

Narrow Band Emergency Messaging System (NBEMS): Fldigi, Flmsg, Flamp

**Prepared for the Midcoast Maine
Amateur Radio Emcomm Groups**

Narrow Band Emergency Messaging System (NBEMS): Fldigi, Flmsg, Flamp

- Contents -

Introduction

Section 1: Fldigi Installation & Configuration

- Hardware
- Downloading and Installing the Fldigi NBEMS software
- Configuring Fldigi
- Testing Fldigi

Section 2: Navigating the Fldigi Screen

Section 3: Introduction to Flmsg

Section 4: Using the Flmsg ICS 213 Form: preparing, transmitting, receiving and replying

Section 5: Using the Flmsg Spreadsheet Form

Section 6: Sending Flmsg Files with RMS Express or via Email

Section 7: Flmsg Custom HTML Forms

Section 8: Flmsg “Agency” GUI

Section 9: Introduction to Flamp

Section 10: Configuring Flamp

Section 11: Sending a File with Flamp

Section 12: Receiving a File with Flamp

Section 13: Flamp “Digipeater” (Relay) Function

Addendum: HF Operation

Introduction

This document is divided into several sections. Section 1 covers the basic installation process for the NBEMS suite of software. Section 2 describes the key features of the Fldigi screen. Later sections cover the use of the NBEMS messaging and file transfer applications, Flmsg and Flamp. These are discussed in terms of VHF and UHF operations. A final addendum briefly discusses the differences in operation when using NBEMS on HF.

While there are many uses for the NBEMS software, this document will only cover the specific applications and procedures that are commonly used in amateur radio emcomm applications. The document is tailored to the practices of the Midcoast NBEMS VHF net.

Beyond studying the contents of this document, you will find that practice is essential. Participate regularly in NBEMS nets such as the Midcoast NBEMS Net and encourage your emcomm group to use NBEMS regularly in their exercises.

The primary resource for the NBEMS software is the program authors' site *Software by W1HKJ & Associates* at <http://w1hkj.com/>

Note: this document is an update of the NBEMS Quick Start which was written in 2014 with updates for Maine ARES in 2015. That predates the flmsg custom forms and "Agency" GUI features. Details on these will be added to this document.

No simple guide can cover everything. However, if you see any errors in this document or areas that could be clarified, please let the author know.

Section 1: Fldigi Installation & Configuration

Fldigi is a modem program that converts text to tones that may be transmitted in the audio passband of a radio. It can work by itself for keyboard to keyboard QSOs or with other applications for sending formalized forms and files. A wide variety of modes are available. Emergency communications relies on modes that have error correction and good to excellent resistance to interference such as static. Preferred modes are discussed later in this document.

Hardware

The hardware used for NBEMS consists of a computer (Windows 7 or later, Linux or Mac OS-X), a radio with data port and a sound card interface. The Signalink is the most common interface. Signalinks are personalized by radio type with a variety of radio cables and the wiring of an internal header with jumper wires. Many radios have 6 pin mini-DIN connectors and any unit that is configured for a radio with a 6 pin mini-DIN data port (e.g. Kenwood TM-D710) may be used with any other radio with the same connector. Further information on configuring the Signalink USB may be found at <http://tigertronics.com>.

Downloading and Installing the Fldigi NBEMS software

The following assumes the Windows operating system and a Signalink USB interface.

- Go to <http://w1hkj.com/> There you will find a listing of the software along with the associated Help documents.
- Download the Windows versions of Fldigi/Flarq (they come together), Flmsg and Flamp.
- When you begin the download you can select “Run” or “Save.” Select “Run” and the software will install with the defaults. When installing Fldigi, unselect Flarq as this application is not required for our purposes at this time.
- If you are installing from saved files, just click on the downloaded files to begin the installation process.

Configuring Fldigi

- Upon install you should get several screens in which to enter your personal data (call sign, name, QTH, grid locator). For the county equipment you will use the group’s call sign and related information. Only the call sign is required. If you skip this on install you can do it later. Open Fldigi, go to Configure-Operator and enter your information. Click “Save” and “Close.”
- Set your sound card information. You will be using the Signalink’s internal soundcard, not the computer’s internal sound device. On the Fldigi screen go to Configure – Sound Card – Devices tab and under “Port Audio” select “USB Audio CODEC.” Now click the Settings tab and click the drop down box for both capture and playback and select the sample rate that has the word "native" next to it. Click “Save,” then “Close.”
- On the Fldigi screen go to Configure – Waterfall – Display tab and select “Always show audio frequencies.” Click “Save,” then “Close.”
- On the Fldigi screen go to Configure – Misc – NBEMS. You will see the screen shown below. The settings shown will couple Fldigi to Flmsg, show the message folder upon receipt of a Flmsg file, will open the Flmsg form and will also display the message as a printable browser screen. You must tell Fldigi where flmsg.exe is located. Do this through the “Locate flmsg” function. Flmsg will be in your C:\Program Files directory.

Testing Fldigi

The following steps are performed with the computer connected to the Signalink USB interface. The Signalink should be turned on and the radio, if connected, turned off.

- Go to the computer's sound controls and open the Playback controls. Select the USB Device (USB Audio CODEC) – Playback. Set the Speaker slider at about 90% and the Wave at a little over 50%.
- On the Fldigi screen, press the Tune button at the upper right. You should see a marker on the waterfall at the center frequency and the Signalink's Red Transmit (PTT) light should come on.
- All subsequent audio adjustments are made with the Signalink's Tx, Rx and Delay knobs. Starting settings are between 9:00 and 12:00 for the Tx and Rx, about 09:00 for the Delay.

To verify operation, you should work with another station with the same equipment. The primary test for VHF/UHF operation is that the received signal as displayed on the waterfall should be well defined with no "splatter." Splattering indicates that the transmitter's modulator is being overdriven. If this is the case, back off the Signalink's Tx knob in small increments to clean the signal up. If the display is faint, increase the Tx level in small increments.

In general, use with a VHF/UHF radio is very forgiving.

Section 2: Navigating the Fldigi Screen

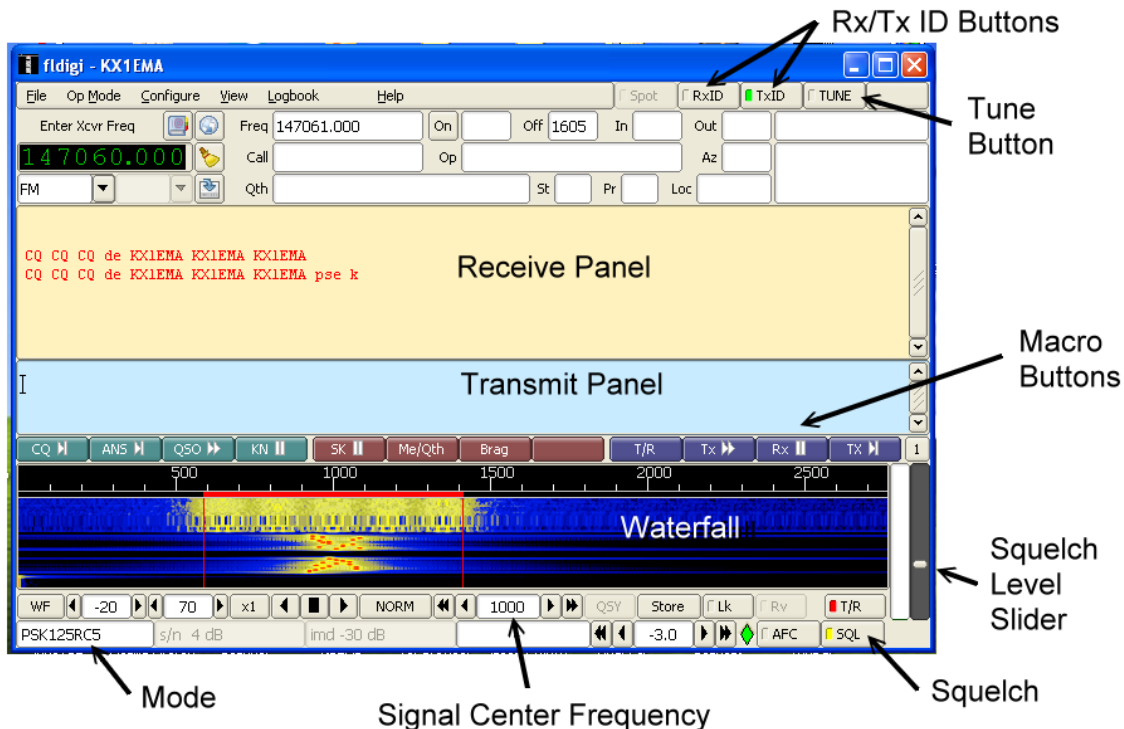
When used with Flmsg or Flamp, the Fldigi application is used minimally by the operator. However, it is important to understand the layout and functionality of the Fldigi screen:

- The waterfall displays signal strength across the radio's audio passband. You have to set the center frequency by clicking on the waterfall and/or using the fine adjustments. The waterfall also allows the operator to discern good from poor signals.
- Rx and Tx IDs are useful in situations where the modes may change frequently. However, with VHF/UHF communications where digital and voice communications can be mixed, it is more convenient for the transmitting station to just announce by voice the mode and center.
- The software squelch should be enabled for VHF/UHF to avoid the generation of random characters ("diddle") on the Receive Panel.
- The Tune button generates a tone at the center frequency. This is used for adjustments and also to compensate for slight tuning errors.
- There are many other features but these are generally used for non-emcomm ham applications (e.g. logging, call sign lookups, rig control interfaces, etc.) and for HF use.

The Fldigi screen is shown on the next page along with labels for the functions of interest. All NBEMS applications have helps that are actuated by simply mousing over the various buttons and displays. Right clicking on the Receive and Transmit Panels will bring up several menus.

For familiarization, with the radio off:

- Select the VHF mode. The figure shows PSK125RC5 (also called 5xPSK125R). Go to Op Mode – PSKR – Multicarrier – 5xPSK125R. Click on the waterfall at 1000 Hz to set the center frequency of the transmitted signal. A set of red lines will appear at the frequency boundaries of the signal. These lines will be centered on 1000 Hz.
 - Note: Our preferred mode when used in good conditions is PSK250RC5. Additionally, 1500 Hz is the default center frequency.
- Click on the left-most macro button. This is labeled “CQ.” You will hear the somewhat raucous sound of PSK125RC5 and the “CQ” message will appear in the Receive Panel. (See figure below).



The figure above shows the fldigi screen and the key features that an operator would use. The Receive Panel shows all received text. Text to be transmitted may be typed in the Transmit Panel. The waterfall shows the audio passband of the radio. Each station has to use a common transmit center frequency. Clicking on the waterfall (audio spectrum display) at the desired location sets this. Adjustments may be made with the up/down arrows to the side of the center frequency display at the bottom/center. For VHF/UHF use with FM transmitters the squelch should be switched on. The squelch level is set with the slider at the lower right.

- The main part of the signal (the part that's transmitting the data) is the wide part in the waterfall. The narrower signal preceding the data is the TxID. This identifies the mode to the receiving station. Clicking the TxID button at the top of the screen enables this feature.
- The Tune button is used to send out a single tone at the center frequency. This is used to check signal quality during set up and also for receiving stations to adjust for slight tuning errors.
- The mode being used shows up at the lower left.

- The macro buttons contain “canned” text like the CQ shown. The right set of macros (blue buttons) serve to control the transmit and receive functions.

If the receiving station is aware of the sender’s mode, the RxID is generally not turned on. If the sending operator is changing modes the receiving station will change modes according to the TxID. For VHF/UHF operation it is more efficient for the transmitting operator to announce by voice that the transmission will be made using a particular mode at a specific frequency.

The preferred VHF/UHF operating modes are shown in the following table. The table includes the data speed in words per minute (wpm), bandwidth and brief notes on use.

Mode	WPM	Bandwidth (Hz)	Notes
PSK250RC5	1100	1650	Primary VHF/UHF mode
PSK125RC5	440	825	First fallback VHF/UHF mode
8PSK1000F	3300	1000	Fast transfers under very good signal conditions
MT63-2000L	200	2000	Heavily error corrected for poorer conditions

Section 3: Introduction to Flmsg

Overview

Flmsg is a complete message composition system that includes ICS and Radiogram forms along with generic and blank forms. It includes the Flwrap checksum functionality and can be used to transmit spreadsheets in .csv (comma separated values) format. Incoming messages are automatically saved to a file directory. When properly configured, transmitted files are automatically opened in the Flmsg form window and/or in printer ready html format in your browser window.

Flmsg has the following message formats:

ICS 203, 205, 205A, 206, 213, 214, 216,3 09
ARRL/RRI Radiogram
Plaintext
Blank
Spreadsheet (csv format)

In addition there are HICS, Red Cross, IARU, MARS and weather reporting forms. The Red Cross and MARS forms are outdated and should not be used.

Messages that are created are text files but each has a file extension that is associated with the type of form in use. For example, the ICS 213 has the file extension .213

Pre-prepared Flmsg text files may be imported into Flmsg via the Drag and Drop (DnD) function. Simply drag the file to the blue dot on the Flmsg form. The forms are generally self explanatory but help notes will appear when you hover your cursor on a blank field.

Files must be plain text. Files such as Word documents (.doc) have formatting and will create files with extraneous characters. Either generate the documents with Notepad or Flmsg or save Word documents as text files.

Flmsg may be used on a separate computer than the one that is connected to the radio. For example, an administrator can prepare a message using Flmsg and then transfer that file to the radio operator via USB memory stick. Likewise, a document prepared in another application may be saved as a text file and then be delivered to the radio operator who uses the DnD function to import a file into Flmsg.

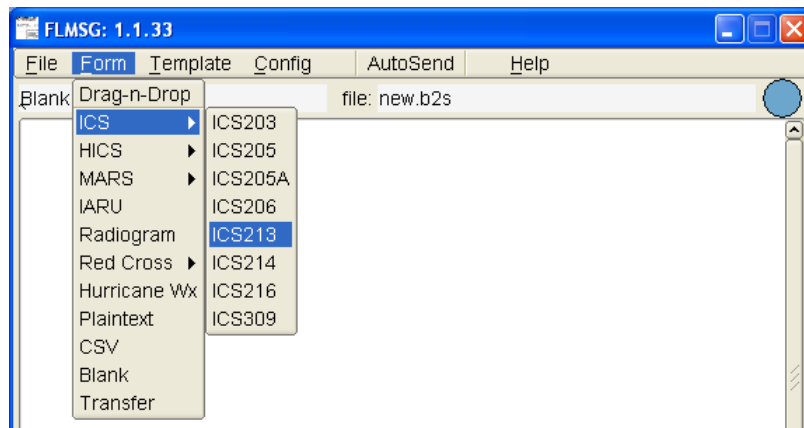
Special templates may be developed and saved using the Template feature. This is useful if there are to be multiple messages with repetitive text.

The following procedure is concerned with the primary form for use in emcomm, the ICS 213. The same procedure is used for the other forms with the exception of the spreadsheet (csv) form. That form will be covered in Section 5.

Section 4. Using the Flmsg ICS 213 form

To compose and send an ICS 213 message with Flmsg:

- If Autostart is not enabled, open Fldigi **before** opening Flmsg. (This sequence ensures that Flmsg will properly communicate with Fldigi.)
- Set the Fldigi squelch “on” to reduce diddle. Turn TxID on. Set the center frequency to 1000 Hz.
- Using the tabs across the top, select the message format that you wish to use. Please note that there are several ICS forms. The figure below shows the selection sequence for the ICS 213.



- Compose your message by filling in the blank fields. Add the date and time stamps. Although these may be typed in manually, clicking the buttons next to these fields will fill them in automatically (be sure that the computer clock is accurate). Note that the ICS 213 has a tab for a reply by the recipient.
- Select the transmission mode (default is PSK250RC5) and whether you want the message to be compressed. Note: only use compression if the file is larger than about 3 kb or if you want to make the file less susceptible to casual eavesdropping. Note that Flmsg will tell you the file size and transmission time.
- Save your file by selecting File – Save As. This will open the default ICS Messages folder.
- A completed form, ready for transmission, is shown on the next page.
- By voice, ensure that your receiving station(s) are ready to copy. Announce over the air “This is <call sign><name>, sending digital traffic, PSK250RC5, 1500 Hz center.”
- To send your message, click “Autosend.” If the form has been changed since the last save, you will be prompted to save again.
- At this point, the transmission sequence will begin. No further action is required except for verifying (by voice) that the message was received correctly.

The screenshot shows the FLMSG: 1.1.33 application window. The title bar includes the application name and standard window controls. The menu bar contains File, Form, Template, Config, AutoSend, and Help. The main area is titled 'JCS-213 report' and 'file: Union.213'. Below this, there are tabs for 'Originator' and 'Responder'. The form fields are as follows:

- To: Scott KB1DSW, Pos: Cushing
- Fm: Ray Sisk KX1EMA, Pos: Knox EMA
- Sub: Deploy trailer to Union
- Date: 2014-02-06, Time: 0824L
- Message:


```

Knox County EMA requests RACES-CERT personnel deploy EMCOMM trailer
to Union Masonic Center located at 149 Sennebec Road in Union to
support ongoing rescue operations for injured PAX of downed acft
NLUC3.

Upon arrival check in with Unified Command (Chief Soule/Warden
Merrifield) and establish comms with Knox EOC on Knox RACES-CERT 2M
Simulcast System freq 147.06 Mhz (+) PL 91.5. Forestry UH1 helo
due to arrive approx. 1030 lcl.

Monitor Ground to air freq 123.8 Mhz for status relay to UC.

Please respond when you reach the location in Union.

Ray Sisk
Knox County EMA
594-5155

```
- Sig: KB1TCE, Pos: Knox EMA
- Encoding: Comp, base128, PSK125RC5, * 1105 bytes / 32 sec

Receiving the Flmsg transmission

Other than ensuring that Fldigi and Flmsg are open and that Fldigi is set for the correct mode and center frequency, nothing is required of the operator.

After receipt, the Flmsg form will appear along with the printable copy in your internet browser.

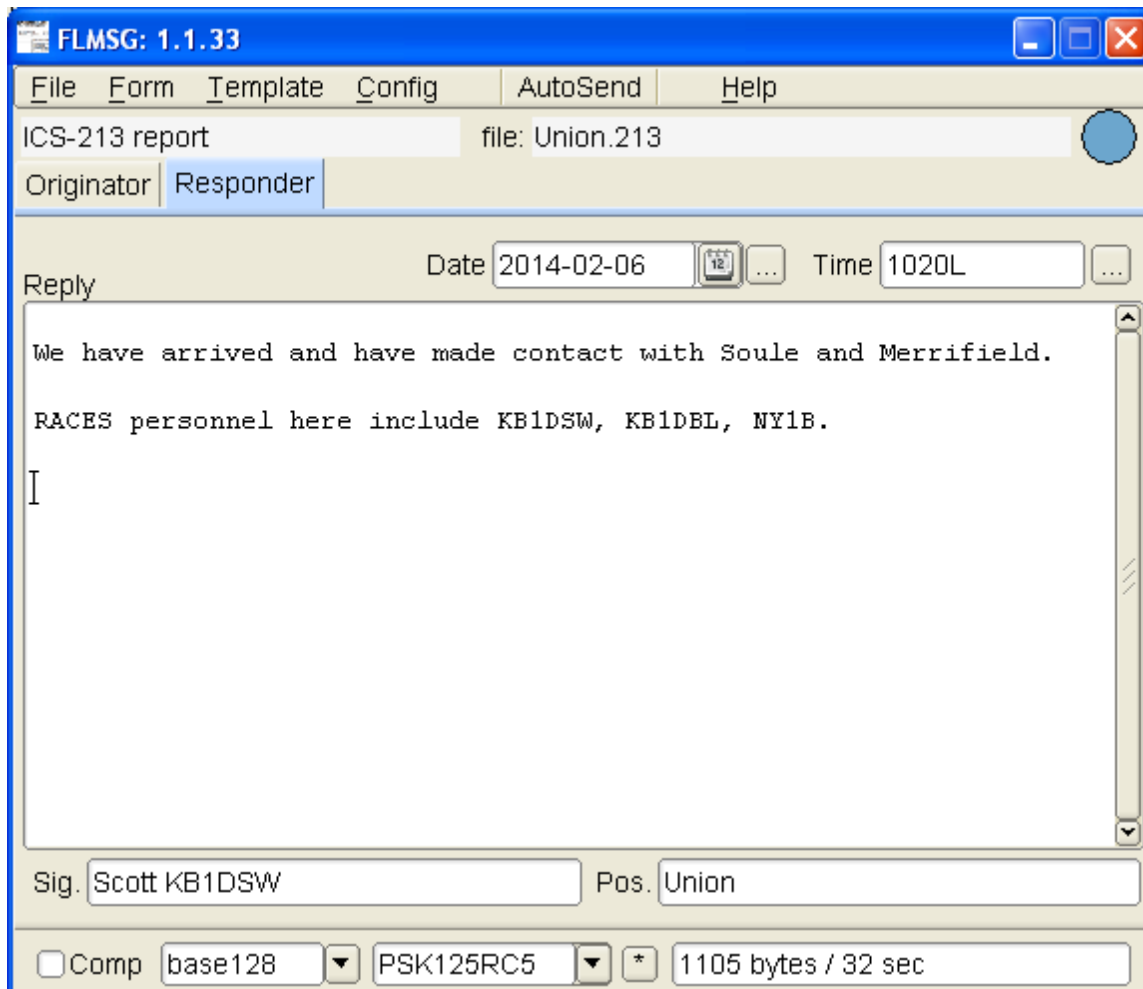
If the check sum does not match (error in transmission), you will get a message that the message was received with errors. You may click to proceed in which case the form will appear. If the message can be interpreted with the errors (e.g. a word or two garbled but understandable) you need go no further. If the message contains critical information such as quantities or other values,

you should request a resend of the message. **If the message was compressed, you will not be able to read any of the message.**

Replying to an ICS 213 Message

- If the message requests a reply, simply click on the “Responder” tab. In the field, type your reply.
- Click to apply date and time and then save the file as described before. Announce your intentions by voice and then transmit by clicking “Autosend.”

The Responder screen is shown below. On the next page is the complete ICS 213 form in printable HTML format.



The screenshot shows the FLMSG 1.1.33 application window. The title bar reads "FLMSG: 1.1.33". The menu bar includes "File", "Form", "Template", "Config", "AutoSend", and "Help". The main window displays "ICS-213 report" and "file: Union.213". Below this, there are two tabs: "Originator" and "Responder", with "Responder" selected. The "Reply" section contains a text area with the following text: "We have arrived and have made contact with Soule and Merrifield. RACES personnel here include KB1DSW, KB1DBL, NY1B." Below the text area, there are fields for "Date" (2014-02-06) and "Time" (1020L). At the bottom, there are fields for "Sig." (Scott KB1DSW) and "Pos." (Union). The bottom status bar shows "Comp" (unchecked), "base128", "PSK125RC5", and "1105 bytes / 32 sec".

GENERAL MESSAGE (ics-213)		
TO: Scott KB1DSW	POSITION: Cushing	
FROM: Ray Sisk KX1EMA	POSITION: Knox EMA	
SUBJ: Deploy trailer to Union	DATE: 2014-02-06	TIME: 0824L
MESSAGE:		
<p>Knox County EMA requests RACES-CERT personnel deploy EMCOMM trailer to Union Masonic Center located at 149 Sennebec Road in Union to support ongoing rescue operations for injured PAX of downed acft NLUC3.</p> <p>Upon arrival check in with Unified Command (Chief Soule/Warden Merrifield) and establish comms with Knox EOC on Knox RACES-CERT 2M Simulcast System freq 147.06 Mhz (+) PL 91.5. Forestry UH1 helo due to arrive approx. 1030 lcl.</p> <p>Monitor Ground to air freq 123.8 Mhz for status relay to UC.</p> <p>Please respond when you reach the location in Union.</p> <p>Ray Sisk Knox County EMA 594-5155</p>		
SIGNATURE: KBITCE	POSITION: Knox EMA	
REPLY:		
<p>We have arrived and have made contact with Soule and Merrifield.</p> <p>RACES personnel here include KB1DSW, KB1DEL, NY1B.</p>		
DATE: 2014-02-06	TIME: 1020L	SIGNATURE/POSITION: Scott KB1DSW / Union

The received text, as it appears on the Fldigi screen, is shown on the next page.

... start
[WRAP:begin][WRAP:from][WRAP:to Union.213]<fmsg>1.1.33
:hdr_fm:22
KX1EMA 20140702182347
:hdr_ed:22
KX1EMA 20140602183648
<ics213>
:to:13 Scott KB1DSW
:p1:7 Cushing
:fm:15 Ray Sisk KX1EMA
:p2:8 Knox EMA
:d1:10 2014-02-06
:t1:5 0824L
:sb:23 Deploy trailer to Union
:s1:6 KBITCE
:p3:8 Knox EMA
:s2:12 Scott KB1DSW
:p4:5 Union
:d2:10 2014-02-06
:t2:5 1020L
:mg:588 Knox County EMA requests RACES-CERT personnel deploy EMCOMM trailer to Union Masonic Center located at 149 Sennebec Road in Union to support ongoing rescue operations for injured PAX of downed acft NLUC3.

Upon arrival check in with Unified Command (Chief Soule/Warden Merrifield) and establish comms with Knox EOC on Knox RACES-CERT 2M Simulcast System freq 147.06 Mhz (+) PL 91.5. Forestry UH1 helo due to arrive approx. 1030 lcl.

Monitor Ground to air freq 123.8 Mhz for status relay to UC.

Please respond when you reach the location in Union.

Ray Sisk
Knox County EMA
594-5155
:rp:118 We have arrived and have made contact with Soule and Merrifield.

RACES personnel here include KB1DSW, KB1DBL, NY1B.

[WRAP:checksum D62C][WRAP:end]
... end

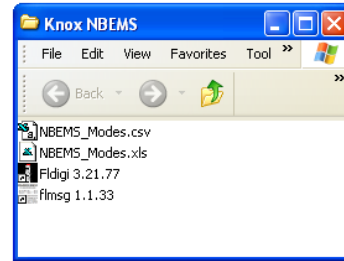
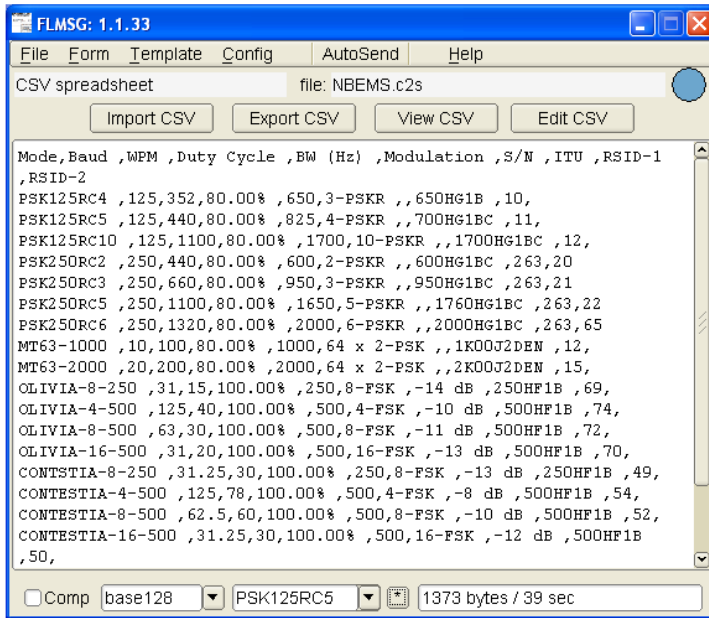
Section 5: Using the Flmsg Spreadsheet Form

Flmsg may be used to send information that is in spreadsheet format. Since Flmsg will only handle text files, a spreadsheet that is in, for example, Excel .xls format must be saved in a text format. The format that is applicable to Flmsg is .csv (comma separated values). Cell colors, fancy fonts and the like won't be carried over. Likewise, .csv files do not contain spreadsheet links, spreadsheet formulas, or multiple sheets. They can be used only for transferring a single spreadsheet with the computed values.

The figure below is a simple spreadsheet that was created in Excel.

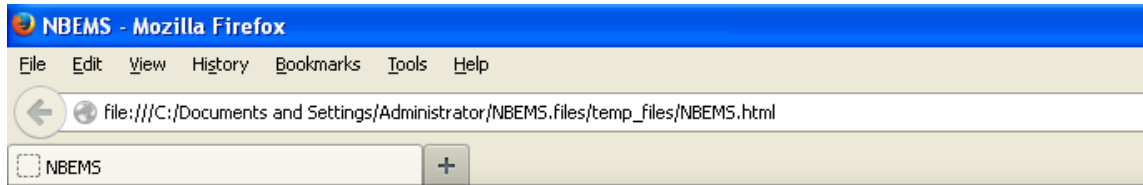
	A	B	C	D	E	F	G	H	I	J
1	Mode	Baud	WPM	Duty Cycle	BW (Hz)	Modulation	S/N	ITU	RSID-1	RSID-2
2	PSK125RC4	125	352	80.00%	650	3-PSKR		650HG1B	10	
3	PSK125RC5	125	440	80.00%	825	4-PSKR		700HG1BC	11	
4	PSK125RC10	125	1100	80.00%	1700	10-PSKR		1700HG1BC	12	
5	PSK250RC2	250	440	80.00%	600	2-PSKR		600HG1BC	263	20
6	PSK250RC3	250	660	80.00%	950	3-PSKR		950HG1BC	263	21
7	PSK250RC5	250	1100	80.00%	1650	5-PSKR		1760HG1BC	263	22
8	PSK250RC6	250	1320	80.00%	2000	6-PSKR		2000HG1BC	263	65
9	MT63-1000	10	100	80.00%	1000	64 x 2-PSK		1K00J2DEN	12	
10	MT63-2000	20	200	80.00%	2000	64 x 2-PSK		2K00J2DEN	15	
11	OLIVIA-8-250	31	15	100.00%	250	8-FSK	-14 dB	250HF1B	69	
12	OLIVIA-4-500	125	40	100.00%	500	4-FSK	-10 dB	500HF1B	74	
13	OLIVIA-8-500	63	30	100.00%	500	8-FSK	-11 dB	500HF1B	72	
14	OLIVIA-16-500	31	20	100.00%	500	16-FSK	-13 dB	500HF1B	70	
15	CONTESTIA-8-250	31.25	30	100.00%	250	8-FSK	-13 dB	250HF1B	49	
16	CONTESTIA-4-500	125	78	100.00%	500	4-FSK	-8 dB	500HF1B	54	
17	CONTESTIA-8-500	62.5	60	100.00%	500	8-FSK	-10 dB	500HF1B	52	
18	CONTESTIA-16-500	31.25	30	100.00%	500	16-FSK	-12 dB	500HF1B	50	
19	MFSK16	15.6	58	100.00%	316	16-FSK		316HF1B	57	
20	MFSK22	21.5	80	100.00%	435	16-FSK		435HF1B	152	

To begin, open Flmsg and select Form – CSV. The next thing you have to do is import the file. Referring to the figure below, you have a few options. You can simply drag the file (NBEMS_modes.csv in the example) into the blank field of the Flmsg screen. You can also right clicking on the panel and select "Insert file." You can select "Import CSV" and browse for the file. Finally, if you are relaying a form and it's already in the Flmsg spreadsheet format (.c2s) you can drag the file to the blue Drag 'n Drop dot. The imported file is shown in the figure. Note that commas separate the cells and rows.



Proceed as with the ICS-213 form: select the mode, save the file as a .c2s, check to be sure that the frequency is clear and that the receiving stations are using the correct mode & center frequency. Then press AutoSend.

At the receiving end, the Flmsg window will show the text exactly as appeared in the sending window per the figure above. In addition, a browser window will open to show the printable spreadsheet. There's no need to open your spreadsheet program. This is shown in the figure on the next page.



Mode	Baud	WPM	Duty Cycle	BW (Hz)	Modulation	S/N	ITU	RSID-1	RSID-2
PSK125RC4	125	352	80.00%	650	3-PSKR		650HG1B	10	
PSK125RC5	125	440	80.00%	825	4-PSKR		700HG1BC	11	
PSK125RC10	125	1100	80.00%	1700	10-PSKR		1700HG1BC	12	
PSK250RC2	250	440	80.00%	600	2-PSKR		600HG1BC	263	20
PSK250RC3	250	660	80.00%	950	3-PSKR		950HG1BC	263	21
PSK250RC5	250	1100	80.00%	1650	5-PSKR		1760HG1BC	263	22
PSK250RC6	250	1320	80.00%	2000	6-PSKR		2000HG1BC	263	65
MT63-1000	10	100	80.00%	1000	64 x 2-PSK		1K00J2DEN	12	
MT63-2000	20	200	80.00%	2000	64 x 2-PSK		2K00J2DEN	15	
OLIVIA-8-250	31	15	100.00%	250	8-FSK	-14 dB	250HF1B	69	
OLIVIA-4-500	125	40	100.00%	500	4-FSK	-10 dB	500HF1B	74	
OLIVIA-8-500	63	30	100.00%	500	8-FSK	-11 dB	500HF1B	72	
OLIVIA-16-500	31	20	100.00%	500	16-FSK	-13 dB	500HF1B	70	
CONTESTIA-8-250	31.25	30	100.00%	250	8-FSK	-13 dB	250HF1B	49	
CONTESTIA-4-500	125	78	100.00%	500	4-FSK	-8 dB	500HF1B	54	
CONTESTIA-8-500	62.5	60	100.00%	500	8-FSK	-10 dB	500HF1B	52	
CONTESTIA-16-500	31.25	30	100.00%	500	16-FSK	-12 dB	500HF1B	50	
MFSK16	15.6	58	100.00%	316	16-FSK		316HF1B	57	
MFSK22	21.5	80	100.00%	435	16-FSK		435HF1B	152	

You can then export the csv file so that it can be opened using your spreadsheet program. Left click on the "Export CSV" to perform this operation.

Pressing the "Edit CSV" button will permit you to export and open the .csv file with your default spreadsheet program. Note that your file manager must open .csv files with the spreadsheet program by default for this action to work.

The "View CSV" button will open a new window (CSV Viewer) that shows the spreadsheet contents. This is only for viewing and the contents cannot be printed or modified.

Section 6: Sending Flmsg Files with Winlink Express or via Email.

Flmsg files may be sent via any communications medium that accepts file attachments. For radio work, this would include Winlink Express for messages that are sent through the Winlink radio-email system or a BPQ BBS. This assumes that the recipient has Flmsg available in order to properly open and display the message.

If the recipient does not have Flmsg, there are several other options that are available. The first would be to send the message as an html file. This can be done by selecting File – View – HTML File Copy. This will open your browser and display the document as shown in the previous section of this document. Note that this will produce a larger file than is the case with an Flmsg file. For example, a 1 kb Flmsg file will be about 4 kb as html. Use compression and a fast mode. This method is very good when used with conventional email.

A second way is to export the file from Flmsg as text and then paste that text into your Winlink Express message window.

The text as shown in the previous section could be sent, however, it is not entirely obvious what each of the code characters refers to. For example “:sb:23”.

To produce an easy to understand text output, go to File – View - Plain Text. When opened with a text editor such as Notepad++, you will see the following:

CS 213 GENERAL MESSAGE

TO: Scott KB1DSW

POSITION: Cushing

FROM: Ray Sisk KX1EMA

POSITION: Knox EMA

SUBJ: Deploy trailer to Union

DATE: 2014-02-06

TIME: 0824L

MESSAGE:

Knox County EMA requests RACES-CERT personnel deploy EMCOMM trailer to Union Masonic Center located

at 149 Sennebec Road in Union to support ongoing rescue operations for injured PAX of downed acft NLUC3.

Upon arrival check in with Unified Command (Chief Soule/Warden Merrifield) and establish comms with Knox

EOC on Knox RACES-CERT 2M Simulcast System freq 147.06 Mhz (+) PL 91.5. Forestry UH1 helo due to arrive

approx. 1030 lcl.

Monitor Ground to air freq 123.8 Mhz for status relay to UC.

Please respond when you reach the location in Union.

Ray Sisk

Knox County EMA

594-5155

SIGNATURE: KB1TCE

POSITION: Knox EMA

REPLY:

We have arrived and have made contact with Soule and Merrifield. RACES personnel here include KB1DSW, KB1DBL, NY1B.

Simply copy and paste the text from the text editor window into your message pane in RMS Express.

Section 7: Flmsg Custom HTML Forms

Use and Installation

Flmsg accommodates custom forms that are created in HTML. These are generally local or regional forms as opposed to the broad usage standard forms (e.g. ICS, radiogram, etc.) that are native to Flmsg.

Custom forms are installed in a specific folder (in Windows, User - NBEMS files - CUSTOM) and may be selected from the Forms menu. Further information on custom forms may be found in the flmsg help at <http://w1hkj.com/files/flmsg/>.

It is important that each station that uses a particular form have the same revision of the form. Otherwise it may not be possible to populate or view a form properly.

Available Forms

For all of the custom forms, DO NOT CHANGE THE FILE NAME WHEN YOU SAVE IT! Changing the file name will render the form unusable.

Local: 9-Line ICS Report 18 January 2017. To download, right click and save. http://maine-ares.org/9_Line.html

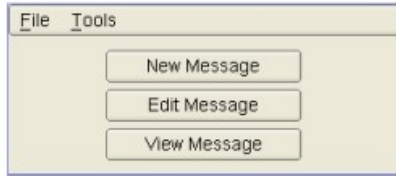
American Red Cross Disaster Services forms: Public archive at <http://w1hkj.com/files/flmsg/templates/>. These forms are being used by the Gold Country Region ARC in Sacramento, CA and fully replicate the printed versions.

Section 8: Flmsg “Agency” GUI - Flmsg as a Stand Alone Tool

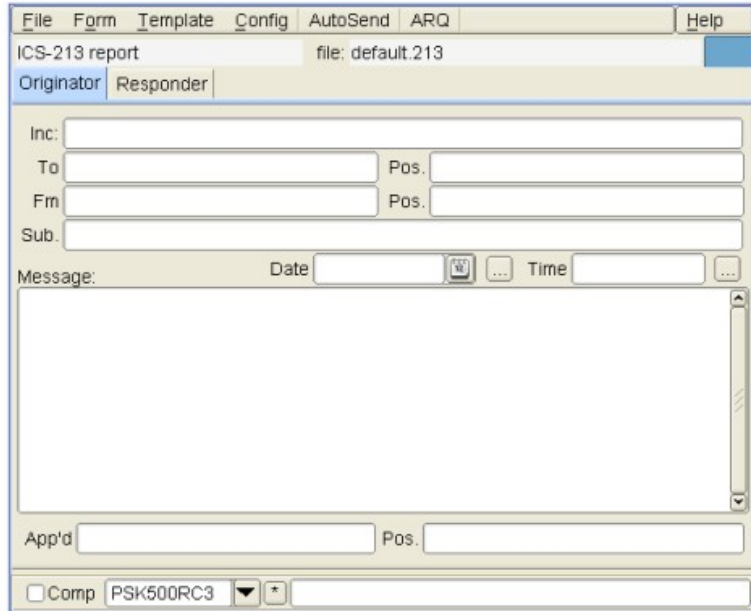
A number of groups have found that Flmsg serves well as a general purpose forms creation and editing tool apart from its use with Fldigi/NBEMS. For example, a form created with Flmsg may be sent via any communications method that can transfer files. This includes email, wired and wireless networks, etc. as well as with other radio methods such as Winlink. (Winlink has developed its own forms system but that system only works with the Winlink Express software. This is very limiting.

A case in point is the Gold Country Region Red Cross which is based in Sacramento. They were looking for a platform for their various disaster forms that could be used for office and field use in addition to transmission by radio. Initially, the Winlink system was evaluated and then rejected based on the issues discussed above. Flmsg met all of the functional criteria but was rejected as the interface was too unwieldy for the person who is only concerned with populating forms and sending & receiving them.

Dave Freese, W1HKJ, the author of Flmsg was approached in the latter part of 2016 about a "simple" version of flmsg for agency use. After a few test iterations, Dave produced a very workable version of Flmsg that can have either the standard or an agency interface. These are shown in the figure below.



Agency Interface

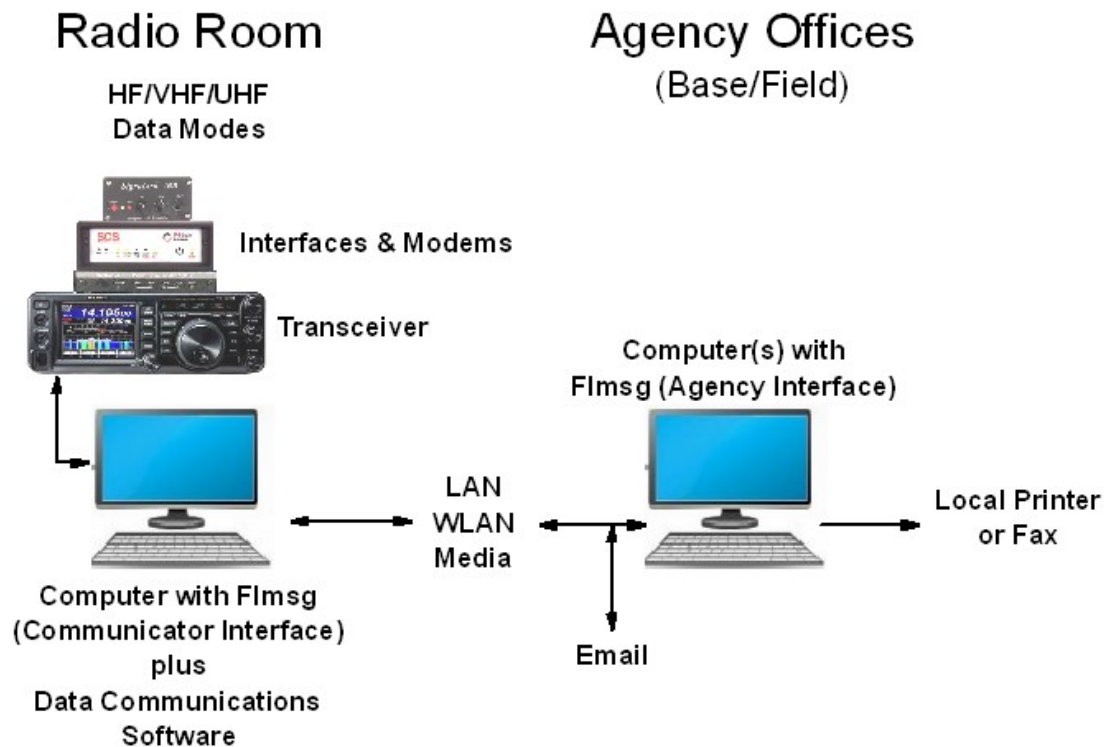


Standard Radio Operator Interface

The Agency interface is selected if you only want to create new messages based on existing custom forms; edit or reply to an existing custom form based message; or view a received message based on either a custom or a built-in form. Form editing and viewing is done in the default web browser that is installed on the same computer as flmsg. The browser may be Internet Explorer, Chrome/Chromium, Firefox, Safari, or some other graphics enabled browser.

The Radio Operator ("Communicator") interface is the one used by NBEMS operators, those desiring to use the built in forms or those who wish to create or edit spreadsheets in .csv format.

How these interfaces are used is depicted in the figure below.



Section 9: Introduction to Flamp

With Flmsg, if a file is not received 100% accurately, the only option is to resend the entire file. Under noisy conditions, it may not be possible to get perfect copy in any single pass. Flamp was developed to get around this problem.

Flamp is a program for AMP or Amateur Multicast Protocol. An Flamp session will transmit one or more files with one or more iterations of the transmission. Each file is broken into blocks, each of which has a checksum. The receiving station saves the blocks that pass checksum. Successive transmissions will fill in the missing blocks provided that the new blocks pass the check sum. After the transmission sequence, the entire file is assembled and may be saved. Files cannot be read until all blocks are successfully received.

As an example, if a transmitted file is broken into 10 blocks and 9 are received error-free, the receiving station can ask for only the missing block to be resent. This process can be repeated any number of times.

Since each block contains a certain amount of overhead, breaking up a file into more blocks will add more overhead, hence more transmission time. Setting the block size controls the number of blocks. For most messages, 8 to 10 blocks should suffice.

Each transmission includes a header that includes the file name, time stamp, sender, etc. If a header is not received intact, no portion of the file will transfer. In poor conditions it is advisable to repeat the header.

Flamp can transmit any text file including Flmsg files.

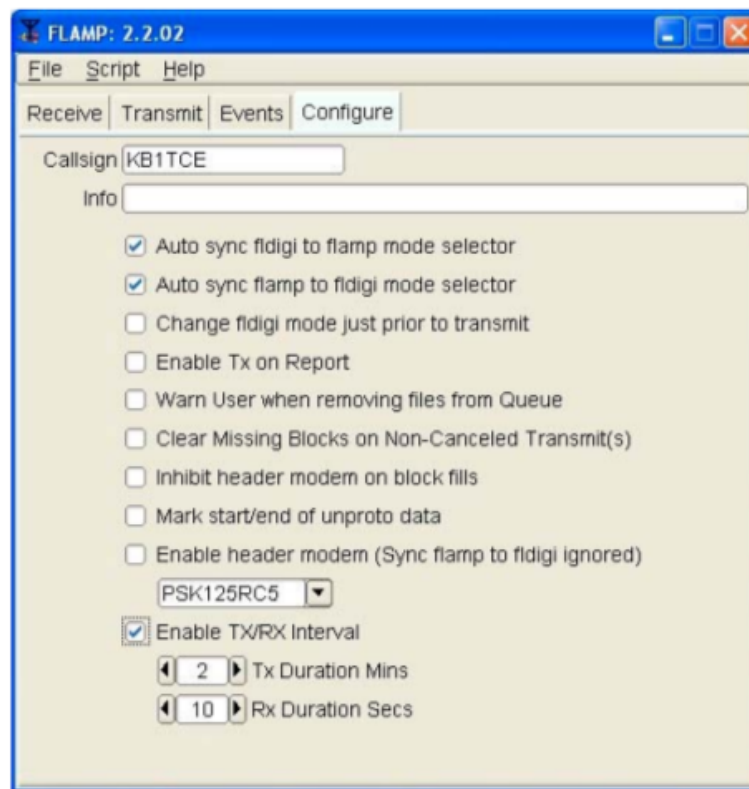
The only general configuration that is required within the scope of this document is to place the station call sign in the appropriate field of the “Configure” tab. There are many other configuration options including timed transmissions and so forth. For these, please refer to the Flamp Help document at <http://www.w1hkj.com/download.html>

The procedure in the Section 10 will use an ICS-213 form within Flamp.

Section 10: Configuring Flamp

The Flamp Configuration screen is shown below. Your station’s call sign must be filled in. Also check the Auto Sync boxes. This will ensure that if you change mode on either Fldigi or Flamp, the other application will change to the correct mode.

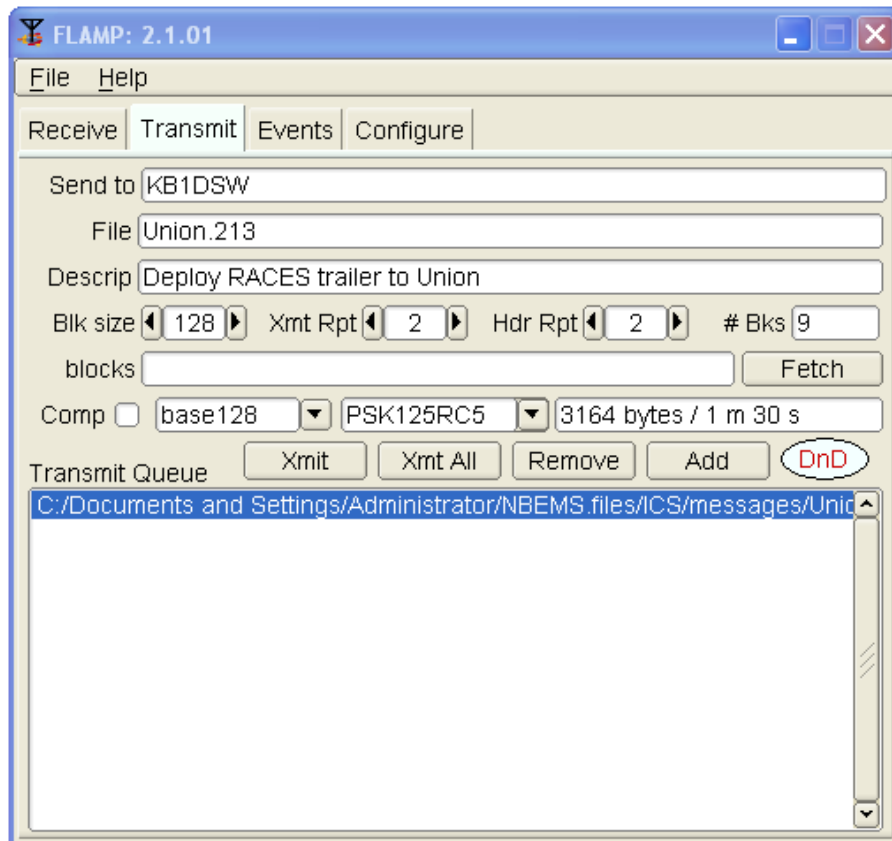
When working through repeaters, a long transmission may time out the repeater. This will result in missing blocks. Checking the TX/RX Interval box can accommodate this. The example below assumes a repeater time out of 3 minutes. With the settings shown, the Flamp transmission will pause after two minutes for 10 seconds. Transmission will resume after the pause.



Section 11: Sending a File with Flamp

To send an ICS 213 .213 file using Flamp:

- Open Flamp on your desktop. Flamp must be opened after Fldigi for the linking to be performed. (The preferred method is to use Fldigi's Autostart feature to open Flamp when Fldigi is started.)
- Click the "Transmit" tab.
- Click "Add" and browse for the file. Alternatively, you may drag the file to the Drag 'n Drop (DnD) oval. The file will appear in the queue. If the file is not highlighted, click on it.
- Type in any additional information in the "Send to" and "Description" fields.
- Select the block size, number of transmit repeats and header repeats. Two each are suggested unless length or experience suggests otherwise. The number of blocks will be displayed.
- Select the mode. The transmit time will be displayed.
- By voice, verify that the frequency is clear and that the receiving stations are set to the proper mode and center frequency.
- Click "Transmit."

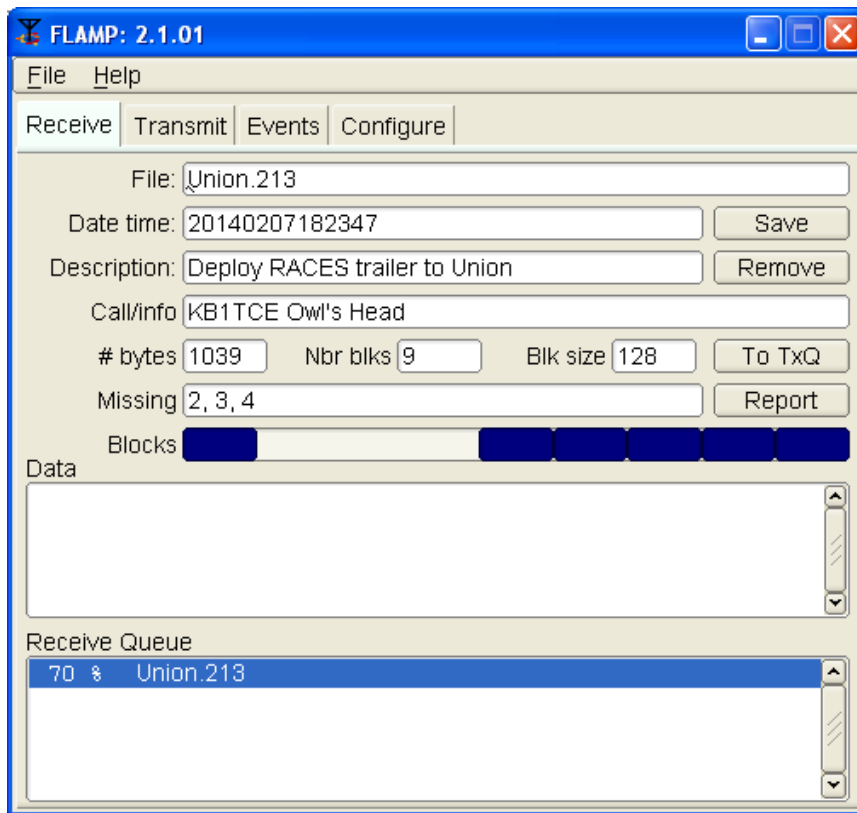


In this example, there is only one file to be transmitted. Multiple files may be loaded. Any highlighted file will be sent. If all files are to be transmitted, just click "Xmt All." This will send the entire queue without the need to highlight.

Section 12: Receiving a File with Flamp:

The receiving station should be monitoring the Receive screen. No action by the operator is required, providing Fldigi is set for the proper mode and center frequency.

In the example below, all of the header information was received properly but blocks 2, 3 and 4 are missing, perhaps due to interference. If the operator clicks “Report,” the receiving station will send a missing block report back to the transmitting station. For VHF and UHF ops where voice can be mixed with digital, it is generally easier just to make the report by voice.



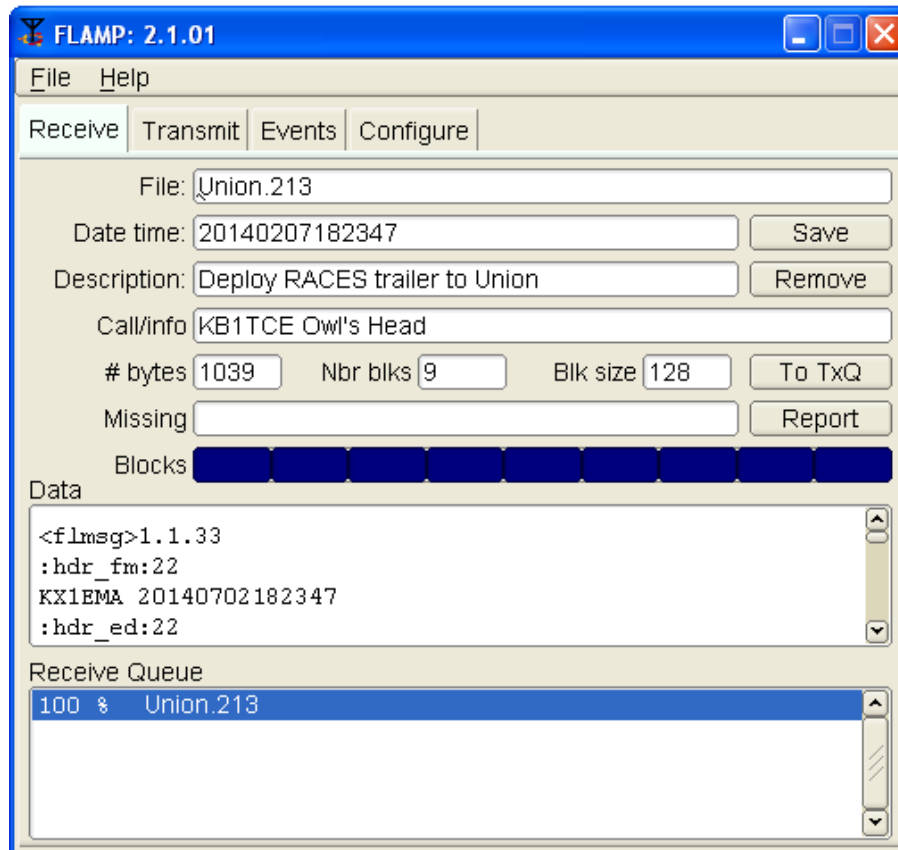
The sending station can then either repeat the entire message or the sending operator can type the missing blocks in his “blocks” field. If the missing blocks were reported by using the “Report” feature, the sending operator can fill in the blocks by clicking “Fetch.” This transfers the missed blocks report data from Fldigi to Flamp.

Here is the information as entered on the transmit screen:



Clicking “Xmit” will then just resend the missing blocks.

The screen capture below shows the now complete reception of the file. Note that the raw text appears in the “Data” panel. (If the content of the file does not appear, it will be found to contain binary components. The file will then have to be opened with the appropriate software.)



The file may now be saved and then opened with Flmsg. “Remove” will delete the file.

If “Auto save on 100% reception” is checked, those files will be saved in Flamp’s “rx/” directory automatically. The saved file will be placed in a sub-directory using a UTC date signature “rx/<DD_MM_YYYY_UTC>/”. This date corresponds to when the file was saved. In order to manually save a file, click “Save” with the file highlighted. This will place the file in the rx folder in the default directory:

Windows 7 and up: C:\Users\User_login_name\flamp.files
 Linux: /home/user/.flamp
 Macintosh: /Users/User_Login_Name/.flamp

If it is necessary for a receiving station to relay the file to another station all that is required is to click “To TxQ.” If the file has not been saved, you will be prompted to save it. Once that is done the file will appear in the queue of the “Transmit” panel.

Section 13: Flamp “Digipeater” (Relay) Function

In addition to the file name, a time stamp identifies a received file. The time stamp is assigned upon saving the file at the receiving station. This time stamp will be different from the time stamp on the file as sent. If a station other than the originating station relays a Flamp file, it will be treated as a new file. Therefore, a station can't relay just a few blocks – the whole file must be resent.

This difficulty is addressed by a relatively new function, referred to as a digipeater. This function is controlled on the Receive screen by the Relay and Fetch buttons.

As with transmitting block fills from the TX queue, the Relay function acts on the missing reports from other receiving stations. Pressing the relay Fetch button will transfer a list of missing blocks associated with the selected received queue item into the relay blocks field. This field is user editable and can be entered directly without the need to press the fetch button. If the Blocks field contains no missing block numbers (empty) the received content of the file will be retransmitted. It is not necessary for the received file to contain 100% of the data. Only checksum verified data is available for retransmission.



If a station did not get the header, that may be relayed by entering block 0.

Retransmission of the data format is limited to how it was received. The user has no control over the blocks size, compression, base conversion, etc. In effect it's a manually initiated digipeater, hence the name of the function.

Once Flamp has been closed or the files removed from the receive queue, the digipeat option for those files is lost.

Addendum: HF Operation

There are a few differences in procedure when using HF. The preferred modes are different, some settings change and there is no voice option on the digital sub bands.

Frequency and mode: On all bands, the mode is USB. The operating frequency is usually called out as the dial frequency and waterfall center frequency e.g. 8583.0 kHz USB + 1000 Hz. When starting a net, always look for signals on the frequency you intend to use and shift up or down a bit if the band position is occupied.

Fldigi Settings: Do not use squelch as you may not receive weaker signals.

Radio Level Settings: Operate the radio at full power. The Signalink Tx pot should then be used to adjust output. Using the Tune feature, advance the Tx knob until you see just a little ALC but no more. This should result in an output of 40-50 watts from the typical 100 watt transceiver.

Modes: Modes for reliable HF digital communications generally incorporate very robust forward error correction. They are also slower than the modes used for VHF/UHF communications. Always be brief and succinct in your HF communications. The chart below shows the preferred modes for HF NBEMS. Note that the MT63 modes have a high degree of latency (delay) making these modes unsuitable for keyboard use.

Mode	WPM	Bandwidth (Hz)	Notes
Olivia 8/500	30	500	Kbrd. Will work well below the noise floor.
Thor 50x1	176	900	Kbrd & file transfers under good signal conditions
MT63-1000L	100	1000	Heavily error corrected for poor conditions
MT63-500L	50	1000	Heavily error corrected for very poor conditions

General Operating Guidelines:

Before typing any response in the Fldigi transmit panel, press the <Enter> key so that your text will start on a new line at each of the receiving stations. This helps to differentiate your communication from the random "diddle" characters that appear on the screen.

To check into a net, use shorthand such as:

“NCS de kb1tce Steve Owls Head 1-net” (who and where I am, I have one message for the net)

“NCS de kb1tce Steve Owls Head 1-kb1dbl (same but the traffic is for kb1dbl)

“NCS de kb1tce Steve Owls Head” (same but no traffic)

Do not use video ID as it takes up too much time.

To get the NCS attention, break by sending a 5 second tuning tone. This is clearly visible and will not interfere with with the ongoing digital communications. NCS will acknowledge the breaker at the first opportunity.