Narrowband Emergency Messaging System (NBEMS)

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What is NBEMS?

- NBEMS – a simple and easy way to send error-free digital messages
  - You don't have to buy an expensive modem or software
  - You don't even need a dedicated connection to your radio.
- The speaker and microphone on the computer and radio will do and the software is ***free***
- NBEMS uses the **FLDIGI suite of software routines**
  - FLDIGI (**F**ast **L**ight **Digi**tal Modem – Software Modem Emulation)
  - FLWRAP (**F**ast **L**ight **Wrap**per – File Encapsulation)
  - FLMSG (**F**ast **L**ight **Msg** – Forms Manager)
- FLDIGI is able to operate many popular digital modes
  - We use MT-63 2KL for UHF/VHF messaging
- NBEMS works with Windows, Linux and Mac computers and can be used on HF too
- What more could you ask for?

Why NBEMS?

- Some disaster response traffic is better suited for digital mode than voice.
  - Voice is too slow and error prone for long or involved messages
- Such traffic may include:
  - City SitReps
  - Detailed Damage Assessment
  - Numbers and Types of Injuries
  - Resource requests for provisions/supplies/medication/personnel
  - Directions to field locations
- NBEMS can handle this traffic at 20 characters/second! … and without error

How NBEMS Works

- Computer does all the work, no need for a TNC
- Sound card generates and decodes signals
- PC's sound goes into radio's microphone
- Radio's sound goes into PC's microphone
- Any radio with a microphone and speaker
- Any Computer
  - No need for a powerful new computer - older machines work just fine

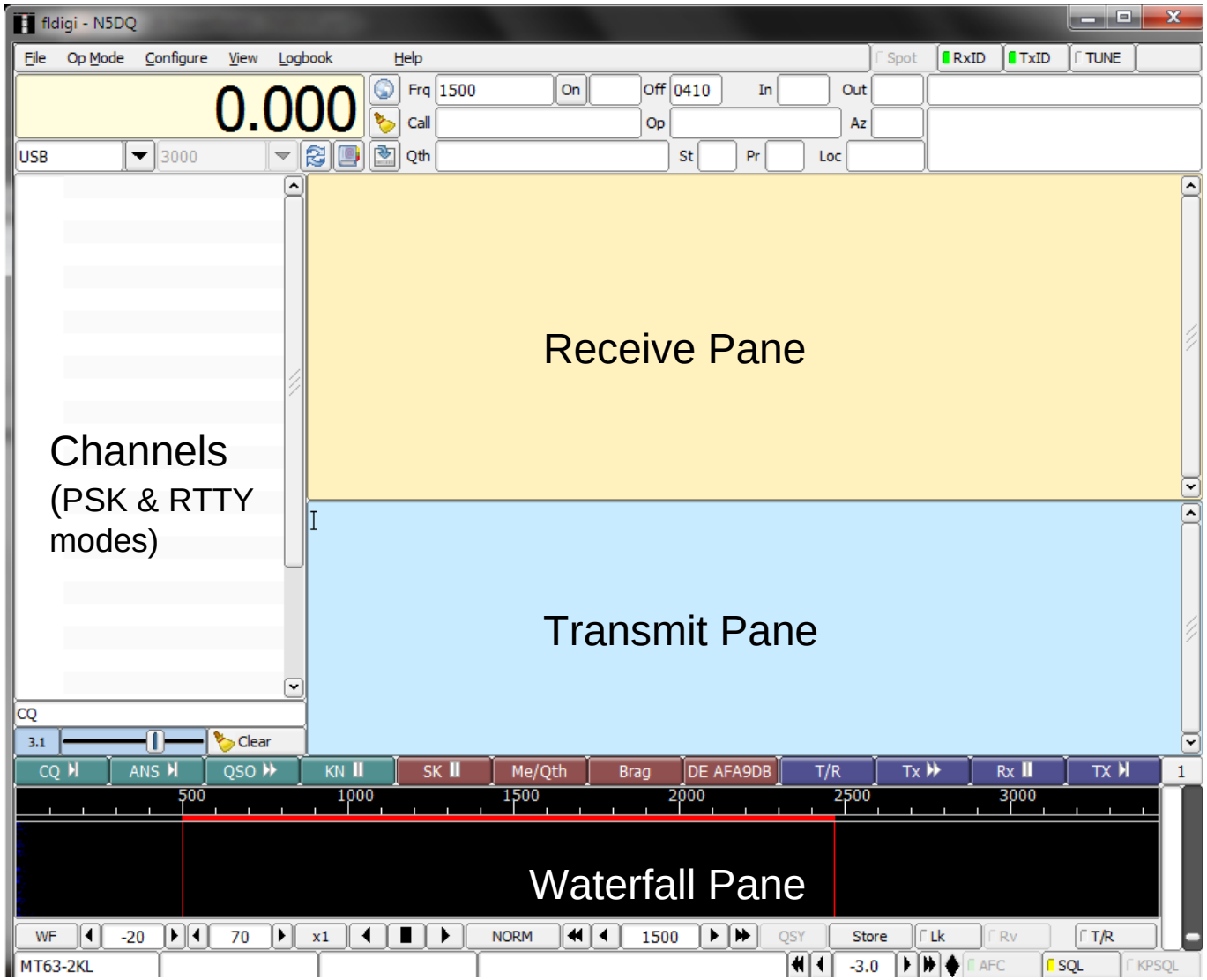
- No interface required – audio coupling works
- Hold the radio's speaker up to the computer's microphone and the message is automatically decoded.
- Hold the radio microphone up to the computer speaker press PTT and play the message from the PC!
- Other computer electrical interface options:
  - Rigblaster, SignaLink

Getting Started

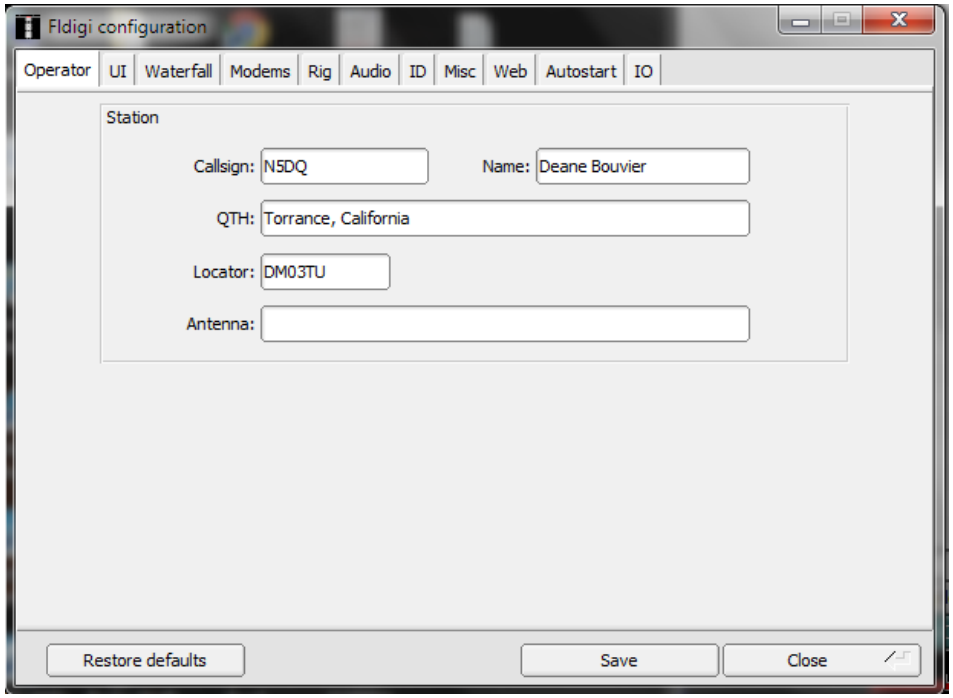
- Author's web site http://w1hkj.com
- Download the three components of NBEMS for your OS
  - From: http://sourceforge.net/projects/fldigi/files/
    (this is a new download site because of security breach on w1hkj.com)
  - **fldigi - version 3.23.09**
  - **flwrap - version 1.3.4**
  - **flmsg - version 2.0.17**
- Install these three programs following the instructions
  - Accept the defaults
- Setup the configuration parameters
  - For FLDIGI and FLMSG
  - Once configured you are ready to go
- FLDIGI also has an extensive Beginner's Guide under the help menu

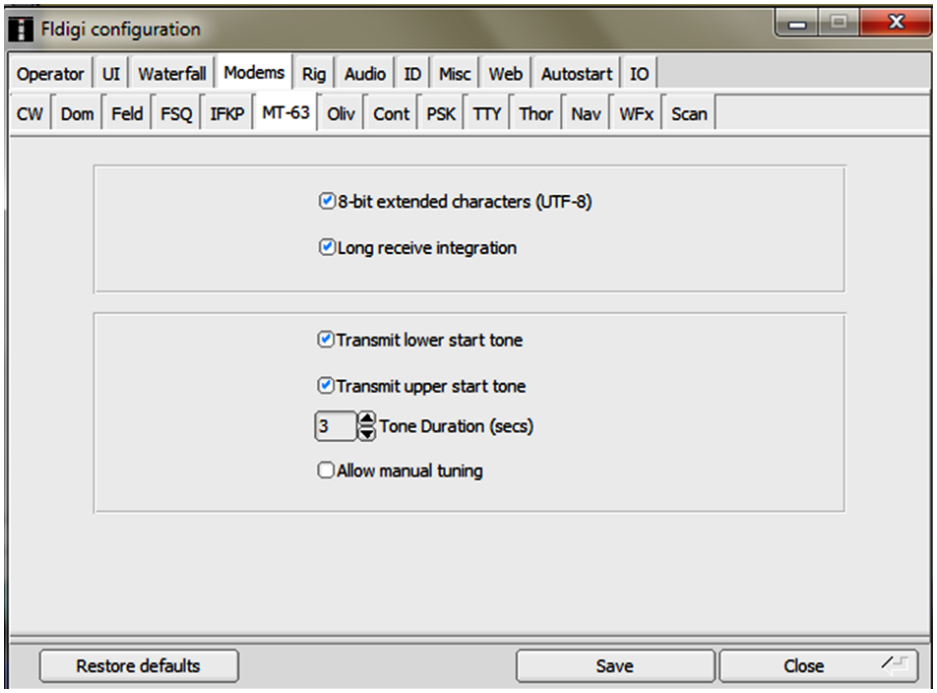
FLDIGI Main Window

- Receive Pane – text from decoded incoming signals displayed
- Transmit Pane – text to transmit when not using forms
- Waterfall pane – spectrogram of audio signal strength versus frequency over time
- Control group of buttons between the transmit and waterfall panes execute macros



FLDIGI Configuration

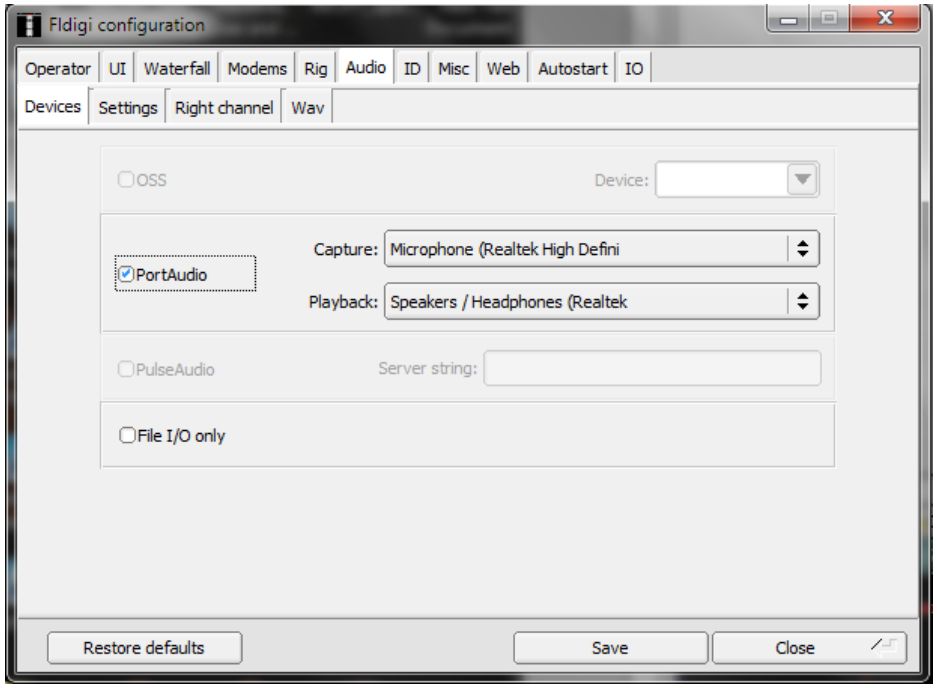


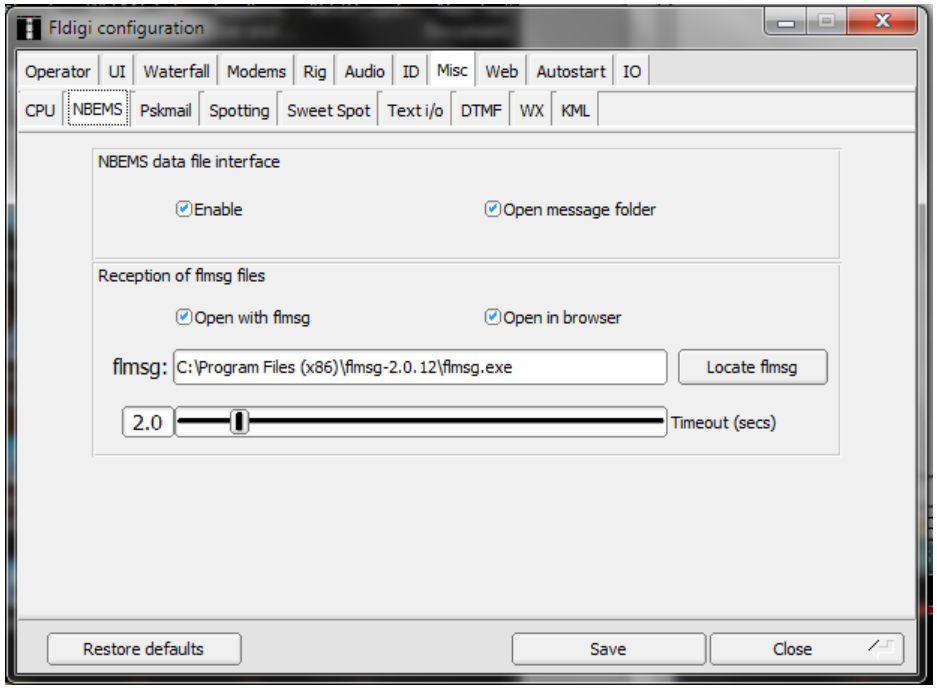


- Operator
  - Enter your information
- MT-63 modem
  - 4 check boxes

After each configuration change click save

FLDIGI Configuration

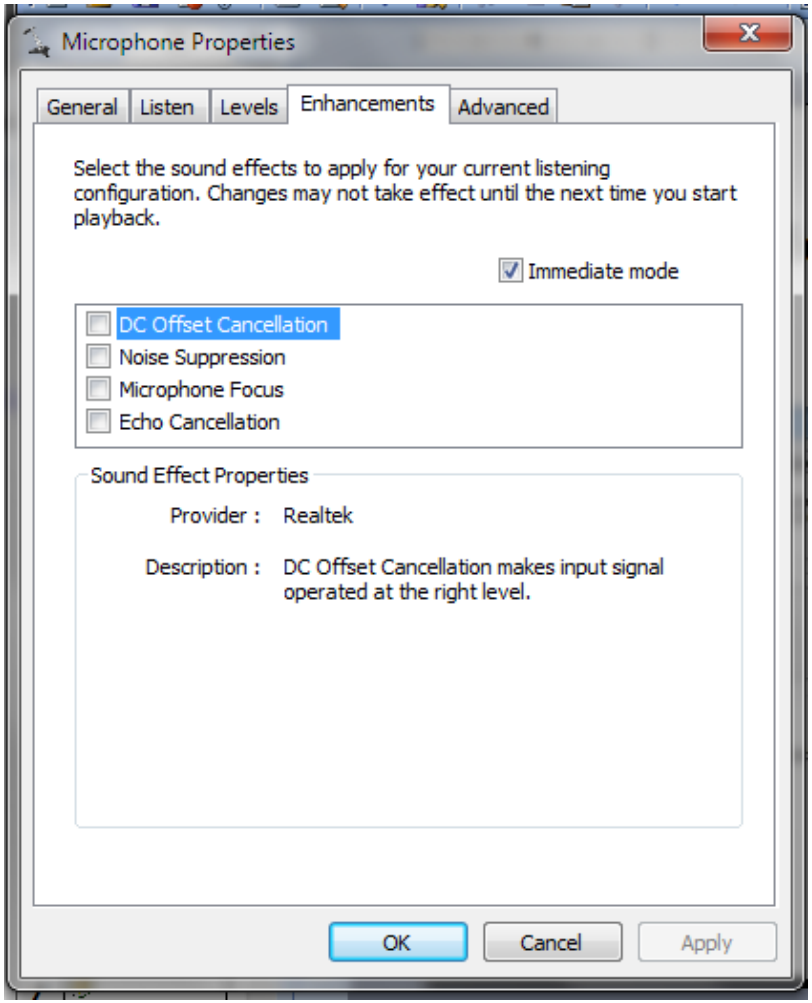


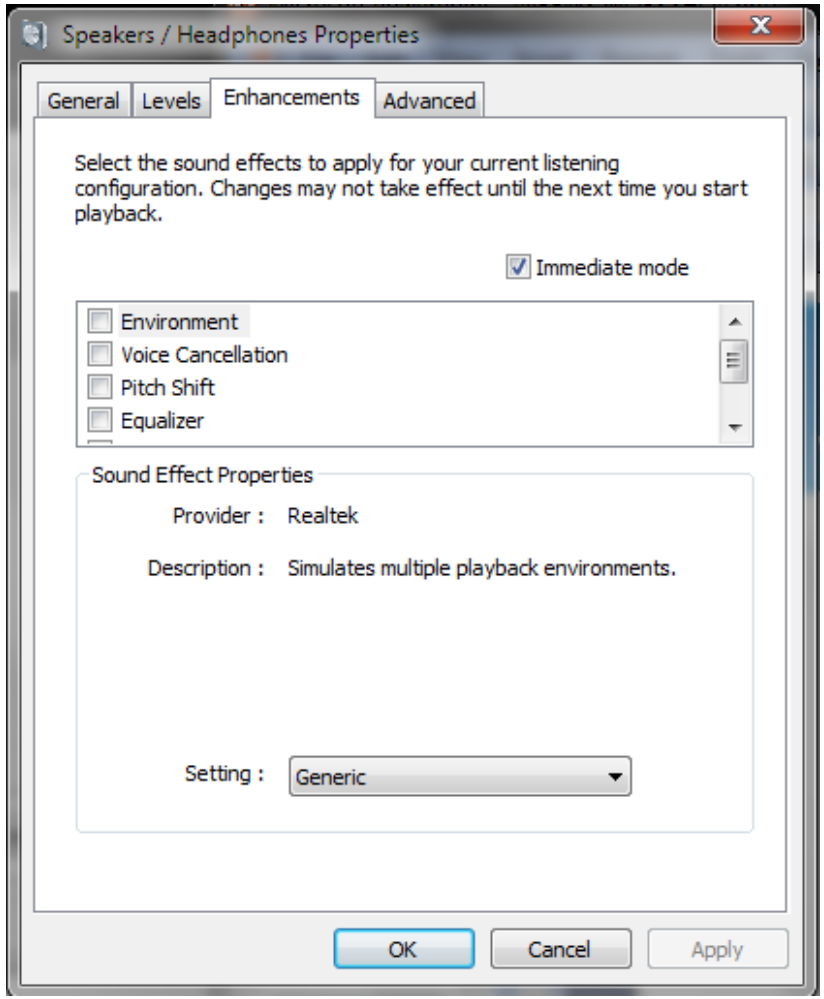


- Audio
  - Port Audio
    - Sound card to use
- Misc
  - NBEMS
    - 4 check boxes
    - Location of flmsg.exe

Turn Off Windows 7 Microphone & Speaker Enhancements

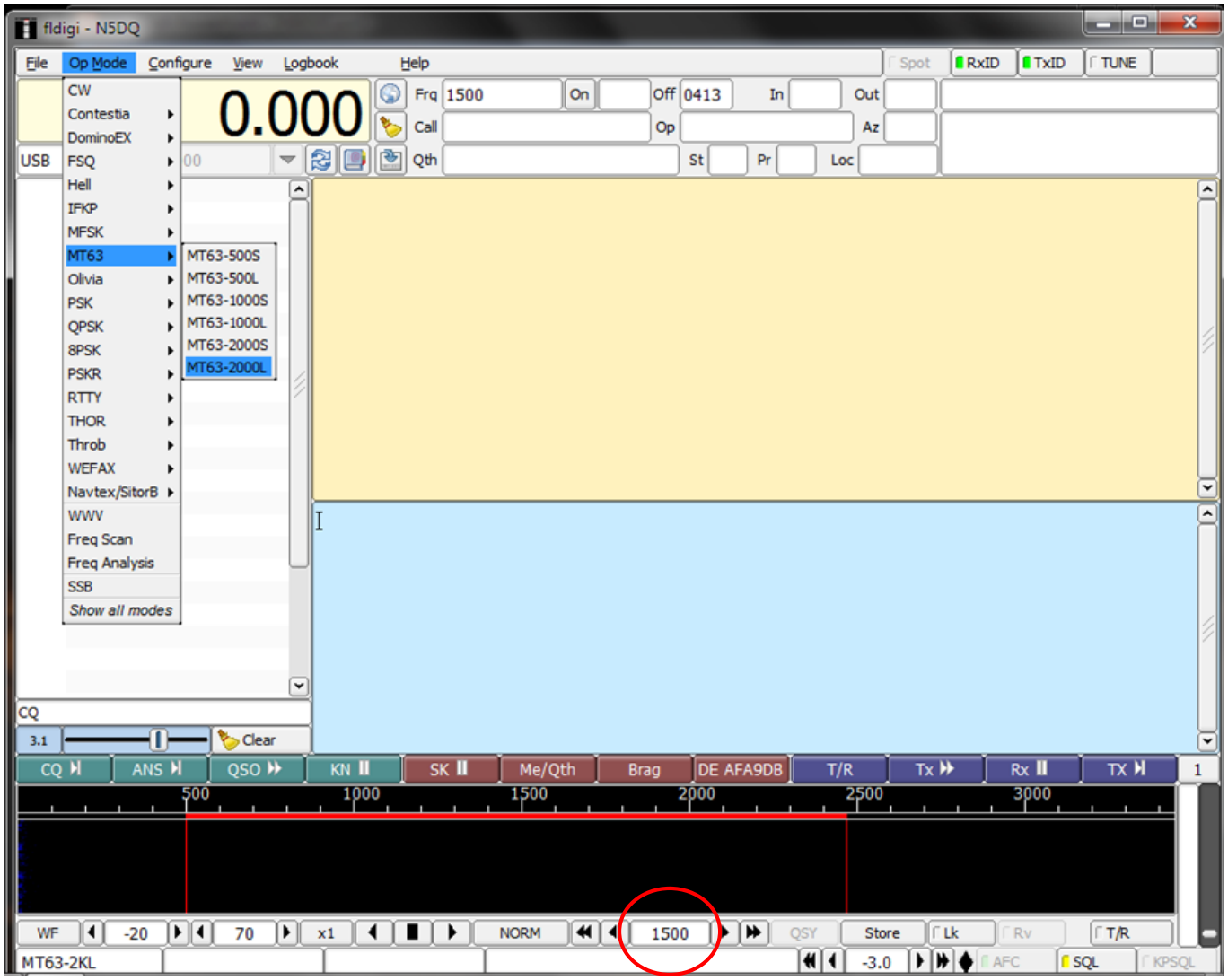
Disable all sound effects





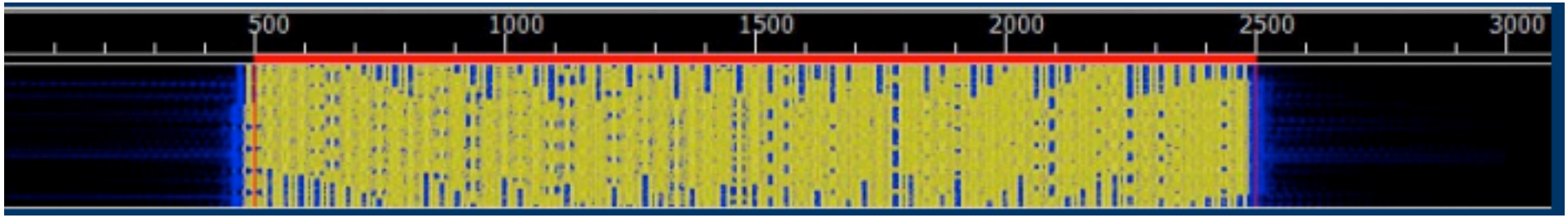
Op Mode MT63 2KL

- Set the Op Mode to MT63-2000L
  - Long inter-leave
- Set the center of the processing window to 1500 Hz



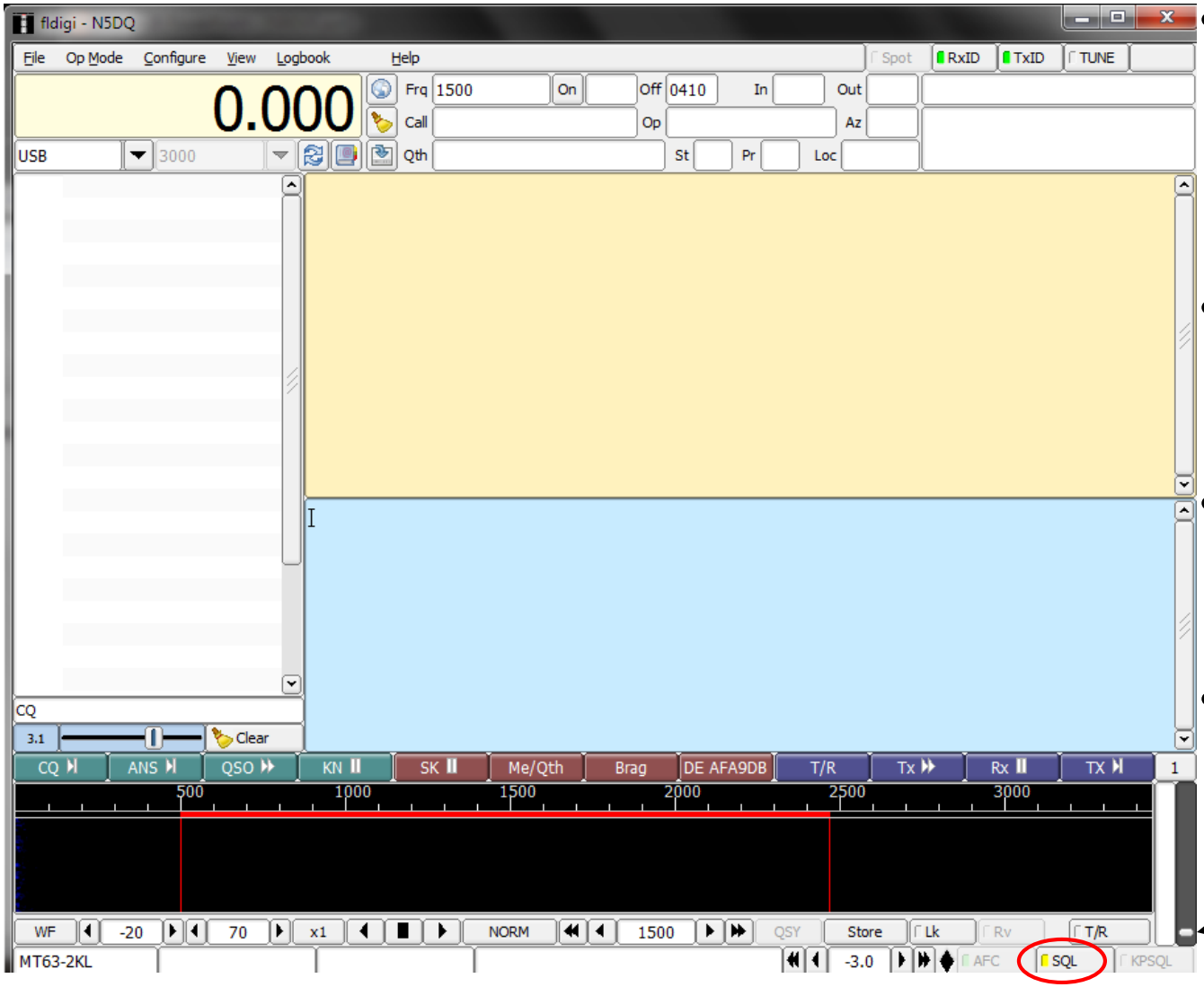
MT- 63 2KL

- MT63 2K long was chosen for portable, mobile and fixed station operations on FM channels (repeater or simplex)
  - Extremely effective, even under very poor simplex RF conditions
  - Extremely accurate decoding (major duplication of data and forward error corrected)
  - Very forgiving on sound levels and requires no tuning when used on FM
  - Excellent for sending larger situation reports or databases



- 64 tones sent at same time
- Signal width is 2000 Hz
- Offset frequency is always fixed at 1500 Hz
- Fixed low frequency eliminates tuning errors
- Sounds like a buzz saw

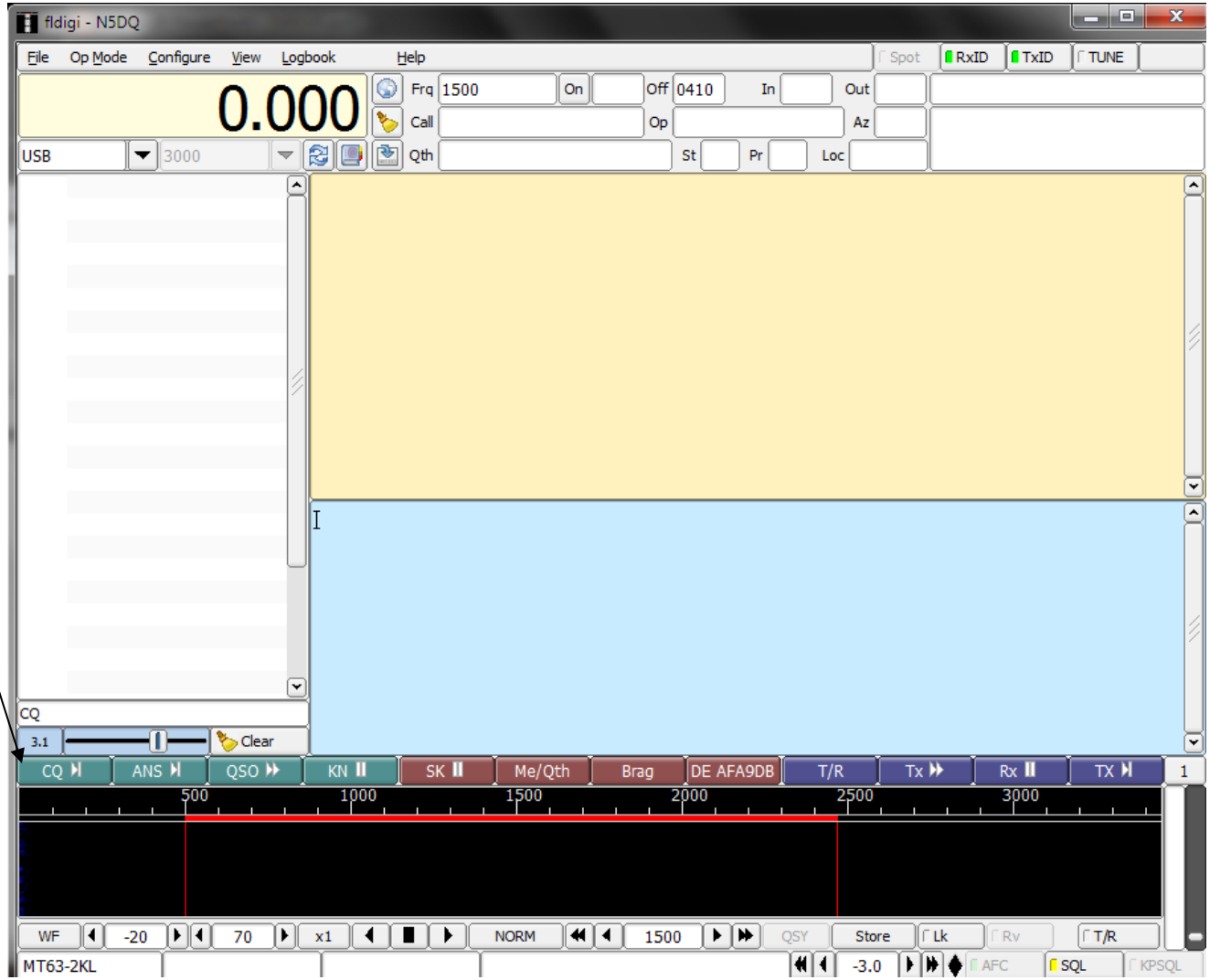
Squelch



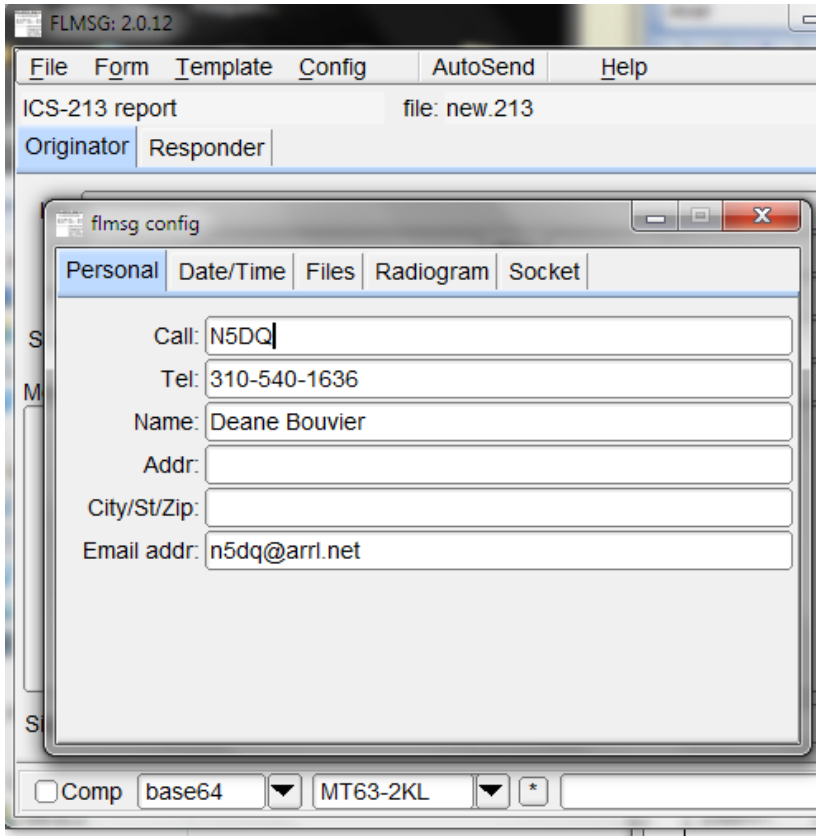
- Squelch stops fldigi from processing ambient noise
- Click the button and set the level
- Set it too high and you get no signals
- Set it just above where the random noise stops

First Exercise

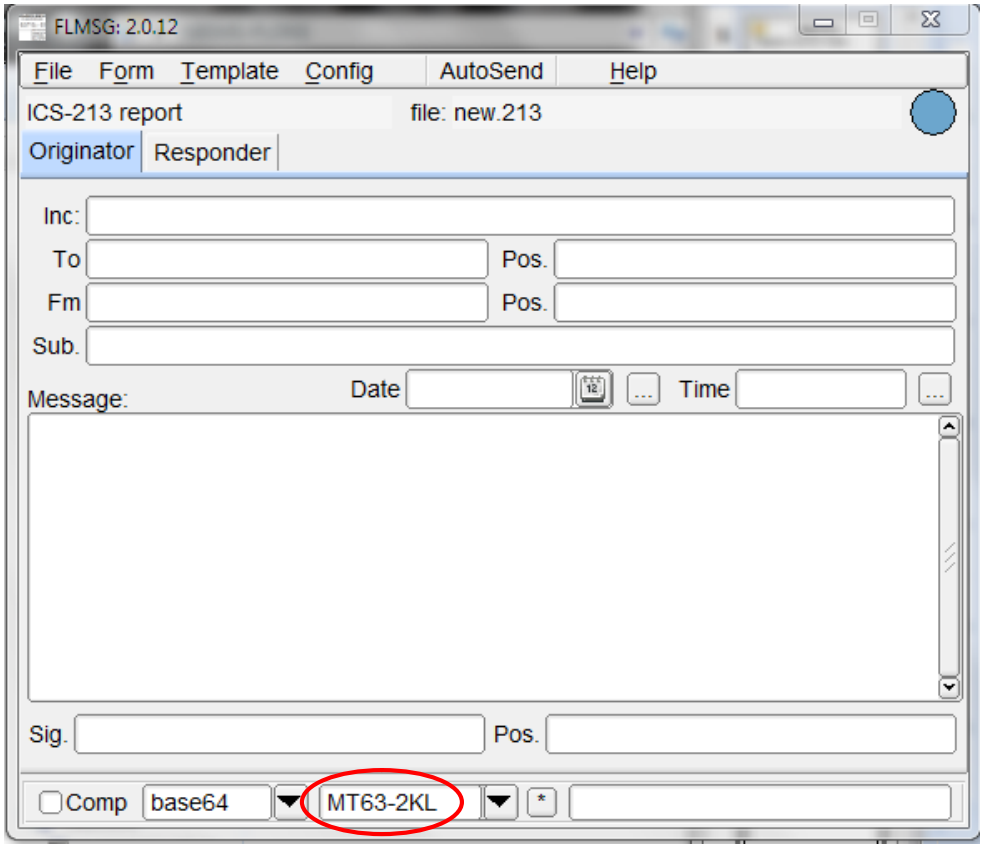
- Send CQ



Configure FLMSG



- Config personal data
- Set the date time format



- Set MT-63-2KL at the bottom of the forms to be used

Second & Third and Fourth Exercise

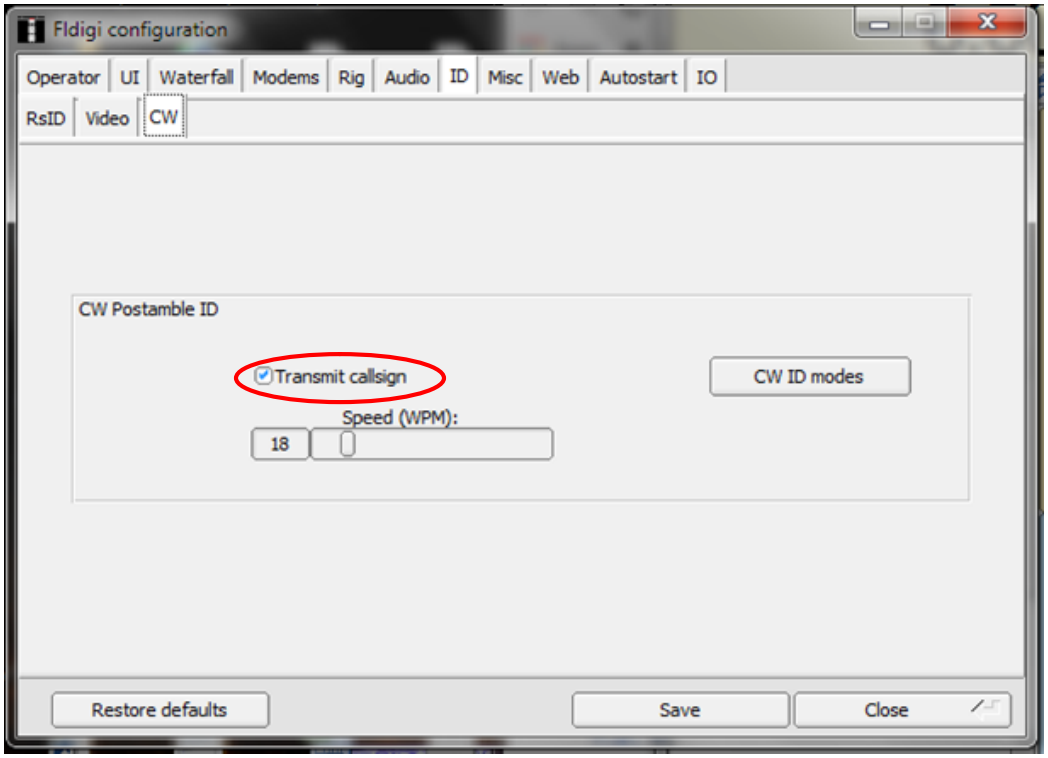
- Receive a General Message
- Send an ICS 213 Message
- Now let’s try CSV Message for extra credit

Other Configuration Options

- Morse Code ID
- Monitor Tx Signal
- Reed Solomon Identifier

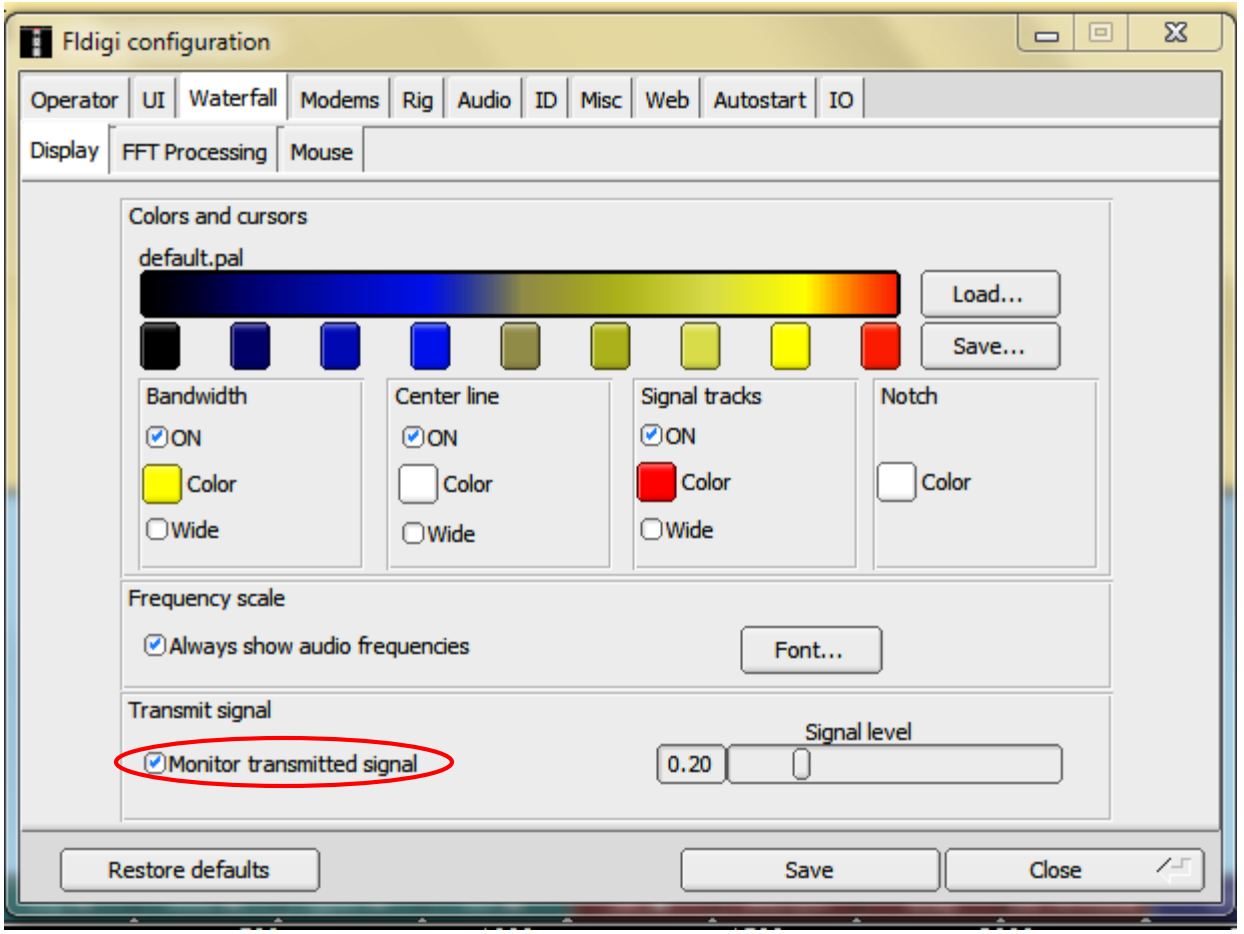
Morse Code Identification

- Configure
  - ID
    - CW
    - Checkbox
- Sends your call sign at the end of the transmission and keeps you legal



Monitor Transmit Signal

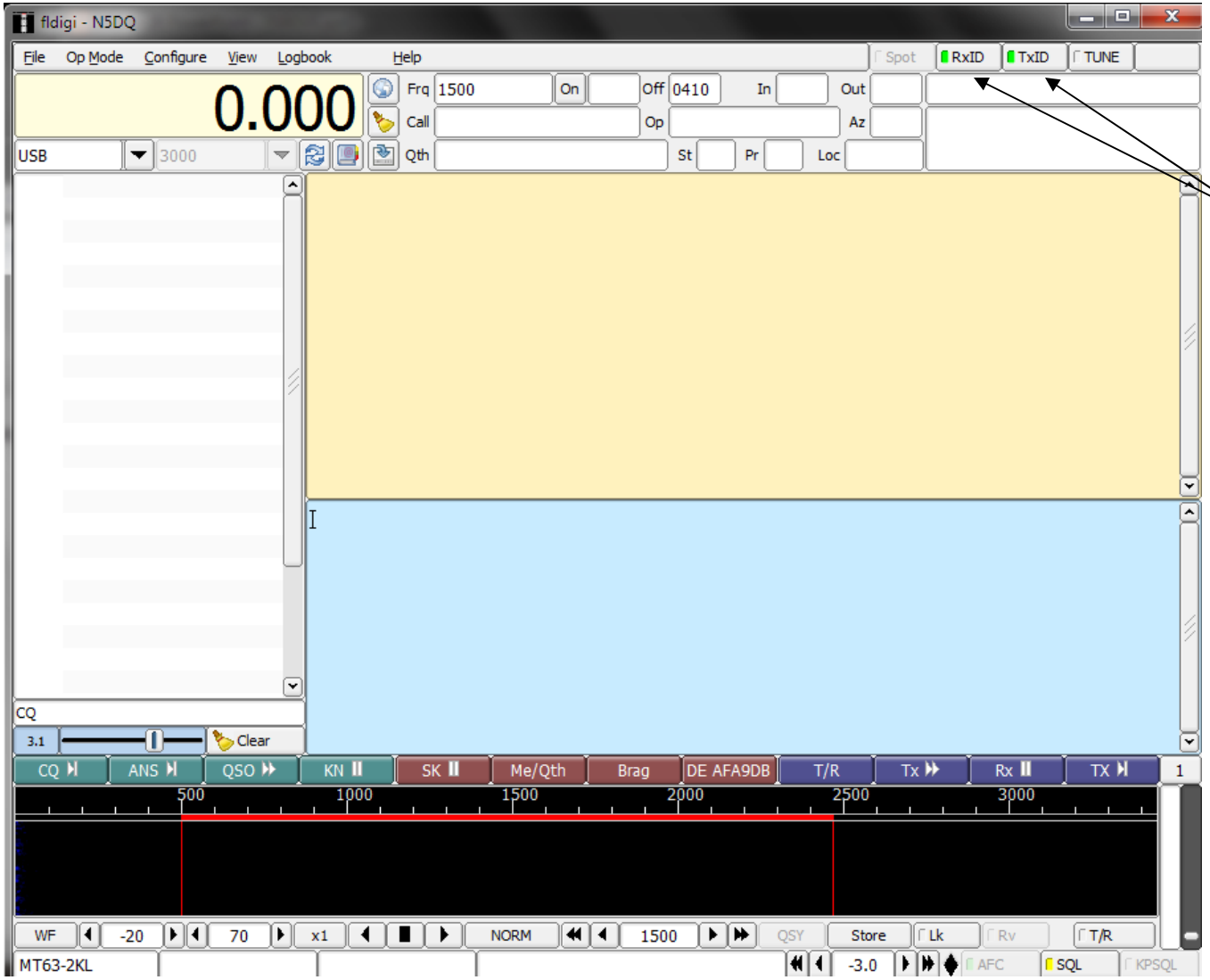
- Helps to monitor operation while transmitting
- Configure > Waterfall
- Check Monitor transmit signal box



Reed Solomon Identifier (RSID)

- The RSID (automatic mode detection and tuning) feature uses a special sequence of tones transmitted at the beginning of each transmission to identify and tune in the signals received.
- This is helpful when you are using FLDIGI for more than one mode
- For this feature to work, not only do you need to enable the feature in the receiver, but in addition the stations you are wishing to tune in need to have this feature enabled on transmission.
- Use the menu Configure→IDs item to set whether you wish to transmit RSID data at the start of each over (this is for the benefit of others and does not affect RSID reception).
- If you plan to regularly use the RSID feature on receive, you should deselect the option that starts new modems at the “sweet spot” frequencies in Misc→Sweet Spot.

RS ID on Rx & Tx



- Click the buttons at the top of the window to enable

Questions/Comments?