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2017 Year End Summary, Update, Preview



Santa Clara County ARES®/RACES

Revised: 06-Dec-2017

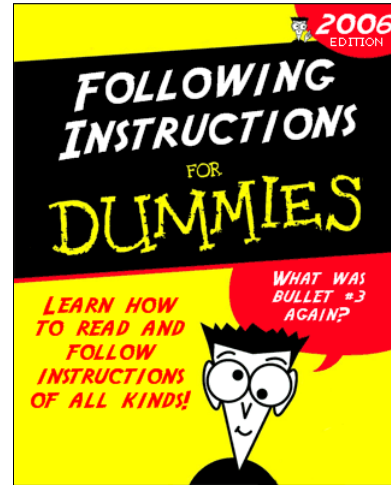
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Housekeeping

- Introductions
- Pen/pencil & paper
- Cell phones on silent or vibrate
- Side conversations
- Questions
- Refreshments
- Breaks
- Restrooms
- In case of emergency



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Agenda

- Net Control
- Message Passing
- Shadowing
- Repeater Linking Delays
- Packet Networking
- SCCo Data Network – The Next Phase
- District Emergency Coordinator – Year End Report
- High Power Performance Award



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Net Control

2017 Year End Summary, Update



Santa Clara County ARES®/RACES
Mark Laubach, K6FJC
Revised: 05-Dec-2017

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Agenda

- Update on California AB 1222 (aka AB 1785, Section 23123.5(f) CVC) and our mobile ham radio use
- Updates to Resource Net mobilization and de-mobilization resource tracking
- Course-correcting for better net communications efficiency:
 - How to be a better Net participant
 - How to be a better NCO

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Update on California AB 1222 (reference material for post class study)

- Signed into law on 27 Sep 2017
 - Slightly amended, taking away the "specialized mobile radio..." association.
 - Press release <http://www.no1pc.org/handsfree/20170927-AB1222-SIGNED.pdf>
 - Intent stated: for phones, not for "trained or licensed professionals, such as utility workers, from using their mounted and [wired] two-way radios for brief communications with one another or dispatch. These devices do not possess the myriad distractions of cellular phones."
- The published Legislative analysis, which although not issued by the Attorney General's office as legal interpretation, does spell out the intent of the law - prohibit hand-held cellular call and text application.
 - [Analysis 1](#)
- A CHP enforcement memo, which comes not from the administrative side of things, but field operations, clarifying for their LEOs what should or should not be enforceable: don't bother with stops for mike use.
 - <http://www.no1pc.org/handsfree/CHPEnforcementMemo.pdf>

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AB 1222 Impact on Hams

- Since the last net control class, things are slightly better.
 - AB 1222 is still not stated crystal clear, and will likely not be improved in any near future.
 - Interpretation is still up to local jurisdictions.
- Opinions / interpretations are that:
 - Holding the active device (e.g. a handheld) by hand (still looks like a phone) is a violation.
 - Hand-held affixed to the vehicle with a speaker-mike is most likely OK.
 - Mounted mobile rig, using a wired hand microphone is most likely OK.
- Carrying a copy of the CHP memo in your vehicle is prudent.
- Visit Jim Aspinwall's (NO1PC) site for the most current summary and discussion:
 - <http://www.no1pc.org/handsfree/>

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Impact on Resource Net Level 3 H&W

- Before 2017, NCO would call out individual calls signs expecting an immediate response from the individual.
- Because of our state government, the 2017 NCO 3B course taught a new method: when NCO is ready for H&W they will make an announcement, and then you are to respond when you determine it is safe to do so.
 - Requires driving to a location where you can safely stop and make your H&W check-in.
- Since then, the law has been further clarified to the point where it seems to be ok (we're not lawyers) if you use a wired microphone attached to a mounted radio.
 - You still determine if it is safe and legal to respond while driving.
- NOTE: This likely will create a communications pile-up.

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Updates to Resource Net Travel Tracking

- Mobilization
 - Unchanged.
 - Will continue to use as is.
- Demobilization
 - Optional.
 - If you decide to use the net, check-in and continue to use until you reach your destination, and then check-out.
 - If you are not going to use the net, simply don't use it.
 - Avoid "check-in, check-out".

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How to be a Better Net Participant

- Observations and feedback, many comments of nets running slowly
 - Most often Resource Net Level 3 Travel Tracking during Mobilization
 - “Can’t check-in”, “can’t check-out”
- After review (including recordings), root causes include the following:
 - Some participants are not coming to the event prepared
 - Thoroughly read and follow any instructions for an event, including anything sent in email before or provided at the event -> prepare your mind.
 - Equipment: make sure it is programmed and all works before arriving.
 - Note: still be able to program your radio in any weather situation or time of day.
 - Show up on time: anticipate lead time for parking, staging, and start of briefings.
 - Net Control’s instructions are not being followed, creating repetition
 - If asking for reports, communicate just what was asked for, nothing more or less.
 - Reminder: if assigned a Tactical Call sign, your transmission is generally always:
 - “This is <Tactical Call> <message> <FCC Call Sign>”
 - The first second of a transmission is missing
 - With linked repeaters, press PTT and THEN WAIT AT LEAST A FULL SECOND before speaking!
 - Yaesu users: TURN OFF WIRES before transmitting anything!.

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How to be a Better Net Control

- The NCO sets the tone, pace, and efficiency of the Net
 - Be clear on any instructions to participants.
 - Be concise and terse, say no more, say no less, stick to net business.
 - Follow scripts and procedures.
 - Try to avoid repeating large portions of assignment instructions.
 - Leave sufficient pauses between messages
 - Need to allow for other participants to transmit as well as allow for emergency or priority traffic interruption.
- If the net has become inefficient, expect:
 - Some corrective suggestions and coaching (from supervisor, scribe, etc.).
 - A shift change, if other personnel are available.
 - A two-way debrief after the shift or event is over.
- All of us: important to course correct an inefficient net into a more efficient net: prepare and practice outside the classroom!


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Message Passing

2017 Year End Review, Update



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Don McKee, KE6DM
Revised: 05-Dec-2017

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Message Passing Fundamentals

The building blocks of the message passing process

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Follow the NTS Manual (plus SCo changes)

- Most of what we will cover comes from the ARRL NTS manual
 - Chapter 2 – Sending Messages on Voice
 - Print it out; keep it in your go kit; refer to it often
- A (very) few NTS procedures don't fit RACES situation where the message author and recipient are not radio operators
 - Example: "X" for end of sentence
- Santa Clara County RACES additions and/or exceptions adjust for our environment (FM simplex or repeaters) and fill in missing procedures
 - Punctuation, symbols, GPS coords, ...

W3YQ, v2: 04-5/02 P3CH APP. -B NTS HDG-SENDING ON VOICE P 2-1

CHAPTER 2 - SENDING MESSAGES ON VOICE

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Symbols

- The NTS manual does not cover how to voice many symbols. SCo RACES will adopt the following standard:
 - "/" is spoken "slash"
 - Example: "... and/or ..." is spoken "... mixed group alpha november delta SLASH oscar romeo ..."
 - "+" is spoken "plus"
 - Example: "... +1-408-867-5309 ..." is spoken "... telephone figures PLUS one <pause> four zero eight <pause> eight six seven <pause> five three zero niner ..."
 - "-" depends on the context
 - "-" is spoken "minus" as part of a number
 - Example: "... -123 ..." is spoken "... figures MINUS one two three ..."
 - "-" is spoken "dash" when used as a dash
 - Example: "... w2xsc-1 ..." is spoken "... mixed group whiskey two x-ray sierra charlie DASH one ..."

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Symbols (cont.)

- **Reminder, voicing of “.” is context dependent:**
 - In a number, “.” is spoken “decimal”
 - Example: “... 146.475 ...”
 - Spoken: “... figures one four six DECIMAL four seven five ...”
 - In an email, packet, or internet address, “.” is spoken “dot”
 - Example: “... joe@host.com ...”
 - Spoken : “... email address juliet oscar echo atsign hotel oscar sierra tango DOT charlie oscar mike ...”
 - At the end of a sentence, “.” is spoken “period”
 - Example: “... Bring food. ...”
 - Spoken : “... bring food PERIOD ...”

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Message Passing Prowords

- Prowords are special words used to facilitate message passing by voice
- They are NOT written into the message
- Prowords can be grouped into three categories, depending on how they are used:
 - **Operational/Control Prowords**
 - Define the start, end, or control the flow of the message
 - **Clarification Prowords**
 - Always spoken after a group
 - Clarifies or emphasizes what was just said
 - **Introductory Prowords**
 - Always spoken before a group
 - Alerts receiving operator to what is coming next
- It is important to use each of them in the right place to avoid confusing the recipient and slowing down the message transfer

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Intro Proword: Figure(s)

- Identifies one or more numerals to follow
- Voice each digit separately
- A “.” is voiced “DECIMAL”

- A preceding “-” is voiced “MINUS”

- Examples:

- Written: Send 12 dozen jelly donuts right away
- Spoken: “Send FIGURES ONE TWO <pause> dozen jelly donuts right away”

- Written: Switch to frequency 146.115
- Spoken: “Switch to frequency FIGURES ONE FOUR SIX DECIMAL ONE ONE FIVE”

- Written: The temperature will dip to -10
- Spoken: “The temperature will dip to FIGURES MINUS ONE ZERO”

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Intro Proword: Telephone Figures

- Identifies a telephone number to follow
- Best to include area code for clarity

- Examples:

- Written: 408-555-1212, (408) 555-1212, or 408.555.1212
- Spoken: “TELEPHONE FIGURES four zero eight<pause> five five five <pause> one two one two

- Written: +8816-408-555-1212
- Spoken: “TELEPHONE FIGURES plus eight eight one six <pause> four zero eight<pause> five five five <pause> one two one two

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Intro Proword: GPS Coordinates

- Identifies a set of GPS coordinates to follow
- Used when a set of numbers contain one or more of the coordinate “marker” symbols:
 - ° (degrees), ‘ (minutes), “ (seconds)
 - N (north), S (south), E (east), W (west)
- Voice the “marker” symbols where they appear
 - But don’t add them, if not already part of written message.
- Include the word “AND” between the latitude and longitude parts.
- Send as a single “unit”, even if written across multiple “slots”
 - You may need to make adjustments to fit the “5 words at a time” rule
- If the numbers look like coordinates, but don’t contain any “marker” symbols, just send them as FIGURES.

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Intro Proword: GPS Coordinates (cont.)

- Examples:
 - Written: 41° 24.20’, 2° 10.44’
 - Spoken: “GEE-PEE-ESS COORDINATES four one DEGREES <pause> two four decimal two zero MINUTES <pause> AND <pause> two DEGREES <pause> one zero decimal four four MINUTES”
 - Written: 41°24’12.2”N 2°10’26.5”E
 - Spoken: “GEE-PEE-ESS COORDINATES four one DEGREES <pause> two four MINUTES <pause> one two decimal two SECONDS NORTH <pause> AND <pause> two DEGREES <pause> one zero MINUTES <pause> two six decimal five SECONDS EAST”

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Intro Proword: GPS Coordinates (cont.)

- Examples:

- Written: 32.30 N, 122.61 W
- Spoken: "GEE-PEE-ESS COORDINATES three two decimal three zero NORTH <pause> AND <pause> one two two decimal six one WEST"

- Written: 32.30°, -122.61°
- Spoken: "GEE-PEE-ESS COORDINATES three two decimal three zero DEGREES <pause> AND <pause> minus one two two decimal six one DEGREES"

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Problem Solving

How to handle the problems that will inevitably happen

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Proword Is Part of the Message

- What if a proword like “figures” is part of the message?
- Answer: Use “I spell”
- Examples:
 - Written: “The latest figures are encouraging.”
 - Spoken: “The latest figures I SPELL foxtrot india golf uniform romeo echo sierra <pause> are encouraging.”
 - Written: “Itemize 4 figures for each.”
 - Spoken: “Itemize FIGURE four <pause> figures I SPELL foxtrot india golf uniform romeo echo sierra <pause> for I SPELL foxtrot oscar romeo <pause> each.”

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Long Messages

- When you run out of room on the form when receiving a message:
 - Make it abundantly clear on page 1 that there is more than one page (“Page 1 of X”)
 - Use plain paper for subsequent page(s)
 - Number each subsequent page (“Page X of Y”)
 - All subsequent pages MUST include message number
 - Use only front of paper
 - Copying and/or scanning often misses the back of pages
 - Immediately staple or otherwise affix all pages together


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Shadowing

2017 Year End Review, Update



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 Don McKee, KE6DM
 Revised: 05-Dec-2017

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Shadow “First 5 Minutes” Checklist

- Inspired by Scott, K6SLB, who made something for his personal use.
- A “checklist” to remind you what to cover during your initial interview with your principal.
 - Who are you? Who is your principal?
 - What you CAN and CAN’T do.
 - Specific instructions from your principal.
 - Reconnect plan.
- Handy “tear off” tab for your contact information.
- Available on the “Shadowing – Type III” course description page

Shadow “First 5 Minutes” Checklist

Name, FCC Call Sign:	Service Call Sign:	Date and Time:
Event/Event Name:	Activation Number:	

1. Introduce yourself.
2. Principal (Name, Title, Contact Info): _____
3. Explain role of shadow, capabilities provided:
 - a. To ensure you can always be reached.
 - b. I am able to get information for you while you attend to other matters.
 - c. I can take messages for you at times you don't want to be interrupted.
 - d. No restrictions are limited to providing communications.
 - e. Any questions?
4. In addition to using my personal ham equipment, I can use principal/event supplied equipment, too
 - a. Mobile Phone Commercial Radio FIRE/EMS/ Other: _____
5. Roles and Responsibilities of principal: _____
6. Is there any specific message traffic, or particular events, that you would like to be kept informed about? _____
7. Reconnect plan if separated: _____
8. Principal's mobile phone number: _____

Tear Here - Give to Principal


Name: _____

Agency: _____

Phone: _____


Notes: _____

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Repeater Linking Delays

2017 Year End Review, Update

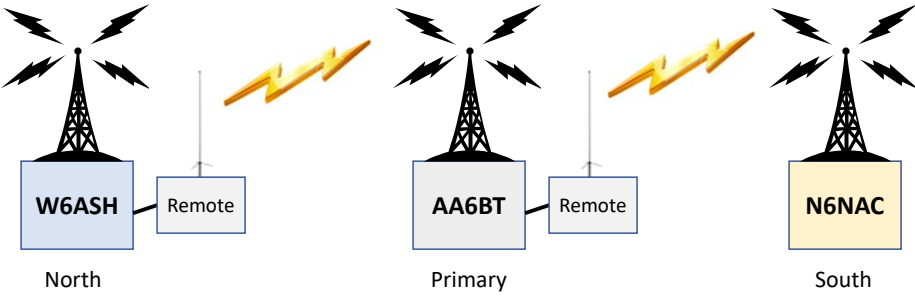


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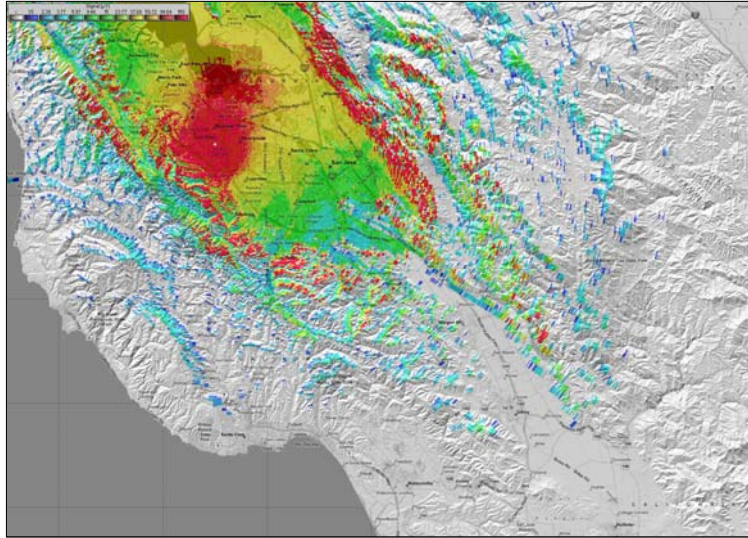
Repeater Delays when Linked

- Normally, the repeaters used for Resource Net are not linked
- When linked there is a delay -- **you need to allow for it**
- Max delay when sending from W6ASH to N6NAC (or reverse)



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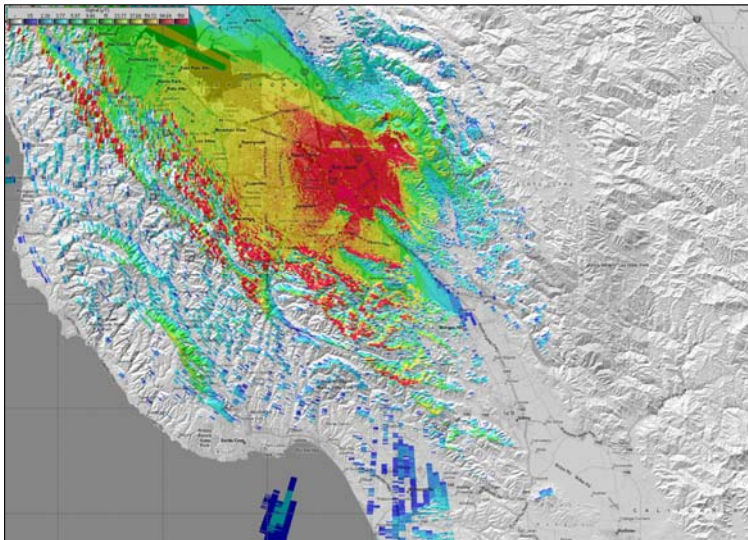
W6ASH Coverage (Resource Net North)



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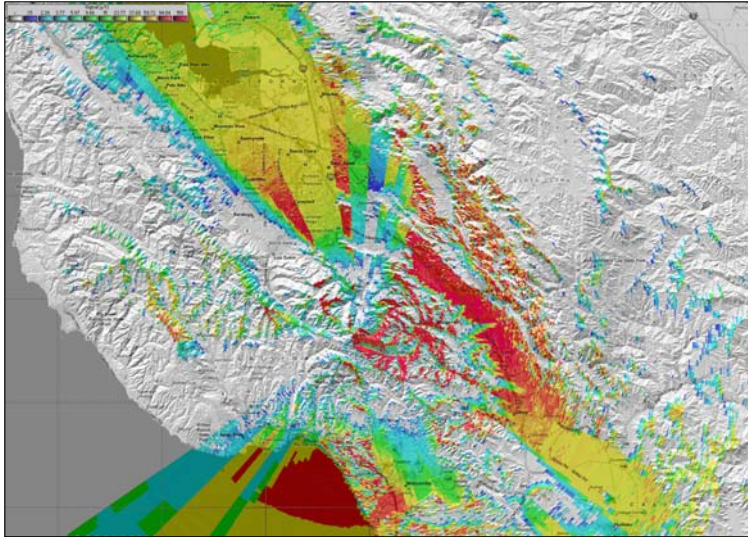
AA6BT Coverage (Resource Net Primary)



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N6NAC Coverage (Resource Net South)



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Linked Repeater Delay Examples

Resource Net level 1

N6NAC



AA6BT



W6ASH



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Linked Repeater Delay Examples

Resource Net level 3

AA6BT



N6NAC



NC calls K6PIG, K6PIG acknowledges
NC puts K6PIG back in assignment que, K6PIG acknowledges

NC calls K6GA, K6GA acknowledges
NC to K6GA with assignment, K6GA acknowledges
NC gives K6GA details of assignment, K6GA copies
NC gives travel directions

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Packet Networking

2017 Year End Review, Update

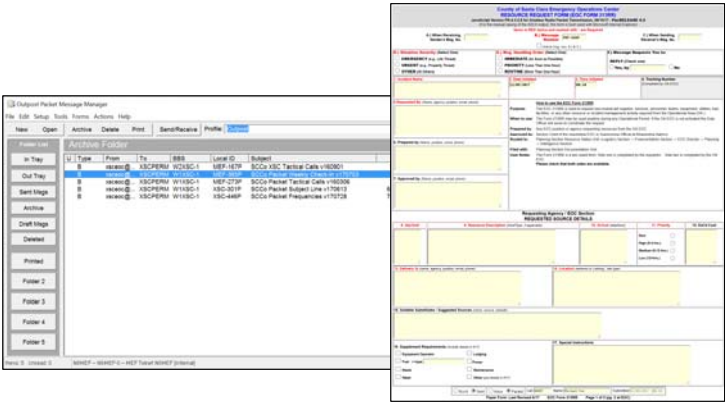


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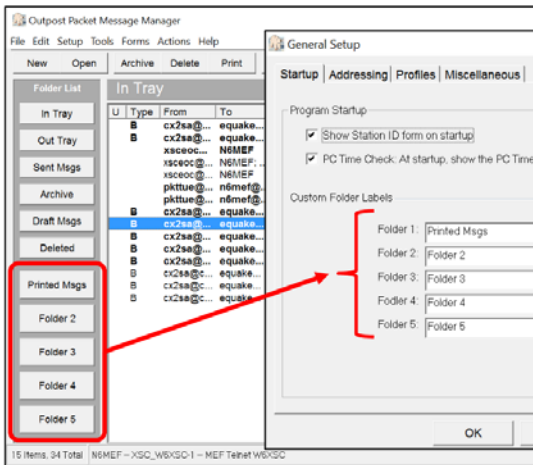
Outpost & PacFORMS
2017 Review, Updates

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User Configurable Folders

- Five more folders for managing the workflow
- Customize the labels
- Supports message drag and drop

Find it...
Tools > General Settings



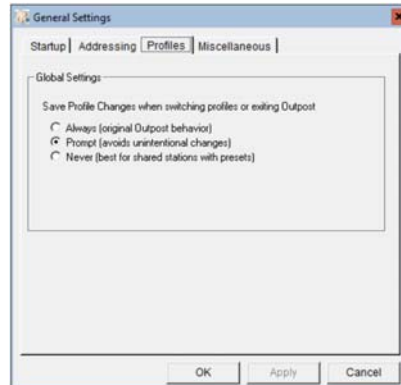
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Profile Locking

- Controls whether configuration changes are saved to the active profile when switching profiles or exiting Outpost
- “Always” is the original Outpost behavior
- “Prompt” avoids unintentional changes
 - SCCo default
- “Never” is best for EOCs

Find it here...

Tools > General Settings, 3rd tab



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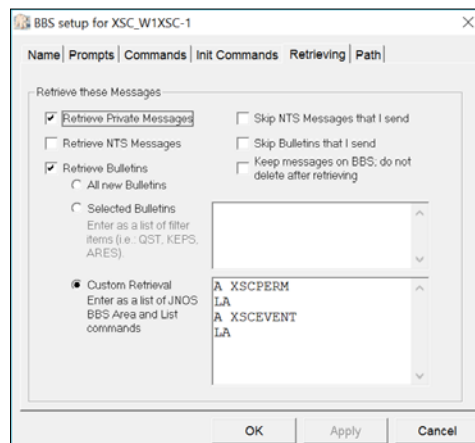
41

Message Retrieving Changes

- Moves the Retrieving Tab from the Send/Receive Set up to the BBS setup
 - Now, each BBS can have its own set of Retrieve Settings
- Custom Bulletin Retrieval
 - Takes JNOS commands specific to message retrieval, like...
 - A ALLWW
 - L> EQUAKE
 - L> SWPC
 - L> TECH
 - Requires a good understanding of BBS Message commands

Find it here...

Setup > BBS, retrieving tab

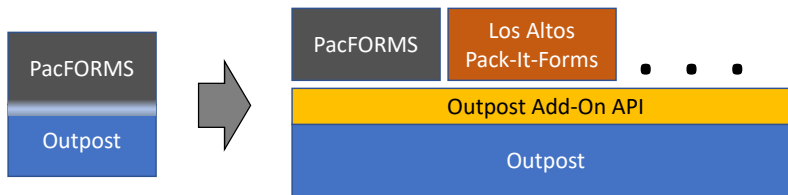


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Add-on API

- The Outpost/PacFORMS integration has been very useful
- But much of the interaction is hard-coded in Outpost
- New API provides standard way to connect apps to Outpost
- Enables more automation and integration with workflow
- PacFORMS will eventually migrate to API as well



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Configurable Send/Receive Button

- Button can be set to: Send/Receive, Send Only, Receive Only
- Perfect for EOCs with one machine sending, one receiving
- Saved in profile; override with Action menu

Tools > Send/Receive Settings

This block contains three screenshots demonstrating the configuration of the Send/Receive button. The first screenshot shows the 'Send/Receive Settings' dialog box with the 'Send/Receive Button Setup' section. The 'Send/Receive' option is selected. The second screenshot shows the 'Outpost Packet Message Manager' application with the 'Send/Receive' button highlighted in the main menu. The third screenshot shows the 'Outpost Packet Message Manager' application with the 'Receive Only' button highlighted in the main menu. Red arrows indicate the flow from the settings dialog to the application buttons.

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Configurable Message Number Separator

- Turn off “:” separator after message number in subject
- No need to back up/delete “:” before typing SCCo standard subject line separator “_”

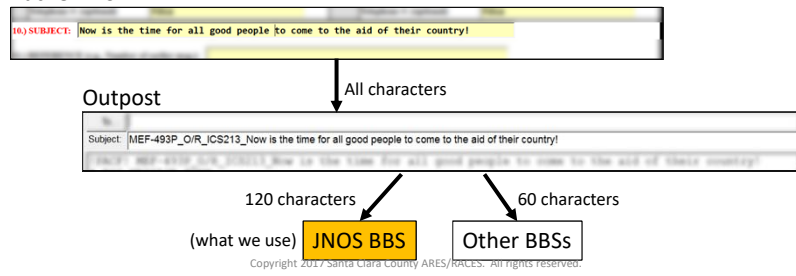
Tools > Message Settings

The screenshot shows three windows. On the left is the 'Message Settings' dialog box with the 'Mag Numbering' tab selected. Under 'Outbound Message Identification', the 'Add message number separator' checkbox is checked. In the center is a 'MEF-336P - Packet Message' window with subject 'MEF-336P'. On the right is a 'MEF-336P_O/R_v130 Features - Packet Message' window with subject 'MEF-336P_O/R_v130 Features'. Red arrows indicate the flow from the settings to the resulting subject lines.

Longer Subject Lines for PacFORMS

- Previous version of PacFORMS limited the Subject line sent to Outpost to 50 char
- PacFORMS now sends all characters to Outpost
- Different BBSs can handle different length subjects
 - JNOS = 120 char; Other BBSs (FBB, BPQ) = 60 characters

PacFORMS



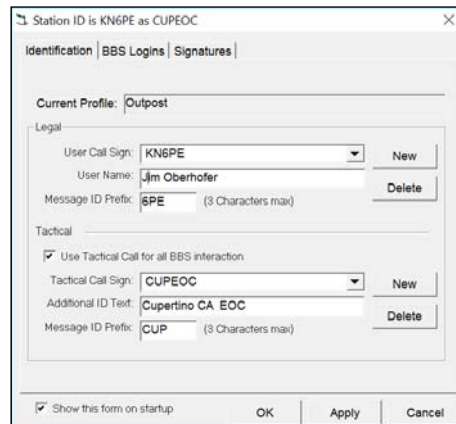
Station ID Changes

Creates a single location for managing information about station identifications.

1. Changes to how users and tactical calls are defined and selected.
2. Consolidates the Signature fields and controls

Find it here...

Setup > Station ID, 1st and 3rd tab



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47

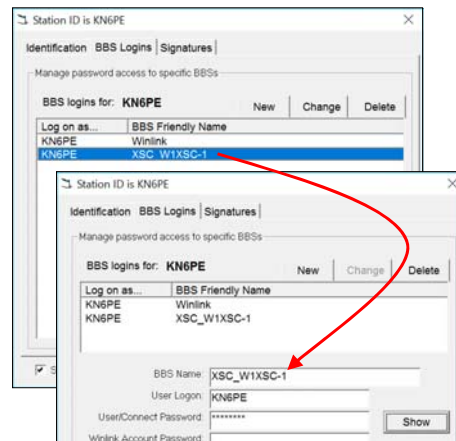
New BBS Telnet Logon

Moves telnet logons from the TNC setup to be clearly associated with the user ID.

- This will be useful with the new high speed access options
- Adds support for Winlink Secure Login

Find it here...

Setup > Station ID, 2nd tab



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Updated EOC-213RR Resource Request

- OES updated again, June 2017
- New format
- New required fields rules
- Only first page is sent
- Second page is added by EOC personnel when received

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Preview: Work Underway ...

- New OA Municipal Status form
 - Replaces City Scan
- Updated RACES Mutual Aid Resource Request, Fulfillment
- MS Edge browser support
 - Firefox is still recommended
- Several other user interface and workflow improvements ...

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50



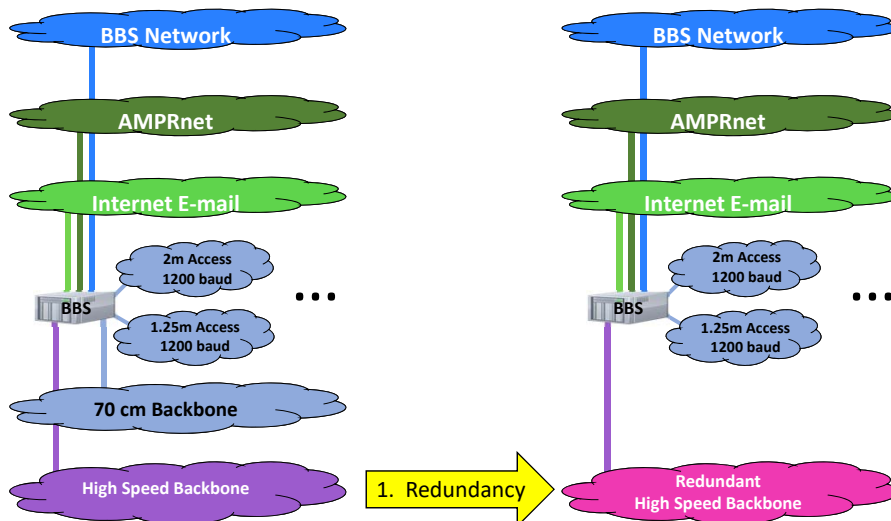
Network

2017 Review, Updates

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Reminder (2014): Migration Strategy



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Reminder (2016): New Home for W3XSC

- The City of Mountain View has been a great host
 - Provided initial radios, antennas, space, power, etc.
 - But the site is too low for microwave line of sight
- New Home: Channing House, Palo Alto
 - 200 feet ASL (vs. 125' in Mountain View)
 - Clear line of sight to W1XSC, W4XSC (vs. none)
 - Multiple mounts for microwave dish/sector antennas (vs. none)
 - Generator, earthquake dampeners
 - Other backup site uses
- Schedule
 - Construction: current
 - Move target: H1-2017



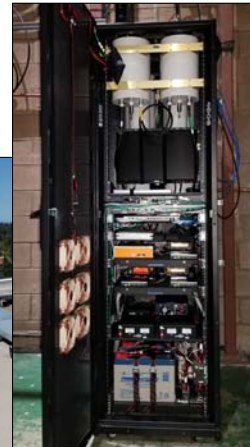
Channing House: Looking SW toward San Jose

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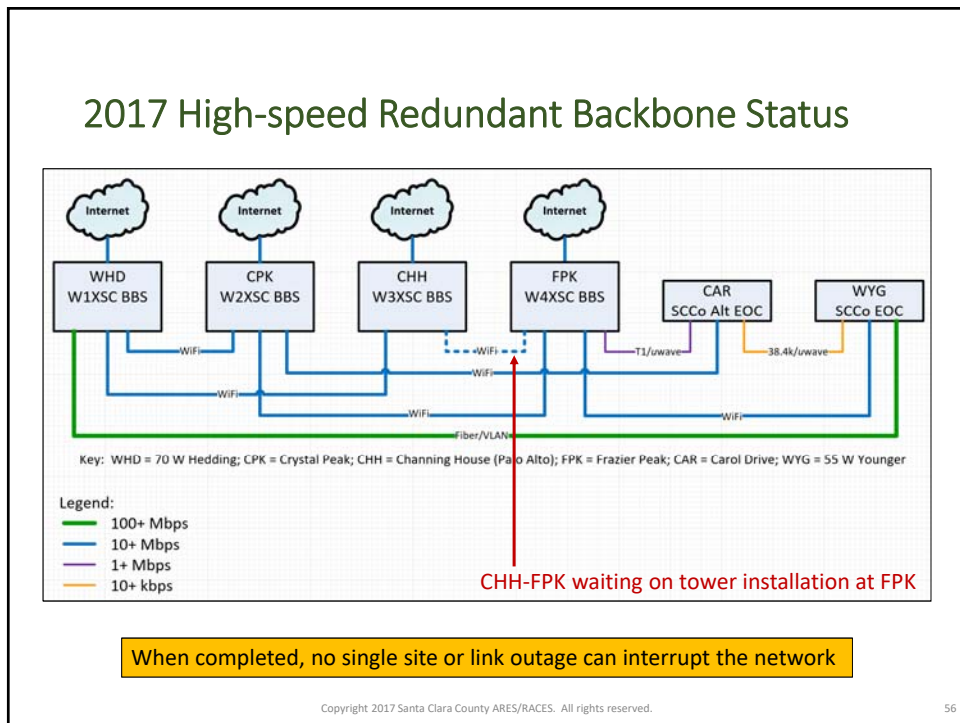
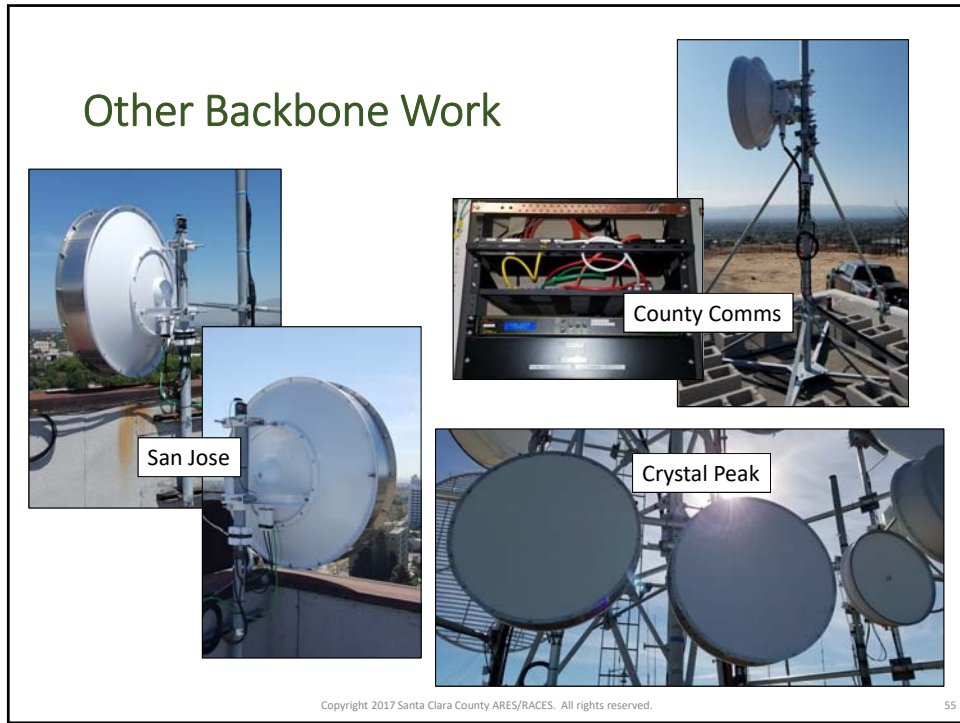
New Home for W3XSC

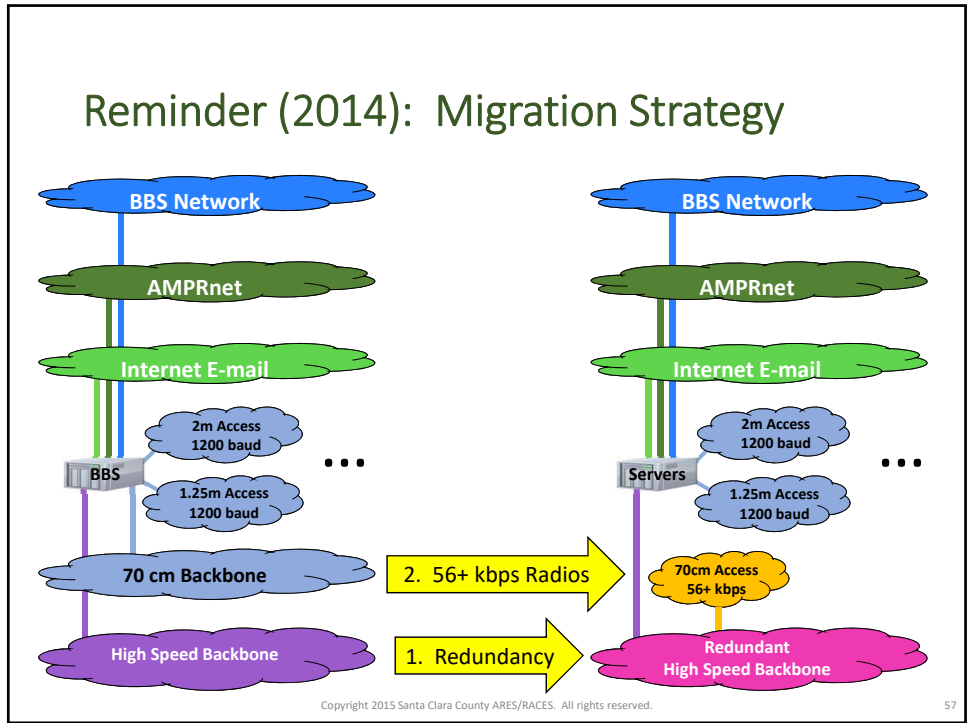
- Done
 - Design approvals
 - Power
 - Conduits
 - Roofing
 - Cable tray
 - Innerducts
 - Grounding
 - Mounting posts/braces
 - Backbone antennas
 - VHF/UHF antenna
 - Cabinet (radios, network, servers)
- Next
 - Access antennas, cabling, network gear for connecting surrounding sites



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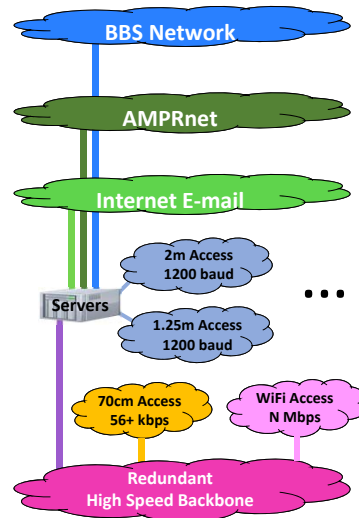
56+ kbps UHF Radio Update

- No show: previously anticipated amateur data radio
- Found: commercial radio with more capabilities
 - TCP/IP Ethernet/radio bridge/router
 - Channel BWs to 50 kHz; data rates up to 128 kbps (100x)*
 - Compression, RTS/CTS, advanced diagnostics, ...
 - Thousands deployed: commercial, government
 - Can operate in amateur radio 70 cm band
 - Turn off encryption, turn on CW ID
- Status
 - Reviewed application/specs with manufacturer; looks good!
 - Next: testing (bench, field), bids/negotiation, contract(s), ...
 - Likely H1-2018 deployment
 - Need to complete redundant backbone first

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Mbps Access Update

- High speed (Mbps) access available
- Requires line of site to hub site
- Construction already started
 - Mounting points
 - Antennas
 - Cabling
 - Firewalls
- First subscribers anticipated in early 2018



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Packet Networking Summary


- Outpost & PacFORMS
 - A dozen or so improvements to efficiency, effectiveness of EmComm workflow
- Network Infrastructure
 - Reliability:
 - Major enhancements to redundancy of high-speed backbone
 - No service outages for seven years!
 - Accessibility:
 - Continued county-wide connectivity to at least two backbone sites (VHF)
 - Soon: 56k+ bps packet access via telnet for most of the county
 - New: Mbps packet access via telnet in many key locations now
- What's Next?
 - Can we do more than packet with the new high speed connections?

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SCCo ARES/RACES Data Network The Next Phase



Santa Clara County ARES®/RACES
Michael E Fox, N6MEF
Revised: 05-Dec-2017

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Overview

- The Santa Clara County RACES data network provides emergency communications responders with a reliable, efficient and effective digital network environment that meets the needs of our served agencies.
 - Emergency communications responders: usually amateur radio operators, but could also include CERT personnel and others
 - Primary need: message traffic
 - Reliability: No service outage in over 7 years!
- Until recently, the network provided one service: packet
 - Accessed using VHF amateur radio for maximum county-wide coverage
 - Provides plain text “e-mail” messages plus bulletins, HTML versions of county EOC and hospital forms, 2-way Internet e-mail gateway
- Recent enhancements to the network allow more services
 - The result is poised to be a major step forward in amateur radio EmComm

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Service Offering Overview

Managing and moving information during emergencies

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Service Strategy

- Initial services have been focused on message, status traffic
 - It's the bulk of EOC communications needs
 - Even at packet speeds, it's ~15 time faster than voice!
 - And it's about to get even faster, with even better message services!
- Future services depend on needs of served agencies and/or amateur radio operator responders
 - Potential next step: intranet, image and file transfer/sharing
 - Other services as the need arises
- Cities can use the network to develop their own services
 - Example: city-wide damage assessment forms with roll-up display in EOC

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Packet BBS Service

- E-mail-like service with automated workflow and documentation
- Capabilities:
 - Simple, e-mail-like client
 - Plain text e-mail-like messages
 - Optimized HTML EOC forms
 - Multi-user notices/bulletins
 - Message numbering & tracking
 - Automatic acknowledgement
 - ICS-309 Comm Log generation
 - Internet e-mail gateway
 - But Internet is not required
- Optimized for low bandwidth
 - VHF/UHF radio access
- Availability:
 - RF throughout county
- Also useful at higher speeds
 - TCP/IP access

The image displays two screenshots of the Packet BBS service interface. The top screenshot shows a 'Packet Message Manager' window with a list of messages, including details like 'From', 'To', 'Subject', and 'Date'. The bottom screenshot shows a 'COMMUNICATIONS LOG' window for 'ICS 309', listing various communication events with columns for 'Time', 'From', 'To', 'Msg ID', 'Level ID', and 'Subject'. The log includes entries for 'Packet Message', 'Packet Acknowledgment', and 'Packet Error'.

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New for 2018

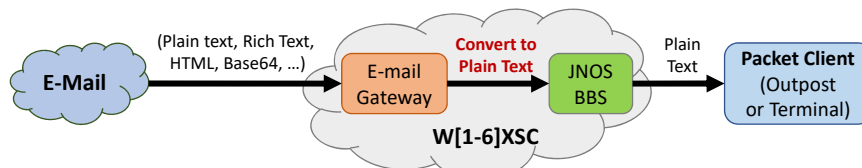
Plain Text Conversion Service for Packet

Let's Packet Users Read Encoded Messages

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Reminder (2016): E-mail to Packet: Conversion to Plain Text

- Most E-mail uses MIME (Multipurpose Internet Mail Extensions) format
 - Packet BBS doesn't understand MIME
- Most E-mail is sent as HTML; packet is plain text
 - Most e-mail senders don't know they need to set plain text mode
 - Even if they do, they may not know how to do it, or they may forget
- Some service providers automatically encode; no choice!
 - Example: Mobile phone text message > HTML > Base64 (ugh!)
- Investigate MIME conversion to plain text in mail gateway



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It Turns Out ... It's REALLY Complicated

Partial List of Text Message Formats

Carrier	Text Message	Resulting E-mail
Sprint	Test	Text > HTML > Base64-encoded
Verizon	Test	Plain text (subject and body)
	Test (S)(S)(S)	Quoted-printable (subject and body)
	Test (S)(S)(S)(S)	Base64-encoded (subject and body)
	Blah blah blah ... blah Test (S)(S)(S)(S)	Blank (subject and body); file attachment

(S) = Smiley face emoji

- Each client/app is different; any of the above could change at any time
- So, we must handle just about every possible combination

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What Should We Do With These Messages?

- We could pass them through “as is” (like we do now)
 - “Test” becomes “VGZdA==” in Base64 (unreadable)
 - Increasingly, many 3rd party e-mail/text messages will need translation
 - Every packet operator would need local tools (no Internet) and training
 - Recreate or rewrite message before passing on; VERY time consuming
 - Result: no communication or greatly reduced throughput
- We could reject them
 - Sender may not receive or understand a rejection notification
 - Sender may understand, but not have control over the format
 - Sender may have control, but not know how or may forget
 - Result: deadlock; no communication
- Or, we could do something else ...

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New

Decode / Notify Conversion Filter

- Try (very hard) to get a usable message through
 - Decode to plain text where possible
 - “VGZdA==” in Base64 becomes “Test” (readable!)
 - Non-text content left encoded for possible manual decoding
 - Recipient sees that “something” is there; can manually decode if needed
 - Notify recipient of other necessary changes
 - Attachments removed
 - Redundant HTML removed
- Only reject messages that we can’t handle at all
 - Currently, only MIME-type message/partial (rarely, if ever, used)
- Result: most likely, a usable message
 - If necessary, recipient can perform further decoding or ask sender for additional clarification

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Example: HTML E-mail w/attachments to Packet

Original E-Mail

Packet: Old Behavior

Packet: New Behavior

Before: VERY long and mostly unreadable message
 After: Text portion is readable, printable; recipient can decide on rest

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Example: Text Message w/ Emojis to Packet

Original Text Message

Packet: Old Behavior

Packet: New Behavior

Before: A completely unreadable message
 After: Text portion is readable, printable; recipient can decide on rest

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And, in case you were wondering ...
Yes, you can recover the graphics!

Outpost Message

Decoder

The screenshot shows an email client window on the left and a decoder tool on the right. The email client window displays a message with a subject line containing a long string of hexadecimal characters. A red bracket highlights this subject line, and a red arrow points from it to the 'Encoded' field of the decoder tool. The decoder tool has a 'Charset' dropdown set to 'Unicode (utf-8)'. The 'Decoded (readable by humans)' field contains three smiley face emojis. The 'Encoded' field contains the same long string of hexadecimal characters as the email subject line. Below the decoder tool, there are buttons for 'Decode', 'One line', and 'Encode'.

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New Status: Plain Text Conversion Service

- Basic functionality working on development server
- Need to add
 - Error-handling
 - Case of blank body w/ text attachment
- Lots more testing needed; move to test server
- Expect production deployment: Spring 2018



New for 2018
Standard Internet E-mail

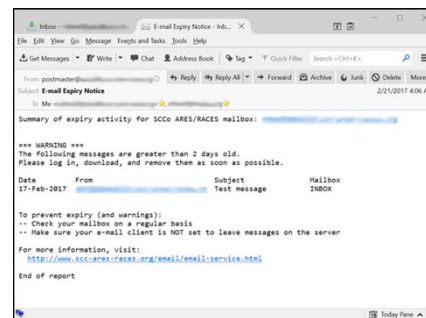
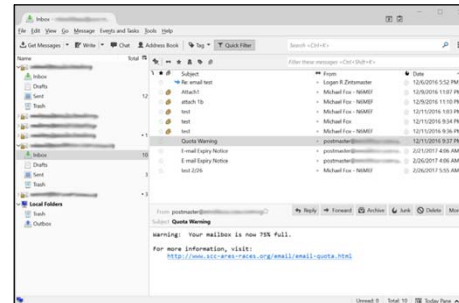
... no Internet required!

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New
E-mail Service

- Standard e-mail service
- Capabilities:
 - Standard server software
 - Standard e-mail client software
 - Recommended: Thunderbird
 - Standard features
 - Rich text formatting, attachments
 - Standard e-mail protocols
 - POP3, SMTP, TLS, SPF, DKIM, ...
 - Anti-X measures
 - Internet gateway
 - But Internet is not required



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E-mail and Packet Servers are Co-located

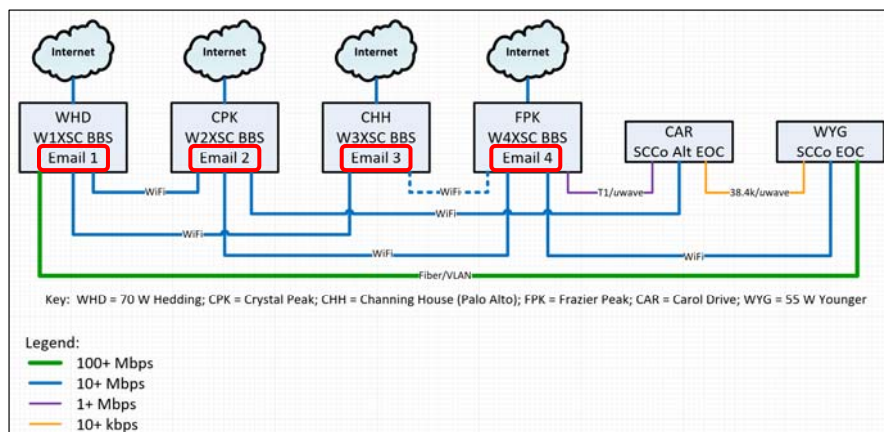
- Multiple servers, just like with packet
- Numbered 1-5, just like with packet
- Each city has primary and secondary, just like with packet
- Failure of one doesn't affect the others, just like with packet

E-mail Domain	Location	Co-located Packet BBS
email1.scc-ares-races.org	San Jose (Santa Clara Co office bldg)	W1XSC
email2.scc-ares-races.org	Crystal Peak (South County)	W2XSC
email3.scc-ares-races.org	Palo Alto	W3XSC
email4.scc-ares-races.org	Frazier Peak (above Milpitas)	W4XSC
email5.scc-ares-races.org	varies (drills, events, incidents)	W5XSC

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2017 High-speed Redundant Backbone Status



When completed, no single site or link outage can interrupt the network

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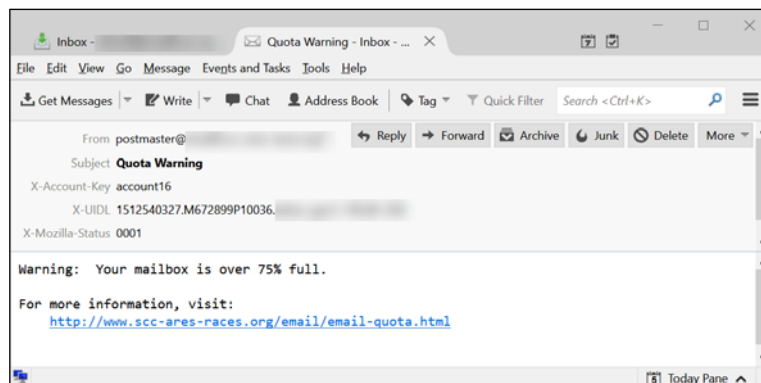
Account Details

Maximum Message Size	10 MB
Mailbox quota <ul style="list-style-type: none">Warnings at 75% and 90%	50 MB
Old message expiry and removal <ul style="list-style-type: none">Warnings at 7 days	92 days

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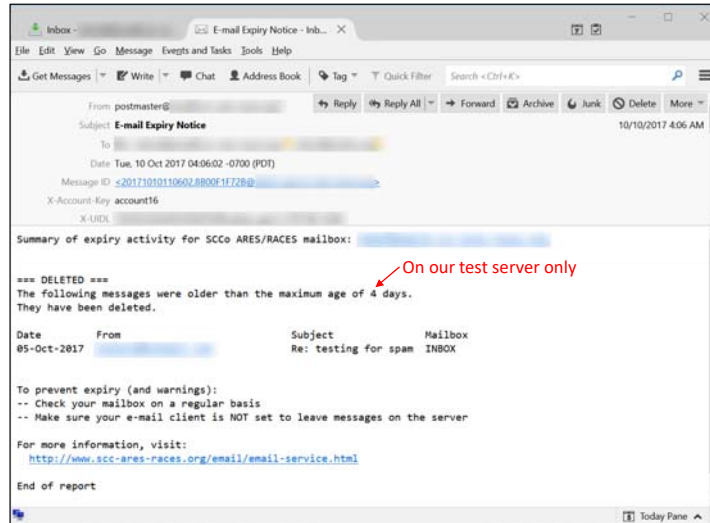
Example: Mailbox Quota Warning



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Example: Old Mail Expiry Notice



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& E-mail ~~vs.~~ Packet - Summary

E-mail		Packet	
GUI Interface	✓	GUI Interface	✓
Supports rich text	✓	Plain text	
Supports attachments	✓	No attachments	
Requires higher bandwidth		Requires minimal bandwidth	✓
Reduced RF coverage		County-wide coverage	✓
No workflow		Rich EmComm workflow (message numbering, delivery receipts, logging, ...)	✓

- Packet – still best for EmComm
 - Best RF coverage; best EmComm workflow
- E-mail – can help with some 3rd party communications
 - Complex encoding, attachments; but requires more BW; less coverage

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Accessing the E-mail Service

- E-mail needs MUCH more bandwidth than packet
 - Larger packets, chattier protocols, attachments, rich text formatting
- To get more bandwidth, we have to use higher frequencies
- Higher frequencies mean less RF coverage
- Access options for our network:
 - TCP/IP at n* Mbps via WiFi: from locations with line of sight to hub
 - TCP/IP at 56+ Kbps via UHF: soon, from most of the county

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New Intra/Internet Service

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New Intra/Internet Service

- Standard TCP/IP connectivity
 - To internal servers (as they are developed)
 - To external, Internet sites
- Capabilities
 - Standard, general TCP/IP service
 - Connect isolated radio room PCs
 - Connect to internal servers or Internet
 - Emergency backup Internet access
 - NOT a replacement for commercial ISP
 - Considering other services
 - Internal DNS, VPN, etc.

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Accessing Intranet/Internet

- General web browsing, file sharing, and other services require even more bandwidth than E-mail
- These services are not possible at VHF/UHF; need WiFi
- Access options for our network:
 - TCP/IP at n* Mbps via WiFi: from locations with line of sight to hub

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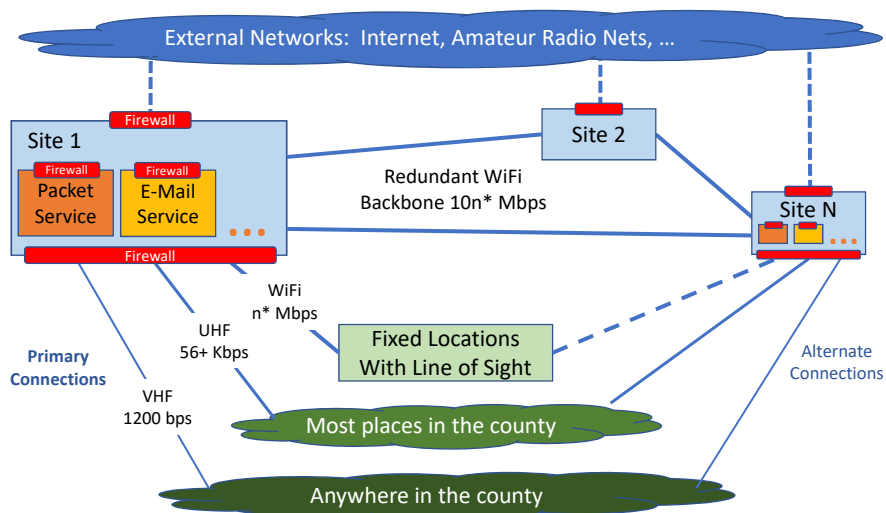
Network Infrastructure Overview

Options for accessing the services

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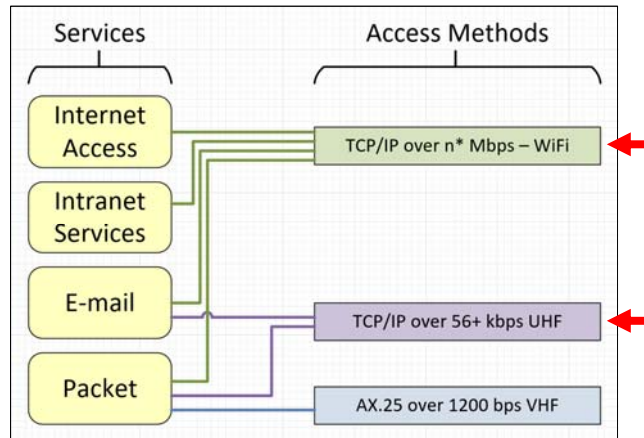
High Level Network Architecture



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Services vs. Access Methods/Speeds



To use the new services, you need one of the new high-speed connections

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General Connectivity Recommendations

- The faster your connection, the more services you can use
- EOCs, hospitals should install WiFi connections, if possible
 - Enables use of all services
 - Line of sight to hub site is required; possible at many EOCs, hospitals
- All fixed sites should install 56+ kbps UHF connections
 - Enables use of e-mail and packet services
 - Available where line of site doesn't exist
 - Can act as fallback in case of WiFi failure
- All sites (fixed or otherwise) should have 1200 baud VHF
 - Enables packet services; broader coverage
 - Can act as fallback in case of UHF failure

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New Updated Web Site

- New “Data” section coming
 - “Packet” is one part of it
- Includes
 - Service details
 - Packet BBS
 - E-mail
 - Intra/Internet
 - Access technology details
 - VHF Packet
 - UHF TCP/IP
 - WiFi TCP/IP
 - Mesh TCP/IP
- Expected: Dec 2017/Jan 2018

The screenshot shows a web page titled "Santa Clara County ARES/RACES" with a navigation menu including Home, Operations, Packet, WiFi/Mesh, Training & Events, Reference, and FAQ, dated December 4, 2017. The main content area is titled "E-MAIL SERVER INFORMATION" and includes sub-sections for "Locations", "Servers", and "Assignments". Below this is a detailed "E-mail Service Description" page with sections for Overview, Functionality, Access, and Domains. The Overview section states that the service is a standard Internet-style e-mail service designed for functionality throughout Santa Clara County. The Functionality section notes that the service is available at any time and is specifically designed to survive and be available during emergency operations. The Access section describes various wireless and wireline options for accessing the service. The Domains section explains that the service operates five independent e-mail domains for improved survivability.

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Getting Involved Is Easy

And there's lots to do!

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Your City/Agency Needs Your Help

- We have impressive capabilities to offer our served agencies
 - But they don't know about them!
- Your agencies depend on you to help them understand
 - The services you/we can provide to them
 - What you need in order to provide those services to them
 - Equipment, space, procedures, etc.
- Opportunity for a team effort in each city
 - Use existing expertise and/or gain new expertise in several areas
 - RF: radios, antennas, propagation
 - Networking: TCP/IP, LANs, E-mail, PC software
 - Operations: procedures, documentation, installation, training, support
 - Room for everyone that's interested to participate

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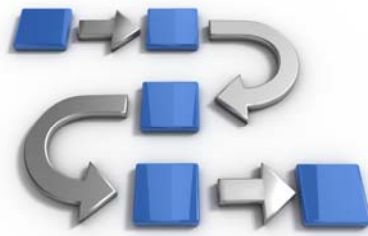
93

Help Also Needed at the County Level

- Help build, maintain the county network and services
- It's challenging. But it's fun!
- Do you want to be a part of making it happen?
- We could use:
 - BBS sysops, Linux sysadmins
 - RF and network engineers
 - Software engineers (shell, Perl, PHP, SQL, ...)
 - Installers (electrical, mechanical, tower, ...)
 - Testers (services, access methods)

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How To Get Connected To The New Services

A recommended approach

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How To Get Connected to New Services

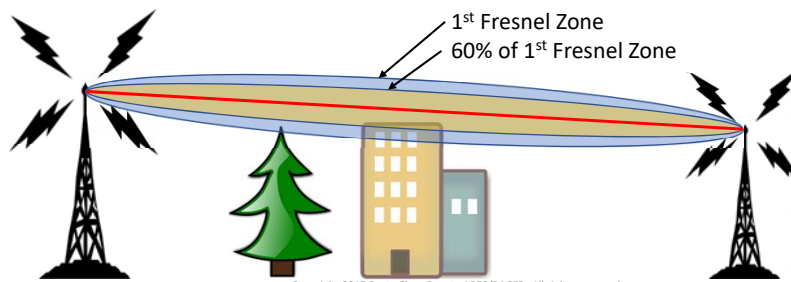
- **Form a data networking team within your ARES/RACES group**
 - Include whoever wants to participate (some lead, some learn)
 - Variety of expertise needed: some technical, some operational
 - Recruit expertise where needed (your city, other cities, county team)
- **Form a plan for using the new services within your group**
 - Learn more details about the services, network infrastructure
 - How can these services be used within your ARES/RACES group?
 - How can these services benefit your served agencies?
- **Investigate options for high-speed connections**
 - WiFi: Clear line of sight to a hub site
 - UHF: Line of site not required; but best antenna location is needed
 - Collect details: Lat/Lon, height above ground, etc.

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Evaluate WiFi Line of Sight to Hub Location

- Absolute minimum = clear 60% of 1st Fresnel Zone
 - Remember: trees grow; buildings get built, rooftops are modified
- Consider antenna mounting options
 - A clear line of site may require installation on a pole or tower; consider wind load
 - Highly directional antennas must be within (climbing) reach for alignment
 - Longer distances require larger antennas; consider installation, maintenance, wind



How To Get Connected to New Services (2)

- Submit site info form (available 1/2018)
- County team verifies line of sight, coverage, signal levels, ...
 - Recommends radio, antenna, cabling, etc.
- Prepare a presentation of your plan for your city/agency
 - Benefits to city/agency of using new services
 - Requirements: equipment, space, access, ...
- Present the plan to your city/agency; get buy-in
 - Funding may take time (government budgets, procedures, ...)
- Keep county team informed of installation plans
 - It helps us to schedule hub site work so we'll be ready

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How To Get Connected to New Services (3)

- Coordinate installation with county team
 - Antenna alignment, signal level checks, routing/firewall updates, ...
- Train users and encourage usage
 - Local procedures, county procedures, troubleshooting, maintenance
 - Weekly check-ins, drills, public service events

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District Emergency Coordinator 2017 Year End Report



Santa Clara County ARES®/RACES/ACS
Logan Zintsmaster, KZ6O
Revised: 05-Dec-2017

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Key Activities

- **Multiple Presentations**
 - Santa Clara County Emergency Operational Area Council
 - City of Palo Alto, Stanford University, Stanford Medical
- **New Emergency Coordinators**
 - Jack Pines – Palo Alto
 - Bert Bailey – Loma Prieta
 - Don McKee – San Jose
- **Ranked in the top ten nationally for 2016 SET Drill**
- **High Power Performance Award Created for Annual Drill**

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Weekly Net Check-ins

- **SPECS Net Weekly Average**
 - 109 Voice
 - 22 Packet
- **SVECS Net Weekly Average**
 - 191 Voice
 - 30 Packet
- **Total Weekly Average**
 - 300 Voice
 - 52 Packet

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Activity Reported to the ARRL

- Average Number of Members
 - 542 Average since Jan 2017
 - 557 reported in October
- Average Number of Operations
 - Drills, Training, Public Service, Emergency
 - 75 operations per month
- Average Number of Participation Hours
 - 1092 hours per month

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Training Summary

- Taught 11 classes
 - 399 attendees
- Training exercise in the field
 - 22 attendees
- Taught 3 sessions (2 classes) of Introduction To and Fundamentals of Emergency Communications for newly licensed operators
 - 98 attendees
- 143 Unique Sign-ups

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2017 Activations

<u>NUMBER</u>	<u>Date</u>	<u>Event</u>
XSC-17-01	1/1 - 12/31/17	SCCo ARES/RACES Data Network Maintenance
XSC-17-02-T	2/18/17	County City Communications Drill - County EOC only
XSC-17-03-T	3/11/17	Red Cross Shelter Support Training- Cancelled
XSC-17-04-T	5/20/17	County City Communications Drill - County EOC only
XSC-17-05-T	7/9/17	Search and Locate SCC Mini-Drill
XSC-17-06-T	7/4/17	Cupertino July 4th Mutual Aid
XSC-17-07-T	7/8/17,7/9/17	Los Altos Art and Wine Festival
XSC-17-08-T	8/19/17	County City Communications Drill - County EOC only
XSC-17-09-T	9/16/17	Santa Clara Art and Wine - Day 1
XSC-17-10-T	9/17/17	Santa Clara Art and Wine - Day 2
XSC-17-11-T	9/14/17	County EOC Activation
XSC-17-12-T	10/14/17	County Simulated Emergency Test
XSC-17-13-T	11/26/17	2017 Los Alfto Festival of Lights

- Supported Statewide Hospital Drill

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2017 Simulated Emergency Test Drill High Power Performance Award



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High Power Performance Award



Santa Clara County ARES®/RACES
Barton Smith, N6HDN
Revised: 05-Dec-2017

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End

See you at a training class next year!

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