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Packet Operations Type III • Part A

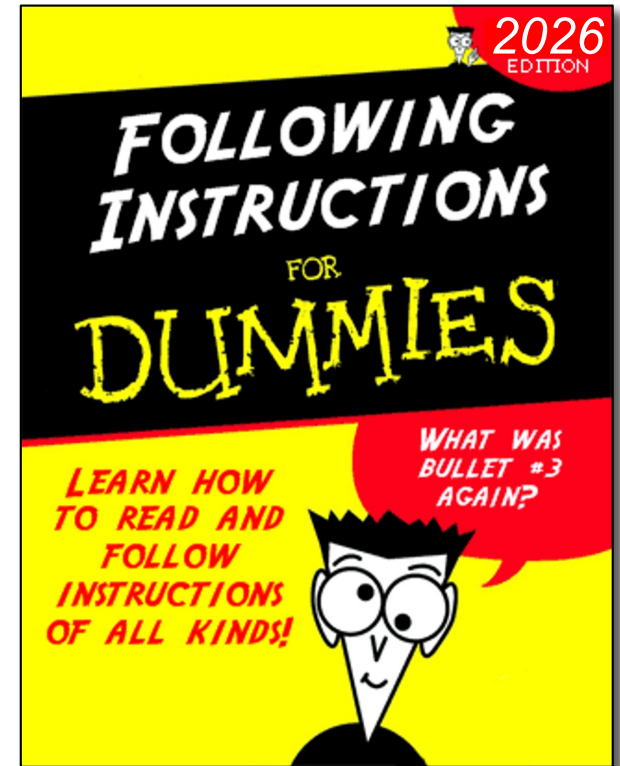


Santa Clara County ARES®/RACES/ACS
Last Updated: 22 July 2026

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Housekeeping

- Introductions
- Pen/pencil & paper
- Cell phones on silent or vibrate
- Side conversations
- Questions
- Breaks
- Restrooms
- In case of emergency
- No wandering or exploring other areas of the building.



Agenda

Type III Part A (this class)

- Introduction to Packet Radio
- Building a Packet Station
- Packet Software
- Outpost Settings
- Packet Field Deployment

Start Up Station

Packet Operations

Shift Change

Shut Down Station

Part B and Type II (Nov. 14)

- SCCo Packet Messenger
- Packet Field Deployment
reprise with SCCo Packet Messenger
- SCCo Packet BBS Network
- Packet Ops in County EOC
- Under the Hood

What This Class Doesn't Cover

Operations outside SCCo ARES/RACES

Packet can be used in many ways other than emergency communications. This class focuses only on how SCCo ARES/RACES uses packet.

Operating mechanics that apply to all roles

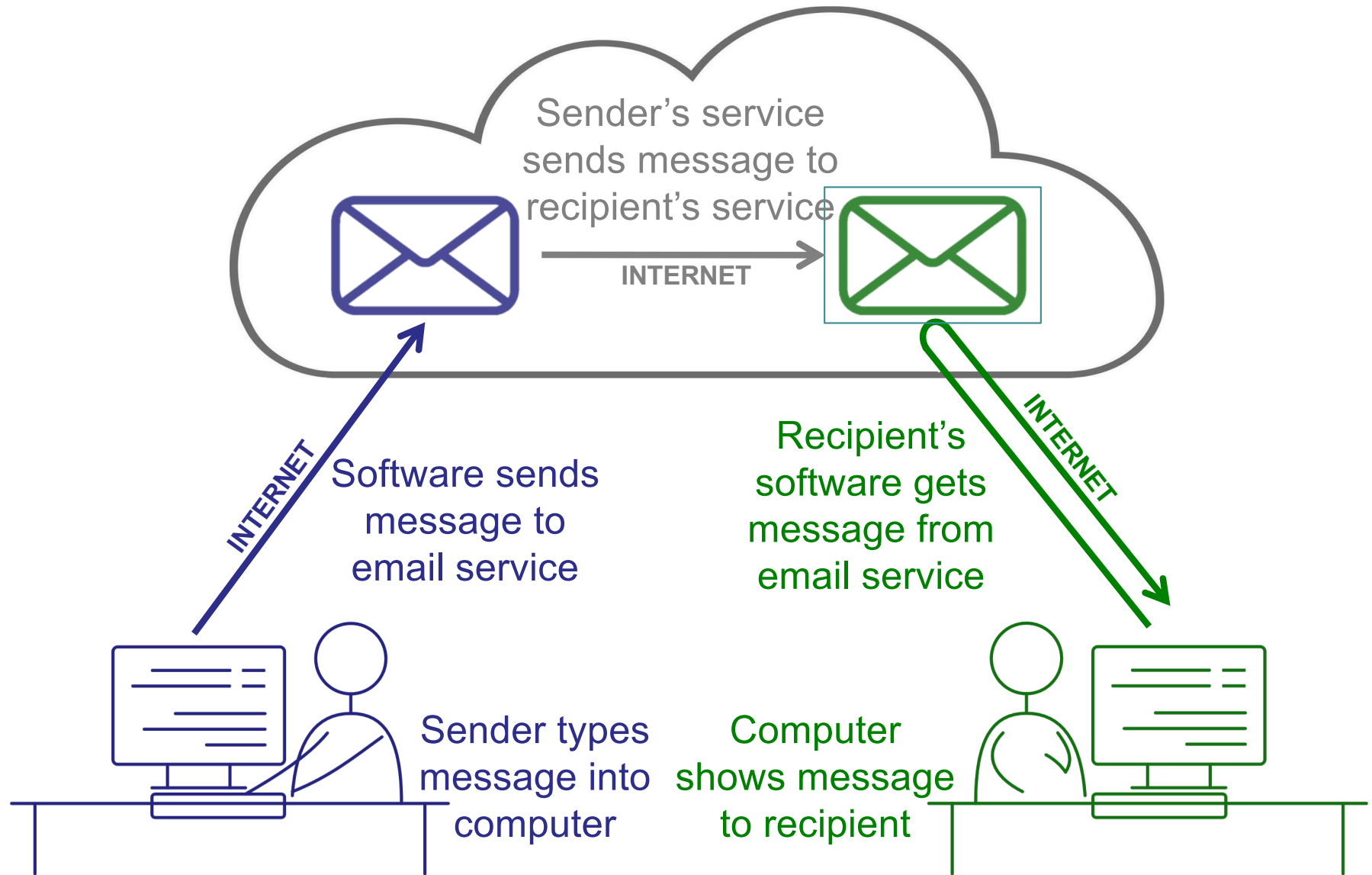
General assignment duties such as resource net usage, ICS-214 forms, shift briefings, and many others are covered in the Field Operations Type III class and the *Performance Standards and Best Practices* manual.

“Manual Mode” packet operations

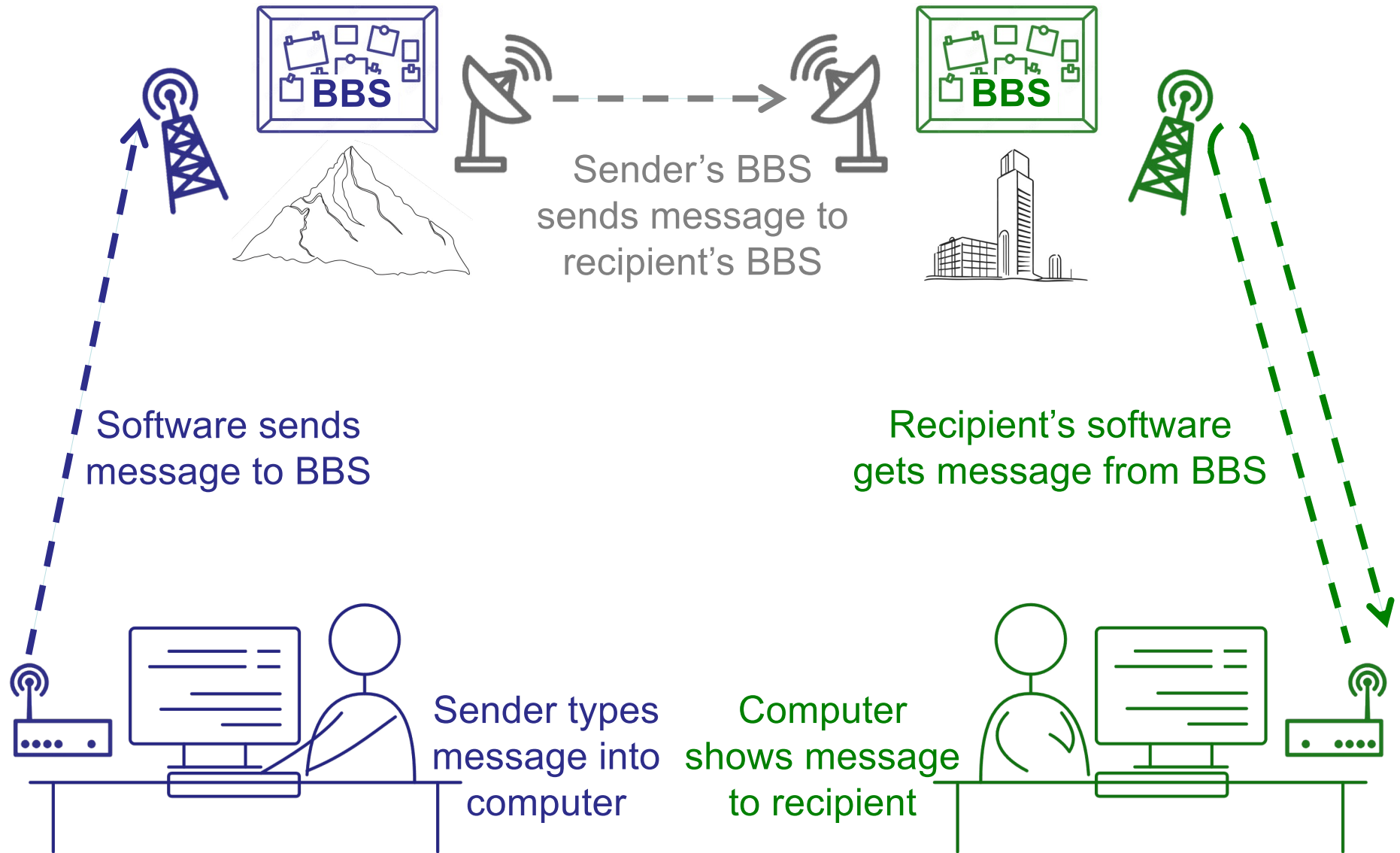
i.e., issuing commands to the TNC and BBS directly in a terminal emulator
SCCo Packet Messenger removes the need for manual mode.
It is no longer a Packet Operator Type II credential requirement.

Introduction to Packet Radio

Packet Radio: Like Email over the Air



Packet Radio: Like Email over the Air



Why is it called “Packet?”

It breaks up your message into 128-byte “packets,” and sends one packet at a time.

If you turn up your speaker, you can hear each packet.

Packet size can vary; SCCo ARES/RACES uses 128 bytes.

It waits for the receiver to acknowledge each packet.

If the receiver doesn’t respond or says it was garbled, the packet is resent.

In addition to 128 bytes of your message, each packet has a routing header and a checksum.

The routing header says who the packet is for.

The checksum lets the receiver determine if the packet was garbled.

Senders share the channel, interleaving packets.

Efficient sharing relies on all stations hearing each other.

About Packet Radio

Advantages

Much faster than voice

A good operator can pass 40+ messages an hour.

Precise and accurate

What you type is exactly what the recipient sees. Especially helpful for complex messages!

Automatic ICS-309 log

The log is generated from the messages directly, saving time.

Neatly printed messages

More legible, no writer's cramp

Challenges

Delayed delivery

Recipient may not check for messages right away. You have to watch for a delivery receipt.

Specialized equipment

Laptop, TNC, high-power radio, good antenna, printer, power

Specialized software

Outpost and PackItForms

Hidden node issues

Protocol is efficient only if every station can hear every other.

Bulletins and Notices

Messages posted to a topic rather than sent to a station

Anyone interested in the topic can read them

XSCPERM

Permanent notices with reference information for SCSO operators

XSCEVENT

Notices regarding an ongoing event

XSCTEST

Test notices (you can experiment here)

*city-code***@XSC**

City-specific bulletins

Packet Operator Credentials

P3

- Fully independent operator
- Set up, configure, and operate existing station
- Basic troubleshooting
- Low to medium traffic
Small EOC, hospital, etc.

P2

- Advanced operator
- Set up, configure, and operate your own station
- Advanced troubleshooting
- Medium to high traffic
Large EOC, shelter, etc.
- Operate without Outpost

P1

- Specialist Operator
- Plan a large packet event
- Deploy and run a BBS

Let's Build a Packet Station!

scc-ares-races.org/operations/equipment

Antenna

The higher the better!

Field Station

Roll-up dual-band J-pole

Tuned for 144 and 433 MHz

Telescoping fiberglass mast

Extends from 3½ to 32 feet

Tripod base

Sandbags on legs for wind support

LMR-240-UF coax up the mast

Lightweight to avoid straining mast



Fixed Station

Tri-band fixed antenna

Mount on roof or tower

Waterproof connections

Grounded and bonded

Avoid shocks and fried equipment

Lightning arrestor

Avoid lightning and storm damage

LMR-400 or better coax

Low-loss cable for longer runs



Radio

Mobile radio with at least 25W power (50W is better)

You need to be heard by everyone else on the same frequency.

We use four key BBSes in Santa Clara County ARES/RACES.

⇒ You need to be heard across much of the county.

Radio with data connector

Consistent audio levels between radio and TNC

Allows operator to listen in during packet operations

Radio with dual VFOs (or two radios)

You'll need to monitor a voice channel also



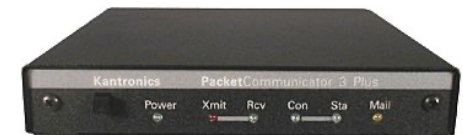
TNC (Terminal Node Controller)

Converts serial data from a computer into audio signals for radio transmission

1200 Hz for a 1-bit, 2200 Hz for a 0-bit, at 1200 bits/sec

TNCs can be:

- Standalone hardware devices
- Integrated into the radio
- Software running on the computer
(not recommended — too finicky)



The county standard TNC is the Kantronics KPC-3 Plus.

Available in USB or DB-25 serial variants

Laptop Computer

Runs the software needed for packet operations

Needs to run Windows 10 or 11

Outpost (county-standard software) only runs on Windows

Does not run well in a Windows emulator or virtual machine

In a pinch, other software is available for other systems

Large screen is better

Forms are easier to read on a large screen

Full-size keyboard

You'll be doing a lot of typing

Battery life of at least 1 hour

Get a model that has a car charger available



Printer

Prints messages and logs

Technically “optional,” but all packet advantages are lost without one

Three technologies in use, all with tradeoffs:

- Inkjet printers are small, cheap, and use low power
but they are slow, and ink dries up when left unused
- Laser printers are fast and produce the best output
but they are bulky, heavy, inconvenient to transport, and power-hungry
- Thermal printers are small and can be left unused
but paper is expensive, sun-sensitive, and doesn't archive or scan well

Power

Packet stations have high power needs.

Radio runs at high power and high duty cycle.

Laptop batteries don't last long.

Laser printers have very high inrush current.

May need 120V AC as well as 12V DC.

Most printers need 120V AC.

Laptops need 120V AC unless you have a car charger or 12V-to-USB adapter.

Options:

- **Building power** if you're indoors and power is on
- **Batteries** if you have high capacity, and an inverter for 120V AC needs
- **Generator** if you're outdoors and can cope with fuel and noise issues

Don't use a vehicle battery if you want to get home.

Operating Area Setup

Table and chair

You need table space for paperwork

You need to sit to type effectively

Lighting

You need to be able to see the paperwork

Heating or cooling

You need to be comfortable to be efficient

You don't want your radio or laptop to overheat either

Wind and Rain Protection

Paperwork can be hard to manage in the wind

Rain can damage equipment as well as paperwork

Clock

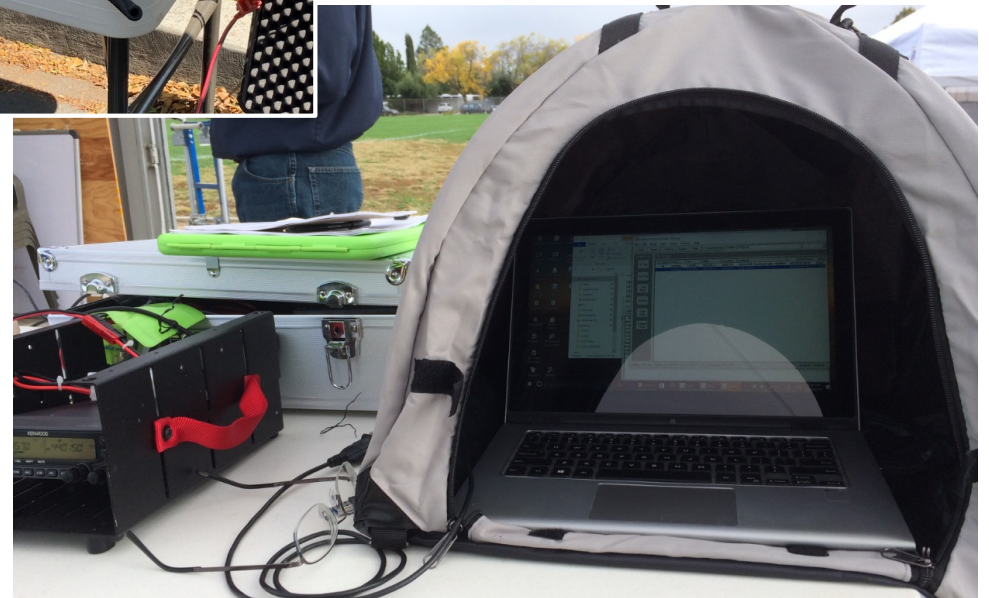
Handy when filling out forms

Sun Shade

Shade is essential when operating outdoors

You won't be able to read your screen in direct sun.

Direct sun can cause your laptop and radio to overheat.



Packet USB Stick

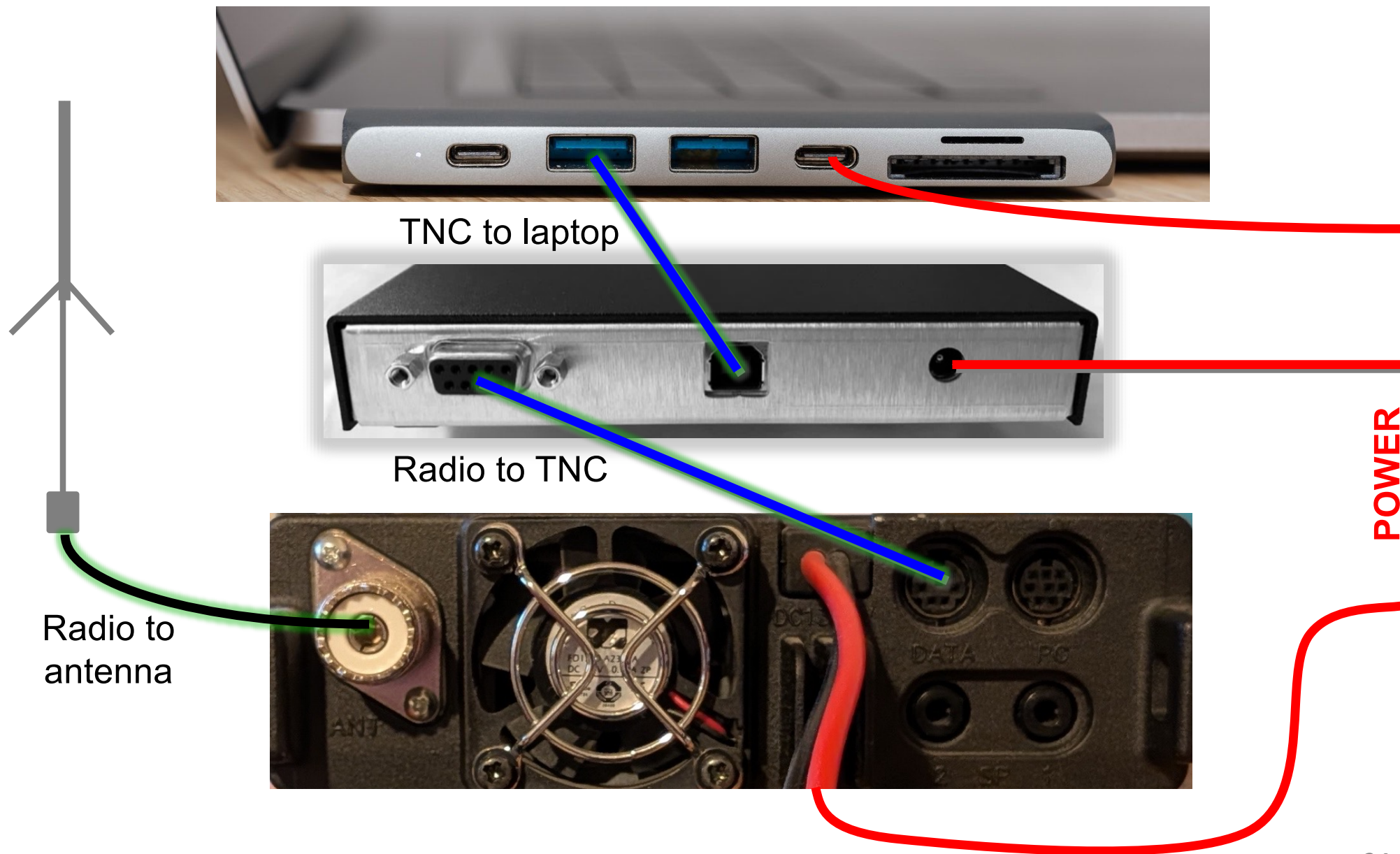


Keep a USB stick in your Go Kit with:

- SCCo combined software installer
- No-install packet application (SCCo Packet Messenger)
- No-install terminal emulator (e.g., Putty)
- Current [XSCPERM](#) bulletins
- PDF manuals for your equipment
- Key documents from county website

Standard Outpost Settings, Standard TNC Settings, etc.

Connections



Connections

Radio to antenna

Always connect the antenna first, disconnect it last

Do not run other cables alongside antenna cable

TNC to radio

Requires special cable, custom for radio-TNC pair, shielded

If the radio has no data connector, connect to speaker, mic, and PTT

Alinco DR-135/235/435T: connector looks like a DB-9 serial port, but isn't

KPC-3+: connector looks like a DB-9 serial port, but isn't

Laptop to TNC and printer

Use shielded USB cables

If TNC has a DB-25 serial port, use a USB-to-serial adapter

Everything to power

Always connect the power last, disconnect it first

Use fused connections to the power supply

Radio Setup

- Turn the radio on and ensure it is working normally.
- Select the correct VFO for data operations.
- Set the correct frequency for your BBS.
- Set to high power.

If unsure of the antenna, do a low power test with an SWR meter first.

If the TNC is connected to the radio's speaker output:

- Open the squelch all the way.

The display should show that it's constantly receiving.

TNC Serial Port

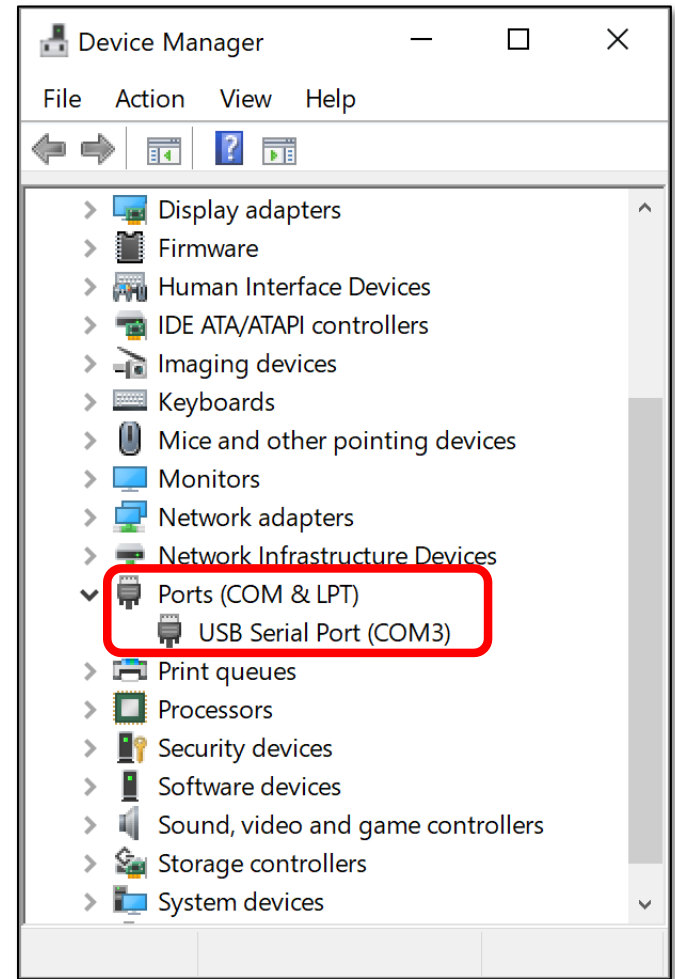
You need to know which “COM port” the TNC is on.

It's often “COM3” but not always.

To find out:

1. Open “Device Manager”
2. Look in “Ports (COM & LPT)”
3. Disconnect and reconnect the TNC.

The TNC port will go away and come back.



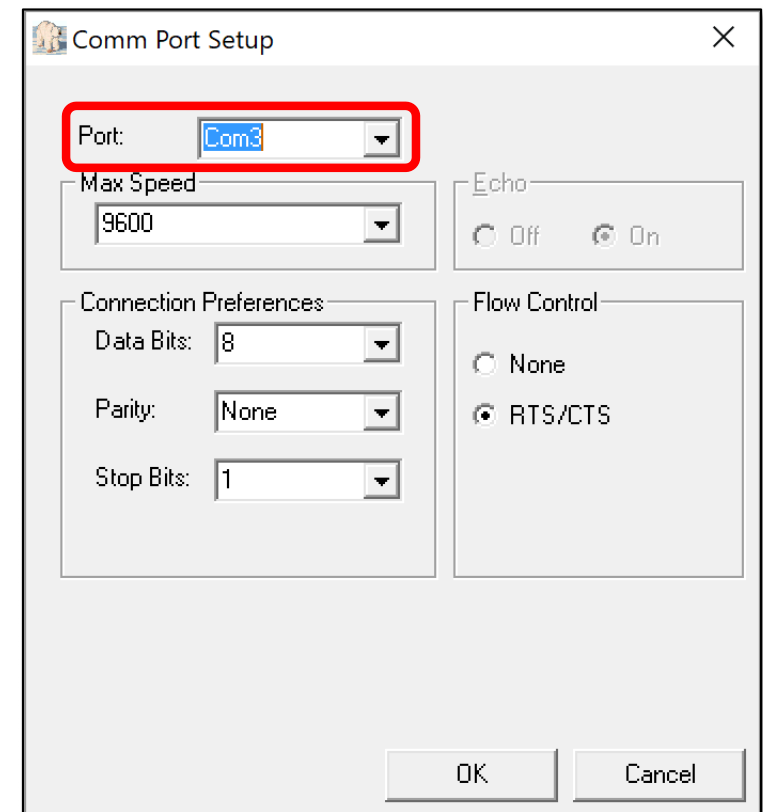
TNC Communications

The laptop and TNC need to agree on serial protocol.

The standard is 9600 baud, 8 data bits, no parity bit, 1 stop bit (8-N-1), and hardware flow control (RTS/CTS).

To verify:

1. Run “ipserial” (installed with Outpost).
2. Enter these settings in the
Setup → Comm Port Settings dialog.
3. Click **Connect** to open the port.
4. Hit ↵ **Enter** to wake up the TNC.

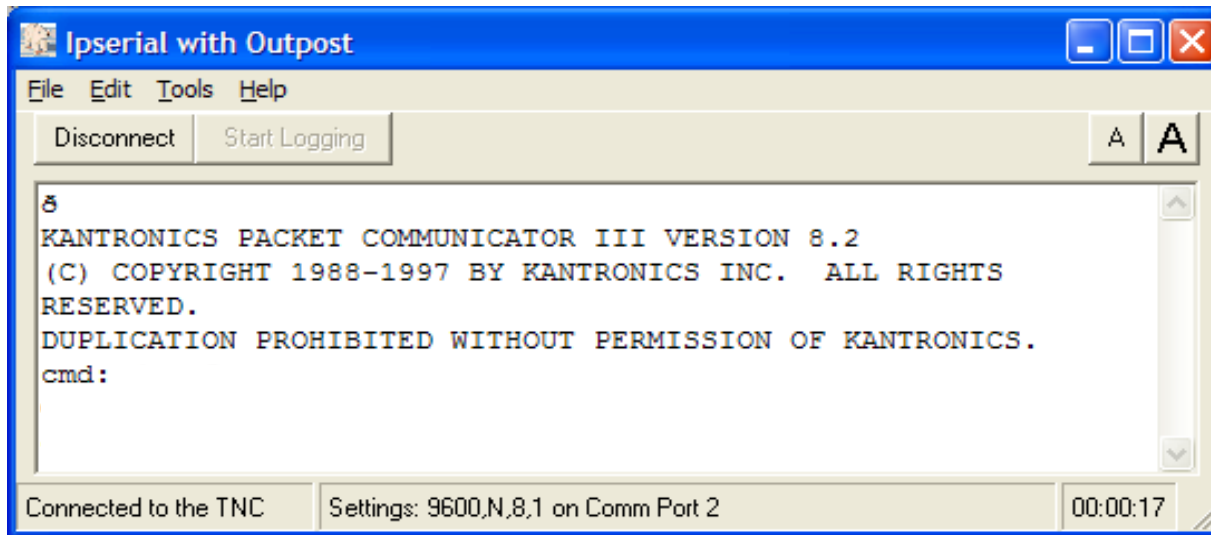


What you do next depends on what you see.

TNC Communications

This is what you want to see.

A response that looks like text, ending in a line with `cmd:`



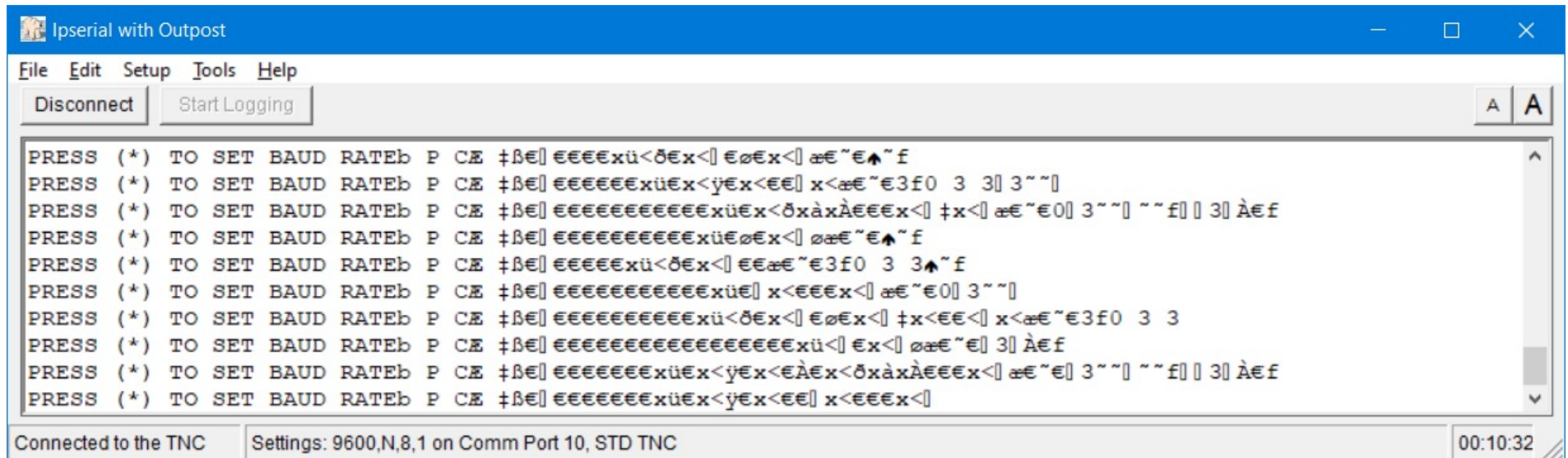
Once you see this, you're done with "ipserial."

Press the **Disconnect** button and close the program.

TNC Communications

If you see this instead:

(repeated lines with “press to set baud rate” followed by noise)



```
File Edit Setup Tools Help
Disconnect Start Logging
PRESS (*) TO SET BAUD RATEb P CÆ ‡ß€[] €€€€xü<ð€x<[] €ø€x<[] æ€~€^~f
PRESS (*) TO SET BAUD RATEb P CÆ ‡ß€[] €€€€€€xü€x<ÿ€x<€€[] x<æ€~€3f0 3 3[] 3~~[]
PRESS (*) TO SET BAUD RATEb P CÆ ‡ß€[] €€€€€€€€€€€€xü€x<ðxàxÀ€€€x<[] ‡x<[] æ€~€0[] 3~~[] ~f[] 3[] À€f
PRESS (*) TO SET BAUD RATEb P CÆ ‡ß€[] €€€€€€€€€€€€xü€ø€x<[] øæ€~€^~f
PRESS (*) TO SET BAUD RATEb P CÆ ‡ß€[] €€€€€€xü<ð€x<[] €øæ€~€3f0 3 3^~f
PRESS (*) TO SET BAUD RATEb P CÆ ‡ß€[] €€€€€€€€€€€€xü€[] x<€€€x<[] æ€~€0[] 3~~[]
PRESS (*) TO SET BAUD RATEb P CÆ ‡ß€[] €€€€€€€€€€€€xü<ð€x<[] €ø€x<[] ‡x<€€€[] x<æ€~€3f0 3 3
PRESS (*) TO SET BAUD RATEb P CÆ ‡ß€[] €€€€€€€€€€€€€€€€xü<[] €x<[] øæ€~€[] 3[] À€f
PRESS (*) TO SET BAUD RATEb P CÆ ‡ß€[] €€€€€€xü€x<ÿ€x<€À€x<ðxàxÀ€€€x<[] æ€~€[] 3~~[] ~f[] 3[] À€f
PRESS (*) TO SET BAUD RATEb P CÆ ‡ß€[] €€€€€€xü€x<ÿ€x<€€[] x<€€€x<[]
Connected to the TNC Settings: 9600,N,8,1 on Comm Port 10, STD TNC 00:10:32
```

Press the * key repeatedly until you see correct output.

It may ask you for your call sign, in which case, give it.

This happens when the TNC is reset to factory defaults.

If you didn't reset it, it probably has a dead battery. Report that.

Make sure to tell the TNC the correct transmit level for the connected radio.

TNC Communications

If you don't get any response at all:

1. Verify the TNC is powered on and connected.
2. Verify the top left button says **Disconnect**.
If it says **Connect**, press it and try again.
3. Verify you have selected the correct COM port.
4. Try the **Tools → Kantronics Kiss Off** menu item.

This will turn off "KISS Mode," if that got turned on.

If none of that works, report the issue to your shift supervisor. You will not be able to operate packet.

Transmit Audio Level

The tones generated by the TNC need to be loud enough to be decoded easily, but not so loud that their waveforms are clipped.

The best audio level is different for each TNC/radio pair.
When you pair a TNC with a new radio, re-tune the audio level.

Instructions are on scc-ares-races.org.

On some TNCs, you configure the audio level with a command.
The TNC will forget the level if you reset it or its battery dies.

Look for a sticker on the TNC saying something like `XMITLVL 16`.

Type that command at the `cmd:` prompt to re-establish the level.

Packet Software

Packet Software

- Handles TNC and BBS communications
- Assigns message IDs
- Tracks sent and received messages
- Generates delivery receipts for received messages
- Retrieves bulletins
- Generates ICS-309 communications logs

SCCo Packet Software

Outpost Packet Message Manager

Windows-only application with email-like interface

SCCo ARES/RACES standard, used in all EOCs, hospitals, etc.

Required for Type III and Type II credentials

Requires Administrator access to install

General purpose packet application, usable for more than SCCo ARES/RACES

SCCo Packet Messenger

Browser-based application modeled on ICS-309

Also has command line interface suitable for manual or scripted use

Runs on Windows 10+, Mac OS, Linux — no installation needed

Tailored to SCCo ARES/RACES operations

Effectively required for Type II credential

Both are included in the SCCo Combined Installer.

PackItForms

Allows WYSIWYG entry of 14 Santa Clara County forms:

Allied Health Status	Hospital Status	Road Closure
CPOD Commodity Update	ICS-213 General Message	Shelter
CPOD Site Information	Notable Report	Situation Report
Damage Assessment	RACES Mutual Aid Request	Windshield Survey
Hospital Bed Availability	Resource Request	

Reduces them to compact text format for transmission

Restores them to original format on receipt

Included in the SCCo Combined Installer

Integrated into both packet software applications

Under the covers, PackItForms is just SCCo Packet Messenger invoked in a different way.

Demonstration

Send an ICS-213 message using each application.

From: KC6RSC@W1XSC, Instructor, Sunnyvale DPS
To: PKTEST@W1XSC, Demo Recipient, Elsewhere
Subject: Demo Message
Handling: ROUTINE, no action, no reply
Body: Hello, world!

Packet Software Settings

Outpost

Packet Software Settings

- Your name and FCC call sign
- Your tactical station name and tactical call sign, if any
- Message ID prefix and starting message number
- Which BBS you're connecting to
- What type of TNC you're using, and its COM port
- What bulletins to retrieve

See Standard Outpost Configuration on the county website:

scc-ares-races.org/operations/packet/std-outpost

Your Name and FCC Call Sign

Your name and call sign go in the “Radio Operator Only” section of every message form.

They’re added to both sent and received messages. They also appear on the ICS-309 communications log.

Your call sign is transmitted for station identification.

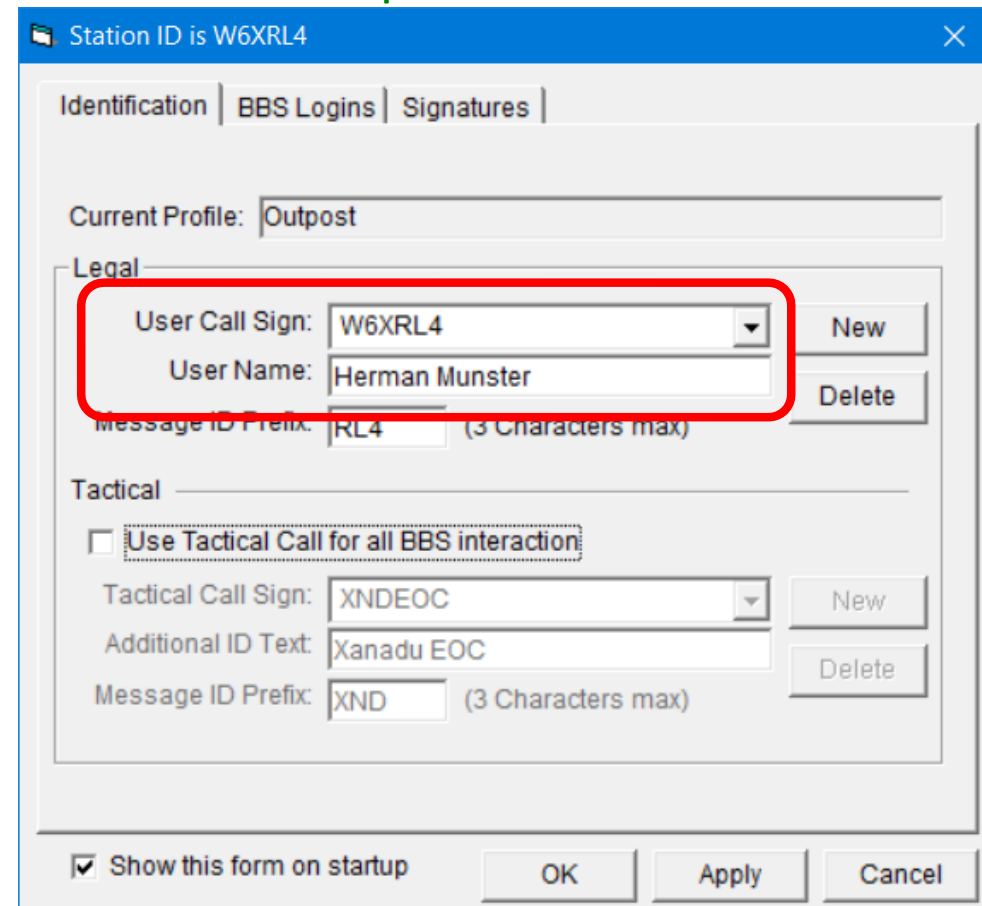
It’s in the header of every packet if you’re not using a tactical call sign.

It’s sent as a BBS comment if you are.

Your call sign is the name of your mailbox on the BBS.

Unless you’re using a tactical call sign.

Setup → Station ID



The screenshot shows a window titled "Station ID is W6XRL4" with a close button (X) in the top right corner. The window has three tabs: "Identification", "BBS Logins", and "Signatures". The "Identification" tab is selected. Below the tabs, there is a "Current Profile:" label followed by a text box containing "Outpost". The "Legal" section is highlighted with a red box and contains the following fields: "User Call Sign:" with a dropdown menu showing "W6XRL4", "User Name:" with a text box containing "Herman Munster", and "Message ID Prefix:" with a text box containing "RL4" and a note "(3 Characters max)". To the right of these fields are "New" and "Delete" buttons. Below the "Legal" section is the "Tactical" section, which includes a checkbox labeled "Use Tactical Call for all BBS interaction" (which is unchecked), a "Tactical Call Sign:" dropdown menu showing "XNDEOC", an "Additional ID Text:" text box containing "Xanadu EOC", and a "Message ID Prefix:" text box containing "XND" with a note "(3 Characters max)". To the right of these fields are "New" and "Delete" buttons. At the bottom of the window, there is a checkbox labeled "Show this form on startup" (which is checked), and three buttons: "OK", "Apply", and "Cancel".

Tactical Station Name and Call Sign

Used when staffing a served agency station

Messages are sent to and from the station, not you individually.

The station name and call stay the same when operators change.

Use a tactical call only during an event when it's assigned to you.

The tactical call sign has its own mailbox on the BBS.

It's in the header of every packet when talking to the BBS.

It and the station name also appear on the ICS-309 communications log.

Setup → Station ID

The screenshot shows a window titled "Station ID is W6XRL4 as XNDEOC". It has three tabs: "Identification", "BBS Logins", and "Signatures". The "Identification" tab is active. Below the tabs, there's a "Current Profile:" field with "Outpost" selected. The "Legal" section contains fields for "User Call Sign:" (W6XRL4), "User Name:" (Herman Munster), and "Message ID Prefix:" (RL4). The "Tactical" section is highlighted with a red box and contains a checked checkbox "Use Tactical Call for all BBS interaction", a "Tactical Call Sign:" field (XNDEOC), an "Additional ID Text:" field (Xanadu EOC), and a "Message ID Prefix:" field (XND). At the bottom, there's a checkbox "Show this form on startup" and buttons for "OK", "Apply", and "Cancel".

Message ID Prefix

Packet message IDs look like

XND-123P

- A three-character prefix for the station
- A hyphen
- A three-or-more digit sequence number
- A suffix letter, usually **P**, to distinguish it from voice

Tactical stations each have an assigned prefix

You should get this in your shift briefing. When operating individually, use the last three characters of your FCC call sign.

Setup → Station ID

The screenshot shows a software window titled "Station ID is W6XRL4 as XNDEOC". It has tabs for "Identification", "BBS Logins", and "Signatures". The "Current Profile" is set to "Outpost".

Legal Section:

- User Call Sign: W6XRL4 (dropdown menu)
- User Name: Herman Munster
- Message ID Prefix: RL4 (3 Characters max) - highlighted with a red box

Tactical Section:

- ☒ Use Tactical Call for all BBS interaction
- Tactical Call Sign: XNDEOC (dropdown menu)
- Additional ID Text: Xanadu EOC
- Message ID Prefix: XND (3 Characters max) - highlighted with a red box

At the bottom, there is a checkbox "Show this form on startup" (checked) and buttons for "OK", "Apply", and "Cancel".

Message Sequence Number

Messages are numbered sequentially

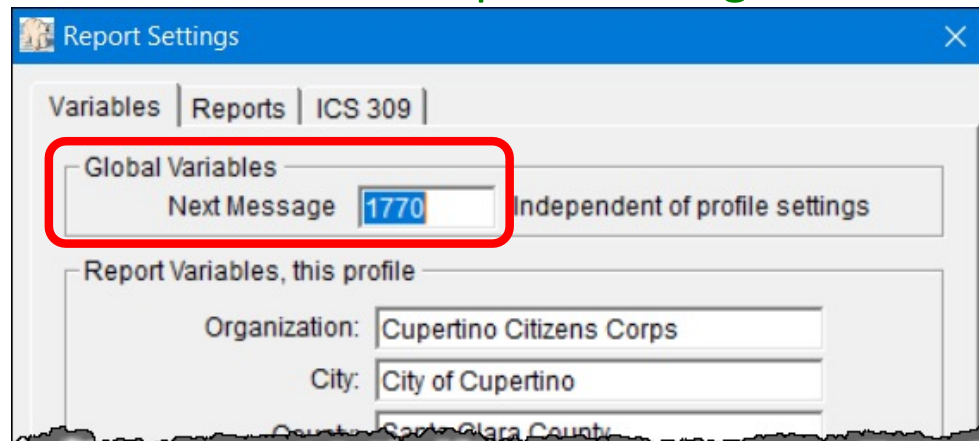
The starting number should be in your shift briefing; if not, start at 100.
In rare cases, sent and received messages may be numbered separately.

If the served agency fills in a message number, use it.

Even if it doesn't conform to our standard.

If it's confusing or a duplicate, notify your shift supervisor.

Tools → Report Settings



The screenshot shows a software window titled "Report Settings" with a blue header bar and a close button. Below the header, there are three tabs: "Variables", "Reports", and "ICS 309". The "Global Variables" section is highlighted with a red rectangle. It contains a "Next Message" input field with the value "1770" and a checkbox labeled "Independent of profile settings". Below this, the "Report Variables, this profile" section contains three input fields: "Organization" with the value "Cupertino Citizens Corps", "City" with the value "City of Cupertino", and "County" with the value "Santa Clara County".

Which BBS to Use

Connect to the Primary BBS assigned to your city or agency

If it's down or you can't reach it, use the Secondary.

Assignments are on the county website

scc-ares-races.org/operations/packet/bbs

Also available in an XSCPERM notice.

City/Agency BBS Assignments			
City/Agency	Prefix	Primary	Secondary
American Red Cross	ARC	W1XSC	W4XSC
Cal FIRE Santa Clara Unit	SCU	W2XSC	W1XSC
Campbell	CBL	W1XSC	W4XSC
Cupertino	CUP	W1XSC	W4XSC
Gilroy	GIL	W2XSC	W1XSC

In Outpost, choose the BBS name starting with **XSC_**.

This is supplied with the SCCo Combined Installer and has proper settings for the BBS.

Setup → BBS

BBS setup for XSC_W1XSC-1

Name | Prompts | Commands | Init Commands | Path

BBS Name

BBS Name: XSC_W1XSC-1

Connect Name: W1XSC-1

Description: Santa Clara County ARES/RACES Packet System. Located in San Jose. JNOS.

BBS Type

☒ Let Outpost determine the BBS and set up the prompts

☐ User defines the BBS prompts

Non-Identifying BBSs

☐ AA4RE BBS

☐ AA4RE BBS with Tactical Call Customization

TNC Name

Set/Get TNC XSC_Kantronics_KPC3-Plus

OK Apply

TNC Model

Outpost needs to know what kind of TNC you have

Different TNCs use different command sets.

Setup → Interfaces

Supported TNCs include:

Kantronics KPC-3 and KPC-3 Plus

Kenwood TH-D72A and TM-D710A

MFJ-1270C / MFJ-1274C

TAPR TNC2

AEA/Timewave PK-96

DireWolf / AGWPE (Outpost only)

OpenTNC (Messenger only)

(and others that emulate those)

Device setup for XSC_Kantronics_KPC3-Plus

Type | Prompts | TNC Cmds | Init Cmds | Com Port | AGWPE | Telnet

Choose a Name

IF Name: XSC_Kantronics_KPC3-Plus

Description: KPC3+ TNC for use with Santa Clara County's BBS System. Verify the COM port setting for your system.

Interface

☒ TNC ☒ TAPR TNC ☐ SCS TNC

☐ AGW Packet Engine

☐ Telnet

New Copy Delete

OK Apply Cancel

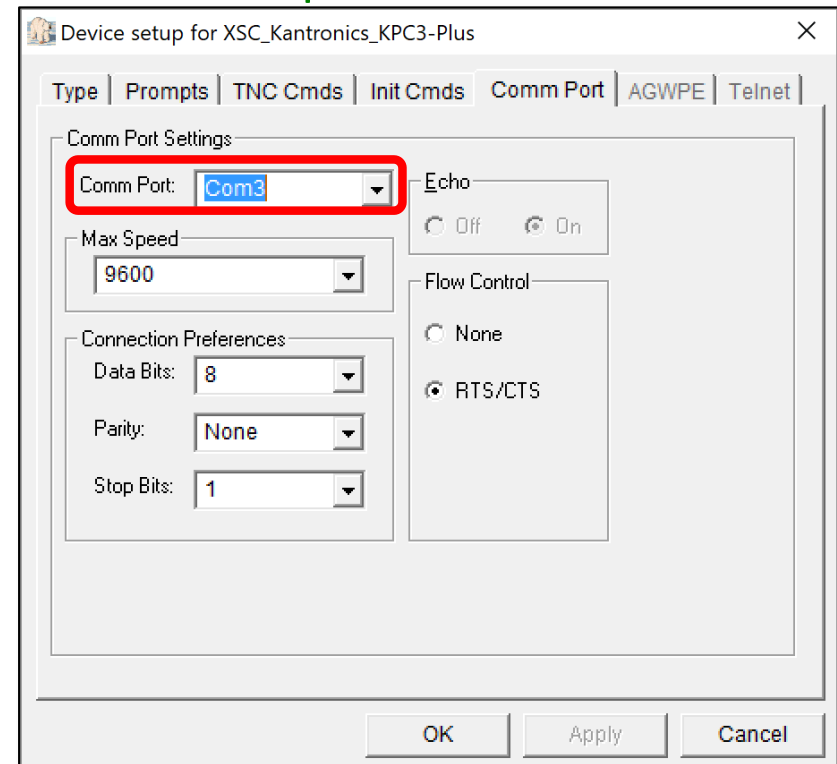
TNC COM Port

Which COM port is the TNC connected to?

You determined this earlier using Ipserial.

Other parameters in Outpost should be
9600, 8, None, 1, RTS/CTS

Setup → Interfaces



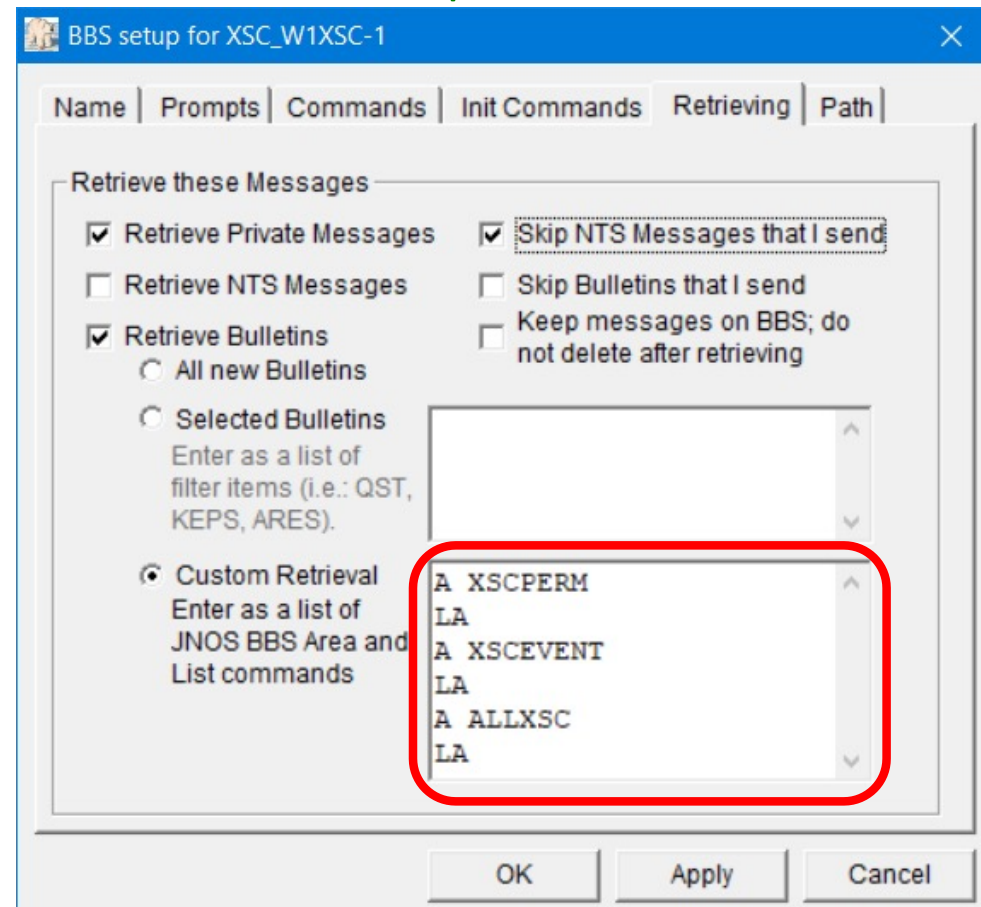
Bulletins to Retrieve

In the “Custom Retrieval” box, enter the BBS commands:

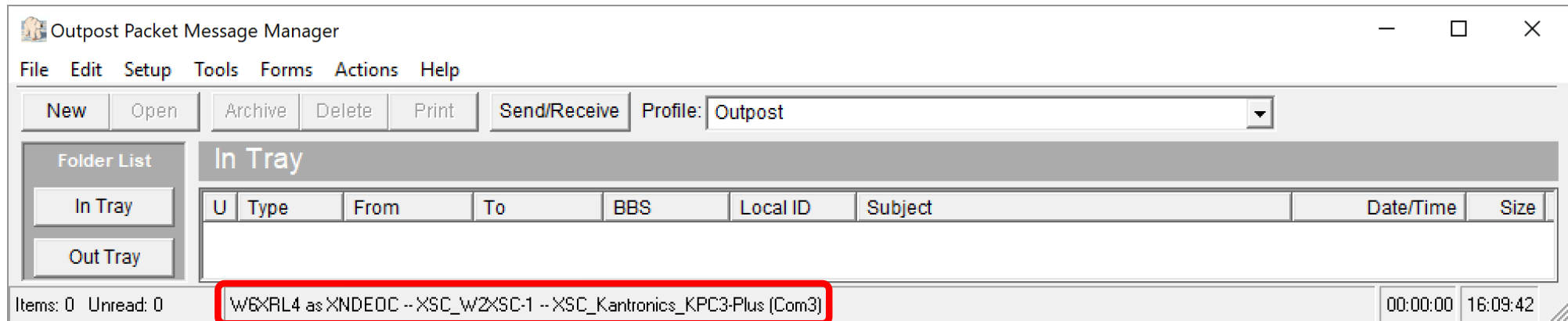
- For a notice area:
`A notice-area-name`
`LA`
- For one city:
`A ALLXSC`
`L> city-code`
- For all cities:
`A ALLXSC`
`LA`

Note: you can retrieve one city or all cities, but not any other number.

Setup → BBS



Check the Key Settings



COM port

TNC type

BBS

Tactical call sign

FCC call sign

Profiles

An Outpost “profile” is a collection of settings

Your name and FCC call sign

Tactical station name and call sign

Message ID prefix

~~Starting message number~~ *not included*

Which BBS to use

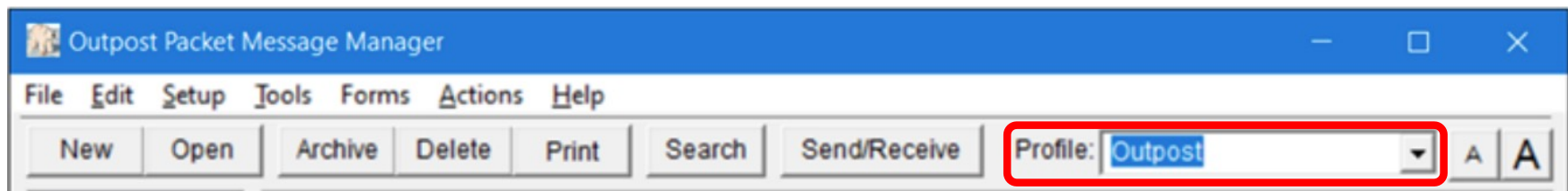
TNC model

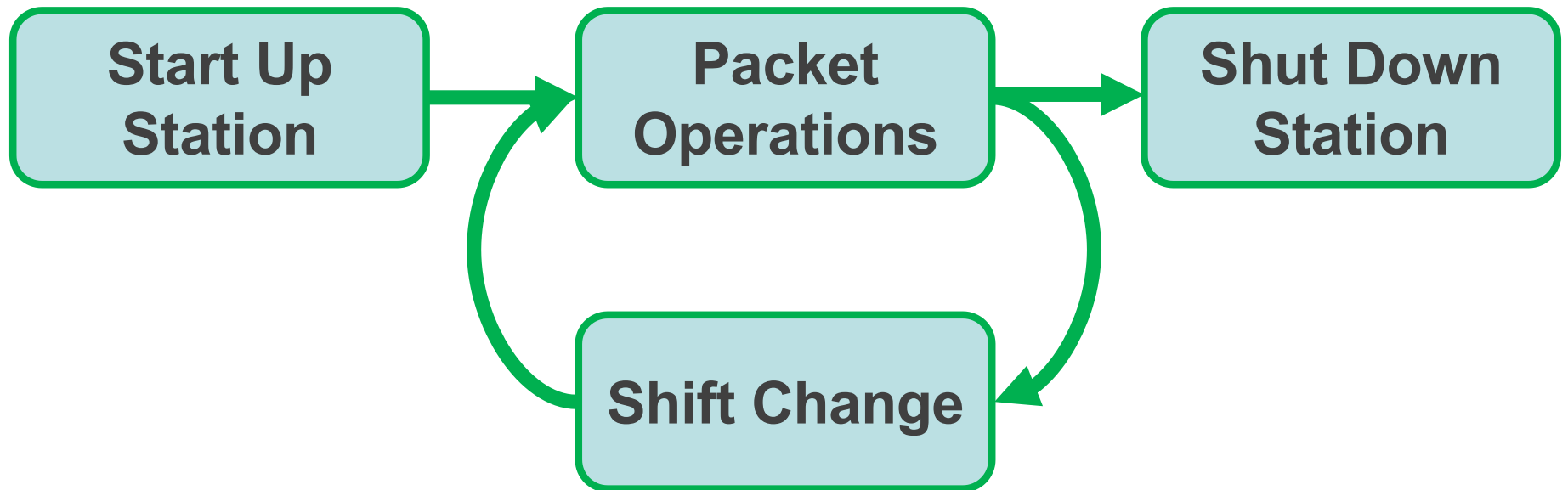
~~TNC COM port~~ *not included*

~~Bulletins to retrieve~~ *not included*

To save a profile, use **Setup → Profiles → New**

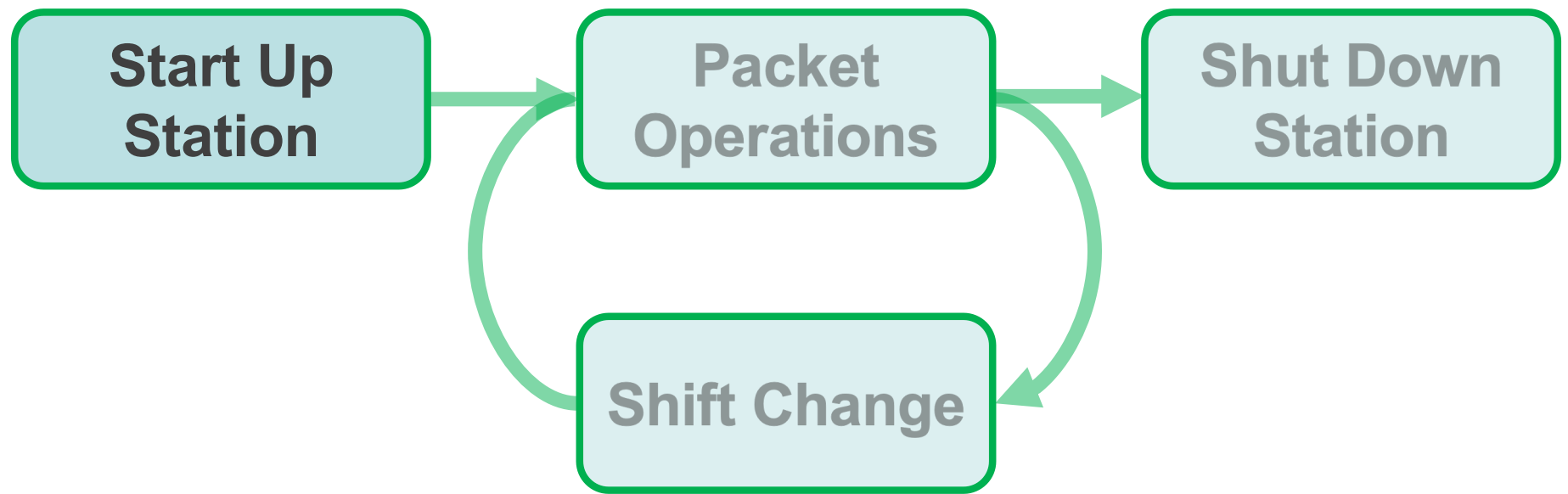
To switch to a profile, choose it from the list





Packet Field Deployment

Outpost



Initial Setup — Scenario

Upon arrival at your assignment, your supervisor tells you the station needs to be set up.

He takes you over to the hardware:



Start Up Station

1. Get a briefing
2. Set up equipment and operating area
3. Set up software
4. Download and review current bulletins
5. Send yourself a test message and verify connectivity
6. Notify shift supervisor that you're ready to start

All of the above should be done before scheduled start time.

7. Send a check-in message *when instructed by supervisor*

Get a Briefing

In addition to the usual non-packet information: (PS&BP 12–13)

- What tactical call sign, BBS, and frequency band to use
- Equipment setup quirks (e.g., proper transmit level)
- Message ID prefix and message numbering range(s)
- Changes to packet addresses for other stations

Set up Equipment and Operating Area

- Set up table, chair, sun shade, etc.
- Lay out and connect equipment
 - Connect the antenna first and the power last
 - Don't forget weights, cones, caution tape, and other safety gear
 - Do an RF safety evaluation to understand safe distances
- Power on equipment
- Configure the radio
 - Correct VFO and frequency on high power
- Establish communications between laptop and TNC
 - Determine COM port, set 9600 8-N-1 RTS/CTS

Set up Software

Ensure you have current software

If not, install current versions (get supervisor approval)

Ensure you have no messages other than bulletins

Archive and remove all messages (get supervisor approval)

Configure the software settings

Your name and FCC call sign

Your tactical station name and tactical call sign, if any

Message ID prefix and starting message number

Which BBS you're connecting to

What type of TNC you're using, and its COM port

What bulletins to retrieve

Default values for new message fields

Download and Review Bulletins

Bulletins and notices may have information you need.

e.g., a station that is using their secondary BBS, or a BBS is down

Get **XSCPERM** notices if you don't already have them.

Get **XSCEVENT** notices if there's an event in progress.

Always get *city-code***@XSC** bulletins for your city.

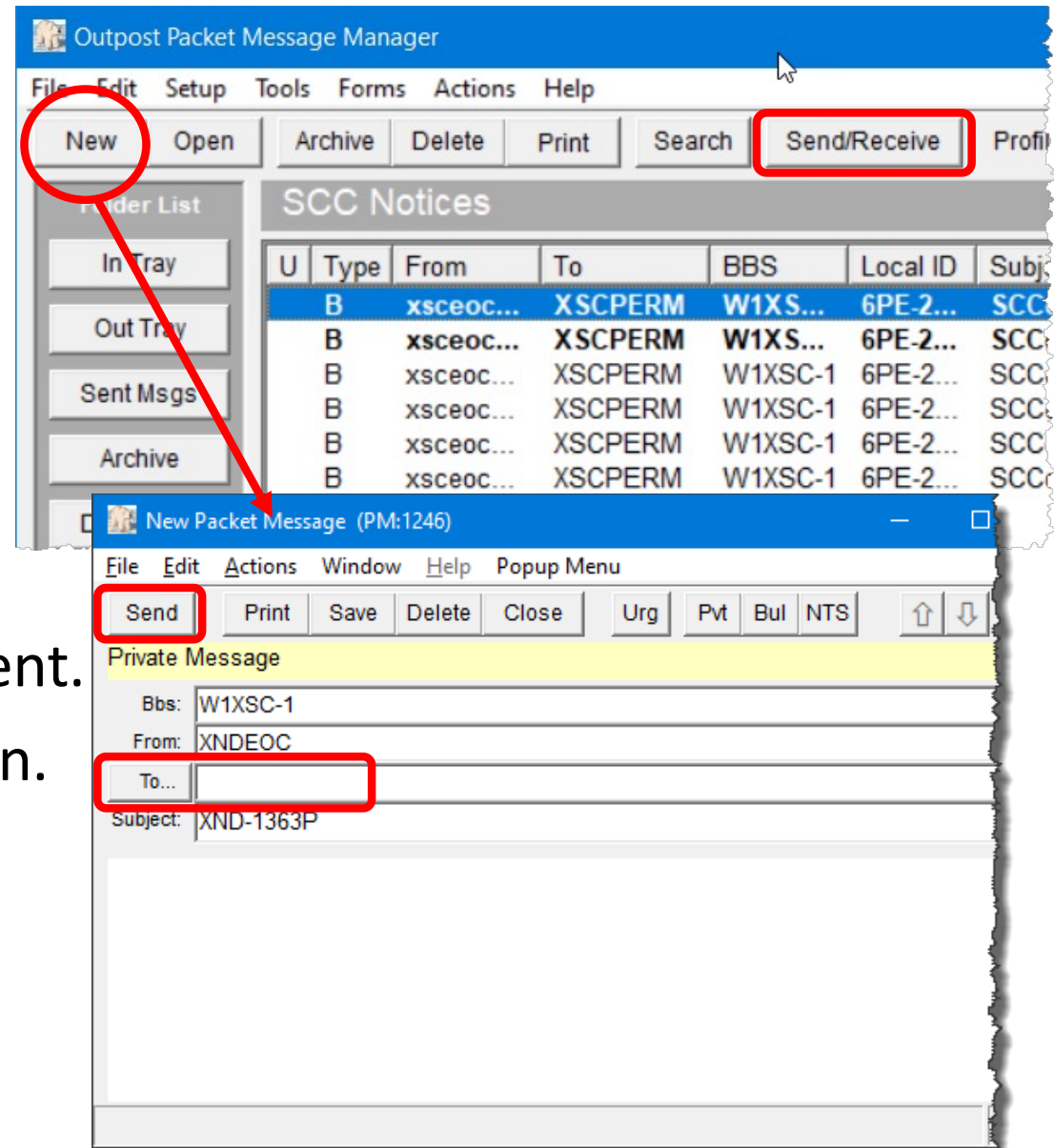
Pass on all bulletins to your shift supervisor.

Check periodically for new ones during your shift.

Outpost checks for new bulletins every time you connect to the BBS.

Send Yourself a Test Message

1. Open a New message
2. Address it "To:" your own TACCALL@BBS.
3. Give an appropriate subject and text.
4. Click "Send"
5. Click "Send/Receive"
The message should be sent.
6. Click "Send/Receive" again.
The message should be received, and a delivery receipt sent.



Send a Check-In Message

Check in when your station is ready and your supervisor OKs it

Check in using the PackItForms Check-In form

Forms → XSC Check-In Message

Submit to Outpost

Fill in destination address (usually your EOC)

Send

Send/Receive

Submit to Outpost

Reset Form

Check-In Message

Radio Operator Only: Origin Msg #: RSC-160P

Destination Msg #:

Operator Call Sign: KC6RSC

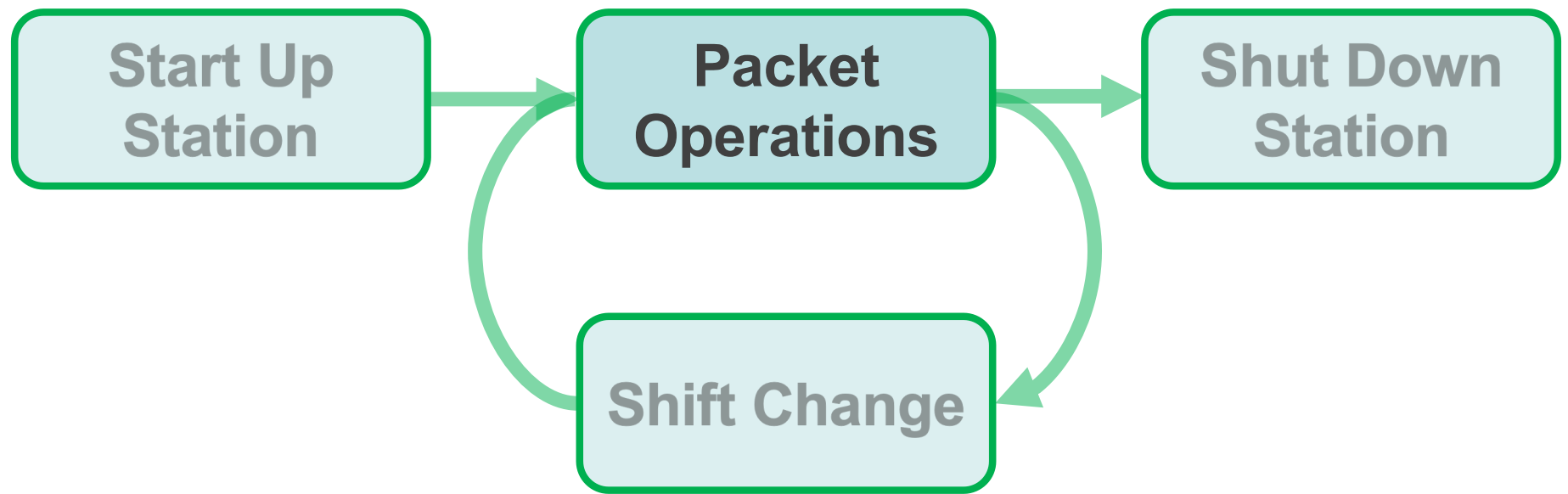
Operator Name: Steve Roth

Tactical Call Sign:

Station Name:

Do not check out / check in for a shift change of a tactical station

The check-in is for the station, not the individual operator.



Sending Messages

- We are not message authors
- Prioritize messages by handling order and date/time
- Standard subject line format
- Creating plain text messages
- Creating form messages
- Recommended form routing
- Addressing outgoing messages
- Connecting to the BBS
- Resending messages with corrections
- Logging outgoing messages

We Are Not Message Authors

Our role is to transmit served agency messages.

We receive messages and give them to the served agency staff.

The served agency creates messages that we send for them.

We do not create third party messages.

Not even during drills and practices.

Third party messages are virtually always forms.

We originate only operator-to-operator messages.

Check-ins, check-outs, H&W checks, etc.

Operator-to-operator messages are virtually always plain text.

Message Prioritization

Prioritize according to handling order, then date/time

Handling orders are Immediate, Priority, and Routine

Use date and time to prioritize within each handling order

Ultimately, the served agency decides the order

Resource Request 1.1				PIF: 1.1 PDF: 20260503	
Radio Operator Only:		1. Origin Msg #: RSC-159P		2. Destination Msg #:	
3. Date: 07/16/2026		4. Time: 15:21		5. Handling: ☐ Immediate (ASAP) ☐ Priority (<1 hr) ☒ Routine (<2 hrs)	
TO	6. ICS Position: Supply Branch		FROM	10. ICS Position: Logistics	
	7. Location: County EOC			11. Location: City EOC	
	8. Name:			12. Name:	
	9. Contact Info:			13. Contact Info:	

Immediate messages are usually sent by voice

If you do send one by packet, tell the recipient on a voice net

Generally use the Command Net for this, or fall back on the Message Net

Tell them the message number

Standard Packet Subject Line

XND-200P_R_Packet Class Exercise

Origin Message ID

- 3-character prefix for station
- A hyphen
- Sequence number
- Suffix letter (usually "P")

Message Summary

Short description of the message contents

Handling Order

I = Immediate

P = Priority

R = Routine

This format makes handling order easy to see in the message list.

Creating Plain Text Messages

Start a new message

“New” button at top left

Fill in the fields

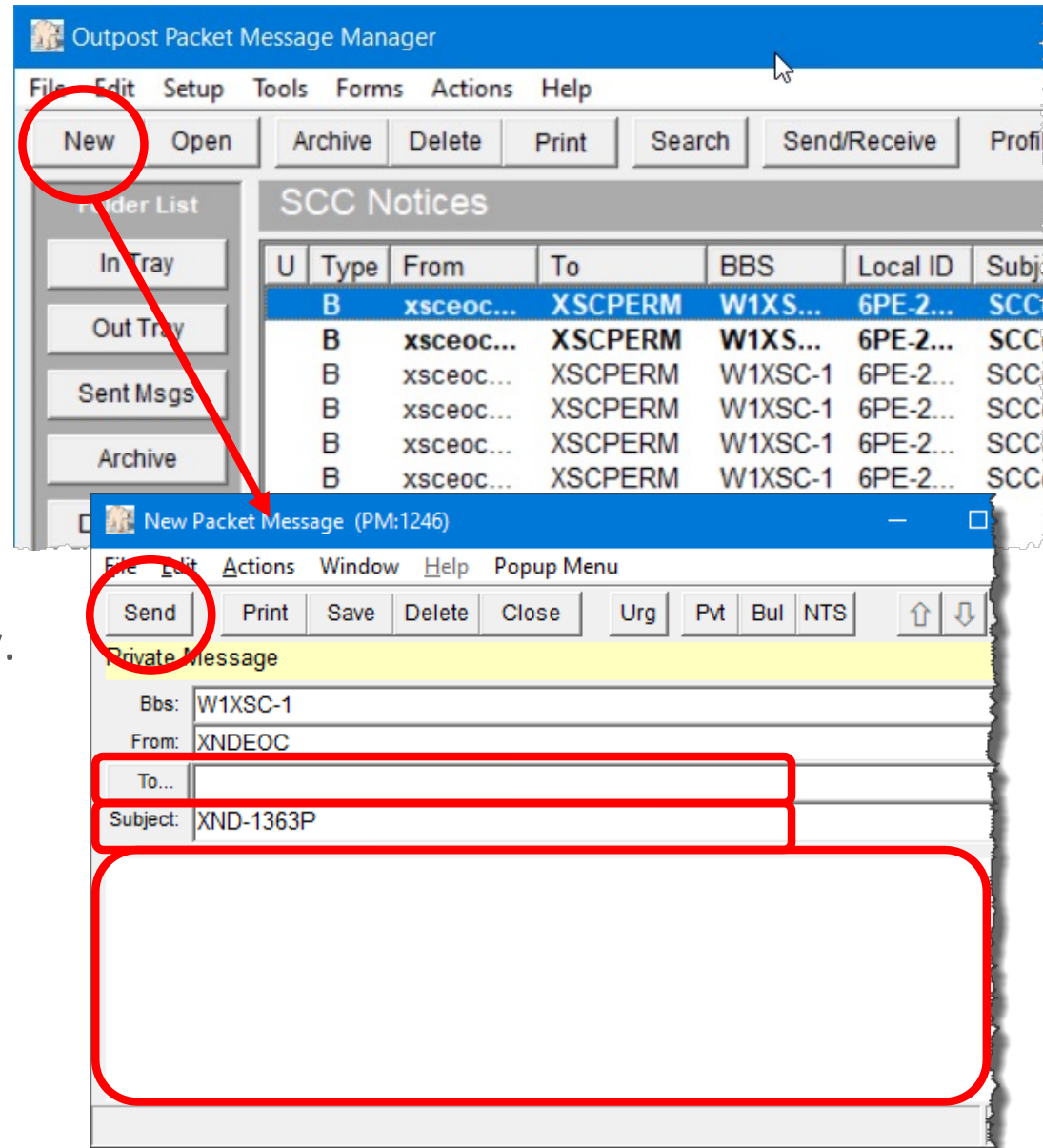
Type the body

Paste it from another source

File → Open a File

Press “Send”

Saves the message in the Out Tray.
It will be sent next time you
connect to the BBS.



Outpost Message Window

The screenshot shows a window titled "XND-1363P_R_JellyDonut Request - Packet Message". The window has a menu bar with "Actions", "Window", "Help", and "Popup Menu". Below the menu bar is a toolbar with buttons for "Print", "Save", "Delete", "Close", "Urg", "Pvt", "Bul", "NTS", and a set of navigation arrows. The main area is labeled "Private Message" and contains the following fields:

- Bbs:** W1XSC-1 (Annotated: Autofilled from Setup > BBS)
- From:** W6XRL4 (Annotated: Autofilled from Setup > Station ID)
- To...:** xndeoc@w2xsc.ampr.org (Annotated: Filled in by you)
- Subject:** XND-1363P_R_JellyDonut Request (Annotated: Filled in by you)

The message body contains the text:

Please pick up 1 dozen jelly donuts.
Thanks.
Herman (Annotated: Filled in by you)

At the bottom right of the window, the number "53" is displayed.

Annotations:

- Autofilled from Tools > Report Settings > Next Msg Number (points to the "To..." field)
- Autofilled from Setup > BBS (points to the "Bbs:" field)
- Autofilled from Setup > Station ID (points to the "From:" field)
- Filled in by you (points to the "To..." field)
- Filled in by you (points to the "Subject:" field)
- Filled in by you (points to the message body)

Creating Form Messages

Start a new form message

Forms → *any form type*

Fill in the fields

A red field is required and not filled in, or has illegal content

ICS-213 Message Form 2.3		PIF: 2.3 PDF: 20260512		
Radio Operator Only:		1. Origin Msg #: RSC-158P	2. Destination Msg #:	
3. Date: 07/16/2021		4. Time: hh:mm	5. Handling: ☐ Immediate (ASAP) ☐ Priority (<1 hr) ☐ Routine (<2 hrs)	
TO	6. ICS Position:		10. ICS Position:	
	7. Location:		11. Location:	
	8. Name:		12. Name:	
	9. Contact Info:		13. Contact Info:	
This message requests you to:		Take Action: ☐ Yes ☐ No		
		Reply: ☐ Yes ☐ No	Reply By:	
Subject:				
Reference:				
Message:				

Recommended Form Routing

The Recommended Routing Cheat Sheet gives handling order, To ICS Position, and To Location recommended by served agencies.

scc-ares-races.org/operations/forms/go-kit/routing

PackItForms fills these into new forms as default values.

Form Type	Handling	To Location **	To ICS Position **
General EOC			
ICS-213 Message Form	Author defined	Author defined	Author defined
CPOD Site Info CPOD Commodities	Routine (<2 hrs)	County EOC	CPOD Unit Else: Mass Care & Emerg. Asst. Branch Else: Operations
Damage Assessment	Author defined Else: Routine (<2 hrs)	For city-managed: City EOC For county-managed: County EOC	Damage/Safety Assessment Group Else: Construction & Eng. Branch Else: Operations

However, the message author may choose something else.

If so, you need to replace the PackItForms defaults with their choices.

Addressing Outgoing Messages

Submit to Outpost gives you an Outpost message window.

It's like the plain text message window, but subject and body are not editable.

Enter the To: address

Press **Send**

Saves the message in the Out Tray.
It will be sent next time you connect to the BBS.

FS1-1780P_R_IC5213_Replacement Generator (PM:354)

File Edit Actions Window Help Popup Menu

Send Print Save Delete Close Urg Pvt Bul NTS ↑ ↓ A A

Private Message

Bbs: W1XSC-1

From: XNDFS1

To... XNDEOC@W1XSC

Subject: FS1-1780P_R_IC5213_Replacement Generator

!SCCoPIFO!
#T: form-ics213.html
#V: 3.9-2.2
MsgNo: [FS1-1780P]
1a.: [09/19/2022]
1b.: [20:13]
5.: [ROUTINE]
7.: [Logistics]
8.: [Radio Operator]
9a.: [Xanadu EOC]
9b.: [Xanadu Station 1]
10.: [Replacement Generator]
12.: [Generator has failed. Need a replacement of at least 5
KW as soon as possible.]
Rec-Sent: [sender]
OpCall: [W6XRL4]
OpName: [Herman Munster]
Method: [Other]
Other: [Packet]
OpDate: [09/19/2022]
OpTime: [20:47]
!/ADDON!

Subject line and message text fields are locked. 463

Addressing Outgoing Messages

What is the tactical call sign of the station you're sending to?

Available in [XSCPERM](#) notices

If unsure, ask your shift supervisor

What BBS is that station checking messages on?

Your briefing or bulletins may tell you. Otherwise:

Use their primary BBS from scc-ares-races.org/operations/packet/bbs

Also available in an [XSCPERM](#) notice

If you've been told that BBS is down, use their secondary BBS

Send your message to [taccall@bbs](#) (e.g., [XNDEOC@w4xsc](#))

This is a shorthand for [taccall@bbs.scc-ares-races.org](#)

Addresses are not case-sensitive

Do not use a plain [taccall](#) without [@bbs](#) — it's error-prone

There are other address options for outside our network.

scc-ares-races.org/operations/packet/addresses

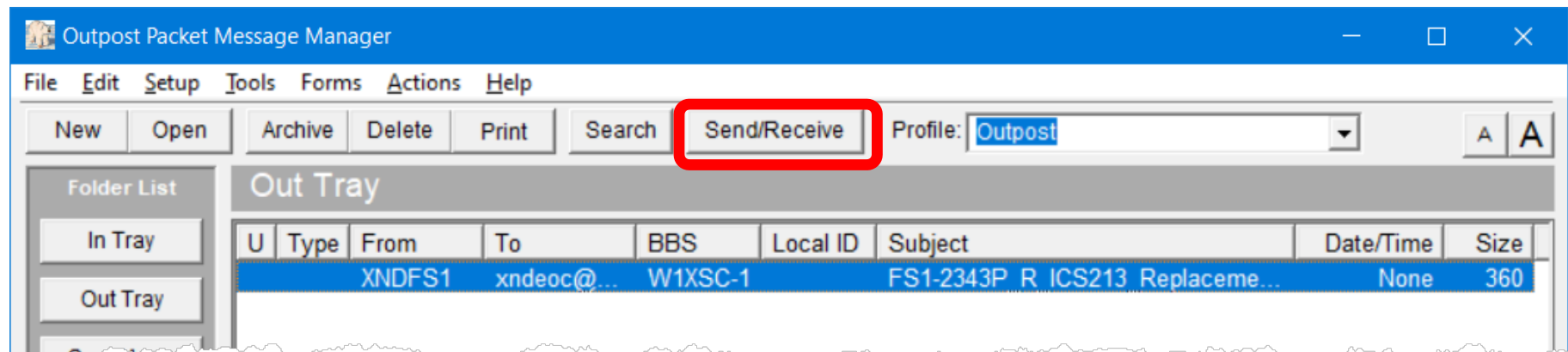
Connecting to the BBS

Messages are not sent until you connect to the BBS.

They are held in the “Out Tray” folder.

Connect to the BBS with the **Send/Receive** button.

It sends outgoing messages, fetches incoming messages, sends delivery receipts for received messages, and fetches new bulletins. You can watch the BBS conversation in a pop-up window.



Resending Messages with Corrections

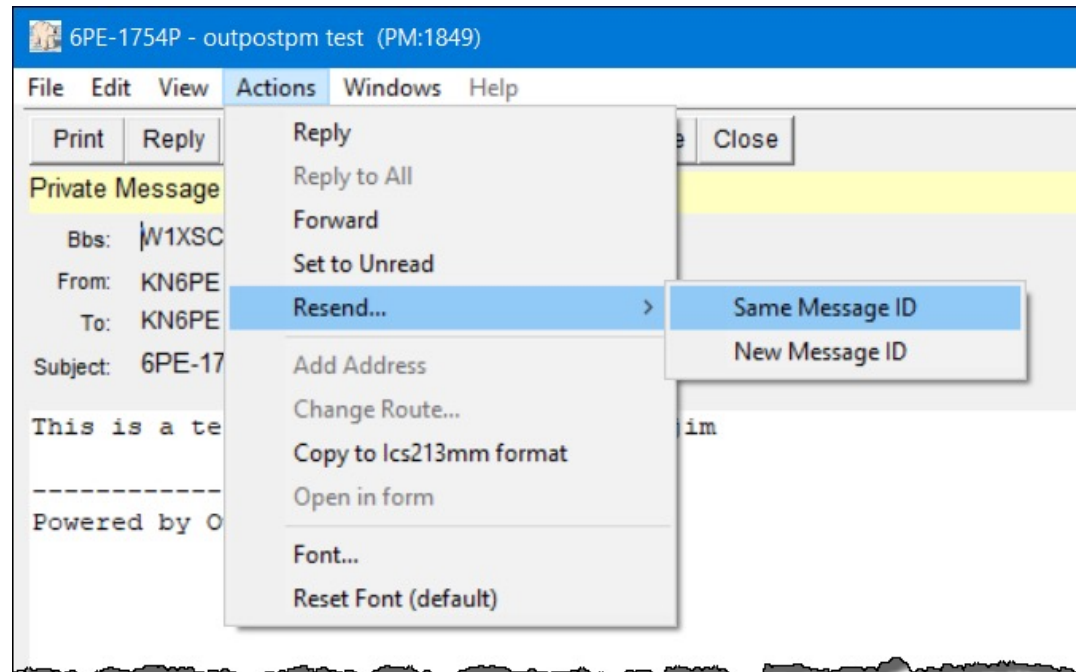
The SCCo standard way to correct a message is to resend it with the message ID suffix changed to **R**.

1. Open the message in the Sent folder.
If it's a form message, select it and use
Actions → Open Enhanced Msg as Text to open it.

2. **Actions → Resend → Same Message ID**

Opens a new message window.

3. Change the message ID suffix to **R**.
4. Make the necessary message corrections.
5. Send the revised message.



Logging Outgoing Messages

Outpost generates your ICS-309 Communications Log, BUT ...
You still need to record your name and call sign, and the date and time sent, on the message form itself. Two options:

1. Write the information at the bottom of the original form, or
2. Print the message from your software after sending it, and staple it to the original form.

This method is preferred if the sent message might not match the original, for example due to bad handwriting.

Either way, write your outgoing message ID on every page of the original form.

Receiving Messages and Bulletins

Receiving messages:

- Connect to the BBS at least every 10 minutes
Outpost can do this automatically: [Tools → Send/Receive Settings](#)
- Give received third-party messages to your principal

Receiving bulletins:

- Check for new bulletins at least every hour
Outpost checks during every BBS connection unless told otherwise
- Give received bulletins to your principal
unless they are operator-only information

Delivery Receipts

Outpost sends a delivery receipt for every received message.

After sending a message, watch for a delivery receipt for it

For messages with multiple recipients, expect a receipt from each

When you receive the receipt:

Record each recipient's message ID on your copy of the sent form

If you don't receive a receipt:

Verify that you sent to the correct address

Ask over a voice channel if the message was received

Report problems to your supervisor

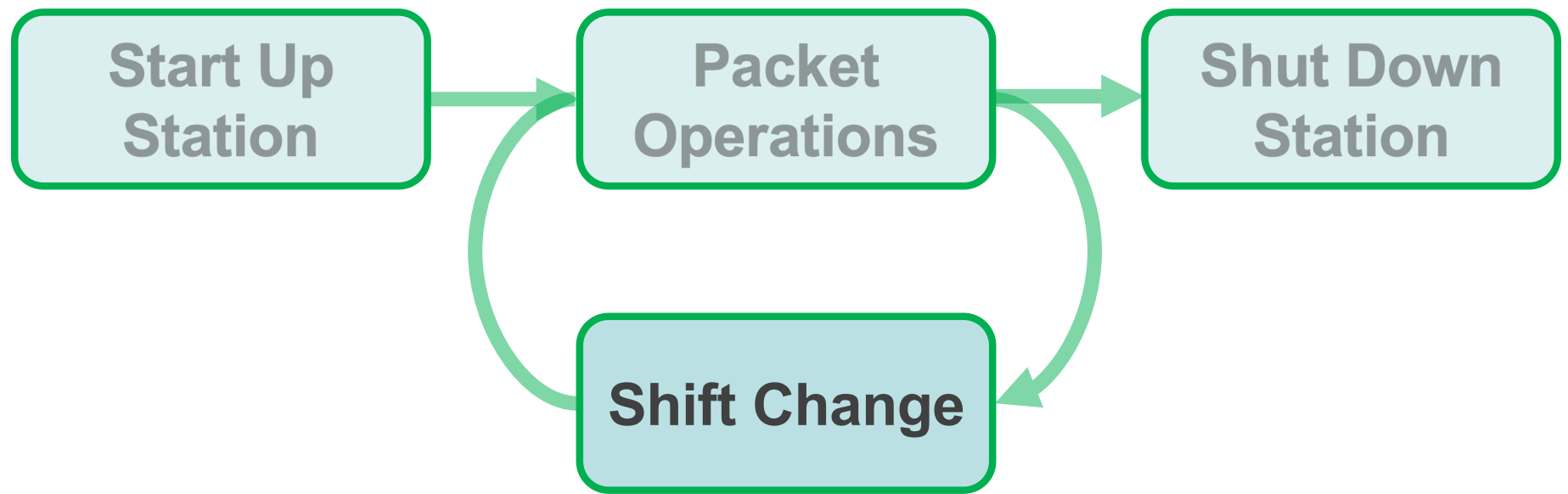
Messages Expecting a Response

If you send messages that expect responses:

- Watch for the incoming responses
- Be ready to answer “Have we gotten a response to ____ yet?” or “Which stations have replied to ____?”

If you receive messages that expect responses:

- Remind your principal if they don't respond in due course
- Be ready to answer “What messages do we still need to respond to?”



Handing off to Another Operator

- Give a briefing
- Generate and sign the ICS-309 logs (packet and voice)
- Generate and save a complete message archive

Taking over from Another Operator

Before the time your shift is supposed to start:

- Get a briefing
- Review all outstanding packet bulletins
- Review all unanswered traffic, sent and received
- Change FCC call sign and operator name in software

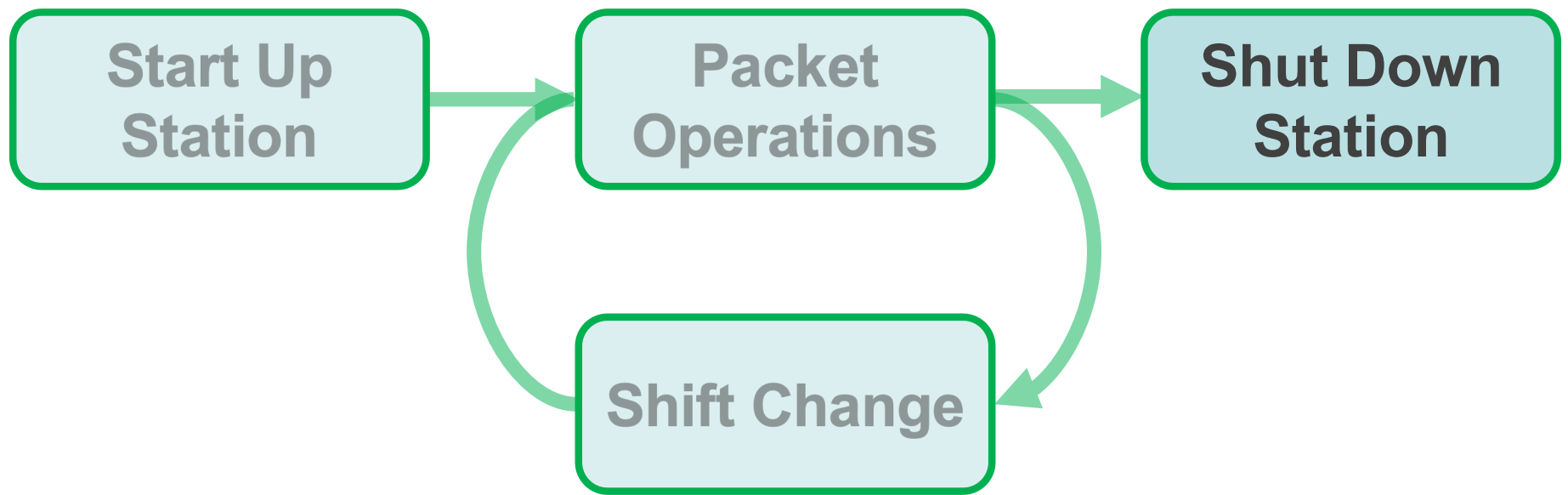
Packet Shift Briefings

In addition to the usual non-packet information: (PS&BP 12–13)

- What tactical call sign, BBS, and frequency band to use
- Equipment setup quirks (e.g., proper transmit level)
- Message ID prefix and message numbering range(s)
- Changes to packet addresses for other stations

For shift changes:

- Any packet bulletins in effect
- Any received messages waiting for a response
- Any sent messages without a delivery receipt
- Any sent messages awaiting a response



Shut Down Station

- Wait to get delivery receipts for all sent messages
- Send a check-out message *when instructed by supervisor*
- Generate and sign the ICS-309 logs (packet and voice)
- Generate a message archive
- Clean out Outpost messages *if instructed by supervisor*
- Shut down and (if appropriate) pack up all equipment
- Leave the site better than you found it

Accuracy and Completeness

FEMA pays out money in disasters. Years later, they will demand it back if an audit doesn't find supporting documentation.

“In FY 2017, we identified \$2.08 billion in questioned costs, which represents 96 percent of the \$2.16 billion audited.”

“... questioned costs that included Ineligible Work and Costs and Unsupported Costs, which we recommended FEMA disallow.”

Summary of Key Findings of Fiscal Year 2017 FEMA Disaster Grant and Audits,
FEMA Office of Inspector General <https://www.oig.dhs.gov/sites/default/files/assets/2018-09/OIG-18-75-Sep18.pdf>

Our documentation could be used to justify a FEMA expense reimbursement or cost recovery request.

The accuracy and completeness of what we submit is critical.

Archiving Event Documentation

The job is not done until paperwork is complete and submitted.

Every paper used during an activation must be submitted.

It must be legible. Take the time to write clearly.

Use one side only. Documents are scanned single-sided.

If you make an error, draw a line through it but do not scratch it out.

These are legal documents.

They may be needed to defend decisions or justify insurance coverage.

Most of this documentation is “discoverable.”

“If it’s not documented, it didn’t happen.”

This includes documentation created after the event or incident, such as the After-Action Report.

ICS-309 Log

Forms → ICS 309 Comm Log

1. Fill in header fields.
2. On the “Period” tab, select “Range”, and fill in your shift times.
3. On the “Content” tab, ensure everything is included.
4. Press Build Data Set.
5. Press Print.
6. Sign the printed ICS 309 form.
You can also have Outpost electronically sign it, but be sure you review the content first. Your signature asserts its accuracy.
7. Give the report to your supervisor.

The screenshot shows the 'ICS 309 Comm Log Builder' application window. It has a menu bar with 'File', 'Edit', and 'Help'. Below the menu are three buttons: 'Build Data Set', 'Print', and 'Exit'. The form is divided into several sections. The top right section contains 'Activation Number' (CUP-23-16T) and 'Date/T' (8/10/2). Below this is the 'Operational Period' (08/01/2023 00:00 to 08/08/2023 19:00) and 'Incident Name' (Prospect "Heights" Earthquake). The 'Radio Operator Name' is Herman Munster, and the 'Station ID / Call Sign' is W6XRL4. A tabbed interface shows 'Period', 'Content', 'Sort', 'Layout', 'Output', and 'e-Signature'. The 'Reporting Period' section has four radio buttons: 'Today (8/10/2023 21:31)', 'Since last report run (8/7/2023 19:14)', 'All (2/4/2019 15:45 to 8/10/2023 21:31)', and 'Range' (which is selected). To the right of these are date and time pickers for 'From Date' (3/1/2), 'From Time' (12:00), 'To Date' (8/10/2), and 'To Time' (23:00). A 'Preview' section at the bottom shows a table of messages. The table has columns: Date/Time, From, To, Msg ID, Local ID, and Subject. The messages are from 8/4/2023 14:22 to 8/8/2023 16:47, involving K06PE and KD6ANC. The status at the bottom indicates '493 messages found for reporting'.

Date/Time	From	To	Msg ID	Local ID	Subject
8/4/2023 14:22	K06PE	K06PE	6PE-2024P	6PE-2024P_R_#1722, #170	
8/4/2023 14:23	K06PE@WIKS~	K06PE	6PE-2024P	6PE-2025P	6PE-2024P_R_#1722, #170
8/4/2023 14:23	K06PE	K06PE@WIKS~			DELIVERED: 6PE-2024P_R_#
8/5/2023 13:42	K06PE	K06PE	6PE-2030P		6PE-2030P: ADDR: DL_CARE
8/5/2023 13:43	K06PE	K06PE	6PE-2030P	6PE-2031P	6PE-2030P: ADDR: DL_CARE
8/5/2023 13:43	K06PE	K06PE			DELIVERED: 6PE-2030P: AD
8/6/2023 13:50	KD6ANC	K06PE			Test Outpost 3.7 - Messa
8/6/2023 13:56	KD6ANC	K06PE			Test Outpost 3.7 - Messa
8/6/2023 14:17	KD6ANC	K06PE			Test Outpost 3.7 - Messa
8/8/2023 16:47	KD6ANC	K06PE			Test Outpost 3.7 - Messa

493 messages found for reporting

ICS-309 Header Information

Incident name: Which incident you're supporting

Activation number: Assigned by the served agency

Operational period: Planning period your shift falls in
This is not the same as your shift time!

You can find this information on the ICS-205.

Forms → ICS-309 Communications Log

ICS 309 Comm Log Builder

File Edit Help

Build Data Set Print Exit

Activation Number

Date/Time

03/05/23 20:34

Operational Period

Incident Name

02/04/19 08:00 to 03/05/23 23:00

Radio Operator Name

Station ID / Call Sign

Message Archives

Your supervisor may want archives of all messages.

There are two kinds:

- **Outpost Export/Import Archive**

This archive can be imported back into Outpost to restore the messages.

It is not usable outside of Outpost.

Create this with **File → Export** and select “All Folders.”

- **Text-Only Archive**

This is a plain text file with each message on its own page.

In each message folder, create this with **File → Save All**.

Reset Outpost for the Next Event

Do not do this unless you have made a message archive.
Do not do this without supervisor approval.

1. Move all SCCo notices into an “SCCo Notices” folder.
If you don’t have one, create it in **Tools → General Settings → Start**.
2. **File → Export** the “SCCo Notices” folder.
3. **File → Delete All Messages**
4. **File → Import** the archived “SCCo Notices” folder.

Shut Down Station (continued)

- Wait to get delivery receipts for all sent messages
- Send a check-out message *when instructed by supervisor*
- Generate and sign the ICS-309 logs (packet and voice)
- Generate a message archive
- Clean out Outpost messages *if instructed by supervisor*
- Shut down and (if appropriate) pack up all equipment
- Leave the site better than you found it

Wrapping Up

Agenda

Type III Part A (this class)

- Introduction to Packet Radio
- Building a Packet Station
- Packet Software
- Outpost Settings
- Packet Field Deployment

Start Up Station

Packet Operations

Shift Change

Shut Down Station

Part B and Type II (Nov. 14)

- SCCo Packet Messenger
- Packet Field Deployment
reprise with SCCo Packet Messenger
- SCCo Packet BBS Network
- Packet Ops in County EOC
- Under the Hood

Class Credit

To receive credit for this class, you must:

- Attend at least 90% of the class
- Participate in the class
- Complete the post-class exercises **by August 9**
- Complete the class evaluation **by August 8**

Post-Class Exercises

To receive credit for this class, you need to use packet.

If you don't have your own packet equipment, ask to borrow equipment from your city ARES group or operate from their radio room.

Download the exercises from the class web page.

scc-ares-races.org/training/role/packet-3a

You will need a city tactical call sign.

Your city EC should have sent you one already.

If you're unable to get one from your city EC, contact the instructor.

Complete the exercises **by August 9.**

If you need an extension, contact the instructor.

Online Class Evaluation

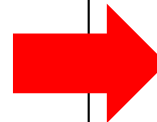
Class Evaluation must be submitted within 7 days to get class credit

Activities Database

Home
Log Out
Activities Home
SCC ARES/RACES Home
Comments/Bugs
Events
List Events By Date
List Events I Joined
Submit Class Evaluation
My Profile
My Contact Info

Website Home Page

	Training & Practice	>
	Classes	>
	<i>Emergency communications training curriculum</i>	
	Submit Class Evaluation	>
	<i>How can we improve?</i>	
	Voice Nets	>
	<i>City nets, SPECS/SVECS, hospital, training, HF</i>	



Packet Practices

Weekly Packet Practice

Every week, ending Monday (SPECS) or Tuesday (SVECS)
Send the provided message with best possible accuracy
Instructions at wpp.scc-ares-races.org

“Monthly” Packet Practice

Miniature packet activation
Check-in, a few messages each way, check-out, ICS-309
Next session August 19–25, signups on county website

Live practice at every county drill

Real activation, with people around you to help
Quarterly drills, plus annual exercise on September 19

THANK YOU!

If you have questions or feedback about this class or packet operations, you can join our Packet discussion group.

scc-ares-races.groups.io/g/packet

This is a moderated group.

Make sure you're signed up for the second part:

Packet Operations Type III, Part B & Type II

November 14

scc-ares-races.org/training/role/packet-3b-2