



NBEMS

Narrow Band Emergency Messaging Software



Norm Thorn, K6UU
Diana Feinberg, AI6DF

Copyright 2013 Norman Thorn, K6UU

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....

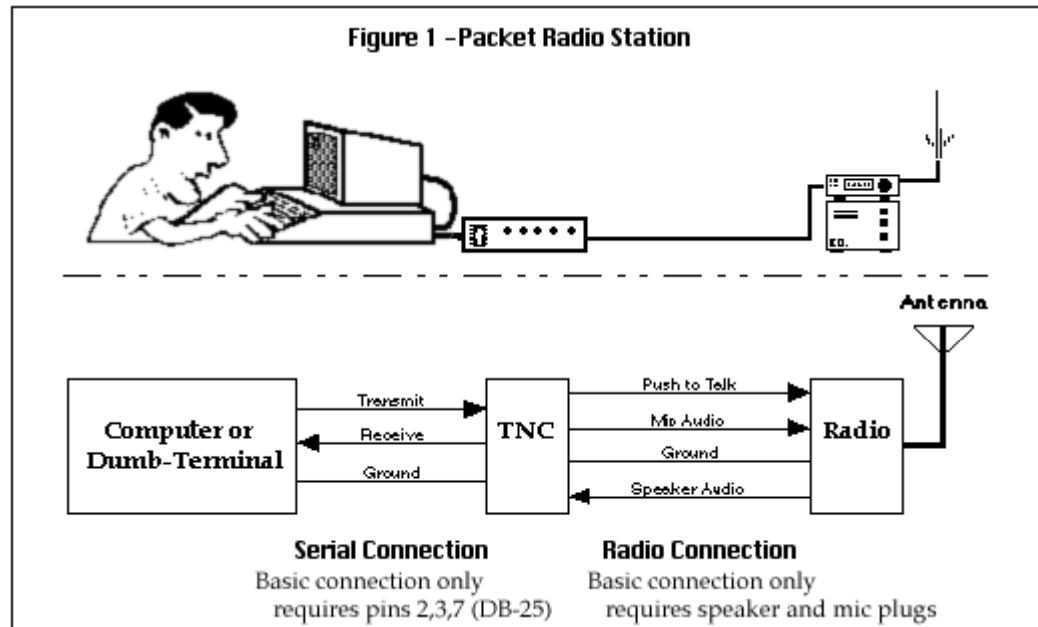
Why Digital Data ?



- ▶ 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

Optional Hardware

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

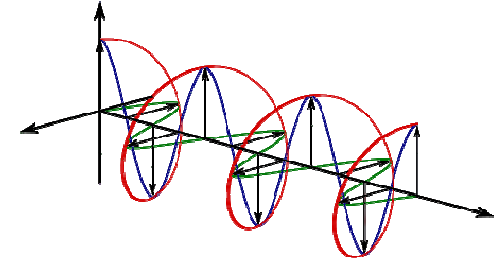


USB

External
Sound Card

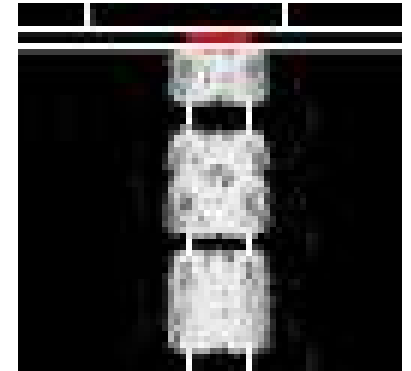
Audio
Link

Components of NBEMS



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

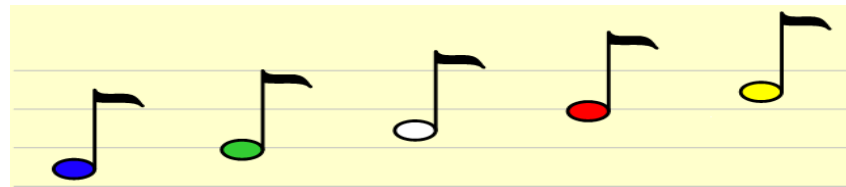
What Is Fldigi ?



- ▶ 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

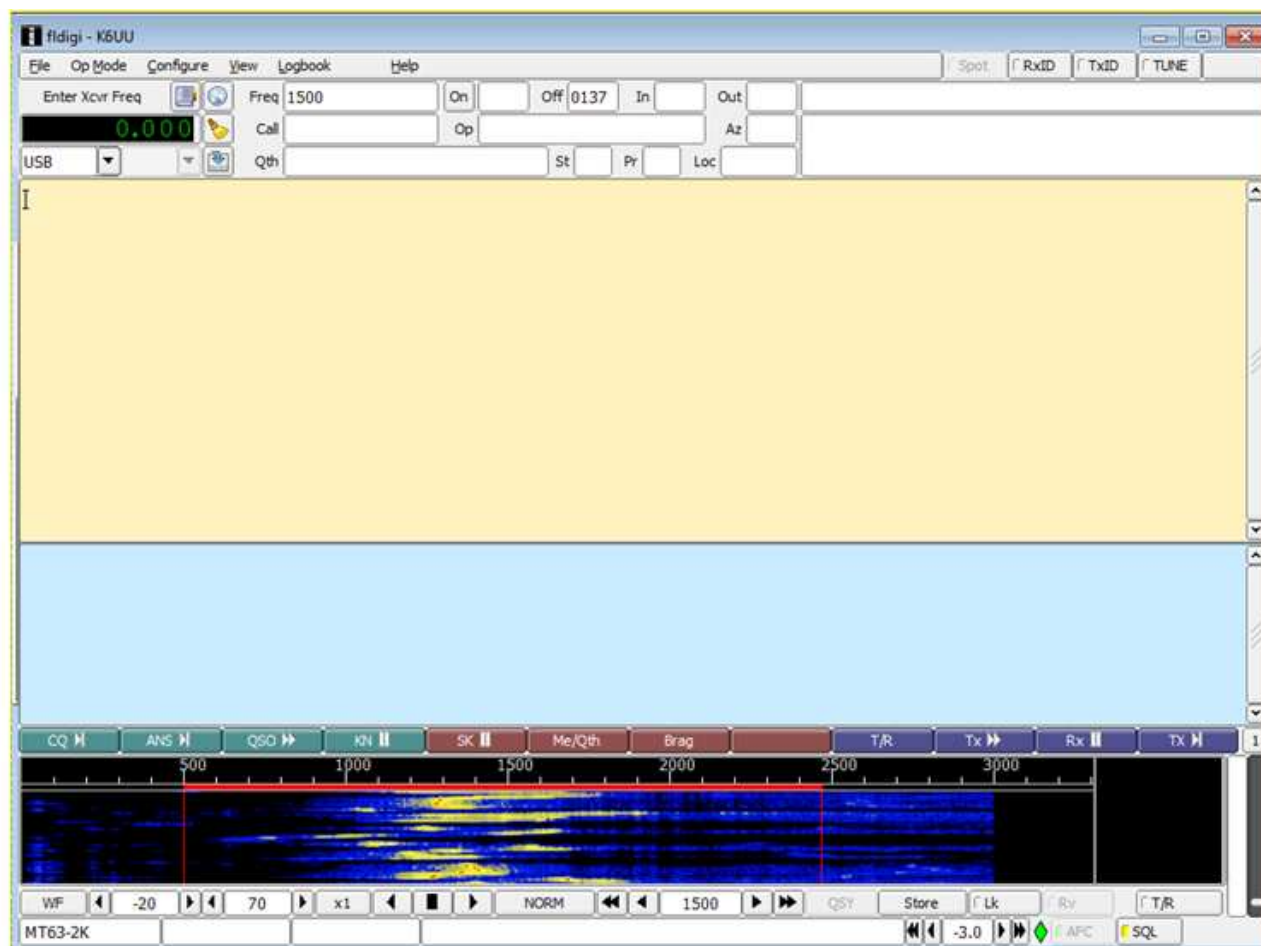
Nbems uses MT-63...

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

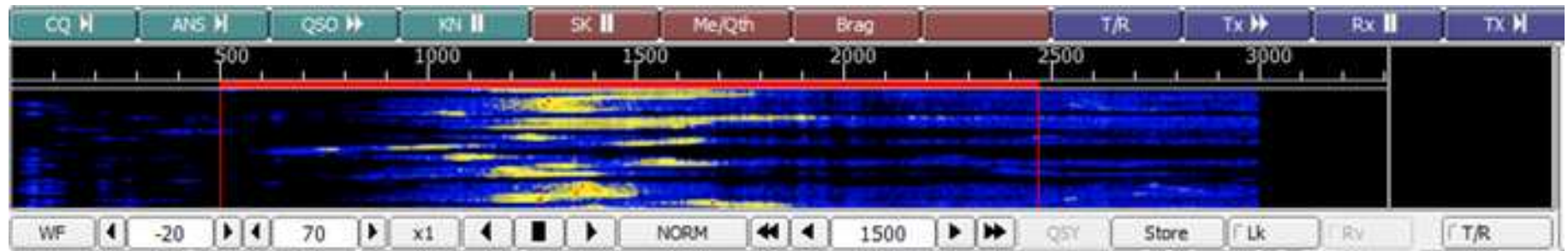
Macro Buttons

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

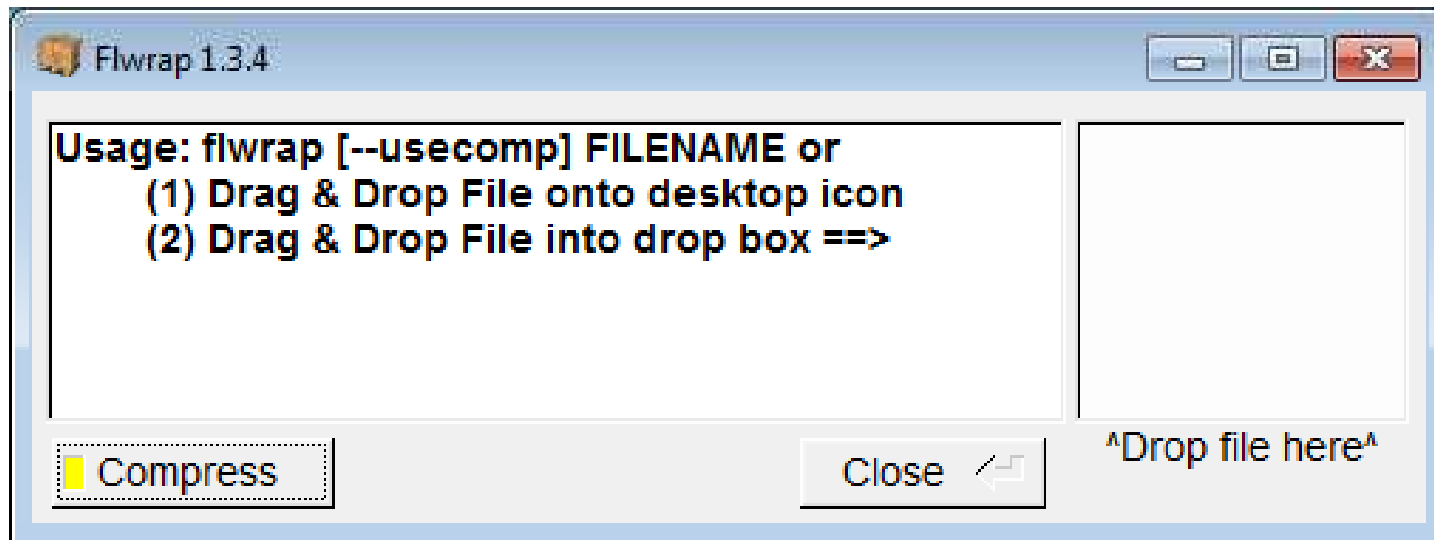


Demo

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

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 ▾

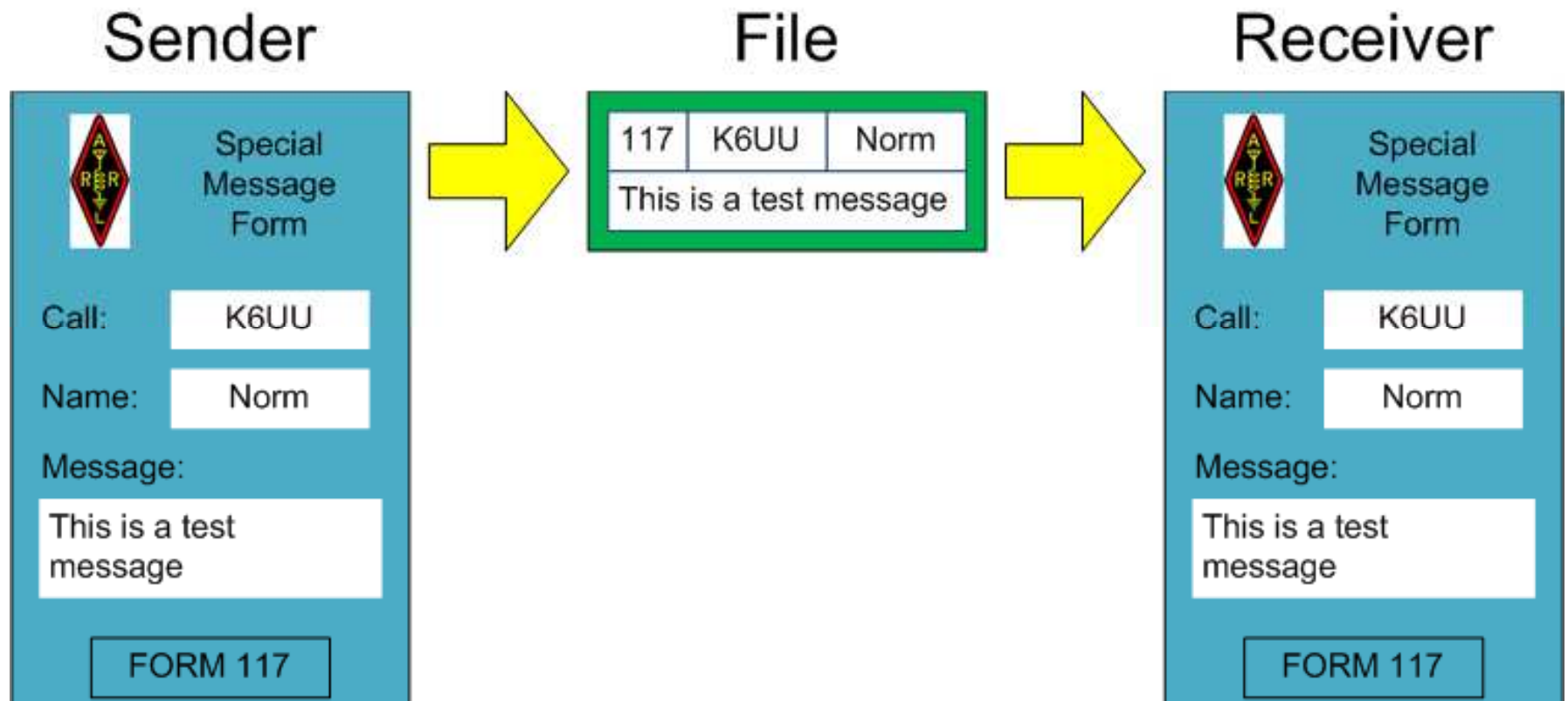
radiogram +

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

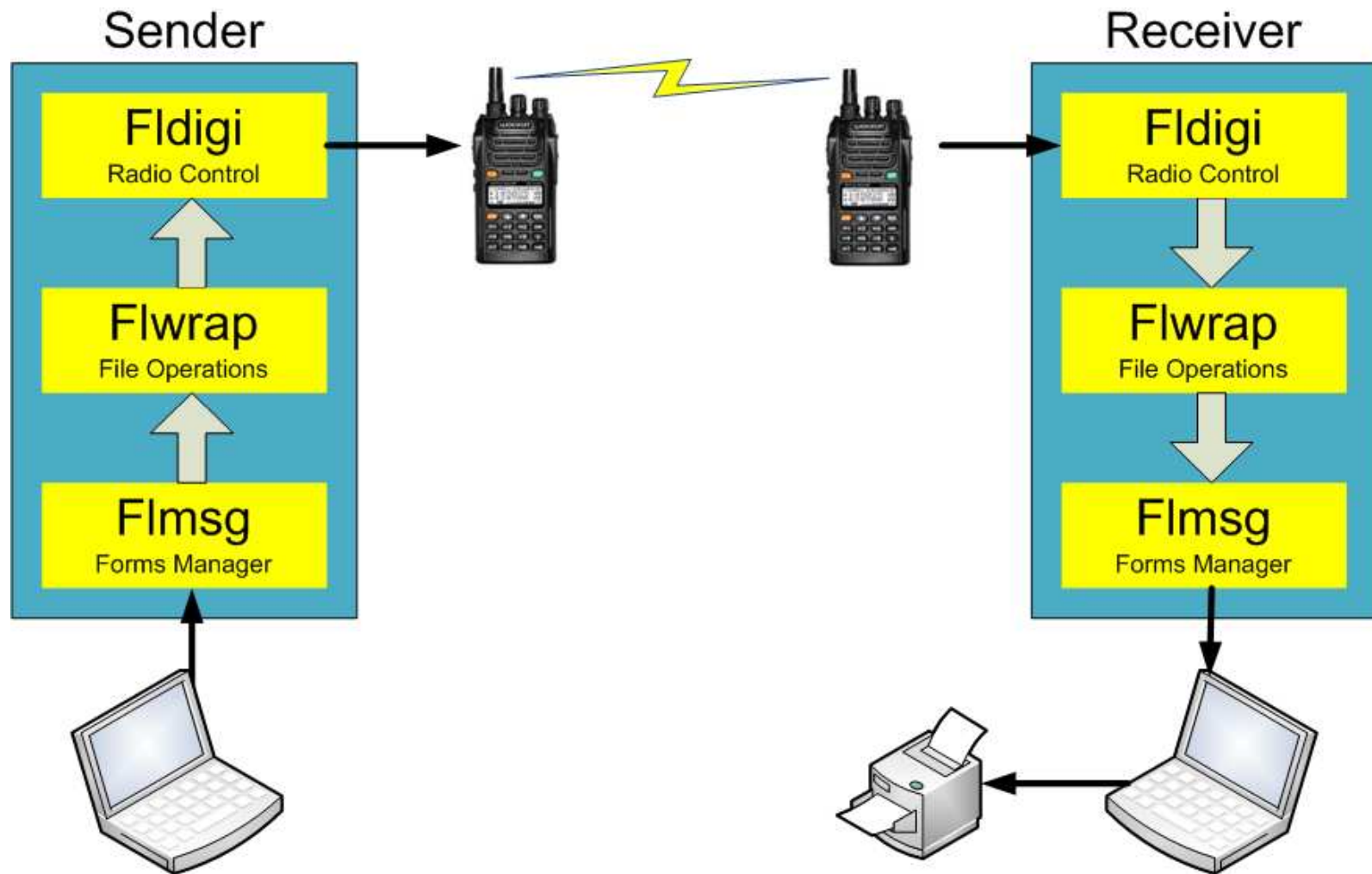
THE AMERICAN RADIO RELAY LEAGUE
RADIOGRAM
VIA AMATEUR RADIO

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

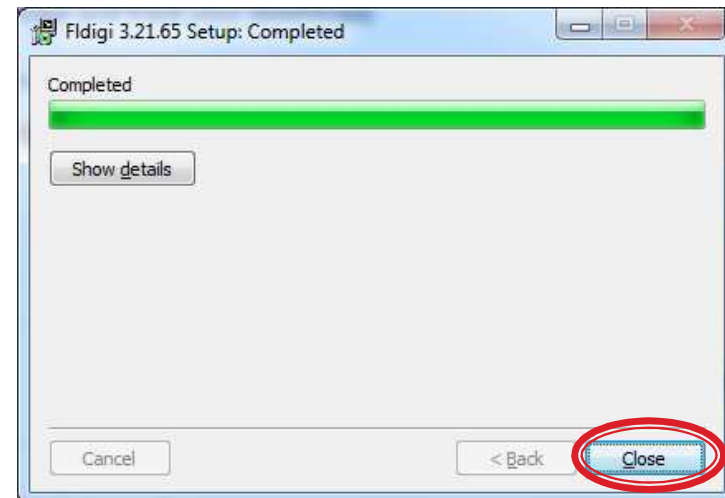
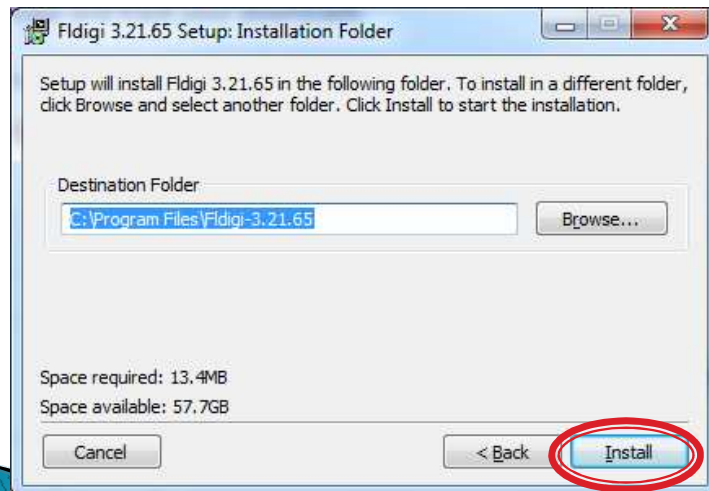
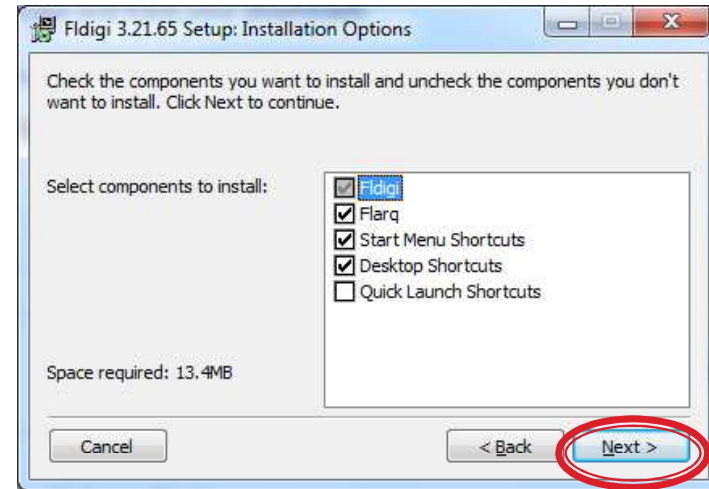
Download page: updated 6 January 2013

	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 fldigi 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'
Fmsg:	fmsg-1.1.29.bin	fmsg-1.1.29.setup	fmsg-1.1.29.dmg	fmsg	fmsg-1.1.29	Fmsg-Help Fmsg-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'
Frig: 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'
Flog:	flog-1.1.6.bin	flog-1.1.6.setup	flog-1.1.6.dmg	flog-1.1.6	flog-1.1.6	flog-help	Maint'

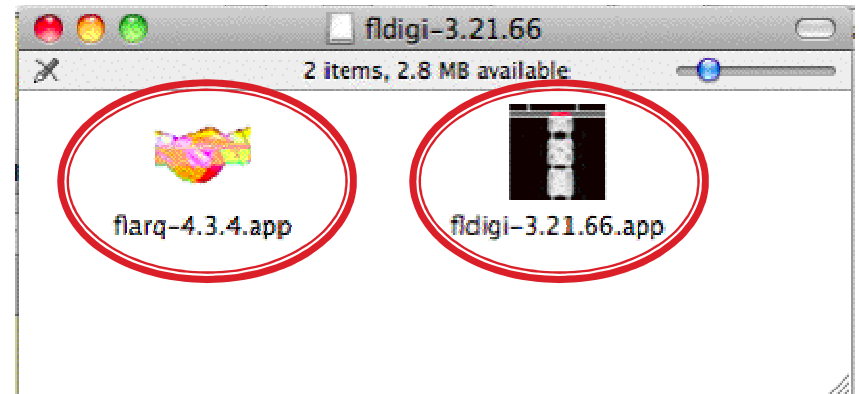
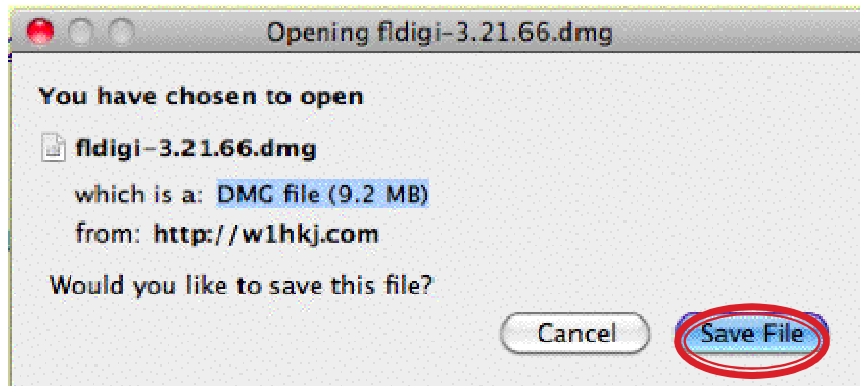
Windows Taskbar: 12:30 PM 1/8/2013

w1hkj.com/download.html

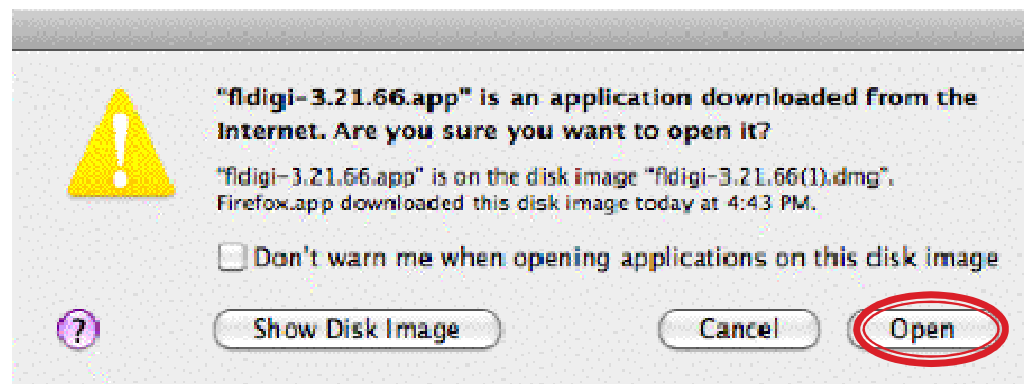
Windows Installation



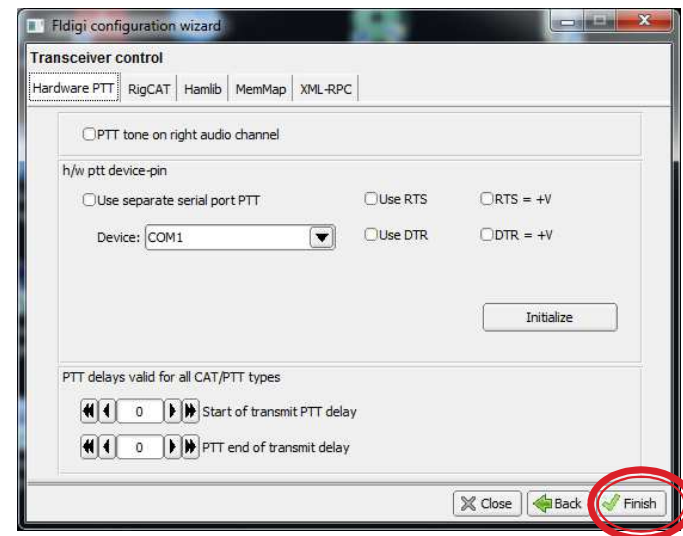
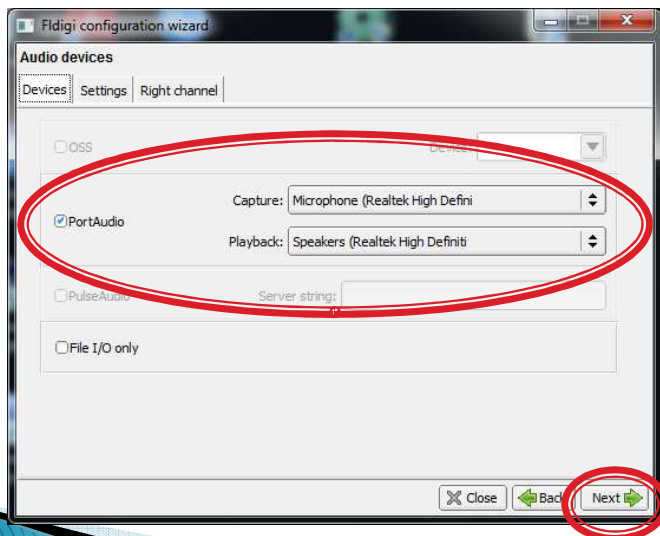
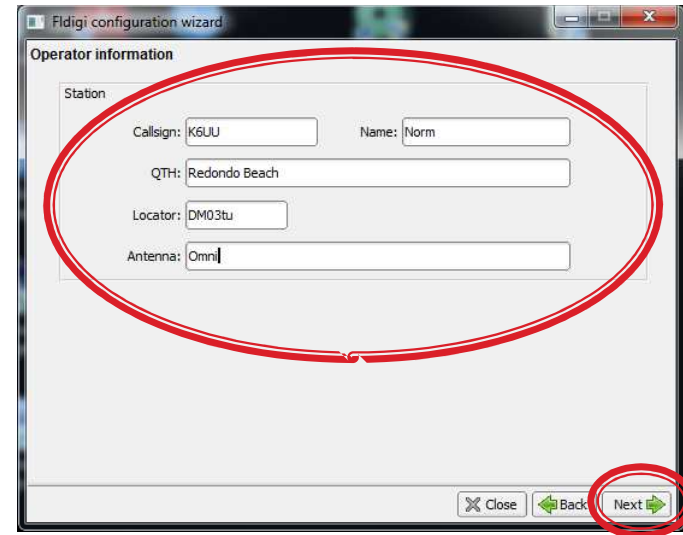
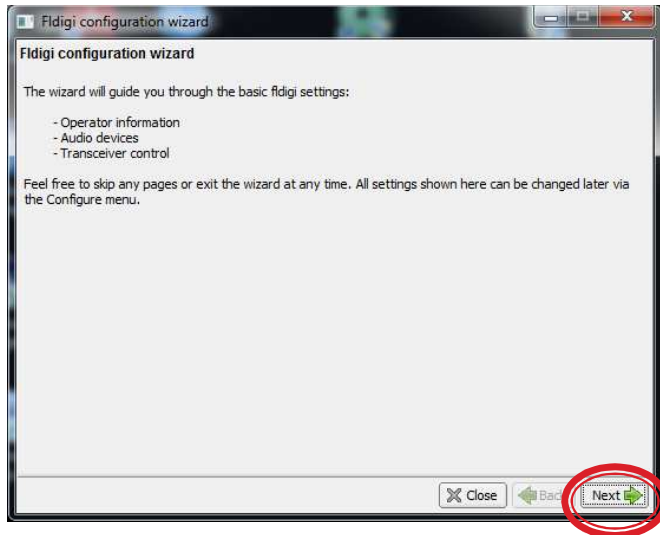
Mac Installation



Move to Applications Folder
Put Shortcut on Desktop

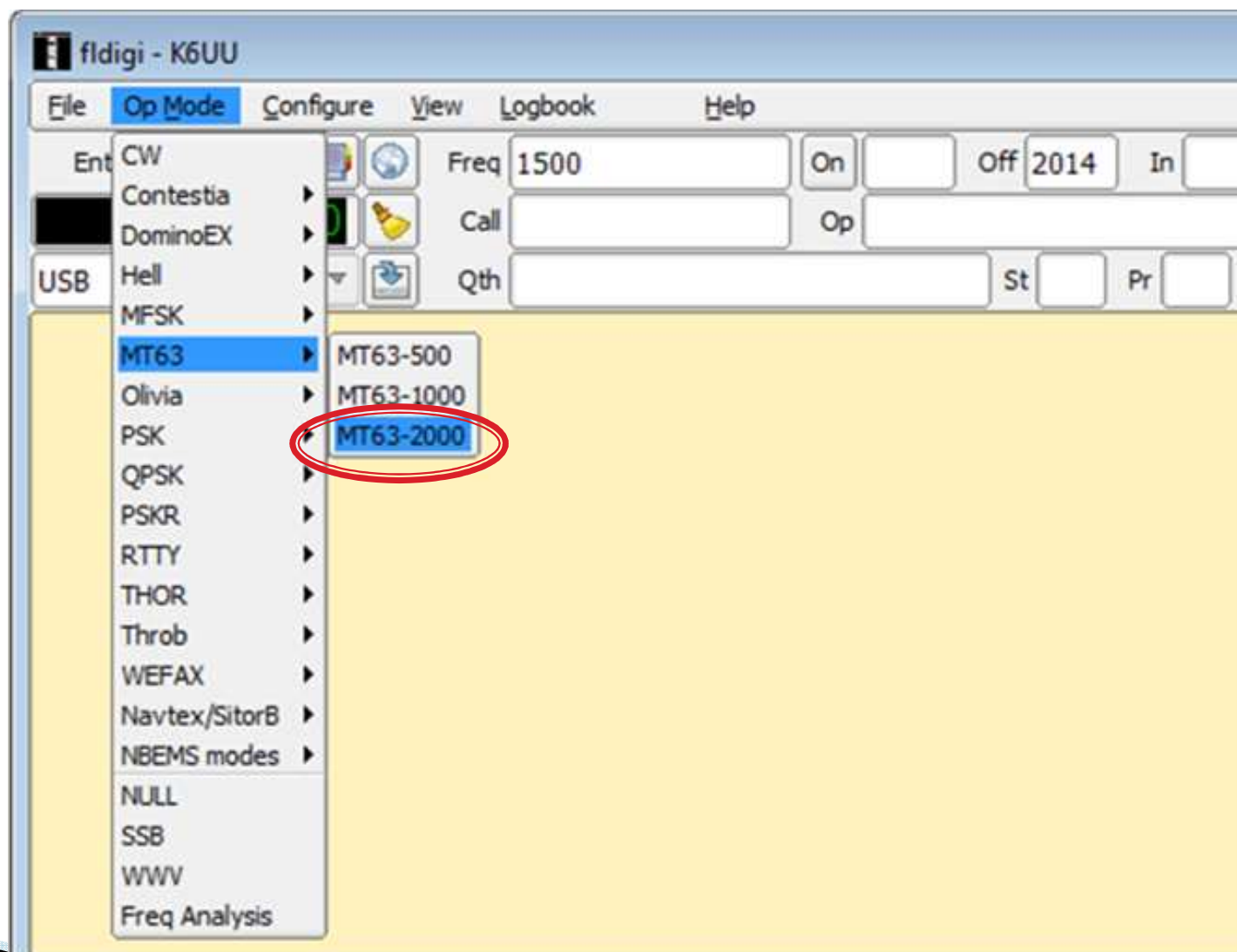


Fldigi Startup (First Time Only)

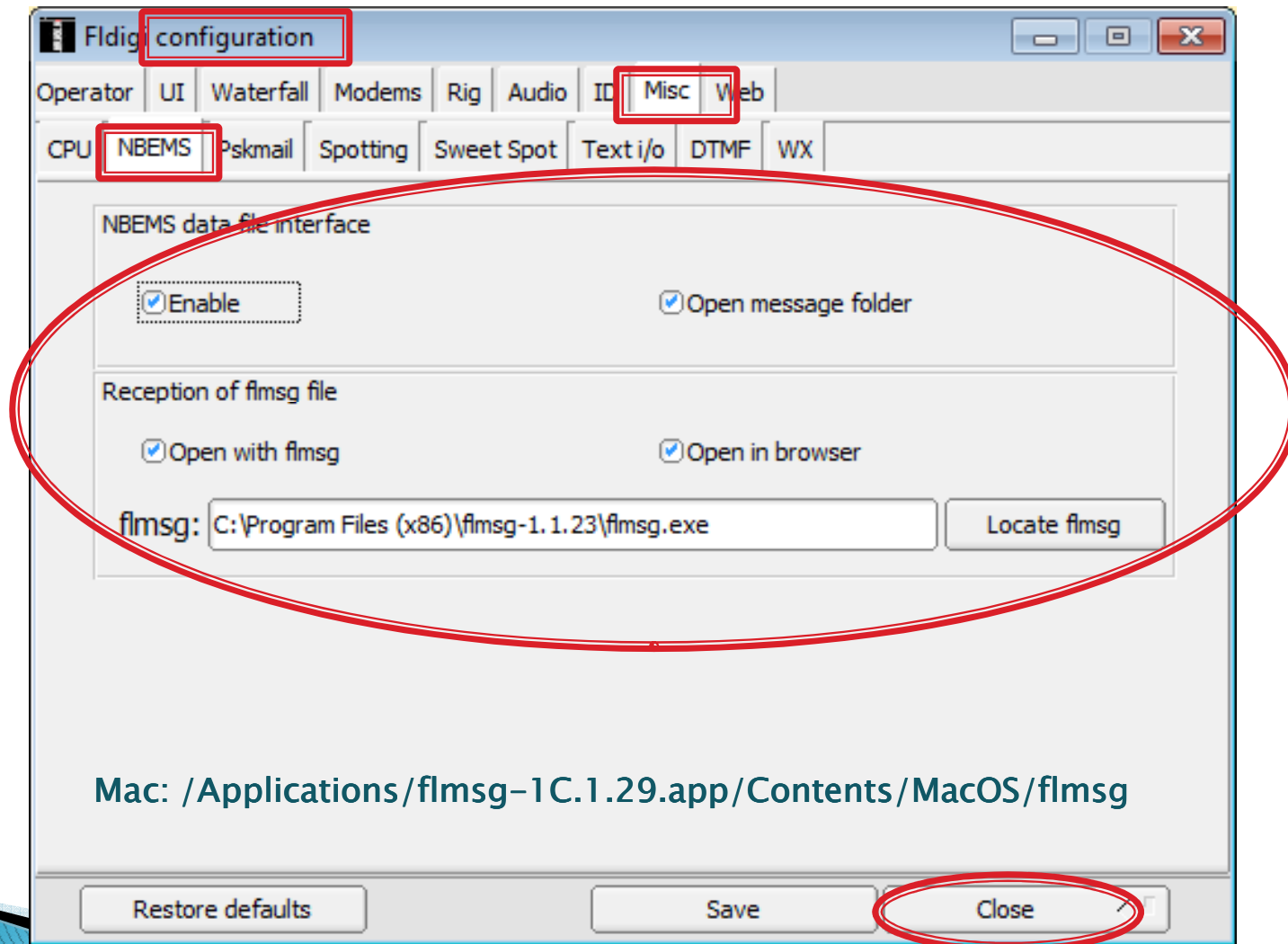


Remember to Save Config !

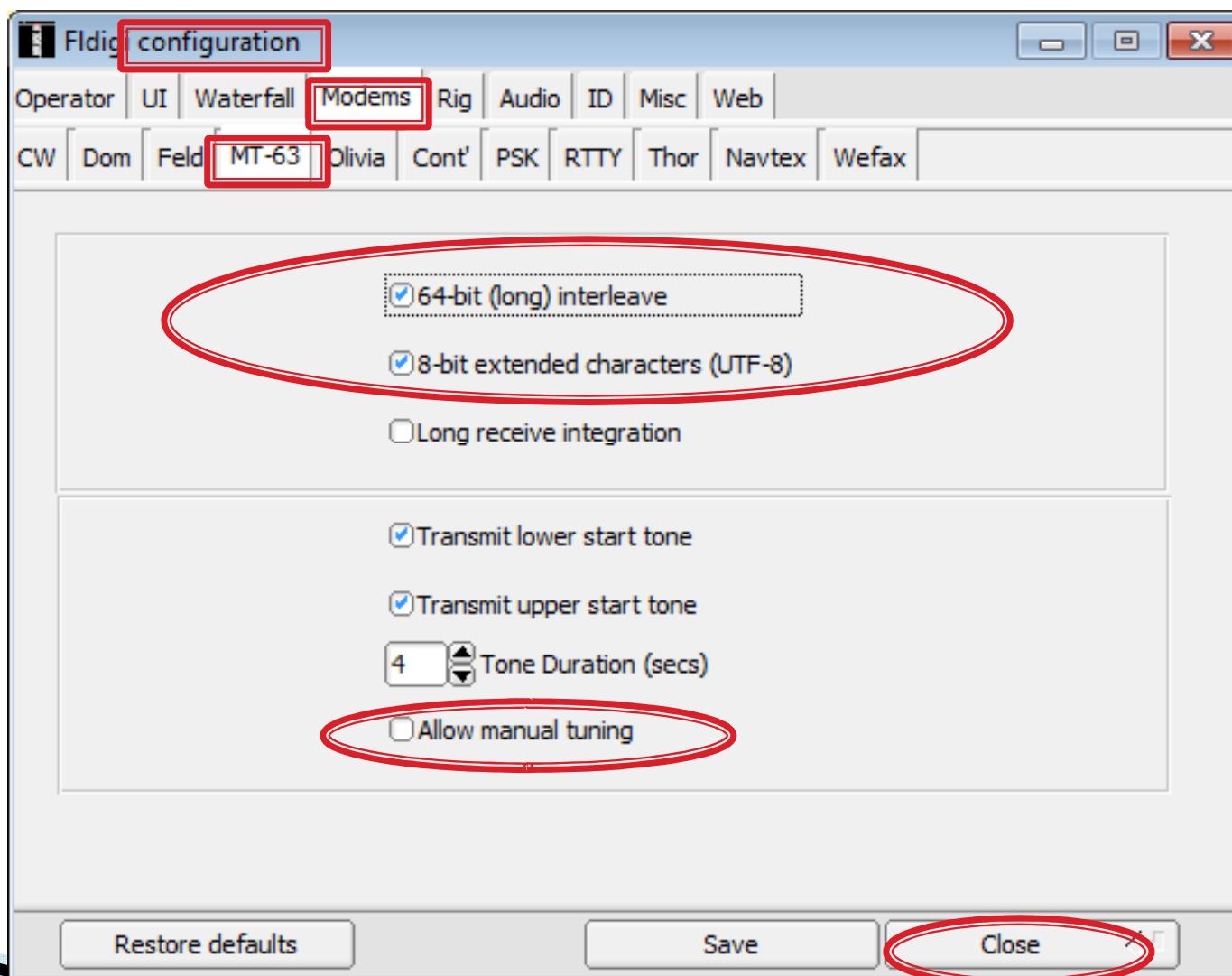
Special Settings for Nbems



Nbems Configuration



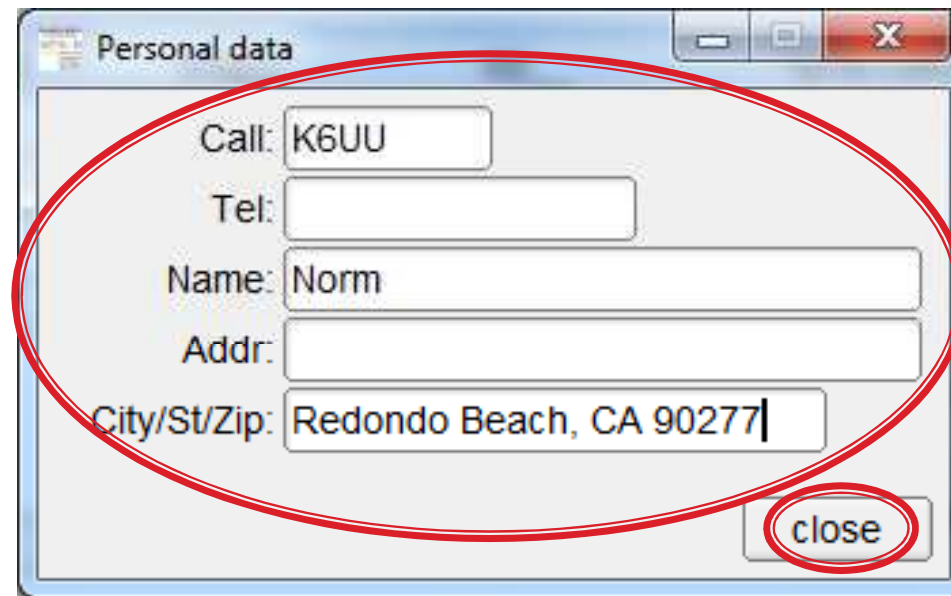
MT-63 Configuration



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 "Call:", "Tel:", "Name:", "Addr:", and "City/St/Zip:" fields, along with the "close" button at the bottom right. The "Call:" field contains the text "K6UU". The "Name:" field contains the text "Norm". The "City/St/Zip:" field contains the text "Redondo Beach, CA 90277". The "close" button is also circled in red.

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

close

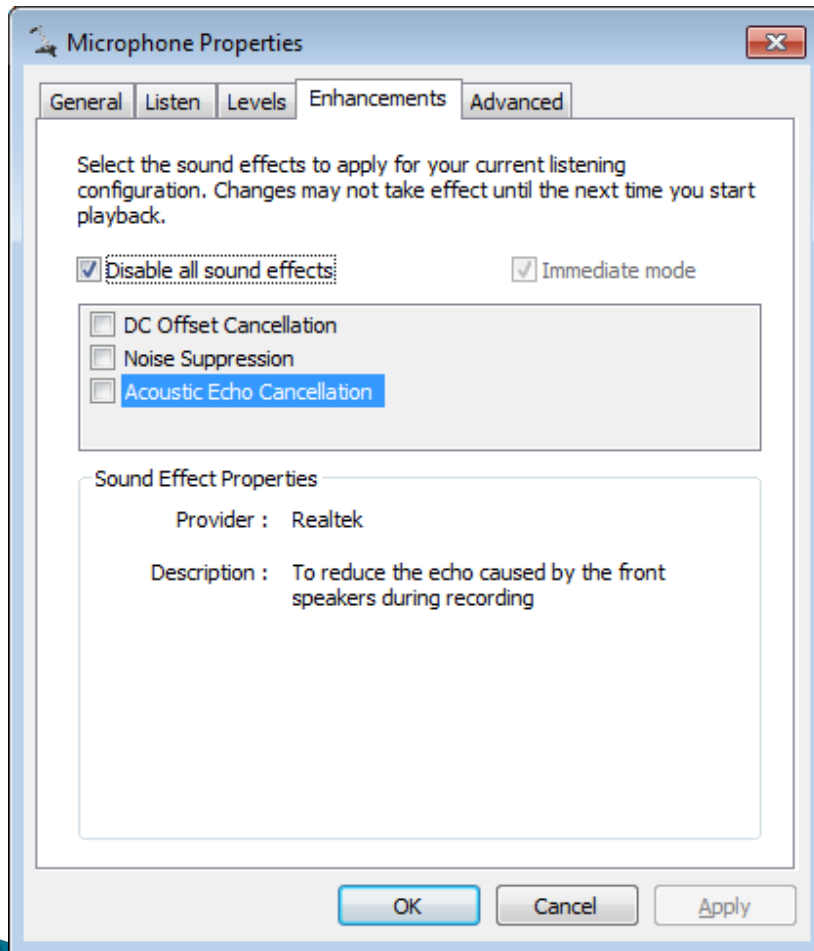


- ▶ Don't have the Speaker/Mic too close
- ▶ Disable speech compression, noise blanking, and all other audio processing
- ▶ Disable any DSP modes on speaker or microphone
- ▶ Reminder: The setup scripts do not automatically save your responses. Go to "Configure" / "Save Config" or you will have to answer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

Turn Off Sound Card Processing

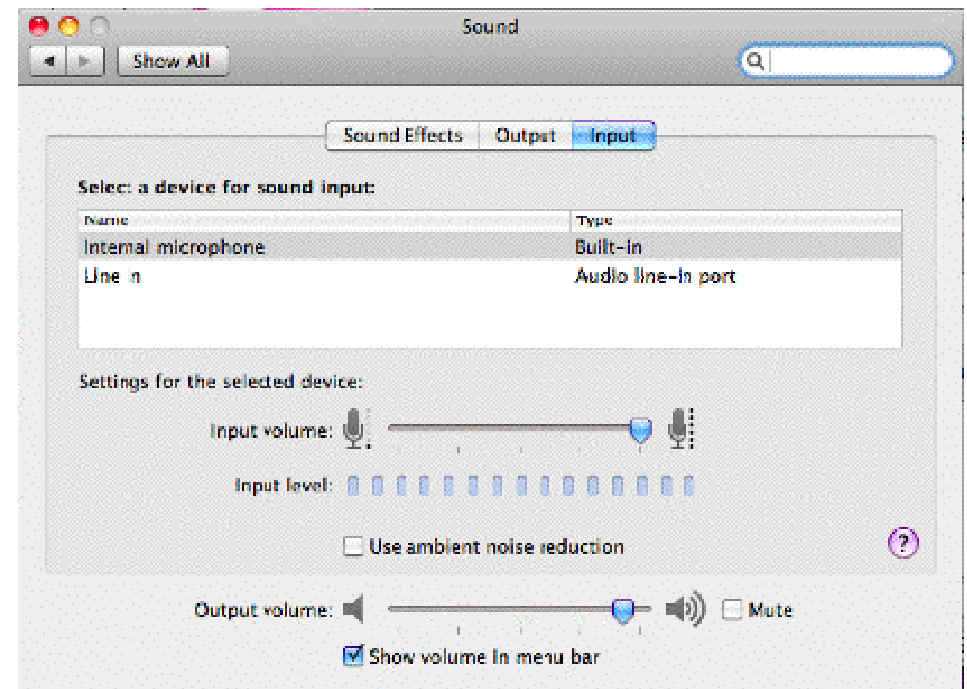
Windows:

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

