

# PAARAgraphs



The Official Newsletter of the

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

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



## 23 Years of Elecraft!

A short history of Elecraft, including lots of products, behind the scenes pictures, crazy customers, DXpeditions and a lot of fun!

Followed by a Q&A session to answer your questions.

### Bio for Eric:

Eric Swartz, WA6HHQ, is Elecraft's Chief Operating Officer, a co-designer of Elecraft's K4, K3S, K2, and other transceivers, and co-founder of Elecraft in 1998 with Wayne Burdick, N6KR. Licensed 49 years, he credits his early interest in Amateur Radio with leading him to a career in electronic design and management. He received his B.S. in Engineering and Applied Science from Yale University and has been involved in a number of successful Silicon Valley startups. Wayne and Eric have both been inducted into the QRP Hall of Fame, and also jointly received the ARRL's Technical Excellence Award in 2001 for their Elecraft designs.

Home Brew night is scheduled for our January 7th meeting. If you have an item(s) you'd like to share, whether in person or on Zoom, then let Rob now by emailing him at

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


Time: Dec. 3, 2021 07:00 PM Pacific Time

<https://us02web.zoom.us/j/89757183057>

Login ID: First name and Call Sign

Meeting ID: 897 5718 3057

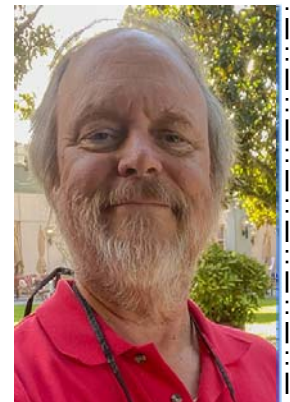
## Upcoming Events

Dec 3***	PAARA General Meeting, 7:00 PM
Jan 7	In-Person and Zoom Meeting
Feb 4	*** Dec IRL Meeting 
Jan 19	Board Meeting, 7:00 PM.
Feb 16	Everyone welcome! Zoom Meeting, eMail President for details!
Dec	Electronic Flea Market Cancelled

## President's Corner

December 2021

I hope everyone had a wonderful Thanksgiving. What a difference a year makes! A year ago, we were all hopeful the vaccine would allow things to return to "normal" or some version of normal. For the most part, that seems to be the case. PAARA held its first IRL club meeting in November after 20 months of conducting meetings using Zoom. We had some great speakers from outside the area that we wouldn't have enjoyed if we weren't using Zoom. During our first IRL meeting we, for the most part, successfully integrated Zoom into the meeting. There are a few refinements that are needed to streamline the process of integrating the two meeting modes. We'll need a few more meetings to work the kinks out before we can consider having a presenter use Zoom during an IRL meeting. The desire is to keep our presentation pool large by al-



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# Noise, Noise, Noise

Darryl Presley, KI6LDM  
— Continued —

## Results

After the power was restored, we saw similar RFI characteristics, but not as intense as before the repair work was done. The noise level dropped to about S5 when it did occur. Also, the frequency of occurrence was reduced significantly. My neighbor who could not receive AM broadcast stations indicated that, while some static was still present, it was not as loud or intense as it was before. The results overall are positive and the work that PG&E did helped quite a bit. Here is a screenshot of the power line noise when it does occur:

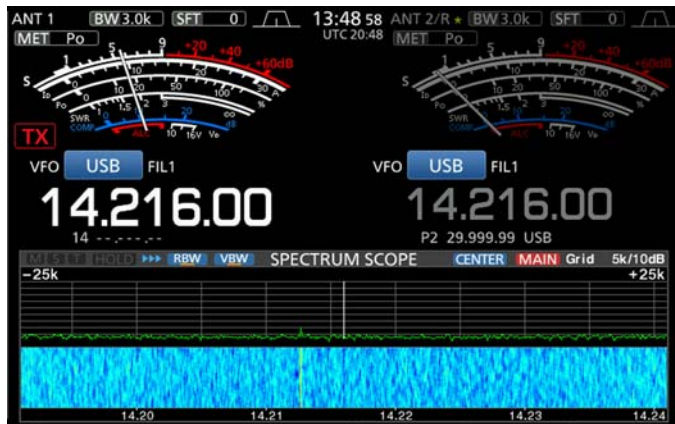


Fig. 7: Screenshot of the IC-7610 showing power line noise but now just above S5 strength.

In Figure 7 above, the noise is still present but is less intense. The strength is just above S5 instead of being over S9+. The waterfall is now pale blue and washed out instead of bright yellow. The noise is still broad band. The power line noise can still occur due to micro-arcing from insulators on other utility poles that have not yet been replaced. The power lines themselves serve as a radiating antenna but the RFI has less intensity. So there is still work that needs to be done by PG&E, but this is a real improvement.

There are more days now without power line noise than before PG&E replaced the insulators, but the noise is not completely gone. On the days when power line noise is not present,

the following two screenshots show no noise as was seen in previous screenshots. The following screenshots were taken on a similar hot day after the insulator replacement work:

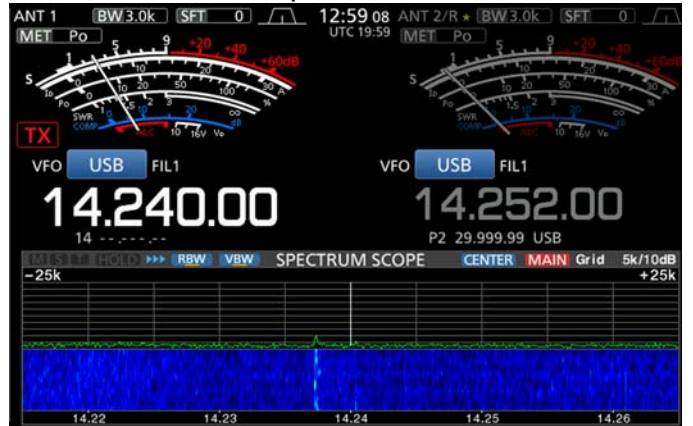


Fig 8: Screenshot of IC-7610 showing only S3 noise post Insulator replacement by PG&E.

A comparison from HSDR also shows minimal to no power line noise, and certainly the 120Hz peek-to-peek spikes are no longer present in the audio domain in the below screenshot.

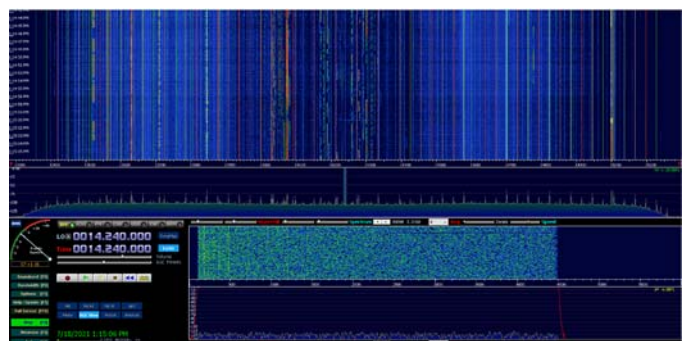


Fig 9: Screenshot of HSDR showing no presence of power line noise.

Figure 9 above clearly shows a marked improvement from the previous HSDR screenshot shown earlier.

## Other Methods for Dealing With RFI Noise

The type of RFI noise and its characteristics will determine which options are available for dealing with RFI noise. For instance, RFI caused by switching power supplies can be dealt with using common mode chokes with ferrite cores of the appropriate core mixture placed on the power cables from the switching power supply. And don't forget to make good use of the noise re-

(Noise, Noise — Continued on page 3)



(Noise, Noise — Continued from page 2)

duction and noise blankers of your transceiver. For specific types of RFI that have a discrete noise signal pattern that you can tune to, a noise antenna can be used with a cancellation device. There are several such noise cancellation devices on the market. For noise cancellation to work, the undesirable RFI must be continuous and stable so that phasing techniques can be used to cancel out the undesirable RFI noise before it reaches your transceiver.

RFI noise such as power line RFI is generally in the electric field of the signal. Small magnetic loop antennas can be used to substantially reduce the electric field portion of the signal and receive the magnetic field of the signal. These loop antennas have bi-directional nulls and can be rotated in order to null out unwanted RFI in the electric field. I personally have the DX Engineering RF-PRO-1B Active Magnetic Loop Antenna which is based on Pixel Technologies and InLogis loop antennas. This is a receive-only loop antenna and it sure came in handy this past Field Day:



Fig 10: DX Engineering RF-PRO-1B active receive only magnetic loop antenna

My ICom IC-7610 has two independent receivers and each can receive on different bands, different modes, and even on different antennas. The main receiver uses the K4KIO Hex Beam antenna while the second (or sub) receiver is connected to the active magnetic loop antenna. Each receiver has its own independent controls. The Heil headphones allow you to listen to each receiver: main on the left ear, sub on the right. During Field Day, working as 1-echo from home, I did experience power line noise. To help work around power line RFI on SSB phone, I was still able to work lots of stations with the magnetic loop.

Here is a screenshot of the IC-7610 display showing both receivers spectrum and waterfalls. In the following screenshot, the main receiver is on the left with its frequency spectrum waterfall just below and the sub receiver is on the right with its frequency spectrum and waterfall on the bottom. The main receiver is connected to the hex beam and the sub is connected to the magnetic loop:

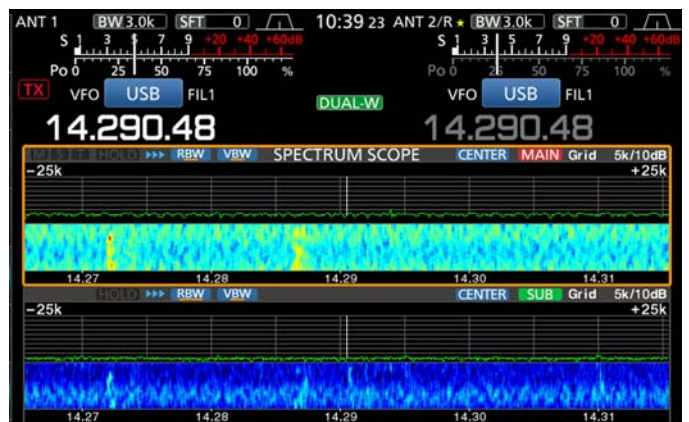


Fig 11: IC-7610 display showing both main and sub receivers with the hex beam on the main receiver and the meg loop on the sub receiver.

#### A few items to note:

- Each receiver shows which antenna it is using: the main on ANT 1, which is the hex beam; the sub is using ANT 2/R, indicating a receive only antenna which is the magnetic loop.
- The waterfall on the top is showing lots of power line RFI with noise level at or above

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S5.

- The bottom waterfall shows nearly all the noise removed with a noise level between S3 and S4.
- The tracking feature of the IC-7610 is enabled so that both receivers track on the same frequency when either VFOs are changed.

The signals will be a bit weaker on the magnetic loop antenna, but without nearly all the power line noise so that the signals are more readable. This magnetic loop does have a pre-amplifier to help boost received signals.

### **In Summary**

When experiencing RFI that hinders or even makes operating on the bands nearly impossible, remember the following items:

- Characterize the noise by describing the noise and answering the questions we presented earlier in this article. Once you have characterized the noise, put your name on it.
- Conduct noise elimination to help isolate the RFI noise source.
- Conduct radio directional finding (RDF) to help determine where the RFI source is or where it is the strongest. For power line RFI, if possible, use an ultrasonic acoustic receiver with a focusing dish to help detect micro-arcing.
- Record a sample of the noise for analysis.
- Make use of the ARRL Engineering lab and send your recorded samples to them if needed.
- For power line RFI, once you have done the above, contact the power company and explain your situation and that you have conducted research and analysis before calling them. Do not expect the first person you contact at the power company to understand what you are talking about. You can simply tell them you are experiencing RFI from nearby power lines; if they still do not understand, then use the term “TVI”. They will then follow their standard procedures. Ask for a ticket

number. Be nice to them.

- Once a technician (who is often a contractor to the power company) contacts you, then you can explain your situation and show them your research and analysis. Provide any findings from the ARRL Engineering Lab if needed.
- Let the technician double-check and validate your work. Remember, it cost big dollars for them to send crews out to shut off power to hundreds of customers and replace insulators. In my case, 409 customers were impacted.
- Once the problem has been verified by the technician, follow up on the ticket number. It can take a couple of months for the repair work to be scheduled and completed.
- Thank them and make sure they know their effort and work is appreciated.

One resource I highly recommend is the ARRL Webinar on Finding and Fixing RFI by Paul Cianciolo (W1VLF) of the ARRL Lab. It is a general overview of various types of RFI and approaches for dealing with RFI.

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lowing presenters to use Zoom.

Thanks go to Kristen, K6WX, for her informative Town Hall-style presentation as the Pacific Division Director at the November meeting. She updated everyone on a wide range of topics and took away a few ideas to take back to the ARRL.

As you'll read in the board minutes, Rich, W6APZ, suggested to the board that PAARA consider approaching Wouxun to modify its KG-UV3D radio to receive 900Mhz so there are other radio options for our 900Mhz repeater other than old Motorola radios, which aren't easily programmed. He suggested PAARA could provide them to members and other hams at a reasonable price thus providing some motivation to Wouxun to make the changes needed. He suggests 100 radios or so might do the trick with members purchasing most of them. The venture would require some seed money for the purchase of the original radios.

I like the fact that Rich is thinking out of the box and proposing new things for PAARA to consider. Mem-

*(President — Continued on page 5)*

(President — Continued from page 4)

Members should always feel free to provide input on the direction the club should consider taking or activities we could undertake. There are a few issues in this case. The concept needs a champion to push it forward. Rich isn't in a position to undertake the challenge but would assist someone who did have the interest in championing the idea. In this case, there are some larger issues, PAARA is a nonprofit organization. We'd lose our tax-exempt status if we started the "business" of selling radios. Thus, a business of one form or another is required as losing our tax status isn't an option. Another item is 100 radios is a large number to us but a drop in the bucket for radio manufactures. That number will not get the attention of any radio manufacture to consider such an idea. Thousands of radios are more in line with numbers that start to get their attention. Joel suggested making a transceiver frequency converter kit that would work with whatever radio you wish to attach it to. An interesting thought but also subject to the above issues. What are your thoughts? Are you interested in championing this idea? Let a board member know if you have an idea on this or any other subject.

Regardless of your interest in morse code, Ron Chester, W6AZ, sent me a very interesting link to a gaming interface using morse code. Check it out here: <https://www.rockpapershotgun.com/the-magic-of-morse-is-in-its-custom-telegraph-controller> I would suggest reading the whole story before watching the video as the video will make more sense after reading the text. Is this a starting point for getting youth interested in ham radio that Kristen talked about?

As older PAARA members remember, at one time we had another meeting after the general meeting at the Round Table Pizza in Menlo Park. For several years we conducted our board meetings there. When the general meeting location moved to Palo Alto, meeting there for the after-meeting wasn't as convenient. Regardless, they are still there and going strong. Joanna, K6YL, and Ron, W6AZ, both sent me a link to an interesting story about that location. The story is found here: <https://www.sfgate.com/restaurants/article/The-first-Round-Table-Pizza-is-in-the-Bay-Area-16629720.php>.

Elections will be held during the December meeting. PLEASE, remember to bring the code attached to this issue of PAARAgaphs where the mailing label is. If you receive a PDF version of our newsletter, you will be sent a card with your code num-

ber on it. Replacement codes can't be issued at the meeting. Like last year, you need that code to vote. Please see Clark's short story on how to vote elsewhere in this issue.

73, Jim K6SV

Get on the air to keep the airwaves alive!

## Voting Instructions:

During the December PAARA Member meeting (in person at Cubberly and via zoom) we will be holding the annual board elections. Prior to the meeting you will receive a "Hash Code", either as part of your PAARAgaphs December mailing, on the outside of the newsletter, just below the return address or, for members who receive PAARAgaphs electronically, it will be sent on a post card. As with our in person meetings the election will be held during the meeting only.

If voting in person one or more computer will be available to access the voting site. You WILL need to bring your Hash Code with you. If you do not have it you cannot vote.

If voting online, during the meeting you will be provided with a website link. Use this link in your browser of choice (a current web browser is recommended).

For either voting method, you will be presented with a page where you will enter your Name, Call sign and the Hash Code already sent to you in the spaces provided. Your unique Hash Code is to authenticate you as a PAARA member. Make sure to enter the Hash Code exactly as provided (case matters). Each Hash Code can only be used ONCE. Click on the Submit button and you will be taken to the voting page.

Make your selections for each position. You do not have to vote for a candidate if you so choose. When you are sure of your vote click on the Submit button at the bottom. Your vote will be anonymously recorded. Voting ends at 8:30 PM, PST.

That's it you're done.

P.S. A big thank you to Shri, KA6Q for developing this website so we could hold the election both in person and online.



### Official Election Slate for 2021

President	Jim Thielemann
Vice President	Rob Fenn
Secretary	Rick Hulett
Treasurer	Bob Korte
Director (2 yr term)	Joel Wilhite
Director (1 yr term)	Doug Teter
Director (1 yr term)	Darryl Presley

#### 11/17/21 Board Meeting Minutes

The November board meeting was held by videoconference. Attending were President Jim Thielemann K6SV, Secretary Ric Hulett N6AJS, Treasurer Bob Korte KD6KYT, Directors Darryl Presley KI6LDM, Joel Wilhite KD6W, and Doug Teter KG6LWE. Also present were Mikko Sannala AB6RF, Clark Martin KK6ISP, and Rich Stiebel W6APZ.

The meeting was called to order at 7:09 pm. A quorum was present.

#### President's Report:

The first in-person club meeting was grand, and well worth the effort. We had some issues with setup, but it worked fine with the split IRL/Zoom meeting. With some audio dropouts, the meeting zoomed pretty well. We need to remind people to act as if we are on TV. Quiet on the set, and use the microphone! We need to ask club members to help preserve hotspot bandwidth.

We discussed what to do during the social break for members who are online. We did not come to a decision.

#### Secretary's Report:

PAARA membership is now up to 169. Members are reminded to renew membership for 2022.

#### Treasurer's Report:

We discussed the cost of PAARAgaphs publication compared to our dues. Unit cost for the newsletter, printed ad-

dressed and mailed is approximately \$23.76 per year.

Add the average Paypal cost per member renewal of \$1.06, and the membership dues are just barely enough to cover newsletter costs.

The November raffle approximately paid for itself.

**VP / Program Chair Report:** See Rob's addendum below

#### Old News:

PAARA members are encouraged draft PAARAgaphs article submissions. This is an ongoing need for the club. If you have a ham-related topic, PLEASE write a few paragraphs (or more!) and submit to Jim K6SV. Currently the hopper is almost empty.

**Refreshments:** The board discussed whether to restart coffee / cookies at the break. The board voted that, until masks are no longer required for our meetings, we will not provide snacks.

#### Elections – Clark Martin

Shri KA6Q will attend the December meeting. He provided support for last year's online election. For this year, we will again mail 'hashtags' to each member. Voting will take place online both for in-person and Zoom attendees. It is important for members to bring their 'hashtag' to the meeting in order to vote.

**EFM update:** Clark: Some discussions are underway around re-opening the Electronic Flea Market, but nothing is definite yet. Joel proposes that PAARA might hold their own EFM. Please let Clark know if you have any ideas or suggestions.

**900 Mhz Repeater Status:** A vendor wishes to use our repeater location for internet service. They may be willing to provide us free internet in exchange for the tower space. Joel proposes a technical committee to meet bimonthly, and support the PAARA repeater

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and other needs. Volunteers are solicited.

**Jim Tiemstra's Tower Removal:** on hold until spring, Doug contacted her via email and we talked to her at Pacificon.

**Dream to Reality Raffle:** The radio has been ordered. Eric will bring it with him.

### New Business

Rich, W6APZ, proposed that we might approach Wouxon (or another manufacturer) and convince them to make 900Mhz radios. Joel proposes that we might make a kit or a transverter for 900MHz. Or find out whether Alinco is willing to build again. The proposal was interesting, but is on hold unless we find a club member to champion this.

**Badges.** There have been ownership changes at our badge engraver. New badges will cost us \$24.95 including shipping. The board agreed to continue selling badges at \$24.95, which is a breakeven proposition.

The widow of Cliff Lloyd KN6DH (SK) has generously donated ham equipment and antennas to the club. We will compile a list of equipment, merge with Rob's list. Ric Hulett will propose a plan for the equipment for discussion in January. Rob KC6TYD will arrange for antenna removal.

The meeting was adjourned at 9:00pm

Rob KC6TYD sent the following notes, after the meeting:

- Nothing new with the outreach project.
- I've forwarded a list of next month's raffle prizes to Bob V.T.
- Waiting on meeting info from Elecraft.
- I'm going to try and bring a couple of the old "boat anchor" radios I picked up from Marty to the meeting and maybe auction them off.

Respectfully submitted,  
Ric Hulett N6AJS  
PAARA Secretary



Nov Raffle Winners: Eric — Watt/Power Meter, Kristen — Fluke Multimeter, Bob — FT-65R HT

### December Raffle

1<sup>st</sup> Place  
Elecraft KX3



2<sup>nd</sup> Place  
Rotary Ratchet



3<sup>rd</sup> Place  
Retekess  
Shortwave  
Radio



4<sup>th</sup> Place  
Anderson  
Power Poles



## Palo Alto Amateur Radio Association, Inc.

PO Box 911 Menlo Park, CA 94026

### Officers

President .....	Jim Thielemann, K6SV	408-839-6815
	thielem@pacbell.net	
Vice President .....	Rob Fenn, kc6tyd	650-888-9060
	kc6tyd@gmail.com	
Secretary .....	Ric Hulett, N6AJS	408-332-4593
	energyconserved@sbcglobal.net	
Treasurer .....	Bob Korte, KD6KYT	408 396 4745
	bob@rgktechsales.com	

### Directors

Director ('21-'22) .....	Joel Wilhite, KD6W	408-839-5948
	kd6w@arrl.net	
Director ('20-'21) .....	Walt Gyger, K6WGY	408-921-5901
	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@enablers.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
	kd6w@arrl.net	
QSL Manager .....	Marty Wayne, W6NEV	408-234-8023
Speaker Coordinator .....	Rob Fenn, kc6tyd	650-888-9060

### PAARAgaphs Staff

Editorial Board		
	Bob Van Tuyl K6RWY	Kristen McIntyre K6WX
	Ron Chester W6AZ	Vic Black AB6SO
	Joel Wilhite, KD6W	Jim Thielemann K6SV
Editor .....	Bob Van Tuyl, K6RWY	408 799-6463
	rrvt@swde.com	
Back Up Editor .....	Jim Thielemann, K6SV	408-839-6815
	thielem@pacbell.net	
Advertising .....	Walt Gyger, K6WGY	408-921-5901
	walt@tradewindsaviation.com	
Member Profiles .....	<i>Position Vacant</i>	
Technical Tips .....	Vic Black, AB6SO	650-366 0636
	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

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

**Tech Benches - Work Stations**  
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 Chairs - Kiosks - Lunchroom  
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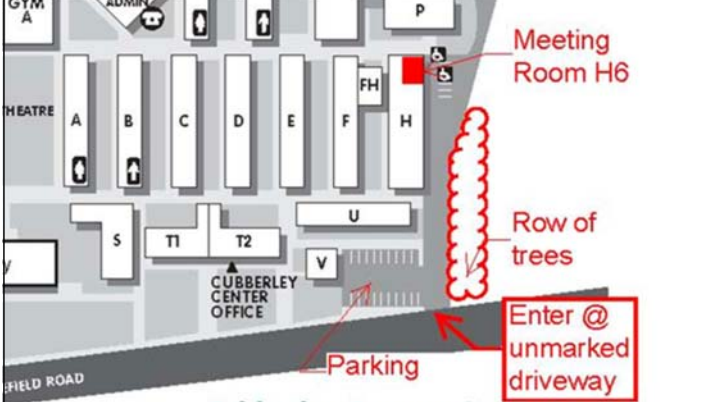
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### PAARA Weekly Radio Net

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.



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

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

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### 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  
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## PAARA Badges

In the absence of in person meet-  
 ings, you can still order a badge  
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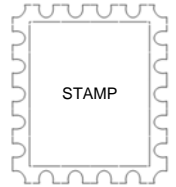
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All fees payable in advance by the year with "scanner-ready" copy or text-only ads. **Give payment and copy to Walt Gyger, K6WGY.**



# PAARAgaphs — December 2021

Accept no substitutes. Produced and printed in California USA



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