

# PAARAgraphs



The Official Newsletter of the

**Palo Alto Amateur Radio Association, Inc.**

Celebrating 84 years as an *active* amateur radio club—*Since 1937*



## Sausage-Making at the ARRL

### Abstract:

As usual, there are many things going on at ARRL. Some you may know about and some you may not. I am fortunate to sit on a number of Board committees, and that gives me insight and influence over what's happening between our semi-annual Board Meetings. I won't be doing slides, so this is more like a discussion. This is your chance to ask questions and get answers about how the sausage is made and what it's made of.

### Bio:

Kristen McIntyre, K6WX, has been interested in radio since she was about 5 years old. She started in Amateur Radio in 1979 getting her ticket while at MIT.

*(Speaker — Continued on page 6)*

**This meeting will be held at  
Cubberly Community Center and Zoom  
(See Ad Section for Location)  
Masks Are Required at Cubberly**

Time: Nov. 5, 2021 07:00 PM Pacific Time

<https://us02web.zoom.us/j/88617453384>

Login ID: First name and Call Sign

Meeting ID: 886 1745 3384

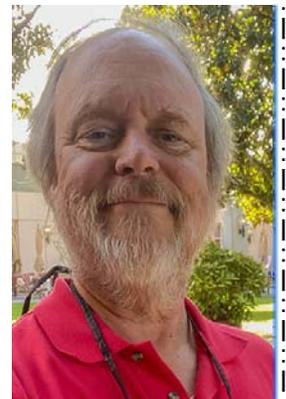
## Upcoming Events

Nov 5	PAARA General Meeting, 7:00 PM
Dec 3***	In-Person and Zoom Meeting
Jan 7	*** Dec IRL Meeting 
Nov 17	Board Meeting, 7:00 PM. Everyone welcome! Zoom Meeting,
Jan 19	eMail President for details!
Nov	Electronic Flea Market Cancelled

## President's Corner

November 2021

Mikko, AB6RF, our Pacificon special event station captain, is to be commended for all his efforts and coordination in putting together a great special event station. Those who set foot into the operating area easily recognized his hard work. Great job Mikko, I hope you enjoyed creating the station as much as those who operated enjoyed using it. Additional thanks go to members who assisted in setting up and taking down the station as well as oversaw the stations operation throughout the show. Special thanks go to Joanna, K6YL, who provided most of the radios and accessories! Mikko's full report is elsewhere in this issue.



The November 5th club meeting will be IN PERSON at Cubberly. We'll attempt to include a

*(President — Continued on page 7)*

## W1AW/6 Special Event Station

It's a fun "sprint" but I do admit it is fair bit of work, especially the prep part, to pull together all the gear and make functional "kits" that can be just deployed there on-site.

### Some of the QSO numbers:

Total QSO: 480  
 SSB: 315  
 CW: 165

On 80M we had contacts all the way to Washington D.C and Mass.

On 40M we got some DXs, including LU, JA and DU

On 20M we got JAs, Europeans, and as a highlight the J5T dxpedition in Guinea Bissau

On 15M the highlight was S9OK dxpedition in Sao Tome and Principe

### Key peeps to make it all happen.

- Joanna K6YL again provided most of the radio gear
- Transporting the tower trailer to the site, Joel, KD6W
- Setting up the station were me, John W6JMK, Frank AF0XX + Karen KK6NGA, Daryl KI6LDM, Joel KD6W and Ric N6AJS
- Teardown was done by me, Frank AF0XX + Karen KK6NGA, Daryl KI6LDM, Ric N6AJS, Randy K8TR, and Jim K6SV.
- Transporting the tower trailer back to storage, Jim K6SV

### Covering the station duty.

- Plan was to keep the station on the air for 48h, but we had to cut it short at 36h. (no volunteers for the last 12h).
- Of the 36h, I covered 15h, Ted, Daryl and Ric covered 6h each, and Joe WB6JOE covered 3h.
- Ted W6SY gets a special thanks for covering the entire Saturday night from 00:00 to 06:00

Mikko AB6RF

*[Ed: Our sincere thanks go to Mikko for all of his hard work over the last couple of months putting this successful event together! Jim K6SV]*

## Noise, Noise, Noise

### Darryl Presley, KI6LDM

The worst enemy of any ham or, for that matter, any radio operator is harmful interference – radio frequency interference (RFI) from various noise sources in the radio frequency (RF) spectrum. Many noise sources take on several different forms within the RF spectrum. Per the ARRL assessment of all types of noise sources, the top three or 90% of all RFI noises are:

1. Power Lines
2. LED lighting, grow lights and dimmers
3. Photo Voltaic (PV) Solar systems

You can add to that list switching power supplies, and those infamous cheap plugin adaptors (wall warts) for computers, network routers, and other electronic equipment.

### Identifying Your Noise

To solve RFI noise, first identify and characterize the noise, which is usually 90% of the problem. To help identify the noise *you* are dealing with, Paul Cianciolo (W1VLF) of the ARRL lab recommends answering the following questions:

- Does the noise only occur on one particular band or frequency range?
- Does the noise occur in multiple locations on the band, such as every *n* KHz on the same band?
- If the noise has multiple locations, what is the bandwidth of the noise?
- Is the noise across the entire band that sounds like static?
- Does the noise occur across multiple bands?
- How strong in S units is the noise?
- How often does the noise occur?
- Does the noise occur at specific times of the day?
- Are there particular weather patterns that exist when the noise occurs?

*(Noise, Noise — Continued on page 3)*

(Noise, Noise — Continued from page 2)

Once you have characterized the RFI, per Paul's suggestion, put your name on it, since this will be *your* noise that you will chase to determine its source. The remainder of this article focuses on my specific experience with RFI.

### My Noise Description

At my home location (QTH), I had noise that was so broad band and so loud that operating on HF was virtually impossible. It started happening periodically, and then it became more constant during the past several months, especially on warm to hot days. Without the noise, here is what you would normally see per the

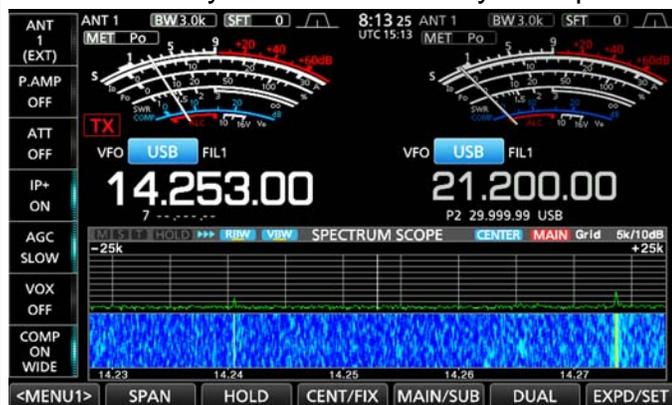


Fig. 1 Screenshot of IC-7610 spectrum and waterfall display without noise

below screenshot of the frequency spectrum and waterfall from my Icom IC-7610:

When the RFI did appear, it was incredibly loud

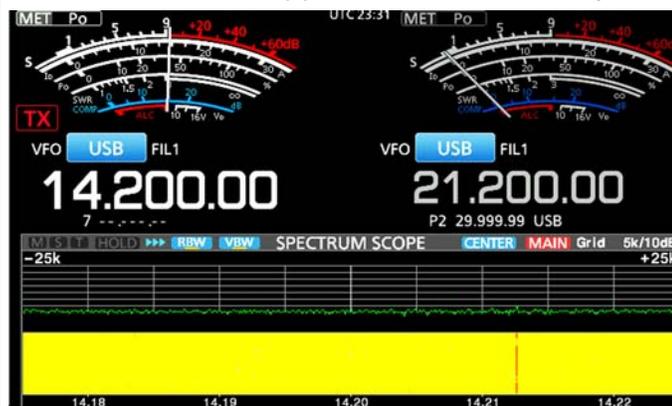


Fig. 2: Screenshot of IC-7610 showing high noise

and broad band. Here is a screen shot from my Icom IC-7610 transceiver's spectrum and waterfall.

Figure 1 above shows that the noise floor was

relatively low that day, between S2 and S3. Compare that with Figure 2 where you see that the noise level is above S9 and the waterfall is just obliterated. If you are not reading the PDF version of this article, its color is pure yellow with some signals marked in red.

The noise was so broad band that it could be heard from all HF bands through 2 meters and would break the normal squelch setting on 2 meter FM.

### The Hunt

First things first -- I wanted to eliminate any possible RFI sources in my own home. We have a PV solar array in addition to other electronic devices in the home. I ran my Icom IC-7610 transceiver off of battery power while shutting off the power to our entire home, by shutting down the PV solar inverter and disconnecting the home from the electrical grid. This had no effect and the noise level did not change. Next, using a 2m/440 Arrow yagi directional antenna connected to a Yaesu FT-60 hand held HT, I set the FT-60 into AM mode, and I could hear the noise across the 2 meter band with the power shut off to our home. This eliminated anything in our home as a possible source of the RFI.

Jim Oberhofer (KN6PE) and I started doing RF directional finding (RDF) by driving around the block with the Arrow yagi and the FT-60 to see if we could find the source of the noise, or at least determine where it is the strongest. We narrowed it down to two utility poles. While Jim and I were out doing directional finding, we ran into one of my neighbors, who was curious about what we were doing. After we explained, he then said "Oh, I can hardly get any AM broadcast stations because of static that sounds a lot like power line noise." He thought that something in his house might be causing it. So, he shut the power off to his house completely, but he still heard the same static and we still heard the noise we were chasing.

In addition to using RDF techniques, I used HSDR software to capture an RFI noise sample from the IC-7610 into wave files that can be

(Noise, Noise — Continued on page 4)

(Noise, Noise — Continued from page 3)

used for analyzing the noise further. I then contacted Paul Cianciolo (W1VLF) the ARRL EMC lab engineer, about the RFI that I was experiencing and I sent him the wave files. Paul confirmed that the RFI was indeed power line

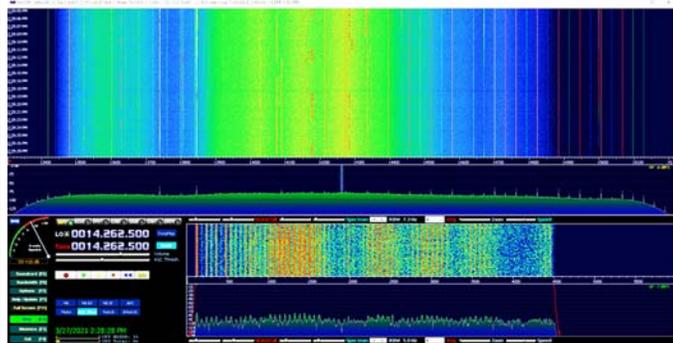


Fig. 3 HSDR showing noise spikes at every 120Hz spacing

noise.

The following is a screenshot from HSDR showing the noise spikes:

In Figure 3 above, you see that the noise level is above S9. Looking just to the right of the VFO frequencies for 20 meters, you see a graph that looks like stripes across the spectrum. This is in the audio frequency domain, showing spikes at 120Hz intervals. This is consistent with very strong power line RFI with 120Hz peek-to-peek. This noise is typically caused by micro-arcing on old or deteriorating power line insulators. You cannot see nor hear micro-arcing, but its presence has the above characteristics. The best way to help identify where insulators might be micro-arcing is to use an ultrasonic acoustic receiver with a focusing dish. We did not have this equipment at our disposal and instead relied on RDF techniques.

### Pacific Gas & Electric (PG&E) Assessment

In early March 2021, after conducting our RDF work, I contacted PG&E who, to their credit, were very responsive. I told them about the directional finding work we had done and where we thought the RFI noise might be coming from. The first PG&E person who came out said his dad, who is a ham, gives him an earful about power line noise. PG&E followed up by sending a technician to try and trace down the

RFI noise source as well. I demonstrated to the technician the noise we were hearing and how we were conducting our RDF work. He spent three hours walking around the block with his own equipment and he heard the same noise — *my noise*.

When the PG&E technician had completed his work, he concluded that the same two power line poles we had observed were where the strongest RFI was coming from, and their insulators would need to be replaced. Insulators can crack or become corroded and cause micro-arcing, which then generates the broad band power line RFI due to the corona discharge as shown above. The insulators on these poles were more than 40 years old.

### PG&E Repair Work

In advance of the repair work, PG&E must get clearance to de-energize the power lines involved and give notices to all residences that would be impacted. I had also kept my neighbors updated, especially those who had the two power line poles on or near their property so they could provide access for PG&E. On June 29, 2021, PG&E sent two crews out for the re-



Fig. 4 New PG&E Insulators

pair work. Power was shut off at 9:30 AM and the repair work began. Here is a photo of one of the new insulators:

Figure 5 photo shows one of the PG&E linemen doing the repair work.

The insulator replacements on both utility poles were completed around 1 PM and power was

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(Noise, Noise — Continued from page 4)



Fig. 5 PG&E Lineman working on insulator replacement – permission from PG&E workman



Figure 6 New insulators on top of the power line pole.

restored. Figure 6 is a photo of the new insulators on the power line poles.

In Figure 6 above, while it may not be possible to see, they also replaced the cross-arms along with the insulators.

<To Be Continued with the Results>

### Oct 21 Board Meeting Minutes

The October board meeting was held via videoconference. Present were President Jim Thielemenn K6SV; Secretary Ric Hulett N6AJS; Treasurer Bob Korte KD6KYT; Directors Walt Gyger K6WGY, and Darryl Presley KD6KYT. A quorum was present. Election Coordinator Clark Martin KK6ISP also attended. The meeting was called to order at 7:18 pm.

**President's Report:** Several PAARA members attended Pacificon last weekend. Attendance was down about 20% from prior years. It was good to meet up with folks we haven't seen. Mikko AB6RF did a great job running the W1AW/6 special event station.

**Secretary's Report:** Club membership is currently 163. Of PAARA members, 53% hold the Amateur Extra, 4% have an Advanced class license, 26% hold a General ticket, and 15% have Technician.

146 members (you know who you are) need to renew their membership by December 31: Check the PAARA website to make a PayPal payment, or to get the club's mailing address.

**Treasurer's Report:** Deposits include two membership renewals, and a California refund check.

All expenses relate to PAARAgaphs (postage and printing costs).

**VP / Program Chair Report:** Rob KC6TYD is travelling, no VP report.

The guest speaker for November will be Kristen McIntyre, K6WX: Kristen's topic is "Sausage Making at ARRL"

### Old Business

Encourage members to draft PAARAgaphs submissions when they talk about an interesting experience. Going month to month hoping for a story isn't enjoyable, PLEASE put pen to paper and get some to me. I only have Darryl's left so please please.....

**November meeting:** The next PAARA meeting is on November 5. The board discussed a plan

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*(Minutes — Continued from page 5)*

to hold the meeting in person, at Cubberley, with a Zoom broadcast available. We noted that the in-person Pacificon meeting was a success: MDARC required participants to show proof of vaccination, or a recent negative COVID test. Since the PAARA meeting is much smaller, this would not be required.

The board voted to hold the November meeting at Cubberley. Also, we voted not to have refreshments at the meeting.

**Elections** – Clark, KK6ISP: All the current officers and directors have agreed to stand for election in 2021. No new nominations have been received.

**Online voting:** Shri KA6Q has agreed to support the web-based voting system that we used last year. Election ballots will be cast online, both by remote members and by those who attend in person.

**Education Committee:** No report, Rob is on the road.

**Pacificon special event station update:** Oct 12-17 ~ THANKS FOR ALL THE HARD WORK!! The board unanimously commended Mikko AB6RF for his efforts to make the W1AW/6 station a great success.

**EFM update:** Clark KK6ISP reports that there are tentative plans to relaunch the Electronics Flea Market in 2022. Details are not yet worked out.

**Accounting:** Sheila Foley is our new accountant. Bob provided input on expenses and deposits so she could post them. The raffle filing was submitted in late September.

**Jim Tiemstra's tower** removal, on hold until spring,

**Dream to Reality:** The radio needs to be ordered if we're moving ahead w/IRL December meeting. We have verified the ability to source a KX3. Jim will e-mail Rob to get the order going.

### **New Business**

**Tower removal:** David, N6SWE is looking for someone to remove his 55' tower w/Force-12

on top. He's in Pittsburg! We will suggest that a more local club may be able to assist.

**Club radios:** The board started a discussion about acquiring some radios for club use: W1AW/6 and Field Day, for instance. No decisions were taken, the matter is on hold.

**December Board meeting:** The board voted to cancel the December 2021 board meeting, unless some urgent topic comes up.

The meeting was adjourned at 8:45 pm.

Respectfully submitted  
 Ric Hulett N6AJS  
 PAARA Secretary.

*(Speaker — Continued from page 1)*

Kristen has worked in many diverse areas from analog circuit design to image processing to starting and running an ISP. She is currently working at Apple in Core Networking, and spent many years at Sun Microsystems Laboratories where she was researching robustness and emergent properties of large distributed computer systems. She is a long time denizen of Silicon Valley and has worked at or consulted for many of the usual suspects. Kristen is an active ham and loves to chase DX on HF with her Elecraft K2 which she built while visiting her mother in Florida. She is ARRL Pacific Division Director, past president of the Palo Alto Amateur Radio Assoc., past Q&A columnist for Nuts and Volts magazine, and is active in many local clubs. Kristen was recently inducted into the CQ Amateur Radio Hall of Fame. She is also a Private Pilot.

*(President — Continued from page 1)*

zoom presence at the meeting. I say attempt only as we've not done this before so there may be a technical challenge or two that are unforeseen. Joel, KD6W, did verify that we have the bandwidth needed at the site but he wasn't able to get into the room or do the testing at our normal meeting time with others using the facility so we're not 100% sure what will happen. I'm sure everyone knows how Murphy can stick his thumb into things. Anyway, MASKS WILL BE REQUIRED of everyone, vaccinated or not. No proof of vaccination will be required. I'd suggest bringing your hand sanitizer but there will be some at the meeting. Please note, there WILL NOT be refreshments at the November meeting, so bring your own. The board felt it wouldn't be prudent to have refreshments yet. For those who attend the meeting in person, we do plan to conduct a raffle at the end of the meeting.

As you read on the front page, Kristen, K6WX, the Pacific Division Director, will be at the November meeting to discuss what's going on at the ARRL. She doesn't plan on much of a talk but having more of a Town Hall-type presentation. So, make sure you have those burning questions ready for the 1st IRL meeting in 20 months!

Also, at the end of the November meeting, the election slate will be set. Please see Clark, KK6ISP, if you wish to run for any position on the board. Elections will be held during the December meeting. You must be a current member to vote.

Speaking of the December meeting, returning for another year is the Dream to Reality Raffle. I'm sure everyone has missed the raffle during the zoom meeting months. We're lucky to get IRL meetings back in time to have this raffle. Once again, we'll be raffling off an Elecraft KX3 with a few accessories. You must be in the meeting room to participate in the raffle. Full details will be in the December issue of PAARAgaphs.

I received a request from the Reliance Ministries looking for a Ham to provide an orientation presentation about Ham Radio at their summit

in October. Darryl, KI6LDM, graciously accepted and put together a presentation and handout for them. On October 23rd, he presented the information via Zoom to an eager group of perspective hams. The presentation was oriented mostly at becoming licensed and EMCOM but also provided insight on HF. Thank you Darryl for putting this together and getting the word out about amateur radio!

Etón Corporation in Palo Alto (at San Antonio Rd. & 101) is still looking to hire someone to work in customer support. You can check out their radios here: <https://etoncorp.com/>. Here is the job description:

“we would like to hire (either full time or at least 30 hours a week) someone to be customer support for our product lines. This would include our emergency preparedness, as well as, our shortwave radio categories. Even though the person may not have to be in the office all the time, we would surely prefer someone who comes to the office every day. Our office hours are from 8:00 am to 4:30 pm PST and most of our calls are from 8:00 am to 1:00 pm. Ideally, someone who has been in the field of amateur/shortwave radios and/or other emergency products will have an added advantage”.

Please send me an email ([thielem@pacbell.net](mailto:thielem@pacbell.net)) if you are interested and I'll forward your information to them.

Looking forward to the January meeting, we anticipate having our annual Home Brew show and tell. I hope that everyone has been working on something that can enlighten the membership on what they have been up to for the past many months. Please let Rob, KC6TYD, know if you plan on showing something so we can figure out if we need a speaker in January or if there will be enough Home Brew items to fill the meeting.

73, Jim K6SV

Get on the air to keep the airwaves alive!

## Palo Alto Amateur Radio Association, Inc.

PO Box 911 Menlo Park, CA 94026

### Officers

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Vice President .....	Rob Fenn, kc6tyd	650-888-9060
	kc6tyd@gmail.com	
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	energyconserved@sbcglobal.net	
Treasurer .....	Bob Korte, KD6KYT	408 396 4745
	bob@rgktechsales.com	

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	kd6w@arrl.net	
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	walt@tradewindsaviation.com	
Director ('21) .....	Doug Teter, KG6LWE	650-367-6200
	dteter@wci.com	
Director ('21) .....	Darryl Presley, K16LDM	650 255-2454
	ki6ldm@arrl.net	

### Appointed Positions

Membership .....	Vic Black, AB6SO	650-366 0636
	ab6so@smrn.com	
Database .....	Ric Hulett, N6AJS	408-332-4593
	energyconserved@sbcglobal.net	
Chaplain .....	Rick Melrose K6RDM	408-341-9070
	K6RDM@yahoo.com	
Public Affairs .....	<i>Position Vacant</i>	
Station Trustee W6OTX, W6ARA....	Gerry Tucker, N6NV	
Station Trustee K6YQT...	Doug Teter, KG6LWE	650-367-6200
Station Trustee K6OTA...	Ron Chester, W6AZ	
Property Manager .....	Gerry Tucker, N6NV	
Badge Coordinator .....	Doug Teter, KG6LWE	650-367-6200
	dteter@wci.com	
Historian Position .....	<i>Position Vacant</i>	
Raffle Coordinators .....	Rob Fenn, KC6TYD,	rtyd@aol.com
	Shrikumar, KA6Q	
	shri.paara@enablery.org	
Field Day Coordinator ...	Doug Teter, KG6LWE	650-367-6200
ASVARO Rep .....	Clark Martin, KK6ISP	
	kk6isp@comcast.net	
Webmaster .....	John Miller K6MM	
	webaron@gmail.com	
Technical Coordinator ...	Joel Wilhite, KD6W	408-839-5948
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Speaker Coordinator .....	Rob Fenn, kc6tyd	650-888-9060

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	ab6so@smrn.com	
Photographer .....	<i>Position Vacant</i>	

## VE Exams

Redwood City Main Library, Community Conference Room, 4th Saturday 10:30 am each month and De Anza Park, Sunnyvale, 2nd Saturday 10:30 am each month except November and December. See website for details and exceptions: <http://amateur-radio.org> or Contact Al, [WB6IMX@att.net](mailto:WB6IMX@att.net)

## Electronics Flea Market

Sponsorship by A.S.V.A.R.O. — Association of Silicon Valley Amateur Radio Organizations

Second Saturday of month, March-September, 6am-12 noon  
 Contact: <http://www.electronicfleamarket.com/>

## PAARA — Palo Alto Amateur Radio Association

Meets 1<sup>st</sup> Friday 7:00pm each month at Room H-6, Cubberley Community Center; Net 145.230 - PL 100Hz Mondays at 8:30. See our website at <http://www.paara.org> for more information or contact: Joel Wilhite KD6W, [KD6W@ARRL.NET](mailto:KD6W@ARRL.NET), 650-325-8239

## FARS — Foothills Amateur Radio Society

Meets 4<sup>th</sup> Friday each month at 7:30pm  
 Contact: <http://www.fars.k6ya.org>

## NCDXC — Northern California DX Club

Meets 3<sup>rd</sup> Thursday 7:30pm each month,  
 Repeater for member info 147.360, Thursday 8:00PM  
 Contact: <http://ncdxc.org> or Mike Gavin W6WZ, (650) 851 8699

## 50 MHz & Up Group

Meets 1st Thursday each month at 7pm in the Summit Room at the Sunnyvale Sports Basement, 1177 Kern Ave, Sunnyvale  
 Contact: <http://50MhzandUp.org>

## San Mateo Radio Club W6UQ.ORG

Meets, 3<sup>rd</sup> Friday, January through November  
 Tuesdays, [Directed] Net, 7pm, N6ZX 145.370Hz -600KHz PL107.2Hz  
 Contact: <http://W6UQ.org/calendar>

## SPECS

### Southern Peninsula Emergency Communication System

Meets each Monday 8:00pm on Net 145.27, 440.80 MHz  
 Contact: <http://specsnet.org> or Tom Cascone, KF6LWZ, 650-688-0441

## SCARES

### South County Amateur Radio Emergency Service

Meets 3<sup>rd</sup> Thursday 7:30pm each month, Belmont EOC, Belmont City Hall, One Twin Pines Lane, Belmont CA 94002. Net is on 146.445 [PL 114.8] & 444.50 (PL-100) 7:30 Monday evenings. Contact: President Gary D. Aden, K6GDA 650-743-1265 (D), 650- 595-5590 (N)  
 Web: <http://k6mpn.org> E-mail: [pres@k6mpn.org](mailto:pres@k6mpn.org)

## SCCARA

### Santa Clara County Amateur Radio Association

Operates W6UU & W6UU/R, repeater 146.985-pl  
 Nets: 2m, 7:30pm Mon; 70cm, 10M (28.385) 8PM Thur.  
 Meets 2<sup>nd</sup> Mon each month @ 7:30 PM.  
 ARRL/VEC license testing contact 408-507-4698

## SVECS — Silicon Valley Emergency Communications

Operates AA6BT repeater (146.115 MHz+)  
 contact: <http://www.svecs.net> or Lou Stierer WA6QYS 408 241 7999

## TEARS — The Elmer Amateur Radio Society

Dedicated to operational training, knowledge building & FCC exam testing.  
 KV6R repeater under construction.  
 Contact: [AA6T@ARRL.NET](mailto:AA6T@ARRL.NET)  
 Most members are Extra Class or VE's. See QRZ dot com/kv6r for class info

## WVARA — West Valley Amateur Radio Association

W6PIY six-meter repeater on 52.58MHz. Normally, six-meters is linked with 147 and 223, while 441 and 1286 repeaters are linked.

VHF: 52.58 (-500) 151.4 ctcss UHF:  
 147.39 (+600) 151.4 ctcss 441.35 (+5.0) 88.5 ctcss  
 223.96 (+1.6) 156.7 ctcss 1286.20 (-12m) 100.0 ctcss

Meetings are 2nd Wednesday of every month except July, August and December.  
 Contact: <http://wvara.org>, Bill Ashby N6FFC, 408-267-3118, [president@wvara.org](mailto:president@wvara.org)

## American Red Cross, Santa Clara Valley Chapter

Contact: <http://santaclaravalley.redcross.org> or Scott Hensley KB6UOO, (408) 967 7924 [shensley@Novell.com](mailto:shensley@Novell.com)

(Please send changes to [PAARAgaphs editor](mailto:PAARAgaphs editor))

# EXCESS SOLUTIONS

## ELECTRONIC SURPLUS MEGA-STORE!

We have completed our move, you should visit to see the new store!

- ✦ That's right...Excess Solutions in San Jose recently lost the lease on their old site as the property was sold. We have moved to new premises very nearby at the far end of S. Seventh St., just before Tully Rd. It's easy to find!
- ✦ Techs, Developers, Experimenters, Hobbyists and Creators will once again have access to the basic electronic parts, hardware and infrastructure that Silicon Valley was built upon!
- ✦ Support your local surplus store...there are few left, and you know how much this vital Silicon Valley resource is needed!

Hardware - Nuts - Bolts Screws  
Spacers - Standoffs Keyways -  
Dowel Pins - Fans  
Springs - Feet - Clips - Motors

Computers - Monitors  
Modems - Cases  
Power Supplies  
Keyboards - Mice

Tech Benches - Work Stations  
Conference Tables - Desks  
Chairs - Kiosks - Lunchroom  
Furniture - Other Office Items

Electronic Components - IC's  
Semiconductors - Wire  
Switches - Relays - Cables  
Capacitors - Shrink Tubing  
Fiber Optics - Connectors

Security Cameras - Shelving  
Lighting Systems  
Entertainment Systems  
Process Equipment

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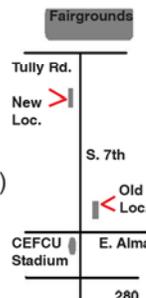
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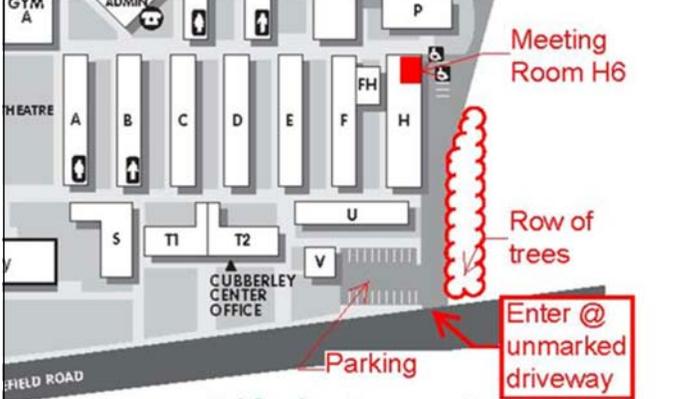




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**Cubberley Community Center**  
 4000 Middlefield Road, Palo Alto, CA 94303  
 650/329.2418  
 650/856.8756 fax  
 www.cityofpaloalto.org

### PAARA Weekly Radio Net

Info and Swap Session  
 every Monday evening at 8:30pm  
 on the N6NFI 145.230 MHz repeater

Week	Control Operator
1 <sup>st</sup>	Joel - KD6W
2 <sup>nd</sup>	John - W6JMK
3 <sup>rd</sup>	Ric - N6AJS
4 <sup>th</sup>	Rob - KC6TYD
5 <sup>th</sup>	Rob - KC6TYD

If you're interested in trying out at Net Control, Contact Doug, KG6LWE. It's good practice, and lots o' fun! Give it a try.

**Meeting Location — Middlefield Road between San Antonio and Charleston in Palo Alto. 4000 Middlefield Road**




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 Email: KARLDRESDEN@juno.com

**Palo Alto Amateur Radio Association**  
 P.O. Box 911, Menlo Park  
 California 94026-0911

Club meetings are on the first Friday of each month, 7:00pm at the Room H-6, Cubberley Community Center.

Radio NET & Swap Session every Monday evening, at 8:30pm, on the 145.230 –600 MHz repeater, PL 100Hz.

Membership in PAARA is \$25.00 per calendar year, which includes one subscription to PAARAgaphs \$6 for each additional family member (no newsletter).

Make payment to the  
 Palo Alto Amateur Radio Association,  
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 Badges will be mailed to purchas-  
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 until we can meet face to face  
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### PAARAgaphs Ad Rates

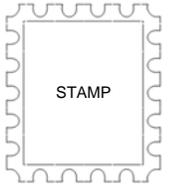
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# PAARAgaphs — November 2021

Accept no substitutes. Produced and printed in California USA



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 PAARAgaphs Newsletter  
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