specify an event by date and time. The event can be a reminder or a macro to run. If you select Scheduler, you will see the list of events.

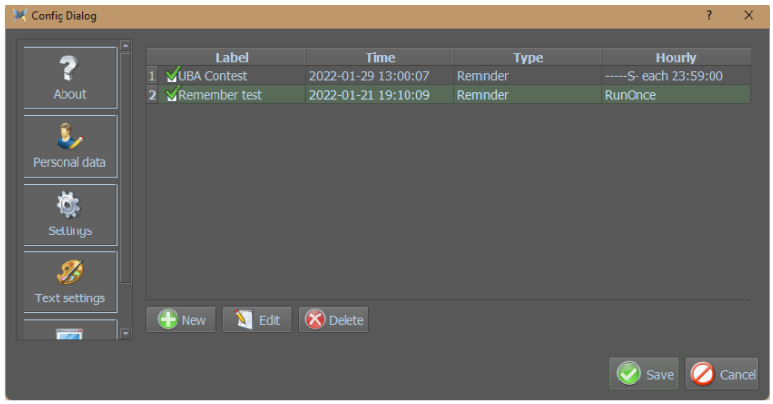
Selecting New or selecting a previously entered open event and selecting Edit details show the event details.



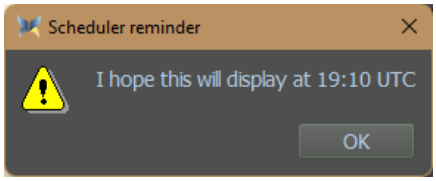
Click OK to save the data



Click OK to save the data



Click on Save to start the Scheduler



This will then be the result

All unprocessed or repetitive activities are copied to the schedule.txt file, in the MixW data folder, in the Data sub folder in ADIF style format.

(top setup) (top)

Band map

This allows you to view and/or change the Band map.

Band map description

The band map defines the limits of the HAM bands in which MixW will work and provides the ability to make personal choices in frequency and mode selection.

Each line in the band folder consists of 6 data columns. The rules for each band are grouped for readability, but do not have to be in a certain order.

The input is:

Band	Mode	Start Fq	Def.Fq see below	End Fq see below

Numeric data in meters or centimetres with m or cm added to the figure	A mode that can be selected from the Modes menu. Can also be **ALL** which defines the Start and End frequencies for this band. The Default frequency is selected if no recognised Mode is selected.	The lower frequency within the band plan for this MixW mode within the band. The lowest frequency in this column defines the low band limit.	The default MixW frequency is set when switching to this band in this mode.	The upper frequency in the band plan for this MixW mode. The highest frequency in this column defines the maximum band limit

Note: When the band plan is saved, the Def.Fq and End Fq columns are exchanged in the saved file.
This is to continue to use the same format as in previous versions and to still be able to use it (file name bands.ini).

For a band to be visible in the CAT display and useable a line must be included:
{band_name} ALL {Min_freq (khz)} {Max_freq (khz)} {Working_freq (khz)}.
This defines the band minimum and maximum frequencies.

As an example, below is the standard entries for the 20-meter (14MHz) band for the band supplied by MixW2 and 3.
See Bands.ini

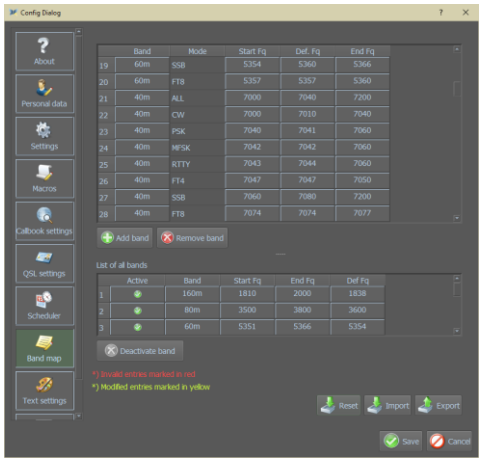
; 20m band

20m	SSB	USB	14100	14350	14100	Determines the maximum tire limit
20m	CW	CW	14000	14350	14010	Determines the lower and upper band limits
20m	RTTY	Default	14065	14112	14080	
20m	PSK31	Default	14065	14112	14070	
20m	QPSK31	Default	14065	14112	14070	
20m	FSK31	Default	14065	14112	14070	
20m	PACKET	Default	14065	14112	14105	
20m	HELL	Default	14065	14112	14062	
20m	SSTV	USB	14220	14240	14230	
20m	ALL	Default	14065	14112	14070	

Note: You will need to check the band folder after installation to determine that the band limits for your region and license are correct.

For each item you want to change, hover over the box and double-click to open editing mode. If you move the mouse pointer to a new box and double-click again, the previous editing details are saved, and that box is selected.

Once the changes are complete, click Save to save the changes



Data validity check

*) Invalid entries marked in red — Invalid entry found.

*) Modified entries marked in yellow — Changed/inserted line.

A validity check is carried out on the Band map information when the Band map setting is opened and after any changes are applied.
If any inconsistencies are found the entry or entries are changed to red.
You will need to use the side scrollbar to check for errors.
There is no warning that hidden entries have errors.

Add band

This feature lets you add a band

Remember to first enter the full band as DEFAULT and click on the "Apply" button and then on the next line you can enter everything by mode see example:

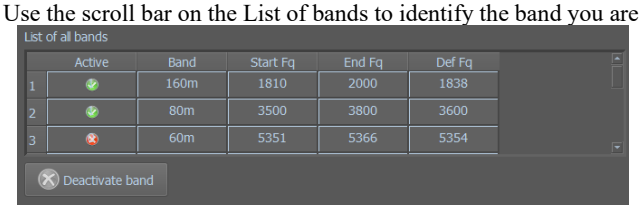
Band	Mode	Start Fq	Def. Fq	End Fq
160m	ALL	1810	1838	2000
160m	CW	1810	1820	1838
160m	MFSK	1838	1838	1843
160m	PSK	1838	1839	1843
160m	FT4	1840	1840	1843
160m	FT8	1840	1840	1843
160m	SSB	1843	1885	2000

Remove band

This function allows you to remove a band

Deactivate/Activate band

These actions are not permanent changes.
They can be reversed later if necessary.
Use the scroll bar on the List of bands to identify the band you are going to change and select it.

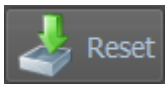


An active band will display a in the Active column.

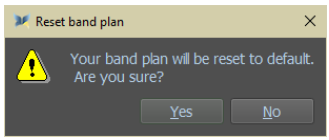
The deactivate control will show a with the band number to be deactivated.

Click on the Deactivate or Activate control.
A message box asking for confirmation of the action is displayed.
If confirmed this will reverse the setting in the List of bands, remove or replace the entire band entries in the Band map and remove or replace the band in the CAT window.
Click Save to activate the changes.

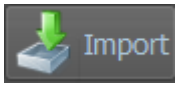
Reset band plan



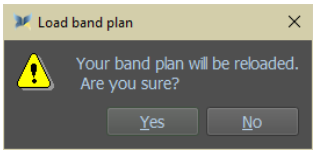
This control Resets the band map to the delivered state. A warning message is displayed.
Click Yes, wait 5 seconds. Any changes made will now be removed.



Import Band plan

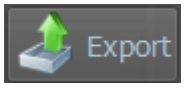


This will reloaded your own band plan or load a modifications file, in MixW3 bands.ini format, to the running band map
Click on Yes, or press the y key. A file selection window will be displayed.

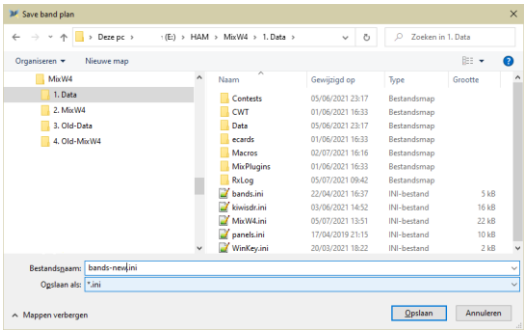


Select the file you wish to import and click on Save. Wait 5 seconds and this file is now merged with the existing band plan data.
Now check the updated data to check for validity of the input data. Lines in yellow have been changed but are OK.

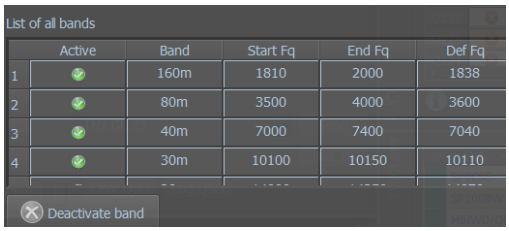
Export Band map



Once any changes have been made Export the changes. This brings up a file selection window.
Enter the filename and click on save. The backup file is now created. The data format is the same as the bands.ini file from MixW3.
Click Export.
Opens a file selection window.



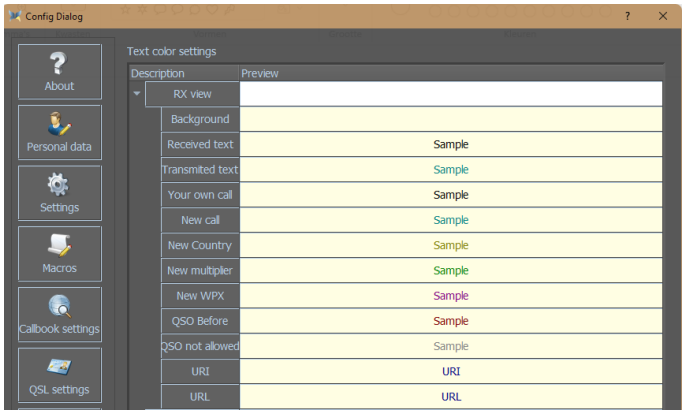
List of all bands



Here are all available tires that are in use by radio amateurs.
With the "Deactivate band" button you can simply deactivate certain bands.

(top setup) (top)

Text settings:

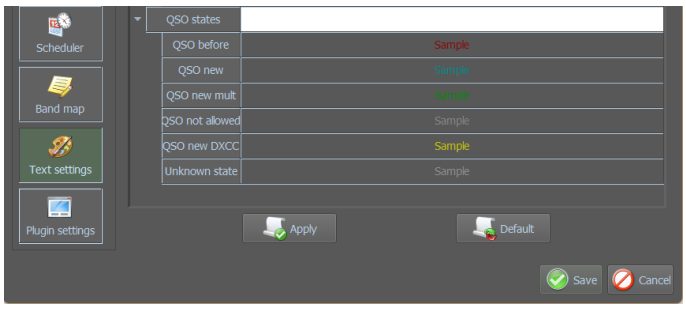


The RX view section.

Select your color preferences.

This setting currently only applies to the receipt/shipping windows.

Now place the mouse in the item you want to change and double-click it. This opens a color palette selection window.
See below.

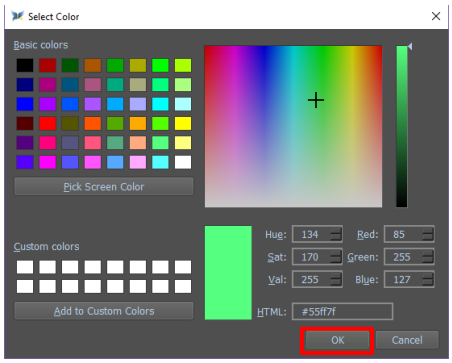


The QSO states section

Defines the Contest mode text colours.
These settings can also affect the
FT4/FT8 text colours,
The DXCluster display,
The QSO Statistics display
The Earth map square colour.

After you select the color, click OK. Repeat for other items you wish to change.

Finally, click Apply, and then click Save. The adjustments are immediately visible

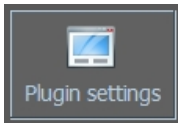


(top setup) (top)

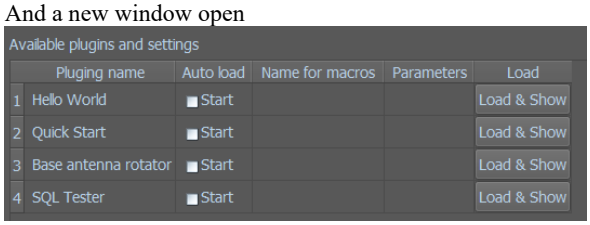
Plugins

MixW4 has a facility to introduce extra functionality with the use of Plugins.
These are extra tools made available to assist users by improving operational capability.
The plugins are found in the {Data_root}\MixPlugins folder.

Click on the Plugin settings



And a new window open



1. **Hello World** - A simple demonstration plugin.

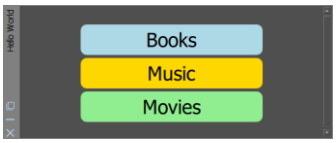
2.	**Quick Start**	-	Tick the box to have the plugin start at MixW4 load time.
3.	**Base antenna rotator**	-	Controls a rotator.
4.	**SQL-tester**	-	Create your own SQL to read data from the multipan.db3 database.

The column names in the table

*	**Plugin name**	-	The name of the plugin.
*	**Auto load**	-	Tick the box to have the plugin start at MixW4 load time.
*	**Name for macros**	-	Use this entry to control loading of the plugin using the macro. The name is case sensitive when used in the macro.
*	**Parameters**	-	Parameters for use by the plugin.
*	**Load**	-	Click on the control to start the plugin. Multiple copies of the plugin can run at the same time.

Hello World

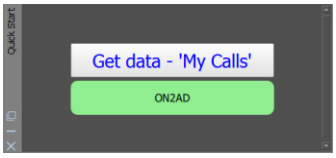
Display only a picture



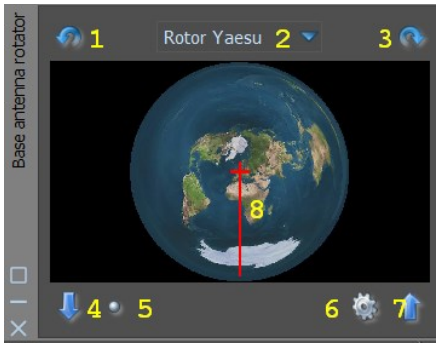
Quick Start

Click on Get data - 'My Calls'

Your call from your last QSO is displayed in the result window.

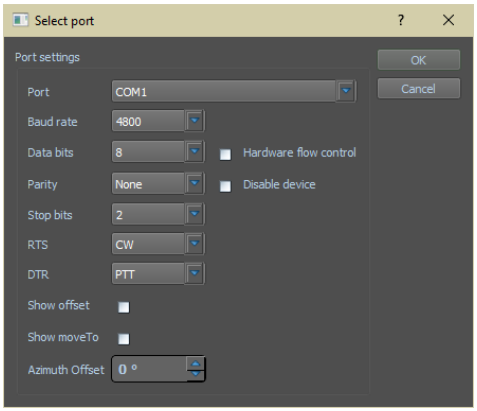


Base antenna rotator



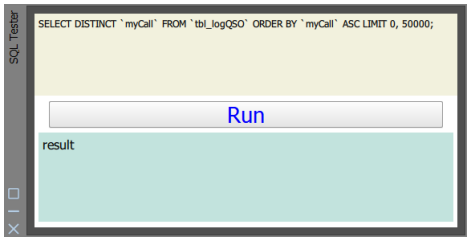
1. Manual operation of the rotor.
2. Choice of:
   Rotor Yaesu
   Rotor ProSisTel
   Rotor HyGain
   Rotor Orion
3. Manual operation of the rotor.
4. Automatic rotor operation.
5. Rotor connection.
6. Rotor setting (see below).
7. Automatic rotor operation.

When clicking on the “wheel” settings, the following window opens for the setting of the selected rotor.



SQL Tester

This is a pre-version where some improvements and simplifications will be made.



With this SQL tester you can execute certain commands, such as the SQL:

SELECT DISTINCT `myCall` FROM `tbl_logQSO`
ORDER BY `myCall` ASC LIMIT 0, 50000;

All of your callsigns will display.

CAT system

Introduction

This chapter explains how to create the best settings. In addition, MixW4 CAT settings and some interfaces, as well as the use of a CAT cable are explained. If you have a functioning MixW4 with an unlisted interface or transceiver, please let us know so that the manuals are always up-to-date and can help other HAM's.

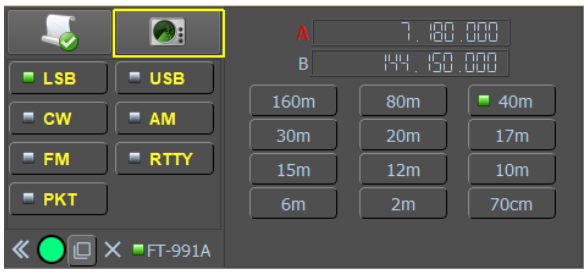
Configuration

There are up to 5 different settings that can affect the operation of the MixW4 transceiver:
1. **Windows** - Audio and COM port settings.
2. **MixW4** - Audio, CAT, Macro and COM port settings as well as Mode settings.
3. **Interface settings** - This applies to transceivers that are not directly connected via USB. Audio (possible), COM ports and settings, controls.
4. **Audio -** This is for non-USB transceivers. Audio can be available in the interface.
5. **Transceiver** - Audio and COM port settings; Control lines.
   To ensure that your MixW4 transceiver connection is working properly, all required components must be configured correctly.
   When you try to configure the installed interface, you may need to use the Windows Device Manager to check the COM ports or audio ports.

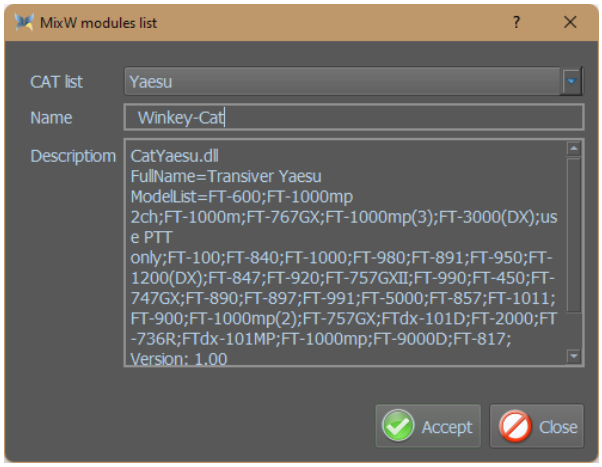
To enable Device Manager, run C:\Windows\System32\devmgmt.msc. I created a desktop icon, but you can also use the {Windows key} + R or use a command prompt by running cmd.exe. Most interfaces are powered by the computer's USB cable. The recommended USB cable with a maximum length is 5 meters.

The use of a 5-meter cable and a potentially loaded PC power supply can cause temporary operational problems. The voltage drops over the USB cable may be sufficient if you do not reach the recommended operating voltage for using your interface unit. One solution that has worked well with previous versions of MixW is to use two shorter USB cables and a SELF-charging USB hub between cables.

Click on CAT-settings



Click on New



Select the brand of your transmission receiver (transceiver) from the CAT list.

In Line Name, you enter the model of your transmission receiver (transceiver) or the setup.

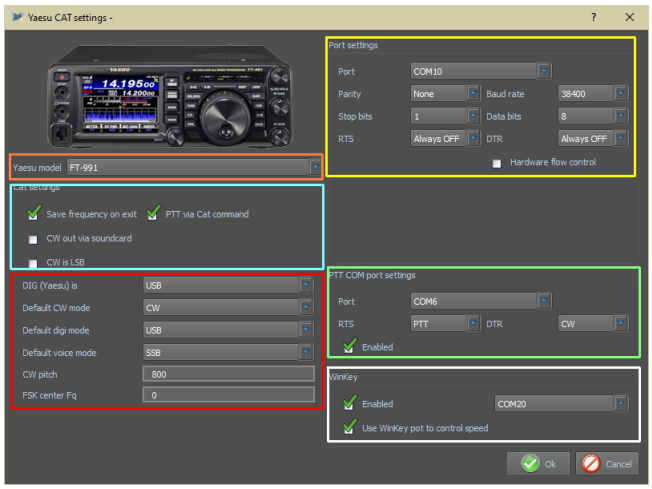
You can create more than 1 transceiver record.

The name for each record must be unique.

Click on Accept

Click Settings now

[CAT screen]



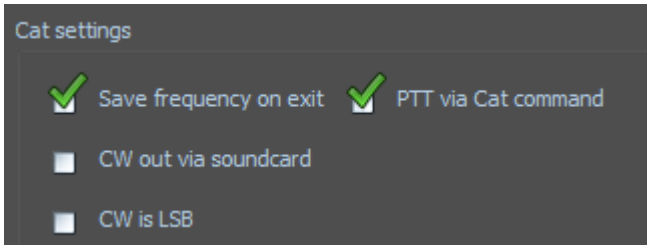
Select your transceiver
Fill in your Port settings like your COM ports.

Here are RTS and DTR on Always OFF for use with the micro KEYER II
Complete your PTT COM port setting.

And tick some CAT settings as you wish, or consult your transceiver manual

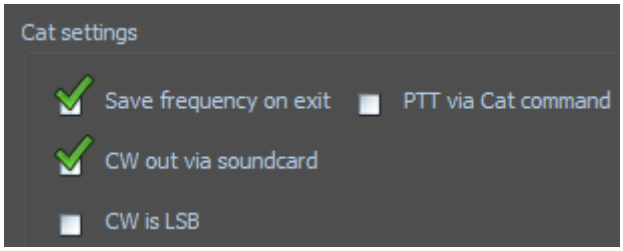
Enable Winkey if you wish to use it

For each manufacturer/brand name, this gives a list of all the transceivers that MixW4 can operate. The model field should show the identity of the transceiver you are going to control using this CAT configuration.



Either this configuration

or



this configuration or ……

Save frequency on exit: When MixW4 is closed, the transceiver frequency is stored.

CW out via soundcard: The Morse generated by MixW4 is sent through the sound card. This means that the rig must be in digital mode as used by PSK31 and that the frequency used is controlled in the same way as the PSK modes.

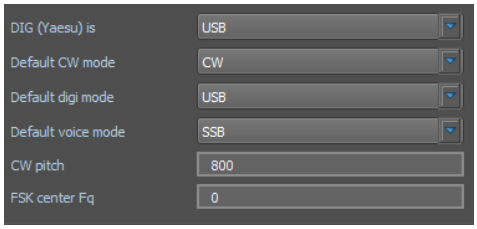
If this is not checked, the transmission cursor in the waterfall will have a fixed frequency, as set by the CW pitch setting below.

CW is LSB: Morse is sent through the lower side band.

MixW4 uses the sound card to generate RTTY. The transceiver must be in the digital mode used for PSK31. When FSK is used, the transceiver generates RTTY signals internally. There is a transceiver mode to control this output and MixW4 has a separate com port to enter the data.
Note: Not all transceivers support FSK operation.

PTT via Cat command: Use the CAT PTT command to switch to transmission. If this is not checked, the transceiver will be switched to TX by using the VOX control, the PTT com port or by manually switching to transmission.

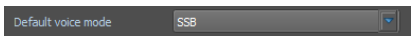
This frequency is visible in the CAT screen



DIG (Yaesu) is: A drop down menu of USB, LSB or FM

Default CW mode: A drop down menu of CW, CWR, USB, LSB, PKT, PKTR or None. For CW via the soundcard use the setting you normally use for digital modes.

Default digi mode: A drop down menu of USB, LSB, PKT, PKTR or None. RTTY via FSK is not currently supported. Use the setting PSK runs in for RTTY mode.

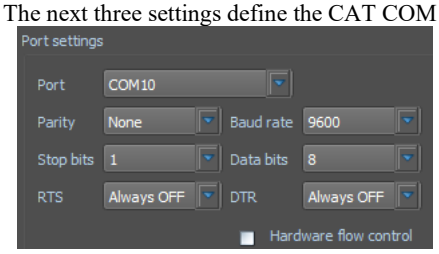


Default voice mode: A drop down menu of SSB, USB, LSB or None.

CW pitch: Set the Pitch value for use when running CW via CAT interface. Default 800.

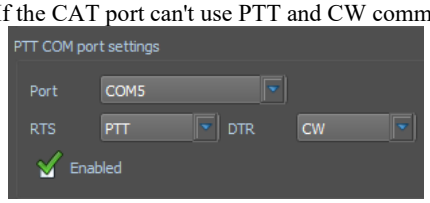
FSK center Fq: If you haven't selected AFSK instead of FSK, enter your selected FSK frequency.
Note: a value of 2250 seems to be a common setting.

The next three settings define the CAT COM port, PTT COM port and Winkey COM port.



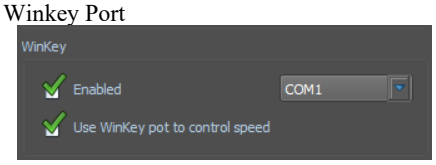
Enter your CAT **Port** number.
Parity, Baud rate, Stop bits and **Data bits** must be the same as those set in your transceiver.
If your transceiver can use the CAT port **RTS** and **DTR** lines for control these can be used for PTT and or CW actions.
Hardware flow control is very rare in modern transceivers.

If the CAT port can't use PTT and CW commands the PTT com port can provide these functions.



Enter your PTT/CW **Port** number.
Select the function **RTS** and **DTR** are to action from the drop down list for each control.
Click **Enabled** to use this port.

Winkey Port



Enter your WinKey port number in the text box.
Select **Enabled** to activate the port.
Select **Use WinKey pot** to control speed if you need to.
Once the CAT settings have been selected click OK. You can return to the settings screen at any time if you wish to make changes. Once the CAT settings have been selected click OK. You can return to the settings screen at any time if you wish to make changes.

(top)

After the CAT settings are accepted, two files are created in the folder data_root.

Catlist.json - The list of all supported transceivers for the brand name

Cat {brand} .json - The individual CAT settings file

PKT vs DATA

Historically, the button is called PKT, but depending on the model, it performs the DATA function on new transceivers and PKT on older ones.
In general, in terms of functionality, this is the same thing.

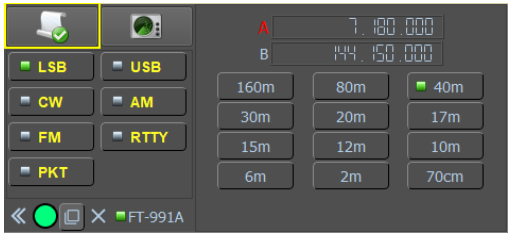
Rig Cat Control

Further control of the transceiver is possible by entering individual CAT commands.
These commands can be found in the corresponding transceiver manual.

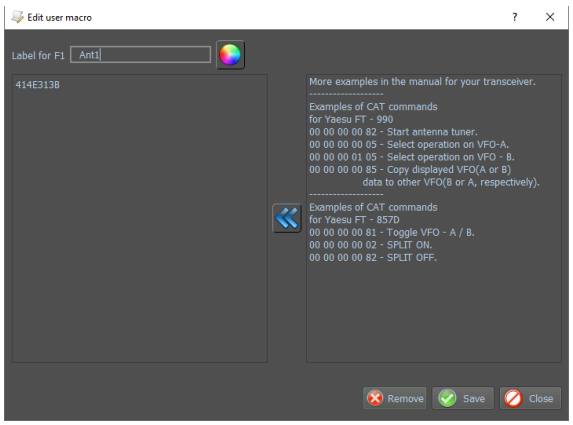
There are two methods of sending CAT commands:
Use the macros <CATCMD:> or <CATCMDHEX:>
Use, the CAT storage area below.

With the left mouse button, a window “Edit user macro” appears.

Click on this icon



Click on Add CAT command



Currently, only hexadecimal commands can be used. The example 414E313B translates to Ant1; This is the command that switches to Antenna 1 on a TS-2000. So, any transceiver that uses alphanumeric characters/numeric characters for CAT control can be controlled here from macros.
It is just time consuming to translate them.

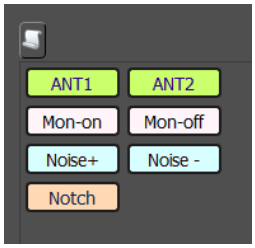
(top)

CAT commando’s TS-2000E

Here are some examples of rig cat control commands.

What	-	Label	-	Hex	
Antenna 1	-	ANT1	-	414E313B	

Antenna 2	-	ANT2	-	414E323B	
Notch	-	Notch	-	4E54313B	1 click switches ON a second click switches OFF
LSB	-	LSB	-	4D44313B	
USB	-	USB	-	4D44323B	
CW	-	CW	-	4D44333B	
TX-monitor ON	-	Mon-on	-	4D4C3030313B	Monitor volume is set to 1
TX-monitor OFF	-	Mon-off	-	4D4C3030303B	Monitor volume is set to OFF
Noise blanker	-	Noise+	-	4E42313B	Noise more blank
Noise blanker	-	Noise-	-	4E42303B	1 click switches ON a second click switches OFF

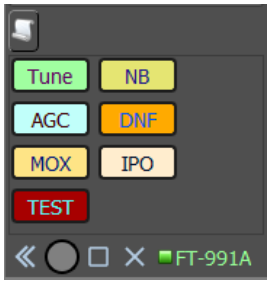


Example for 7 macros for the TS-2000 with the info listed above
ANT 1 and **ANT 2** switch on antenna 1 or 2
Mon-on and **Mon-off** switch the monitoring of the transmitted signal
Noise+ and **Noise-** switch the Noise filter
Notch switches the Notch filter

CAT commando's voor de FT-991A

Here are some examples of rig cat control commands.

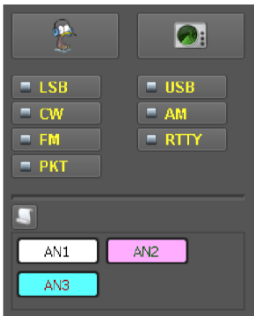
MODE	HEX	CATCMDHEX command	CATCMD Command
A/B	41 42 3B	<CATCMDHEX:41 42 3B>	<CATCMD:BA;>
A=B	42 41 3B	<CATCMDHEX:42 41 3B>	<CATCMD:AB;>
FREQ 014250000 kHz (14.250 kHz)	46 41 30 31 34 32 35 30 30 30 30 3B	<CATCMDHEX:46 41 30 31 34 32 35 30 30 30 30 3B>	<CATCMD:FA014250000;>
IPO1	50 41 30 31 3B	<CATCMDHEX:50 41 30 31 3B>	<CATCMD:PA01;>
IPO2	50 41 30 32 3B	<CATCMDHEX:50 41 30 32 3B>	<CATCMD:PA02;>
MODE AM	4D 44 30 35 3B	<CATCMDHEX:4D 44 30 35 3B>	<CATCMD:MD05;>
MODE AM-N	4D 44 30 44 3B	<CATCMDHEX:4D 44 30 44 3B>	<CATCMD:MD0D;>
MODE C4FM	4D 44 30 45 3B	<CATCMDHEX:4D 44 30 45 3B>	<CATCMD:MD0E;>
MODE CW-LSB	4D 44 30 37 3B	<CATCMDHEX:4D 44 30 37 3B>	<CATCMD:MD07;>
MODE CW-USB	4D 44 30 33 3B	<CATCMDHEX:4D 44 30 33 3B>	<CATCMD:MD03;>
MODE DATA-FM	4D 44 30 41 3B	<CATCMDHEX:4D 44 30 41 3B>	<CATCMD:MD0A;>
MODE DATA-LSB	4D 44 30 38 3B	<CATCMDHEX:4D 44 30 38 3B>	<CATCMD:MD08;>
MODE DATA-USB	4D 44 30 43 3B	<CATCMDHEX:4D 44 30 43 3B>	<CATCMD:MD0C;>
MODE FM	4D 44 30 34 3B	<CATCMDHEX:4D 44 30 34 3B>	<CATCMD:MD04;>
MODE FM-N			<CATCMD:MD0B;>
MODE LSB	4D 44 30 31 3B	<CATCMDHEX:4D 58 31 3B>	<CATCMD:MD01;>
MODE RTTY-LSB	4D 44 30 36 3B	<CATCMDHEX:4D 44 30 36 3B>	<CATCMD:MD06;>
MODE RTTY-USB	4D 44 30 39 3B	<CATCMDHEX:4D 44 30 39 3B>	<CATCMD:MD09;>
MODE USB	4D 44 30 32 3B	<CATCMDHEX:4D 44 30 32 3B>	<CATCMD:MD02;>
MOX ON	4D 58 31 3B	<CATCMDHEX:4D 58 31 3B>	<CATCMD:MX01;>
NB OFF	4E 42 30 30 3B	<CATCMDHEX:4E 42 30 30 3B>	<CATCMD:NB00;>
NB ON	4E 42 30 31 3B	<CATCMDHEX:4E 42 30 31 3B>	<CATCMD:NB01;>
QUICK SPLIT	51 53 3B	<CATCMDHEX:51 53 3B>	<CATCMD:QS01;>
SWR	4D 53 33 3B	<CATCMDHEX:4D 53 33 3B>	<CATCMD:AC000;>
TUNER OFF	41 43 30 30 30 3B	<CATCMDHEX:41 43 30 30 30 3B>	<CATCMD:AC000;>
TUNER ON	41 43 30 30 31 3B	<CATCMDHEX: 41 43 30 30 31 3B >	<CATCMD:AC001;>
TUNER Start - Stop	41 43 50 33 32 3B	<CATCMDHEX:41 43 50 33 32 3B>	<CATCMD:AC002;>



Example for 6 macros for the FT-991A with the info listed above
Tune switch the Tune mode on.
NB switch the Noise Blanker on.
AGC switch the Automatic Gain Control on
DNF switch the Digital Notch Filter in enabled
MOX locked the transmitter on ON
IPO switch the Intercept Point Optimation on

The example shows three macros that switch an FTdx3000 to antenna 1, 2, or 3.

Clicking on a macro name on the left creates execution.



In **AN1**, 414E30313B is entered and this is the command that switches to antenna 1.

All CAT commands entered here are stored in the CAT settings file (CatYaesu.json).

Transceiver Mode change

These mode switches control the mode in which your transceiver is located. They do not make the MixW software select a mode.

LSB	-	selects the LSB mode
USB	-	selects the USB mode
CW	-	selects the CW mode
AM	-	selects the AM mode
FM	-	selects the FM mode
RTTY	-	selects RTTY mode. This mode works in conjunction with FSK control
PKT	-	selects the Data (data or digital) Digital mode

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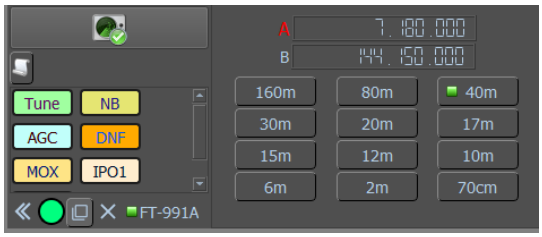
Check your transceiver's guide to decide which setting is the right one for the mode you want to work in. Not all modes are available in all transceivers

For example: maybe you want to work with Data USB. Just using the USB control will put your transceiver in USB mode, which may mean that your data entry takes place through the microphone input, although MixW sends it through the data input port.

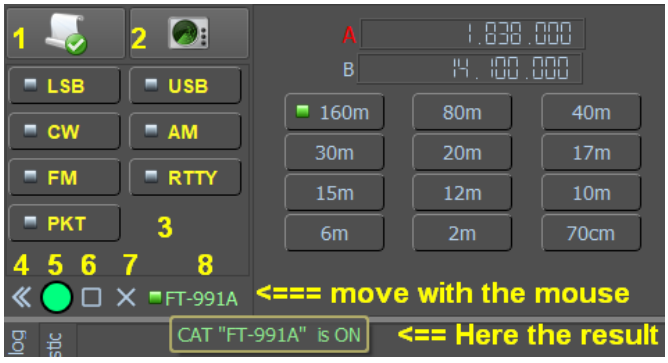
(top)

Hide and show CAT screen



By pressing this button, the CAT's screen disappears, making way for the waterfall

CAT screen



1. Show/Hide KiwiSDR Waterfall.
2. CAT settings
3. Transceiver Mode Switching
4. Collapse window
5. Select the basic color
6. This symbol allows you to lock a screen and not insert it
7. Close the window
8. CAT port status information.
   Hover the mouse over the square.

Colours:

CAT not configured yet.
CAT not functioning correctly.
CAT operational.
Not used yet.

9. The CAT window displays the current transceiver frequency and provides there change facilities.

10. The selected band has a small green indicator associated with the selection button.
This window can be turned on or off by clicking on the box to the left of Show / Hide Views in the items on the main menu (Main menu items).

(top)

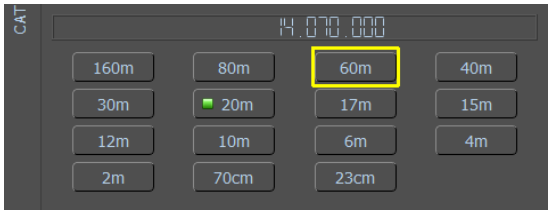
Create a new band entry in the CAT window

Go to Settings/Band map click on Add band and fill in all the info need for this band.
But do not forget to write “DEFAULT” in the “Trcvr” column, the begin frequency in “Start Fq” and the end frequency in the “End Fq” column.
Then you can in a second or more lines all the other needed info.
eg:

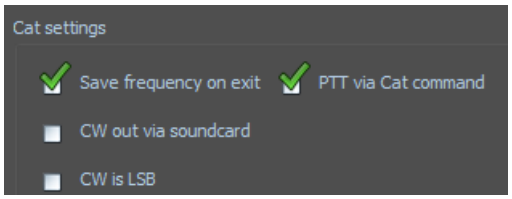
Band	Mode	Trcvr	Start Fq	Def.fq	End Fq
60m	ALL	DEFAULT	5351	5352	5366
60m	CW	CW	5351	5351	5354

After this is done click on “Apply” and then on “Save”

Now the new band is view in the CAT window

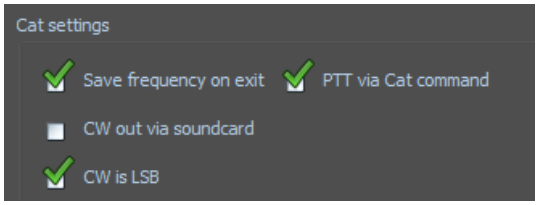


CAT setting for CW, in CW modi



Turn the transmitter into CW mode and turn MixW into CW mode click the CAT setup now and click on the Settings of your transmitter and check as in example

CAT setting for CW, in SSB modi



Turn the transmitter into SSB mode and turn MixW into CW mode click the CAT setup now and click on the Settings of your transmitter and check as in example

(top)

Digital Mode Signal Reception and Transmission

Reception and transmission of signals in digital mode can be split into two parts. General requirements for all different operating modes and mode-specific requirements.
This section covers the common requirements for digital mode reception and transmission. Any special requirements for a specific mode will be included in that mode's section.

MixW4 Mode selection.

To select the mode, you want or to change mode, you can either;
Use the Status Bar Rx Mode menu choice
Or
Use the <MODE:> and / or <BAUDRATE:>, <SET TONES:> and <SET BW:> macros as required.

Tuning.

The transceiver tuning is used to locate signals of the selected mode in the selected band. Fine tuning will be done by using the waterfall cursor to line up on the signal. Minor adjustments maybe made by using the Mouse wheel. Use the MixW General settings Mouse wheel configuration settings to set for your choice of stepping values

Once the signal has been selected a decode should start to appear in the receive window. Further micro adjustments maybe achieved by creating a pair of macros.
Either:

<FQ: +0,001>
<FQ: -0.001>
These macros adjust the transceiver tuning by +/- 1 Hz.

Or:
<AUDIOFQ:+0.001>
<AUDIOFQ:-0.001>
These macros adjust the audio frequency by +/-1Hz.

The reception frequency may be locked by use the Fixed Rx frequency control in the Receive Mode status bar or the <LOCKRX> macro.

USB or LSB?

The convention for working in digital mode is USB. Several modes can be operated in USB or LSB and received in the opposite side band. Historically with RTTY as an FSK signal mode, it is common to find LSB signals.

MixW4 has an Invert control available which will reverse the signal being received. If a signal is being received but no sensible data is being displayed in the receive window reversing the setting of the Invert control may enable a decode..

Filters

Currently, MixW4 has no built-in filtering. The only aids to assist with signal resolution are the waterfall zoom and magnification controls.

Modern transceivers with Digital Signal Processing (DSP) can provide very good signal filtering. Consult your transceiver manual to find the best filtering available for your needs.

MixW4 will most likely need to be configured to set your transceiver into the correct operation mode for the MixW4 mode you are operating in. See the sections on Band map, CAT configuration, and Transceiver mode switchung.

By use of the CAT Macro commands <CATCMD:>, <CATCMDHEX:> or the CAT control storage area you may be able to include CATCMD macros to select your choice of transceiver filters. Consult your transceiver manual or transceiver CAT programming manual.

Transmission

Once the transceiver is tuned to a wanted signal or frequency, the required selected and you have entered your call on the Personal data page, you are now ready to transmit.

Type data in the transmit window or use macros to enter regularly used data.

To put MixW into the transmit, use the Send button under the transmit window (the control will changes to Stop whilst MixW4 is transmitting) or use the macros <TX> or <TXTOGGLE>. You may continue typing data into the transmit window whilst MixW4 is transmitting.

As data is transmitted, it will be reflected in the receive window. The colour of this text can be changed to your personal choice using the Text Settings menu.
To stop transmitting it will use the stop button under the receive window, use the macros <RX>, or <RXANDCLEAR> or <TXTOGGLE> or press the Escape key which is an 'Emergency Stop Control'. If you use the Escape key, the transmission will stop instantly possibly leaving unsent data in the Tx window. If the Escape key is pressed twice in quick succession, the data in the TX window is erased.

You may find your digital QSO's 'wandering'. The reception signal is never on the same frequency as the previous transmission. To counteract this, try Locking or Fixing your transmit signal. Either use the Fixed TX frequency control in the Transmit Mode status bar or the <LOCKTX> macro

When transmitting, the waterfall will freeze and remain frozen until it returns to Receive.

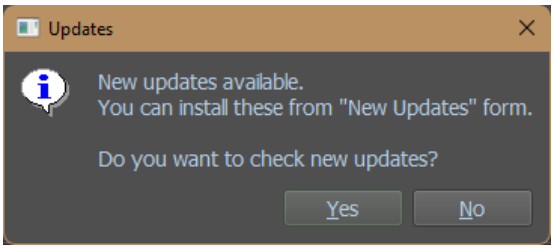
Multiple windows

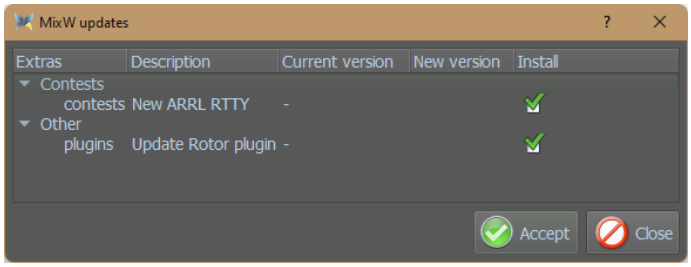
With most of the digital modes, It is possible to open multiple windows and switch the active window (the one you will be sending from) between them.

(top)

Updates available

Only displayed if new updates are available.
Click “Yes” if you want to update, otherwise click “No”
If you clicked “Yes, a selection screen will be displayed.





Here you select the desired updates.

Then click Accept to install the updates.

A new icon also appears when there are updates

Fonts and Colours.

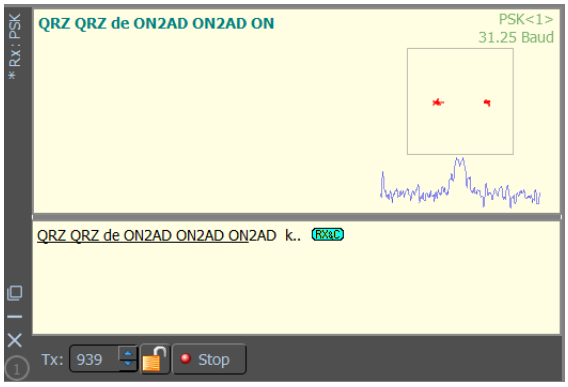
The Tx/Rx windows fonts may be set by the Rx Window. Only one font maybe selected for all modes that use the RX/TX window except Hellschreiber.
For Hellschreiber mode up to 4 fonts may be selected by using the Hellschreiber Mode settings dialogue.

Text colours

Set the text colours using the Setting-Config dialog menu Text settings.

Operating

Receive and Transmit windows



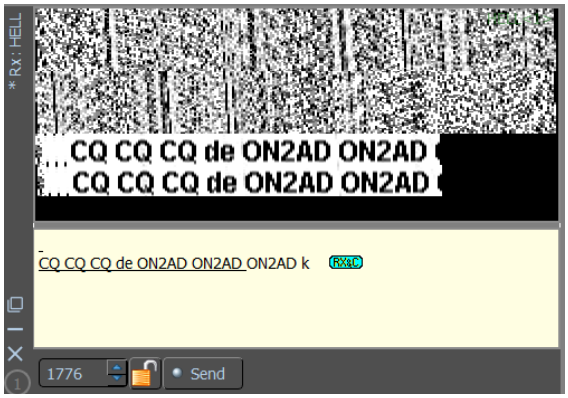
Receive window.
Right click in the window to bring up the Receive Window Menu.

The same font is used in both Receive and Transmit windows apart from Hell mode.

Transmit window. Right click in the window to bring up the Transmit Window Menu

The font colours are selected from the Text settings menu.

Transmit controls bar.



A choice of up to 4 transmit fonts are available in Hell mode.

The receive font is as selected by the station you are receiving.

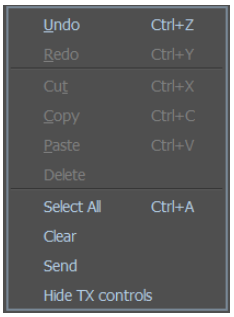
The transmit window font is as selected for all modes.

A Receive Mode Status Bar is located at the bottom of the main MixW4 window.

A Transmit Controls bar is located below the transmit window.

Transmit Window Menu

By right clicking the mouse in the TX Window the following menu is displayed.



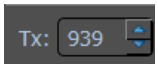
Undo
Redo
The menu items from **Copy** to **Clear** are standard windows text edit controls.

Send/Stop has the same effect as the Send/Stop button below.

Hide TX controls closes the transmit window.

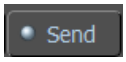
(top)

Transmit Controls

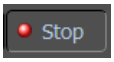


Transmit audio frequency

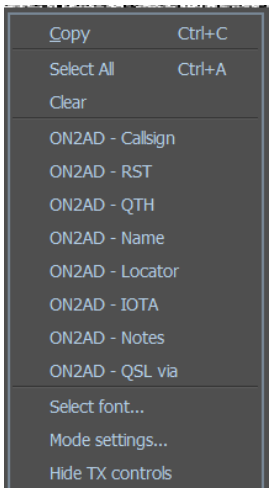
Transmit lock/unlock indicator and toggle control.



Toggles the transceiver between Tx and Rx.
The button changes from Start to Stop when MixW is transmitting.



Receive Window Menu



The menu items from **Copy** to **Clear** are standard windows text edit controls.

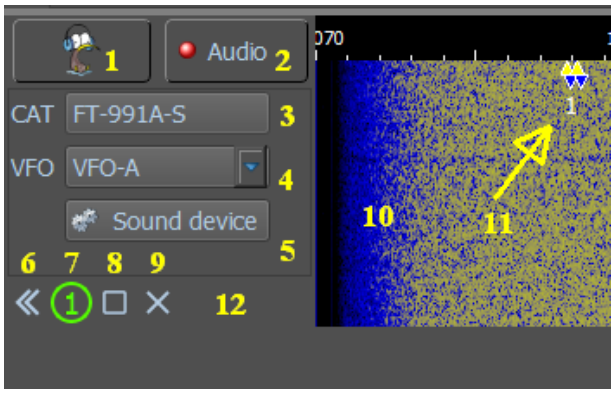
If text is highlighted in the RX window the above menu becomes modified to this one, and you can select one of this

Callsign
RST
QTH
Name
Locator
IOTA
Notes
QSL via

Select font... Opens a Font selection dialogue. The selected font is for the RX and TX windows. Font colours are selected through the Text settings menu.
Mode settings... Opens the Current MixW4 Mode settings window.
Hide TX controls A toggle control to show or hide the Transmit window.

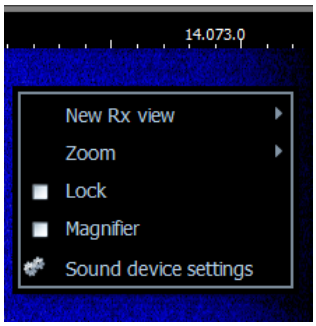
(top setup) (top)

Waterval settings

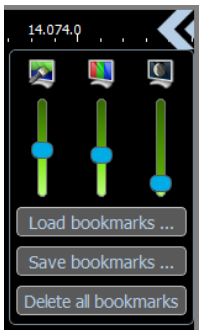


1. Show/Hide KiwiSDR Waterfall.
2. Toggle between RF or Audio frequency on waterfall display.
3. Cat Configuration in use (set up in CAT settings).
4. Select VFO to use (frequency shown in CAT display).
5. Select Sound device.
6. Waterfall size adjust.
7. Waterfall number.
8. Dock/Undock for Waterfall resizing and repositioning.
9. Close Waterfall. Also closes the Mode display.
10. Waterfall
11. Diamond(s) and Number of Spectrum
12. Right click displays Show/Hide views menu.

By clicking the left facing double arrow icon the waterfall size is increased. The double arrow now changes to right facing. Click this and the waterfall shrinks



Place the cursor in the waterfall area and right-click the menu that appears, select Zoom, and choose the value that is right for you

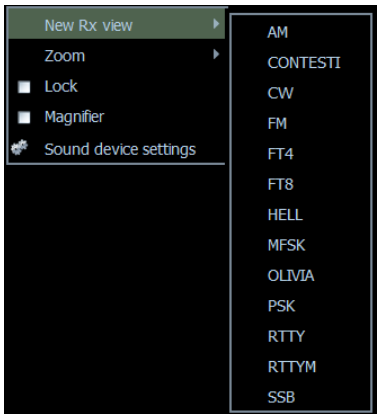


You can change the brightness, contrast and speed of the waterfall in the pop-up menu by clicking in the upper right corner of the waterfall with the left mouse key, and moving the sliders from bottom to top

Bookmarks

May have been saved or loaded from files.
These files are stored in the folder
{Data files load point} \ Text type data(.txt).

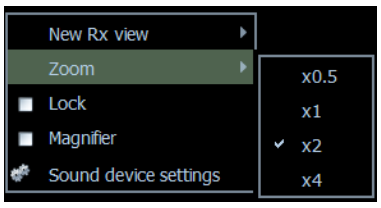
New Rx View:



Select the mode for any additional signals you wish to monitor.

A new receive window will be opened.

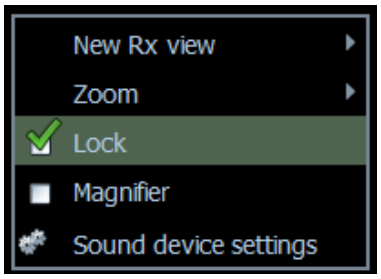
Zoom:



Select Zoom from the pop-up menu and set the value you want.

Use Zoom to help align signals.

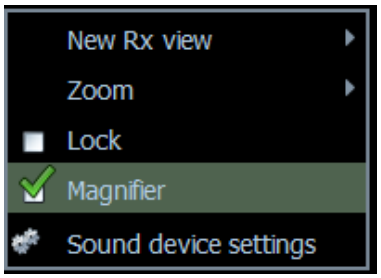
Lock:



The Lock locks the cursor on the signal

(top)

Magnifier:



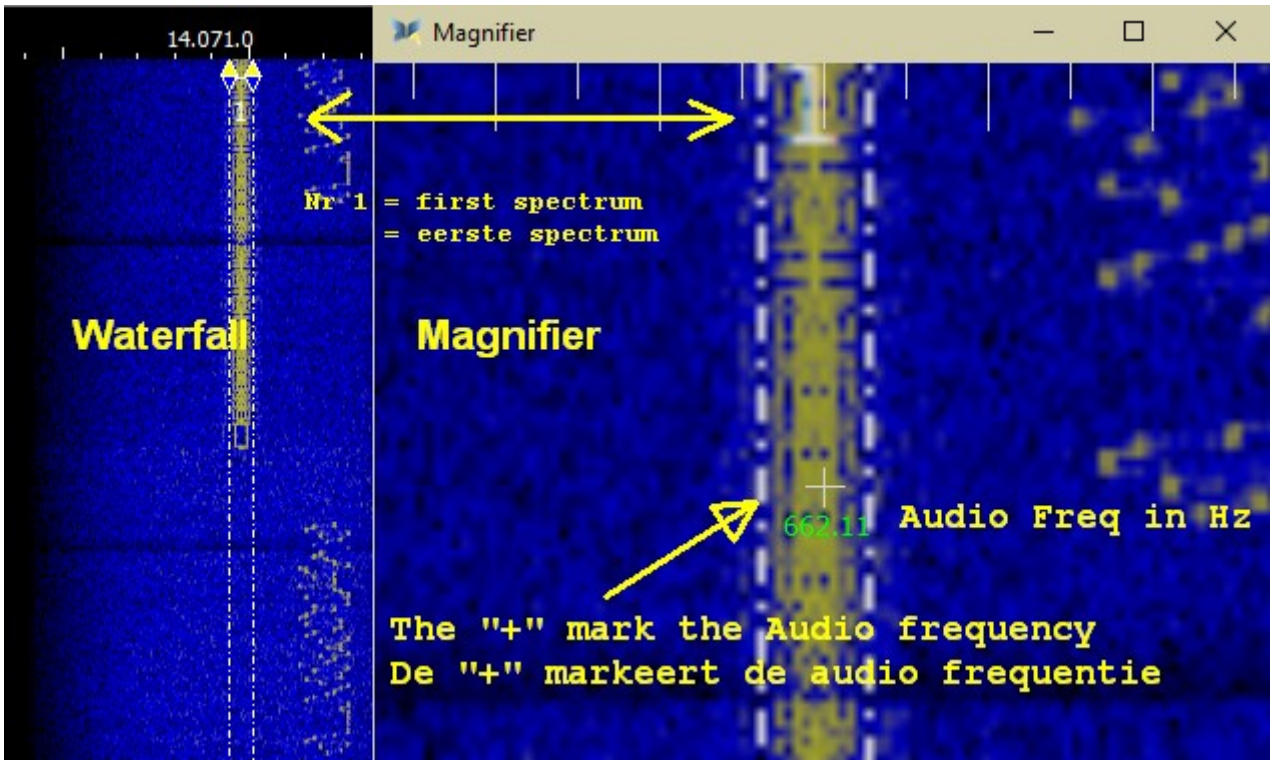
Magnifying glass opens a new magnifying glass window.

Resize this window to meet your requirements.
This window displays an enlarged part of the waterfall display.

Use it to help align signals.

(top)

Waterfall display with a magnifying glass window:

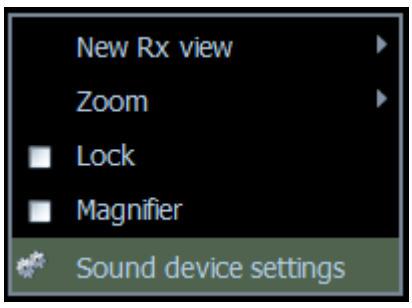


A PSK31 signal is displayed in the waterfall
In the Magnifier the middle point is indicated with a “+” sign and the Audio frequency in Hz.
The number 1 in the waterfall and the Magnifier refer to the first spectrum or waterfall.

The area of the waterfall that is enlarged depends on the size of the magnifying glass window.
To select an area to enlarge, place the cursor in the waterfall. An area around the waterfall cursor appears in the magnifying glass window. As you move the cursor slowly into the waterfall, you will see the corresponding data in the magnifying glass window change.
Do not click the mouse unless you want to move the decoded signal from the selected Rx window.

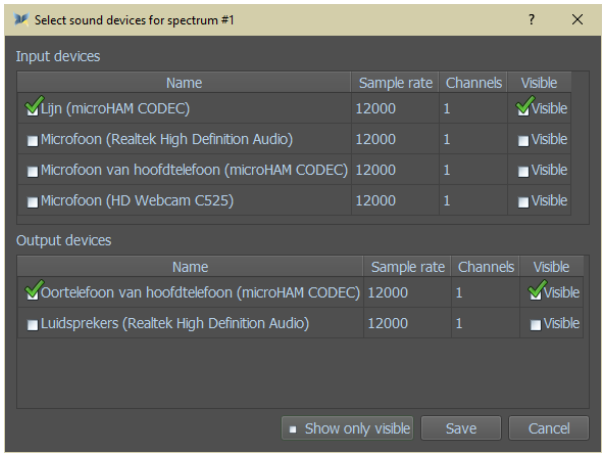
Patience and experience are required to make convenient use of this tool.

Sound device settings



By clicking on the “Sound device settings” a new window will open for the correct setting of the sound card drivers (CODEC)

Select sound devices for spectrum



Here you select the correct one:
Input device
and
Output device

It is also possible that you only want to display the selected devices, by checking “Show only visible”.

(top)

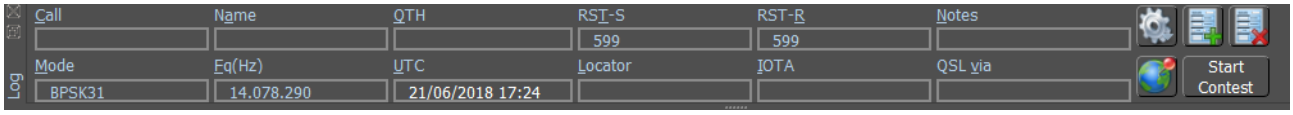
Logbook

QSO's log

The MixW4 log is stored in the {Data files load point} \ **multipan.db3 file**.

MixW4 has several methods for entering and displaying a QSO and other log data:
Runtime QSO Input.
Edit a QSO using the(Short Log)shortened log.
Edit or add a new QSO with Log Search.

Daily QSO's input



Input field selection
There are 4 ways to move the cursor to different input fields

- Place the mouse pointer in the required field and click the left mouse button.
- Use the macro <CURSOR: n>. <CURSOR: 1> selects the Call field.
- Each field name has an underlined letter. Use the ALT + letter to get to the field.
- Use the TAB key to browse between fields.

By clicking Show QSO log icon in the dialogue bar, the log opens.

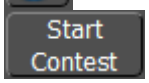
Tool icons

Display a menu selection allowing changes to be made to the displayed data input columns.

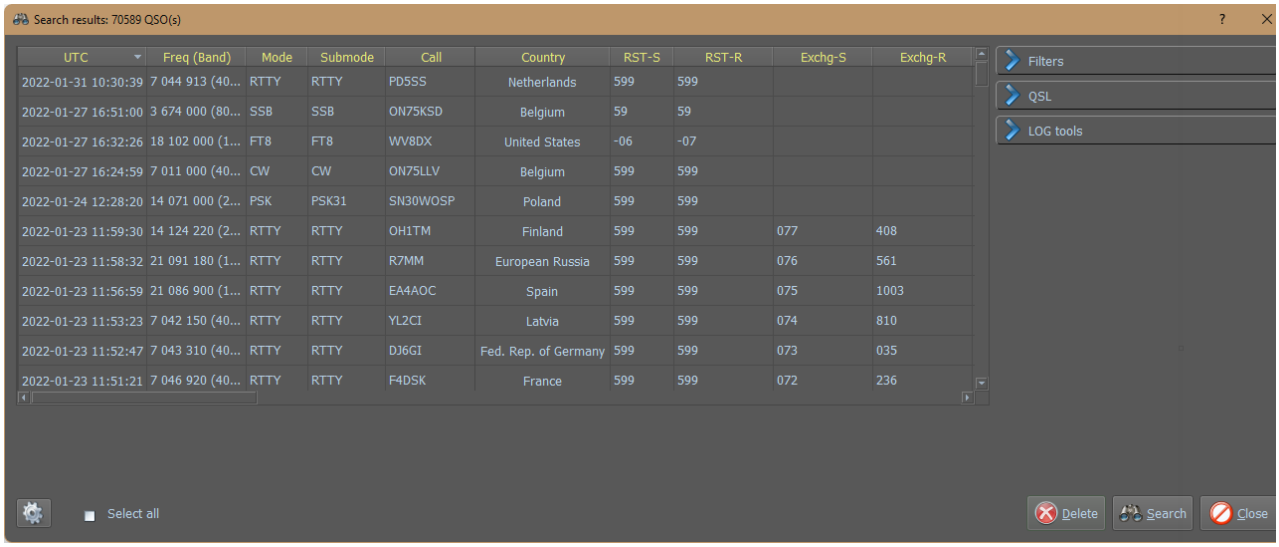
Save the current QSO data. This data will now be available for display in the Short Log and Log Search screens.

Clear the current QSO data.

Send a Spot to the Cluster.

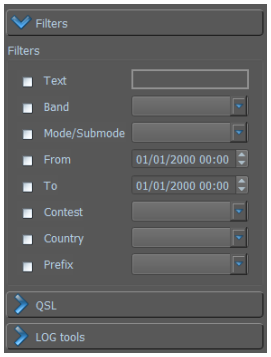


Enter Contest mode.

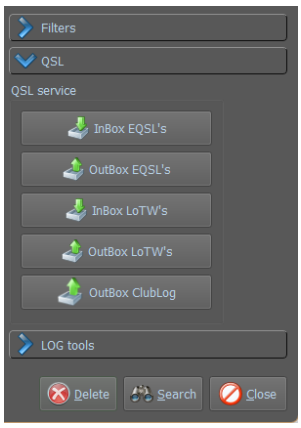


Filters:

Click Filters and the next screen appears
To find a particular text in the logbook
check your Text and type the word to be found or
call sign, and then click Search



Logbook QSL:



InBox EQSL's: Reading of your eQSL Inbox.

OutBox EQSL's: Sending selected QSOs to your eQSL Outbox.

InBox LoTW's: Get records from your LoTW InBox.

OutBox LoTW's: Send selected records to LoTW.

OutBox Clublog: Send selected records to ClubLog.

eQSL card from eQSL.cc

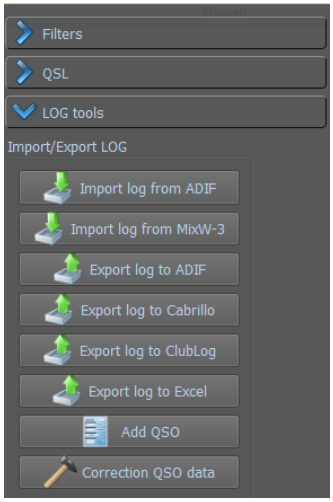
To get an eQSL card image you must have your Username and Password set up in the eQSL settings. If an eQSL has been received an icon is inserted to the right of the eQSL entries. Hover the cursor over this icon and a further icon is superimposed. Click on this icon and an attempt is made to copy this eQSL card image to MixW4. There is no separate indication of failure. The original eQSL received icon remains. If successful, the icon changes to an icon image of the received eQSL card. The file, suffixed PNG of JPG, received from eQSL is stored in the {data_root} ecards folder. The file name will not identify who the eQSL image is from. This filename is stored with the QSO information in the multipan.db3 database. This information is not displayed with other QSO information. This saved image, with a .PNG or .JPG suffix will correctly display by MixW4. If the mouse is hovered over the received eQSL icon an icon is superimposed on it. Left click on this icon and the received card image is displayed full size.

Print prints the eQSL.
SaveAs will save the eQSL in proper PNG format and enable a useable name for the file. A file selection box will be displayed.

Close ends the eQSL display.

(top)

LOG tools:



Import log from ADIF

Import log from MixW3

Export log to ADIF

Export log to Cabrillo

Export log to Clublog

Export log to Excel

Add QSO

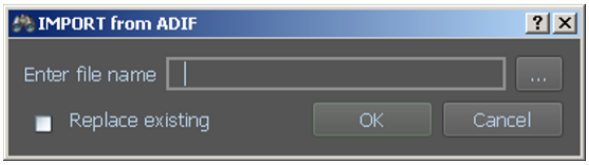
Correction QSO data

Import from ADIF file

Selecting this option opens a file selection and options window.

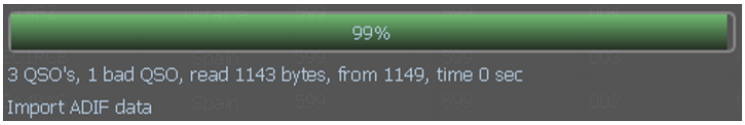
MixW4 expects to find the file in the {program files charging point} folder. To use a file from another location, a full path name must be specified.

If you load the QSO information for the first time, the Replace existing box should not be checked. To update existing QSO's, check the Existing Replacement box.

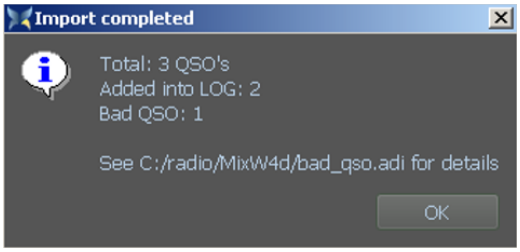


Click OK

The progress of the import is now displayed. When the import is complete, a summary of the activity is displayed.



The Import Completed window with the summary is shown. You can move this window safely to see the overview.



The information about the actions performed is now displayed.

A file *{data files load point}*\bad_qso.adi is always produced. If no errors are detected, this file has zero length. All ADIF rules in the import file that have generated errors are written to this file. There may not be a rule error. If a QSO import has been executed and an attempt has been made to import a duplicate of a QSO into the log, this QSO information is in the bad qso.adi file.

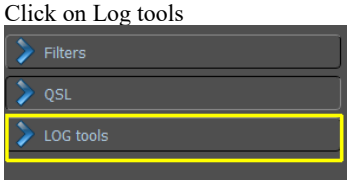
The “Exist QSOs” are displayed in the exists_qso.adi.

If a replacement run has been performed, new QSOs may be in the log if all replacement criteria are not met. Check out the Short QSO display to see if this has happened.

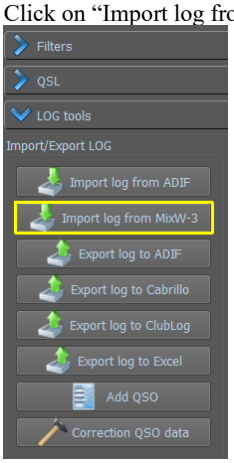
Import log from MixW-3

Click on it and a new screen opens

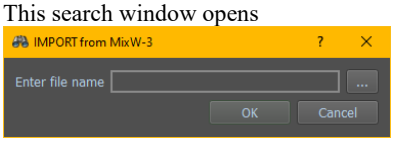
Click on Log tools



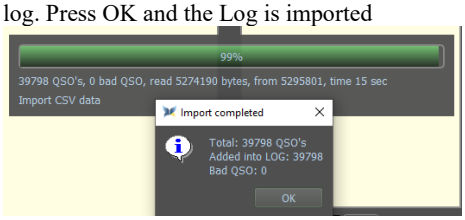
Click on “Import log from MixW-3



This search window opens

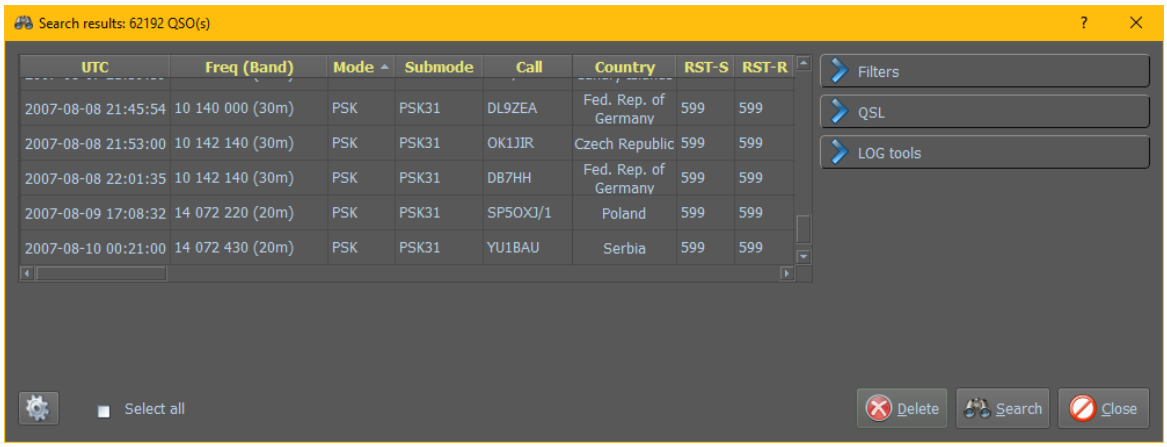


Click on the three dots and search the MixW3 log. Press OK and the Log is imported



(top)

The result is immediately visible:



Export log to ADIF

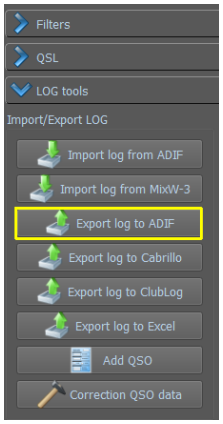
To create an ADIF copy of the entire log:

View the entire log.

Select everything by clicking "Select all".

Select LOG tools.

Select Export Log File to ADIF.



This now displays a marquee for Windows files.

Enter the file name and click Save

The ADIF file has now been created.

Now make a copy of the MixW4.ini file as a backup.

This is important to save the latest settings.

Export log to Cabrillo

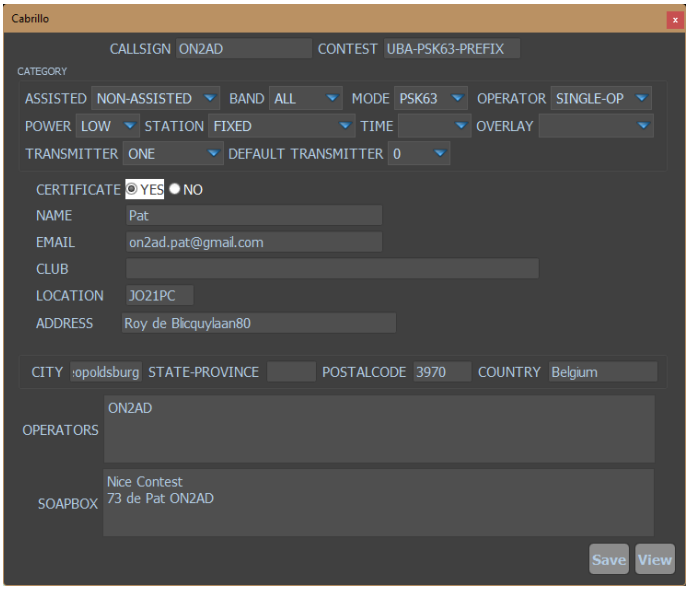
Before you create a Cabrillo file, select the QSOs you want to use. If no QSOs are selected by default, the production is aborted. Also make sure you have the match rules available and make sure you know all possible exchanges for this match.

Select this option and the following window will appear:

Click on “Yes” and the next window open:

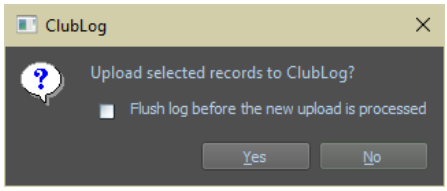
Please enter the relevant information for the contest for which you create this file.

Click 'Generation' and a file selection window appears



(top)

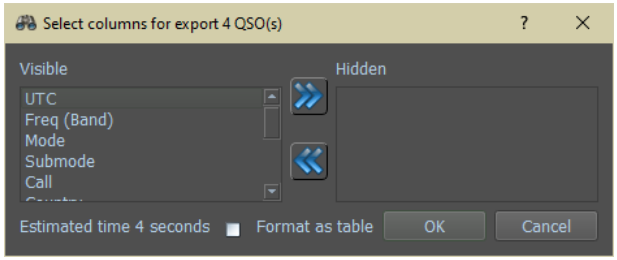
Export log to Clublog



Consult ClubLog upload for use of the Flush log feature.

Select first the QSO’s that you will upload to Clublog
Click the on “Export log to Clublog” and then on “Yes”

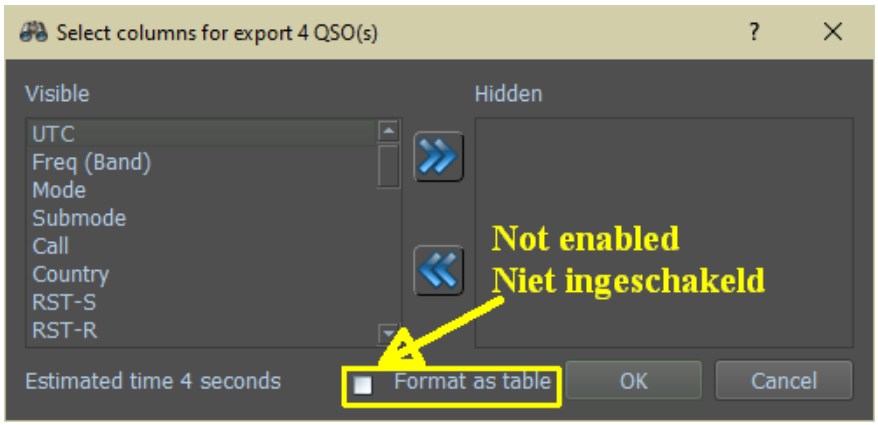
Export log to Excel



Select the QSO’s in the logbook you will need and click on “Export log to Excel” Now an Excel file will be created, only if you have the Excel program on your computer.

There are two way’s for export to an Excel file.

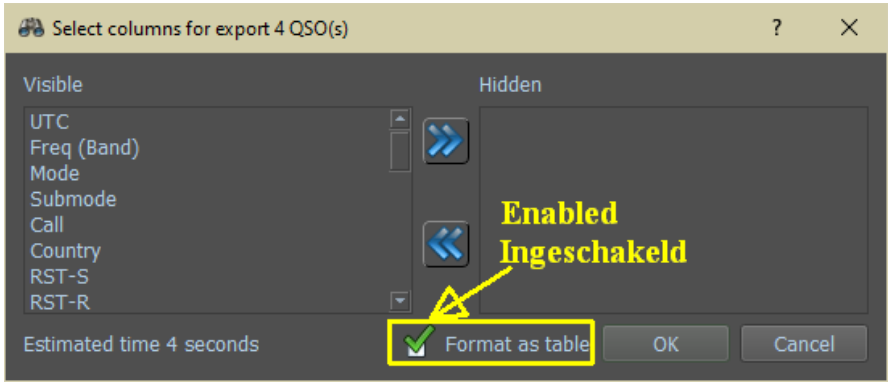
Format not as table



With as result

UTC	Frequency	Band	Mode	Submode	Call	Country	RST-S	RST-R	Name
2021-06-10T13:58:57.000	7 144 000	40m	SSB	SSB	M0DXT/P	166	59	59	
2021-06-10T13:50:54.000	28 488 000	10m	SSB	SSB	EH4MCG	128	59	59	SES
2021-06-10T13:12:45.000	50 313 853	6m	FT8	FT8	ON4ATW	248	6	-4	
2021-06-10T13:11:15.000	50 314 499	6m	FT8	FT8	EA4T	128	3	-16	

Format as table

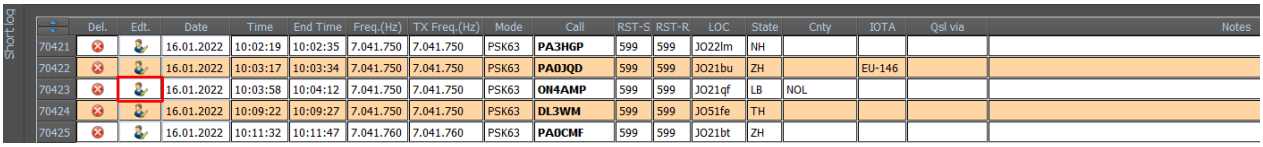


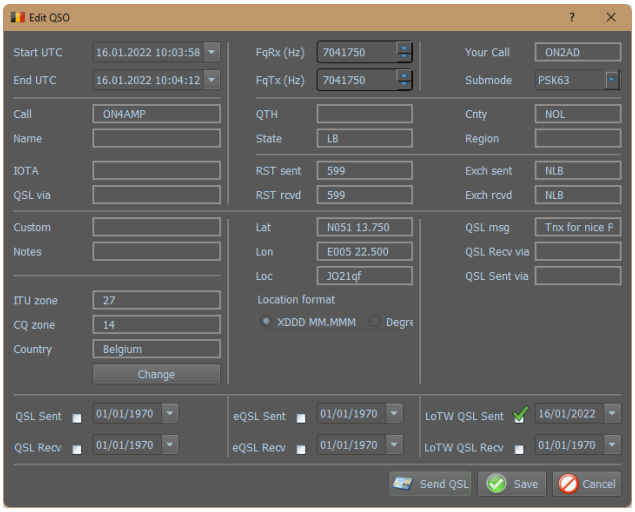
With as result

Kolom1	Kolom2	Kolom3	Kolom4	Kolom5	Kolom6	Kolom7	Kolom8	Kolom9	Kolom12
UTC	**Frequency**	**Band**	**Mode**	**Submode**	**Call**	**Country**	**RST-S**	**RST-R**	**Name**
2021-06-10T13:58:57.000	7 144 000	40m	SSB	SSB	M0DXT/P	166	59	59	
2021-06-10T13:50:54.000	28 488 000	10m	SSB	SSB	EH4MCG	128	59	59	SES
2021-06-10T13:12:45.000	50 313 853	6m	FT8	FT8	ON4ATW	248	6	-4	
2021-06-10T13:11:15.000	50 314 499	6m	FT8	FT8	EA4T	128	3	-16	

Add QSO

Adjusting and/or changing a QSO is done by clicking on the Edt. Icon



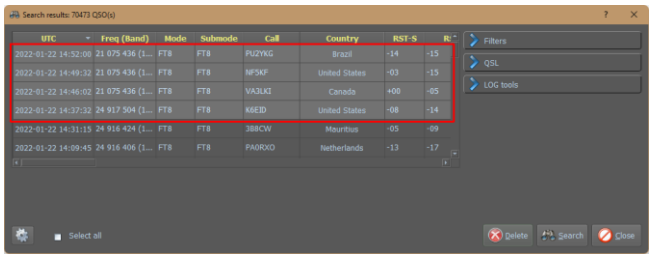


Then the following window appears, which is almost similar to that of the Add QSOfunction.

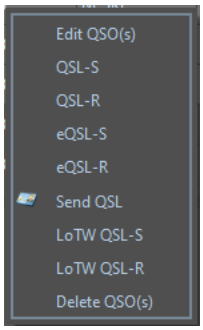
The difference is that in the address bar above "Edit QSO" is stated.

After making the necessary adjustments, press Save.

Multiple QSO Actions



Select some QSOs either the last worked or select certain QSOs via the Logboek Filters and right click on the selected QSOs and a new window will appear.

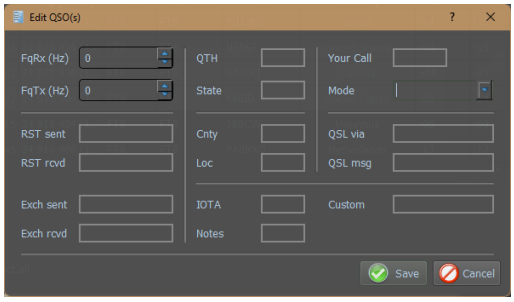


Edit QSO(s). see Editeer multiple QSO's
QSL-S: Select the date that you send the QSL via Bureau or Direct.
QSL-R: Select the date you received the QSL card.
eQSL-S: Select the date you send the QSL via eQSL.
eQSL-R: Select the date you received the eQSL.
Send QSL: Sends the eQSLs again and if it has already been done, the following window will appear

LotW QSL-S: Select the date you send the QSOs via LoTW
Lotw QSL-R: Select the date that the QSO was confirmed via LoTW.
Allows all selected QSO entries to be updated with the correct date.

Delete QSO(s) deletes the selected QSOs

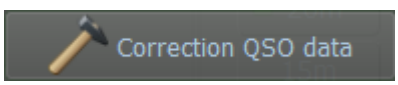
Edit multiple QSO's



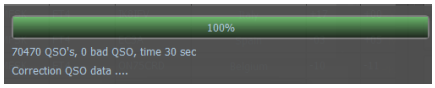
Selecting Edit QSOs displays this window.

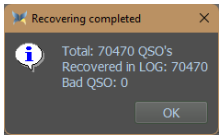
This allows an update of the selected field(s) with the same data to be updated for all selected QSOs.

Correction QSO data

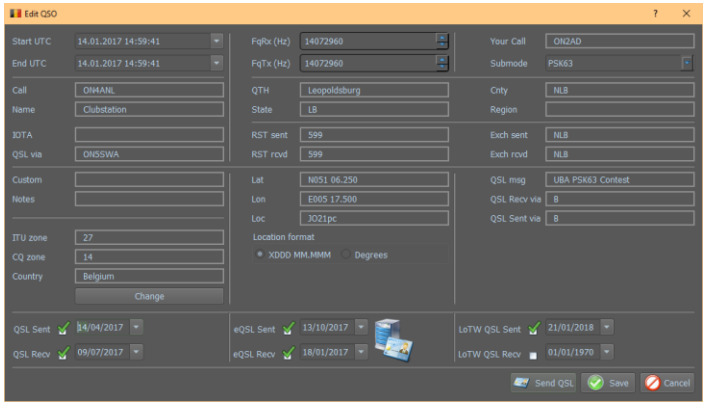


Change or correct the country (and according zones) of example KH6A from Hawaii to US, on the base of latest CTY.dat.
After click on this button the next windows will appear.

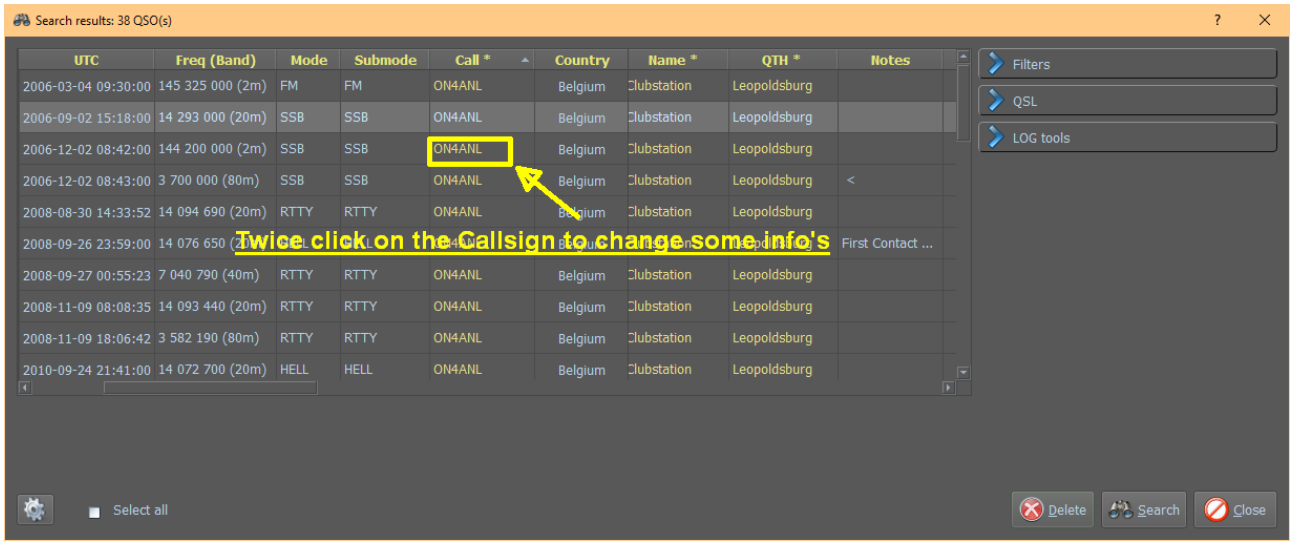




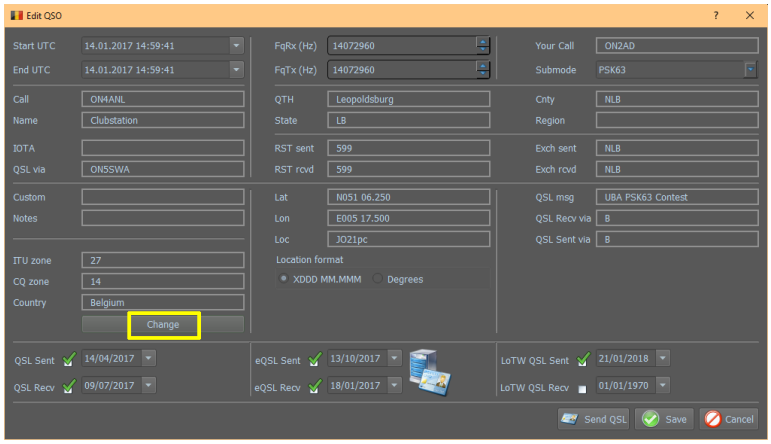
Customize QSO in the log:



Double-click in the Call column field to customize the data



Now the Edit screen opens where you can customize the QSO.

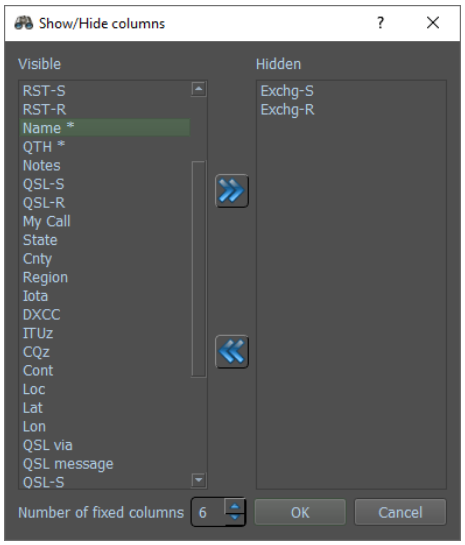


Click Change opens the next screen.

Here you can possibly adjust the country, the ITU zone and the CQ zone

(top)

Log search



The Log Search icon lets you select the information displayed and the number of fixed columns at the beginning of the screen.

If you choose to hide one of the fixed columns, an empty column will remain visible. To prevent this, reduce the number of fixed columns by 1.

In this example, the first 6 columns are fixed (fixed). If you scroll horizontally, those first 6 columns will remain.

(top setup) (top)

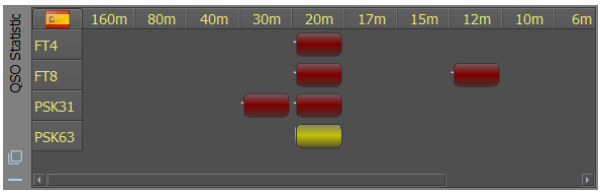
Short log and QSO Statistics

Short log and QSO statistics can be used as access to the logbook, to see what the latest QSO's are and also whether you could already receive a QSL card from this country

The big advantage here is that you can use both separately.

You can start this by clicking the following icon in the status bar.

The next screen opens, now click on a call in the Shortlog and the following is displayed



And the next screen will display a Short log and the QSO statistics.

By using the control, the number of QSOs displayed can be increased/reduced by multiples of 25. Use the slider on the right side of the display to move the displayed selection.

(top)

QSO Statistics settings

QSO Statistics Tool bar.

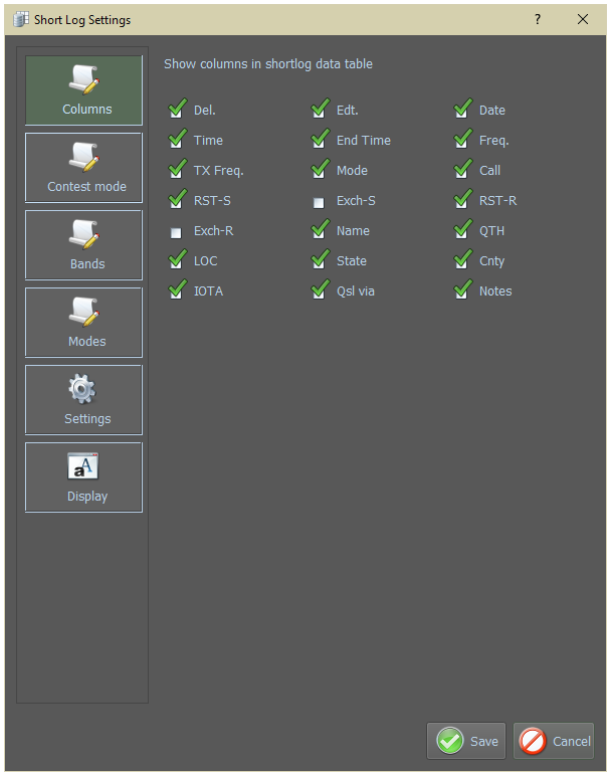
1 - View of QSO Statistics Info
2 - Information about the station. This is obtained from cty.dat, pfx.dat, calls.dat and Locator.
3.- Hide and show the QSO Statistic
4.- Reset the filter
5 - Search the entire log for this call sign. Appears only if a call sign is in the QSO input field.
6 - Display the Settings menu for the Short Log and Statistics screen.

QSO Statistics legend

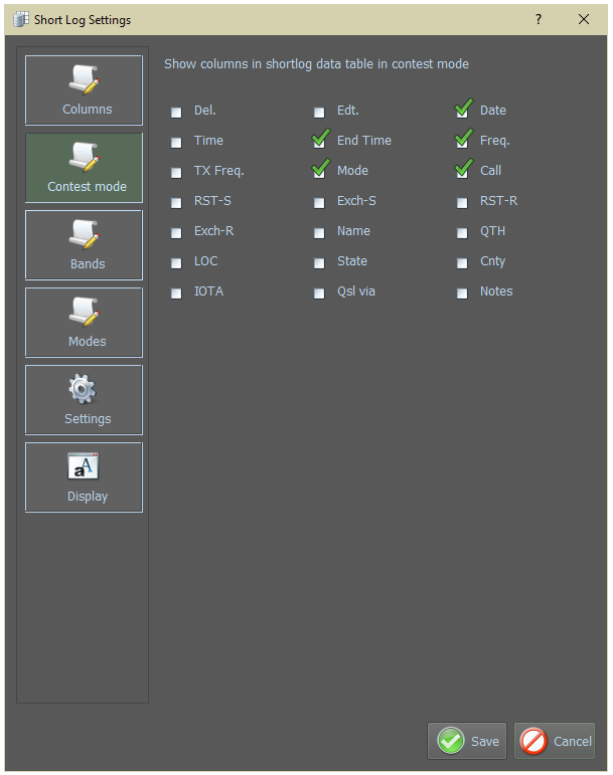
If you click on Info, the Legend of the icons in the QSO Statistics will be displayed. Like QSO before (already worked) Dupe (double) Sent QSL and Recv QSL and the S/R QSL (send and received QSL)

Statistics settings

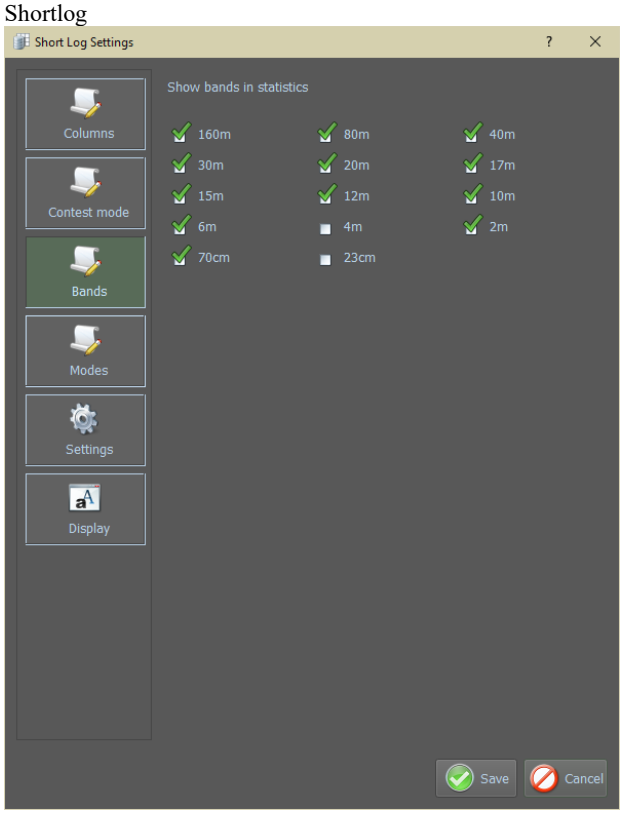
A click on the gear opens the QSO Statistics settings

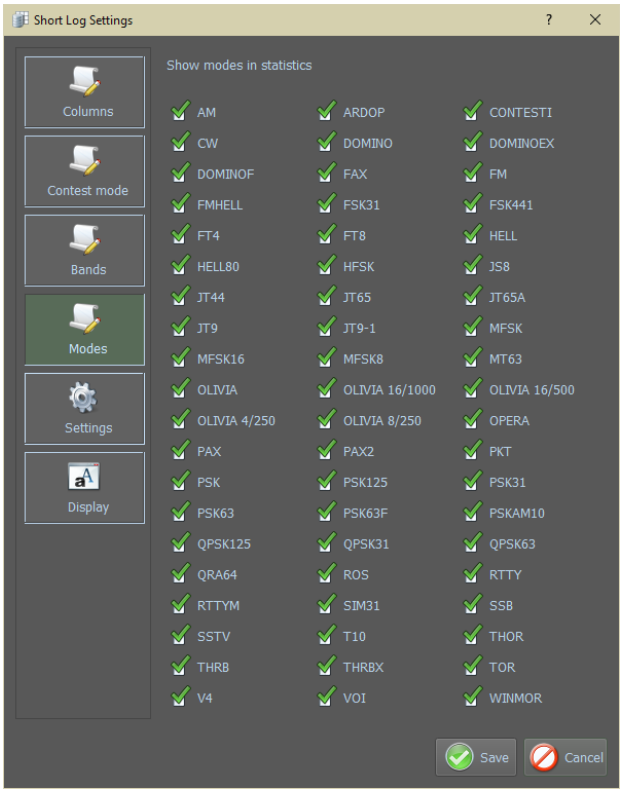


In the Columns menu, select the columns you want for the Shortlog

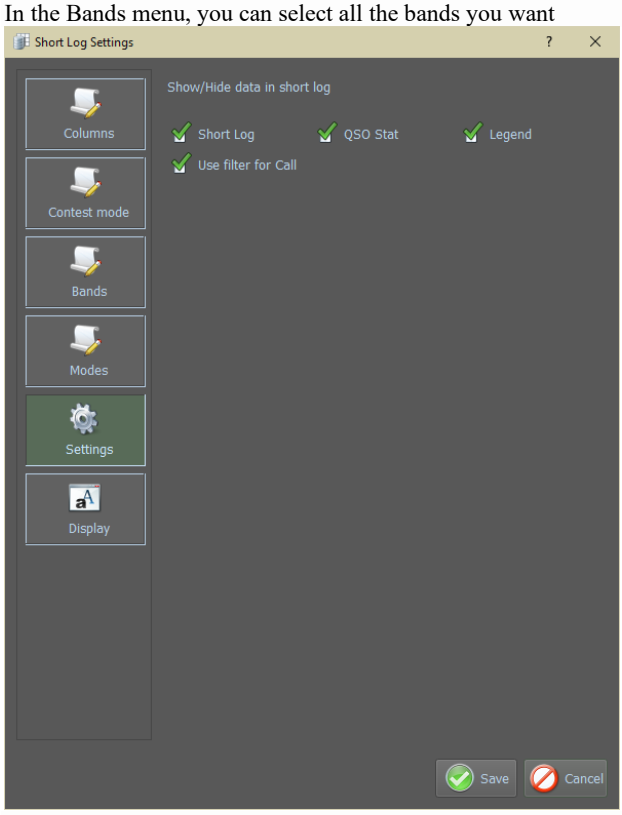


In the Menu Contest mode, you can set the necessary views



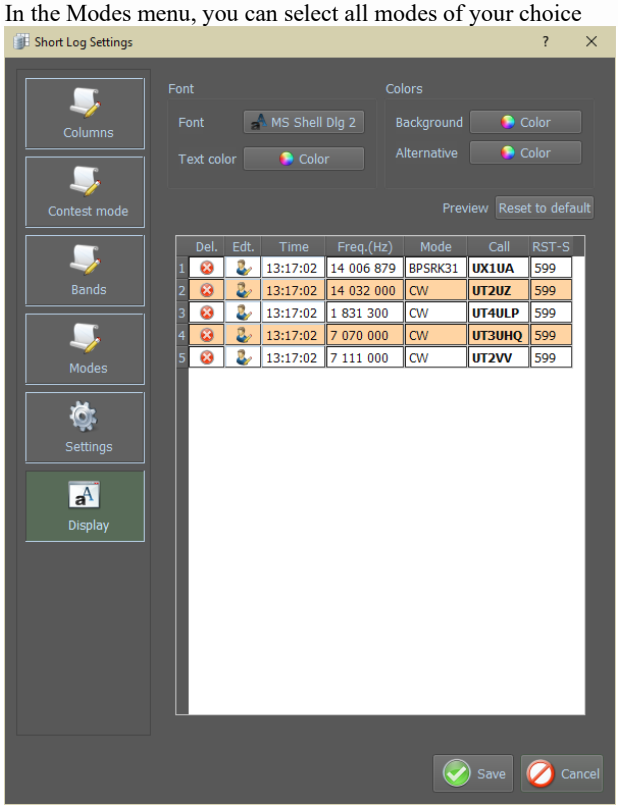


In the Bands menu, you can select all the bands you want



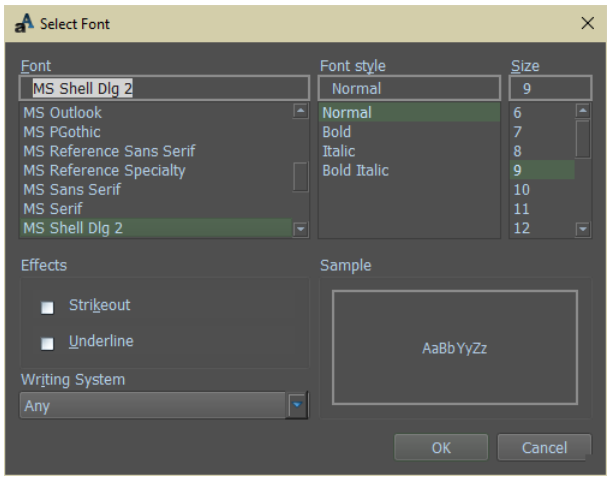
In the Settings menu you have the choice of following views Short log and QSO Stat Legend Use filter for Call of .....

In the Modes menu, you can select all modes of your choice

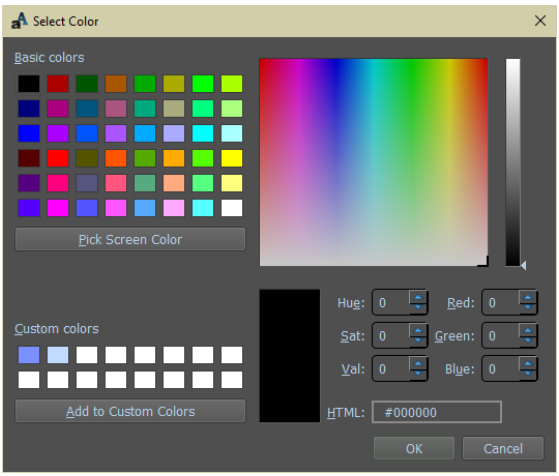


In the Display menu, set the different colors, fonts, and sizes

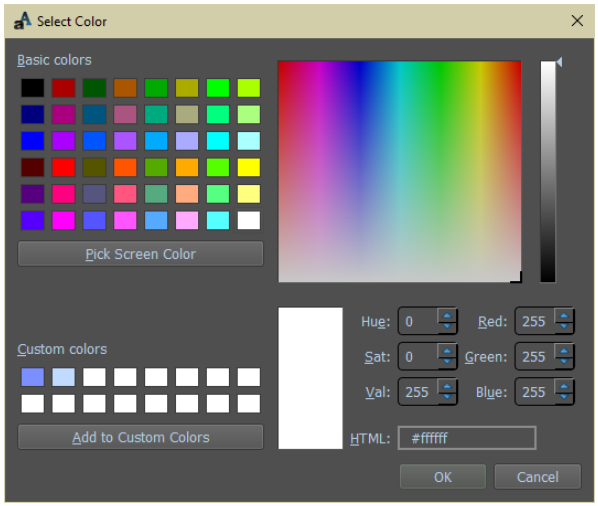
Short Log color and Font settings



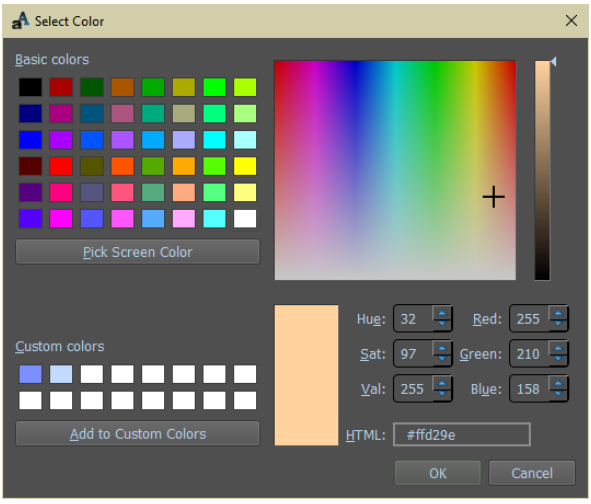
In Menu Font, choose the font and size you want



In Color Text menu, set the font color you want

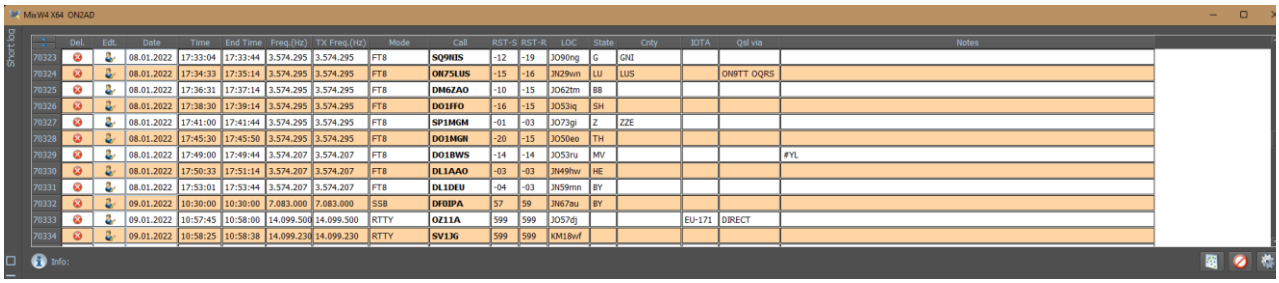


Menu Background sets the color background



Menu Alternative, setting the alternative color

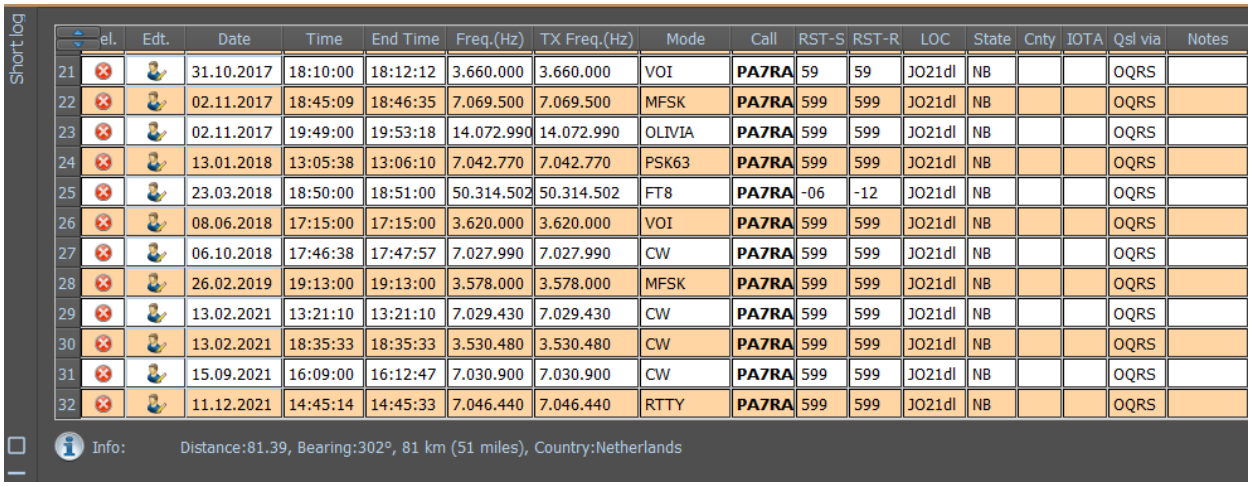
The result below has been obtained by doing the following settings:
Font = MS Shell Dlg 2
Font Size = 9
Text Color = HTML: #000000
Background = HTML: #ffffff
Alternative = HTML: #ffd9b3



Short log

(top)

Displays the logged QSOs in

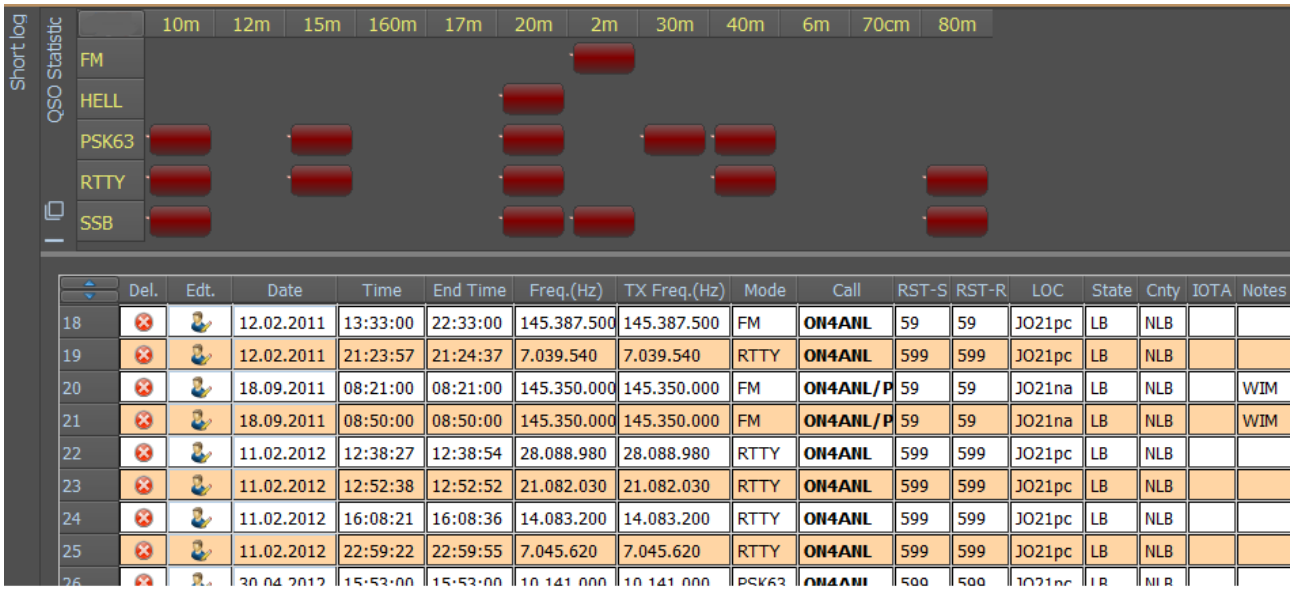


	Del.	Edt.	Date	Time	End Time	Freq.(Hz)	TX Freq.(Hz)	Mode	Call	RST-S	RST-R	LOC	State	Cnty	IOTA	Qsl via	Notes
21			31.10.2017	18:10:00	18:12:12	3.660.000	3.660.000	VOI	PA7RA	59	59	JO21dl	NB			OQRS	
22			02.11.2017	18:45:09	18:46:35	7.069.500	7.069.500	MFSK	PA7RA	599	599	JO21dl	NB			OQRS	
23			02.11.2017	19:49:00	19:53:18	14.072.990	14.072.990	OLIVIA	PA7RA	599	599	JO21dl	NB			OQRS	
24			13.01.2018	13:05:38	13:06:10	7.042.770	7.042.770	PSK63	PA7RA	599	599	JO21dl	NB			OQRS	
25			23.03.2018	18:50:00	18:51:00	50.314.502	50.314.502	FT8	PA7RA	-06	-12	JO21dl	NB			OQRS	
26			08.06.2018	17:15:00	17:15:00	3.620.000	3.620.000	VOI	PA7RA	599	599	JO21dl	NB			OQRS	
27			06.10.2018	17:46:38	17:47:57	7.027.990	7.027.990	CW	PA7RA	599	599	JO21dl	NB			OQRS	
28			26.02.2019	19:13:00	19:13:00	3.578.000	3.578.000	MFSK	PA7RA	599	599	JO21dl	NB			OQRS	
29			13.02.2021	13:21:10	13:21:10	7.029.430	7.029.430	CW	PA7RA	599	599	JO21dl	NB			OQRS	
30			13.02.2021	18:35:33	18:35:33	3.530.480	3.530.480	CW	PA7RA	599	599	JO21dl	NB			OQRS	
31			15.09.2021	16:09:00	16:12:47	7.030.900	7.030.900	CW	PA7RA	599	599	JO21dl	NB			OQRS	
32			11.12.2021	14:45:14	14:45:33	7.046.440	7.046.440	RTTY	PA7RA	599	599	JO21dl	NB			OQRS	

(top)

QSO Statistics

Shows the QSO statistics in here



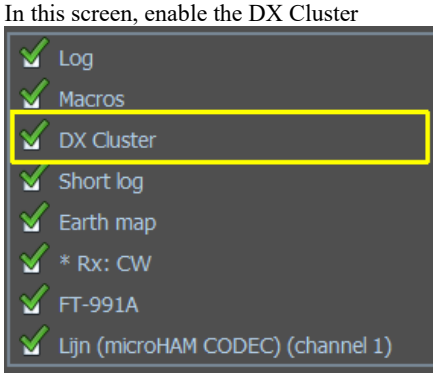
	Del.	Edt.	Date	Time	End Time	Freq.(Hz)	TX Freq.(Hz)	Mode	Call	RST-S	RST-R	LOC	State	Cnty	IOTA	Notes
18			12.02.2011	13:33:00	22:33:00	145.387.500	145.387.500	FM	ON4ANL	59	59	JO21pc	LB	NLB		
19			12.02.2011	21:23:57	21:24:37	7.039.540	7.039.540	RTTY	ON4ANL	599	599	JO21pc	LB	NLB		
20			18.09.2011	08:21:00	08:21:00	145.350.000	145.350.000	FM	ON4ANL/P	59	59	JO21na	LB	NLB		WIM
21			18.09.2011	08:50:00	08:50:00	145.350.000	145.350.000	FM	ON4ANL/P	59	59	JO21na	LB	NLB		WIM
22			11.02.2012	12:38:27	12:38:54	28.088.980	28.088.980	RTTY	ON4ANL	599	599	JO21pc	LB	NLB		
23			11.02.2012	12:52:38	12:52:52	21.082.030	21.082.030	RTTY	ON4ANL	599	599	JO21pc	LB	NLB		
24			11.02.2012	16:08:21	16:08:36	14.083.200	14.083.200	RTTY	ON4ANL	599	599	JO21pc	LB	NLB		
25			11.02.2012	22:59:22	22:59:55	7.045.620	7.045.620	RTTY	ON4ANL	599	599	JO21pc	LB	NLB		
26			30.04.2012	15:53:00	15:53:00	10.141.000	10.141.000	PSK63	ON4ANL	599	599	JO21pc	LB	NLB		

(top)

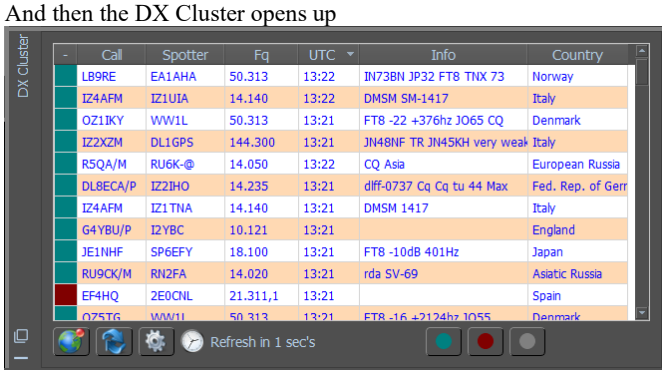
DX Cluster

To open the DX Cluster, click Show/hide views

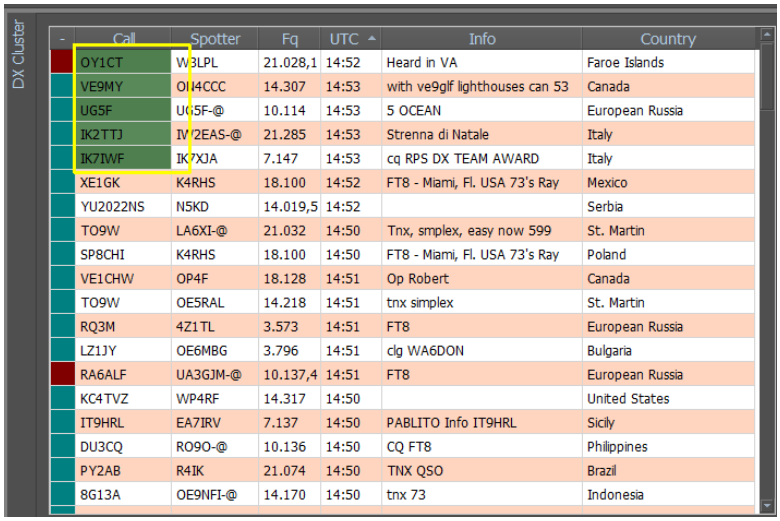
In this screen, enable the DX Cluster



And then the DX Cluster opens up



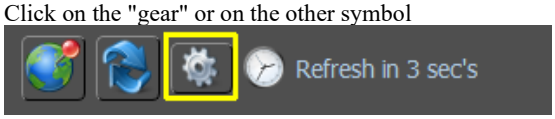
Newly incoming DX info is displayed as shown in the adjacent screen

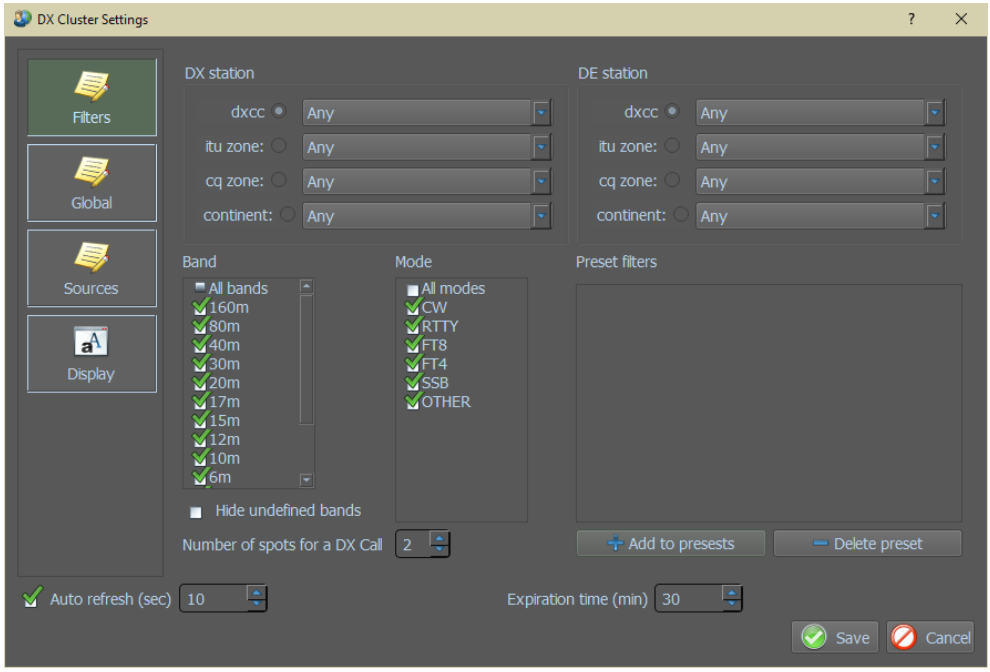


Call	Spotter	Fq	UTC	Info	Country
OY1CT	W3LPL	21.028,1	14:52	Heard in VA	Faroe Islands
VE9MY	OH4CCC	14.307	14:53	with ve9glf lighthouses can 53	Canada
UG5F	UG5F-@	10.114	14:53	5 OCEAN	European Russia
IK2TTJ	IW2EAS-@	21.285	14:53	Strenna di Natale	Italy
IK7IWF	IK7XJA	7.147	14:53	cq RPS DX TEAM AWARD	Italy
XE1GK	K4RHS	18.100	14:52	FT8 - Miami, Fl. USA 73's Ray	Mexico
YU2022NS	N5KD	14.019,5	14:52		Serbia
TO9W	LA6XI-@	21.032	14:50	Tnx, smplex, easy now 599	St. Martin
SP8CHI	K4RHS	18.100	14:50	FT8 - Miami, Fl. USA 73's Ray	Poland
VE1CHW	OP4F	18.128	14:51	Op Robert	Canada
TO9W	OE5RAL	14.218	14:51	tnx simplex	St. Martin
RQ3M	4Z1TL	3.573	14:51	FT8	European Russia
LZ1JY	OE6MBG	3.796	14:51	clg WA6DON	Bulgaria
RA6ALF	UA3GJM-@	10.137,4	14:51	FT8	European Russia
KC4TVZ	WP4RF	14.317	14:50		United States
IT9HRL	EA7IRV	7.137	14:50	PABLITO Info IT9HRL	Sicily
DU3CQ	RO9O-@	10.136	14:50	CQ FT8	Philippines
PY2AB	R4IK	21.074	14:50	TNX QSO	Brazil
8G13A	OE9NFI-@	14.170	14:50	tnx 73	Indonesia

DX Cluster settings

Click on the "gear" or on the other symbol





DX station and DE station: (see image above)
Here the settings are done to determine which DXCC, ITU, CQ or Continent to see with will in the DX-Cluster, the bands and the modes

Example:
I only wish to see the UA-European station in the DX-Cluster from my DXCC, then select in:

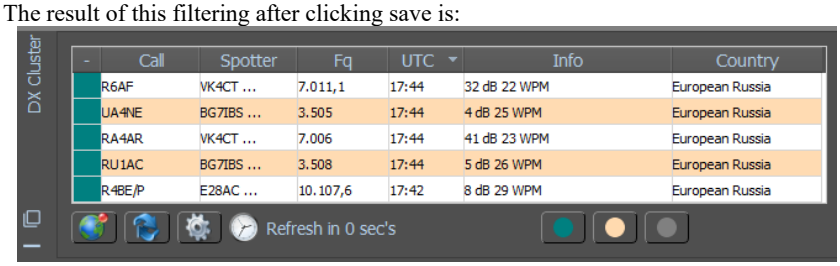
DX station	DE station
dxcc – UA – European Russia and in	ON - Belgium

If necessary, click on Add to presests to keep it temporarily because delete preset allows you to remove it back.

Auto refresh (sec):	Enter the number of seconds when the spots are refreshed If not selected the DXCluster will not start
Expiration time (min):	Enter the number of minutes the DX Cluster should keep.

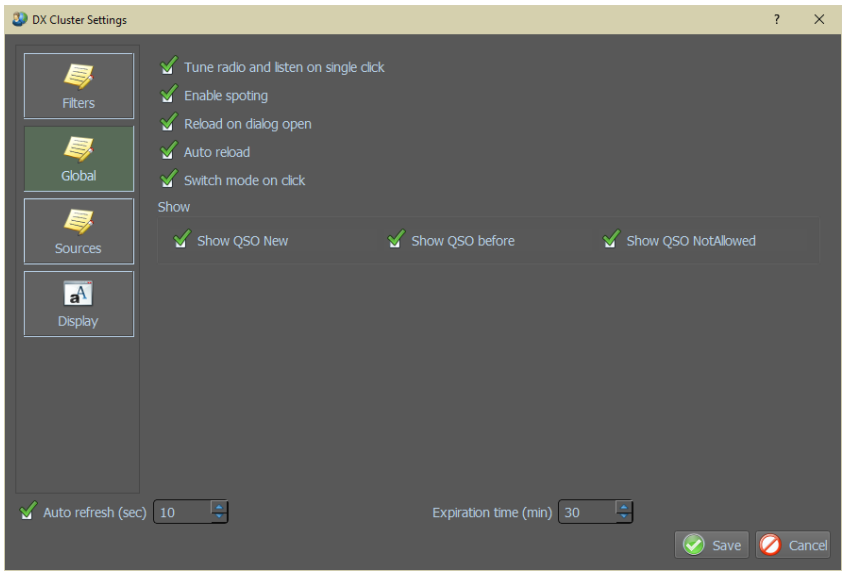
(top)

The result of this filtering after clicking save is:



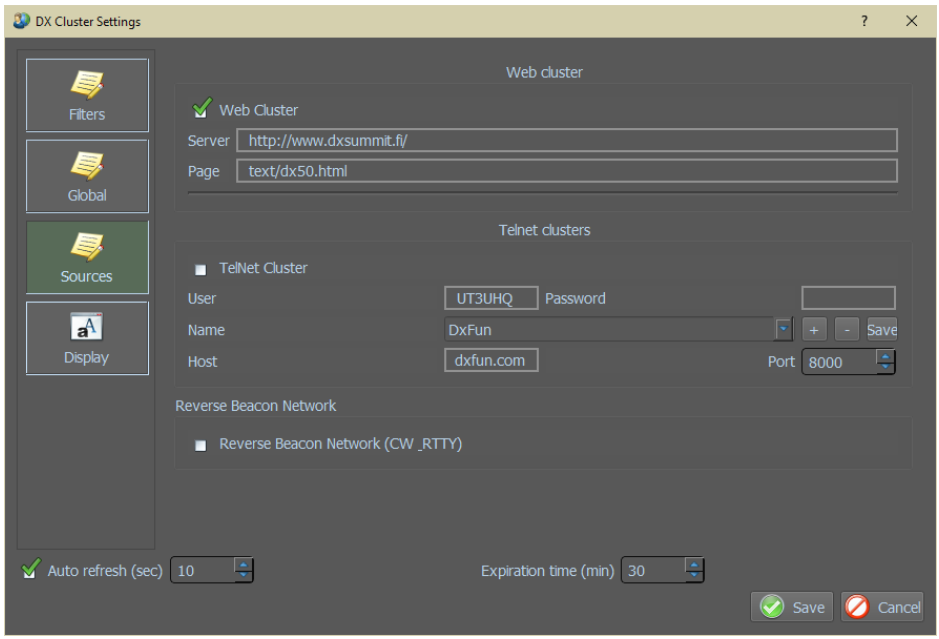
(top)

Menu Global



Tune radio and listen on single click:	If this is checked and you click on a DX Call in the DX spottings, your Trcvr will go to the frequency of the spotted Callsign / DX- Callsign.
Enable spotting:	If this is checked, you can spot DX stations yourself via the DX Cluster.
Reload on dialog open:	Load DX data when opening the DX Cluster.
Auto reload:	Automatically retrieve the DX data according to the Auto refresh seconds setting.
Show QSO New	Show a new QSO
Show QSO before	Show already worked QSO
Show QSO Not Allowed	QSO display not allowed

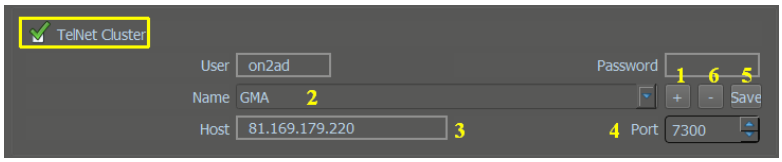
Menu Sources



WebCluster

Server	Page
http://www.dxsummit.fi/	text/dx50.html

Telnet clusters



Check Telnet Cluster

1. Click on the plus sign
2. Enter the name of the Cluster / Telnet
3. Enter the Host
4. Select the Port for this Telnet
5. Click on Save
6. Here you can delete a Telnet / cluster

When everything is filled in, click on Save at the bottom

User	Name	Host	Port
ON2AD	DxFun	Dxfun.com	8000
ON2AD	DxNetUa	dx.net.ua	7300
ON2AD	GMA	81.169.179.220	7300

RBN (Reverse Beacon Network)

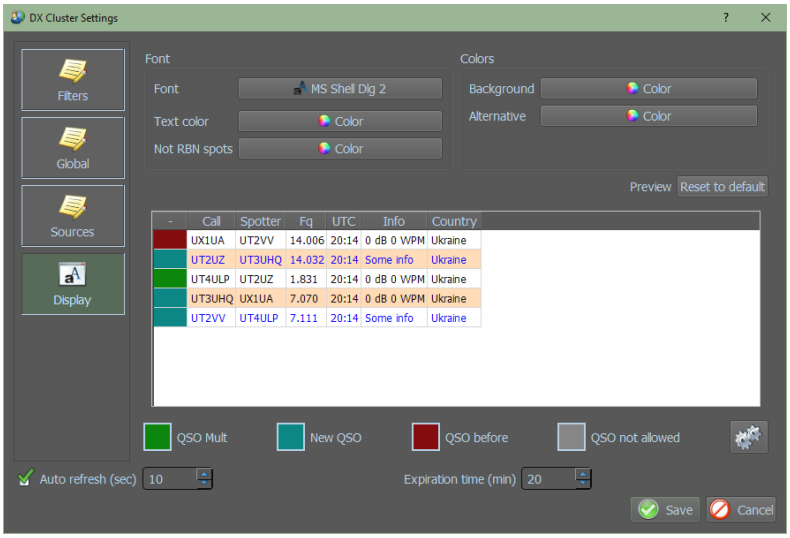
Server
Reverse Beacon Network (CW, RTTY

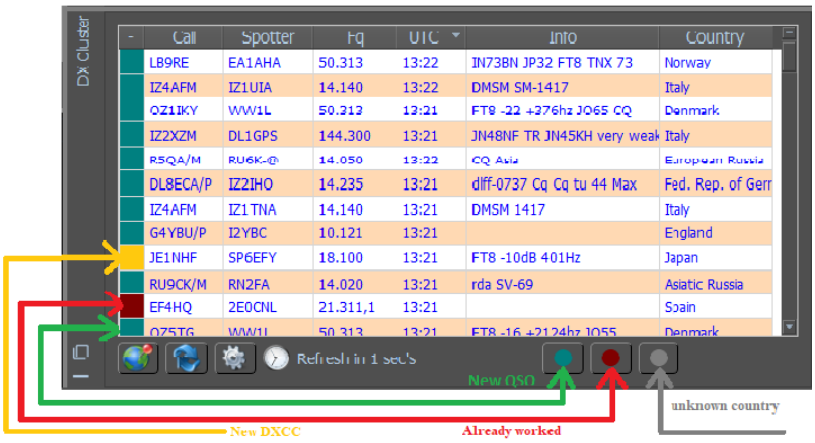
(top)

Menu Display

The result below has been obtained by doing the following settings:

Font = MS Shell Dlg 2
Font style = Normal
Size = 9
Text Color = HTML: #000000
Background = HTML: #ffffff
Alternative = HTML: #ffd9b3
Not RBN Spots = HTML: #0000ff

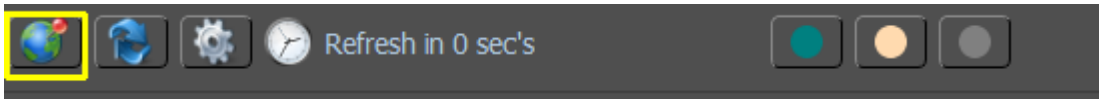




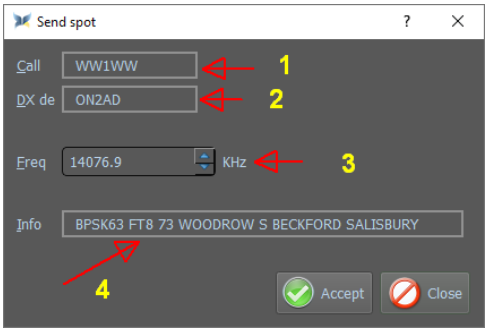
Important:
These colours can be customized via the Menu Setting/Text settings in the QSO states

(top)

Spotting



Click on this globe icon and the next screen opens to spot a DX.



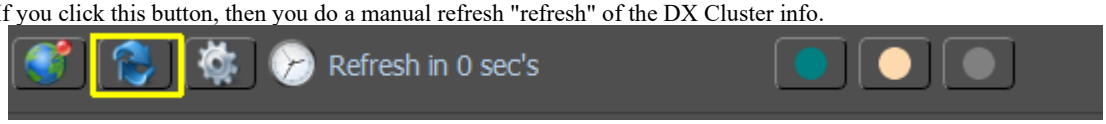
1 DX Callsign (call).
2 Your Callsign
3 The right frequency
4 The usual info

This data automatically pops up when you have the DX call sign in the "Log" module, The Frequency appears when you have a working CAT control.

(top)

Refresh data

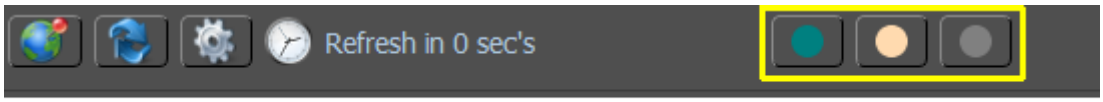
If you click this button, then you do a manual refresh "refresh" of the DX Cluster info.



Refresh in xx.sec.

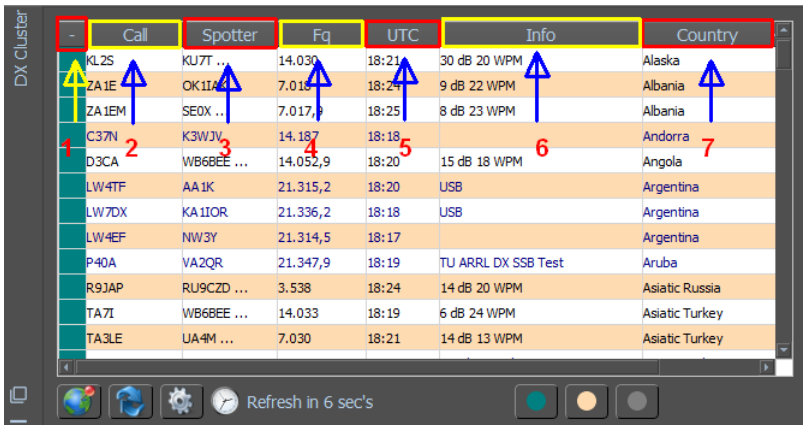
Here you can see the time in seconds to the automatic "refresh" of the DX Cluster data.

Sort in the DX Cluster



1. Show – hide new Call spots
2. Show – hide spots from QSO's already worked
3. Show – hide unknown country spots

Sorting in the DX Cluster is done by clicking on the title's column. The sorted column will then be given an arrow up or down as you have sorted from top to bottom, or from bottom to top



1 Sort by legend (see Legend) time in the manual attached)
2 Sort by Callsigns
3 Sort by the Spotters
4 Sort by frequency
5 Sort by UTC-time
6 Sort by Info
7 Sort by Country

Legenda:

New DXCC new QSO Earlier QSO

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MixW4 folders and files

Although at installation time there were 2 possible methods both result in the same Folder structure on disc.

Program file structure.

The contents of this folder and sub-folders are generated before the MixW4 installation file is built.
Only MixW4.exe or uninst.exe may need to be addressed.
None of the Program files should be changed.

Program files that are loaded {*Program_files root*}

Folder	Info
audio	
bearer	
CatDLLs	Contains the DLLs for the different transceivers
iconengines	
plugins	Has sub-folders. Contains the mode .DLL files. This is not used in the same way as the MixW2 / 3 plugins folder.
qmltooling	
Qt	Has sub-folders.
QtGraphicalEffects	Has sub-folders.
QtQml	Has sub-folders.
QtQuick	Has sub-folders.
QtQuick.2	
QtTest	
QtWinExtras	
Sqldrivers	

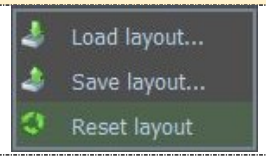
File Tree Data {*Data_root*}

Folder	Info
AudioLog	For saved audio files Created after MixW4 has been started for the first time.
Contests	Contains: the contest settings; the contest statistics; the contest Macros; the production of the Cabrillo files the world maps
CWT	Morse character set files. Minimum content must be ENG.cwt.
Data	Data storage for:
	bandMap;
	calls.dat;
	cty.dat;
	dxccEntity.json. A file used for references to internal programs; Do not modify this file.
	pfx.dat;
	schedule.txt; Saved scheduler tasks
	Submodes.json; Contains the data of all modes and their associated submodes
e-cards	For storing QSL cards or other QSO photos.
Macros	Macro files for every mode for daily use, so no contest. Macro's have the .json extensions.
MixPlugins	Installed MixPlugins. Each plugin has a separate folder.
RxLog	Storage for RX logs. This folder is not created until the Log RxView content to file control in the Settings menu is checked.
Translations	No information available as to what its use will be. This folder is not created until MixW4 is started for the first time.

If a file is in one of the program structure folders, leave it alone!

Ini files

Een ini bestand wordt gebruikt in computerprogramma's en zijn in feite een formaat voor configuratiebestanden

Bands.ini	The band plan is shown here	
KiwiSDR.ini	Here are the KiwiSDR addresses	
MixW4.ini	Here all data is used to start up MixW4	
Panels.ini	This is a layout with default settings.	

Layout files

These are files you have created to have a different layout for each mode.
The files have the ".layout" extension.
For example:
1.Normal.layout: This then becomes a layout for use of normal modes such as PSK, RTTY etc... on 1 screen.
2.Normal.layout: This then becomes a layout for use of normal modes such as PSK, RTTY etc... on 2 screens.
FT8.Layout: This then becomes a layout that can be used for FT4 and FT8

Database

Multipan.db3	Contains: the structure of the log; the log. Can be open with "DB Browser for SQLite".

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File descriptions

ADIF files

Files with a suffix .adi must be files according to the Amateur Data Interchange Format.
See The independent ADIF site for up-to-date information.

MixW4 writes some lines in an adi file under which it also specifies which ADIF version format is used.

Note: ADI entries will not be generated for QSOs where the QSO frequency is not within the bounds of any band frequencies in the Band map.

calls.dat passed

The file calls.dat is used in conjunction with the files cty.dat and pfx.dat to help MixW identify a country or region.

The file consists of a few lines of data. The data consists of by a colon (:) segregated fields:

UT2UZ: US5U

The left field is a complete call sign, and the right field is a prefix for cross-references in the files cty.dat or pfx.dat

In the example above, the Call UT2UZ (normally shown in call information below the log) is now located in the US5U call area referenced from the pfx.dat (Kyjivs'ka oblast [KO] is displayed instead).

Rules in the file that start with a semicolon (;) treated as comments.

cty.dat file

The cty.dat file is used for contesting to help generate land multipliers from call signs. MixW also uses the entries to refer to the pfx.dat file to potentially obtain further land information.

Each input consists of multiple lines of data, the first contains 8 data separated by the colon, the second and next lines are commas separated fields. Further data rules must start with a space or tab, and the last line will end with a semicolon. The eight fields of the first line are:

Country name
CQ Zone
ITU Zone
Two letter continents
Latitude: a negative value is South
Longitude: a negative value is East. (East).
This is the opposite of the data in the Personal Data
Time difference from UTC
Primary country prefix:

The following rules are:

- Further prefixes linked to this country
- A prefix or partial call followed by a digit in parentheses.
  Changes the CQ zone for this prefix or partial call.
- A prefix or partial call followed by a digit between square hooks.
  Changes the ITU zone for this prefix or partial call.
- A prefix or partial call with numbers between both round and square hooks.
  This change both zones.
- A full call sign preceded by the equal sign indicating that this call
  linked to this country.

This file is regularly updated to reflect land changes, individual call location changes, and other special calls for events.

The version of cty.dat is installed and in use by MixW4 can be identified by entering VERSION as the current QSO call sign
The country that appears changes for each version. A release note with the cty file that indicates which country is identified by the VERSION call sign.

The latest version of the file and more information can be found at:
http://www.country-files.com/

There is also a large copy of this file. For more information about the large cty.dat file, see:
http://www.country-files.com/bigcty/index.htm

A copy of this file comes with the MixW software.

Pfx.dat file

The file pfx.dat provides more information about the current QSO call sign prefix. This information complements the information in cty.dat.

The file format is similar to the cty.

Each entry consists of multiple lines of data, the first contains 8 colon/space separated fields, the second and subsequent lines, are comma separated further data pertaining to the country prefix. The further data lines must start with a space or tab characters and the last line is terminated by a semi-colon. The eight fields of the first line are:

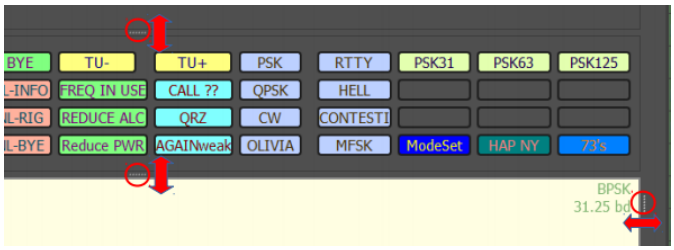
Extra name:
CQ Zone:
ITU Zone
Twee letters continent
Latitude: (-ve is South) (Zuid)
Longitude: (-ve is East. (East) This is the opposite of the data in Personal Data)
Time difference from UTC:
Primary country prefix.

The following rules are call names (call signs) or partial call names that should be associated with the first line of data. The partial call signs will contain wildcards. ? for a single character and * at the end of the call.

This file comes with the MixW software.

(top)

By touching and dragging the dotted line with the mouse, one can change the height or width of the window.

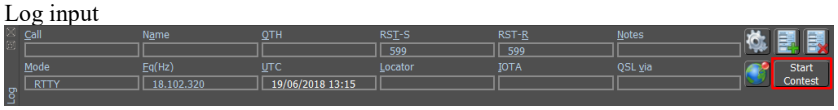


(top)

Contest

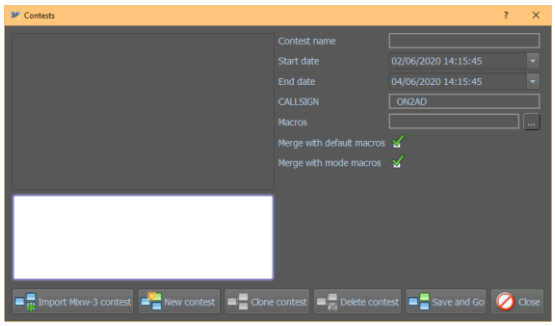
Contest settings

Log input

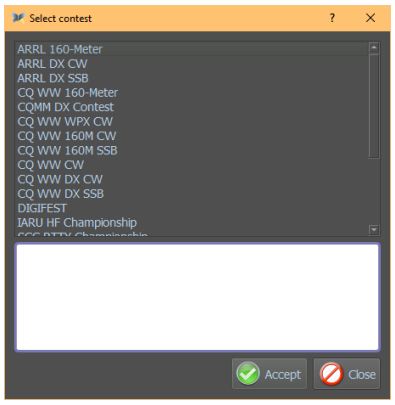


Click Start Contest and the next menu opens.

Click on New contest



All available contests will be visible

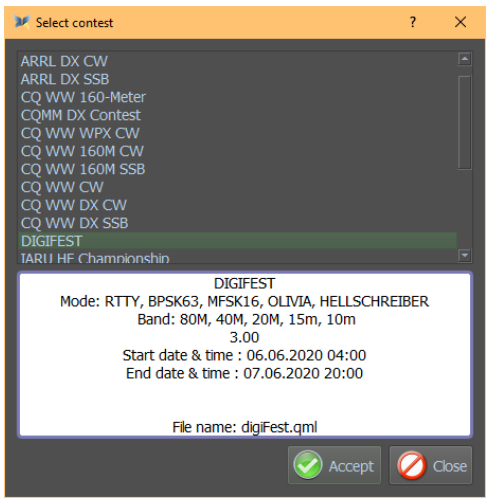


Now select the contest you want.

In this example, the DIGIFEST contest is selected.

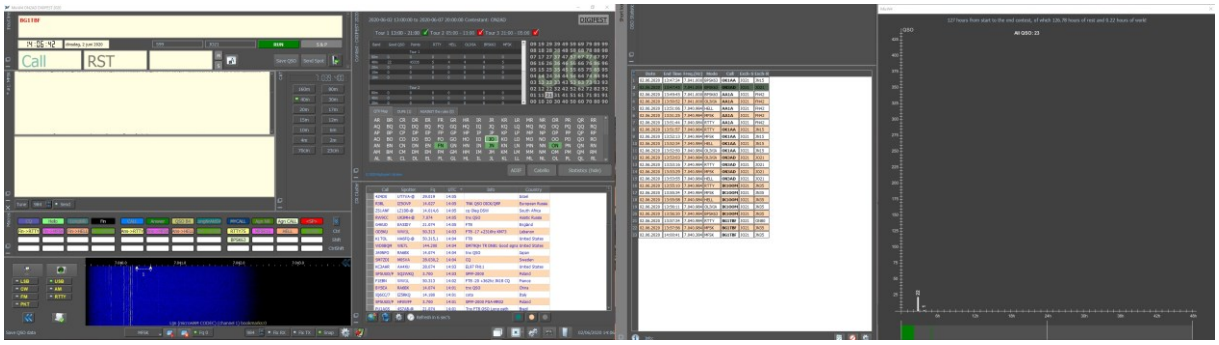
Once this contest is selected then press Accept.

Then the window appears below with the necessary info about this contest. Then press Accept



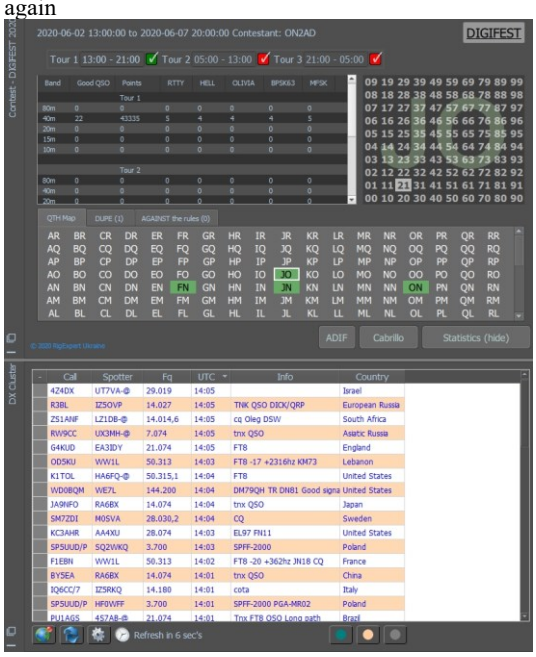
If necessary, check out the merge default and mode macros and press Save and Go

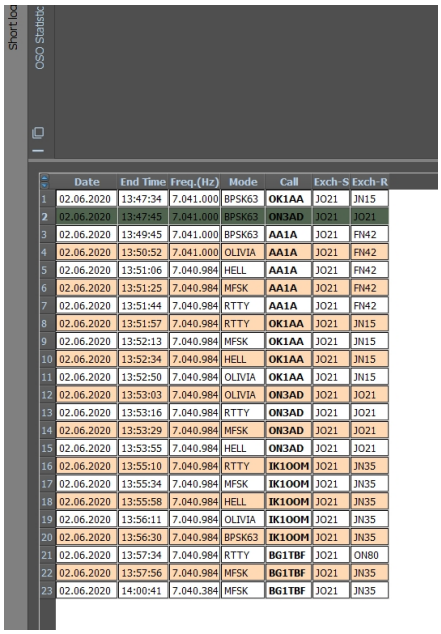
Then this could be your contest screen



This screen has the contest data and the DX-Cluster again

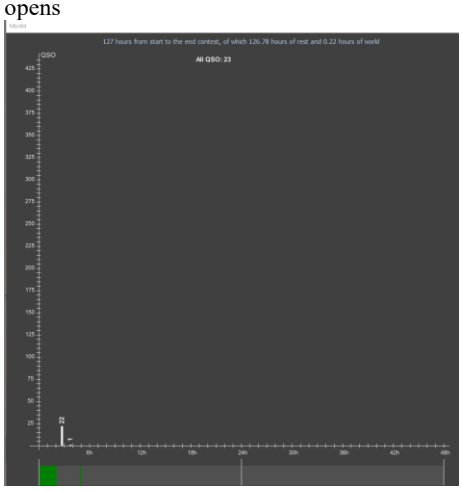
This screen display the ShortLog that serves as a Contest Log





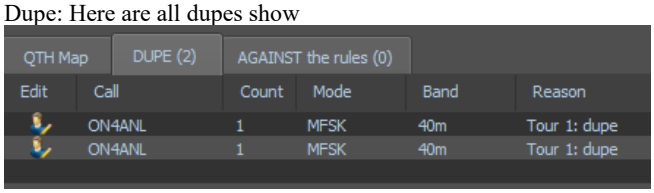
	Date	End Time	Freq.(Hz)	Mode	Call	Exch-S	Exch-R
1	02.06.2020	13:47:34	7.041.000	BPSK63	**OK1AA**	JO21	JN15
2	02.06.2020	13:47:45	7.041.000	BPSK63	**ON3AD**	JO21	JO21
3	02.06.2020	13:49:45	7.041.000	BPSK63	**AA1A**	JO21	FN42
4	02.06.2020	13:50:52	7.041.000	OLIVIA	**AA1A**	JO21	FN42
5	02.06.2020	13:51:06	7.040.984	HELL	**AA1A**	JO21	FN42
6	02.06.2020	13:51:25	7.040.984	MFSK	**AA1A**	JO21	FN42
7	02.06.2020	13:51:44	7.040.984	RTTY	**AA1A**	JO21	FN42
8	02.06.2020	13:51:57	7.040.984	RTTY	**OK1AA**	JO21	JN15
9	02.06.2020	13:52:13	7.040.984	MFSK	**OK1AA**	JO21	JN15
10	02.06.2020	13:52:34	7.040.984	HELL	**OK1AA**	JO21	JN15
11	02.06.2020	13:52:50	7.040.984	OLIVIA	**OK1AA**	JO21	JN15
12	02.06.2020	13:53:03	7.040.984	OLIVIA	**ON3AD**	JO21	JO21
13	02.06.2020	13:53:16	7.040.984	RTTY	**ON3AD**	JO21	JO21
14	02.06.2020	13:53:29	7.040.984	MFSK	**ON3AD**	JO21	JO21
15	02.06.2020	13:53:55	7.040.984	HELL	**ON3AD**	JO21	JO21
16	02.06.2020	13:55:10	7.040.984	RTTY	**IK1OOM**	JO21	JN35
17	02.06.2020	13:55:34	7.040.984	MFSK	**IK1OOM**	JO21	JN35
18	02.06.2020	13:55:58	7.040.984	HELL	**IK1OOM**	JO21	JN35
19	02.06.2020	13:56:11	7.040.984	OLIVIA	**IK1OOM**	JO21	JN35
20	02.06.2020	13:56:30	7.040.984	BPSK63	**IK1OOM**	JO21	JN35
21	02.06.2020	13:57:34	7.040.984	RTTY	**BG1TBF**	JO21	ON80
22	02.06.2020	13:57:56	7.040.984	MFSK	**BG1TBF**	JO21	JN35
23	02.06.2020	14:00:41	7.040.384	MFSK	**BG1TBF**	JO21	JN35

When clicking the Statistics button above, next screen opens



QTH Map: The grids used are indicated

Dupe: Here are all dupes show



Edit	Call	Count	Mode	Band	Reason
	ON4ANL	1	MFSK	40m	Tour 1: dupe
	ON4ANL	1	MFSK	40m	Tour 1: dupe

Against the Rules: Here is information from QSOs that are not according to the contest rules

Edit	Call	QSO	Reason
	ON4ANL	1	Out of tours
	ON4ANL	1	Out of tours

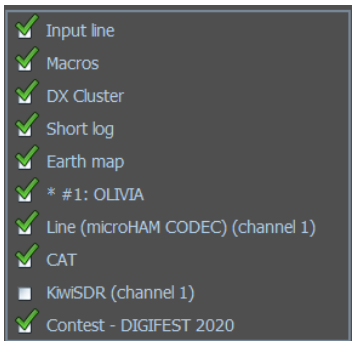
At this point, a file, contest.json, is created/ updated in {*Program files load point*} \Contests with this contest information.

[

```
  {
    "ContestInfo": "DIGIFEST\r\nMode: RTTY, PSK63, MFSK16, OLIVIA, HELLSCHREIBER \r\n Band: 80M, 40M, 20M,
15m, 10m\r\n3.00",
    "FileName": "digiFest.qml",
    "Macros": "DIGIFEST 2020.json",
    "MyLocator": "JO21PC",
    "MyName": "Pat",
    "Name": "DIGIFEST 2020",
    "TransiverPower": "LOW",
    "YourCall": "ON2AD",
    "bAutoExchgCqZone": false,
    "bManualNR": false,
    "bMergeDefaultMacros": false,
    "bMergeModeMacros": false,
    "endDate": "07.06.2020 20:00:00",
    "extField_0": "Time category (8/24);24;0;24",
    "stContestVerion": "3.00",
    "startDate": "06.06.2020 04:00:00",
    "validBands": "80m;40m;20m;15m;10m;;;;;",
    "validModes": "RTTY;HELL;OLIVIA;PSK63;MFSK;;;;;"
  }
]
```


(top)

The main menu Show / Hide views shows this contest now.

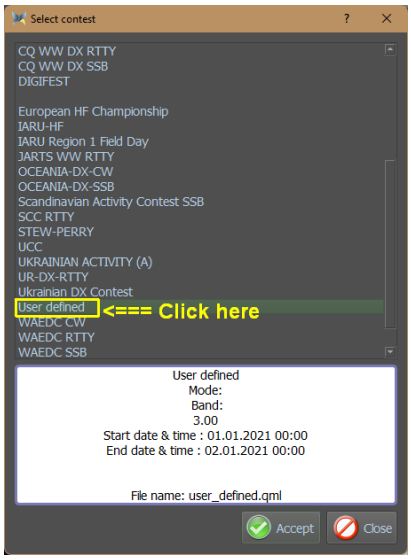


User defined (create your own Contest module)

Click on “Start Contest” and then on “New Contest” as mentioned above.

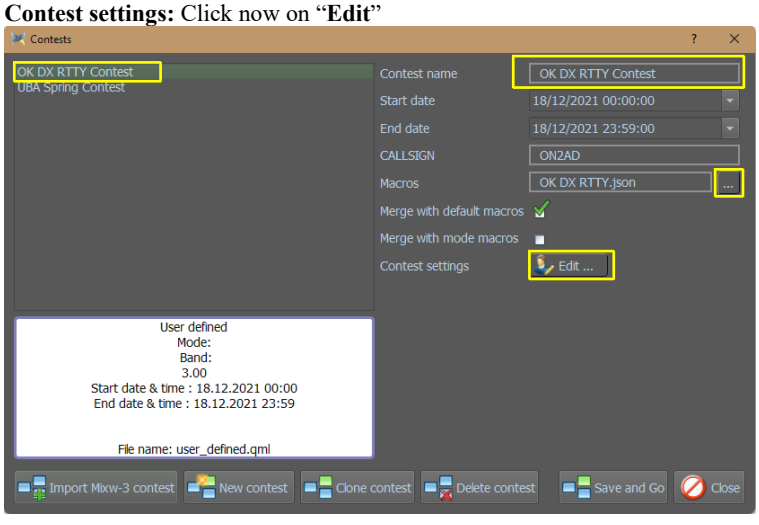
Scroll down and select

“User defined” and click on “Accept”



Contest name: Enter the Contest name here.
Start – End date: Fill the correct dates and time of this contest.
Callsign: The Callsign used in this contest.
Macros: By pressing the three dots button you can select your own macros or else give this contest its own macro name.
Merge with default macros: Merge with the default macros.
Merge with mode macros: Merge with the mode macros.

Contest settings: Click now on “**Edit**”



Select everything needed for this contest

Such as the Band, the Mode (don't forget) the report number or an automatic tracking number.

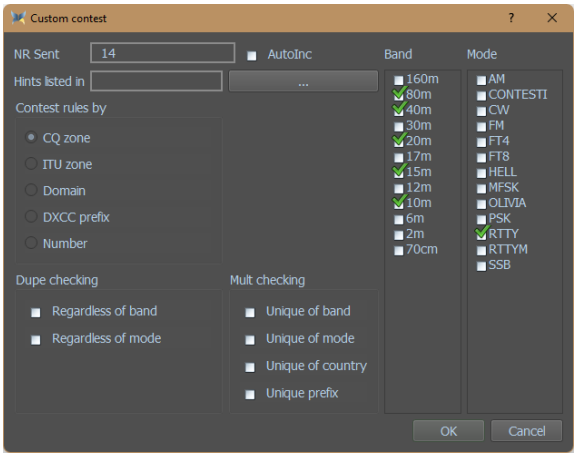
In this contest the WAZ number is requested.

If there are Hints for this contest then select them too

Don't forget what should come in the Exch box, here in this contest the CQ zone was selected.

Exit by pressing OK.

And then on Save and Go.



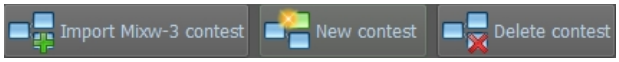
This is what your screen may look like after pressing “Save and Go”

Contest (contest) QSO's entry

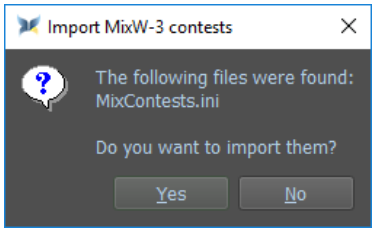
	Display a menu selection that allows changes to the displayed data entry columns.
	This data is now available for display in the Short Log and Log Search screens
	Clear the current QSO data.
	Send a spot to the DX Cluster.
Start Contest	Start the contest (competition) module.
	Close the contest module.
RUN	Control selects Run mode.
S & P	Control selects Search and Pounce mode.
M	Blank NRR entry save control. Causes to save, when set, a contest QSO with a blank NRR using the Intellegent macros, activated by the Carriage Return key or Space bar. Note: If this control is on before a valid NRR is received the QSO maybe saved with no NRR saved.
S	Allow NRR manual space entry control. When set allows manual entry of NRR that contains a Space character. When the QSO is to be saved a double Carriage Return key or Space bar action is required.
	Select display font and colours.
	Exit Contest.
Save QSO	Save QSO.
Send Spot	Send spot

Import Contests from MixW3

Click on the Import MixW-3 contest.



Click Yes



To leave the contest section click on

(top)

Contest Macros

A filename box Macros is one of the details requested before starting the contest.
If this is the first time the contest has been entered a default filename is offered.
There are 3 possible options that can be entered in this filename box:

1. Use the default filename. If this file does not exist it will be created with 48 blank macro entries and the contents of file {data_root}\Macros\smart-input.json. These extra macros use the Gray keys and macro (see below). This file is saved to the {data_root}\Contests\Macros folder.
2. Use the browse control (to the right of the filename box) to use a previously created set of contest macros.
3. Delete the current contents and leave the filename blank.

Other options offered are to merge the current default macros and current mode macros with the contest macros. Three new keyboard controls are introduced for contest mode macro control:

1. Gray+
2. Gray-
3. Gray*

Each of these key names can be used in a contest macro file and assigned a function. These keys are preset in the default macro file but can be changed by the contester as required.
There are seven macros to switch between RUN or SEARCH AND POUNCE mode:

<SP1>	-	enable Search and Pounce modes.
<SP0>	-	disable Search and Pounce mode (run mode on).
<S/P>	-	toggles between Search and Pounce and Run modes.
<SP:1>	-	is equal to <SP1>
<SP:0>	-	is equal to <SP0>
<OnSP1>	-	is equal to <SP1>
<OnSP:0>	-	is equal to <SP0>

Other macros used during the contest:

<OnCR>	-	Preset to in the contest macros. This macro is called when the Return key or Space bar are pressed with the Cursor in the CALL, RST or NRR fields.
<GRABCALL>	-	Get the next Call from the input data
<ACALL>	-	See The ACALL macro
<CCALL>	-	See The CCALL macro
<NRS>	-	Add Exchange to send
<NRR>	-	Insert received Exchange
<PREVCALL>	-	Insert previous Call
<PREVRSTS>	-	Insert Previous sent RST (inserts previous RST sent)
<PREVRSTR>	-	Insert Previously received RST
<PREVNRS>	-	Add previous Exchange to send
<PREVNRR>	-	Add previous Exchange received

The following 3 macros require support from the contest control software. They may not work with all contests.

<CONTESTCMD:file_json>	JSON command in contest mode
<CONTESTCMDF>	Choose JSON file in contest mode
<CONTESTCMDF:file_name>	Open JSON file in contest mode

(top)

The macro's RUN, SEARCH EN POUNCE and INTELLIGENT (<INT>)

In Contest mode there are several macros which are dependent on each other and the contents of certain fields in the contest log.

These macro sequences are controlled by the (Intelligent) macro. This macro is called by the OnCR macro whilst MixW4 is in Contest mode or a single macro key can be programmed with the macro enabling a 1 key control of a complete contest QSO in Search and Pounce mode or a 2 key control in Run mode.

Search and Pounce Mode

Call	RX Exchange	Output	Macro to Edit
-empty-	-empty-	?	INTQRL
NEWCALL	-empty-	de mycall	INTDE
WKDCALL	-empty-	nothing	none
NEWCALL	exchange	QSL UR 599 001 <SAVEQSO> See Input line M & S controls above.	INTQSL

Run Mode

Call	RX Exchange	Output	Macro to Edit
-empty-	-empty-	CQ TEST de mycall	INTCQ
NEWCALL	-empty-	newcall GA 599 001	INTGA
WKDCALL	-empty-	Newcall QSO B4 QRZ	INTQB4
NEWCALL	exchange	QSL 73 QRZ de mycall <SAVEQSO> See Input line M & S controls above.	INTQRZ

Use of <ACALL> & <CCALL> macros

The <CALL> macro reads the Call field from the Input line immediately after it has been activated, usually embedded in another macro. This works as long as the call is complete eg the <GRABCALL> macro has been used or the call has been obtained from the receive window by positioning the mouse cursor in the call and double left clicking.

Some modes cannot reliably use the above method, Hellschreiber or CW for example. The call has to be input into the Call field by manually typing it in. In a contest time can be lost in replying as the call has not been completely entered. To overcome this problem two macros have been created.

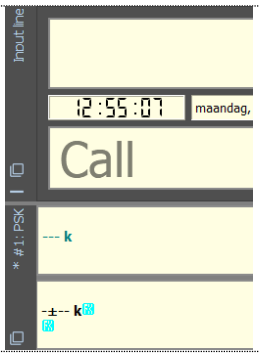
The <ACALL> & <CCALL> macros have a similar function.
Both allow the updating of a call in the call field after MixW4 has gone to Transmit mode.
However, the final output is different for each macro.

The <ACALL> macro

This macro can be substituted once in a data transmission string for the <CALL> macro anywhere it is used.
It will always read and output the current contents of the Input line Call field as it is executed from the transmit window.

Example of actions.

An artificial macro sequence used to demonstrate the actions:
<CRLF><CALL>-<ACALL>-<CALL>-k <RX>

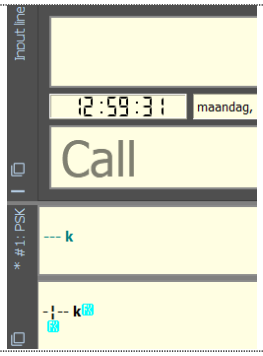
Macro called with no call in the Call field.	Partial call inserted and TX window activated.	Macro recalled with partial call in the Call field. The TX window is activated, and the call completed.
		
TX Window not activated as there is no call to output.	The <CALL> macros output no data but the <ACALL>macro outputs the partial call.	The <CALL> macros output the partial call and the <ACALL> macro outputs the complete call.

Note the ± (plus-or-minus symbol) used to indicate the position of the macro.

The <CCALL> macro

This macro can be substituted for the <CALL> macro but it will not output any data unless the macro detects, *as it is executed*, the Call field of the Input line has been changed.

Example of actions.
<CRLF><CALL>-<CCALL>-<CALL>-k <RX>

Macro called with no call in the Call field.	Partial call inserted. The macro recalled and the TX window activated.	Macro recalled with partial call in the Call field. The TX window is activated, and the call completed.
		
TX Window not activated as there is no call to output.	The <CALL> macros output the partial call data but as there has been no change to the partial call since the macro was called the <CCALL>macro outputs no data.	The <CALL> macros output the partial call and the <CCALL> macro outputs the complete call as the changes were made after the macro was called.

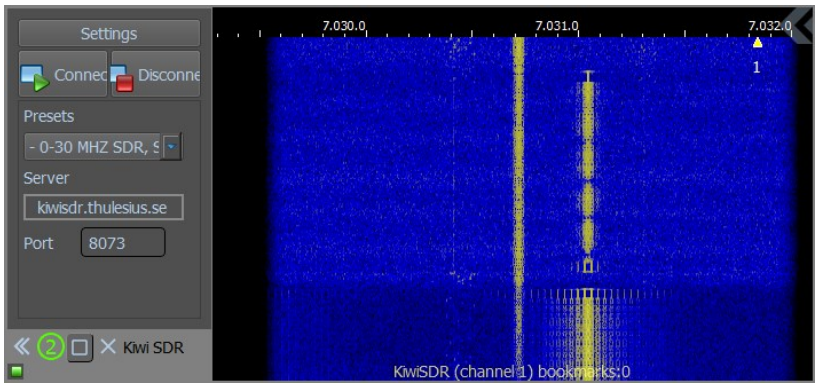
Note the ¦ (pipe symbol) used to indicate the position of the macro.

Warning: If both the <ACALL> and <CCALL> macros are included in the same macro sequence the results may be unpredictable.

The contest facilities, apart from the Gray keys <ACALL> and <CCALL> macros, can be used during normal running.

(top)

KiwiSDR



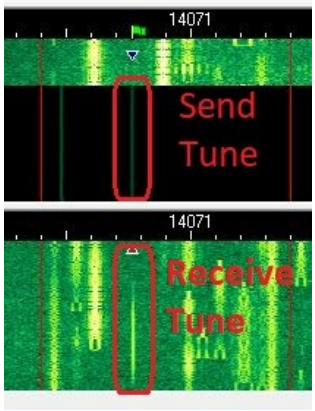
Introduction

KiwiSDR is an SDR (software defined radio) receiver for the entire frequency range of 10 kHz to 30 MHz and ~. A whole range of these receivers can be controlled over the Internet and you can see what they receive there on the spot.
The KiwiSDR supports up to four simultaneous (internet) connections, each with their own independently controlled audio and waterfall channels.

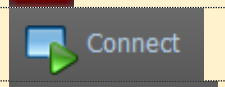
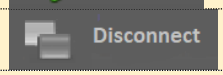
Why is KiwiSDR good for in MixW?

Sometimes we have been broadcasting CQ for a while and no one's responding to the signal. The questions one asks themselves are of this nature:
I have problems with my antenna (SWR was OK anyway?) my transceiver has problems; or the propagation is bad, etc ...

But with a connected KiwiSDR server one can quickly see if the own signal arrives at the chosen server.
This can be done by sending a signal with a certain mode and tracking whether it arrives. It is easier to send out a TUNE signal.
In this photo I sent a TUNE signal (top image) and I saw that this KiwiSDR (bottom image) received my TUNE signal.



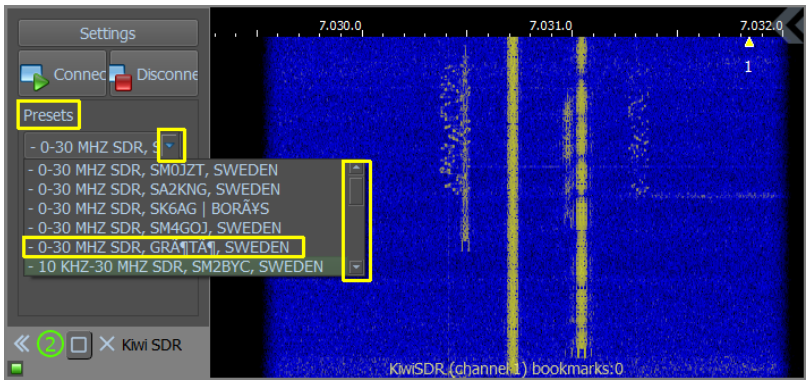
KiwiSDR Index and symbols

	KiwiSDR is not selected to a KiwiSDR server.
	KiwiSDR is trying to connect to a KiwiSDR server.
	KiwiSDR is connected to a KiwiSDR server.
	KiwiSDR is not connected to a KiwiSDR server.
	Connecting to a KiwiSDR server.
	Disconnect from a KiwiSDR server.
Presets	Make your choice here from the different KiwiSDR servers.
Server	Displays the address of the server.
Port	The port number for the KiwiSDR is shown here.
Cutoff	The port number for the KiwiSDR is shown here.
Shift	Start and end of the KiwiSDR bandwidth that is adjustable. Here you can adjust the difference in frequency between the transceiver waterfall and the KiwiSDR waterfall. Negative values are preceded by "-" Example: -5 means that the difference between the two waterfalls is minus 5 Hz.
Compress	Compress the Cutoff values.
Set	Confirm the Cutoff values.
	AGC checked is automatic AGC control. AGC unchecked, you can manually control the AGC with the slider.

Use of the KiwiSDR

Click the KiwiSDR symbol. Then the KiwiSDR setting and waterfall appears above.

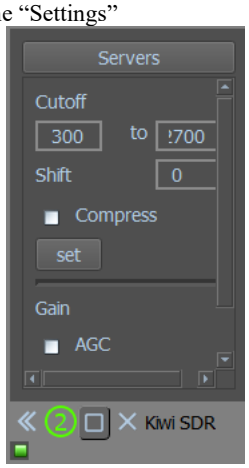
In the Field of Presets (yellow frame) click the arrow (yellow frame above right) and select a KiwiSDR server (yellow frame below) If you want to see no other servers scroll down.



If a KiwiSDR server is selected, click Connect . Now the check mark goes from Red to Orange and if there is a connection to the chosen KiwiSDR server then this mark changes to green. If the chosen server cannot be connected due to the fact that there are already 4 connections or that that server is not on, this is displayed by a Red marker. See below in order as described above

By click on open a scrollbar so you can select the server you will use

The "Settings" button has a dual function if you click on it then it changes to "Servers" The image above shows the Servers and the image below the “Settings”

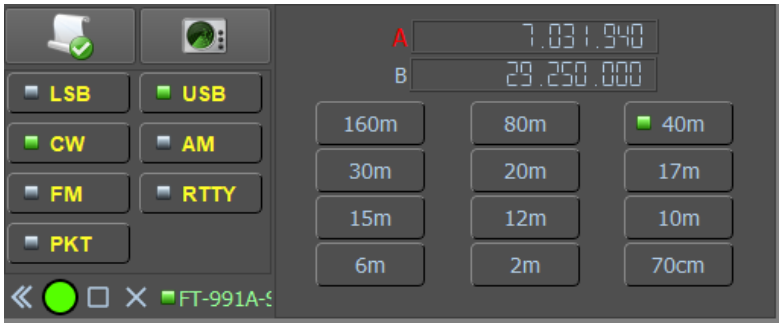


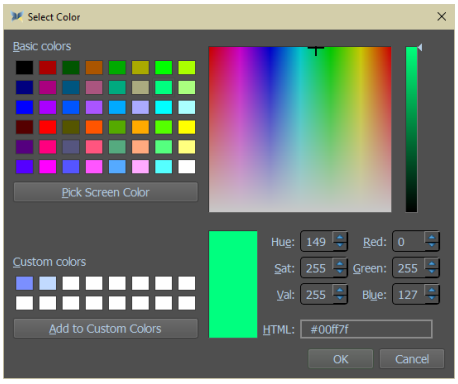
Cutoff = The bandwidth that ranges from 0 to the maximum bandwidth that that server can handle
Shift = If the Kiwi SDR waterfall deviates from the MixW4 waterfall you can adjust it by filling in a negative or positive number (- is negative and if positive there should be no + sign)
Compress =
Gain:
AGC = Automatic Gain Control, if it’s shaved, everything happens automatically, if it is turned off, you can adjust the Gain via the slider

Currently when writing this KiwiSDR manual there is still no KiwiSDR RX screen but will probably be built into a next version of MixW4 later. Then it will be possible to read your own texts in both screens

CAT settings and Waterfall display windows.

To move the CAT window double click between two modes.
As example: CW and AM.
Clicking on the green circle opens a new window to adjust its color





These procedures need practice and patience to get the desired result.

(top)

Modes and Digital modes

AM	Contestia	CW	FT4	FT8	Hellschreiber	JT65
MFSK	Olivia	PSK	QPSK	8PSK	RTTY	RTTYM

(top)

Contestia

Introduction to Contestia operations

Contestia theory

Contestia is a development from Olivia mode with a reduced character set and robustness created by Nick Fedoseev (UT2UZ).

Contestia is a version of MFSK, and in MixW the operating procedures are the same as for MFSK, with the exception of certain options that can be set in the Contestia Mode settings via the ModeSet macro. The "number of tones" can be selected from 8 different settings between 2 and 256, and the "bandwidth in Hz" can be selected from 5 different settings between 125 and 2000. The tones/bandwidth combination appears as characters/s in the status bar.
The signals on the waterfall are almost identical to Olivia and RTTYM signals. As with all digital modes, the user will soon be able to visually identify the different formats in the waterfall with some experience.

It is important for a successful Contestia operation that the sound card is calibrated.

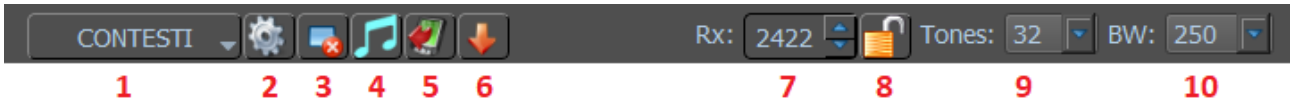
Find and tune Contestia signals

Contestia under MixW, like all other MFSK modes, is used by clicking on the waterfall or spectrum view at the desired mid-frequency.
Frequencies currently used for Contestia appear to:
For 125/250/500 bandwidth just above the PSK63/125 frequencies

40 meters, 7072-7074
30 meters, 10134-10139
20 meters, 14100-14112

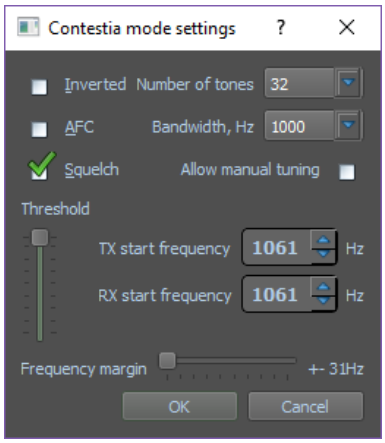
The best combination for calling CQ is probably 500 Hz, 8 Tones. However, a common practice is to agree in whatever mode the operator wants to work in. Be careful with the 1000 Hz width, and especially if you change from 500 Hz to 1000 Hz, so you do not cause interference with other users.

Contestia dialog bar



1. Mode choice menu.
2. Modes settings.
3. Clear RX window.
4. Tune.
5. Show/hide TX controls.
6. Save audio history (40 sec) Right click to browse files.
7. RX midfrequency.
8. Lock the RX-freq. A red pin appears above the RX cursor Display the Mode Settings window.
9. Number of tones.
10. Bandwidth (Hz).

Contestia mode settings



Inverted: causes the signal to be reversed.
AFC: helps to tune and follow the Contestia signal.
Squelch and Threshold: can be customized to suit your preferences.
Number of tones: selects from 8 values between 2 and 256
Bandwidth, Hz: selects from 5 values between 125 and 2000
Allow manual tuning: allow is permanently enabled.
Tx/ Rx start frequency: are the signal low frequency settings.
Frequency margin: changes the frequency range within which signals are decoded.

The TX/RX mid frequency, number of tones, and bandwidth can also be set using the Contestia status bar at the bottom of the MixW4 main window.

The signals on the waterfall are almost identical to Olivia and the RTTYM signals. As with all digital modes, after a short experience, the user will be able to visually identify the different formats in the waterfall.
It is important for a successful Contestia-operation that the sound card is calibrated.

(top)

CW

CW Introduction and theory CW operation

CW Intro & theory

Credit Steven R. Hurst, KA7NOC
CW and morse code. CW stands for "continuous wave", but when HAM's use the term today, they refer to the use of the international morse code to communicate with a series of on and off pulses of a single RF frequency.
Morse code is named after Samuel F.B. Morse, 1791-1872. The code consists of a series of dots and dashes. Each letter of the alphabet and the numbers 0 to 9 have individual combinations assigned to them. For example, the letter "E" is a single "this", making it the easiest letter to learn and send. Some people can copy code at speeds of up to 70 words per minute, but most HAM's copy in the range of 10 to 30 words per minute. Once you have passed the learning curve, the Morse code becomes a second language and you

start hearing "words," not just individual letters. You start to recognize the rhythm of the words, so you can easily pick them out and take them with you with the conversation.
Novice HAM's usually send CW with a "straight" or hand key and copy every letter and every word of a QSO as they hear it on their receiver. If they enjoy CW, they can grow to transmit with a semi-automatic "bug", or they use paddles and an electronic key for fully automatic dots and dashes.
CW as an automated digital mode. With a program like MixW, CW can be sent and received using the keyboard and computer screen, just like the more recent digital modes. MixW will copy the computer-generated code almost without errors. It also copies the code that is well sent with a Lambic paddle and an electronic keyer, provided the timing is right. It can even record small variations if the user is adept at choosing the good copy of the bad on the screen. However, most hand-transmitted code cannot be printed on the computer. The timing is just not consistent enough for the computer to understand. In such situations, copying the code on the ear can help to replenish the code that the computer decrypts for you.
Sending CW via the keyboard is particularly valuable for people with physical disabilities who can't use a key or paddles, but still want to work CW and who can decode the code in their head at high speeds.

(top)

CW operation

Configuration

There are six different methods for working with CW in MixW.

1. Send and receive with the sound card (while the transceiver is in SSB mode)
2. Manual send and receive (while the transceiver is in CW mode).
3. Keying your transceiver with a key connected to the computer, which is similar to the way MixW handles the PTT signal for the other modes (your transceiver is in CW mode)
4. Use a CAT command for your transceiver (your transceiver is in CW mode).
5. Use a dedicated multimode hardware moderate TNC for both decoding and encoding CW through the TNC (your transceiver is in CW mode).
6. Use a WinKeyer (your transceiver is in CW mode).

CW with the sound card

The sound card approach of the CW operation is the easiest to implement. In this approach, your transceiver is in SSB mode (USB or LSB works). Configuring MixW to use the sound card approach is the same as with the other digital modes. Click the CAT button and click Settings and select "CW from via sound card". Click OK

Put your cursor on any frequency. To send text you can use a Macro that you have created for CW mode only.
But you could also send your own text by typing your own text with your keyboard in the TX screen. Your transceiver will be switched to, TX, VOX or CAT, just like any other mode.

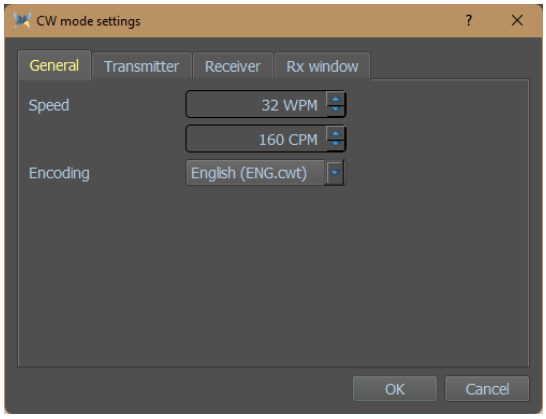
CW dialog bar

1. Mode choice menu.
2. Mode settings.
3. Clear RX window.
4. Tune.
5. Show/Hide TX controls.
6. Save audio history (40 sec) Right click to browse files.
7. RX frequency.
8. Lock/Unlock RX frequency.
9. Snap frequency.
10. Reduce CW speed
11. Increase CW speed.

(top)

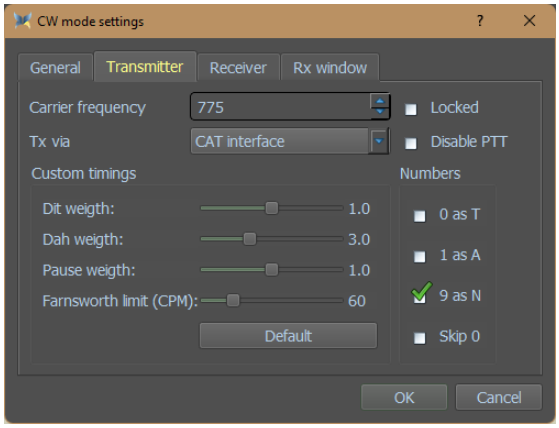
Then select the mode CW and then select the mode settings on the dialog bar.

General



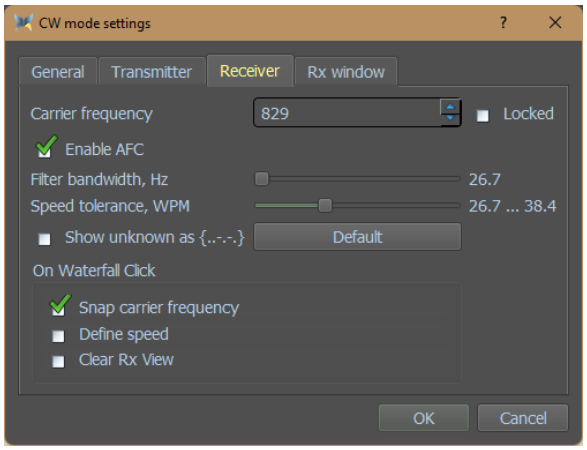
Here you set the following:
WPM (Words Per Minute).
or the:
CPM (Characters Per Minute)
Encoding: English (ENG.cwt)

Transmitter



Carrier frequency: TX frequency in the watervall
TX via: You have the choise between
"Sound card wave output" and
CAT interface
Custom timings: Here you can set the CW signals and if the result is not satisfactory then click on Default to get the default settings.
Locked: TX will lock on the watervall.
Disable PTT: Disabled the PTT
Numbers: The numbers in a report RSQ (T) are converted to letters
Default: Return to the default settings.

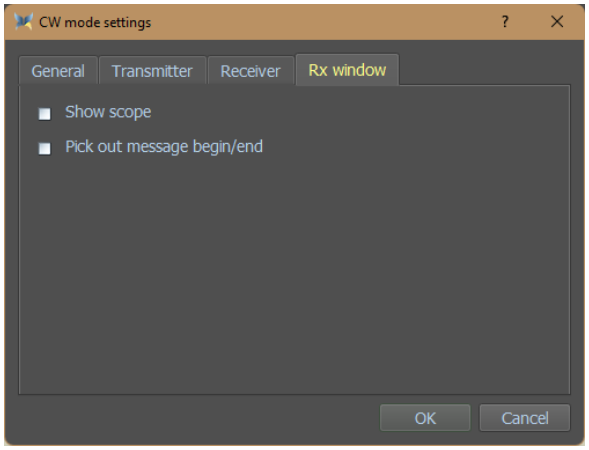
Receiver



Carrier frequency: RX frequency on the Watervall.
Locked: Locked the RX frequency on the Waterfall.
AFC: **A**utomatic **F**requency **C**ontrol.
Filter bandwidth, Hz: Bandwidth filter in Hz.
Speed tolerance, WPM: Tolerance of speed in WPM.
For higher decoder sensitivity, set the "Filter bandwidth" and "Speed tolerance" sliders to the leftmost position. In this case, the decoder rejects near standing signals and signals with various keying speed. To achieve wide range of accepting carrier frequency and keying speed set this sliders to rightmost positions. The decoder becomes less sensitive to weak signals and more affected by noise.
Absolute values of bandwidth and WPM tolerance depend on the general WPM setting.
But the track bars positions specify the relative values and do not change when you specify new general WPM value.

Show unknown as {..-.-.}: Undecoded characters are displayed as {..-.-.- etc displayed
Default: Default settings
On Waterfall Click:
Snap carrier frequency: Carrier frequency will snap
Define speed: The speed is determined.
Clear Rx View: Clear RX View screen

RX Receiver



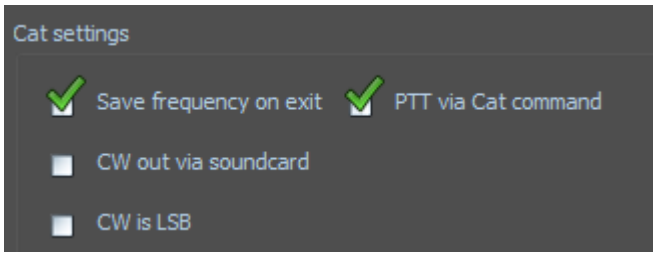
Show scope: Scope will visible.
Pick out message begin/end:
If this is checked then you will be at it:
Start of the signal <SOM>
and at it
End of the signal <EOM>

Manual send and receive

In manual mode, you only use MixW as a tuning and log program. Click the CAT button and click Settings
Check out "CW via sound card". Click OK. Then select the CW mode, and then select the mode settings by right-clicking the CW RX (reception screen) screen and
clicking Mode settings... In the RX Algorithm field, select "Manual". Plug in your radio key and put the transceiver in CW mode. Now the frequency of the CW transfer is set by the transceiver, so MixW will secure the TX on the waterfall and display the red flag for that. You can set the RX frequency wherever you want, as you will decode by ear. With the RX algorithm set to manual, you can type in the RX window and use MixW's log functions. You need to tune in to the transceiver, but if you are looking at the waterfall, you can set the TX frequency directly to the station you are answering.
Direct CW encryption: This method allows MixW to use your transceiver directly through a connection between your computer's COM port and your transceiver's key input (this connection uses a PTT-type circuit). This works in the same way as connecting an external keyer to your transceiver, the only difference being that MixW (and your computer) act as the external keyer. In this case, your transceiver will be used in CW mode and will send you cw. You will then have all the advantages of the CW filters of your transceiver etc... .

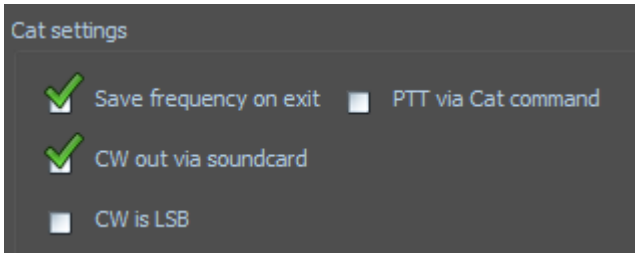
CAT setting for CW in CW mode

Turn the transmitter into CW mode and turn MixW into CW mode click the CAT setup and click on the Settings of your transmitter and check as in example

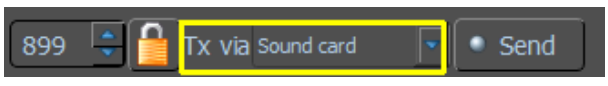


CAT setting for CW in SSB mode

Turn the transmitter into SSB mode and turn MixW into CW mode click the CAT setup now and click on the Settings of your transmitter and check as in example



In the TX screen select TX via Soundcard.



(top)

FT4

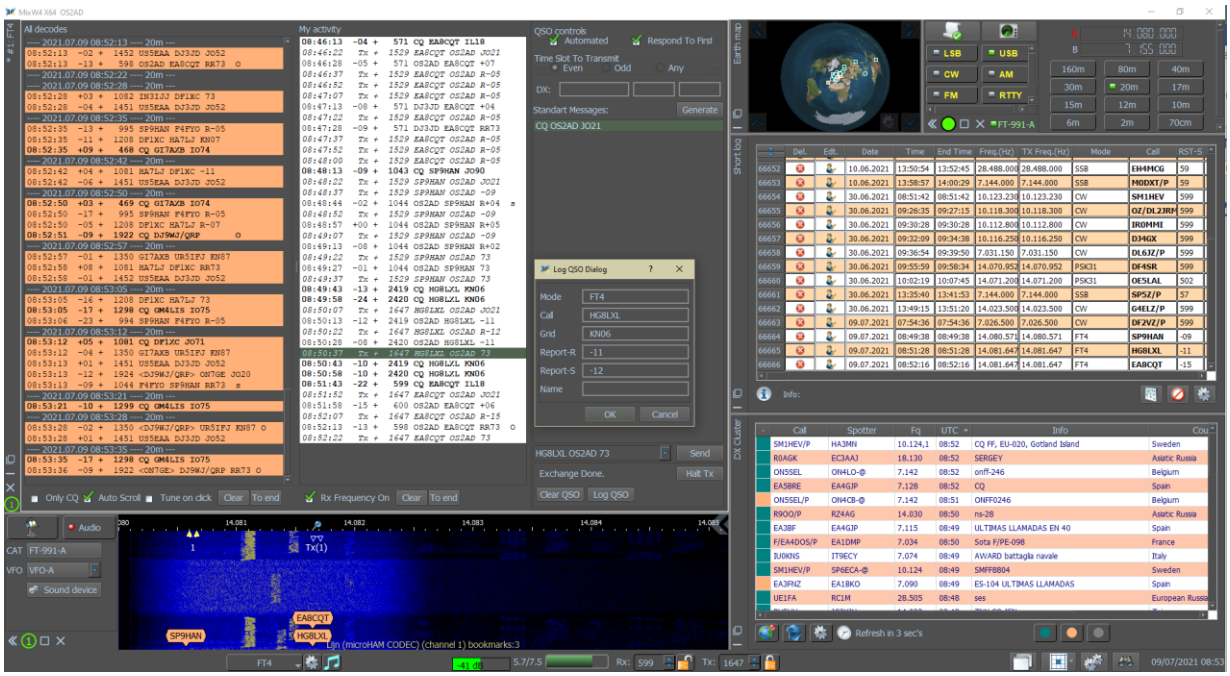
Introduction and theory

FT4 was developed by Joseph H. Taylor, K1JT, Steven J. Franke, K9AN and Bill Somerville, G4WJS.

FT4 is an experimental digital mode designed specifically for contesting.

Like FT8, it uses fixed-length transmissions, structured messages with formats optimized for minimal QSOs and strong forward error correction.
T/R sequences are 6 seconds long, so FT4 is 2.5× faster than FT8 and about the same speed as RTTY.

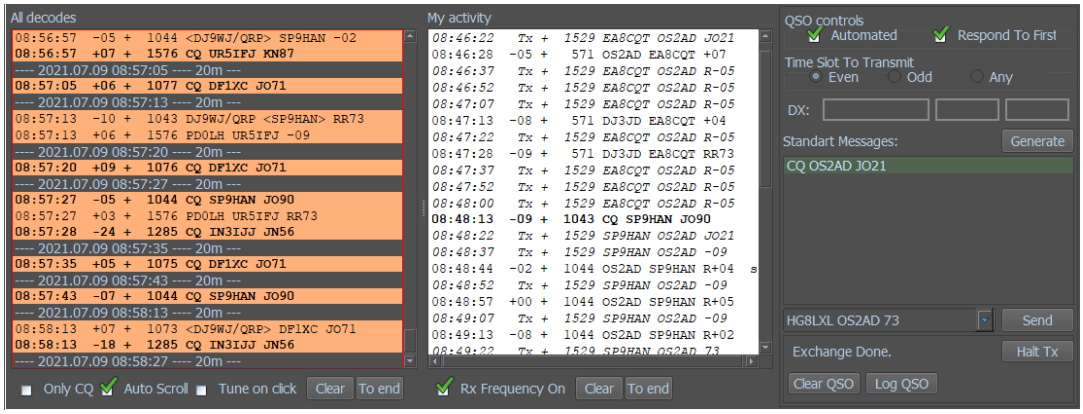
FT4 can work with signals that are 10 dB weaker than needed for RTTY, while much less bandwidth is used. FT4 message formats are the same as those in FT8 and coded with the same low-density (174.91) parity check code. Transmissions last 4.48 seconds, compared to 12.64 seconds for FT8. Modulation uses 4-tone frequency-shift-keying at about 23.4 baud, with tones separated by the baudrate. The occupied bandwidth (which contains 99% of the broadcast power) is 90 Hz. (source UBA)



FT4 Dialoogbalk

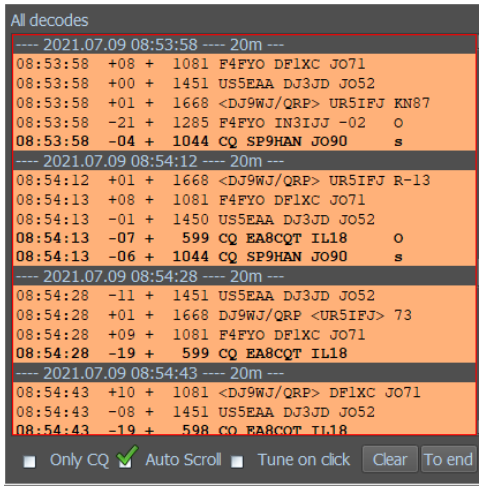
1. Mode choice menu.
2. Mode settings
3. Activate the Tune controls.
4. Save audio history (40 sec) Right click to browse files.
5. Soundcard input (RX) in dB. Ideally adjust your input for the green shading to cover about 50% of the box.
6. Signal activity period Time bar. 7.5 seconds for FT4.
7. Audio frequency (RX).
8. Lock/Unlock the RX.
9. Audio frequency (TX).
10. Lock/Unlock the TX.

Display and control windows



All decodes

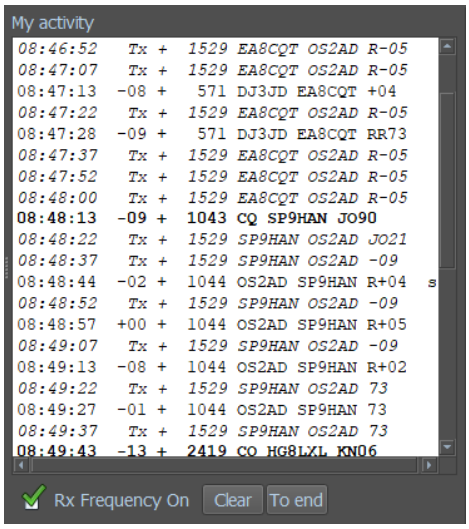
Legend



The letter o means that the signal is decoded with a soft decoder (osd), which means that it is weak in level or strong in noise.
Decibels can be -10 ...- 25.
The letter s (subtra) means that the signal is drawn under another stronger signal with partial or complete overlap of the spectra.
Maybe ss - the signal is pulled from under the signal that is pulled from under another signal.
The decoder has the ability to distinguish ssss and even ssss on a very full band.
There may be combinations of os oss osss ossss.

Only CQ - only display CQ messages
Auto Scroll - Scrolls this window
Tune on click - MixW4 tunes to the call clicked on.
Clear - Clear this window
To end - Scroll to end of all decodes list.

My activity



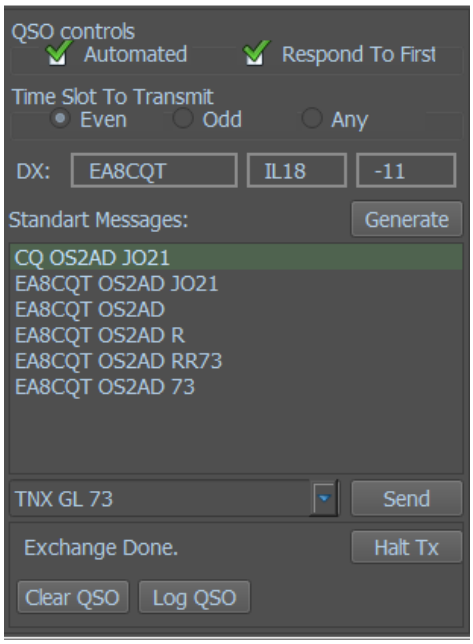
This window displays the data transmitted by MixW4 and the signals decoded from the Receive frequency setting if enabled below.

Rx frequency on - Display data on the RX frequency.

Clear - Clear this window.

To end - Scroll to end of My activity list.

QSO Controls



Automated: QSO controlled by MixW4.
Respond to First: First identified caller to your CQ answered.
Time Slot: To Transmit Either the Even start seconds (0/30), the Odd start seconds (15/45) or MixW4 chooses for you.
DX: The Call, WW Locator square and your Signal strength as reported from the remote station.

Standard Messages:
A list of the messages generated after you have selected a call and clicked on Generate.

Send: (Transmit) The drop down menu shows nonstandard messages you can send.
Halt TX: (Stop transmission) The bar to the right shows the progress of the transmission or Iddle.
Clear QSO: Clear the DX line.
Log QSO: Copy the DX line to your log.

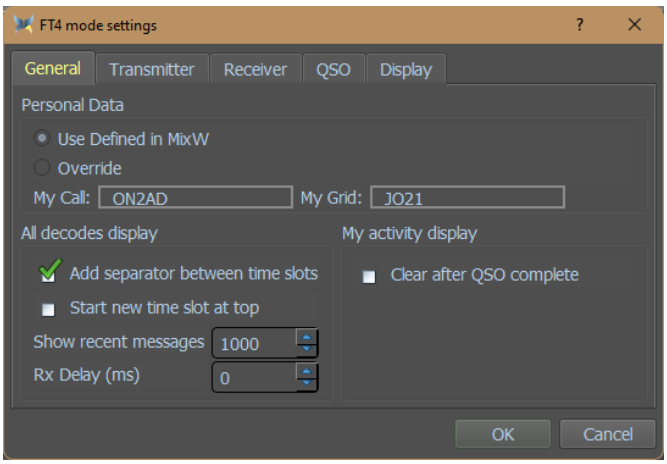
FT4 settings

General

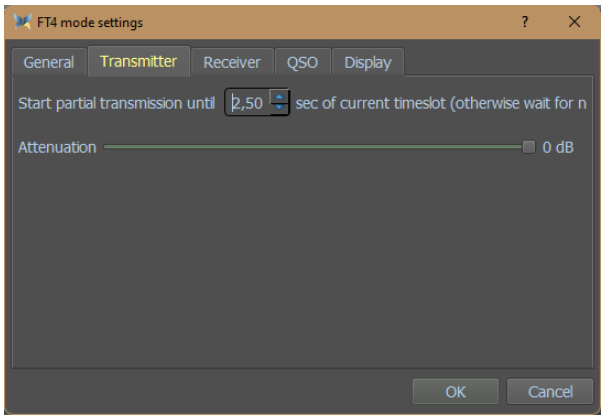
Personal Data:
Use Defined in MixW: Use defined in MixW
Override: Use if operating /p, /a etc, Call/Grid are temporary
Call: Enter your Callsign here
Grid: Enter your Grid here

All decodes displays:
1 Add Seperator between time slots separates the decodings
for each signal reception period.
2 Start new time slot at top
3 Show recent messages: selects how many messages in the
screen are buffered.
4 Rx Delay (ms)

My activity display
Clear activity after QSO is complete



Transmitter



Start partial transmission until - seconds remaining in time slot after which no transmission will take place.

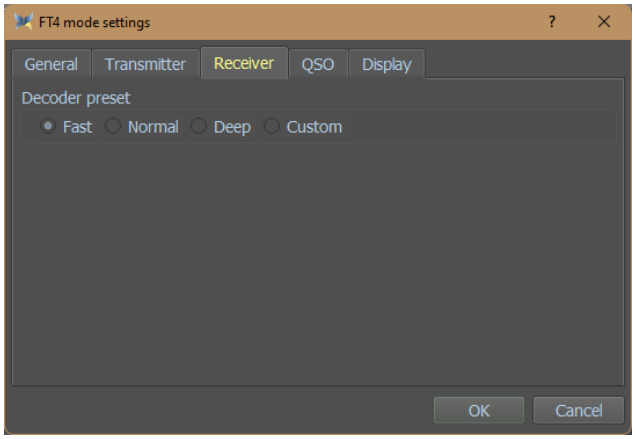
Attenuation - Signal attenuation between 0db and -50db.

Receiver

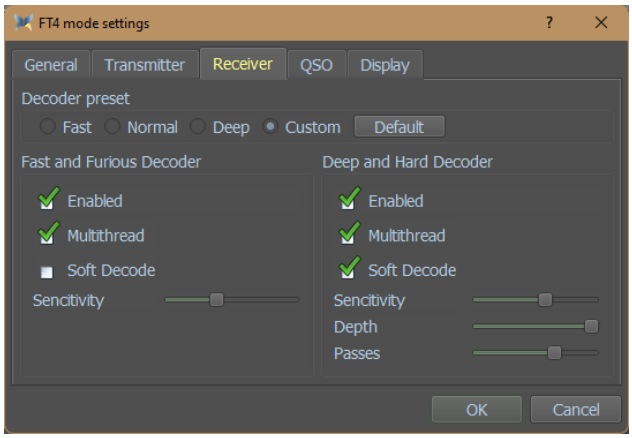
Decoder preset:
Select how the signals are to be decoded.

Fast
Normal
Deep

Clicking on the "Custom" opens the “Default” window, see below.



Custom



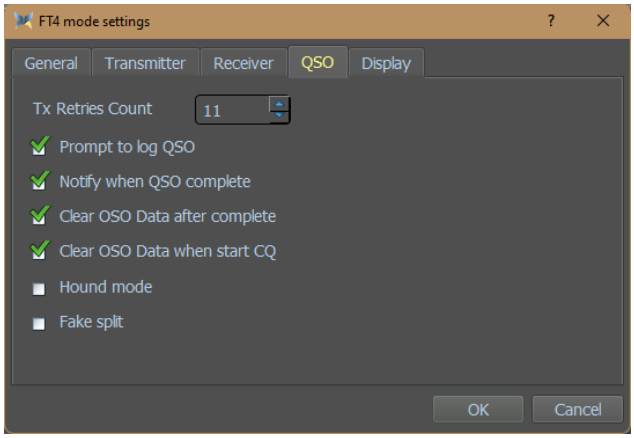
Enabled here what applies to you:

Fast and Furious Decoder:
Enabled
Multithread
Soft Decode
Sencitivity slider

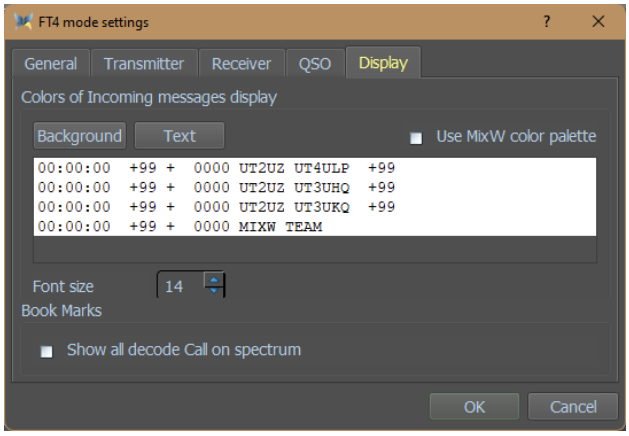
Deep and Hard Decoder:
Enabled
Multithread
Soft Decode
Sencitivity slider
Depth slider
Passes slider

QSO

Tx Retries Count: How many times send message to receive proper answer
Prompt to log QSO
Notify when QSO complete
Clear QSO Data after complete
Clear QSO Data when start CQ
Hound mode:
Fake split: Fake, sound card based frequency split



Display



Colors of Incoming messages display. -
Choose FT4 selection or use the overall MixW colors.

Text - Your choice of font size for the FT4 display only.

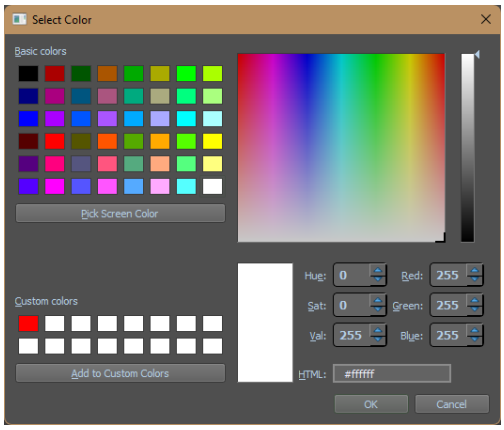
Use MixW color palette

Font size BookMarks - Select whether to display the calls of decoded signals on the display or not. On a busy band the waterfall can become very cluttered.

Show all decode Call on Spectrum

Background and Text

Here you can change the background and text colors



(top)

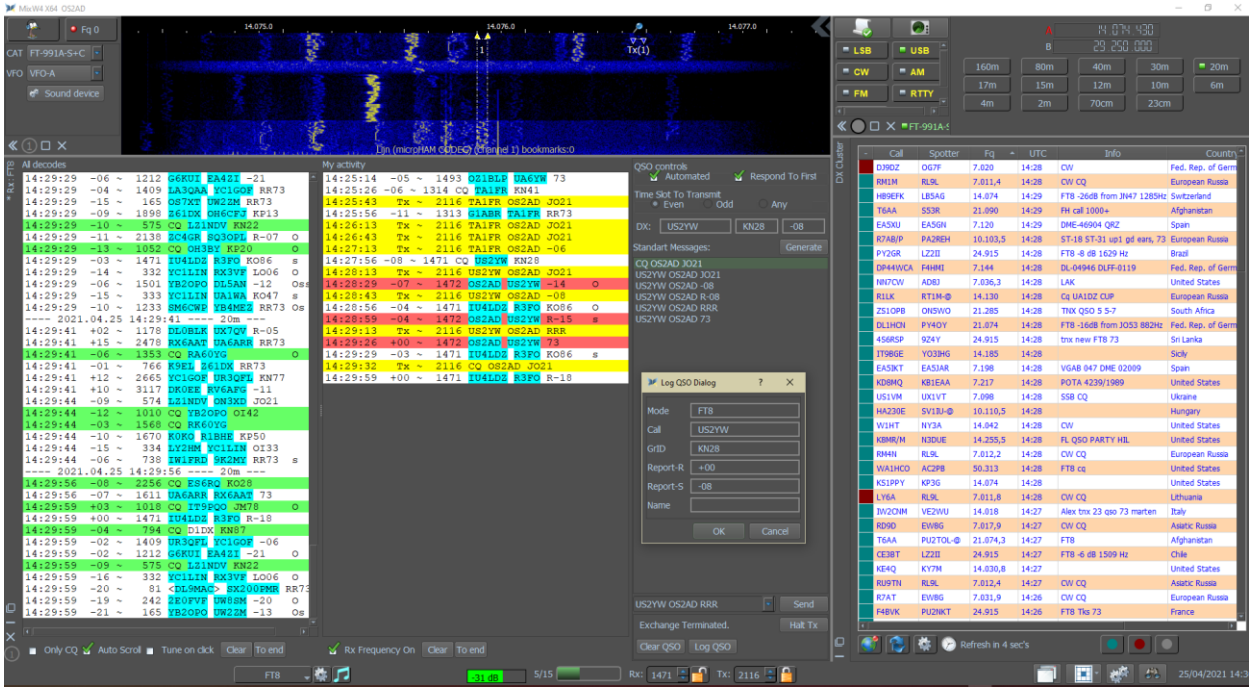
FT8

Introduction and theory

FT8 was developed by Steven J. Franke, K9AN and Joseph H. Taylor, K1JT.
The mode name "FT8" stands for "Franke and Taylor, 8-FSK modulation".
FT8 uses 15-second transmission/reception sequences, provides a 50% or better decryption rate up to -20 dB on an AWGN channel and maintains good performance with Doppler fading.
An auto-sequencing feature includes an option to respond semi-automatically to a CQ call.
FT8 QSOs are 4 times faster than JT65 or JT9 QSOs.
FT8 is an excellent mode for HF DX and for situations such as multi-hop E_s at 6 meters with a low QSB.

FT8 properties

TX / RX sequence length:	15 s official 13.48 Sec
Message length:	77 bit + 12 bit CRC
FEC code:	LDPC (174.87)
Modulation:	8-FSK, pitch 6.25 Hz
Waveform with constant curve:	
Engaged bandwidth:	50 Hz
Synchronization:	7x7 Costas arrays at the beginning, middle and end
Shipping speed:	79 * 1920/12000 = 12.64 s
Decoding threshold:	-20 dB, a few dB bearing with AP decoding
Multi-decoder finds and decodes all FT8 signals in the pass-through band	
Optional automatic sequencing and automatic response to a CQ call	
Performance similar to JT9, JT65	



FT8 dialog bar

1. Mode choice menu.
2. Mode settings
3. Tune.
4. Save audio history (40 sec) Right click to browse files.
5. Soundcard input (RX) in dB.
6. 15 second time window expires.
7. Audio frequency (RX).
8. Lock the RX.
9. Audio frequency (TX).
10. Lock the TX.

FT8 Settings

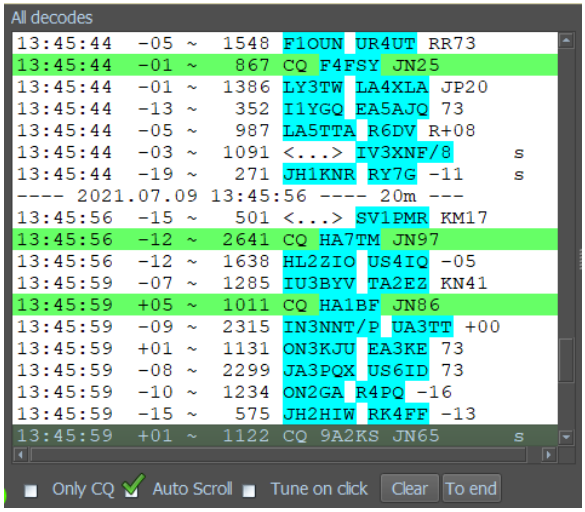
Display and control windows.

MixW user interface

All Decodes

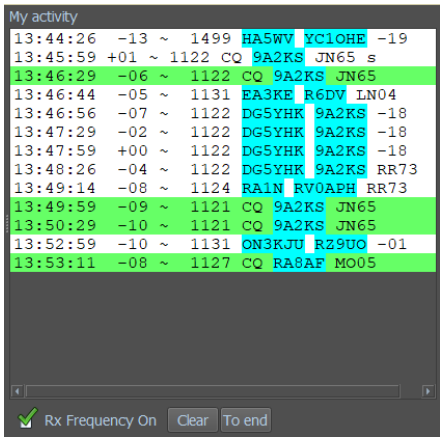
Legend

The letter o means that the signal is decoded with a soft decoder (osd), which means that it is weak in level or strong in noise.
Decibels can be -10 ...- 25.
The letter s (subtra) means that the signal is drawn under another stronger signal with partial or complete overlap of the spectra.
Maybe ss - the signal is pulled from under the signal that is pulled from under another signal.
The decoder has the ability to distinguish ssss and even ssss on a very full band.
There may be combinations of os oss osss ossss.



Only CQ - only display CQ messages
Auto Scroll - Scrolls this window
Tune on click - MixW4 tunes to the call clicked on.

My activity



This window displays the data transmitted by MixW4
and the signals decoded from the Receive frequency if enabled below.

Rx frequency on - Display data on the RX frequency.

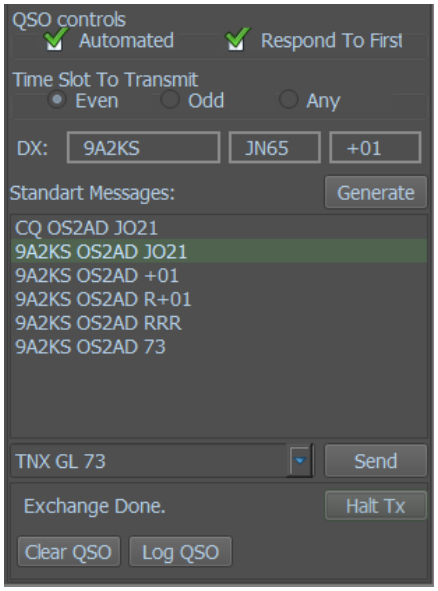
Clear - Clear this window
To end - Scroll to end of all decodes list.

QSO controls

Automated: QSO controlled by MixW4.
Respond to First: First identified caller to your CQ answered.
Time Slot: To Transmit Either the Even start seconds (0/30), the Odd start seconds (15/45) or MixW4 chooses for you.
DX: The Call, WW Locator square and your Signal strength as reported from the remote station.

Standard Messages:
A list of the messages generated after you have selected a call and clicked on Generate.

Send: (Transmit) The drop down menu shows nonstandard messages you can send.
Halt TX: (Stop transmission) The bar to the right shows the progress of the transmission or Iddle.
Clear QSO: Clear the DX line.
Log QSO: Copy the DX line to your log.



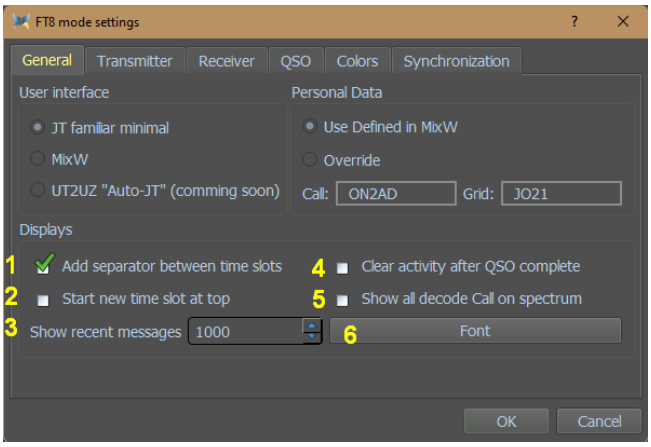
Mode settings

General

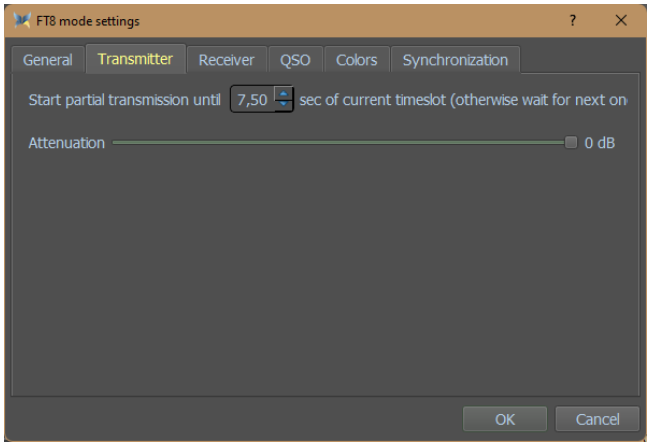
User interface:
JT familair minimal: Design of the screen as in JT.
MixW: Design of the screen as MixW.
UT2UZ "Auto-JT": (Coming soon)

Personal Data:
Use Defined in MixW: Use defined in MixW
Call: Enter your Callsign here
Grid: Enter your Grid here
Override: Allows for a modified Call and Grid. Can be used for portable operation.

Displays:
1 Add Seperator between time slots separates the decodings for each signal reception period.
2 Start new time slot at top
3 Show recent messages: selects how many messages in the screen are buffered.
4 Clear activity after QSO is complete
5 Show all decoded Calls in the spectrum.
6 Font.



Transmitter



1 Remaining time in a transmission period which one new transmission will not be activated.
2 Attenuation

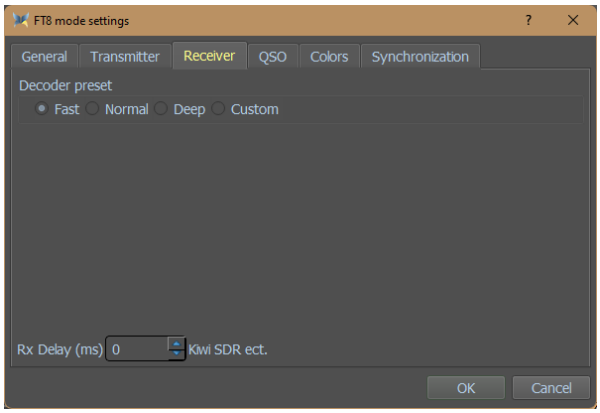
Receiver

Decoder preset:
Select how the signals are to be decoded.

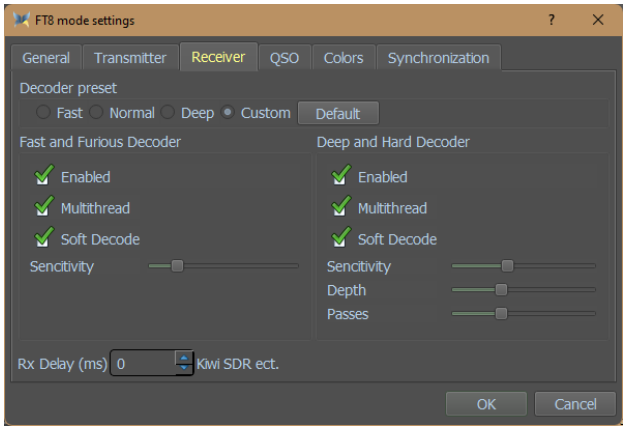
- **Fast**
- **Normal**
- **Deep**

Clicking on the "Custom" opens the “Default” window, see below.

RX Delay (ms) for KiwiSDR enz…



Custom

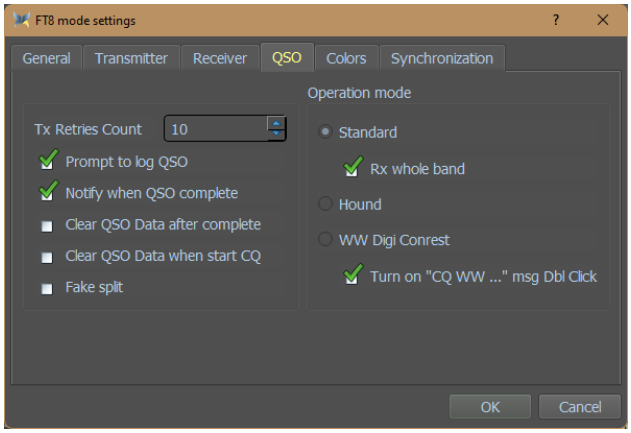


Enabled here what applies to you:

Fast and Furious Decoder:
Enabled
Multithread
Soft Decode
Sencitivity slider

Deep and Hard Decoder:
Enabled
Multithread
Soft Decode
Sencitivity slider
Depth slider
Passes slider
RX Delay (ms) for KiwiSDR enz…

QSO



Tx Retries Count: How many times send message to receive proper answer
Prompt to log QSO
Notify when QSO complete
Clear QSO Data after complete
Clear QSO Data when start CQ
Hound mode:
Fake split: Fake, sound card based frequency split see Info 1

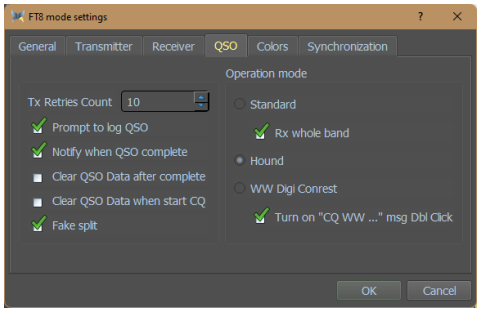
Operation mode:
RX whole band: see Info 2
Hound: see Info 2
WW Digi Contest
Turn on “ CQ WW…” msg dubbele klikken

Info 1

Split mode operation assumes usage separate VFOs or different frequencies for Rx and Tx.
By default in FT8 one VFO is used for Rx and Tx and audio frequency for Tx is the same as for Rx.
Manual split mode can be done by locking Tx frequency on desired value.
Fake split option allows to emulate the split mode by automated Tx frequency changing.

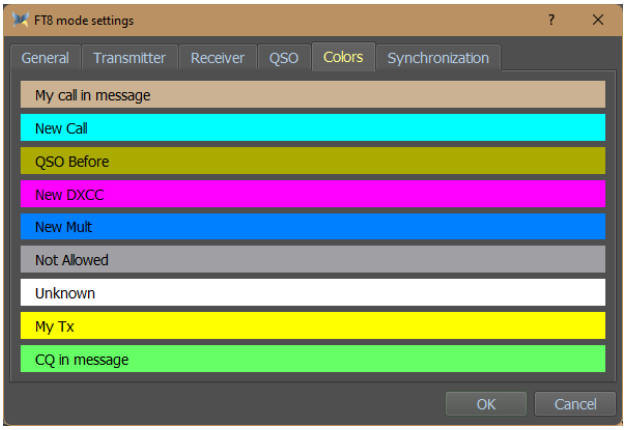
Info 2

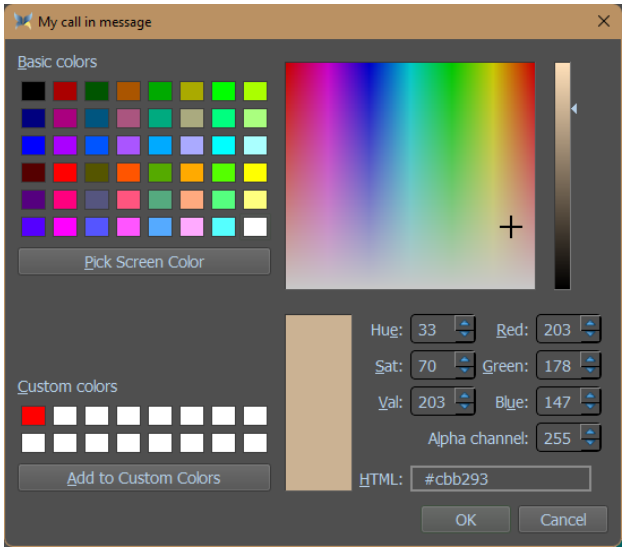
"Rx whole band" check box relates to "Hound" mode and settings dialog looks like this



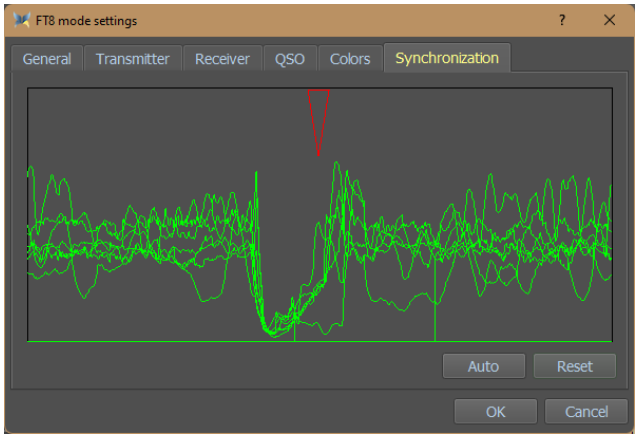
Colors

Click in one of the colors and a new window will open where you can choose your own colors.
See below.





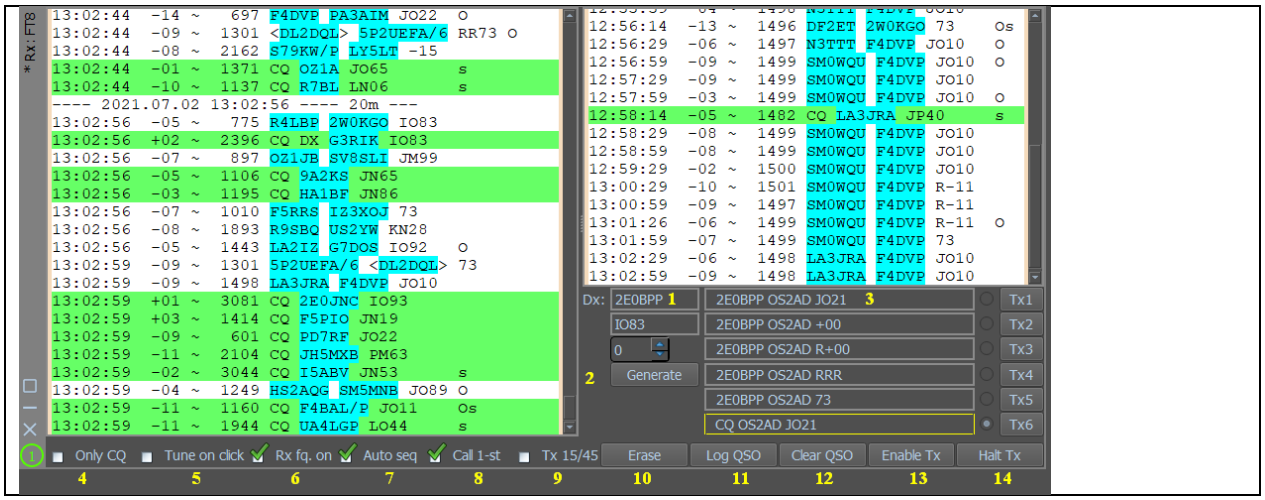
Synchronization



Synchronization overview

JT familair minimal

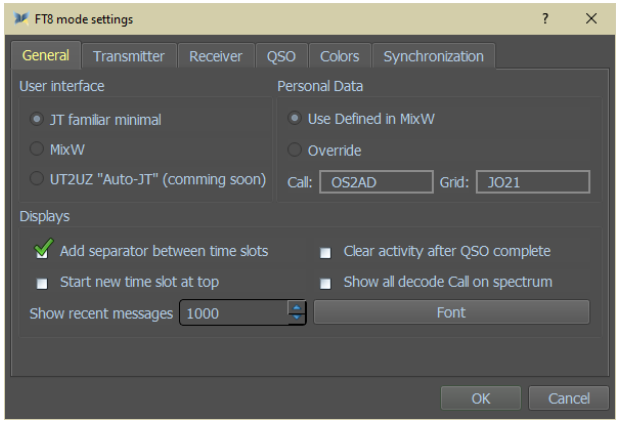
Legend



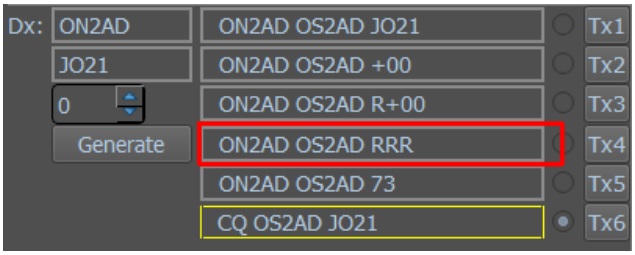
1	**DX**	and the two lines below - Call, Locator and received signal report of the station you are working.
2	**Generate**	Click to create the 5 standard QSO messages associated with the DX call.
3	**The 5 standard messages slots**	plus your CQ call message, Tx1 - Tx6. The dot next to the messages indicates which one will be sent next. Message Tx4 maybe changed. Select Mode Settings General. Switch to JT familiar minimal User interface. Right click in the Tx4 message box. One of 3 messages maybe selected: See Description of the settings
4	**Only CQ**	Only CQ calls will visible
5	**Tune on click**	Tune on click
6	**RX fq.on**	RX frequenz is on
7	**Auto seq**	MixW4 controls the message sending sequence. If disabled then **Call 1-st** also are disabled
8	**Call 1-st**	First identified caller to your CQ answered.
9	**TX 15/45**	Set your TX start time at 15 or 45 seconds in the minute.
10	**Erase**	Clear all data.
11	**Log QSO**	Copy the DX information to the log.
12	**Clear QSO**	Clear the DX data.
13	**Enable Tx**	Allow next message to be sent at next 15sec time slot start.
14	**Halt TX**	stop transmission immediately

Description of the settings

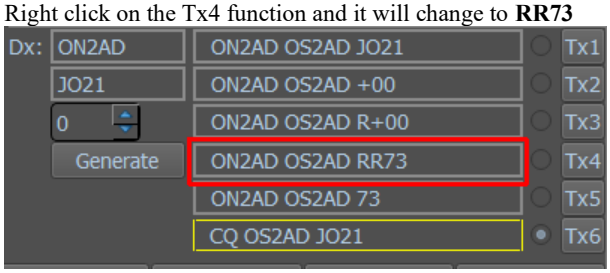
Click on JT familiar minimal and then click on OK



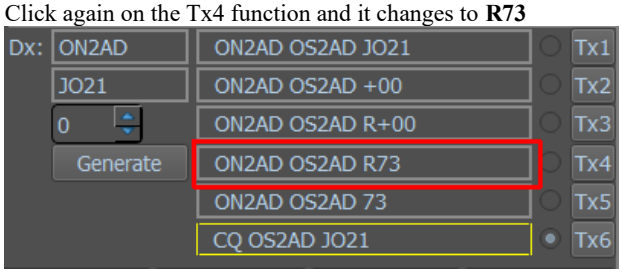
This is the standard Tx4 function with **RRR**



Right click on the Tx4 function and it will change to **RR73**



Click again on the Tx4 function and it changes to **R73**



(top)

Hellschreiber

Hellschreiber introduction and theory Hellschreiber operation

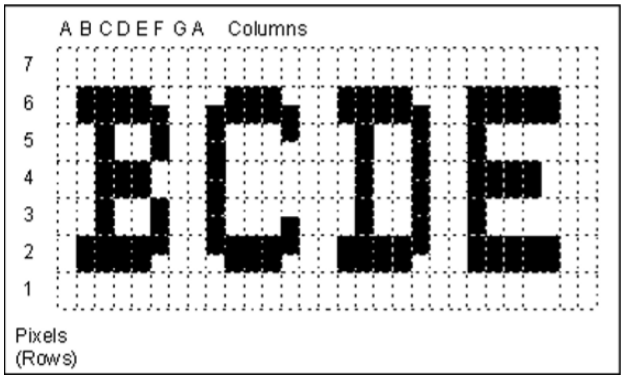
Hellschreiber Intro

by Murray Greenman, ZL1BPU

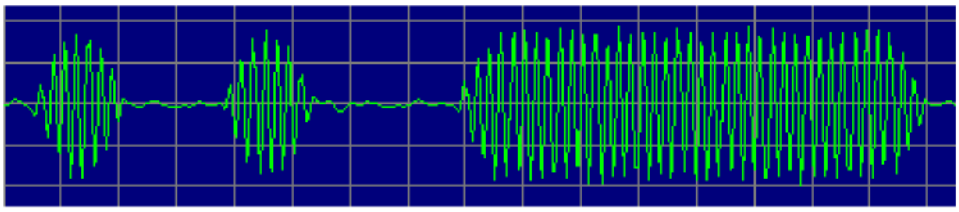
Feld-Hell Hellschreiber was patented in 1929 and is still in use with the original format. Hellschreiber was the first successful direct-print text transmission system and was very popular at a time when teleprinters were complex and expensive (the Hell reception mechanism had only two moving parts). Initially, the Hellschreiber was mainly used for fixed press services, which continued well into the 1980s. A military version was used by the German Condor Legion during the Spanish Civil War (1933). During World War II, Hellschreiber was widely used for portable military field equipment, for which it proved to be very suitable because the equipment was simple and robust. Today we use the term "Feld-Hell", or "Field Hell" for this system, to help it distinguish from the somewhat different fixed press systems.

Each character of a Feld-Hell transmission is depicted as a series of dots, in a matrix, just like printing by a dot matrix printer. The dots are sent one by one, instead of Morse code. Feld-Hell sends in the following order - each column from bottom to top, then up from each column from left to right.

The following image shows a snippet of the text "BCDE", which specifies the order in which the point elements are printed. Each of the dotted rectangles represents a potential point location and is identified by a location letter/ number. The shipping order is therefore A1, A2, A3 ... A7, B1, B2 ... Etc.



In this image, the dotted rectangles show individual point locations in the matrix. There are blank, unsent image elements (pixels) at the top and bottom of each character and between characters. These appear as blank white rectangles. The sent (down key) pixels appear black. If we look at the diagram above, it is easy to see that the transmitter's work cycle is quite low (about 22%). Another way of saying this is that the peak-to-average ratio is very high, which is important for good readability in noise. 150 characters are sent every minute. Each character needs 400ms. Since there are 49 pixels per character, each pixel is 8,163 ms long. The effective Baudrate is 1/8,163 ms = 122.5 baud and the throughput is 2.5 characters per second, or about 25 WPM.



The original Feld-Hell equipment and the best software deployments transmit two pixels (every half height or half the duration) for each pixel in the diagram, improving vertical resolution. If you look closely at the diagram above, you can see how this comes about without increasing the signal bandwidth. Rudolf Hell designed the font so that a half-height pixel is never sent. For example, the right side of the "B" has an improved resolution that is obtained by shifting the timing of full height pixels by half the height of one pixel. Three half-height pixels are sent without pause, so the bandwidth is not increased.

Another important reason for the limited design of the bandwidth, while they were specific characters, was that this technique ensured that pulses to the radio transmitter were never less than 8ms. Shorter pulses (of half a pixel) could be severely distorted by the slow ascent time of the transmitter and as a result cause excessive bandwidth or do not activate the mechanical pressure hammer in the receiver.
The output of the wartime Feld-Hell machine was a 900 Hz entered audio tone, sent on a telephone line or to a transmitter modulator, for example an MCW transmitter. In some models, it was possible to separate the contact points for directly entering a CW transmitter. Feld-Hell is therefore amplitude-coded, like Morse, like CW or MCW. Each pixel of a point matrix is sent in a fixed pattern as a CW point. Where there is no black dot, nothing is sent. Feld-Hell is actually a simple facsimile mode. The early press system, F-Hell, was identical except that it ran at 245 baud (5 characters/sec). An asynchronous variant, GL-Hell, (used by landline machines) used a fixed starting block of pixels on the left side of each character, resulting in character-based synchronization, but this method has no advantage for amateurs. An excellent article describing the traditional mechanical method for sending and receiving Feld-Hell appeared in Ham Radio Magazine, December 1979. An article describing the Hell font and containing other useful information was printed in Radcomm, April 1981. The actual machine described by the late G5XB, that device is now owned by Ian G4AKD. The Siemens A2 war time machine is also described in detail on the Feld-Hell History page.
For more information, including a summary of the various Hell formats, see: Murray's Website on Hell modes.

Performance: Feld Hell performs very well where the path is fairly stable (little fading) and where the signal level is equal to the average noise or better. If grayscale reception is used, low signal performance to noise is much better. Feld-Hell is fairly immune to interference, but can be heavily influenced by frequency carriers or Morse.

Hellschreiber dialog Bar

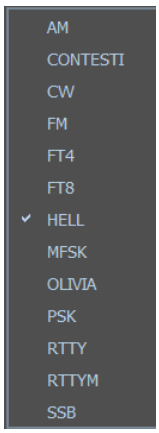
1. Mode choice menu.
2. Modes settings.
3. Clear RX window.
4. Tune.
5. Show/hide TX controls.
6. Save audio history (40 sec) Right click to browse files.
7. RX midfrequency.
8. Lock the RX-freq. A red pin appears above the RX cursor.

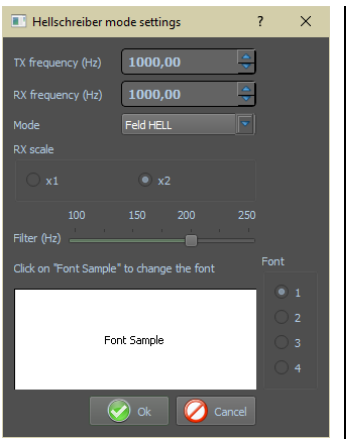
Hellschreiber operation

Hellschreiber is a unique mode. Some argue that it is not a digital mode at all. For our purposes, because we use digital techniques to operate Hellschreiber, we will call it a digital mode. It has more of a click or chirping sound than the other, more recent digital modes. Receiving Hellschreiber text is more like receiving a FAX image. The characters you receive and send are, in fact, images of characters.
Hellschreiber is another narrowband mode, such as PSK31, and will benefit from the same settings for the transceiver. To view these settings, see the topic on the PSK31 operation.

First, switch to Hellschreiber mode by using Hellschreiber mode at the bottom of the RX screen, and then bring the mode settings forward by clicking the Macro ModeSet

This will open the following dialog box:

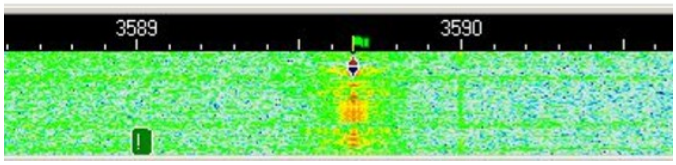




The TX and RX frequencies show that your cursor's location is in the spectrum window. The best frequency is about 1500 Hz, which keeps your transceiver working almost in the middle of the pass-through band.

Mode: The drop-down list gives a choice of 3 sub modes:
Feld HELL - The sub mode to which this description refers. FM 105bd - See the description of the FM-Hell. FM245bd - For FM Hell modes, a cursor with two diamonds is used in the waterfall.:

These modes can also be selected using the <SET SUBMODE:> macro.
Filter: You have a selectable DSP filter width of software between 100 and 250Hz.



improve during different conditions. A 200Hz setting generally seems to work well.
RX scale: Setting the RX scale to x2 can help you decipher hard-to-read characters, but you won't be able to see as much text on every screen. Use x1 unless you are having trouble seeing the text at this resolution.
Font selection: You can pre-select up to four different fonts by clicking the button next to each font # and then clicking in the sample text window. This is the font you do not receive. You will receive the font selected by the sending station.

Hellschreiber reception

Place the cursor in the center of the signal with a left mouse button. The text then appears as a HELL strip in the reception ***window.***

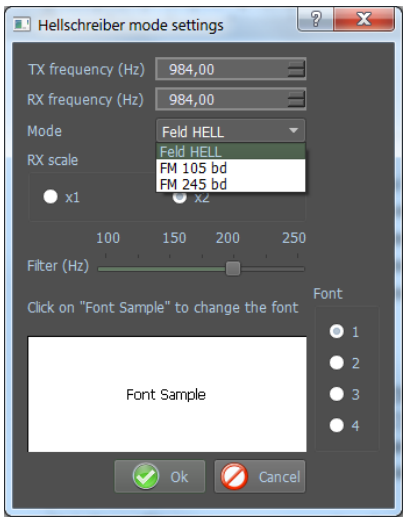
(top)

Hellschreiber-transmit

To call a drive, it is tuned as described above. It is possible to prescribe text already in the TX window. The text from the broadcast window is sent and appears in the RX window after broadcast. After you press the keys that have just been written, the program returns to receipt after the last characters are executed. The ESC key immediately stops transmission. You can automate the process with macros.

Hellschreiber (FM-Hell)

In recent years, Nino (IZ8BLY) has developed new Hellschreiber variants in collaboration with Murray (ZL1BPU): PSK-Hell and FM-Hell, which is also supported by MixW.
In this type of transmission, the characters are also sent as a series of points matrix, but which is unlike Feldhell (7 times 7 = 49 points) 42 points (six points in seven columns). The reduction of one point per column results in a lower baud speed (105 baud) at the same column speed of 17.5 columns/sec. The text speed is the same as Feld-Hell (122.5 times 6/7 = 105). This mode is speed compatible with Felldhell mode (122.5 baud), although bandwidth and text resolution are reduced. Doubling the transfer rate to 245 baud produces twice the resolution of doubling the bandwidth. Therefore, a special character set with 14 pixels/column instead of seven is required here. However, there is no need for 'half pixel tricks' as there is a full resolution and bandwidth of a 98-point grid. Both standard Hellschreiber and windows character sets can be used without changing the signal bandwidth!



PSK-Hell with 245 baud (20m DX)

At 245 baud, the signal is necessarily wider, but still narrower than Feld-Hell or RTTY. During the development of PSK-Hell it quickly became clear that a side tyre can be suppressed or filtered out for good reception.

245 Baud FM-Hell

The same signal can then essentially be generated with "Minimum Shift Keying" (MSK). This mode is not only intensive, but also requires less filtering because of the

clean signal. At a white point, not the phase, but the frequency is slightly phase-coherently changed until the necessary phase change has taken place. The result of this MSK method was called 'FM-Hell'. This makes it possible to broadcast a 245 baud broadcast with a bandwidth of 50 Hz. However, the sensitivity is highest with a Hub of 122.5 Hz.
The advantages of FM-Hell are:
The broadcast is narrower than PSK-Hell and Field-Hell
Full character resolution is supported. Windows fonts are no wider than Hellschreiber fonts
Complex ZSB modulation is not required, constant power is transmitted
Because the signal has a constant amplitude, no linear transmitter is required
DX signals appear less blurry than PSK or Feld Hell.
But the biggest advantage of PSK and FM-Hell is its sensitivity. The signal/noise ratio compared to Feldhell is probably in the order of 6 to 8 dB. The following examples compare PSK and Feldhell signals with 105 baud at an S/N of about 0 dB and about -12 dB received at a 3 kHz noise band width. FM-Hell with 105 baud is almost equal to PSK-Hell in these conditions, while with 3 dB it is worse with 245 baud.

PSK Hell:0 dB S/N (left) and -12 dB S/N (right)

Feld-Hell: 0 dB S/N (left) and -12 dB S/N (right)

(top)

MFSK

MFSK Introduction and Theory

by Murray Greenman, ZL1BPU

MFSK overview for beginners:

MFSK is a technique for transmitting digital data using multiple tones, extending the RTTY technique with two tones to many tones, usually, but not always, with one tone at a time.
MFSK means Multi-Frequency Shift Keying and should not be confused with Minimum Shift Keying (MSK). There are a number of different techniques, using simultaneous (or parallel) tones, successive (one after the other) tones and combinations of tones. MT-Hell can be both simultaneous and sequential, DTMF tones used for phone signalling are simultaneous tone pairs, while Piccolo and Coquelet, although using tone pairs, are decidedly sequential.
MFSK broadcasts have a unique sound, almost musical.
Therefore, Piccolo and Coquelet received their names (Coquelet means cock).
MFSK uses a relatively narrow tonal distance, so remarkable data speeds are achieved for a given bandwidth - 64 bps in a signal bandwidth of 316 Hz is typical. The following image is a spectrogram of an MFSK16 signal (16 carriers) with a distance of 15,625 Hz and works at 15,625 baud. The transmission operates at 62.5 bps (about 80 words per minute!) And takes up about 316 Hz bandwidth. The two black horizontal lines in the image are at 1000 Hz and 1300 Hz and the horizontal scale is about 20 seconds.
Fig. 1. Spectrogram of an MFSK16 signal
Benefits:
MFSK has several performance benefits:
High rejection of pulse and broadband noise due to narrow receiver bandwidth per tone
Low baud speed for sensitivity and multipath rejection - data bit speed higher than symbol baudrate Constant transmitter power
Tolerance for ionospheric effects such as Doppler, fading and multi-way
Most important of all, with an MFSK system, improves the margin of error when the number of tones is increased, so with as many as 32 tones the execution is second to none. With PSK systems, the opposite is true.

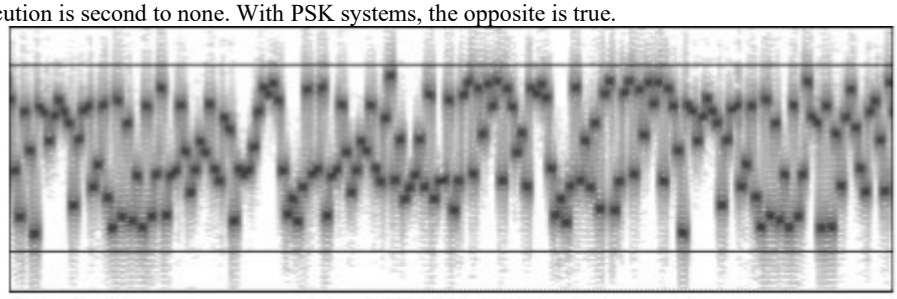


Fig. 1. Spectrogram of an MFSK16 Signal

Cons: Let us face it, there are downsides to MFSK! The main disadvantages relate to the narrow gap and the narrow bandwidth of the individual tone detectors.

Drift can be a problem and precise tuning is essential. Good voting indicators and AFC are needed at the lower speeds. It is important that the radio transceiver is very stable and also that it has a very small frequency offset between transmission and receiving (preferably less than 5 Hz).
MFSK also uses more bandwidth for a given text speed than a 2FSK or PSK system, but in the same way it is more robust.

Alphabet Coding

There are many ways to encode the alphabet from the keyboard for shipment. Perhaps the most common is now ASCII (ITA-5), but ITA-2 (as used by teleprinters) is normal. MFSK16, such as PSK31, is based on a Varicode, which unlike most of these alphabets assigns a different number of bits to different characters, so more commonly used characters have fewer bits and are therefore sent faster.
The number of bits per character therefore depends on the character frequency, as does Morse.
For example:
Character Varicode

space 100
a 101100
e 1100
E 111011100
Z 101010110100

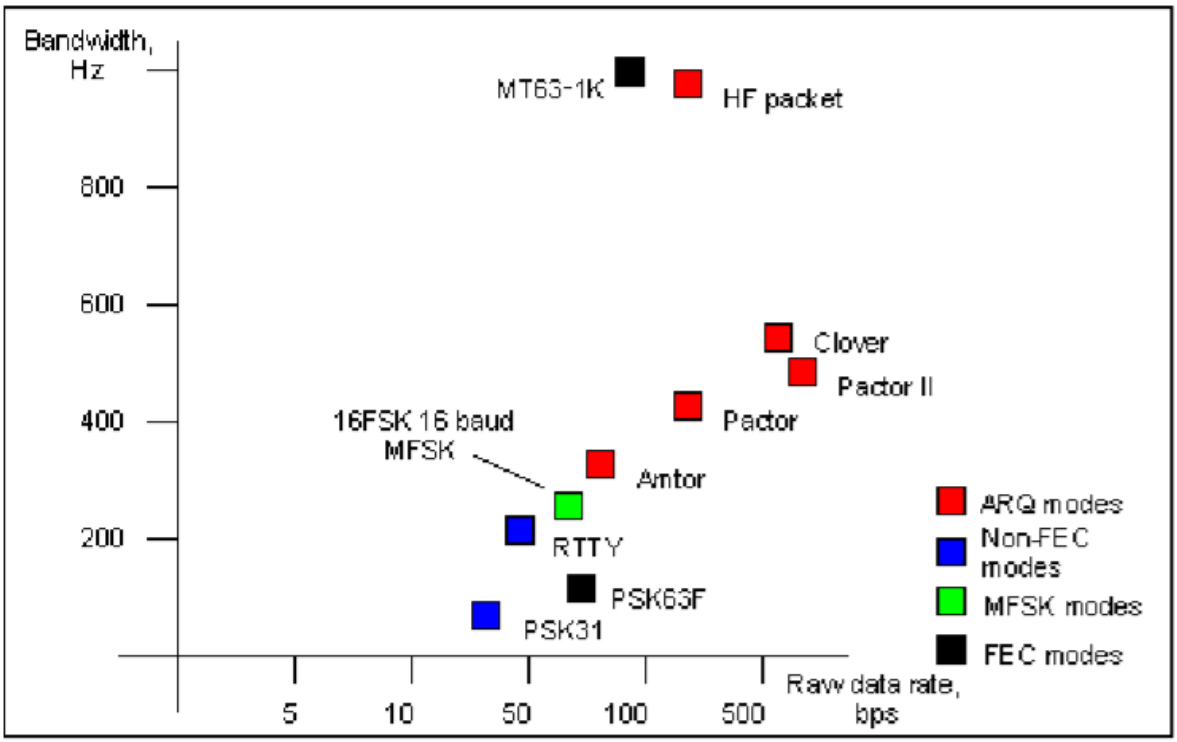
The efficiency of the alphabet encoding therefore depends on the chosen code and with a Varicode, even on the text sent:

Alphabet Bits/ Char
ITA-5 ASCII 10
ITA-2 7.5
Varicode ~ 7-8

The power of the varicode is that the character set is essentially infinitely expandable. For example, all
European characters with accents are defined and others are added for control purposes outside the character set. The MFSK16 varicode is not the same as the PSK31 varicode, although the technique is similar.
Another important advantage of using a varicode is that the data flow can be resynchronized much faster in the event of errors than is possible with other systems, thus reducing the loss of data.
Text throughput: The user is most interested in actual usable text throughput (streaming), which is specified in characters per second (CPS) or words per minute (WPM). Both depend on the alphabet used and the number of words per minute depends on the average word size. In English, this is conveniently considered five letters plus a space. So, we can say that:
Text throughput (CPS) = User Data Rate/ Alphabet Bits per character Text throughput (WPM) = CPS x 60 / letters per word
Sample: Let's, we use an MFSK system with 16 tones (16FSK), working at 15,625 baud with FEC speed = 1/2 and an ASCII alphabet with 10 bits/ character.
Then:
Symbol Rate = 15.625 baud
Channel Data Rate = 15.625 x log216 = 15.625 x 4 = 62.5 bps
User Data Rate = 62.5 x 1/2 (FEC RATE) = 31.25 bps
Text Throughput (CPS) = 31.25 / 10 CPS = 3.125 CPS
Text Throughput (WPM) = 31.25 x 60 / (10 x 6) = 31.25 WPM
This will take place in a bandwidth of just over 16 x 15,625 = 250 Hz.

Comparisons: Amateur radio RTTY works at 45.45 baud and reaches 60 WPM without error correction and requires about 300 Hz bandwidth. 300 baud Packet is error corrected but is unsuitable by design to HF conditions and rarely delivers better than 30 WPM, and often much less. Packet requires a bandwidth of 1 kHz. PSK31 operates at 31.25 baud and provides an error correction of approximately 31.25 WPM in QPSK mode. It has the narrowest bandwidth, less than 100 Hz.
Fig. 5. Chart showing the raw data rate of different digital modes versus estimated bandwidth.

(top)



In terms of performance, of the examples given, only MFSK16 and PSK31 are considered practical for DX QSOs. PSK31 often performs poorly on a long path and offers no improvement when the FEC is used, so it is usually used without use. MFSK is practically as sensitive as PSK31 in practice and is not affected by Doppler. It is also less affected by interference and provides effective FEC. These results are supported by ionospheric simulation tests.

MFSK16

The new MFSK16 mode includes continuous phase tones and many other improvements, especially for the receiver. The mode is loosely based on Piccolo, but differs on some important aspects:

- The transmitted data is bit oriented, and not oriented.
- The basic signal is a single symbol, not a symbol pair.
- Error reduction coding is built in.
- The tonal distance and baud speeds are divisions of 125.
- The sent show is phase synchronous CPFSK.
- No symbol phase or other AM information is sent.

1. The system may therefore be able to send text and binary files, any alphabet including varicodes, and may use error coding.
2. De tones and baud speeds (15,625 Hz, 31.25 Hz etc.) have been chosen to allow a simple computer sound card to sample samples with a sample frequency of 8 kHz.
3. This means that the transmitter does not have to be linear. With the help of the receiver FFT, the transferred carrier wave phase can be extracted, and the symbol phase is derived from it. This technique is very fast and reliable.

Of course, MFSK16 is computer-oriented instead of an electromechanical system, so easy and inexpensive to install and easy to operate, without performance difficulties.

- Precise tuning for reception operation using "point and click" techniques.
- Convolutionally Coded FEC (Forward Error Correction) with Interleaver for Error Reduction
- -FFT (Fast Fourier Transform)-
- Symbol Filtering and Detection
- Symbol Synchronization Recovery by Transitions or Carrier Phase in the Symbol FFT
- Show two signal speeds with different numbers (but the same bandwidth) to meet the circumstances

The MFSK Varicode is slightly more efficient than others because smaller codes are available. This in turn is because the combinations "000", "0000" etc. do not need to be reserved for inactivity and can be used in character bit flows. Only the combination "001" is prohibited, as this indicates the end of a character and the beginning of the next. The speed on plain language text is almost 20% faster than using the G3PLX varicode. The average number of bits per character for raw text is measured at 7.44, giving MFSK16 a text throughput of 42 WPM at 31.25 baud users data speed.

Note : Murray has an excellent website with much more information about MFSK16 and other related modes. This is a great resource for anyone who wants to know more about this fascinating new mode:

MFSK, "The official MFSK website "Murray Greenman, ZL1BPU. http://www.qsl.net/zl1bpu/MFSK/

MFSK editing and image mode

MFSK16 uses about the same bandwidth as 170Hz shift RTTY and so the settings of your MFSK16 Transceiver can be about the same as those used for standard shift RTTY.

Transceiver Settings

Fine Tuning

If your radio receiver is equipped with a "FINE" tuning function, always use it to fine tune the digital mode after you have found the general area of signals, but most of your adjustments can be made in the software, and not with the Transceiver's VFO if you prefer. Some older transceivers are really not stable enough for MFSK operation and will drift significantly away from the frequency.

USB

USB is the convention for MFSK use in all bands. Both side tyres can be used, but the transmitter and receiver must use the same side tyre, or one drive must be reversed (see: Inverted).).

Filtering

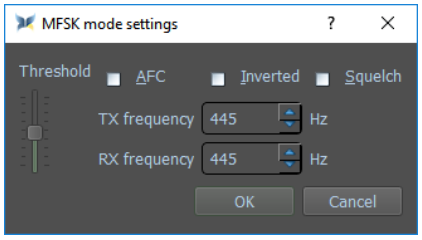
Optimal filtering depends on your transceiver's SSB filter options and IF rejection characteristics. Broad filtering allows you to edit the largest spectrum without re-adjusting your transceiver, but can also cause problems if there are strong signals next to it. A narrow filter (RTTY or FSK) can significantly help with some radios and situations. Many transceivers do not have narrow filtering options while working in SSB modes.

MFSK Settings

MFSK dialog bar

1. Mode choice menu.
2. Modes settings.
3. Clear RX window.
4. Tune.
5. Show/hide TX controls.
6. Save audio history (40 sec) Right click to browse files.
7. RX midfrequency.
8. Lock the RX-freq. A red pin appears above the RX cursor Display the Mode Settings window.
9. Snap frequency.

MFSK mode settings:

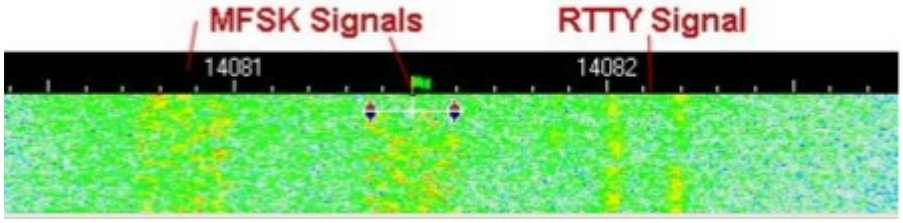


Click the mode box at the bottom of the RX status bar and select MFSK. Then click the macro ModeSet. Opens the following dialog box:
TX and RX frequencies are set to the location of your cursor in the spectrum window. If you keep this around 1500 Hz, your transceiver will continue to work close to the center of the pass-through band.
AFC, which should always be set to ON for MFSK operation due to the critical nature of MFSK alignment.
Squelch and the Squelch threshold can be adjusted to reduce clutter, but you can also miss signals by using squelch.
The MFSK tones can also be reversed by checking the Inverted box.

Note: This feature works differently in MixW than most other digital programs with sound cards, so read and understand the information about Inversion.

Tuning MFSK

You can easily recognize the sound of MFSK once you have heard it. It looks a lot like RTTY, only with multiple, rather musical tones. The following tuning screen shows the distinctive waterfall pattern of MFSK16



As you can see, the multiple MFSK tones are scattered across the bandwidth of the signal while the two different Mark and Space tones of the RTTY signal are located at the edges of the bandwidth. You can also see that MFSK16 uses just a little more bandwidth than the standard 170Hz RTTY signal. To match an MFSK signal, click the cursor in the center, and then adjust both sides with the CTRL arrow keys until you start receiving text in the RX window and the AFC locks on the signal. Due to interleaving, you may notice that it takes a little longer to tune MFSK than to RTTY or even PSK. You will also notice that the RX text will appear in batches instead of a steady flow.

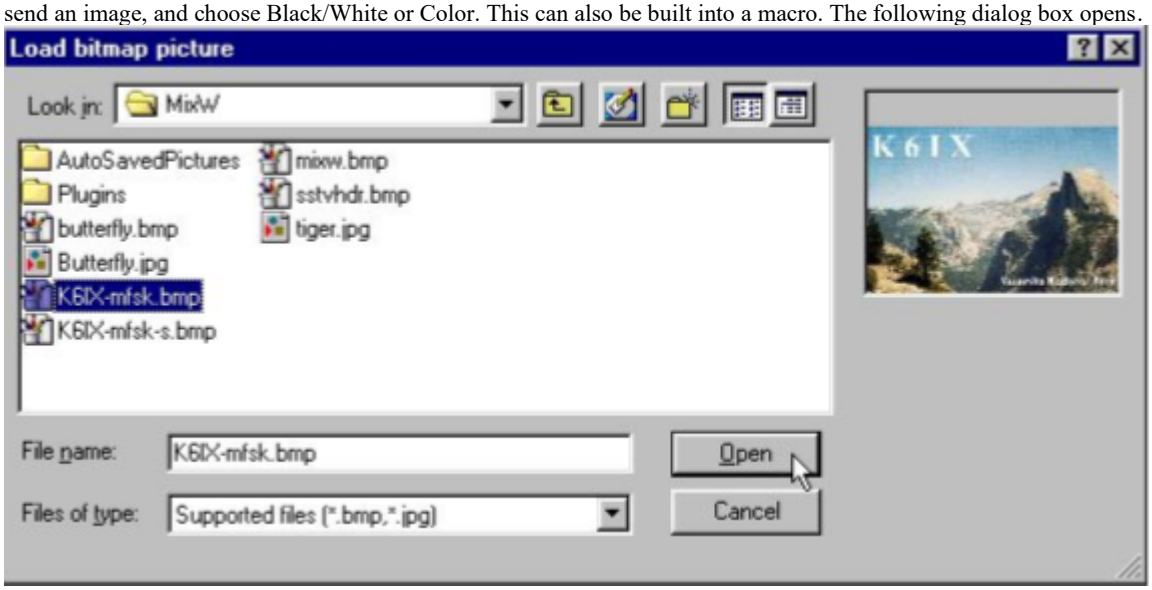
Send: To switch between sending and receiving, press the Send key , to receive back click on the Stop key As with most other digital modes, it is possible to open multiple RX windows and switch the active window (the window from which you are going to send) between them.

Not yet in this version

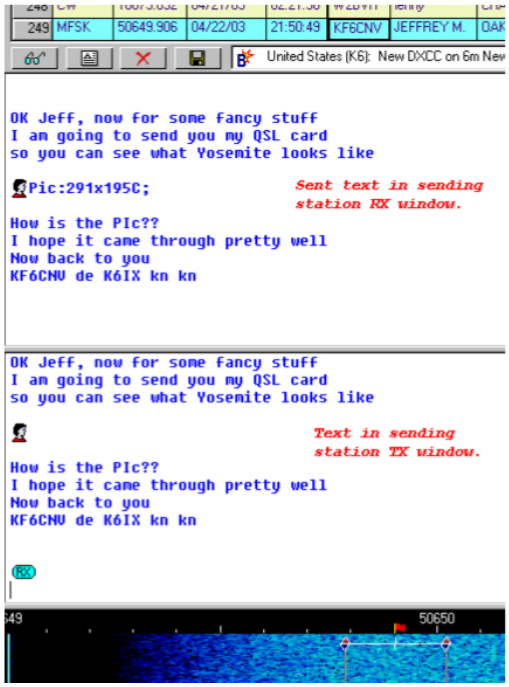
MFSK Image Mode

Send images in MFSK

While working in MFSK mode, it is possible to switch to a narrow-band image mode and send small images without the operators on the transmitting or receiving station manually changing MFSK mode.
The images should be small, no larger than about 250 x 200 pixels. The operation is much easier when the image is placed in the MixW folder, but it is not necessary.
The sending station must inform the receiving station that a photo is being sent. Next, the transmitting operator must select a file to send an image, and choose Black/White or Color. This can also be built into a macro. The following dialog box opens.



Note:
Z/W or Color only applies to the shipping method. If you choose Z/W, this will result in a shorter shipping time than if the same photo is sent in color.
Click open to start sending the photo.
An icon appears in both the RX and TX windows of the sender's MixW screen as the image is being sent.
Note: If an "X" appears over the icon, it means that MixW was unable to open the image file because of the file type or because the file was corrupted.
The receiving drive displays the same icon in the RX window and displays the photo in the upper-left corner of the screen.



When the broadcast is complete, the receiving operator can click the icon in the upper-left corner of the received image, then save Picture ... select and then select a location to save it.
On both drives, MixW switches back to MFSK mode.

There are four macros that can be used in MFSK to send images
<PIC? N> - Same as Selecting File | Send image ...
Z / W... opens the dialog box to select the image file, sends in black and white
<PIC? N% C> - same as selecting File | Send image ...
Color opens dialog box to select image file, sends in color
<PIC: file name.ext 00> - sends image file in high resolution black and white
<PIC: file name.ext% C> - sends image file in high resolution color

(top)

Olivia

Olivia introduction

(info comes from the German manual of MixW4).
Pawel Jalocha SP9VRC, known as the spiritual father of PSK31 and MT63, published a new mode of operation. It is essentially a Walsh-based MFSK mode(**M**ultitone **F**requency **S**hift **K**eying) with a Forward Error Correcting (FEC) code. Pawel gave this the name of his daughter, Olivia.
Originally written as a LINUX version (mfsk_trx.tgz), a variant (mfsk_trx.exe) was released in December 2004, which could also be performed with Windows using the 'Cygwin' simulator. It represented an interactive transmitter and receiver with a simple user interface.

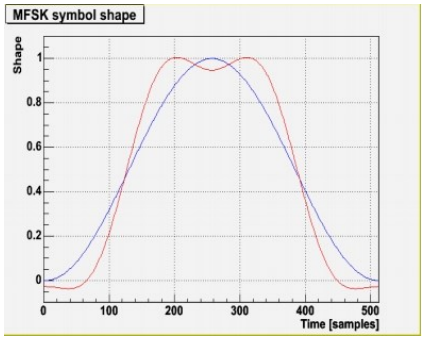
The plan was a program that should be able to decode a message that was even weaker than MT63 in the allowed amount of noise. So, this is how this mode was created that recognizes text that 22 dB can be below the noise level (white noise with Gauss distribution). The program uses a bandwidth of 125 ... 2000 Hz with 4, 8, 16, ... 128 tones. At 1000 Hz and 32 tones (default values), a shift of the receiver to +/- 250 Hz could be compensated.

Although originally intended only as an experimental version, many users were found over time and can now write these signals 24 hours a day on all channels that are designated as de-facto standard. The service was more than Spartan, but met perfectly. It was now in this very early state to find out which parameters should be used for the best possible data transfer to decode weak and disturbed signals.

Pawel SP9VRC says about its new program:

"I think that MT63 and MFSK can coexist very well on the same frequency, because MT63 for MFSK is shown as broadband noise and MFSK allows broadband sound very well. On the other hand, MFSK will only disturb individual bits of the MT63 transmission, and this in turn will not be a problem for MT63. Therefore, I think that even with large differences in signal strength MT63 and MFSK will hardly disturb each other.
With PACTOR-3 we have the same situation ... ".

Olivia's MFSK modulation

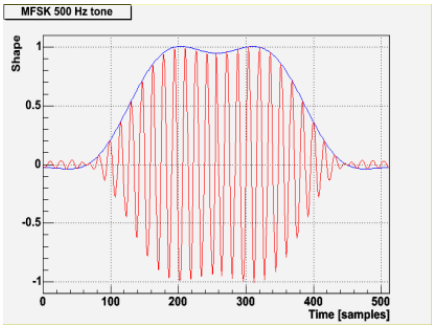


In 'default mode', 32 tones are sent within a 1000 Hz wide channel, so the pitch of the tones is 1000 Hz / 32 = 31.25 Hz.
The tones are rounded to minimize the energy emitted outside the nominal bandwidth.
The shape that is applied appears as a red line in the following diagram:
The blue line (locked) represents the more classic Hanning window used in the first version of the system.

The exact formula is:
+1,0000000000+1,1913785723*cos(x)-0,0793018558*cos(2x)-0,2171442026*cos(3x)-0,0014526076*cos(4x)
where x lies in the range of- π tot + π.

The coefficients represent the symbol curve in the frequency domain and are calculated using a minimization method for the least crosstalk and has the smallest frequency overflow.

Pawel reserves the right to change the shape a bit if he finds a better solution. However, such a change should not have a significant impact on behaviour or compatibility.



The diagram shown on the right shows the 500 Hz MFSK tone (red signal) that is shaped towards the above formula.

The blue (top) track is the curve (envelope).

The tones are sent at 31.25 baud or every 32 milliseconds.
The phase of one tone is not preserved compared to the previous one, but a random shift of ± 90 degrees is introduced to prevent a pure, continuous sound from being emitted when a symbol is repeated several times.

Because the symbols have a smooth transition, we do not need to keep the phase, which would normally be the case if there wasn't a smooth pattern (for example, a rectangle).
The 5-bit symbols are encoded with a gray code and converted to tones in the modulator.

The generator works with a Sampling rate of 8000 Hz. The tones are split into the time axis at intervals of 256 samples and the shape window is 512 samples long.
The demodulator is based on an FFT of 512 points. The pitch in the frequency domain is 8000 Hz / 256 = 31.25 Hz and the FFT demodulator has the resolution of 8000 Hz / 512 = 15,625 Hz, which is half the pitch.

To adapt the system to different propagation conditions, the number of tones and bandwidth can be set, and the time and frequency parameters can be changed proportionally. You can use 2, 4, 8, 16, 32, 64, 128 or 256 tones within a bandwidth of 125, 250, 500, 1000 or 2000 Hz.

The error correction in Olivia

As mentioned earlier, the FEC is based on a Walsh function.
By default, one of the 32 tones is sent. Each tone thus represents a symbol that contains 5 bits of information. For the FEC code, 64 symbols form a block. Within each block, one bit is taken from each symbol that encodes a 64-bit vector as a Walsh function. Each 64-bit vector represents a 7-bit ASCII character, so each block represents 5 ASCII characters.
In this way, only one bit of each 64-bit vector is damaged if a symbol (sound) is disturbed by the noise, so the transmission errors are uniformly distributed across all characters within a block.

The two sections of the FEC code (MFSK and Walsh function) can be treated as a two-dimensional encoder.
- One dimension is formed along the frequency axis of the MFSK, while
- The other dimension is formed by the Walsh functions along the time axis.

The two-dimensional arrangement stemmed from the idea of solving such an ordered FEC code with an iterative algorithm, but to date such an algorithm has not been used.

An encrypted and simple bit transmission is useful for displaying the generated symbol patterns more randomly and with minimal autocorrelation.
This prevents unnecessary blocking of the recipient:

Bit shift

The Walsh function for the first character in a block consists of the first bit of the first symbol, the second bit of the second symbol, and so on. The 2nd Walsh function consists of the second bit of the first symbol, the third bit of the second symbol, and so on.

Scrambling

The Walsh features are encoded with a pseudo-random sequence 0xE257E6D0291574EC. The Walsh function for the first character in a block is encoded with the encryption sequence, the 2nd Walsh function is encoded with the series rotated right with 13 bits, the third with the series rotated with 26 bits, and so on.

(top)

Operation and adaptation

The setting of parameters in MixW may differ slightly from the original version or deployments in other programs.
There is no protection against over-the-countering the entrance. Therefore, it is necessary first to check with another possibility whether the received signal does not send the analog/digital converter of the sound card or the RigExpert to saturation. The signal level does not have to be 100% of the modulation range; 10-20% is enough.

Never correct the power during use (and if so, then very slowly) - it is better to quickly balance the power between shipments.

SSB filter:

In most cases, it is best to leave the filter wide (2 or 2.5 kHz) because the decoder chooses the right bandwidth. However, in some cases, the suppression of strong side band signals or carriers significantly improves.

AGC:

Use a setting that avoids rapid level changes. The SSB receiver usually responds too quickly to glitches or temporarily strong signals. If this is the case, lower the amplification so far that there are only minor changes or use the interference blanker.

Tuning:

Depending on the setting, shifting the receiver is tolerated without loss of performance due to incorrect tuning (table).

Influence of number of tones and bandwidth to the allowable offset

Bandwidth Hz	Total of Tones	Minimum Offset	Maximum Offset
125	2	+- 62 Hz	+- 343 Hz
125	4	+- 31 Hz	+- 171 Hz
125	8	+- 15 Hz	+- 85 Hz
125	16	+- 7 Hz	+- 42 Hz
250	2	+-125 Hz	+- 687 Hz
250	4	+- 62 Hz	+- 343 Hz
250	8	+- 31 Hz	+- 171 Hz
250	16	+- 15 Hz	+- 85 Hz
250	32	+- 7 Hz	+- 42 Hz
500	2	+-250 Hz	+-1375 Hz
500	4	+-125 Hz	+- 687 Hz
500	8	+- 62 Hz	+- 343 Hz
500	16	+- 31 Hz	+- 171 Hz
500	32	+- 15 Hz	+- 85 Hz
1000	2	+-500 Hz	+-2750 Hz
1000	4	+-250 Hz	+-1375 Hz
1000	8	+-125 Hz	+- 687 Hz
1000	16	+- 62 Hz	+- 343 Hz
1000	32	+- 31 Hz	+- 171 Hz
1000	64	+- 15 Hz	+- 85 Hz
2000	4	+-500 Hz	+-2750 Hz
2000	8	+-250 Hz	+-1375 Hz
2000	16	+-125 Hz	+- 687 Hz
2000	32	+- 62 Hz	+- 343 Hz
2000	64	+- 31 Hz	+- 171 Hz
2000	128	+- 15 Hz	+- 85 Hz

One clearly recognizes the relationship between tone number, bandwidth and offset. The minimum offset results from the formula offset = bandwidth /tone number, the maximum possible is a factor of 5.5 but requires a very high computing power. Depending on CPU speed, the allowable offsets should be so low

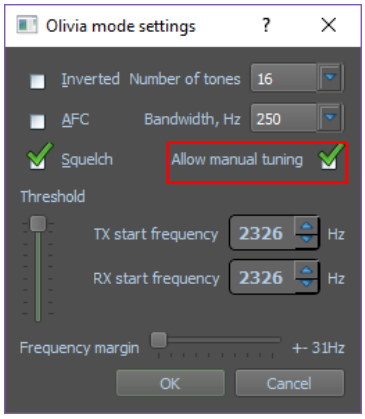
(top))

The setting of parameters in MixW may differ slightly from the original version or deployments.
In practice, values between 50 and 100 Hz were found to be perfectly suited for a computer that is not very powerful.

The best reception results are always achieved at precisely tuned frequency!

Olivia in MixW4

Compared to the original version, MixW only has the three essential operating parameters:
'Show Number', 'Bandwidth in Hz' and 'Frequency - Offset'
The first two parameters define the mode of operation and all drives participating in a QSO must have identical values, otherwise the decoder will not recognize the signal.



For best results, check the AFC check boxes and manually tune in, at least for weak and deranged signals. If you are working with AFC, you are going after the partner station. TX and RX start frequencies are constantly changing and may be drifting away from the original frequency.
It is important that you are within the channels (here you actually work with channels, for example 14,105.50 // 14,106,50 etc.). Because of the bandwidth of Olivia (1000 Hz) you are very fast in a neighbouring QSO!

The settings are created through the Macro ModeSet or the dialog bar (4)

Olivia dialog bar

1. Mode choice menu.
2. Modes settings.
3. Clear RX window.
4. Tune.
5. Show/hide TX controls.
6. Save audio history (40 sec) Right click to browse files.
7. RX midfrequency.
8. Lock the RX-freq. A red pin appears above the RX cursor Display the Mode Settings window.
9. Number of tones.
10. Bandwidth (Hz).

Olivia in MixW using

Olivia is a version of MFSK and in MixW the operating procedures are the same as for MFSK with the exception of certain options that can be set in the Olivia mode settings via the Macro ModeSet dialog box.
The "number of tones" can be selected from 8 different settings between 2 and 256, and the "bandwidth, Hz" can be selected from 5 different settings between 125 and 2000.
The combination of tones/bandwidth is displayed in the status bar.
In practice, the combinations used are:

500	Hz	bandwidth	8	Tones
500	Hz	bandwidth	16	Tones
1000	Hz	bandwidth	16	Tones
1000	Hz	bandwidth	32	Tones

The signals on the waterfall are almost identical to Contestia-and RTTYM signals. As with all digital modes, after a short experience, the user will be able to visually identify the different formats in the waterfall.
It is important for Olivia to be successful that the sound card is calibrated.

Find Olivia signals and adjust

Olivia under MixW works just like any other MFSK mode, clicking on the waterfall or spectrum view at the desired mid-frequency.

Olivia frequencies currently used

Center is cursor on waterfall. If you are using DIAL, using a 1,500 Hz offset waterfall in the Center results.

The setting of parameters in MixW may differ slightly from the original version or deployments

Center		Dial	Tones	/	Bandwidth	Notes
1.8390 MHz	-	1.8375 MHz	8	/	250	(ITU Region 1, etc.; Primary International)
1.8270 MHz	-	1.8255 MHz	8	/	250	(ITU Region 2, Secondary)
3.5830 MHz	-	3.5815 MHz	8	/	250	
7.0405 MHz	-	7.0390 MHz	8	/	250	(ITU Region 2, etc.; Primary International)
7.0730 MHz	-	7.0715 MHz	8	/	250	Secondary
10.1430MHz	-	10.1415 MHz	8	/	250	
14.0730 MHz	-	14.0715 MHz	8	/	250	
14.1075 MHz	-	14.1060 MHz	16	/	1000	
18.1030 MHz	-	18.1015 MHz	8	/	250	

21.0730 MHz	-	21.0715 MHz	8	/	250	
24.9230 MHz	-	24.9215 MHz	8	/	250	
28.1230 MHz	-	28.1215 MHz	8	/	250	
……	-	…..	..	/	…	

Remember that if you use the dial frequency (the second frequency in each row, above), set your waterfall center at 1500 Hz,

(top)

PSK

PSK Introduction and Theory

PSK31 is based on an idea of SP9VRC and developed by Peter Martinez, G3PLX, who also developed AMTOR. PSK is based on RTTY and is used for live keyboard-to-keyboard QSOs with 50 WPM (31 Baud) and uses "Phase Shift Keying" to signal Mark and Space values, rather than change the frequency.

DSP is used to change the 180-degree phase when switching from marker to space. DSP analysis by the program immediately detects this "Phase Shift".

PSK31 operates in a very narrow bandwidth that greatly reduces noise and QRM. This narrow signal also makes it an excellent QRP (low power) mode, with between 5 and 10 watts one obtains in some cases excellent intercontinental connections.

The front-end DSP filter and pulse formation keep the waveform compact, about 40 Hz at -3 dB and 80 Hz at -40 dB. Pulse formation uses an elevated cosine to slope amplitude during phase transitions and leaves the amplitude at full value outside the phase reverses.

PSK31 uses much less bandwidth than traditional digital modes, as shown here:

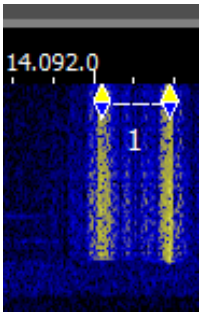


Image of an RTTY signal in MixW4

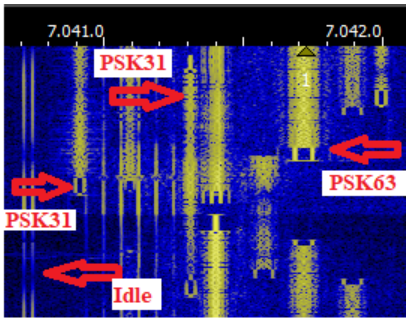


Image of a PSK signals in MixW4

PSK31 has two modes:
BPSK: **B**inaire **P**hase **S**hift **K**eying
QPSK: **Q**uadradure **P**hase **S**hift **K**eying

In QPSK mode, instead of just keying through phase reverses or 180-degree phase shifts, an additional pair of 90- and 270-degree phase shifts are possible.

If you consider PSK to reverse the polarity of the signal, then QPSK can be seen as two PSK signals at the same frequency, but 90 degrees out of phase relative to each other and with only half the power in each.

The extra speed in QPSK is used for error correction. This works well under most circumstances. Certain noisy conditions and weaker signals can benefit from the full power (one signal) of QPSK mode.

Visit the official homepage of PSK31 at: http://aintel.bi.ehu.es/PSK31.html

PSK31 operation

PSK31 basics

Due to the limited bandwidth, PSK31 is perhaps the most critical mode for a good configuration of the sound card to the radio. Transferring the audio input of your transceiver will cause modulation, create multiple side bands, and cause interference with adjacent QSOs.

(top)

Transmission receiver settings

Fine tuning

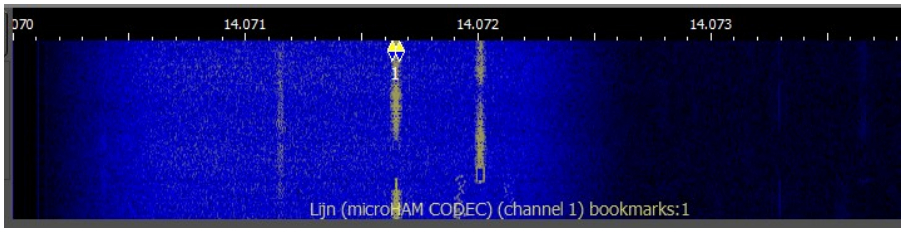
If your transceiver is equipped with a "FINE" tuning function, always use it for PSK31 tuning, but you will notice that most of your adjustments are made in software and not with the transceiver's VFO. Some older devices are not stable enough for PSK31 operation and can significantly drift away from the frequency.

USB

USB is the convention for PSK31 operation in all bands. For PSK31, both side bands can be used, but QPSK31 must use the same sideband, or one drive must be indigested (see Inversion in the Configuration section of the Configuration and Settings section.

Filtering

the optimal setting depends primarily on the intermodulation strength of the transceiver and the filter selection. SSB bandwidth makes it possible to display the widest spectrum (panorama view). However, there may be problems with adjacent strong signals. A narrow CW or RTTY filter can help enormously with some recipients and in many situations. Unfortunately, many transceivers do not allow the use of narrow filters in the SSB setting. Check your manual and experiment to find the optimal setting. The following waterfall screen shows MixW's panoramic display while using a wide filter setting on the transceiver:



Here there are 8 different PSK31 QSOs that we can copy with the simple mouse click in roughly 3 kHz spectrum. You can even see the bottom of an MFSK QSO on the far right of the screen

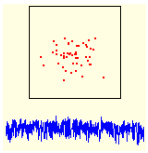
Power

Because of the narrow bandwidth, PSK transmit power should be kept to a minimum. PSK31 is an excellent mode for QRP operations.

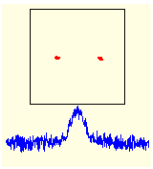
MixW Settings

In the RX screen you can immediately see the "Phase scatter" (square) and the "Spectrum Scope" (blue).

The "Phase scatter" and the "Spectrum scope" without a PSK signal



The "Phase scatter" and the "Spectrum scope" with a PSK signal



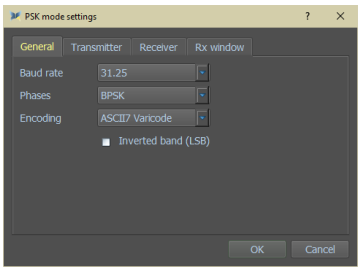
PSK dialog bar

1. Mode choice menu.
2. Modes settings.
3. Clear RX window.
4. Tune.
5. Show/hide TX controls.
6. Save audio history (40 sec) Right click to browse files.
7. RX midfrequency.
8. Lock the RX-freq. A red pin appears above the RX cursor Display the Mode Settings window.
9. Snap frequency.
10. Baudrate.

(top)

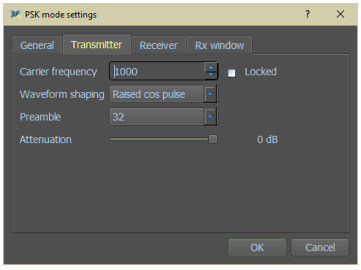
PSK mode setup

General



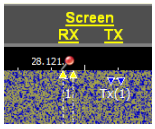
Baud rate: Three different baud rates can be set: 31.25, 62.5 en 125.
Default = PSK31
Phases: Here you have the choice of:
PSK: **B**inaire **P**hase **S**hift **K**eying, 2 constellaties
QPSK: **Q**uadradure **P**hase **S**hift **K**eying, 4 constellaties
8PSK: **8** **P**hase **S**hift **K**eying, 8 constellaties
Default = PSK
Encoding: Here you can choose:
ASCII7 Varicode or ASCII8 Varicode (+Russian).
Default = ASCII7 Varicode
Inverted band (LSB): Change the sideband from USB to LSB

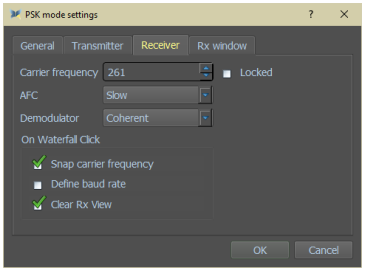
Transmitter



Carrier frequency: Carrier frequency in Hz that can be fixed via "Locked"
Waveform shaping: Raised cos pulse
Preamble: 16, 32 of 64
Default = 32
Provides a delay from when the transmitter is activated to when the first character is sent.
Attenuation: Attenuation from -50 dB till 0 dB

Receiver





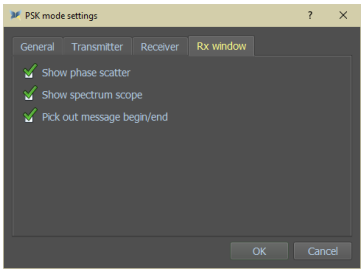
Carrier frequency: Carrier frequency in Hz that can be fixed via "Locked" see image
AFC: **A**utomatic **F**requency **C**ontrol
Here one can do four settings, None, Slow, Normal and Fast
Default = Slow
Demodulator: Coherent

On Waterfall Click: Affects the waterfall when clicking on it.
Snap carrier frequency: Here MixW will correctly place itself on the selected received signal
Define baud rate: If you tick this, and you click then on the two dotted lines of the received signal, you change the baud rate from 31.25 to 62.5 or 125 etc…
Clear Rx View: Refresh the RX window

Rx Window

Phase scatter

Spectrum scope

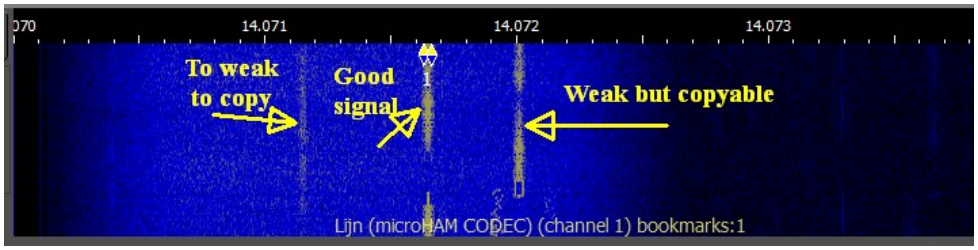


Show phase scatter: Show the phase scatter
Show spectrum scope: Show the Spectrum scope
Pick out message begin/end:
Put SOM on the line before a message.
Put EOM on the line following the message.

The message is defined by the signal strength, which can be displayed on the Phase scatter diagram.

Receiving PSK31 signals:

PSK31 signals are displayed as two parallel lines that are close to each other in the spectrum window. Tune in to a PSK31 signal by pointing the mouse and clicking the left mouse button. The text sent by the drive then appears in the Receive (RX) window.



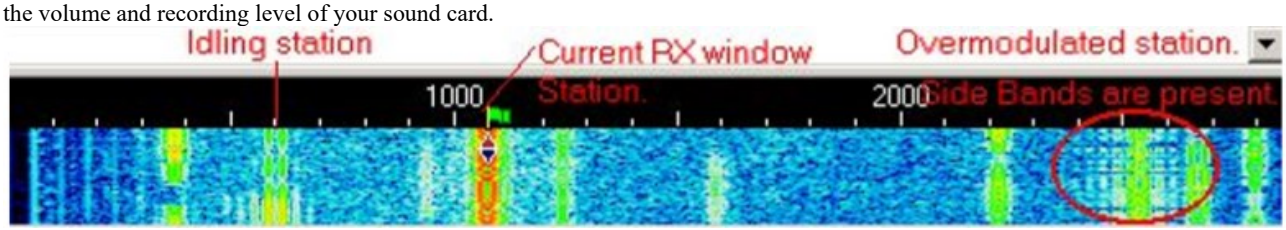
In this screen shot of part of the spectrum window of a current MixW screen, the bright orange stripe with the diamond-shaped cursor in the middle is a strong PSK31 drive, the signal to its left is a weak PSK31 drive (yellowish stripes), but would probably still be able to print a readable copy and the very weak signal on the right is a PSK31 drive that is too weak to copy enough to support a QSO. PSK31 is less than 40 Hz of bandwidth, so it's virtually impossible to manually tune in to the correct frequency with the Transceiver's VFO, or even to manually touch the tuning because the steps are so small. However, if your Device is equipped with "FINE" tuning, always use it when working in PSK31 and QPSK31 modes.

PSK31 transmit:

For transmit to a station, first tune in as indicated above. Type outgoing text in the shipping window. Press the Send button and the text in the transmission window is sent. You can continue typing and that text will also be sent. As it is sent, the text in the broadcast window also appears in the Receive window. Press the Stop button again to stop the transmission. When you press ESC, the broadcast breaks down and MixW is sent back to reception mode, but the last typed characters are not sent. This process can also be automated using the MixW Macros.

Note: PSK31 uses the full ASCII character set, so normal use is upper case and lowercase instead of just upper case and the punctuation you want. Call letters are upper case and lowercase letters or ALL CAPS. Both ways are acceptable, but an important consideration is that the lowercases use fewer phase changes and are less likely to be distorted in poor conditions.
During transmission, the waterfall freezes and remains frozen until you return to reception.

See the **Basic Settings** topic to adjust your sound card's volume control. PSK31 is extremely sensitive to a proper adjustment of both the volume and recording level of your sound card.



This screenshot of a MixW screen shows several PSK31 drives. The drive to the left of our QSO is stationary (not typing) and the two desired side bands of the PSK31 signal can clearly be seen as parallel lines. Also visible are two weaker parallel lines on each side of the massive parallel lines at the bottom of this signal, which are unwanted side bands, produced by slightly transmitting the transceiver. It seems that this station "sets" the output level of the sound card. It was too strong at first and produced the unwanted side tires, and it looks about right where they ended up at the top of the screen. The signal marked and circled as "over modulated drive" also has the wide unwanted side bands. Notice how close the side bands to the QSO are directly to their right and therefore interfere.
As with most other digital modes, it is possible to open multiple RX windows and switch the active window (the window you are going to send to) between them.

PSK63/ 125:

PSK63 and PSK125 Basic concepts:

PSK63, PSK125, QPSK63 and QPSK125 are a variation on PSK31 & QPSK31 by changing the BAUDRATE with a macro command or settings dialog box. Two macros are proposed, one for switching to PSK63/125 and one for switching to PSK31.

PSK63 works exactly like PSK31, except that the signal is twice as wide, and you can transmit twice as fast (if you can type it quickly). Similarly, PSK125 will be 4 times faster.

MixW will recognize the mode in the log based on the Baudrate. Internally, however, MixW only registers the mode as PSK31 or QPSK31. Thus, mode-specific macros for PSK63/ 125 or QPSK63/125 will not be selected.

Macro for PSK31: <MODE:PSK> <BAUDRATE:31.25>
Macro for PSK63: <MODE:PSK> <BAUDRATE:62.5>
Macro for PSK125: <MODE:PSK> <BAUDRATE:125>

You can also change the Baudrate by clicking on the ModeSet macro and adjusting your Baudrate in it.
NOTE: PSK63 & 125 are normally found above the traditional PSK31 frequencies instead of being mixed with them, as PSK63 & 125 require more bandwidth. If you switch from PSK31 to PSK63 or PSK125 during a QSO, you run the risk of expanding to the signal of other users, which does your image as a polite and attentive operator no good.

(top)

QPSK

QPSK Introduction:

info Wikipedia

This method is more complex than PSK, using four phases: 45°, 135°, 225° and 315°.
With these four phases, it is possible to propose two bits per phase.

QPSK Setup

See PSK mode

(top)

RTTY

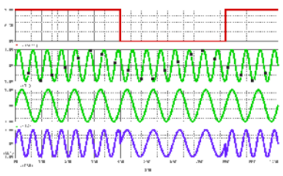
RTTY introduction

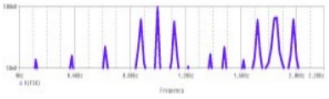
From Richard B. Griffin's website, NB6Z

RTTY or Radio Teletype is a direct machine-to-machine communication mode using the Baudot (or Murray) code. This mode became popular with many amateurs when excess TTY machines became available at a reasonable price after World War II. These mechanical samples provided a keyboard for input and a paper roll for printed output. They were also useful to keep the house down in times of hurricane winds - they weighed at least a ton. Video displays were still too exotic and expensive at the time. It was not until the mid-1970s that we started using the video display more generally. (By the way, have you ever wondered why early programming languages like BASIC use the PRINT command to display their output?)

When transmitting morse code, the transmitter is turned on and off to create the dits and dahs. However, when transmitting Teletype, the transmitter works continuously, sending one of the two frequencies commonly known as Mark and Space (a reference to the receipt of telegraphy on paper). The early pioneers who found the on/off review were not as successful with their Teletype signals due to static electricity interference.

They experimented with FSK or **F**requency **S**hift **K**eying and found that it performed much better. With FSK, the transmitter is moved in frequency every time a Mark is sent, returning to the lower frequency for a Space. The amount of the shift is usually 170 Hz for use as an amateur radio, although many commercial teletype signals use other values, notably 425 Hz and 850 Hz. Many systems use AFSK or **A**udio **F**requency **S**hift **K**eying. When sent, the transmitting station generates the Mark and Space sound tones and carries them to the transmitter's microphone input. The result at the receiving end is that the same sound tones are heard and processed, regardless of whether the transmitting station has used FSK or AFSK.





When you listen to a teletype signal, you will soon recognize mark and space's familiar warble tones. In the amateur shack, the TTY machine is usually connected to an HF receiver or transceiver that matches the operator so that the received audio has just the right pitch or audio frequency to activate the demodulator's Mark and Space resonators.

If the receiver deviates slightly from the correct frequency, the tones vary, and the text is distorted or even completely lost. To help the other drive correctly match the receiver, an RTTY operator can alternately send a series of R and Y characters to RYRYRYRYRYRY. This pattern is chosen because it produces the most frequent and almost symmetrical alternation of marking and space tones, giving the receiving operator the best chance to tune the receiver before the "real" message starts. But even if the signal is precisely tuned, the information can become distorted or completely lost due to interference, blurring or noise. Often it is possible to understand the message, even with missing parts, but RTTY is **not a** flawless mode!

I would like to point out that there are similar problems for other modes, including Packet. While the information still can't be processed in the more advanced modes, the error detection capability of some, especially Packet and PACTOR, ensures that the operator receives accurate information or nothing at all. Usually, where "nothing at all" is received, the information is automatically resent when the radio is reset, or the interference stops, (etc.) And nothing is lost.

The Baudot code is a 5-bit code and those of you who are familiar with binary notation know that the maximum number of values we can have with 5 bits is 32. That means that each unit of broadcast, one keystroke if you like, can contain one of the 32 possible values. If you look up a table of Baudot codes, you will see 32 values listed, one code for each letter of the alphabet plus a few other codes for other things, such as a space and a Carriage Return. But what if we want to send a number like "9" or a question mark? These are not listed in that table because all 32 codes have already been used.

The solution is very similar to the typewriter or the computer keyboard, where we use the Shift key to get several additional codes from the keyboard. Most keys produce a different result when we hold down the Shift key as we type. Well, one of those original 32 codes is a special code known as FIGS (for Figures Shift). The agreement is that if we want to send a number or other special character such as a punctuation mark, we can do so by sending a FIGS code first.

Instead of using that original table with 32 codes, we have a second table with codes to use and that second table contains all ten numeric digits and different punctuation marks. Provided that both sides of the conversation respect the convention, the sender can send a FIGS and start using the second table; the recipient will see the FIGS code and will interpret all data that follow from the second table.

With only 5 bits of data we have almost 64 different codes that we can send and receive. (I say almost because there is some duplication in the two tables, including a space and a Carriage Return but that is not important here). Even that number of codes is not enough to handle all 26 letters of the alphabet in both UPPER and lowercase letters, so RTTY systems always only work in uppercase letters.

If we wanted to type a large number (say "13579"), we do not have to send FIGS before each digit. We only send that code once and the receiver will then take everything we type now as if it belongs in the second table. If we want to return to the normal alphabet table with codes, we can send another special code, this one is called LTRS (for Letters Shift). Then everything goes back to normal, using the first table of codes.

Normally we do not have to deal with these FIGS and LTRS codes. Our computer equipment takes care of those things for us. We simply type away and rely on the system to generate and transmit those codes when needed.

As I said earlier, it's quite possible that you lose bits here and there when you receive an RTTY signal, whether it's fading, interference, frequency drift or whatever. One of the major problems with lost data is the possible loss of a FIGS or LTRS code! Let's say we sent "13579" and then typed "HAPPY BIRTHDAY." Our equipment would have sent an LTRS code before the first 'H', but what if the receiver hadn't copied the LTRS code we sent? Can you imagine what's happening? As for the receiver, we still send numbers or other codes from the numeric table! So, our “HAPPY BIRTHDAY” is going to look like "#-006? 845 #$ - 6". And everything we type from that moment on will look just as weird until we happen to send another LTRS code. It is for this reason that many systems contain an option for "Un-shift on space". If you have a TNC with multiple modes that RTTY can handle, you probably have this option in your TNC. If that option is enabled, your receiving system will contain an LTRS code each time it receives a space. So, if you seem to copy a lot of funny songs from a strong, well-tuned signal, try to set that option.

We can solve some of these problems by using ASCII instead of the Baudot code. With ASCII we can have 128 different codes, so we do not need the FIGS/LTRS codes. All PCs use ASCII as their native language, so it's reasonable to use it. Although it is not part of the defined ASCII standard, it has become an almost de-facto standard in the computer world that there are 128 additional characters available, often called Extended ASCII. But despite these advantages, Baudot continues to control the airwaves for teletype broadcasts of amateur and commercial services.

Nowadays, RTTY is still a popular mode, especially on the HF tires. The arrival of the "Glass Terminal", first the Dumb Terminal and now the Personal Computer, has brought this mode to even more operators around the world. Many specialized RTTY systems have been developed for amateur enthusiasts, but have now been replaced by the personal computer with one of the Multi-mode TNC's, which deals with RTTY and many other modes.

(top)

RTTY operation

The latest computer-controlled RTTY equipment generally allows us to use the mode better, quieter and more efficiently, consume less power and take up less space than the old TTY machines, but the limitations of the mode remain.

Sender receiver settings

Fine tuning

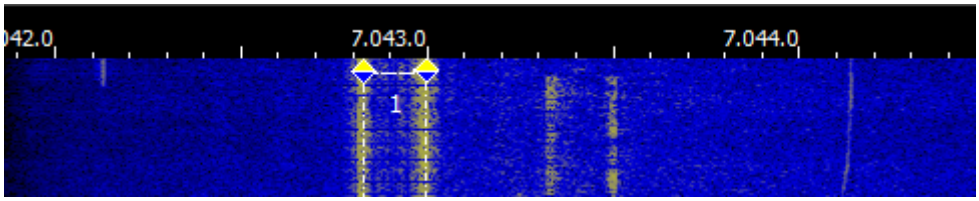
If your transceiver is equipped with a "FINE" tuning function, always use it for RTTY tuning once you have found an RTTY activity. Most of your adjustments can be made in the software and not with the VFO of the transceiver if you prefer. In the PSK31 modes, virtually all tuning takes place in the software. For RTTY I prefer to vote for the VFO. Some older devices are really not stable enough for PSK31 use and will significantly drift away from the frequency, but due to the larger bandwidth they are fine for RTTY.

USB

In the past, radio RTTY operators used LSB transmissions and a 170 Hz shift between the MARK and SPACE signals, with the MARK signal being higher in frequency. With MixW is the convention to use USB for all modes, because the program will automatically adjust the inversion.
Note: MixW automatically adjusts the Mark and Space tones, depending on the side band you are working with. If you are not using CAT, MixW needs to know which sideband you are going to work on to set Mark and Space correctly. (See inversion in the Configuration topic).

Filtering

Optimal filtering depends on your transceiver's SSB filter options and IF rejection characteristics. Wide filtering allows you to edit the largest spectrum without resetting your transceiver, but can also cause problems if there are strong signals next to it. A narrow filter (RTTY or FSK) can significantly help with some radios and situations. However, many transceivers do not have narrow filter options while working in SSB modes. Consult your manual and experiment for the optimal configuration for your setup and conditions. The following waterfall screen shows MixW's panoramic view when using a wide filter setting on the transceiver:



Here are 2 different RTTY QSO's that we could copy with the simple mouse click in roughly 3 KHz spectrum. The strong in the middle is currently selected and offers the best print. The other may be too weak to copy 100 percent.

Power

RTTY uses a large bandwidth and therefore it needs relatively high power compared to modes such as CW and PSK31. However, never use more power than you need for a particular situation.

(top)

RTTY setting

MixW4 has the ability to send RTTY signals in two different ways:

FSK

The transceiver generates baudrate/shift frequencies.
Note: Not all transceivers support FSK operation.

AFSK

MixW4 generates baudrate/shift frequencies.

CAT:

The type of broadcast is selected in the CAT configuration. If AFSK is not checked (selected) instead of FSK, FSK is used.

For FSK, MixW4 uses an FSK-com port.

The FSK mid frequency should be selected.

Band map:

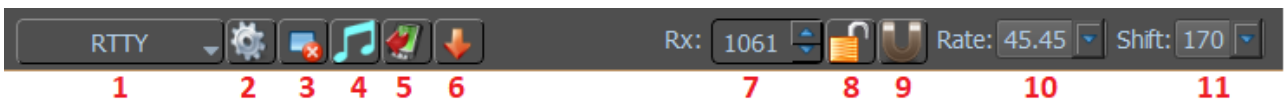
The band map needs to be adjusted to facilitate operation.
An example is shown below for the 20m band.

For FSK operation, RTTY mode must be:
20 m RTTY {Mode_RTTY} 14065 14112 14080

and AFSK operation:
20 m RTTY {Mode_Digital} 14065 14112 14080

Mode_RTTY is the mode name that MixW4 uses to switch your transceiver into RTTY mode. Mode_Digital mode to switch to normal digital modes (Olivia, Hellschreiber, etc.).
See the Band map section for all the details.

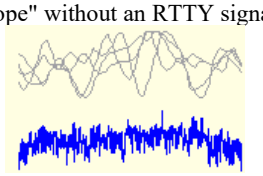
RTTY dialog bar



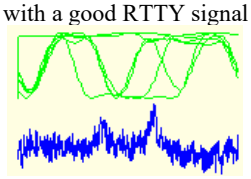
1. Mode choice menu.
2. Modes settings.
3. Clear RX window.
4. Tune.
5. Show/hide TX controls.
6. Save audio history (40 sec) Right click to browse files.
7. RX midfrequency.
8. Lock the RX-freq. A red pin appears above the RX cursor Display the Mode Settings window.
9. Snap frequency.
10. Baudrate.
11. Shift frequency.

In the RX screen you can already see the "Eye" diagram and the "Spectrum Scope" (blue).

The "Eye" diagram and the "Spectrum scope" without an RTTY signal



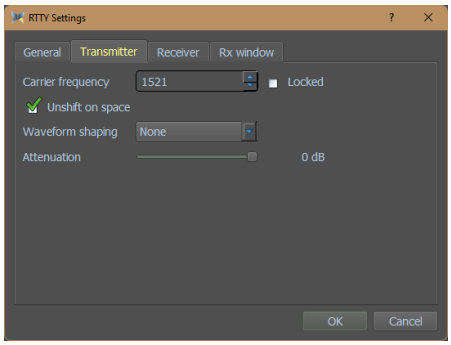
The "Eye" diagram and the "Spectrum scope" with a good RTTY signal



RTTY mode setup

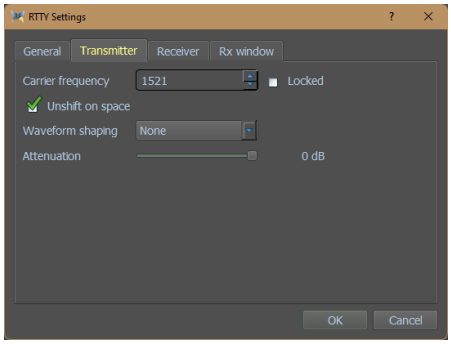
General

Baud rate: Here the baud rate is set. ***Default 45.45***
Shift: Here you set the band frequency. ***Default 170***
Encoding: Here you have the choice of:
5 bit Baudot, 7 bit ASCII and 8 bit ASCII. ***Default 5 bit Baudot***
Stop bit scale: The choice is1, 1.5 of 2. ***Default 1.5***
Parity: Here you have the choice between non, odd of even. ***Default None***
Inverted band (LSB): Change the site band from USB in LSB



Transmitter

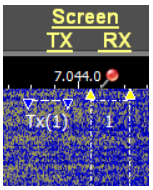
Carrier frequency: Carrier frequency in Hz that can be fixed via "Locked"
Unshift on space: Don't shift space
Waveform shaping: Choice between None, Amplitude shaping and Frequency shaping
Default None
Attenuation: Attenuation from -50 till 0 dB

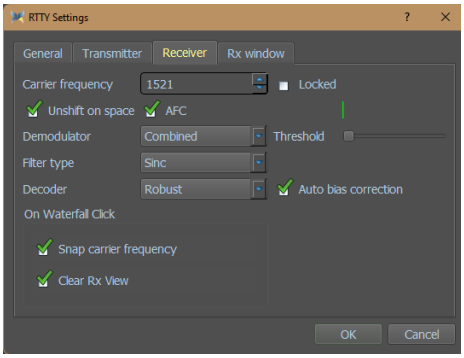


Receiver

Carrier frequency: Carrier frequency in Hz that can be fixed via "Locked" see image
AFC: **A**utomatic **F**requency **C**ontrol

Demodulator: The choice is:
Frequency detector, Filter based en Combined
Filter type: Choose between, Gaussian, Sinc en Raised Cos
Default Gausian
On Waterfall Click: Affects the waterfall when you click on it.
Snap carrier frequency: Here MixW will correctly place itself on the selected received signal
Clear Rx View: Refresh RX scherm

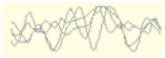




Green bar is a simplified indicator of signal strength at the decoder input band. Threshold slider just below the indicator controls at the same scale the decoder sensitivity. When signal level is more then threshold (rightmost) - decoder works. Otherwise decoder is stopped to prevent garbage in Rx window.

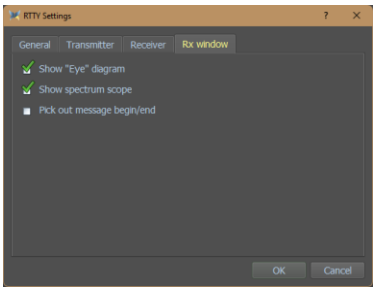
Rx Window

Show “Eye” diagram: Show the “Eye” diagram
Show spectrum scope: Show Spectrum scope
Pick out message begin/end:
Put SOM on the line before a message.
Put EOM on the line following the message.



Eye diagram

Spectrum scope



The message is defined by the signal strength, which can be displayed on the Phase scatter diagram.

It works when the signal level is higher than an acceptable threshold and the "Eye" diagram turns green, otherwise it is gray. Signal below the threshold can are still decoded, but the quality is moderate

Transceiver manual

RTTY received

RTTY signals appear as two parallel lines with most already 170 Hz apart. Tune in to an RTTY signal by pointing the mouse in the center of the two tracks and clicking the left mouse button. The text sent by the drive then appears in the RX window. The diamonds will move together to follow and tune RTTY QSOs.

RTTY transmitting

To transmit to a station, first tune it in as indicated above. Type your outgoing text in the Transmit Window. Press the Send button under the Tx window and the text will be transmitted. You can continue to type, and that text will also be transmitted. As it is being transmitted, text in the transmit Window will also appear in the Receive Window. To stop transmitting press the Stop button under the Tx window. Pressing ESC will abort transmission and return MixW to receive mode but unsent characters typed will not be transmitted.

RTTY power

RTTY uses a wide bandwidth and so it will require relatively high power compared to modes such as CW and PSK31. Never use more power than you need for any given situation, however.

Note: RTTY uses a limited character set and only uses UPPER CASE. MixW automatically converts lowercase letters to uppercase letters. You will also notice that not all punctuation marks are supported, although most do.
The following characters are supported: - () $! "/:?.
During transmission, the waterfall freezes and remains frozen until it returns to reception.

(top)

RTTYM

Introduction of RTTYM

RTTYM is a development from the Contestia mode with further reduced facilities and robustness created by Nick Fedoseev (UT2UZ).

RTTYM in MixW

RTTYM is a version of MFSK and in MixW the operating procedures are the same as for MFSK, with the exception of certain options that can be set in the RTTYM Mode settings via the ModeSet macro

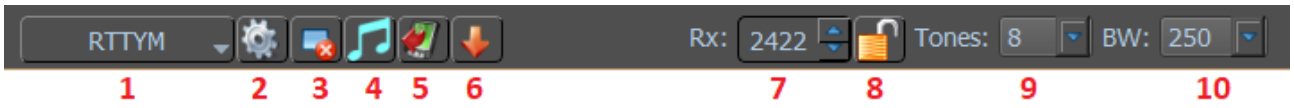
The "number of tones" can be selected from 8 different settings between 2 and 256, and the "bandwidth in Hz" can be selected from 5 different settings between 125 and 2000.
The tones/bandwidth combination appears as characters/s in the status bar.
The signals on the waterfall are almost identical to the Olivia and Contestia signals. As with all digital modes, after a short experience, the user will be able to visually identify the different formats in the waterfall.
It is important for a successful RTTYM operation that the sound card is calibrated.

Finding and tuning RTTYM signals.

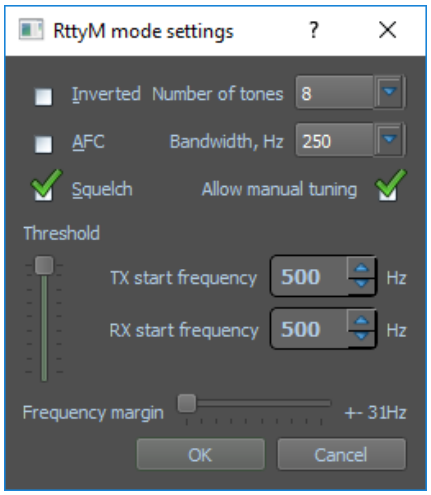
RTTYM under MixW is used like all other MFSK modes by clicking on the waterfall or spectrum view at the desired mid-frequency.
Frequencies currently used for RTTYM appear to be:
For 125/250/500 bandwidth just above the PSK63/ 125 frequencies
40 meters, 7072-7074
30 meters, 10134-10139
20 meters, 14100-14112

The best combination for calling CQ is probably 500 Hz, 8 Tones. However, a common practice is to agree in whatever mode the operator wants to work in. Be careful with the 1000 Hz width, and especially if you change from 500 Hz to 1000 Hz, so you do not cause interference with other users.
RTTYM is not as popular on the bands as Contestia and Olivia

RTTYM dialog bar



1. Mode choice menu.
2. Modes settings.
3. Clear RX window.
4. Tune.
5. Show/hide TX controls.
6. Save audio history (40 sec) Right click to browse files.
7. RX midfrequency.
8. Lock the RX-freq. A red pin appears above the RX cursor Display the Mode Settings window.
9. Bandwidth (Hz).
10. Number of tones.



Inverted: causes the signal to be reversed.
AFC: helps to tune and track the Contestia signal.
Squelch and Threshold: can be customized to suit your preferences.
Number of tones: selects from 8 values between 2 and 256
Bandwidth, Hz: selects from 5 values between 125 and 2000
Allow manual tuning: allow is permanently enabled.
TX / RX start frequency: are the signal low frequency settings.
Frequency margin: changes the frequency range within which signals are decoded.

(top)

Annexes

Introduction

The purpose of these attachments is to give a better understanding of how certain settings are done and this with the different transmission receivers.

Also covered are the CAT settings from MixW4 and some Interfaces and the use of a CAT cable.

If you have a well-functioning MixW4 with an unlisted Interface or transceiver, please send it to us so that you can supplement these manuals. They are a great help to other HAM's.

(top)

Configuration

There are up to 5 different settings that can affect the operation of the transceiver from MixW4:

1. Windows - Audio, COM ports, and settings.
2. MixW4 - Audio, CAT, macros, COM ports and settings, mode settings.
3. Control Interface - This is for non-USB <> USB connected transceivers. Audio (maybe), COM ports and settings, control rules.
4. Audio - this is for non-USB <> USB connected transceivers. Audio may be included in your operating interface.
5. Transceiver - Audio, COM ports and settings, steering lines.

To ensure that your MixW4 transceiver connection works correctly, all required components must be configured correctly.

While attempting to configure the interface you have installed, you may need to use Windows Device Manager to check COM ports or audio ports.

To enable Device Manager, run C:\Windows\System32\devmgmt.msc.
I created a desktop icon, but you can also use the {Windows key} + R or use a command prompt by running cmd.exe.
Most interfaces are powered by the computer's USB cable.

The recommended USB cable with a maximum length is 5 meters.

The use of a 5-meter cable and a potentially loaded PC power supply can cause temporary operational problems.
The voltage drops over the USB cable may be sufficient, if you do not reach the recommended operating voltage for using your interface unit.
One solution that has worked well with previous versions of MixW is to use two shorter USB cables and a USB hub with its own power supply between the cables.

(top)

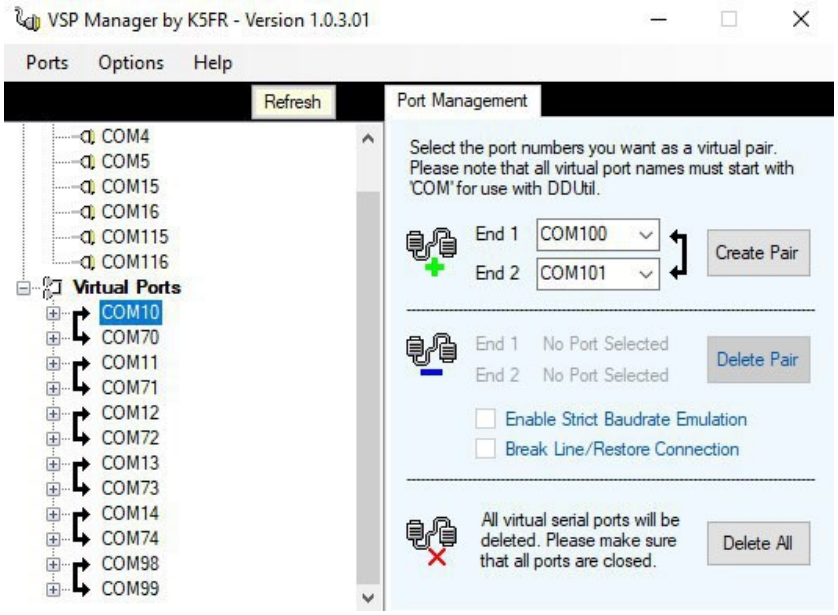
Interfaces, Trcvr's settings

Flex SDR

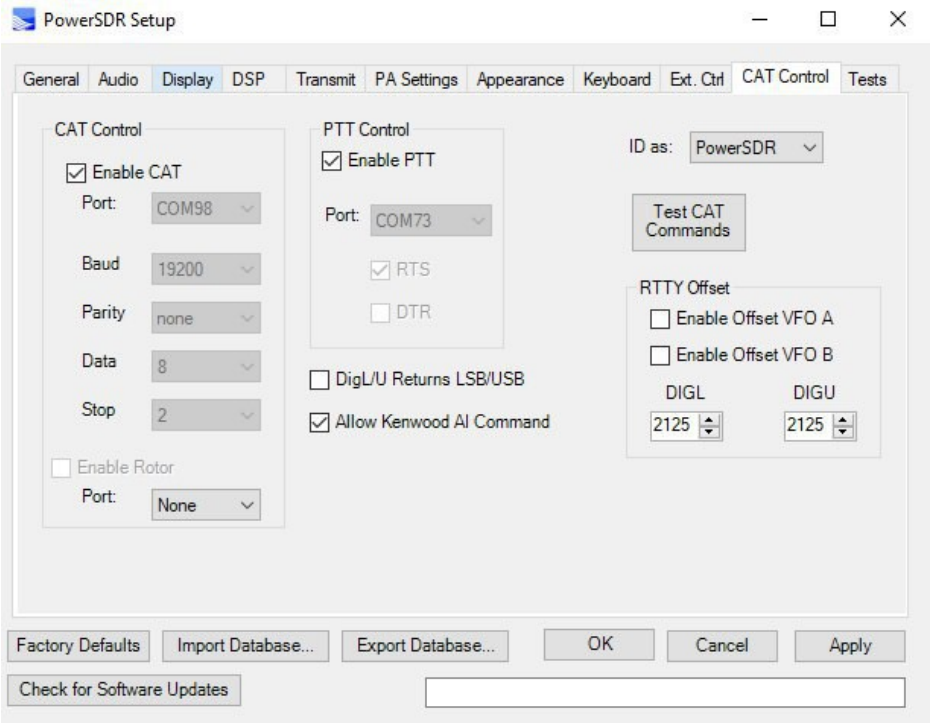
MixW4 with a Flex Radio 5000 SDR + Power SDR

(by Alex Timmi, UT4ULP)

The VSP Manager is needed to create virtual pairs of COM ports.
Since, unlike the 6000 series, the standard tools of Flex programs cannot do this. For radio amateurs, the author sends this application for free after request.

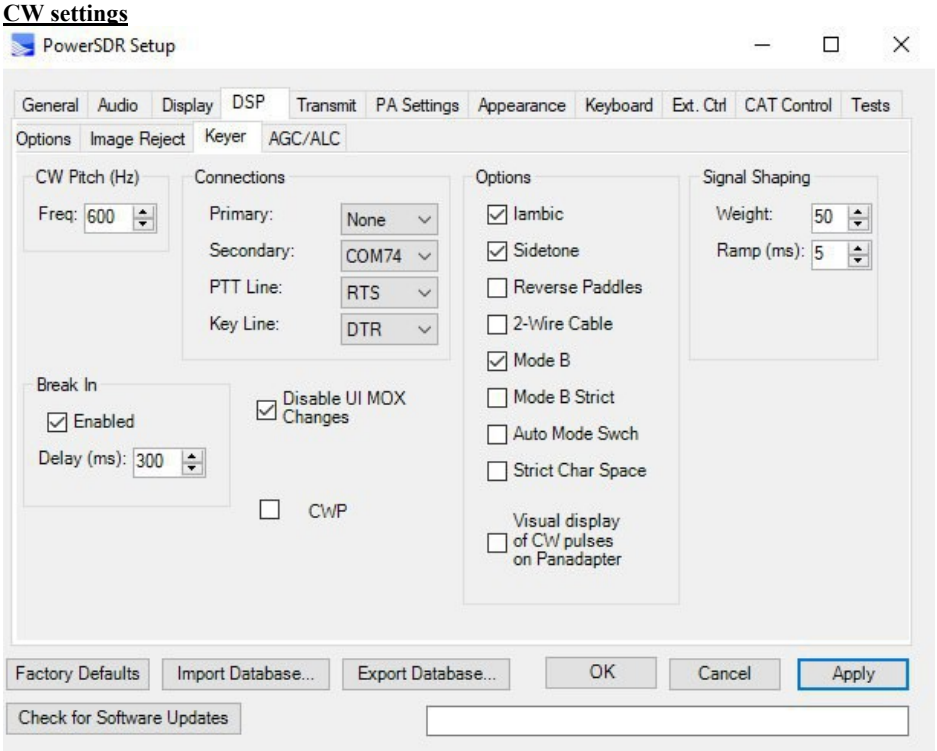


PowerSDR settings
Unfortunately, this program for work and in the digital and voice modus uses one option, and for work and in the CW mode another.
SSB and DIGI settings

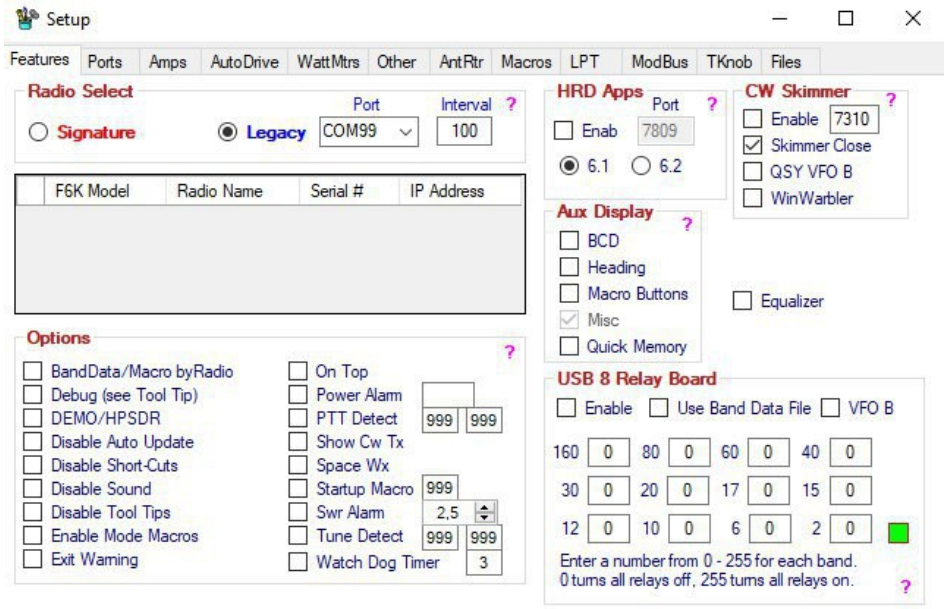


(top)

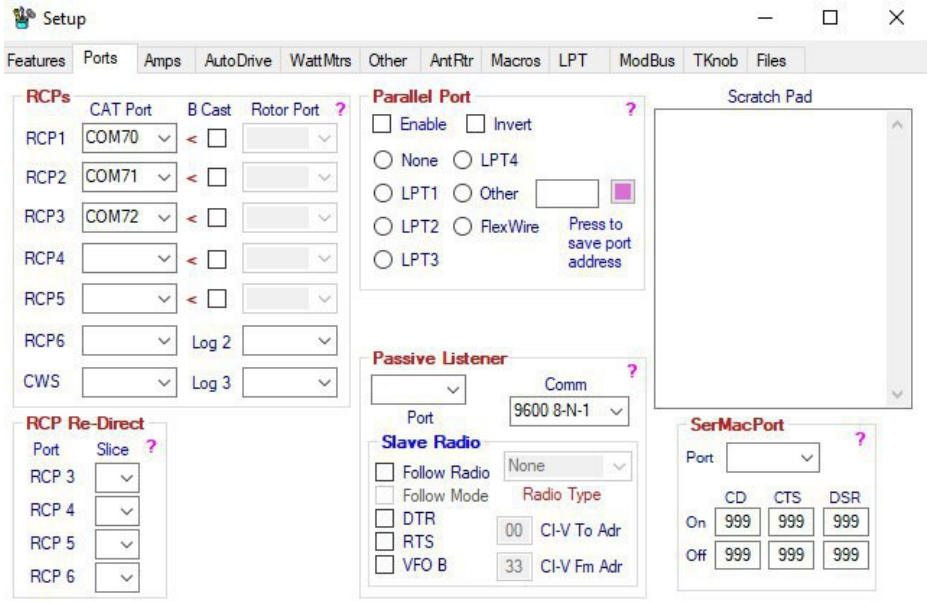
CW settings



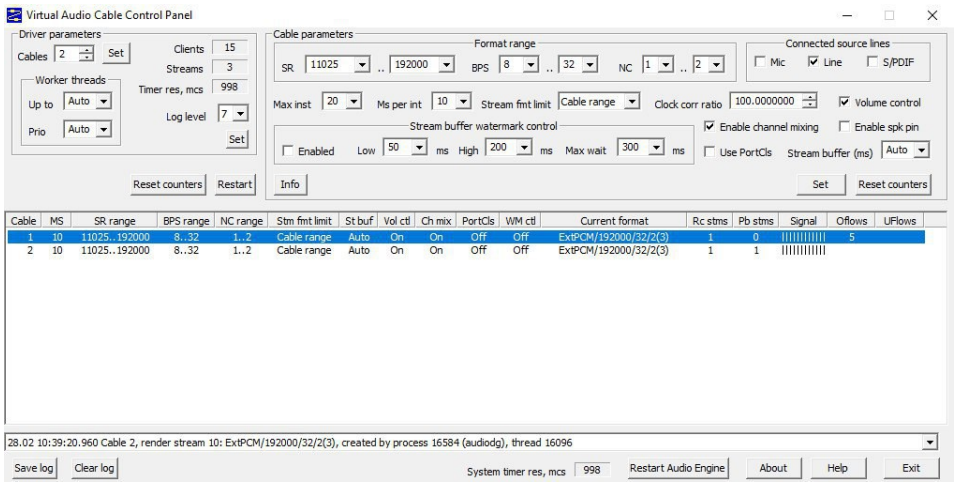
The DDUtil program is used for easy use of the CAT
In principle, this program is very popular with Flex owners.

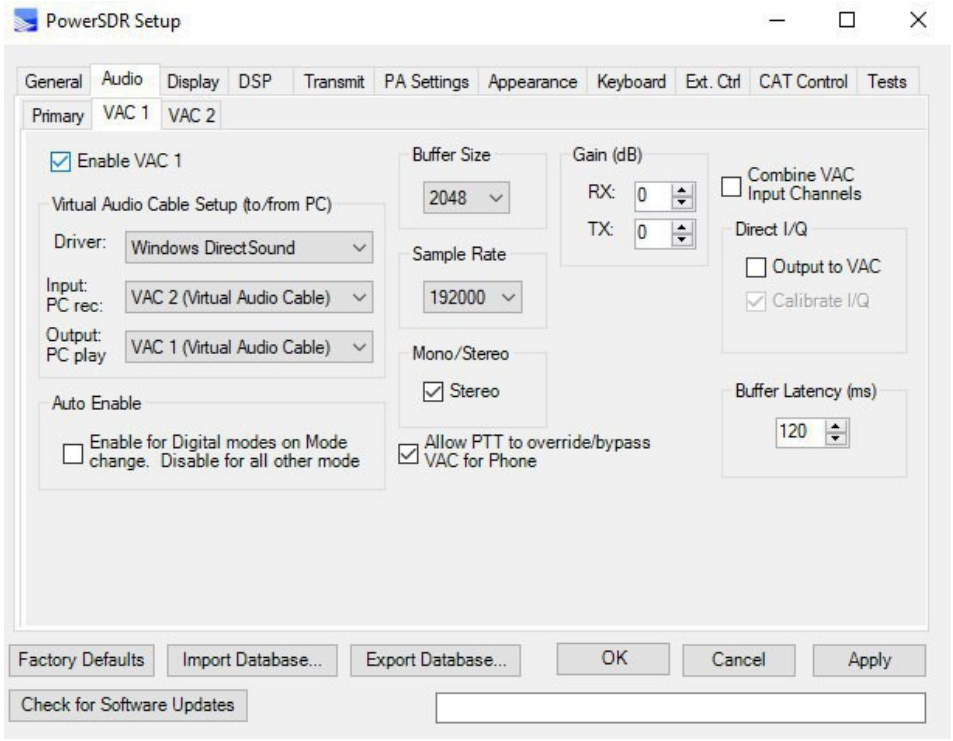


(top)



To convey sound, virtual cables are used in the VAC program

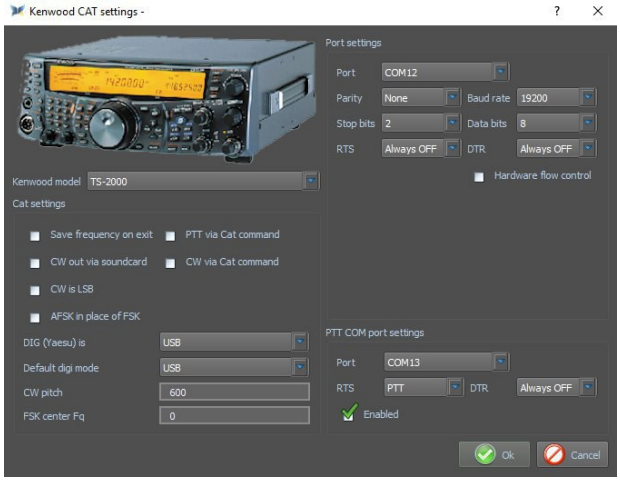




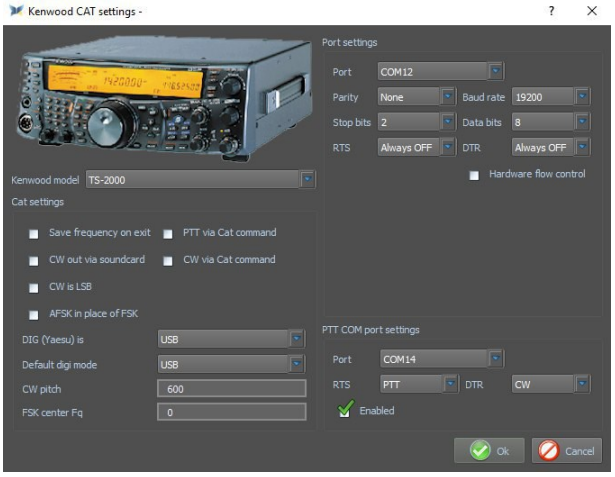
(top)

MixW4 settings

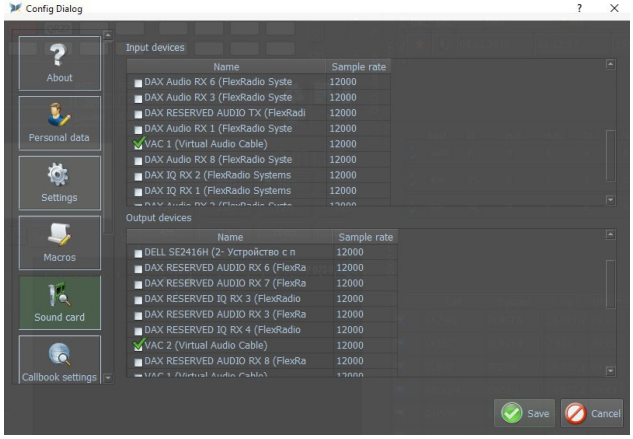
CAT settings for SSB and DIGI modes



CAT for the CW modus

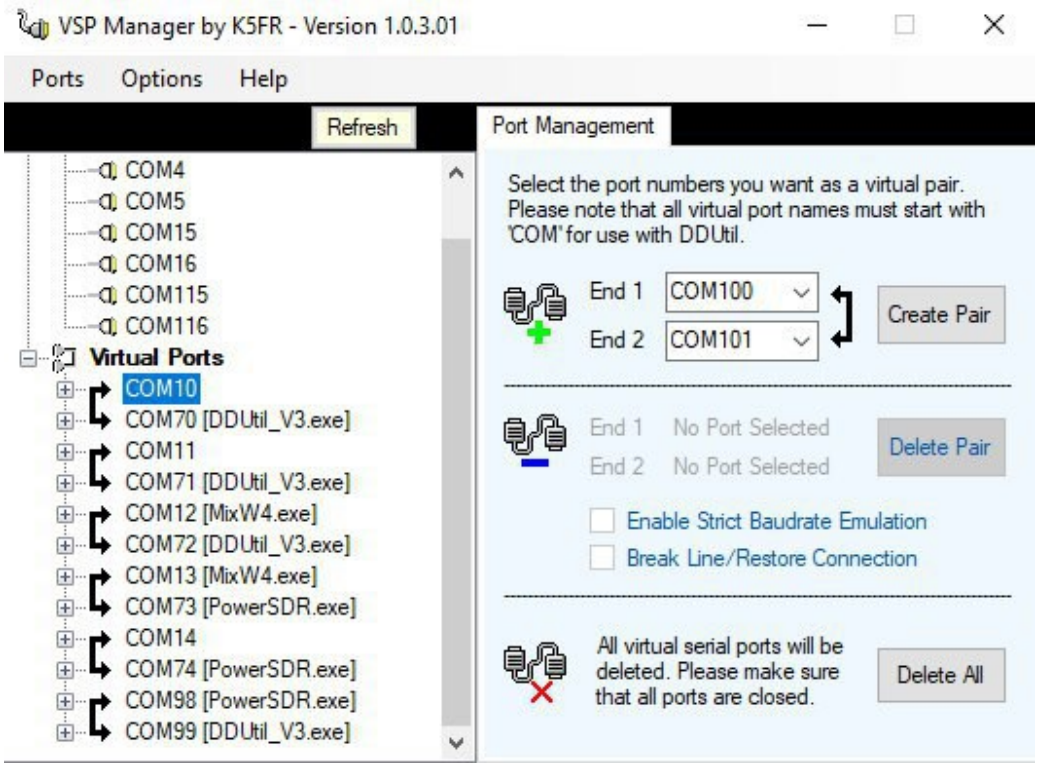


Audio Card settings



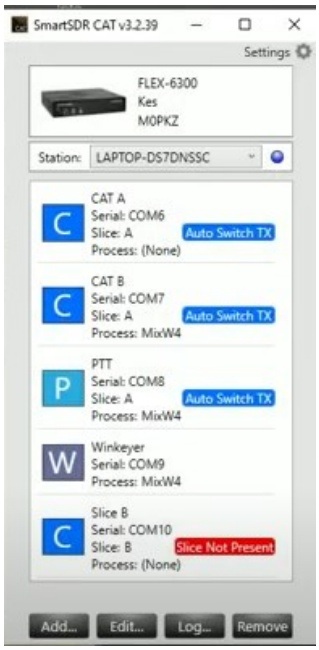
(top)

This is what a virtual com port manager looks like after everything is connected and executed.

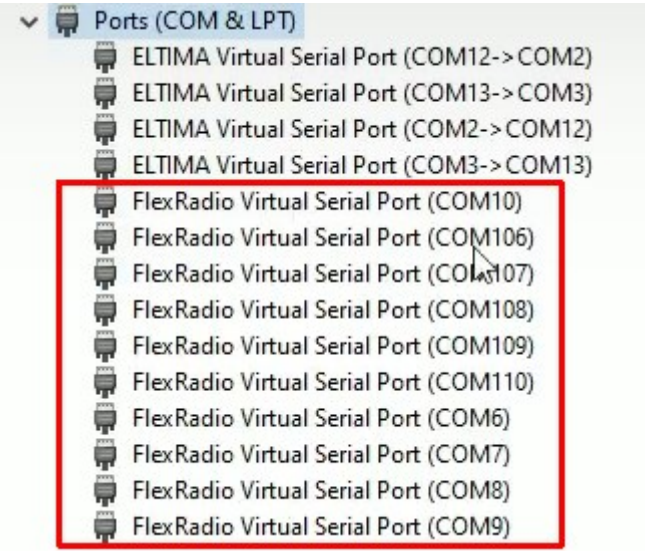


MixW with a Flex Radio 6300 + SmartSDR

(by Kes, M0PKZ)



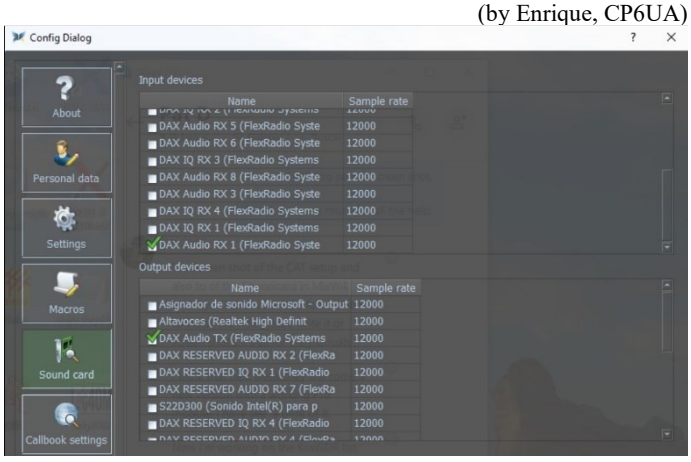
Device manager and sound card settings

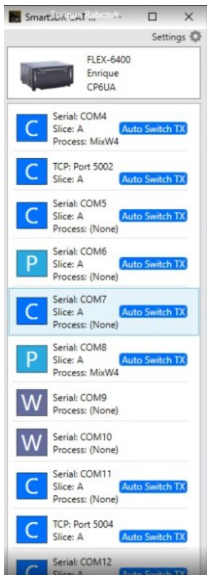


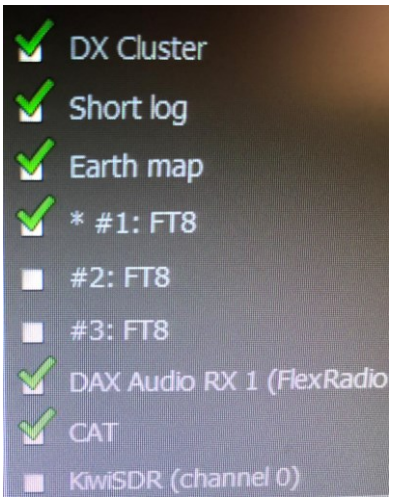
(top)

MixW4 with a Flex Radio 6400 SDR + SmartSDSR

(by Enrique, CP6UA)







(top)

Micro HAM-interfaces

The microHAM interfaces use the Eltima Virtual Serial Port drivers, which are installed when installing the microHAM USB Device Router. To do this, go to the Vertical Port menu and select the necessary COM ports that you think you will use. Personally, I've selected 13 COM ports.

FT-991A with a micro KEYER II

(By Pat, ON2AD)

Since I noticed when I used the FT-991A in DATA-USB the frequency was always 1 kHz higher than normal, I decided to always use the FT991A in USB mode. A few settings had to be made for that in the Menu of the FT-991A

FT-991A setup

No.	Menu Function	Available Settings	ON2AD	Default Value
004	HOME FUNCTION	SCOPE/FUNCTION	FUNCTION	SCOPE
012	KEYER TYPE	OFF/BUG/ELEKEY-A/ELEKEY-B/ELEKEY-Y/ACS	OFF	ELEKEY-B
028	GPS/232C SELECT	GPS1/GPS2/RS232C	RS232C	GPS1
029	232C RATE	4800/9600/19200/38400 (bps)	38400	4800bps
031	CAT RATE	4800/9600/19200/38400 (bps)	38400	4800bps
033	CAT RTS	ENABBE/DISABLE	DISABLE	ENABLE
034	MEM GROUP	ENABLE/DISABLE	ENABLE	DISABLE
050	CW LCUT FREQ	OFF/100Hz - 1000Hz(50Hz/step)	100Hz	250Hz
052	CW HCUT FREQ	700Hz - 4000Hz(50Hz/step) / OFF	4000Hz	1200Hz
055	CW AUTO MODE	OFF/50M/ON	ON	OFF
056	CW BK-IN TYPE	SEMI / FULL	SEMI	SEMI
059	CW FREQ DISPLAY	DIRECT FREQ/PITCH OFFSE	DIRECT FREQ	PITCH OFFSE
060	PC KEYING	OFF/DAKY/RTS/DTR	DTR	OFF
062	DATA MODE	PSK/OTHERS	OTHERS	PSK
064	OTHER DISP (SSB)	-3000 – 0 - 3000(10Hz/step)	0Hz	0Hz
065	OTHER SHIFT (SSB)	-3000 – 0 - 3000(10Hz/step)	1500Hz	0Hz
066	DATA LCUT FREQ	OFF/100 - 1000(Hz)(50Hz/step)	OFF	300Hz
067	DATA LCUT SLOPE	6dB/oct / 18dB/oct	6dB/oct	18dB/oct
068	DATA HCUT FREQ	700Hz - 4000Hz(50Hz/step)/OFF	4000Hz	3000Hz
069	DATA HCUT SLOPE	6dB/oct / 18dB/oct	18dB/oct	18dB/oct
070	DATA IN SELECT	MIC/REAR	REAR	REAR
071	DATA PTT SELECT	DAKY/RTS/DTR	DAKY	DAKY
072	DATA PORT SELECT	DATA/USB	DATA	DATA
094	RTTY HCUT FREQ	700Hz - 4000Hz (50Hz/step) / OFF	4000Hz	3000Hz
096	RTTY SHIFT PORT	SHIFT/DTR/RTS	RTS	SHIFT
104	SSB HCUT FREQ	700Hz - 4000Hz (50Hz/step) / OFF	4000Hz	3000Hz
106	SSB MIC SELECT	MIC/REAR	REAR	MIC
108	SSB PTT SELECT	DAKY/RTS/DTR	DAKY	DAKY
109	SSB PORT SELECT	DATA/USB	DATA	DATA
110	SSB TX BPF	100-3000/100-2900/200-2800/300-2700/400-2600	100-3000	300-2700
115	SCP DISPLAY MODE	SPECTRUM/WATERFALL	WATERFALL	SPECTRUM
116	SCP SPAN FREQ	50/100/200/500/1000 (kHz)	300kHz	100kHz

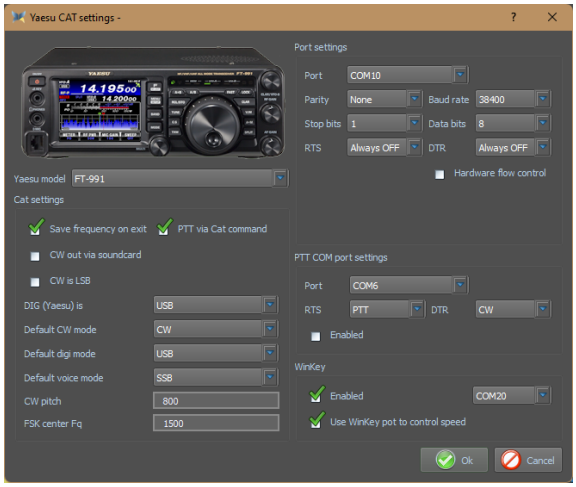
Menu F (M-List)

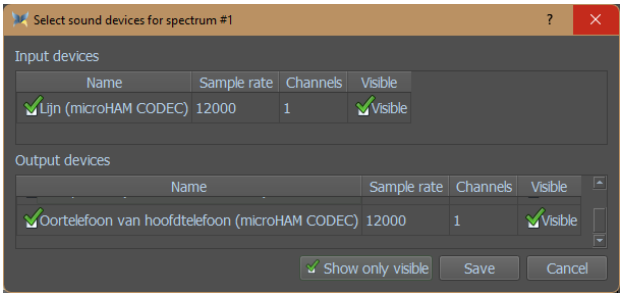
WIDTH	MIC GAIN	NAR/WIDE	MONI	PROC	DT GAIN	NB	IPO	AGC	5/10	MIC-EQ	BK-IN
3000Hz	50	W 3 k	15	50	50	ON	AMP 1	AUTO	10Hz	ON	OFF

Menu Mode

Digimodes select USB
CW mode select CW (USB)
With CW set the KEYER to OFF and the BK-IN to ON

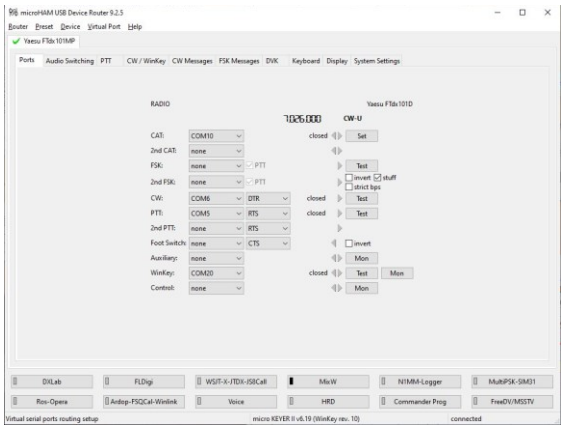
MixW4 instellingen

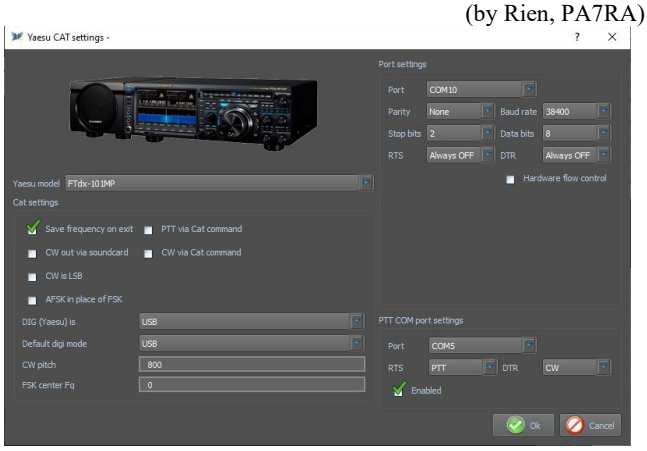




FTdx-101MP with a micro KEYER II

(by Rien, PA7RA)





FTdx5000 with a micro KEYER II

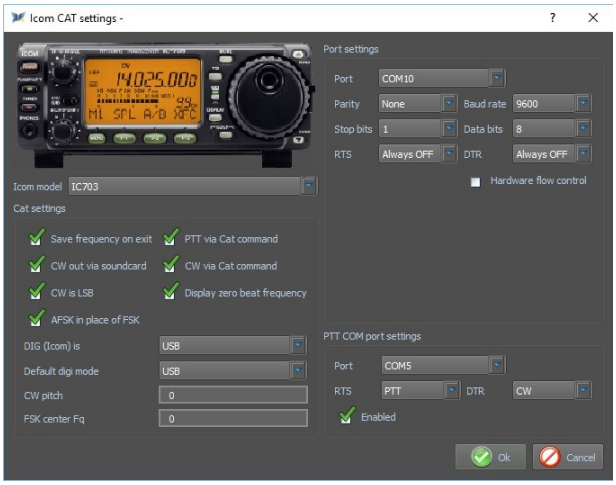
(by Rien, PA7RA)

For the settings of the micro Keyer II see this of the TS-2000

IC-703 with a micro KEYER II

(by Pat, ON2AD)

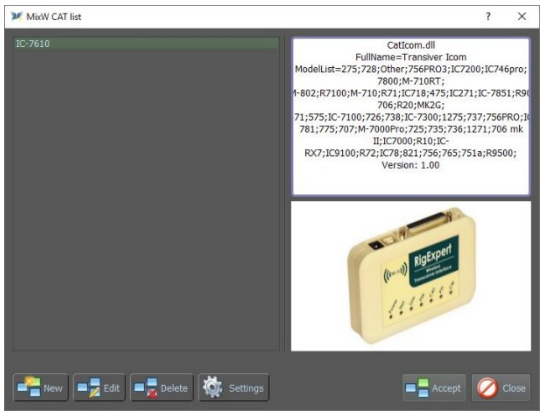
For the settings of the micro Keyer II see this of the TS-2000



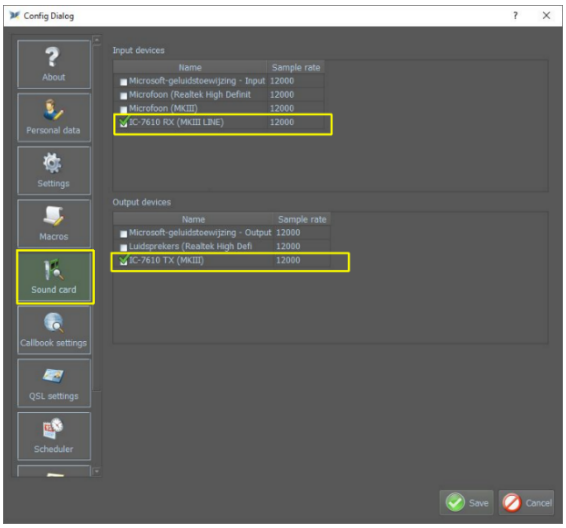
(top)

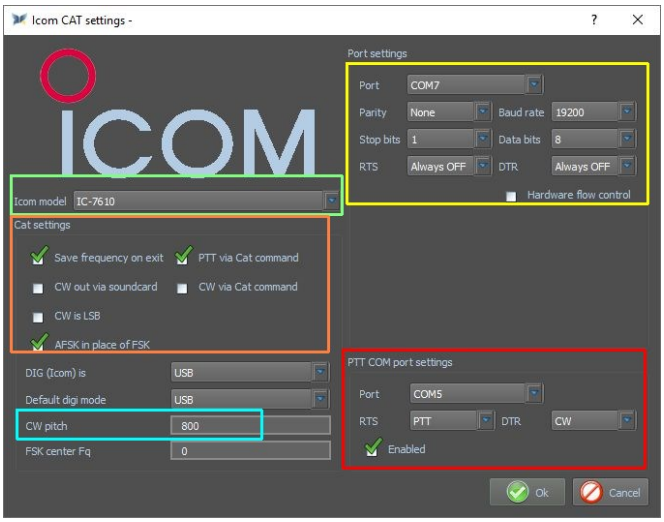
IC-7610 with a micro KEYER III

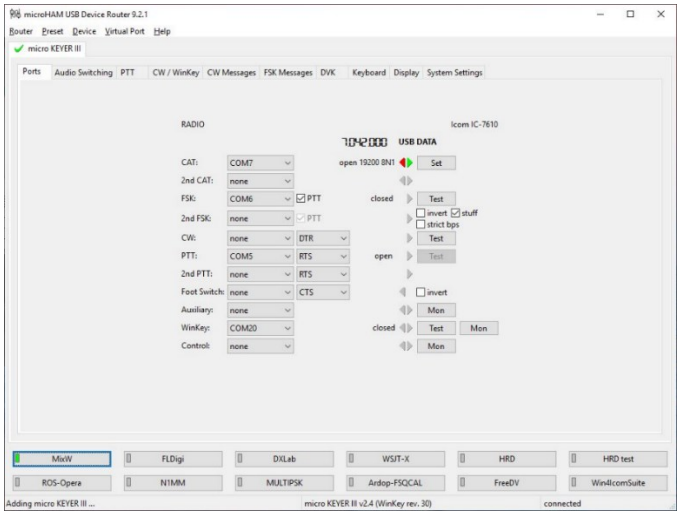
(by Rien, PA7RA)



Selecteer USB PKT voor gebruik met een micro Keyer III

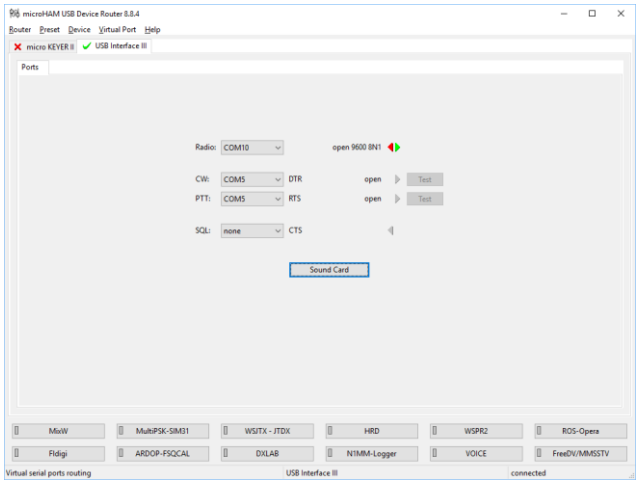


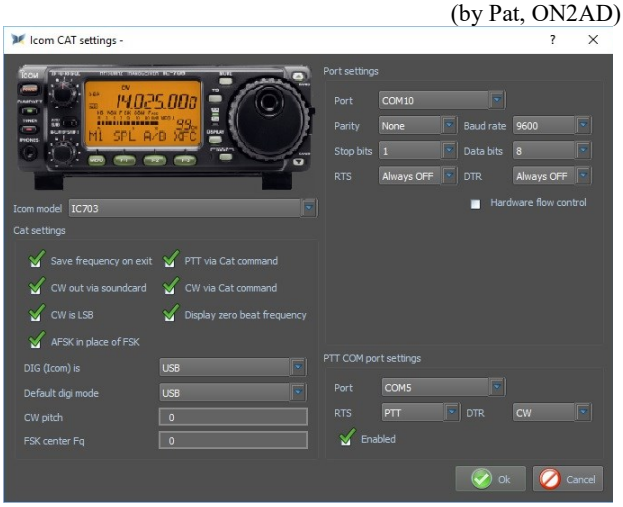




IC-703 with a microHAM USB Interface III

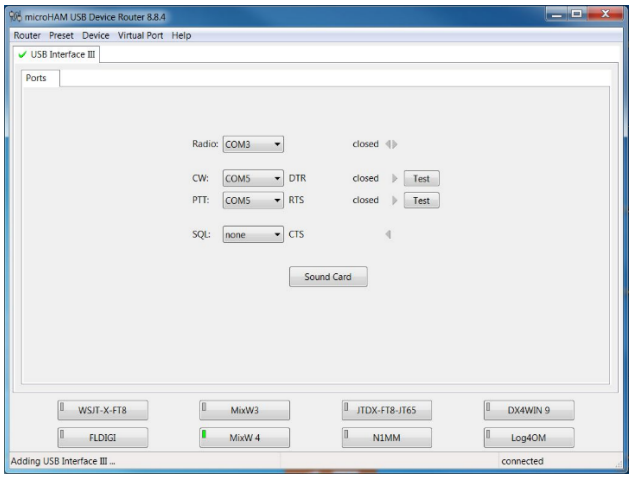
(by Pat, ON2AD)

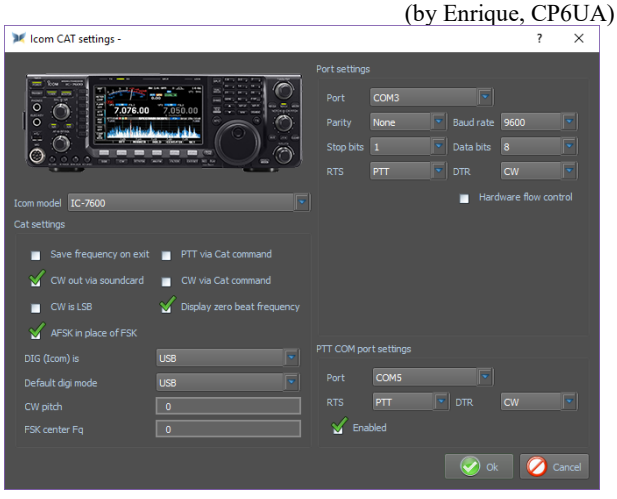


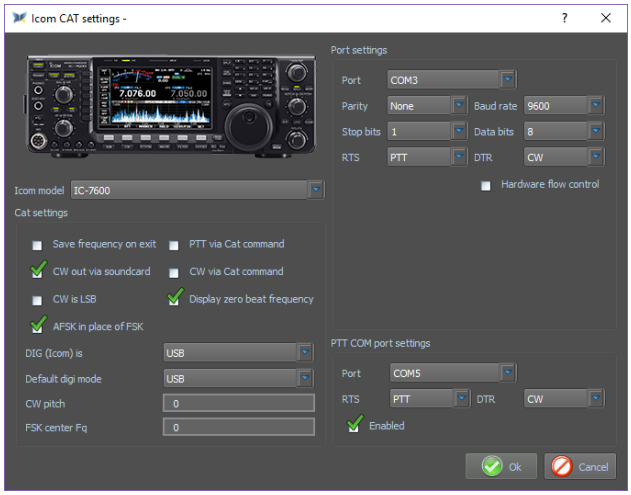


IC-7600 with a microHAM USB Interface III

(by Enrique, CP6UA)

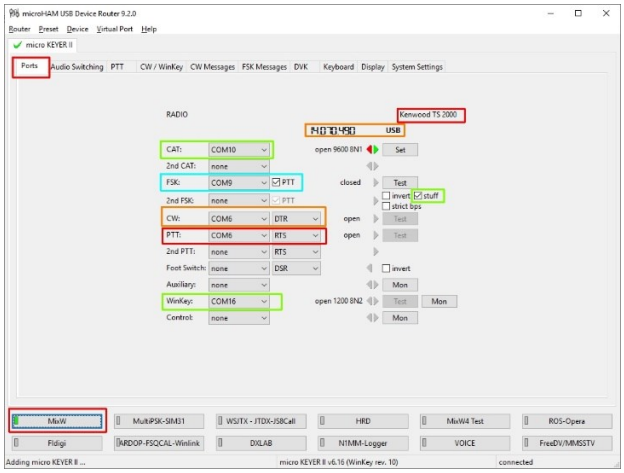


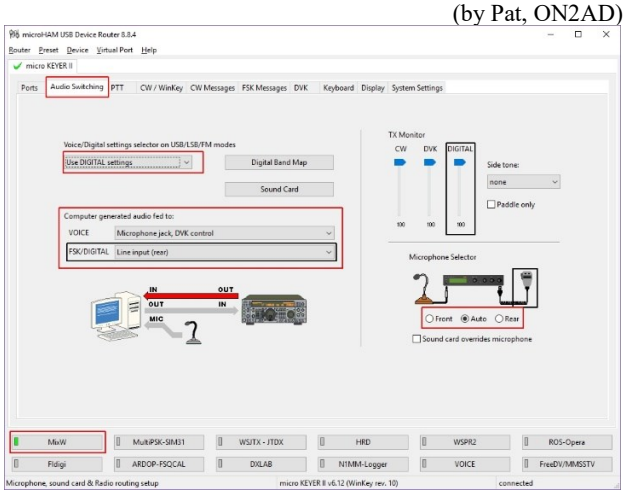


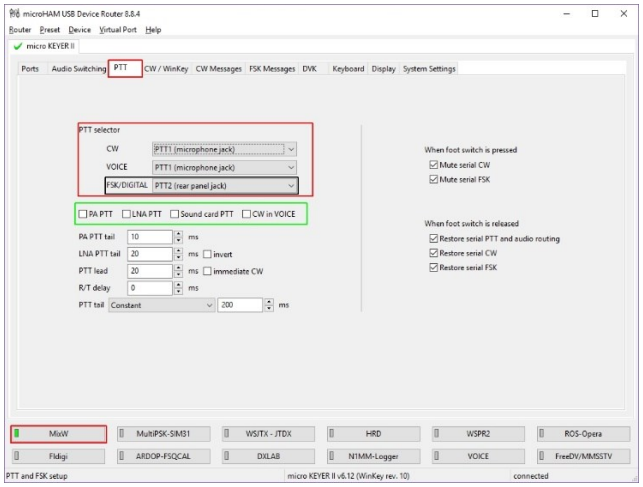


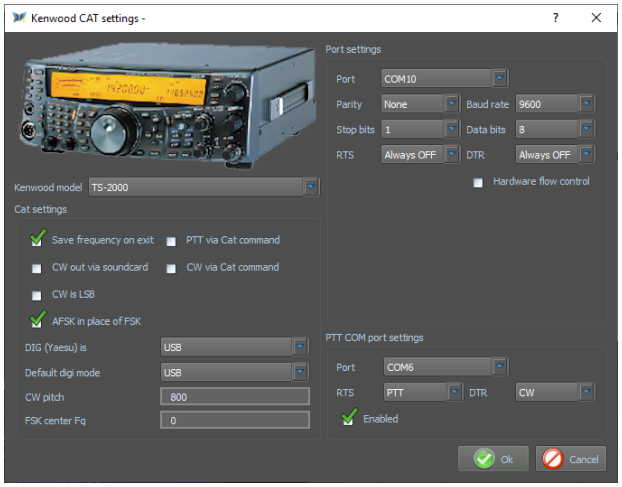
TS-2000 with a micro KEYER II

(by Pat, ON2AD)







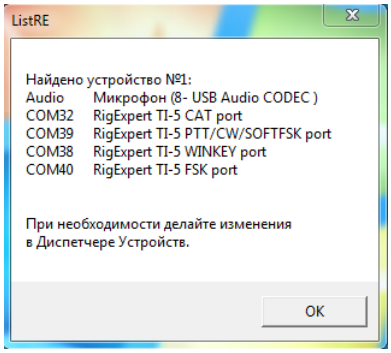


(top)

RigExpert interfaces

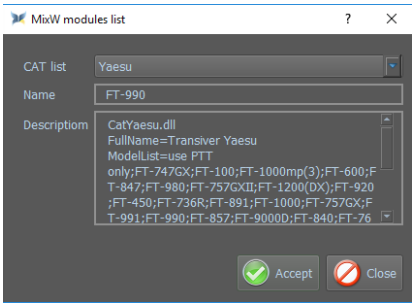
RigExpert Standart/TI-5/Plus

(by Alex, UT0UN)

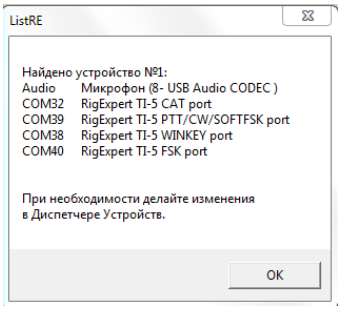


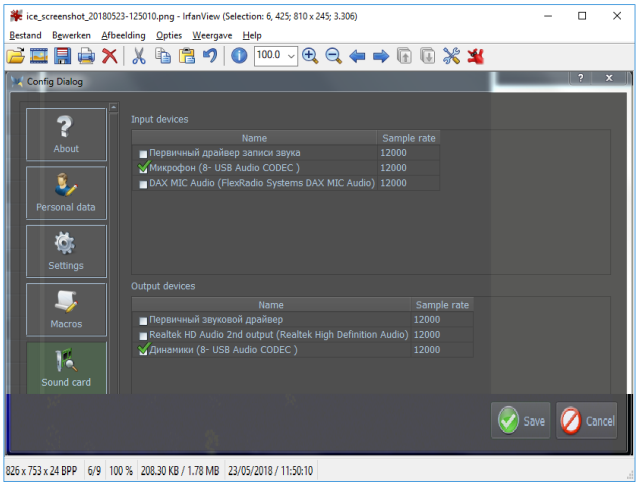
After you connect the interface to your computer, run the List RE program.

In the CAT list window, you must add your transceiver. You can add multiple transceivers to the list and quickly switch between these transceivers.



In the MixW4 program, enter the required port numbers.





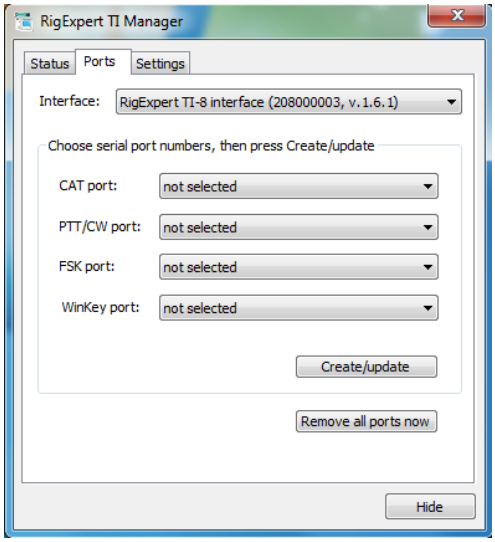
Select the interface sound card from the sound card settings menu

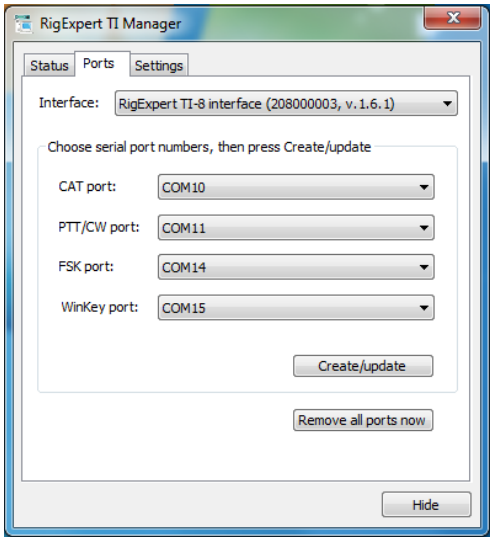
(top)

RigExpert TI-7/TI-8

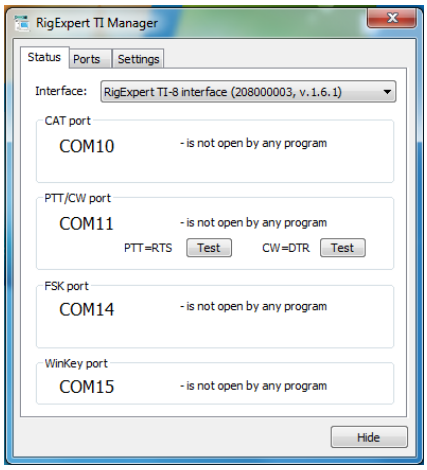
(by Alex, UT0UN)

After connecting the interface to the PC, the program starts - RigExpert Navigator for TI-7 or RigExpert Manager for TI-8.





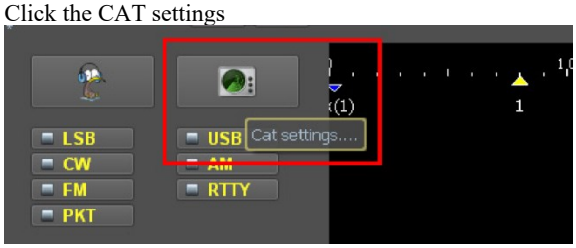
On the Ports tab, select any available COM Ports. Then click – Create/update.



On the Status tab, make sure the ports are created.

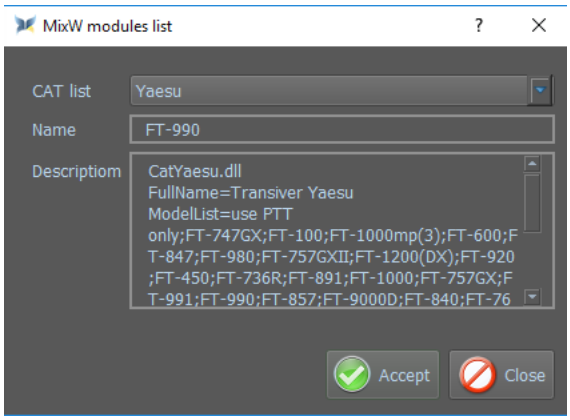
(top)

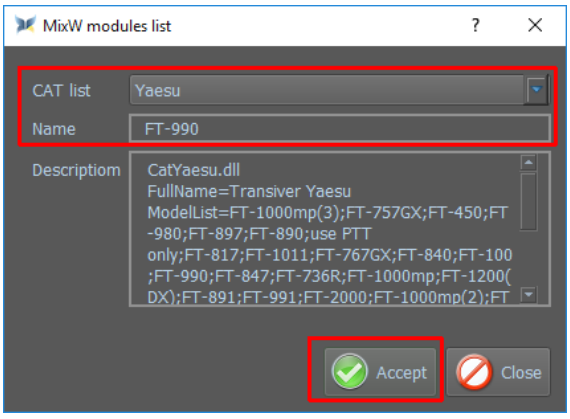
Click the CAT settings



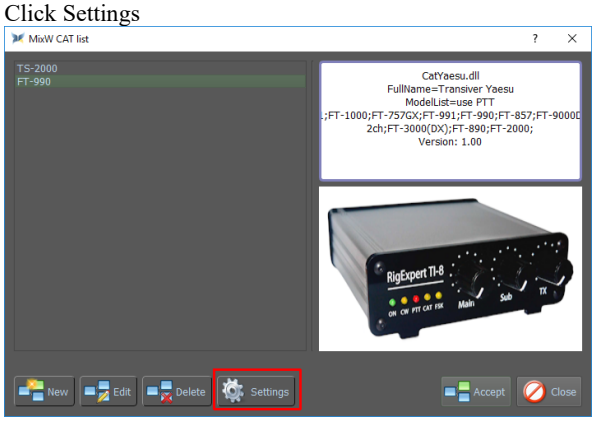
Click New

In the CAT list window, you must add your transceiver. You can add multiple transceivers to the list and quickly switch between these transceivers.
Select your transmitter from the CAT list and enter the name of your transmitter in the Name box, and then click Accept

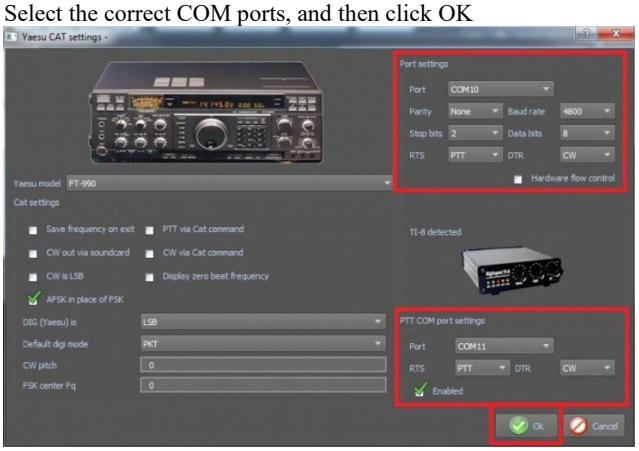




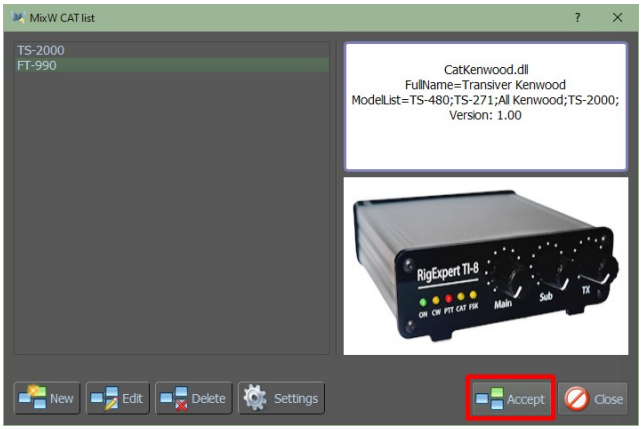
Click Settings



Select the correct COM ports, and then click OK



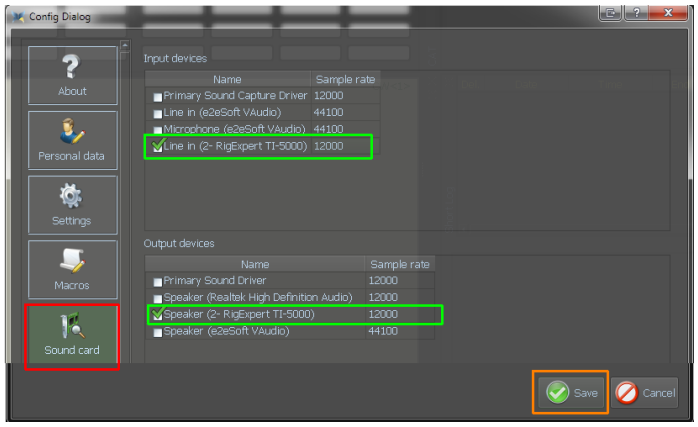
Click Accept



(top)

FT-990 with RigExpert TI-5000

(by Alex, UT0UN)

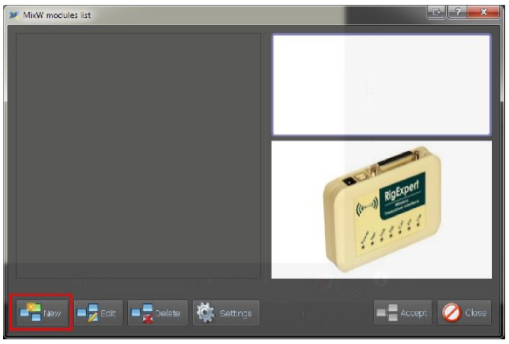


After connecting the TI-5000 interface to the PC, start MixW4.

Click Settings, and then click Sound card, and select the Input and Output devices as in the example, and then click Save

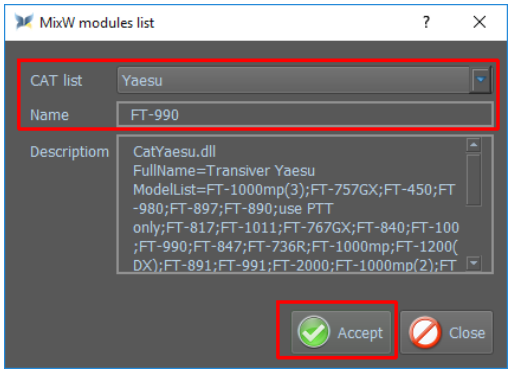
Click the CAT settings

Click New



Select your transmitter from the CAT list and enter the name of your transmitter in the Name box, and then click Accept

Click Settings now

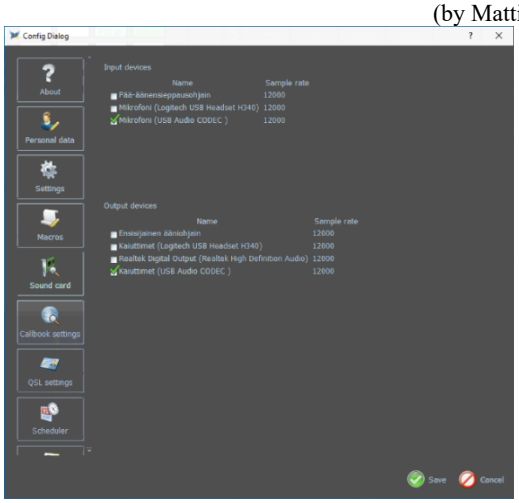


Fill in all the values as in example, and then click OK, and then on the next screen, click Accept

(top)

IC-7100 with RigExpert TI-8

(by Matti – OH2NT)



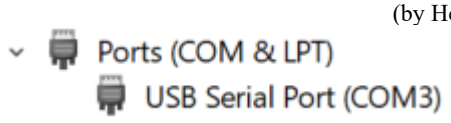
SignaLink™ USB

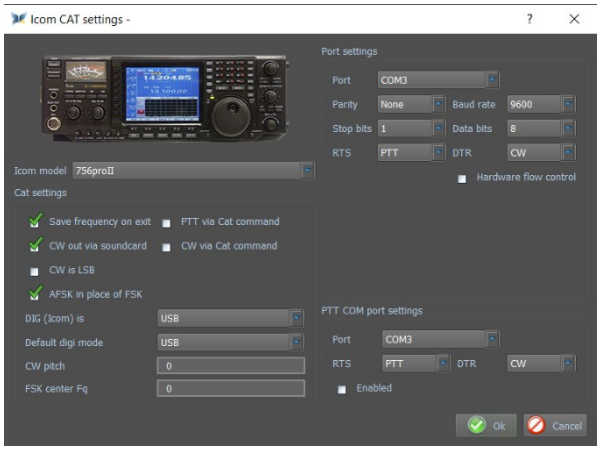
CT-17 CI-V CAT interface

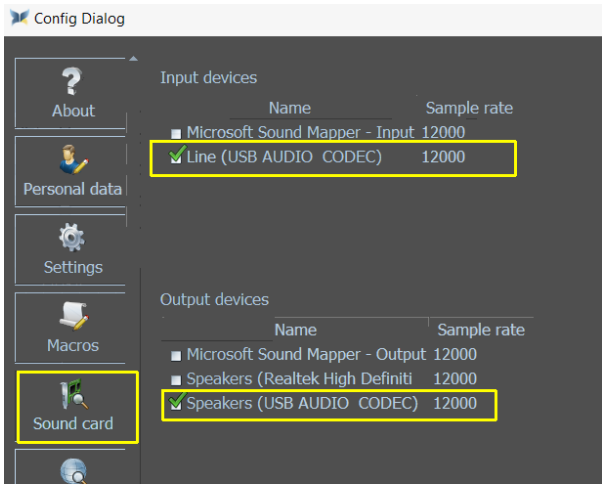
IC-756 Pro2

(by Henry - W0TNM)

After installing the SignaLink, open your Device Management to see which COM port was installed. Here the COM3 port was installed







This COM3 port is also used for port settings and for PTT COM Port settings

It is important that you set the correct Data bits in the Port settings, otherwise the CAT may not work properly or even.

The IC-756 Pro II is connected to a CT-17 CI-V CAT Process the band, mode and frequency for the CAT.

The SignaLink USB interface processes the CW and PTT information between MixW4 and the transceiver

(top)

CAT cable connected to the USB port

FT-991A with a USB cable

(by Pat, ON2AD)

Installing the Communication Ports (COM)

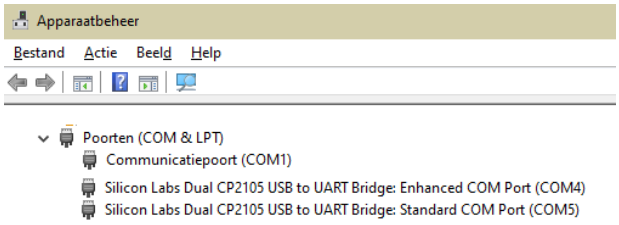
Go to Yaesu's website select the FT-991A click Files and download the FT-991A / SCU-17 USB driver (virtual com port driver)

After installing these drivers, two com ports are created

The Enhanced COM Port is used for CAT control.
The Standard COM Port is used for the TX

(the COM ports may be different from those in the example)

You can view the installed COM ports in device manager



FT-991A setup

No.	Menu Function	Available Settings	ON2AD	Default Value
028	GPS/232C SELECT	GPS1/GPS2/RS232C	RS232C	GPS1
029	232C RATE	4800/9600/19200/38400 (bps)	38400	4800bps
031	CAT RATE	4800/9600/19200/38400 (bps)	38400	4800bps
062	DATA MODE	PSK/OTHERS	OTHERS	PSK
072	DATA PORT SELECT	DATA/USB	USB	DATA
076	FM PKT PTT SELECT	DAKY/RTS/DTR	DTR	DAKY
096	RTTY SHIFT PORT	SHIFT/DTR/RTS	DTR	SHIFT
104	SSB HCUT FREQ	700Hz - 4000Hz (50Hz/step) / OFF	4000Hz	3000Hz
109	SSB PORT SELECT	DATA/USB	USB	DATA
110	SSB TX BPF	100-3000/100-2900/200-2800/300-2700/400-2600	100-3000	300-2700

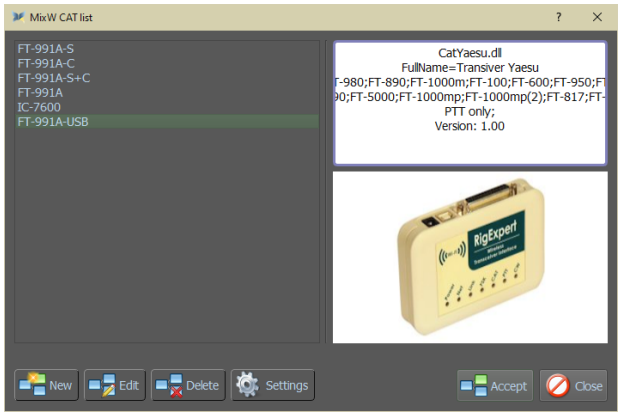
Menu F (M-List)

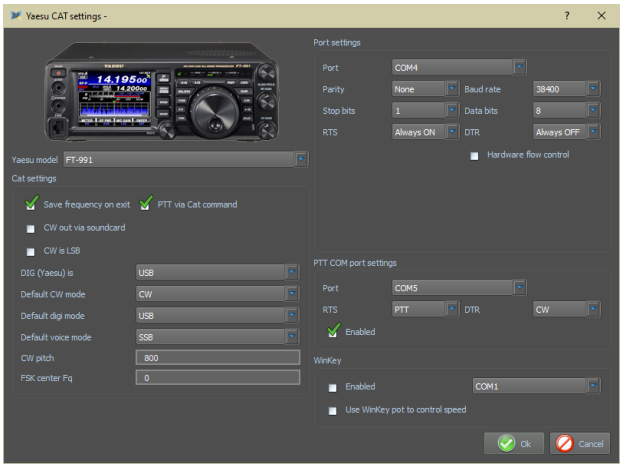
WIDTH	MIC GAIN	NAR/WIDE	MONI	PROC	DT GAIN	NB	IPO	AGC	5/10	MIC-EQ	BK-IN
3000Hz	50	W 3 k	15	50	50	ON	AMP 1	AUTO	10Hz	ON	OFF

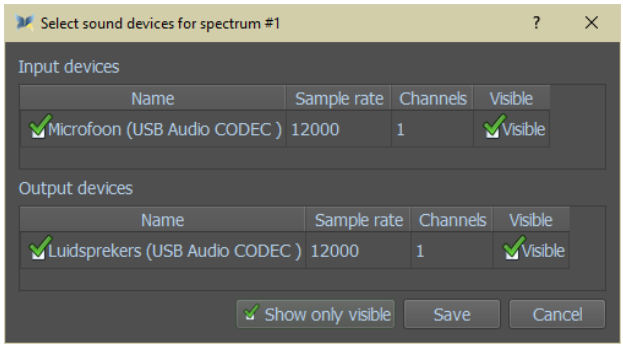
Menu Mode

Digimodes select USB
CW mode select CW (USB)

MixW4 setup







FTdx3000 connected via USB-port

(by Colin, 2E0BPP)

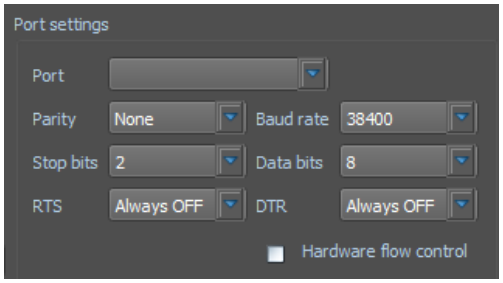
This document describes a method I used to make my Yaesu FTdx3000 work through the USB port on MixW4 1.0.5.

I do not normally use my FT3k via USB. I miss having level controls at hand easily.

Met FT3K verbonden via de USB kabel.

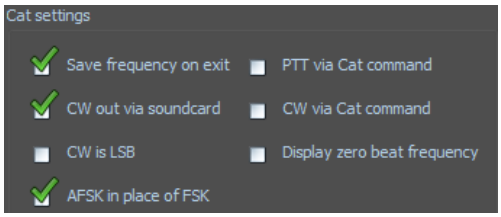
Radio menu:		
Menu	**Name**	**Setting**
37	CAT	USB
40	CAT RTS	Disabled
65	PC Keying: Set to DTR if you plan to use CW only through the sound card.	
65	PC Keying: Set to DTR for data modes but set to RTS if you plan to use CW, but not with the sound card.	
75	Data	USB

MixW setting.



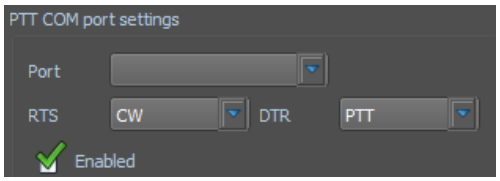
I found myself untrustworthy with RTS Always ON.

I didn't experience any problems with DTR ON or OFF, so I worked with both on OFF.



CW off via sound card: checked

Check:
Save frequency on exit
CW out via soundcard
AFSK in place of FSK



For the PTT COM port settings, the PTT + CW setting is not available.

To transmit data or CW via the sound card, the DTR box must contain PTT. When you set this up, the RTS box automatically goes to CW. With these settings, I can send PSK or CW. The FT3K must be set to DATA mode.

CW off via sound card: unchecked
You must change the radio menu 65 to RTS. This is to overcome a problem I had with saving the CAT settings, causing MixW4 to regularly lose control of the CAT.
You need to make sure the FT3K is in CW mode when you use CW through a COM port.
I can only send CW with these settings. To send data, you must change the FT3K and MixW4 settings.

Occasionally I have held the TX after sending CW. The only way I have found to fix this is by going to the CAT settings, removing the check mark from the PTT COM port settings enabled box, click OK, and then accept. Stops the TX.

(top)

A preliminary solution
However, I managed to find a reasonably reliable way to send CW and data modes without manually making changes to MixW4. As a result, the CAT's lost control is sometimes erased when saving the CAT settings. Also, I haven't experienced that the FT3K is stuck in shipping using the following method.

I created 5 macros.

Naam	Macro	Actie
Mode CW	<CATCMD:MD03;> <MODE:CW>	Set FT3k to CW mode and set MixW4 to CW mode
RTSCW	<CATCMD:EX0652;>	Set FT3K CW PC encoding to RTS
Modedata	<CATCMD:MD0C;> <MODE:PSK31>	Convert FT3K to Data USB and MixW4 to PSK31 mode. This mode can be any data mode that MixW4 can use.
DTRCW	<CATCMD:EX0651;>	Set FT3K CW PC encoding to DTR
CWData	<CATCMD:MD0C;> <MODE:CW>	Convert FT3K to Data USB and MixW4 to CW mode

Make sure the PTT COM port is set to RTS is CW and DTR is PTT
Data is always sent with ft3K in data mode and MixW4 in required data mode. Run Macros Mode data followed by DTRCW
Data modes need to work now.

CW from through sound card editing.
Run macros CWData followed by DTRCW.
CW should now be sent via the sound card.

CW without sound card operation.
Run ModeCW macros followed by RTSCW
CW must now be sent by switching the RTS line of the PTT COM port.

(top)

IC-7300 connected via USB port

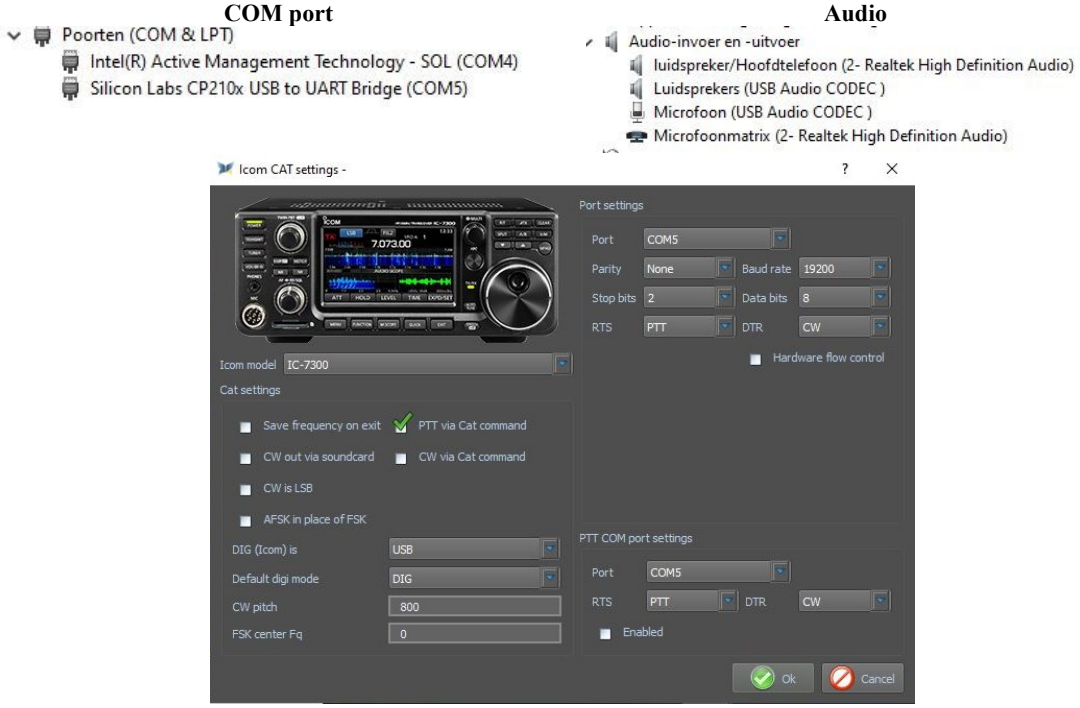
(by Rene, ON6OM)

Setup of the IC-7300
You press the Menu button => Set->Connectors => Mod Input => DATA OFF Mod => and here you must select MIC,USB !
Reason:
In USB alone everything is going to work fine for your digital mode but if you want to make a regular QSO you have no microphone modulation and in the MIC,USB you have that, but then you have to
Put the microphone aside and, if necessary, cover up so that no sound comes through or simply disconnect the microphone from the transmitter.

Shut down and then you can broadcast in USB mode, not USB-D1

Device Manager shows the image below, although the COM ports may be different.

COM port **Audio**

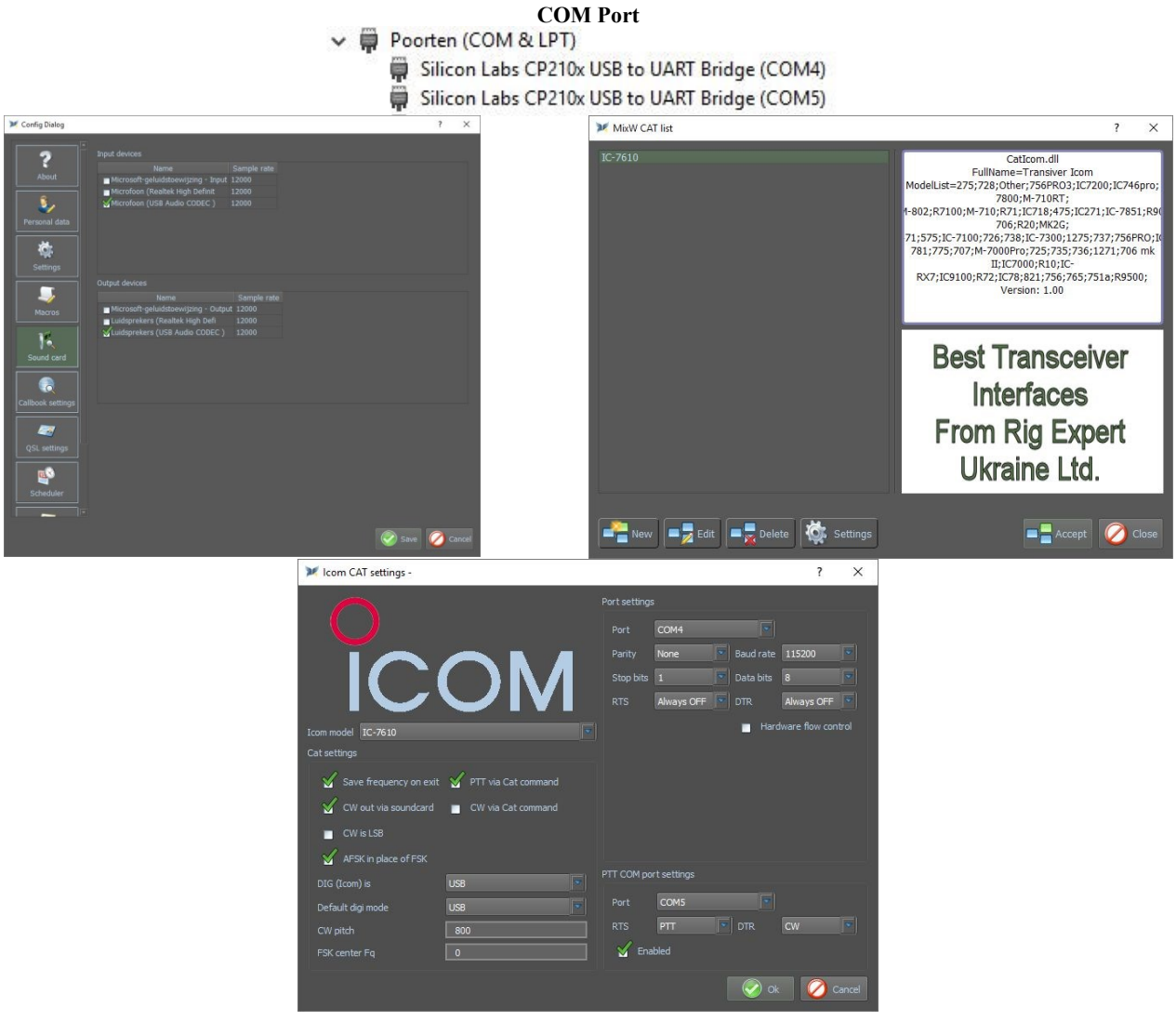


IC-7610 connected via USB port

(by Rien, PA7RA)

Device Manager shows the image below, although the COM ports may be different.

COM Port



IC-7610 connected via USB port

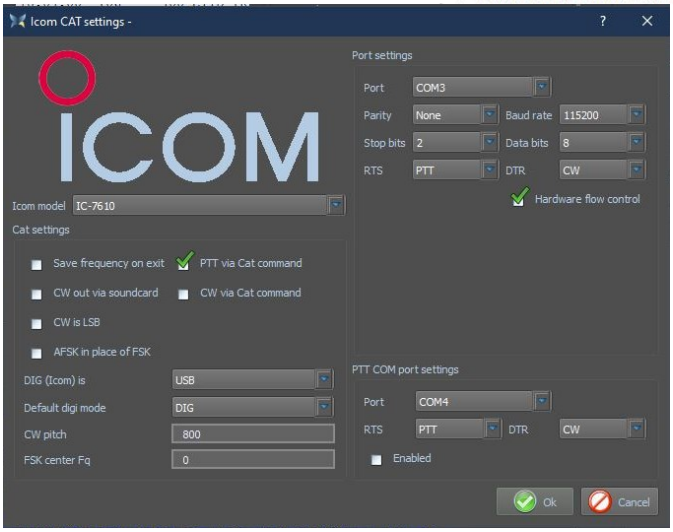
(by Rene, ON6OM)

Setup of the IC-7610
You press the Menu button => Set->Connectors => Mod Input => DATA OFF Mod => and here you must select MIC,USB !
Reason:
In USB alone everything is going to work fine for your digital mode but if you want to make a regular QSO you have no microphone modulation and in the MIC,USB you have that, but then you have to
Put the microphone aside and, if necessary, cover up so that no sound comes through or simply disconnect the microphone from the transmitter.

Shut down and then you can broadcast in USB mode, not USB-D1

COM Port

Audio

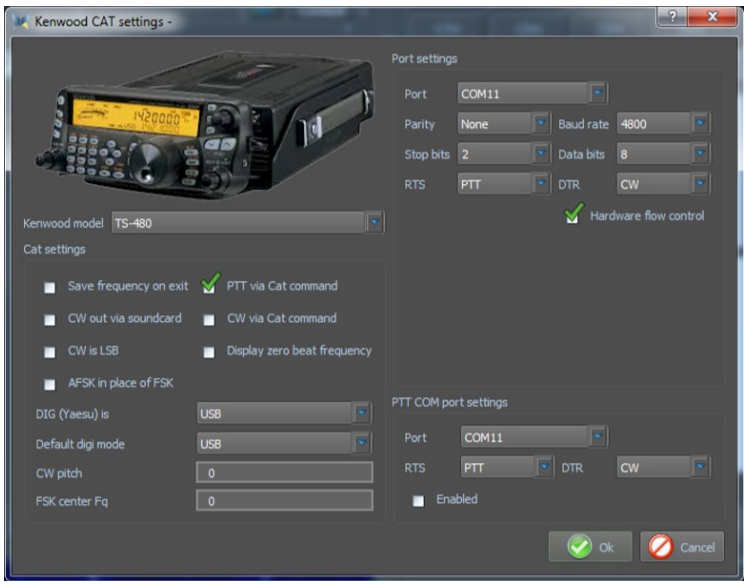


(top)

Transceiver interfaces

TS-480 SAT with FUNKAMATEUR USB transceiver interface

(by Rudolf, DL3AYJ)

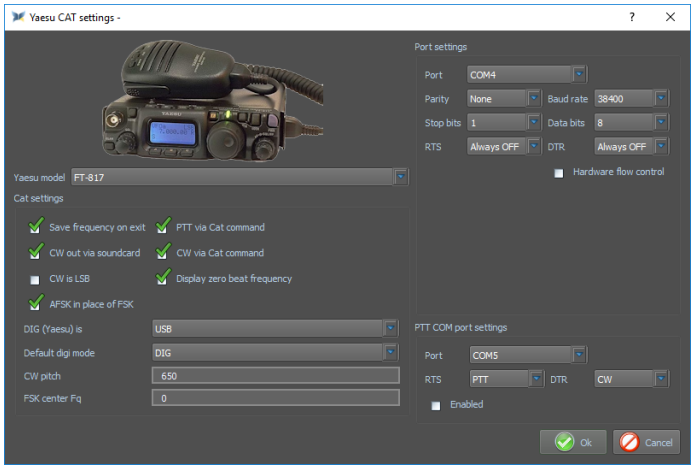


(top)

Yaesu SCU 17

FT-817nd

(by Filippo, IT9IGN)



Port settings:
Controle your PC drivers:
Silicon Labs… CP210x ENCHANGED COM (nr.) port, here the COM4 is used.
RTS and DTR on Always OFF

FT-817ND
Menu 14 Set RTX
CAT rate 38400 like de Baud rate

PTT COM port settings
Check your PC drivers:
Silicon Labs... CP210x STANDARD COM (no.) port, here the COM5 is used. If you use the "back door" of the RTX (3.5 mm (3.5-inch) connection for CW/PSK)

Default digi mode is DIG (settings in the Trcvr menu 26 DIG-mode User-U)
CW-pitch = 650 (Tone CW)

Sound card setting:
Open the Config Dialog and click Sound Card and tick the following settings
Input devices
Microphone (USB Speakers) and Sample rate 12000

Output devices
Speakers (USB Speakers) and Sample rate 12000

(top)

Simple-Interface

FT-817

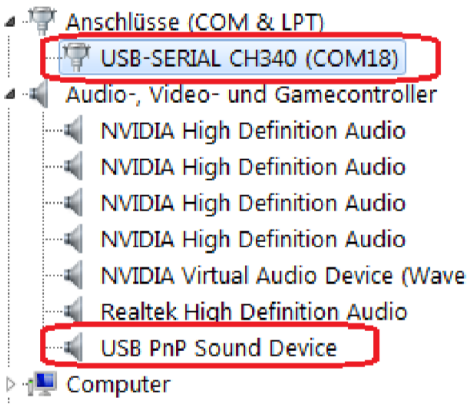
(by Rudolf, DL3AYJ)

It does not always have to be caviar ...

Here a very reasonably priced solution is presented (about 10 euros or 8 US$) consisting of USB CAT-Interface cable and USB sound stick. The sound stick is only needed if you do not want or cannot use the computer soundcard

CAT-cable Interface

Windows Device Manager

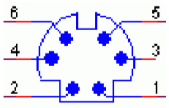


USB-soundcard stick

These CAT cables are also available for other transceivers, e.g. ICOM, but BEWARE! It only works if the transceiver supports PTT via CAT command! For example, the FT-817 models can do this.

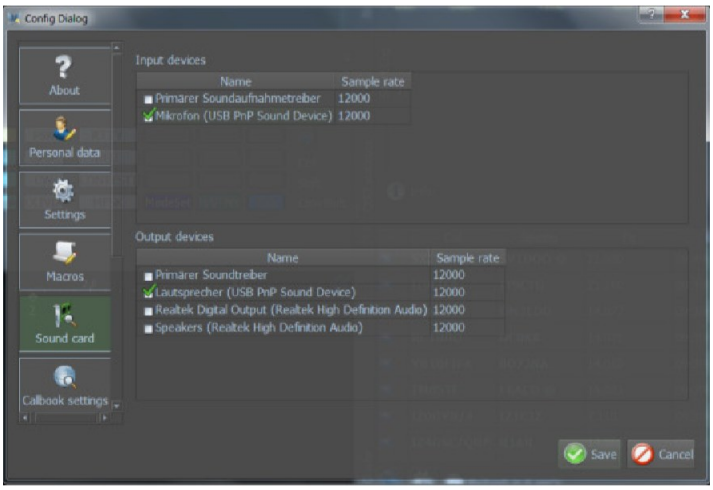
Settings in MixW

The NF link must connect the FT-817 data connection to the sound card (best over a voltage divider1:10)



Pin 5 ➔ Microphone
Pin 1 ➔ Speaker
Pin 2 ➔ Mass

Looking to plug soldering pens



(top)

G4ZLP PRO3

The G4ZLP's included manual describes the installation procedure in detail.
Once the installation of the software is complete, run Find Digi Master PRO.exe.
At least 3 interfaces must be displayed. If more than 3 are shown, the detailed installation procedure describes how the G4ZLP PRO3 ports can be identified.

Configure the MixW4 CAT port with the CAT port number that appears on the display.
Although not displayed, USB Audio Codec channels have been created. Configure it in MixW4 Audio settings.

(top)

Info

This manual is not complete and may contain language errors and other errors. If you have such errors and other additional information, please send a please to my email address that is on QRZ.com.
Many texts of this manual have been translated with the Google translator, read, and adapted, and supplemented with my own experience with MixW4.
The use of this manual is for own personal responsibility. I am not responsible for any errors and operating errors and operation.

1. First Russian curtailed manual.
2. English manual from, Colin 2E0BPP.
3. German manual of, Rudolf DL3AYJ.
4. Dutch manual, Pat ON2AD.
5. English manual, Pat ON2AD.
6. Details of the English manual of MixW3.2.105.
7. Thanks to Erwin PE3ES, for checking and improving Dutch spelling.
8. Thanks to all here not mentioned for the necessary additions, tips, and improvements.
9. Alex Timmi, UT4ULP, of the MixW-Team.
10. Alen, from the MixW-Team.