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Net Control Type II Classroom Presentation



Santa Clara County ARES®/RACES

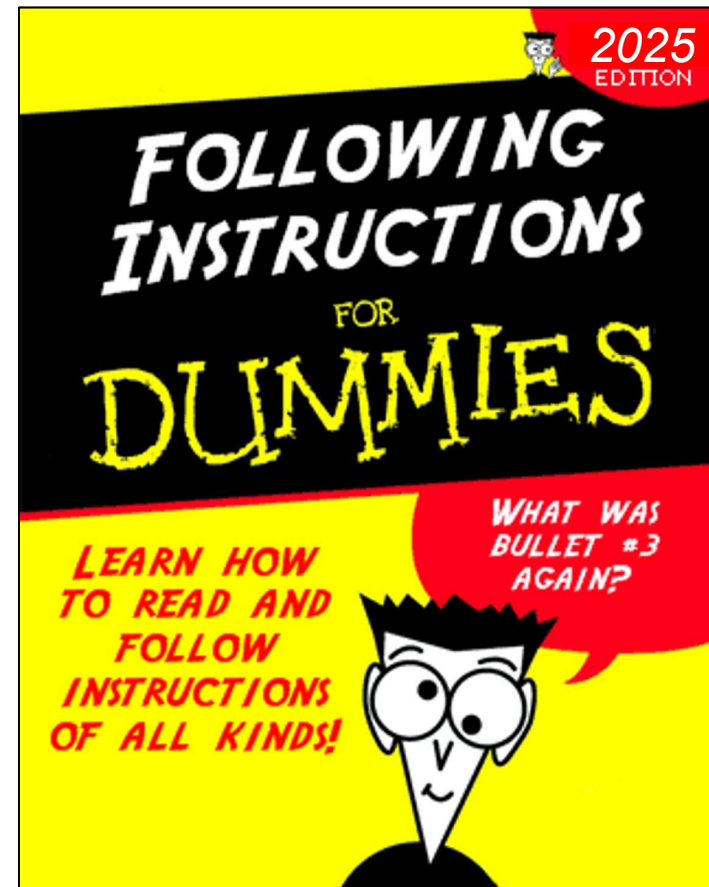
Revised: 22-April-2025

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Housekeeping

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



Review:

What does it take to be a great Net Control Operator?

- You need to be a great communicator,
 - com·mu·ni·cate: to transmit information, thought, or feeling so that it is satisfactorily received or understood
- Who is able to communicate *precisely*,
 - pre·cise·ly: 1. in a precise manner 2. exactly
- Following a shared, standard procedure, that EVERYONE is trained to use!
- What else?
 - Training (you are here now doing that),
 - Preparation, and
 - Practice

Net Control – After your training

Preparation and Practice

- Preparation, such as:
 - Go-kit periodically checked and updated
 - Scripts prepared / updated
 - SCCo website and documentation updates, if any
 - Personal checklists prepared / updated
 - Radio familiarity
 - Periodically set up your station at an alternate location
 - E.g., field station, table, chair, power/batteries, etc.
 - Is all your field station equipment still good to go for an activation?
- Practice
 - Weekly nets
 - City nets, SPECS, SVECS, etc.
 - Hospital net
 - County drills and exercises
 - Real events
 - Public service events
 - Actual activations

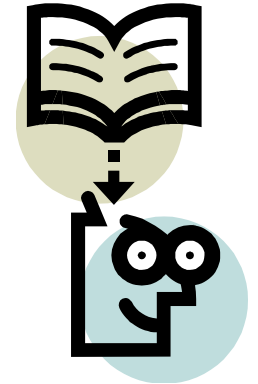
SCCo: Drills and Mini-drills

- Dress rehearsal for a real event
- Event information provided by Staging after Check-In
 - Assignment specifics, ICS-205, etc.
- Briefing will be held before the operational period starts
 - **Ask** If anything is unclear during the briefing
- Principal/supervisor will be assigned (real or simulated)
 - All transmitted 3rd party message content will be provided by the principal
 - 3rd party message (formal or informal), content comes from principal
 - No radio “operator-created” 3rd party content
 - All received 3rd party content is to be delivered to the principal

SCCo: Drills and Mini-drills (Cont.)

- Participation requirements
 - Mobilization Resource Net (for all participants)
 - Staging Check-in and Check-out
 - For each drill tactical net: check-in/out appropriately, respond to H&W, log messages appropriately, etc.
 - Required forms turned in completed and signed
 - Typically at Staging during Check-out or as directed by principal or supervisor
 - A Drill Evaluation (Hot Wash) may be required
 - In person or submitted form/report
 - Will be made clear in SCCo event listing and during the briefing. If not clear: **ask**

Learning Objectives



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

- Describe the role of an advanced net control operator (N2)
- Checklists, Scripts, and Preparation
- Describe the advanced concepts, techniques, equipment and procedures required to operate:
 - Two nets simultaneously
 - County Resource Net Levels 1-3
 - County Message Net
 - Other critical and/or high-traffic nets
- Organizational models for net control
- Describe the basics of net control planning

N2 Required Equipment, where to find:

Reference:

- SCCo_RACES_Credentialing_Prgm_Handbook_v3.1.3 (26-Mar-2024)
- ***All required equipment for Field Communicator Type II (F2)***
 - ***All required equipment for Field Communicator Type III (F3)***
 - **and 2m/70cm 25+W mobile, batteries for it, Power adapters, dual-band antenna, mast, tripod & weights, coax cable, coax adapters.**
 - ***F3 requires all required equipment for Communicator Type IV (C4)***
- The go kit must contain the following equipment:
 - All required items in the SCCo ARES/RACES standard 2-hour Carry Kit
 - All required items in the SCCo ARES/RACES standard 12-hour Go Kit
- Both kits are documented in the SCCo_Go_Kit_v20240326
Go kit: <https://www.scc-ares-races.org/operations/go-kit>

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
- We may use other fictitious characters and calls as needed:
 - Wolfman Jack: W6WOOF
 - Dracula: W6DRAC
 - Etc.
- We may also use others as simulated for real people:
 - Eddie Munster
 - Grandpa Munster
 - Etc.



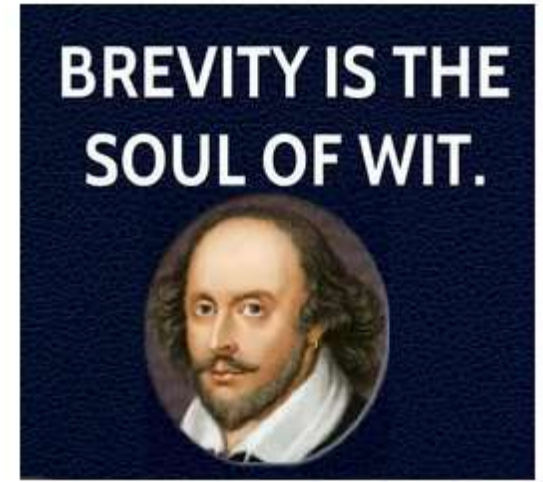


Five Keys to Success

ADVANCED TECHNIQUES FOR NET CONTROL

Be Brief

- Speak only when you have to speak
 - But don't forget to ID and announce net
- Say only what you have to say
- Use prowords whenever possible
- Avoid open mic pauses and non-words (“uh”)
- Avoid Push-To-Think



By Polonius, Act 2, Scene 2
of Hamlet, circa 1603

Reminders for Avoiding Repeats



- Wear a headset
 - So you can hear and don't need to ask for repeats
 - So you maintain consistent mic position – even if you turn your head
- Adjust mic gain for your voice
 - For FM, usually low/med/high; for USB/LSB, usually gain & compression
- Speak clearly, correctly
 - Proper enunciation; proper use of phonetics, numbers, prowords
- Speak crisply, but not too quickly
 - You can't speak quickly enough to make up for the time needed to repeat
 - Pace your speed on written messages by “air” writing as you speak
- Listen carefully and log quickly, accurately and legibly
- Know repeater delays !!
 - Pause after keying up; pause after courtesy tone; remind others to pause
- Monitor for doubles
 - Use HT or scanner – earbud under headphones



Information: Know it, Have it Ready

- Be as informed as possible; be prepared with details
 - Know the specific procedures for the net you are running
 - Anticipate questions and have answers ready
 - Backlog is created the first time you can't answer a question right away
 - Clearing the backlog takes time away from all other activity
- Anticipate questions, have answers ready
 - Examples: lost traveler, missing frequency info, missing contact info ... or line up a way to get answers quickly via supervisor
 - Resource net: maps, travel advisories/hazards, DSW status
 - Staging or other sites: site status, facilities, parking, resource status
 - Command net: phone numbers, frequencies, reporting structure
- Anticipate check-in verification requirements
 - Have city list or County DSW list ready to verify check-ins

Provide Direction



- Inform (remind) the field communicators of reply format
 - Some people may be new/inexperienced; others excited, tired
- Examples:
 - “I will now take check-ins from County DSW RACES volunteers ** who have been released from their cities. If you have not been released by your city, you should return to your city net or contact your EC for release. I’ll take the first five call signs only.”
 - ... then: “When I call you, respond with your credential status (if any) use phonetics, such as ‘foxtrot 2’ or ‘november 3’ , then followed by any completed endorsements (3 letter code). End with your FCC call sign.”
 - “I will now call for Health and Welfare checks. When you hear your call sign, and when safe to transmit, respond with the last three digits of your odometer, your city, your nearest major street intersection, and your call sign ...”
 - Note: ** call for check-ins will be based on actual needs at the time, this is just an example to talk about the process.

Multiple Actions with One Command

5x

If the circumstances allow you to leverage efficiency in your favor

- Do things five (or more) at a time
- Check-ins
 - Take 5 call signs at a time
 - Tell them what info you need; how to respond
 - Then call each one for the details
- Resource net activations
 - Collect 5 call signs, issue instructions; get 5 acknowledgements
- Health and welfare
 - Announce H&W roll-call, then run through them all at once
- Ask for multiple pieces of information with one check-in
 - “When I call you, respond with your city, your credentials, your cell phone number, and your FCC callsign”

Multiple Actions with One Command

5x

- Example: Taking one Mike-Mike report at a time
 - We pick up the net after the opening script



- Your Observations?
 - What techniques were used?
 - What worked?
 - What could be improved?

Multiple Actions with One Command

5x

- Example: Taking five Mike-Mike reports at a time
 - Again, we pick it up the after the opening script



- Your Observations?
 - What techniques were used?
 - What worked?
 - What could be improved?

Multiple Actions with One Command

5x

- So, what are the trade-offs?
- One at a time:
 - Simple
 - Anyone should be able to handle net control duty
 - Slow
 - Speed limit: how much the net control has to say
- Five at a time:
 - There will be lots of “doubles”
 - Net control must be good at picking out partial call signs
 - Net Control must provide good instructions and enforce net procedures
 - Net control must be good at avoiding more doubles (use partial call sign)
 - Can be much faster (up to 2-3 times)
 - Especially for where lengthy information must be conveyed
 - Speed limit: ability of field operators to follow instructions
Net Controls ability to control the net



Activating a remote county for the California QSO Party



A contesting "super station"

Contesting can dramatically improve your efficiency & effectiveness

IMPROVING YOUR SKILL LEVEL

Contesting is FANTASTIC Practice for EmComm

- Similar goals: Speed and accuracy
 - Contests award points for each correct entry; penalties for mistakes
 - For many contests, penalties for incorrect log entries are worse than a few extra contacts, so accuracy is paramount
- Similar success factors:
 - Station quality
 - Station can hear and be heard by as many other stations as possible
 - Everything in working order, even during power outages, other problems
 - Operator skill
 - Listening and speaking skills, attention to detail
 - Preparation, operating procedures, logging, practice, ...

Example: ARRL Sweepstakes Contest

- “Exchange” is patterned after ARRL Radiogram Preamble



The image shows a green header for an ARRL Radiogram. The header contains the text "THE AMERICAN RADIO RELAY LEAGUE" and "RADIOGRAM" in large yellow letters, with "VIA AMATEUR RADIO" in smaller yellow letters below. On either side of the header is a yellow diamond logo with "ARRL" inside. Below the header is a yellow table with a grid of fields. The fields are: NUMBER (1), PRECEDENCE (R), HR (G), STATION OF ORIGIN (K4IWW), CHECK (12), PLACE OF ORIGIN (CARY NC), TIME FILED, and DATE (DEC 20). The first five fields are highlighted with a red border.

NUMBER	PRECEDENCE	HR	STATION OF ORIGIN	CHECK	PLACE OF ORIGIN	TIME FILED	DATE
1	R	G	K4IWW	12	CARY NC		DEC 20

- For Sweepstakes, the information you send:
 - Number: the contact # (1 for your first contact, 2 for your second, ...)
 - Precedence: contest station category
 - A = low power; B = high power; Q = QRP; M = multi; S = school; U = unlimited
 - Station of origin: your call sign
 - Check: the last two digits of the year you were licensed
 - Origin: your ARRL Section Abbreviation
 - Ours would be “SCV” for Santa Clara Valley

Example: ARRL Sweepstakes



- And it sounds like this ...
 - N6BV sends: <number> B N6BV 59 East Bay
 - Without looking below, can you copy what the others send 100%?
- As you listen, why is N6BV so much farther ahead?

N6BV's Number	Their Number	Precedence	Station	Check	Section
211	71	A	K5IID	56	WV
212	12	M	NN2T	59	NNJ
213	95	B	K2PLF	55	MD
214	80	B	K3MD	63	EPA
215	14	A	N5LYG	86	STX
216	38	A	N1WR	61	MD
217	35	A	NN2L	64	NNY
218	33	A	VE3FWA	85	ON

Why Is It Good Practice for EmComm?

- The same operator skills apply:
 - Listen carefully, pick out call signs, copy quickly
 - Avoid “doubles” (... “station ending in delta” ...)
 - Speak clearly, as quickly as possible
 - Use proper prowords, say numbers correctly
 - Use a minimum of words
 - “number ...” vs. “you are my number, uh ...”; no “please copy ...”
 - Don’t repeat information, unless required to clarify
 - Message format is usually known in advance (Ex: ICS-213 field order)
 - Preparation is critical
 - Radio, antennas, controls, quality power (w/backup)
 - Logging method, typing skills, section abbreviations (like our agency prefixes)
 - Food, water, clock, ...
- For more info about contesting in Northern California:
 - Northern California Contest Club: <http://www.nccc.cc>



WORKING TWO NETS SIMULTANEOUSLY AND CROSSBAND

Review from Homework

- Any questions on Working two Nets simultaneously AND Crossband Repeat?



RESOURCE NET OPERATIONS LEVEL 1 (REVIEW)

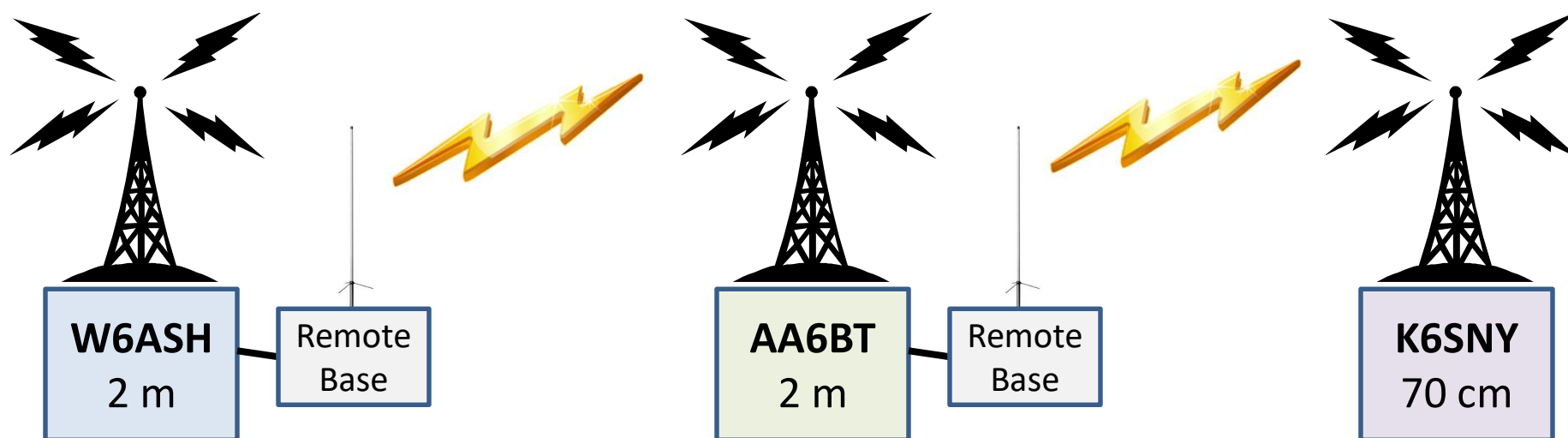
Review

- Any questions on Resource Net Level 1?



How Resource Net Repeater Linking Works

- Normally, the repeaters used for Resource Net are not linked
- Some repeaters include a “remote base” wired into repeater
 - Control operator uses DTMF tones to send commands
 - Remote tuned to next repeater: transmits on input/listens on output
- Max delay when sending from W6ASH to K6SNY (or reverse)
 - Net control should use AA6BT whenever possible
 - Or, use K6SNY (on 440) when lots of other 2m field stations nearby





RESOURCE NET OPERATIONS LEVEL 2

Resource Net Level 2 Operations

- Assume Resource Net Level 1 operations underway
- At some point, if local situation warrants, city/agency EOCs will activate
 - City EOC: “Los Altos EOC has been activated and is taking check-ins on our local tactical frequency of 146.595 simplex”
 - NCO: “Los Altos EOC, Roger. All stations, all stations, if you are from Los Altos, please switch to the Los Altos frequency of 146.595 simplex and check in with your city.”
- Resource Net is now at Level 2 operation
- If repeaters aren't already linked, request linking now
- Make regular announcements of which tactical nets are up
 - Be prepared with frequency info if asked
- Continue to take damage reports from other cities/agencies

Example – Resource Net Level 2

- Drill included simulated Resource Net Level 2
- Situation:
 - Simulated earthquake
 - Resource Net Level 1 established
 - Mike-Mike reports underway for about 10 minutes
 - Then ...



Challenges for Resource Net Level 2

- Mixed traffic during transition between level 1 and level 2
 - Start tracking city status (plain paper, t-cards, index cards, ...)
- Inexperienced operators – don't know about city nets
 - Maintain a copy of the county frequency list
- Least practiced aspect of the resource net
 - No one is particularly experienced at doing this
 - Understand the process, do your best, be professional
- Hand-off from previous operator or to next operator
 - Resource net is typically handled remotely during level 1
 - At some point it will likely transition to someone at the county EOC
 - Be prepared to hand off damage reports and city/agency EOC/net status



Exercise – Resource Net Level 2

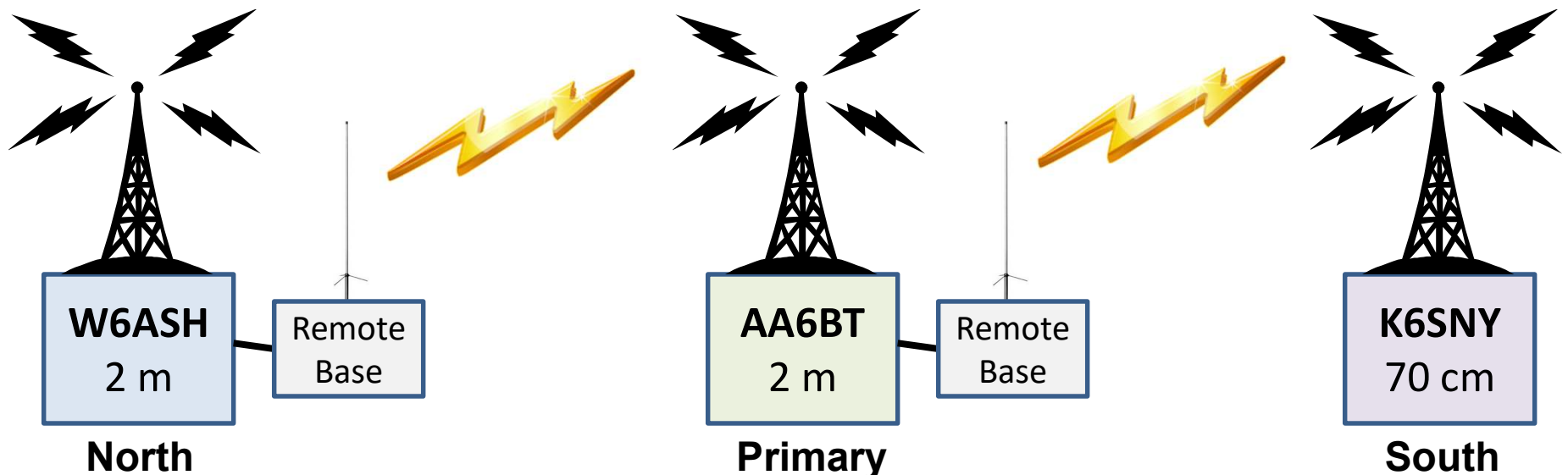


- Situation
 - An earthquake recently occurred
 - You activated the resource net and you're taking Mike-Mike reports
 - Some reports from some cities indicate significant damage (MM-5+)
 - A city EOC checks-in on the resource net and reports they are taking check-ins on their local tactical frequency
- Response
 - What do you say next?
 - What do you do next? (hint: if you are in a supervised radio room)
 - What do you say 10 minutes from now? (hint: net status)

Resource Net Repeater Linking

- Repeater linking capabilities
 - W6ASH 2m (North) can link to AA6BT (Primary), or K6SNY 70cm (South), AA6BT (Primary) 2m can link to K6SNY 70 cm (South)
 - W6ASH 70cm (Alternate North) can link to AA6BT 2m (Primary)
 - No linking can be originated from K6SNY

Normal Linking - W6ASH ↔ AA6BT ↔ K6SNY



Resource Net Repeater Linking (Cont.)

- Requesting a link – two methods (non-planned events)
 - Come up on repeater to be linked and ask for a control operator
 - On W6ASH, ask for a control operator to link to AA6BT (or K6SNY 70cm)
 - On AA6BT, ask for a control operator to link to K6SNY
 - Or contact the DEC or any of the ADECs to link the repeaters
 - <https://new.scc-ares-races.org/operations/contact/staff>
(keep a copy in your go kit!)
- Don't forget to ask for link to be removed when done
 - Let the control operator know how long you need the link
 - Contact a control operator or DEC/ADEC when finished with event
- Also: for drill and exercises, repeater linking is planned in advance. We always get permission from each repeater owner or representative prior to any drill, exercise, or public service event.



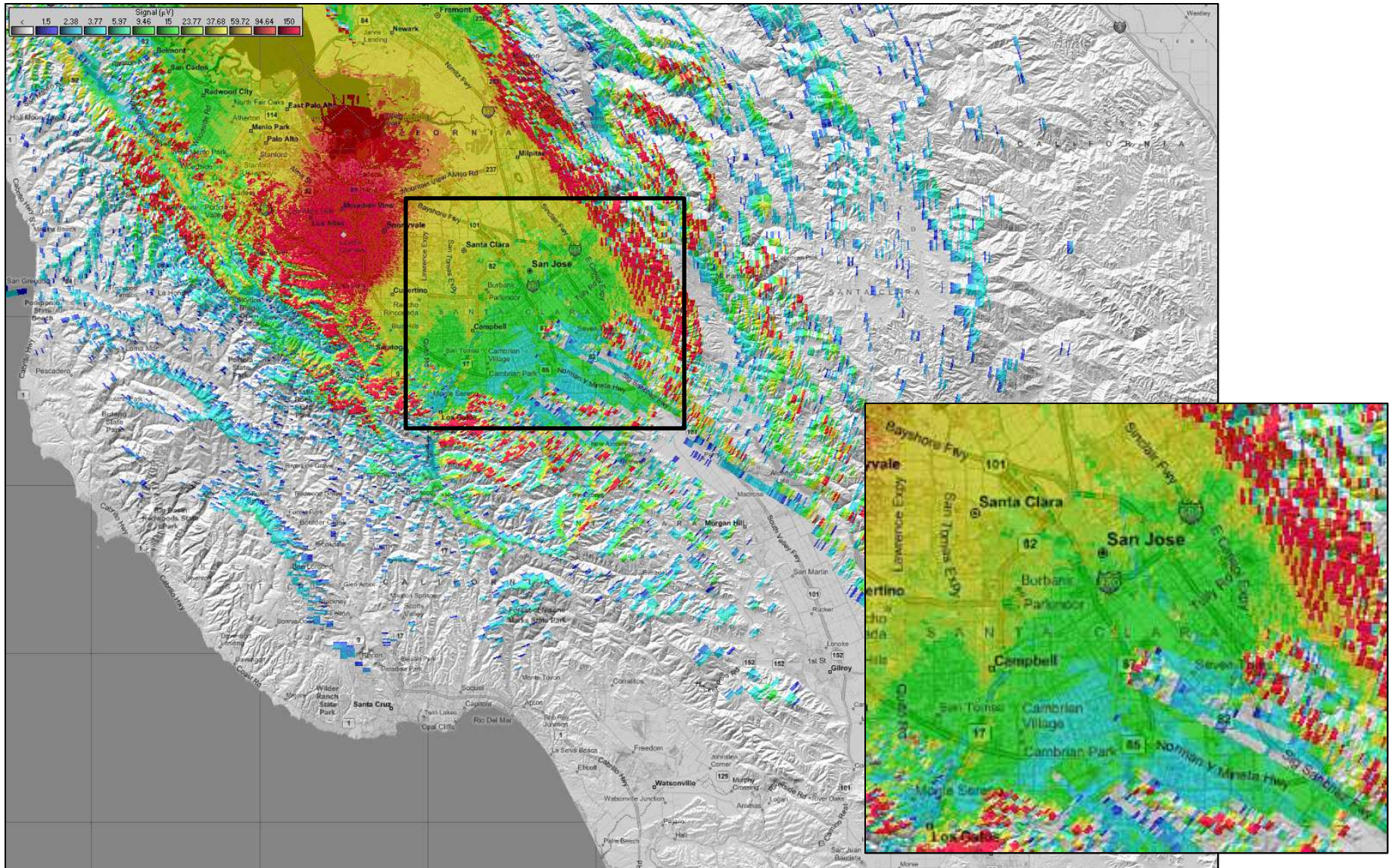
RESOURCE NET OPERATIONS LEVEL 3

Resource Net Level 3 – Location awareness

- Managing operators while traveling to their assignment requires understanding of:
 - Where they are and where they will be going.
 - Their approximate location.
 - Recommending a switch to a different repeater
 - Based on coverage patterns along the operator's route
 - If it looks like it might be necessary
 - Before having reachability / communications problems
 - Ask them to verify with net control after the frequency change
 - If no contact, remind them to switch back to current frequency
- Yes, operators should be aware of coverage and reachability
 - However, the NCO should be “on top” of the changing situation

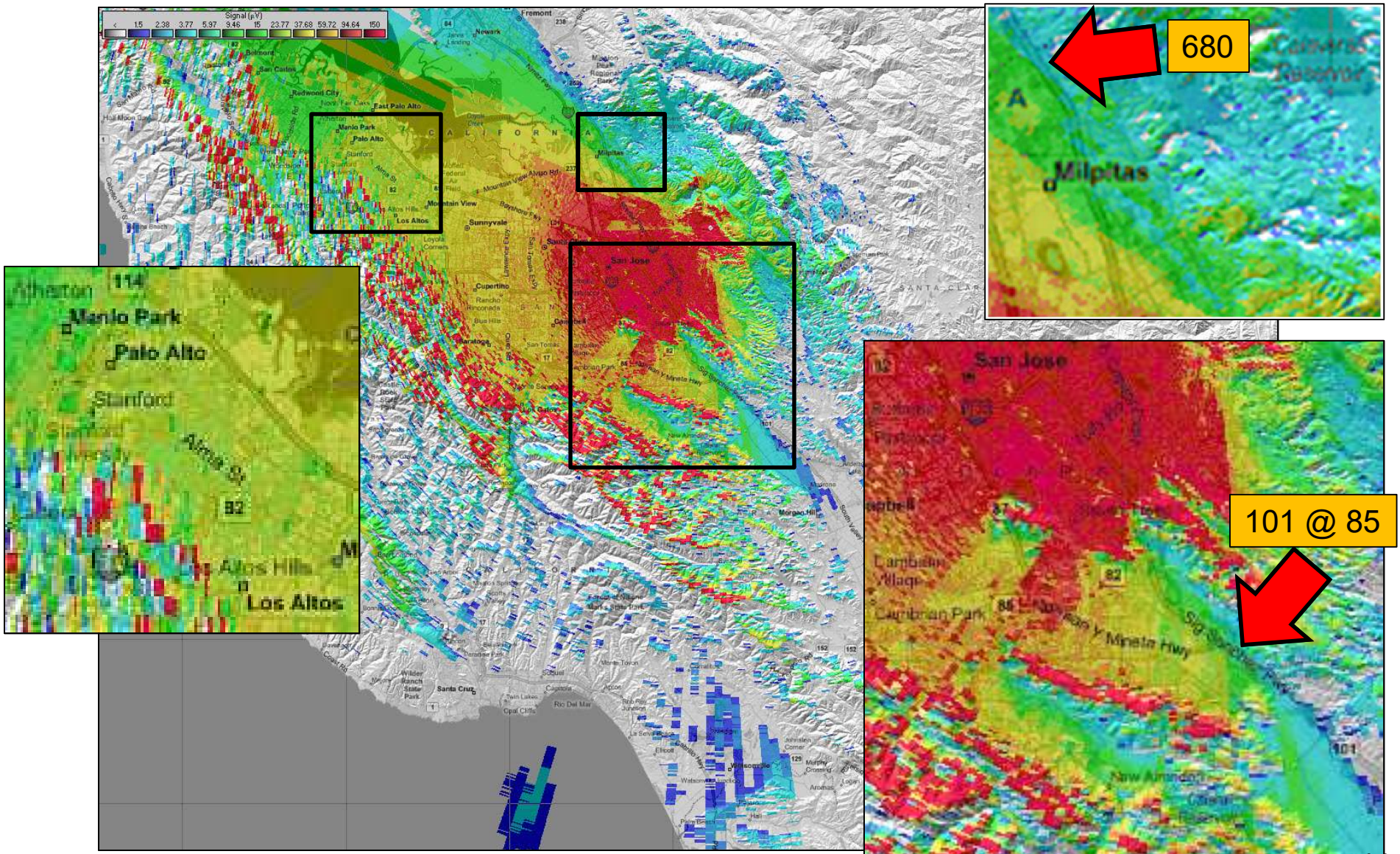


W6ASH Coverage 2m (Resource Net North)



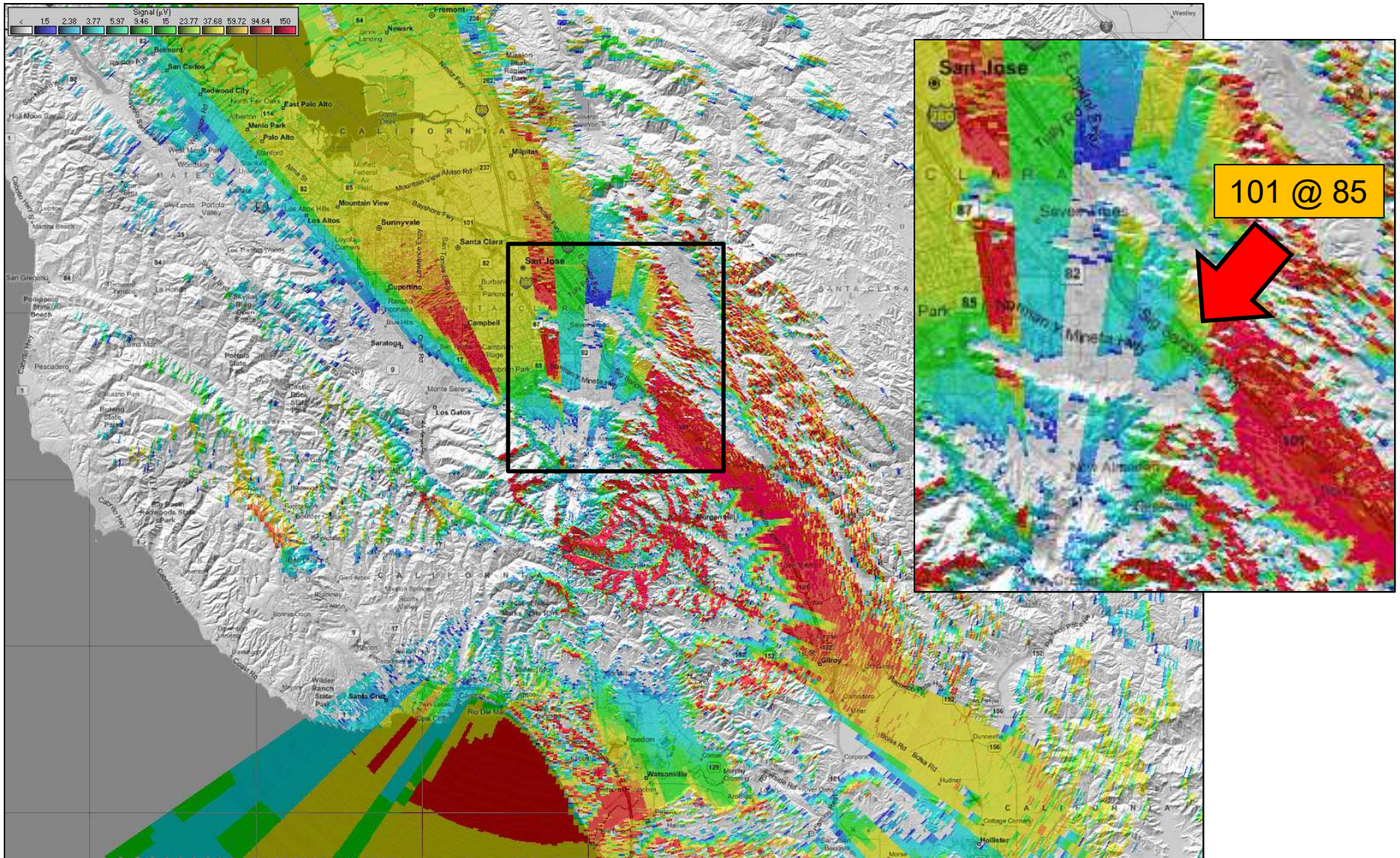


AA6BT Coverage (Resource Net Primary)





K6SNY Coverage (Resource Net South)



Resource Net Level 3 Operations

- Resource Net Level 2 operations may be underway
- At some point:
 - Cities may begin requesting resources
 - City sends a SCCo RACES Mutual Aid Request form (typically Packet Net, or possibly on Message Net) however, they may need to send via the Command Net if other nets are busy
 - Resource Net NCO may be asked by supervisor to request resources from cities
 - County Mutual Aid Communicators (MACs) may begin checking in after being released by their city

Requesting RACES Mutual Aid

- Announcements will be made on the Resource Net about a need for Mutual Aid Communicators (MACs)
- If telephones and the internet are available:
 - Groups.io message will be sent to EC and MAC lists
 - AlertSCC will be used to contact RACES members with County DSW registration.
- RACES Response Preparation message posted on web site about current status if Internet is accessible.



Santa Clara County
ARES®/RACES

SCCo ARES/RACES is an organization of over 350 volunteer radio operators providing emergency communications services to Santa Clara County.

ADVISORY Prepare for Possible RACES Response
Notice posted 2025-04-14 at 01:08

RACES Response Preparation Levels

LEVEL 3

Four Preparation Levels: Advisory, Alert, Staging, & Activation



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ADVISORY Prepare for Possible RACES Response
Notice posted 2025-04-14 at 01:08

ALERT Listen for Possible RACES Response
Notice posted 2025-04-19 at 19:32

STAGING MAC Staging for Possible RACES Response
Notice posted 2025-04-19 at 19:32

ACTIVATED RACES Activation in Progress
Notice posted 2025-04-19 at 19:32

<https://www.scc-ares-races.org/services/emcomm/levels>

Volunteer Check-Ins

- “This is ..., net control for the Santa Clara County resource net, standing by for check-ins from County Mutual Aid Communicators who have been released by their cities”
- Record minimum info on T-Card (Special T-Card used at XSC EOC)
 - Call sign, Credentials, Endorsements, home city
 - If phones are working, get cell phone number
- Place in “available” status
- If not available until later – have them check out
 - Record time when they will be available; place in “other” status area

Name (Last, First) Munster, Herman		Call Sign W6XRL4	
Credentials Endorsements	F2 N3 MAC ERO	Verified (Cred. & Endor.)	<input checked="" type="checkbox"/>
City/Agency	XND	Released By City/Agency	<input checked="" type="checkbox"/>
Cell Phone	408-555-1212	SCCo DSW enter X for yes	<input checked="" type="checkbox"/>
Other contact methods for individual / Time to check back into net Available after 1700			

Resource Net Level 3 T-Card Example (XSC EOC)

LEVEL 3

Name (Last, First)		Call Sign	
Credentials Endorsements		Verified (Cred. & Endor.) <input type="checkbox"/>	
City/Agency		Released By City/Agency <input type="checkbox"/>	
Cell Phone		SCCo DSW enter X for yes <input type="checkbox"/>	
Other contact methods for individual / Time to check back into net			
Dispatch Limitations:			
Proposed Assignment			
Assignment Accepted Y <input type="checkbox"/> N <input type="checkbox"/>	Date/Time	Reason not accepted	
Proposed Assignment			
Assignment Accepted Y <input type="checkbox"/> N <input type="checkbox"/>	Date/Time	Reason not accepted	
MAR - Agency Msg #	Location:		
Mobilization Date:	Time:		
Arrived Date:	Time:		
Demobilize Date:	Time:		
Checked Out Date:	Time:		
Rev: 20240711		<input type="checkbox"/> Check box if additional notes have been added to the back of T-card	

Resource Net Level 3 Operations (Cont.)

- Resource Net shifts to (or opens with) level 3 operation
 - Mobilize (assignment, activation), track, demobilize mutual aid resources
- Regular announcement
 - Taking check-ins from MACs already released by their city/agency
 - Remind cities/agencies to send RACES Mutual Aid Requests via packet (preferably) or message net
- RACES Mutual Aid must be approved by OEM official
- Assignment of Resources and Activations
 - CRO and DCROs are authorized to make resource assignments and activations
 - Assignments done per DSW rules – according to training
 - RACES Unit Leader at County EOC will know/follow procedure
 - Resource Net Control will receive assignment information from RACES leadership and communicate assignments to MACs

LEVEL 3

Exercise – Resource Net Level 3 Check-ins



- Situation
 - Resource Net is operating at Level 2.
 - When and how do you transition to Level 3?
 - How do you ask for check-ins?
Note: we can only take **County DSW** volunteers, with a preference for Credentialed Operators and a MAC Endorsement.
 - Then consider each of the following:
 - A (single) volunteer checks in after being released by his/her city, or
 - A city wants to make a resource request (usually on the Message or Packet Net)
- Things to consider:
 - What do you say next?
 - What do you do next?
 - What do you say 10 minutes from now?

RACES Resource Request Challenges

If you have to send or take a Mutual Aid Resource Request

- Served agencies may or may not know about credentials and endorsements
 - Some know exactly what they need
 - Some will ask for the highest, even if they don't need it
 - Some don't know Credential levels; only know what skills they need
- Type II NCO is expected to know and understand Credential levels and Endorsements
 - Key services/capabilities; typical assignments; equipment
 - Hint: it's all in the Credential Program Handbook

RACES Resource Request Challenges

If you have to send or take a Mutual Aid Resource Request

- May need to help the requester to ask for the correct resource
 - Agency must first use SCCo RACES Mutual Aid Request form, receive approval from local city/agency official
 - Supervisor can help
 - Translate verbal descriptions into qualification levels
 - Request: “busy net, outdoor shelter, cover a wide area on simplex,” “high traffic field assignment,” “25W rig and antenna with mast” needs an F2
 - Translate common assignments to credential levels
 - Example: Typical Red Cross shelter or Hospital needs F3+P3
- Preferred transmission method: send a RACES Mutual Aid Request form via Packet to the RACES Unit Leader at the SCCo EOC.

SCCo ARES/RACES Credentials at a Glance

Expertise	Skill Areas			
	Field Comms	Net Control	Shadow	Packet
Type 1 Specialist	Field Comm 1	Net Control 1	Shadow 1	Packet 1
Type 2 Advanced	Field Comm 2	Net Control 2	Shadow 2	Packet 2
Type 3 Independent	Field Comm 3	Net Control 3	Shadow 3	Packet 3
Type 4 Basic	Type IV Communicator			
Type 5 Unknown	Licensed Amateur Radio Operator w/DSW			

Higher Proficiency ↑

Endorsements at a Glance

- They are covered in the homework section of this presentation and detailed in the Credentialing Program Handbook
- Status summary:
 - Mutual Aid Communicator (MAC)
 - County Fire Station Radio Operator (FRO) - pending
 - Still awaiting County Fire training class
 - County EOC Radio Room Operator (ERO)
 - County SHARES Radio Operator (SRO)
 - County EOC RACES Unit Leader (RUL)
- Any questions on these Endorsements?

Resource Mobilization Steps

- Provide assignment info to the resource(s) (volunteers)
- Resource may accept or reject the assignment
 - We're volunteers! They may refuse if they feel unqualified, unsafe
- Record accepted assignment on T-card (or other tracking tool)
- Provide the assigned activation number (do not make it up)
 - Typical county numbers are XSC-YY-NN, where:
 - "XSC" = Santa Clara County Operational Area
 - "YY" = Year (i.e. "25" for 2025)
 - "NN" = event number (i.e. "01" for first event, "02" for second event, ...)
 - For training exercises, a "T" will be appended to the end (e.g. XSC-25-04T)
- Provide address, travel advisories, contact information, etc.
- Record starting odometer, intersection
- Begin tracking resource en route to assignment

Dispatch Template for mobilization

- Lots of details to cover for a real activation; much less for drills
- No two situations are the same
- No one script can cover them all
- Use template to prepare script
 - Assignment
 - Location, address, coordinates, contact, start-time, etc.
 - Activation
 - In-transit
 - Frequencies, procedures
 - Restrictions, hazards, advisories
 - Arrival

Santa Clara County Resource Net – Dispatch Template

(Use portions and order as appropriate for situation)

Assignment (if appropriate):

- (Use as appropriate: for most drills and events, people already know their assignment)
- [Optional] I have an assignment for you. Are you ready to copy?
- [Optional] Your assignment is: *{duties of assignment}*
- [Optional] You should report to:
 - Location: *{name of staging area, park, shelter, school, etc.}*
 - Address: *{street address, city, special directions (if needed)}*
 - Local Contact: *{name, phone number, local frequency, [tone, offset]}*
- [Optional] Your start time will be: *{time}*
- [Optional] Operational period is expected to be [about]: *{#}* hours. Please be prepared (with any food, water, clothing or supplies you may need.)
- Do you accept this assignment?

Activation:

- Your activation number is: *{activation number}*

Pre-departure Instructions and Frequencies:

- Monitor this net as you travel
- Call net control about every 15-20 min. to report your location and last 3 digits of your odometer.
- When you arrive, stay in your vehicle and contact me
- [Optional] Frequency Information:

The following repeaters are linked:

 - AA8BT (Primary): 146.115 MHz (+) 100.0 Hz
 - WBASH (North): 145.270 MHz (-) 100.0 Hz
 - K8SNY (South): 443.275 MHz (+) 107.2 Hz
 - Other: _____

Reminder - when you get to *{location}* switch to *{freq, [offset, tone]}*
- [Optional] Travel Restrictions and Hazards (if any):
 - Advise them of any weather hazards
 - Advise them of any road closures or hazards
 - Advise them if electricity or telephones are out – may affect gas stations, ATMs, etc.
 - Advise them if any special access credentials are required

Departure:

- Get departing location and odometer reading
- Verify that they copied all instructions
- Wish them safe travel

Arrival Instructions:

- Remain in your vehicle and contact *{name or net control}* on *{freq, [offset, tone]}*
- Other _____

SCCo ARES*/RACES (Rev. 20240821) Page 1 of 1

Challenges for Resource Net Level 3

- Resource allocation
 - Availability
 - Who is available? Where are they? (home, staging, some other county) What skills do they have? What constraints? Do they have a County DSW?
 - County RACES staff will make assignment, Net Control needs to track details
 - Mutual Aid Resource Requests
 - What type of resources have been requested? When are they needed? What flexibility do we have (level, time, quantity)? Are there any specific requirements, such as: climbing stairs, lifting heavy weight, etc.?
 - Documented on RACES Mutual Aid Resource Request Form.
 - Assignments
 - Who should be assigned? What alternatives do we have?
 - RACES CRO/DCRO staff will make assignments; net control needs to track.
- Credentials and endorsements define skills unambiguously. Learn them!
- T-cards (or substitute) are essential.
- A scribe is really helpful when tracking lots of resources.

Challenges for Resource Net Level 3

- Status tracking
 - Questions from requesting city/agency?
 - How many people en route? What skill sets? When can I expect them to arrive? How long can they stay? What about replacements?
 - Questions from home city ECs
 - How many of my people are deployed? Where are they? When will they be back? Do you need more help? When?
 - Questions from county staff
 - How many people deployed? Where? Who? What resource gaps do we have? Where/when can we fill them?
- Other challenges
 - Possible coordination with other counties, region, and state
 - Demobilization – people are exhausted, need more guidance than usual

Challenges for Resource Net in General

- Inexperienced operators – weak or rusty on our procedures
 - Don't know/remember where to go, when, how, ...
 - Direct existing ARES/RACES members back to their city nets
 - Need release from city before available for assignment anyway!
 - Must have County DSW, otherwise we can not activate them
 - Prefer MACs but may take others for simple assignments
- Spontaneous volunteers – don't know our procedures
 - Typical radio questions
 - “Hey, are you guys running a net or something?”
 - “What's going on? ... Did something happen?”
 - “I'm in <city> and ... How can I help?”
 - Direct spontaneous volunteers to city nets
 - Volunteers are closest to their cities where they can be better utilized
 - Volunteers need to be vetted, registered with DSW and trained to be useful during an emergency

MESSAGE FORM		Origin Msg #: ² _____	Destination Msg #: ³ _____
<p>► For paper: use ballpoint pen – blue or black ink only (See back for instructions)</p>			
Date: ¹ ____/____/____ (mm/dd/yy)	Time (24hr): ____:____ (0001 to 2400)	Handling ⁵ (✓one): <input type="checkbox"/> Immediate (ASAP) <input type="checkbox"/> Priority (<1 hr) <input type="checkbox"/> Routine (<2 hr)	
This Message Requests You To ⁶ : TAKE ACTION (✓one): <input type="checkbox"/> Yes <input type="checkbox"/> No REPLY (✓one): <input type="checkbox"/> Yes, by _____ <input type="checkbox"/> No			
T O	ICS Position: (required) ⁷ _____		ICS Position: (required) ⁸ _____
	Location: (required) ⁹ _____		Location: (required) ⁹ _____
	Name: (optional) _____		Name: (optional) _____
	Telephone #: (optional) _____		Telephone #: (optional) _____
SUBJECT: ¹⁰ _____ REFERENCE (e.g., Number of earlier msg.): ¹¹ _____ MESSAGE: ¹² (what, when, where needed; how long; contact name and phone number - KEEP MSG BRIEF)			
ACTION TAKEN: ¹³ (For use by Originator / Recipient) ► USE SEPARATE MESSAGE FORM IF SENDING REPLY!			
CC: <input type="checkbox"/> Management <input type="checkbox"/> Operations <input type="checkbox"/> Planning <input type="checkbox"/> Logistics <input type="checkbox"/> Finance			
Operator Use Only: ¹⁴			
Relay: _____	Revd: _____	Sent: _____	
How Received <input type="checkbox"/> or Sent <input type="checkbox"/> (✓one): <input type="checkbox"/> Telephone <input type="checkbox"/> Dispatch Center <input type="checkbox"/> EOC Radio <input type="checkbox"/> FAX <input type="checkbox"/> Courier <input type="checkbox"/> Amateur Radio <input type="checkbox"/> Other _____		Operator Call Sign: _____ Operator Name: _____ Date: _____ Time: _____	
<small>Outgoing (Sent): ¹⁵ Message Originator: Send the original to radio. Retain a copy for your reference. Radio: After sending, complete Operator Use Only and file in radio. Incoming (Received): ¹⁵ Radio: Complete Operator Use Only then route to the Addressee. Retain a copy in radio if directed by Supervisor. Addressee: Take appropriate action.</small>			
<small>SCCo RACES ICS Form 213 (01/19/2022)</small>			

Review

MESSAGE NET OPERATIONS

Radio Routing Slip

- Message Types
 - 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.
 - Informal, handwritten; encourage the sender to re-write on an ICS 213
- To help manage effective to/from, handling order, message ID tracking; use the Radio Routing Slip if information is not part of the form
 - 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: <input type="radio"/> Immediate (ASAP) <input type="radio"/> Priority (<1 hr) <input type="radio"/> Routine (<2 hr)		
T O	⁵ ICS Position:			F R O M	⁹ ICS Position:	
	⁶ Location:				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):

Message Prioritization

- Prioritize according to Handling, Date, and Time
 - SCC Handling order: Immediate, Priority, Routine
 - Use Date to prioritize between same Handling order
 - Use Time to prioritize between same date
 - Ultimately, the served agency decides the order

MESSAGE FORM ▶ For paper: use ballpoint pen – blue or black ink only (See back for instructions)		Origin Msg #: ² _____	Destination Msg #: ³ _____
Date ¹ : 2 ____/____/____ (mm/dd/yy)	Time (24hr): 3 _____ (0001 to 2400)	Handling ⁵ (✓one): <input type="checkbox"/> Immediate (ASAP) <input type="checkbox"/> Priority (<1 hr) <input type="checkbox"/> Routine (<2 hr)	
		This Message Requests You To ⁶ : TAKE ACTION (✓one): <input type="checkbox"/> Yes <input type="checkbox"/> No REPLY (✓one): <input type="checkbox"/> Yes, by _____ <input type="checkbox"/> No	

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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:

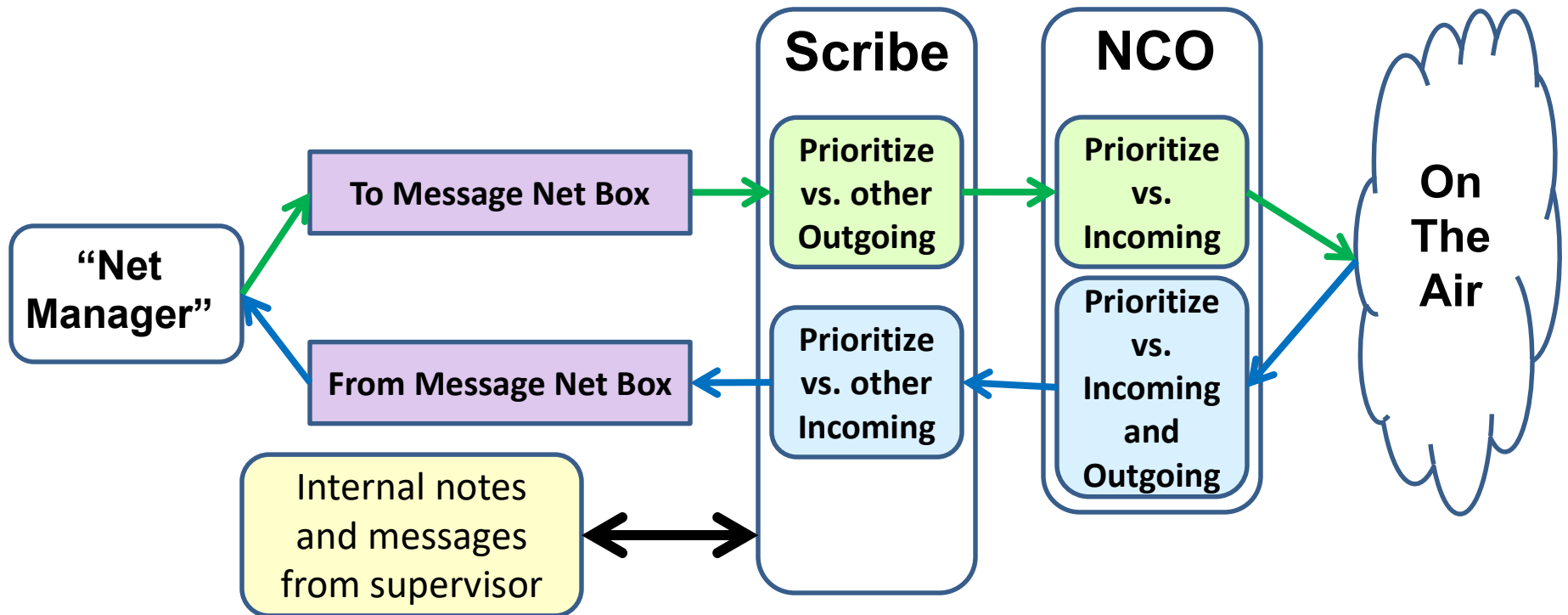
Time	Receiving From	Handling Order
0920	Los Altos	Priority
0930	San Jose	Immediate

- List these six messages in the proper send/receive order
- NOTE: assume no other messages come in during this time



Homework Exercise: Message Prioritization

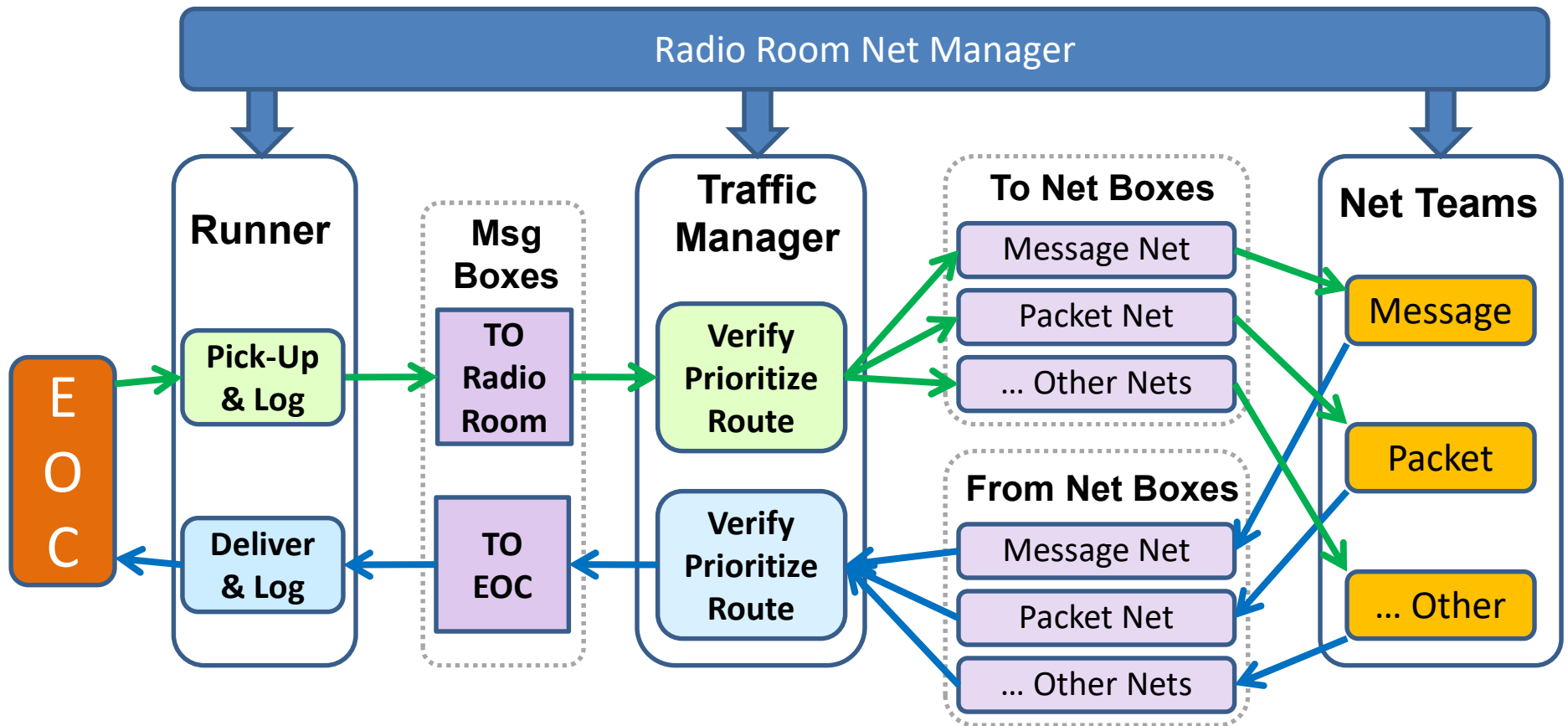
Review: Prioritizing Traffic Within a Net



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

Review:

Radio Room Traffic Routing/Prioritization



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

Exercise: Net Manager / Traffic Manager

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?
How might net conditions/operators influence your choice?

Reminder: Message Handling Challenges

- Speed / message throughput on voice
 - Two skilled operators can pass an ICS-213 in about 2-3 minutes or less, unskilled 2x to +3x longer
- Numerical sequences (lists of numbers): “15, 45, 26 ...”
 - “Figures one five, figures four five, figures two six, ...”
- Heterographs: to/too/two, for/four/fore, ate/eight, plain/plane, site/sight/cite, one/won, ...
 - “I spell ...”
- Traffic volume – can be non-stop
 - Although it is less so with more messages passed by packet
 - But higher volume of operator-to-operator traffic may increase the workload

Reminder: Message Handling Challenges (Cont.)

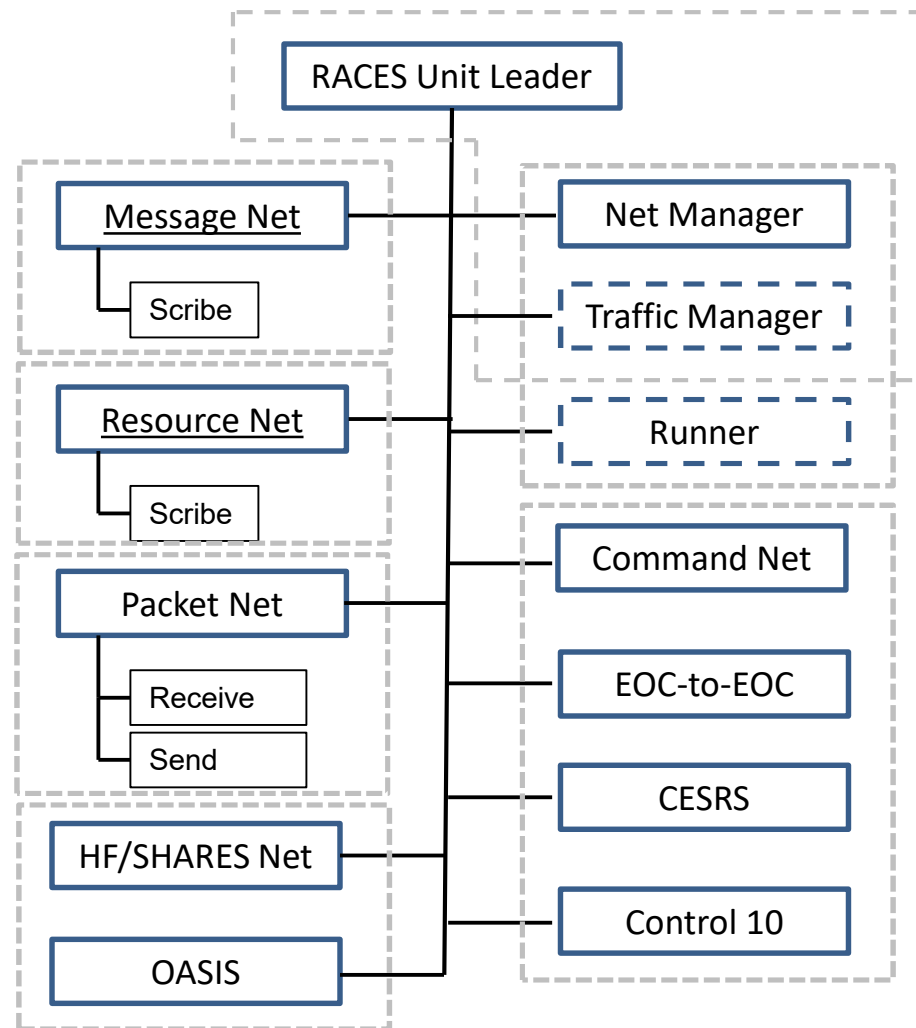
- Prioritizing traffic
 - Individual message prioritization (handling order, date, time)
 - Incoming vs. outgoing messages
- Inexperienced operators
 - Failing to identify quantity and priority of messages when they contact you, improper prioritization, poor message passing skills
- If packet is available, use message net primarily for Immediate messages
 - You better get it right!
- Keep your message passing skills up to date and practice!
 - Quarterly Training Net. Sign up under county web site events.
 - Message Passing class
 - Drills and Public Service Events



ORGANIZATIONAL MODELS FOR NET CONTROL

County Radio Room Positions and Structure

- Specific staffing dependent upon situation (and # of volunteers)
- Some NCO positions may be combined, if traffic levels permit
- Dashed lines suggest positions that may be covered by one person until more volunteers arrive.
 - Up to RACES Unit Leader delegation



Net Control Models

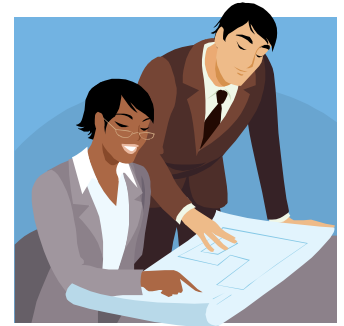
- More than one model exists for net control:
 1. Net control (with optional scribe) is also EOC Operator [county]
 - NCO/scribe team direct traffic AND handle EOC messages
 - NCO and scribe divide workload for maximum efficiency
 - Appropriate when most traffic is to/from EOC
 - Santa Clara County nets operate this way
 2. Net control separate from EOC Operator [some cities]
 - NCO responsible for directing traffic and potentially assigning msg #'s
 - EOC operator sends/receives messages from/to EOC
 - EOC operator goes through net control, just like other field stations
 - Used by some cities
 3. Others ...
- Be sure you understand which model is being used before you take over net control duties



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

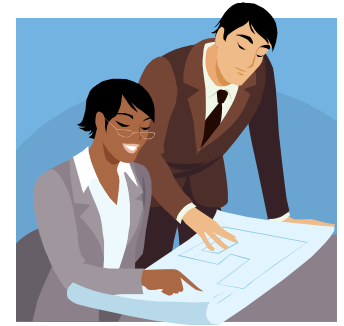
INTRODUCTION TO PLANNING FOR NET CONTROL

Review: 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
- 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

Review: Planning for an Event



- Advanced net control operator (N2) should be able to
 - Plan a net for a smaller to medium 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 includes:
 - Net types / quantity
 - Frequency selection and Intermod considerations
 - 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

Review: Net Type and Quantity Considerations

- Resource Net
 - Directed net
 - Common for county exercises and many city exercises
 - 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

Review: Net Type and Quantity Considerations

- 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
 - Traffic: All informal: parades, bike races, checkpoints, rovers
 - How long to gather key 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

Review: Net Type and Quantity Considerations

- 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.
 - May need a NC liaison between the shadow nets

Review: Net Types and Quantity Considerations

- 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
- Staging nets and other tactical nets
 - Where and when needed
 - Can be quite large, but relatively simple – check-in/out; H&W
- Packet Nets (not part of Net Control but ...)
 - May use existing county BBS frequencies
 - May use separate training BBS and non-SCCo frequencies
 - Can greatly reduce the traffic level on voice message nets
 - Encourage use, especially when formal message traffic is needed
 - Why would Net Control planner be concerned about Packet operations?

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 <u>Freq</u> / W	Rx Tone or NAC	Tx <u>Freq</u> / W or + / - / S	Tx Tone or NAC	Mode <u>A</u> , <u>D</u> , <u>M</u>	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

- 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

Review

STRETCH HOMEWORK

Placeholder: Review ICS-205 homework assignment

Placeholder: Review of Net Control Staffing Plan

Placeholder: Assignment / Dispatch Template

Feedback to Event Staff

- An N2 advanced net control operator can provide more detailed comments to the event staff
- Comments can include:
 - Problems and concerns
 - Observations and feedback
 - Lessons learned
 - Improvement ideas for future events
 - Remember we do not run their event we are communicators
- If appropriate at the time, verbalize comment to event staff
- Document it (again) on your ICS 214
 - We do review all 214's (as well as all the other drill paperwork)
- It helps with building the After Action Report
 - All paperwork from DSW events is organized, scanned and archived for 7 years

SUMMARY

Summary



You should now be able to:

- Describe the role of an advanced net control operator (N2)
- Describe the advanced concepts, techniques, equipment and procedures required to operate:
 - Two nets simultaneously
 - County Resource Net Levels 1, 2, and 3
 - County Message Net
 - Other critical and/or high-traffic nets
- Describe the basics of net type and quantity for planning small events

Performing any of these roles well requires practical experience that cannot be gained in the classroom. So, get on the air! We hope to see you at the next event!

Summary + In addition

- Any Type 2 operator (including N2) is expected to be more familiar with SCC procedures, documentation, and reference information:
 - Credentialing program:
 - Capabilities & Services, Assignments, and Equipment of all Type 3 and Type 2 credentials
 - Endorsements
 - Evaluation process
 - Operations (everything on the SCC web pages), for example:
 - Optional and additional forms
 - Considerations and Recommendations for constructing stations
 - Station Components
 - Standards and Procedures
 - Etc.

Go Practice! (and participate in Drills)

- Learning to be a good net control takes practice
 - Multiple hours, multiple events
 - Multiple event types, multiple net types
 - Real radio environment
 - Unfortunately, that's just not possible in a 3-hour classroom
- But we have lots of practice opportunities available:
 - Monday/Tuesday night nets
 - City events (amateur radio, CERT, etc.)
- Drills too
 - Quarterly communication drills
 - Yearly, county-wide drill (September)
 - Field mini-drills
- Public service events (parades, bike races, festivals, ...)

Thank You – Receiving Course Credit

- “90% or better class time attendance required for credit”
- If you did the stretch homework share it with staff. But keep it for reference after it is reviewed.
- Sign out on the class ICS 211A SCCo RACES Check-In List
- Complete the on-line course evaluation form

On-Line Evaluation Form

Your evaluation form is available on-line for this course.
Please fill out and return promptly.

Reminder: must be completed within 7 days to receive credit for this course.

Santa Clara County ARES®/RACES

Welcome, Herman (W6XRL4) (This isn't you? Then [log in...](#))

Home

- [Log Out](#)
- [Activities Home](#)
- [SCC ARES/RACES Home](#)
- [Comments/Bugs](#)

Events

- [List Events By Date](#)
- [List Events I Joined](#)
- [Modify an Event](#)
- [List/Print an Event Roster](#)
- [Log Event Participation](#)
- [Submit Class Evaluation](#)

My Profile

- [My Contact Info](#)

Calendar of Events

Show: Current events Past events Event Descriptions

Introduction to Emergency Communications (Zoom)

Date:	Start:	Type:	Credential Credit?	Location:
02/27/21	9:00 AM	County Training	Yes	Conducted via Zoom

Congratulations! You just got your Ham Radio license and are anxious to get started... but how? There were plenty of new terms and concepts that yo...

Net Control - Type II (Zoom)

Date:	Start:	Type:	Credential Credit?	Location:
03/06/21	9:00 AM	County Training	Yes	Conducted via Zoom

The course description and handouts are available via the link below. [Click here to view the course description and download](#)

If you have questions or feedback about this or other training activities, please join our Training discussion group.

<https://scc-ares-races.groups.io/g/training>

This is a moderated group.

Reminder:

Watch the Activities Calendar for future training and exercise opportunities:

See: <https://www.scc-ares-races.org/activities/events.php>

Suggested Next Classes:

Shadowing June 21st

Message Passing on July 19th.