NBEMS

Narrow Band Emergency Messaging Software

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Overview

▸ Intro to Fldigi

▸ Setting Up Hardware

▸ Concepts

▸ Demo sending data without wires

▸ Operating Procedures

▸ Sending Forms & Files

▸ Installing Software

Most event traffic is well suited to voice communications

▸ But what if you were asked to send:
  ◦ A list of the first 500 finishers of a race
  ◦ A list of many frequencies, tones and offsets
  ◦ A roster of everyone working on the event
  ◦ A 5 page Incident Status Report
  ◦ A list of medicines needed
  ◦ The Telephone Directory for an Incident
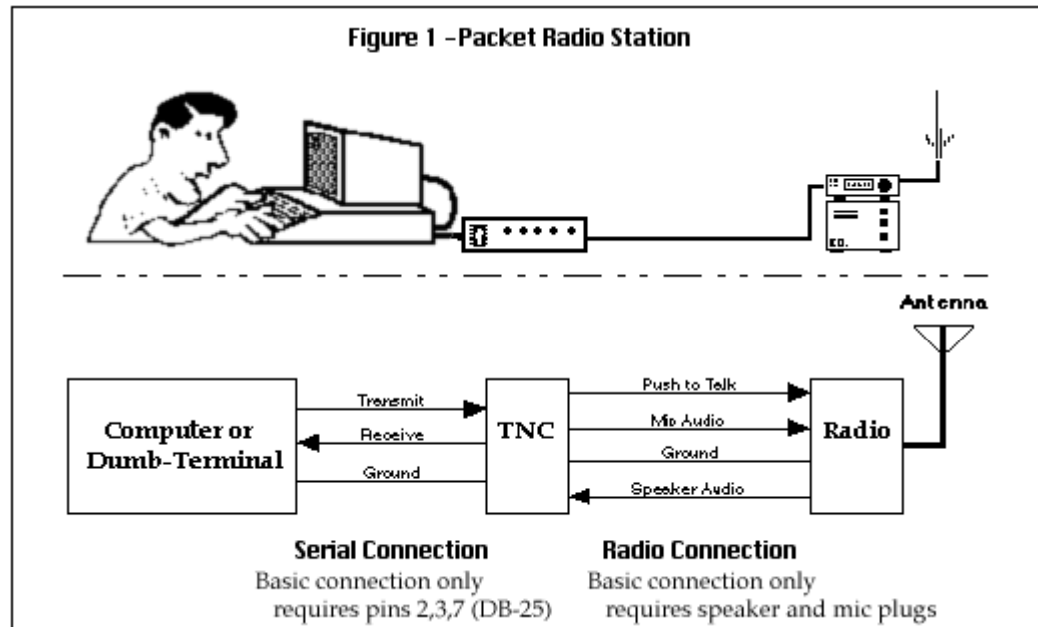
Or even more….

Using NBEMS in Emergencies
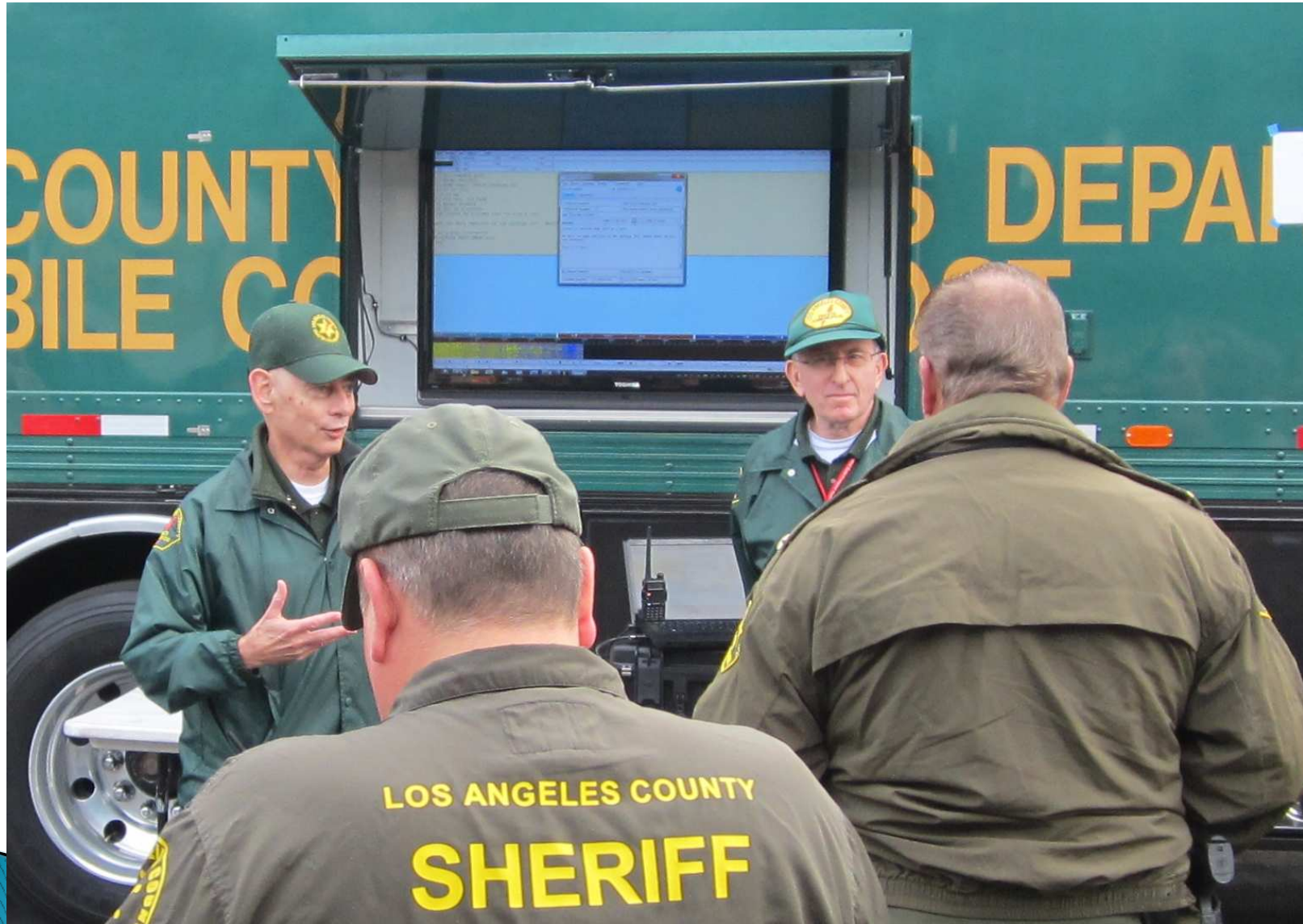
Why Digital Data ?

- Disasters run on documents
- Requirement for reimbursement
- Document transfers need to be fast and accurate
- We need a log of what was sent and when
- Automation of functions ensures repeatability

Digital Modes

- Packet Radio
- D-Star
- Winlink
- Echolink
- Others

Figure 1 – Packet Radio Station

- Why Another One To Learn?

NBEMS is Ideal for Disaster Situations

- Easy To Learn
- No special hardware required
- Free (Open Source) Software
- Very Flexible
- Accurately sends data from one computer to another by radio
- Optimizes bandwidth
- Very redundant protocol
- High reliability
- Use ANY audio path

Connecting to a Computer
No Wires !

▸ Uses your sound card

▸ Built-in or external speaker and microphone

▸ Works well in quiet environments

High Noise Environments

Optional Hardware

▸ May be linked with SignalLink or RigBlaster
▸ Also automates Push to Talk

USB

External
Sound Card

Audio
Link

Components of NBEMS
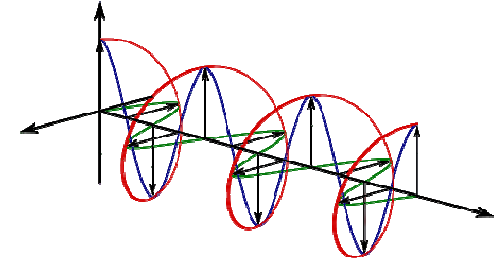
- **Fldigi** – Digital Modem Software
  - Uses Sound Card

- **MT-63** – A very resilient data protocol

- **Flwrap** – File Packaging & Management

- **Flmsg** – Forms management

What Is Fldigi ?
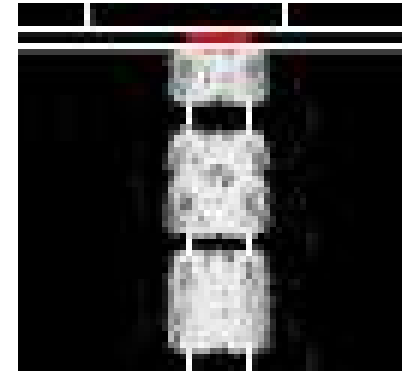
- <u>F</u>ast <u>L</u>ight <u>Digi</u>tal Modem Application
- Code by Dave Freese, W1HKJ
- Widely used on VHF by Sheriff's DCS, ARES, Red Cross, Others
- Most common HF digital protocols (Multi-Mode)
  ◦ Older protocols like RTTY and Even Morse Code
  ◦ Newer protocols like PSK31, WeFAX, MT-63
- Uses PC sound card and a Transceiver
- Can also control the radio via serial port
- Available for Windows, Mac and Linux

Nbems uses MT-63…

MT-63 Protocol
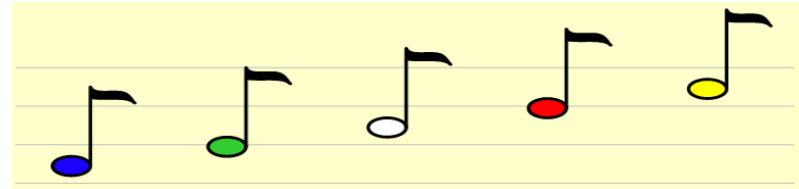
- MT63 utilizes 64 tones spaced 15.625 Hz
- Digital Radio Modulation Mode for use in High Noise environments
- Superb robustness, by distributing the encoding of each character over a long time period and over several tones. (Up to 6.4 seconds latency)
- Noise tolerant – Can lose up to 25% of signal and still copy

The Fldigi Main Window
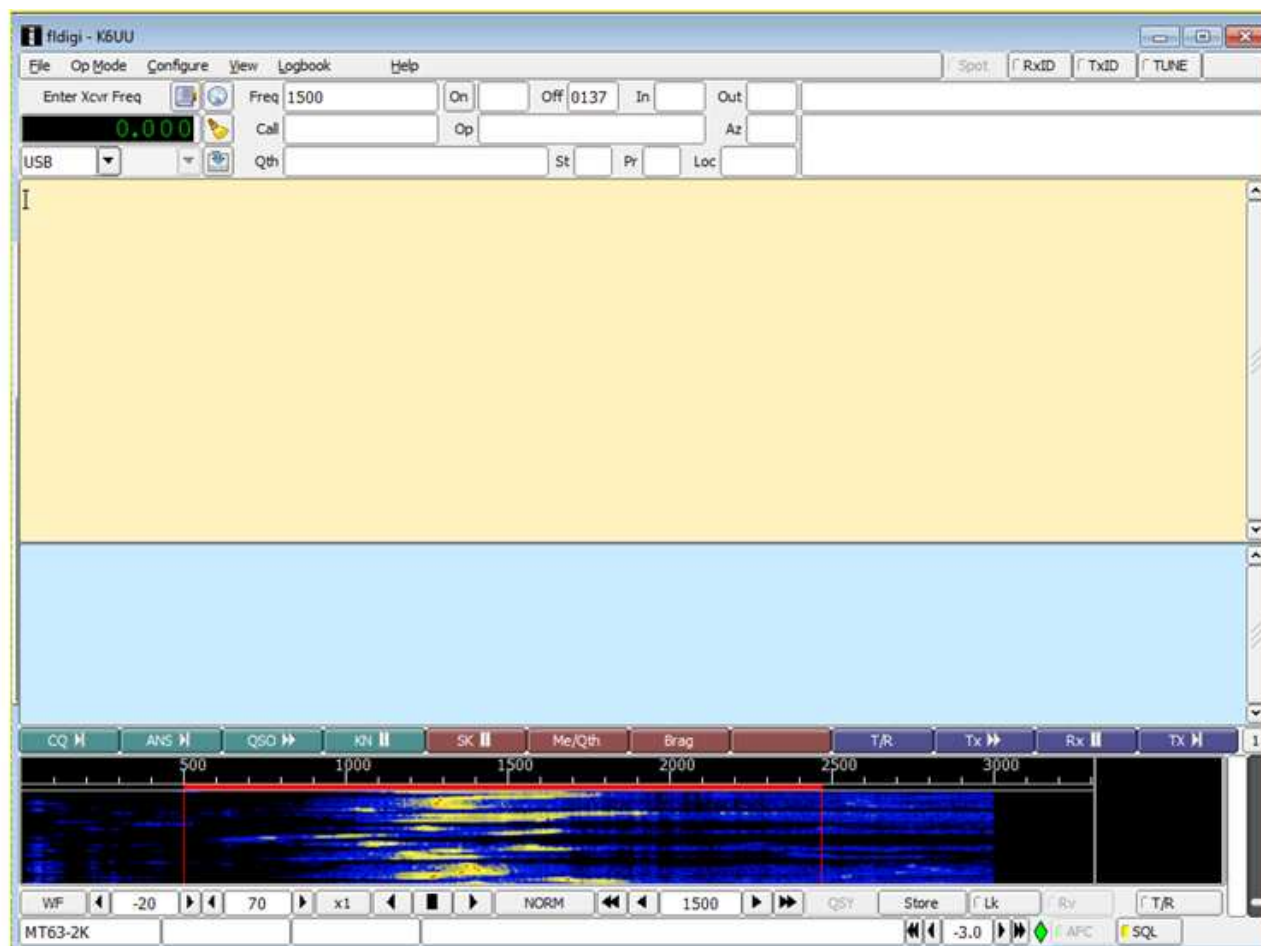
Waterfall for MT-63

▸ Signal width is 2000 Hz
▸ Center frequency is always fixed at 1500 Hz
▸ Fixed low frequency reduces tuning errors
▸ Sounds like a buzz saw
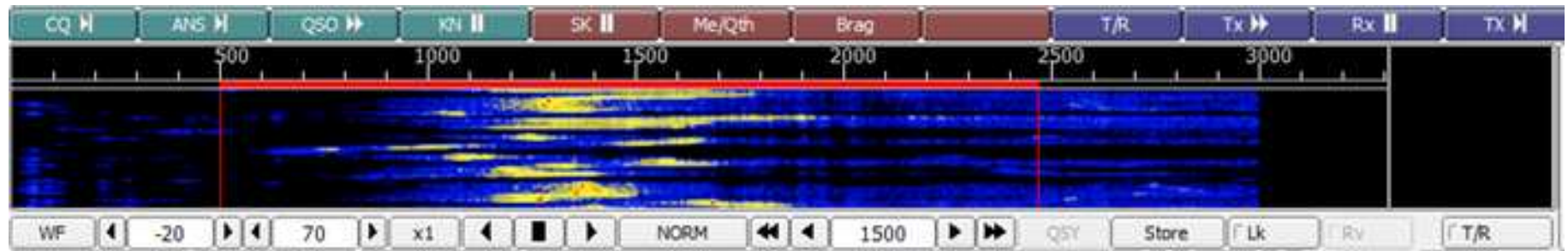
Demo
Sending Text with Fldigi

Sending Files – Flwrap

- Drag and Drop
- Can Compress Files
- Allows accurate file transfer...

Flwrap 1.3.4

Usage: flwrap [--usecomp] FILENAME or
    (1) Drag & Drop File onto desktop icon
    (2) Drag & Drop File into drop box ==>

^Drop file here^

☐ Compress   Close
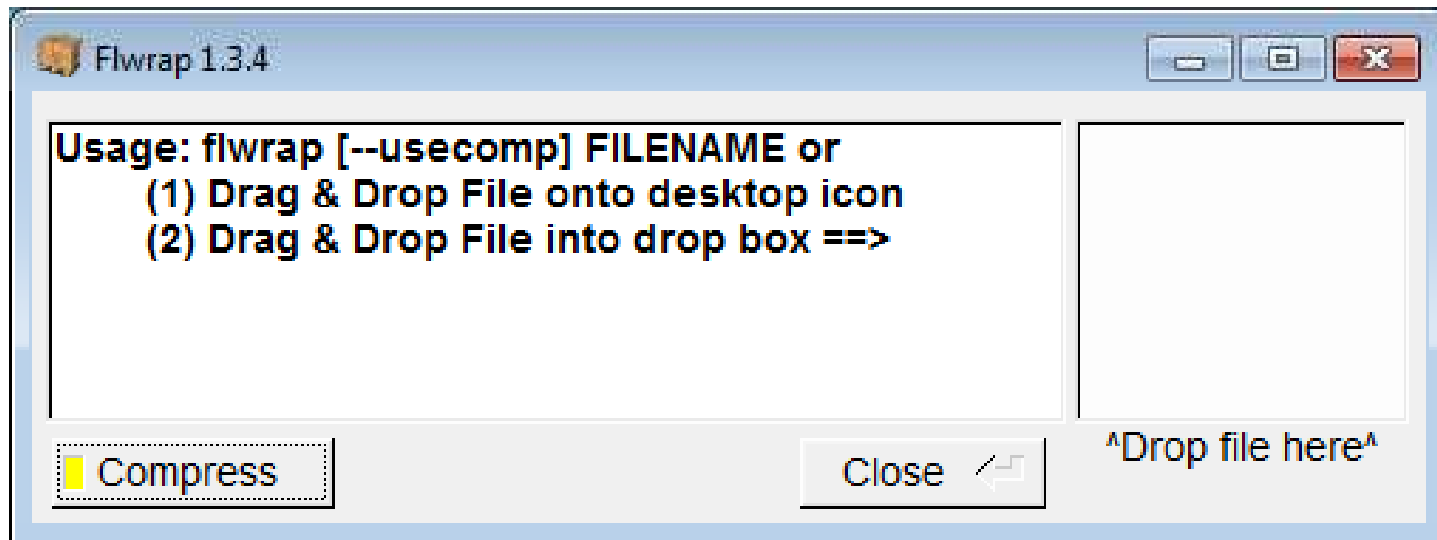
File Operations

- Flwrap automatically adds a checksum before file is sent
- The receiver calculates the checksum again.
- If they are the same, the file was received without any errors

- This allows multiple stations to receive and confirm the message.

- You will be prompted to save the file, with an automatically assigned unique filename

Speed Tests

Mode	2kb Bulletin (Sec)	6kb Bulletin (Sec)
MT63-2000	115	320
MT63-2000 Compressed	95	215

Per Harry Bloomberg, W3YJ

▸ Keep files as short as possible
▸ Compression mainly helpful on larger files

Current Forms– Flmsg

- Radiogram – ARRL, IARU
- Hurricane Wx
- ICS – 203, 205, 205a, 206, 213, 214, 216
- HICS – 203, 206, 213, 214
- MARS – Daily, IN/EET, Net, Army, Navy
- Red Cross – Welfare, 5739, 5739A, 5739B

- CSV – Comma Separated Values (Spreadsheet)
- Blank – (Just type what you want to send)

- Custom Forms can be created

Incoming messages are automatically opened in Flmsg

Entering Form Data

The Printed Form

THE AMERICAN RADIO RELAY LEAGUE

RADIOGRAM

VIA AMATEUR RADIO

NUMBER	PRECEDENCE	HX	STATION OF ORIGIN	CHECK	PLACE OF ORIGIN	TIME FILED	DATE
5	TEST PRIORITY	HXB24	K6UU1	23	REDONDO BEACH CA	0845L	JAN 14

TO

HEADQUARTERS

THIS RADIO MESSAGE WAS RECEIVED AT

K6UU 424 226-6762
Norm
PCH
Redondo Beach

PHONE NUMBER

310 555 1212

THIS IS A DRILL X
PLEASE SEND 400 COTS AND
BLANKETS TO SHELTER 1 X
WE ALREADY HAVE 350 VICTIMS
AND EXPECT MORE

Sending a Form
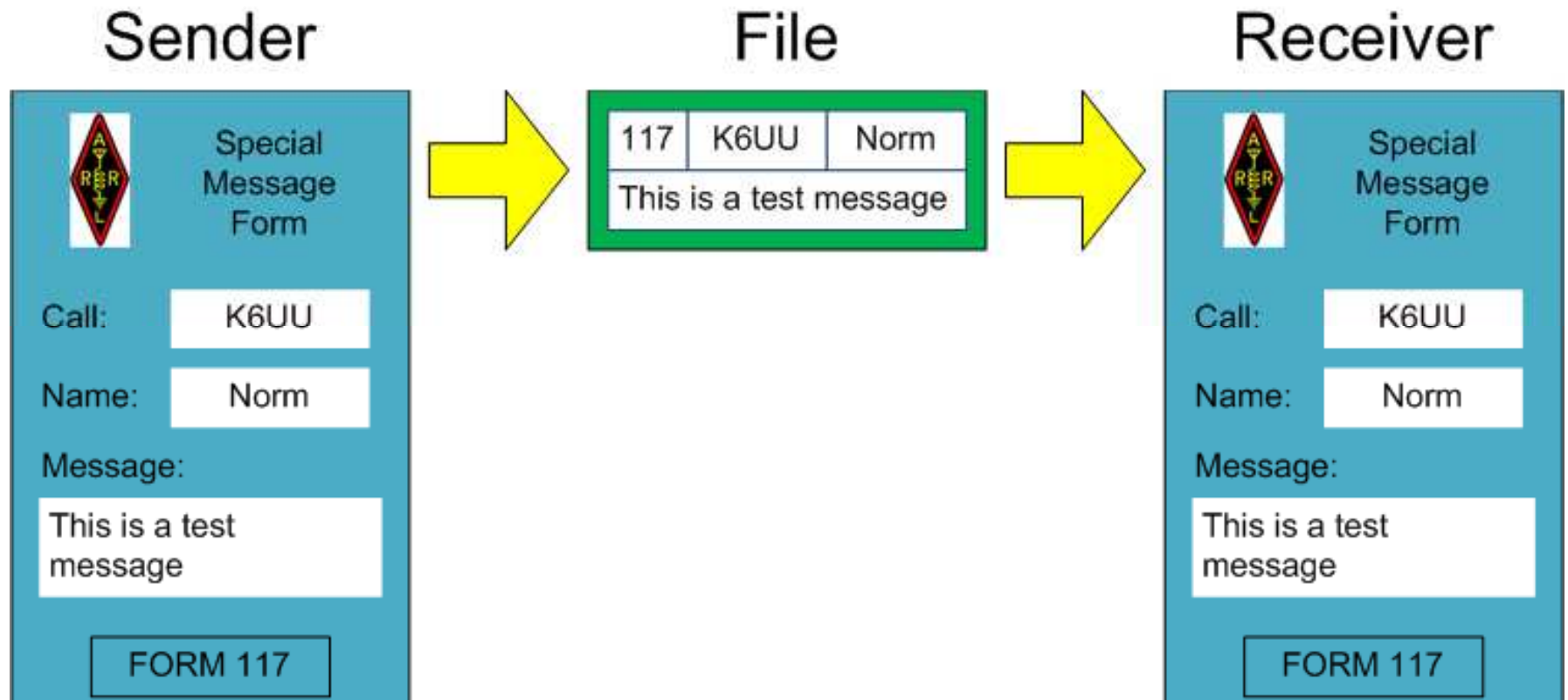
NBEMS Program Interaction
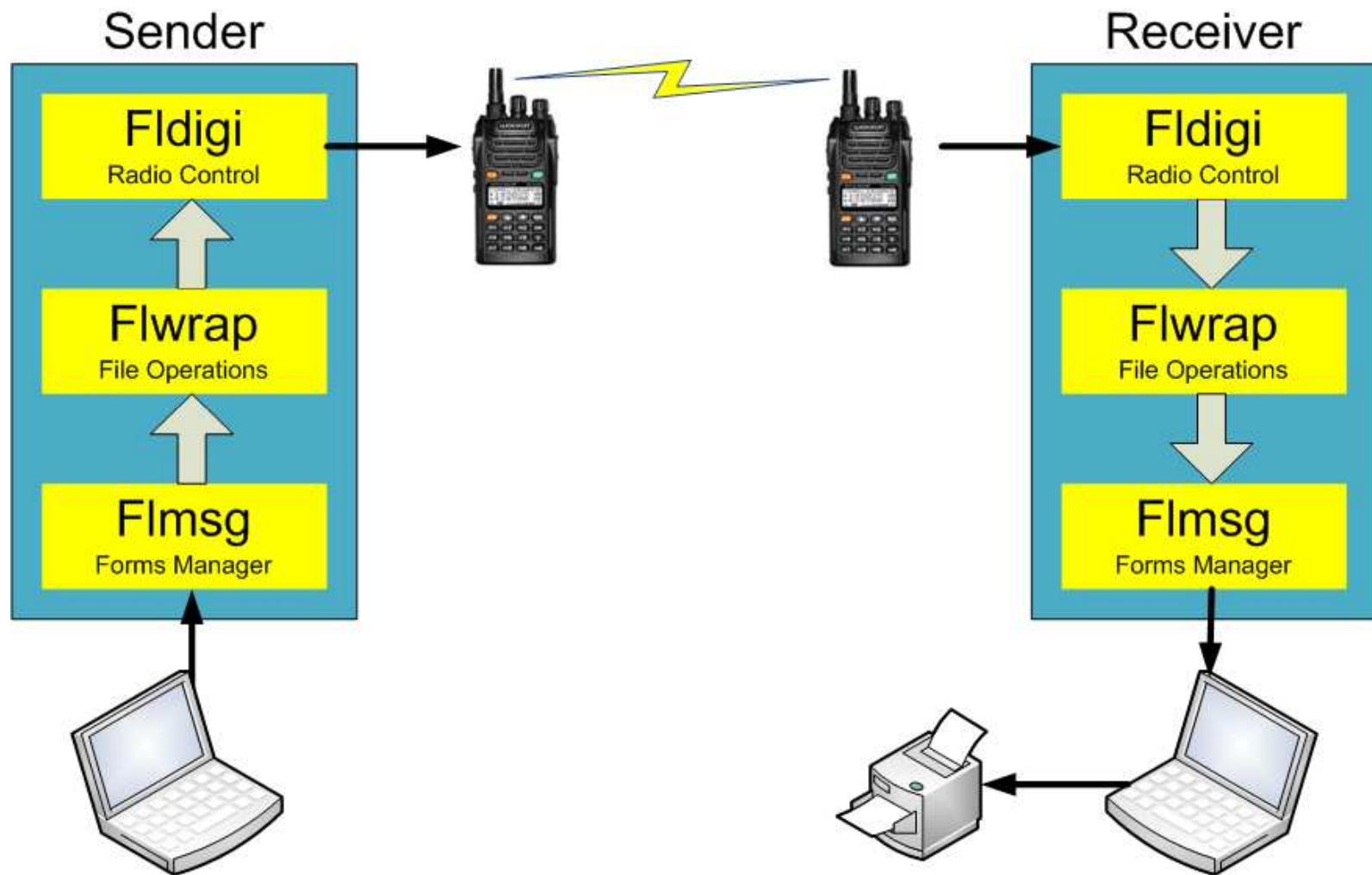
Demo
Sending Files & Forms

Downloading the Software

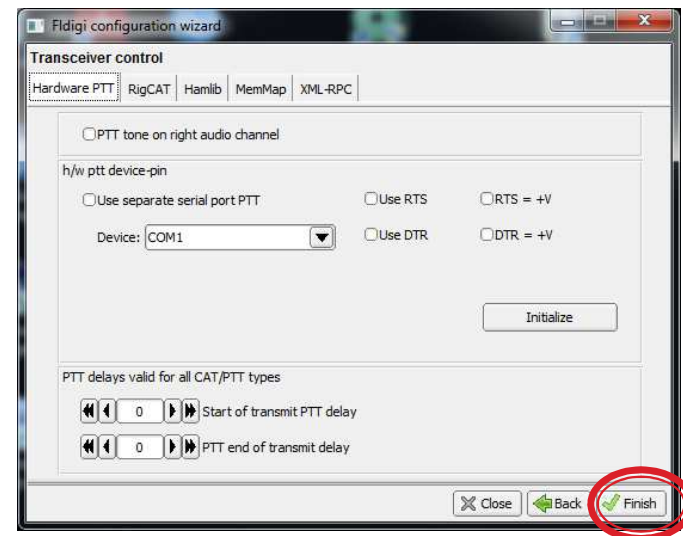w1hkj.com/download.html
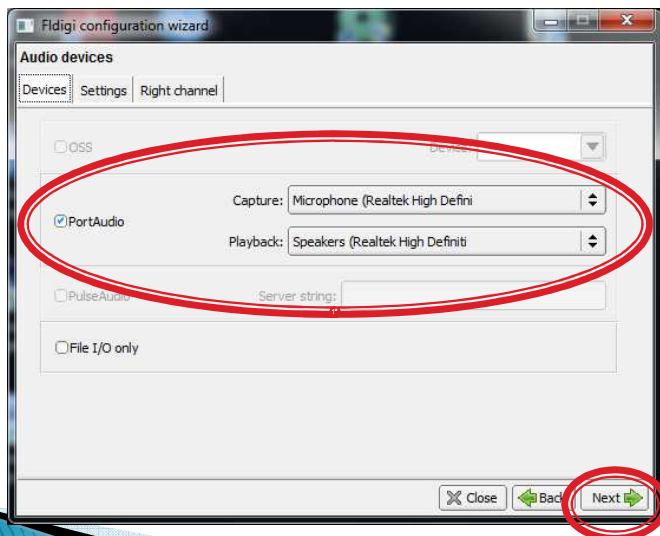
Windows Installation
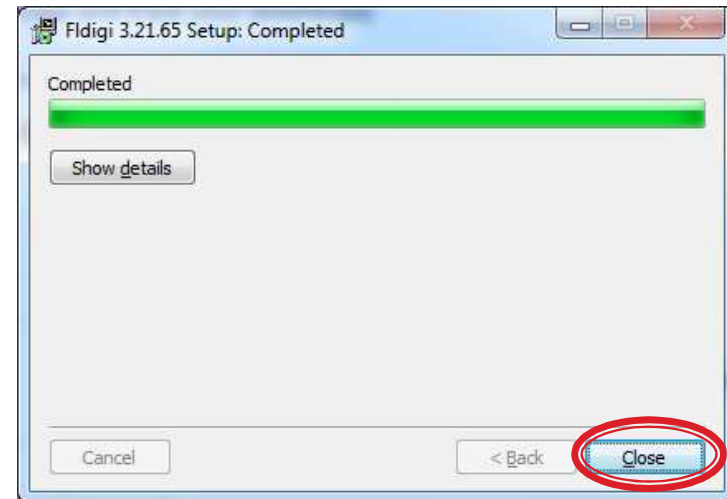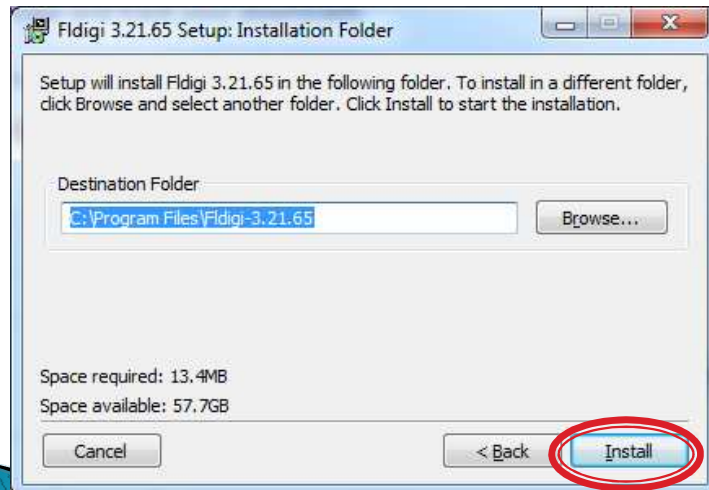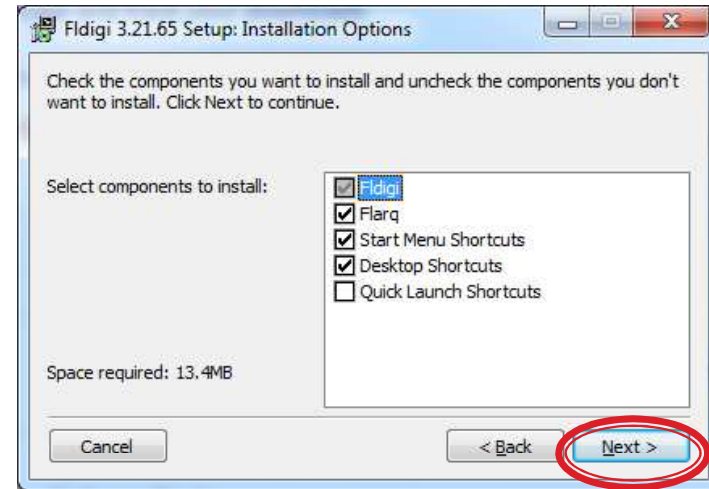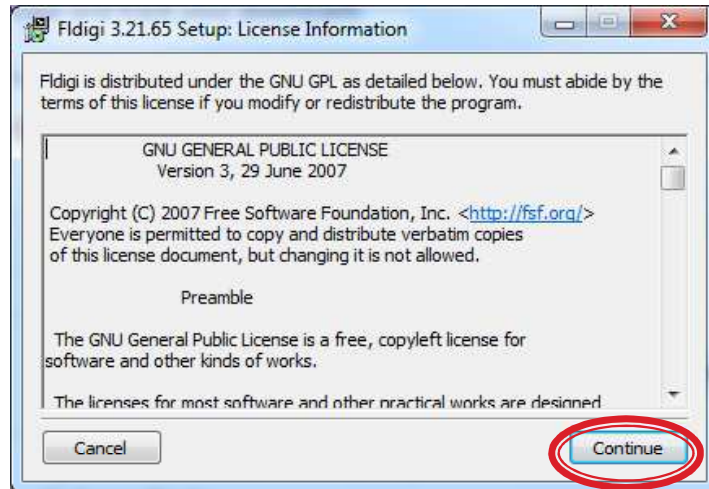
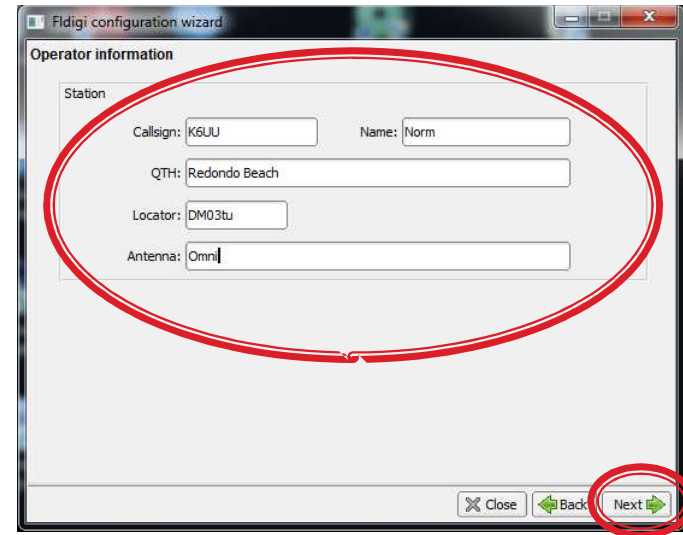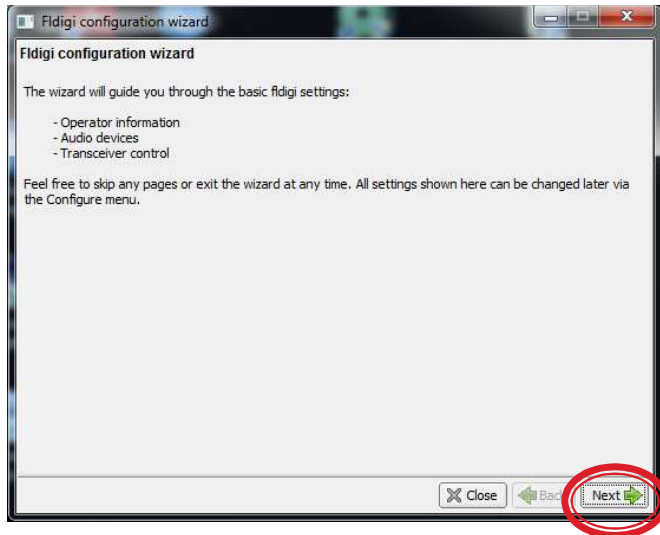# Mac Installation
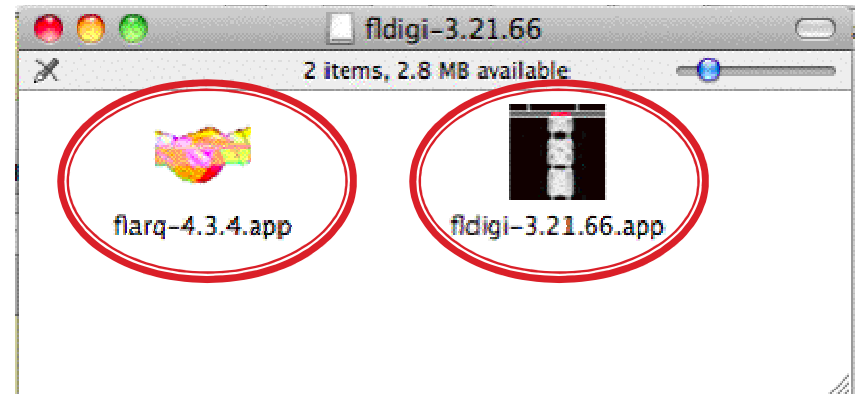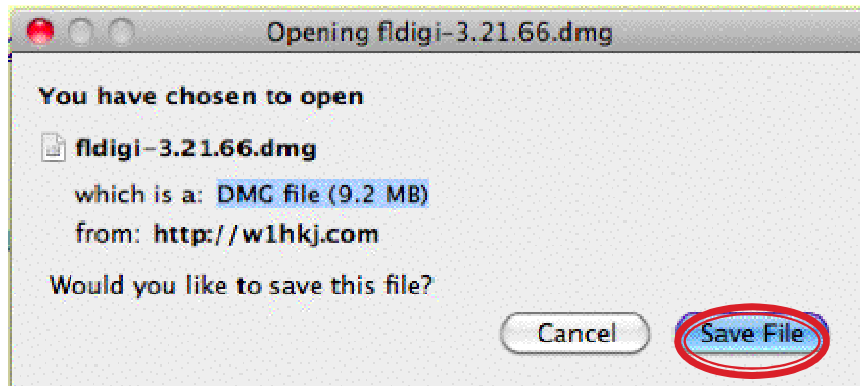
Move to Applications Folder
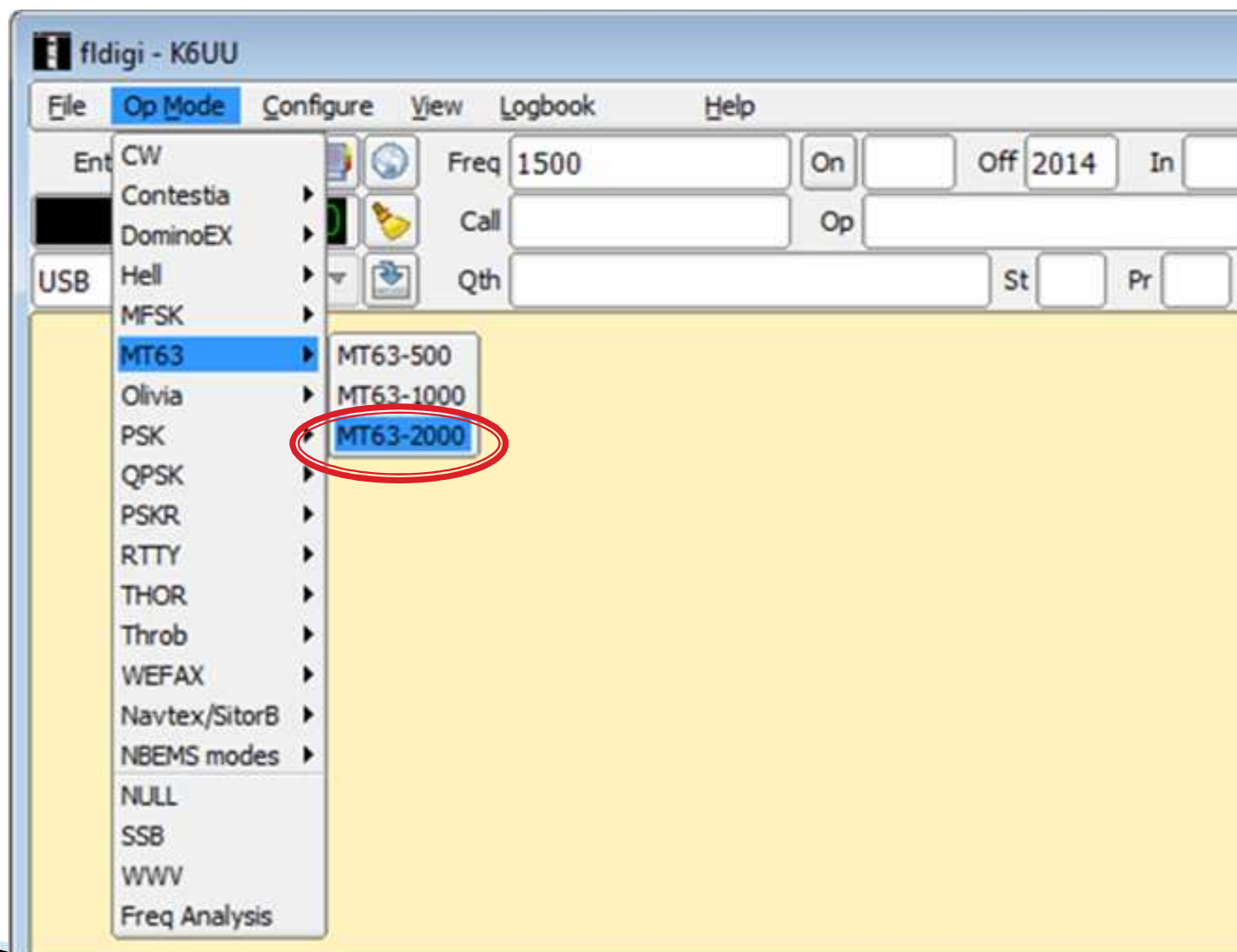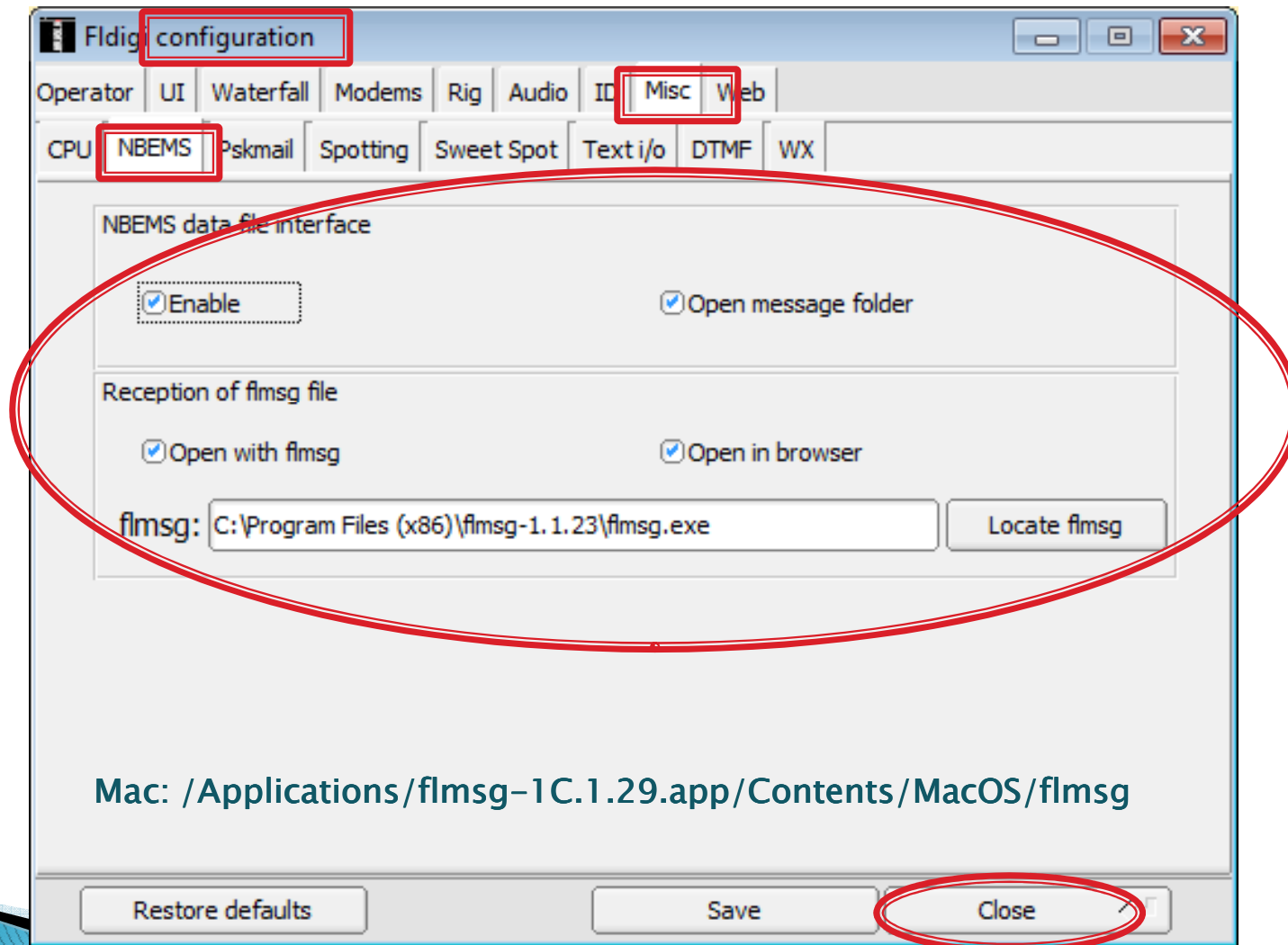Put Shortcut on Desktop
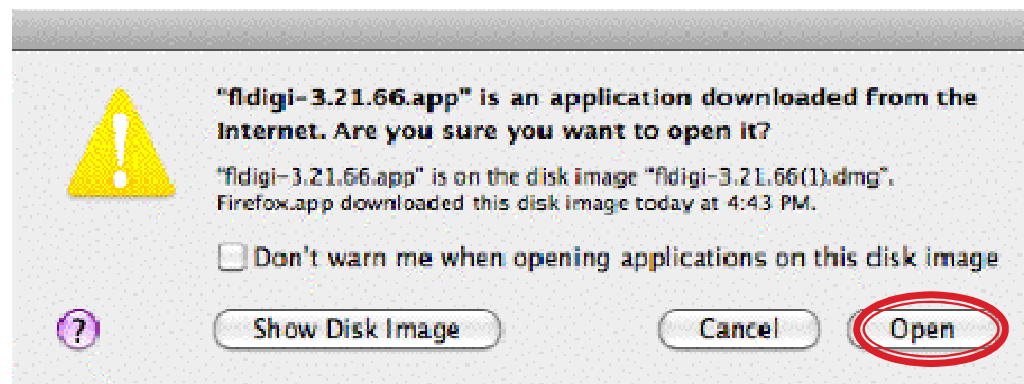
Fldigi Startup (First Time Only)

Remember to Save Config !

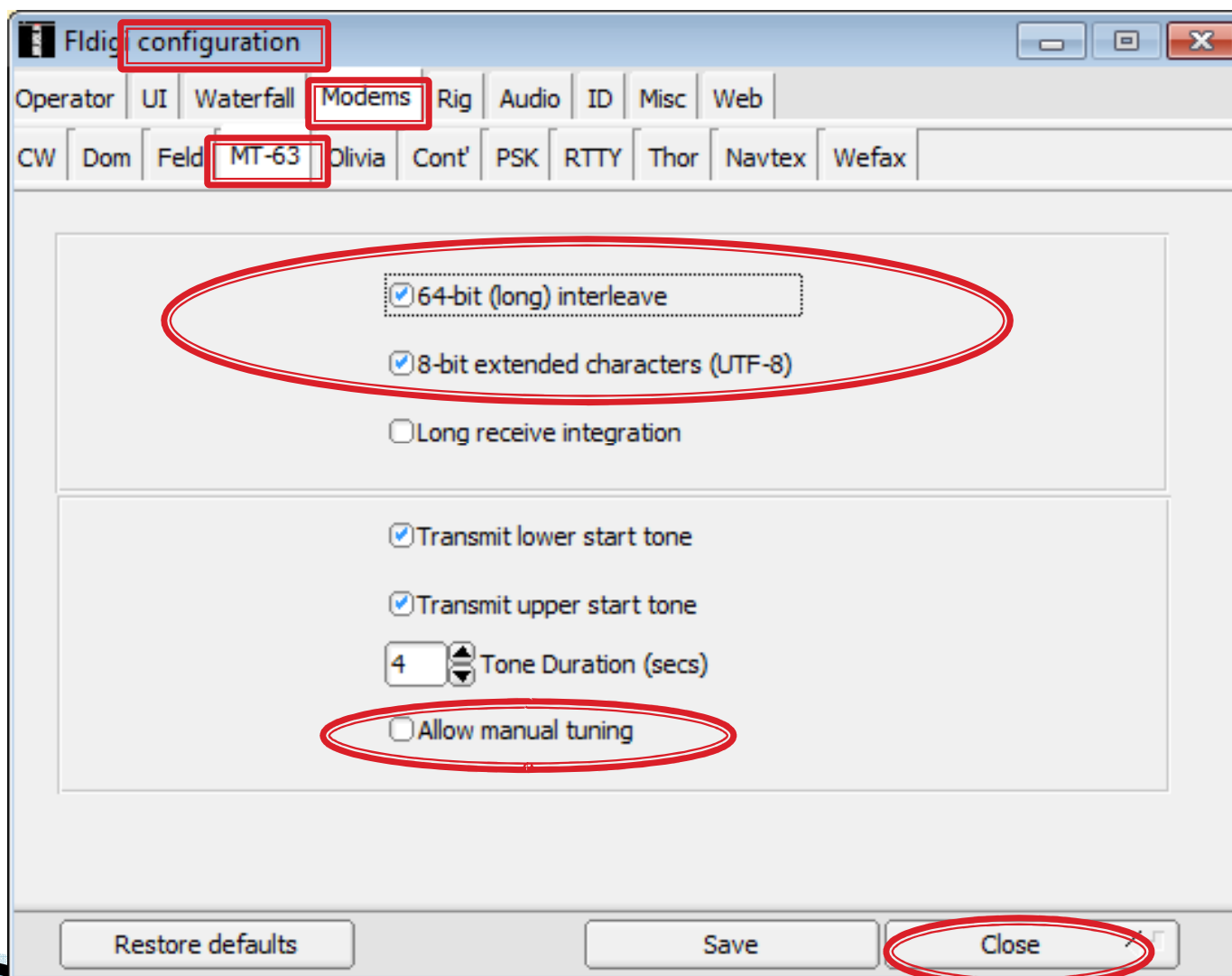# Special Settings for Nbems

Nbems Configuration

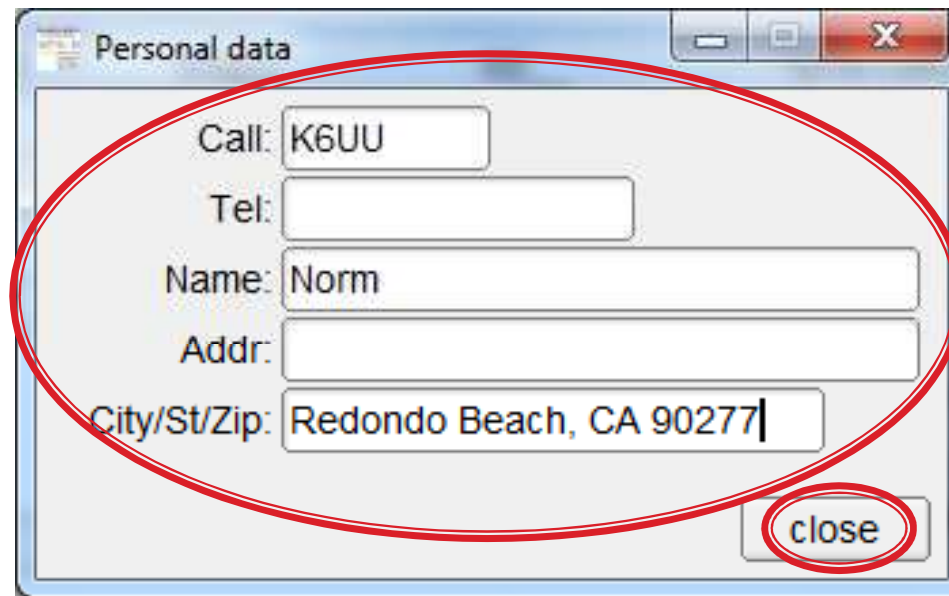Mac: /Applications/flmsg-1C.1.29.app/Contents/MacOS/flmsg

MT–63 Configuration

Summary of Settings for Fldigi

- Op Mode
  - MT63
    - MT63-2000
- Configure
  - Misc
    - NBEMS data file interface
      - CHECK – Enable
      - CHECK – Open message folder
    - Reception of FLMSG file
      - CHECK – Open with Flmsg
      - CHECK – Open in browser
  - Modems
    - MT-63
      - CHECK – 64-bit (long) interleave
      - CHECK – 8-bit extended characters (UTF-8)
      - UN-CHECK – Allow Manual Tuning (For VHF)
  - Audio
    - Devices
   - (Make sure your sound card is selected)

Startup for Flmsg

- Don't have the Speaker/Mic too close
- Disable speech compression, noise blanking, and all other audio processing
- Disable any DSP modes on speaker or microphone
- Reminder: The setup scripts do not automatically save your responses. Go to "Configure" / "Save Config" or you will have to answer them again next time you start up.
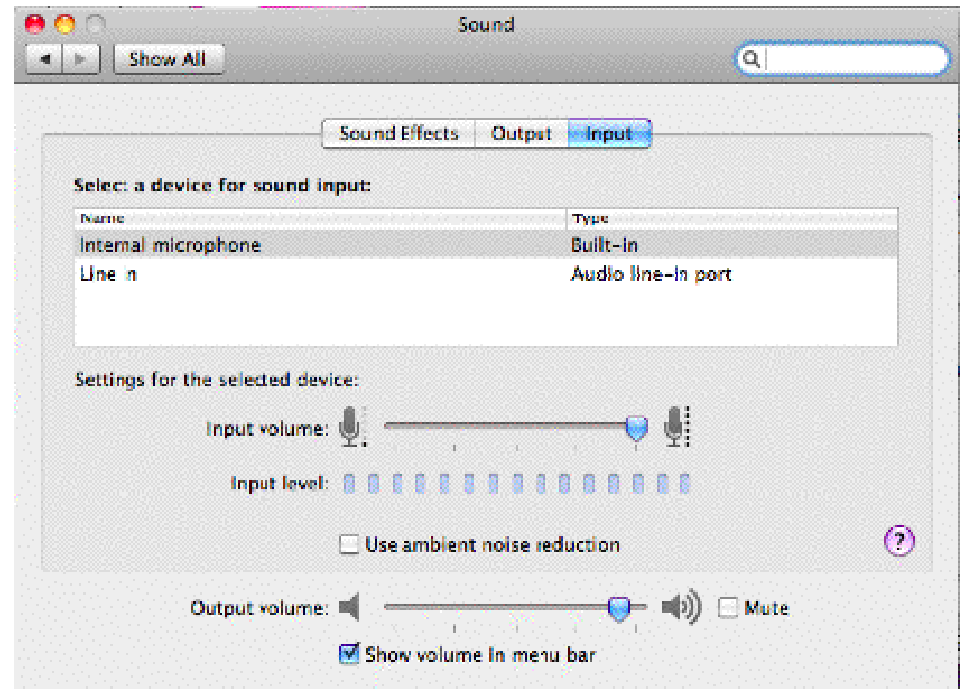
Turn Off Sound Card Processing

Windows:
Control Panel / Sound / Microphone & Speakers
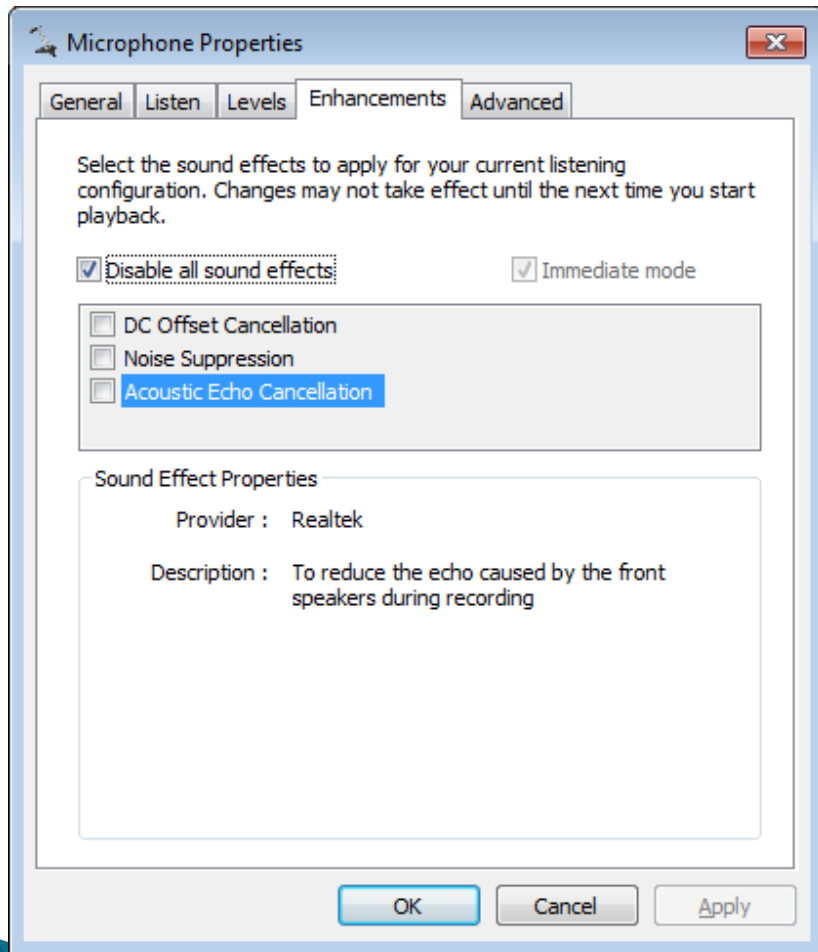
Mac:
Control Panel / Sound

Links

- w1hkj.com

- youtube.com/watch?v=SWZ2vKWSiIE

- arrl.org/nbems

- Norm Thorn
- K6UU@NOROC.com