

Narrowband Emergency Messaging System (NBEMS)

Deane Bouvier & Diana Feinberg LA County Disaster Communications Service 6 April 2016



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 (Fast Light Digital Modem Software Modem Emulation)
 - FLWRAP (Fast Light Wrapper File Encapsulation)
 - FLMSG (Fast Light 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



- 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: <u>http://sourceforge.net/projects/fldigi/files/</u> (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



- 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 Main Window





FLDIGI Configuration

Fldigi configuration	×	Fldigi configuration
Operator UI Waterfall Modems Rig Audio ID Misc Web Autostart IO		Operator UI Waterfall Modems Rig Audio ID Misc Web Autostart IO
Station		CW Dom Feld FSQ IFKP MT-63 Oliv Cont PSK TTY Thor Nav WFx Scan
Callsign: N5DQ Name: Deane Bouvier		(2) 8-bit extended characters () (TE-8)
QTH: Torrance, California		Construction of the second se
Antenna:		Transmit lawar start tone
		 Transmit upper start tone
		3 💭 Tone Duration (secs)
		O Allow manual tuning
Restore defaults Save Close		Restore defaults Save Close /

- Operator
 - Enter your information

- MT-63 modem
 - 4 check boxes

After each configuration change click save



FLDIGI Configuration

Fldigi configuration		Fldigi configuration	X
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Ooss Device:		NBEMS data file interface Image: Comparison of the interface Image: Comparison of the intering interintering	lder
Capture: Microphone (Realtek High Defini Playback: Speakers / Headphones (Realtek		Reception of fimsg files COpen with fimsg COpen in browser	
OPulseAudio Server string:		fimsg: C:\Program Files (x86)\fimsg-2.0.12\fimsg.exe	Locate fimsg
⊖File I/O only		2.0	Timeout (secs)
Restore defaults Save	Close <	Restore defaults Save	Close <

- 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

Microphone Properties	Speakers / Headphones Properties
General Listen Levels Enhancements Advanced	General Levels Enhancements Advanced
Select the sound effects to apply for your current listening configuration. Changes may not take effect until the next time you start playback.	Select the sound effects to apply for your current listening configuration. Changes may not take effect until the next time you start playback.
☑ Immediate mode	Immediate mode
DC Offset Cancellation Noise Suppression Microphone Focus Echo Cancellation Sound Effect Properties Provider : Realtek Description : DC Offset Cancellation makes input signal operated at the right level.	Environment Voice Cancellation Pitch Shift Equalizer Sound Effect Properties Provider : Realtek Description : Simulates multiple playback environments. Setting : Generic
OK Cancel Apply	OK Cancel Apply



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

Op Mode MT63 2KL

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	DEK		MT6	3-300L 3-1000S																	
	OPSK	1	MT6	3-1000L																	
	SPCK	1	MT63	3-2000S																	
	PSKR	- (MT63	3-2000L																	
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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







Configure FLMSG

	FLMSG: 2.0.12									
<u> </u>	le F <u>o</u> rm <u>T</u> e	mplate	Config	AutoSend	Help					
ICS	ICS-213 report file: new.213									
Or	Originator Responder									
r										
	fimsg config									
	Personal Da	ate/Time	Files Rad	liogram Socke	et					
s	Call:	N5DQ								
м	Tel:	310-540	0-1636							
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	City/St/Zip:									
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- Config personal data
- Set the date time format

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Sub.								
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	mp ba	ase64	MT63-	2KL	•			

• 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

Fldigi configuration		
Operator UI Waterfall Modems Rig Audio ID Misc We	b Autostart IO	
RsID Video CW		
CW Postamble ID		
✓Transmit callsign	CW ID r	modes
Speed (WPM):		
Restore defaults	Save	Close



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

Monitor Transmit Signal

Fldigi co	nfiguration										
Operator U	II Waterfall Modems	Rig Audio ID Misc	Web Autostart IO								
Display FFT	Display FFT Processing Mouse										
Co	Colors and cursors default.pal										
				Load Save							
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0	ON	⊘ON	⊘ ON								
	Color	Color	Color	Color							
0	Wide	○Wide	○Wide								
Fre	equency scale										
6	Always show audio fre	equencies	Font								
Tra	Transmit signal										
Monitor transmitted signal											
Rest	ore defaults		Save	Close <							



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





Questions/Comments?