

Amateur Packet Radio Field Reference, Type II

For SCCo RACES Responders

November 2023



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Rev: 231013

1 Quick Reference

Frequencies (MHz)

Call Sign	Connect	User Access	My Pri, Sec BBS
W1XSC	W1XSC-1	145.750, 223.620, 433.570	
W2XSC	W2XSC-1	145.730, 223.560, 433.590	
W3XSC	W3XSC-1	144.310, 223.540, 433.450	
W4XSC	W4XSC-1	145.690, 223.600*, 433.550	

*223.600 is primarily for BBS forwarding; O.K. for back-up user access, testing.

BBS Locations

Call Sign	Location
W1XSC	San Jose
W2XSC	Crystal Peak (South County)
W3XSC	Palo Alto
W4XSC	Frazier Peak (East of Milpitas)

2 Introduction

2.1 Purpose

This handbook is not an official Santa Clara County RACES deliverable.

This handbook provides the field packet radio operator with a job aid for the different tasks and activities that are needed to be successful in the field.

It builds on a reasonable working knowledge of:

1. Digital communications using amateur packet radio
2. Amateur packet radio hardware, software, and configuration
3. SCC RACES packet procedures, protocols, and standards

The experienced packet radio operator can use this handbook as a job aid and real-time reminder of the tasks that need to occur when deployed to the field. It is intended to ensure task consistency, completeness, and operational alignment with SCCo RACES policies and procedures when carrying out field packet radio operations.

2.2 How to use this Handbook

This handbook is not a tutorial on Amateur Radio Packet and will not teach you all about packet, the hardware, software, and local procedures. You are encouraged to attend SCCo RACES packet classes, acquire and use a packet station, and participate in weekly and monthly packet practice, and regular exercises where packet radio is deployed.

This handbook does provide a summary of how to operate packet radio in the field. However, the packet operator is responsible for keeping current with environmental, procedural, and SCCo RACES packet system changes by:

1. periodically checking the www.scc-ares-races.org website joining,
2. monitoring the packet@scc-ares-races.groups.io mailing list, and
3. attending SCCo RACES packet training courses

Updates to this handbook should be made by the handbook user as soon as you become aware of them.

2.3 Other References

Have these SCCo RACES documents available to reference:

1. Standard Outpost Configuration Instructions - 08/04/2018
2. Standard TNC Parameter Settings - 04/07/2016

3 Manual Packet Operations

3.1 TNC Commands

1. **HELP** [command]
When entered alone, lists all available commands. With a command, provides details on that specific command.
2. **MYCALL** xxxxxx
Tells the TNC what its call sign is. Can be an FCC or Tactical Call sign
3. **CONNECT** call1 [via call2, call3, ...]
Call1 = Call sign of the station to be connected to. Adding "via call2..." connects to the BBS by digipeaters.
4. **CONVERS**
Puts the TNC into Conversational mode. Then, whatever you type is immediately transmitted.
5. **<Cntl>C**
Puts the TNC into Command Mode. Enter TNC commands at the prompt.
6. **RESTORE DEFAULT**
Resets the TNC to the factory default settings; performs the AUTOBAUD routine. Defaults INTface to NEWUSER. Hard reset can also be performed with internal jumpers.
7. **INTERFACE** [TERM | ...]
When set to TERMinal, the full command set of the TNC is available.
8. **XMITLVL** [<value>]
If blank, displays the current transmit level. If a value is included, sets the transmit level.

3.2 BBS Commands

1. **HELP** or ? [command]

H = List of available commands. **?** is the same as **H** or **HELP**

H <cmd> = Provides details on the command.

example: **H List** = shows all **List** command options and what they do.

2. **LIST**

L = Displays the headers for all unread messages, if any.

LA = Lists ALL messages, both read and unread

LM = Lists MY messages addressed to me

L> addr = Lists all messages that have "addr" in the message's To: field

3. **READ #**

= The message number to be displayed.

4. **KILL #**

= The message number to be deleted.

5. **AREA**

A = Lists all available bulletin areas.

AF = Gives a full listing of areas with descriptions (if available).

A area_name = Positions you to that area. Then, use the List and Read commands to view messages.

6. **SEND [option] <dest_address>**

S[P] = Send Private; example: *SP w6xrl4@w5xsc.ampr.org*

SB = Send Bulletin; example: *SB mtv@xsc*

ST = Send Traffic; this is used for NTS packet messages

SC = Send Copy; to multiple destination addresses

example: **SC w6xrl4@w5xsc.ampr.org** (enter the 1st address)

(BBS then prompts with **Cc:** for the other addresses. Enter other addresses each separated by a comma.)

7. **BYE**

Disconnects from the BBS

8. **XM [lines to display]**

XM = Displays the current page length setting

XM 24 = Sets the page length to 24 lines

XM 0 = Turns off pagination (required when using Outpost)

NOTE: If a page length is set, message listings, messages and other content longer than the page length are paused and a "More (N=no)?" prompt is shown. Press SPACE to see the next page or 'n' to stop

3.3 Connecting to the TNC with PuTTY

Set up PuTTY as follows:

1. Getting Started

___ Find and run PuTTY

2. Session Menu

___ Connection Type: Serial

___ Enter serial port name (i.e.: COM3)

3. Session > Logging

___ Session Logging: "All session output"

___ Log file name: Enter a path and file name

___ What to do if...: "Always append to the end of it"

4. Terminal > Keyboard

___ Backspace key: "Control-H"

5. Serial

___ Speed (baud): 9600

___ Data Bits: 8

___ Stop Bits: 1

___ Parity: None

___ Flow Control RTS/CTS

6. Session

___ Saved Sessions: Enter a name in the field, click **Save**

___ Click **Open** to start the session

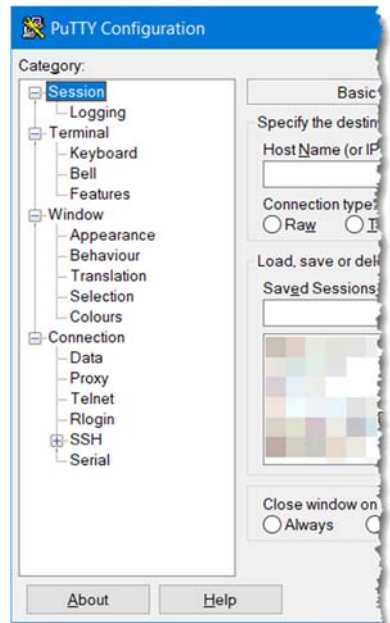
7. Verify

___ Put cursor in the PuTTY text area.

___ Make sure the TNC is turned on.

___ Press **Enter** and confirm you see the

___ TNC Prompt (cmd:)



3.4 Start of Shift: Configure TNC Settings

HINT!!! Create TNC Init Command text files

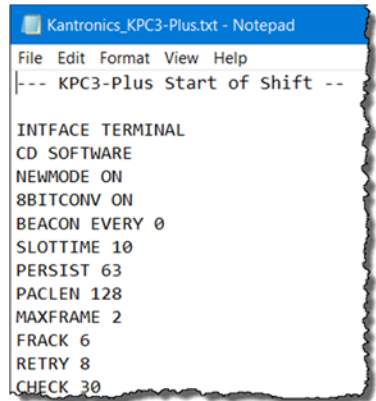
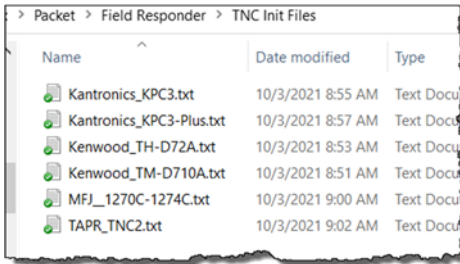
Create text files that contain the *Start-of-Shift* and *End-of-Shift* TNC commands for the TNCs you might use. This should be done before you ever find yourself needing to send and receive packet messages manually.

1. For each TNC that you use, create a text file with the “Start of Shift” and “End of Shift” TNC commands.
2. Each file should contain both sets of commands.

CAUTION: Do NOT cut-and-paste directly from the PDF into your terminal emulator; it may not work.

****Best practice:** copy the commands first into a text editor (Notepad), save it, and then copy-and-paste from there into your terminal program.

3. Save each file with the TNC Name.



TNC Reset

Insure all TNC settings are at the **current** SCCo standard values

1. Get current Transmit Level

___ Connect to the TNC with PuTTY

___ **cmd: XMITLVL** (for KPC-3+)

Record the value displayed.

2. Reset the TNC

cmd: restore default

___ Watch for...

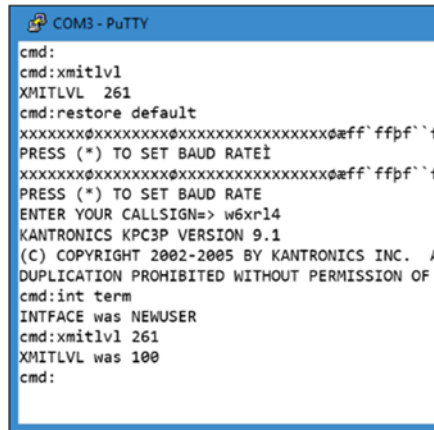
PRESS (*) TO SET BAUD RATE

___ When you see this text, PRESS “*” and enter your call sign at the prompt.

___ **cmd: INT Term**

___ **cmd: XMITLVL <value>**

___ **cmd: CD software**



3. Start of Shift

- ___ If assigned a tactical call sign, then check or enter it now:
cmd: mycall <TacCall>

4. Send Start-of-Shift TNC commands

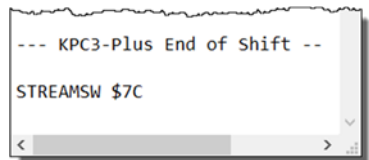
- ___ Select and copy (<ctrl>C) the entire “Start of Shift” command list from the text file.
- ___ At Putty, mouse **right-click** to paste the TNC commands

3.5 End of Shift: Restore TNC Settings

When your shift is over and before you pack up the gear or turn it over to someone else, return the TNC to “normal” settings.

1. End of Shift TNC cleanup

- ___ Disconnect from the BBS.
- ___ Cut-and-paste the “End of Shift” TNC commands into PuTTY at the TNC command prompt

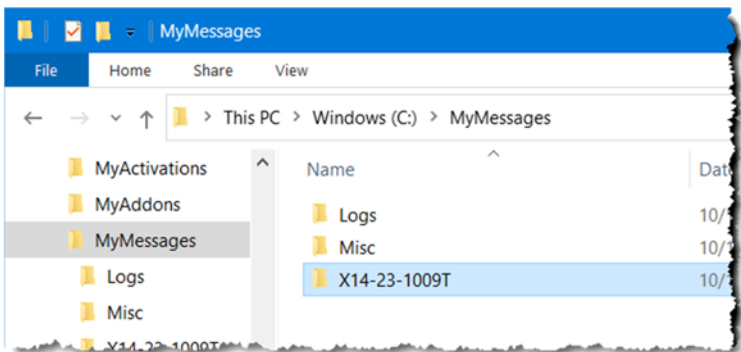


```
--- KPC3-Plus End of Shift --  
STREAMSW $7C
```

3.6 Getting ready for Manual Messaging

Directory structure for manual messages

1. Create a directory structure (your choice) for your manual text message files, such as:
 - C:\MyMessages\XND-23-1009T (Activation no, example below)
 - C:\MyMessages\2023-10-09 (date)
 - C:\MyMessages\XND-F14 (assignment)
 - Other
2. Identify a starting message number.

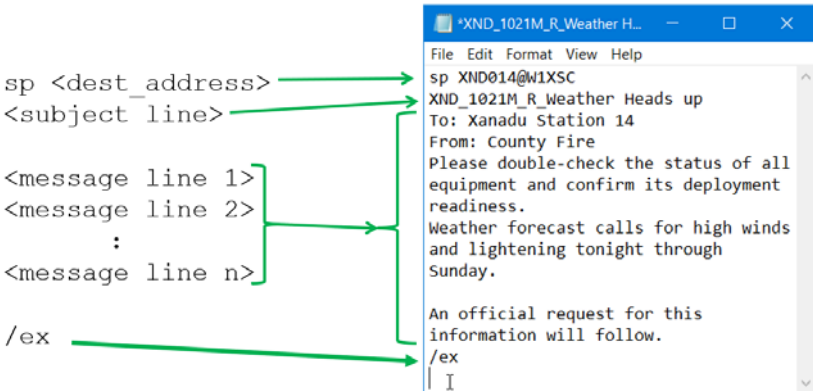


3.7 Manual message basics

Knowing how manual packet works will help you troubleshoot problems. Manually create a message without Outpost or PackItForm for test purposes.

1. Manually create a packet message

- ___ Open Notepad or any other text editor.
- ___ Create a message with the four key elements of a manual packet message:
 - sp <destination> **Send Private**
 - <subject line> standard SCCo Subject line format
 - <message lines> the essence of the message to send
 - /ex <CR> End of Message
- ___ Create a round-trip test message (send to yourself) with whatever message content you want (example below).
- ___ Use the Subject as the file name and save to your **manual data** folder.



2. Use PuTTY to the manually send the packet message

- ___ Highlight the entire message from the saved file. **Select All** with <ctrl>A, then **Copy** using <Ctrl>C.
- ___ Start PuTTY.
- ___ Connect to the BBS.
- ___ Put the cursor in the PuTTY screen by the BBS Prompt. Paste using **Mouse right-click** into Putty. The message should start transmitting immediately.

3.8 Sending a manual PackItForm message

3.8.1 Run manual PackItForms

1. Open File Explorer, navigate to C:\PackItForms\Outpost\SCCo
2. Find and double-click on **manual . cmd**.

3.8.2 Setup Manual PackItForm

SETUP Page is displayed.

3. Fill in or update all fields:
 - User information
 - Tactical call information
 - Next Message Number
4. Press **OK** when done.

File Edit View History Bookmarks Tools Help

SCCo PackItForms x Setup PackItForms

127.0.0.1:64874/manual

Santa Clara County ARES/RACES PackItForms

User Call Sign:

User Name:

Message ID Prefix: (3 characters max)

Use Tactical Call Sign

Tactical Call Sign:

Tactical Name:

Message ID Prefix: (3 characters max)

Next Message Number:

3.8.3 Pick and fill in a Form

HOME Page is displayed.

5. From the dropdown menu, select a PackItForm.
6. Press **Create Message**.
7. Fill in the PackItForm as usual.
8. When done, press **Create Message**.

File Edit View History Bookmarks Tools Help

SCCo PackItForms x +

127.0.0.1:50400/manual 110%

Santa Clara County ARES/RACES PackItForms

[Setup](#) [Edit ICS-309 Log](#)

Create a message to send

Message type:

Create Message

3.8.4 Create the packet message

MESSAGE Page is displayed.

9. If needed, check the boxes if this message is **Urgent** or a **Bulletin** .
10. In the **To:** Field:
 - enter a single Dest address
 - multiple addresses separated with commas.
11. When done, press **Log and Send**.

File Edit View History Bookmarks Tools Help

SCCo PackItForms x X14-312M_R_ICS213_Eq

127.0.0.1:54874/manual-mes

Urgent: Bulletin:

To:

Subject:

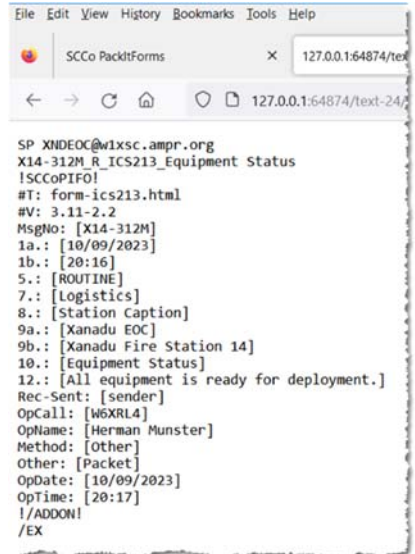
Message:

[Log and Send](#)

BBS COMMAND Page is displayed.

12. **Copy the message.** Put your mouse cursor in the text area, and then either: **Edit > Select All**, then **Edit > Copy** or enter **<ctrl>A <ctrl>C**.

NOTE: Do not change the subject line.



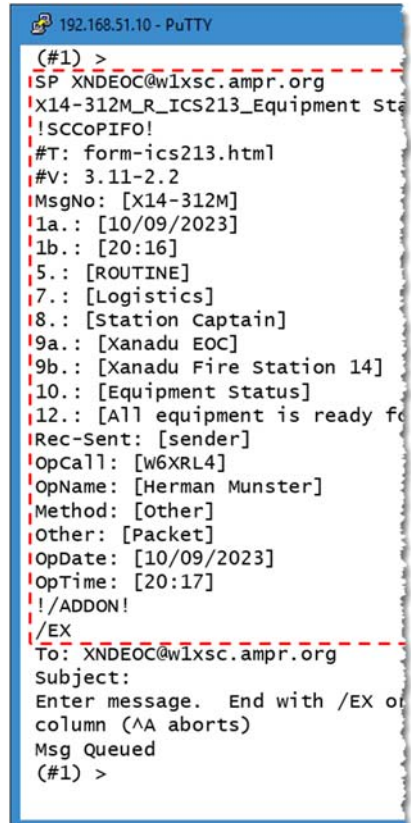
```
File Edit View History Bookmarks Tools Help
SCCo PacketForms x 127.0.0.1:64874/text-24
← → ↻ 🏠 🛡️ 📄 127.0.0.1:64874/text-24
SP XNDEOC@w1xsc.ampr.org
X14-312M_R_IC5213_Equipment Status
!SCCoPIFO!
#T: form-ics213.html
#V: 3.11-2.2
MsgNo: [X14-312M]
1a.: [10/09/2023]
1b.: [20:16]
5.: [ROUTINE]
7.: [Logistics]
8.: [Station Caption]
9a.: [Xanadu EOC]
9b.: [Xanadu Fire Station 14]
10.: [Equipment Status]
12.: [All equipment is ready for deployment.]
Rec-Sent: [sender]
OpCall: [w6XRL4]
OpName: [Herman Munster]
Method: [Other]
Other: [Packet]
OpDate: [10/09/2023]
OpTime: [20:17]
!/ADDON!
/EX
```

3.8.5 Send the message with PuTTY

PuTTY is displayed.

13. Make sure you previously copied the packet message from the **BBS Command Page** (previous section).
14. Start PuTTY
15. Connect to the BBS
Verify you get the BBS Prompt.
16. **Paste the message** in PuTTY:
 - Put the cursor in the PuTTY text area after the last BBS prompt, and then
 - **Mouse *right-click*** to paste in the message.

Reminder: All SCCo BBSs have a 2-minute inactivity timer.

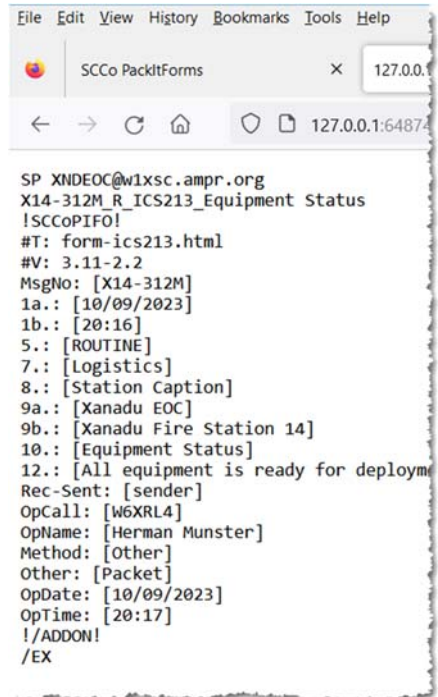


```
192.168.51.10 - PuTTY
(#1) >
SP XNDEOC@w1xsc.ampr.org
X14-312M_R_IC5213_Equipment Sta
!SCCoPIFO!
#T: form-ics213.html
#V: 3.11-2.2
MsgNo: [X14-312M]
1a.: [10/09/2023]
1b.: [20:16]
5.: [ROUTINE]
7.: [Logistics]
8.: [Station captain]
9a.: [Xanadu EOC]
9b.: [Xanadu Fire Station 14]
10.: [Equipment Status]
12.: [All equipment is ready fo
Rec-Sent: [sender]
OpCall: [w6XRL4]
OpName: [Herman Munster]
Method: [Other]
Other: [Packet]
OpDate: [10/09/2023]
OpTime: [20:17]
!/ADDON!
/EX
To: XNDEOC@w1xsc.ampr.org
Subject:
Enter message. End with /EX or
column (^A aborts)
Msg Queued
(#1) >
```

3.8.6 Save the Message

BBS COMMAND Page, back to this page

- ___ 17. Put your mouse cursor in the text area, and then from the browser menu, **File > Save As** or press **<ctrl>S**
- ___ 18. If not shown, navigate to the PackItForm save directory previously created.
- ___ 19. Press **Save**.



```
File Edit View History Bookmarks Tools Help
SCCo PackItForms 127.0.0.1
127.0.0.1:6487
SP XNDEOC@w1xsc.ampr.org
X14-312M_R_IC5213_Equipment Status
!SCCoPIFO!
#T: form-ics213.html
#V: 3.11-2.2
MsgNo: [X14-312M]
1a.: [10/09/2023]
1b.: [20:16]
5.: [ROUTINE]
7.: [Logistics]
8.: [Station Caption]
9a.: [Xanadu EOC]
9b.: [Xanadu Fire Station 14]
10.: [Equipment Status]
12.: [All equipment is ready for deployment]
Rec-Sent: [sender]
OpCall: [W6XRL4]
OpName: [Herman Munster]
Method: [Other]
Other: [Packet]
OpDate: [10/09/2023]
OpTime: [20:17]
!/ADDON!
/EX
```

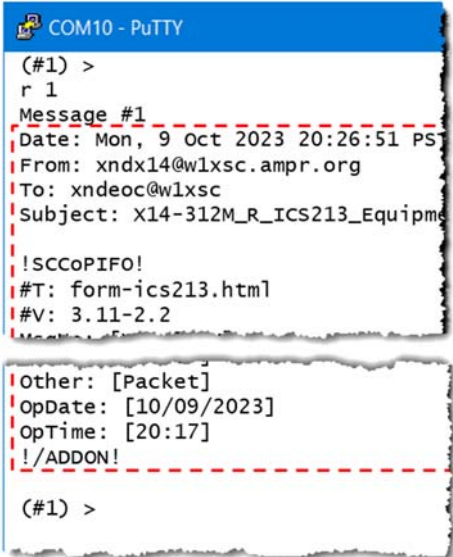
3.9 Receiving a PackItForm message manually

3.9.1 Receive a PackItForm message

PuTTY is displayed.

1. Connect to the BBS using PuTTY.
2. List your messages with **LM**
3. Read your messages with **R #**
4. Highlight all text from **Date:** to **!/ADDON!** (inclusive).

Copy Text from PuTTY: just select the text to copy it to the clipboard.

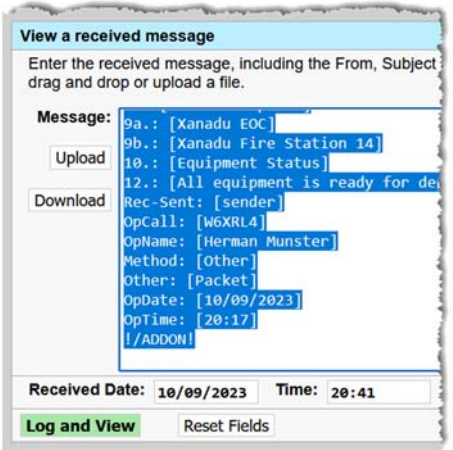


```
COM10 - PuTTY
(#1) >
r 1
Message #1
Date: Mon, 9 oct 2023 20:26:51 PST
From: xndx14@w1xsc.ampr.org
To: xndeoc@w1xsc
Subject: X14-312M_R_ICS213_Equipme
!/SCCoPIFO!
#T: form-ics213.html
#V: 3.11-2.2
Other: [Packet]
OpDate: [10/09/2023]
OpTime: [20:17]
!/ADDON!
(#1) >
```

3.9.2 Recover the Message

HOME Page is selected.

5. Put your cursor in the lower “View a received message” section, and enter **Edit > Paste** or **<ctrl>V** to paste in the message.
6. Press **Log and View**.
 - This entry is logged to the ICS 309
 - The received message is opened in its PackItForm.
7. Once the PackItForm is opened, print it and hand it off for delivery.



View a received message

Enter the received message, including the From, Subject, drag and drop or upload a file.

Message: 9a.: [Xanadu EOC]
9b.: [Xanadu Fire Station 14]
10.: [Equipment Status]
12.: [All equipment is ready for de
Rec-Sent: [sender]
OpCall: [W6XRL4]
OpName: [Herman Munster]
Method: [Other]
Other: [Packet]
OpDate: [10/09/2023]
OpTime: [20:17]
!/ADDON!

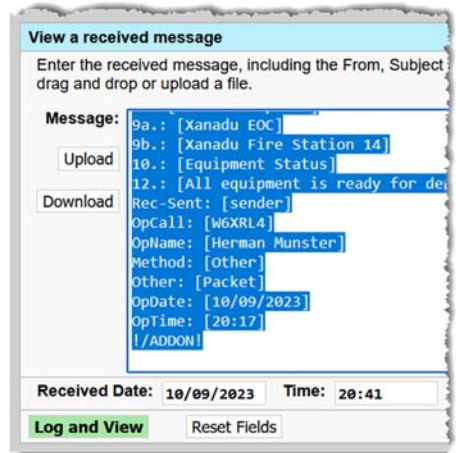
Received Date: 10/09/2023 Time: 20:41

Log and View Reset Fields

3.9.3 Save the Message

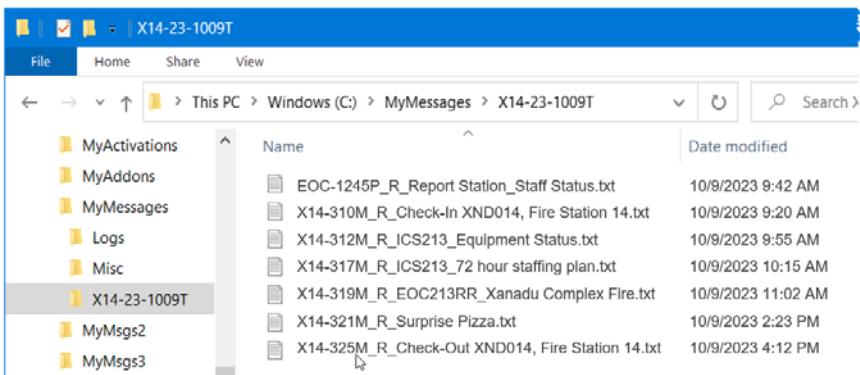
HOME Page, back to this page

8. Back on the Homepage, Press the **Download** button. The **Message Page** opens and shows the message text.
9. Put your mouse cursor in the text area, and then: From the browser menu, **File > Save As...** or **<ctrl>S**
10. Navigate to the PackItForm save directory previously created. The file name is set to the Subject.
11. The file name is set to the Subject. Press **Save**.



3.10 Viewing saved messages

1. View your saved messages in the directory set up in Section 3.6. For example: C:\MyMessage\X14-23-1009T\
2. Sort by clicking on the **Name** or **Date Modified** column headers.



3.11 Notes on Manual ICS 309 Comm Log

1. From the PackItForm **Home Page**, clicking on **Edit ICS 309 Log** opens the ICS 309 form for editing and printing.
2. All fields are editable.
3. Required fields are highlighted in RED.
4. **Trash Can** symbol deletes the entry.
5. **Plus** symbol adds another line for a manual entry.
6. **Erase All** – clears the form
NOTE: does not require a **Save** to commit the changes.
7. **Download CSV File** – creates a .csv file of the Comm Log.
8. **Print** – prints the Comm Log to the selected printer.
9. **Save** – Saves any changes you made.

