

Cupertino ARES/RACES 2024 Year-End Review

December 5, 2024
Jim Oberhofer KN6PE



Topics for tonight

Seven topics of interest for CARES and Cupertino Citizens Corps operations...

7. What's up with City Hall?
6. Cupertino Parks on the Air (CPOTA) Results
5. Website changes, updates
4. Packet Operations
3. Handbook update for 2025
2. Ham Radio, GMRS, and FRS
1. Mesh Networking



#7

WHAT'S UP WITH CITY HALL?

What's up with City Hall?

What's the problem?

1. Originally build in 1965; renovated in 1986.
2. Evaluation performed in 2011, found problems with...
 1. Roof weight and shear capacity. (2012 report)
 2. Insufficient shear walls on all four sides of the building that are over-stressed by ~150% (2011 report).
3. As a result: City Hall is not a qualified Critical Facilities Building.

Slow headway

1. A proposal to replace the city hall and EOC; declined by City Council in 2015, then again in 2017.
2. The original 2018 Vallco project called out new city facilities and EOC; project held up by Council, now approved (SB-35) and scaled back.
3. Another proposal appears to be working its way through the system.



What's up with City Hall?

- In July 2024, the Cupertino City Council voted to open negotiations on moving city departments into an empty office building while the nearly 60-year-old City Hall is renovated or rebuilt.
- The decision follows years of concern over seismic safety, aging infrastructure and inadequate space at the 10300 Torre Ave. location.
- The city is exploring purchasing or renting the ~20,000 sq ft building at 19400 Stevens Creek Blvd.
- Estimates to seismically retrofit the existing facility could cost about \$7M with the complete renovation costing about \$27.5M.
- A total City Hall rebuild is estimated to cost \$80M.



Ref: <https://sanjosespotlight.com/cupertino-weighs-moving-location-of-aging-city-hall/>



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DISPLAY



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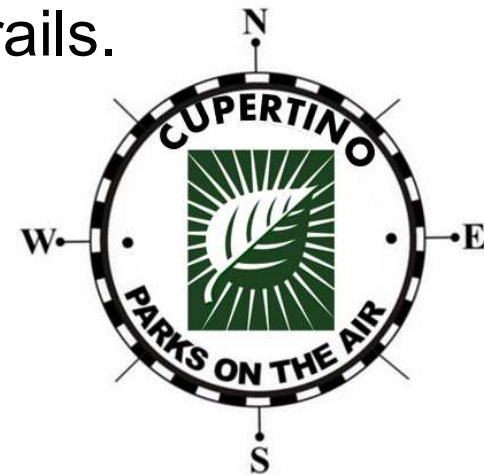
IN/OUT: PD 60W

#6
CPOTA RESULTS!

Cupertino Parks On the Air – CPOTA

1. After years of thinking about it, we finally did it!
2. Cupertino Parks on the Air (CPOTA) is modeled after the real **Parks on the Air** program for international portable amateur radio operations that promote emergency awareness and communications from national, federal, state, and provincial level parks.
3. In Cupertino, we have 24 parks and another 11 trails.
4. See the details as presented at the 5 Sep 2024 general meeting here...

<https://cupertinoares.org/docs/240905-CPOTAv3.pdf>



How did we do?

Cupertino Parks On the Air – CPOTA

- **Three sites were activated:**

Count of Band Park ID	Date	Activator	Band		Grand Total
			2m	70cm	
☒ CUP09 - Jollyman Park	☒ 10/9/2024	KR1JOE	10	11	21
☒ CUP11 - Linda Vista Park	☒ 9/11/2024	N6TAE	12	4	16
☒ CUP12 - Little Rancho Park	☒ 9/11/2024	KN6YUH	7	2	9
Grand Total			29	17	46

- Duplicate hunters per band were removed such as different radio or power level.



How did we do?

Cupertino Parks On the Air – CPOTA

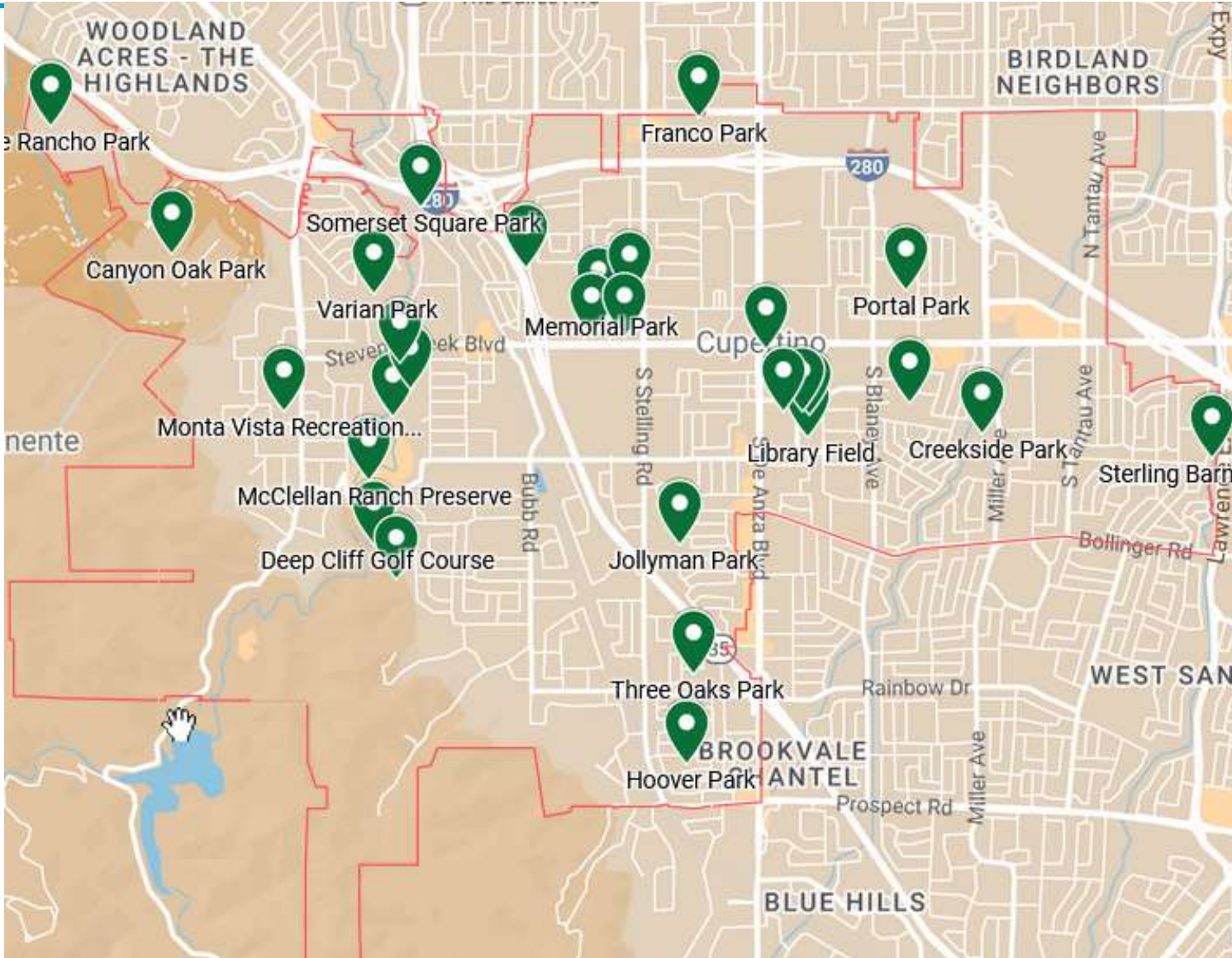
- **Twenty-one (21) hunters were active:**
 - Cupertino: 18
 - Saratoga: 3
- Each band at a park is a separate contact.
- Both VHF and UHF bands were in used.

Count of Hunter	ShortPark				
Hunter		CUP09	CUP11	CUP12	Grand Total
AA6PM		2		1	3
AJ6HM		2			2
K6EWO		2			2
KE6FIC		1			1
KI6DRN		2			2
KI6GCX				1	1
KI6LDM		2		1	3
KJ6OHF				1	1
KK6EWQ				1	1
KK6FPI		2	2	1	5
KK6GNB		1	1	1	3
KM6ZWR		2			2
KN6EKQ		1			1
KN6PE		1	2	1	4
KN6YUH		2	1		3
KO6FIC				1	1
KR1JOE			2	2	4
N4GN			1	1	2
N6TAE				2	2
NG4N			1		1
W6DGE		1			1
Grand Total		21	16	9	46



Who (and where) is next?

PARKS



Cupertino ARES/RACES

Providing emergency and public service communications for the City of Cupertino, California

Welcome, Jim!

- Home
- About us
- Operations
- Frequencies
- Forms
- Training
- Exercises & Events
- Docs & References
- Resources
- Cupertino Citizen Corps
- County RACES
- City of Cupertino

Members area

Log out

5 Dec 2024

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Welcome to Cupertino ARES/RACES

This site is operated and maintained for Cupertino Amateur Radio Emergency Service (CARES) members and visitors for emergency preparedness and amateur radio communication. Visitors are welcome to check us out.

What's News!

2024 Field Day

Posted by Jim KN6PE, 26 Jun 2024


Congratulations to the 14 CARES members who made this year's ARRL Field Day event a success.

CARES treats field day (first) as a field emergency communications exercise where *nothing* works except our own antennas, radios, power, and skills to put our necessary array of radios on the air.



Website Updates

#1... Search

- Each page as the search field in the top below the banner picture. Enter something specific to look for on the CARES site, and press 

- Example:



About 21 results (0.11 seconds)

Sort by:

Relevance ▾

[After Action Report Field-to-EOC FRS/GMRS Radio Test](#)

[www.cupertinoares.org](#) › [CUP-22-10T-FRS-GMRS-Field-Test-AAR](#)



File Format: PDF/Adobe Acrobat

May 5, 2022 ... The focus of this **AAR** is on the Cupertino Citizen Corps (CCC) FRS-GMRS field radio test and our ability to exchange information from individual ...

[After Action Report Earthquake Day 2 Comm Outage Exercise](#)

[www.cupertinoares.org](#) › [docs](#) › [CUP-21-39T-EQday2-AAR](#)

File Format: PDF/Adobe Acrobat

AAR/IP: Improvement Plan; identifies specific corrective actions, assigns ... The focus of this **AAR** is on the Cupertino Amateur Radio Emergency Service ...

[After Action Report Infrastructure Safety Assessment Exercise](#)

[www.cupertinoares.org](#) › [docs](#) › [CUP-21-24T-ISA-AAR](#)

File Format: PDF/Adobe Acrobat

AAR/IP: Improvement Plan; identifies specific corrective actions, assigns ... The focus of this **AAR** is on the Cupertino Amateur Radio Emergency Service ...

[After Action Report First Look Area Assessment Exercise - Cupertino ...](#)

[www.cupertinoares.org](#) › [docs](#) › [CUP-20-40T-FirstLook-AAR](#)

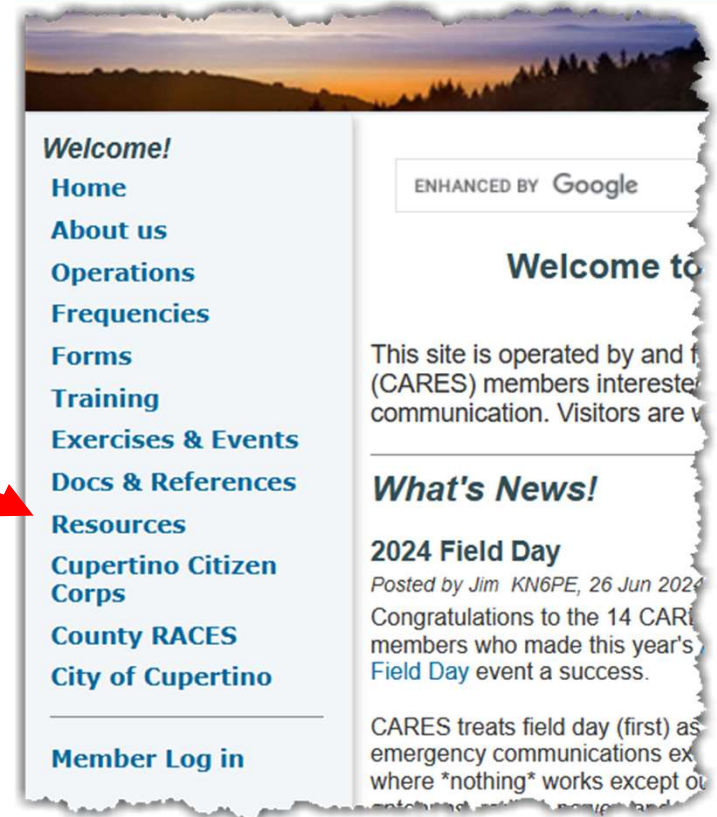
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AAR/IP: Improvement Plan; identifies specific corrective actions, assigns ... The focus of this **AAR** is on the Cupertino Amateur Radio Emergency Service ...

Website Updates

#2 Resources

- **Process Pages**
 - Net Control Operations
 - Packet Operations
 - Preliminary Safety Assessment
 - Windshield Survey
 - Cupertino Community Communications
- **Risk Resource Pages**
 - Communications Outage
 - Earthquakes
 - EMP – Electromagnetic Pulse
 - Flooding Events
 - Pandemics
 - Public Safety Power Shutoff
 - Wildland Urban Interface Fires

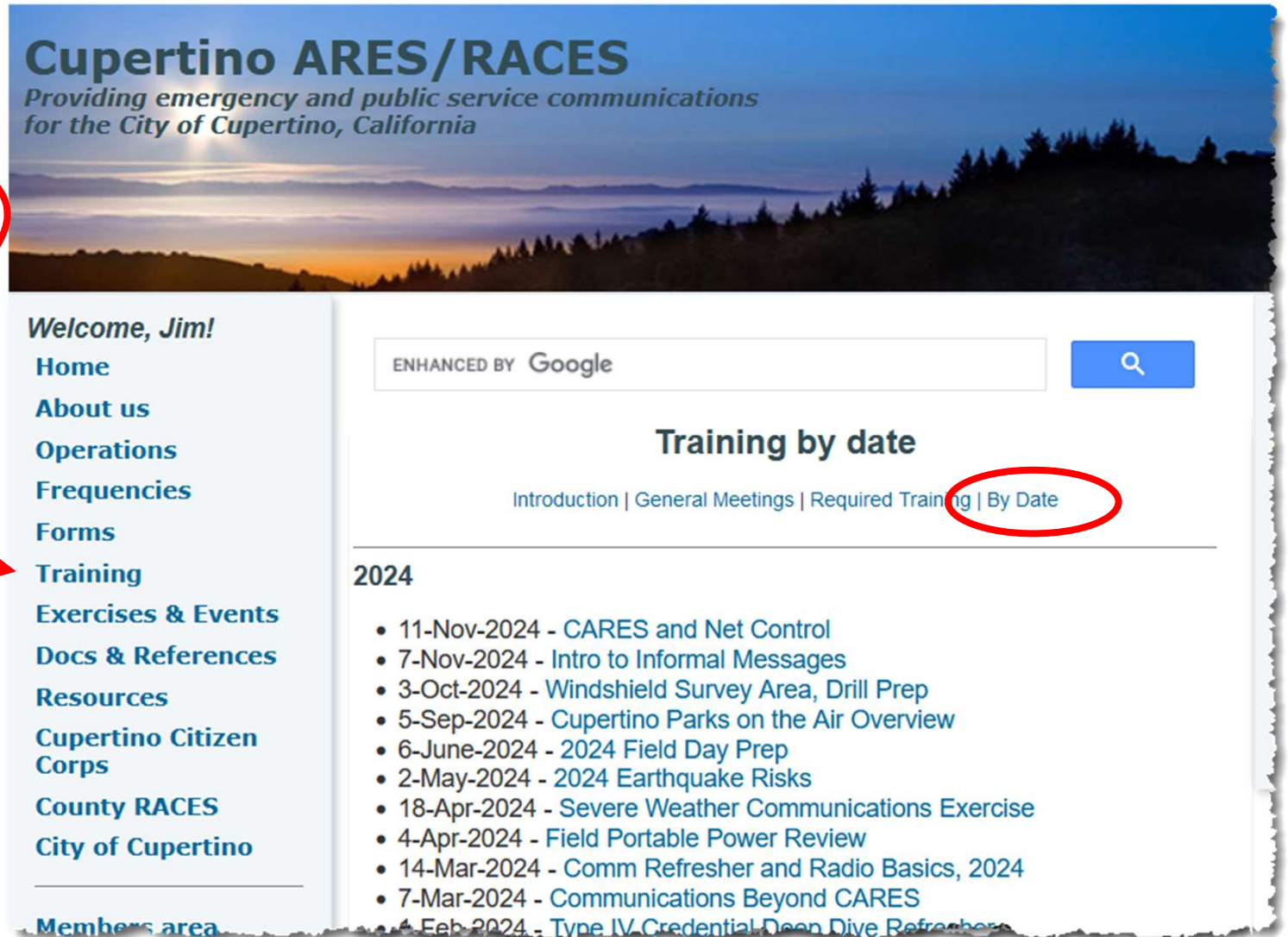


- **Operating Tools**
 - Radio Cheat sheets
 - Mesh Networking
 - Radio Equipment



Website Updates

#3 Training



Cupertino ARES/RACES
Providing emergency and public service communications for the City of Cupertino, California

Welcome, Jim!

Home
About us
Operations
Frequencies
Forms
Training
Exercises & Events
Docs & References
Resources
Cupertino Citizen Corps
County RACES
City of Cupertino

Members area

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Training by date

Introduction | General Meetings | Required Training | **By Date**

2024

- 11-Nov-2024 - CARES and Net Control
- 7-Nov-2024 - Intro to Informal Messages
- 3-Oct-2024 - Windshield Survey Area, Drill Prep
- 5-Sep-2024 - Cupertino Parks on the Air Overview
- 6-June-2024 - 2024 Field Day Prep
- 2-May-2024 - 2024 Earthquake Risks
- 18-Apr-2024 - Severe Weather Communications Exercise
- 4-Apr-2024 - Field Portable Power Review
- 14-Mar-2024 - Comm Refresher and Radio Basics, 2024
- 7-Mar-2024 - Communications Beyond CARES
- 4-Feb-2024 - Type IV Credential Deep Dive Refresher





#4

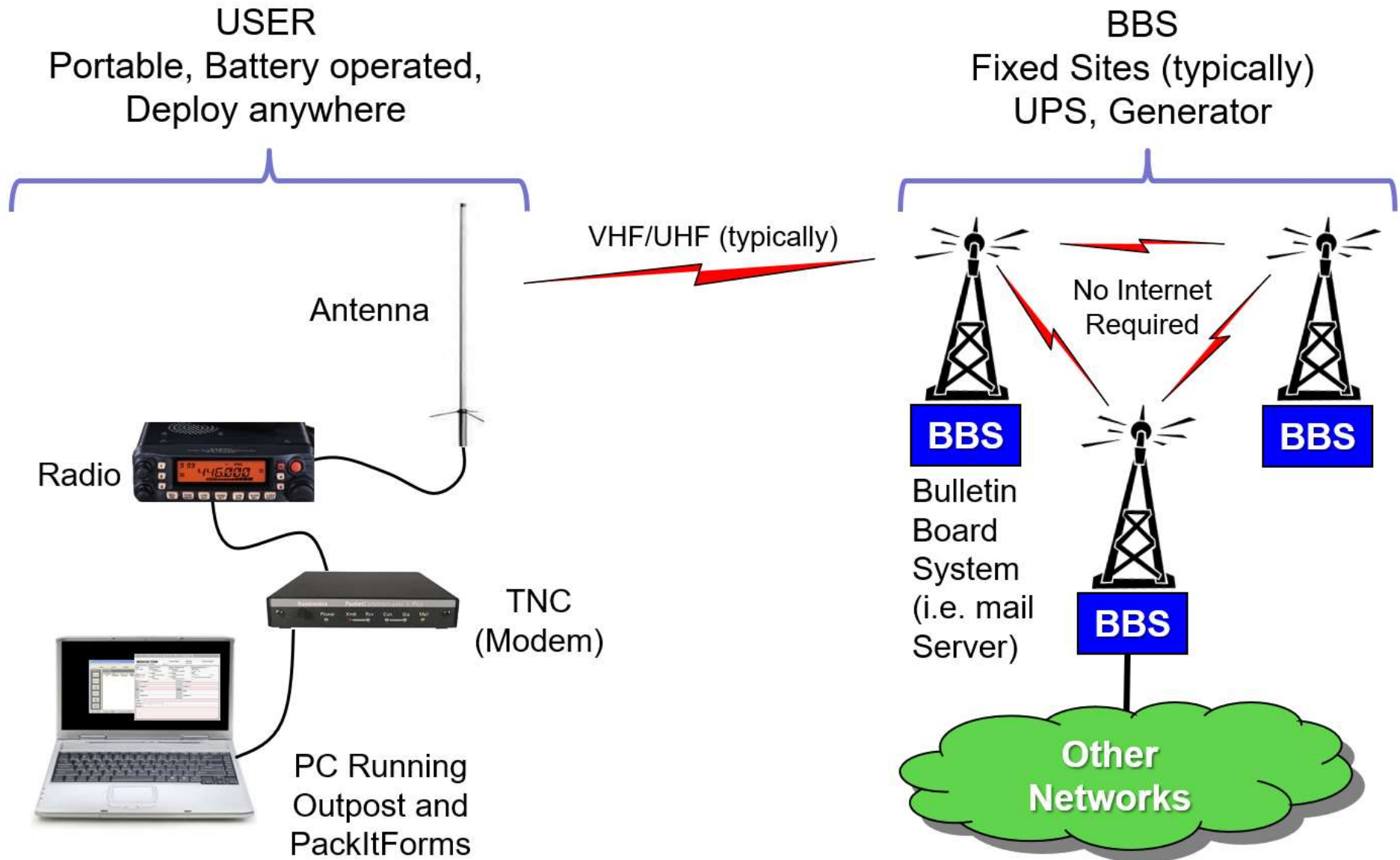
PACKET OPERATIONS

What is Packet Radio?

- One of many digital modes available in Amateur Radio
- Transmitted information is error free!
- It's fast
 - ... when there is no Internet (We operate at 1200 baud on VHF & UHF)!
 - ~15 times faster than voice
- It's easy
 - Hardware: pre-built cables; straight-forward connections
 - Software: if you can use e-mail, you can use Outpost
if you can use a browser, you can use PackItForms
 - Procedures: extensive documentation on the County RACES website
- It fits our served agencies' needs and workflow
 - Preferable for long, complex, and/or high-volume messages; forms; message numbering; explicit acknowledgments, logging, tracking



What is Packet Radio?



CARES Packet Operations

What are CARES Packet Ops doing?

Cupertino Activities...

1. About 14 CARES members with packet radio setups
2. Built personal packet kits or using a CARES loaner packet kits
3. Participating in Cupertino exercises with packet
4. Using City-specific processes and methods

County Activities...

4. Weekly packet check-in practice
5. Monthly packet message passing exercise
6. Taking County Packet classes
7. Participating in County packet exercises
8. Pursuing County packet certifications



Want to get started?

Option 1

1. CARES Loaner Packet Kit

- Kit contains a 13.8vdc power supply, 2m Radio, TNC, Mag Mount antenna
- You supply Windows Laptop with software loaded, 120vac outlet



- ### 2. We need you to get familiar with packet (practice, exercises, classes) and be ready to deploy to an ARK with your packet kit.

Option 2

- ### 1. Build your own packet kit. See the SCC RACES website for the list of recommended equipment



Want to get started?

- **Antenna**
 - Field: Roll-up J-pole, 2m for individuals; push-up tripod, sandbags and/or stakes
 - ARKs: Mag Mounts
- **Coax**
 - Field: 25' LMR-240 up mast; 25-50' LMR-400 to station
 - ARKs: Mag Mount antennas come with about 18ft attached
- **Radio**
 - Mobile radio 25W minimum
- **TNC**
 - External Terminal Node Controller preferred; custom cable to connect to the radio.
- **PC**
 - Windows preferred
 - Outpost and PackItForms, plus other recommended applications
- **Power**
 - Field: Battery, 12vdc, 25Ah deep cycle battery, cables, Powerpoles
 - ARKs: 120VAC Generator feeding 13.8vdc, 30A power supply

Ref: <https://www.scc-ares-races.org/data/access/ax25-vhf/ax25-vhf-access.html#equipment>



Cupertino A



2025 HANDBOOK UPDATES



Watch your mail for an update package

Revisions planned, tentatively for Spring 2025

1. ARK Activation Handbook
2. Field Communications Handbook
3. Net Control Handbook
4. Packet Field Reference
5. CCC Field Communications Handbook (GMRS License holders)





COMMUNICATIONS
COMMISSION
USA

U.S. Government
Officially Licensed

Emergency
Communications
Unit

#2

HAM RADIO, GMRS, & FRS

Ham Radio, GMRS, & FRS

Where we are today

- No, we are not abandoning Part 97 Amateur Radio.
- Yes, we have been driving the adoption of FRS/GMRS in the CERT community.
- CARES has 20 members with GMRS licenses (~35%)
- Cupertino CERT has another 8 known members with GMRS licenses
- We currently hold monthly CERT radio nets ...
 - 4th Saturday FRS/GMRS ARK zone net
 - 4th Tuesday evening GMRS check-in net
- Annual zoom training for CERT members interested in radio
- Annual hands-on training



Ham Radio, GMRS, & FRS

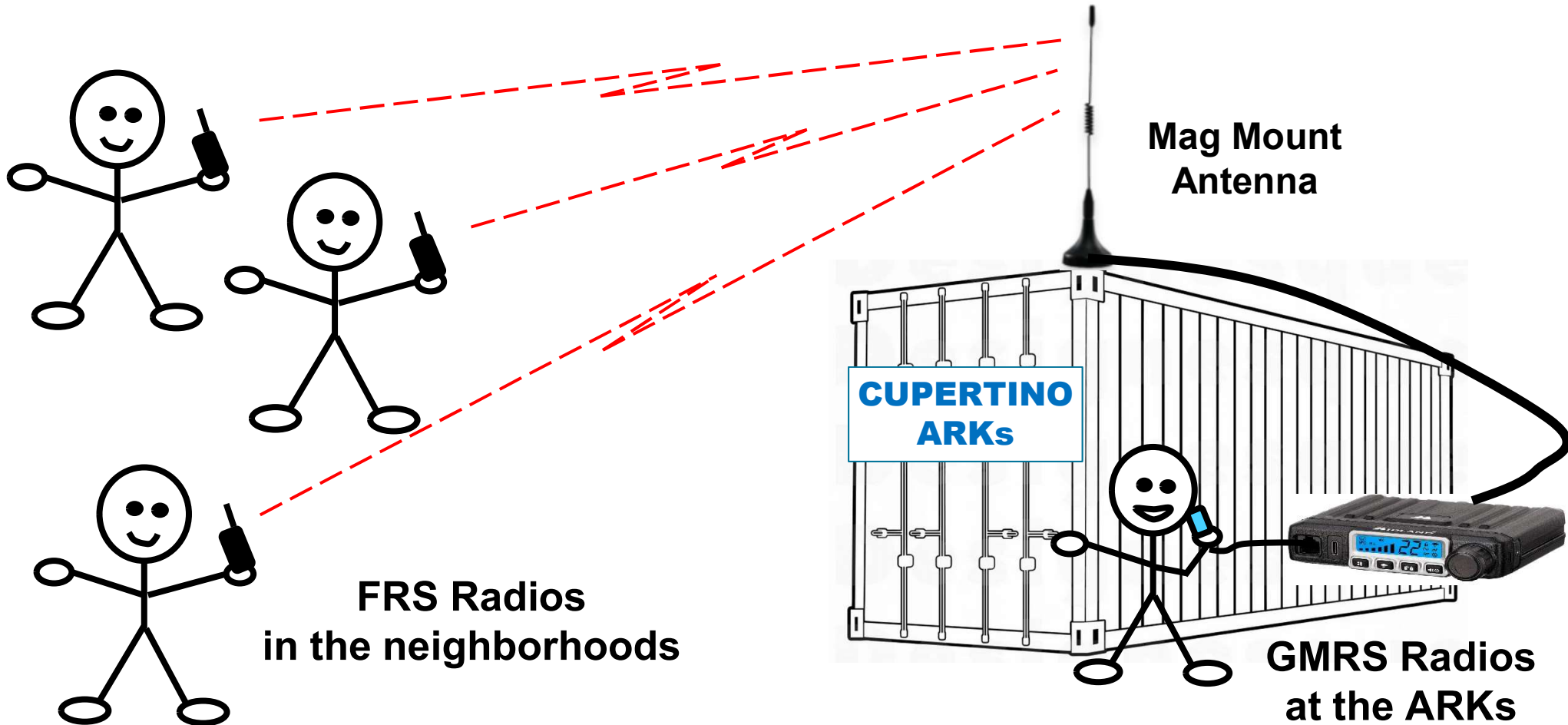
What are we doing this?

- CARES may not have sufficient resources to staff ARKs and neighborhoods while covering the tasks we need to perform
- The Cupertino CERT community represents a huge resource pool that could supplement our efforts... our **force-multiplier**
- Help CERT become more self-sufficient with general communications tools such as FRS and GMRS
- Introduce CERT to meaningful tasks that support the city response



How we will use FRS and GMRS

Field Teams and ARKs

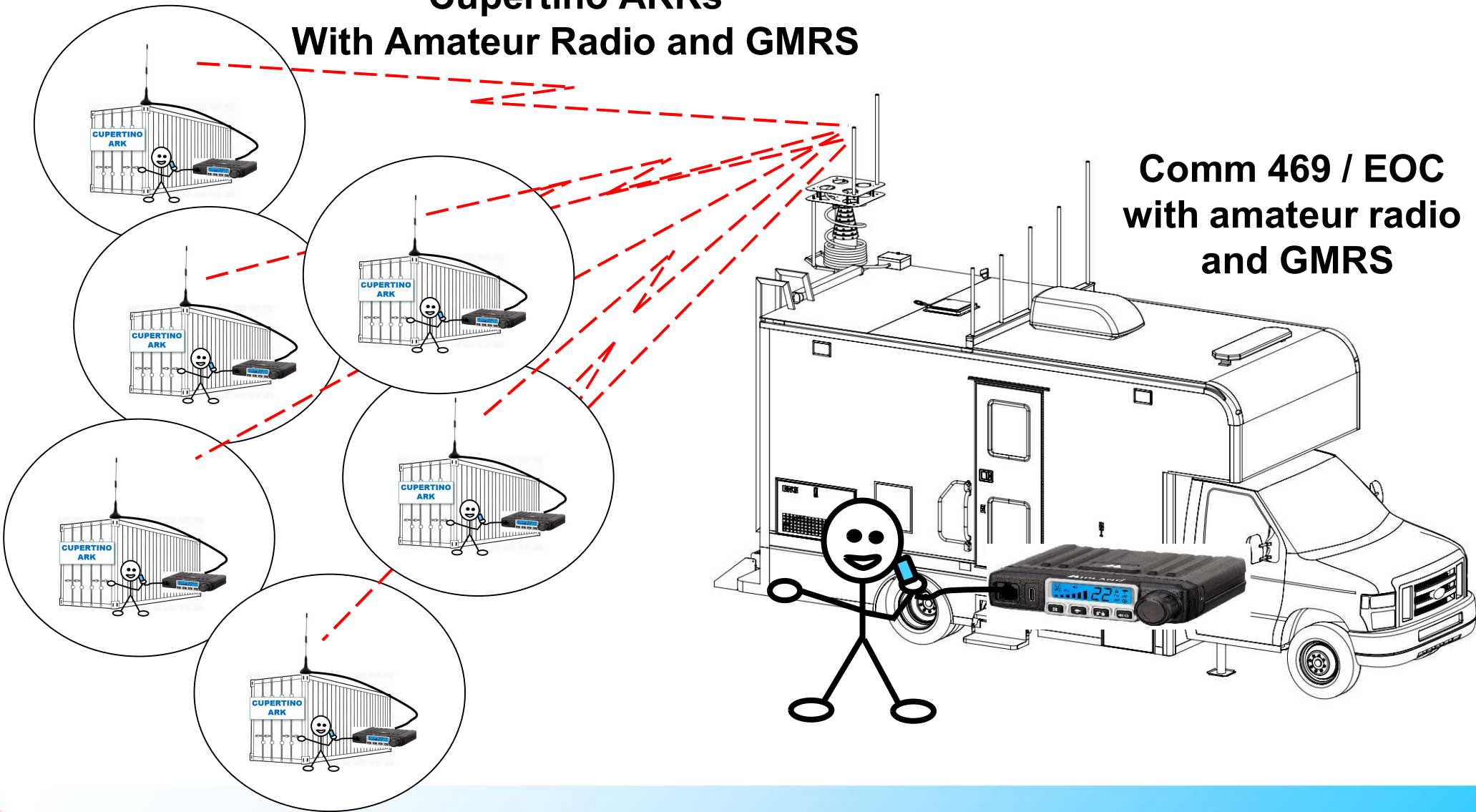


How we will use GMRS & Amateur Radio

ARKs and the EOC

Cupertino ARKs With Amateur Radio and GMRS

**Comm 469 / EOC
with amateur radio
and GMRS**



What are CERT comm tasks?

Wildland Fire Threat (Exercise: May 2022)

1. Neighborhoods report their evacuation **readiness status**, local medical issues, reluctant evacuees, and progress in the event of an evacuation order.
2. Where no CARES members reside, **assign to** senior living facilities that includes independent living, assisted living, and skilled nursing. Marianist Center and Cupertino Healthcare and Wellness will need coverage.
3. Help with **staffing checkpoints** to report on traffic flow, congestion, information sharing, and relaying received reports from evacuating residents.

Damage Observations (Exercise: April 2024)

4. Provide local **damage reports** from extreme weather events.

Earthquake (Exercise: October 2024)

5. **Report status** and findings from neighborhood assessment teams.



How can you help?

1. Get your GMRS License (\$35, no test, good for 10 years, covers the entire family).
2. Buy an FRS radio, check into the monthly FRS ARK net. **Or**
3. Buy a GMRS radio (same FRS frequencies, just more power)
4. Check into both the monthly FRS ARK and GMRS nets.
5. Offer to cover a GMRS net at an ARK during an activation.
6. Put your ham radio experience to use and offer to coach your neighborhood on preparing for an emergency and self-sufficiency.





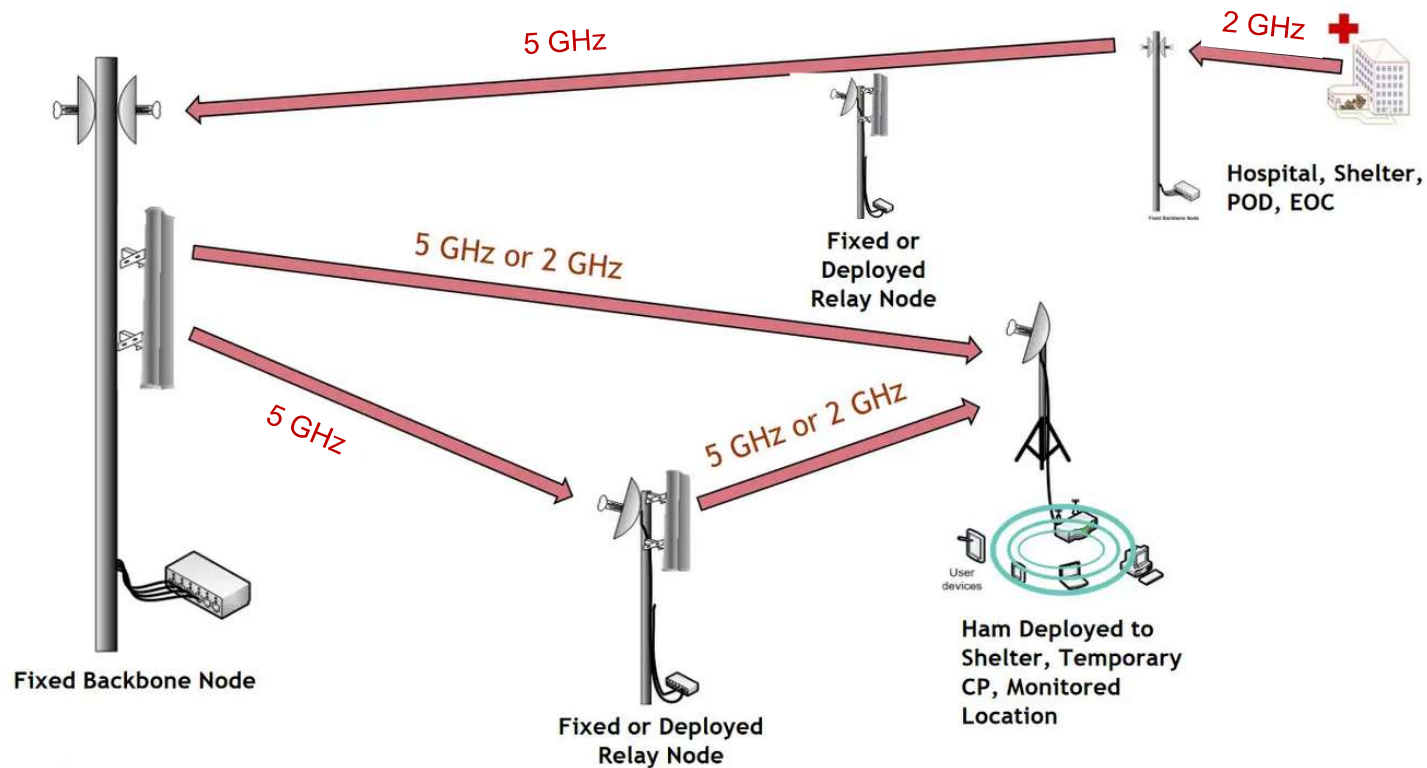
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MESH NETWORKING

Amateur Radio Mesh

What is it?

- A system where amateur radio operators use commercially available WiFi radios and antennas, operating on allocated amateur radio frequencies to create a self-organizing data network



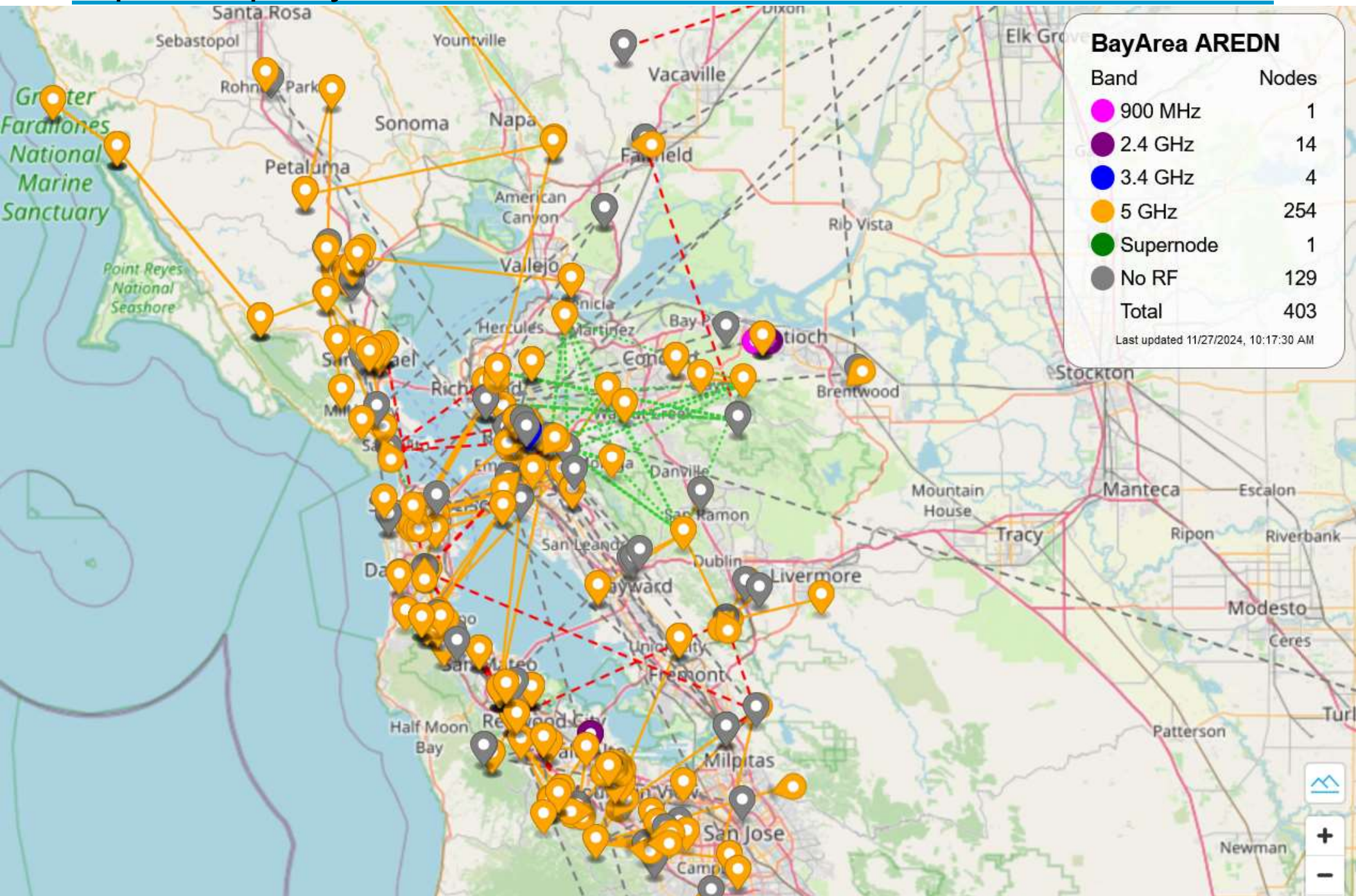
What can you do with Mesh?

- Video (e.g., web cams)
- Telephone (VoIP)
- File Transfer
- Chat
- Packet/BBS over mesh
- QuickCapture reports over mesh

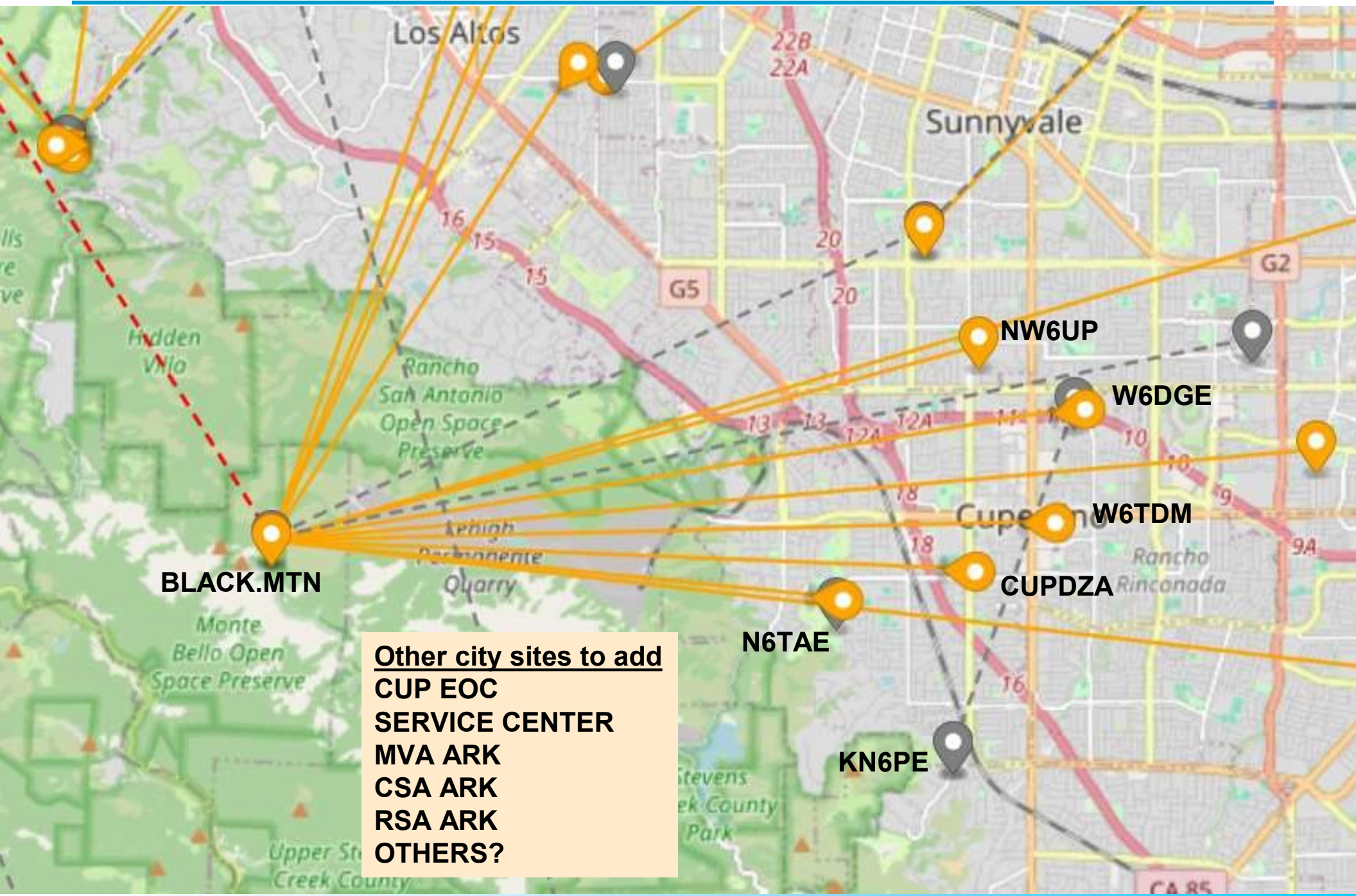


Mesh in the Bay Area

<https://map.bayareamesh.us/#8/37.8/-122.09>



Mesh in Cupertino



BLACK.MTN

NW6UP

W6DGE

W6TDM

CUPDZA

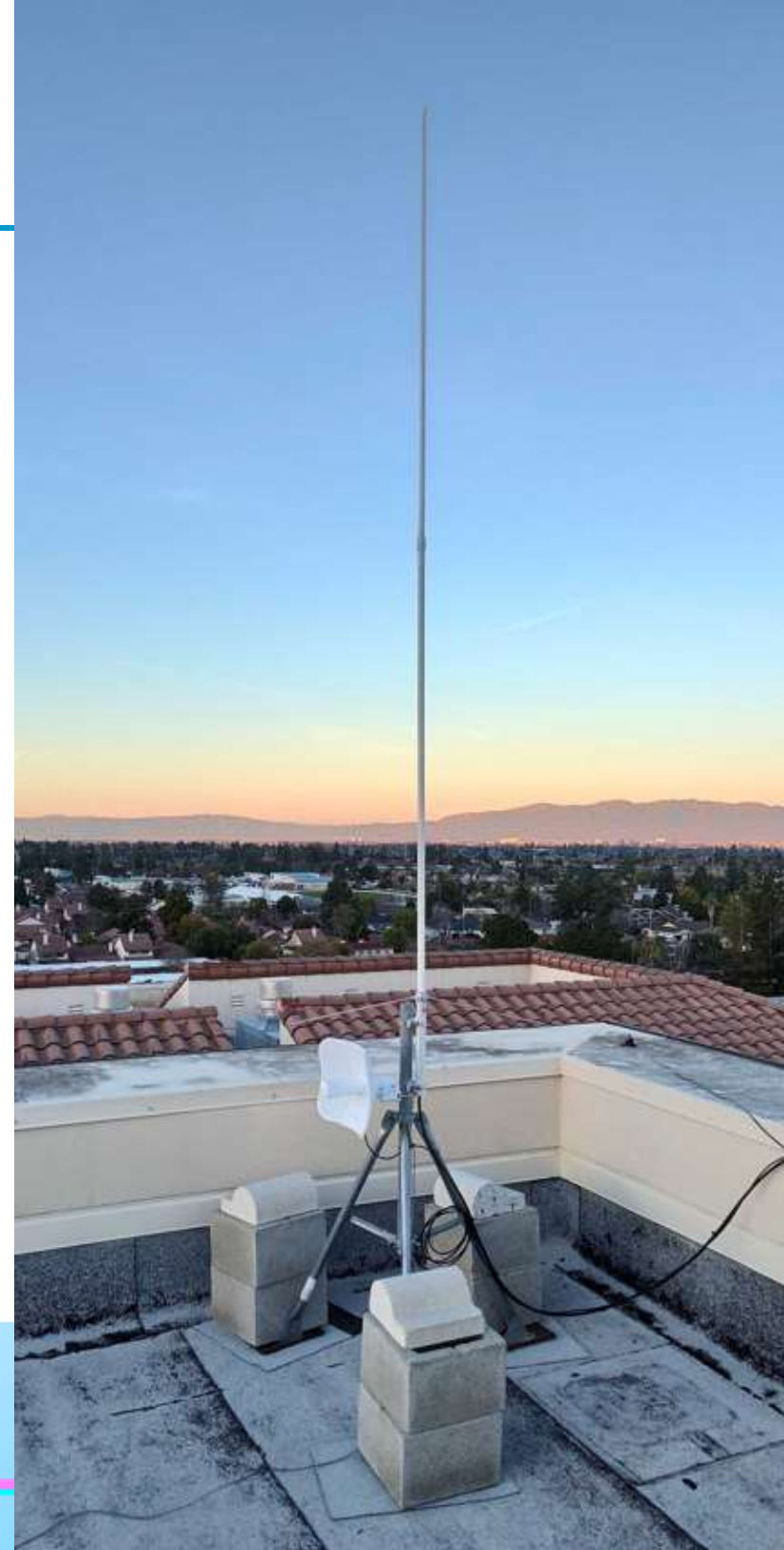
N6TAE

KN6PE

Other city sites to add
CUP EOC
SERVICE CENTER
MVA ARK
CSA ARK
RSA ARK
OTHERS?

W6TDM Repeater Site

- Node pointing to Black Mountain

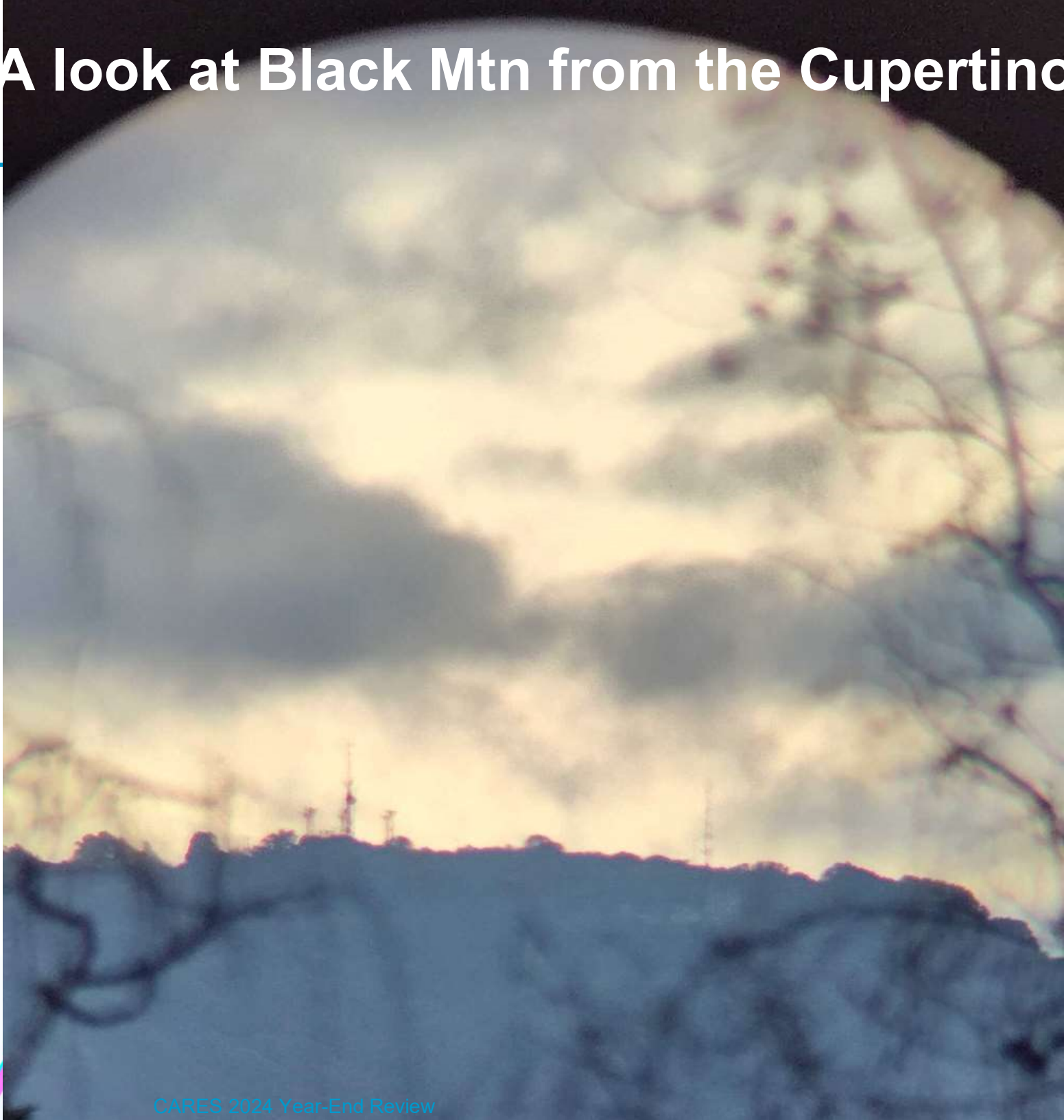


N6TAE's Roof-top Node

- Finding that ideal Line-of-Sight path through the trees.
- Black Mountain sector site...



A look at Black Mtn from the Cupertino





☀ 52°NE (T) ● 37°17'44"N, 122°2'37"W ±4m ▲ 116m



KN6PE's crummy roof-top mesh site ☹. Trees make LOS impossible. This is also true for some ARKs.

12 Jan 2024, 11:52:23

Field Day / Field Portable Site!



What's next

1. Define and test out some portable field station locations
2. Test smart phone connectivity for QuickCapture reports
3. Deploy another 3-5 additional city sites in 2025
4. Build into a field exercise



Field Portable Test – one option



Pointing to
Black Mountain

Built-in Wifi
Access Point

Battery Box,
POE Injector,
Network Switch



Want to help?

1. Define and test out some portable field station locations
2. Test smart phone connectivity for QuickCapture reports
3. Deploy another 3-5 additional city sites in 2025
4. Build into a field exercise
5. Like to tinker with computer networking or just want to check out mesh networking? Then we want to hear from you!



Thank you

Any Questions?

