

CARES General Meeting

5 October 2017

Cupertino ARES/RACES



County Drill for Alternate EOC's

SCCo RACES

when: 14-Oct, 08:00 to 16:00

where: Ed Levin County Park, Milpitas

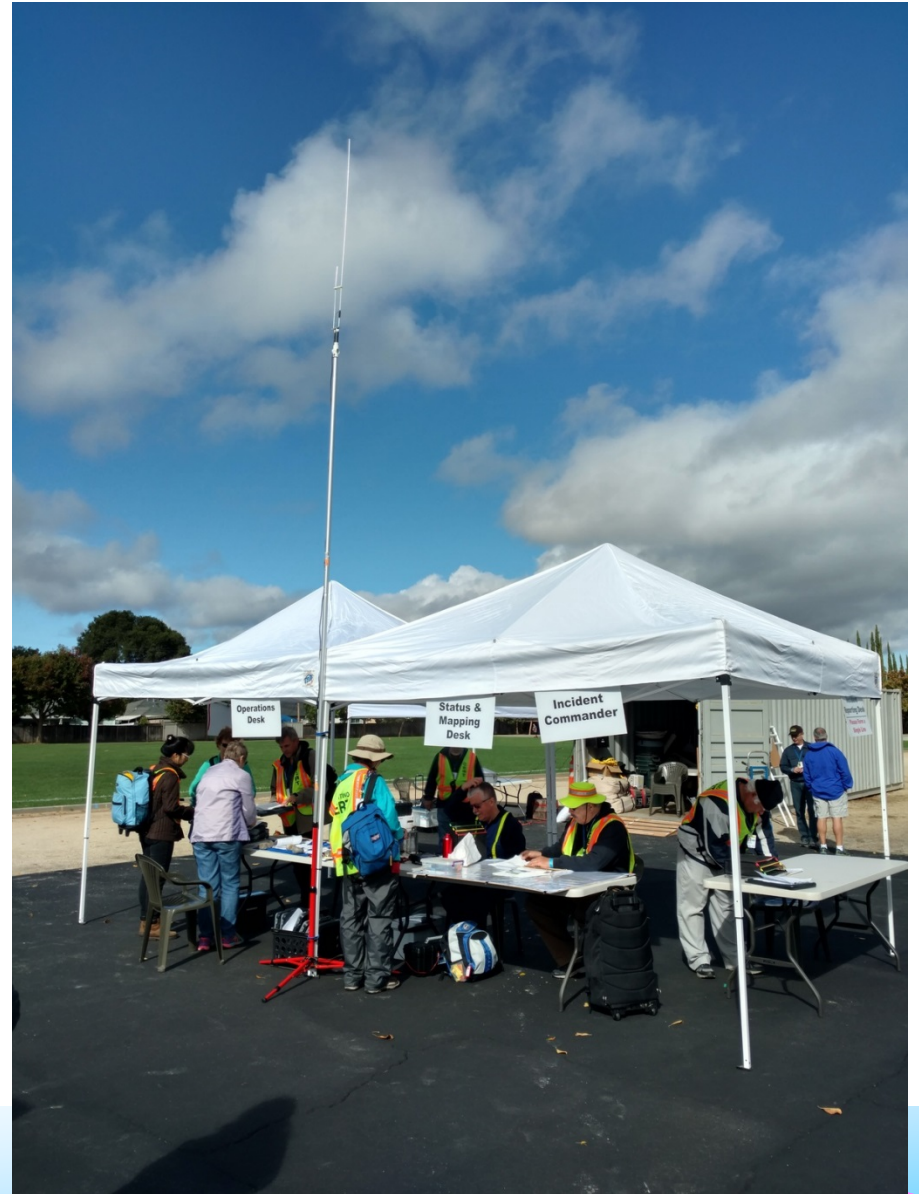


Lawson Zone Canvassing

Cupertino Citizens Corp

when: 15-Oct, 13:00 to 16:00

where: Lawson Ark



Cupertino ARES/RACES

Sheriff Hero Fun Run

Sheriff's Office

when: 4-Nov, 08:00 to 11:00

where: City Hall



Cupertino ARES/RACES



Public Safety Communications Vehicle Update

5 October 2017

Cupertino ARES/RACES

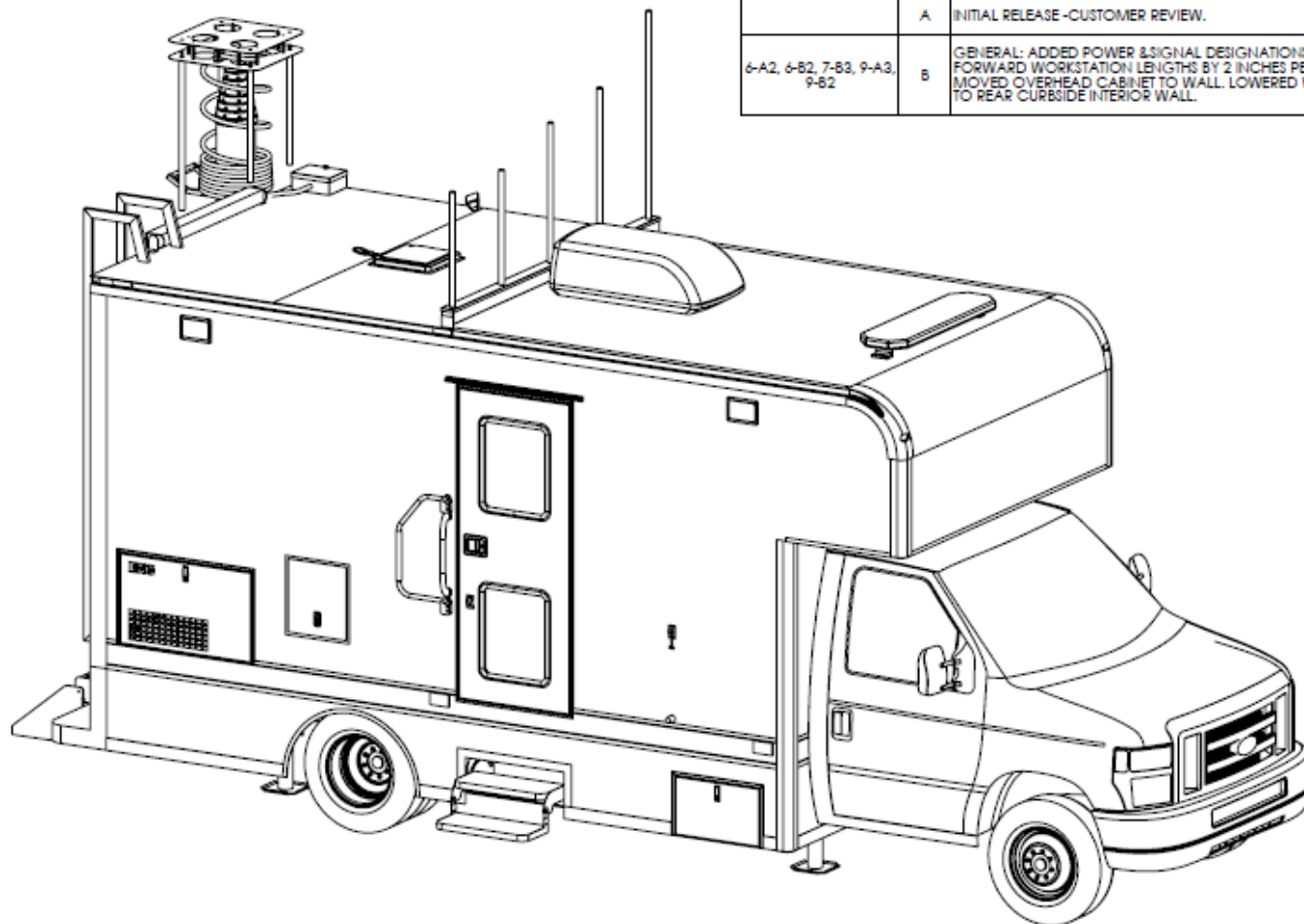


Feature highlights

- Automatic transmission
- Leveling and stabilization system, 4 point, automatic
- underbody storage boxes
- Air conditioning
- Equipment rack (radios, networking, computer)
- Four operating positions
- Generator, 7.0 kW (120 VAC 60Hz)
- 48 ft. Mast, aluminum pneumatic
- DC Power system 2 @ 200 AH batteries, w/ 90 amp battery charger
- Flexibility to reconfigure radios and antennas





REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE -CUSTOMER REVIEW.	08/27/17	KRB
6-A2, 6-B2, 7-B3, 9-A3, 9-B2	B	GENERAL: ADDED POWER & SIGNAL DESIGNATIONS TO ALL VIEWS. ADDED SIGNAL & JACK DIAGRAMS TO SET. REDUCED FORWARD WORKSTATION LENGTHS BY 2 INCHES PER BODY BUILDER ADVISORY. CHANGED RACEWAY TO HORIZONTAL; MOVED OVERHEAD CABINET TO WALL. LOWERED WALL HEATER TO MIN. DISTANCE FROM FLOOR. RELOCATED FIRST AID KIT TO REAR CURBSIDE INTERIOR WALL.	9/14/2017	KRB



SHEET SCHEDULE	
SHEET NO.	DESCRIPTION
1	PROJECT COVER
2	EXTERIOR ELEVATION - RIGHT
3	EXTERIOR ELEVATION - LEFT
4	EXTERIOR ELEVATIONS - FRONT & REAR
5	ROOF PLAN
6	FLOOR PLAN
7	INTERIOR ELEVATION - LEFT
8	INTERIOR ELEVATION - RIGHT
9	SECTION VIEWS - FRONT & REAR
10	AC ELECTRICAL DIAGRAM
11	DC ELECTRICAL DIAGRAM
12	SIGNAL DIAGRAM
13	JACK SYSTEM DIAGRAM

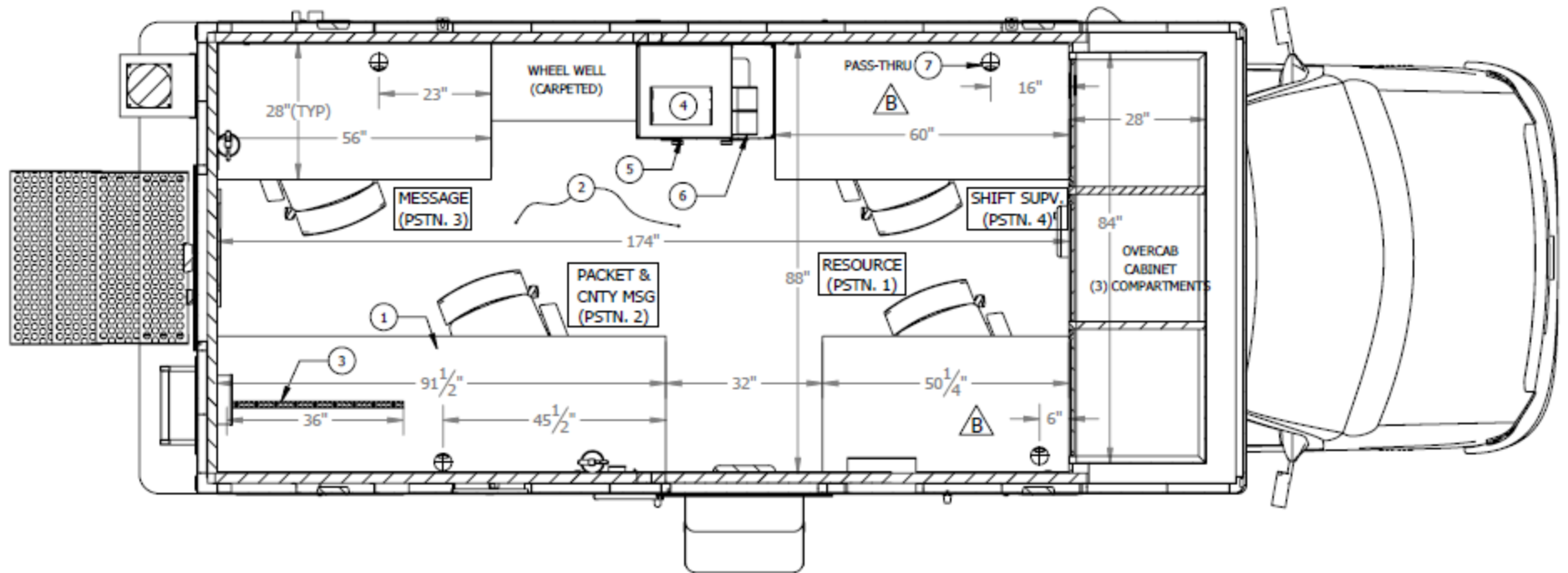
NOTES, UNLESS OTHERWISE SPECIFIED:

1. MANUFACTURE PER E-N-G MOBILE SYSTEMS STANDARDS.
2. RF EQUIPMENT INTEGRATION (CFE) IS INCLUDED IN THE SCOPE OF THE SALES ORDER.

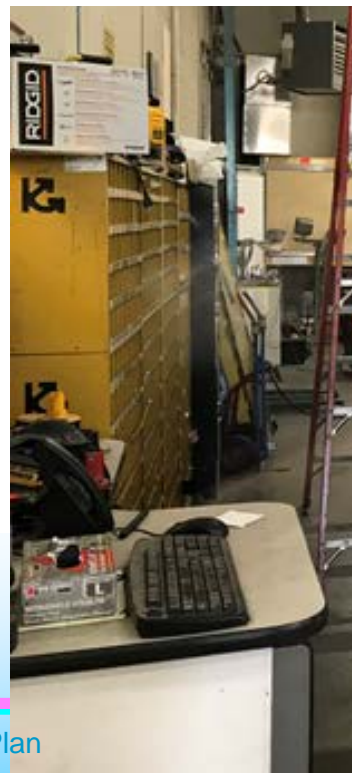
UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES. FRACTIONAL = ± 1/32 TOLERANCES: X.X = ± .050 X.XX = ± .020 X.XXX = ± .005 ANGLES: ± .5°		MATERIAL: AS SPECIFIED IN PARTS SCHEDULE		 E-N-G Mobile Systems, Inc. 2245 Via de Mercados, Concord, CA 94520 Tel. 925-798-4060 Fax. 925-798-0152 Web: e-n-g.com			
PROPRIETARY INFORMATION THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E-N-G MOBILE SYSTEMS, INC. ANY REPRODUCTION OR REDISTRIBUTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E-N-G MOBILE SYSTEMS, INC. IS PROHIBITED.		FINISH: AS SUPPLIED		ENGINEER: KRB DRAWN DATE: 08/25/17	TITLE: CITY OF CUPERTINO SERVICE CENTER, CARES UNIT		
		DO NOT SCALE FROM DRAWING		SIZE: B		SCALE: 1:30	DRAWING NUMBER: 917024
		3rd ANGLE PROJECTION 		FIRST USED:			SHEET NUMBER 1 OF 13



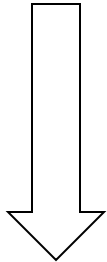
Top view



FLOOR PLAN



Schedule

✓ 11-July	PO Delivered to E-N-G	
✓ 19-July	E450 chassis & body ordered	
✓ 18-Sep	Truck and box delivered to E-N-G	
✓ 19-Sep	Cupertino Fleet department chassis inspection	
✓ 2-Oct	E-N-G starts build	
22-Nov	E-N-G build complete	(estimate)
27-Nov	City starts acceptance test	
4-Dec	City #469 in town, start vehicle detailing	
18-Dec	CARES Commissioning	



CARES Frequency Use

5 October 2017
Jim Oberhofer KN6PE

Cupertino ARES/RACES



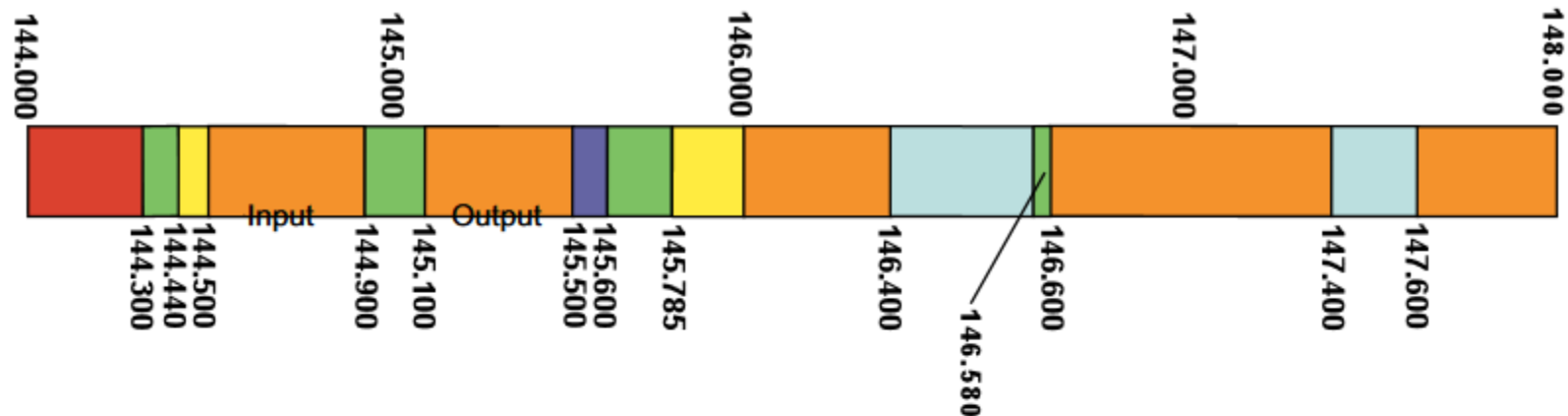
Situation







- County RACES records, presents the state of city/agency frequency use.
- Not many 2 meter simplex frequencies are left “unclaimed”.
- Only 3 440 simplex frequencies exist.
- CARES occasionally has a need for more frequencies than what we currently have.



2 meter band plan

Northern California



Legend	
	Satellite
	Digital
	Experimental
	Simplex
	Weak Signal
	FM Repeaters

For Repeater coordination in Northern California contact NARCC
www.narcc.org

For Packet Radio info contact the Northern California Packet Assc. (NCPA)
<http://www.n0ary.org/ncpa/>

For satellite information see Amsat
www.amsat.org

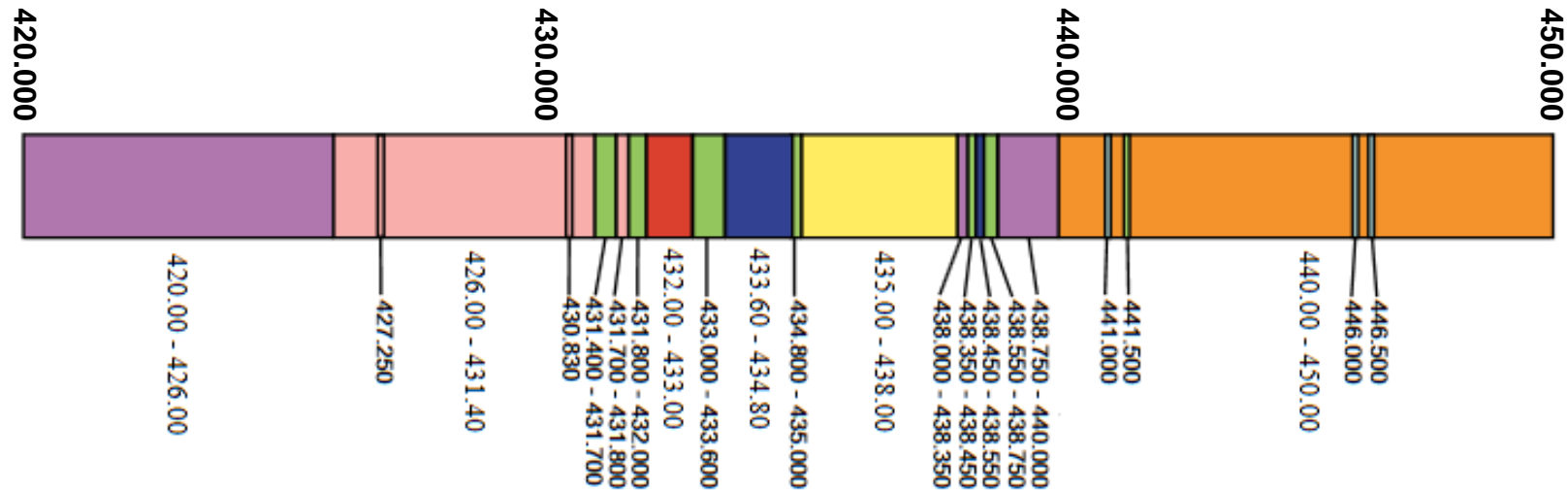
Specific Frequency info
FM Channel spacing
20 kHz below 146.00
15 kHz above 146.00

144.000-144.100 CW only
144.200 SSB calling
144.390 APRS
146.58 Digital
145.51 SSTV
146.52 Nationwide FM calling.
FM Simplex frequencies:
146.415, 146.430, 146.445,
146.460, 146.475, 146.490, 146.505,
146.520, 146.535, 146.550, 146.565,
146.595, 147.405, 147.420, 147.435,
147.450, 147.465, 147.480, 147.495,
147.510, 147.525, 147.540, 147.555,
147.570, 147.585

25!

77 cm (440) band plan

Northern California



Narrow band FM AUX/Links (only)
420.00 - 426.00 (duplex pairs 3 MHz spacing)
438.00 - 438.35
438.75 - 440.00

Weak Signal
432.00 - 433.00
432.00 - 432.07 EME
432.07 - 432.10 CW
432.10 Weak signal Calling

Mixed/Experimental
433.60 - 434.80
438.45 - 438.55

Satellite
435.00 - 438.00

ATV Aux only no repeaters (97.205)
426.00 - 432.00
427.250 Video, 430.83 colorburst, 431.75 audio

Digital
431.40 - 431.70, 431.80 - 432.00
433.00 - 433.60, 434.80 - 435.00
438.35 - 438.45, 438.55 - 438.75 & 441.500

FM Repeaters
Duplex pairs 5MHz separation
440.000 - 449.975
440.000 - 444.975 (outputs)
445.000 - 449.975 (inputs)
441.875/446.875 (shared non protected channel)

FM simplex
446.000
446.500
441.000

Channel Spacing
440.00 - 450.00 (25 KHz)
438.00 - 438.35 (20 KHz)
438.75 - 440.00 (20 KHz)
420.00 - 426.00 (20 KHz)

Cupertino ARES/RACES

This list updated by Mark Laubach, K6FJC, SCCo ADEC, K6FJC@arri.net

Items in **red** have been recently added or changed.

Adobe PDF versions available: [1 per page](#), [2 per page](#) or [4 per page](#)... [Notes](#), [Definitions](#),
[Excel Version](#)

Frequency List

SCCo RACES

- SCC RACES reports on the frequencies claimed by its incumbent cities.
- Coordination happens between cities.
- There are 20 cities/agencies that have “claimed” one or more frequencies for their jurisdiction’s use.
- Throughout SCC, we use...
 - 37 Repeaters (2m, 220, 330. 1.2Ghz)
 - 34 Simplex channels (2m/440)
 - 8 Packet channels (2m/220)

COUNTY								
Operational Area	Channel Name	Resource Name	R/S	Frequency	OS	PL	Notes	Reviewed
County	Message Net	W6TI	R	147.360	+	110.9		Feb-11
County	Message Net Alt (Linked)	K6FB	R	145.450	-	100	H	Jun-12
			R	442.575	+	100	H	Jun-12
County	Command	WB6ZVW	R	442.500	+	100		May-16
County	Command Net Alt.	K6SNY	R	443.275	+	107.2	G	Feb-11
County	Resource Net Alt.							
County	Resource, Primary	AA6BT	R	146.115	+	100	D	Feb-11
County	Resource, North	W6ASH	R	145.270	-	100	E	Feb-11
County	Resource Alt, North	W6ASH	R	440.800	+	100	E	Jul-17
County	Resource, South	N6NAC	R	444.625	+	110.9		Feb-11
County	Hospital Net	N6NFI	R	145.230	-	100	F	Feb-11
County	Hospital Net Packet	simplex	S				A	Feb-11
County	NTS	WR6ABD	R	146.640	-	162.2		Feb-11
CAMPBELL								
Operational Area	Channel Name	Resource Name	R/S	Frequency	OS	PL	Notes	Reviewed
Campbell	Tactical	Simplex	S	146.565			J	Feb-11
Campbell	Alt Tactical	Simplex	S	147.585			C	Feb-11
Campbell	Packet 220	Simplex	S				A	Feb-11
Campbell	Packet 440	Simplex	S				A	Feb-11
CUPERTINO								
Operational Area	Channel Name	Resource Name	R/S	Frequency	OS	PL	Notes	Reviewed
Cupertino	Tactical-1	Simplex	S	147.570		151.4	2	Feb-11
Cupertino	Tactical-2	Simplex	S	146.460		151.4		Feb-11
Cupertino	Tactical-3	W6TDM	R	440.150	+	100		Feb-11
Cupertino	ATV EOC Feed	Simplex	S	427.250				Feb-11
Cupertino	Packet 220	Simplex	S				A	Feb-11
GILROY								
Operational Area	Channel Name	Resource Name	R/S	Frequency	OS	PL	Notes	Reviewed
Gilroy	Tactical-1	Simplex	S	147.480				Feb-11
Gilroy	Tactical-2	Simplex	S	146.445				Feb-11
Gilroy	Tactical-CERT	Simplex	S	146.595				Feb-11
Gilroy	Packet-2M	Simplex	S				A	Feb-11
Gilroy	Packet-440	Simplex	S				A	Feb-11
LOMA PRIETA								
Operational Area	Channel Name	Resource Name	R/S	Frequency	OS	PL	Notes	Reviewed
Loma Prieta	Tactical	AB6VS	R	440.550	+	94.8		Feb-11
Loma Prieta	Tactical	AE6KE	R	146.835	-	94.8		Feb-11
Loma Prieta	Packet 2M	Simplex	S				A	Feb-11

Where are the frequencies going?

SCCo Cities – Simplex Only

145.170	1 Sunnyvale	440.150	1 Cupertino (repeater output)
145.570	1 Los Altos	443.275	1 Sunnyvale (repeater output)
146.415	2 Mountain View, Sunnyvale	446.000	1 Sunnyvale
146.430	1 San Jose	446.500	1 Sunnyvale
146.445	2 Gilroy, NASA-Ames		
146.460	1 Cupertino		
146.475	1 San Jose		
146.490	3 Morgan Hill, NASA-Ames, Stanford U		
146.505	2 NASA-Ames, Saratoga		
146.535	1 Mountain View		
146.550	2 NASA-Ames, Stanford U		
146.555	1 Morgan Hill		
146.565	1 Campbell		
146.580	1 Santa Clara		
146.595	4 Gilroy, Los Altos, Los Gatos, Saratoga		
147.405	1 Sunnyvale		
147.420	1 RED Cross - All		
147.435	2 Los Altos Hills, San Jose		
147.450	1 Santa Clara		
147.465	1 NASA-Ames		
147.480	3 Gilroy, Los Gatos, Palo Alto		
147.510	1 Santa Clara		
147.525	1 Milpitas		
147.540	3 Morgan Hill, Palo Alto, San Jose		
147.555	1 Palo Alto		
147.570	1 Cupertino		
147.585	3 Campbell, Cupertino , Sunnyvale		

Cupertino ARES/RACES



CARES channel line up

Ch	Use	Freq	R/S	Offset	Tone	Tone Mode
1	TAC1 (Resource)	145.750	Simplex		151.4	T
2	TAC2 (Message Net)	146.460	Simplex		151.4	T
3	TAC3 (Command)	440.150	Repeater	+	100.0	
4	Unassigned					
5	TAC5 (VTAC)	147.585	Simplex		151.4	T



What are the problems?

1. We can anticipate interference from Foster City
 - Cupertino shares 147.570 (T=151.4) with Foster City (T=114.8). When the big one hits, we will be stepping on each other.
2. Desense between CARES TAC1/147.570 and TAC2/146.460 in the comm van resulted in missed calls
 - Only 1.11 Mhz separation between both frequencies
 - Less than 24" separation between both antennas
3. Simplex coverage between HT and Comm Van requires that we link in the repeater during initial ARES activation, weekly nets to ensure coverage
4. No designated CARES 440 frequency for cross-band operations
5. Frequency availability to support multiple ICP deployments

Is our frequency line-up the best for CARES Operations?



1. Managing Interference

- What is ***Tone***?
 - When enabled, your radio superimposes a very low frequency audio tone on your transmitted carrier to operate a repeater. 42 different codes.
- What is ***CTCSS*** or ***Tone Squelch*** (CT or TSQL)
 - When enabled, your receiver is muted until it hears a station transmitting the same tone frequency that you set on your radio.
 - This does not make your transmissions private, but it does block out everything else.
- What is Digital Coded Squelch (DCS)
 - More advanced tone system, functions the same way as CTCSS, but with a different encode/decode method, 104 different 3 digit codes.
- In your Radio... your tone options
 - Kenwood (none) > T > CT > DCS
 - Yaesu (none) > T > TSQL > REV TN > DCS
 - ICOM (none) > T > TSQL
 - Alinco (none) > T > TSQ > DCS
 - Baofeng Menu 11=R-CTCS, Menu 13=T-CTCS (similar for DCS)

1. Managing Interference

1. We can anticipate interference from Foster City

- Cupertino shares 147.570 (T=151.4) with Foster City (T=114.8). When the big one hits, we will be stepping on each other.

Plan to Address:

- CARES Comm Van 2m radios set up 147.570, 146.460, and 147.585 with CT turned on and set to 151.4
- All CARES members turn on Tone on for TAC1, TAC2, TAC5 to reach the Comm Van



2. Managing Desense

2. Desense between CARES TAC1/147.570 and TAC2/146.460 in the comm van resulted in missed calls
- Only 1.11 Mhz separation between both frequencies
 - Less than 24" separation between both antennas

Options to test:

- 1) Align one TAC1 antenna pointing up, TAC2 antenna pointing down
-- test to confirm
- 2) Move TAC2 antenna to the roof...
-- may reduce city simplex coverage, but test to confirm
- 3) Move Resource Net to a 440 Simplex frequency
-- test to confirm
- 4) Move Resource Net to W6TDM 440 repeater, Command Net to Simplex
-- resolves problem, but...



3. Simplex coverage

3. Simplex coverage between HT and Comm Van requires that we link in the repeater during initial ARES activation, weekly nets to ensure coverage

Plan to Address:

- Revisit procedures for requesting and passing relays for stations not acknowledged by Net Control.



4. No 440 simplex

4. No designated CARES 440 simplex frequency for cross-band operations.

Plan to Address:

- Add 441.000 to the CARES frequency list, TAC 4. Set CT / TSQL = 151.4 (per requirements of SCCo RACES)



5. Channel capacity

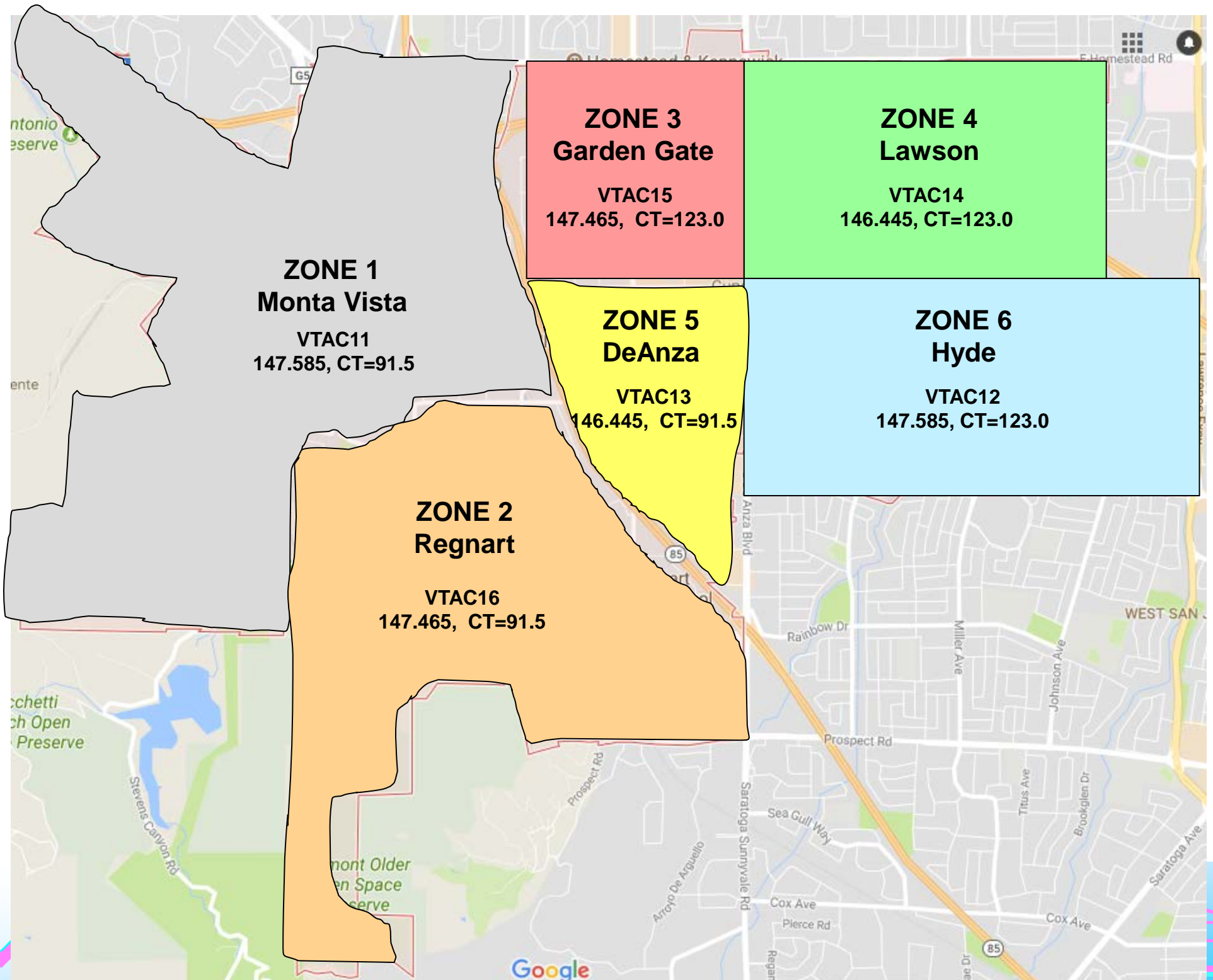
5. Frequency availability to support multiple ICP deployments

- Used when there are a number of field teams being deployed, one from each of the ARKs.
- There are no other unassigned frequencies available for CARES use

Plan to Address:

- Investigate allocating a frequency/CT Tone pair to the 6 field command areas





Revised CARES channel line up

Ch	Use	Freq	R/S	Offset	Tone	Tone Mode
1	TAC1 (Resource)	145.750	Simplex		151.4	T
2	TAC2 (Message Net)	146.460	Simplex		151.4	T
3	TAC3 (Command)	440.150	Repeater	+	100.0	
4	TAC4 (UTAC)	441.000	Simplex		151.4	CT / TSQL
5	TAC5 (VTAC)	147.585	Simplex		151.4	T
6	TAC1 (Resource)	145.750	Simplex		151.4	CT / TSQL
7	TAC2 (Message Net)	146.460	Simplex		151.4	CT / TSQL
8	TAC3 (Command)	440.150	Simplex		100.0	T
9	unassigned					
10	TAC5 (VTAC)	147.585	Simplex		151.4	CT / TSQL
11	VTAC11	147.585	Simplex		91.5	CT / TSQL
12	VTAC12	147.585	Simplex		123.0	CT / TSQL
13	VTAC13	146.445	Simplex		91.5	Ct / TSQL
14	VTAC14	146.445	Simplex		123.0	CT / TSQL
15	VTAC15	147.465	Simplex		91.5	CT / TSQL
16	VTAC16	147.465	Simplex		123.0	CT / TSQL

INCIDENT RADIO COMMUNICATIONS PLAN (ICS 205)

1. Incident Name:	2. Date/Time Prepared: Date: Time:	3. Operational Period: Date From: Date To: Time From: Time To:
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4. Basic Radio Channel Use:

Zone Grp	Ch #	Function	Channel Name Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	TX Tone/NAC	Mode (A, D, or M)	Remarks
	1	Resource Net	VTAC1	CARES	147.570W	none	147.570W	151.4	A	SPLX , T
	2	Message Net	VTAC2	CARES	146.460W	none	146.460W	151.4	A	SPLX , T
	3	Command	UTAC3	CARES	440.150W	100.0	445.150W	100.0	A	RPTR, W6TDM, el 130'
	4	Alt Tactical	UTAC4	CARES	441.000W	151.4	441.000W	151.4	A	SPLX , CT/TSQL
	5	Alt Tactical	VTAC5	CARES	147.585W	none	147.585W	151.4	A	SPLX , T, s/w Sunnyvale
	6	Resource Net	VTAC6	CARES	147.570W	151.4	147.570W	151.4	A	SPLX , CT/TSQL
	7	Message Net	VTAC7	CARES	146.460W	151.4	146.460W	151.4	A	SPLX , CT/TSQL
	8	Command	UTAC8	CARES	440.150W	100.0	440.150W	100.0	A	SPLX , CT/TSQL used on repeater failure only
	9	Unassigned	Unassigned							
	10	Alt Tactical	VTAC10	CARES	147.585W	151.4	147.585W	151.4	A	SPLX, LP , CT/TSQL, s/w Sunnyvale
	11	Field Cmd	VTAC11	CARES	147.585W	91.5	147.585W	91.5	A	SPLX, LP , CT/TSQL, s/w Sunnyvale
	12	Field Cmd	VTAC12	CARES	147.585W	123.0	147.585W	123.0	A	SPLX, LP , CT/TSQL, s/w Sunnyvale
	13	Field Cmd	VTAC13	CARES	146.445W	91.5	146.445W	91.5	A	SPLX, LP , CT/TSQL, s/w NasaAmes
	14	Field Cmd	VTAC14	CARES	146.445W	123.0	146.445W	123.0	A	SPLX, LP , CT/TSQL, s/w NasaAmes
	15	Field Cmd	VTAC15	CARES	147.465W	91.5	147.465W	91.5	A	SPLX, LP , CT/TSQL, s/w NasaAmes
	16	Field Cmd	VTAC16	CARES	147.465W	123.0	147.465W	123.0	A	SPLX, LP , CT/TSQL, s/w NasaAmes

5. Special Instructions:

1. Standing CARES Radio Communications Plan.
2. Abbreviations:
 - CT/TSQL – CTCSS or Tone Squelch (radio-specific)
 - LP – Low Power
 - RPTR – Repeater
 - SPLX – Simplex
 - T – TX Tone only

6. Prepared By:

Next Steps

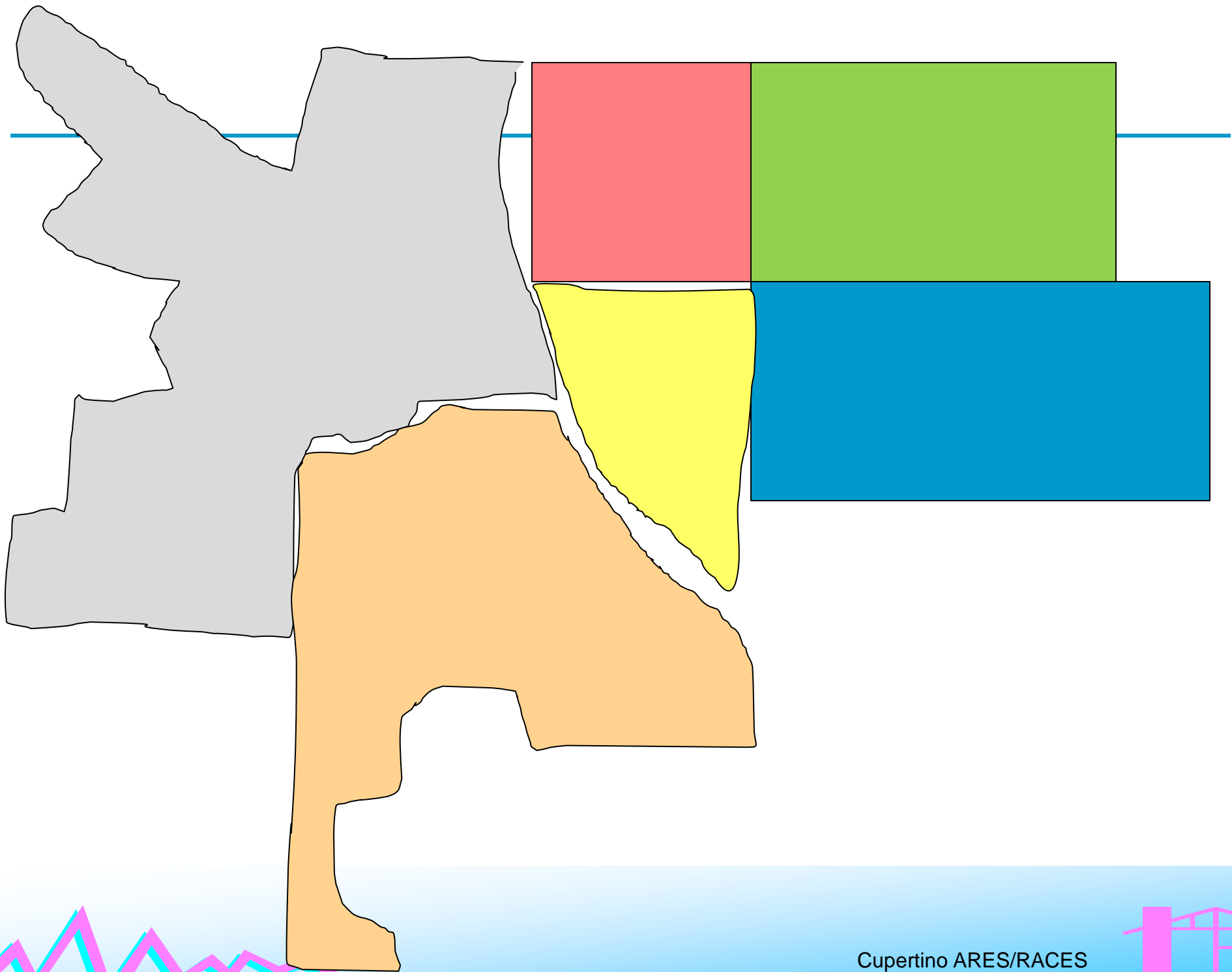
1. Notify SCCo RACES of 441.000 use
2. Plan a test of VTAC11-16
3. Confirm our plan with Nasa/Ames



Thank you

Any Questions?





Cupertino ARES/RACES