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# 2013 End of Year Summary

Santa Clara County ARES®/RACES

Last Updated 10-Dec-2013


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## Learning Objective

By the end of this class, you will:

- Understand the changes to training classes and operations procedures that occurred during 2013
- Be aware of some additional changes that are coming soon

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## Agenda

- Enhancements to “Antenna Fundamentals” class
- Enhancements to packet network
- Enhancements to training program
- Message passing and logging

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# Antenna Fundamentals
# End of Year Summary

Santa Clara County ARES®/RACES

Last Updated 12-02-2013



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## All You Need to Know about Antennas

$$\nabla \cdot \mathbf{D} = \rho$$

$$\nabla \cdot \mathbf{B} = 0$$

$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$

$$\nabla \times \mathbf{H} = \mathbf{J} + \frac{\partial \mathbf{D}}{\partial t}$$

Maxwell's Equations



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## What is a decibel?

- The **decibel** (**dB**) is a logarithmic unit that indicates the **ratio** of a physical quantity (usually power) to a specified reference level.

$$dB = 10 \ Log_{10} (P_{meas}/P_{ref})$$

| | |
|---|---|
| 1 dB = | 26% change |
| 3 dB = | 2 times change |
| 10 dB = | 10 times change |
| 20 dB = | 100 times change |

  - 1 dB is the smallest change in sound detectable by an average listener


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## Antenna Gain

Gain – ratio of power received (or transmitted) in a specific direction (azimuth and elevation) relative to a reference source

- Gain is quoted for the point of maximum gain
- May be for antenna in free space (typical)
- Or above the ground and includes ground effects


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# Antenna Pattern

Pattern – a collection of gain measurements for a range of angles in azimuth and elevation

May be a table or graphical view


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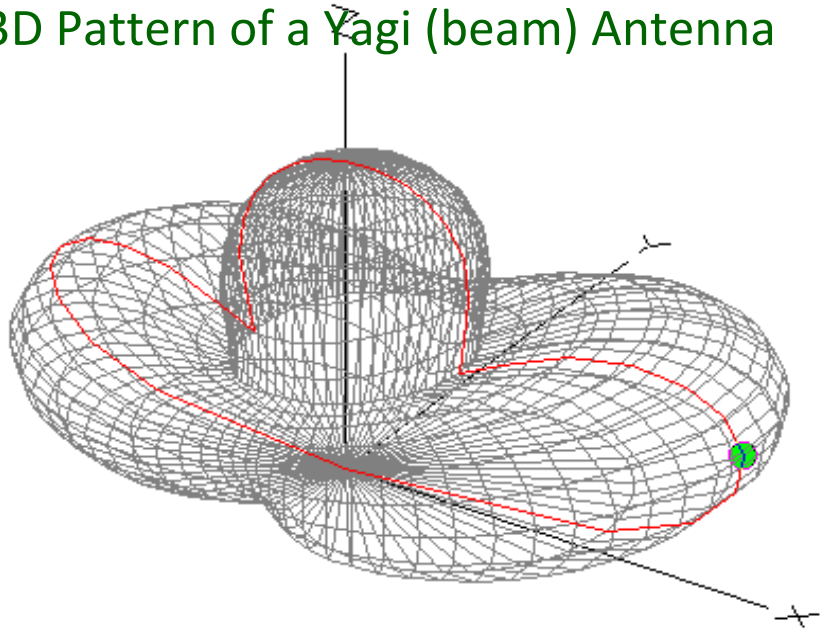
## 3D Pattern of a Yagi (beam) Antenna

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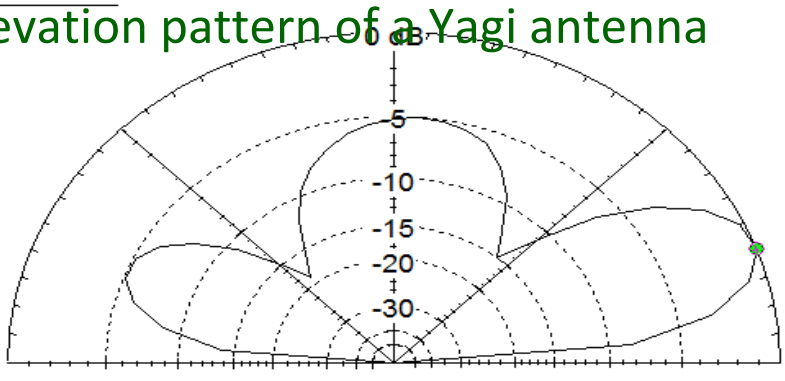
## Elevation pattern of a Yagi antenna




| | | | |
|---|---|---|---|
| Elevation Plot | | Cursor Elev | 20.0 deg. |
| Azimuth Angle | 0.0 deg. | Gain | 8.46 dBi |
| Outer Ring | 8.46 dBi | | 0.0 dBmax |
| | | | 0.0 dBmax3D |
| 3D Max Gain | 8.46 dBi | | |
| Slice Max Gain | 8.46 dBi @ Elev Angle = 20.0 deg. | | |
| Beamwidth | 23.8 deg.; -3dB @ 10.3, 34.1 deg. | | |
| Sidelobe Gain | 3.34 dBi @ Elev Angle = 85.0 deg. | | |
| Front/Sidelobe | 5.12 dB | | |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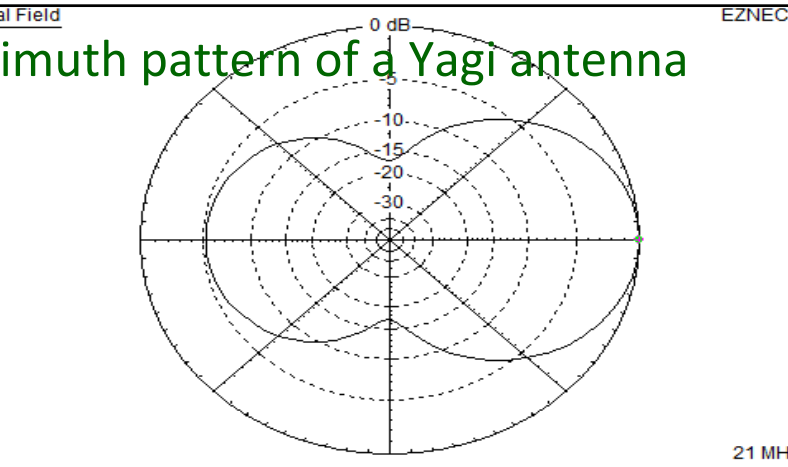
## Azimuth pattern of a Yagi antenna




| | | | |
|---|---|---|---|
| Azimuth Plot | | Cursor Az | 0.0 deg. |
| Elevation Angle | 20.0 deg. | Gain | 8.46 dBi |
| Outer Ring | 8.46 dBi | | 0.0 dBmax |
| | | | 0.0 dBmax3D |
| 3D Max Gain | 8.46 dBi | | |
| Slice Max Gain | 8.46 dBi @ Az Angle = 0.0 deg. | | |
| Front/Back | 5.2 dB | | |
| Beamwidth | 75.9 deg.; -3dB @ 322.0, 37.9 deg. | | |
| Sidelobe Gain | 3.26 dBi @ Az Angle = 180.0 deg. | | |
| Front/Sidelobe | 5.2 dB | | |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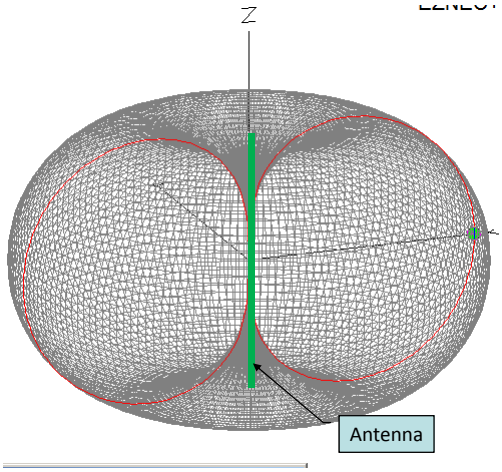
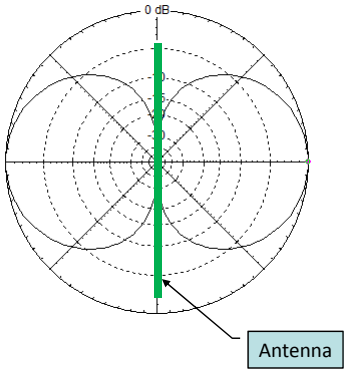
## ½ Wave Vertical Dipole in Free Space




3 D view

Elevation Pattern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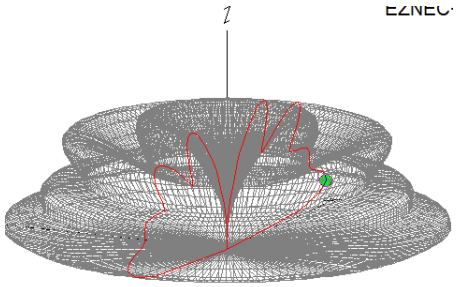
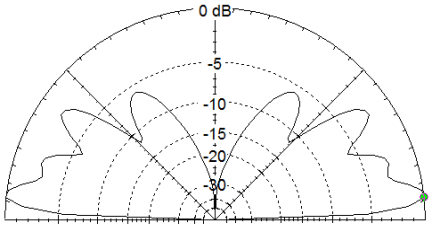
## ½ Wave Vertical Dipole 10 ft high




3D View

Elevation Pattern

- Note the null directly above the antenna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## Typical Antenna Gain Specifications

- dBi – dB referenced to an isotropic antenna
  - Isotropic antenna radiates equally in all directions
- dBd – dB referenced to a dipole antenna

  0 dBd = 2.15 dBi

Typical gains

| | | |
|---|---|---|
| ¼ wave ground plane | 0 dBd | 2.15 dBi |
| ½ wave dipole | 0 dBd | 2.15 dBi |
| J-pole (end fed ½ wave) | 0 dBd | 2.15 dBi |

- For antennas likely to be used for ARES/RACES other factors will be important
  - Portability, mounting, weight, supporting structure, etc.


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## Antenna Placement

- Perform a site survey and assess
  - Overhead wires and other hazards
  - Traffic patterns, non-intrusive to others
  - Location relative to operating position
  - **Where will the cables go?**
- Clear path to intended users
  - Height
  - Building blockages
- Tradeoffs
  - Minimize trip/fall hazards
  - High enough for needed coverage, low enough to be safe
    - Wind
    - Stability of supporting structures, tripods, etc.


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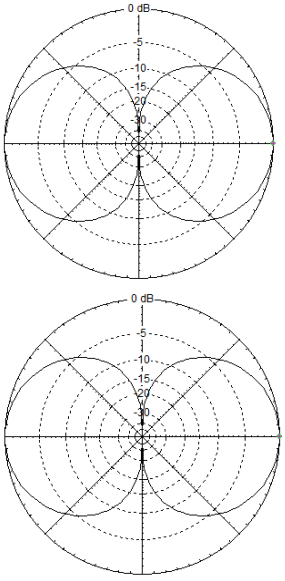
## Antenna Placement

- For multiple radios, exploit the pattern nulls
  - Use vertical separation
  - Horizontal separation may help, as well





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## Coax Cable

Connecting the radio to the antenna


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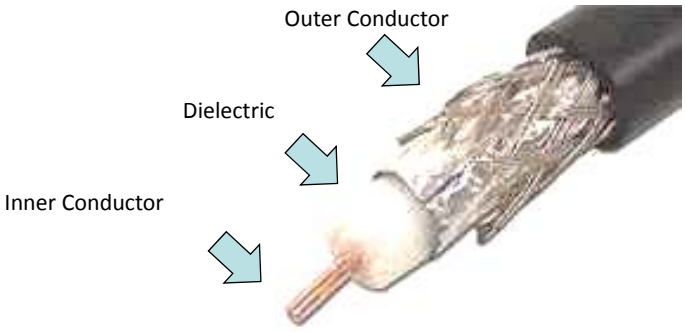
## Anatomy of Coax Cable




- Impedance depends on ratio of diameters of Inner and Outer conductors and type of dielectric
- Power handling and loss depends of insulating qualities of the dielectric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## Common Types of Coax Cable

- Table of common cable types and approximate losses at VHF/UHF

| | | Loss per 100 ft. | | |
|---|---|---|---|---|
| | Dia | 144 MHz | 440 MHz | Cost/ft |
| RG-58 | 0.195” | 7.6 | 13.0 | $ 0.59 |
| RG-8X | 0.242” | 4.8 | 8.4 | $ 0.59 |
| LMR 240 | 0.240” | 3.4 | 5.2 | $ 0.79 |
| | | | | |
| RG-8U | 0.405” | 2.6 | 4.4 | $ 1.59 |
| RG-213 | 0.405” | 3.0 | 5.0 | $ 1.69 |
| 9913 | 0.405” | 1.8 | 2.9 | $ 1.49 |
| LMR 400 | 0.400” | 1.7 | 2.7 | $ 0.99 |


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## What is SWR?

- Standing Wave Ratio (SWR)
  - Measure of the amount of power that goes into the antenna compared to the power reflected back to the radio
  - 1.0 No reflected power, perfect match
  - 1.5 20% reflected power
  - 2.0 33% reflected power

    For VHF/UHF, you should keep SWR below 2.0
- Most commercial antennas will be below 2.0 SWR "out of the box"
- Can be checked with an SWR meter or Antenna Analyzer


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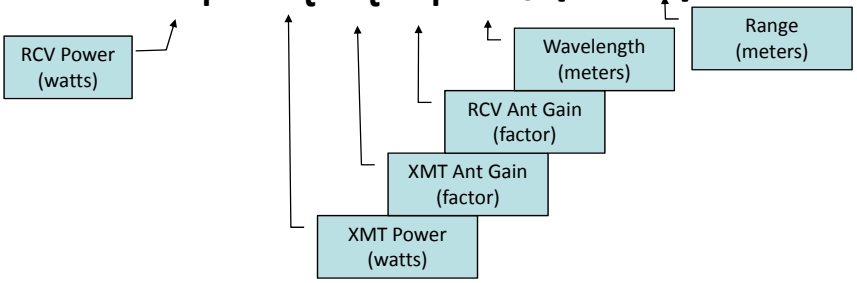
## "On a clear day, you can talk forever"

### All you need to know….

**(in real numbers, not dB)**

$$P_r = P_t G_t G_r \lambda^2/(4 \pi r)^2$$





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## In Decibel form…

$$P_{r(dBw)} = P_{t(dBw)} + G_{t(dBi)} + G_{r(dBi)} - \alpha$$

**Path loss $\alpha = 20 \log(Rf) + 37.8$**

**R = range in NM, f = freq in MHz**

- How far can you talk with a 5 w HT on 2m with dipole antennas? ARRL says -117dBm is a good FM signal

$$-117_{dBm} = 37_{dBm} + 2.1_{dBi} + 2.1_{dBi} - \alpha_{dB}$$

$$\alpha = 117 + 37 + 2.1 + 2.1 = 158.2$$

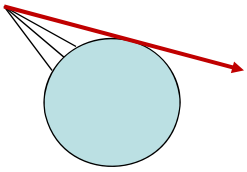
$$158.2 = 20 \log (R * 146) + 37.8$$

$$R = 7{,}172 \text{ NM}$$




## Limitations to Line of Sight

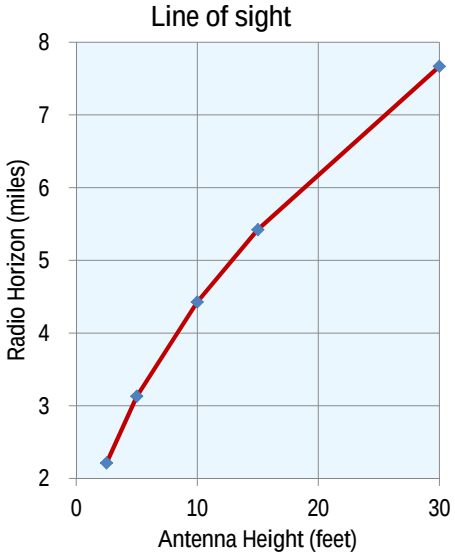
- Obstacles
  - Buildings, hills, mountains, canyons, etc.



- Curvature of the earth –
  - Signal travels in a straight line
  - When it hits the horizon it goes straight into space
- Farthest you can on Earth is when both parties share a common horizon
- Radio Horizon = $1.4 * \sqrt{H(ft)}$ miles

## Radio Horizon at 146 MHz

| Height (ft) | Radio Horizon (miles) | |
|---|---|---|
| 2.5 | 2 | Table Top |
| 5 | 3 | HT near your mouth |
| 10 | 4 | Tripod with mast |
| 15 | 5 | Small push up mast |
| 30 | 8 | Long push up mast |





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## RF Safety Evaluation

- License requires evaluation
- FCC Bulletin OET 65 Appendix B is written specifically for hams
- Keep human exposure below specified levels
- Table shows when evaluation is required
- Power level includes both transmitter power and isotropic gain of antenna
  - Dipole => 2.15dBi

| Band | Power | Band | Power |
|---|---|---|---|
| 160m | 500 W | 6m | 50 W |
| 80 | 500 | **2** | **50** |
| 40 | 500 | **1.25** | **50** |
| 30 | 425 | **70** | **70** |
| 20 | 225 | 33 | 150 |
| 17 | 125 | 23 | 200 |
| 15 | 100 | 13 | 250 |
| 12 | 75 | | |
| 10 | 50 | | |


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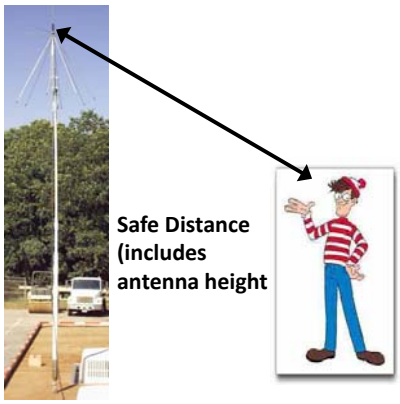
## From OET Bulletin 65 Appendix B…

- VHF/UHF - Less than 50 watts radiated, no evaluation needed
- Safe exposure distance from the antenna for 50 watt transmitter and antenna from Bulletin 65 (worst case)




| | (dBi) | (feet) |
|---|---|---|
| 144(2m) | 3 | 10.6 |
| | 6 | 14.9 |
| | | |
| 222(1.25m) | 3 | 10.6 |
| | 6 | 14.9 |
| | | |
| 450 (70 cm) | 3 | 8.6 |
| | 6 | 12.2 |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# Packet Networking
# 2013 End of Year Summary

Santa Clara County ARES®/RACES

Last Updated 10-Dec-2013


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## Agenda

- Outpost Enhancements
- PacFORMS Enhancements
- Network Enhancements
- Preview of Upcoming Enhancements

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## Outpost Enhancements

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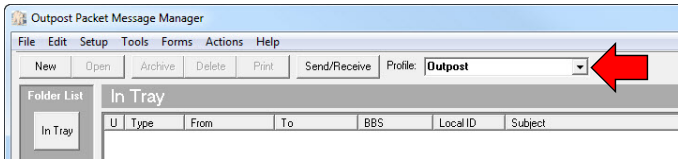
## Profiles

- Allows different combinations of Outpost settings to be stored under a single profile name
  - Example: Primary and backup BBS, TNC selection
- Switch between profiles without restarting Outpost
- "Outpost" profile is set with the default Santa Clara County Settings

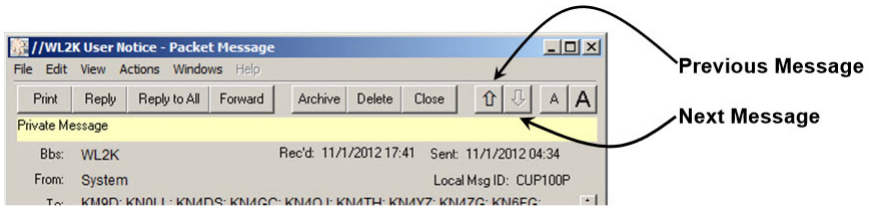






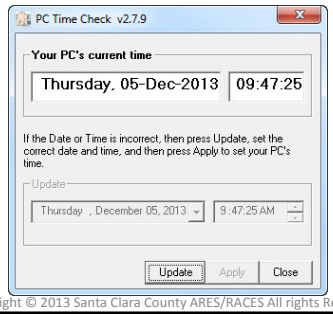
## Message Navigation

- Up and Down arrows on message forms allow easy movement to previous or next message
- No need to close message, then open next message



## PC Time Check

- Old and/or seldom-used PCs are usually not set to the correct time
- Outpost and PacFORMS use PC time
- Causes incorrect and confusing information
- On startup, Outpost now displays current time and offers chance to update it





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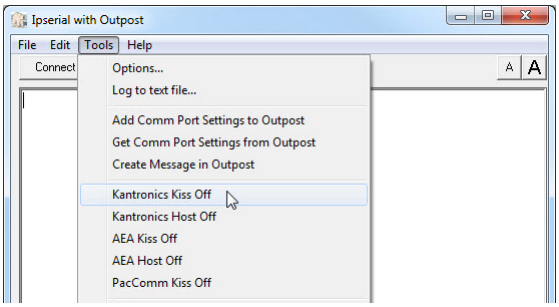
## Ipserial: Turn off KISS and HOST modes

- Some other packet applications may not properly exit KISS or HOST mode
- Return to command mode requires sending obscure control characters to the TNC (or else full reset!)
- New Ipserial menu options do this for you!





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## New Serial Comm Library

- Previous
  - Worked great with hardware comm ports
  - Struggled with USB-to-Serial adaptors on Windows7 64 bit machines.
- This new library offers several improvements
  - Better USB-to-serial adaptor tolerance
  - Outpost now recognizes comm ports up to COM99
  - Better Linux/Wine operability. While Outpost still does not run native on Linux and it has not been fully tested, it now works with both hardware serial ports and USB-to-Serial adaptors on Linux.
    ***!!!*** *Until fully tested, Outpost on Linux should be considered a Pilot.*


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## USB-to-Serial Adapter Testing

- 13 of the most common USB-to-Serial adapters were tested with Outpost
- Information on selecting adapters posted to web site
  - http://www.scc-ares-races.org/packet/usb-serial-adapters.html
- Adapter test results summarized and posted to scc-packet
  - http://groups.yahoo.com/group/scc-packet

| Adapter Type | | Adapter Features | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Manufacturer | Model | Chipset | Length | Ferrite Bead | LEDS | Connector | Consistent COM Port | Unique ID | Manufacturer URL |
| IOGear | GUC232A | ATEN | 1 ft | No | 1: TX | Male DB-9; Female Binding Posts | No | No | www.iogear.com |
| | | | | | | | | | |
| CSI/Generic | MT609-2 | FTDI | 8" | No | None | Male DB-9; Female Binding Posts | No | Yes | generic |
| GearMo | USA-FTDI-A12 | FTDI | 1 ft | Yes | 3: Connected, TX, RX | Male DB-9; Female Binding Posts | Yes | Yes | www.gearmo.com |
| GearMo | USA-FTDI-A36 | FTDI | 3 ft | Yes | 3: Connected, TX, RX | Male DB-9; Female Binding Posts | Yes | Yes | www.gearmo.com |
| MFJ | MFJ 5429 | FTDI | 42" | No | 3: Connected, TX, RX | Male DB-9; Female Binding Posts | Yes | Yes | www.mfjenterprises.com |
| RT Systems | RTS-03 | FTDI | 8" | No | None | Male DB-9; Female Binding Posts | No | Yes | www.rtsystemsinc.com |
| Sabrent | SBT-FTDI | FTDI | 6 ft | No | None | Male DB-9; Female Binding Posts | Yes | Yes | www.sabrent.com |
| StarTech | ICUS82321F | FTDI | 6 ft | No | None | Male DB-9; Female Binding Posts | Yes | Yes | www.startech.com |
| US Converters | XS880 ("Ultimate") | FTDI | 5 ft | Yes | 3: Connected, TX, RX | Male DB-9; Female Binding Posts | Yes | Yes | www.usconverters.com |
| | | | | | | | | | |
| Tripp Lite/Keyspan | USA-19HS | Keyspan | 3 ft | No | 1: Connected & TX | Male DB-9; Female Binding Posts | Yes | Yes | www.tripplite.com |
| | | | | | | | | | |
| Belkin | F5U409 | NXP | 14" | No | 3: Connected, TX, RX | Male DB-9; Female Binding Posts | Yes | Unknown | www.belkin.com |
| | | | | | | | | | |
| Airlink | ACUSBS | Prolific | 27" | No | None | Male DB-9; Female Binding Posts | No | No | www.airlink101.com |
| Unknown | Unknown | Prolific | 6 ft | No | None | PG-5G for Kenwood TM-D710 Head | No | No | stores.ebay.com/affordable-radio |
| | | | | | | | | | |
| | | Notes: | | | | | | | |
| | | Consistent COM Port: "Yes" means the adapter maintains the same Windows COM port number each time it is plugged in, even if moved to a different USB port | | | | | | | |
| | | Unique ID: "Yes" means the device has a unique identifier that can be used in a Linux udev rule to assign a consistent device name to a given adapter | | | | | | | |


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# Global Message Numbering

- What Is It?
  - Outpost automatically generates the next message number when you send a new message
  - Profiles were added in the last version, but message numbering was on a per-profile basis
  - If you don't pay attention to how you set up the profiles, you could cause duplicate message numbers
  - Example:
    - Create Profile 1, next message number = 100
    - Create Profile 2, next message number = 100
    - Send a message using Profile 1; assigned msg # is 100
    - Switch to Profile 2
    - Send a message using Profile 2: assigned msg # is 100; **Duplicate!**


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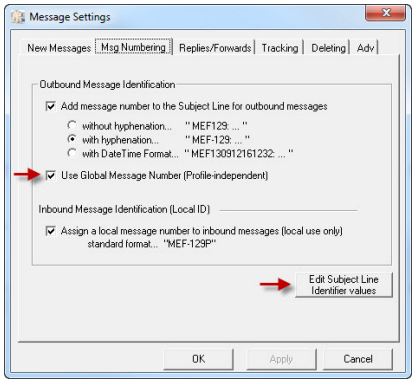
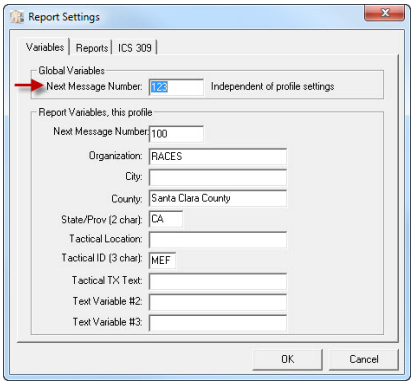
# Global Message Numbering

- How to Use It
- Global message numbering is now the default
- To update old profiles …

Tools > Message Settings




Tools > Report Settings





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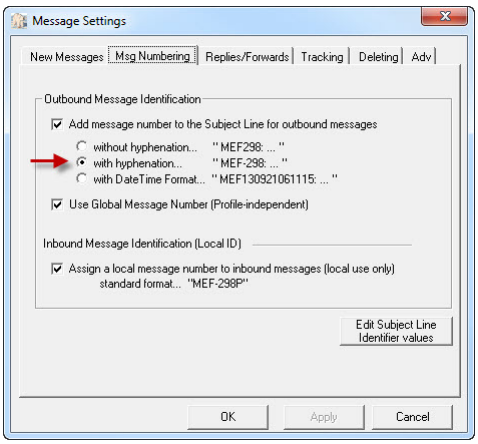
# New Default Message Number Format

- Improves readability
  - FS1234 vs. FS1-234
- Update your old profiles
  - Tools > Message Settings

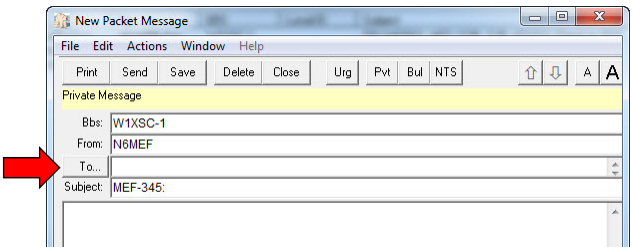






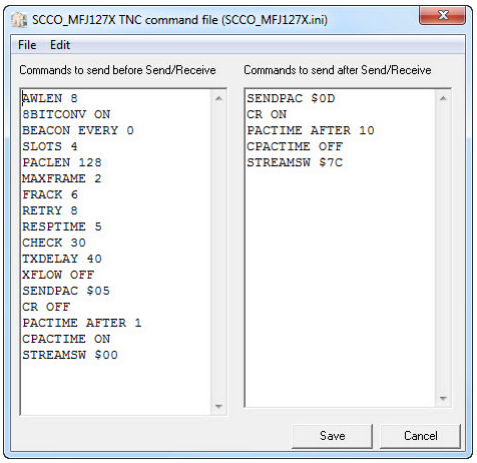
# Improved Address Handling

- BBS-style
  - Allows use of "#" character (ex: kn6pe@w1xsc.#nca.ca.usa.noam)
- SMTP-style
  - Now supports standard address formats (with/without "< >")
  - Allows use of 2-char top-level-domains (ex: user@host.domain.**eu**)
  - No longer sends delivery receipts to "mailer-daemon"
    - Considered bad practice to respond to mailer system messages



## New TNC Command Files

- Optimizes channel utilization for two additional TNCs:
  - MFJ 127X
  - TAPR TNC2





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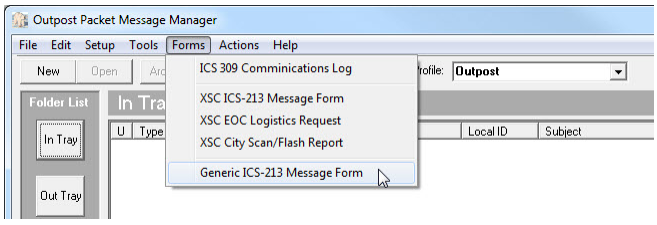
## Return of Generic ICS-213 Form

- 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 counties





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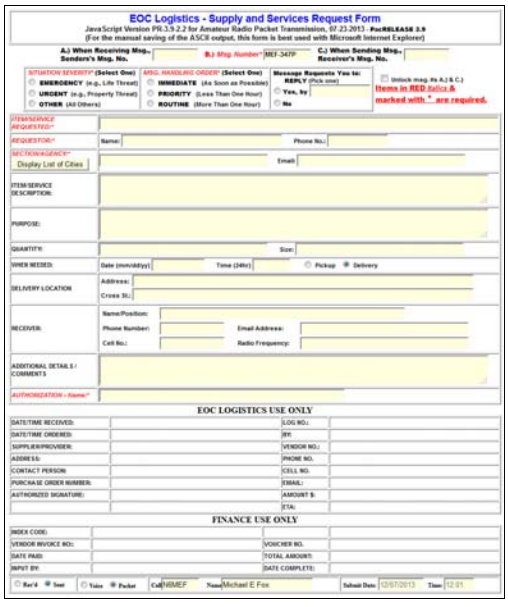
## PacFORMS Enhancements




## New Logistics Form

- Matches updated form in county EOC



## 7-bit Compatibility

- Previously, PacFORMS used some 8-bit ASCII characters (¿¥€) for internal formatting purposes
- These were normally stripped out when the PacFORM was received and displayed in the browser
- But if a 7-bit system was in the transmission path, these characters would be corrupted, resulting in lost formatting and extra "?" symbols in messages
  - Examples: e-mail systems; some really old TNCs
- PacFORMS now uses only 7-bit ASCII characters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## Network Enhancements


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## Bulletin Area Name Change

| Name | Purpose & Usage |
|---|---|
| xscperm | • Official operating info needed by all network users every day<br>• Examples: tactical call list, primary and alternate BBS assignments, frequency list<br>• Replaced previous "perm" area<br>• Does not expire; requires sysop to remove bulletins |
| xscevent | • Official operating info related to emergency incidents, public service events, drills or other types of activations<br>• Information changes over time<br>• Examples: official instructions, plans or informational updates specific to the current activation, current operational period<br>• Expires after one day |
| xsctest | • Unofficial. For testing purposes only.<br>• Users can send test bulletins here to avoid using official bulletin areas<br>• Expires after one day |
| allxsc | • Multi-purpose bulletin area for future use |


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## W1XSC Frequency Change

- 2m access frequency on W1XSC changed
  - Previous: 144.990 MHz
  - **Current: 145.750 MHz**
- New frequency is in repeater-prohibited portion of the band



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## Two-way E-mail Gateways

- Outbound:
  - Address just like any e-mail application:
    - Example: fat.joey@donutsaremylife.com
- Inbound:
  - <callsign>@<bbscall>.ampr.org
  - FCC Call signs: w6xrl4@w2xsc.ampr.org
  - Tactical Call Signs: xndeoc@w4xsc.ampr.org
- Be sure to set e-mail client to plain text mode
  - Otherwise message may be 10x (or more) larger!
- Redundancy
  - Currently using 3 different ISPs in three different parts of the county

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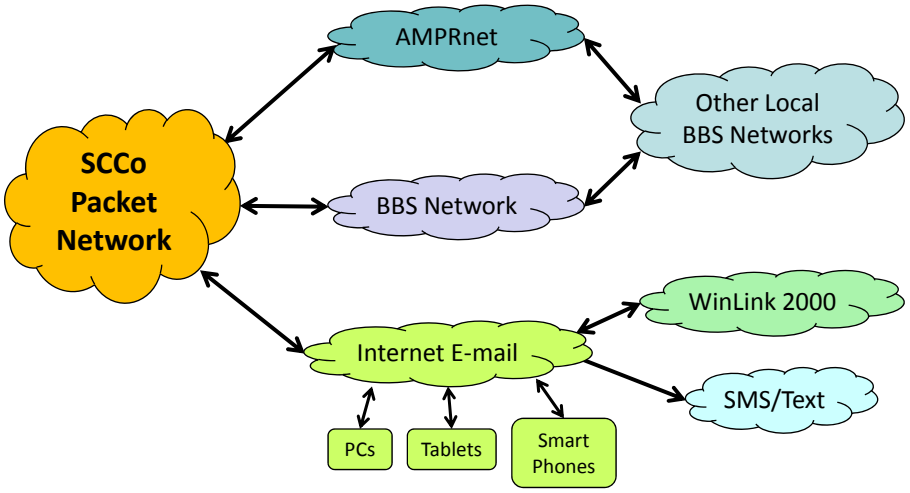
## We Are Well Connected!

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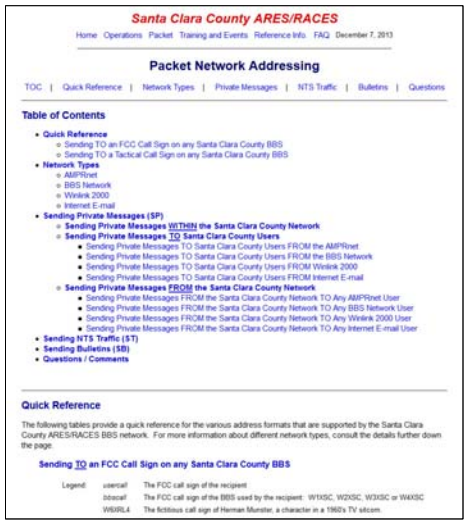
## Packet Network Addressing Web Page

- Our network connects to several other networks, each with different address formats
- New web page provides a "cheat sheet" for how to address message to or from any other network type
- Useful in your packet go kit


Santa Clara County ARES/RACES

Home Operations Packet Training and Events Reference Info FAQ December 7, 2013

Packet Network Addressing

TOC | Quick Reference | Network Types | Private Messages | NTS Traffic | Bulletins | Questions

Table of Contents

- Quick Reference
  - Sending TO an FCC Call Sign on any Santa Clara County BBS
  - Sending TO a Tactical Call Sign on any Santa Clara County BBS
- Network Types
  - AMPRnet
  - BBS Network
  - Winlink 2000
  - Internet E-mail
- Sending Private Messages (SP)
  - Sending Private Messages WITHIN the Santa Clara County Network
  - Sending Private Messages TO Santa Clara County Users
    - Sending Private Messages TO Santa Clara County Users FROM the AMPRnet
    - Sending Private Messages TO Santa Clara County Users FROM the BBS Network
    - Sending Private Messages TO Santa Clara County Users FROM Winlink 2000
    - Sending Private Messages TO Santa Clara County Users FROM Internet E-mail
  - Sending Private Messages FROM the Santa Clara County Network
    - Sending Private Messages FROM the Santa Clara County Network TO Any AMPRnet User
    - Sending Private Messages FROM the Santa Clara County Network TO Any BBS Network User
    - Sending Private Messages FROM the Santa Clara County Network TO Any Winlink 2000 User
    - Sending Private Messages FROM the Santa Clara County Network TO Any Internet E-mail User
- Sending NTS Traffic (ST)
- Sending Bulletins (SB)
- Questions / Comments

Quick Reference

The following tables provide a quick reference for the various address formats that are supported by the Santa Clara County ARES/RACES BBS network. For more information about different network types, consult the details further down the page.

Sending TO an FCC Call Sign on any Santa Clara County BBS

Legend: usercall The FCC call sign of the recipient
bbscall The FCC call sign of the BBS used by the recipient: W1XSC, W2XSC, W3XSC or W4XSC
W6SRL4 The fictitious call sign of Herman Munster, a character in a 1960's TV sitcom.




## Other Documentation Updates

- PDFs (http://www.scc-ares-races.org/packet.html)
  - Standard Outpost Configuration Instructions
  - Standard TNC Parameter Settings
  - Standard Format for Packet Message Subject Line
  - How to Send a Message with Outpost
- Web page updates:
  - http://www.scc-ares-races.org/freqs/packet-freqs.html
  - http://www.scc-ares-races.org/packet.html
  - http://www.scc-ares-races.org/packet/packet-addressing.html

## Preview of Upcoming Data Networking Enhancements

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## Section-wide BBS Forwarding via RF

- All surrounding counties can reach at least one of our BBSs by radio from their EOC
  - Monterey, San Benito, San Mateo, Santa Cruz
- But some use non-SCCo BBSs for their primary BBS
  - Santa Cruz uses N0ARY on Mt. Umunhum
  - San Mateo uses N6ZX on Skyline Drive above Woodside
- Forwarding to these other BBSs is currently done via Internet
- Working on forwarding via 1.25m band
- Will require swapping 220 frequencies between W2XSC (Crystal Peak) and W4XSC (Frazier Peak)
- Anticipate completion by January

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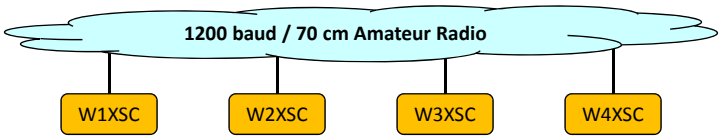
## Enhanced Backbone Connectivity

- XSC BBSs currently connected via 1200 baud RF on 70 cm band




- Advantages
  - Reliable (1200 baud is VERY forgiving)
  - Easy to maintain (deviation can be set by ear, if necessary)
  - Has handled even the heaviest drill traffic without any problem
- Disadvantage
  - 440 radio/TNC failure can isolate an individual BBS
  - It does limit us if we want to move toward higher bandwidth services in the future, including large/binary attachments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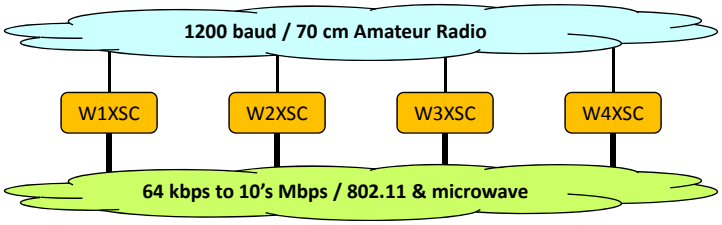
## Enhanced Backbone Connectivity

- In 1Q2014, all sites will have higher speed, alternate connectivity of at least 64 kbps; 440 RF as backup




- Equipment in currently on order and will take some time to install (especially given winter weather)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## Mesh Networking

- Currently, user access speed is limited to 1200 baud on 2m or 1.25m bands
  - Advantages:
    - Deployable: *FROM ANYWHERE* in the county, *TO ANYWHERE* in the county, without the Internet or *ANY* additional infrastructure
    - Survivable: Access 2+ backbone sites from anywhere, no Internet required
    - Fast/Functional: Send small text messages about as fast as with Internet e-mail (< 30 sec to send a form or text message)
  - Disadvantages:
    - Limits *reasonable* message size to approx. 10k bytes (+/-)
    - Limits traffic to text messages (no audio, video, or large binary file attachments)


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## Mesh Networking


- Mesh networking may be a good option
  - Automatic configuration, operation
    - User doesn't need to know routing protocols
    - Cover as much or as little as local hams desire
  - Operates at multiple Mbps
    - Multiple traffic types: voice, video, large binary files
  - Low cost hardware is available on eBay; easy to update
  - Uses ham portions of 802.11 bands
    - We can use much better antennas, higher power (with no encryption)
- But … very, *VERY* line-of-site limited
  - Even trees are a problem at 2.4 GHz
  - It takes many, many nodes to reach the same distance as existing methods
- Still … we're going to give it a try …


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## Mesh Networking

- Some initial "tinkering" underway; more in 2014
- For more information
  - http://www.broadband-hamnet.org/
    - Custom software and instructions
    - Read thoroughly before you buy anything!
- Come join the fun
  - http://groups.yahoo.com/group/scc-mesh
    - New Yahoo group set up to discuss mesh networking in Santa Clara County
  - SVECS Breakfast, January 25, 2014
    - http://www.svecs.net
    - Program: "Toward an Integrated Electronic Messaging System"
    - Covers enhancements to our data networking capabilities made over the last three years, plus a preview of what's coming next

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# Training Program Changes

Santa Clara County ARES®/RACES

Last Updated 10-Dec-2013

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## New Event Planning Class (Part 1 of 2)

- Intended audience
  - ECs and AECs
  - MAC Type 1 candidates
  - Any others who will be planning events
- Prerequisite
  - Any type 2 class (Field Ops, Net Control, Packet)
- Agenda
  - Type of planning situations
  - The planning process
  - Planning an event
  - Problems and pitfalls

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## Night Classes

- Saturday morning classes not possible for some
  - Work or family obligations
- We will experiment with night classes in 2014
- Field Operations classes will be the first such trial
- Attendance and feedback will determine what happens after that
- Check the event schedule for details

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# Messaging Passing and Logging

Santa Clara County ARES®/RACES

Last Updated 10-Dec-2013



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## A few reminders …

… based on experience from recent events



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## Prowords

- Introductory Words for Groups
  - Said BEFORE the object to which they refer
  - Examples: “figures”, “telephone figures”, “initial”, “initials”, “mixed group”, “mixed group figures”, “amateur call”, “email address”, “packet address”, “internet address”, …
- Prowords, operational words
  - Said AFTER the object to which they refer
  - Examples: “I spell”, “I say again”, …


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## Exercise: Prowords and Introductory Words

Use the proper prowords and introductory words to make sure the following information is properly conveyed:

- 123
- A123
- 123B
- 123 Apartment B
- 123 Apt B
- K Street
- Kay Street
- 1st Street
- 123 Apt B, K Street
- 456 Apt 4B, Kay Street
- 789 Ste B1, 1st Street
- N6MEF
- N6MEF/P
- (214) 867-5309
- w6xrl4@w2xsc.ampr.org
- w6xrl4@w2xsc.#nca.ca.usa.noam
- http://www.scc-ares-races.org
- Supercalifragilisticexpialidocious
- Sesquipedalianism
- Get me a jelly donut!


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## Say Again …

- … word after ____
- … word before ____
- … all after ____
- … all before ____
- … between ____ and ____




## Exercise: Say Again

Use the proper "say again …" phrase to request the missing information

- Michael is a ____ instructor.
- ____ ____ is a better instructor.
- This class is ____ ____.
- On Saturday mornings, I prefer to be ____.

## ICS-213 Transmission Process

- Sender (wait for ACK after each step)
  - Message #, Date, Time
  - Severity, Handling, Requests
  - To, From
  - Subject
  - Reference (if any)
  - Message - 5 words at a time
  - "End of message"
- Receiver
  - ACK each section or request fill
  - ACK end of message followed by …
  - "My message number is <#>. This is <call sign>."
  - Fill in Operator Info
- Sender
  - ACK Msg # / Fill in receiver's message #
  - "This is <call sign>"
  - Fill in Operator Info


MESSAGE FORM

• Use Ballpoint Pen-Press Hard; Print Clearly

Date: (mm/dd/yy) | Situation Severity (✓ one) | Msg. Handling Order (✓ one) | Message Requests You To:

❒ EMERGENCY (e.g., Life Threat) | ❒ IMMEDIATE (As Soon as Possible) | TAKE ACTION (✓ one) ❒ Yes ❒ No

Time: (24 hour clock) | ❒ URGENT (e.g., Property Threat) | ❒ PRIORITY (Less Than One Hour) | REPLY (✓ one) ❒ Yes, by ____ ❒ No

❒ OTHER (All others) | ❒ ROUTINE (More Than One Hour) | ❒ FOR YOUR INFO. (no action required)

To: ICS Position: (required) | Location: (required) | Name: (optional) | Telephone #:(optional)

From: ICS Position: (required) | Location: (required) | Name: (optional) | Telephone #: (optional)

SUBJECT:

REFERENCE (e.g., Number of earlier msg.):

Message: (what, when, where needed; how long; contact name and phone number) KEEP MSG BRIEF

ACTION TAKEN: (For use by Originator / Recipient) • USE SEPARATE MESSAGE FORM IF SENDING REPLY!

CC: ❒ Management ❒ Operations ❒ Planning ❒ Logistics ❒ Finance

Operator Use Only:

How Received ❒ or Sent ❒ (✓ one) | Operator Call Sign:

❒ Telephone ❒ Dispatch Center | Operator Name:

❒ EOC Radio ❒ FAX ❒ Courier

❒ Amateur Radio ❒ Other _____ | Date: Time:

Outgoing (Sent):

Message Originator: Send the top copy (white) to radio, yellow to PLANNING, retain the pink copy for your reference.

Radio: After sending, complete Disposition info., return white copy for file in radio.

Incoming (Received):

Radio: After receiving, complete Disposition info., route the top copy (white) to the Addressee, yellow to PLANNING, retain pink for file in Radio.

Addressee: Take appropriate action.

SCCo ICS Form 213 6/20/2007

http://www.scc-ares-races.org/operations.html



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## Say Again … for Multi-Station Message

- If you are the pacing station, you can use "say again …" each time the sender pauses during transmission
- Otherwise, you have to wait until after the entire message is transmitted
- Use field name to quickly isolate the desired word(s):
- Say again <field name> …
  - Say again message number
  - Say again situation severity
  - Say again to location
  - Say again subject
  - Say again message (ouch!)
  - Say again message, word after …
  - Say again message, between … and …
- Use more than one word to describe location, if needed
  - Say again message, word after "Pinky and the"



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# ICS 309 – Communications Log

- Our version: ICS 309-SCCo
- Net Control Operators and stations with high message traffic
- Columns help organize key message tracking info
- Does not replace 214
  - EVERYONE fills out a 214
- Turn in to supervisor at end of shift
- Instructions on back


COMM Log
ICS 309-SCCo
ARES/RACES

1. Incident Name and Activation Number

2. Operational Period (Date/Time)
From: To:

3. Radio Net Name (for NCOs) or Position/Tactical Call

4. Radio Operator (Name, Call Sign)

5. COMMUNICATIONS LOG

| Time (24:00) | FROM Call Sign/ID | FROM Msg # | TO Call Sign/ID | TO Msg # | Message |
|---|---|---|---|---|---|

6. Prepared By (Name, Call Sign)

7. Date & Time Prepared

Page ____ of ____

ICS 309-SCCo ARES/RACES (rev. 2009-Sep-03)

http://www.scc-ares-races.org/operations.html


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# ICS 309: Header and Footer

- When you start a new page, fill in the header

| COMM Log ICS 309-SCCo ARES/RACES | 1. Incident Name and Activation Number: Transylvania Mummy Race TSV-13-13 | 2. Operational Period (Date/Time): From: Oct 31, 2013 2000 To: Oct 31, 2013 2359 |
|---|---|---|
| 3. Radio Net Name (for NCOs) or Position/Tactical Call: Resource Net | 4. Radio Operator (Name, Call Sign): Herman Munster, W6XRL4 | |

5. COMMUNICATIONS LOG

| Time (24:00) | FROM Call Sign/ID | FROM Msg # | TO Call Sign/ID | TO Msg # | Message |
|---|---|---|---|---|---|
| | | | | | |

- When you complete a page (or the net) fill in footer

| 6. Prepared By (Name, Call Sign) | 7. Date & Time Prepared | |
|---|---|---|
| Wolf Man, K6WOOF | Oct 31, 2013, 2359 | Page 1 of 1 |

ICS 309-SCCo ARES/RACES (rev. 2009-Sep-03)


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# ICS 309: Shift Change

- Record outgoing and incoming Net Control/Scribe
- Make it clear, obvious what happened

| 5. COMMUNICATIONS LOG | | | | | |
|---|---|---|---|---|---|
| Time (24:00) | FROM | | TO | | Message |
| | Call Sign/ID | Msg # | Call Sign/ID | Msg # | |
| [ End of shift H&W Check entries ] | | | | | |
| 1300 | ---------- | | ---------- | | ---- SHIFT CHANGE ---- |
| ------ | ---------- | | ---------- | | Outgoing NCO=<call sign>; Scribe=<call sign> |
| ------ | ---------- | | ---------- | | Incoming NCO=<call sign>; Scribe=<call sign> |
| [ Log continues ] | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |


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# ICS 309: Activity on Another Form

Be sure to record all activity, even if using another form

- ICS 213 Message Form

| 5. COMMUNICATIONS LOG | | | | | |
|---|---|---|---|---|---|
| Time (24:00) | FROM | | TO | | Message |
| | Call Sign/ID | Msg # | Call Sign/ID | Msg # | |
| 1327 | XNDEOC | XND-107 | | | Inventory Status |
| | | | | | |

- Crowd Count (Los Altos Festival of Lights)

| 5. COMMUNICATIONS LOG | | | | | |
|---|---|---|---|---|---|
| Time (24:00) | FROM | | TO | | Message |
| | Call Sign/ID | Msg # | Call Sign/ID | Msg # | |
| 1745 | ---------- | | ---------- | | Conducted 1st crowd count; see crowd count form |
| | | | | | |


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## And Finally: Staying Current

- Today's purpose was …
  - To review *changes* to training and operational procedures that occurred over the past year (and a few that are coming soon)
- Obviously …
  - This is only effective for those who are already familiar with the training and operations procedures in place the year before
- So …
  - If you haven't taken the base classes in the last two years and/or you haven't practiced at least a few times by attending a few drills/events per year, you won't have the whole story
- Therefore …
  - To keep current and maintain top skill levels, you need to attend full training classes at least every two years and attend a few drills/events each year.

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## The End … For Now

Thanks

See you next year!

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