Packet Type III

Part A

Santa Clara County ARES®/RACES

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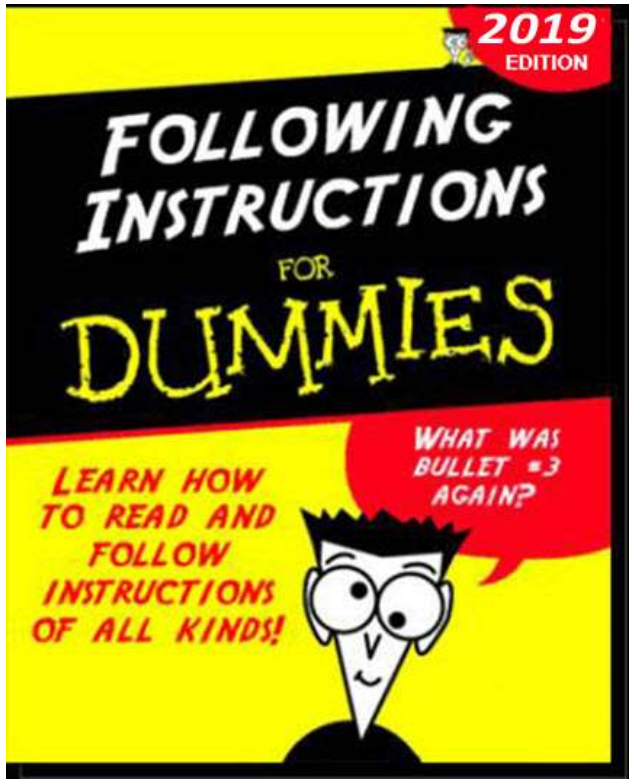
HOUSEKEEPING

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



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1. OVERVIEW

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Overview: Packet Classes

Packet Type III, Part A
- Packet Operator Credentials
- Packet Network Overview
- Packet Network Components
- Packet Station HW & SW
- Accessing the Network
- Standard Workflow

Packet Type III, Part A+
- Packet Operations Self-Paced Exercise workbook

Packet Type III, Part B
- Packet Operations
- Diagnosing Setup Problems
- Selecting a BBS
- Creating Messages
- Event Documentation
- Productivity Hints
- Exercises

Packet Type II: Advanced Techniques, such as County EOC Packet Station Setup & Operations, Operating without Outpost.

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Learning Objectives

At the end of this class, you should be able to:

- Describe the purpose and use of packet communications
- Describe the Santa Clara County BBS network
- Describe the components of the baseline packet station
- Describe the Outpost and PackItForms software and their basic use

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Agenda

- Packet Operator Credentials
- Packet Network Overview
  - What is packet? Why do we use it?
- Packet Network Components
  - SCCo BBSs, other networks, antennas, radios, TNCs, PCs, printers
- Baseline Packet Station: hardware & software
- Accessing the Network
- Standard Workflow
- Homework Intro

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2. PACKET OPERATOR CREDENTIALS

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Packet Operator Type III

- Capabilities and services offered
  - Fully independent operator
  - Set-up an existing, pre-installed packet system that is currently disconnected and stored
  - Turn everything on and verify connectivity
  - Operate a PC that has Outpost and PackItForms already pre-installed
  - Configure Outpost options to the county standard
  - Operate a packet station to send, receive, print, log and track packet messages
  - Send 7 standard PackItForm messages (Check-In/Out message, ICS 213 Message, ICS 213RR Resource Request, OA Jurisdiction Status, Shelter Status, Allied Health Status, RACES Mutual Aid Request)

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Packet Operator Type III

- Typical Assignments
  - Locations with low-to-medium traffic and pre-installed packet station
  - Small city EOC
  - Small staging area
  - Small aid station
  - Shelter
  - Health facility
  - Point of Distribution/Dispensing site

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Packet Operator Type II, Type I

- Packet Operator Type II = Advanced Operator
  - Perform the tasks of a Packet Operator III
  - Equipped with a complete packet station
  - Able to install Outpost and PackItForms
  - Able to send messages, including PackItForms without Outpost
  - Medium to high traffic conditions

- Packet Operator Type I = Specialist Operator
  - Capable of the most complicated, highest traffic levels
  - Capable of designing, deploying, operating and coordinating complex multi-radio, multi-band, multi-node packet networks for larger events or incidents
  - Set-up, manage, and troubleshoot a packet BBS
  - Equipped for and capable for out-of-county and extended deployments

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For more information…

Credentialing Program

- Program Information

  https://www.scc-ares-races.org/credentials

- Discussion group

  https://www.scc-ares-races.org/discuss-groups.html

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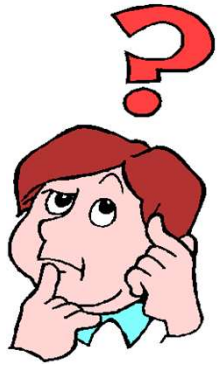

What is packet radio? Why do we use it?

3. PACKET RADIO OVERVIEW

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What is Packet Radio?

- One of many digital modes available in Amateur Radio
- Transmitted information is error free!
- AX.25; based on the X.25 protocol, with Amateur Radio features
- Sends a “packet” of data at a time: envelope + payload
  - Differs from character-at-a-time modes (PSK31 or RTTY)
  - Envelope contains header at beginning & checksum at end

  - Header contains addressing information (to, from)
  - Payload contains the data to be sent
  - Checksum used to determine if packet was received error-free… the error check
- Typically operates at 1200, 9600 baud on VHF & UHF and 300 baud on HF

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Why Packet Radio?

- It's fast
  - When there is no Internet, it's fast!
  - ~15 times faster than voice
  - 80+ messages sent/received, logged, acknowledged, printed in triplicate, perfectly legible, in < 2 hrs, with 0 errors, by 1 person!
- It's easy
  - Hardware: pre-built cables; straight-forward connections
  - Software: if you can use e-mail, you can use Outpost
  - Procedures: extensive documentation on website
- It's deployable
  - Virtually anywhere in the county and most of surrounding counties
- It fits our served agencies' needs and workflow
  - Preferable for long, complex, and/or high-volume messages; forms; message numbering; explicit acknowledgments, logging, tracking

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Why Use Packet Radio?

- Packet is ideal for passing complex messages
  - Lists of information
  - Addresses
  - Instructions
  - Complex words

    "turboencabulator", "thymidylate synthetase"
- Messages are transmitted accurately
  - Originator can verify contents before it is sent
  - Reduces transcription errors
- Messages are transmitted quickly
  - Keeps the voice channel clear

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Typical Message Content

- Unstructured Text (informal message)
  - Health and Welfare
  - Simple text messages
- Forms
  - Status
  - Resources
  - ICS 213
  - Others…..
- Structured Text
  - Lists
  - Addresses
  - Tables

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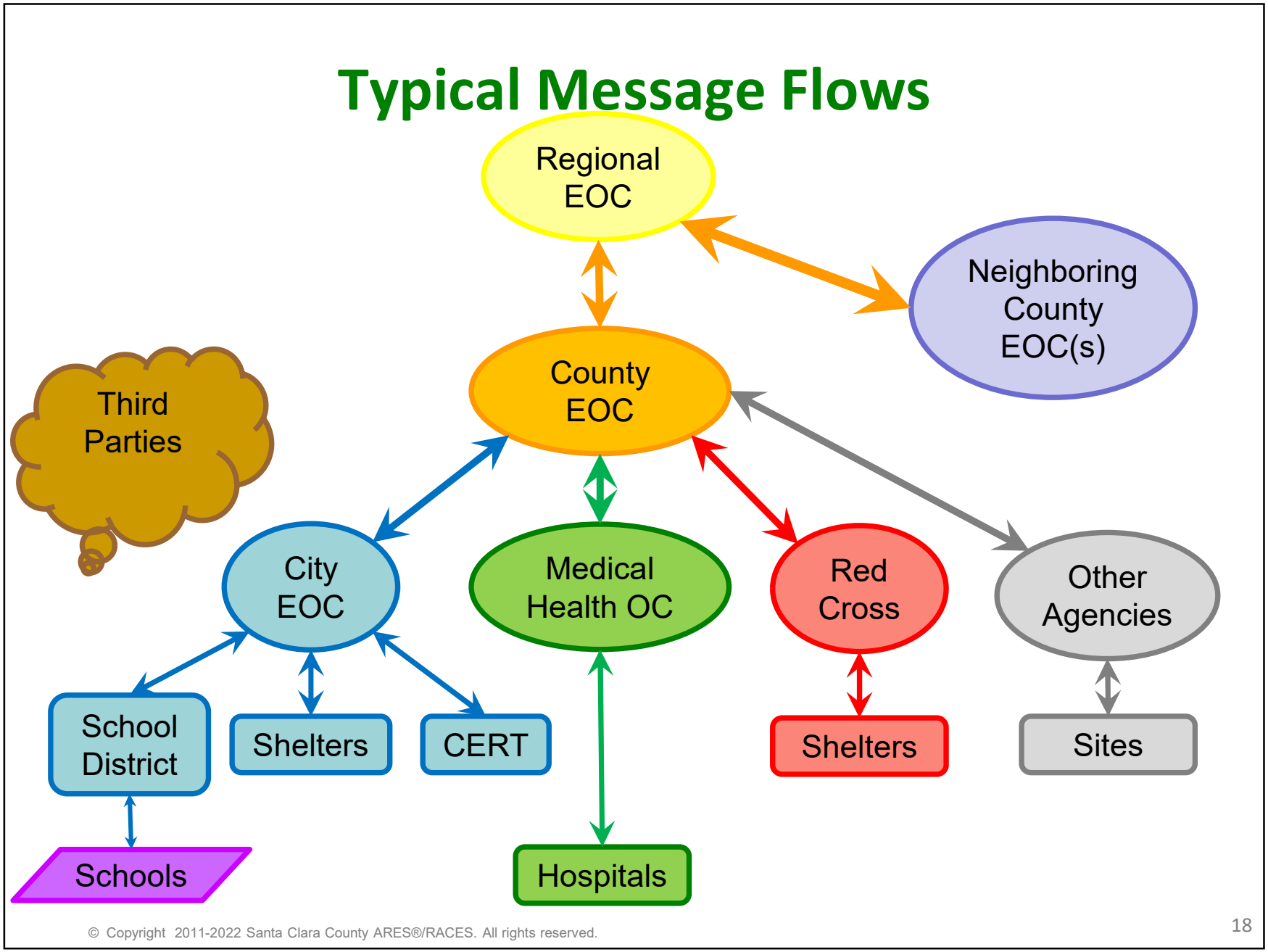

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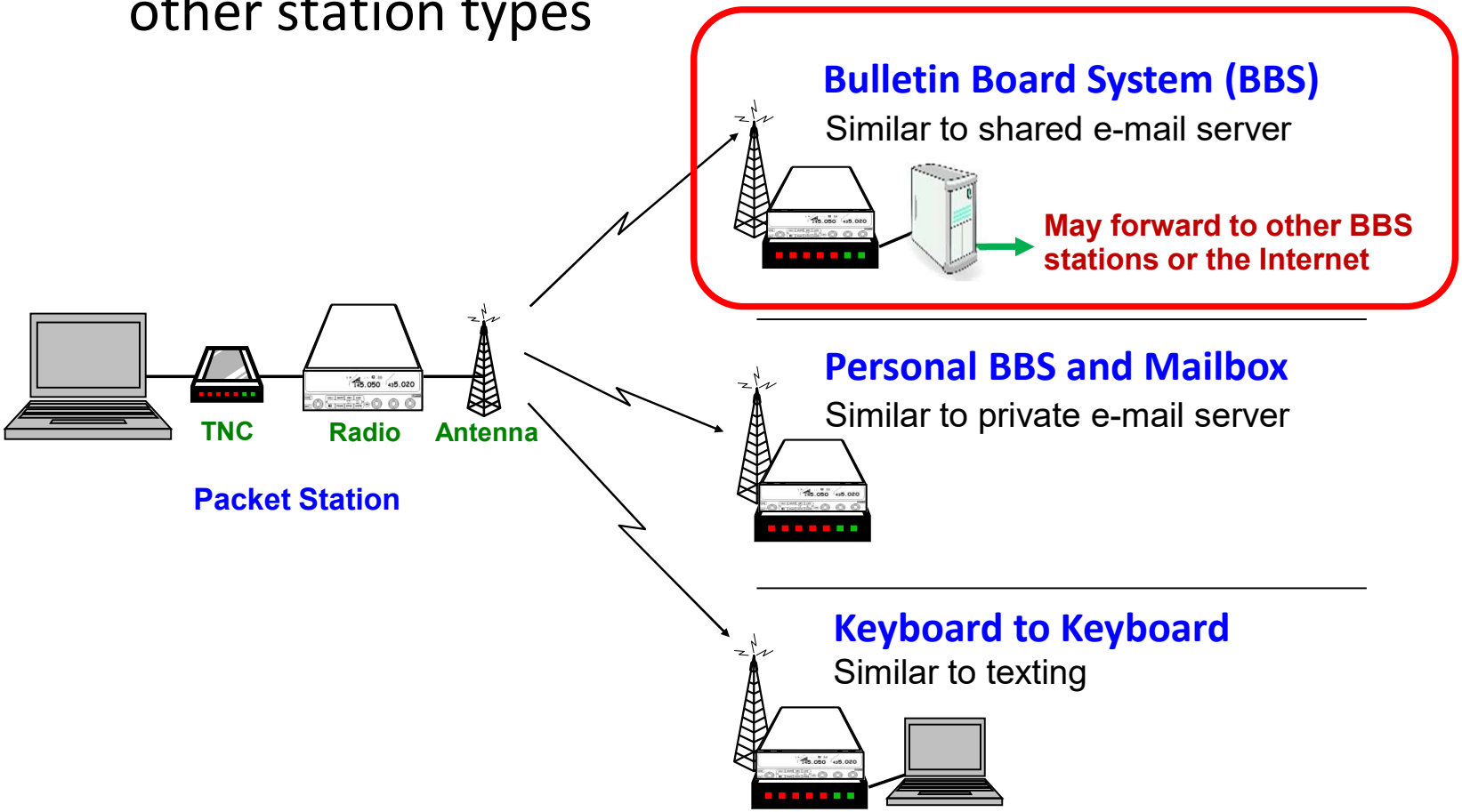
What Can We Connect To?

- A packet radio station can connect to a variety of other station types



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High level overview

4. PACKET NETWORK COMPONENTS

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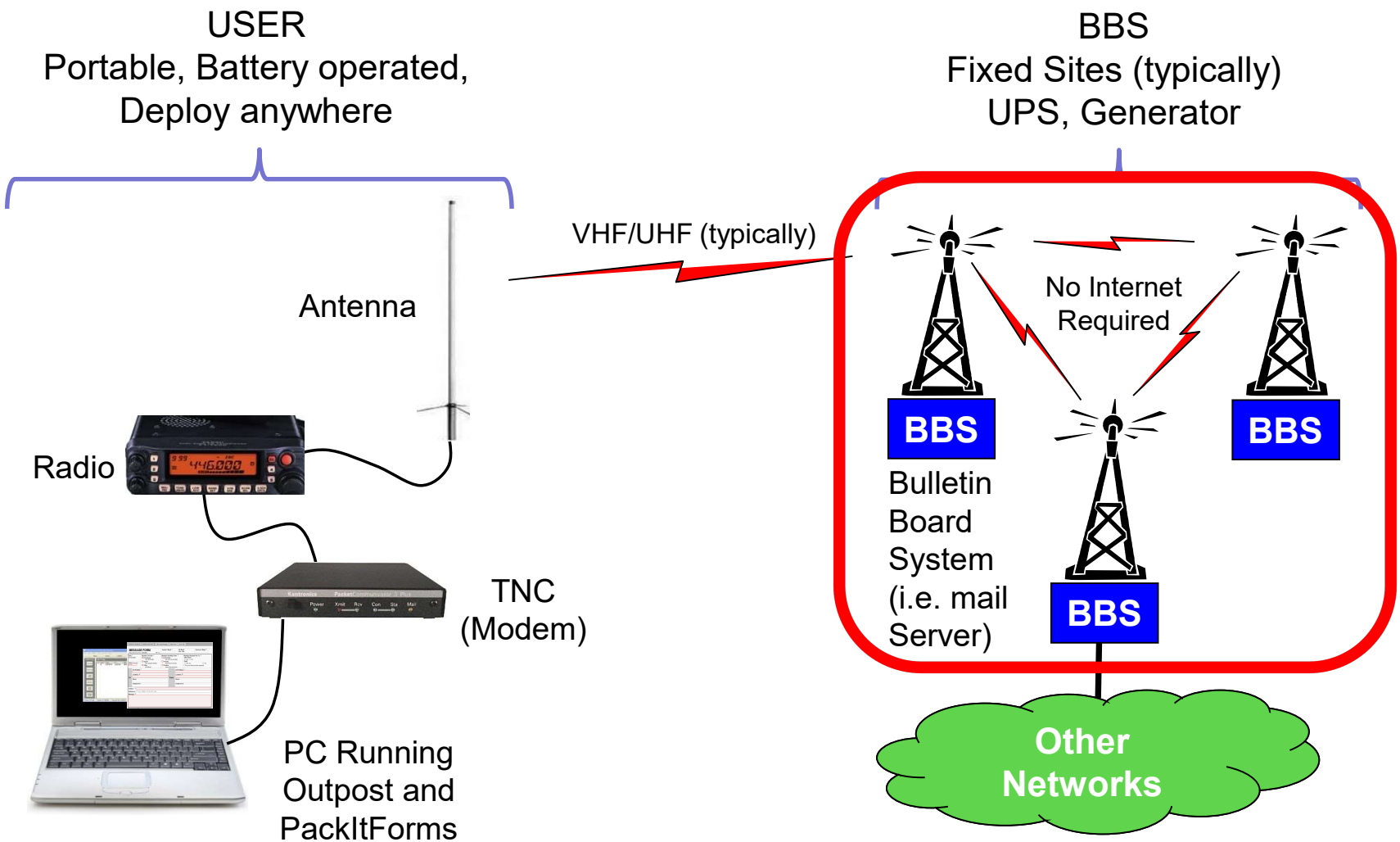
Typical Packet Network Components



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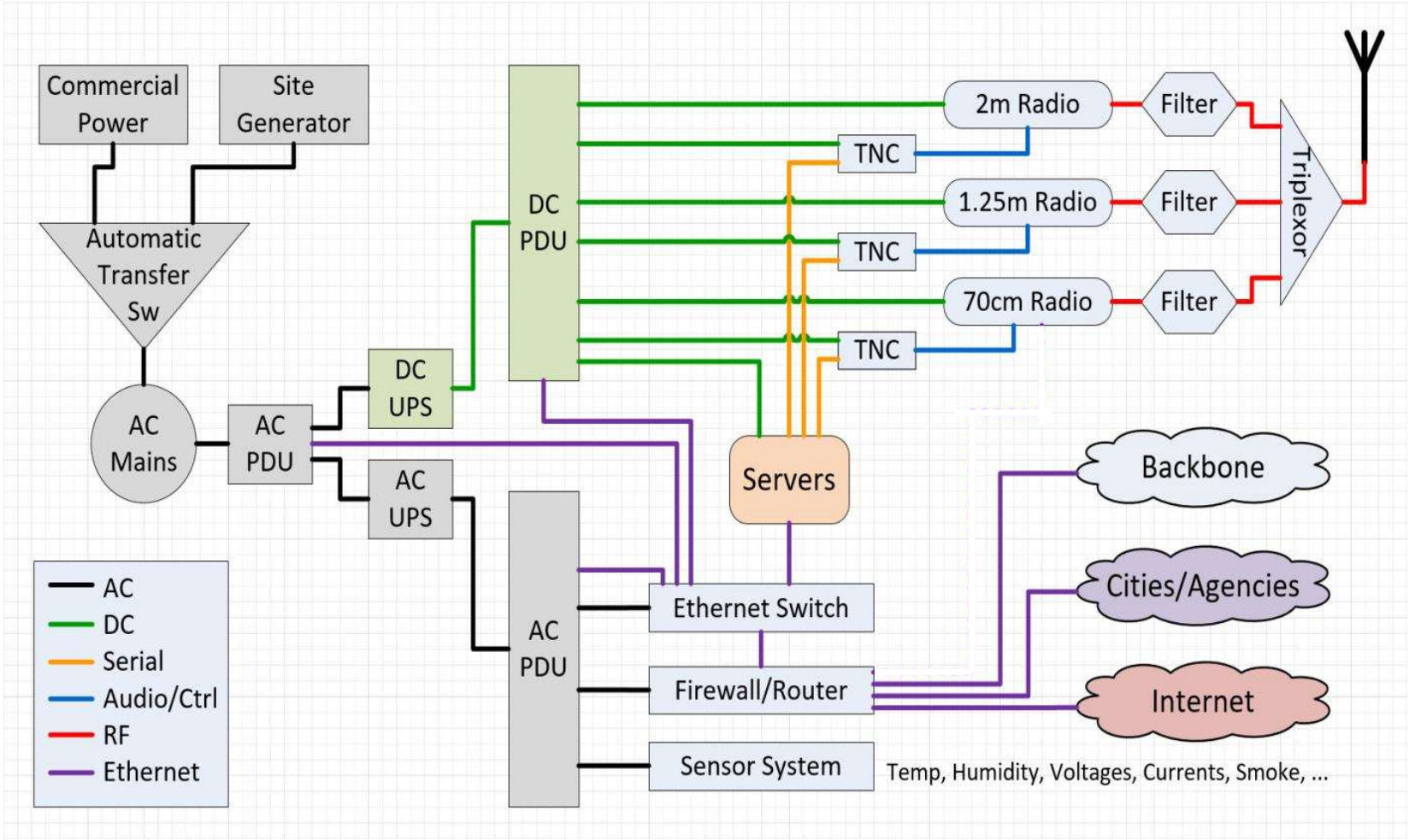
Typical SCCo BBS Block Diagram



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Typical 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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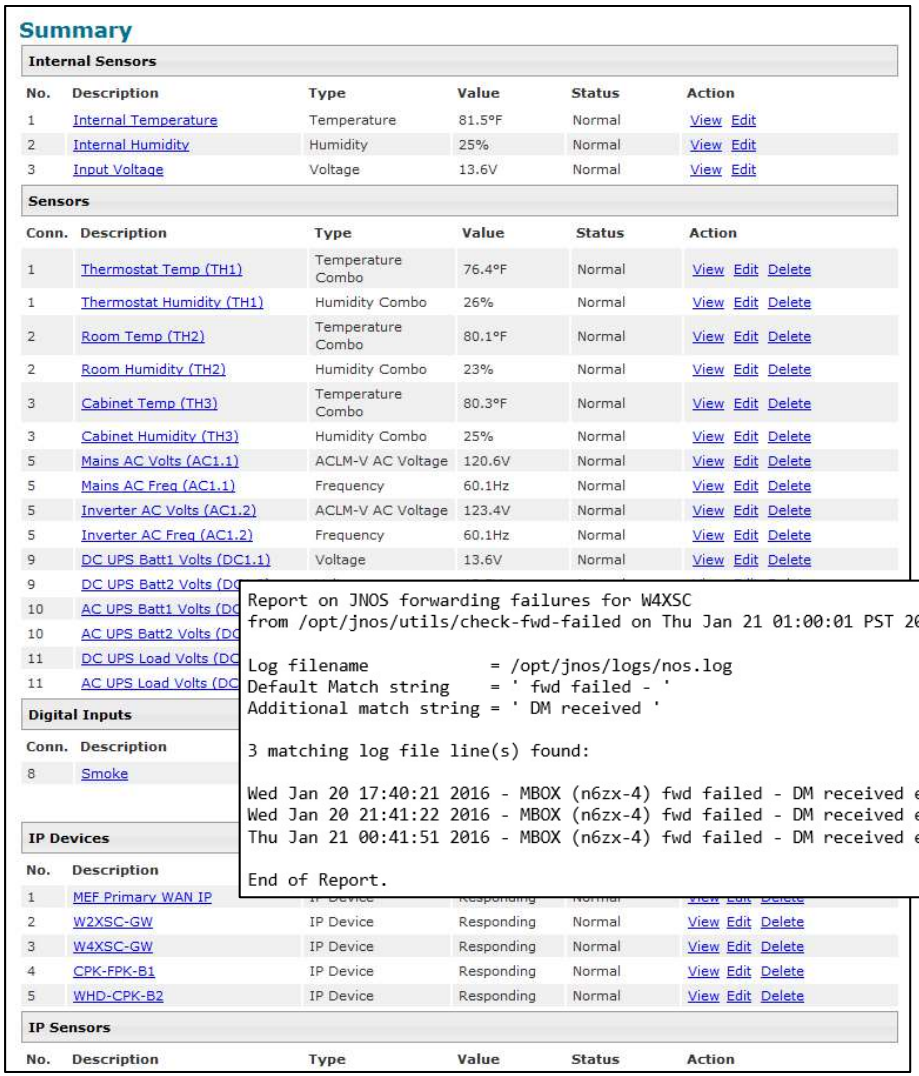
Typical Sensors and Alarms



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 (DC				
10	AC UPS Batt1 Volts (DC				
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	IP Device	Responding	Normal	View Edit Delete
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

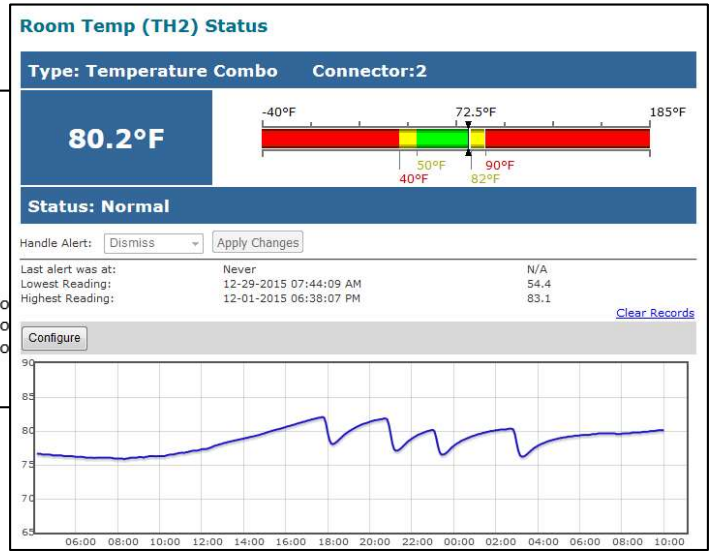
```
Report on JNOS forwarding failures for W4XSC
from /opt/jnos/utils/check-fwd-failed on Thu Jan 21 01:00:01 PST 2016

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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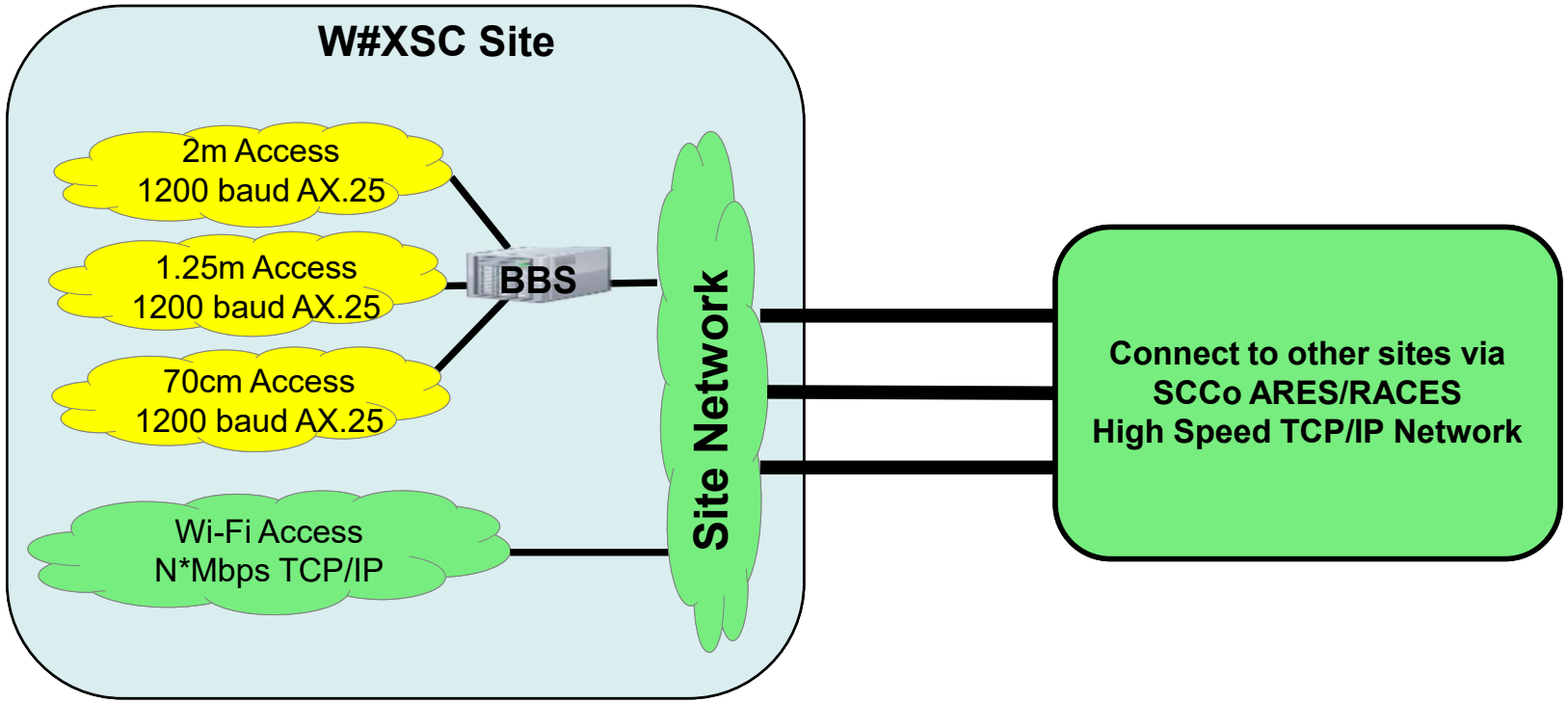
Typical Access Connectivity



Key Points:
- Low speed packet access allows countywide, non-line of sight coverage
- Higher speed TCP/IP access available where line of sight exists

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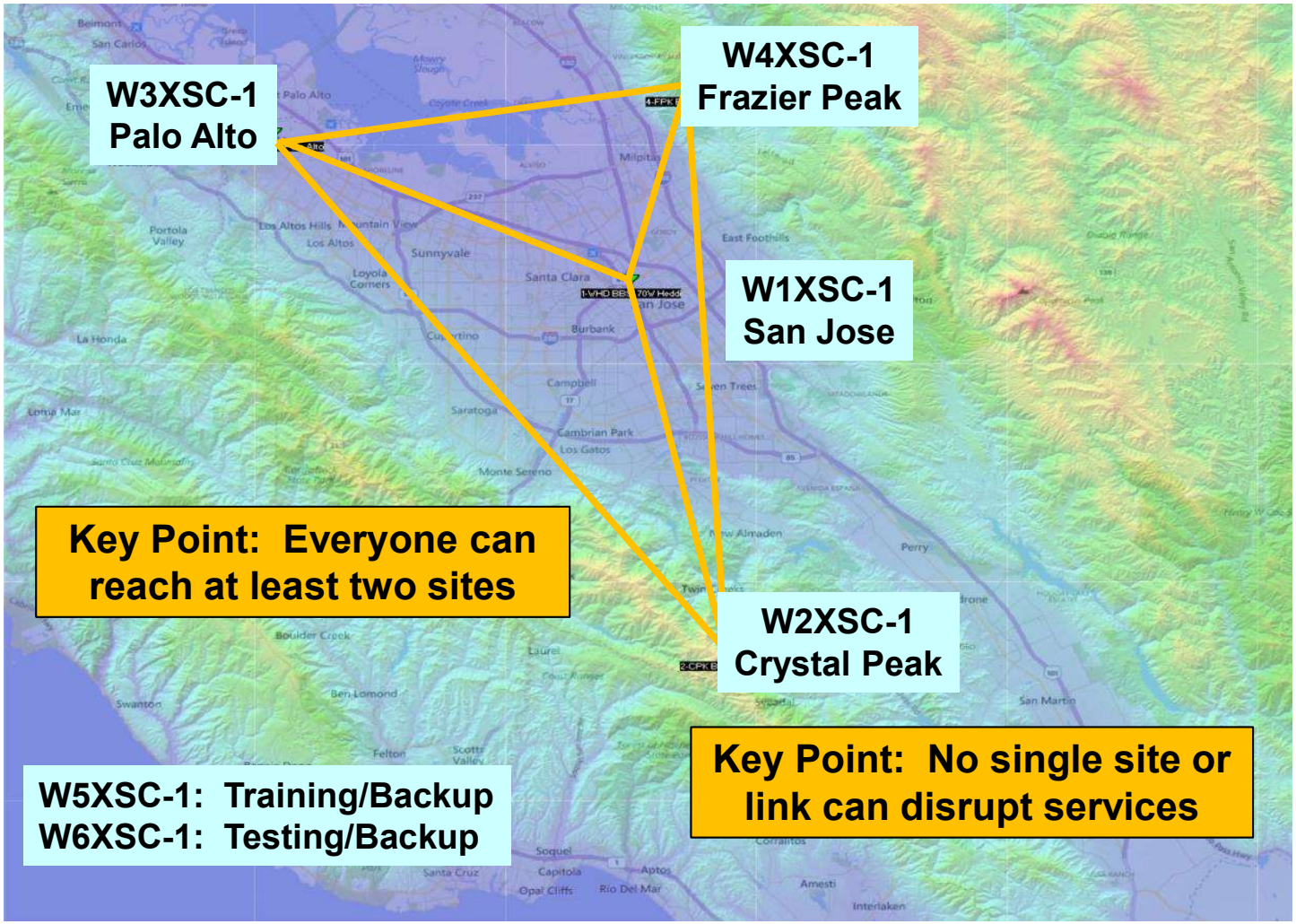
W*n*XSC BBS Locations

Redundant Sites; Redundant Links



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Which BBS Should I Use?

- Every city/agency has a primary and secondary BBS
  - Based on RF coverage and user load
  - All users in that city/agency should use those BBS's
- Use the primary BBS whenever possible
- If the primary is not available, use the secondary
- If the primary and secondary are not available, use whatever you can reach

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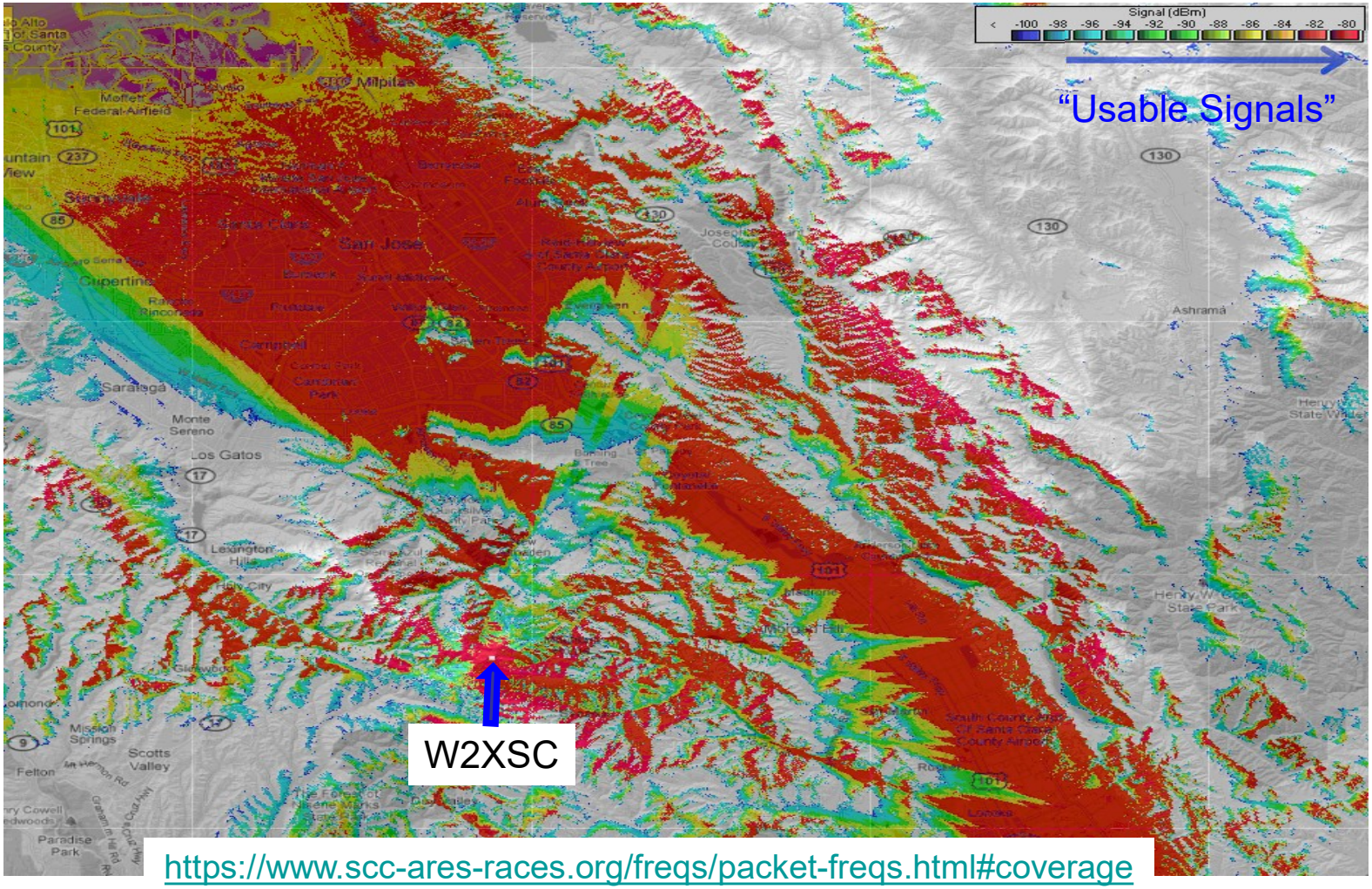
Coverage Maps Available On The Web



https://www.scc-ares-races.org/freqs/packet-freqs.html#coverage

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Primary & Secondary BBSs

- Primary and Secondary BBSs are listed on the website

#	Agency	Prefix	Primary BBS	Secondary BBS
Santa Clara County Cities and Agencies				
1	American Red Cross	ARC	W1XSC	W4XSC
2	CAL FIRE VIPs - Santa Clara Unit	SCU	W2XSC	W1XSC
3	Campbell, City of	CBL	W1XSC	W4XSC
4	Cupertino, City of	CUP	W1XSC	W4XSC
5	Gilroy, City of	GIL	W2XSC	W1XSC
6	Hospitals (all SCCo) & DEOC	HOS	W2XSC	W1XSC
7	Loma Prieta Region	LMP	W2XSC	W1XSC
8	Los Altos, City of	LOS	W3XSC	W1XSC
9	Los Altos Hills, Town of	LAH	W3XSC	W1XSC

https://www.scc-ares-races.org/freqs/packet-freqs.html

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BBS Call Signs and Frequencies

- BBS access frequencies are also listed on the website

Call Sign	AX.25	User Access	BBS-BBS	Location
W1XSC	W1XSC-1	145.750, 223.620, 433.570		Santa Clara Co Office Bldg (San Jose)
W2XSC	W2XSC-1	145.730, 223.560, 433.590		Crystal Peak (South County)
W3XSC	W3XSC-1	144.310, 223.540, 433.450		Palo Alto
W4XSC	W4XSC-1	145.690, 223.600*, 433.550	223.600	Frazier Peak (above Milpitas)
W5XSC	W5XSC-1	varies	varies	Training, events, backup
W6XSC	W6XSC-1	varies	varies	Testing, backup

- Recommendation
  - Individuals use 2m or 440 access (more readily available equipment)
  - EOCs use 220 access (less congested)
  - Download and print this listing for your Go Kit
  - Check web site and bulletins for changes

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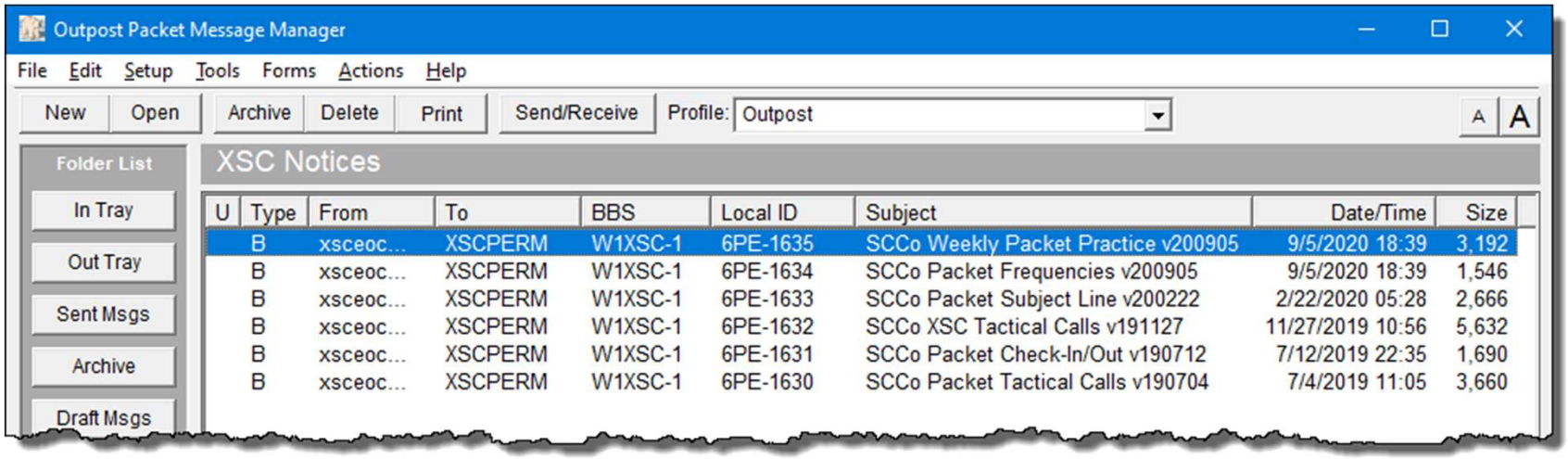
BBS information on packet

What if the web site is not available?

- The same information is also posted in a notice on all BBSs
  - Currently located in the “xscperm” area.
- Keep a copy in your Outpost “Archive” folder or create a “XSC Notices” folder
- Post it at your EOC or packet operating position



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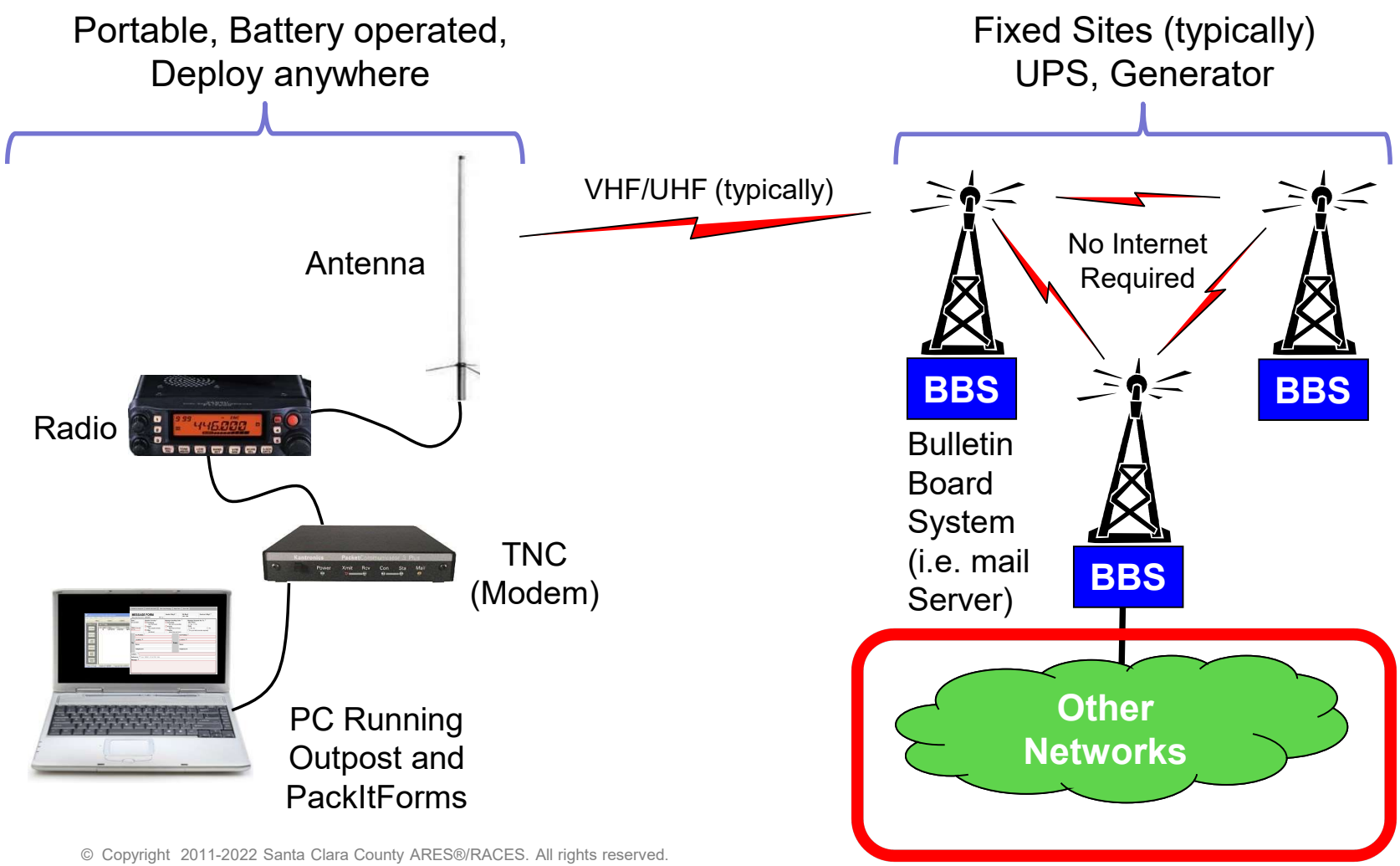
Typical Packet Network Components



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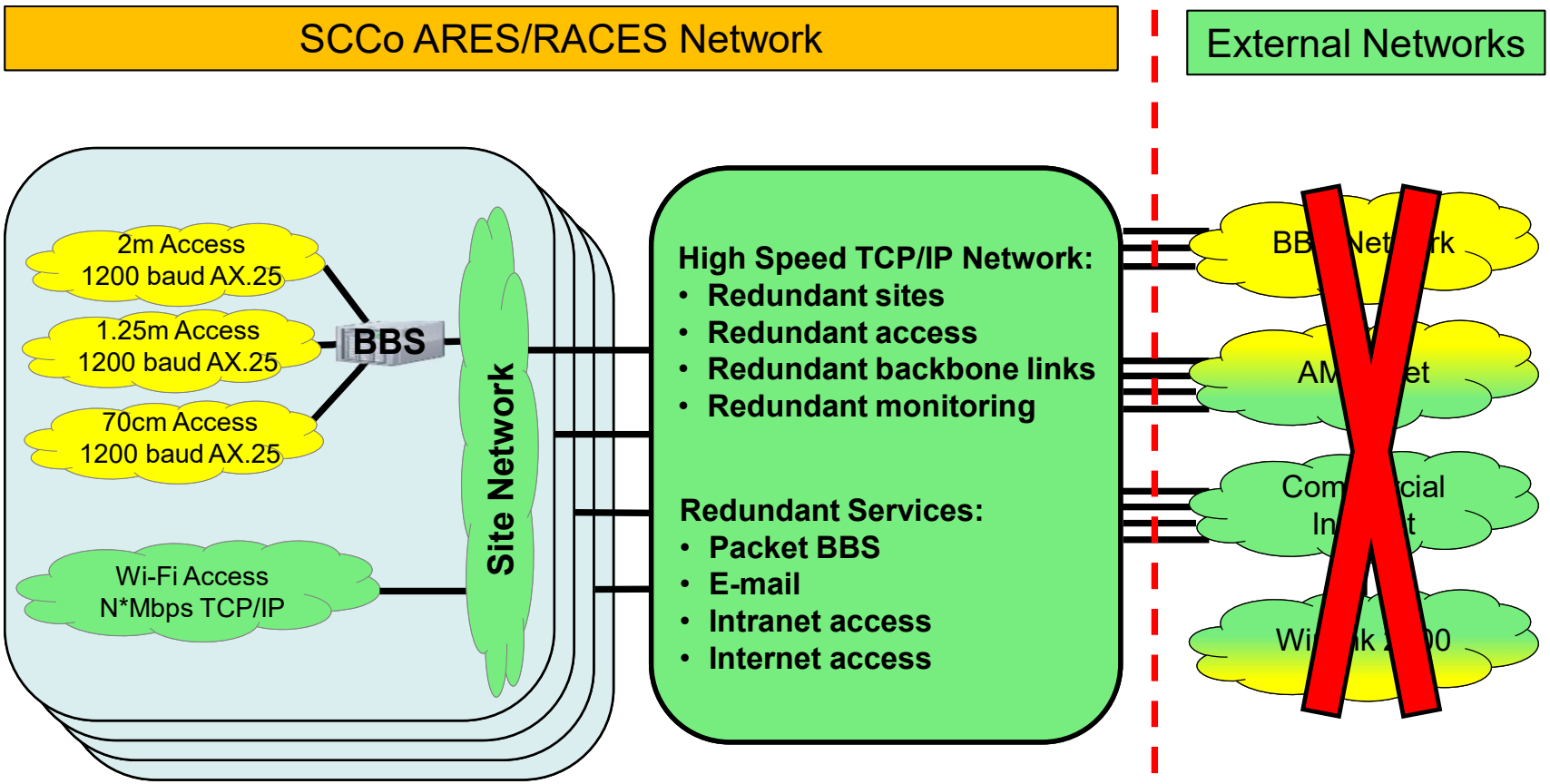
Connectivity to Other Networks



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

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Designed for harsh conditions

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

- Some sites experience high winds (100+ MPH), freezing conditions (including snow and ice), high temperatures (when A/C fails), power outages, or worse
- Conditions may make sites inaccessible for days or even weeks.
- Regardless of the situation, the network has to keep running or it won't be useful in an emergency
- This influences everything we do:
  - Station design (redundancy), equipment selection
  - Hardware installation standards, software configuration practices
  - Monitoring and alarms

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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
- Santa Clara County 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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6. Typical Packet Network Components

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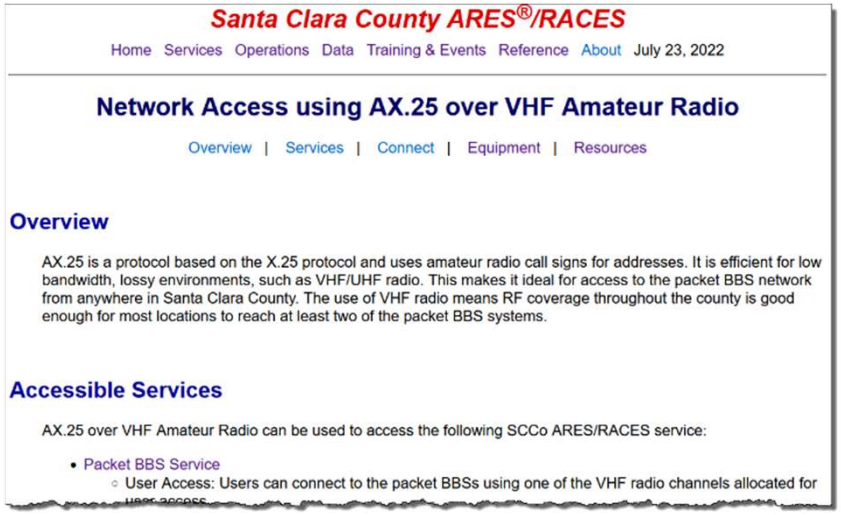
Packet Station Components (Details)



Santa Clara County ARES®/RACES

Home Services Operations Data Training & Events Reference About July 23, 2022

Network Access using AX.25 over VHF Amateur Radio

Overview | Services | Connect | Equipment | Resources

Overview

AX.25 is a protocol based on the X.25 protocol and uses amateur radio call signs for addresses. It is efficient for low bandwidth, lossy environments, such as VHF/UHF radio. This makes it ideal for access to the packet BBS network from anywhere in Santa Clara County. The use of VHF radio means RF coverage throughout the county is good enough for most locations to reach at least two of the packet BBS systems.

Accessible Services

AX.25 over VHF Amateur Radio can be used to access the following SCCo ARES/RACES service:

- Packet BBS Service
  - User Access: Users can connect to the packet BBSs using one of the VHF radio channels allocated for

- Detailed information is available to help select each component of your packet station

Equipment and Software

- AX.25 over VHF Station Configuration Diagram (PDF)
- Consider the following when building an AX.25 (packet) over VHF radio station:
  - City/Agency EOC/DOC Station Considerations
  - Antenna
  - Lightning Arrestor
  - Radio
  - TNC
  - USB-to-Serial Adapter
  - Computer
  - Printer
  - Software
  - Power
  - Make sure your station helps to reduce/eliminate the "hidden node" problem

https://www.scc-ares-races.org/data/access/ax25-vhf/ax25-vhf-access.html

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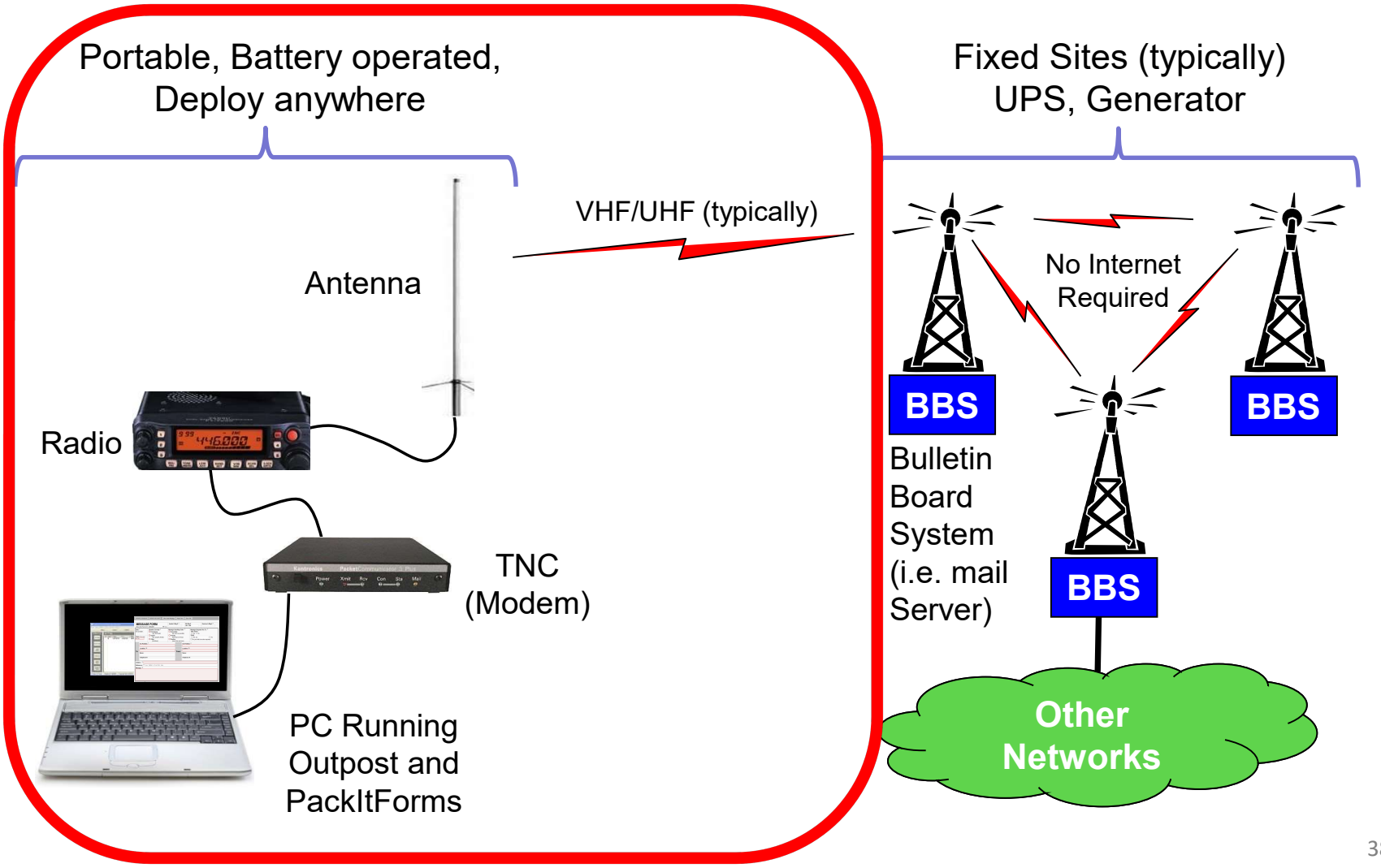
Typical Packet Network Components



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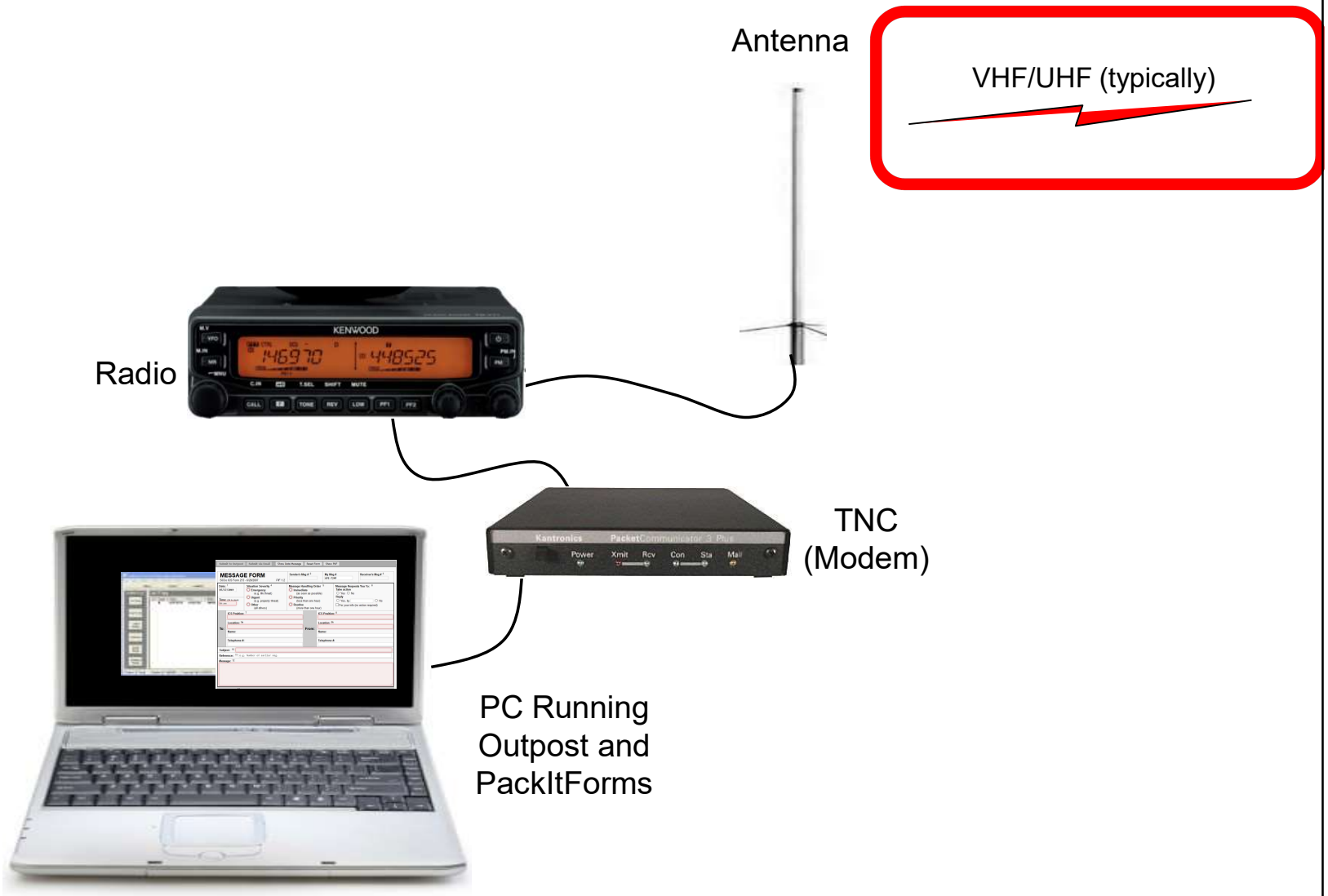
Typical Packet Network Components



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Access Frequencies

- Access is simplex with no tone
- 2m band access
  - User access; typically individuals, some EOCs
- 1.25m (220) band access
  - User access; typically EOCs, some individuals
- 70cm (440) band access
  - User access; typically individuals, some EOCs

- Advantages:
  - Simple antennas such as J-pole
  - Line of sight not required; county-wide coverage
  - But remember… do not be a “hidden node”

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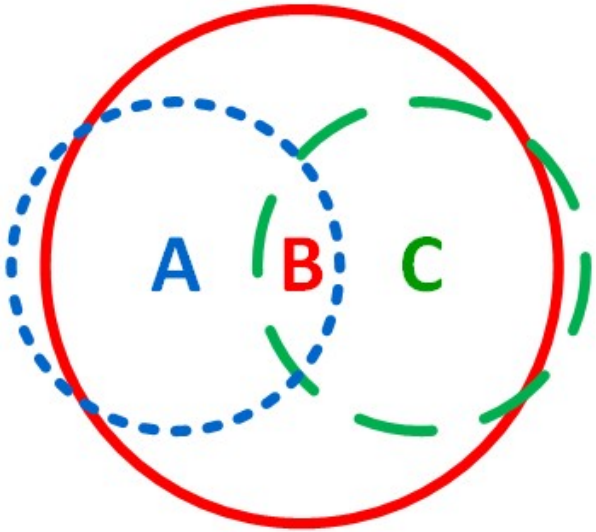
Hidden Node Problem

- Affects ALL simplex communications (voice, packet, Wi-Fi, CW, ...)



- If: A & B can hear each other, and B & C can hear each other, but A & C cannot hear each other …
- Then: A will transmit while C is transmitting (and vice versa), causing B to hear a “double”, which causes retries and slows down the channel for everyone

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Hidden Node Solution

- Solution: don't be a hidden node!
  - Make sure your signal is heard by EVERYONE that is using the same BBS (multiple cities)
- Get your antenna up high
  - High enough that your signal is heard by as many people using the same BBS, as possible
- Use plenty of power
  - Enough that your signal is heard by as many people using the same BBS as possible

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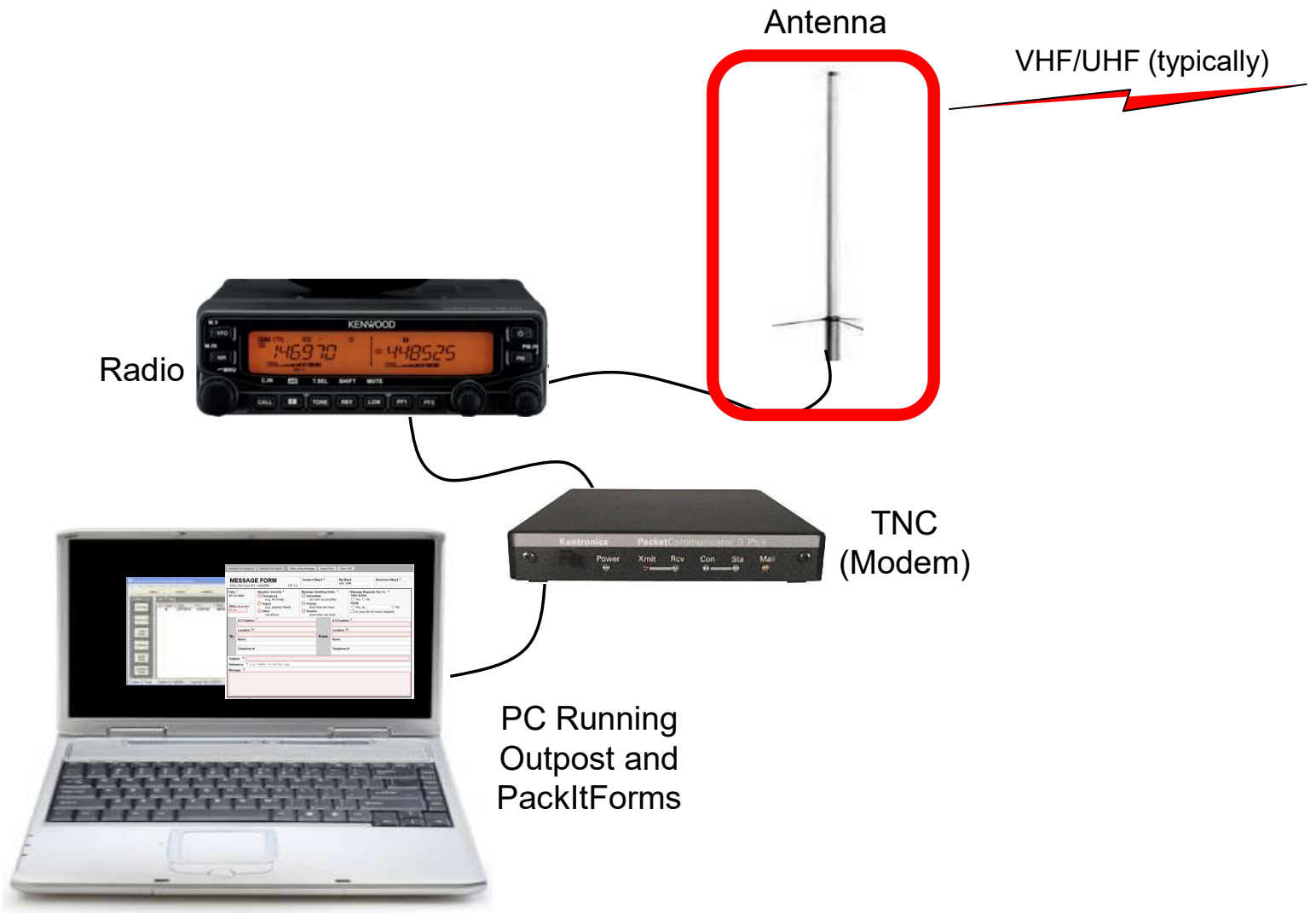
Typical Packet Network Components



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Antennas

- Get your antenna up high
- Home or EOC installation recommendation:
  - Tri-band ground-plane mounted on a tower or a mast above the roof
- Go Kit recommendation:
  - Roll-up j-pole antennas for 2m/440 and 220
  - 32 ft collapsible fiberglass windsock mast
    - Collapses to < 4 feet; weighs just a few pounds
    - Gets antenna above all 1-story and many 2-story buildings
  - Tripod with sandbags to support mast in wind
  - 50 feet of quality coax

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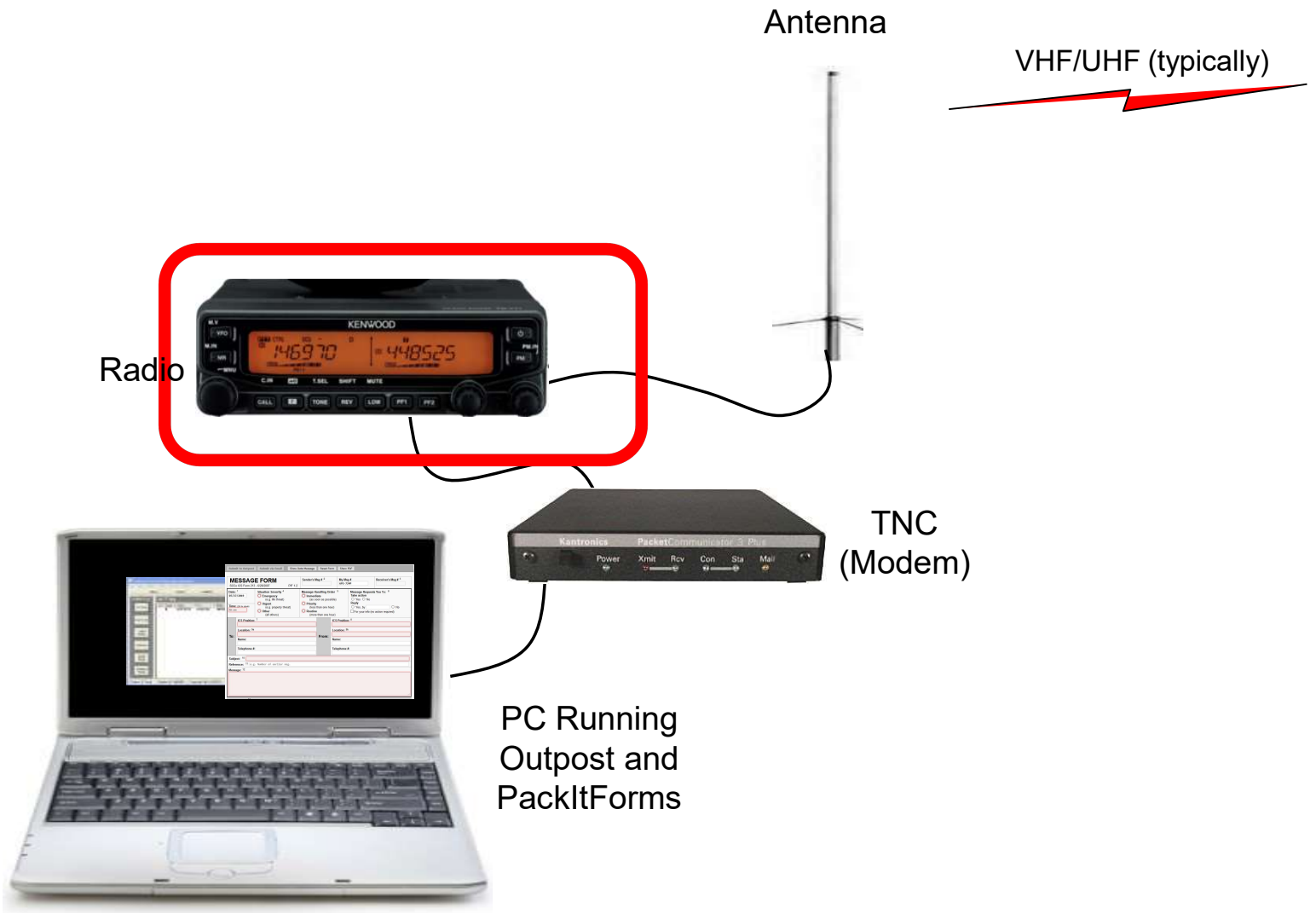
Typical Packet Network Components



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Radios

- Use plenty of power (25 to 50 Watts)
- Recommendation:
  - Mobile radio with 25 or more Watts of output
  - Data connector on back (usually 6-pin DIN)
    - Consistent audio levels between radio and TNC; unaffected by volume control
    - Allows operator to listen to speaker while operating
  - Dual receive – allows simultaneous monitoring of voice channel
- What about an HT?
  - Yes, it will work, BUT you will be a hidden node to everyone except your next door neighbors!
  - May be OK for hobby time or experimentation when the frequency is not busy (how would you know?), but will cause problems during real EmComm deployments.

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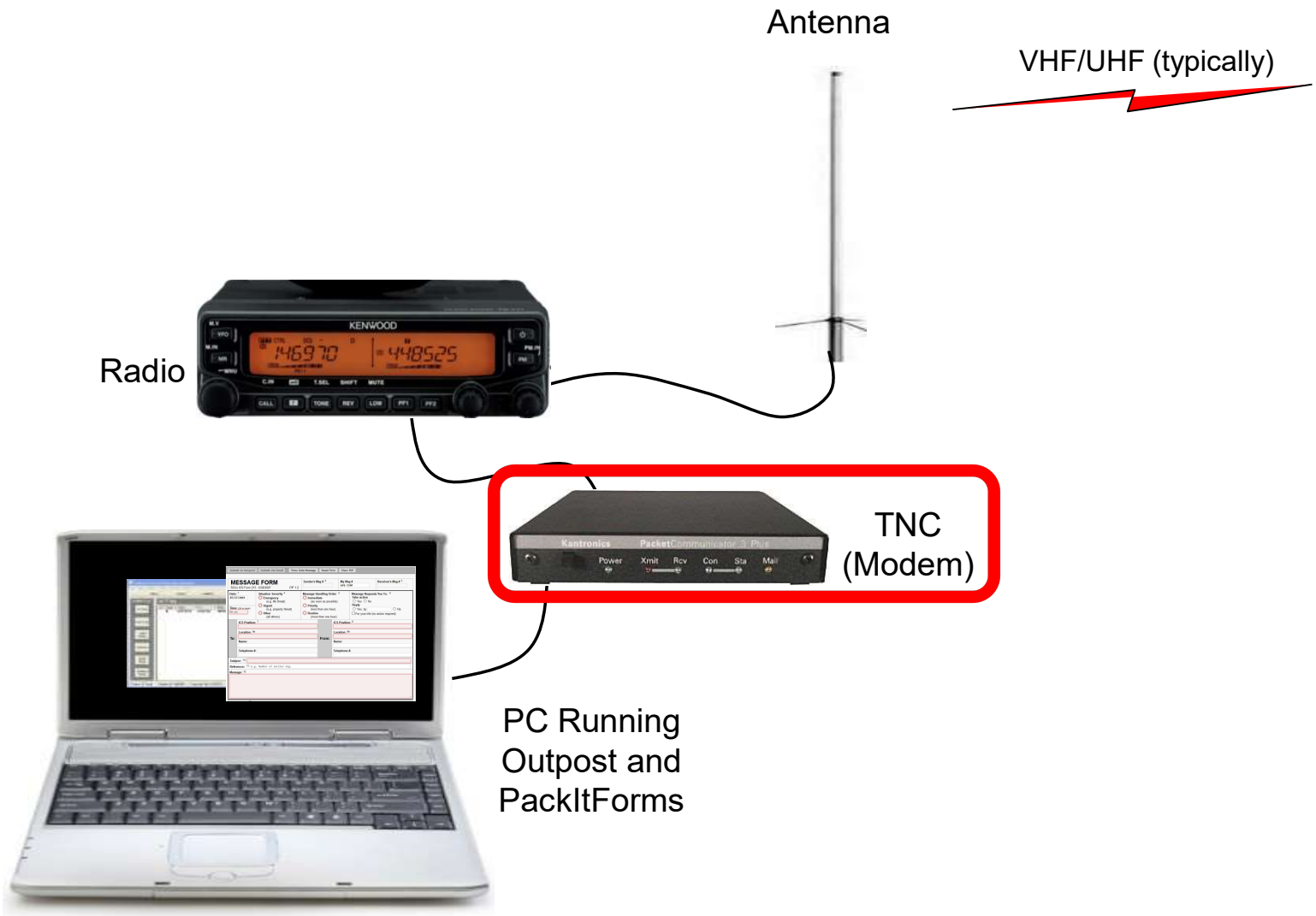
Typical Packet Network Components



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Terminal Node Controller (TNC)

- Reliable, consistent, out of the box operation needed
- Hardware TNCs preferred
  - County BBSs make extensive use of Kantronics KPC 3+ TNC
  - KPC 3+ has other features, such as:
    - Personal BBS, digipeater, node
    - Command line interface (Outpost not needed)
- What about software TNCs?
  - Yes, they will work
  - HOWEVER, experience shows they are finicky to set-up and operate; good for personal use or hobby work
  - But, not recommended for EmComm work

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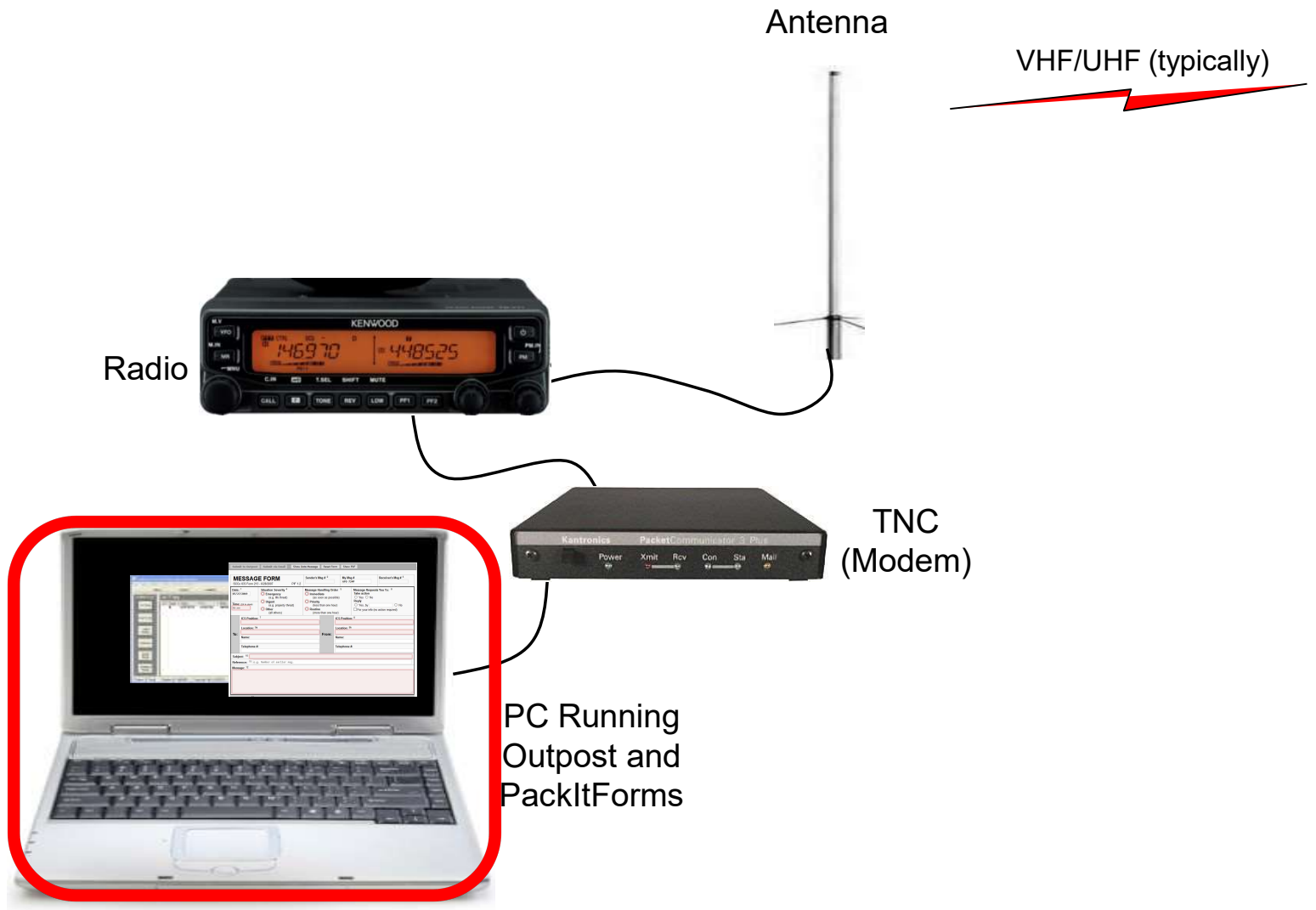
Typical Packet Network Components



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PC

- Characteristics
  - Must run a current version of MS Windows
  - Screen must be big enough to read and fill in large forms easily
  - Keyboard must allow for easy, reliable typing
  - Battery runtime of at least 1 hour
- Recommendation
  - Laptop or larger netbook running at least Windows 10 (end of W8.1 extended support… January 10, 2023)
- What about tablets?
  - As long as it runs Windows and has an external keyboard and mouse. But most people find the screen sizes too small for extended use.
- What about Linux or MAC?
  - Not recommended. The software we use runs on Windows. Running a virtual machine or emulator just complicates things. Experience has shown that people who try this struggle to make it work effectively.

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Required for Type III Qualification

7. ASSEMBLING A PACKET STATION

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Type III Scenario

W6XRL4, this is Xanadu EOC

This is W6XRL4, go ahead

W6XRL4, please deploy to Xanadu Community Hospital and set up the on site packet station. Tactical call is XNDHSP. Do you need directions?

Acknowledged. I know the location and will deploy immediately. W6XRL4

Xanadu EOC

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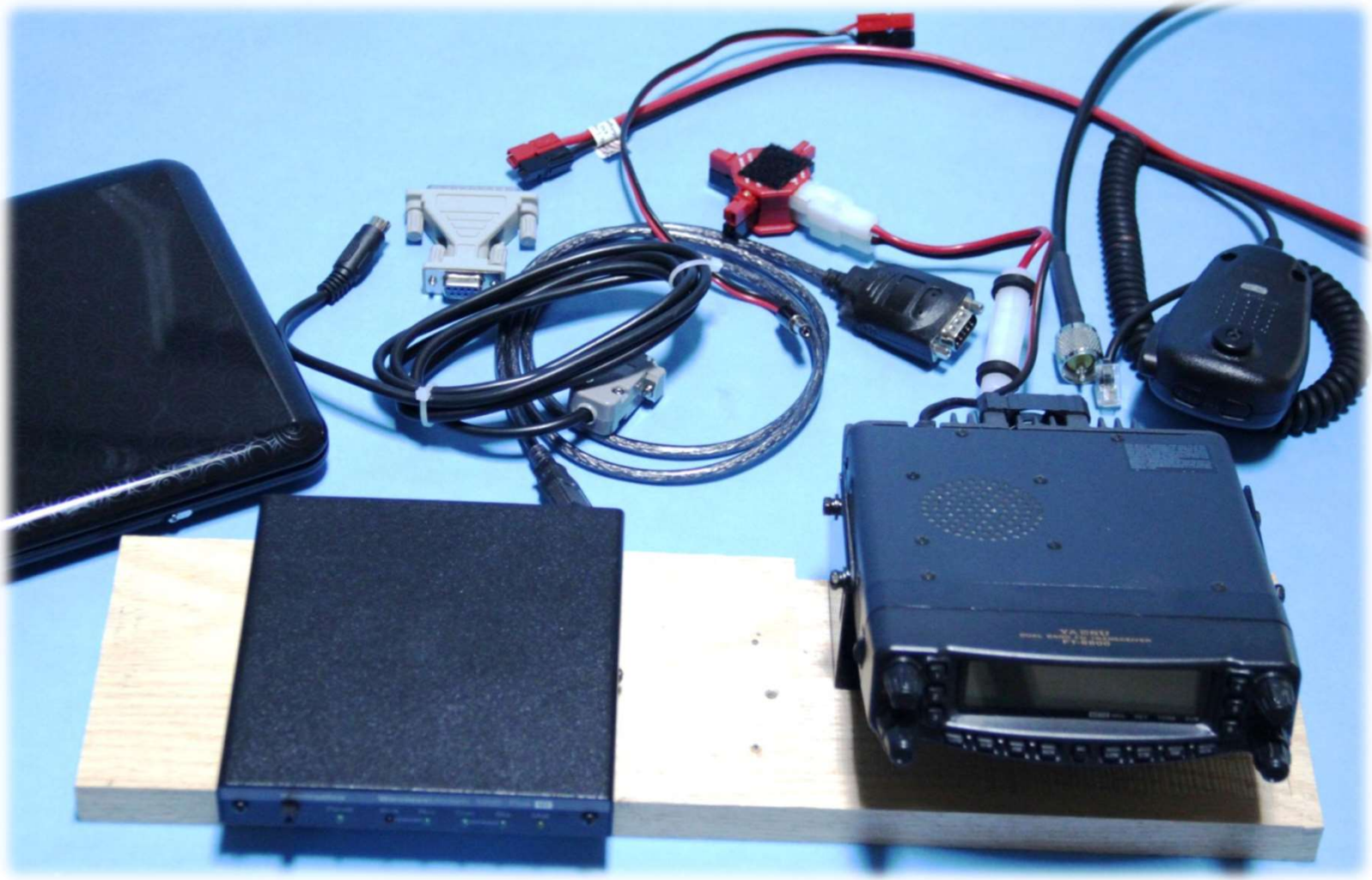
“Thinking outside the box”



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But first, what's in the box? (partial list)

Radio	2m, 220, 440, 25-50W
	Power Cable, adaptors 12VDC
	Microphone
Antenna	2m, 220, 440 roll-up J-Pole
	Mast, tripod, straps, sandbags, etc.
	50ft of Coax
TNC	KPC-3+ Packet Communicator
	RS232 Serial cable to PC; 25pin/M to 9pin/F, or USB (newer KPC's)
	Custom cable to Radio; 9pin/M to <whatever_your_radio_has>
	Cable to 12VDC
Laptop, PC	Windows PC
	USB-to-Serial Adaptor (older KPC3's) or USB cable
	Power adaptor
	Mobile Printer
Power	Battery or Power Supply
	Splitter, jumper cables

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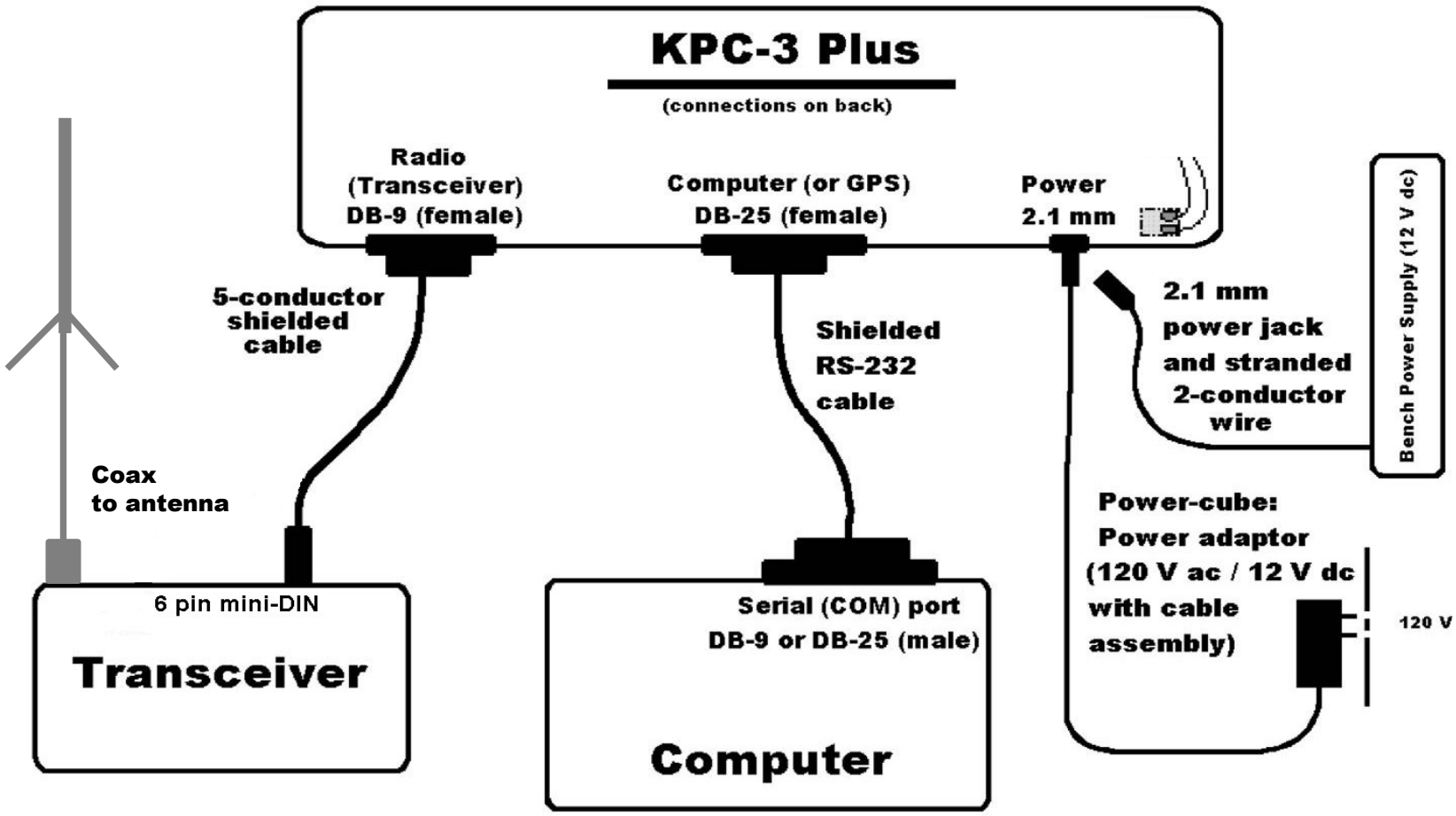
Building The Packet Station

KPC3 Plus / Serial Connector



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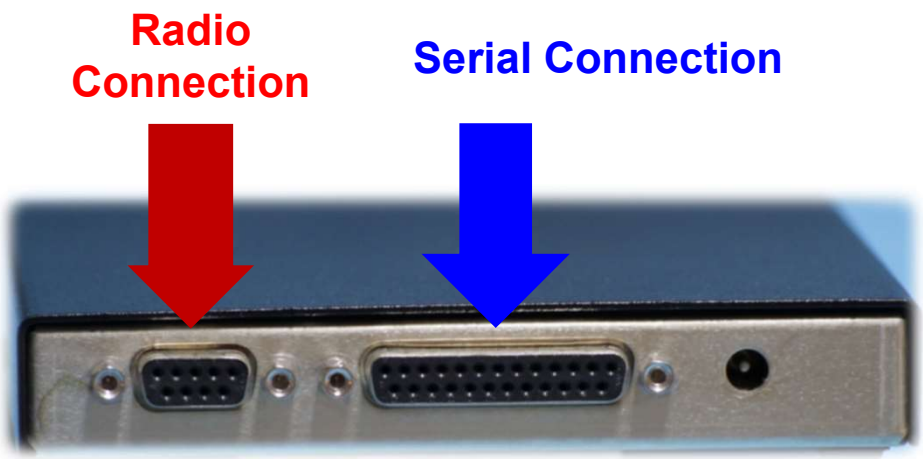
Connect TNC to PC

KPC3+ Serial port version



- KPC-3+ serial port has a DB-25 connector
  - DB-9 adapter may be needed
- Standard RS-232 serial cable; with USB-to-Serial for newer PCs
- **Caution – The Radio connector is a DB-9 !**
  - **PTT, Transmit audio, Received Audio (NOT RS-232!)**

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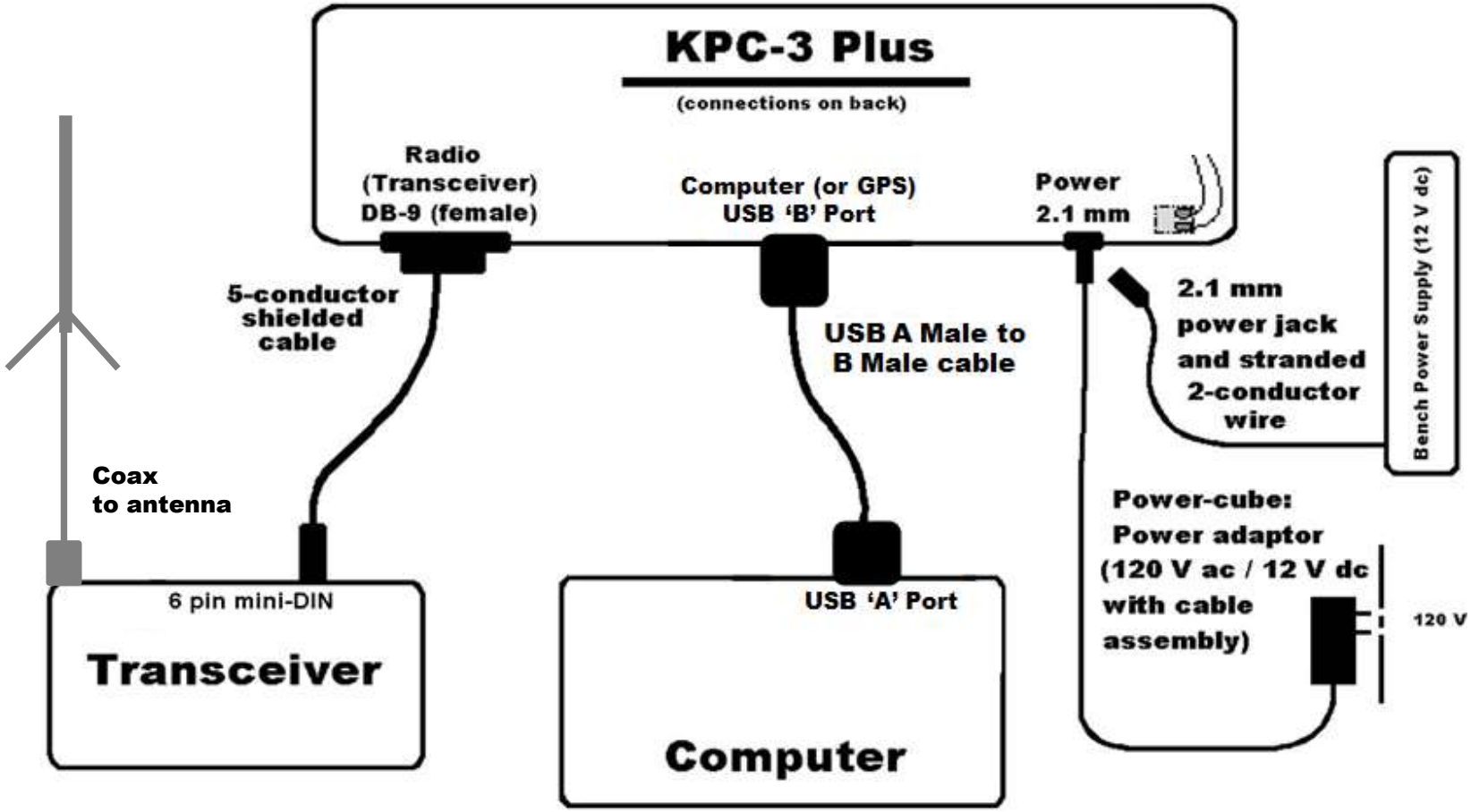
Building The Packet Station

KPC3 Plus / USB Connector



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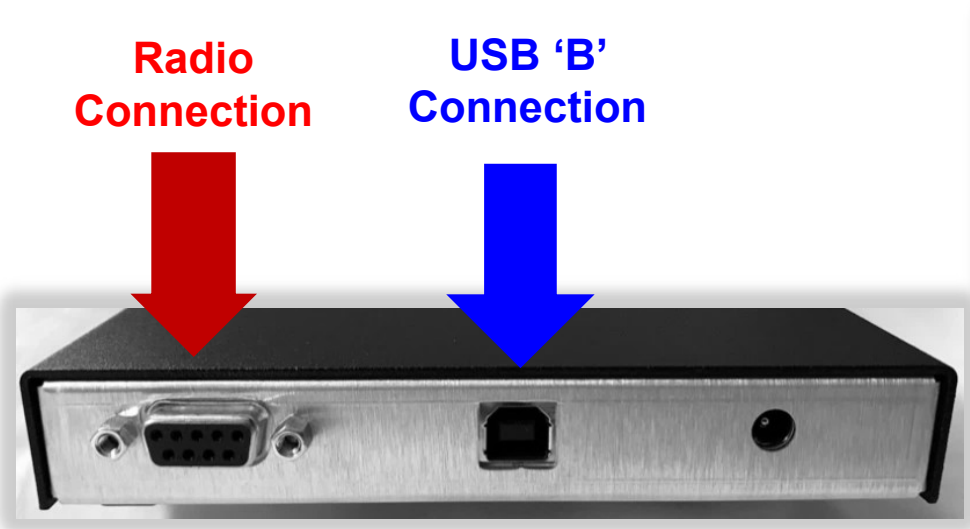
Connect TNC to PC

KPC3+ USB version



- KPC-3+ USB port is a 'B' connector
- No longer requires a separate USB-to-Serial adaptor (FTDI USB chip is built in); ***BUT…*** not the case for other TNCs
- **Caution – The Radio connector is a DB-9 !**
  - **PTT, Transmit audio, Received Audio (NOT RS-232!)**

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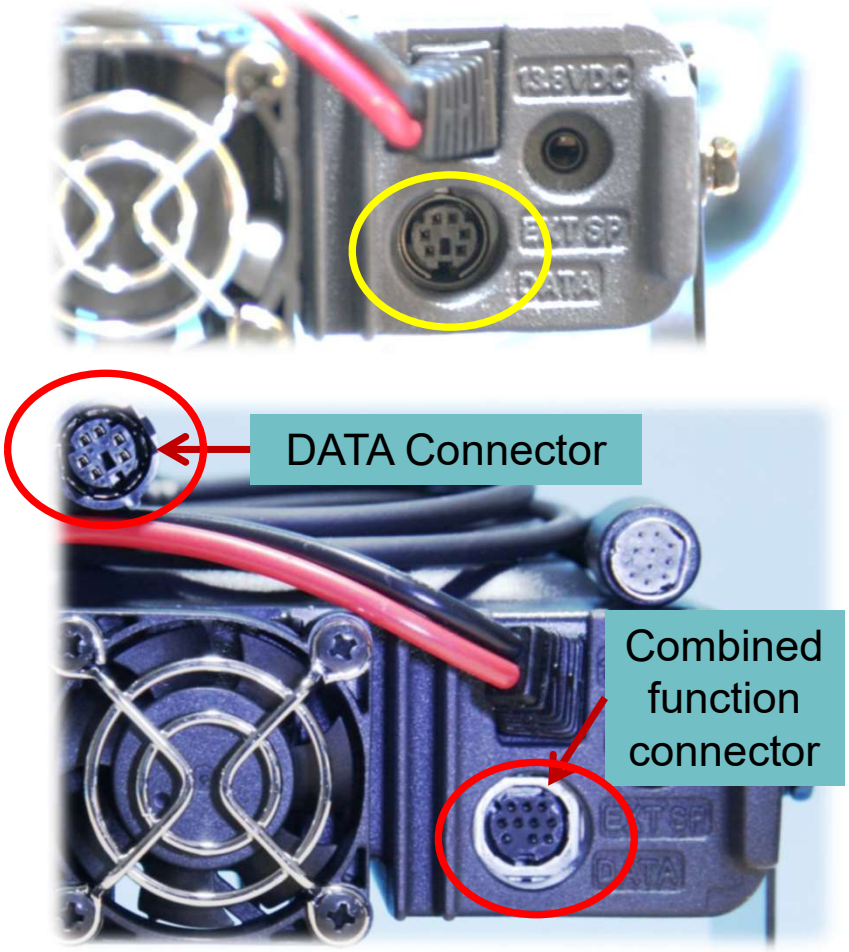
Connect TNC to Radio



- Most radios have a dedicated 6 pin mini-DIN DATA connector
- Some have a combined 8 pin mini-DIN connector and a breakout cable
  - ***Best Option!!***
- Otherwise you will use the speaker and mike connectors

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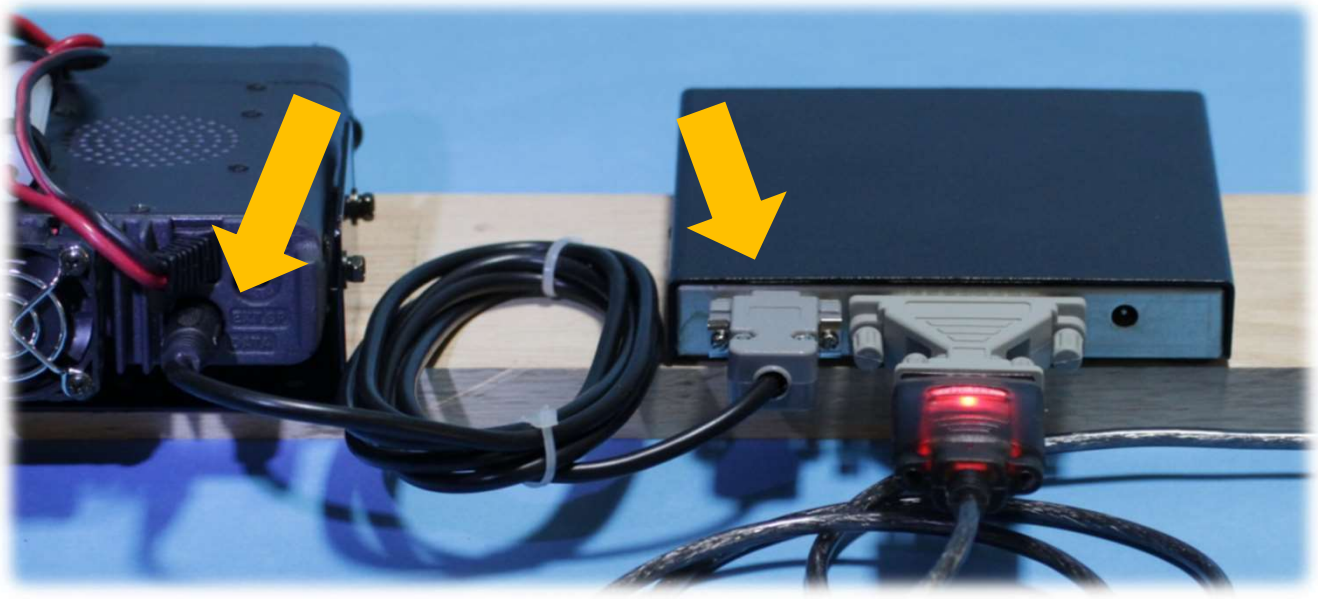
Connect TNC to Radio



- KPC-3+ has a DB-9 connector
- Radio will have a dedicated “data” connector for packet
  - 6 pin mini-DIN
  - May have to use mic connector and external speaker

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A note on the Alinco radios for packet

Rear view

DATA Connector

- Alinco DR-135T (2m), DR-234T (220) and DR-435T (440) are single-band radios and very popular for packet.
- The radios use a DSUB-9 connector for their data port.
- **Do not use** the internal ***EJ-41U module*** as a TNC; it has insufficient memory for EMCOMM message passing.
- For an **external TNC**, ***do not use*** *a standard RS-232 modem cable!* You need a ***custom cable*** for PTT, Transmit Audio, Receive Audio, and GND.

- ***Lastly…*** the DR-235T and DR-435T are no longer in production ☹.

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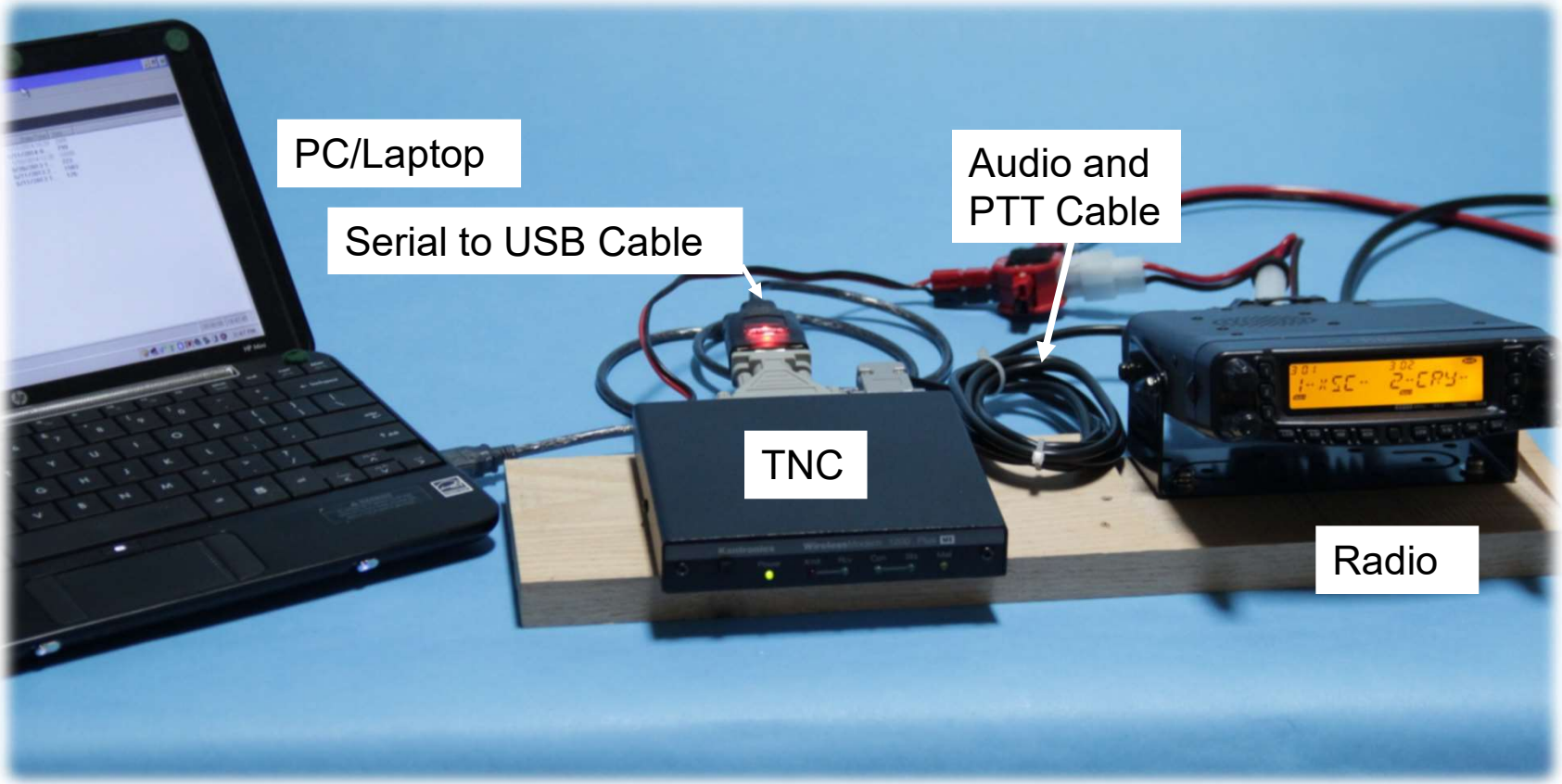
"Got My Act Together"



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PC Setup

- Secure a work area suitable for computer use
  - Protected
  - Out of sunlight
  - AC power, if possible
- Set up PC
  - Verify that Outpost and PackItForms are installed
  - Verify the version
  - Set up user identification and Tactical ID (if needed)
  - Make sure computer date and time are set correctly
  - Verify correct Profile
  - Verify BBS and TNC settings
  - Adjust other settings as needed for the assignment

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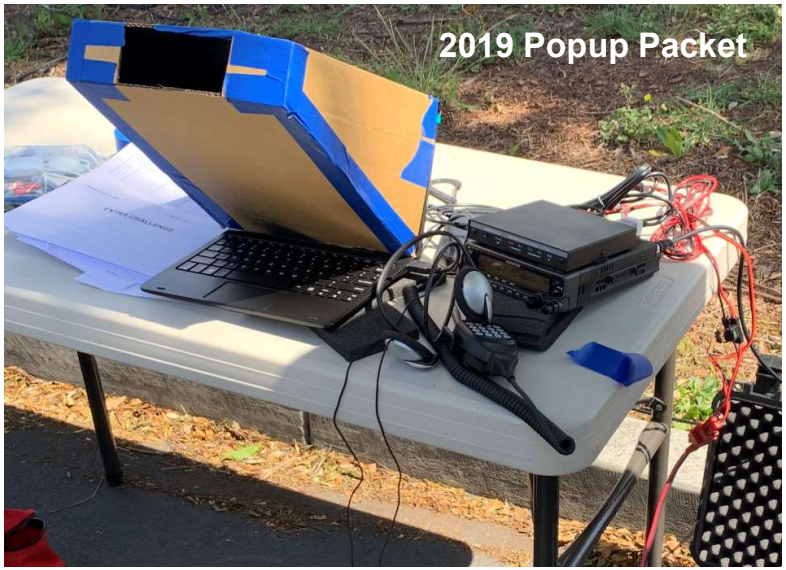
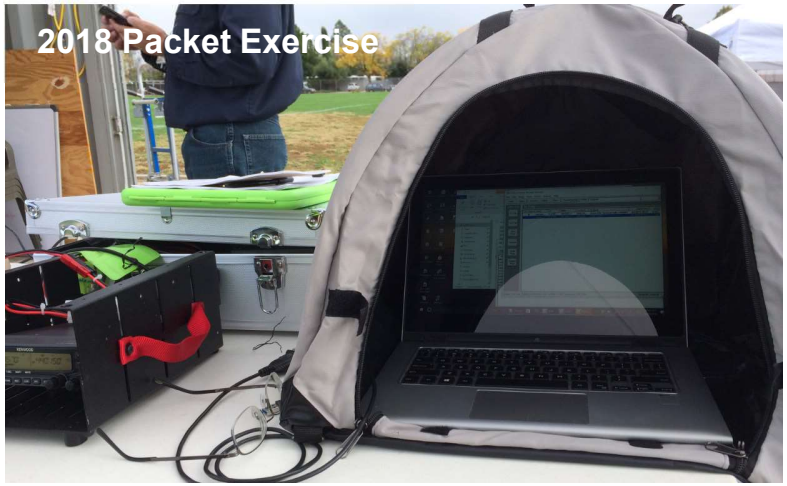
Creative "*Get-out-of-the-Sun*" ideas





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Radio Settings

- Consult radio manual for packet settings
  - Packet or data mode
  - Packet baud rate – 1200 bps
  - If Dual Receive, which side does Packet use?
  - Simplex
  - No tone or tone squelch
    - Yaesu users - make sure WIRES is off
  - RF squelch/S-meter squelch to minimum
  - Turn off any function that might interrupt radio function
  - 25 W or more transmit power

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KPC-3+ Setup Overview

- Use a *terminal emulator* (such as Outpost's Ipserial program) to communicate with the TNC
  - Verify Com Port settings
  - Verify that TNC "connected" – "**`cmd:`**" prompt
  - Adjustment of serial connection baud rate may be needed
- Use the Command mode to instruct the TNC
  - Actions to be performed
  - Parameters to be set
  - Diagnostic information

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Outpost and PackItForms

8. NOW FOR THE SOFTWARE…

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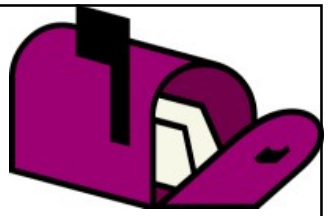
What is Outpost?



- A Windows-based packet messaging client; email-like GUI; hides the complexity of the packet world
- Helps ARES, RACES, and other amateur radio emergency response teams meet the needs of their served agencies
- Automates and manages all message handling between you and your BBS
- Lets you read, delete, create, send, reply to, and forward messages back to the BBS
- SCCo Packet Installer is available from County web site
  - www.scc-ares-races.org/data/packet
- General release version available from Outpost web site
  - www.outpostpm.org

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Install Santa Clara County Version

- Combined Installer for Outpost & PackItForms
  - Unique directory names
    - Programs: C:\Program Files (x86)\SCCo Packet
    - Data: C:\SCCo Packet
  - Does not interfere with general release version of Outpost on the same machine
- Includes all updates
  - Standard TNC and County BBS setups
  - Standard County user settings
  - Standard County forms
  - Updates will not overwrite user defined settings

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Install Outpost and PackItForms

- Single click install process for both Outpost and PackItForms
- Click the defaults

Start

Finished

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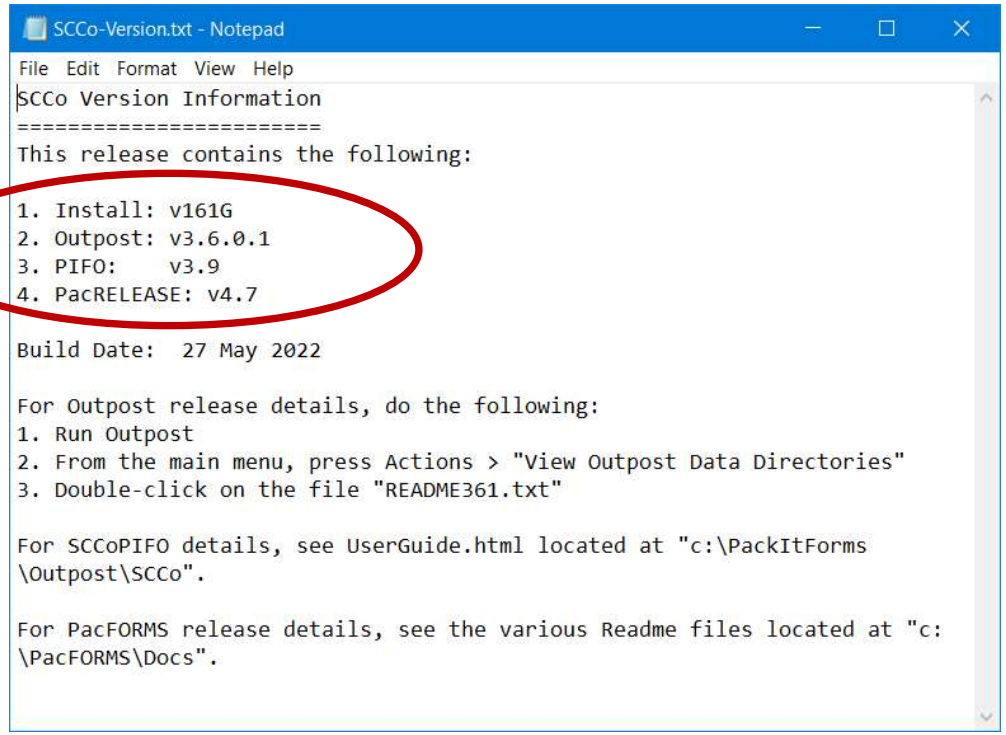
Confirming the installed version



From the Start Menu, look for ***SCCo Packet*** under:

- Windows 10: Start > scroll down through the list of apps
- Windows 11: Start > All Apps, scroll down through the list of apps

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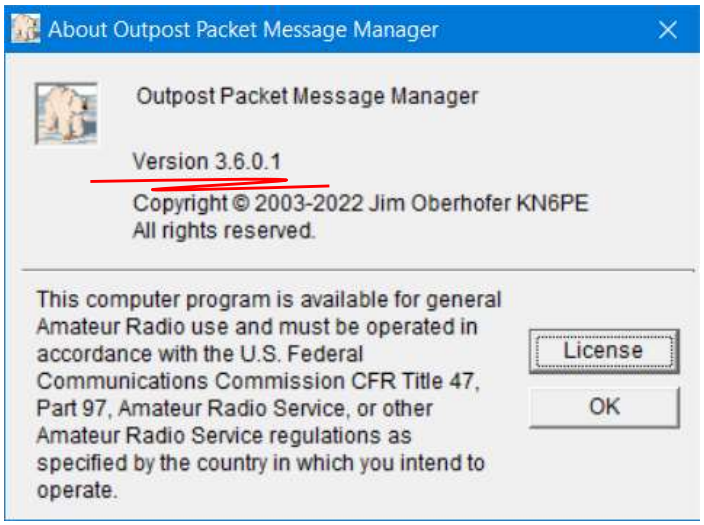
Confirming the installed version

Outpost Startup

Outpost: Help -> About



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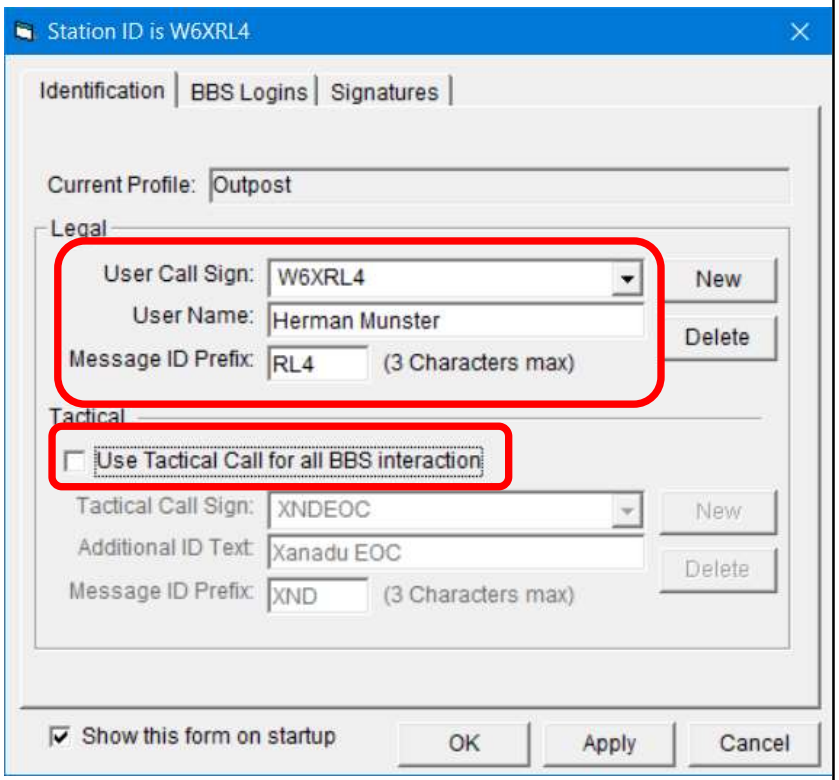
Setting up Outpost's User ID

Outpost Setup > Station ID



- Previously setup? Select your call from the ***User Call Sign*** drop down
- First time user setup? Press New
- Fill in all Legal ID fields:
  - User call sign
  - User Name (Your full name)
  - Message ID Prefix
    - Defaults to the last 3 letters of your call sign
- To change from FCC call to Tactical
  - Click/Unclick - ***Use Tactical Call***
  - When unchecked and fields are greyed out, you are using your FCC call
- Press OK when done
- When you take over a shift as a Packet Operator, you will need to change the User Call sign and User Name

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Tactical Calls

Outpost Setup > Station ID

- Tactical Calls are assigned to support message processing
  - Independent of operator's FCC call sign
- Once added to BBSs:
  - Packet users can log in with city tactical call signs
- Updates occur upon request from an agency
- Tactical calls for your city are available from your EC
- Tactical calls also added for Coastal Region and all surrounding counties
- To request new or update your agency's tactical calls, see: http://www.scc-ares-races.org/data/packet
  - "How to Request Tactical Calls"

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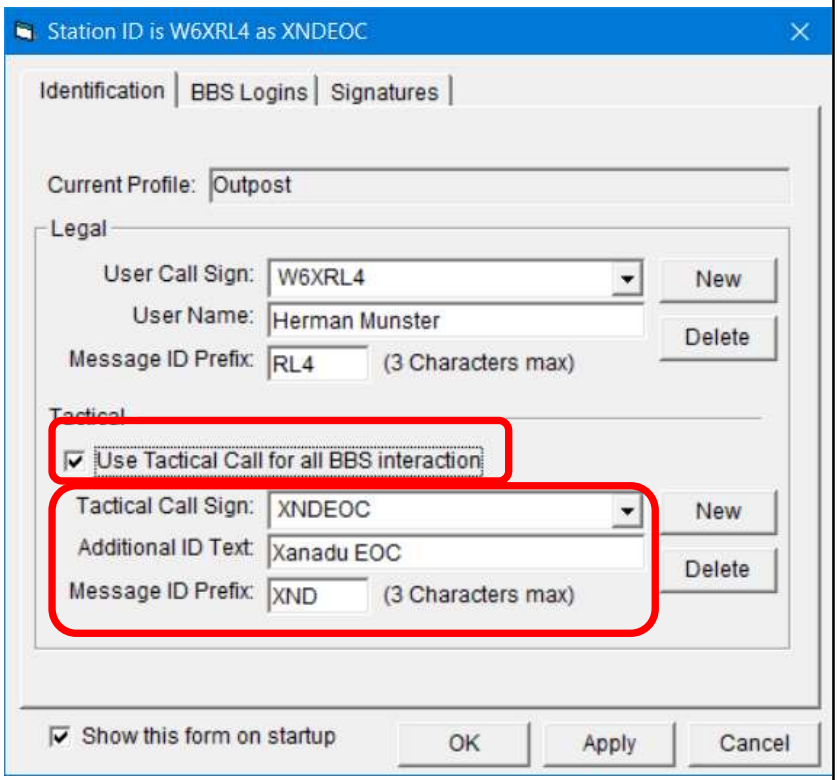
Setting up a Tactical Call ID

Outpost Setup > Station ID



- If Using a Tactical Call, check the "Use Tactical Call …" box
- Previously setup? Select the tactical call from the ***Tac Call Sign*** drop down
- First time Tac call setup? Press New
- Fill in all Tactical fields:
  - Call Sign
  - Additional ID Text
  - Message ID Prefix
    - 3 letter prefix used in msg number
    - Set per your served agency policy
- Press OK when done
- When you take over a shift as a Packet Operator, you will need to change the User Call sign and User Name, and confirm the tactical call

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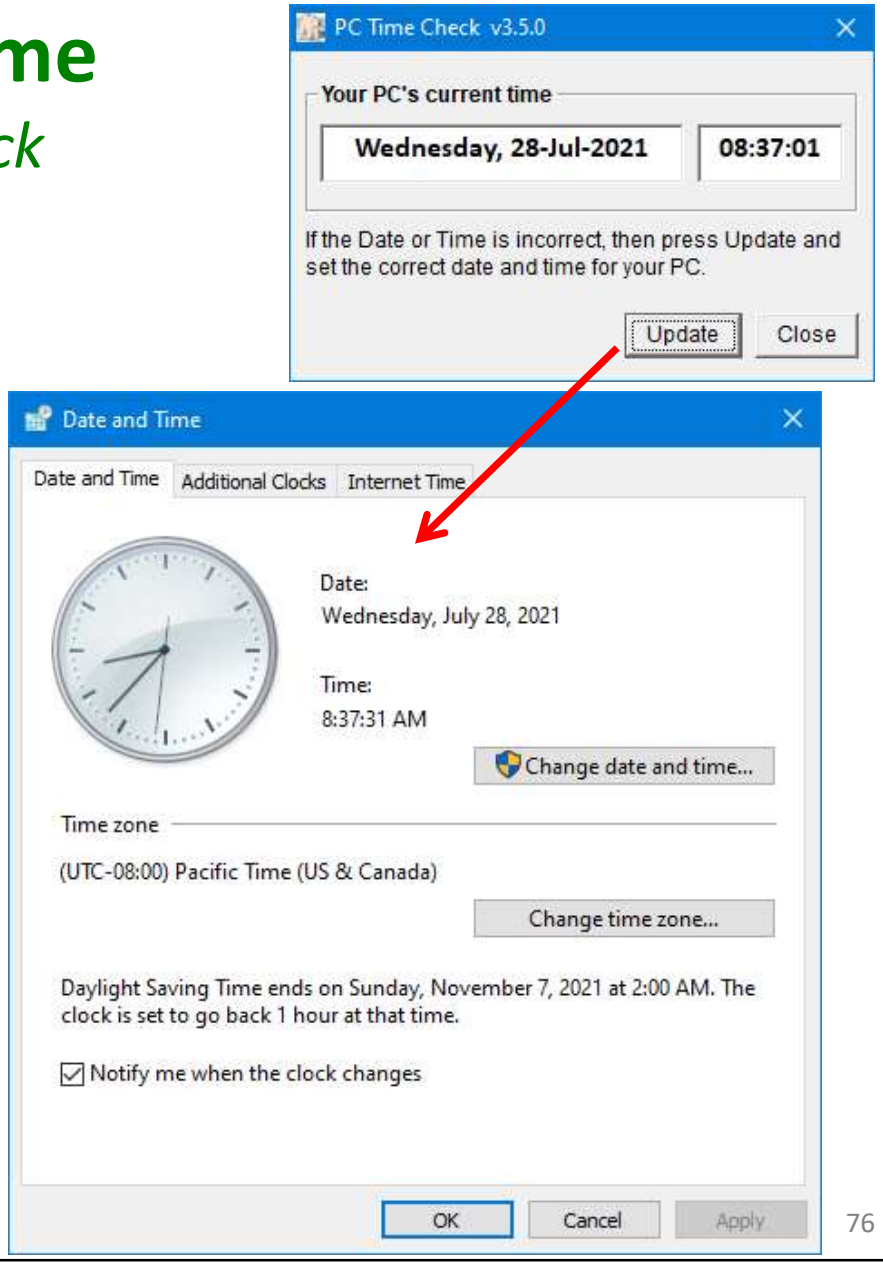
Confirming the PC Time

Outpost Startup > time check

- Old and/or seldom-used PCs are usually not set to the correct time
- Outpost and PackItForms use the PC time
- If wrong, causes incorrect and confusing information on message listing and logs
- On startup, Outpost displays the current PC time and offers a chance to change it



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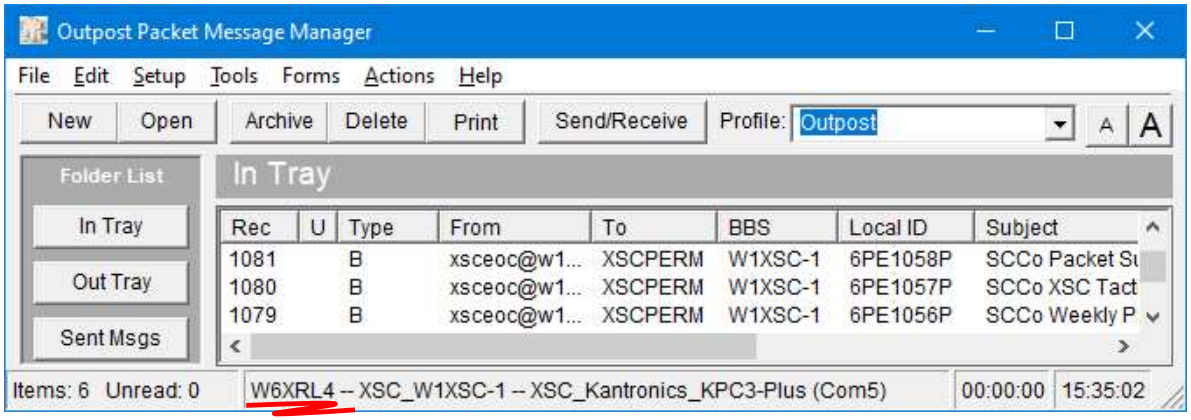
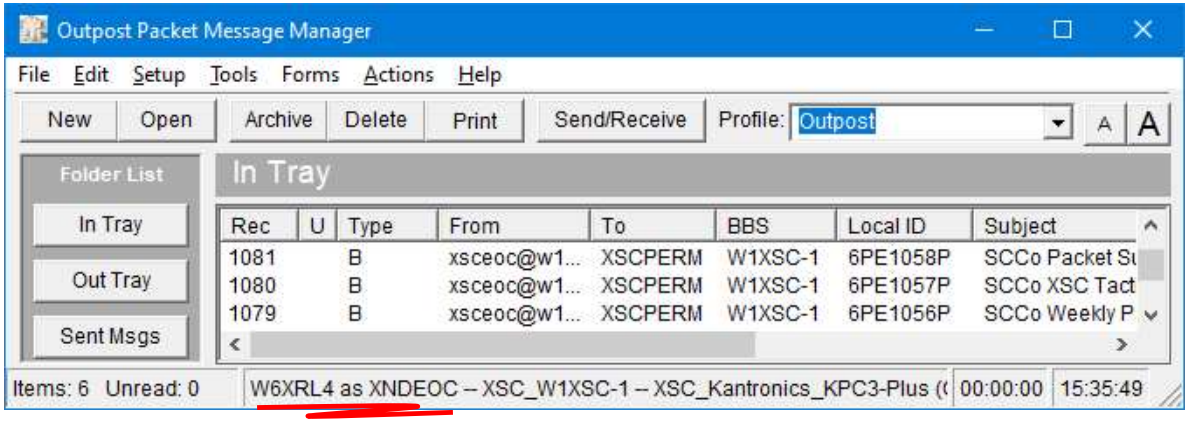
Confirming the Station ID

Outpost Setup > Station ID

- **FCC Call** - Only the call sign is listed



- **Tactical Call** – listed as "*<call_sign>* as <tactical_call>"



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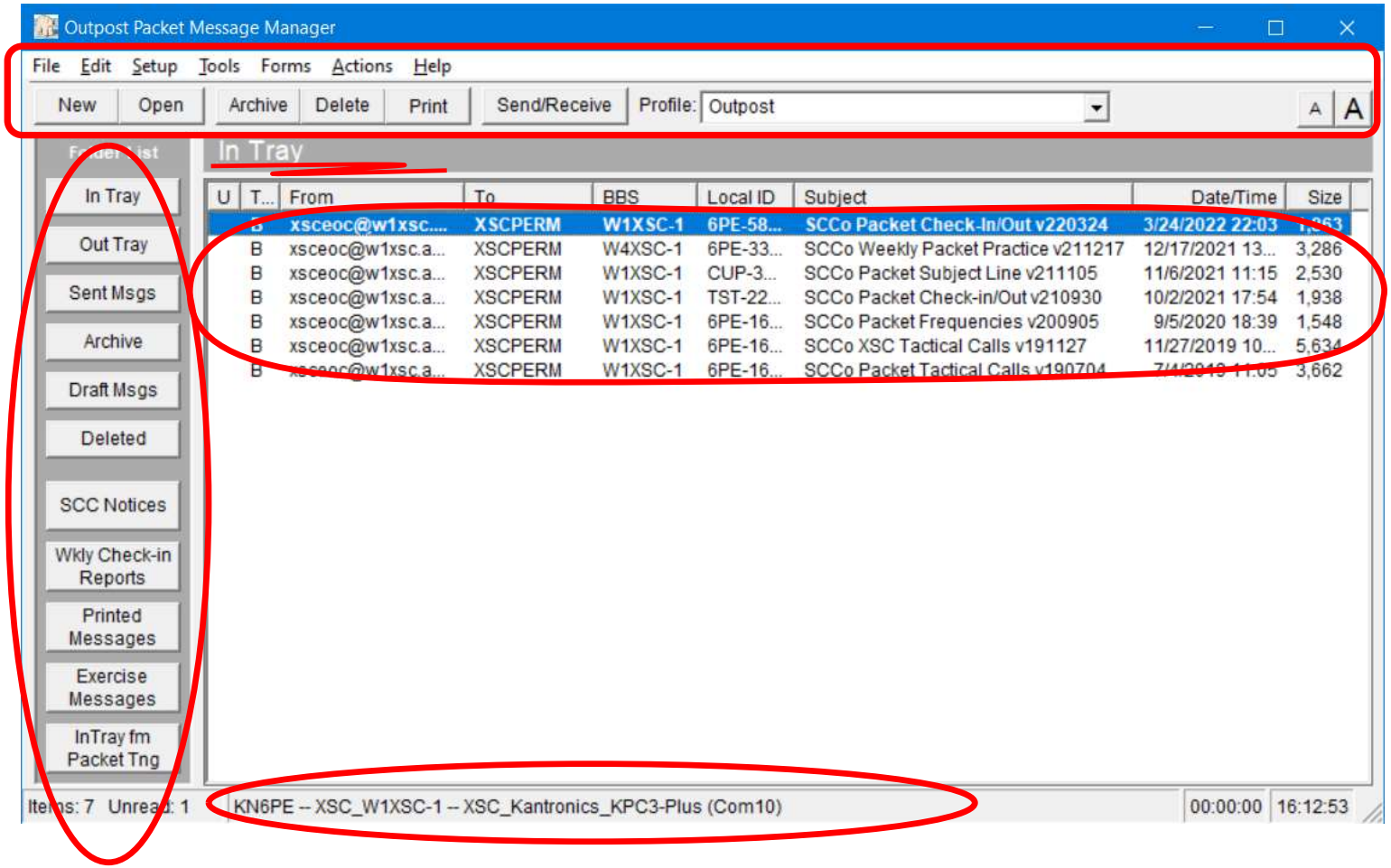
Outpost - A Closer Look

Main form controls



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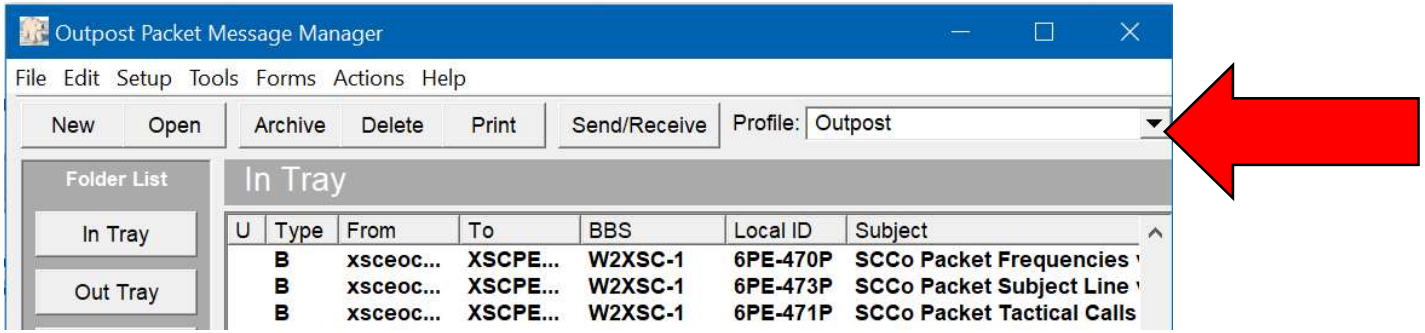
Outpost – Profiles

Main form controls

- Profiles store Outpost settings under a name
  - Tools menu settings, Station Identification, BBS, TNC selection, etc.
  - The “OUTPOST” profile contains all of the default SCCo settings
- Switch between profiles without restarting Outpost
- Verify that the Profile is correct



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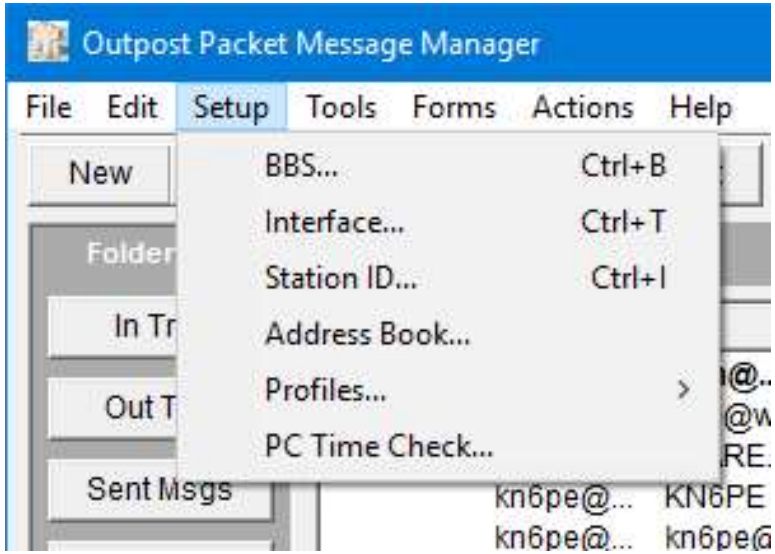
Configuring Outpost

Setup menu

All configuration items are under two Menu items



- The **Setup** menu…
  - ***BBS…*** Santa Clara County BBS's are preloaded
  - ***Interface…*** Preconfigured TNCs
  - ***Station ID…*** for setting your FCC and tactical call
  - ***Address Book…*** create alias and distribution lists
  - ***Profiles…*** allows multiple configurations
  - ***PC Time Check…***

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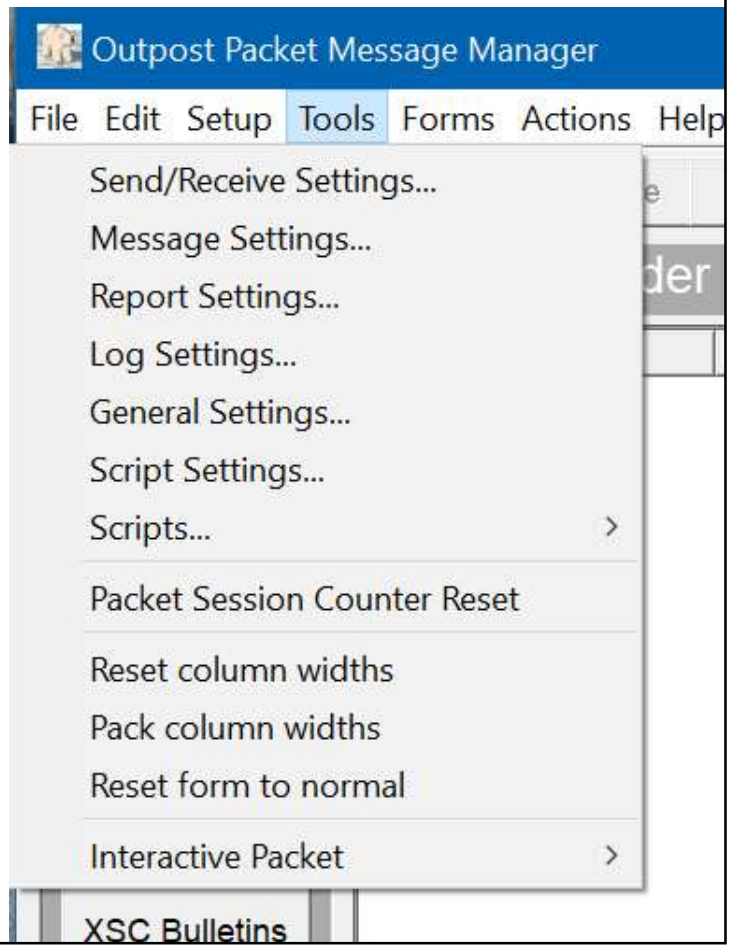
Configuring Outpost

Tools menu

All configuration items are under two Menu items

- The **Tools** menu…
  - ***Send/Receive…*** Automation, Auto Printing, etc.
  - ***Message…*** defaults, numbering, receipts
  - **Log settings…** helps with troubleshooting
  - ***General…*** Print settings, name extra folders
  - ***Scripting…***
  - Column resets
  - Manual packet programs



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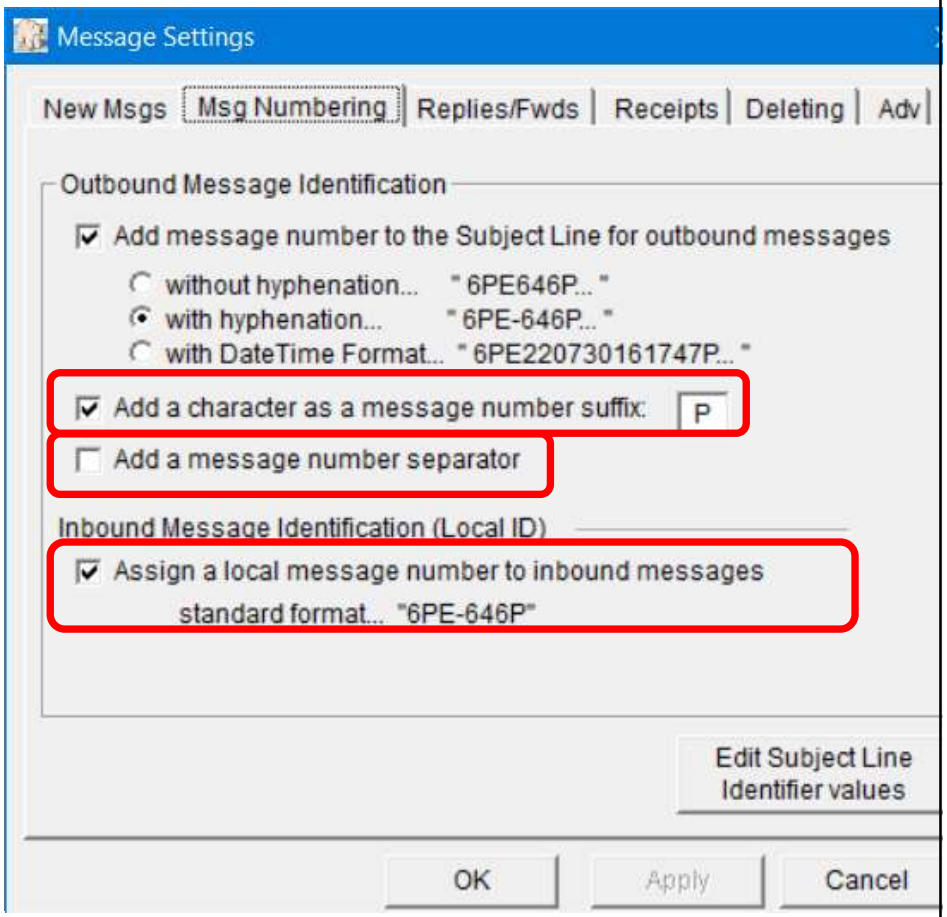
Configuring Outpost

Tools menu > Message Settings > Msg Numbering Tab

- ☑ Add message number…
  - ⊙With hyphenation
- ☑ Add message number suffix. Adds a “P” suffix to all inbound and outbound message numbers
  - Check this box
  - Plain Text
  - PackItForms
- ☐ Add message num separator
  - leave unchecked
- ☑ Assign a local message ID
  - check this box
- Message numbering is common across profiles
  - Numbers are common across all profiles



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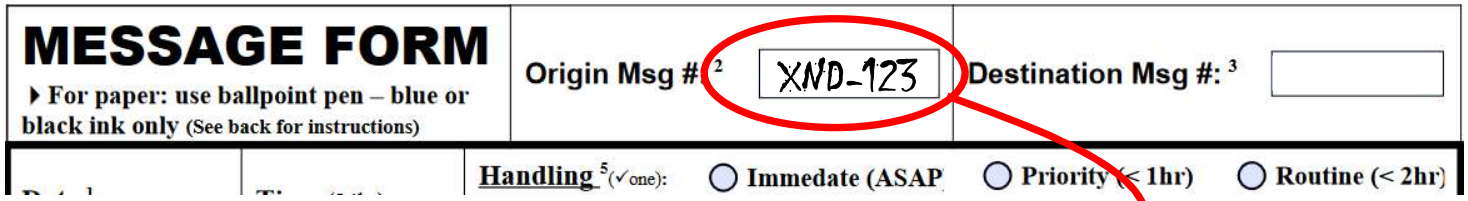
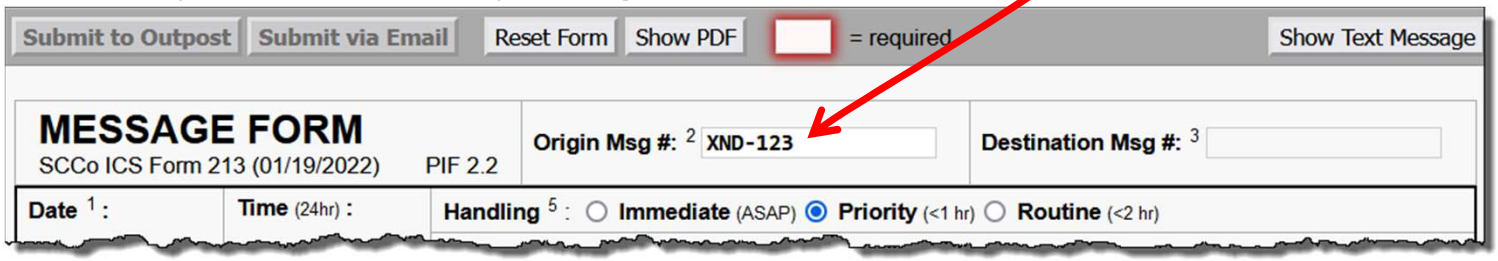
Message numbers

Considerations

- If you are given a paper form with an existing message number, do not change it!
- For instance: If you are given this:



- then replace the Outpost-generated number with:



- It's that simple!

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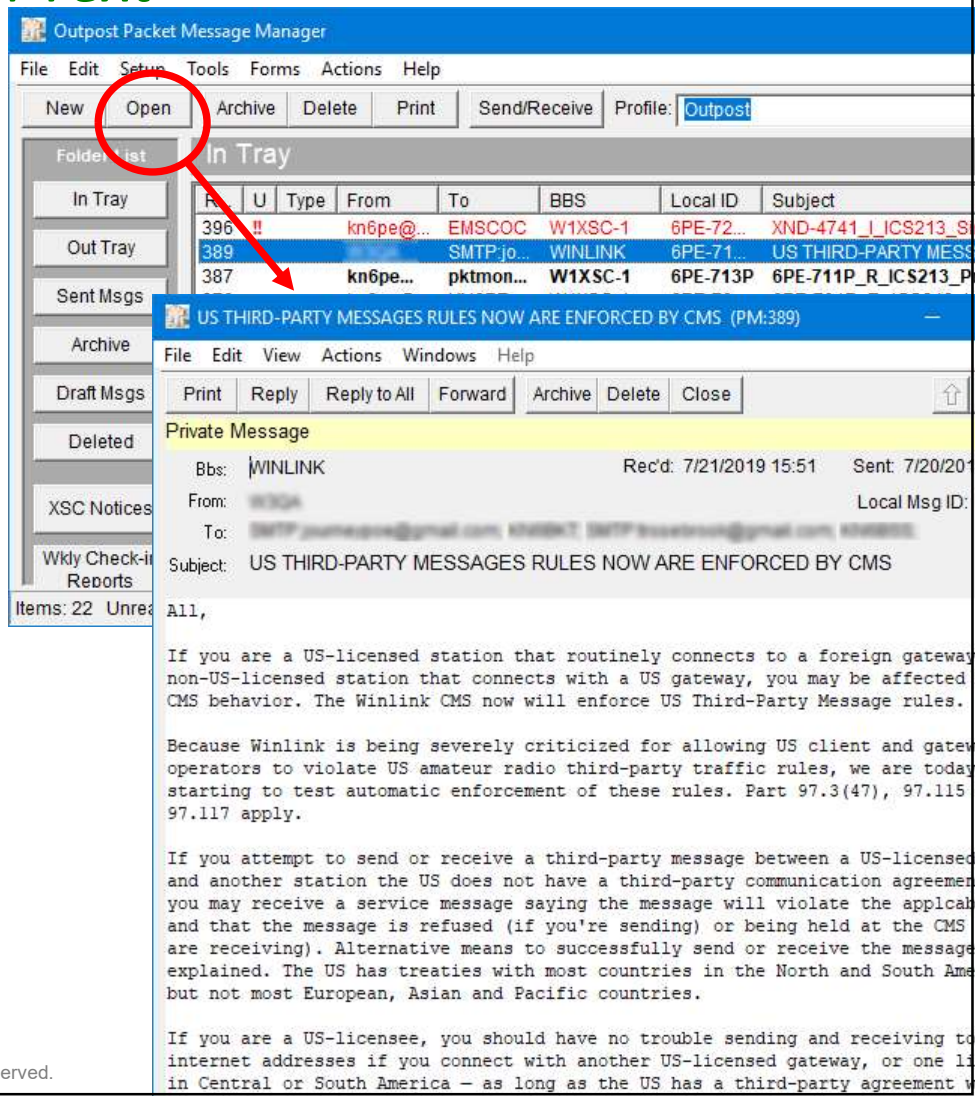
Working with messages

Viewing messages – Plain Text

- Supports viewing, printing, deleting or saving a message to a local file
- Reply and Forward message formatting
- To view a message,
  1. Highlight, then press Open, or
  2. Double-click on a message



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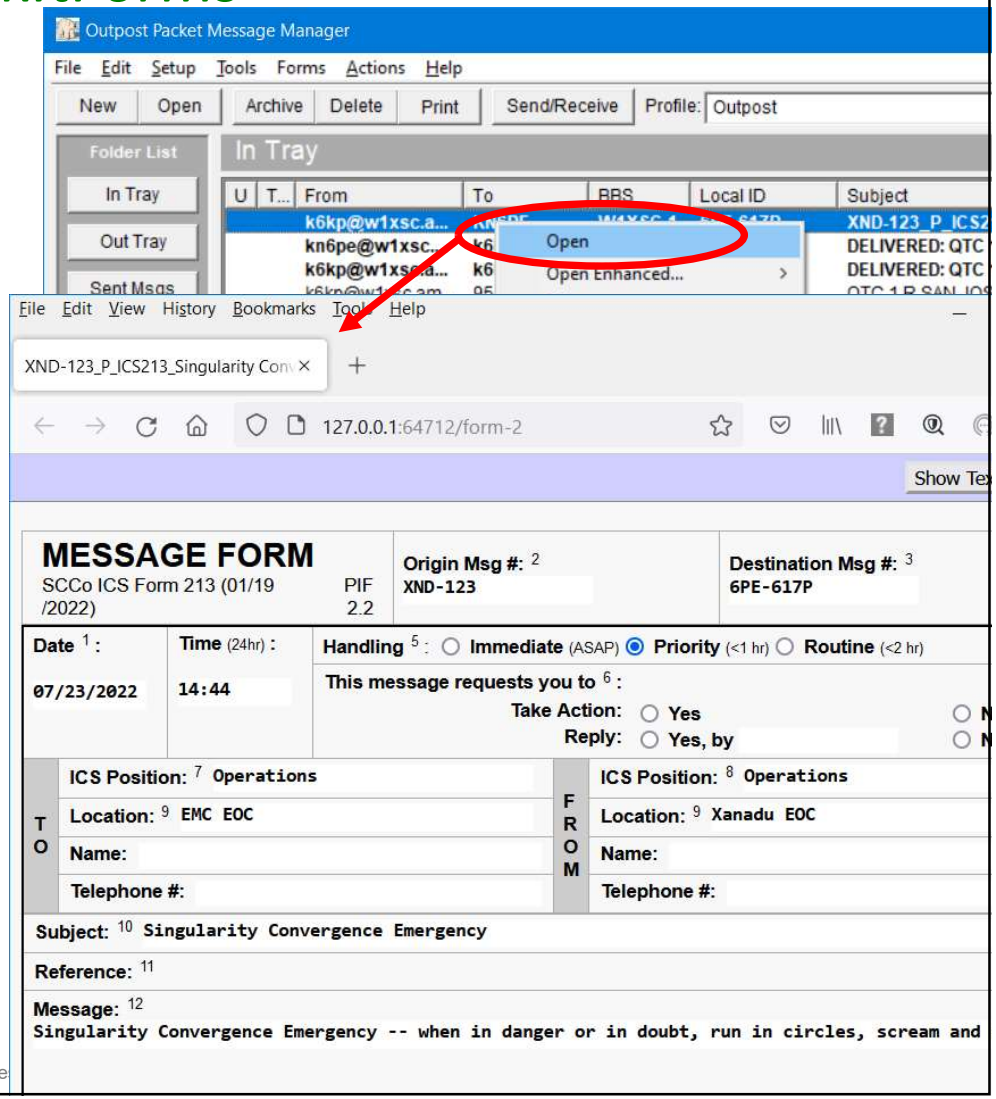
Working with messages

Viewing messages – PackItForms

- What if it is a PackItForm?
- To view a message,
  1. Highlight a PackItForms message, then press Open, or
  2. Right-click to open the popup menu



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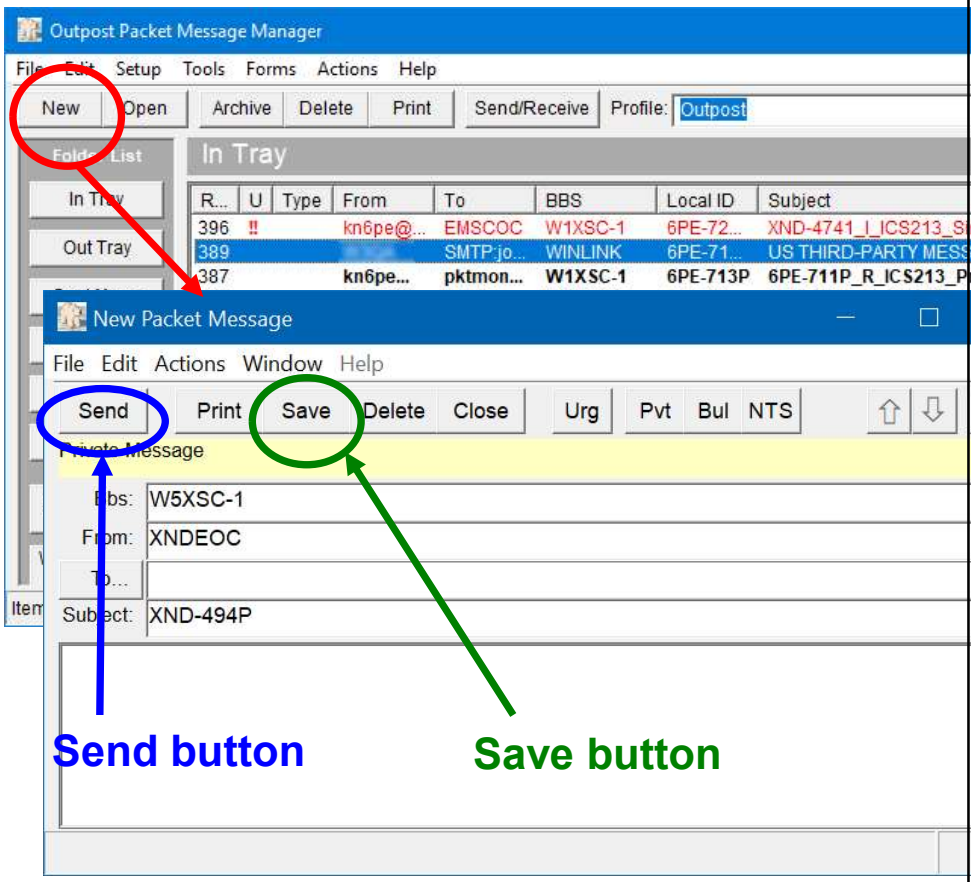
Working with messages

Creating messages

- Start a new message:
  1. Press New
  2. Fill in all remaining fields
- Multiple message sourcing options
  1. Free-form: what you see is what you get
     - Supports TAB characters thereby reducing the character count
  2. Cut and Paste from other apps, like notepad, Excel
  3. Import .csv files
  4. Import text files directly into the message form
  5. Press **Send** or **Save** when done



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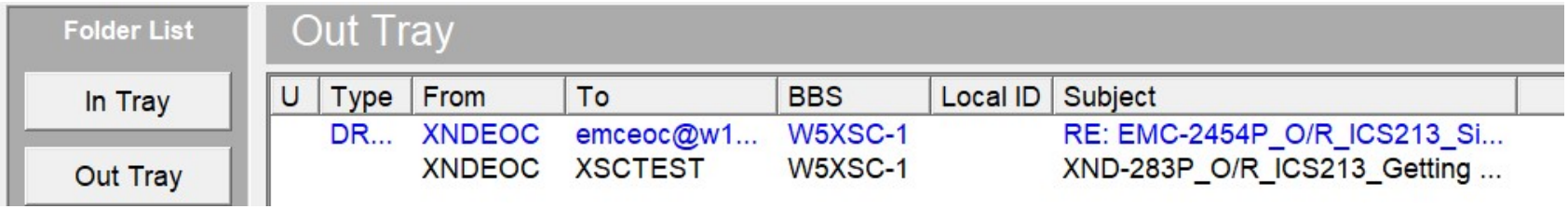
Watch out for Drafts

Creating messages



- If you click "**Save**", the message is saved as a DRAFT and will not be sent
  - The blue highlighted text means it is a DRAFT message
  - Lose your Saved Message? Check the Draft Folder
- If you click "**Send**", the message will be saved, and
  - A black text entry means it is ready to be sent
- Check the **Out Tray** after a **Send/Receive** to make sure your messages were sent

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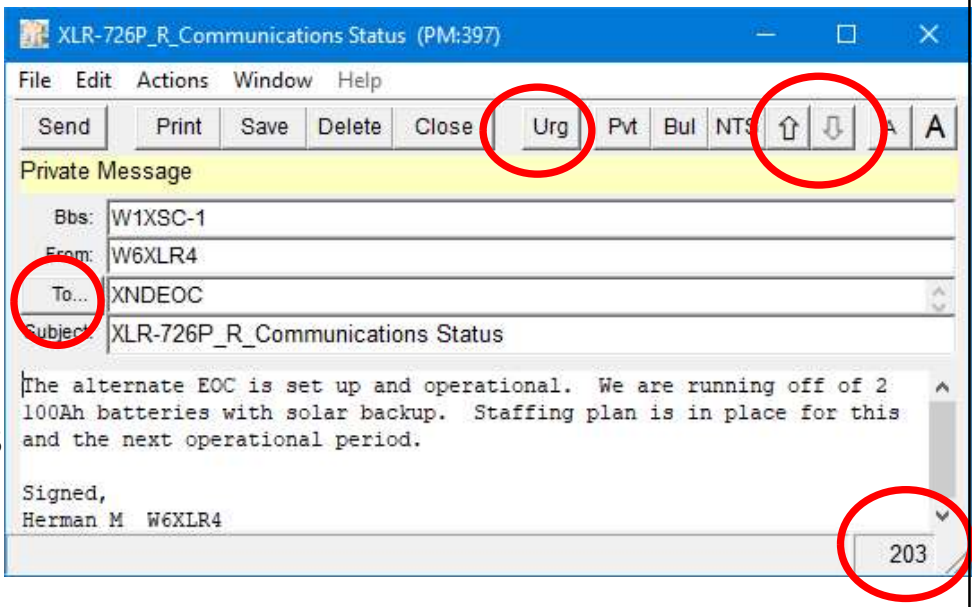
Message form specifics

Creating messages

- Message character counter
  - Watch when preparing large messages… this is a shared channel
- Moving between messages
  - Up/Down arrows allow easy movement to previous or next message
- Urgent Message
  - Flags a message as urgent and displays in **RED** at the receiving station
- Address Book entries
  - Press To: button to select previously defined address book entries



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Outpost Workflow

How it Gets Done

1. On Outpost: press “New” to create a new message
2. On the Message Form
   - Compose the message. Fill in all blank fields
   - Press “**Send**” – message is moved to Out Tray
     (Press “**Save**” to store to the **Draft Msgs** folder)
3. On Outpost: Press “Send/Receive”
   - Looks for and sends messages from the **Out Tray** for this *User* and *BBS*
   - When sent, message is moved to the **Sent Msgs** folder
   - Checks for and retrieves new messages, places them in bold in **In Tray**
4. Read and handle new messages
5. Print, Delete, Archive, or move messages to a folder as needed
   - Deleted messages are automatically moved to Deleted Messages folder

If you think there is a problem with a message, refer the message to your Shift Supervisor for resolution

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Outpost do's and don'ts

- DO…
  - Keep your message short enough to communicate what needs to be passed… same as a voice message
  - Be Patient; after your message is downloaded by the recipient, they will send a delivery receipt. Then you will retrieve it on your next Send/Receive session.
- DON'T…
  - Continuously press Send/Receive to check for a reply. This ties up the channel needlessly.
  - If a message was not acknowledged:
    - Check the message address and BBS
    - Resend the message if needed
    - Let your supervisor know

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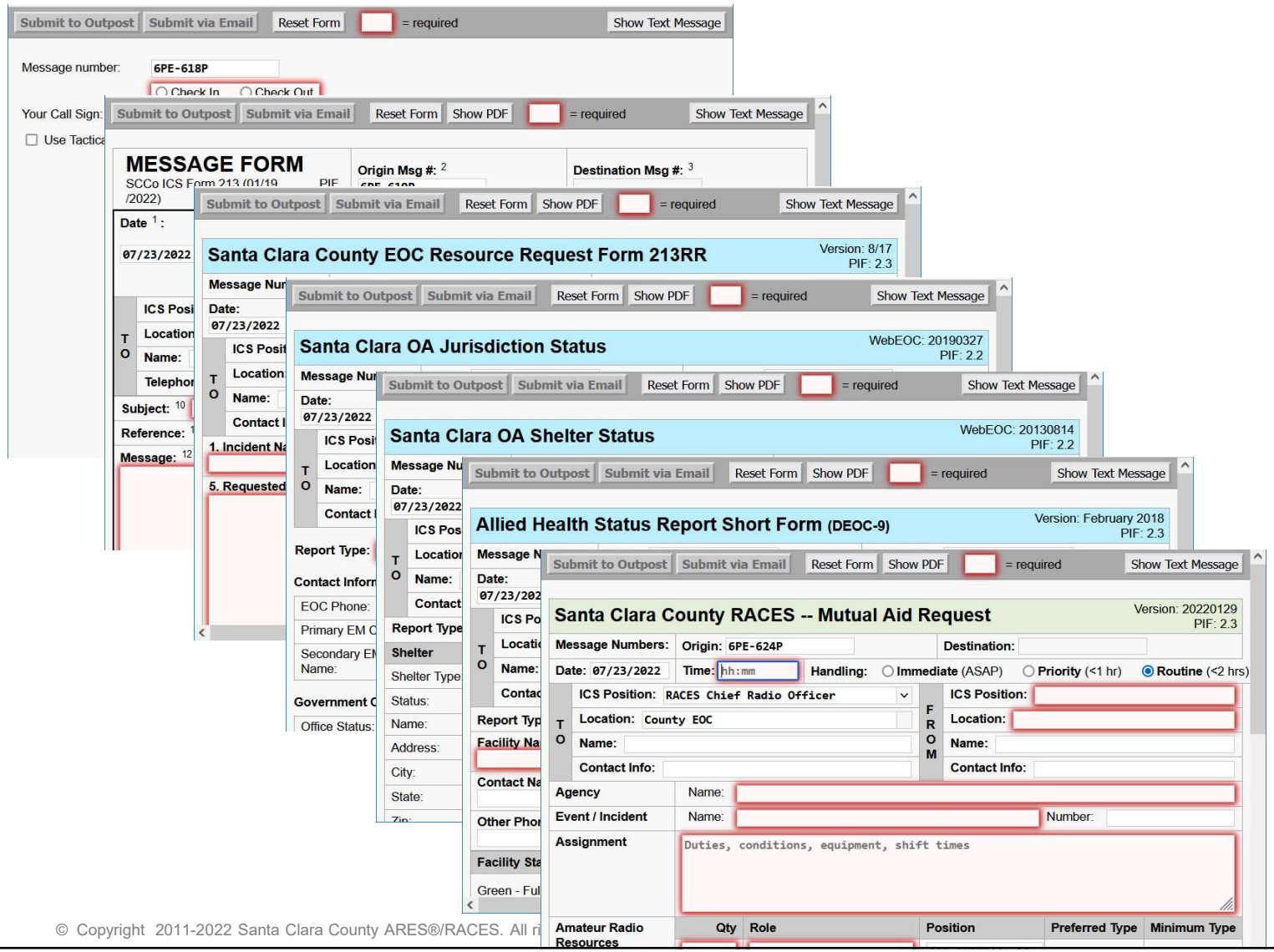
PackItForms



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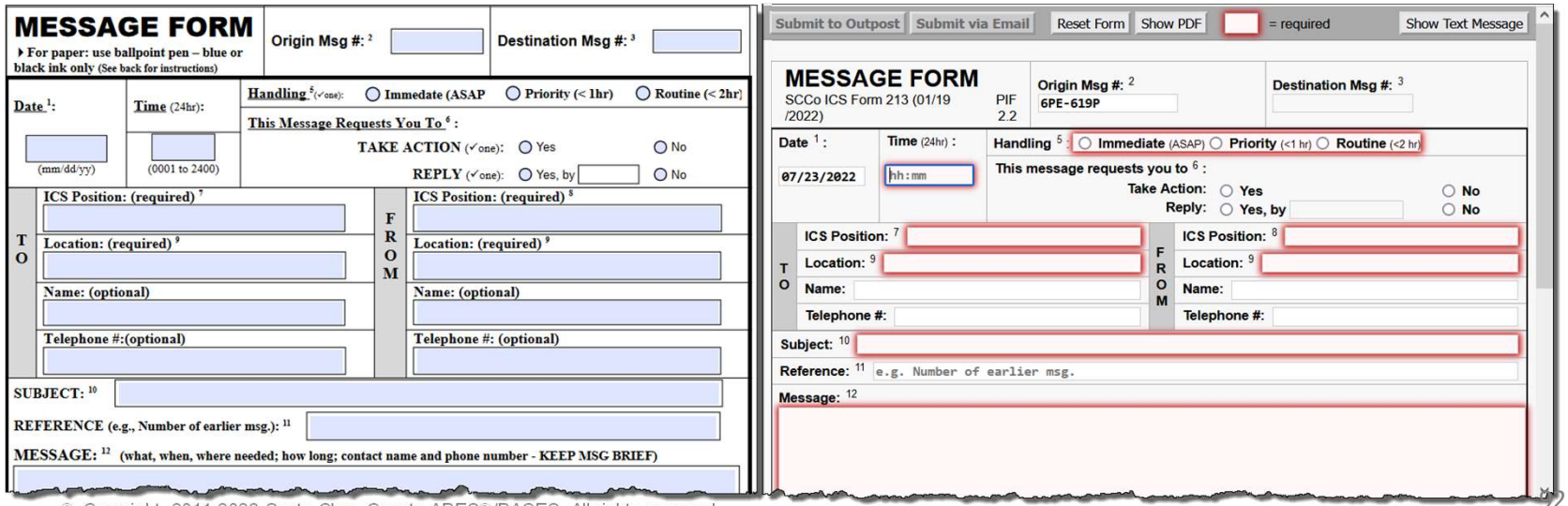
Introduction to PackItForms

- PackItForms are an enhanced tool for forms-based messaging and supports sending Santa Clara County forms by packet radio
  - Minimizes data actually sent
  - Web tool to “fill in the blanks”
  - Code to extract the text information from the forms into a string of ASCII text data that contains the form information



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County Use of PackItForms

- Santa Clara County PackItForms contains these public forms
  1. *XSC Check-In/Out Message* Form
  2. *XSC ICS-213 Message* Form adapted for Santa Clara County to transmit messages.
  3. *XSC EOC-213RR Resource Request* Form – Requests specific resources needed to support an emergency.
  4. *XSC OA Jurisdiction Status* Form – Reports jurisdiction emergency situation status to county OEM.
  5. *XSC OA Shelter Status* Form – Reports information and status on shelters opened in the cities to county OEM.
  6. *XSC Allied Health Facility Status* – Reports information & status of private Skilled Nursing facilities to SCC Public Health Department.
  7. *XSC RACES Mutual Aid Request* Form used by a jurisdiction to request a RACES Mutual Aid.
- The SCC Installer program automatically installs these packet forms along with Outpost.
  - Additional forms may be provided by your EC

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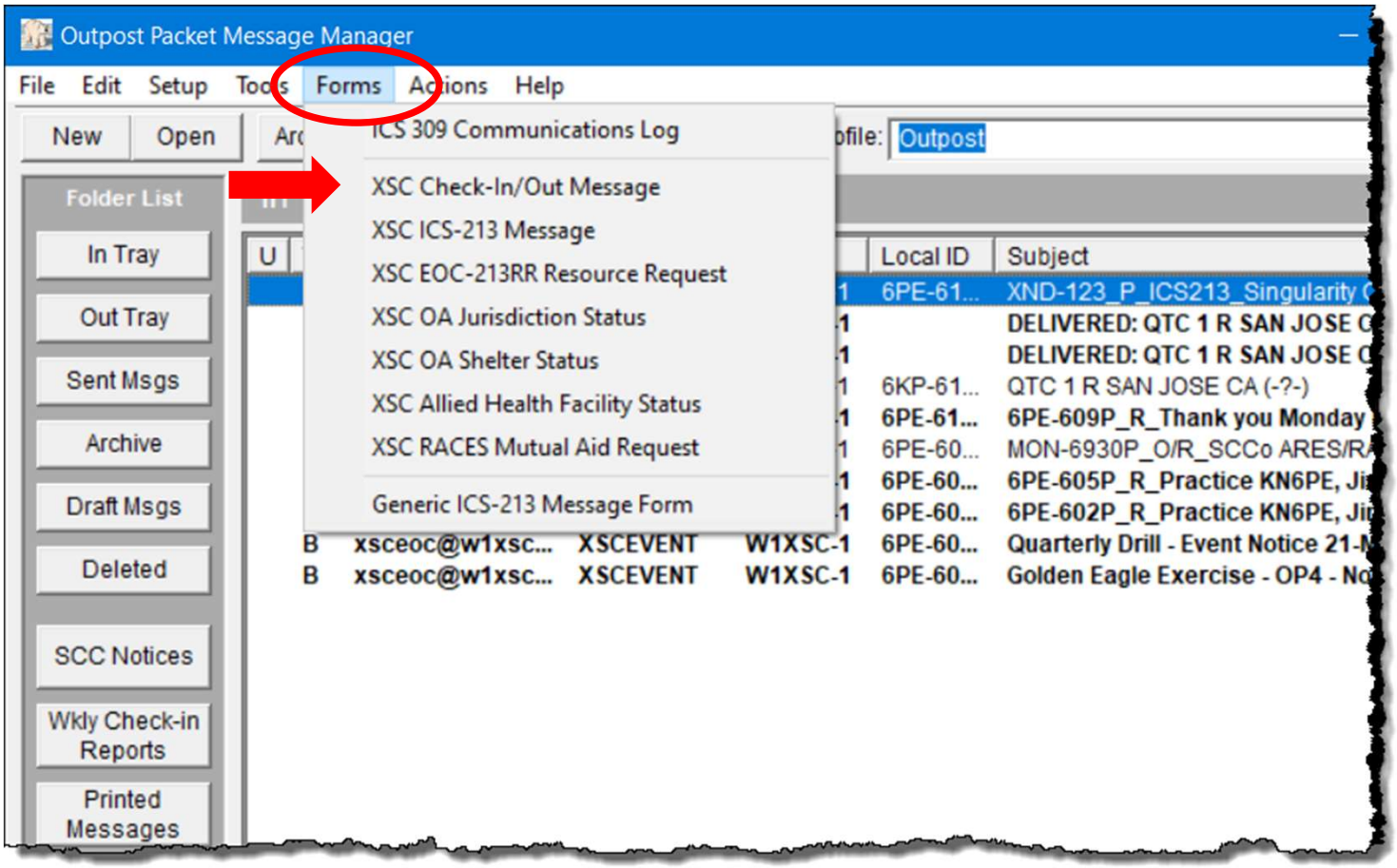
PackItForms and Outpost



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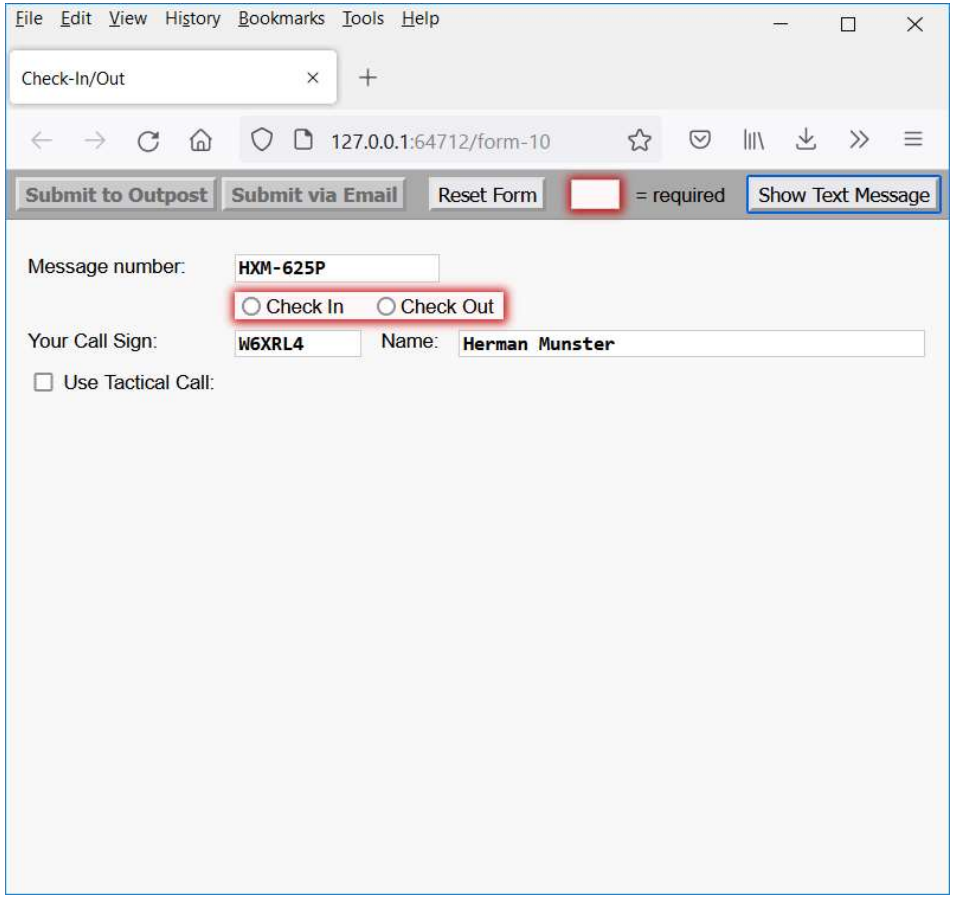
XSC Check-In/Out Message



- For check-in and check-out messages
- Most fields are automatically filled in
  - Message Number
  - Call Sign
  - Name

  If **Use Tactical Call** is checked,
  - Tactical Call
  - Tactical Name

- Make your selections:
  - Check-in or Check-out
  - Use Tactical Call

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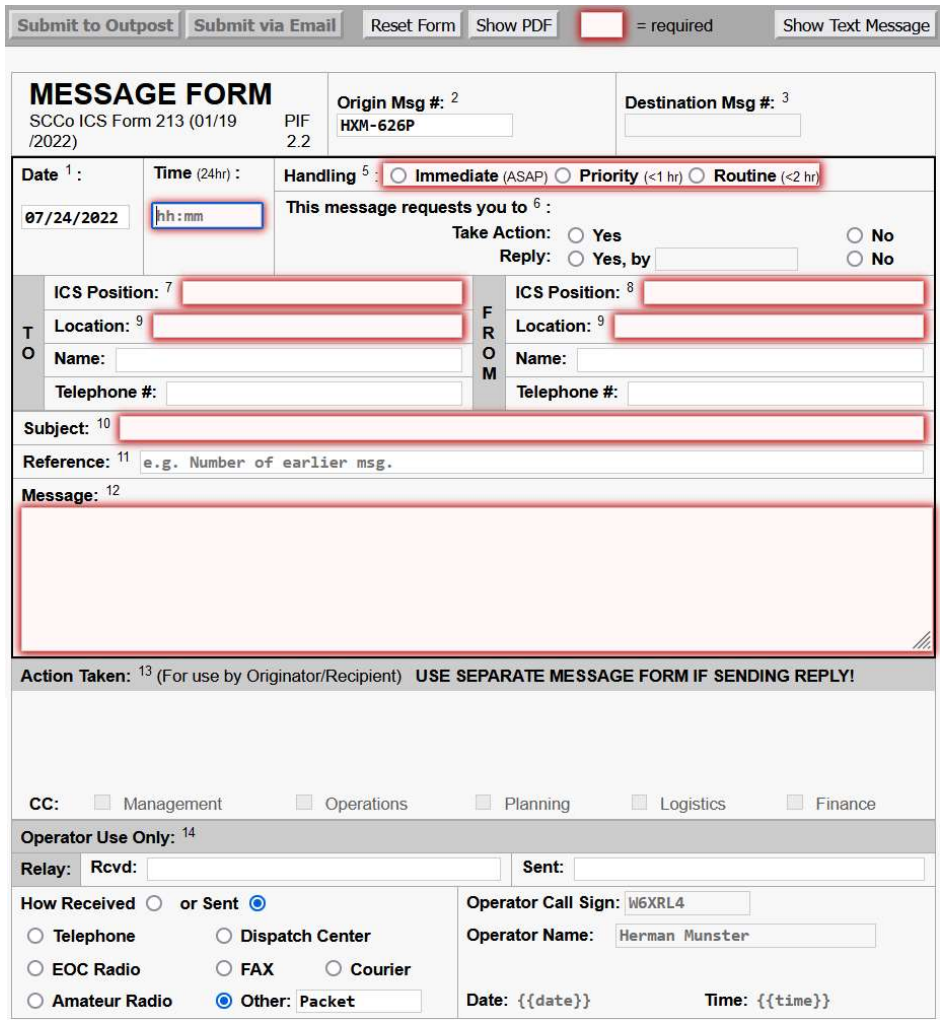
XSC ICS 213 Message Form



- SCC IS 213 Message Form
- *Updated Form fields!*
  - Message Number Fields
- Paper form should come to you already filled out
  - If you have to fill it out, have the originator review and initial it
- <u>For drills</u>, fill in the blanks just like the paper version
- No need for 5 words per line
- Replies to a received message must have the original message number in the reference line

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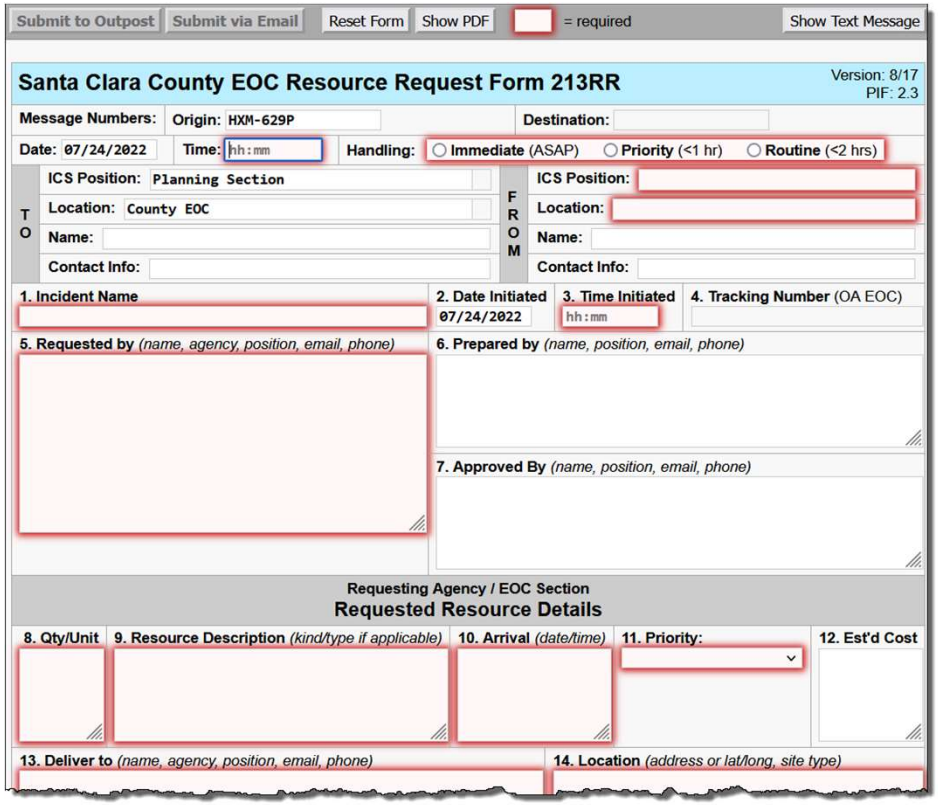
XSC EOC Resource Request 213RR



- For material, equipment, and staff requests, never for RACES Mutual Aid
- *New form defaults!*
  - To ICS Position: ***Planning Section***
  - To Location: ***County EOC***

  Note! Fields can be changed at message create time
- Paper form should come to you already filled out
- Should answer
  - What do you need
  - Who needs it
  - Where do you need it
  - When do you need it
  - How long do you need it
  - How do you get there

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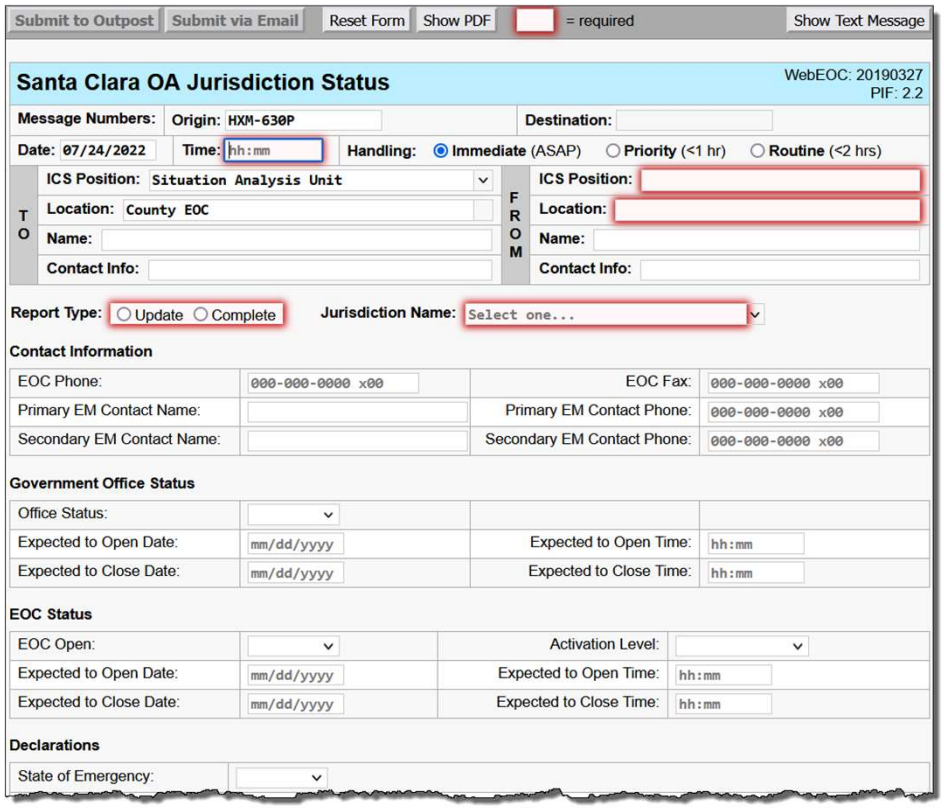
XSC OA Jurisdiction Status Report



- For jurisdiction status & incident reporting to County EOC
- *New form defaults!*
  - Handling Order: ***Immediate***
  - To ICS Position: ***Situation An…***
  - To Location: ***County EOC***

  Note! Fields can be changed at message create time
- Paper form should come to you already filled out
- Replaces the City Scan form

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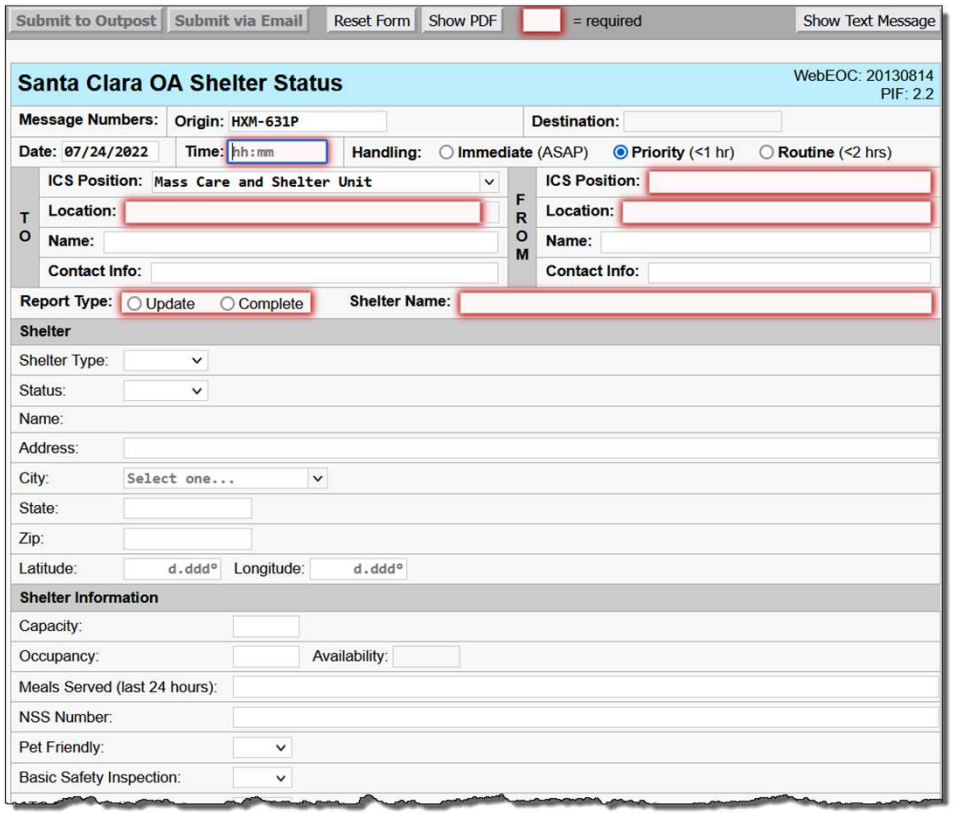
XSC OA Shelter Status Report



- For local shelter status reporting
- *New form defaults!*
  - Handling Order: ***Priority***
  - To ICS Position: ***Mass Care and…***

Note! Fields can be changed at message create time

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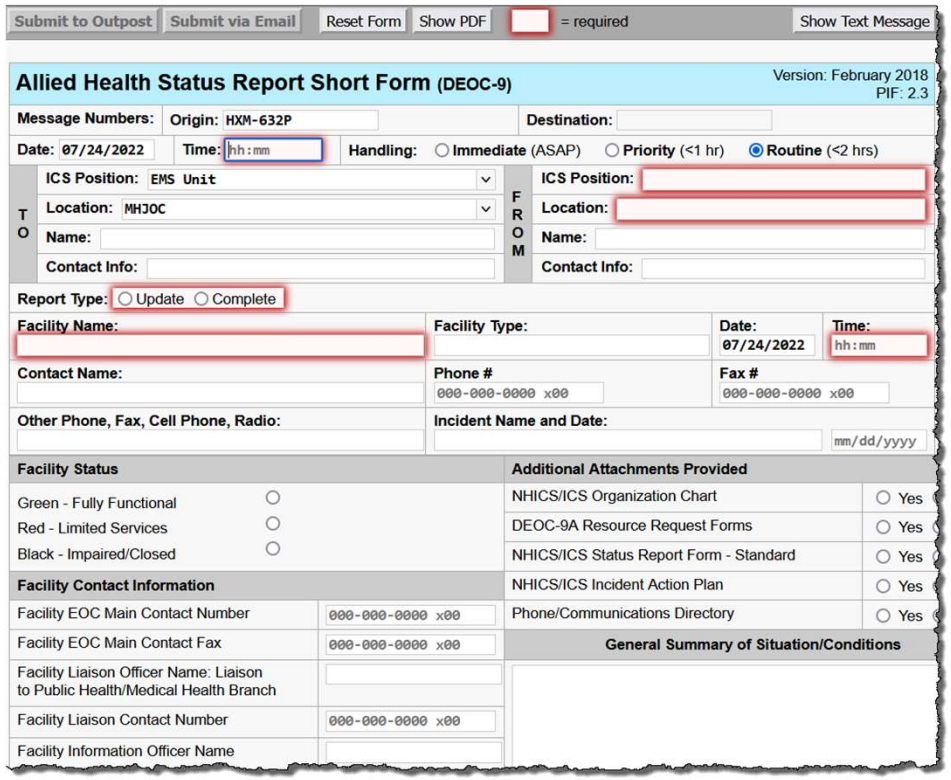
XSC Allied Health Status Report



Submit to Outpost | Submit via Email | Reset Form | Show PDF | = required | Show Text Message

Allied Health Status Report Short Form (DEOC-9) Version: February 2018 PIF: 2.3

Message Numbers: Origin: HXM-632P Destination:

Date: 07/24/2022 Time: hh:mm Handling: ○ Immediate (ASAP) ○ Priority (<1 hr) ◉ Routine (<2 hrs)

TO: ICS Position: EMS Unit; Location: MHJOC; Name:; Contact Info:

FROM: ICS Position:; Location:; Name:; Contact Info:

Report Type: ○ Update ○ Complete

Facility Name: | Facility Type: | Date: 07/24/2022 | Time: hh:mm

Contact Name: | Phone # 000-000-0000 x00 | Fax # 000-000-0000 x00

Other Phone, Fax, Cell Phone, Radio: | Incident Name and Date: mm/dd/yyyy

Facility Status		Additional Attachments Provided	
Green - Fully Functional	○	NHICS/ICS Organization Chart	○ Yes
Red - Limited Services	○	DEOC-9A Resource Request Forms	○ Yes
Black - Impaired/Closed	○	NHICS/ICS Status Report Form - Standard	○ Yes
		NHICS/ICS Incident Action Plan	○ Yes
		Phone/Communications Directory	○ Yes

Facility Contact Information	
Facility EOC Main Contact Number	000-000-0000 x00
Facility EOC Main Contact Fax	000-000-0000 x00
Facility Liaison Officer Name: Liaison to Public Health/Medical Health Branch	
Facility Liaison Contact Number	000-000-0000 x00
Facility Information Officer Name	

General Summary of Situation/Conditions

- For skilled nursing facility status reporting
- *New form defaults!*
  - Handling Order: ***Routine***
  - To ICS Position: ***EMS Unit***
  - To Location: ***MHJOC***
  - ***Note!*** Fields can be changed at message create time
- Hand off SCC Public Health Department

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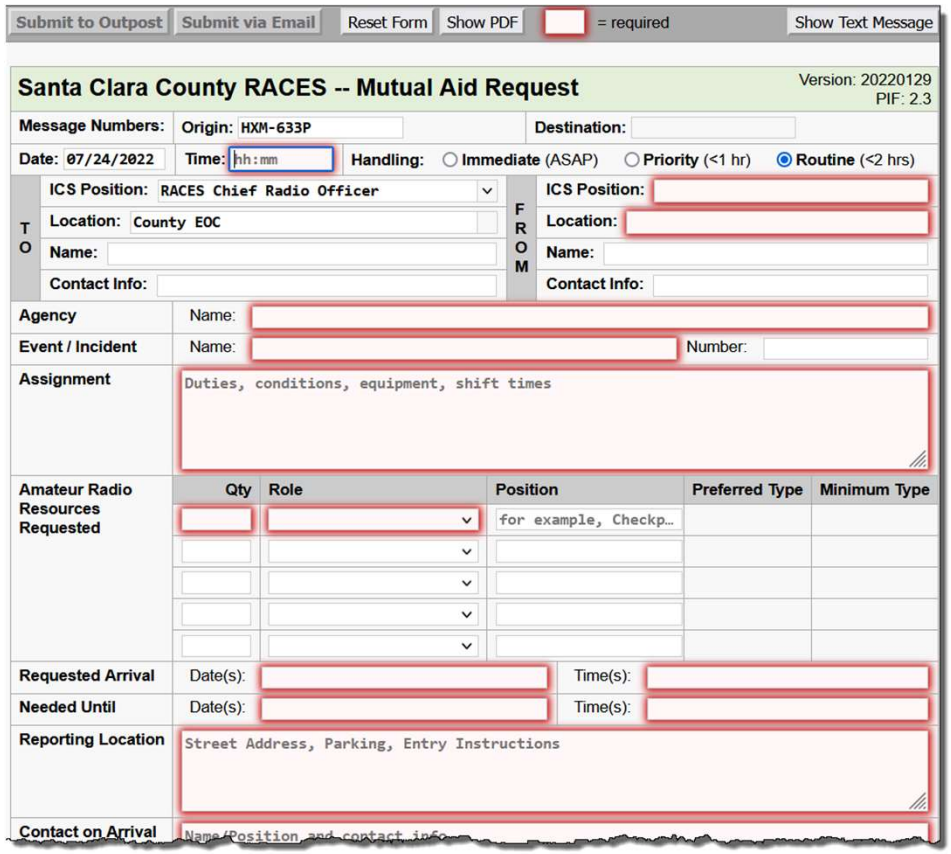
XSC RACES Mutual Aid Request



Submit to Outpost | Submit via Email | Reset Form | Show PDF | = required | Show Text Message

Santa Clara County RACES -- Mutual Aid Request

Version: 20220129
PIF: 2.3

Message Numbers:	Origin: HXM-633P	Destination:	
Date: 07/24/2022	Time: hh:mm	Handling: ○ Immediate (ASAP) ○ Priority (<1 hr) ◉ Routine (<2 hrs)	

TO		FROM	
ICS Position:	RACES Chief Radio Officer	ICS Position:	
Location:	County EOC	Location:	
Name:		Name:	
Contact Info:		Contact Info:	

Agency	Name:			
Event / Incident	Name:		Number:	
Assignment	Duties, conditions, equipment, shift times			

Amateur Radio Resources Requested	Qty	Role	Position	Preferred Type	Minimum Type
			for example, Checkp…		

Requested Arrival	Date(s):		Time(s):	
Needed Until	Date(s):		Time(s):	
Reporting Location	Street Address, Parking, Entry Instructions			
Contact on Arrival	Name/Position and contact info			

- For RACES Mutual Aid requests only
- *New form defaults!*
  - Handling Order: ***Routine***
  - To ICS Position: ***RACES Chief…***
  - To Location: ***County EOC***
  - ***Note!*** Fields can be changed at message create time
- For jurisdiction material, equipment, and staff requests, use the ICS 213RR form.

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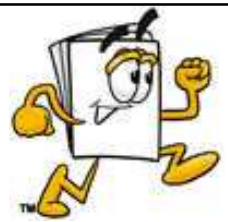
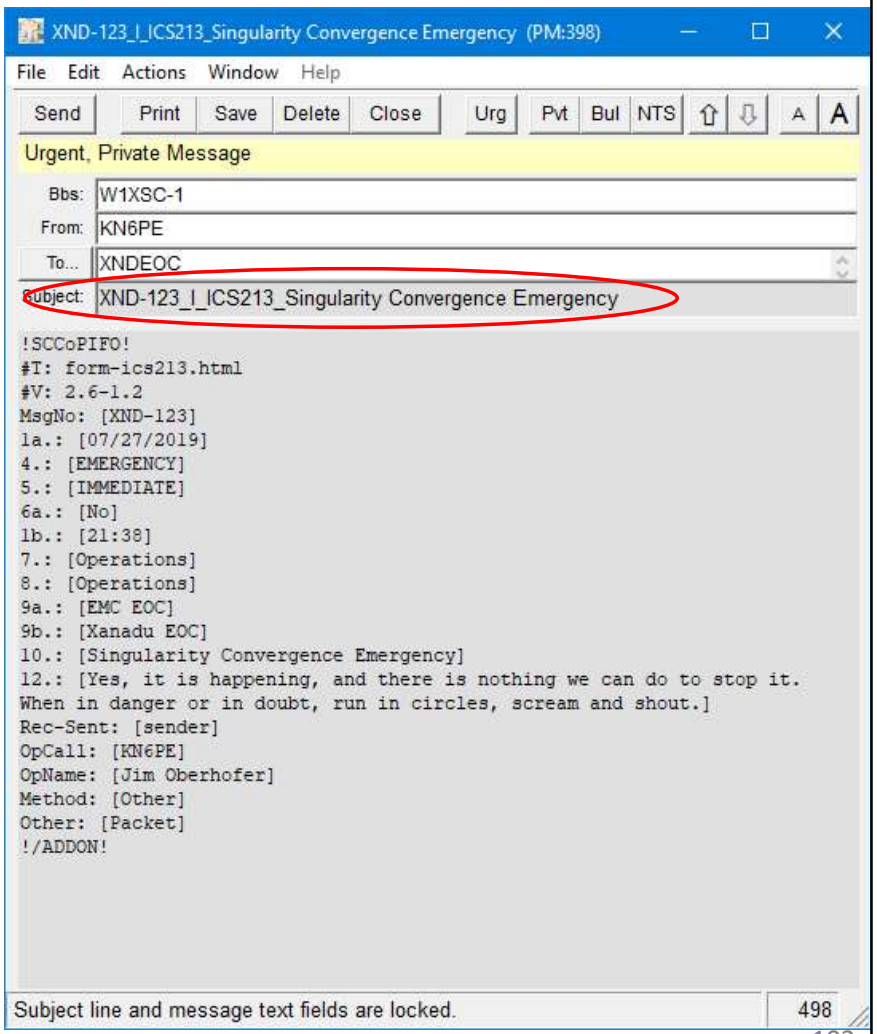
What Really Gets Sent



- PackItForms creates the Outpost subject line automatically
- Subject line and message body are locked (grayed out); cannot be changed.
- If you need to make changes,
  - Open (or double-click on) the message in Outpost
  - it will open in the Browser and now can be updated,
  - Then press “Submit to Outpost” to resubmit the updated message.



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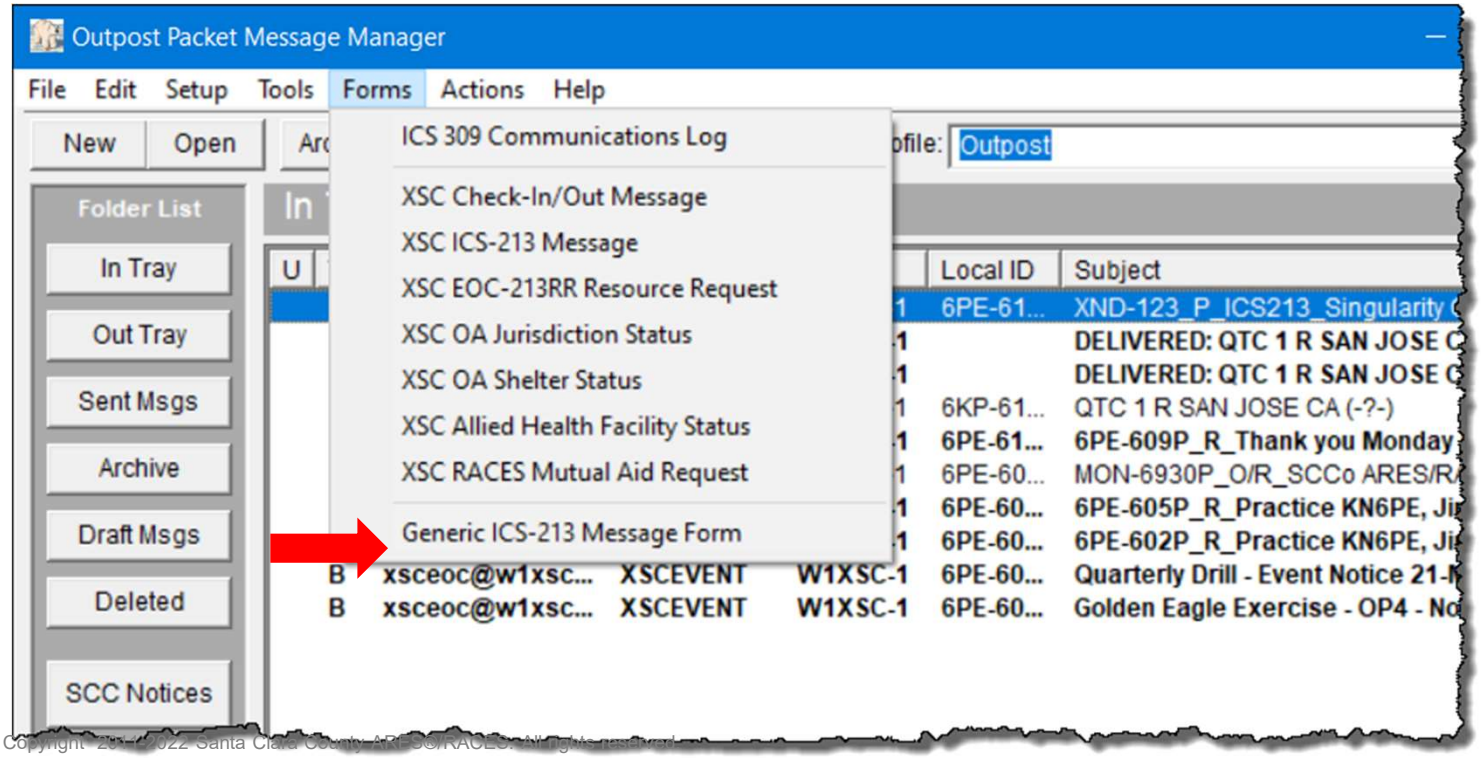
Generic ICS-213 Form

- Use XSC ICS-213 Message Form in Santa Clara County
- Use Generic ICS-213 Message Form elsewhere
  - Communications to/from Regional EOC
  - Communications to/from other county EOCs



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WRAP UP

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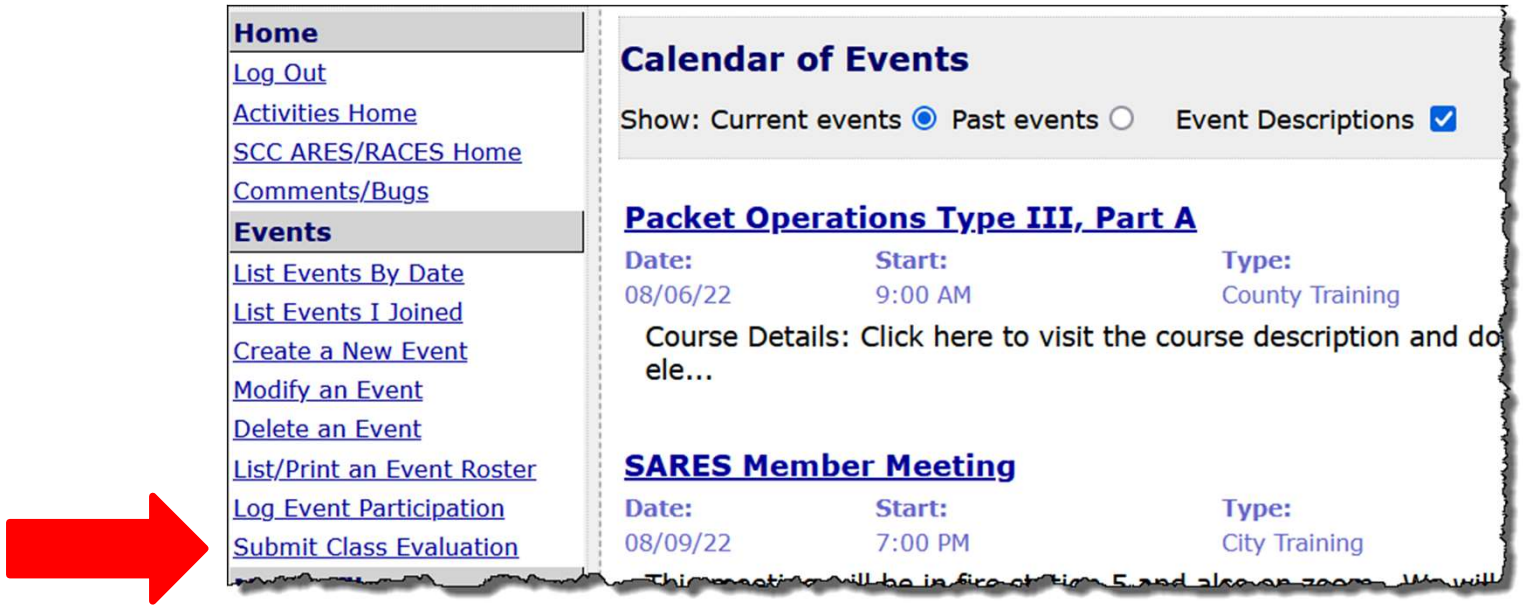
Final Assignment

- Online Class Evaluation
  - Log into https://www.scc-ares-races.org/activities/events.php
    Click “Submit Class Evaluation” in Events



  - Submit your evaluation as soon as possible... after 1 week, the form will no longer be available for this class!

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HOMEWORK!

- Complete the following tasks before attending the next class.
  1. Familiarize yourself with entire SCCo ARES/RACES Packet web page
     - http://www.scc-ares-races.org/data/packet
  2. Join the scc-packet group (packet@scc-ares-races.groups.io)
  3. Install Outpost and review the settings menus
  4. **Read and Understand the "Packet Network Addressing" web page**
     - **http://www.scc-ares-races.org/data/packet/packet-addressing.html (linked from main packet page)**
     - **Use packet groups.io for questions**
  5. From your packet station
     - Connect to your primary BBS and send yourself a message
     - Download, save, read and understand the SCCo Notices
     - Check in to the Mon/Tue packet net (see the SCCo packet web page)
  6. And, complete the SCC Packet Exercise Workbook!

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SCCo RACES Packet Exercise Workbook

2022 edition

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For Your Information

- Download SCC Notices into Outpost
  - Store in Archive folder to save for reference

    Check-In/Out

    Frequencies (and BBS's)

    Subject Line Format

    Tactical Calls

    Weekly Packet Practice

    XSC Tactical Calls

- Force a one time SCC Notice download
  - Actions -> Force one-time bulletin retrieve

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For Your Information

- These documents are recommended for your Go Kit
  - Packet Frequencies and BBS Assignments
  - Outpost Configuration Settings
  - Message Addressing
  - Standard Subject Line Format

- Download and print out a hardcopy

http://www.scc-ares-races.org/data/packet

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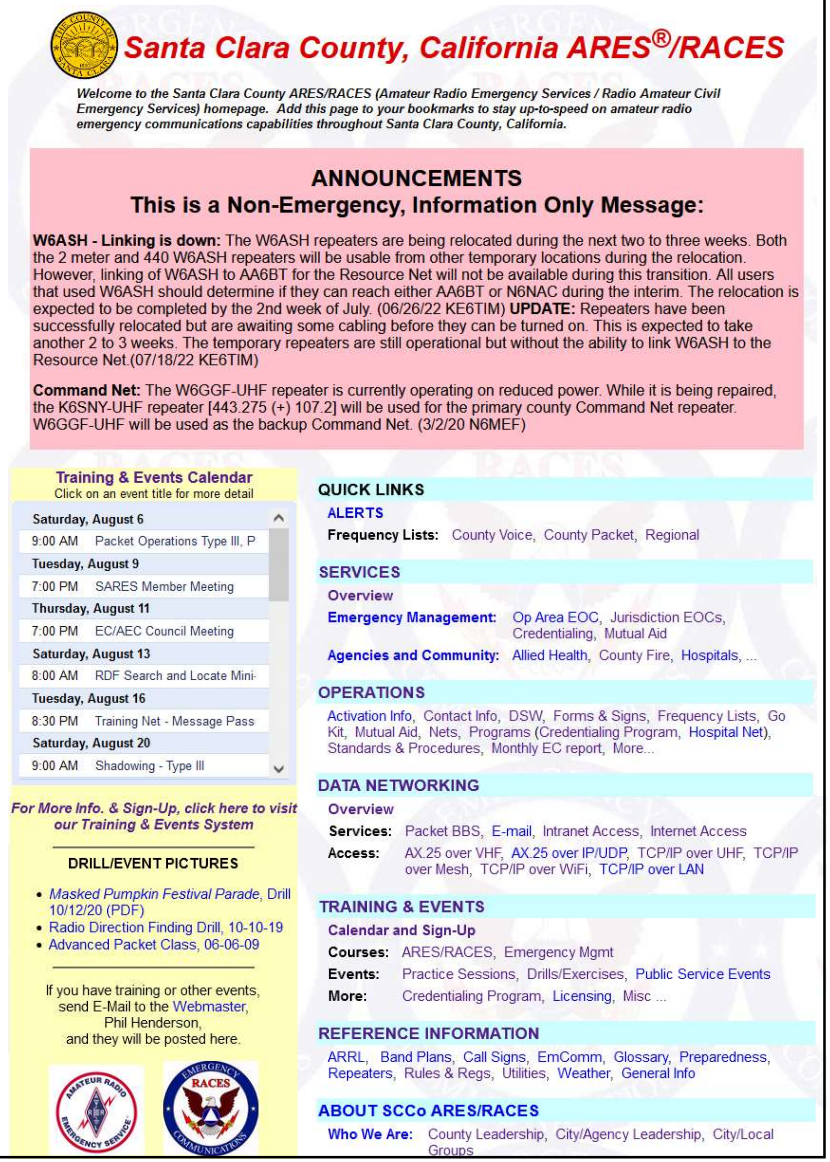
Stay Current, Stay Informed

- Visit the County web site often
- Check the Announcement space
- Check the Packet page
- Check for updates often
- Take personal responsibility for keeping yourself and your equipment up-to-date

- Join the SCC-Packet group

packet@scc-ares-races.groups.io

Keep your equipment, software, and yourself up to date



Santa Clara County, California ARES®/RACES

Welcome to the Santa Clara County ARES/RACES (Amateur Radio Emergency Services / Radio Amateur Civil Emergency Services) homepage. Add this page to your bookmarks to stay up-to-speed on amateur radio emergency communications capabilities throughout Santa Clara County, California.

ANNOUNCEMENTS
This is a Non-Emergency, Information Only Message:

W6ASH - Linking is down: The W6ASH repeaters are being relocated during the next two to three weeks. Both the 2 meter and 440 W6ASH repeaters will be usable from other temporary locations during the relocation. However, linking of W6ASH to AA6BT for the Resource Net will not be available during this transition. All users that used W6ASH should determine if they can reach either AA6BT or N6NAC during the interim. The relocation is expected to be completed by the 2nd week of July. (06/26/22 KE6TIM) **UPDATE:** Repeaters have been successfully relocated but are awaiting some cabling before they can be turned on. This is expected to take another 2 to 3 weeks. The temporary repeaters are still operational but without the ability to link W6ASH to the Resource Net.(07/18/22 KE6TIM)

Command Net: The W6GGF-UHF repeater is currently operating on reduced power. While it is being repaired, the K6SNY-UHF repeater [443.275 (+) 107.2] will be used for the primary county Command Net repeater. W6GGF-UHF will be used as the backup Command Net. (3/2/20 N6MEF)

Training & Events Calendar
Click on an event title for more detail

Saturday, August 6
9:00 AM Packet Operations Type III, P
Tuesday, August 9
7:00 PM SARES Member Meeting
Thursday, August 11
7:00 PM EC/AEC Council Meeting
Saturday, August 13
8:00 AM RDF Search and Locate Mini-
Tuesday, August 16
8:30 PM Training Net - Message Pass
Saturday, August 20
9:00 AM Shadowing - Type III

For More Info. & Sign-Up, click here to visit our Training & Events System

DRILL/EVENT PICTURES

- *Masked Pumpkin Festival Parade*, Drill 10/12/20 (PDF)
- Radio Direction Finding Drill, 10-10-19
- Advanced Packet Class, 06-06-09

If you have training or other events, send E-Mail to the Webmaster, Phil Henderson, and they will be posted here.

QUICK LINKS
ALERTS
Frequency Lists: County Voice, County Packet, Regional

SERVICES
Overview
Emergency Management: Op Area EOC, Jurisdiction EOCs, Credentialing, Mutual Aid
Agencies and Community: Allied Health, County Fire, Hospitals, ...

OPERATIONS
Activation Info, Contact Info, DSW, Forms & Signs, Frequency Lists, Go Kit, Mutual Aid, Nets, Programs (Credentialing Program, Hospital Net), Standards & Procedures, Monthly EC report, More...

DATA NETWORKING
Overview
Services: Packet BBS, E-mail, Intranet Access, Internet Access
Access: AX.25 over VHF, AX.25 over IP/UDP, TCP/IP over UHF, TCP/IP over Mesh, TCP/IP over WiFi, TCP/IP over LAN

TRAINING & EVENTS
Calendar and Sign-Up
Courses: ARES/RACES, Emergency Mgmt
Events: Practice Sessions, Drills/Exercises, Public Service Events
More: Credentialing Program, Licensing, Misc ...

REFERENCE INFORMATION
ARRL, Band Plans, Call Signs, EmComm, Glossary, Preparedness, Repeaters, Rules & Regs, Utilities, Weather, General Info

ABOUT SCCo ARES/RACES
Who We Are: County Leadership, City/Agency Leadership, City/Local Groups

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Summary

- You should now understand
  - The role of a Packet Operator Type III
  - What packet is and why we use it
  - The Santa Clara County BBS network and BBS assignments
  - How to set up the baseline packet station
  - The use of Outpost and PackItForms

- Next Class – Packet III B
  - Operating Procedures
  - Troubleshoot a packet station
  - Bulletins and Message addressing
  - Send and receive PackItForms messages using Outpost

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Thank You!

Please complete the Course Evaluation
and packet exercise homework
on or before next Saturday!

If you have questions or feedback about this or other training activities, you can join our Training discussion group.
https://scc-ares-races.groups.io/g/packet

Make sure you're signed up for the second part:
Packet Type III, Part B

Questions, comments, suggestions?
kn6pe@arrl.net

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