



QRO

MONTHLY NEWSLETTER OF THE PALOS VERDES AMATEUR RADIO CLUB

MARCH 2019



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Amateur Radio and the American Radio Relay League (ARRL)

Dick Norton, N6AA

ARRL Southwestern Division Director

Thursday, March 7, 2019

6:30 pm: "What's Next?"
group...all ham radio
questions are welcome

7:30 pm: Main meeting

Fred Hesse Community Park
(McTaggart Hall)

29301 Hawthorne Blvd.
Rancho Palos Verdes, CA

Visitors always welcome

PVARC's upcoming meeting topics...

At the PVARC's March 7th meeting **ARRL Southwestern Division Director Dick Norton, N6AA**, will speak about developments affecting amateur radio throughout the U.S. as well as American Radio Relay League directions to further our hobby and public service. Dick is an avid amateur radio DXer and contester with a personal goal of operating a major contest from each of the 40 CQ Magazine zones spanning the world. He has already been to most and as HF amateur radio contest enthusiasts know Dick continues serving as President of the Southern California Contest Club.



Dick Norton, N6AA

Dick's ARRL Southwestern Division includes the ARRL Santa Barbara, Los Angeles, Orange, San Diego, and Arizona Sections. Within California the following counties are in the ARRL's Southwestern Division: San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, San Bernardino, Riverside, Inyo, San Diego, and Imperial. All Arizona counties are also in the Southwestern Division. ARRL Division Directors comprise the League's Board of Directors and Dick also serves on Board's Administration & Finance Committee.



Our April 4th monthly meeting debuts a new video your **QRO** Editor is producing about the **PVARC's February 20-24, 2019, Islands On The Air DXpedition to Two Harbors** on Catalina Island. Nine PVARC members experienced our coldest-ever IOTA DXpedition to Catalina but had a great time making nearly 1,100 contacts with all 50 states and 45 countries despite poor HF propagation conditions.



Speaking at our May 2nd meeting about Digital Mobile Radio (DMR) is **Michael Rickey, AF6FB**, the PAPA System's technical expert. Unique among the linked repeater systems in southern California the PAPA System has extensive DMR and D-Star repeater capability besides traditional analog FM repeaters.

Our June 6th meeting topic will be announced soon. As previously reported there won't be a PVARC meeting on July 4th when Hesse Park's building will be closed. We are hopeful Hesse Park is available for a substitute meeting on August 1. We still expect holding our International Lighthouse Weekend and family picnic at Pt. Vicente in mid-August. ■

PVARC readies new dual-mode UHF digital / analog repeater for K6PV...and here's why we chose DMR

By Clay Davis, AB9A

In the May 2017 **QRO** issue I wrote an article about my introduction to DMR...and my investigation of the various flavors of digital radio formats for the VHF and UHF bands. I also explained why I chose to go with Digital Mobile Radio (DMR). If you haven't read it, you can find it here: <http://n6rpv.net/pvarc/2017QRO/QROMay2017.pdf>

All three of the major digital radio formats use versions of the same AMBE Codec (Advanced Multiband Excitation encoder and decoder). All of them are capable of providing superior low noise, high-quality digital voice transmission, compared to conventional FM analog voice formats. The term that describes a signal report for very high quality transmission through an analog repeater is "full quieting." But it is not the normal analog experience. By contrast, the digital voice repeaters are full quieting whenever you are in range of the repeater.

The aspects that differentiate DMR from the other two digital voice formats are:

1. **There are many manufacturers of DMR radios** vs. one or two manufacturers of the other formats. This gives you more choices and lower entry cost of getting into Digital Voice.
2. **DMR is an international standard** defined by the European Telecommunications Standards Institute (ETSI), that has been adopted by the Amateur Radio community. The commercial DMR market is much larger than the Amateur market. So, DMR radios will continue to be developed and updated.
3. **DMR repeaters can carry twice the voice traffic of analog repeaters.** Tier 2 DMR repeaters use a two time slot, Time Division Multiplexed (TDM) data stream. This allows DMR repeaters to carry two voice channels simultaneously.

For the reasons above, DMR has been widely adopted in southern California. You can enjoy almost continuous coverage on DMR repeaters from Santa Barbara to the Mexican border (see the PAPA System DMR website).

There's More...

DMR repeaters can be networked together over the internet. The PVARC has chosen to connect to the Brandmeister Network (<https://brandmeister.network>), one of several DMR networks available. Brandmeister has extensive coverage in southern California plus growing coverage throughout the United States and worldwide.

Talk Groups are a key feature of the Brandmeister Network. As of this writing Brandmeister lists 1,246 Talk Groups in its database. Talk Groups are a way of managing network traffic and connecting people together in their own virtual Talk Group. The result: only that Talk Group hears the conversation and is not bothered by the other 1,245 conversations. There can be any number of participants in the Talk Group. Think of it kind of like a global conference call. The PVARC has been assigned Talk Group number 31060 which anyone can use. But, it's a Talk Group you can go to and expect to find members of the PVARC.

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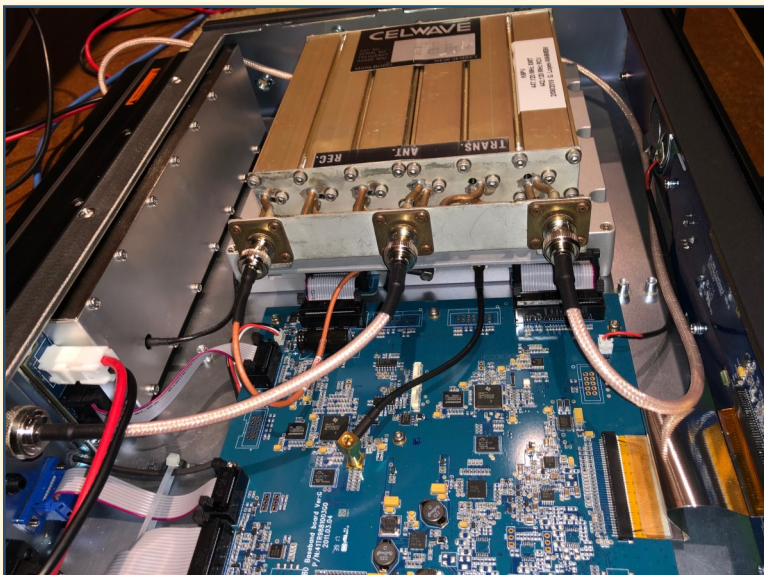
PVARC readies new dual-mode UHF digital / analog repeater for K6PV...and here's why we chose DMR

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The PVARC has acquired a Hytera dual mode DMR repeater. Dual mode means it is capable of handling both DMR or analog traffic. If you go in analog, your signal will come out analog. If you go in DMR, your signal will come out DMR and also be networked. We are currently setting up and testing this repeater. And soon we'll be installing it to replace K6PV's current analog repeater.

If you want to participate in the DMR experience, you will need to get a Tier 2 DMR radio, program it and learn how to use it. This sounds straight forward but there is a learning curve to using this new technology. Because DMR started life as a commercial radio standard, the lexicon and procedures for programming and using the radio, especially on the network, are different than what you are used to in the analog world.

The PVARC will soon be launching an effort to educate our members on what DMR is, how to select a radio and how to successfully use it. In the meantime, I would encourage you to google "DMR radio tutorial" and read what you find. ■



Above: A view inside the new K6PV dual-mode repeater after installing a Celwave UHF duplexer (rear) donated by Gary Lopes, WA6MEM.

PHOTO: GARY LOPES, WA6MEM

Some questions and answers about K6PV's new dual-mode repeater

Q. When will K6PV be DMR capable?

- A. We hope to install the new repeater and its network connections by the end of March. Gary, WA6MEM, and Clay, AB9A, are working on the networking and control aspects.

Q. Will my existing analog handheld and mobile radios work with the new repeater?

- A. Yes, they will work as currently in analog mode...but your analog radios cannot be networked or connected to Brandmeister talk groups.

Q. Should I buy a DMR-capable radio now?

- A. We suggest waiting until next month. With dozens of DMR radios on the market the PVARC won't be able to provide programming or technical assistance for every DMR model. But we will offer our members extensive learning and support for three or four widely-used DMR radios. If you absolutely feel the need to buy a Tier 2 DMR radio now please get advice from either Gary Lopes, WA6MEM (gary@wa6mem.com) or Clay Davis, AB9A (claydav@pacbell.net) before making a purchase.

Q. Will the PVARC's weekly Tuesday night nets operate in analog FM or DMR after the new repeater is installed?

- A. Our weekly 7:30 pm K6PV nets will continue operating in analog FM with a 2-meter cross-link on the Palos Verdes Peninsula's west side. But at 8:00 pm we will additionally hold a DMR net for anyone interested. PVARC's Monday night nets on K6PV will also remain analog. Interesting aspect: One can turn a personal computer into a DMR "hotspot" to reach K6PV via a small USB device and the internet if you cannot reach K6PV in DMR over the air. This allows checking into your local net or Talk Group using your DMR radio and computer from anywhere in the world if an internet connection exists.

Q. What will happen to K6PV's current analog repeater?

- A. The K6PV Kenwood analog repeater that served us well since 2004 will be returned to Mel Hughes, K6SY. Mel provided much of the funding to purchase this repeater and as K6PV trustee is very familiar with maintaining it. ■

— Diana Feinberg, AI6DF

CW Keyer Renewal with Arduino

By Jerry Kendrick, NG6R

About twenty years ago, MFJ Enterprises, Inc., introduced the MFJ-492, a microcontroller-based unit that was thought by some as the be-all end-all of iambic memory CW keyers. You can see its twenty front-panel programming options (four rows and five columns) in Figure 1. I bought one of these units many years ago and enjoyed it until it began to fail. It became erratic after its warranty period and when it finally quit altogether, I considered repairing it. However, with few discrete components and relying as it does on embedded programmable micro-processor chips, there was little hope of restoring its functionality. Yet, I didn't have the heart to toss it, so it became a permanent resident of the ever-growing junk box . . . maybe someday I could find a use for it.



Figure 1. Front view of MFJ-492 menu driven memory CW keyer. It is controlled via a menu of options shown on the front panel by successively selecting a row with the top-left MENU button (confirmed by lighting a row LED) and then selecting a column with buttons F1 thru F5. There are rotatable controls for code speed and audio volume, as well as on/off power button, also accessible on the front panel.

Well, just recently an opportunity surfaced to inject new life into this unit. A year or so ago, fellow PVARC club member Clay, AB9A, took on the challenge of creating an iambic memory CW keyer built around a micro-controller device from the Arduino family. Three of the more popular versions of Arduino boards are shown in Figure 2.

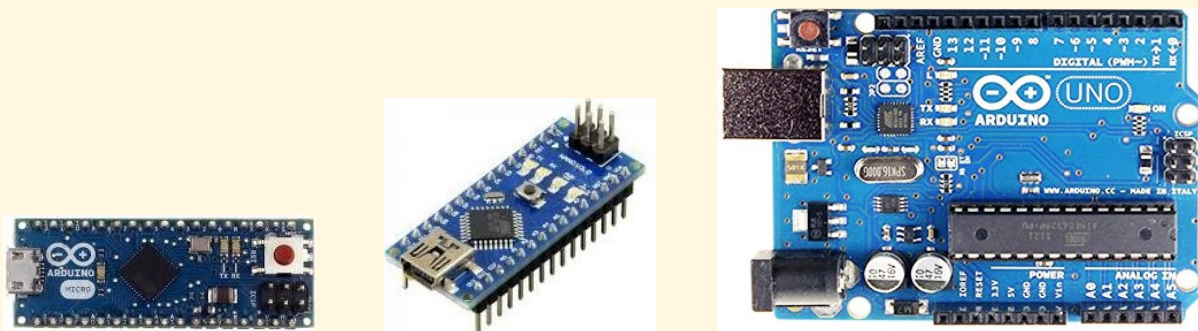


Figure 2. Three popular boards from the Arduino family of micro-controllers; left to right: Micro, Nano and UNO.

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CW Keyer Renewal with Arduino

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These Arduino boards have a set of general purpose input/output (GPIO) pins that enable an experimenter to insert inputs and extract outputs from the embedded “computer” chip. These inputs can include switches that open and close and variable resistors that rotate over their range of motion. Outputs can include voltage to turn on LEDs, to open/close a voltage state—to key a transmitter for example—and square waves of selected frequencies to produce an audio tone in an attached speaker. The embedded micro-controller chip can be programmed using a unique software language (similar to C or C++ programming language). In order to create a CW keyer, Clay developed a software program (called a “sketch” in Arduino-ese) of over 700 lines of code for the Arduino Micro board. Arduino code can be developed using a free Arduino application (called an Integrated Development Environment, or IDE) on any Mac, PC or Linux desktop or laptop computer. After the code is developed and successful compilation is verified, the code then can be loaded onto the Arduino board (via a USB connector on most Arduino boards).

Clay generously offered that completed sketch to me if I wished to load it onto an Arduino board and make my own CW keyer. His offer spawned a plan to retrieve that old MFJ keyer from the junk box and see what would be needed to configure it with an Arduino UNO. Even though the original electronics were of no use, many of the external interface components, like button switches, one or more LEDs, on/off power switch, connectors and variable resistors should be reusable. Figure 3 shows the result of that makeover, compared with how the interior looked prior to this effort.



Figure 3. (Left) MFJ-492 with cover removed. Integrated circuit (IC) dominance on the horizontal PCB is obvious. Note the red button switches are on a separate vertically oriented PCB. All the external interface components are attached directly to the horizontal PCB (rear: RCA connectors for TX keying; ¼” stereo jack for CW paddle; 12V-15V DC power jack; and front: on/off power switch; speed and volume control variable resistors) (Right) The original embossed front panel with the 4x5 programming matrix was removed and discarded. The bulk of the original green PCB has been cut away and discarded to make room for the Arduino UNO that is secured to the bottom of the aluminum enclosure. Two small PCBs have also been added—one near the rear that contains an LM386 audio amplifier IC circuit; and one on the left side that houses five resistor/capacitor pairs acting as a low-pass filter to convert an output square wave tone signal (from the Arduino) to a near sine wave for improved tonal quality; and also contains a 4N33 optocoupler chip to key a transmitter (via the RCA jack at the rear) and yet isolate the Arduino from the external transmitter keying circuit.

There was a need to keep enough of the structure of the original green PCB in place around the periphery to provide stability for the interface components we wished to reuse, i.e., connectors, switches and controls. The two knobbed front-panel controls (speed and volume) that were integrated into the original PCB were removed and discarded. In their place, two 10 kilohm variable resistors were panel mounted

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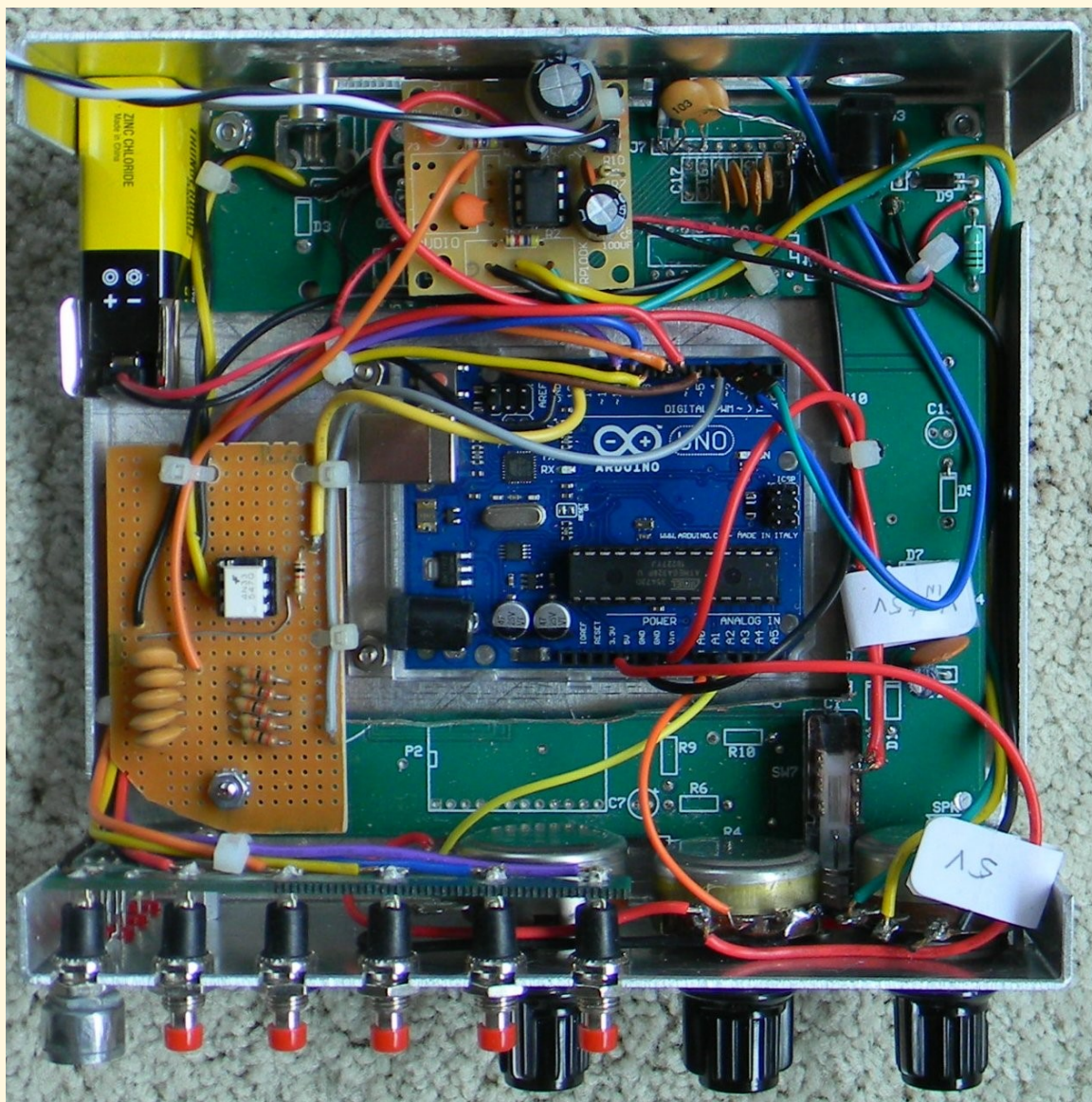
CW Keyer Renewal with Arduino

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into those same holes. Additionally, a third hole was drilled equidistant over and a third 10 kilohm variable resistor was added to control the frequency of the audio tone for the Morse code. Front and rear views are shown in Figure 4 and a top view is shown in Figure 5.



Figure 4. (Left) Front-panel view of repurposed CW Keyer. The top left red button switch is used to initiate programming of the five code sequence memories (m1 thru m5). Once programmed, a single push of a memory button will transmit the respective code sequence. (Right) Rear view of keyer showing intact connectors: 12V-15V DC power input, paddle key and direct TX keying output. Paddle dot/dash polarity can be reversed by simply interchanging the blue and green connector wires without having to remove the unit cover.



PHOTOS:

JERRY KENDRICK, NG6R

Figure 5. Top view of CW Keyer showing the Arduino UNO in the center, surrounded by remnants of the original green PCB. Note the multicolored wires soldered onto the rear of the six red button switches and which terminate on selected pins of the Arduino UNO.

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CW Keyer Renewal with Arduino

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This was a fun project that resulted in a useful operational unit. It was gratifying to convert a heretofore-useless device into a fully functional unit once again. This unit is primarily a CW transmitter keyer, but it is also very useful for Morse code practice. The Arduino is programmed (via readily changeable and re-loadable software) for a code speed range of 10 wpm to 35 wpm and an audio tone range from 400 Hz to 1000 Hz; exact choice of speed and tone frequency within those ranges is simply adjusted by the front panel potentiometer controls. The front panel volume control is wired directly to the add-on LM386 circuit board and doesn't interface directly with the Arduino UNO. Except for adding a variable audio tone frequency control function, the software sketch used in this CW keyer is the same as that used by Clay in his keyer.

The family of Arduino micro-controller boards offers a tremendous opportunity for electronics experimentation. The programming language learning process requires a bit of time and disciplined study and any previous software programming experience is of value in speeding that effort. But, if programming "from scratch" is not among your interests, there are many complete and published sketches available for free download from several sites, most notably from <https://github.com/> and <https://playground.arduino.cc/>. ■

HF Enthusiasts Group meets next on Saturday, March 9

Whether you have an item to show or discuss...or just want to observe...all are welcome at the PVARC's HF Enthusiasts

Group monthly meetings on 2nd Saturdays. The Group meets from 10:00 am to Noon at the Palos Verdes Library's main branch (701 Silver Spur Rd / 650 Deep Valley Dr.) in the Purcell Room, located in the corner behind the Reference Desk. There is plenty of free parking on the Library roof, in an adjacent parking structure on Deep Valley Drive, and in a small parking area accessed from Silver Spur Rd. ■



It's still renewal time for PVARC membership...also consider being an ARRL member

PVARC member dues are collected early each year...so please send your renewal if you haven't. You may also pay at our monthly meetings where we have renewal forms. Additionally, we have set up a PayPal link to renew but it doesn't have our renewal form attached. To pay by PayPal (\$20 individual membership, \$25 for family membership) log onto PayPal and enter as the recipient: **PVARC90274@gmail.com** .

Additionally please consider joining the American Radio Relay League (ARRL) if you aren't a member. The ARRL is the only national organization representing amateur radio and has another significance for the PVARC: We receive benefits from being an ARRL-affiliated club but being an ARRL-affiliated club requires at least 51% of club members also be ARRL members. Annual ARRL membership costs \$49 and includes the monthly QST magazine as well as access to numerous web-based materials. Visit: www.arrl.org/ then click on the "Join/Renew" tab. ■

Harold (Hal) Croyts, KO6M (SK)

We were saddened to learn PVARC member Hal Croyts, KO6M, passed away on February 14, 2019, at age 98.

A 26-year U.S. Air Force veteran, Hal served in World War II and Korea. He retired with the rank of Colonel and received the Legion of Merit medal for his outstanding contributions in developing the Apollo Lunar Excursion Module while assigned to NASA.

Hal served on the Lomita City Council for four terms (including as Mayor) after serving on the Parks & Recreation and Planning Commissions. As a City Council member he was proud to represent Lomita as president of both the California Contract Cities Association and the League of California Cities Association.

Hal was also involved in many civic, service, educational, and other organizations. He served as president of the Lomita Sister City Association, Lomita Historical Society, Friends of the Lomita Library, Lomita-Harbor City Kiwanis Club, Narbonne PTSA and Gateway Council PTSA.

After retirement, Hal and his wife Linda enjoyed 15 years of RV traveling in the US and Canada. His hobbies included sailing with the Navy Yacht Club of Long Beach (where he served as a Commodore) and participating in ham radio activities of the South Bay Amateur Radio Club and the Palos Verdes Amateur Radio Club. Hal was initially licensed in 2000 as KG6EHW, briefly held AF6CG after receiving his Extra Class license, then became KO6M. He also served the PVARC as one of our Volunteer Examiners during license test sessions.

Hal is survived by his wife Linda and six children plus five great-grandchildren.

A Military Honors Memorial Service will be at Riverside National Cemetery on Tuesday, March 5 at 1:30 PM. Anyone wishing to attend should arrive at the main gate on 22495 Van Buren Blvd. by 1:00pm.



Hal Croyts, KO6M (SK)

(QRO Editor acknowledgement: Thanks to www.legacy.com for publishing much of the above information about Hal's distinguished public service which we incorporated for this tribute.)

PVARC Club News

7 PVARC badges await pickup at February meeting...or another time

Gary Lopes, WA6MEM, has the following new PVARC badges ready for distribution at our February 7, 2019, monthly meeting at Hesse Park or by special arrangement.

- KC6ROX
- KI6YMD
- K6GHL
- N6XJM
- W6BMD
- WJ1P / DU1X

To make special arrangements with Gary contact him at: gary@wa6mem.com. ■

Embroidered PVARC patches available at monthly meetings

PVARC club patches are available at our monthly meetings for \$4 each. You may sew these onto any cap, jacket, shirt, or bag.

The four illustrations in the patch center are emblems of the Palos Verdes Peninsula's four cities (clockwise from top left: Palos Verdes Estates, Rolling Hills Estates, Rancho Palos Verdes and Rolling Hills.) ■



Palos Verdes Amateur Radio Club

An American Radio Relay League Affiliated Club

Board of Directors:

President	Diana Feinberg, AI6DF
Vice President	Ray Day, N6HE
Treasurer	Peter Landon, KE6JPM
Secretary	Ron Wagner, AC6RW
Directors	Clay Davis, AB9A
	Gary Lopes, WA6MEM
Past Vice President	Bob Sylvest, AB6SY

Appointed Offices:

QRO Editor	Diana Feinberg, AI6DF
Webmaster	Kel Vanderlip, W6KCV
Club Librarian	Bryant Winchell, W2RGG
K6PV QSL Manager	Jeff Wolf, K6JW
K6PV Repeater Trustee	Mel Hughes, K6SY
LAACARC Delegate	Jeff Wolf, K6JW
VE Coordinator	Dave Scholler, KG6BPH
VE ARRL Liaison	Jerry Shaw, KI6RRD
Net Control Operators	Malin Dollinger, KO6MD;
	Dale Hanks, N6NNW; Bob Sylvest, AB6SY;
	Ron Wagner, AC6RW; Dan Yang, K6DPY

Contacts:

QRO Editor: 310-544-2917, ai6df@arrl.net

Webmaster: 310-742-6123, kelvinvanderlip@gmail.com

Email us: k6pv@arrl.net

Website: www.k6pv.org

Mailing Address:

Palos Verdes Amateur Radio Club
PO Box 2316
Palos Verdes Peninsula, CA 90274-8316

Monthly Meetings:

1st Thursday (except August and December) at 7:30 pm at Fred Hesse Park, 29301 Hawthorne Blvd., Rancho Palos Verdes, CA. Visitors always welcome.

Repeaters (Open, though often listed as "Closed"):

Club: K6PV, 447.120 MHz (-), PL 100.0, CTCSS
"PV-West": K6IUM, 449.980 MHz (-), PL 173.8, CTCSS

To order a Club badge:

Gary Lopes, WA6MEM, gary@wa6mem.com

To order a Club jacket or patch:

Dave Scholler, KG6BPH, 310-373-8166

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Front page photo — Pt. Vicente Lighthouse at dusk on February 27, 2019. Distant lights on Catalina Island are at Catalina Airport. PHOTO: DIANA FEINBERG, AI6DF

PVARC Club News

PVARC upcoming dates in 2019

- ♦ **PVARC monthly meeting at Hesse Park, McTaggart Hall**
1st Thursday each month, 7:30-9:30 pm, except in July and December. 6:30-7:25 pm, "What's Next?" group for newer hams.

In 2019 only: No monthly meeting on July 4 due to Independence Day; special meeting August 1.
- ♦ **HF Enthusiasts Group meetings at Palos Verdes Library, Peninsula Center main branch**
2nd Saturday every month, 10 am to Noon in the Purcell Room.
- ♦ **Walt Ordway, K1DFO, Technician and General amateur radio license classes at Hesse Park**
Saturdays, May 4 and 11, 2019; license exam session, May 18.
Saturdays, November 2 and 9, 2019; license exam, November 16.
- ♦ **Public service events in 2019:** Heart of the Homeless 5K in Rolling Hills Estates, **April 27**; Ridgecrest 5K at Promenade Mall, **May 5**; Hills Are Alive 10K/5K in Rolling Hills Estates, **August 10**; Conquer the Bridge run/walk at Los Angeles Harbor across Vincent Thomas Bridge, **Labor Day September 2**; and Palos Verdes Half Marathon-10K-5K, **November 16**.
- ♦ **PVARC 2019 Islands On The Air DXpedition to Two Harbors, Catalina Island, February 20-24.**
- ♦ **ARRL 2019 Field Day**, Soleado Elementary School, Rancho Palos Verdes, June 29-30.
- ♦ **2019 International Lighthouse & Lightship Weekend**, Pt. Vicente Lighthouse, August 16-18.
- ♦ **PVARC 2019 Holiday Dinner:** Dec. 12, Los Verdes Golf Course, Rancho Palos Verdes

Non-PVARC Events of Note:

- ♦ **(Public service) Los Angeles Marathon**, March 24. Amateur operators needed along 26.2-mile route. <https://www.lamarathon.com/race-weekend/volunteer> and click G1—Radio Operator
- ♦ **International DX Convention**, April 12-14, at Visalia, CA, Convention Center.
- ♦ **Dayton Hamvention**, May 17-19, Xenia, OH, at Greene County Fairgrounds. ■

WELCOME NEW MEMBERS OF THE PALOS VERDES AMATEUR RADIO CLUB IN 2018-2019

Michael Leyba, KK6KCH
John Tsohas, KM6OPE
Gregg Perkins, KM6OPD
Thomas Wynne, KM6QVW
Frank Attenello, KM6QVU
Debra Shrader, KM6QVX
Daniel Shrader, KM6QXC
Baldomero Fernandez, KM6QVV
Brian Keen, KM6QWC
Emanuele Rodrigues-Berardini, KM6QVZ
Neal Pollack, N6YFM
Daniella Ward, KM6TRC
Talbot Knighton, KM6TDF
Dylan Brown, KM6TDI
Robert Cullinan, KM5DI
Ellen Tessitore, N6XJM
Michael Vulpilat, KJ6RVU
Brian Clebowicz, K6BRN
Warren Arata, KM6YGR
Chris Sundlee, N6CGS
Brad Rachielles, KC6NNV
Georgiann Keller, KM6GYM
Annalise Little, KM6YGS
Tim Couture, KM6QWA
Frank Brown, KM6YGQ
Charlie Hansen, AJ6HZ

PVARC Calendar

March 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5 PVARC weekly net on K6PV repeater & cross- band, 7:30 pm	6	7 PVARC monthly meeting, Hesse Park. 6:30 pm, "What's Next?"; 7:30 pm main meeting	8	9 PVARC HF Enthusiasts Meeting, 10am- Noon, Palos Verdes Library Peninsula Center
10	11	12 PVARC weekly net on K6PV repeater & cross- band, 7:30 pm	13	14	15	16
17	18	19 PVARC weekly net on K6PV repeater & cross- band, 7:30 pm	20	21	22	23
24 2019 Los Angeles Marathon radio operations (non- PVARC public service event.)	25	26 PVARC weekly net on K6PV repeater & cross- band, 7:30 pm	27	28	29	30 W6TRW Swap Meet, 7:00- 11:30 am at Northrop Grumman, North Redondo Beach.
31						

Tell your friends and family about our upcoming ham license classes at Hesse Park

Two Free Amateur Radio Courses

FCC **“Technician”** course (entry level)

FCC **“General”** course (2nd level)

Each course is 2 sessions

The sessions will be on 4 May and 11 May 2019

Technician 9:30 AM to 1:30 PM both Saturdays (bring your lunch)

General 1:30 PM to 5:00 PM both Saturdays

The FCC tests will be 10:00 AM to noon on 18 May 2019

At the start of the 4 May Technician course, the Palos Verdes Amateur Radio Club will give a 30-minute presentation on how to get further involved with amateur radio.

The class location is at Fred Hesse Community Park,
29301 Hawthorne Blvd., Rancho Palos Verdes.

Confirm your attendance to Walt, K1DFO at waltordway@juno.com

There is **no fee** for either course.

Taking the FCC test is \$15.

Optional Material (sold at cost)

Gordon West books with all the FCC test questions,

\$26 for the Technician and \$26 for the General

Paper copy of Walt's Power Point charts,

\$22 for the Technician and \$22 for the General -

For courses sponsored by the Palos Verdes Amateur Radio Club, students thru grade 12 who pass their examination at a PVARC VE test session will, upon application to the Club, be eligible for reimbursement up to a maximum of \$50 to cover the cost of materials and the examination fee.

Everyone who obtains their first ham radio license through a PVARC VE test session, regardless of age, will receive a free membership in the Palos Verdes Amateur Radio Club for the remainder of the current calendar year.



Palos Verdes Amateur Radio Club
P.O. Box 2316
Palos Verdes Peninsula, CA 90274
www.n6rpv.net/pvarc or k6pv.org

NEW MEMBER & MEMBERSHIP RENEWAL FORM

NEW: _____ **or RENEWAL:** _____ **MEMBERSHIP** **DATE:** _____

Last Name: _____ **First Name:** _____ **Spouse:** _____

Street Address: _____

City: _____ **Zip:** _____

Phone: Home _____ **Work** _____ **Cell** _____

Email address: _____

(Unless otherwise noted emails will be sent to the applying member only)

License Call: _____ **License Class:** _____ **ARRL Member?** _____ **Birth Mo./Day:** _____

Other amateur radio groups you belong to: _____

Additional Household and/or Family Members (if Applicable):

Name _____ **Call** _____ **Class** _____ **ARRL** _____ **Birth Mo./Day:** _____

Name _____ **Call** _____ **Class** _____ **ARRL** _____ **Birth Mo./Day:** _____

Name _____ **Call** _____ **Class** _____ **ARRL** _____ **Birth Mo./Day:** _____

Individual membership (\$20.00) \$ _____

Household and/or Family membership (\$25.00) \$ _____

Additional donation to support PVARC activities \$ _____

Cash: _____ **or Check #:** _____ **Date** _____ **TOTAL \$** _____

Please make checks payable to: Palos Verdes Amateur Radio Club; Dues based on January 1st to December 31st year.

All New and Renewal Member applications must be signed below.

I am applying for a new or renewal membership in the Palos Verdes Amateur Radio Club and understand that by accepting membership I agree to abide by the Club's constitution and by-laws (available on-line at: <http://www.n6rpv.net/pvarc/constitution.htm> or upon request.)

Signature: _____ **Date:** _____

Family Member Signature: _____ **Date:** _____

Family Member Signature: _____ **Date:** _____