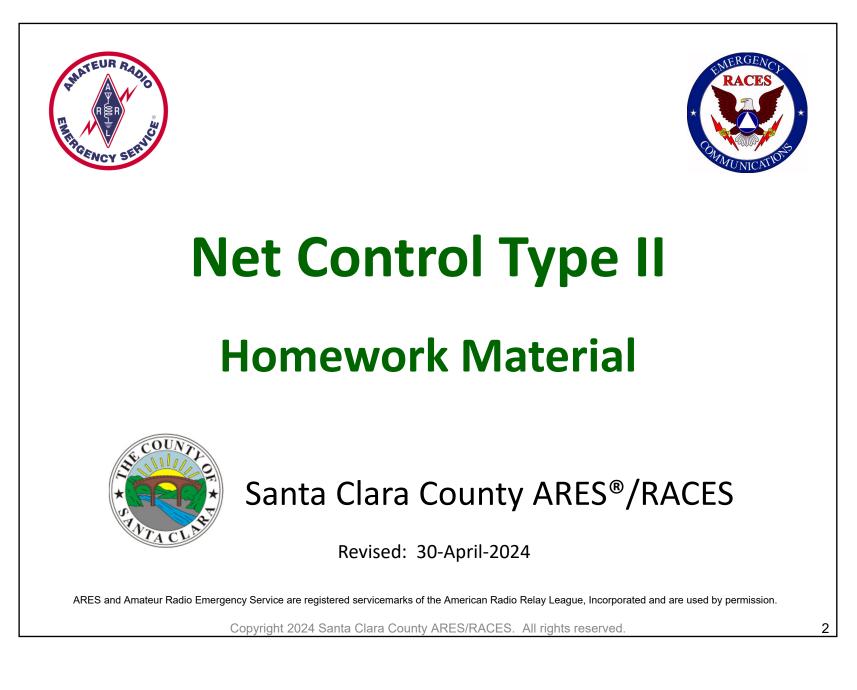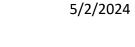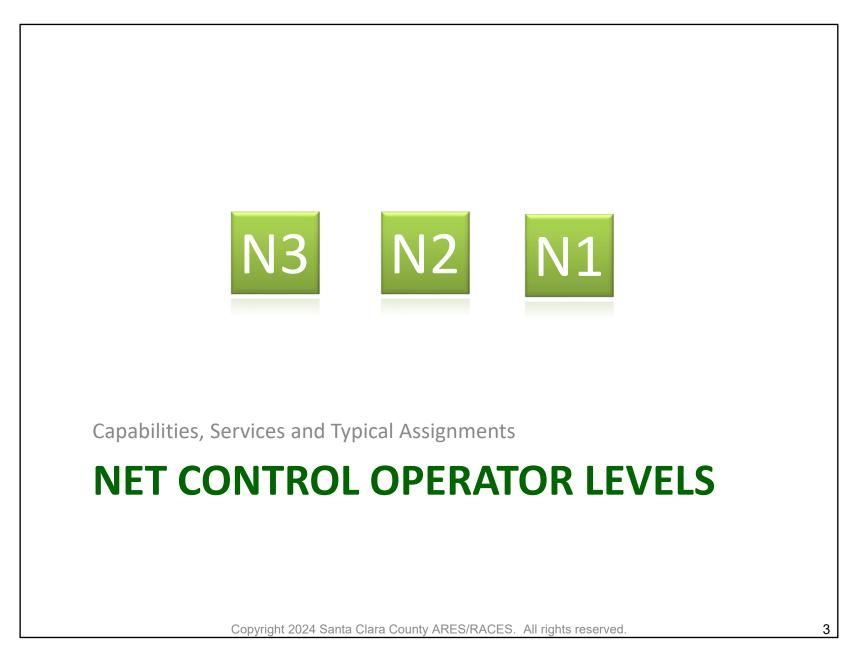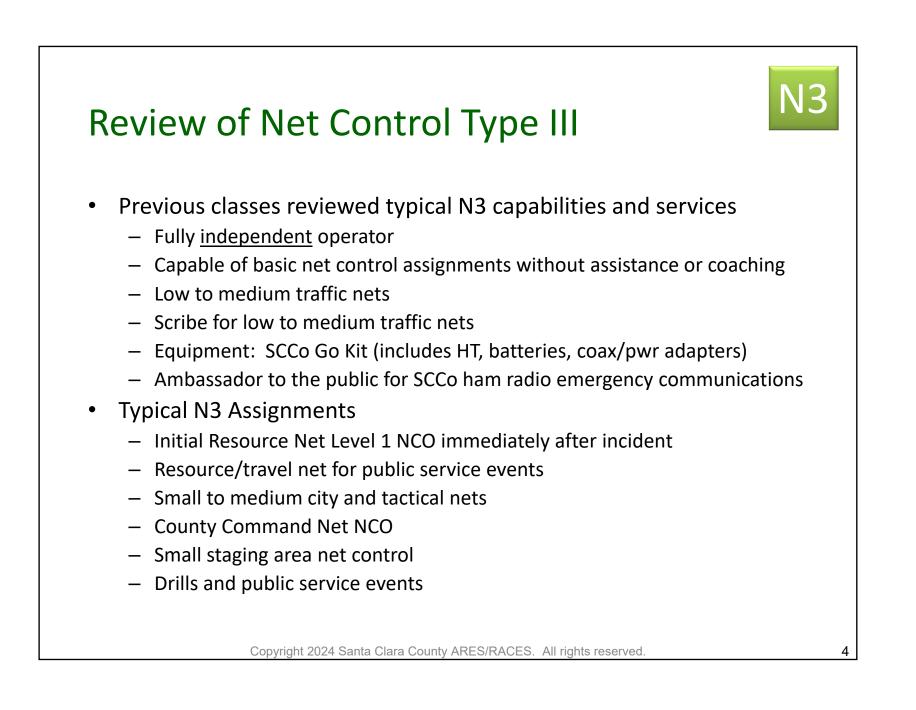# USE AND DISTRIBUTION NOTICE

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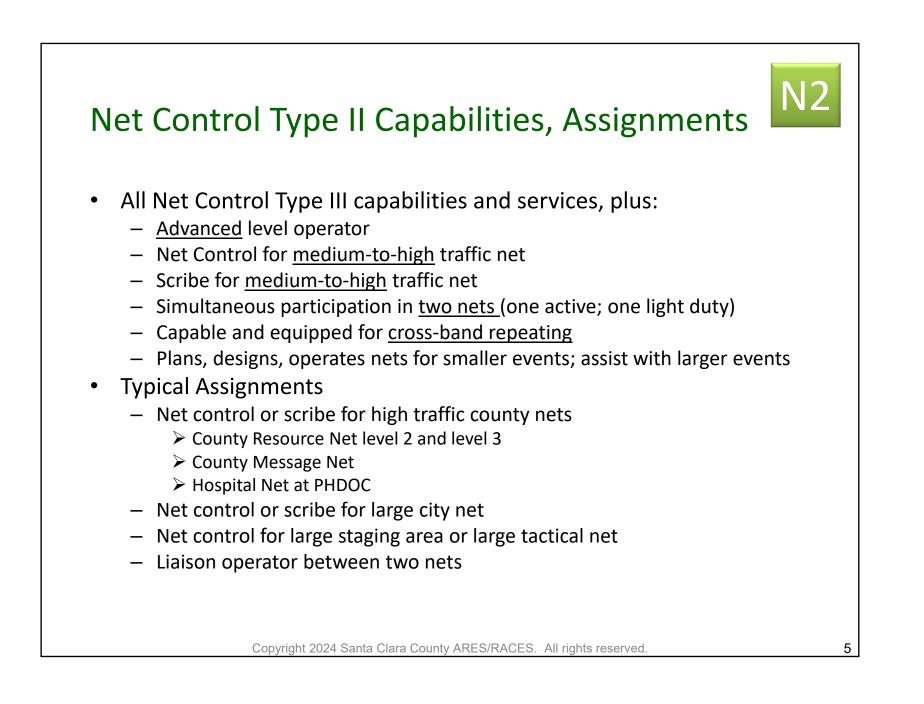
1

Net Control Type II

Homework Material

Santa Clara County ARES®/RACES

Revised: 30-April-2024

2

N3   N2   N1

Capabilities, Services and Typical Assignments

NET CONTROL OPERATOR LEVELS

3

Review of Net Control Type III

N3

- Previous classes reviewed typical N3 capabilities and services
    - Fully <u>independent</u> operator
    - Capable of basic net control assignments without assistance or coaching
    - Low to medium traffic nets
    - Scribe for low to medium traffic nets
    - Equipment: SCCo Go Kit (includes HT, batteries, coax/pwr adapters)
    - Ambassador to the public for SCCo ham radio emergency communications
- Typical N3 Assignments
    - Initial Resource Net Level 1 NCO immediately after incident
    - Resource/travel net for public service events
    - Small to medium city and tactical nets
    - County Command Net NCO
    - Small staging area net control
    - Drills and public service events

4

4

Net Control Type II Capabilities, Assignments N2

- All Net Control Type III capabilities and services, plus:
  - <u>Advanced</u> level operator
  - Net Control for <u>medium-to-high</u> traffic net
  - Scribe for <u>medium-to-high</u> traffic net
  - Simultaneous participation in <u>two nets</u> (one active; one light duty)
  - Capable and equipped for <u>cross-band repeating</u>
  - Plans, designs, operates nets for smaller events; assist with larger events
- Typical Assignments
  - Net control or scribe for high traffic county nets
    - County Resource Net level 2 and level 3
    - County Message Net
    - Hospital Net at PHDOC
  - Net control or scribe for large city net
  - Net control for large staging area or large tactical net
  - Liaison operator between two nets

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Net Control Type I Capabilities, Assignments

N1

- All Net Control Type II capabilities and services, plus:
  - Specialist level operator
  - The most complicated, highest traffic, most critical assignments
  - Planning, designing, and operating complex multi-radio, multi-net configurations for larger events or incidents
    - Including filling out (creating) the event ICS-205 Communications Plan
  - Equipped for and capable of out-of-county and extended deployments
  - Knows where to find all relevant documentation on the scc-ares-races.org website
- One additional course will cover topics of interest to all Type I qualification areas:
  - Event Planning Table Top

- This course focuses on Net Control Type II

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Thank you for working towards a Type II credential!!

- Obtaining any Type II credential (F2, N2, P2, S2) is a nice step
  - You have gone through at least two evaluation consideration processes
  - This signifies a Fully Independent and Advanced Operator
  - You have demonstrated your capability and performance for the resource type based on SCCo RACES program standards
  - SCCo and you have confidence that you can provide dependable and reliable communication services to a <u>served agency </u>in benefit to the <u>public</u> for real and public service events.

7

Routine Profile Maintenance and Review

CREDENTIAL CARD, PROFILE, ACTIVITY RECORD AND ENDORSEMENTS

8

8

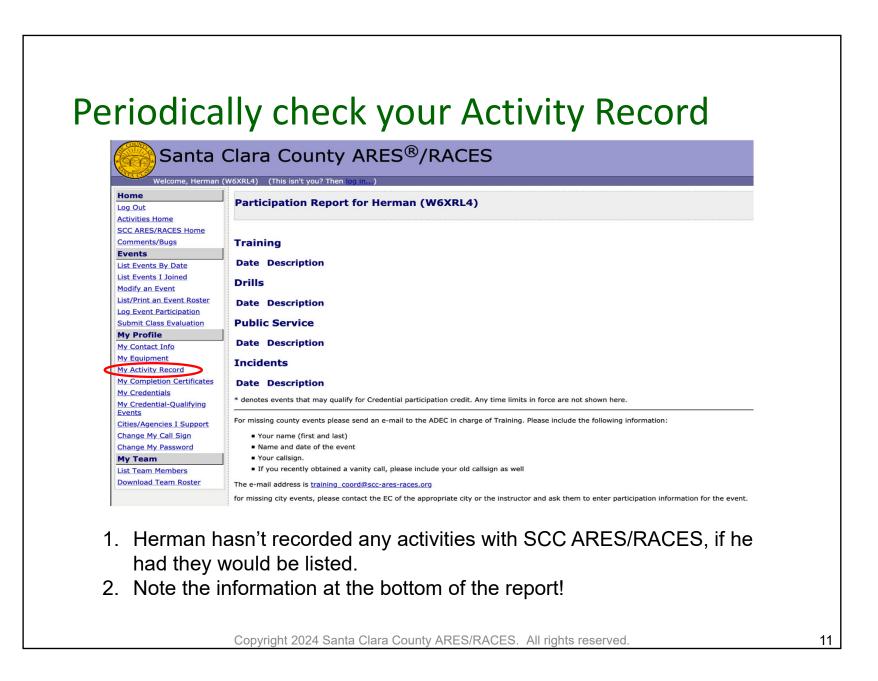# Print and laminate your Credential Wallet Card after Jan 31st each year or when you advance:

9

Verify your Contact Information: beginning of each year or when your make changes.
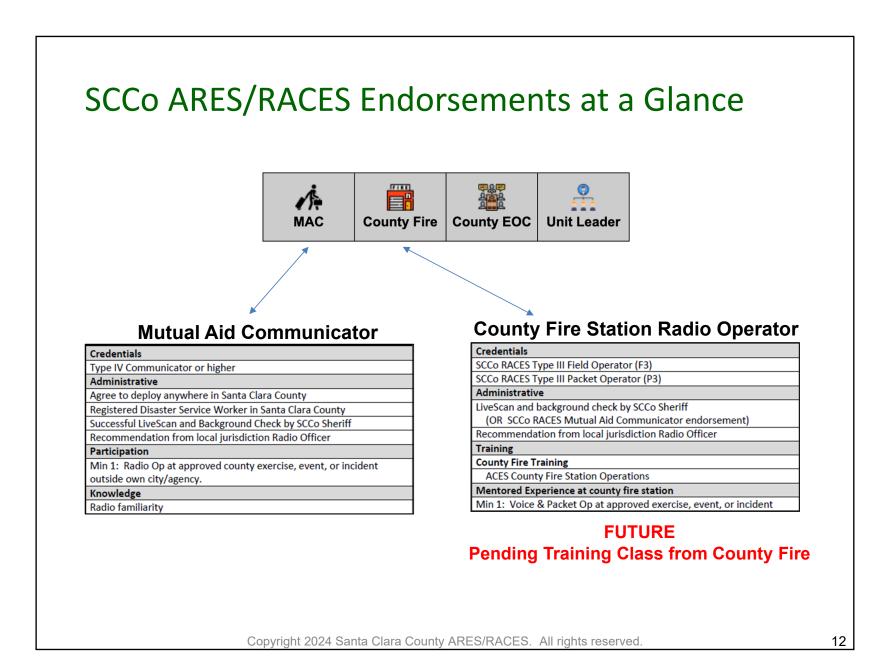
- "My contact Info"

- Verify / modify info

- Note: you need to separately fill in your AlertSCC information.

- Mark the check box after "I have reviewed"
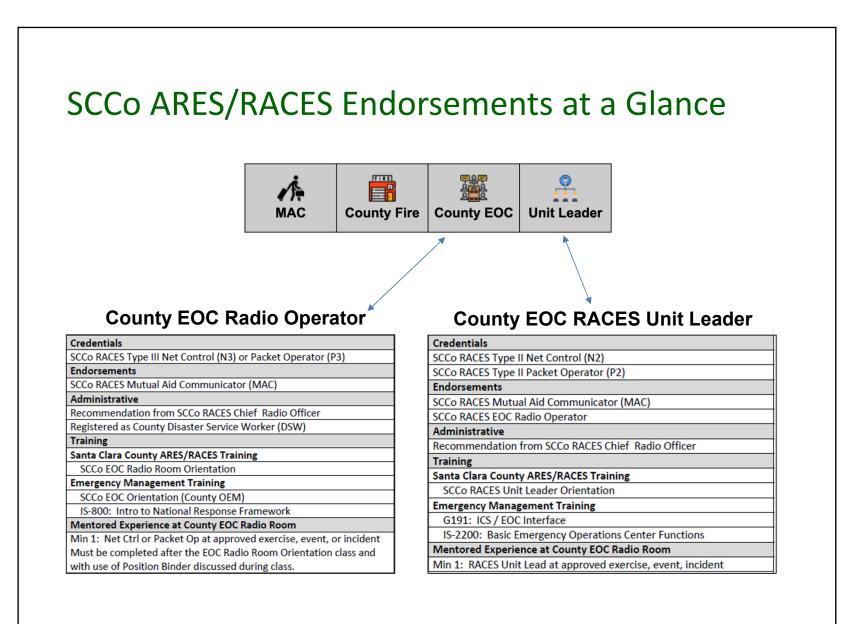
- Click "Save Changes"

We need to have accurate and up-to-date contact information in order to contact people: email, AlertSCC, by phone, etc.

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Periodically check your Activity Record

1. Herman hasn't recorded any activities with SCC ARES/RACES, if he had they would be listed.
2. Note the information at the bottom of the report!

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SCCo ARES/RACES Endorsements at a Glance

| | MAC | County Fire | County EOC | Unit Leader |

Mutual Aid Communicator

Credentials
Type IV Communicator or higher
Administrative
Agree to deploy anywhere in Santa Clara County
Registered Disaster Service Worker in Santa Clara County
Successful LiveScan and Background Check by SCCo Sheriff
Recommendation from local jurisdiction Radio Officer
Participation
Min 1: Radio Op at approved county exercise, event, or incident outside own city/agency.
Knowledge
Radio familiarity

County Fire Station Radio Operator

Credentials
SCCo RACES Type III Field Operator (F3)
SCCo RACES Type III Packet Operator (P3)
Administrative
LiveScan and background check by SCCo Sheriff (OR SCCo RACES Mutual Aid Communicator endorsement)
Recommendation from local jurisdiction Radio Officer
Training
County Fire Training
ACES County Fire Station Operations
Mentored Experience at county fire station
Min 1: Voice & Packet Op at approved exercise, event, or incident

FUTURE
Pending Training Class from County Fire

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SCCo ARES/RACES Endorsements at a Glance

| MAC | County Fire | County EOC | Unit Leader |

County EOC Radio Operator

Credentials
SCCo RACES Type III Net Control (N3) or Packet Operator (P3)
Endorsements
SCCo RACES Mutual Aid Communicator (MAC)
Administrative
Recommendation from SCCo RACES Chief Radio Officer
Registered as County Disaster Service Worker (DSW)
Training
Santa Clara County ARES/RACES Training
SCCo EOC Radio Room Orientation
Emergency Management Training
SCCo EOC Orientation (County OEM)
IS-800: Intro to National Response Framework
Mentored Experience at County EOC Radio Room
Min 1: Net Ctrl or Packet Op at approved exercise, event, or incident Must be completed after the EOC Radio Room Orientation class and with use of Position Binder discussed during class.

County EOC RACES Unit Leader

Credentials
SCCo RACES Type II Net Control (N2)
SCCo RACES Type II Packet Operator (P2)
Endorsements
SCCo RACES Mutual Aid Communicator (MAC)
SCCo RACES EOC Radio Operator
Administrative
Recommendation from SCCo RACES Chief Radio Officer
Training
Santa Clara County ARES/RACES Training
SCCo RACES Unit Leader Orientation
Emergency Management Training
G191: ICS / EOC Interface
IS-2200: Basic Emergency Operations Center Functions
Mentored Experience at County EOC Radio Room
Min 1: RACES Unit Lead at approved exercise, event, incident

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Reminder:
Keep your documentation current

- Performance Standards and Best Practices
  (PDF - 1.0 MB) [v2.2, Revised: 27-Apr-2022]

- Credentialing Program Handbook v3.1.3
  (PDF - 608 KB) [v 3.1.3, Revised: 26-Mar-2024]

- SCCo ARES/RACES Message Passing Procedures
  (PDF - 3.5 MB) [Revised: 11-Jul-2022]

  Errata Sheet [Revised: 22-Jan-2024]

Also from scc-ares-races.org:
- Frequency lists: County Voice and County Packet
- County Leadership and City/Agency Leadership
- Go-kit forms, including appropriate additional/other forms

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Our Example Operator: Herman Munster

- "The Munsters" was a TV show in the mid-1960s

- Herman was the father, played by Fred Gwynne

- Herman was an amateur radio operator: W6XRL4

- Herman's mobile phone: 555-867-5309

- We may use other characters
  and calls based on the TV show:
  - Wolfman Jack: W6WOOF
  - Dracula: W6DRAC
  - Etc.

- We may also use others as
  simulated for real people:
  - Eddie Munster
  - Grandpa Munster
  - Etc.

W6XRL4

Herman Munster
1313 Mockingbird Lane
Camelot, New Jersey USA

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Work faster, work longer, work smarter

EQUIPMENT FOR ADVANCED NET CONTROL

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Net Control Type II Equipment

- N2 requires the same equipment as F2:
  - 2m/70cm dual-band radio, 25 Watts minimum (typically, mobile-style)
    - Dual-VFO required
    - Cross-band repeat capability required
    - Must be capable of deployment independent of vehicle
  - Headphones (for above radio)
    - Headset and foot/hand switch recommended
  - Charged batteries for 12 hours of operation (20 Ah min., 26 Ah rec'd)
  - Power cable adapters to connect mobile radio to:
    - Powerpoles, cigarette lighter socket, vehicle battery terminals
  - 2m/70cm dual-band portable base antenna (such as roll-up J-pole)
  - Portable antenna mast; must raise base of antenna at least 10 ft above ground)
  - Tripod or other self-supporting base for mast (independent of vehicle)
  - Minimum of 25 feet of 50 ohm coaxial cable (50 feet recommended)
  - Coax adapters to connect mobile unit to coax and coax to:
    - BNC male and female, UHF male and female, N-type male and female

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M = Mono
S = Stereo

Equipment for Two Frequencies

- Single Operator / Two Radio Controller
  - Stereo headset (one radio per ear)
  - Separate PTT for each radio (footswitch)
  - Allows reception while transmitting
  - Ideal for static configuration (Contesting)
  - Complicated set-up/maintenance (not ideal for mobile/field EmComm)

- Two radios, one headset, two mics
  - Stereo headset (one radio per ear)
  - Two mics (main radio mic in headset)
  - Allows reception while transmitting
  - Most practical option for EmComm

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M = Mono
S = Stereo

Alternative Equipment for Two Frequencies

- One mobile, one HT
  - Stereo headset for mobile radio & HT
  - Or, earbud for HT tucked under headphones
  - Common for N2 evaluations

- Two radios, two speakers
  - Distance between speakers helps identify radio
  - Very noisy!
  - It may be all you can do if you also have to perform other duties

- One radio, two VFOs
  - Stereo headphones (VFO per ear)
  - Must remember to select TX VFO each time
  - No reception on 2nd VFO while TX on same band

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What About Equipment for a Scribe?

- Stereo headphone amp or splitter still works
  - Feed radio 1 into left channel; radio 2 into right channel
  - Plug net control and scribe headsets into the headphone amp
  - Net control and scribe both wear stereo headphones
- Consider whether to work the two nets separately
  - If you are net control for two low-to-medium speed nets
    - It may be more efficient if the scribe becomes the net control for the second net
  - If you are net control of one high traffic net and liaison on the other
    - It may be more efficient to have a scribe to help with high traffic
    - Therefore, one net control & one scribe for both nets may be best
  - Ultimately, use common sense to match skills with requirements

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Alternative Power Sources

- Battery may not be enough for extended shifts or two radios
  - Example: net control power requirements (½ speak, ½ listen)
    - $Watts_{avg}$ = Volts * $Amps_{avg}$ = 13.8 Volts * [(Rcv current + Xmit current) / 2] Amps
    - Even more for two radios
  - Also consider other power requirements
    - Headphone amp, lights, fan, charger for HT, cell phone, etc.
  - Read the application note: AGM vs LPF Battery Testing
    - https://www.scc-ares-races.org/operations/docs/AGM_vs_LFP_Battery_Test_App_Note_v190208.pdf
- Solar
  - Foldable/portable available in ~20W to ~150+W; higher wattage available with stiff panels; don't forget charge controller, and a way to aim panels at sun!
  - Sunlight-time hours only
- Generator
  - Inverter style best for sensitive electronics
    - Examples: Honda EU2000i, Yamaha, Honeywell, others
  - Consider: weight, noise, run time (tank capacity, efficiency), exhaust
  - Other: rain canopy, fire extinguisher (includes Class B)**, splash pan**, power cable and plug covers

  ** required for use in SCC Parks and use of generator may need prior approval

Power Distribution

- **Power requirements**
  - Radio(s), fan, lighting, HT charger, cell phone charger (USB?)
  - Scribe's equipment, others
- **Powerpoles are county standard**
  - "Red, right, roof, rear"
- **DC Power Supply**
  - Consider one with multiple output connectors
- **Battery charger/battery backup switch**
  - Power radio and charge battery while **A/C is on**
  - Switch to battery power if **A/C fails**
  - Shown: West Mountain Radio Super PWRgate
- **Fused distribution**
  - Shown: West Mountain Radio RigRunner
  - Don't forget the spare fuses!
- **An in-line V/A/W meter can useful**

WORKING TWO NETS SIMULTANEOUSLY

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Why Work Two (or more) Nets?

- First person / only person on site
  - County or City EOC: multiple nets already operational
  - Event / exercise: limited staffing for NCO for multiple tactical nets

- Resource net repeater link not working between one pair
  - E.g., two separated resource nets.

- Some nets in the EOC are usually low traffic
  - Single operator designated to monitor multiple nets

- People on your net need information from another net
  - You might only monitor the second net
  - You might participate as the liaison to the second net
  - A "liaison" is someone who represents one net to another

- You may be going for your F2, N2, or S2 credential (!)

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Roles for Two (or more) Nets

- Possible roles for you on each net:
  - Net Control: manages the net
  - Liaison: participates as a member of the net, brings/retrieves info
  - Monitor: listen-only

- Combinations depend on net requirements, operator skill
  - Liaison operator on both nets
  - Full time net control on one net; liaison operator on second net
    - Required for Net Control Type II Qualification
  - Full time net control on both nets
    - Not really practical except when both nets are very low traffic

Working Two (or more) Nets

- Decide which net will be the primary net
- Give precedence to traffic on the primary net
  - Set expectations for members of both nets
  - "If I don't respond to you immediately, I may be talking on the other net"
- Organize everything left vs. right to match headphones/speakers
  - Equipment: radios, foot switches, cables, etc.
  - Paperwork: logs, message forms, in/out boxes, etc.
  - Use labels or name "tents" for each side
    - At some point, you WILL get tired or flustered and forget which is which
    - Especially if you need to use different call signs on each net!
- Use the correct Tactical and FCC call signs for each net
  - Both may be different
- Equipment becomes more important
  - If available equipment doesn't meet the needs of the role, adjust the role to handle what you can do with what you have

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Logging two (or more) Nets

- Use a <u>separate ICS 309</u> for each net
  - Each Net will have different mix of participants
  - Easier for your supervisor to see what is going on
  - You may get a relief operator for one of the nets, just hand them the ICS 309 as part of the relief briefing
  - Need to reconstruct details after the event is over without confusion

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CROSS-BAND REPEAT
FOR NET CONTROL

Typical Scenario

For more detail:
Cross-Band Repeating / Antenna Fundamentals course.

Repeater

Radio Room
or
Vehicle

Freedom of Movement

X-Band Repeater

EOC or Command Post

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Cross-band Repeating for Net Control

For more detail, consult the Cross-Band Repeating / Antenna Fundamentals course

- **Advantages**
  - Freedom of movement within the EOC/command post for message pick-up and delivery, or locating people with the information you need
  - May be the only option you have if you're the only operator
  - Reports of successful use in real situations like Hurricane Katrina
- **Challenges**
  - HT audio is usually not very good, for either TX or RX
    - Use a headset with boom mic, instead of earbud with inline mic
  - Net control is a high duty cycle operation
    - HT batteries will run down
      - Use extra-low power, have extra batteries charging at all times
    - Cross-band repeater radio will overheat
      - Use extra-low power on local/user side
      - Use a good antenna and low power on the remote/uplink side
      - Consider using a base station radio capable of higher duty cycle

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Cross-Band Repeating / Antenna Fundamentals

- **Cross-Band Repeating / Antenna Fundamentals**
- Next class offered on: 09/07/24
- See: https://www.scc-ares-races.org/activities/events.php

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County EOC RACES Radio Room

CHECKLISTS, SCRIPTS, AND PREPARATION (AND BINDERS…..)

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County OEM Position Binders

- Every position in the County EOC has a position binder that was prepared by the Office of Emergency Management

- Following that model, RACES team created a binder for each position in the Radio Room
  - Looks the same as any EOC binder
  - Position specific information are in designated tabs

Tab 2 and 3 the same for all positions

COUNTY OF SANTA CLARA
EMERGENCY OPERATIONS CENTER – RADIO ROOM

TAB 2 – Activation and Operation

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Tab 2 and 3 the same for all positions

COUNTY OF SANTA CLARA
EMERGENCY OPERATIONS CENTER – RADIO ROOM

TAB 3 – End of Shift and De-Mobilization

Tab 8 has position specific procedures

For Message Net – all the scripts for operating based on activation type
and resources used

COUNTY OF SANTA CLARA
EMERGENCY OPERATIONS CENTER – RADIO ROOM

TAB 8 – Position Procedural – Message Net

Example Checklist: Start of Shift

Start of Shift

☐	Put on the assigned vest for your position.
☐	Review the contents of each tab of this position binder.
☐	Obtain the Relief Briefing from the current staff (if you are not the first person to arrive)
☐	Verify the Activate Radio Room checklist steps have been completed for your position.
☐	Locate and have available on the counter-top multiple copies of the following set of forms appropriate to the station/position. For example: 1. ICS 309 Communication log 2. ICS 213 Message Form 3. Radio Routing Form 4. T-Cards 5. Form 1 – blank paper
☐	Locate other forms (as needed), blue or black ink pens, stapler and staple refills
☐	Enter/update your identification information: For voice net: start your ICS 309 form for your position. For packet: perform the Tab 8 *Start of Shift – Packet* checklist and return here.
☐	Verify the starting number or continuing number for the message numbering for your position.
☐	Verify your position equipment can communicate: Verify Tab 2 *Activate Radio Room* checklist complete(d) for your position. For voice net and packet via radio: radio is operational and on frequency. For packet via radio or via Internet: communicate with the intended BBS Review Tab Nine (9) for any radio equipment reference and supplemental material that may be appropriate for this position: e.g., EOC to EOC radio, OASIS radio, etc.
☐	For voice net: If not open: upon permission from the Unit Lead / Net Manager, open the net. If open: announce the update script Review Tab Eight (8) Radio Room Position Procedural for the appropriate scripts and any preparation work (if needed).

--end of checklist--

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County EOC RACES Radio Room
Future in-advance preparation well-before arriving

1. Slightly more in-depth look at binders and checklists is part of the SCCo EOC Radio Room Orientation (ERO) course

2. In the future we will likely be asking volunteers for County EOC Radio Room duty (real event, dril, or exercise) to:

    a) Study-up on the ERO endorsement course

    b) Create a position binder for their assigned position from material in the groups.io sub-group for the ERO endorsement

        i.   Checklists

        ii. Scripts

    c) Groups.io access is limited to those holding or working on the ERO endorsement and those assigned to work in the SCCo EOC Radio Room.

    d) Know your position's equipment

3. Web access to materials will be made available on an individual basis to those working on or holding the ERO Endorsement

Not just for County EOC RACES Radio Room

- As an N3 and especially N2, you should be prepared for
  - City participation at an event or drill
  - County EOC participation at an event or drill
  - If you are a MAC: a mutual-aid assignment
- Whether is a city or county experience
  - Have your personal checklist ready and up to-date
  - Have your basic scripts prepared
    - If you assignment has scripts already, get them in advance of arriving
  - Familiarize yourself with the equipment you will be using
    - If you will be using someone else's, ask in advance for information
- Keep your 2-hour and 12-hour go-kits current
  - Periodically review all your equipment and supplies for operational readiness
  - Refresh your "radio familiarity" with your own equipment
- Updates to documentation are communicated via the groups.io announce list

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RESOURCE NET OPERATIONS
LEVEL 1 (REVIEW)

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Resource Net Level 1 Operations

LEVEL 1

(Review)

- Come up on the Resource Net
  - If possible, use AA6BT (primary)
  - If possible, cover W6ASH (North) and N6NAC (South) with liaisons
- Listen for active stations
- If no net currently exists, announce that you are organizing a net to collect damage information
- Inform that you have no ability to dispatch help
- Take gross reports of damage until relieved
  - Use the Modified Mercalli ("MIKE-MIKE") Scale (1-8) for earthquakes
- Be prepared to …
  - Move to Level 2 operations if situation severity increases, or
  - Pass summary information to a more experienced NCO

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Resource Net Level 1 Challenges

LEVEL 1
(Review)

- When/whether to start the net
  - No harm in starting a net
  - Knowing (for certain) that the event was small is important info!
- Fear of taking responsibility as net control
  - Be professional, follow your training, do your best
  - Consult "Performance Standards and Best Practices"
- Repeaters initially unlinked
  - Primary vs. North vs. South county – info in 3 different places
  - Use liaison operators while unlinked to consolidate info
  - Ask a control operator or DEC/ADEC to initiate the link, if warranted
- Inexperienced operators
  - Give guidance where needed
  - Announce how you want responses formatted
    - "When I call you, give your call sign, city, Mike-Mike #, and call sign"

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Review

MESSAGE NET OPERATIONS

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Message Net

- County message net can be non-stop action for hours
  - As packet use has increased, message net is much more manageable
- Scribe is essential part of the team
- Message net team needs to be the best message handlers
  - Other operators will pattern themselves after net control
  - Clearly state the quantity and nature of the traffic
    - "I have one priority message for you."
  - Cleary state the message type
    - "Message type is ICS-213", "Message type is informal"
  - Crisp, clear, concise – even for informal messages
    - Say what's needed, nothing more
  - Proper phonetics, numerals and prowords are critical on this net
  - Pass or copy messages exactly as written
  - Use ICS 213-SCCo for formal messages

Message Net Repeater Coverage (W6TI)

Be aware: Morgan Hill and Gilroy have weaker coverage; listen for them!

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W6TI – we are secondary users during exercises

- W6TI is owned/operated by the Northern California DX Club.

- We get permission to use it for each exercise.

- When it is an exercise and we are using W6TI, we are secondary users. DX club messages are primary

- Scripts in the County EOC Radio Room Message Net position binder cover all the permutations.

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Message Net Alternate Repeaters (K6FB)

- Two linked repeaters
  - 145.450 (-) 100 Hz – Las Cumbres (above Los Gatos/Saratoga)
  - 442.575 (+) 100 Hz – Black Mountain (near W6TI)
- Prior testing at county drill
  - Coverage in Gilroy and Morgan Hill are an issue

Message Announcement Examples

- Step 1: Announce quantity and handling order as usual
  - Sender calls receiver
    - "Los Altos, I have 2 Priority messages for you"
    - "Santa Clara, I have 1 <u>Immediate</u> and 1 Routine message for you"
  - Receiver prioritizes by handling order, then: "go ahead" or "ready to copy"
- (Reminder) Step 2: Announce message type before sending
  - Let the receiver know what's coming so they can prepare the right form
    - "Message type is ICS-213"
    - "Message type is Logistics Request Form"
    - "Message type is informal" (ex. unstructured, non-form-type messages)
  - Receiver readies the right form, then: "go ahead" or "read to copy"
- Step 3: Send the message as usual
  - "Message number …"

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Radio Routing Form

- 3rd party vs Operational

  – Operational messages are between radio operators: used to manage the net, such as check-ins, health & welfare, status/info gathering, etc.

  – 3rd party is what we do for our served agencies. ICS forms, SCCo forms, Mutual Aid Request, handwritten, etc.

    o Informal, handwritten; encourage the sender to re-write on an   ICS 213

- To help manage effective to/from, handling order, message ID and tracking on some forms, a Radio Routing Slip is used.

  – Think of it as a standardized envelope

- Fill out and staple to forms that don't already have the information.

Radio Routing Slip

Santa Clara County RACES -- Radio Routing Slip		Rev: 190527
Radio Operator Only:	¹ Origin Msg #:	Destination Msg #:

This Section to be Completed by Message Author/Creator: _(Underlined=Required)_

² **Date:**	³ **Time** (24hr):	⁴ **Handling:** ○Immediate (ASAP) ○Priority (<1 hr) ○Routine (<2 hr)

	⁵ **ICS Position:**		⁹ **ICS Position:**
T O	⁶ **Location:**	**F R O M**	¹⁰ **Location:**
	⁷ **Name:**		¹¹ **Name:**
	⁸ **Contact Info:**		¹² **Contact Info:**
Form:	¹³ **Type:**		¹⁴ **Topic:**

Instructions for Message Author/Creator:
1. Complete section above, surrounded by BOLD line (see instructions on back)
2. Fill in all Required fields
3. Attach to the front of a form to be sent via radio
4. Deliver to radio operator for transmission

Radio Operator Only:				
Relay:	**Rcvd:**		**Sent:**	
Name:		**Call Sign:**	**Date:**	**Time** (24hr):

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Message Prioritization - Updated

- Prioritize according to handling order and time
  - SCC handling order: Immediate, Priority, Routine
  - Situation Severity is being deprecated – not all forms are replaced
    - Sender: continue to vocalize it if still there, not crossed out, and marked
    - Receiver:
      - If it is on your form and you don't hear it, don't mark it and move on.
      - If it is not on your form and you hear it, just make a note and move on.
  - Use Date then Time to prioritize between same handling order
  - Ultimately, the served agency decides the order

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Homework Exercise: Message Prioritization

- You are net control for the county message net

- The following messages are waiting to be sent:

Msg Nbr	Time	Sending To	Handling Order
XSC327	0915	Sunnyvale EOC	Routine
XSC349	0921	Gilroy EOC	Priority
XSC207	0925	Morgan Hill EOC	Priority
XSC401	0930	All EOCs	Immediate

- You also have the following incoming messages waiting:

Time	Receiving From	Handing Order
0920	Los Altos	Priority
0930	San Jose	Immediate

- List these six messages in the proper send/receive order

- NOTE: assume no other messages come in during this time

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Homework: Message Prioritization
Prior to the class, do the following:

Sort the messages on the preceding slide into their transmission order: i.e., which is first, second, third….., sixth.

We will review and discuss during class.

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Prioritizing Traffic Within a Net

- NCO prioritizes message on the air
  - Holds incoming for high priority outgoing and vice versa
- Scribe prioritizes & logs message into & out from the team
  - Maintains prioritized incoming and outgoing message bins

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Radio Room Traffic Routing/Prioritization

- For small, low traffic events, radio room Net Manager (formerly shift supervisor) may also perform the traffic manager role

Homework: Net Manager / Traffic Manager Prior to the class, do the following:

The following messages have come in from the EOC to be sent out via Amateur Radio. Which county net would you use and why?

To	Handling Order	Which Net?	Why?
Sunnyvale EOC	Routine		
Fire Station 75	Immediate		
All EOCs	Priority		
All EOCs	Immediate		

How might the contents of the message influence your choice?

We'll review and discuss during the class.

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It's not rocket science. But it does take effort & attention to detail

INTRODUCTION TO PLANNING FOR NET CONTROL

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Focus of this section

- The formulation and documentation of a formal net control plan is beyond the scope of this course
  - Medium+ to large events require detailed and formal documentation
  - Covered in the Event Planning Table Top course (June 1st, 2024)

- An N2 can plan for smaller events

- Use the planning information in this section to help you think through different Net types and the planning process
  - Each drill and event will be different
  - But plans from previous instances of a drill or event can be helpful

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Planning for an Event

- Advanced net control operator (N2) should be able to
  - Plan a net for a smaller event
  - Be able to (re)create an ICS 205 for a small to medium event
    - One to two tactical nets
  - Assist with net control planning for a larger event
- Components of a larger formal net control plan include:
  - Net types / quantity
  - Frequency selection and Intermod
  - Power level selection and Fundamental Overload
  - Antenna placement
  - Schedule
  - Equipment and logistics
  - Personnel requirements/assignments
  - Net control script
  - Net control briefing

Mentioned here, covered in Event Planning Table Top course

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Net Type and Quantity Considerations

- Resource Net
  - Directed net
  - Common for county exercises and many city exercises
  - Usually required at events where SCC credential evaluations are being conducted
  - Required for activation under DSW and mutual aid
  - For smaller events, could consider as an informal "talk in" frequency
  - Larger events will probably need an experienced NCO and maybe a scribe
  - If possible, arrange event so everyone doesn't need to be on the net at the same time
    - E.g., try to spread out arrivals

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Net Type and Quantity Considerations (Cont.)

- Message Net / Field team / Tactical nets
  - Directed net
  - Traffic: All formal: e.g. shelters, schools, fire stations, hospitals…
    - How many teams? Messages per team? Time/message? Operator quality?
    - Expect 4 to 8 teams per net (depends on traffic volumn)
  - Traffic: All informal: parades, bike races, checkpoints, rovers
    - How long to gather principle data (crowd size, etc.), health & welfare?
    - Usually no more than 15-20 teams per net
  - Traffic: Mixture
    - Think through traffic types, quantity of messages per team, quantity of teams, health & welfare checks, capability of likely net control operators, availability of net control operators
  - NCO staffing: larger nets will likely need a scribe

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Net Type and Quantity Considerations (Cont.)

- Shadow Nets
  - Usually works best as an open net
  - Most shadows need to talk to another shadow, not to Net Control
  - Traffic is almost always informal (usually no forms-based traffic)
  - Try to stay with one shadow net whenever possible
    - Shadows are highly mobile/portable
    - Radio is in pouch, backpack, vest, etc.; difficult to switch frequencies
    - HT output is mono; difficult to tell which frequency is in use
    - Working two frequencies usually only possible with 2 HTs; 2 earbuds
  - Open net performance is dependent on everyone on net
    - Consider: who the operators will be; how "chatty" the principals are; number of shadows; number of expected messages per shadow; …
  - If you need more than one net, divide according to traffic clusters
    - Geography, functional area, etc.

Net Type and Quantity Considerations (Cont.)

- Command Net
  - For event staff to communicate with each other
  - Large events can benefit greatly; some medium events, too
  - Typically operated as an open net

- Packet Nets
  - May use existing county BBS frequencies
  - May use separate training BBS and non-SCCo frequencies
  - Can greatly reduce the traffic level on message nets
  - Encourage use, especially when formal message traffic is needed

- Staging nets and other tactical nets
  - Where and when needed
  - Can be quite large, but relatively simple – check-in/out; H&W

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Review: ICS 205 – Communications Plan

COMMUNICATIONS PLAN SCCo ARES/RACES/ACS	1. Incident Name/Location Countywide RACES/CERT Exercise, Moffett Field			2. Activation Number XSC-18-08T		3. Operational Period Date/Time From Date: 10/27/2018 To Date: 10/27/2018 From Time: 0600 To Time: 1600			
4. Communications Resources									
Ch #	Function	Call Sign and/or Sys / Net / Ch / TG Name	Assignment	Rx Freq_N / W	Rx Tone or NAC	Tx Freq_N / W or + / - / S	Tx Tone or NAC	Mode A,D,M	Remarks
	Emergency	9-1-1	All event staff and participants	Telephone		Telephone		M	For actual emergencies, first call 9-1-1. Then report the situation to Net Control, prefacing your message with "THIS IS NOT A DRILL."
	Resource	AA6BT Resource Net Primary	RACES resources traveling to or from the drill site	146.115 W		+	100.0	A	Directed Net. Link to N6NAC. Link repeaters at 0600. Unlink after finished tracking departing resources (~1600). Frequency open to non-participant use during low resource net utilization.
	Resource	W6ASH (UHF) Resource Net North	RACES resources traveling to or from the drill site	440.800 W		+	100.0	A	Link to AA6BT
	Resource	N6NAC Resource Net South	RACES resources traveling to or from the drill site	444.625 W		+	110.9	A	Linked from AA6BT
									Directed Net (at Staging Manager's

- Function – primary function
- Call Sign and/or Net – e.g. repeaters call sign, name of the net
- Assignment – brief description of how used
- Rx Freq (narrow / wide), Rx Tone, Tx Freq (N/W), Tx Tone
- Mode – Analog, Digital, Mixed
- Remarks – important comments for implementation

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ICS-205 Communications Plan, Net Control Staffing, Dispatch Template

EVENT PLANNING
STRETCH HOMEWORK

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Stretch Homework

- These remaining homework items are "stretch" items.

- Please complete as much as possible and bring your results and notes to the class for discussion and interaction.

The ICS-205 Communications Plan.

- Is a fundamental part of event planning and preparation
- A well thought out communications plan should list:
  - Primary tactical resources for each net: e.g. simplex frequency, repeater with split, PL tone, tone squelch, etc.
    - Tactical nets. Examples: Field, Shadow, Tactical 1, etc.
    - Ideally nets should be listed "directed" or "open"
  - Backup/Alternate resources for each primary net
  - Resource Net repeaters and any required linking (if to be used)
  - Other communication resources:
    - BBS stations and frequencies
    - Dedicated frequencies for event use: e.g. Fox transmitters, beacons, APRS (if used), etc.
  - Helpful, makes it more complete:
    - Direct dial numbers for local police and fire
    - Mobile phone numbers for primary staff

Sample: Los Altos Festival of Lights (page 1/1)

COMMUNICATIONS PLAN SCCo ARES/RACES/ACS	1. Incident Name/Location Los Altos Festival of Lights 2021				2. Activation Number LOS-2021-004 XSC-21-08T		3. Operational Period Date/Time From Date: 11/28/2021 To Date: 11/28/2021 From Time: 1200 Hrs To Time: 2200 Hrs			
4. Communications Resources										
Ch #	Function	Call Sign and/or Sys / Net / Ch / TG Name	Assignment	Rx Freq N / W	Rx Tone or NAC	Tx Freq N / W or + / - / S	Tx Tone or NAC	Mode A,D,M	Remarks	
	Resource Net	AA6BT Repeater W6ASH Repeater N6NAC Repeater		146.115 + 440.800 + 444.625 +		146.715 445.800 449.625	100 PL 100 PL 110.9 PL	A	Repeaters will be linked	
	Parade Tactical	K6LOS Repeater		146.940 -	None	146.340	**	A	** Use your assigned PL tone	
	Tactical Backup 1	(Simplex)		146.595 (S)	None	146.595 (S)	**	A	**Use your assigned PL tone	
	Tactical Backup 2	(Simplex)		147.435 (S)	None	147.435 (S)	**	A	** Use your assigned PL tone	
	Shadow Net	K6LOS Repeater		441.525 +	None	446.525	**	A	** Use your assigned PL tone	
	Shadow Net Backup	W6ASH Repeater		145.270 -		144.670	100 PL	A		
	Phone	Event IC	650-823-9433						Art Whipple	
	Phone	Event IC Alt	650-823-3265						Jim Clark	

5. Special Instructions
Do not enable Tone Squelch (input tone or receive tone) on your radio for any of the local parade frequencies.

ICS 205 SCCo RACES	6.Prepared by (Communications Unit Leader) Art Whipple – WA3AW	7.Prepared Date/Time 11/20/2021	8. Page 1 of 1

See reverse for instructions. All channels are shown as if programmed in a base station, mobile or portable radio.   Repeater stations must be programmed with the Rx and Tx reversed.

ICS 205-SCCo ARES/RACES/ACS (rev. 2018-Jul-09)   Page 9

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Sample: Oct 2021 RACES Comm Drill (page 1/3)

COMMUNICATIONS PLAN SCCo ARES/RACES/ACS	1. Incident Name/Location Countywide Communication Exercise Edith Morley Park, Campbell		2. Activation Number XSC-21-07T	3. Operational Period Date/Time From Date: 10/09/2021 To Date: 10/09/2021 From Time: 08:00 To Time: 14:00		

4. Communications Resources

Ch #	Function	Call Sign and/or Sys / Net / Ch / TG Name	Assignment	Rx Freq N / W	Rx Tone or NAC	Tx Freq N / W or + / - / S	Tx Tone or NAC	Mode A,D,M	Remarks
	Resource Net	W6ASH	Resource Net North	440.800	100.0	+		A	Listen-Only at the drill site
	Resource Net	AA6BT	Resource Net Main	146.115	100.0	+		A	
	Resource Net	N6NAC	Resource Net South	444.625	110.9	+		A	
	Resource Net	K6SNY	Resource Net (South) Alternate	443.275	107.2	+		A	Backup to N6NAC, not normally linked
	Tactical		Tactical Net 1	145.430	S			A	Repeater Output W6MLP Milpitas
	Tactical		Tactical Net 2	146.490	S			A	
	Command Staff		Command Net	441.000	S			A	
	Evaluation Use Only		Type 2 Eval Net	445.050	S			A	Repeater Input – Must use LOWEST power setting
	Staging		Staging Net	146.475	S			A	
	Emergency Phone	Campbell PSAP	Emergency	911 or 408-378-8161					After calling 911 inform NCO and/or IC on Command Net

5. Special Instructions
Use LOWEST possible power setting on all radios, except for W1XSC, W2XSC W4XSC Packet BBS frequencies

ICS 205 SCCo RACES	6.Prepared by (Communications Unit Leader) Andreas Ott, K6OTT (ADEC and NetControl Planner)	7.Prepared Date/Time V4 10/06/2021 21:40	8. Page 1 of 3

See last page for instructions. All channels are shown as if programmed in a base station, mobile or portable radio. Repeater stations must be programmed with the Rx and Tx reversed.

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Sample: Oct 2021 RACES Comm Drill (page 2/3)

COMMUNICATIONS PLAN SCCo ARES/RACES/ACS	1. Incident Name/Location Countywide Communication Exercise Edith Morley Park, Campbell			2. Activation Number XSC-21-07T		3. Operational Period Date/Time From Date: 10/09/2021 To Date: 10/09/2021 From Time: 08:00 To Time: 14:00			

4. Communications Resources

Ch #	Function	Call Sign and/or Sys / Net / Ch / TG Name	Assignment	Rx Freq N / W	Rx Tone or NAC	Tx Freq N / W or + / - / S	Tx Tone or NAC	Mode A,D,M	Remarks
	Packet BBS	W1XSC	W1XSC-1 2m	145.750		S		D	
	Packet BBS	W1XSC	W1XSC-1 1.25m	223.620		S		D	
	Packet BBS	W1XSC	W1XSC-1 70cm	433.570		S		D	
	Packet BBS	W2XSC	W2XSC-1 2m	145.730		S		D	
	Packet BBS	W2XSC	W2XSC-1 1.25m	223.560		S		D	
	Packet BBS	W2XSC	W2XSC-1 70cm	433.590		S		D	
	Packet BBS	W4XSC	W4XSC-1 2m	145.690		S		D	
	Packet BBS	W4XSC	W4XSC-1 1.25m	223.600		S		D	Also used for BBS forwarding
	Packet BBS	W4XSC	W4XSC-1 70cm	433.550		S		D	
	Packet Voice		Packet Op voice net	446.475		S		A	Repeater input, use LOWEST possible power

5. Special Instructions
Use LOWEST possible power setting on all radios, except for W1XSC, W2XSC or W4XSC Packet BBS frequencies

ICS 205 SCCo RACES	6.Prepared by (Communications Unit Leader) Andreas Ott, K6OTT (ADEC and NetControl Planner)	7.Prepared Date/Time V4 10/06/2021 21:40	8. Page 2 of 3

See last page for instructions. All channels are shown as if programmed in a base station, mobile or portable radio.   Repeater stations must be programmed with the Rx and Tx reversed.

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Sample: Oct 2021 RACES Comm Drill (page 2/3)

COMMUNICATIONS PLAN SCCo ARES/RACES/ACS	1. Incident Name/Location		2. Activation Number		3. Operational Period Date/Time	
	Countywide Communication Exercise		XSC-21-07T		From Date: 10/09/2021 To Date: 10/09/2021	
	Edith Morley Park, Campbell				From Time: 08:00 To Time: 14:00	

4. Communications Resources

Ch #	Function	Call Sign and/or Sys / Net / Ch / TG Name	Assignment	Rx Freq N / W	Rx Tone or NAC	Tx Freq N / W or + / - / S	Tx Tone or NAC	Mode A,D,M	Remarks
	Packet BBS	W3XSC	W3XSC-1 2m	144.310		S		D	
	Packet BBS	W3XSC	W3XSC-1 1.25m	223.540		S		D	
	Packet BBS	W3XSC	W3XSC-1 70cm	433.450		S		D	
	Backup		Backup Simplex 1	147.810		S		A	Repeater input – MUST use LOWEST power
	Backup		Backup Simplex 2	146.745		S		A	
	Backup		Backup Simplex 3	146.460		S		A	IMP @ AA6BT-out, W6PIY-220, W1XSC-220
	Backup		Backup Simplex 4	440.150		S		A	Repeater input W6TDM Cupertino
	Backup		Backup Simplex 5	445.500		S		A	Repeater input – MUST use LOWEST power
	Backup		Backup Simplex 6	447.050		S		A	Repeater input – MUST use LOWEST power; also use for cross-band 70cm simplex side
	Crossband	W6PIY	Crossband Repeating	147.390	151.4	+		A	Use for cross-band 2m "county" repeater side

5. Special Instructions
Use LOWEST possible power setting on all radios, except for W1XSC, W2XSC or W4XSC Packet BBS frequencies

ICS 205 SCCo RACES	6.Prepared by (Communications Unit Leader)	7.Prepared Date/Time	8. Page
	Andreas Ott, K6OTT (ADEC and NetControl Planner)	V4 10/06/2021 21:40	3 of 3

See last page for instructions. All channels are shown as if programmed in a base station, mobile or portable radio. Repeater stations must be programmed with the Rx and Tx reversed.

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And always - the back page

ICS 205
Communications Plan, Adapted for Santa Clara County ARES/RACES/ACS

Purpose: The Communications Plan (ICS 205) provides information on all radio frequency or trunked radio system talkgroup assignments for each operational period. The plan is a summary of information obtained about available radio frequencies or talkgroups and the assignments of those resources by the Communications Unit Leader or Incident Commander for use by incident responders.

Preparation: The ICS 205 is prepared by the Communications Unit Leader or other individual designated by the Incident Commander.

Distribution: The ICS 205 is provided to all incident responders.

#	Block Title	Instructions
1	Incident Name/Location	Enter the name assigned to the incident and, optionally, the location of the incident.
2	Activation Number	Enter the activation number assigned to the incident, otherwise leave blank if none.
3	Operational Period Date/Time	Enter the start date (mm/dd/year) and time (24-hr clock) and the end date and time for the operational period to which the form applies.
4	Communications Resources	Enter the following information about radio channel use:
	Ch #	Use at your discretion. Channel number (Ch #) may equate to channel numbers in pre-programmed incident radios, used as reference numbers on the ICS 205 document, or left blank for recipient use.
	Function	Enter the ICS or local function for which this channel will be used (Operations, Command, Logistics, Resource, Tactical, Emergency, etc.).
	Call Sign and/or Sys / Net / Ch / TG Name	Enter the call sign of the repeater or station (if appropriate) and the system, net, channel or talkgroup name by which this channel is commonly known.
	Assignment	Enter the individual(s), group(s), or function(s) that will be the primary users of this channel.
	Rx Freq N / W	Enter the Receive Frequency (Rx Freq) as the mobile or portable subscriber would be programmed, followed by "N" for narrrowband or a "W" for wideband emissions. For HF, include USB or LSB, as appropriate.
	Rx Tone or NAC	Enter the Receive Continuous Tone Coded Squelch System (CTCSS) subaudible tone (Rx Tone) or Network Access Code (Rx NAC) for the receive frequency as the mobile or portable subscriber would be programmed.
	Tx Freq N / W or + / - / S	Enter the Transmit Frequency (Tx Freq) as the mobile or portable subscriber would be programmed, followed by "N" for narrrowband or a "W" for wideband emissions. For HF, include USB or LSB, as appropriate. Alternatively, for repeaters using standard amateur frequency offsets (e.g. 600 Hz for 2m, 5 MHz for 70cm), enter "+" or "-" as appropriate. Enter "S" if Rx Freq represents a simplex frequency.
	Tx Tone or NAC	Enter the Transmit Continuous Tone Coded Squelch System (CTCSS) subaudible tone (Tx Tone) or Network Access Code (Tx NAC) for the transmit frequency as the mobile or portable subscriber would be programmed.
	Mode A,D,M	Enter "A" for analog, "D" for digital, or "M" for mixed mode operations. If needed, enter specific mode type (D-Star, DMR, etc.) in Remarks.
	Remarks	Enter miscellaneous information related to the channel.
5	Special Instructions	Enter any special instructions or other emergency communications needs.
6	Prepared By (Comm Leader)	Enter the name and FCC call sign of the person preparing the form.
7	Prepared Date/Time	Enter date prepared (mm/dd/year) and time prepared (24-hr clock).
8	Page	Enter the page number and number of pages.

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Homework Assignment – ICS-205

- Create an ICS-205 for a simulated event
  - Event name: Simulated April-Day Market Street Parade
  - Activation number: XSC-22-04SP   (yes, the date is a few years ago, use this date)
  - Operational period: 4/9/2022, 08:00 to 13:00, parade runs from 10:00 to 12:00
  - Agency/City: SJC RACES, San Jose, somewhere in San Jose [note **]
  - Nets:
    1. County Resource Net for mobilization and demobilization travel tracking
    2. Parade Tactical for 15-20 "eyes and ears" checkpoints and crowd estimate
    3. Shadow Net for 6-10 principles, 2-3 are key and very active
  - Use Herman Munster as the event IC
  - Create "a well thought out communications plan"
  - Bring your filled-out ICS-205 to class for review.   Mark up with any notes while in class. Show to staff before checking-out, but take it home with you.

NOTE **: Simulated SCCo ARES/RACES credential event participation credit will be available for this event.

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Homework Assignment – Staffing Plan

Net Control Planning questions. During the class time. Be prepared to volunteer your draft plan and rationale for staffing needs. Assume you can get all volunteers needed. Suggestion is to use a spreadsheet format, include at least:

1. Overview personnel count, credential types, roles, and shifts:
   - Resource Net
   - Parade Tactical
   - Shadow Net
2. What else do you need to make sure is done by the DEC/ADEC or SJC RACES staff?

Note: much of an actual plan gets developed as part of an event planning team. This is just a stretch exercise to explore and discuss some of the basics.

Note: Print it, make any notes during class time. Show to staff before checking-out, but take it home with you.

Homework Assignment – Dispatch Template

Assignment/Dispatch Template Briefing.

- <u>Try</u> filling out a dispatch template form.
  https://www.scc-ares-races.org/operations/docs/SCCo_Res_Net_Dispatch_Template_rev2010-07-08.pdf
  We will discuss the form during class. (yes, the form is old but still works, updates in progress)
- Additional information, include the following.
  – RACES Staging location: N.E. Corner, Parking Lot, 60 West San Carlos, SJC
  – Assume location is well placard'd for RACES volunteers, e.g. where to go for staging
  – IC briefing for all staff at 09:00
- Assume all volunteers have received an information packet in email well prior to the event
  – What are the key things they need to know on the day of the event?

Note: Print it, make any notes during class time. Show to staff before checking-out, but take it home with you.

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Homework Preparation Checklist

Done?	Homework Items to bring to class:
☐	Completed homework: Message Prioritization
☐	Completed homework: Net Manager / Traffic Manager
☐	Stretch homework: ICS-205 communications plan
☐	Stretch homework: Draft event staffing plan
☐	Stretch homework: Draft assignment and dispatch template
☐	Start an ICS 214 SCCo ARES/RACES Unit Activity Log before you leave home for class. Use the simulated activation number XSC-23-5TC. Complete the form during class. Have it checked at the end of class. Make any corrections. Turn the form in before signing out on the ICS-211A. **Turning in a a correct and completed ICS-214 is required for class credit.** Reminder: follow the examples in the self-paced ICS0214 video at: https://www.scc-ares-races.org/training/ar-courses.html

Done?	Other Items
☐	If needed, print your credential wallet card. Cards expire(d) end of January.
☐	If needed, check SCCo go-kit forms for any updates and update personal go-kit
☐	If needed, review your scc-ares-races.org "My Profile" -> "My Contact Info" • Updated any information – also AlertSCC information. • Check the box following "I have reviewed the information on this page" • Pressed "Save Changes" Note: please try to do this at the beginning of every year and when there are changes to your contact information

Thank You!

Some of the homework and the assignment will be reviewed during the class.

The rest you will have to retain in your knowledge.

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