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Packet Operations
Type III Part B and Type II

Santa Clara County ARES®/RACES/ACS

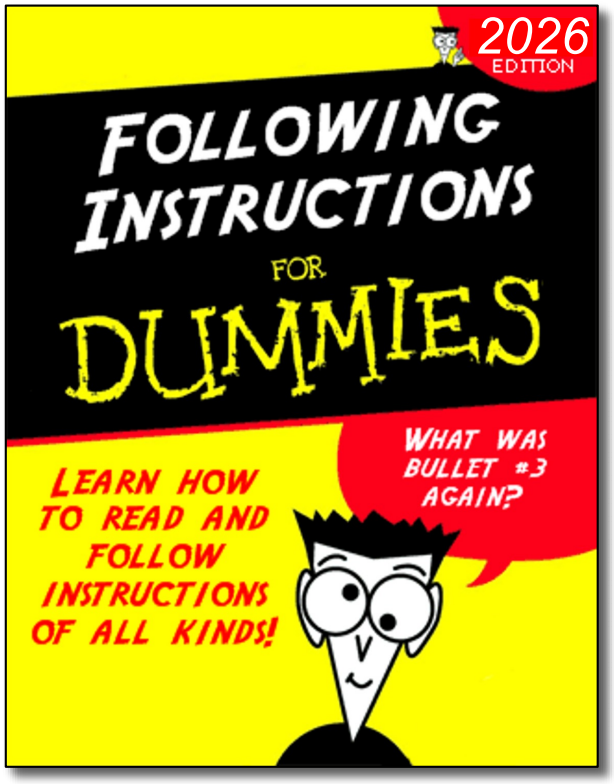
Last Updated: 6 November 2026

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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.



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Agenda

Type III Part A (August 1)

- 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 (this class)

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

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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.

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Currently Available Hardware

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Mobile Radios

The following are currently available mobile radios that meet minimum requirements for SCCo ARES/RACES packet operations:

dual band, 25W minimum, data port or sufficiently capable internal TNC

- Alinco DR-735T
- Icom IC-7100
- Kenwood TM-D750A
- Yaesu FTM-150R
- Yaesu FTM-310DR
- Yaesu FTM-510DR

Many discontinued radios meet these requirements and may be available in used markets.

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Terminal Node Controllers (TNCs)

The Kantronics KPC-3 Plus series of TNCs are the only commercially available hardware TNCs known to meet minimum requirements for SCCo ARES/RACES.

- OpenTNC by NA6D is under evaluation and may also meet requirements.

Software TNCs and KISS-only TNCs may be adequate for at-home, non-emergency use, but are not suitable for actual incidents.

- Installation and configuration of software TNCs is not sufficiently turn-key to expect all packet operators to learn it, which means they are not suitable for shared-use stations in EOCs, hospitals, etc.
- KISS-only TNCs cannot honor AX.25 protocol timings and can significantly degrade performance on congested packet frequencies.

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SCCo Packet Messenger

a.k.a. PackItForms 4

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SCCo Packet Messenger

Multi-platform alternative to Outpost

- Runs on Windows 10+, Mac OS, and Linux (even Raspberry Pi!)

No installation process or administrator access needed

- Type II credential requires using something that doesn't need admin access
- Included in SCCo combined installer; also available as standalone application

Browser-based interface and terminal interface

- Terminal is suitable for both manual and automated use
- Either interface satisfies Type II requirement (don't have to learn both)

Modeled on ICS-309

- Each incident has its own settings and messages in its own directory
- Message list looks like an ICS-309 log with all messages together

Tailored to SCCo ARES/RACES operations

- Standard software settings, TNC settings, and behaviors are baked in

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One Program, Three Faces

PackItForms

Plugin to Outpost to encode and decode form messages

SCCo Packet Messenger

Browser-based packet software, alternative to Outpost

Packet Shell

Command line packet software, alternative to Outpost

These are all the same program! Just invoked differently.

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Choice of packet software

Use Outpost if…

- Operating in EOC or other served agency station
- Getting P3 or P2 credential
- Operating packet outside SCCo ARES/RACES
- Using AGWPE TNC
- Used to it or like it better

Use Messenger if…

- Can't install Outpost (no admin access)
- Getting P2 credential
- Operating on Mac or Linux (not for use in activations or drills)
- Using KISS TNC
- Automating packet traffic
- Need command line access
- Need access to messages when software isn't running

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Messenger Productivity Features

- All settings in one place
- Periodic bulletin retrieval
- Destination Message ID fields filled in
- “No delivery receipt” flag
- Manual and editable log entries
- Hide delivery receipts
- “Needs Follow-Up” flag
- Default destination address
- Default To/From Position/Location
- Default body text (e.g., `This is drill traffic`)
- Override PackItForms field validation

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Starting SCCo Packet Messenger

SCCo Combined Installer

For browser usage:

C:\PackItForms\pifo.exe

Consider putting a shortcut to that on your desktop.

For command line usage:

C:\PackItForms\packet.exe

Put that in your %PATH%.

Standalone Application

Put the application anywhere convenient on your system.

It's usually named `packet`.
Put its location on your $PATH.
Running from a USB stick is fine.

For browser usage:

```
$ packet gui
```

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Incident Settings (Browser)

Incident Settings

Incident Directory:	/Users/stever/Desktop/2026-11-14-Packet-3B2				
Incident Name:	2026 Packet Type III Part B and Type II Class				
Activation Number:					
Operational Period:	**Start:**	11/14/2026 09:00	**End:**	11/14/2026 12:00	
Operator:	**Call Sign:**	KC6RSC	**Name:**	Steve Roth	
Tactical Station:	**Call Sign:**		**Name:**		
Starting Message ID:	**Receive:**	RSC-100P	**Send:**	RSC-100P	

BBS Communications

Connection Method: ○ Manual ◉ Serial+TNC ○ Telnet

Serial+TNC Settings:	**TNC Type:**	Kantronics KPC-3 Plus
	Serial Port:	/dev/tty.usbserial-1410
	BBS Address:	W1XSC-1

Bulletin Retrieval

Area	Check Every		Check Now
XSCPERM	24 hr.	0 min.	☐
XSCEVENT	1 hr.	0 min.	☐
XND@XSC	1 hr.	0 min.	☐
	hr.	min.	

Defaults for New Messages

Send To Address: XNDEOC@W1XSC

TO	**ICS Position:**		**FROM**	**ICS Position:**	Instructor
	Location:			**Location:**	Sunnyvale DPS

Main Body Text: **** This is drill traffic ****

Incident Settings (Terminal)

```
~/Desktop/2026-11-14-Packet-3B2
❯ packet
SCCo Packet Messenger v4.1.0.  Type "help" for help.
packet> edit config
Editor: [F1]=Help [Tab]=Next [Shift-Tab]=Prev [ESC]=Exit [Ctrl-C]=Abort
Incident Name                2026 Packet Type III Part B and Type II Class
Activation Number
Operation Start              11/14/2026 09:00
Operation End                11/14/2026 12:00
Operator Call Sign           KC6RSC
Operator Name                Steve Roth
Tactical Call Sign
Tx Message ID                RSC-100P
Rx Message ID                RSC-100P
Connection Type              Serial+TNC
TNC Type                     Kantronics KPC-3 Plus
Serial Port                  /dev/tty.usbserial-1410
BBS Address                  W1XSC-1
Bulletin Checks              XND@XSC:1h XSCEVENT:1h XSCPERM:24h
Default To Address           XNDEOC@W1XSC
Default To ICS Position
Default To Location
Default From ICS Position    Instructor
Default From Location        Sunnyvale DPS
Default Body                 **** This is drill traffic ****
```

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Connection Methods

Serial+TNC — Amateur radio connection to BBS

- Computer → TNC → Radio
- Supports both full-featured and KISS-only TNCs

Manual — Messenger doesn't connect to BBS, you do

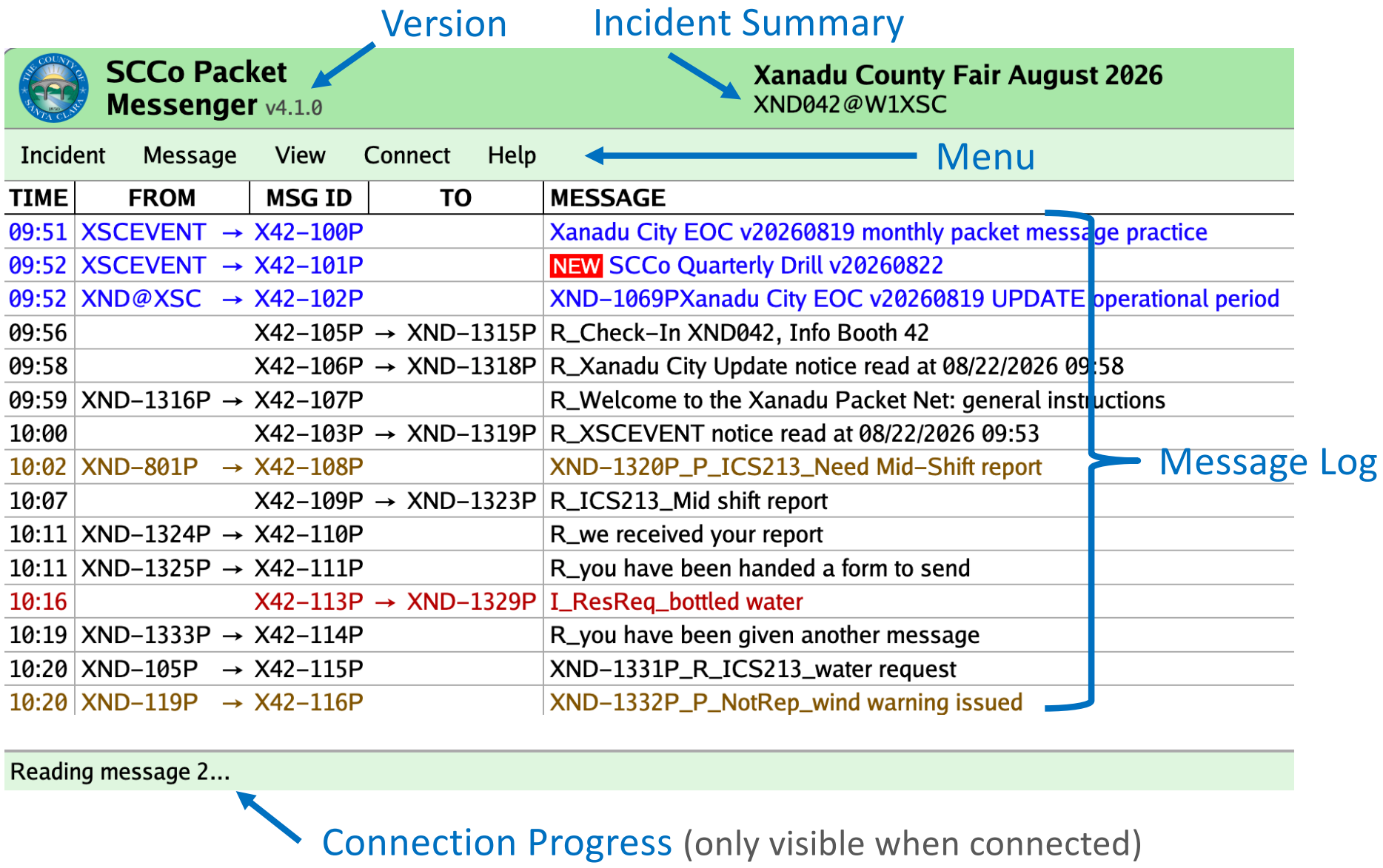
- Generally using a terminal emulator to talk to the TNC
- Messenger still tracks and generates messages
- Useful for TNCs that Messenger doesn't support

Telnet — Internet connection to BBS

- Not generally available; used by BBS maintainers

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Message Window



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Message List in ICS-309 Format

SCCo Packet Messenger v4.1.0 — **Xanadu County Fair August 2026** — XND042@W1XSC

Incident Message View Connect Help

TIME (24:00)	FROM		TO		Message
	Call Sign/ID	Msg #	Call Sign/ID	Msg #	
09:51	XSCEVENT			X42-100P	Xanadu City EOC v20260819 monthly packet message practice
09:52	XSCEVENT			X42-101P	NEW SCCo Quarterly Drill v20260822
09:52	XND@XSC			X42-102P	XND-1069PXanadu City EOC v20260819 UPDATE operational period
09:56		X42-105P	XNDEOC	XND-1315P	X42-105P_R_Check-In XND042, Info Booth 42
09:58		X42-106P	XNDEOC	XND-1318P	X42-106P_R_Xanadu City Update notice read at 08/22/2026 09:58
09:59	XNDEOC	XND-1316P		X42-107P	XND-1316P_R_Welcome to the Xanadu Packet Net: general instructions
10:00		X42-103P	XNDEOC	XND-1319P	X42-103P_R_XSCEVENT notice read at 08/22/2026 09:53
10:02	XNDEOC	XND-801P		X42-108P	XND-1320P_P_ICS213_Need Mid-Shift report
10:07		X42-109P	XNDEOC	XND-1323P	X42-109P_R_ICS213_Mid shift report
10:11	XNDEOC	XND-1324P		X42-110P	XND-1324P_R_we received your report
10:11	XNDEOC	XND-1325P		X42-111P	XND-1325P_R_you have been handed a form to send
10:16		X42-113P	XNDEOC	XND-1329P	X42-113P_I_ResReq_bottled water
10:19	XNDEOC	XND-1333P		X42-114P	XND-1333P_R_you have been given another message
10:20	XNDEOC	XND-105P		X42-115P	XND-1331P_R_ICS213_water request
10:20	XNDEOC	XND-119P		X42-116P	XND-1332P_P_NotRep_wind warning issued
10:31		X42-117P	XNDEOC	XND-1341P	X42-117P_R_ICS213_wind response
10:54	XNDEOC	XND-1346P		X42-118P	XND-1346P_R_You have been released
10:57		X42-119P	XNDEOC	XND-1347P	X42-119P_R_Check-Out XND042, Info Booth 42
11:02	XNDEOC	XND-1349P		X42-120P	XND-1349P_R_Knowledge Stimulation
11:03	XNDEOC	XND-1348P		X42-121P	XND-1348P_R_Goodbye from the Xanadu Packet Net

The printed log is always in ICS-309 format.

Delivery receipts are hidden by default on screen, but always printed.

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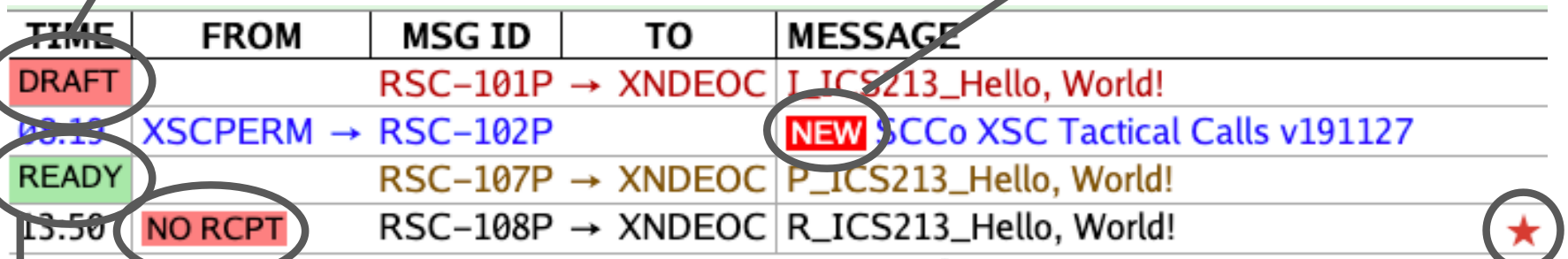
Compact View (default)

TIME	FROM	MSG ID	TO	MESSAGE
09:51	XSCEVENT →	X42-100P		Xanadu City EOC v20260819 monthly packet message practice
09:52	XSCEVENT →	X42-101P		NEW SCCo Quarterly Drill v20260822
09:52	XND@XSC →	X42-102P		XND-1069PXanadu City EOC v20260819 UPDATE operational period
09:56		X42-105P →	XND-1315P	R_Check-In XND042, Info Booth 42
09:58		X42-106P →	XND-1318P	R_Xanadu City Update notice read at 08/22/2026 09:58
09:59	XND-1316P →	X42-107P		R_Welcome to the Xanadu Packet Net: general instructions
10:00		X42-103P →	XND-1319P	R_XSCEVENT notice read at 08/22/2026 09:53
10:02	XND-801P →	X42-108P		XND-1320P_P_ICS213_Need Mid-Shift report
10:07		X42-109P →	XND-1323P	R_ICS213_Mid shift report
10:11	XND-1324P →	X42-110P		R_we received your report
10:11	XND-1325P →	X42-111P		R_you have been handed a form to send

```
packet> list
TIME   FROM          MSG ID      TO          MESSAGE
09:51  XSCEVENT   →  X42-100P                Xanadu City EOC v20260819 monthly packe
09:52  XSCEVENT   →  X42-101P    NEW         SCCo Quarterly Drill v20260822
09:52  XND@XSC    →  X42-102P                XND-1069PXanadu City EOC v20260819 UPDA
09:56                X42-105P →  XND-1315P   R_Check-In XND042, Info Booth 42
09:58                X42-106P →  XND-1318P   R_Xanadu City Update notice read at 08/
09:59  XND-1316P  →  X42-107P                R_Welcome to the Xanadu Packet Net: gen
10:00                X42-103P →  XND-1319P   R_XSCEVENT notice read at 08/22/2026 09
10:02  XND-801P   →  X42-108P                XND-1320P_P_ICS213_Need Mid-Shift repor
10:07                X42-109P →  XND-1323P   R_ICS213_Mid shift report
10:11  XND-1324P  →  X42-110P                R_we received your report
10:11  XND-1325P  →  X42-111P                R_you have been handed a form to send
10:16                X42-113P →  XND-1329P   I_ResReq_bottled water
10:19  XND-1333P  →  X42-114P                R_you have been given another message
```

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Message List Markings



Colors:

Blue = bulletin

Red = immediate

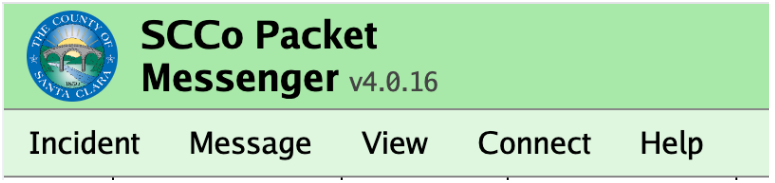
Gold = priority

Black = routine

Gray = receipt

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Menus



Incident

- New Incident
- Open Other Incident
- Incident Settings
- Generate ICS-309

Message draft

- New N
- Manual Log Entry
- Print P
- Edit ↵
- Delete
- View Encoded
- Ready to Send
- Needs Followup

Message sent

- New N
- Manual Log Entry
- View ↵
- Print P
- Edit Log Entry
- Resend
- Send Copy
- View Encoded
- Needs Followup

Message rec'd

- New N
- Manual Log Entry
- View ↵
- Print P
- Edit Log Entry
- Send Copy
- Reply
- View Encoded
- Needs Followup

right-click on message

View

- ✓ Compact View
- Show Receipts
- Large Font

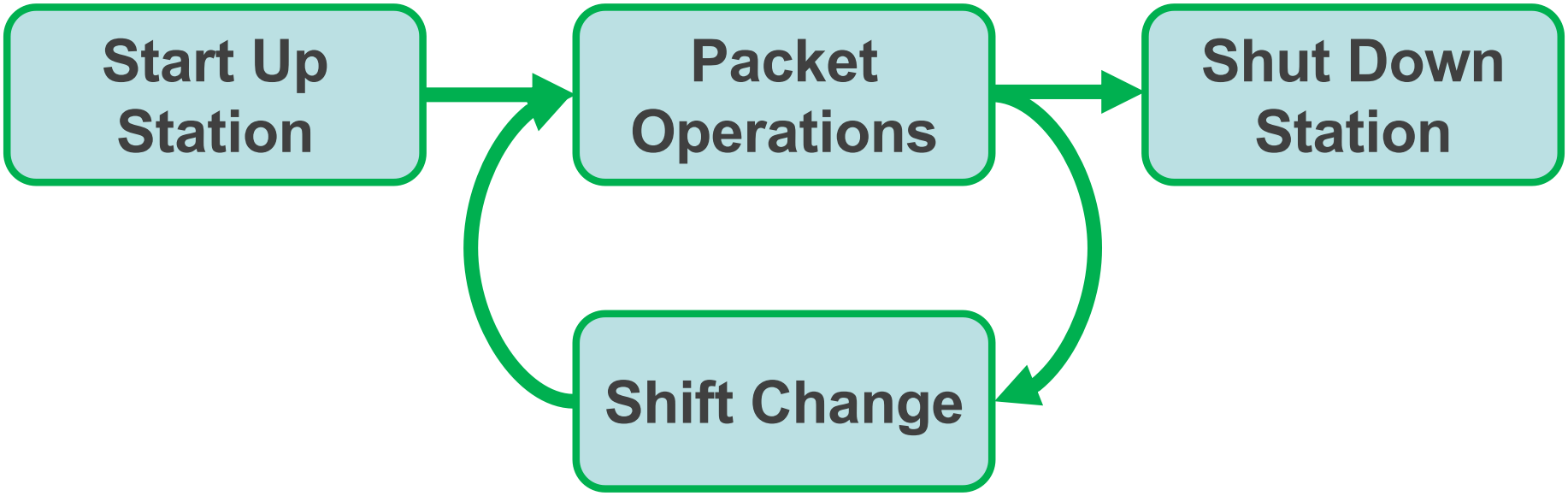
Connect

- Send/Receive All C
- Immediates Only
- Abort Connection ^C

Help

- Software Manual
- Packet Email List
- Github Repository

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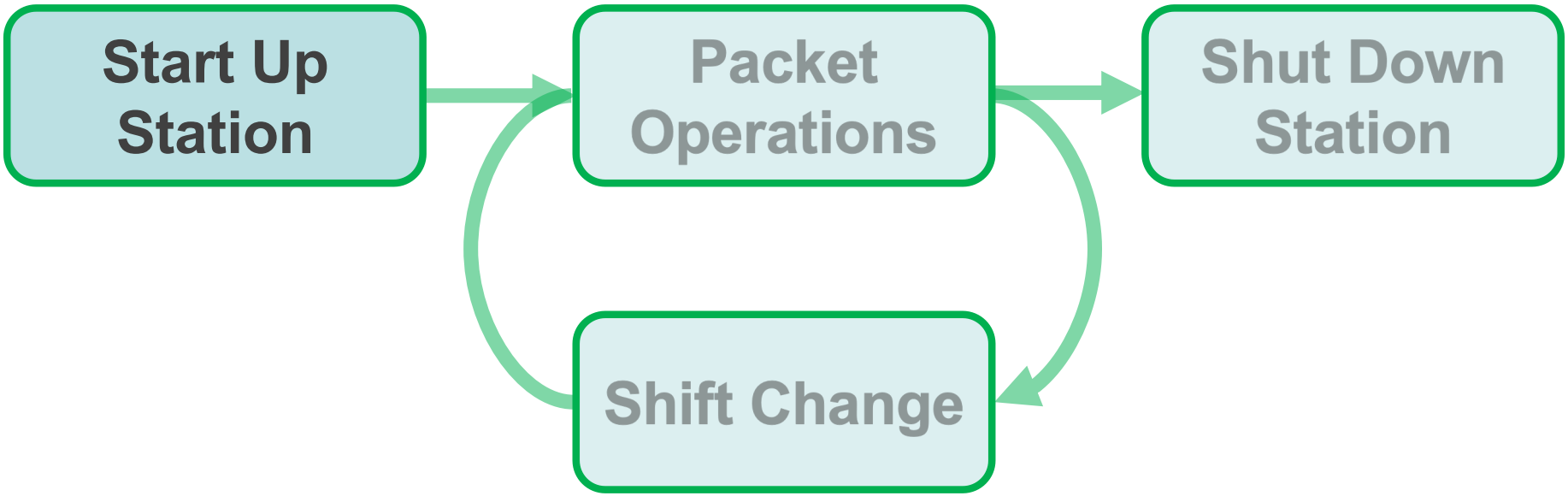


Packet Field Deployment

SCCo Packet Messenger

★ = differences from Outpost

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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*

   Also check into the appropriate voice net if not already done.

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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

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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

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Set up Software

Ensure you have current software

- If not, install current versions (get supervisor approval)

★ ## Create a new incident directory for your activation

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
- ★ ICS-309 header information (incident name, activation number, op period)
- ★ Default values for new message fields

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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.

At least once an hour; more often if the situation calls for it.

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★ Send Yourself a Test Message

1. Message → New → Plain Text (or type `n p`)
2. Address it “To:” your own TACCALL@BBS.
3. Give an appropriate subject and text.
4. Click “Send”
5. Connect → Send/Receive All (or type `c`)
6. The message should be sent.
7. Connect again.
   The message should be received, and a delivery receipt sent.

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★ Send a Check-In Message

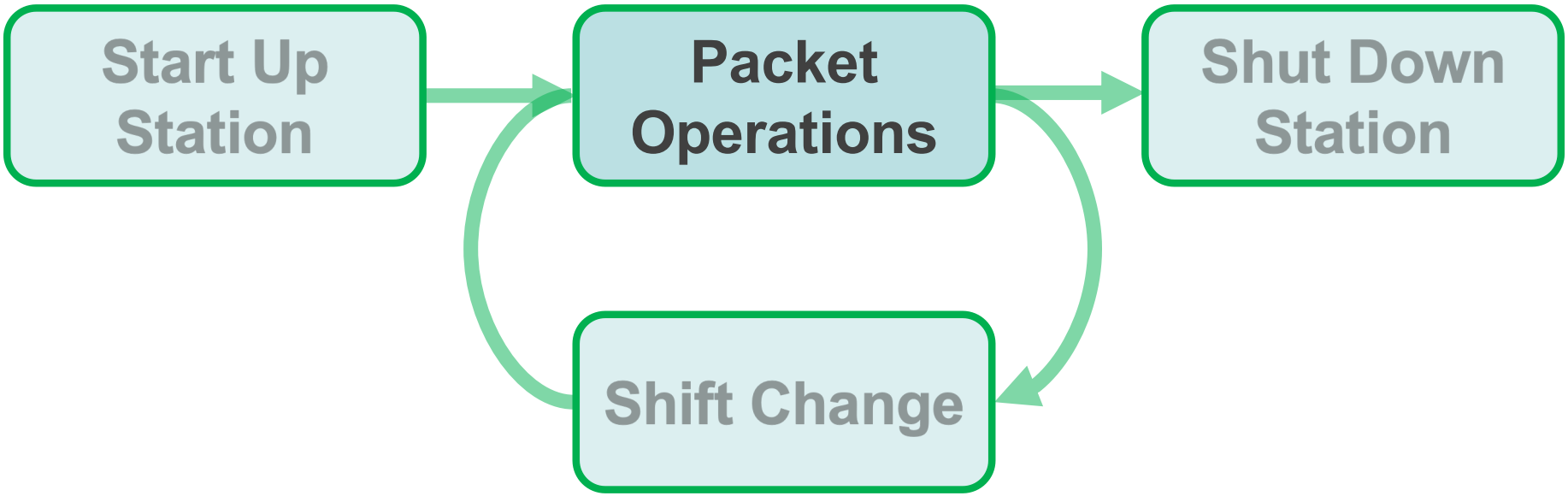
Check in when your station is ready *and* your supervisor OKs it

1. Message → New → Check-In Message (or type `n ci`)
2. Verify the details (pulled from your incident configuration)
3. Address it "To:" the station running your net (usually an EOC).
4. Click "Send Message"
5. Connect → Send/Receive All (or type `c`)
6. The message should be sent.

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.

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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

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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.

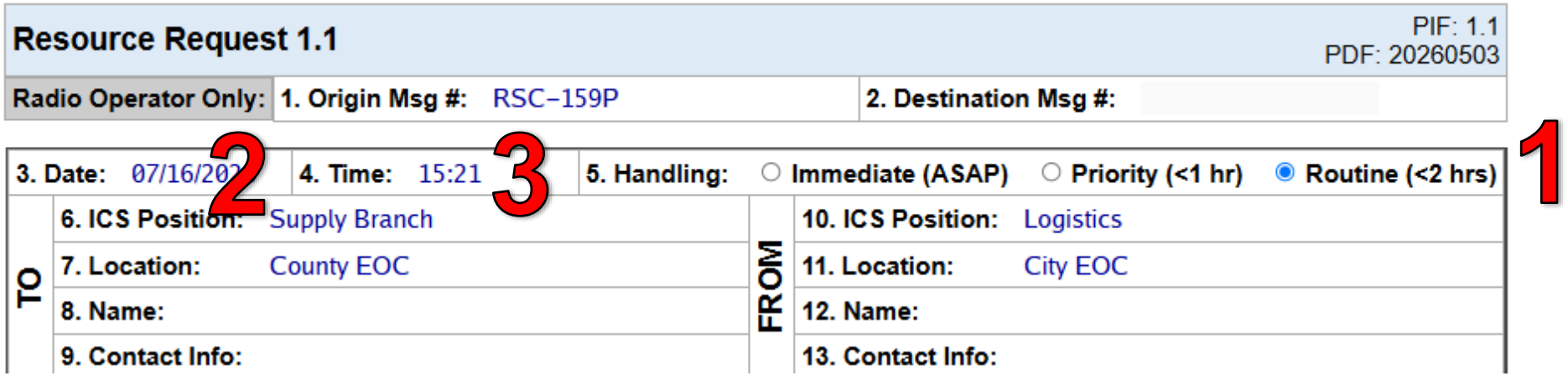
- Check-ins, check-outs, H&W checks, etc.
- Operator-to-operator messages are virtually always plain text.

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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 #:

2 3 1

3. Date: 07/16/202	4. Time: 15:21	5. Handling: ○ Immediate (ASAP) ○ Priority (<1 hr) ◉ Routine (<2 hrs)

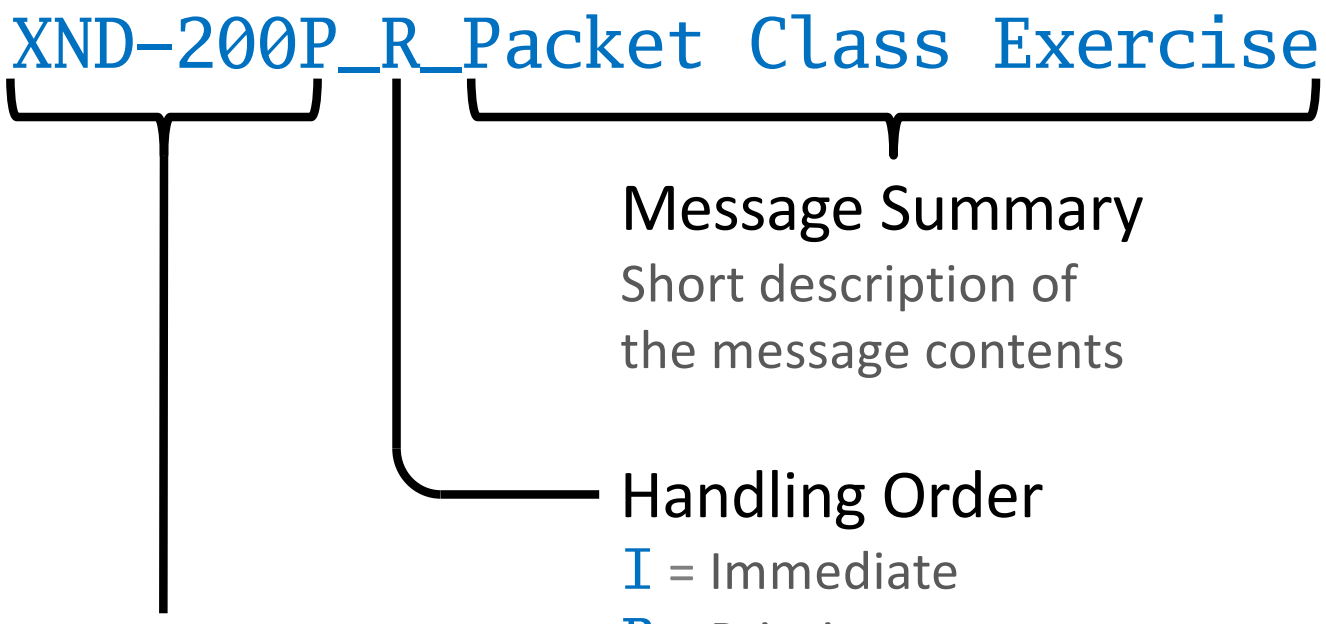
TO		FROM	
6. ICS Position:	Supply Branch	10. ICS Position:	Logistics
7. Location:	County EOC	11. Location:	City EOC
8. Name:		12. Name:	
9. Contact Info:		13. Contact Info:	

Immediate messages are usually sent by voice

- If you do send one by packet, tell the recipient on the proper voice net
- Tell them the message number

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Standard Packet Subject Line



★ SCCo Packet Messenger formats the subject line for you.

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★ Creating Plain Text Messages

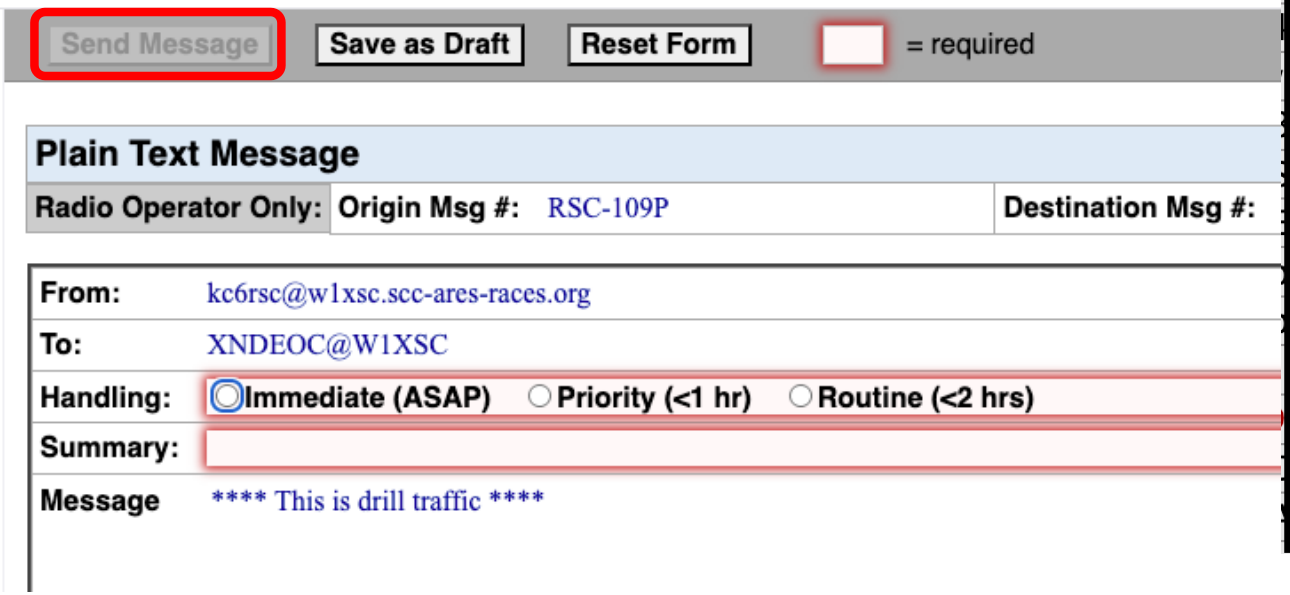
Message → New (or type n)

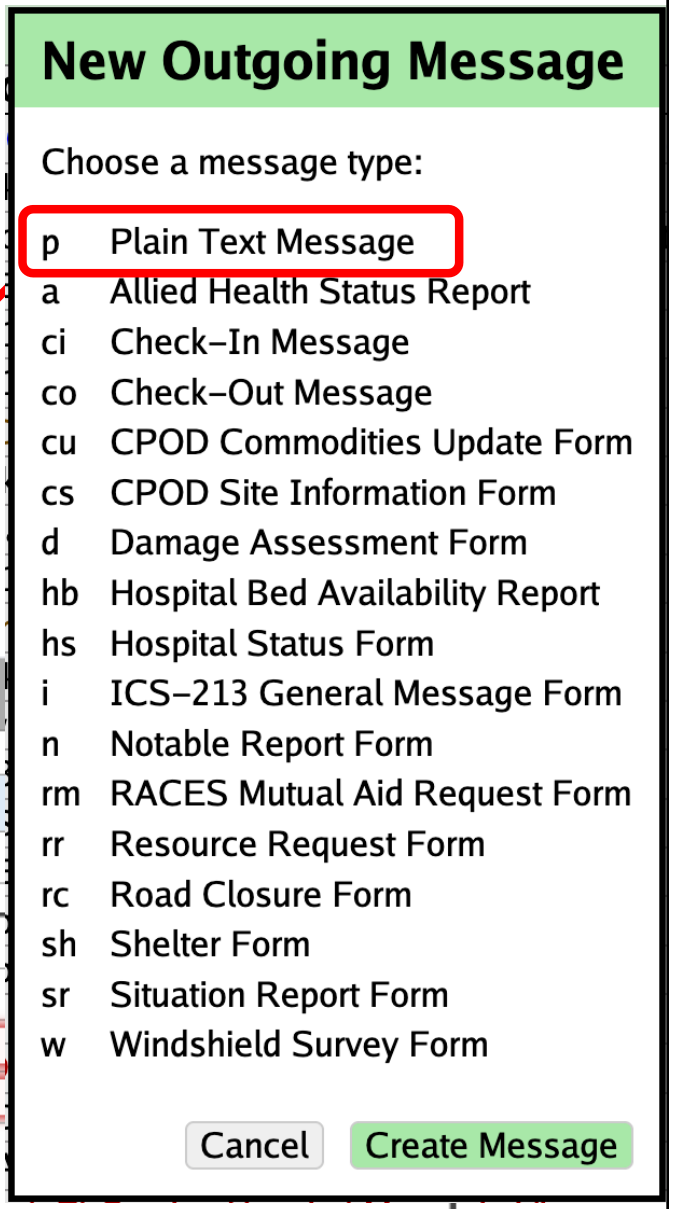
Plain Text Message (or type p)

Fill in the fields

Press Send Message

It will be sent next time you connect to the BBS.





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★ Creating Form Messages

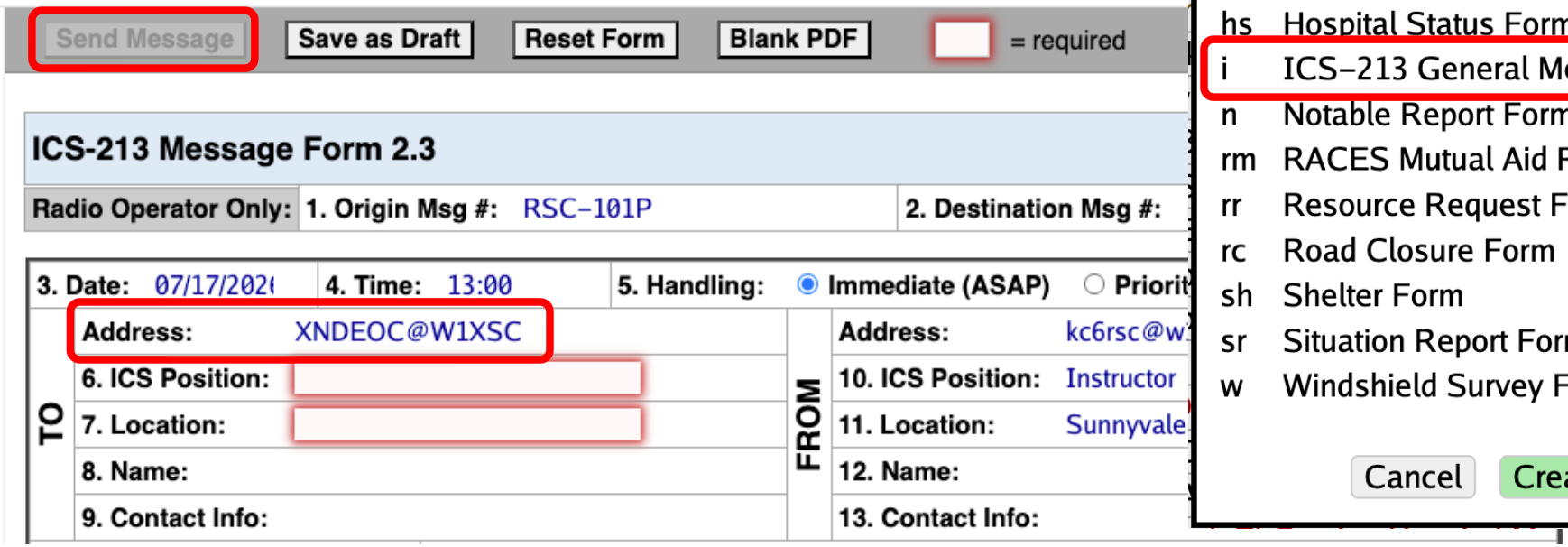
Message → New (or type n)

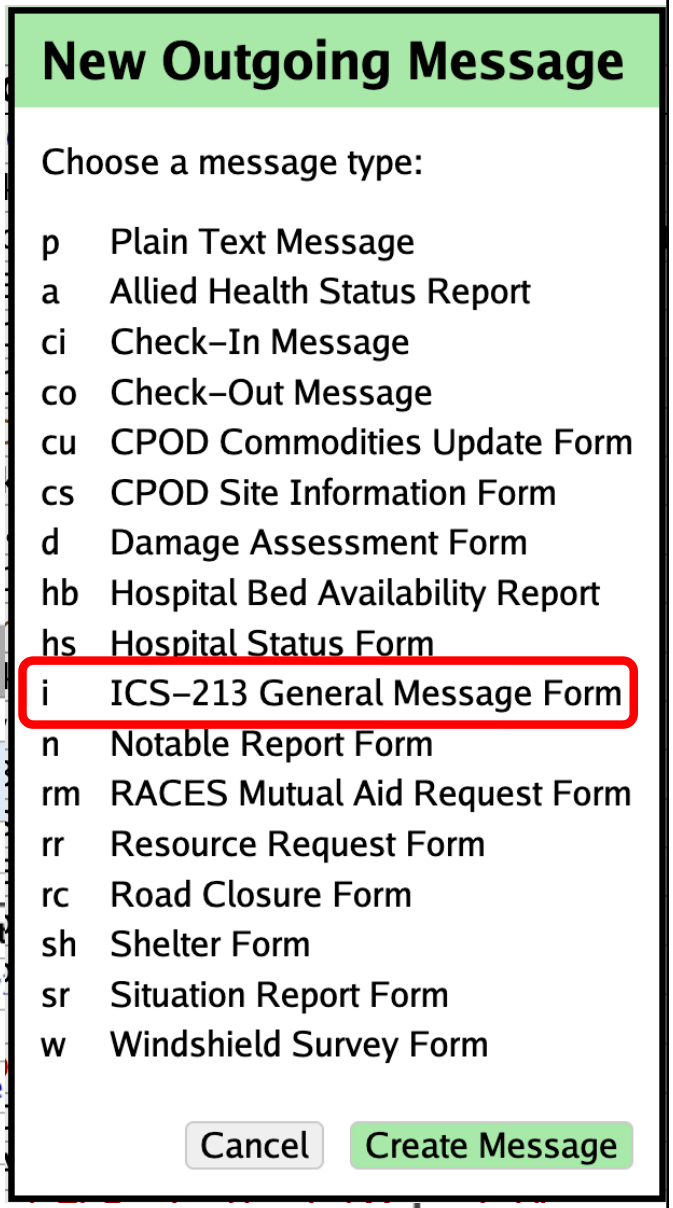
Choose a form type

Fill in the fields, including To Address

Press Send Message

It will be sent next time you connect to the BBS.



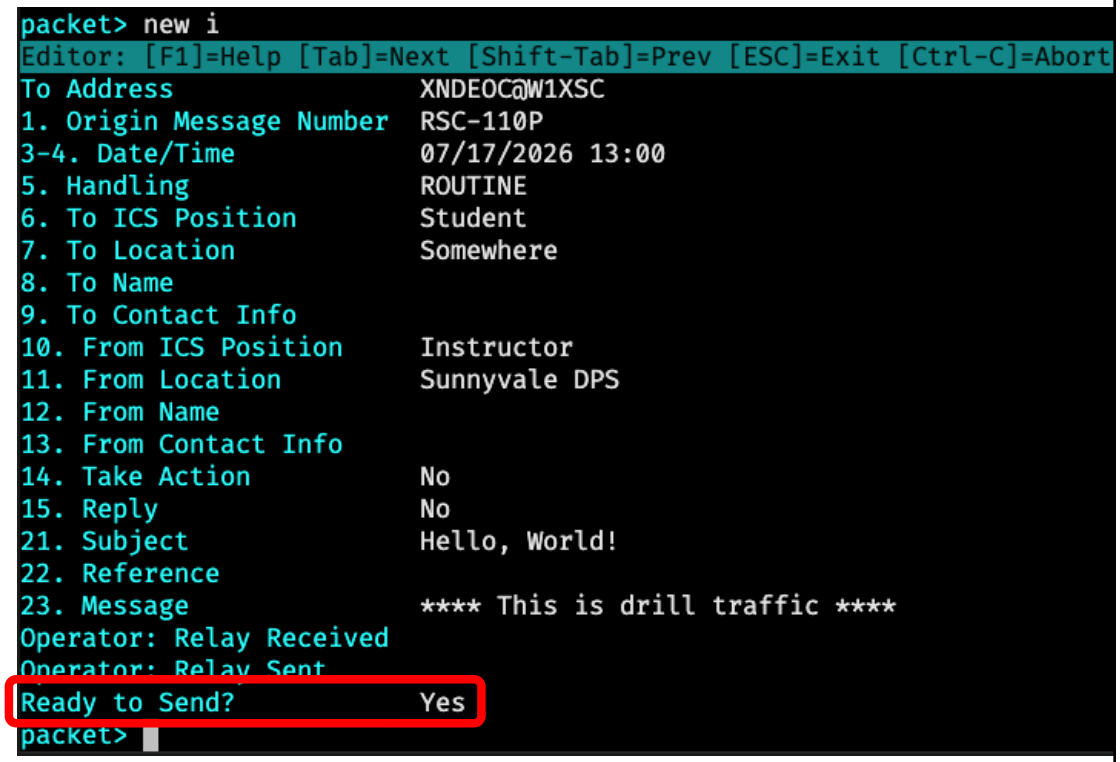


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★ Creating Messages in the Terminal

`new` *form-type*

Run `forms list` for a list



It will ask for each field.

Type the field value, or select a choice with arrow keys.

Use ⇥ Tab or ⏎ Enter to move to the next field.

For multi-line fields, ⇥ Tab or ⏎ Enter three times

To go back to the previous field, use ⇤ Shift-Tab

At the end it will ask if the message is ready to send.

If you say no, it will be saved as a draft for later editing.

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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 Ino **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
	If Severity on form is:	**The Handling is:**	

However, the message author may choose something else.

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

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Addressing Outgoing Messages

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

- scc-ares-races.org/operations/packet/taccalls
- Also available in XSCPERM notices
- If all else fails, 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

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★ Connecting to the BBS

Messages are not sent until you connect to the BBS.

Browser: Connect → Send/Receive All (or type c)

Terminal: connect

It sends outgoing messages and fetches incoming ones.

- It also sends delivery receipts for received messages.
- It fetches bulletins as dictated by the incident configuration.
- You can continue using the browser interface while it's connected.

If you need to abort the connection, press Control-C.

- Or Connect → Abort Connection

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★ Resending Messages with Corrections

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

Browser: Select or right-click on the message
Message → Resend

Terminal: `new --resend` *message-ID*

Make the necessary corrections and send as normal.

The change in message ID suffix is automatic.

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Logging Outgoing Messages

Messenger 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.

   ★ Wait until the delivery receipt is received to print the message: that way it will have the destination message ID on it.

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

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Receiving Messages and Bulletins

Receiving messages:

- Connect to the BBS about every 10 minutes
- Give received third-party messages to your principal

Receiving bulletins:

- Check for new bulletins at least every hour
- Give received bulletins to your principal unless they are operator-only information

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Delivery Receipts

SCCo Packet Messenger sends a delivery receipt for every received message.

- After sending a message, you should get a delivery receipt for it
- ★ It will have a NO RCPT flag in the message list until you do
- 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 (or wait until the delivery receipt is received to print your copy)

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

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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:

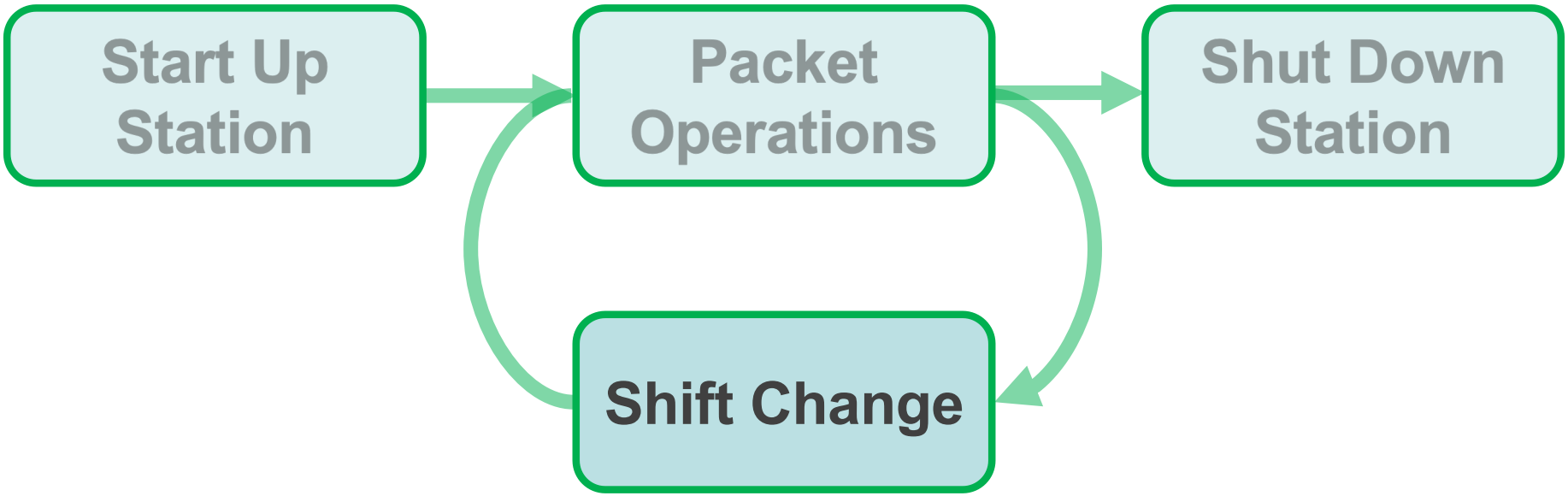
- Remind your principal if they don’t respond in due course
- Be ready to answer “What messages do we still need to respond to?”

★ Mark messages needing follow-up in the message list

Browser: Message → Needs Followup

Terminal: `mark` *message-ID* `followup`

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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
- ★ Start a new incident in a new incident directory

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Packet Shift Briefings

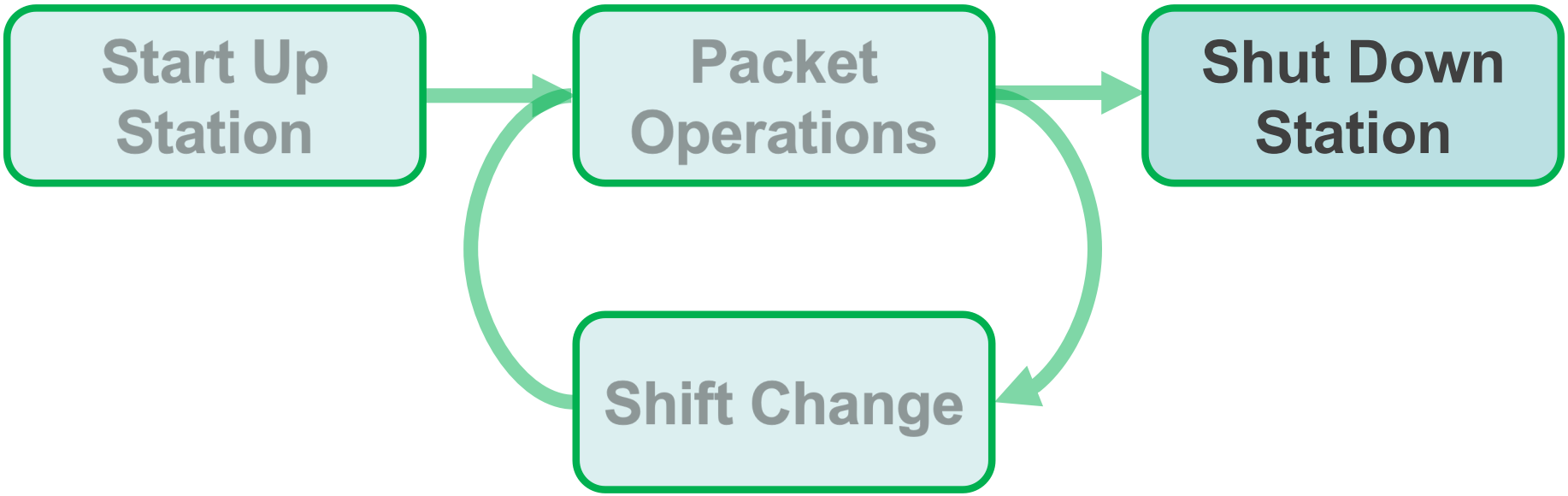
In addition to the usual non-packet information: (PS&BP 12–13)

- 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

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Shut Down Station

- Wait to get delivery receipts for all sent messages
- Send a check-out message *when instructed by supervisor* and wait for a delivery receipt for it
- Check out of the voice net
- ★ 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

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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 a used to justify a FEMA expense reimbursement or cost recovery request.
The accuracy and completeness of what we submit is critical.

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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.

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★ ICS-309 Log

Browser: Incident → Generate ICS-309

Add a signature in the dialog if desired.

Terminal: `ics309`

or `ics309 --signature "your-name"`

The ICS-309 log will be generated and displayed.

It will also be stored in ics309.pdf in the incident directory.

This file is removed automatically if there is new activity in the incident.

Your signature legally asserts that the log is accurate.

Don’t sign the log without reviewing it first.

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★ Message Archives

Your supervisor may want archives of all messages.
If so, create a ZIP archive of the incident directory.

Windows: In File Explorer, right-click the incident directory
Send To → Compressed (Zipped) Folder

Mac/Linux: `cd` into the incident directory
`zip` *archive-filename*`.zip *`

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Shut Down Station (continued)

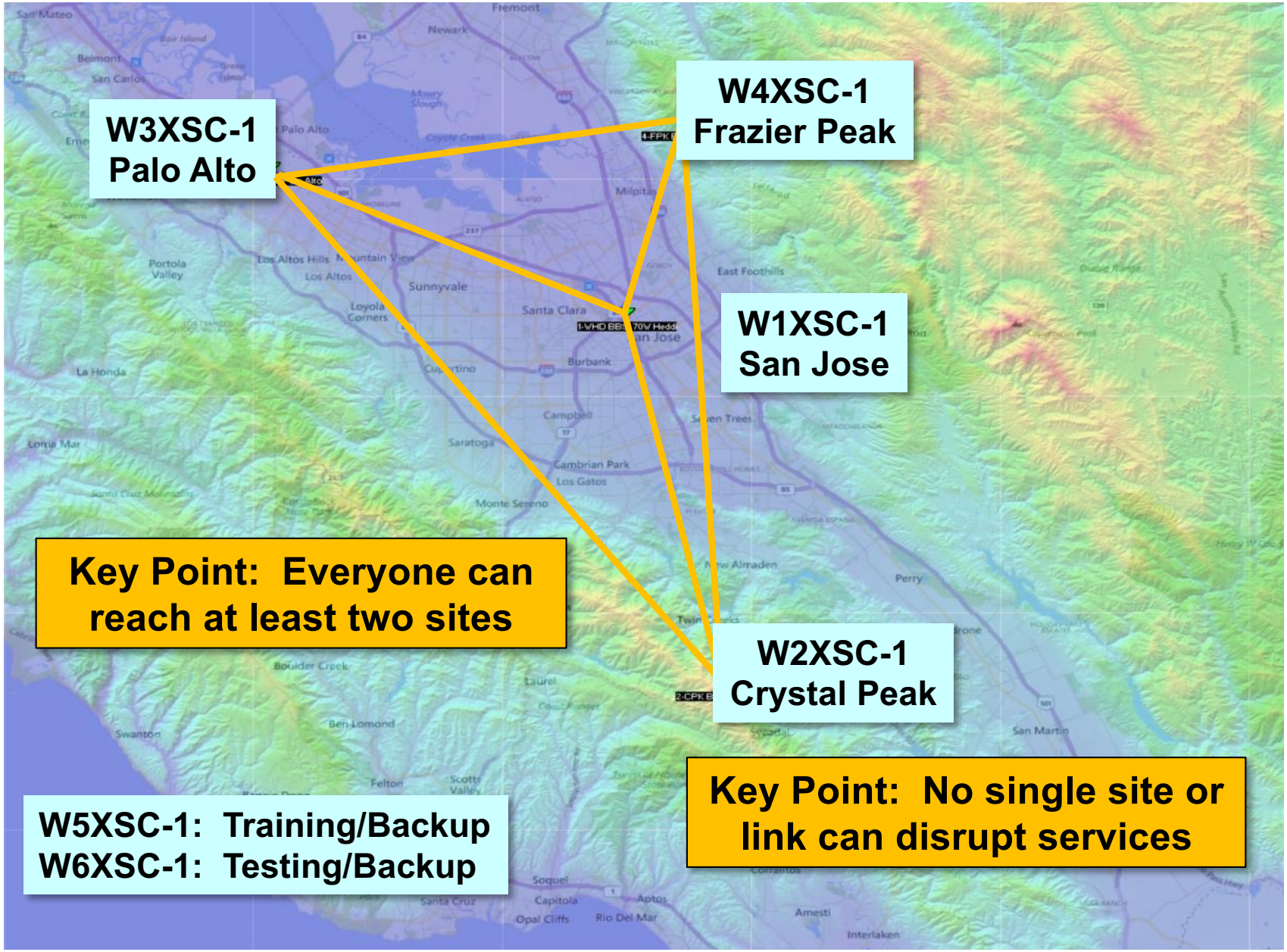
- Wait to get delivery receipts for all sent messages
- Send a check-out message *when instructed by supervisor* and wait for a delivery receipt for it
- Check out of the voice net
- ★ Generate and sign the ICS-309 logs (packet and voice)
- ★ Generate a message archive
- ★ ~~Clean out Outpost messages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

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SCCo ARES/RACES Packet BBSes

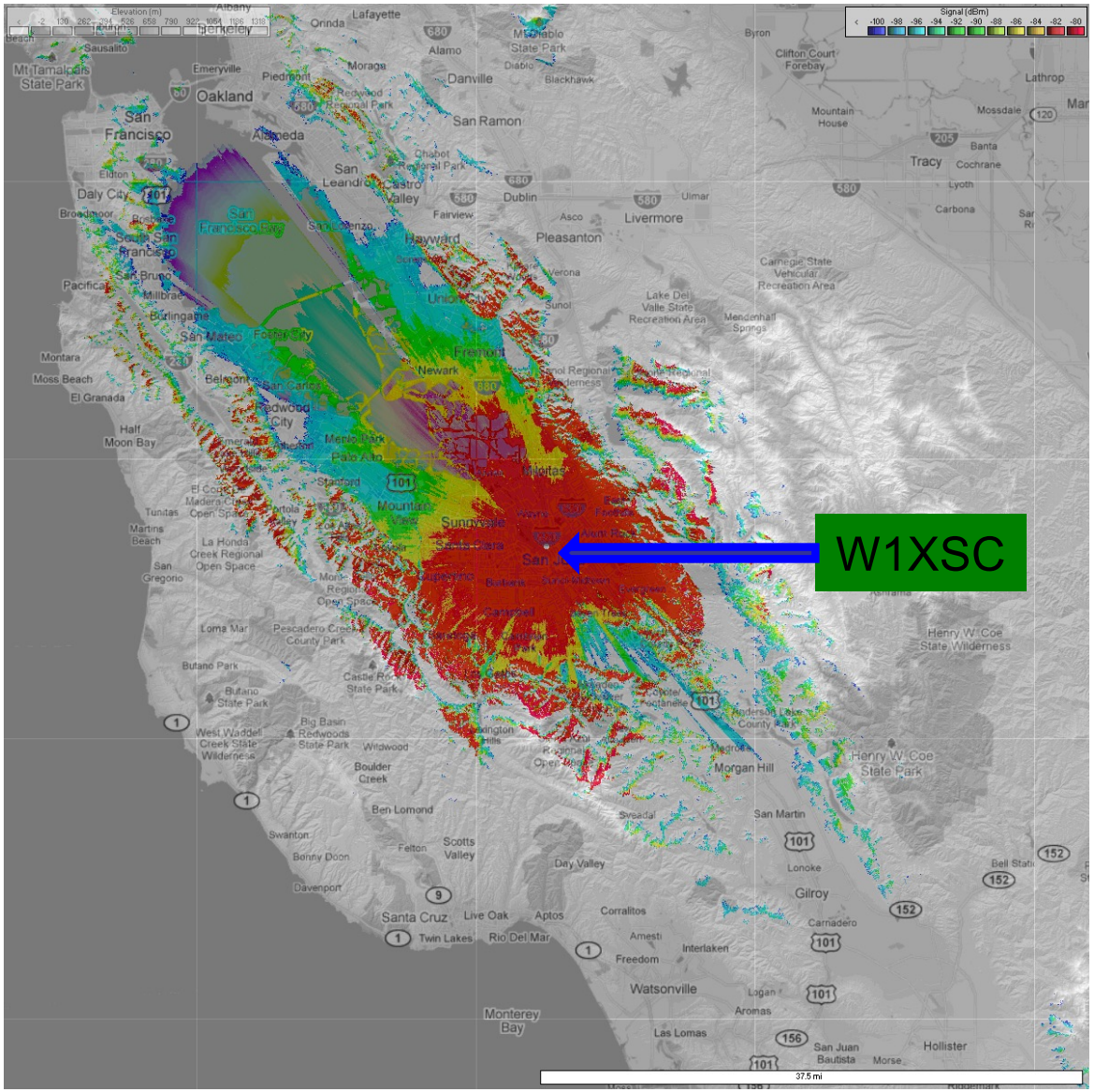
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SCCo ARES/RACES Packet BBSes



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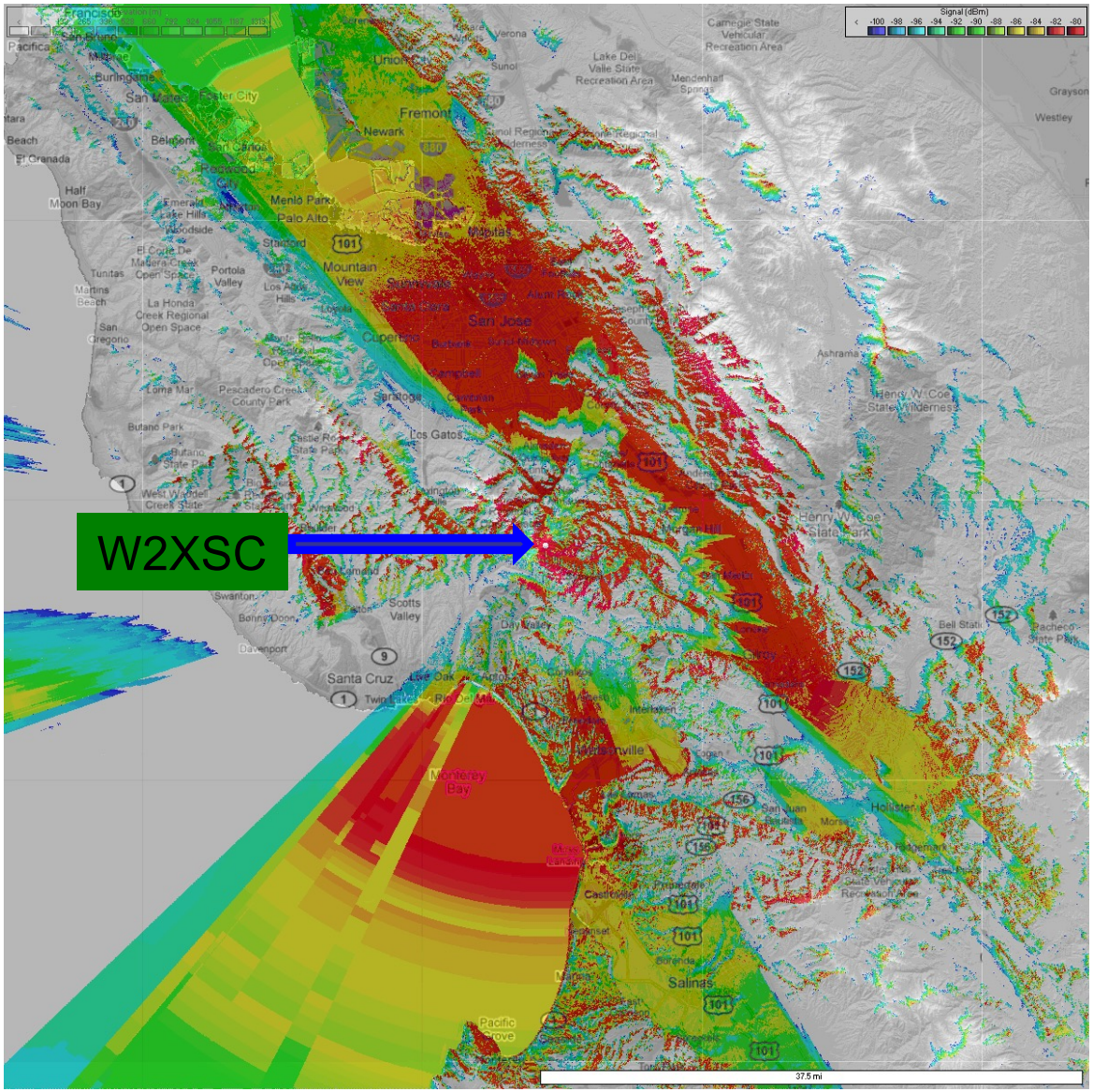
W1XSC Coverage Map



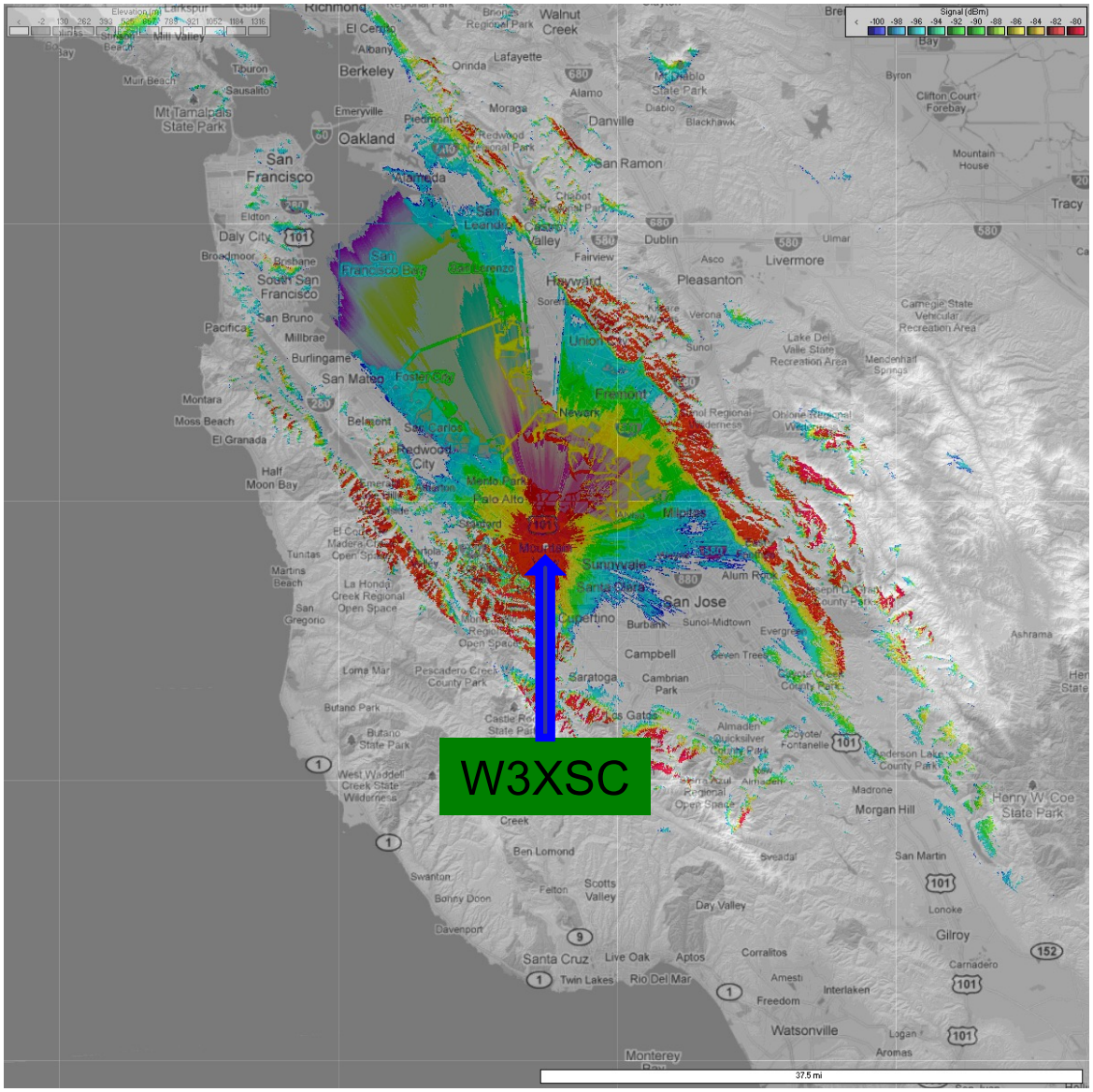
scc-ares-races.org/operations/packet/coverage

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W2XSC Coverage Map


W2XSC
Signal (dBm)
-100 -98 -96 -94 -92 -90 -88 -86 -84 -82 -80
San Francisco
Fremont
Newark
Redwood City
Menlo Park
Palo Alto
Stanford
Mountain View
Sunnyvale
San Jose
Cupertino
Los Gatos
Scotts Valley
Santa Cruz
Monterey Bay
Salinas
Pacific Grove
Hollister
Gilroy
Morgan Hill
Milpitas
Alum Rock
Ashrama
Henry W. Coe State Wilderness
Lake Del Valle State Recreation Area
Carnegie State Vehicular Recreation Area
Mendenhall Springs
Grayson
Westley
Half Moon Bay
Portola Valley
Los Altos Hills
Los Altos
Saratoga
Castle Rock State Park
Big Basin Redwoods State Park
Pescadero Creek County Park
Butano State Park
Davenport
Bonny Doon
Swanton
Aptos
Capitola
Live Oak
Soquel
Watsonville
Castroville
Marina
Seaside
Sand City
Del Rey Oaks
Prunedale
Aromas
San Juan Bautista
Tres Pinos
Paicines
Hollister
Bell Station
Pacheco State Park
Sunol
Verona
Union City
Foster City
San Mateo
Burlingame
San Carlos
Belmont
El Granada
Moss Beach
Martins Beach
Tunitas Creek Open Space
La Honda Creek Regional Open Space
El Corte De Madera Creek Open Space
Emerald Lake Hills
Woodside
Loma Mar
Butano Park
West Waddell Creek State
Big Basin Redwoods State
Swanton
Bonny Doon
Davenport
Scotts Valley
Capitola
Live Oak
Soquel
Watsonville
Castroville
Marina
Seaside
Sand City
Del Rey Oaks
Prunedale
Aromas
San Juan Bautista
Tres Pinos
Paicines
Hollister
Gilroy
Morgan Hill
Milpitas
Alum Rock
Ashrama
Henry W. Coe State Wilderness
Lake Del Valle State Recreation Area
Carnegie State Vehicular Recreation Area
Mendenhall Springs
Grayson
Westley
Half Moon Bay
Portola Valley
Los Altos Hills
Los Altos
Saratoga
Castle Rock State Park
Big Basin Redwoods State
Pescadero Creek County Park
Butano State Park
Davenport
Bonny Doon
Swanton
Aptos

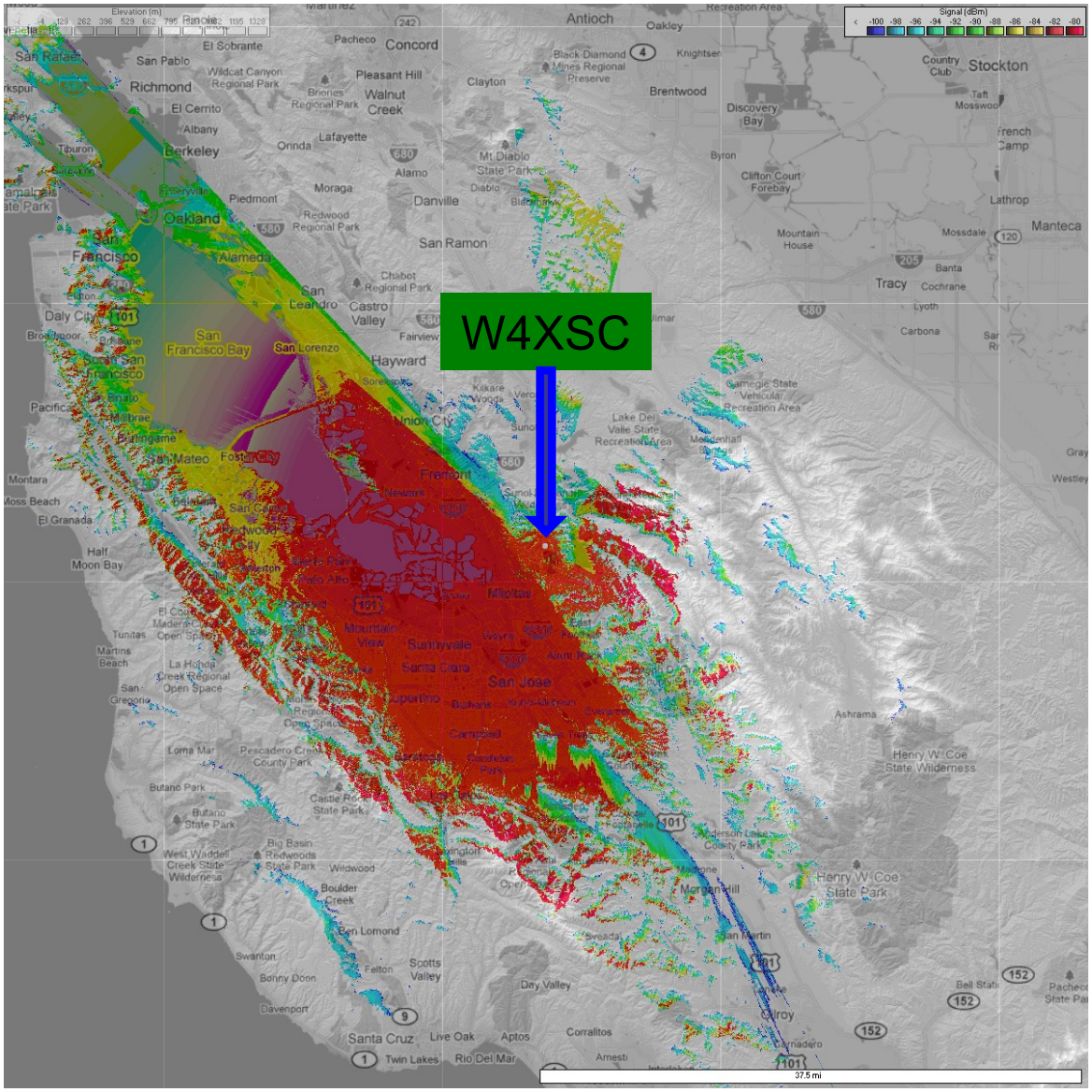
W3XSC Coverage Map



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

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W4XSC Coverage Map



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

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Frequencies and Assignments

Available on the county website:

Packet Services and Frequencies			
System	**Service**	**Frequency**	**Notes**
W1XSC	W1XSC–1 BBS	145.750 223.620 433.570	Downtown San Jose
W2XSC	W2XSC–1 BBS	145.730 223.560 433.590	Crystal Peak (South County)
W3XSC	W3XSC–1 BBS	144.310 223.540 433.450	Palo Alto
W4XSC	W4XSC–1 BBS	145.690 223.600* 433.550	Frazier Peak (above Milpitas) 223.600 is for BBS forwarding

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
Hospitals & PHDOC	HOS	W1XSC	W2XSC

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

Also available in XSCPERM notices.

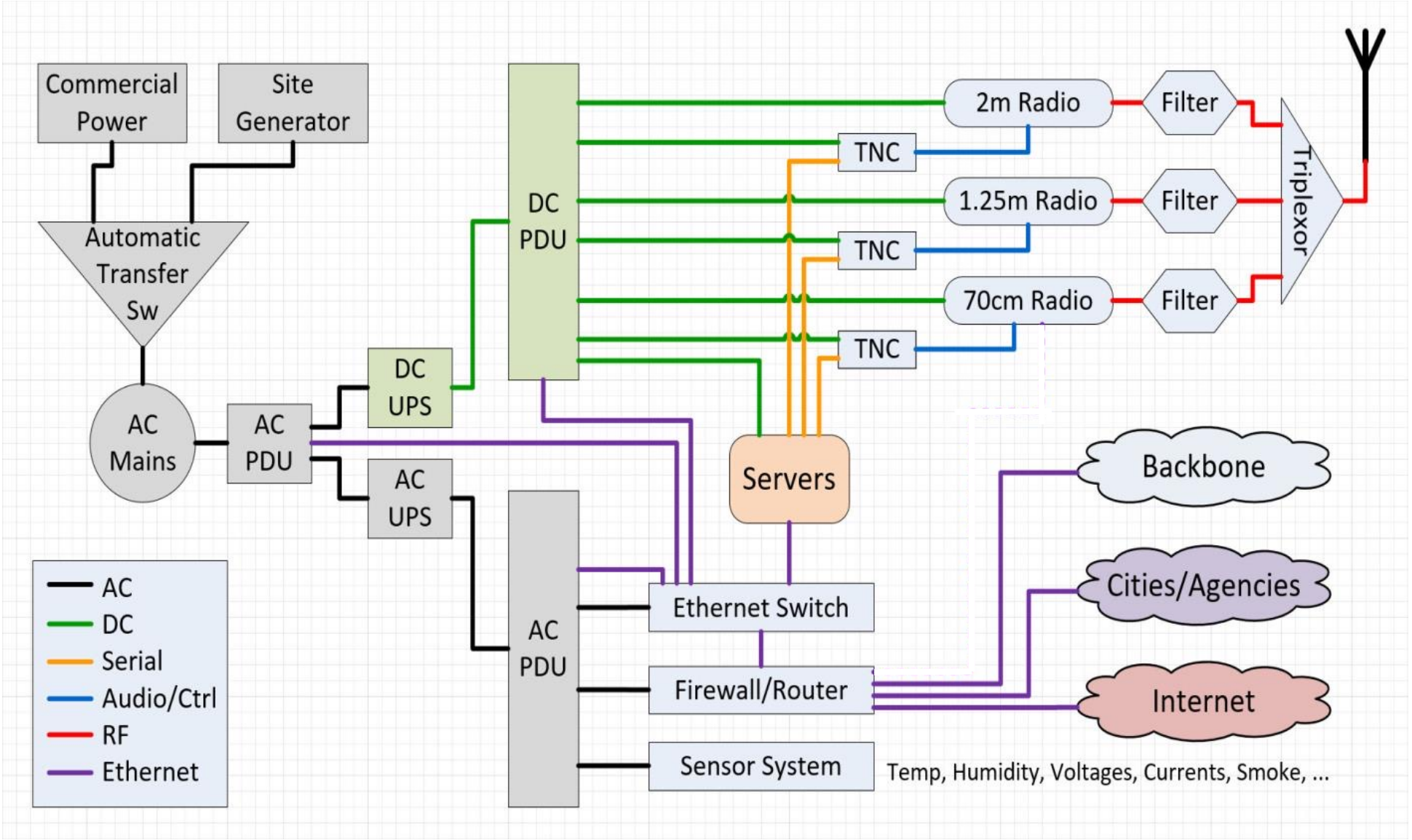
Keep copies in your Go Kit.

Home and field stations typically use 2m or 70cm band.

Fixed agency stations like EOCs typically use 1.2m band.

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SCCo BBS Block Diagram



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SCCo BBS Installation



Cavity Filters

Sensor System

KB/Mouse/Display

Routers

Ethernet Switch

Firewall

Wi-Fi PoE

Server(s)

Radios

Power Dist/Control

AC & DC UPS

All strapped or bolted down



Commercial installation standards, shielding, frequency coordination



No moving parts (fanless)
Mirrored SSD storage
Commercial temp range (120F)

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Sensors and Alarms

Summary

Internal Sensors

No.	Description	Type	Value	Status	Action
1	Internal Temperature	Temperature	81.5°F	Normal	View Edit
2	Internal Humidity	Humidity	25%	Normal	View Edit
3	Input Voltage	Voltage	13.6V	Normal	View Edit

Sensors

Conn.	Description	Type	Value	Status	Action
1	Thermostat Temp (TH1)	Temperature Combo	76.4°F	Normal	View Edit Delete
1	Thermostat Humidity (TH1)	Humidity Combo	26%	Normal	View Edit Delete
2	Room Temp (TH2)	Temperature Combo	80.1°F	Normal	View Edit Delete
2	Room Humidity (TH2)	Humidity Combo	23%	Normal	View Edit Delete
3	Cabinet Temp (TH3)	Temperature Combo	80.3°F	Normal	View Edit Delete
3	Cabinet Humidity (TH3)	Humidity Combo	25%	Normal	View Edit Delete
5	Mains AC Volts (AC1.1)	ACLM-V AC Voltage	120.6V	Normal	View Edit Delete
5	Mains AC Freq (AC1.1)	Frequency	60.1Hz	Normal	View Edit Delete
5	Inverter AC Volts (AC1.2)	ACLM-V AC Voltage	123.4V	Normal	View Edit Delete
5	Inverter AC Freq (AC1.2)	Frequency	60.1Hz	Normal	View Edit Delete
9	DC UPS Batt1 Volts (DC1.1)	Voltage	13.6V	Normal	View Edit Delete
9	DC UPS Batt2 Volts (DC1.2)	Voltage	13.5V	Normal	View Edit Delete
10	AC UPS Batt1 Volts (DC2.1)	Voltage	13.5V	Normal	View Edit Delete
10	AC UPS Batt2 Volts (DC				
11	DC UPS Load Volts (DC				
11	AC UPS Load Volts (DC				

Digital Inputs

Conn.	Description
8	Smoke

IP Devices

No.	Description				
1	MEF Primary WAN IP				
2	W2XSC-GW				
3	W4XSC-GW	IP Device	Responding	Normal	View Edit Delete
4	CPK-FPK-B1	IP Device	Responding	Normal	View Edit Delete
5	WHD-CPK-B2	IP Device	Responding	Normal	View Edit Delete

IP Sensors

No.	Description	Type	Value	Status	Action

```
Report on JNOS forwarding failures for W4XSC
from /opt/jnos/utils/check-fwd-failed on Thu Jan 21 01:00:01 PST 2016

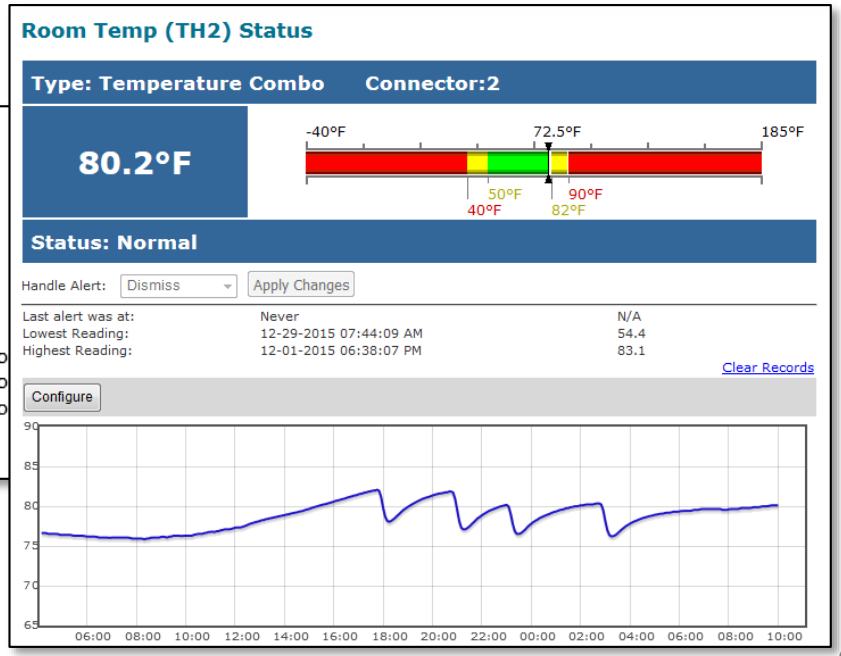
Log filename            = /opt/jnos/logs/nos.log
Default Match string    = ' fwd failed - '
Additional match string = ' DM received '

3 matching log file line(s) found:

Wed Jan 20 17:40:21 2016 - MBOX (n6zx-4) fwd failed - DM received errno
Wed Jan 20 21:41:22 2016 - MBOX (n6zx-4) fwd failed - DM received errno
Thu Jan 21 00:41:51 2016 - MBOX (n6zx-4) fwd failed - DM received errno

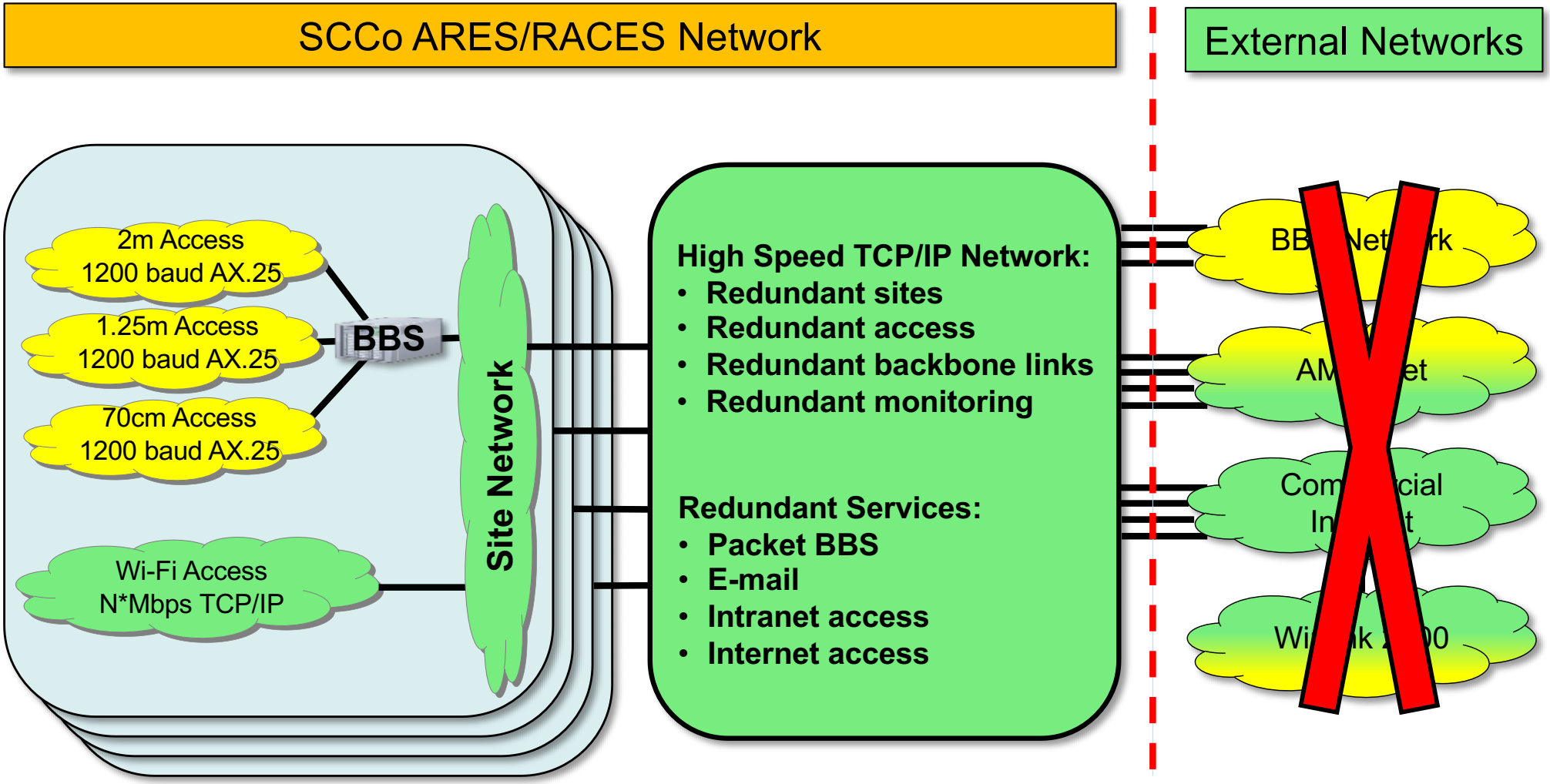
End of Report.
```

- Environmental
  - Temp, humidity, voltage, current, smoke, …
- Operational
  - Backbone links, critical systems, storage, gateway functions, forwarding, …



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Connectivity to Other Networks



Key Point: Connectivity and services continue within the county, even if every external network fails

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When All Else Fails:



2016 Loma Fire

Failure on top of failure

- Commercial power failed
- Generator at radio site failed
- Roads closed; no access to site to bring backup generator
- Internet service provider networks failed
- Most private communications systems failed

SCCo ARES/RACES network continued to run

- Provided temp, humidity, smoke sensor info to other site tenants
- Used to send/receive Internet email while ISP networks were down

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Designed for Harsh Conditions

January 2020: winter conditions on Crystal Peak (3600 ft ASL)…
6 to 8 inches of snow



High winds (100+ MPH) • Freezing conditions, snow and ice
High temperatures (when A/C fails) • Power outages
Inaccessible for days or even weeks
It has to keep running or it won't be useful in an emergency!

Station design • Redundancy • Equipment selection
Hardware installation standards • Software configuration practices
Monitoring and alarms

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County EOC Packet Operations

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County EOC Packet Operations

- County message handling can be non-stop action
- Has separate send & receive stations
- Learn to use the automation
  - Automated polling every 5 minutes by Telnet
  - Automated ICS 309 Logging
- Watch message handling order
- Move the messages to the Traffic Manager quickly
- Balance outgoing and incoming traffic
- Follow the *SCCo Radio Room Packet Procedures*

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Packet Net Reference Binder

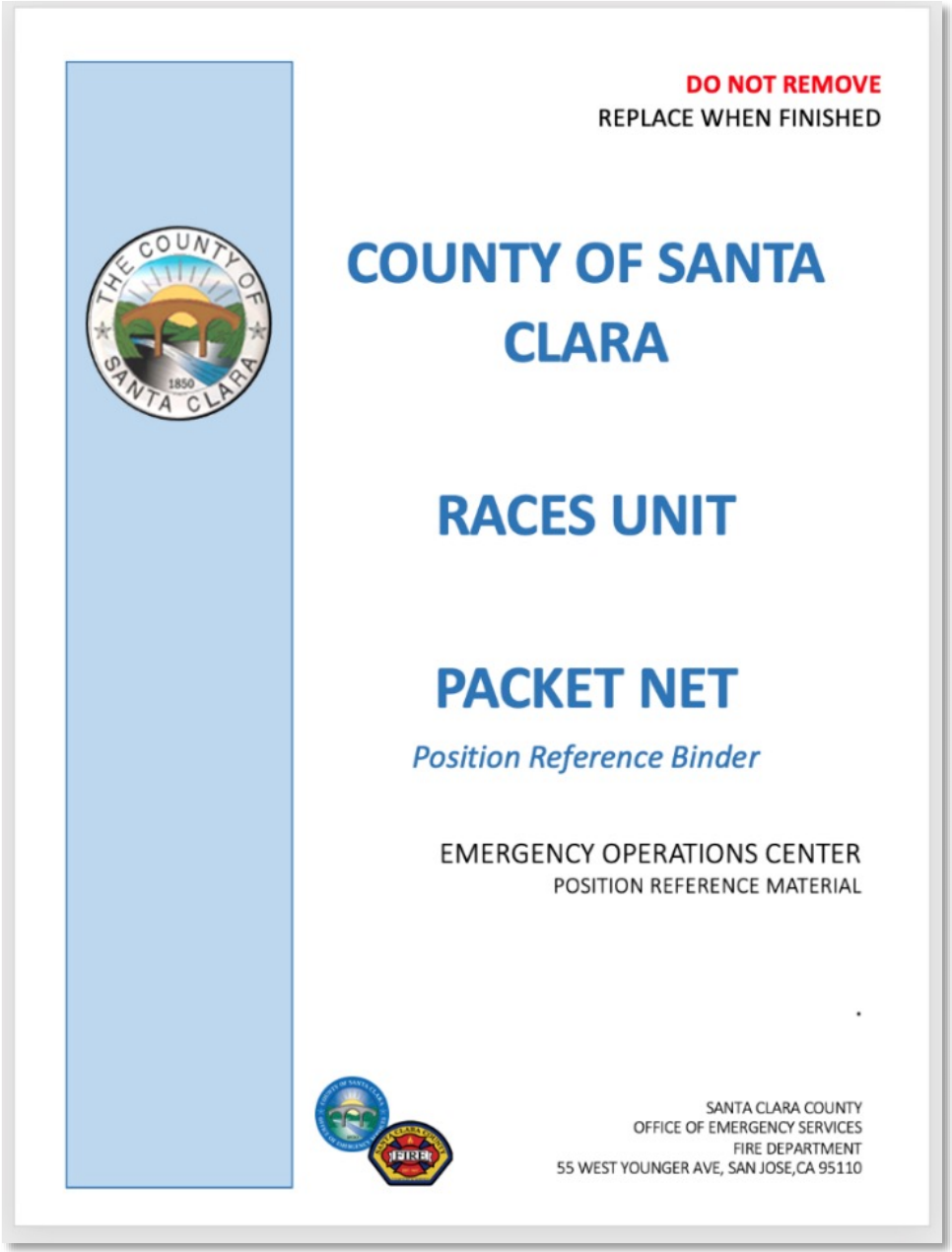
There is a binder for every position in the SCC EOC

- Including each position in the RACES radio room
- People with EOC Radio Room Operator (ERO) endorsement may have their own binder

Includes:

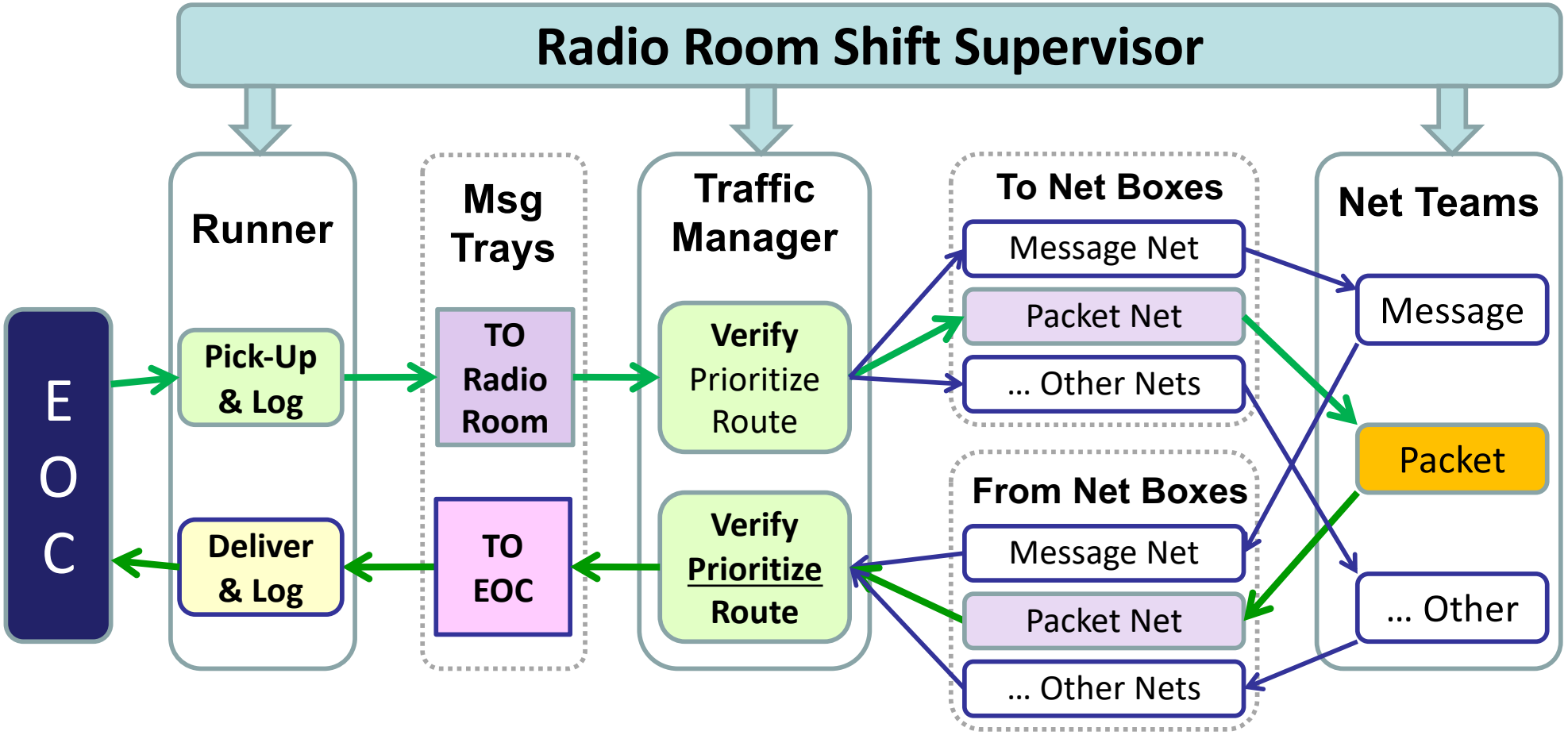
- Activation and operation
- Shift end and demobilization
- Packet-specific activities

The first step in any activation is to review the binder.



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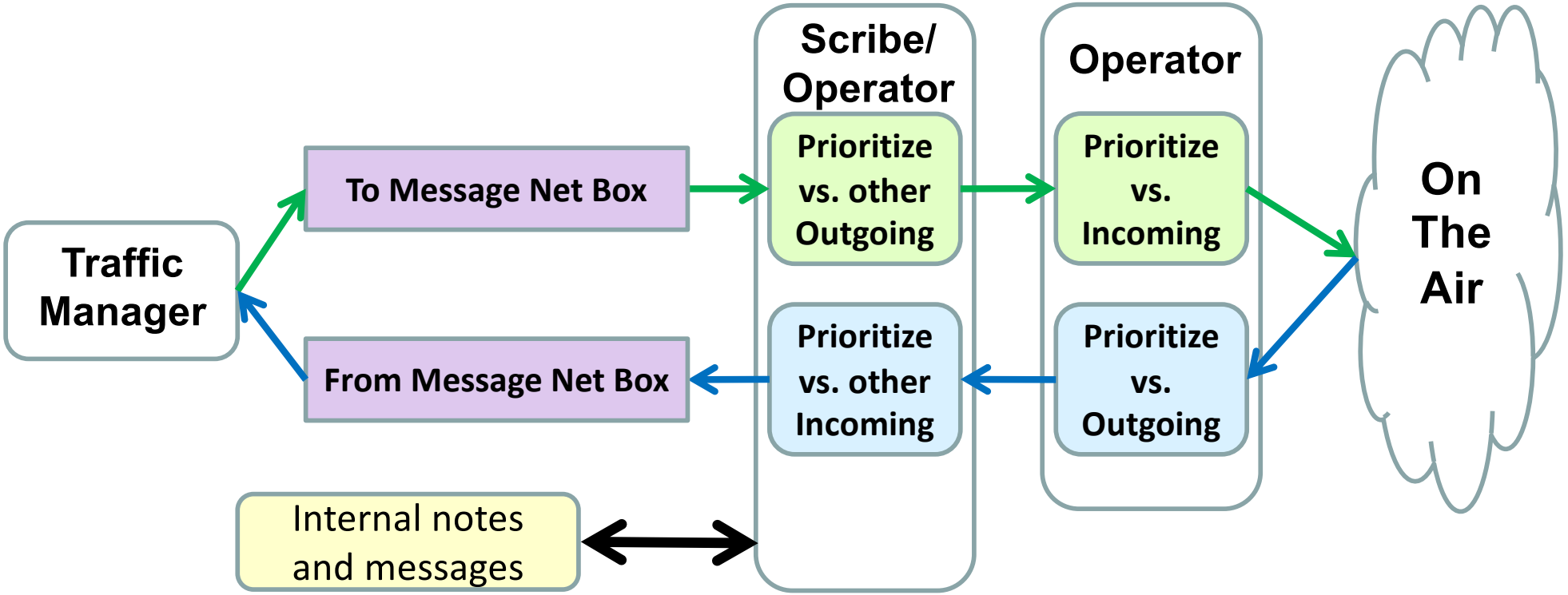
County Radio Room Traffic Routing



For small, low traffic events, the radio room supervisor may also perform the traffic manager role

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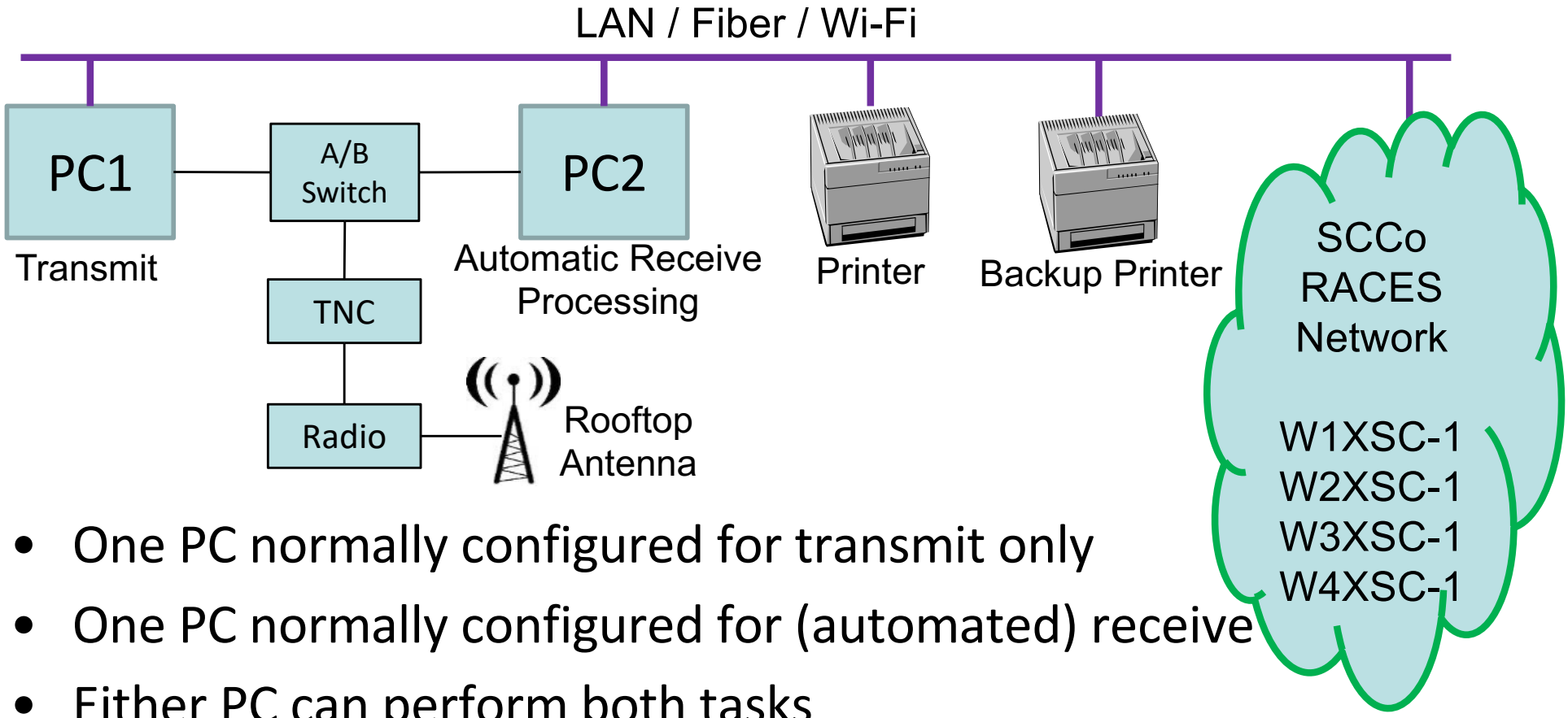
Prioritizing Packet Traffic



- Operator prioritizes message in Outpost
  - Holds incoming for high priority outgoing and vice versa
- Scribe/Operator prioritizes & logs message in to & out from the team
  - Maintains prioritized incoming and outgoing message bins
- Separate Send & Receive stations facilitate processing

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County EOC Packet Station



- One PC normally configured for transmit only
- One PC normally configured for (automated) receive
- Either PC can perform both tasks
- Both PCs have a primary and backup printer defined
- Backup TNC/radio can be switched to either PC

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Under the Hood

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Software Log Files

When reporting or troubleshooting software problems, check the log files. There are two:

1. Log of program actions

   Outpost: Actions → View Outpost Data Directory
   `logs\session`*`YYMMDD`*`.log`

   Messenger: `C:\PackItForms\Log\`*`YYYY-MM-DD`*`.log`
   (Linux/Mac: `$HOME/.local/state/packet/log`)

2. Transcript of BBS communications

   Outpost: Actions → View Outpost Data Directory
   `logs\transaction`*`YYMMDD`*`.log`

   Messenger: *`bbsname`*`.log` in incident directory

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TNC Commands

HELP	displays online help
MYCALL *callsign*	sets your call sign (FCC or tactical)
CONNECT *bbs*	connects to a BBS (don't forget the –1 on the end)
RESTORE DEFAULT	resets the TNC to factory defaults
INTFACE TERM	enables full set of TNC commands
XMITLVL *level*	sets the transmit audio level

SCCo standard TNC settings: scc-ares-races.org/operations/packet/std-tnc

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BBS Commands

HELP	displays online help
LIST	lists unread messages
READ *num*	displays a message
KILL *num*	removes a message from the BBS
AREA *name*	switches to the named bulletin area
SEND *to-addr*	sends a message
BYE	closes the BBS connection

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Outpost Tags

Packet software may add short tags to a message:

!URG! Colors the message red in the Outpost list

SCCo Packet Messenger colors messages based on handling order

!RDR! Requests a delivery receipt from the recipient

Unnecessary because delivery receipts are default behavior

!RRR! Requests a read receipt from the recipient

Rarely used in Outpost; ignored by SCCo Packet Messenger

!B64! Marks the message body as Base64-encoded

Everything after this tag is a Base64 string

This is used when the message contains unsafe characters

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PackItForms Encoding

`!SCCoPIFO!`	Starts the form
`#T: form-ics213.html`	Identifies the form type
`#V: 4.0-2.3`	Software and form versions
`MsgNo: [XND-123P]`	Field label and value
`10.: [Subject]`	Field label and value
`!/ADDON!`	Ends the form

Caution: the field labels in the PackItForms encoding are not the same as field numbers on the printed form.

Field values are enclosed in brackets.
Newlines in a field value are encoded as `\n`.

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Form Bundles

A “form bundle” is a set of related forms that are installed and updated as a unit.

- `SCCoPIFO.forms` contains the county forms. It is preinstalled.
- Cities may provide their own form bundles with their own forms.

Bundles contain an HTML file, PDF file, and metadata file for each version of each form.

- They also include shared style sheets, scripts, etc.

Form bundles are unpacked into the Forms directory.

- Windows: `C:\PackItForms\Forms`
- Mac/Linux: `$HOME/.local/share/packet`

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Automatic Forms Updates

PackItForms will automatically check for updates to form bundles.

- It checks once per day, if the system has Internet access.
- You can force it to check at other times with `packet forms update`.

If it finds new or updated forms, it will install them and show a message describing what changed.

- Systems without Internet access: put the updated form bundle on a USB stick and install it with `packet forms install`.

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Wrapping Up

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Agenda

Type III Part A (August 1)

- 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 (this class)

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

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Class Credit

To receive credit for this class, you must:

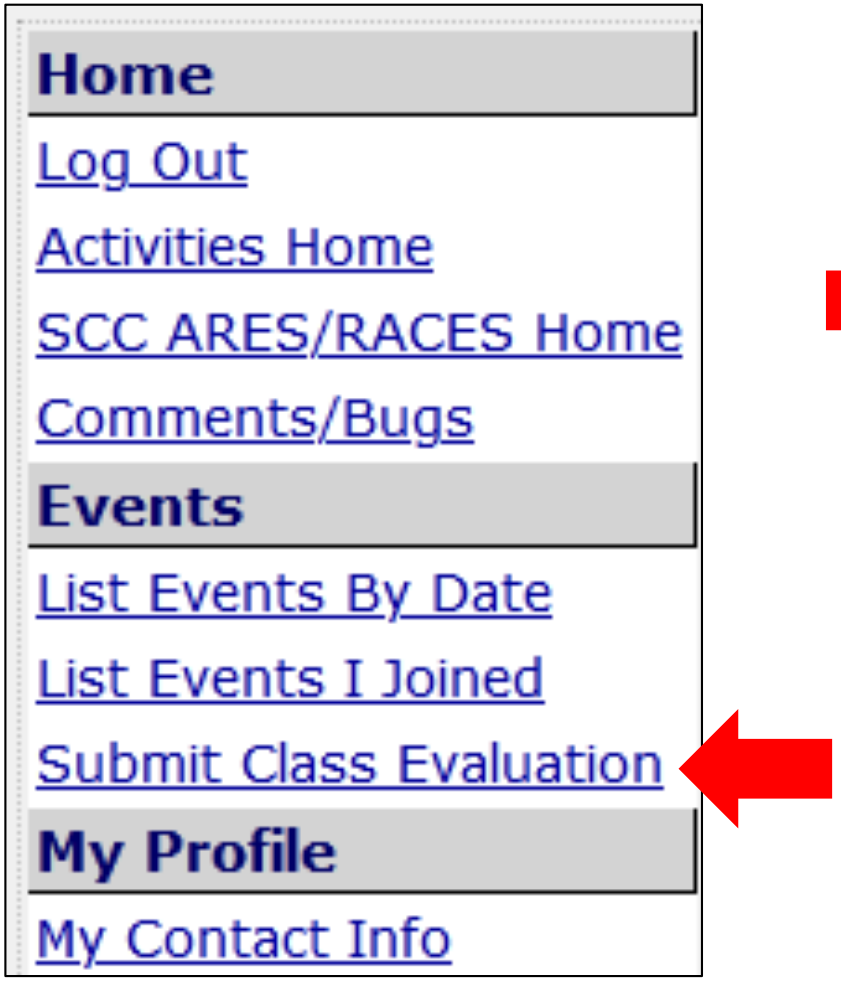
- Attend at least 90% of the class
- Participate in the class
- Complete the class evaluation by November 21

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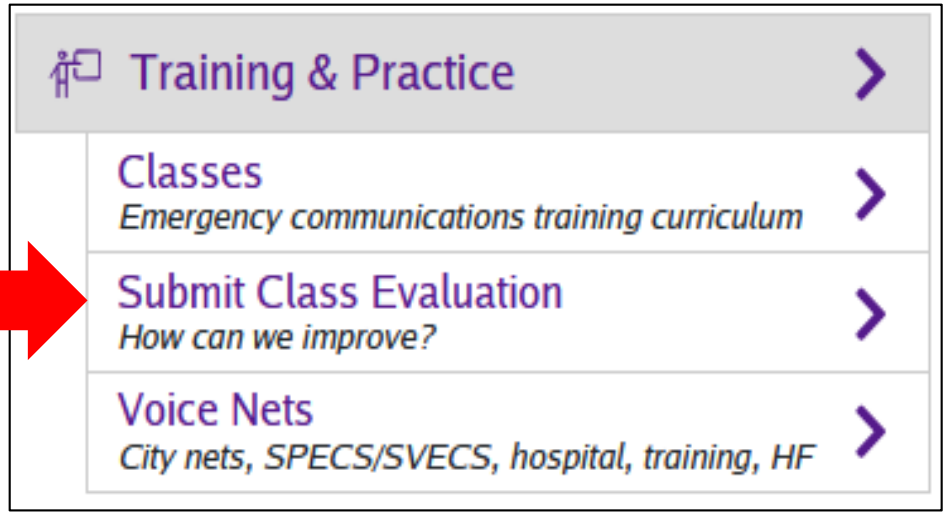
Online Class Evaluation

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

Activities Database



Website Home Page



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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 November 18–24, signups on county website

Live practice at every county drill

- Real activation, with people around you to help
- Quarterly drills, plus annual exercise in September

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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.

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