# QRO

#### THE PALOS VERDES AMATEUR RADIO CLUB NEWSLETTER

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All **QRO** monthly issues since 2007 are on the PVARC website at <u>www.k6pv.org</u> under the "Newsletter" tab.

Additional club news appears in the PVARC Weekly Bulletin sent by email to members.

#### ARRL Southwestern Division Director Dick Norton, N6AA

MAY 2022

*In-person at Hesse Park* Thursday, May 5, 2022

Meeting at Hesse Park and on Webex

6:30 pm: "What's Next?" for newer hams 7:15 pm: Webex room opens 7:30-9:15 pm: Hybrid Meeting

Guests welcome. Email ai6df@arrl.net for the Webex meeting link.

Other meetings in May:

**PVARC HF Enthusiasts Group** Saturday, May 14, 10:00-11:45 am at Palos Verdes Library Purcell Room

**PVARC EmComm Interest Group** Saturday, May 21, 10:00-11:00 am via Webex

## About upcoming PVARC monthly meetings



At the PVARC's **May 5**, **2022** hybrid meeting ARRL Southwestern Division Director Dick Norton, N6AA, is speaking in-person at Hesse Park about major developments at the ARRL and ham radio generally. His personal goal has been to operate from each of the 40 CQ Worldwide Zones...and he will share some of that as well. Dick last spoke at the PVARC in February 2019. Since then the pandemic, regulatory matters, technology, and changes in ham operator activity have resulted in significant ARRL initiatives.

We continue using Webex for members to participate in meetings from anywhere. The Webex meeting link will continue being emailed to all.

Dick Norton, N6AA

May 5 also marks three pre-pandemic meeting aspects returning.

First, at 5:30 pm we have a **no-host pre-meeting dinner** with our speaker at the Asaka Restaurant, 31208 Palos Verdes Drive West, Rancho Palos Verdes in Golden Cove Shopping Center. If you like Japanese food and wish to attend be sure to advise our Vice President Ray Day, N6HE, at <u>rayday@cox.net</u> before coming. Because May 5 is Cinco de Mayo the Red Onion Restaurant in Rolling Hills Estates is expected to be extremely busy.

Second, for the first time since March 2020 our "What's Next?" gathering for newer hams meets in our Hesse Park room's alcove area at 6:30 pm. Ask any question about your radios or amateur radio–all will be answered in a courteous and understandable manner. Experienced hams are welcome too.

Third, **we are resuming refreshments** at our in-person monthly meetings, although a bit differently. Refreshments on May 5 will be pre-packaged for members to grab and go but in the near future we'll return to open platters of treats.

Our **June 2** monthly meeting has Dr. Arnold Shatz, N6HC, presenting about serving as team physician on numerous DXpeditions to remote locations.

#### Several additional radio operators needed for RHE

#### "Hills Are Alive" in August

The PVARC's radio coverage at the August 6, 2022 Rolling Hills Estates "Hills Are Alive 10K/5K" still needs several more operators. Contact Walt Ordway, K1DFO, at wfordway@juno.com if you can commit to operate then.

Hills Are Alive is run annually along the city's horse trails to raise money for the Rolling Hills Estates Pepper Tree Foundation.■



# Continuing something new: Random accomplishments of PVARC members...in 35 words or less

Laura, KA6LMR, and Marlee, KA6MJR, report participating in the 2022 SSB ARRL Rookie Roundup...and said they had a blast!

Is there a random accomplishment in your amateur radio future? If so, let us know. Gary, WA6MEM, built a new power amplifier for a donated nonfunctioning Motorola XPR-8300 UHF repeater to replace the existing PV-West repeater unit. The newly working XPR-8300, installed April 26, is now on the air.

PVARC members operating at the April 24<sup>th</sup> Ridgecrest Intermediate School 5K were: Steve, KI6TEQ; Matthew, N6MDC; Herb, KO6RC; Sergio, WA6WV; Bob, AC6RM; David, KE6GFR; and Walt, K1DFO. The race started/ finished on Norris Center Drive.



**Above:** Nearly 560 runners (mostly Palos Verdes Peninsula Unified School District students) ran the Ridgecrest Intermediate School 5K on April 24. The route (shown in yellow) started on Norris Center Drive, turned southeast to Indian Peak Road, then downhill on Crenshaw, northwest onto Silver Spur Rd., finishing on Norris Center Drive. PVARC radio operators were stationed along the route and with the race director. AERIAL IMAGE: GOOGLE MAPS

#### Gadgets for Electronics and Amateur Radio Hobbyists - A Series

#### Gadget #2: PC USB portable digital storage oscilloscope [1]

#### By Jerry Kendrick, NG6R

We're accustomed to thinking about an oscilloscope as a somewhat expensive piece of essential industrial electronics test equipment, or as a fixture atop the electronic hobbyist's well-appointed garage workbench. Oscilloscopes are basically graph-displaying devices that show how signals change with time. The vertical axis represents voltage and the horizontal axis represents time. [2] But, with the proliferation and miniaturization of digital technology, and recognition that virtually all display capability required in an oscilloscope is inherent within even the simplest and cheapest of laptop computers, several manufacturers are now offering relatively inexpensive oscilloscope "front ends" in small and compact packages. These "front-end" units are connected to a companion computer by a universal serial bus (USB) cable that not only provides a serial interface for exchange of control instructions and data but also becomes the oscilloscope's operational power source of 5V DC. One such offering is the subject of this article, the **Hantek** model 6022BE 20MHz-bandwidth dual-channel PC USB portable digital storage oscilloscope. The complete package, including the two probes, USB cable, instruction manual and software disc, is shown in Figure 1.



Figure 1. The dual-channel Hantek model 6022BE package, including probes, USB cable, instruction manual and software disc (Internet stock photo)

Hantek is one of many vendors now competing in this growing marketplace, including Banggood, Owon (via Digi-Key), Instrustar, Velleman, Pico, SainSmart and others, mostly based in China and quite possibly with similar (or even common) designs. Hantek does appear to be the most popular. The author's unit was purchased in January 2020 from China via eBay for \$57 with free shipping, a fairly modest outlay for such a capable device. There has been a noticeable price increase over the past two years, likely due to pandemic-driven supply chain shortage issues.

Hantek makes several models at different price points, distinguished by the number of separate channels and maximum channel bandwidth. Pricing data harvested from Amazon.com or eBay are shown in Figure 2. Prices range from less than \$100 for 2ch/20MHz to over \$300 for 4ch/250MHz.

# Gadget #2: PC USB portable digital storage oscilloscope

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#CH	BW (MHz)	Model #	\$\$\$
2	20	6022BE	70
2	50	6052BE	189
2	80	6082BE	210
4	70	6074BE	209
4	100	6104BE	302
4	200	6204BC	311
4	250	6254BD	370

Figure 2. Pricing data (@ April 2022) collected from Amazon.com and/or eBay showing the relationship (with some scatter) between cost and bandwidth for a given number of channels; noticeable price increase over the past two years, likely driven by supply chain shortage issues

Loading of the software into the host computer is fairly straightforward—just follow the instructions provided. The software loaded onto a laptop using Windows 10 OS with no issues. It makes most sense to load the software onto a laptop for portability, unless the permanent site for the oscillo-scope is a garage workbench that already has a fixed desktop or tower computer and monitor display. Shown in Figure 3 is the portable setup used by the author for the demonstration photos in this article.



Figure 3. Test configuration used for this demonstration. Note the two USB cables plugged into the laptop—one to provide both 5V power and serial data and the other to supply 5V power only—as two cables are needed to meet the power demands of the unit. PHOTO: JERRY KENDRICK, NG6R

The Hantek 6022BE device has two signal input ports so that two different signals can be displayed simultaneously. Having at least two-signal display capability is considered a must when monitoring circuits for cause-and-effect or other relationships between two signals.

Operation of the dual display capability is illustrated with the following example. Since there is a single-frequency square-wave signal generator built in to the Hantek oscilloscope unit, it was desired to construct a simple circuit and display both the input and output of that circuit driven by this signal generator. The simple circuit chosen for this demonstration is a basic low-pass filter—a se-

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# Gadget #2: PC USB portable digital storage oscilloscope

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ries resistor and a shunt capacitor in an "L" configuration – drawn as a schematic in the right half of Figure 4.

The following reasoning was used in selecting component values. The built-in single-frequency square-wave signal generator operates at 1 kilohertz frequency and has a calibrated voltage swing of 2V peak-to-peak. At 1 kHz, a full cycle is 1 milli-second, or 0.5 ms in each half cycle. It was desired to select the "time constant" of this circuit (R x C) to enable the output waveform to almost reach its final maximum value within the 0.5 ms duration of a half cycle. It will reach close to its final maximum value (99%) in about five time constants.

Expressed mathematically then,

5RC = 0.5 ms, or dividing both sides by 5,

 $RC = 0.5/5 \text{ ms} = 0.1 \text{ ms} = 100 \ \mu \text{s} = 10^{-4} \text{ seconds}$ 

Now, in order not to load down the generator (and potentially alter the pristine waveform of the square-wave signal), a high-ohmage value of R of 100 k-ohms (10<sup>5</sup> ohms) was selected. Using the formula above and solving for the value needed for C,

 $C = 10^{-4}/R$ , where  $R = 10^{5}$  ohms. So,  $C = 10^{-4}/10^{5} = 10^{-9}$  Farads = 1 nanofarad = .001 µF (a common value).





Figure 4. (left) Both channel display signals are shown. The upper signal, corresponding to point A in the schematic (right), is the output from the generator that is supplied as input to this simple circuit. The lower signal, labeled B in the schematic, is the output from the circuit and is the voltage across the capacitor. The display voltage per division is set via the control panel to 1 V/div and the time per division is set to 0.5 ms or 500 µs/div.

As can be observed, the display is clean, easy to interpret and stable on the screen. Triggering of both displayed signals is keyed to the trailing edge of the input signal (CH 1).

The control panel for setting the vertical and horizontal scales for the oscilloscope's display, as shown in Figure 5, is always visible on the right side of the display window. Its layout and operation are simple and intuitive. The horizontal display time base can be adjusted by turning the "blue knob" using the mouse or by selecting the digital time base directly from the on-screen window labeled "Time/DIV." There are 39 selectable time steps ranging from 1 ns/div to 5000 sec/div, or from 1x10<sup>-9</sup> to 5x10<sup>3</sup> seconds/division. Likewise, the vertical display voltage is adjusted with independent controls for each channel, the "yellow knob" for CH 1 and the "green knob" for CH 2. Voltages selectable by these controls range from 20 mV/div to 5 V/div. Additionally, each probe is equipped with a two-position slide switch (1X and 10X) to accommodate voltages up to 50 volts/div. And, since there are 8 vertical divisions on the screen, each channel can display up to 400 volts peak-to-peak with the probe in the 10X switch position.

# Gadget #2: PC USB portable digital storage oscilloscope

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This is a large enough voltage range to accommodate most situations encountered by hobbyists.



Figure 5. The control panel, located on the right side of the computer display, offers simple and intuitive control of essential display parameters.

In addition, there is a header section of the computer display screen shown in Figure 6 that is devoted to the same parameter selections as the control panel, but also includes some additional selections not provided in the control panel. Features such as enabling printing, saving of images, and loading in previously saved images are available.

Hantek602	2BE Ver 1.0.6	;								
File View	Horizontal	Vertical	Trigger	Display	Cursor	Utility	Help			
	x÷ R	ЛЛ		K II			$\sim \sim$	AU TO		
4 Scope										
Trig'D										

Figure 6. Header section display.

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# Gadget #2: PC USB portable digital storage oscilloscope

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#### Summary and conclusions

This second-in-a-series article on gadgets for the electronics and amateur radio hobbyist highlights an inexpensive yet quite capable oscilloscope. This oscilloscope is unique; it has no inherent display screen but instead takes advantage of the video processing and display capability built in to every laptop computer. It uses a universal serial bus (USB) connection for signal transfer into the host computer, as well as for supplying 5 volts DC for powering the device's electronics. The oscilloscope is quite simple and intuitive to use, not at all intimidating as the larger and much more complex laboratory scopes can be. As an avid experimentalist or amateur radio hobbyist, for less than \$100 this device should satisfy most of your needs for those occasions when you need to peek at the inner workings of your latest electronics project.■

#### References

1. Gadget #1 QRO article: page 4, http://www.n6rpv.net/n6rpvpage/pvarc/2020QRO/QRO\_Jun\_2020.pdf

2. Tektronix primer: XYZs of Oscilloscopes, https://download.tek.com/document/03W 8605 7 HR Letter.pdf

# **PVARC HF Enthusiasts Group meetings seek a hybrid solution**

The PVARC's April 9<sup>th</sup> HF Enthusiasts Group meeting in the Palos Verdes Library's Purcell Room had six attendees but also tested a virtual meeting option using two iPads for two members at home. The Purcell Room is difficult for virtual meetings due to layout, lighting, and acoustics.

Our May 14 HFE Group meeting will test a different virtual meeting setup. We found the Library's WiFi had sufficient bandwidth as few other patrons were in the building then. But unlike at Hesse Park we cannot wheel in a lot of equipment nor have much time for setting up.

We encourage in-person HFE attendees to bring unwanted radio items that might be useful to others.■



**Above:** Attending the April 9, 2022 HFE meeting in the Palos Verdes Library were (L-R) Jeff, K6JW; Bob, AC6RM; Don, WG6E; Ray, N6HE; and (not pictured at far right) Don, NA6Z; plus Diana, Al6DF, taking the photo. Jerry, Kl6RRD, and Jerry, NG6R, tested the Webex connection from their respective homes..

#### A different path for the Palos Verdes Half Marathon?

We are sorry to learn the LaceUp Running Series recently cancelled all three of its 2022 Half Marathons (Irvine, Palos Verdes, and Riverside) and announced there are currently no plans to resume in 2023.

The Palos Verdes Half Marathon (and predecessor Palos Verdes Marathon through 2011) had been our club's largest public service event annually since the late-1970's. PVARC radio operators were always positioned throughout the race route, at the Start/ Finish, and net control. The Rolling Hills Estates Kiwanis Club was the original sponsor.

We await learning if another organization will assume managing/staging the Palos Verdes Half Marathon. Lexus automobiles had been the LaceUp Running Series lead sponsor in recent years. Stay tuned for further information.■

# Update on PVARC's 2022 Field Day: Operators and assistance needed

The PVARC's 2022 ARRL Field Day (June 25-26) at Soleado Elementary School in Rancho Palos Verdes awaits our permit application's final approval. We expect receiving it within a week.

Rocco Lardiere, N6KN, is again serving as K6PV Field Day chairperson and will host a planning meeting with our Field Day team. If you can either operate, assist with Field Day set-up/take-down, or supply tents or generators please advise Rocco at: <u>roclar4321@gmail.com</u>. Since Field Day is a 24hour operation we also need operators able to work part of an overnight shift.

Lastly, we will ensure prudent health protocols for everyone. More info to follow. ■





**Above:** Midnight view of K6PV's 2018 Field Day operation at Soleado Elementary School. PHOTO: FRAME FROM AI6DF "2018 FIELD DAY IN THE ARRL LOS ANGELES SECTION" VIDEO

# **PVARC upcoming events in 2022**

• PVARC hybrid monthly meetings online via Webex and at Hesse Park

1<sup>st</sup> Thursday each month, 7:30-9:15 pm, except in December

• PVARC HF Enthusiasts Group meetings in-person or via Webex

2<sup>nd</sup> Saturday each month, 10:00 am-Noon in Palos Verdes Library main branch's Purcell Room; Webex virtual option when possible.

 PVARC EmComm Interest Group online meetings via Webex

3<sup>rd</sup> Saturday each month, 10:00-11:00 am or 11:00-Noon (time depends on other radio events that day)

 Walt Ordway K1DFO Technician and General amateur radio license classes at Hesse Park

May 7 and 14, 2022; VE test session, May 21. Other dates to be announced.

- **ARRL Field Day,** June 25-26, Soleado Elementary School, Rancho Palos Verdes
- Public Service Events:
  - Hills Are Alive 10K/5K on Rolling Hills Estates horse trails, August 6, 8 am.
  - Other events TBA.
- PVARC 2022 Holiday Dinner, Dec. 8, Los Verdes Golf
   Course

#### Non-PVARC Events of Note:

- W6TRW Swap Meet, last Saturday each month. 7:00-11:30 am. Northrop Grumman parking lots, Aviation Blvd./Marine Ave., North Redondo Beach
- Dayton Hamvention, May 20-22, 2022. <u>https://</u> hamvention.org/
- SEA-PAC / ARRL Northwestern Division Convention, Seaside OR, June 3-5. <u>https://www.seapac.org</u> ■

## Become an ARRL member: support amateur radio while increasing your learning

Consider joining the American Radio Relay League (ARRL) if not already 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, which requires at least 51% of club members be ARRL members.

Annual ARRL membership costs \$49 and includes your choice of the printed monthly **QST** magazine or the ARRL's new On The Air magazine for newer hams. Both are available electronically to all ARRL members plus free online access to ARRL's two other publications, **QEX** and **National Contest Journal**.

Additionally all ARRL members can access numerous web-based materials, ARRL staff, and assistance with ham radio issues. Visit: <u>www.arrl.org/</u>. ■

# Need a PVARC badge?

If you wish to order a new or replacement engraved PVARC badge please contact Gary Lopes at wa6mem@cox.net and he will make arrangements for your payment and sending your new badge. Badges cost \$13. ■

# **Embroidered PVARC patches** still available

PVARC club patches are still available by special arrangement for \$4 each. They may be sewn onto any cap, jacket, shirt, or bag.

During our period of virtual meetings if you would like a patch contact Diana, Al6DF, ai6df@arrl.net and we'll find a way to get your patch to you. ■

#### May 2022



# About Us...

Welcome to the Palos Verdes Amateur Radio Club, K6PV.

Founded in 1975, today our 150+ members hail from every city in Los Angeles County's South Bay region...and beyond.

Our club fosters diverse ham radio interests including public service, DXing, contesting, digital modes, and electronic experimentation.

We also teach license classes several times annually and gladly assist newer hams in understanding amateur radio technology or procedures.

Many PVARC members serve in the government-affiliated disaster amateur radio groups for the South Bay's cities and Los Angeles County. We also provide public service communication at no charge to sponsors of community and running events.

No matter where you are along your ham radio journey you are welcome as a PVARC member. ■

#### Palos Verdes Amateur Radio Club

An American Radio Relay League Affiliated Club

#### **Board of Directors:**

President
Vice President
Treasurer
Secretary
Directors

Diana Feinberg, Al6DF Ray Day, N6HE Georgiann Keller, KM6YGM Ron Wagner, AC6RW Clay Davis, AB9A Gary Lopes, WA6MEM Bob Sylvest, AB6SY

Past Vice President

#### Appointed Offices:

**QRO** Editor K6PV QSL Manager K6PV Trustee LAACARC Delegate VE Coordinator VE ARRL Liaison Net Control Operators:

Diana Feinberg, Al6DF Jeff Wolf, K6JW Mel Hughes, K6SY Jeff Wolf, K6JW Dave Scholler, KG6BPH Jerry Shaw, Kl6RRD Ron Wagner, AC6RW;

Dale Hanks, N6NNW; Bob Sylvest, AB6SY; Malin Dollinger, KO6MD; Dave Turner, KM6LGX; Jerry Shaw, KI6RRD; Gary Lopes, WA6MEM; Clay Davis, AB9A; Rick Heaston, KG6RH; Jeff Remington, KA6JMR; Laura Remington, KA6LMR; Marlee Remington, KA6MJR; Derek Okada, K6DMO

#### Contact us:

**QRO** Editor: 310-544-2917, ai6df@arrl.net Email: k6pv@arrl.net Website: <u>www.k6pv.org</u> Postal Address: Palos Verdes Amateur Radio Club PO Box 2316 Palos Verdes Peninsula, CA 90274-8316

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

PVARC: K6PV, 447.120 MHz Analog FM: (-), PL 100.0, CTCSS Digital DMR: 447.120 MHz (RX); 442.120 MHz (TX) Talkgroup 31060, Color Code 1, Time Slot 2 "PV-West": W6MTA, 449.980 MHz (-), PL 173.8, CTCSS

Club badges: Gary Lopes, WA6MEM, <u>wa6mem@cox.net</u> Club jackets or patches: Dave Scholler, KG6BPH, 310-373-8166

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Front page photo — Pt. Vicente Lighthouse after breakfast on October 28, 2017. PHOTO: DIANA FEINBERG, AI6DF

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-PVARC	Calendar	OF EVENTS			M	ay <b>2022</b> -
SUNDAY	Monday	TUESDAY	WEDNESDAY	THURSDAY	Friday	SATURDAY
1	2	3	4	5	6	7
		K6PV analog net, 7:30 pm	K6PV DMR net, 7:30 pm	PVARC Monthly Meeting at Hesse Park and via Webex: ARRL SW Dir. Dick Norton 7:30 pm		PVARC ham license classes at Hesse Park taught by Walt, K1DFO, 9:30 am-5:00 pm; also May 14
8	9	10	11	12	13	14
		K6PV analog net, 7:30 pm	K6PV DMR net, 7:30 pm			PVARC HF Enthusiasts Group meets,10:00 am at Palos Verdes Library Purcell Room
15	16	17	18	19	20	21
		K6PV analog net, 7:30 pm	K6PV DMR net, 7:30 pm			PVARC EmComm Interest Group meeting, 10:00 am via Webex VE test session,
<b></b> 22	23	74	25	26	27	Hesse Park 10a
		K6PV analog net, 7:30 pm	K6PV DMR net, 7:30 pm	20		W6TRW Swap Meet at Northrop Grumman, North Redondo Beach
29	30	31				
		K6PV analog net, 7:30 pm				

# Equipment offered for sale by PVARC member

#### For sale by Jeff Wolf, K6JW: Two Heil desk microphones

These microphones are from the estate of my cousin, N3HG, SK. As far as I can tell, neither was ever used by him; nor have I used them other than to test both to confirm that they are fully functional. Both are in mint condition.

#### Microphone #1: Heil HM-12

This microphone is a general use dynamic microphone that has an integral push-to-talk button. It is in current production by Heil and retails for \$79.

Mic does not come with cable. The buyer will have to obtain the correct cable for the intended radio. Cables are readily available from Heil, HRO, DX Engineering, and other suppliers. See on the Heil website at: <u>https://heilhamradio.com/product/hm-12/</u> Price: \$40.00



#### Microphone #2: Heil MD-2 Electret

This microphone was made by Heil for Elecraft or other radios capable of providing required bias voltage on the integral connecting cable. The microphone's cable is compatible with Elecraft radios and may work unmodified with some Kenwood radios. If necessary, an adapter can be found on the internet that will plug into the end of the provided cable for the proper connection to the intended radio. For some radios, it may be necessary to add a bypass capacitor to the cable if audio distortion is encountered. I found excellent audio with no distortion when testing the microphone with a K3. I believe the original price of this mic was between \$120 and \$150. The mic is provided in its original box.



# Equipment offered for sale by PVARC member

For Sale

Flex 6400M - \$2599--

- 100W HF Software Defined Transceiver with auto ATU, HF-6m
- Autonomous operation or Computer Interface via Ethernet
- With original Flex hand mic, packed in original box
- Full specifications and feature set at FlexRadio website: https://www.flexradio.com/products/flex-6400m-signature-series-sdr-transceiver/

Software upgradable/updatable. This is a fully current model running v 2.6.2.50 It can be upgraded to latest software, including SmartSDR<sup>™</sup> via download. Current FlexRadio pricing - new \$3628, used (when available) \$2999 +tax

# Contact: Bob Sylvest. <u>AB6SY@me.com</u> (310) 977-1198



May 2022

Postal mail form below; email version: http://www.n6rpv.net/n6rpvpage/pvarc/membership\_form.pdf

PLOS VEROS	Palos Verdes P.( Palos Verdes <u>htt</u>	s Amateur Radi D. Box 2316 S Peninsula, CA <u>p://k6pv.org</u>	o Club 90274	N	New Member & 2022 Iembership Renewal Form
New:	or Rene	WAL:	_ Мемв	ERSHIP	<b>D</b> ате:
Last Name:		First Name:			Spouse:
Street Address:					
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Phone: Home _		Work		0	Cell
Email address: _	(Unless othe	erwise noted ema	ails will be	sent to	the applying member only)
License Call:	Licens	se Class:	ARRL Mei	nber?	Birth Mo./Day:
Other amateur ra	idio groups you	belong to:			
Additional House	ehold and/or Fan	nily Members (if	Applicable	e):	
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					Individual membership: \$20.00
				or Hou	sehold / Family membership: \$25.00
		(Optional) [	Donation t	o suppo	rt PVARC activities: \$
PayPal:	_Cash:	or Check #:		Date	TOTAL \$
Please make check	s payable to: Palo	s Verdes Amateur	Radio Club;	Dues ba	sed on January 1 <sup>st</sup> to December 31 <sup>st</sup> year.
PayPal payment: G	io to <u>www.paypal.</u>	<u>com</u> , enter recipier	t name as:	PVARC	90274@gmail.com
Α	ll New and Ren	ewal Member	applicati	ons mu	st 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: <a href="http://www.n6rpv.net/n6rpvpage/pvarc/constitution.pdf">http://www.n6rpv.net/n6rpvpage/pvarc/constitution.pdf</a> or upon request.)
Signature: \_\_\_\_\_\_ Date: \_\_\_\_\_\_\_
Family Member Signature: \_\_\_\_\_\_ Date: \_\_\_\_\_\_\_

# QRO

## **Two Free Amateur Radio Courses**

(NOTE: IF REQUIRED BY COUNTY PUBLIC HEALTH ORDER OR THE CITY OF RANCHO PALOS VERDES ALL ATTENDEES MUST WEAR A MASK)

FCC <u>"Technician</u>" course (entry level) FCC <u>"General"</u> course (2<sup>nd</sup> level) <u>Each course is 2 sessions</u> <u>The sessions</u> will be on 7 and 14 May 2022 <u>Technician</u> 9:30 AM to 1:15 PM both Saturdays (bring your lunch) <u>General</u> 1:30 PM to 5:00 PM both Saturdays The FCC tests will be 10:00 AM to noon on 21 May 2022

At the start of the 7 May Technician course, a member of the Palos Verdes Amateur Radio Club will give a 30-minute presentation on how to get further involved in amateur radio.

The class location is at Fred Hesse Community Park, 29301 Hawthorne Blvd., Rancho Palos Verdes, CA 90275 Confirm your attendance to Walt, K1DFO at wfordway@juno.com

> There is <u>no fee</u> 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 \$20 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.