

# PAARAgraphs



The Official Newsletter of the

**Palo Alto Amateur Radio Association, Inc.**Celebrating 83 years as an *active* amateur radio club—*Since 1937*

## How to Build Your Own Robot

Mike Wimble, KM6WP

We are arguably at the same point in home brew robotics that we were at the beginning of the home brew computer revolution. All the components you need to piece together a robot that can accomplish useful activities are at hand now. More and cheaper sensors are available every week. Fast, inexpensive computers are at hand. Plenty of resources are available to teach you how to put it all together and program your robot. This short talk will give you an overview of what is out there and pointers to help you join in the robotics revolution. I'll show you robots you can build in the \$20 to \$2000 range, talk about where to source parts and kits and where to find local and online resources. With a credit card in hand and a curious mind, you could start building your own robot in a couple of weeks.

### Biography

Michael Wimble is a retired computer scientist who has been seriously building robots for four years. First licensed as an amateur radio operator in 1968, his license lapsed when he left Vermont and was relicensed as an Amateur Extra Class in 1995. Michael is also a jeweler, wood worker and carver, photographer, musician, engraver, leather worker, inventor, hiker, biker and engaged in several other activities.

**Meeting Note: The speaker may not be able to participate in the zoom meeting on April 3rd. If that's the case, he'll be rescheduled for a later date**

## Upcoming Events

April 3 May 1 June 5	PAARA General Meeting, 7:00 PM Zoom Meeting, see article for details
April 15 May 20 June 17	Board Meeting, 7:00 PM Everyone welcome! Zoom Meeting, eMail President for details!
April 11	Electronic Flea Market Cancelled

## President's Corner

April 2020

We are in uncharted times though there are similarities to the last pandemic, the Spanish Flu in 1918 ~ 1920. Times were much different then and communication methods much slower. Though there is one thing in common, amateur radio. We all hope this event is contained quicker and better than that one. I'm not going to rattle on about the situation as I'm sure everyone is well aware of things. That said, the board and I are glad we decided to cancel the March club meeting ahead of the shelter in place orders. It was a tough decision to make but it was the

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right one. I don't know about anyone else, but it left a bit of a hole in my Friday night.

As documented in the board minutes, we conducted a virtual board meeting using Zoom conferencing software. It was as much of a test on conducting a meeting that way as there was a real need for the board to meet with a little more presence than a conference call. The board discussed the upcoming April meeting, which is within the original Bay Area Shelter in Place order, thus is canceled. As you likely know, Cubberley is also closed. As the virtual board meeting went well, we decided to conduct the April club meeting using videoconferencing.

At this time, it's unclear if we'll have a speaker. Needless to say, the format will be a bit different than a usual meeting. Currently, I'm thinking it will be more like a roll call net and discussion. Shall we say this is a chance to get together, "see" each other, talk about how we're doing, and what ham activities we've been able to participate in. Please check out our web site for information on how you can join in on the fun. Feel free to send me an email if you have any other ideas on the format for the meeting or topics for discussion.

Speaking of cancellations, I had an email exchange with ASVARO as I drafted this column. We both feel it's in everyone's best interest to cancel the next Electronics Flee Market. None of us wants to pull the plug on this event again but the Governor's shelter in place proclamation doesn't have an end date. There is just too much planning into putting the event to wait until April 7th, the expiration date of the current BA order let alone if the State order will be lifted at that time or not.

A word of caution, shopping online does limit your exposure to others allowing you to easily keep away from direct contact with anyone. However, that package that was delivered to your doorstep might not be as "clean" as desired. Using gloved hands, I transport them to the side of the house where I liberally spray them with Lysol or open them and dump the

contents out in another area away from where the outside box was. This is to minimize the possibility of the little buggers entering my QTH or making contact with me. I say this as I'm now seeing a story that UPS and FedEx employees are reportedly reporting to work sick because they feel they have to! Use caution with packages delivered to your doorstep.

On the brighter side of things, I hope everyone has taken some of this time to get on the radio. I understand the 9 AM talk net (M-F on N6NFI) has been active. There's also our net at 8:30 PM net on Monday's, also on N6NFI. Those with HF capabilities can always get on the air and talk with anyone on the air or into numerous other HF nets. In checking the bands, it seems there is more activity than usual, not a big shocker there.

This is a great time to dust your skills off for Field Day. The FD leaders will be conducting a virtual meeting on 3/25/20 to begin the planning for the June 27-28th event. We all remain hopeful that we can set up again at Bidwell Bayfront park. Should the FD not be held in a public space, there will be lots of activity from everyone's QTH. If FD in public spaces isn't canceled, we may have to punt on having any antenna parties to ready the antennas. We still need a volunteer to take care of the food for the events. Please reach out to Doug, KG6L-WE or me if interested.

In closing, please remain vigilant and follow the CDC guidelines so you don't become one of the "caught it" group. I hope to see all of you at the virtual club meeting on April 3rd. You can join from any device you may have available. Though having the video is part of the fun, it's not a requirement. If you're not familiar with Zoom, you can learn about the software here: <https://support.zoom.us/hc/en-us/articles/201362193-Joining-a-Meeting>. The meeting information will be available on the web site and on page 7.

73, Jim K6SV

Keep the airwaves alive by getting on the air!

## A Visit to Ham Heaven

Hiroki Kato AH6CY

Have you ever wondered what ham heaven looks like?

Bob Mix, KF6ABC, and I have recently visited and played in what we believe to be ham heaven on earth, located on Washington Island, Wisconsin, two and half hour's drive and ferry ride from Green Bay. This is a super ham station and a private ham museum on a 500 acre antenna farm (originally an apple and cherry growing orchard; now they grow tall antennas) owned by George Ulm, W9EVT, and his wife Susan. Susan had until recently run a B&B on this farm, called Greengate Farm. Bob and I were private guests at the farm and stayed in their Apple House (so named because it used to house apple sorting and packing facility) cottage for three days.

Everything George has amassed here is so enormous in quantity and superlative in quality that it is difficult to know where to begin to accurately describe what he owns and what he has done to them. Photos just don't do justice. But let me try.

First of all, the size of his ham radio collection, vintage and modern, is arguably the largest in the world. What you see in the Fig. 2 is a collection of several hundred operational radios in his shack. He has practically every radio ever produced for ham radio market, including a few prototypes which never

hit the market. In addition, he has many military radios, both American and foreign, including some Chinese radios. We saw and learned what portable radios the Allied forces used in the D-Day landing. (Did you know the handy-talkie BC-611 was a one-time use throw-away radio?) Then there are the top of line contest-grade modern radios from Yaesu, Kenwood, ICOM, FlexRadio and Hilbrerling. He is waiting to receive an Elecraft's K4 now. I have seen some great radio collections in the US and around the world, both in public museums and in private hands. But none I have seen comes close to the size of George's collection.

Collins radios are often the most favorite boat anchor radios of many collectors, and I have met many hams who are proud owners of several Collins radios. But George has a dedicated room for all of his working Collins (See Fig. 3).

What you see in the Figs. 2 and 3 are what George usually shows to visitors. But he has a detached workshop 200 feet away from his shack where he has a collection of another hundreds of yet-to-be-restored radios stacked to the ceiling (See Fig. 4). In this workshop/storage building, not only does he have tools and testing equipment but he also has shelves with boxes of old parts including thousands of tubes. He is running out of space and is building another warehouse to store unopened boxes of radios shipped from everywhere.

To old timers among us,

(Ham Heaven — Continued on page 4)

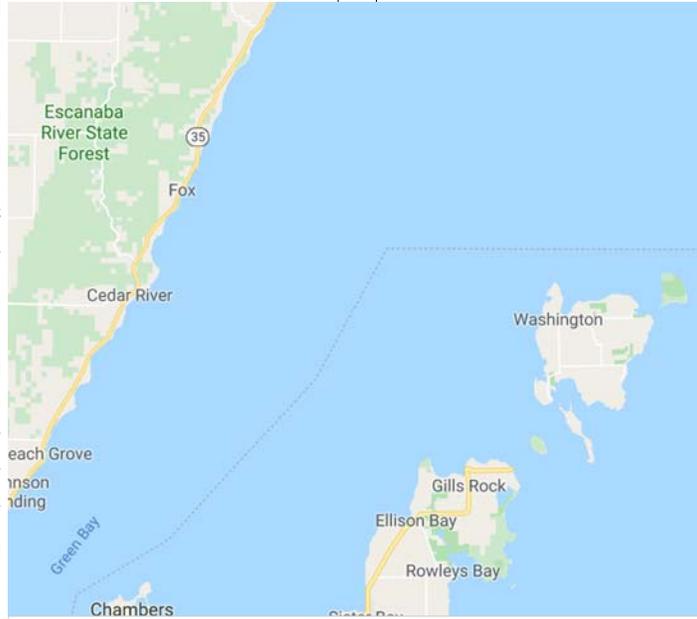


Fig. 1 - Washington Island, Wisconsin



Fig. 2 - Collection of Operational Radios

(Ham Heaven — Continued from page 3)

the brand names like Collins, Hammarlund, Hallicrafters, National, Drake and E. F. Johnson are the sweetest sounding words on earth. In our youth, when our financial resources were meager, the top line of their products were unreachable dreams. George not only displays most of



Fig. 3 - Collins Radio Room



(14268 M-S, 14307 Sun) every morning at 11:30 CDT (1600Z), the net I occasionally check in from my home QTH. (Ohana means family in Hawaiian; the net was originally started by Hawaiian hams.)

His antenna farm currently has three towers and he has

another 200 feet tall tower waiting to be erected. We saw it lying in the bush. What you cannot see clearly in the photo is a 560 feet long horizontal delta loop suspended among the three towers about 100 feet above ground. George usually uses the loop for 160, 80 and 40 m band operation.



Fig. 4 - Yet to be Restored

those radios and their accessories in his shack, but he has also restored most of them to their operating conditions. But, as we conversed, I learned that George personally knew the owners and founders of many of these companies, Art Collins and William J. Halligan (the founder of Hallicrafters) among them. These companies are all gone and George's generation who had direct knowledge of these pioneers is fast disappearing sadly. But sitting in his shack and listening to George's endless stories made history come alive for me. George is a vigorous 89 years old who loves to talk (and talk and talk) and is someone I aspire to be like when I reach his age. He co-hosts the Ohana net on 20m



Fig. 5 - Antenna Farm Replacing Orchard

What is it like to operate this super station? Indescribable comes to mind. As we are all painfully aware, we are at the bottom of the sun spot cycle now and the band condition has been very poor these days (and months and months). But in spite of it, when I called CQ on 40m at 0700 CDT (1200 Z), not expecting many stations

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awake at that hour on Sunday, it immediately caused a pileup and after working stations with no break for nearly an hour, I had to finally tell stations, "Sorry folks, I need to QRT. I will be back later today. 73." Nature was calling me and I really had to go. George is a night owl and he was still asleep and Bob was also not awake when I slipped out of our cottage and got to the shack. My working condition at that time was as follows:

- Transceiver: Icom 7300
- Linear Amp: Alpha 9500 1.5 kw
- Antenna: 560 feet long delta loop

The 20 and 17 m bands were closed to Europe and Asia all day but when the band opened to Central and South America in the afternoon, I looked at the DX Summit reporting program and noticed a bunch of stations on the air. With each station I looked up on QRZ.com and found out the exact azimuth., e.g., 8P5AA in Barbados is 135.5 degrees and turned the 6-element Yagi exactly toward that direction. George's multi-element Yagis can be turned in less than one degree exactitude in a few seconds. In less than 10 minutes starting at 1530 CDT (2030Z) I worked:

- PY6RT Brazil
- YV1KK Venezuela
- HI8AT Dominican Republic
- 8P5AA Barbados
- PV8AL Brazil
- CE7VPQ Chile
- CE2LE Chile
- CE3JBD Chile
- HI8K Dominican Republic

Most of these stations were having pileups. I "busted" them all, mostly on the first call.

There are a few one-of-a-kind exhibits in George's shack. One is the world's very first stand-alone commercially built S-meter by National. There are no transceivers in the market today which don't have an S-meter and we don't think twice about it. But some of us oldtimers do remember how much our operating was improved when we installed an S-meter in our home-brew receiver.

Another interesting thing we saw on his wall was this particular DXCC award. It looks like any other DXCC award. The DXCC has become a dime a dozen sort of thing these days with so many con-



Fig. 6 - S-Meter

tests, great rigs and digital modes making it easy to achieve it. Some hams achieve it during a single weekend using FT8. Linear amps are much more affordable and modern rigs with panoramic scope and precise filters make it easier to work DX. But George's DXCC award was a mobile-to-mobile DXCC, the likes of which I have never seen. It is so rare that the ARRL award rule does not even have a mobile-to-mobile endorsement (yet). George was an avid mobile operator from his Cadillac in his younger days.



Fig. 7 - Mobile Century Club

George's QTH on Washington Island is a ham heaven not just because of the gear and antenna he has, but also because of the location of the island itself. With only 600 people living sparsely spread on the island and his property occupying the north eastern corner ending at water's edge, it is a very RF quiet location. Other than occasional atmospheric QRN, there is no locally generated noise. His QTH doesn't even have cell phone signal (though he has installed satellite based Internet service). Thus, when tuning on any band you don't hear any noise between stations. The only experience like this I had was when I operated portable on the Bad Water salt bed in Death Valley many years ago.

Well, I can go on but you got the idea as to what ham heaven looks like.

-end-

## Mar 18, 20 Board Meeting Minutes

Attending: Jim Thielemann K6SV, President; Marty Wayne W6NEV, Vice President; Ric Hulett N6AJS, Secretary; Bob Korte KD6KYT, Treasurer; Walt Geiger K6WGY, Joel Wilhite KD6W, Doug Teter KG6LWE, Darryl Presley KI6LDM, directors, and Clark Martin KK6ISP, ASVARO coordinator.

Meeting was called to order at 7:10. A quorum was present

### President's report:

The COVID-19 virus has made significant challenges for PAARA. We were proactive, and cancelled the March PAARA meeting, and we are holding the board meeting as a web conference. We don't know at this time when things will get back to normal. We appreciate the patience of the club membership as we all go through this together.

### Secretary's report:

PAARA has 210 members, 78 have not yet renewed for 2020. 15 folks have signed up for PAARAgaphs by e-mail. We might consider cancelling the hardcopy PAARAgaphs for April.

Last month, we put a reminder sticker on unrenewed members' newsletters. Members can renew by paypal or credit card, or can mail a check. See the PAARA website:

<http://paara.org/pages/members-current.html>

for details.

### Treasurer's report:

No income last month, since there was no club meeting. Normal bills were paid, in line with prior months. We sent a check to cover our electric and internet expenses at the repeater site.

### Vice President's report:

We have postponed the Hiller aviation trip for May. Will attempt to reschedule for this fall.

We have notified prospective speakers: We will keep your current dates, and will update as we know more.

Future speakers: Mike Wimble KM6WP:

"Robots", Kathy Balistreri: "The physics of AM broadcast", Michael Workman "Alpha Hotel Six Charlie Yankee"

### Old Business:

We need more stories for PAARAgaphs. Members are strongly encouraged to author ham-radio stories for the newsletter. Maybe a story about how ham radio has helped you through the current situation?

The board voted to retain the membership of those who have not renewed for an additional month, due to the unusual health situation.

Doug will work with Gerry to help organize his PAARA stuff.

### Raffle:

Transition to Shri KA6Q and Rob KC6TYD was smooth. Some good prizes are available for the next meeting TBD

Marty has the list of radios for sale posted on the PAARA website, at:

<http://paara.org/pages/eqpt.html>

The board reviewed a draft statement for an equipment loan program. We made some minor changes to the draft: We won't be providing a Morse paddle or an antenna. N6AJS will update the proposal for discussion at the next board meeting.

Electronic Flea Market for April has been cancelled.

A replacement for Ron Chester as accountant has been identified. He's a CPA, has committed to doing it, but we won't take action until after April 15

The club needs a volunteer to coordinate food at Field Day.

We have a list of 'Elmers', hams who will volunteer to assist new hams with aspects of radio, but have not posted to the website yet. Send an e-mail to Jim, K6SV to be added to this list.

(Minutes — Continued from page 6)

### **New Business:**

Joel is interested in building a 1.2GHz ATV repeater. We could use this for virtual club meetings. He is talking to MDARC about ATV concepts. MDARC might be willing to provide their transmitter/truck for a PAARA meeting. This will also be a story for PAARAgaphs.

We had some discussion about having an FM sprint contest as part of a club meeting. Tabled until we actually have a physical meeting.

### **Next PAARA meeting:**

We considered using the web conference application Zoom for the next club meeting. We may hold a roll call only meeting, likely with no presenter for April.

### **Field Day coordination meeting:**

Next meeting will be held online via zoom. Wednesday at 7:00 3/25/2020. E-mail Doug Teter to be included.

The meeting was adjourned at 8:50 p.m.

Respectfully Submitted  
Ric Hulett N6AJS  
Secretary

### **Hiller Aviation Trip Postponed**

I'm sorry to announce that, due to the coronavirus and an abundance of caution for our community health, we are postponing the PAARA visit to the Hiller Aviation Museum. Hiller is following recommendations from the San Mateo County Health Department and closing part of its hands-on exhibits and changing some other protocols. We will be working closely with Hiller to reschedule our trip; likely sometime in the fall. If that isn't possible, we'll try again to schedule next spring. If you have reserved a spot for the tour, your money will be refunded.

We appreciate your patience and understanding about this postponement and look forward to rescheduling the trip for you in the future. If you have any questions, please contact me and I will try to answer them.

Marty, W6NEV & the PAARA Board  
[mcwayne2@comcast.net](mailto:mcwayne2@comcast.net)

## **Zoom Meeting Details**

Jim Thielemann, K6SV, is inviting you to a scheduled Zoom meeting.

Topic: PAARA Club meeting

Time: Apr 3, 2020 07:00 PM Pacific Time (US and Canada)

### **Join Zoom Meeting:**

<https://zoom.us/j/871576900?pwd=MTdibFBSZURXN21kWDd4UER3bmYyUT09>

Login using your first name and call sign.

Meeting ID: 871 576 900

Password: 008061

### **One tap mobile**

- +16699006833,,871576900# US (San Jose)
- +13462487799,,871576900# US (Houston)

### **Dial by your location**

- +1 669 900 6833 US (San Jose)
- +1 346 248 7799 US (Houston)
- +1 253 215 8782 US
- +1 301 715 8592 US
- +1 312 626 6799 US (Chicago)
- +1 929 205 6099 US (New York)

Meeting ID: 871 576 900

Find your local number:

<https://zoom.us/j/871576900>

These details will be posted on the PAARA website: <https://www.paara.org>

## Palo Alto Amateur Radio Association, Inc.

PO Box 911 Menlo Park, CA 94026

### Officers

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Vice President .....	Marty Wayne, W6NEV	408-234-8023
	w6nev@arrl.net	
Secretary .....	Ric Hulett, N6AJS	408-332-4593
	energyconserved@sbcglobal.net	
Treasurer .....	Bob Korte, KD6KYT	408 396 4745
	bob@rgktechsales.com	

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	walt@tradewindsaviation.com	
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	dteter@wci.com	
Director ('21) .....	Darryl Presley, KI6LDM	650 255-2454
	ki6ldm@arrl.net	

### Appointed Positions

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	ab6so@smrn.com	
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	energyconserved@sbcglobal.net	
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	K6RDM@yahoo.com	
Public Affairs .....	<i>Position Vacant</i>	
Station Trustee W6OTX, K6YQT, W6ARA....	Gerry Tucker, N6NV	
Station Trustee K6OTA...	Ron Chester, W6AZ	
Property Manager .....	Gerry Tucker, N6NV	
Asst. to the Treasurer....	Ron Chester, W6AZ	
Badge Coordinator .....	Doug Teter, KG6LWE	650-367-6200
	dteter@wci.com	
Historian Position .....	<i>Position Vacant</i>	
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Field Day Coordinator ...	Doug Teter, KG6LWE	650-367-6200
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	webaron@gmail.com	
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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, [W6BIMX@att.net](mailto:W6BIMX@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://nodxc.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>

## 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)

## SCCARRA

### 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: 441.35 (+5.0) 88.5 ctcss  
 147.39 (+600) 151.4 ctcss 1286.20 (-12m) 100.0 ctcss  
 223.96 (+1.6) 156.7 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))

WE ARE PLEASED TO ANNOUNCE  
THE NEXT CHAPTER FOR US:

**HSC** HAS SOLD TO

**EXCESS SOLUTIONS!**



**That's right!**

- ✦ Halted Specialties Co., Inc. has sold HSC Electronic Supply to Excess Solutions of San Jose...making the biggest surplus electronics store in the Bay Area!
- ✦ Much of the millions of parts seen on HSC's shelves will be showing up soon on Excess Solutions' shelves...for your electronic needs.
- ✦ Techs, Developers, Experimenters, Hobbyists and Creators will once again have access to the basic parts that Silicon Valley was built upon!
- ✦ Support your local surplus store...there are few left, and you know how much this Silicon Valley resource is needed!

## Excess Solutions and HSC Electronic Supply

Now under one roof!

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San Jose, CA 95112

(Diagonally across intersection from Spartan Stadium)

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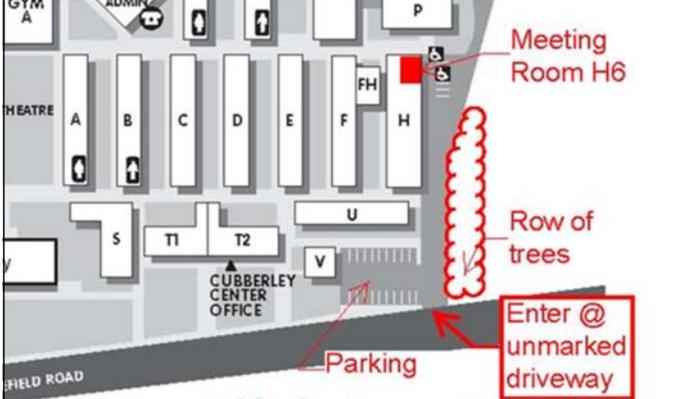
www.jameco.com

### 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 Room H6**

**Row of trees**

**Enter @ unmarked driveway**

**Parking**

**Cubberley Community Center**  
 4000 Middlefield Road, Palo Alto, CA 94303  
 650/329.2418  
 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).

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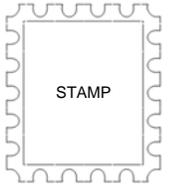
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