



NBEMS

Narrow Band Emergency Messaging Software



Norm Thorn, K6UU
Diana Feinberg, AI6DF

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Overview

- ▶ Intro to Fldigi
- ▶ Setting Up Hardware
- ▶ Concepts
- ▶ Demo sending data without wires
- ▶ Operating Procedures
- ▶ Sending Forms & Files
- ▶ Installing Software



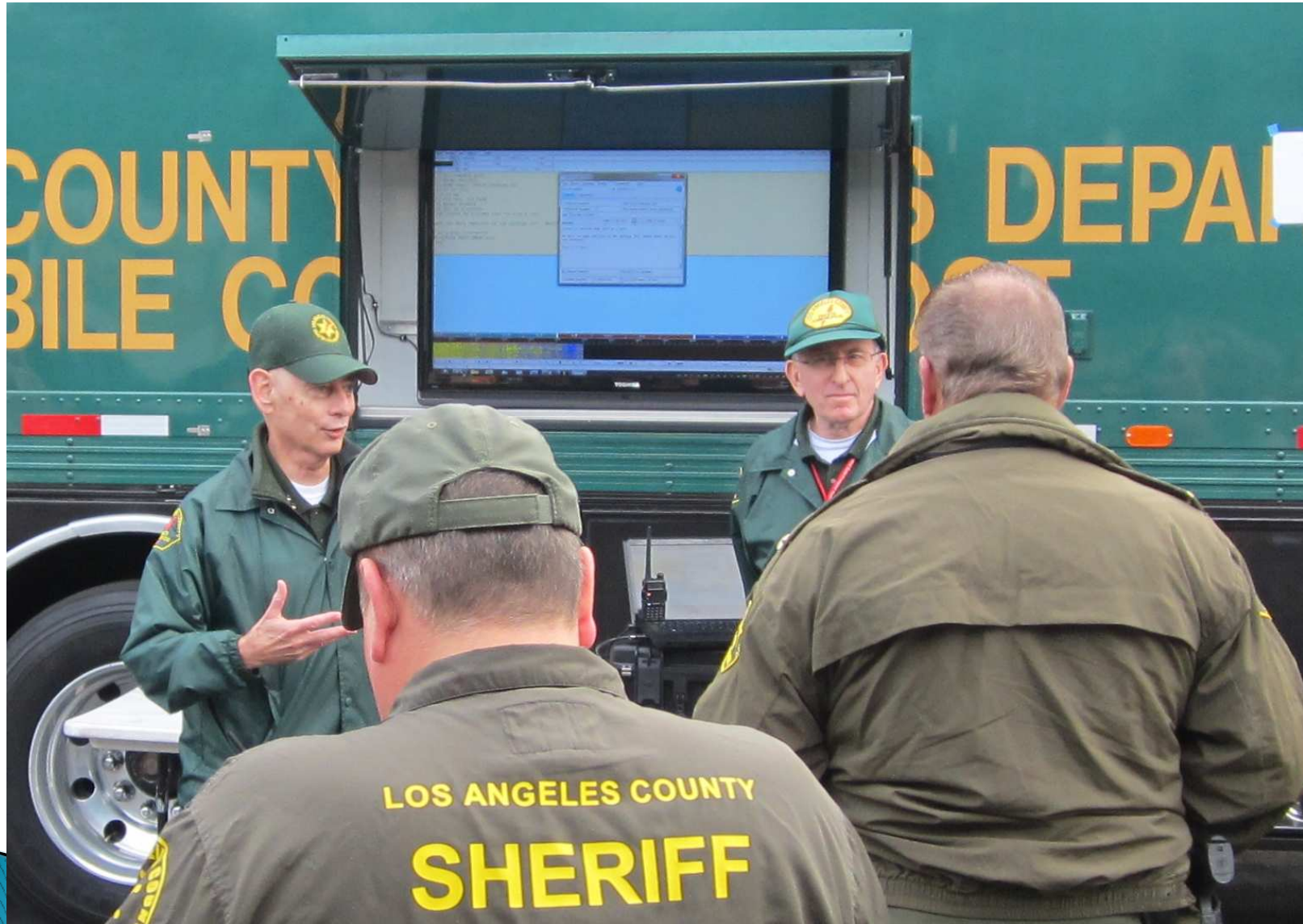
Most event traffic is well suited to voice communications



- ▶ 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



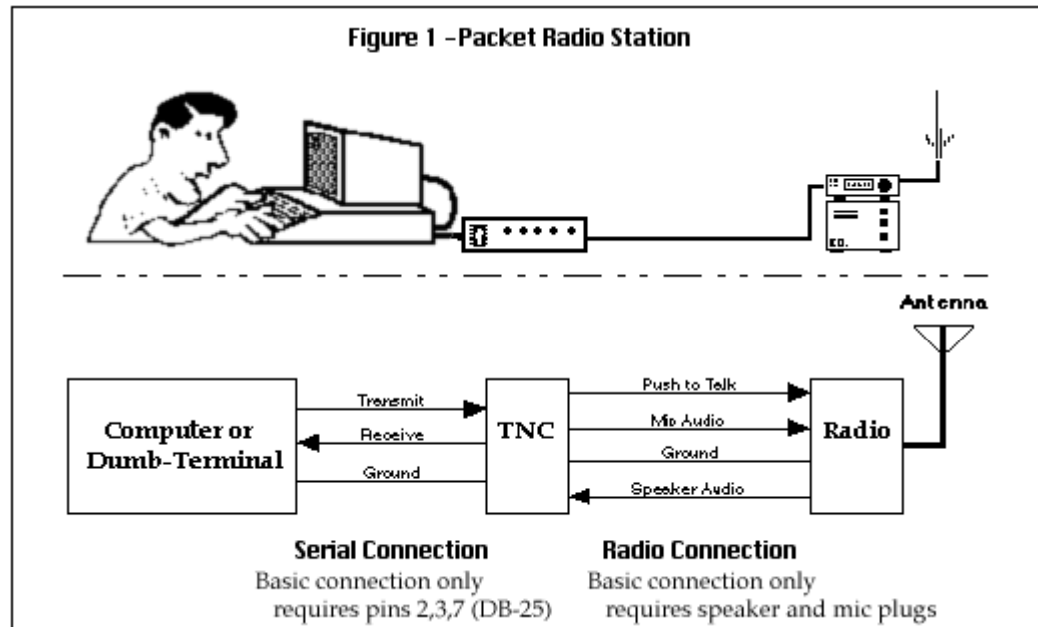
Why Digital Data ?



- ▶ 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



- ▶ 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

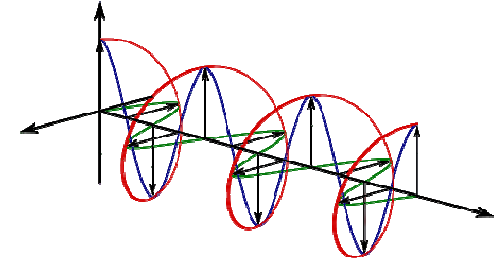


USB

External
Sound Card

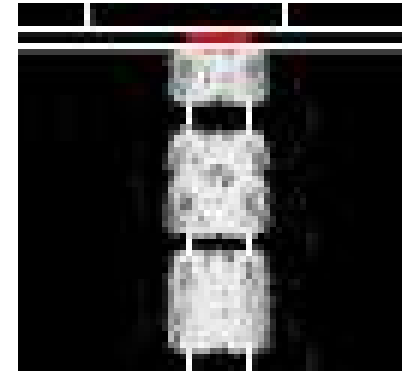
Audio
Link

Components of NBEMS



- ▶ Fldigi – Digital Modem Software
 - Uses Sound Card
- ▶ MT-63 – A very resilient data protocol
- ▶ Flwrap – File Packaging & Management
- ▶ Flmsg – Forms management

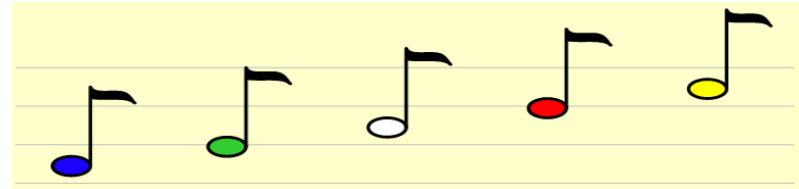
What Is Fldigi ?



- ▶ Fast Light Digital 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

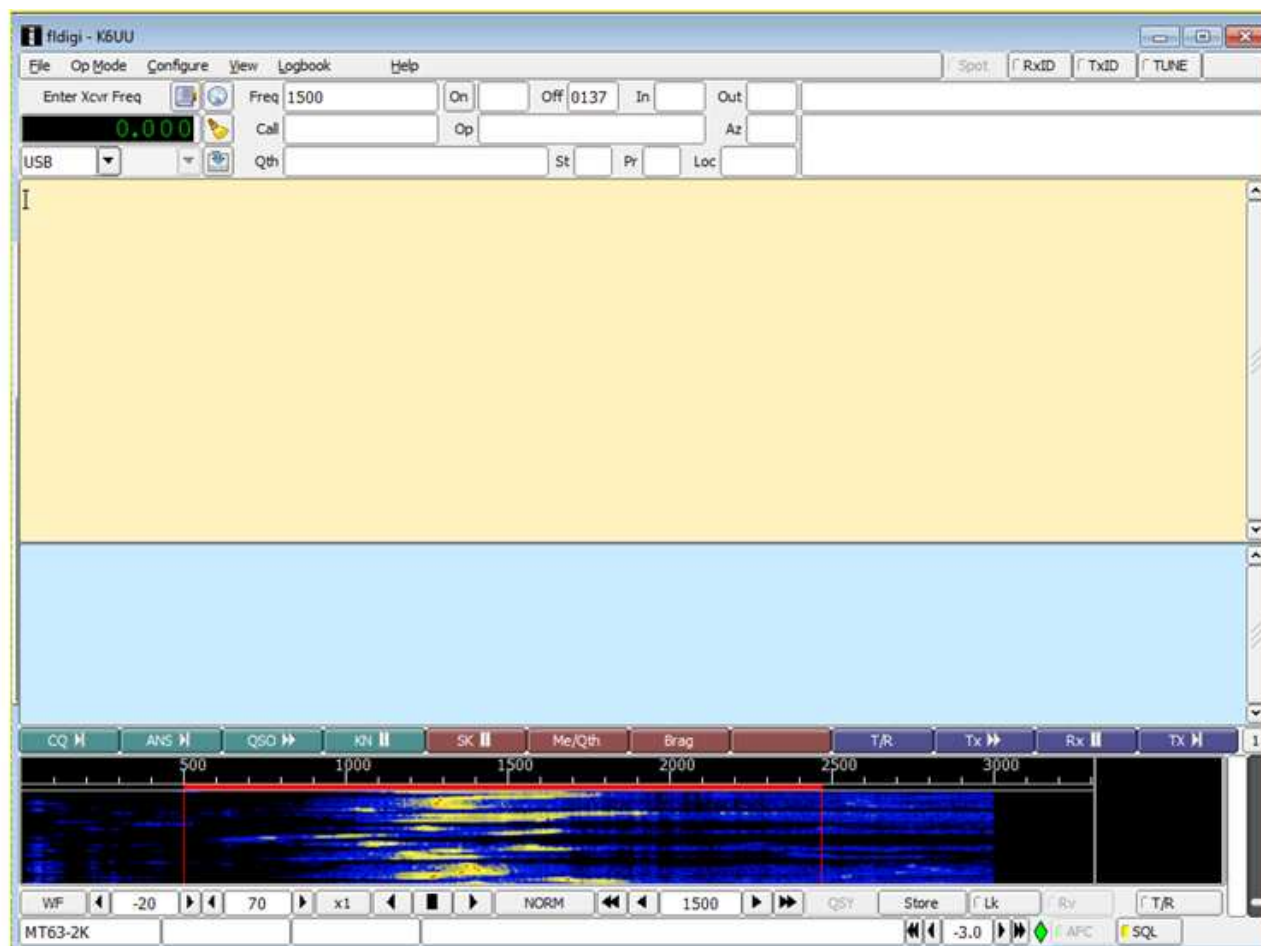
Nbems uses MT-63...

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



Menu

Rig Info Pane

Receive Pane

Transmit Pane

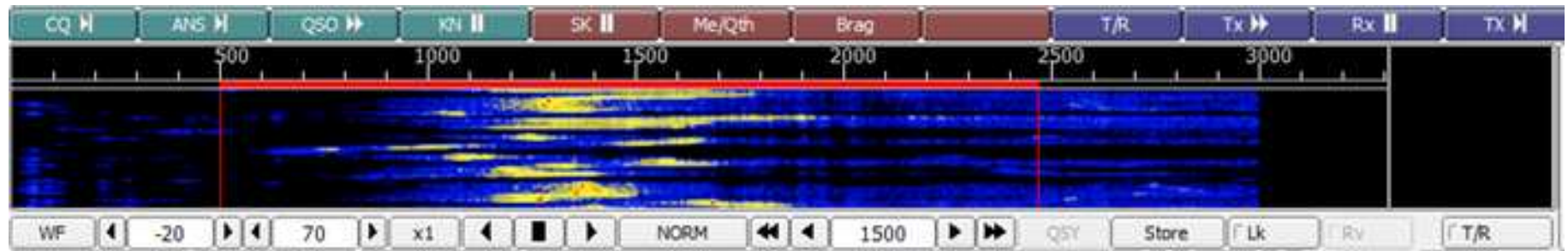
Macro Buttons

Waterfall Pane

Controls

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

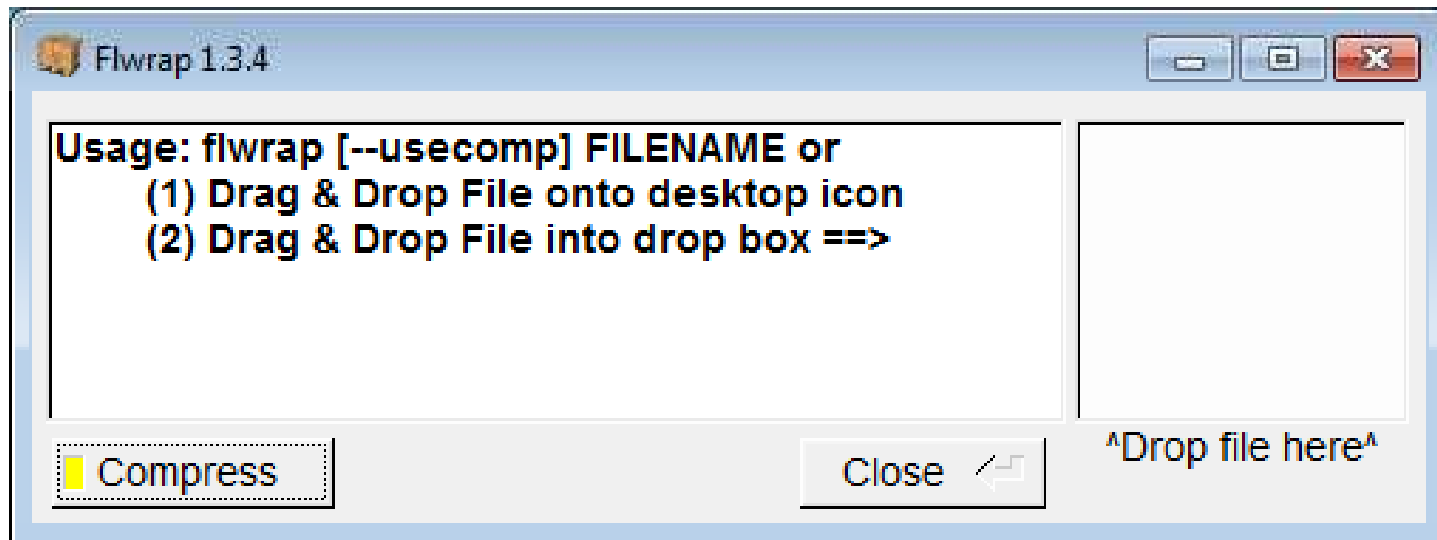


Demo

Sending Text with Fldigi

Sending Files – Flwrap

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



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

FLMSC-1 1.29

File Form **Template** Config **AutoSend** Help

ARRL radiogram file: K6UU-5.m2s

Message Records

SVC ☐ *NR 5 *PREC TEST PRIORIT HX HXB24 hx *STN ORIG K6UU1 CK 23 ck

PLACE OF ORIG REDONDO BEACH CA TIME FILED 0845L ... *MON DY JAN 14 ...

*TO HEADQUARTERS TEL: 310 555 1212

OP NOTE:

☒ Standard Format ARL MSG

TXT:

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

SIG: OP NOTE:

☐ Comp base64 MT63-2K 440 bytes / 22 secs

The Printed Form

Firefox ▾

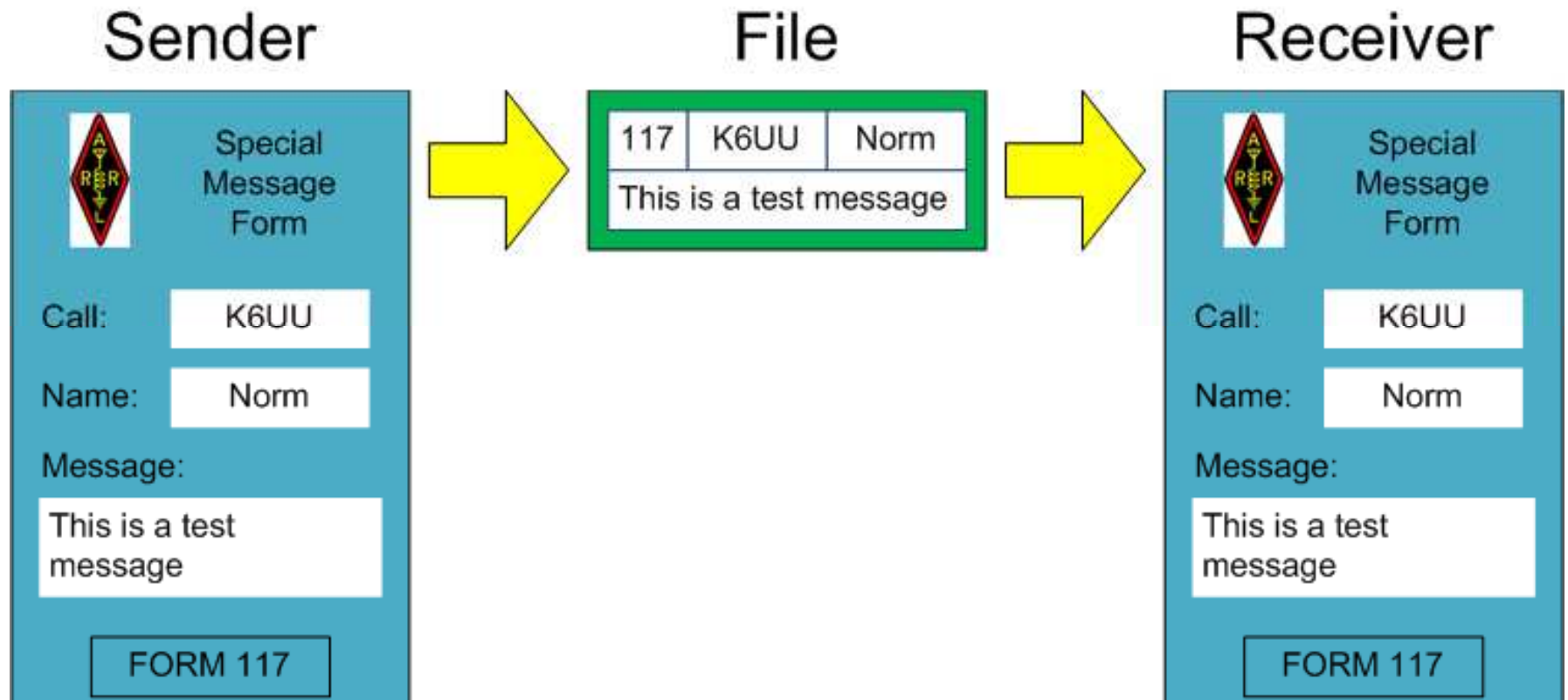
radiogram +

file:///C:/Users/norm/NBEMS.files/ICS/radiogram.html ☆ ▾ ↻ screen capture on apple r 🏠 ☆ ▾ 📎 ▾

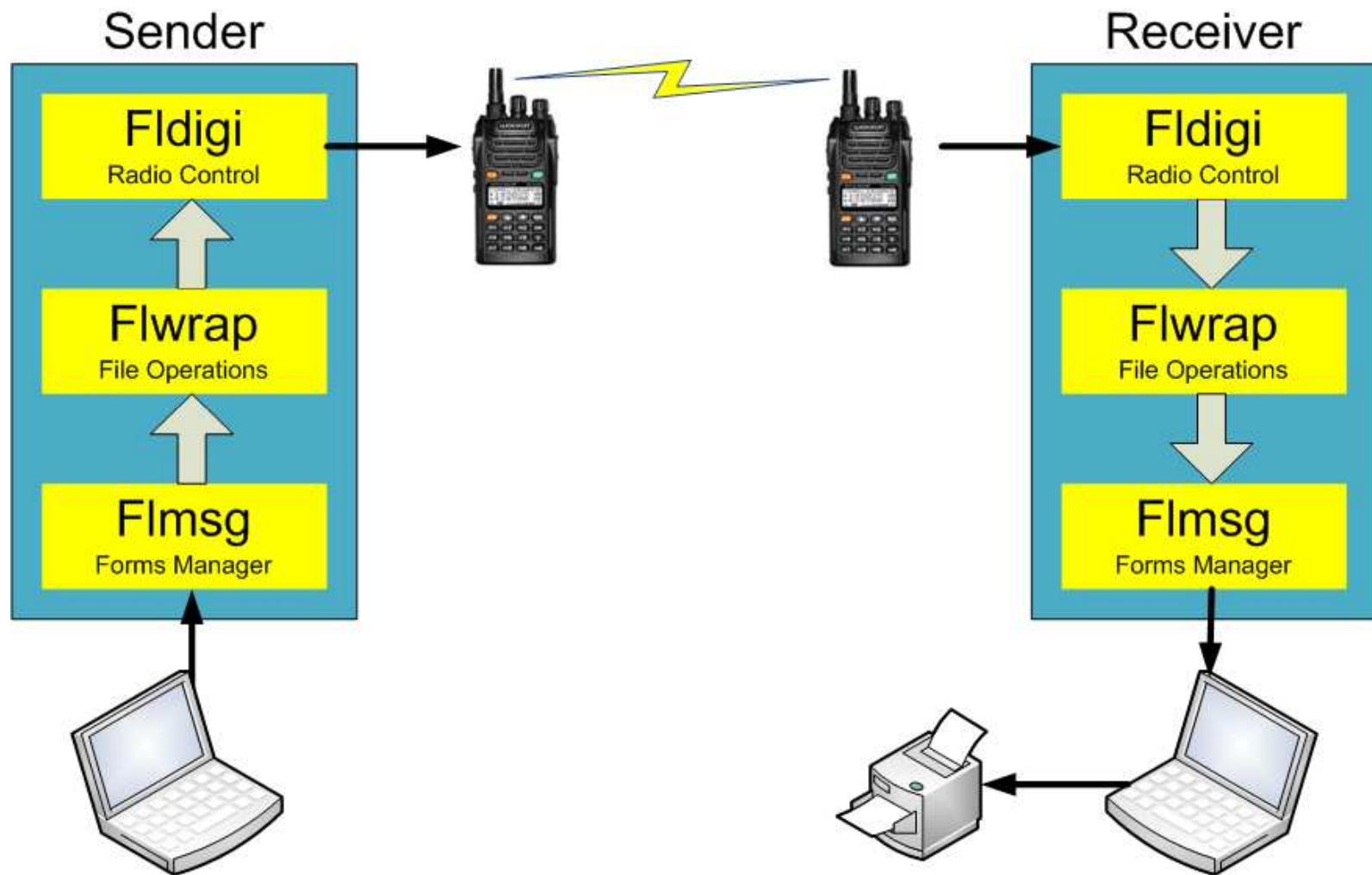
THE AMERICAN RADIO RELAY LEAGUE
RADIOGRAM
VIA AMATEUR RADIO

| 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

Firefox | Inbox (1) - norm@noroc.com - ... | ARRLPubSvc.pdf (application/p... | Introduction_to_FLDigi_NBEMS... | Download page | Digital Modes of Communicatio... |

www.w1hkj.com/download.html | fldigi

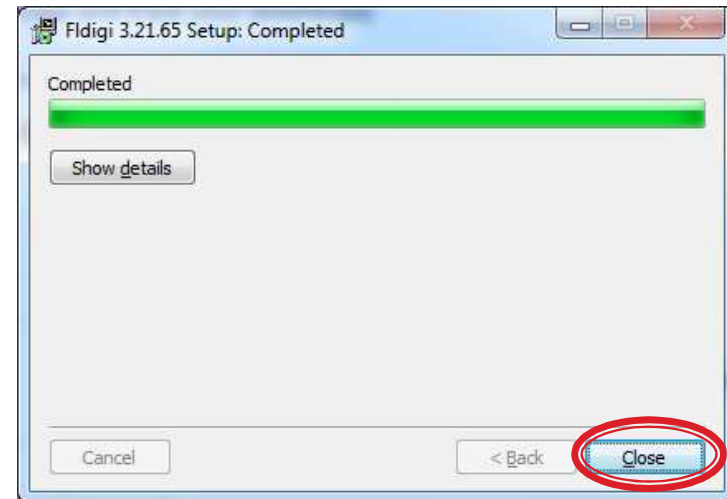
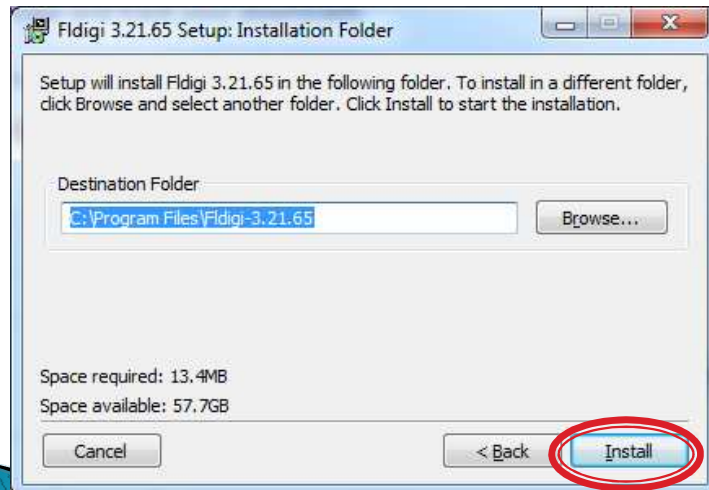
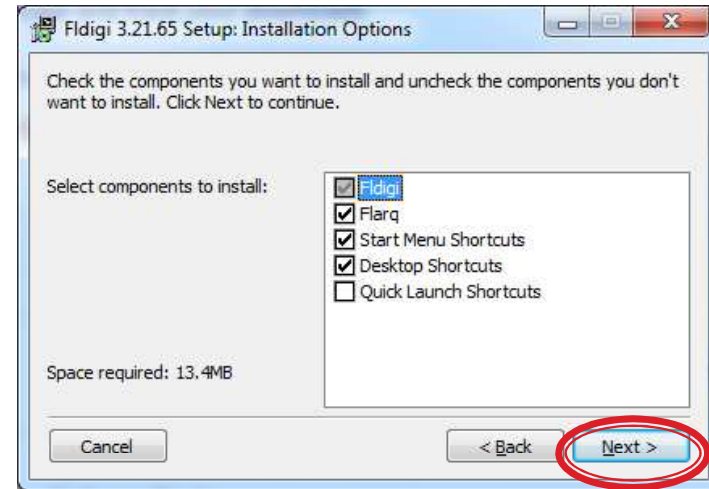
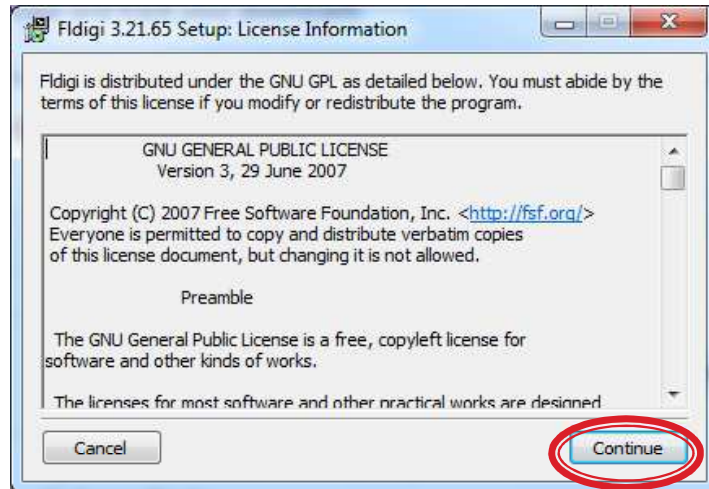
Download page: updated 6 January 2013

| | Linux Binary | Windows Setup | OS X dmg | Puppy Pet (1) | Source | Help | Release Info |
|--|--|--------------------------------------|------------------------------------|--|------------------------------------|--|------------------------|
| Fldigi / Flarq: | fldigi-3.21.65.bin README | fldigi-3.21.65 setup | fldigi-3.21.65 dmg | fldigi-3.21 flarq-4.3 pet libs | fldigi-3.21.65 | Fldigi-Help Flarq-Help fldigi manual (pdf) | Maint' |
| | | | | | required for all fl__ applications | | |
| RigCat Xmls | xml archives | | | | | | |
| Flamp: | flamp-1.0.01.bin | flamp-1.0.01 setup | flamp-1.0.01.dmg | flamp | flamp-1.0.01 | Flamp-Help(html) Flamp-Help - adobe reader | |
| Flwrap: | flwrap-1.3.4.bin | flwrap-1.3.4 setup | flwrap-1.3.4 dmg | flwrap | flwrap-1.3.4 | Flwrap-Help | Maint' |
| Flmsg: | flmsg-1.1.29.bin | flmsg-1.1.29 setup | flmsg-1.1.29 dmg | flmsg | flmsg-1.1.29 | Flmsg-Help Flmsg-Help-PDF | Maint' |
| Flwkey: | flwkey-1.1.4.bin | flwkey-1.1.4 setup | flwkey-1.1.4 dmg | flwkey | flwkey-1.1.4 | Flwkey-Help | Maint' |
| Flrig: Supported rigs | flrig-1.3.11.bin | flrig-1.3.11 setup | flrig-1.3.11 dmg | flrig-1.3.11 | flrig-1.3.11 | flrig-help | Maint' |
| Fllog: | fllog-1.1.6.bin | fllog-1.1.6 setup | fllog-1.1.6 dmg | fllog-1.1.6 | fllog-1.1.6 | fllog-help | Maint' |

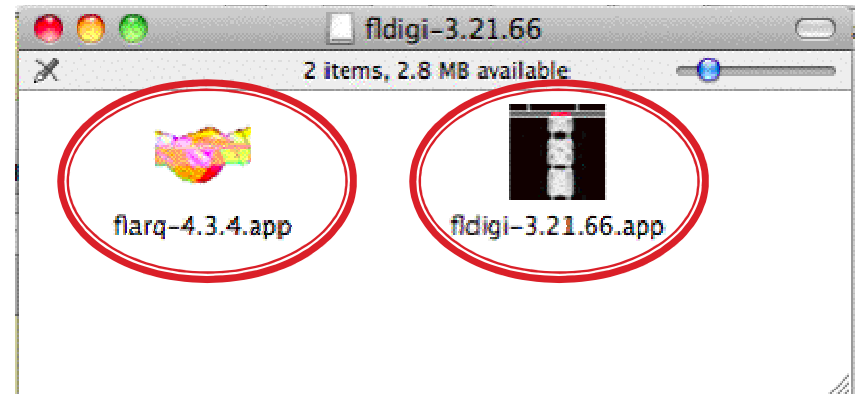
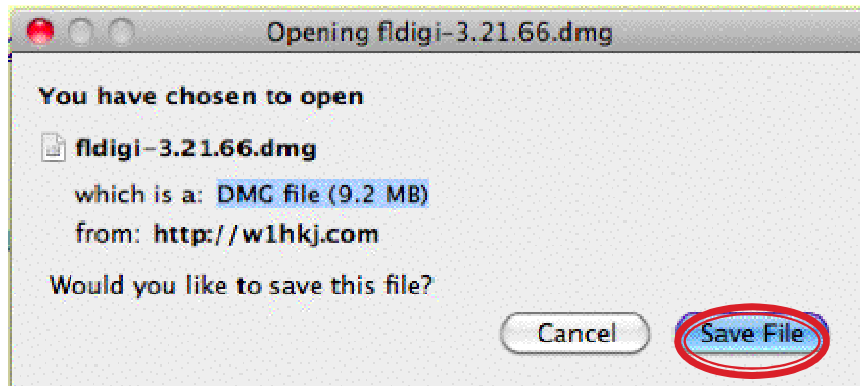
12:30 PM 1/8/2013

w1hkj.com/download.html

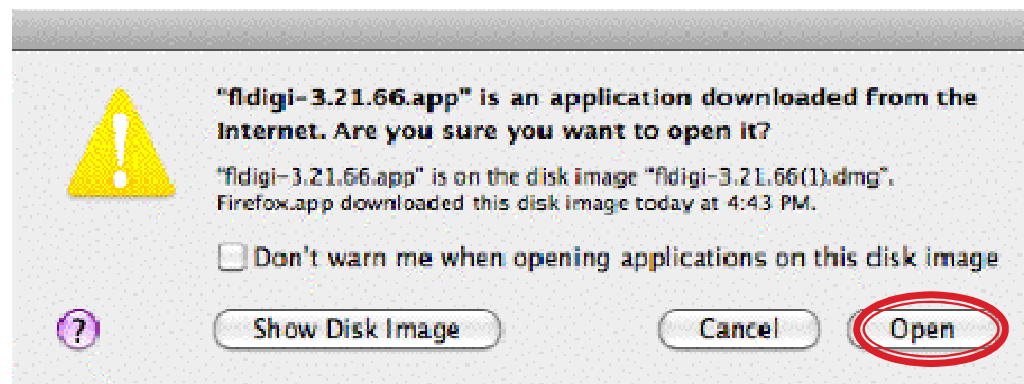
Windows Installation



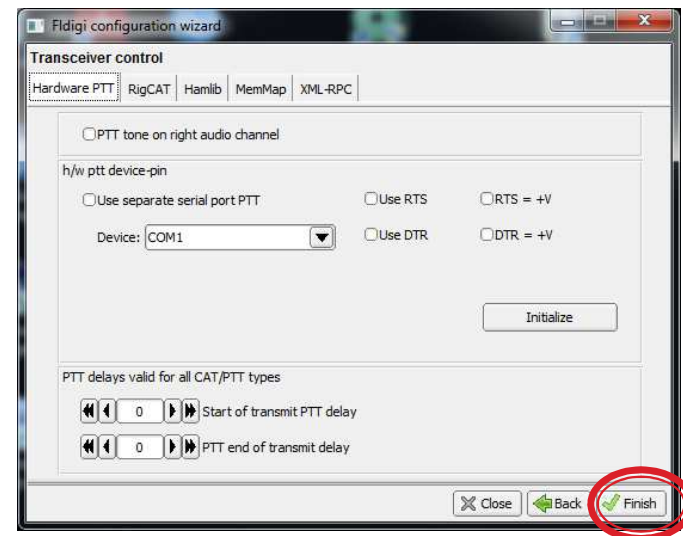
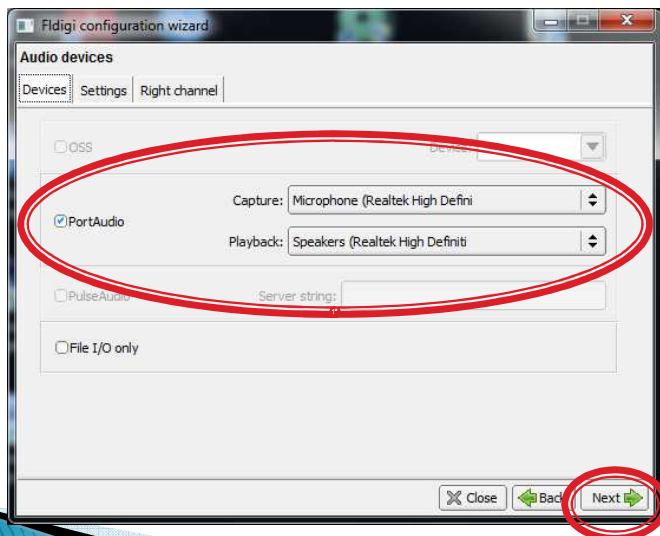
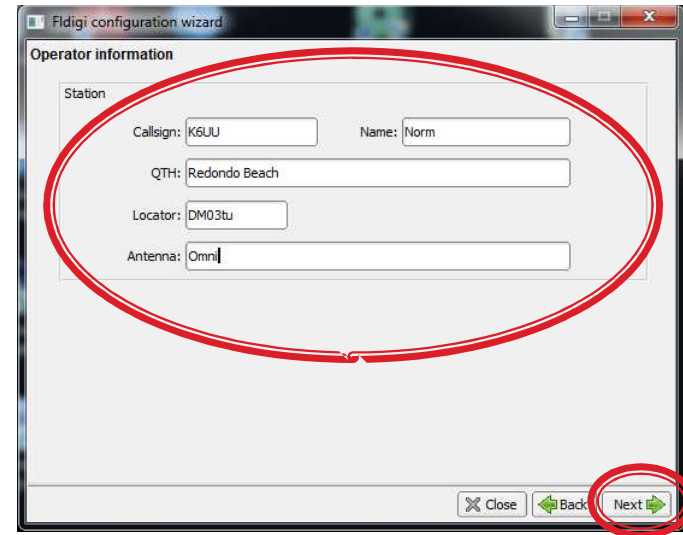
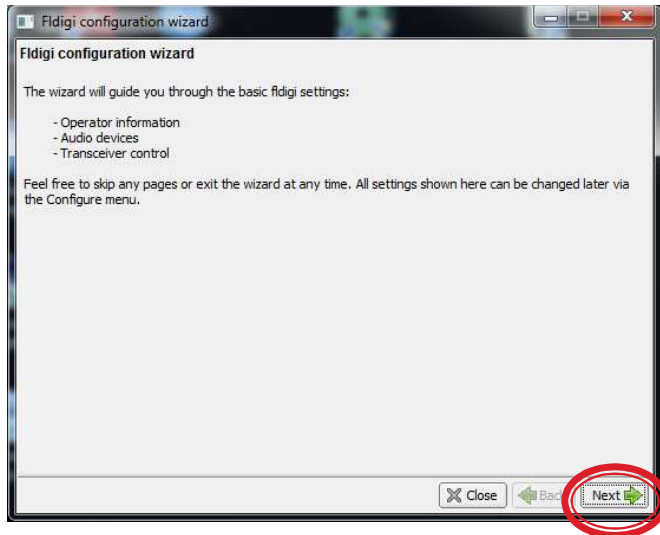
Mac Installation



Move to Applications Folder
Put Shortcut on Desktop

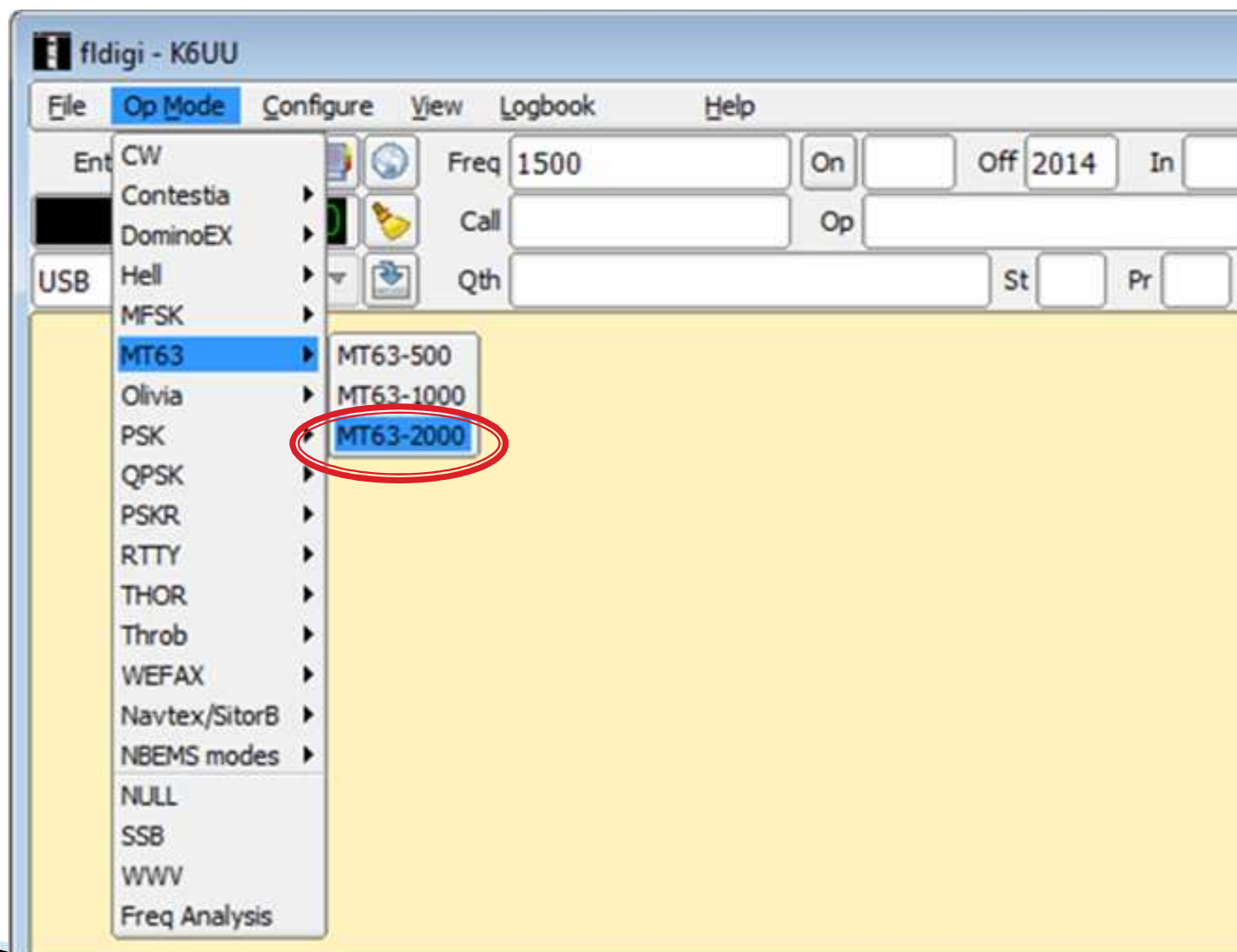


Fldigi Startup (First Time Only)

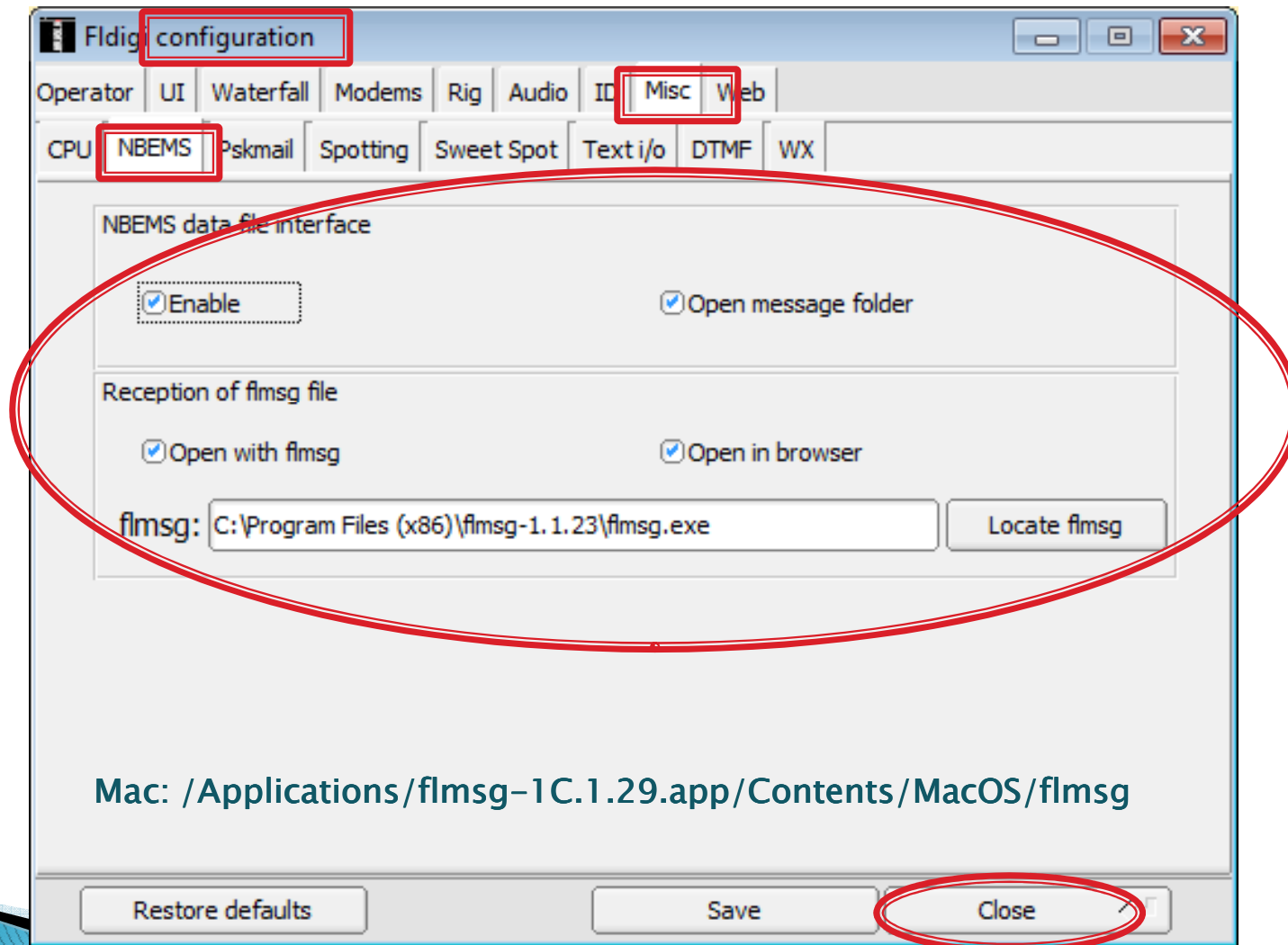


Remember to Save Config !

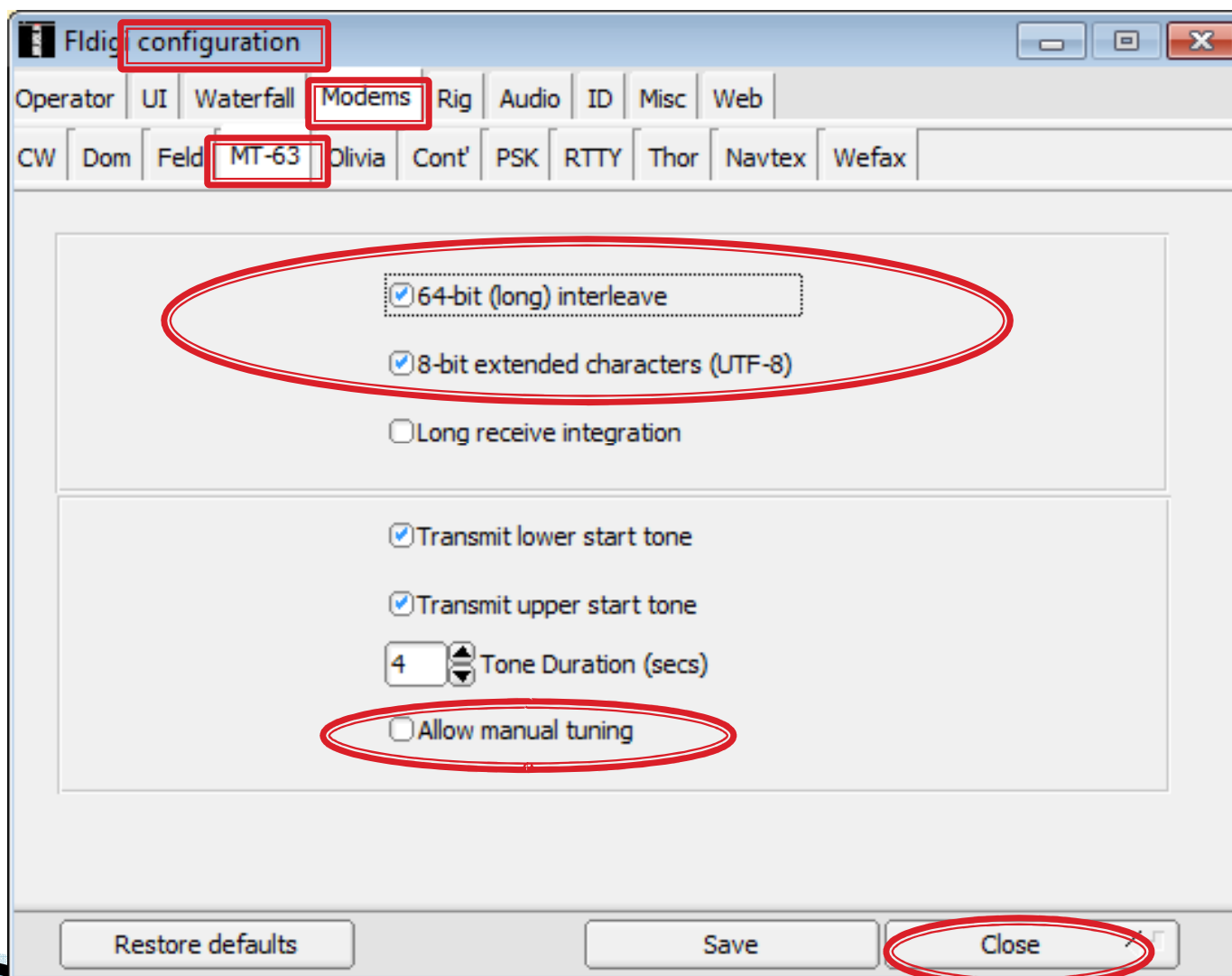
Special Settings for Nbems



Nbems Configuration



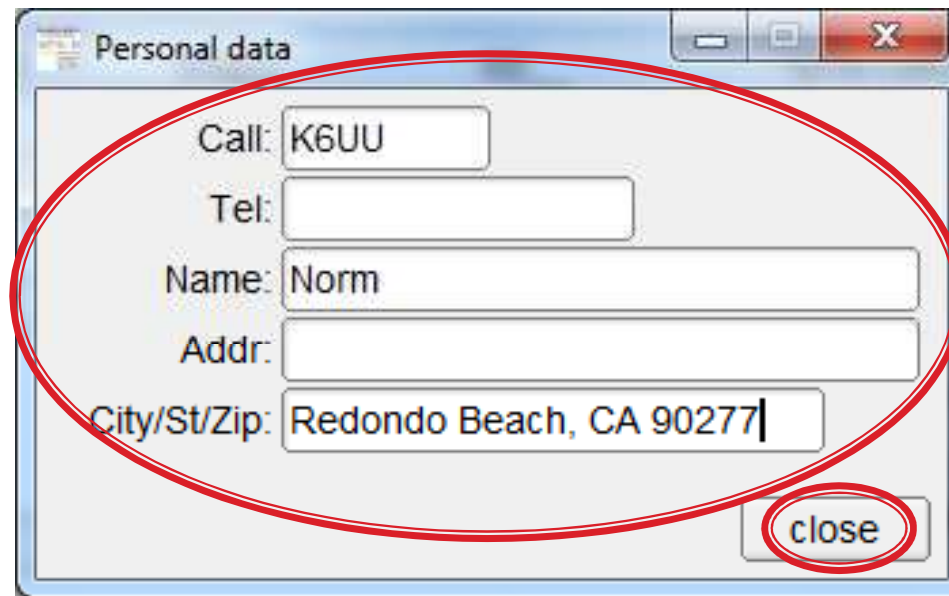
MT-63 Configuration



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



A screenshot of a Windows-style dialog box titled "Personal data". The dialog box contains several text input fields. A red oval is drawn around the entire content area of the dialog, including the input fields and the "close" button. The input fields are labeled as follows:

- Call: K6UU
- Tel: (empty)
- Name: Norm
- Addr: (empty)
- City/St/Zip: Redondo Beach, CA 90277

The "close" button is located at the bottom right of the dialog box.

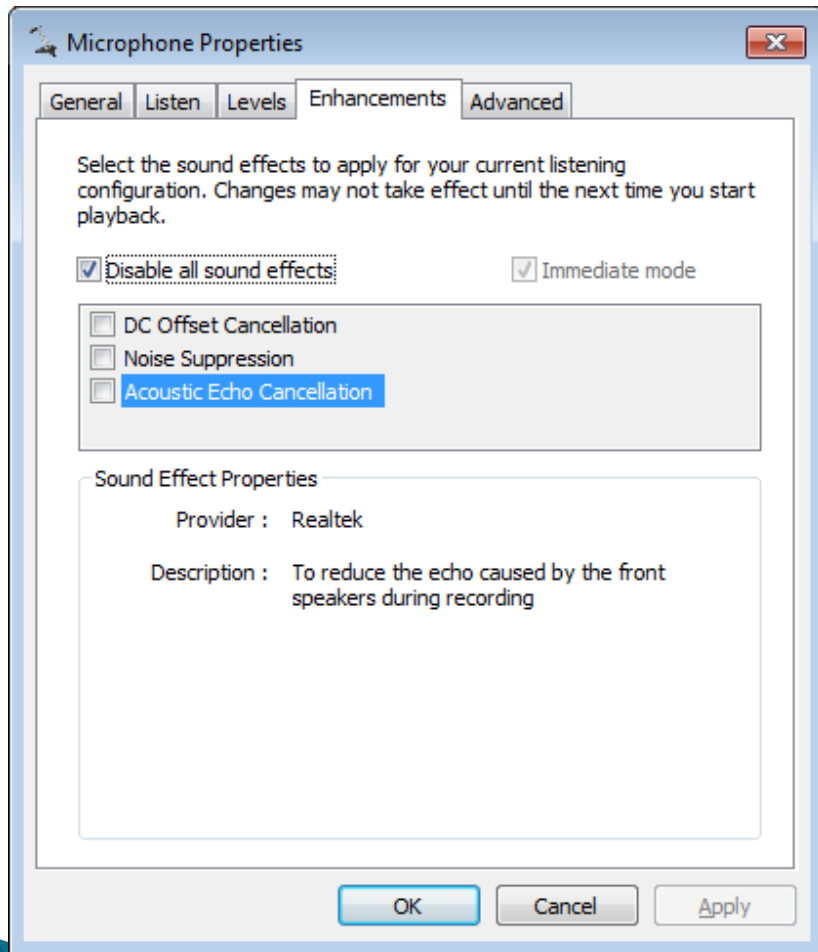


- ▶ Don't have the Speaker/Mic too close
- ▶ Disable speech compression, noise blanking, and all other audio processing
- ▶ Disable any DSP modes on speaker or microphone
- ▶ Reminder: The setup scripts do not automatically save your responses. Go to "Configure" / "Save Config" or you will have to answer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

Turn Off Sound Card Processing

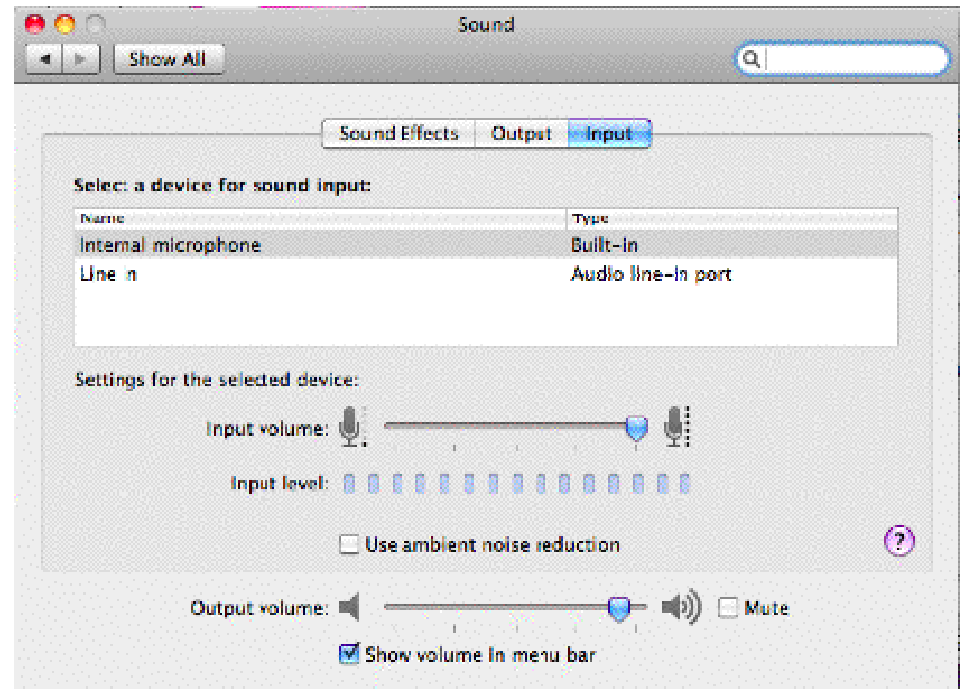
Windows:

Control Panel / Sound / Microphone & Speakers



Mac:

Control Panel / Sound



Links

- ▶ w1hkj.com
- ▶ youtube.com/watch?v=SWZ2vKWSiE
- ▶ arri.org/nbems
- ▶ Norm Thorn
- ▶ K6UU@NOROC.com

