

# Amateur Packet Radio Field Reference, Type II

For SCCo RACES Responders

October 2024



# Table of Contents

<b>1</b>	<b>QUICK REFERENCE .....</b>	<b>2</b>
<b>2</b>	<b>INTRODUCTION .....</b>	<b>3</b>
2.1	PURPOSE .....	3
2.2	HOW TO USE THIS HANDBOOK .....	3
2.3	OTHER REFERENCES .....	3
<b>3</b>	<b>MANUAL PACKET OPERATIONS.....</b>	<b>4</b>
3.1	TNC COMMANDS .....	4
3.2	BBS COMMANDS.....	5
3.3	CONNECTING TO THE TNC WITH PUTTY .....	6
3.4	START OF SHIFT: CONFIGURE TNC SETTINGS .....	7
3.5	END OF SHIFT: RESTORE TNC SETTINGS .....	8
3.6	GETTING READY FOR MANUAL MESSAGING.....	8
3.7	MANUAL MESSAGE BASICS .....	9
3.8	SENDING A MANUAL PACKITFORM MESSAGE .....	10
3.9	RECEIVING A PACKITFORM MESSAGE MANUALLY .....	13
3.10	NOTES ON OUTPOST TAGS.....	14
3.11	VIEWING SAVED MESSAGES .....	14
3.12	NOTES ON MANUAL ICS 309 COMM LOG.....	15

Rev: 241031

## 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](http://www.scc-ares-races.org) website joining,
2. monitoring the [packet@scc-ares-races.groups.io](mailto: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 – 10/31/2022

## 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. **INTFACE** [ 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 1<sup>st</sup> 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

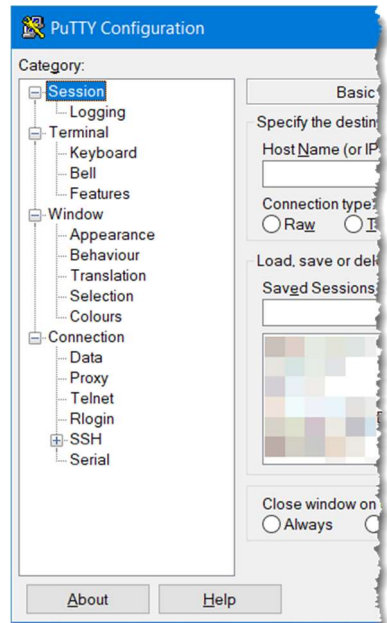
**XM 0** = Turns off pagination (required when using Outpost)

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:

<b>1. Getting Started</b>	
___	Find and run PuTTY
<b>2. Session category</b>	
___	Connection Type: Serial
___	Enter serial port name (i.e.: COM3)
<b>3. Session &gt; Logging category</b>	
___	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"
<b>4. Terminal &gt; Keyboard category</b>	
___	Backspace key: "Control-H"
<b>5. Connection &gt; Serial category</b>	
___	Speed (baud): 9600
___	Data Bits: 8
___	Stop Bits: 1
___	Parity: None
___	Flow Control RTS/CTS
<b>6. Window &gt; Translation category</b>	
___	Change "Remove character set" to <b>Win1252 (Western)</b>
<b>7. Session category</b>	
___	Saved Sessions: Enter a name in the field, click <b>Save</b>
___	Click <b>Open</b> to start the session
<b>8. Verify</b>	
___	Put cursor in the PuTTY text area.
___	Make sure the TNC is turned on.
___	Press <b>Enter</b> and confirm you see the TNC Prompt (cmd:)



---

### 3.4 Start of Shift: Configure TNC Settings

#### **HINT!!!** Create TNC Init Command text files

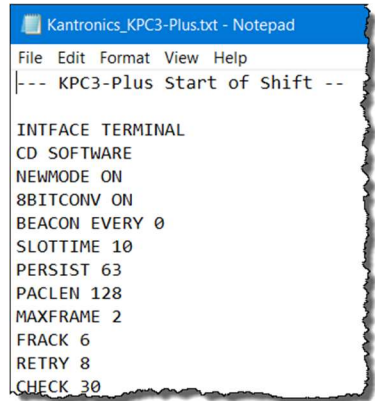
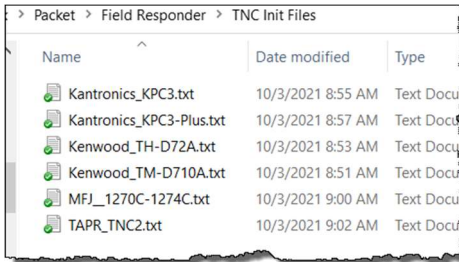
Create text files that contain the **Start-of-Shift** and **End-of-Shift** TNC commands for the TNCs you might use. This should be done before you ever find yourself needing to send and receive packet messages manually.

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

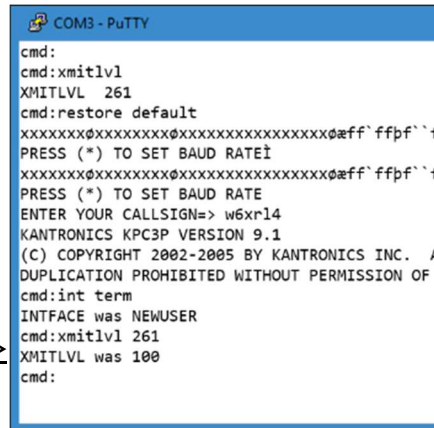
enter your call sign at the prompt.

**ENTER YOUR CALL SIGN: <callsign>**

— **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

---

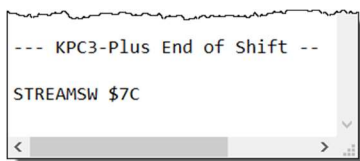
## 3.5 End of Shift: Restore TNC Settings

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



---

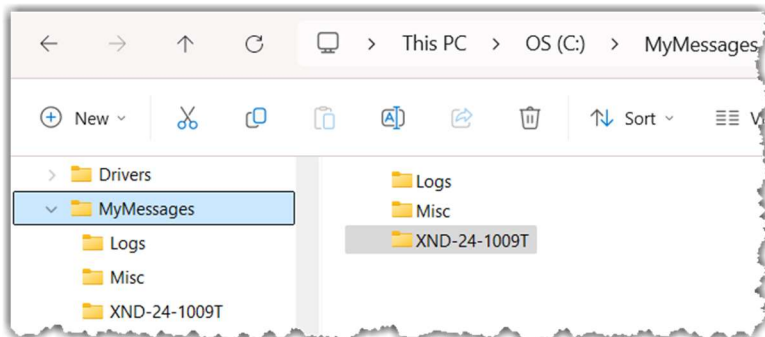
## 3.6 Getting ready for Manual Messaging

### Directory structure for manual messages

1. Create a directory structure (your choice) for your manual text message files, such as:

- C:\MyMessages\XND-24-1009T (Activation no, example below)
- C:\MyMessages\2024-10-09 (date)
- C:\MyMessages\XND-F14 (assignment)
- Other

2. Identify a starting message number.



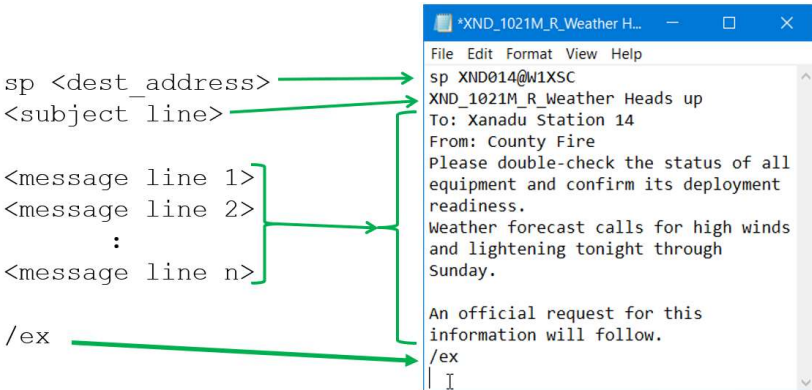
---

## 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 SCo 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
  - Select your Archive Folder (messages are auto saved here)
  - Select Terminal Encoding
  - Next Message Number
4. Press **OK** when done.

### 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**.

### 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**.

The screenshot shows the 'Setup PackItForms' window. It contains the following fields and values:

- User Call Sign: W6XRL4
- User Name: Herman Munster
- Message ID Prefix: RL4 (3 characters max)
- ☒ Use Tactical Call Sign
- Tactical Call Sign: XND014
- Tactical Name: Fire Station 14
- Message ID Prefix: X14 (3 characters max)
- Archive Folder: C:\MyMessages\XND-24-1009T
- Terminal Encoding: Windows-1252
- Next Message Number: 312

The screenshot shows the 'HOME' page of the PackItForms application. It includes a 'Setup' button and an 'Edit ICS-309 Log' button. Below these is a section titled 'Create a message to send' with a 'Message type:' dropdown menu and a 'Create Message' button.

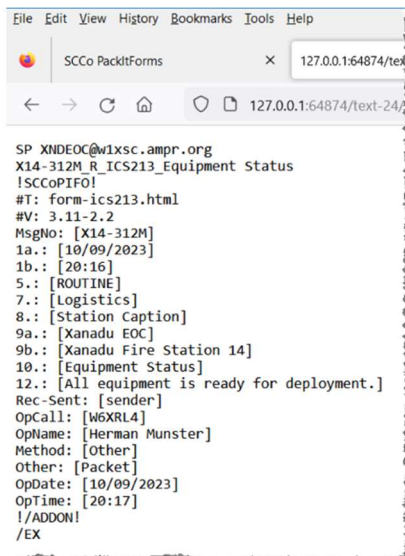
The screenshot shows the 'MESSAGE' page. It contains the following fields and values:

- Urgent: ☐ Bulletin: ☐
- To: XNDEOC@w1xsc.ampr.org
- Subject: X14-312M\_R\_ICS213\_Equipment Status
- Message: !SCCoPIFO!  
#T: form-ics213.html  
#V: 3.11-2.2  
MsgNo: [X14-312M]  
1a.: [10/09/2023]  
1b.: [20:16]  
5.: [ROUTINE]
- Log and Send button

**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 127.0.0.1:64874/text-24/
SP XNDEOC@w1xsc.ampr.org
X14-312M_R_ICS213_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

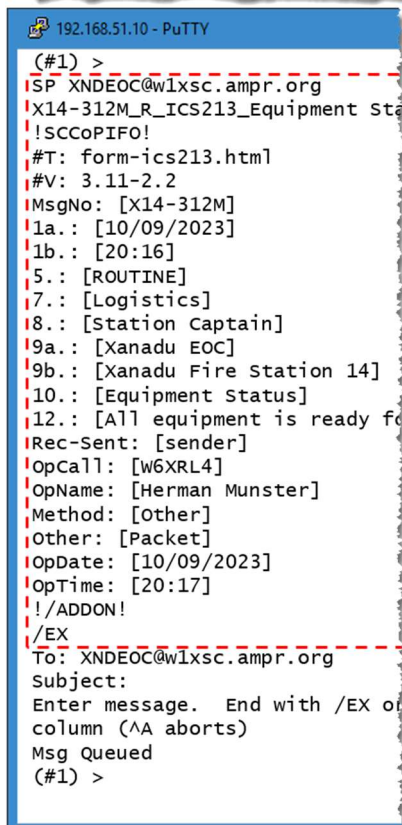
**PuTTY** is displayed.

- \_\_\_ 13. Make sure you previously copied the packet message from the **BBS Command Page** (previous section).

**NOTE:** Include the blank line below the **/EX** statement.

- \_\_\_ 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_ICS213_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 Sending Plain Text Messages with PuTTY

PackItForms does support manual Plain Text message sending and receiving.

- from the **Home Page, dropdown menu**, pick **Plain Text Message**. The Message Page opens.
- Message ID and Handling order are filled in, **DO NOT CHANGE THIS!**
- Fill in...
  - To: destination packet address
  - The rest of the Subject text
  - Your plain text message
- Finally, press **Log and Send**

The rest of the send process is the same.

The screenshot shows a web browser window with the title 'XSC ICS-213 Message'. The address bar shows '127.0.0.1:56660/man...'. The form contains the following fields and controls:

- Urgent:** ☐ **Bulletin:** ☐
- To:**  (Annotating red arrow points from the list item 'To: destination packet address' to this field.)
- Subject:**  (Annotating blue arrow points from the list item 'The rest of the Subject text' to this field.)
- Message:**
- Log and Send** (A green button)

The browser's menu bar includes File, Edit, View, History, Bookmarks, Tools, and Help. The tab bar shows 'Google' and 'XSC ICS-213 Message'.

---

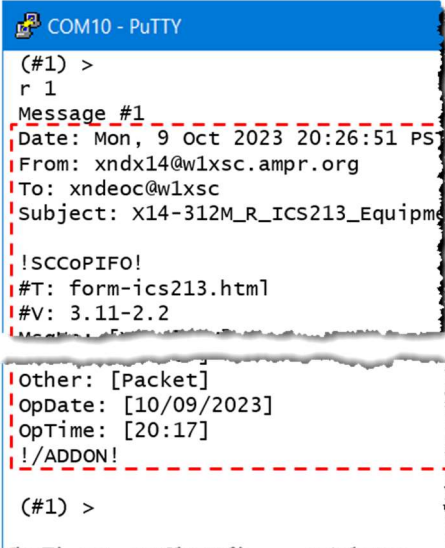
## 3.9 Receiving a PackItForm message manually

### 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.



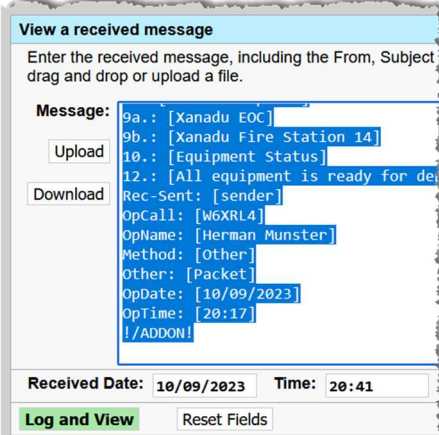
COM10 - PuTTY

```
(#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  
Upload  
Download  
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

---

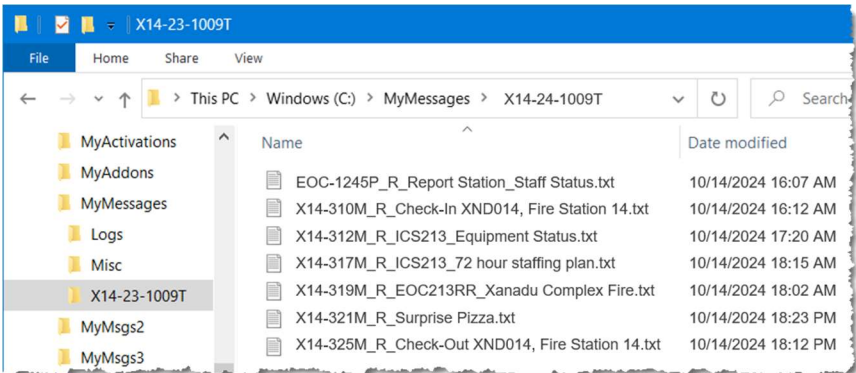
## 3.10 Notes on Outpost Tags

- Messages sent from Outpost occasionally have “tags” inserted in messages that you might see.
- Some of the more common tags are:
  - !RRR! Request Read Receipt
  - !RDR! Request Delivery Receipt
  - !SCCoPIFO! This is a PackItForm message
  - !/ADDON! The end of a PackItForm or other Addon message
  - !UG! Mark message as urgent (lists as RED in the Outpost listing)
- PackItForms will ignore many Outpost tags that it sees and they will not show up in the message.

---

## 3.11 Viewing saved messages

1. View your saved messages in the directory set up in Section 3.6. For example: C:\MyMessage\X14-24-1009T\
2. Sort by clicking on the **Name** or **Date Modified** column headers.



## 3.12 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.  
Once pressed, **Undo Erase All** is displayed that will restore the form
7. **Generate 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.

File Edit View History Bookmarks Tools Help

SCCo PackItForms x ICS-309 x +

127.0.0.1:60400/manual-edit-log 110%

**COMM Log**  
ICS 309-SCCo  
ARES/RACES

1. Incident Name and Activation Number

2. Operational Period (Date/Time)

From: m/d/yyyy hh:mm To: m/d/yyyy hh:mm

3. Radio Net Name (for NCOs) or Position/Tactical Call

4. Radio Operator (Name, Call Sign)

call-sign

**5. COMMUNICATIONS LOG**

Time (24:00)	FROM		TO		Message	
	Call Sign/ID	Msg #	Call Sign/ID	Msg #		
13:49	XND022	X22-121M	XNDEOC@w1 ...		R_Check-In XND022, Kios	
14:27	XND022	X22-123M	XNDEOC@w1 ...		R_IC5213_Opening Status	
14:41	xndeoc@w1 ...	XND-3001P	XND022	X22-124M	R_IC5213_opening status	
15:13	xndeoc@w1 ...	XND-2009P	XND022	X22-126M	R_IC5213_4-hour festiva	
15:33	XND022	X22-127M	XNDEOC@w1 ...		I_EOC213RR_XANADU PICNI	

09:26

XND014

X14-312M

XNDEOC@w1 ...

R\_Check-Out XND014, Fir

09:26

XND014

X14-313M

XNDEOC@w1 ...

R\_Check-Out XND014, Fir

09:37

xndeoc

EOC-1245P

XND@xsc

R\_Report Station/Staff

hh:mm

6. Prepared By (Name, Call Sign)

6A. Signature

7. Date & Time Prepared

m/d/yyyy hh:mm

ICS 309-SCCo ARES/RACES (Rev. 2021-Apr-08)  
PIF: 1.1

Erase All

Generate CSV File

Print

Save

15/16

