Amateur Packet Radio
Field Reference, Type III

For SCCo RACES Responders

February 2025

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Rev: 250217

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)

11.4   Reset (cleanup) Outpost for the next event

> ***STOP!***   Do not proceed until you have created a **Message Archive>All Folders** first.

> ***STOP!***   Do not proceed until you have permission from your supervisor.

1. If not already done, set up the **SCC Notices** message folder:
   a. **Tools** > **General Settings**, **Start** tab.
   b. Set the name of one of the folders to **SCC Notices** (**Tools** > **General**).
   c. Move or drag all SCC Notices to this folder.

2. If not already done, export (backup) the **SCC Notices** folder:
   a. Click on this folder. **File** > **Export**, then select **This Folder**.
   b. Give it a name, such as "*SCC_Notices*". Press **OK**.
   c. Verify that the 6 notices messages were processed.
   NOTE: your file is in the C:\SCC Packet\archive directory

3. Delete all Outpost messages:
   a. Go to **File** > **Delete All Messages**, select **Yes** at the prompt. All your files are deleted.

4. Restore the SCC Notices:
   a. **File** > **Import**, select the file, press **OK**

5. Your system is now ready for the next event or incident.

6. Inform your supervisor that this task is complete.

11   Archiving Event Documentation

Whether it be an exercise or a real activation, when your shift is over, your management will provide instructions on things that need to be done. These can include:

- Submitting all documentation (to whom and how)
- Preparing the packet station for the next use, including archiving your shift or the event

11.1   Create the ICS 309 Communication Log
Follow these steps to produce the Packet ICS 309:
1. From Outpost, **Tools** > **Report Settings**, 3rd tab, the **Other ICS 309 Fields** section. Enter all fields. These fields flow to the ICS309 Form.
2. From Outpost, **Forms** > **ICS 309 Communication Log**.
3. Enter the **Operational Period**.
4. Select **Period** Tab. Select **Range**, set the **From**: and **To**: to the date/time range for when your shift (or event) occurred.
5. Select **Content** Tab. Do not exclude anything.
6. Select **Output** Tab. Check all the output formats you want.
7. Select **e-Signature** Tab. Check 'Add Electronic Signature'.
8. Press **Build Data Set**, then press **Print**.
9. If you print this form without e-signature checked, then sign the ICS 309.
10. Deliver this report to your supervisor.

NOTE: If you do not have a printer, then select the *Microsoft Print to PDF* printer to produce a .pdf file.

11.2   Create a printable list of your messages
1. From Outpost, **File** > **Save All**. This creates an Ascii formatted file or all messages in the current folder with a *Page Break* inserted between each message.
2. Use meaningful file names.
3. Repeat this step for any other folder where event messages were created, sent, received, and stored.
4. At some future time, this file could be printed to generate one message per page. Or, because the messages are in a .txt file, individual messages can be copied and pasted into another test editor for other purposes.
5. Deliver this file(s) to your supervisor.

11.3   Create an Archive of your messages
1. From Outpost, **File** > **Export**, then select "**All Folders**" (for your entire system).
2. Use meaningful file names. This creates an Outpost readable file that later can be imported into Outpost to restore your messages back to their original folders.
3. Deliver this file to your supervisor.

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.

A checklist is a type of job aid that helps ensure consistency and completeness in carrying out a task or executing a process. This checklist is relevant for all packet radio operators during exercise, event, and incident activations where field packet operations is required.

1. First Shift: Establishing a packet station

_____ 1. Inform Resource Net Control that you have arrived. Check out of the Resource Net before you leave your car.

_____ 2. Check into the assigned voice net before you leave your car. Start an ICS 309 Comm Log for the voice net.

_____ 3. Make an ICS 214 Unit log entry.

_____ 4. Sign in on the site's ICS 211 Check-in sheet.

_____ 5. Find the supervisor and inform them of your arrival.

_____ 6. Request a safety and assignment briefing; get details on any site- or event-specific conditions that exist. You need to know:

   a. Supervisor's Name
   b. Activation Number
   c. Operational Period
   d. ICS Location
   e. Your Tactical Call and Message ID Prefix
   f. BBS to use
   g. Band and frequency
   h. Primary and secondary packet addresses for any preferred destinations

_____ 7. Find and set up the workspace for packet operations.

2. Initial setup: Equipment check-out

_____ 8. Find, assess, and setup the packet radio equipment (see *Section 4, Packet Startup Procedure*)

_____ 9. Confirm or set your User Identification (FCC Call Sign) and *Tactical Call for the assigned agency*.

_____ 10. Check settings before transmitting:
   Correct BBS in Outpost
   Correct Interface in Outpost
   Correct radio frequency

_____ 11. Begin packet operations. Make ICS 214 Unit log entry.

3. Packet Operations: Managing the message flow

_____ 12. Download all notices to ensure you have the latest; read them.

_____ 13. Set up a folder named "SCC Notices" (**Tools** > **General Settings**, **Startup** tab) and move all notices to this folder.

_____ 14. Send a test message to yourself to confirm you can create, send to, and receive from the assigned BBS.

_____ 15. Create a Check-In message to your assigned agency using your *Tactical Call* sign (see *Section 9 Check-in, Check-out Message*).

Medical Forms

Handling	To Location	To ICS Position
HAvBed Report		
Immediate (ASAP)	If open: PHDOC Else: County EOC	EMS Unit Else: Medical Health Branch Else: Operations Section
Medical Facility Report		
Immediate (ASAP)	If open: PHDOC Else: County EOC	EMS Unit Else: Medical Health Branch Else: Operations Section
Medical Resource Request – OBSOLETE Replaced by EOC 213RR		
Allied Health Facility Status		
Routine (<2 hrs)	If open: PHDOC Else: County EOC	PHDOC: Health Care Liaison County EOC: EMS Unit-or-Public Health Unit Else: Medical Health Branch Else: Operations Section

General EOC, RACES Forms

Handling		To Location	To ICS Position
ICS-213 Message Form			
Author-Defined		Author defined	Author defined
EOC-213RR Resource Request			
If "Priority" is:	Then "Handling" is:	County EOC	Planning Section
Now	Immediate (ASAP)		
High (0-4 hrs)	Immediate (ASAP)		
Medium (5-12 hrs)	Priority (<1 hr)		
Low (12+ hrs)	Routine (<2 hrs)		
OA Jurisdiction Status			
Immediate (ASAP)		County EOC	Situation Analysis Unit Else: Planning Section
OA Shelter Status			
Priority (<1 hr)		City-managed: City EOC County-managed: County EOC	Mass Care and Shelter Unit Else: Care and Shelter Branch Else: Operations Section
RACES Mutual Aid Request			
Routine (<2 hrs)		County EOC	RACES Chief Radio Officer Else: RACES Unit Else: Operations Section

___ 16. Send, receive, log and process packet messages. To only send a message as soon as it is created, use **Actions** > **Send Only**

___ 17. Manually initiate an Outpost Send/Receive at least every 10 minutes.

___ 18. If a message was not acknowledged:

    a.   Check the message address and BBS

    b.   Resend the message if needed

    c.   Let your supervisor know

___ 19. If new notices are retrieved, follow any new instructions.

___ 20. Maintain voice radio contact on the designated voice net.

___ 21. Make ICS 214 Unit log entries as appropriate.

___ 22. Report any issues or problems to your supervisor in person or over the voice net (if remote).

4. Incoming Shift Change: If you are relieving someone else, do the following:

___ 23. Inform Resource Net Control that you have arrived. Check out of the Resource Net before you leave your car.

___ 24. Sign in on the local ICS 211 Check-in sheet.

___ 25. Find the supervisor and inform them of your arrival.

___ 26. Request a safety and assignment briefing; get details on any site- or event-specific conditions that exist.

___ 27. Find the person you are relieving and receive a shift change briefing (see *Shift Change Information* below).

___ 28. Make packet system updates – Station ID, others as needed.

___ 29. Make all relevant shift change entries in your ICS 214 Unit log.

5. Outgoing Shift Change: If you are being relieved, do the following:

___ 30. When contacted by your replacement, provide a shift change briefing (see *Shift Change Information* below).

___ 31. Generate and sign a packet ICS 309 Comm Log for your shift.

___ 32. Generate all event packet documentation for your shift and deliver as instructed (see *Section 11 Archiving Event Documentation*).

___ 33. Turn over all assigned equipment to your replacement.

___ 34. Find your supervisor and inform them of the shift change and your departure.

___ 35. Make the appropriate shift change entries in your ICS 214 Unit log. Complete and sign the form.

___ 36. Turn in all paperwork to your supervisor.

___ 37. Sign out on the site's ICS 211 Check-in sheet.

___ 38. Check into the Resource Net. Inform Net Control what you plan to do (go home, return to EOC, etc.).

6. Securing Operations: when you are directed to shut down, do the following:

_____ 39. Get permission from your supervisor to shut down.

_____ 40. Create a Check-Out message to your assigned agency using your *Tactical Call* sign (see *Section 9 Check-in, Check-out Message*).

_____ 41. Generate and sign a packet ICS 309 Comm Log for your shift.

_____ 42. Generate all event packet documentation for your shift and deliver as instructed (see *Section 11 Archiving Event Documentation*).

_____ 43. Complete and sign your ICS 214 Unit log.

_____ 44. Shut down and pack up all assigned equipment.

_____ 45. Turn in all paperwork to your supervisor.

_____ 46. Sign out on the site's ICS 211 Check-in sheet.

_____ 47. Check out of the assigned voice Net and check in with the Resource Net. Inform Net Control what you plan to do (go home, return to EOC, etc.).

Shift Change

Before turning over or accepting a shift, both the in-coming and out-going operators should review as much information as possible, including:

1. Past history of messages sent, replies you expect, and who should get them.
2. The location of the toilet, food, water, etc.
3. What to do in the event of an emergency.
4. Location and timing for briefings that may occur during each shift change.

   NOTE: if you are also changing PCs, then pass on the next message number, located here: from Outpost, **Tools** > **Report Settings** > **Variables** tab, *Next Message* field).

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9 Check-in, Check-out Message

Last revised: 21-Jan-2024 at 19:11 by Mark Laubach, K6FJC

Check-In/Out messages follow the standard subject line format. See the "SCCo Packet Subject Line" notice for general subject line format info.

Use the PackItForms XSC Check-In/Out Message form as a preference when using Outpost. Otherwise create a plain text message that meets these guidelines.

Check-In/Out messages always have Handling Order = R (Routine), and have a specific subject and body format

---
Tactical Check-In:
Subject: <SenderMsgNbr>_R_Check-In <TacticalCallSign>, <TacticalName>
Body: Check-In <TacticalCallSign>, <TacticalName>
[FCC call sign and full name of the Packet Operator]

Example:
Subject: `SH1-123P_R_Check-In XNDSH1, Xanadu Shelter 1`
Body: `Check-In XNDSH1, Xanadu Shelter 1`
`W6XRL4, Herman Munster`

Tactical Check-out:
Check-Out messages are the same, except replace "Check-In" with "Check-Out"

Example:
Subject: `SH1-128P_R_Check-Out XNDSH1, Xanadu Shelter 1`
Body: `Check-Out XNDSH1, Xanadu Shelter 1`
`W6XRL4, Herman Munster`

Individual Check-In:
Unless required by the local jurisdiction, it is unlikely you will need to do an individual check-in/out. But if you do...

Subject: <SenderMsgNbr>_R_Check-In < FCCCallSign >, < FullName >
Body: Check-In <FCCCallSign>, <FullName>

Example:
Subject: `XRL-234P_R_Check-In W6XRL4, Herman Munster`
Body: `Check-in W6XRL4, Herman Munster`

Individual Check-out:
Check-Out messages are the same, except replace "Check-In" with "Check-Out"
Example:
Subject: `XRL-237P_R_Check-Out W6XRL4, Herman Munster`
Body: `Check-Out W6XRL4, Herman Munster`

Note: Weekly SPECS/SVECS Packet Practice Messages are not simple check-in messages. So, their subject line and contents are somewhat different. See the "SCCo Packet Weekly Practice" notice for details.

8	Standard Subject Line Format

Last revised: 03-Aug-2022 at 07:30 by Steve Roth, KC6RSC

Always use the following subject line format to allow the recipient to review and prioritize messages. The standard subject line format is:

<SenderMsgNbr>_<HandlingOrder>_<MsgSummary>

Where:

<SenderMsgNbr>	Typically, a three-character Tactical ID consisting of letters and/or digits, followed by a hyphen ("-"), followed by three or more digits, followed by an optional letter suffix. ▪ Tactical ID: Individuals should use the last three characters of their call sign. Agency EOCs/DOCs should use their assigned three-letter Tactical ID. Others should use the three-character value assigned by their agency, typically the last three characters of the tactical call sign. ▪ Letter suffix: Used to make the number different from any that may already exist on pre-printed forms. o Outpost automatically adds the suffix "P". o For Manual messages: use the suffix "M". o For Resending messages with the same content and same Msg Number, manually change the Msg Number suffix to "R". Avoid using letters which could be mistaken for digits (I, O, Q, Z).
<HandlingOrder>	One letter: I = Immediate; P = Priority; R = Routine
<MsgSummary>	Short description of the contents of the message

Example:
Subject Line: **LOS-127P_R_Status of sandbag supplies**

 Meaning: Sender Msg Nbr: LOS-127P
       Handling Order: _R_ (Routine)
       Msg Summary: Status of sandbag supplies

NOTES:
1. Underscore characters "_" are used between the above three fields to provide better visual separation.

2. PackItForms will automatically format the subject line and include the type of form used as part of the subject.

3. Check-In/Out messages have a specific <MsgSummary> format and body format. See the "SCCo Packet Check-In/Out" notice for details.
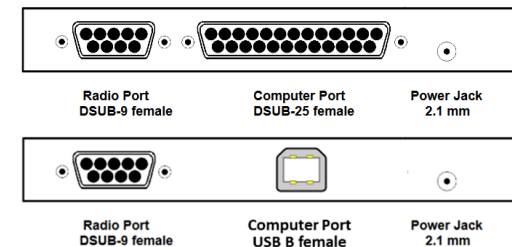
4	Packet Startup Procedure

This is a five-step approach for confirming the operational state of a packet station.
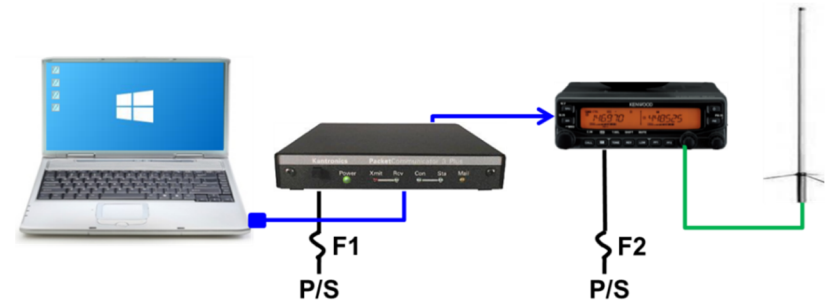
1. **Connections:** Confirm that all packet components are correctly cabled.

_____ 1. Laptop; Serial USB Adaptor available if no serial comm port exists.

_____ 2. TNC (KPC3+ shown)

 a. Computer: Correct serial modem cable to USB – Serial Adaptor, or USB cable for newer KPC3+.

 b. Radio: **Custom** data cable; depends on the radio.

 c. Power: fused, connected to battery or power supply.

_____ 3. Radio

 a. Antenna: coax connected to antenna

 b. Power: fused, connected to battery or power supply

2. **Power Up:** Apply power. Verify all devices are correctly powered up.

_____ 4. Boot up Laptop; battery is charged or power adaptor is plugged in.

_____ 5. TNC: Apply power:
  Verify TNC power LED lights up.
  Verify (if using a RigRunner) the fuse LED is not lit (indicates a blown fuse).

_____ 6. Radio: Apply power.
  Verify the radio turns on.

3. TNC Check: Verify that you can communicate with the TNC.

_____ 7. *Verify:* If using a USB-Serial adaptor, the correct Windows driver is loaded; check with Windows Device Manager (right-click Windows **Start** ( ), left-click **Device Manager**, look for **Ports (COM & LPT).**

_____ 8. Run the terminal emulator such as **Ipserial.exe** or **PuTTY such as Ipserial SCC** desktop icon, or from Outpost **Tools** > **Interactive Packet** > **Serial Com Port**.

_____ 9. From Ipserial, select **Setup** > **Com Port Settings**. Select the Comm Port for your TNC… Press **OK** when done.

_____ 10. From Ipserial, press **Connect**. Press **Enter**.
    Verify that you see the TNC prompt (`cmd:`).

_____ 11. If you do not get the TNC prompt or any text, then check:
   a. Power is applied to the TNC; the TNC is turned on.
   b. If the TNC was left in KISS mode; then reset the TNC. Try:
      i. From Ipserial, **Tools** > **Kantronics Kiss Off.**
      ii. See TNC manual to perform a hardware reset.

_____ 12. If you do get garbled text, then check Com Port settings:
   9600 baud, 8, N, 1

4. Equipment Settings: Confirm all equipment settings. This occurs prior to starting Outpost.

_____ 13. TNC Settings: Use **Ipserial.exe** or **PuTTY**.
   a. Check the Comm Port settings
   b. TNC: `cmd: int terminal`
   c. TNC: `cmd: cd software`

_____ 14. Antenna is up as high as possible

_____ 15. Radio is set to the frequency for the selected BBS. Plus,
   a. Tone set to NONE
   b. Offset set to NONE
   c. Squelch is open
   d. Radio is set to high power
   e. Correct side of the radio is selected for packet (depends on the radio)

5. Outpost Application Settings

_____ 16. Packet application (see the next section in this handbook).
   a. Station ID is set to your FCC Call Sign
   b. Tactical Call, Additional Text, and Message Prefix is set per your operational instructions
   c. PC Time is checked to be the correct time
   d. BBS is set to the required BBS
   e. Interface is set to the TNC and Com Port you are using

RECEIVING

If you receive a message with .csv in the title, then do the following:
   13. Open the message.
   14. Select **File** > **Save As…** The file name will default to that of the message's subject with the correct "*csv" extension. Press **Save**.
   15. Close the message.
   16. Deliver the file to the intended recipient.

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7   Message Addressing

1. Addresses within the SCCo packet network use the standard Internet-style username@domain address format:

   usercall*@*bbscall.scc-ares-races.org

   W6XRL4*@*w2xsc.scc-ares-races.org   (example)

   XNDEOC*@*w4xsc.scc-ares-races.org   (example)

2. Three different addressing formats for sending messages:

   a) ***W6XRL4*@*w2xsc*.scc-ares-races.org**   *Full address is always the best*

   b) ***W6XRL4*@*w2xsc***   **……..**   <u>At least</u> add the ***bbscall*** sign. Within the SCC network, this works equally as well as the complete address.

   c) ***W6XRL4***   **………………**   ***NEVER*** **use this shortcut**; Without the "@...", the message will stay on the same BBS as you, which may not be where you want it to go.

3. Always send to the user's **Primary BBS**, unless:
   a) that BBS is down (then, use their **Secondary BBS**), or
   b) that user cannot reach his/her primary BBS (bad location), or
   c) you are told to use a different BBS.

4. When sending from email to a packet address, ***ALWAYS*** send as a plain text e-mail.

5. Familiarize yourself with the ***Packet Network Addressing Guide*** http://www.scc-ares-races.org/data/packet/packet-addressing.html
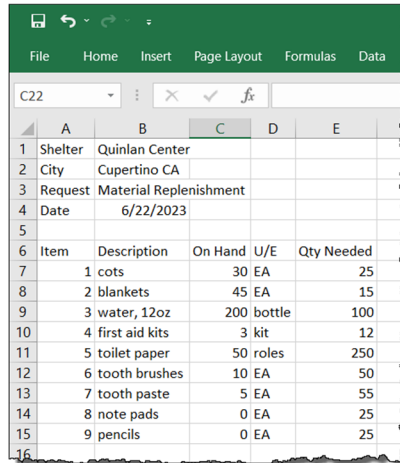
8. From Outpost, press **Send/Receive** to send this message.

6.3 Sending a spreadsheet .csv file – One Approach

Outpost can send spreadsheet data when it is exported into one or more ASCII formats that are compatible with packet. A comma-delimited file (.csv) is one such format. To send a .csv file, do the following:
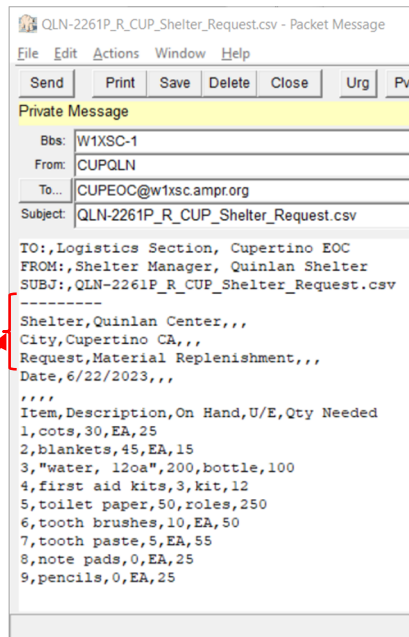
PREPARATION
1. You or the data originator creates a spreadsheet, for example: 5 columns: "Item#"; "Description", "Onhand", "U/E". "Qty needed".

2. Populate the spreadsheet with the data.

3. Press **File->Save As** from the spreadsheet menu.

4. Change the "**Save as Type**" to "Comma Delimited (*.csv)". Press **Save**. A file with a *.csv extension is created.

5. In this example, the file name was CUP-Shelter-Request.csv.

SENDING
6. From Outpost, Press **New**.

7. Add "_R_" after the Msg ID for **R**outine Message or other priority.

8. Select **File > Open a File**.

9. Change the box at the lower right from **Text Files (*txt)** to **All files (*.*)**.

10. Find the previously saved .csv file and select it. Verify that:

    a. The message body is loaded with the comma-delimited ASCII text,

    b. The file name is appended to the subject line after the "_**R**_".

11. If not included, add some basic routing information above the text file. This should include ICS Positions and locations if known.

12. Press **Send**, and then from Outpost, **Send/Receive**.

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5 Client Software

Application Startup

1. **Start Outpost.** Find the Outpost icon on the PC desktop, and double-click on it.

2. The **Station Identification Form** opens.
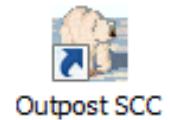
    a. Use the **User Call Sign** dropdown to select your call sign. If your FCC call sign is not listed, press **New** and fill in all fields. Verify that **ALL** User Fields are filled in as follows:

User Call Sign:	< your call sign >
User Name:	< your name >
Message ID Prefix:	<Last 3 chars of your call sign, or enter your initials>

    b. Press **Apply** when Done.

    c. Use the **Tactical Call Sign** dropdown to select your tactical call. If your assigned Tactical call is not found, press **New** and fill in all fields. Verify that **ALL** Tactical Call Fields are filled in as follows:

Use Tactical Call:	☑ CHECKED.
Tactical Call Sign:	< per your assignment >, 6 characters
Additional ID Text:	Short description of your location
Message ID Prefix:	< per your assignment> 3 characters. Check with your supervisor

   d. Press **OK** when done. The Outpost main form will open.

3. **Setting up the TNC.** From Outpost, select **Setups > Interface**.

    a. On the *Type* tab, set the Device Name, such as **XSC_Kantronics_KPC3-Plus**.

    b. On the *Com Port* tab,
i.	Com Port:	select the Comm Port for the TNC
ii.	Baud Rate:	9600
iii.	Data Bits:	8
iv.	Parity:	None
v.	Stop Bits:	1
vi.	Flow Control:	RTS/CTS

    c. Do not change any fields on any other tabs.

    d. Press **OK** to Save your settings.

4. **Setting up the BBS.** From Outpost, select **Setups** > **BBS**.

   a. On the **Name** tab, select the primary BBS Name for your city. If that BBS is not available, select your secondary BBS.

   b. Set **BBS Type** to "**Let Outpost determine…** "

   c. Press **Set/Get TNC** to reopen the TNC Settings form, and press **OK** from that form. This links the TNC to this BBS.

   d. Do not change any fields on any other tabs.

   e. Press **OK** to Save your settings

5. **Setting up City Notices.** From Outpost, select **Setups** > **BBS**

   a. Select **Retrieving** Tab
   b. Under ⊙ **Custom Retrieval** section, enter or update:
   ```
   A ALLXSC
   L> XXX
   ```
   where XXX is the standard three character prefix for your city. See your Shift Supervisor for details.

   NOTE: JNOS does not support multiple City lookups.
   NOTE: For ALLXSC notices, Outpost defaults to "`LA`" (List All). Change this to select the jurisdiction to access.

   c. This section should look like this (XND in this example):
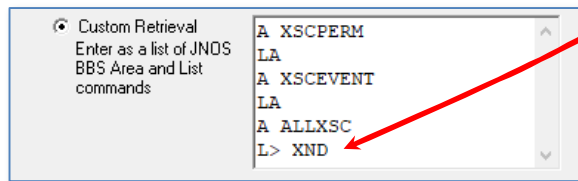
   d. Press **OK** to Save your settings

6. **Confirm your settings.** Check the bottom of the Outpost main form and confirm you see your Station ID, Tactical Call, BBS, and TNC listed as you have just set up.
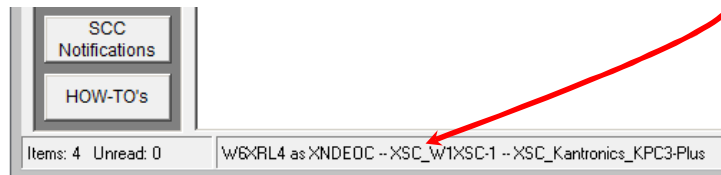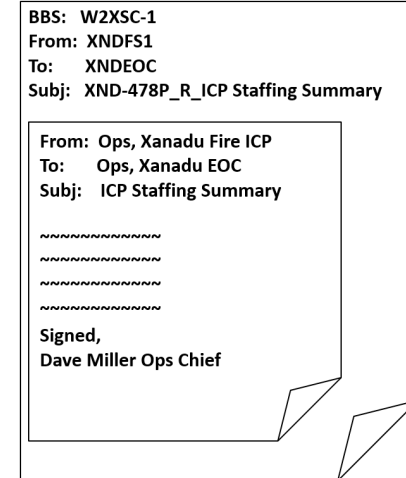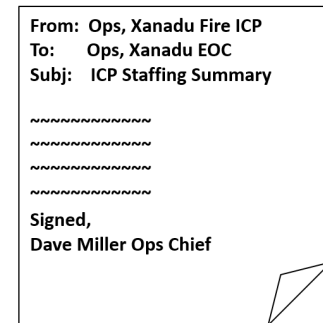

6 Packet Messaging

6.1 Packet Messaging Basics
Addressing a packet message requires 2 types of addresses:

1. What individual do you want to receive the message?

2. What packet station can deliver it to that individual?

We want to "embed" our message below into a packet message with additional addressing information

6.2 Free Form (Plain Text) Message
1. From Outpost's main window, create a new message by either pressing the **New** button. The following form opens.

2. The **BBS:** and **From:** fields are automatically filled in with the **BBS** and Station ID (call sign or tactical call) that was previously defined.

3. Fill in the **To**: field with the call sign or tactical call of the station to which this message is going.

4. The **Message ID** is automatically filled in.

5. Add "**_R_**" after the Msg ID for **R**outine Message or other priority. Complete the **Subject:** text with your text.

6. Enter the body of the message.

7. Press **Send** when done.