QRO

Monthly Newsletter of the Palos Verdes Amateur Radio Club

August 2020

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All **QRO** monthly issues since 2007 are on the PVARC website at: www.k6pv.org in the "Newsletter" tab. Additional club news appears in emailed PVARC Weekly Bulletin.

PVARC online meeting via Webex

"Using Arduino micro-processors in amateur radio"

Dennis Kidder, W6DQ

Thursday, August 6, 2020

7:15 pm: Webex meeting room opens
7:30-9:00 pm: Meeting and presentation

Use your PC, Mac, Linux, iOS, Android device in full video—or just audio by phone.

We'll be using video conferencing for PVARC meetings until conditions permit resuming in-person meetings.

PVARC's upcoming meeting topics

The PVARC's 7:30 pm **August 6** online monthly club meeting has well-known ham Dennis Kidder, W6DQ, speaking about "Arduino microprocessors for amateur radio." Dennis spoke in-person at four PVARC meetings over the past 12 years while he lived in Fullerton and previously in Rolling Hills Estates. He now resides in Inyokern and is a natural for presenting at virtual meetings. As many already know, inexpensive Arduino boards (mostly made in Italy, such as the Aruduino Uno shown at right) are single-task oriented and widely used for many sensor or controller applications. On the other hand, Raspberry Pi boards (another low-cost microprocessor) are full computers with a Linux operating system and its resulting overhead along with multiple I/O ports. When you turn on an Arduino unit it is ready immediately vs. a Raspberry Pi needing to "boot-up."

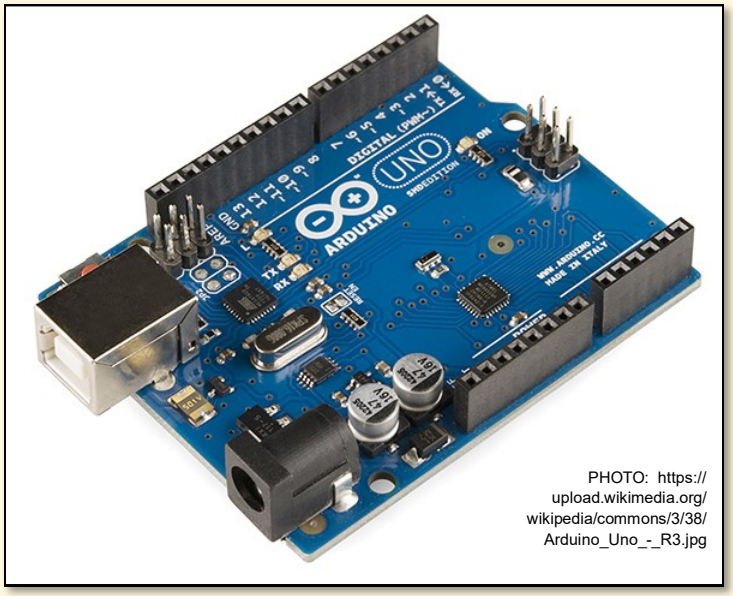

PHOTO: https://upload.wikimedia.org/wikipedia/commons/3/38/Arduino_Uno_-_R3.jpg

The August 6 meeting replaces our usual International Lighthouse & Lightship Weekend event at Pt. Vicente Lighthouse. As events unfolded the PVARC Board of Directors felt it was best to cancel our 2020 ILLW event but we look forward to returning in August 2021. We also thank Captain Kip Louttit and the U.S. Coast Guard for their consideration of our 2020 ILLW. If you have HF capability please make contacts with other lighthouses that will be operating during ILLW on August 21-23. This year the North American QSO Party SSB Contest will be operating August 15, leaving the bands wide open for ILLW contacts.

The PVARC's **September 3** online monthly meeting has ARRL Assistant Laboratory Manager Bob Allison, WB1GCM, speaking from Connecticut about the ARRL's laboratory that tests ham radio equipment for review in **QST** magazine and provides precise measurement of electronic phenomena. Bob is an excellent speaker and many of our club members enjoyed meeting him during the HAMCON 2017 / ARRL Southwestern Division Convention at the Torrance Marriott Hotel.

Speakers for our **October 1** and **November 5** monthly meetings will be announced soon.

The PVARC's December 2020 holiday dinner has been canceled due to COVID-19 limitations as have holiday meals of many other Los Angeles-area radio clubs. We are looking at an alternative holiday event that will still spread the holiday cheer, even if remotely. ■

Status of PVARC public service events

Two upcoming public service events where the PVARC provides free communications support have been canceled for 2020. Walt Ordway, K1DFO, advises the Rolling Hills Estates "Hills Are Alive 10K/5K" had been re-scheduled from August 8 to September 12 but is now canceled. The Labor Day "Conquer the Bridge" run/walk across the Vincent Thomas Bridge over Los Angeles Harbor also will not be held this year.

The Palos Verdes Half Marathon is still scheduled for Saturday, November 21. The PVARC's operator team led by Steve Collins, KI6TEQ, will supply radio communication coverage if this event is held. The official PV Half Marathon website acknowledges COVID-19 is an ever-changing situation and advises runners signing up that in the event of cancellation their race fees will be applied to another event or a postponed PV Half Marathon. ■

Free-to-attend "QSO Today" virtual ham radio expo, Aug. 7-9, could be game-changer for amateur radio conventions

COVID-19 health orders brought many amateur radio clubs into holding online meetings since last April and into 2021. Now we can add virtual hamfests and conventions to that.

The first-ever virtual hamfest happens during August 7-9, 2020, when QSO Today enables amateur radio operators worldwide to attend from the comfort of home or wherever there's reasonably fast internet access. QSO Today is free of charge for ham operators—fees from exhibitors cover all the bandwidth and "setup." Hams may register at: https://www.qsotodayhamexpo.com/ and see the complete list of 60+ presentations and the exhibitors who will have virtual booths. Registered attendees may additionally view all presentations and vendor rooms for 30 days afterwards.

Despite being held virtually QSO Today is an ARRL-sanctioned hamfest and won't be the last of its type. Besides the necessity based on public health conditions preventing in-person events, virtual hamfests and conventions have obvious economic advantages. Attendees incur no expenses for travel, hotel, parking, or admission; for the organizers no venue costs for meeting rooms, exhibit space, audio-visual equipment rental, or onsite labor. The obvious disadvantages: little opportunity for attendee mingling, no flea-market for used radio gear, and inability to "touch" exhibitors' products.

QSO Today came together fairly quickly, as did similar virtual conventions for many industry and trade groups this year. It's important noting that these virtual conventions do not operate via Zoom or Webex types of meeting platforms. Instead they use web browser technologies that can handle 50,000+ attendees without users needing to download any software apps. If you can't be at QSO Today there's already the virtual 2021 International DX Convention replacing the usual gathering in Visalia, CA, next April. ■ — *Diana Feinberg, AI6DF*

Above: Screen shot of QSO Today website's home page, https://www.qsotodayhamexpo.com/. Further down this home page is a click button for free registration to QSO Today.

Ham antennas would become more difficult to obtain (or impossible for some) under proposed RPV antenna ordinance

By Diana Feinberg, AI6DF
PVARC President

The Rancho Palos Verdes Planning Commission's August 25 meeting will continue a public hearing from its July 28 meeting on proposed amendments to the city's non-commercial (amateur) radio antenna code. Many of these amendments are detrimental to amateur radio in that they unrealistic or impractical under the Federal Communication Commission's PRB-1 ruling.

The FCC's discussion of PRB-1 is lengthy but one paragraph best summarizes it:

> 25. Because amateur station communications are only as effective as the antennas employed, antenna height restrictions directly affect the effectiveness of amateur communications. Some amateur antenna configurations require more substantial installations than others if they are to provide the amateur operator with the communications that he/she desires to engage in. For example, an antenna array for International amateur communications will differ from an antenna used to contact other amateur operators at shorter distances. We will not, however, specify any particular height limitation below which a local government may not regulate, nor will we suggest the precise language that must be contained in local ordinances, such as mechanisms for special exceptions, variances, or conditional use permits. Nevertheless, local regulations which involve placement, screening, or height of antennas based on health, safety, or aesthetic considerations must be crafted to accommodate reasonably amateur communications, and to represent the minimum practicable regulation to accomplish the local authority's legitimate purpose.

Staying informed about Rancho Palos Verdes' proposed non-commercial antenna ordinance

To receive emailed copies of all City staff reports, Planning Commission agendas, and correspondence pertaining to RPV's proposed non-commercial antenna code amendments please send an email to:

Ms. Jaehee Yoon jyoon@rpvca.gov
Associate Planner
City of Rancho Palos Verdes Community Development Department

A suggested email would be:

Dear Ms. Yoon,

Please add me as an Interested Party to all current and future notifications, agendas, staff reports, etc. regarding the Amateur Radio Code Amendment matter under consideration by the Planning Commission.

Also, please email me the Late Correspondence PDF documents for the Planning Commission meeting of July 28, 2020 and future meetings.

Thank you.

(Your name and email address)

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Ham antennas would become more difficult to obtain (or impossible for some) under proposed RPV antenna ordinance

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The City's existing code for amateur radio antennas was carefully developed in 1999 with input from several knowledgeable PVARC members, community members, and the city's Director of Community Development. In our opinion the existing code has served the city well in balancing the communication needs of amateur operators with their neighborhoods. Not all hams want or need towers...in fact, very few tower applications are received in RPV due to the expense involved and many hams having other radio interests.

It's important to note the existing RPV amateur antenna code and PRB-1 do not require granting every ham operator an antenna permit at the height they requested. Rather, localities under PRB-1 must reasonably accommodate amateur radio communication on intended frequencies.

So what's wrong with some of the proposed amendments? They do not represent reasonable accommodation.

First, the proposed code lowers the height for a "by right" antenna not requiring any permit or city approval from 16' to 12' above ground. Given RPV's rugged terrain and wrap-around letter "C" geography many emcomm hams needing an external antenna won't be able to effectively communicate on VHF/UHF. That extra four feet can make a difference. Palos Verdes Estates currently has a 15' "by right" antenna limit. We advocate keeping the existing 16' height.

Second, financial burdens on antenna applicants will substantially increase under the proposed code amendments. Any antenna structure over 12' would require the applicant to fabricate a complete mock-up of the structure and its antenna, temporarily install these, and have the mock-up certified for safety by a licensed structural engineer. These will likely add at least $4,000 to the cost besides the city's filing fees which currently are $382 for any structure 16' to 41' and $1,225 for over 41' because the latter goes to the Planning Commission. Under the proposed code all antenna structures over 28' will require Planning Commission approval with the $1,225 filing fee while any structure 12' to 28' has the $382 fee.

Next, any antennas exceeding 12' height in the proposed ordinance would require notifying every property owner within a 500' radius instead of only the immediately adjacent properties. Currently antenna structures exceeding 41' require notifying all other property owners in the 500' radius.

Fourth, the proposed antenna code would prohibit use of any guy wires or any lattice type structure (that's how most amateur radio towers are made). These are very impractical limitations.

Fifth, the proposed ordinance requires all antennas to be retracted to their minimum height when not in use. While it seems a worthwhile idea the reality is that antenna tower lift cables aren't designed for repeated up-down-up cycles throughout a day.

Lastly, the proposed ordinance calls for all antenna structures to minimize their presence through camouflage, paint, foliage, or texturing "to be compatible with surrounding architectural elements and building materials." That too will add greatly to the cost.

On the other hand there is positive news: some hams have wrongly concluded that amateur antennas in RPV would be limited to 41'. A careful reading of the proposed ordinance shows no height limit. What would change is that antenna structures between 12' and 28' need approval by the city's Director of Community Development (vs. those from 16' to 41' currently) while all antenna structures over 28' would require Planning Commission approval vs. only those over 41' currently. Nevertheless these and the discussed changes above will cause significantly higher costs to ham operators in the antenna permit process….a subtle way to discourage/prevent ham antennas through pricing.

We hope PVARC members will provide comments to the Planning Commission before the August 25 meeting. Send comments to: planning@rpvca.gov ■

DDS VFO

By Jerry Kendrick, NG6R

This article describes a DIY project for a variable frequency oscillator (VFO) using a direct digital synthesizer (DDS). The initial application of this DDS VFO is a VLF/LF/MF/HF sine-wave signal generator for bench troubleshooting and circuit performance assessment. However, there are tentative plans to use this finished project in a 3-band (40m, 30m, 20m) cyclic time-sequenced very-low-power Weak Signal Propagation Reporter (WSPR, pronounced "whisper") beacon transmitter [1][2]. Preserving that possibility for a future effort will govern the physical layout of the finished product.

DDS modules have become so ubiquitous and inexpensive that their applications in ham radio projects, such as software defined radios, are increasingly common. The DDS can be found in signal generators, local oscillators (LOs), function generators, modulators, sound synthesizers and phase-locked loops [3][4][5].

A direct digital synthesizer basically consists of a frequency reference (such as a crystal), a numerically-controlled oscillator and a digital-to-analog converter (DAC). Also, there is generally a low-pass filter following the DAC for some applications to clean up and smooth out the resulting analog output signal by removing/attenuating harmonics and spurs. The value of that for certain applications will be demonstrated later in this article.

The DDS module selected for this project is designed around the AD9850 DDS chip manufactured by Analog Devices, Inc. of Norwood, Massachusetts [6]. The module can be purchased inexpensively on eBay, Amazon.com and from several other online sources. The DDS module used for this project was purchased from eBay for about $12.

This DIY project consists of six key components: the DDS module; an Arduino Nano microcontroller board, as used in previous projects and documented in prior **QRO** articles [7][8][9]; a rotary encoder; an LCD for displaying the selected frequency; a buffer amplifier to increase the power output from the DDS module to a level suitable for bench testing purposes; a regulated 12V and 5V DC supply board; and with interrelationships among these components shown conceptually in Figure 1.

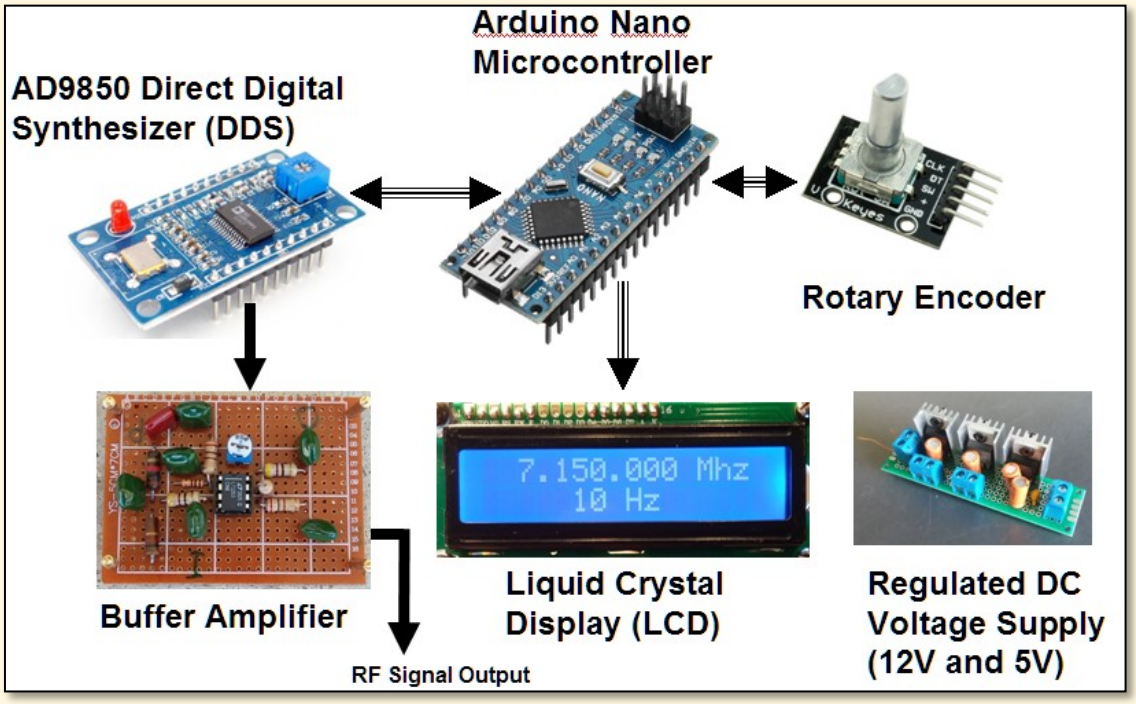

Figure 1. Key components of the DDS VFO. The Arduino Nano microcontroller is the central player, coordinating the actions of: the DDS, which generates the precise analog frequency (range of 10 Hz to 30 MHz) specified digitally by the microcontroller; the rotary encoder, which instructs (via the microcontroller) the generated frequency to either increase or decrease by the selected step size; the LCD, which displays both the output frequency and the selected incremental frequency step size. Step size is selected incrementally in decades from 10 Hz to 1 MHz by pushing in the shaft of the rotary encoder [14]. The wideband LT1253-based buffer amplifier provides about 20 dB of additional gain to create an adequate output signal for bench testing purposes. The silver colored component at the left end of the DDS module is a 125 MHz crystal; the mid-board IC is the actual AD9850 DDS chip.

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DDS VFO

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Preconstruction assessment

Numerous hams have constructed DDS-based adjustable frequency sources using the AD9850 and Arduino microcontroller working in concert. A configuration very close to what is desired for this project was previously created by Rich AD7C [10]. The schematic drawn in Reference [10] shows how the various pins of the DDS module, the Arduino Nano and the LCD are interconnected. The configuration shown in that schematic is replicated in the initial breadboard shown in Figure 2. [Exception: "D10" on the Nano board is connected to "DATA" (not shown in schematic) on the DDS module, not "D7."]

The Arduino microcontroller software code or sketch for the project was also taken from Reference [10]. It required very little modification for use in this project. The lines of code in the sketch are simply highlighted, copied and then pasted into the desktop's Arduino Integrated Development Environment (IDE) prior to loading into the microcontroller via the USB cable. Once a couple of modifications were made [e.g., remove a feature related to intermediate frequency (IF) that the creator wanted, but which this author did not] and the sketch was loaded, the display lit up with the pre-loaded initial frequency of 7.150 MHz and with a default 10 Hz rotary encoder step size (as shown in Figure 1).

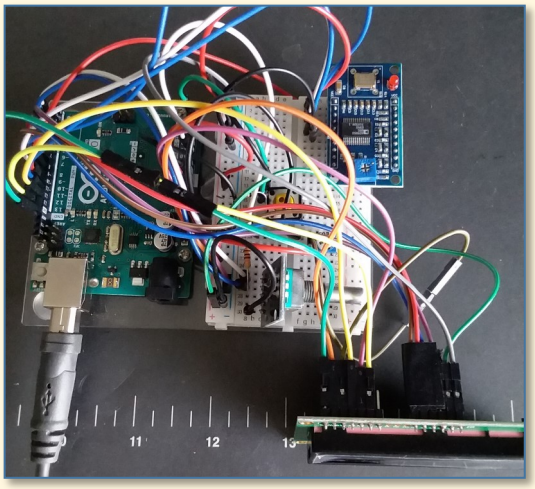
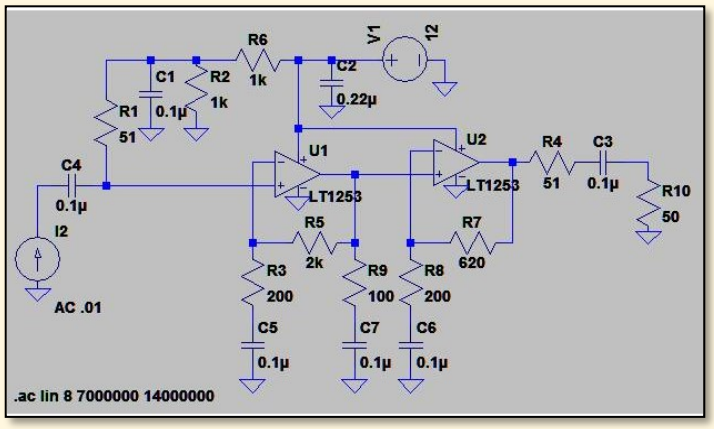


Figure 2. Author's breadboard of four of the six components of the DDS VFO (less the homemade buffer amplifier and regulated voltage boards). An Arduino UNO was used in lieu of the smaller Nano, but it has similar pinouts. The USB cable in the lower left not only provides power for all active components via the Arduino 5V bus, but also provides the means for uploading the software program or "sketch" into the Arduino microcontroller.

Relative to the buffer amplifier, it is known that the DDS module is designed to have a constant-current output, rather than a constant-voltage output. There are commercial amplifiers available that exploit this fact and provide up to 20dB of additional gain relative to that supplied by the DDS module itself [11]. Rather than purchase a commercial amplifier, it was decided instead to use the schematic of the commercial LT1253-dual-video-op-amp circuit shown in Reference [11] and build it using parts from our existing component supplies. Only the LT1253 op amp IC itself needed to be procured.



Prior to the decision to make, rather than buy, this amplifier, the schematic in Reference [11] was simulated using LTSpice. The SPICE simulation tool is very familiar and has been used for previous PVARC projects [12]. The simulation diagram is shown in Figure 3.

Figure 3. The author's LTSpice simulation of the homemade buffer amplifier based on the schematic of a commercial unit [11]. Operation of this amplifier over the frequency range of 7 MHz to 14 MHz was successfully simulated, which provided the confidence to proceed with the amplifier build process. See Reference [16] regarding a change in the value of R1 subsequent to completing this SPICE simulation.

Hardware construction

Once the breadboard proved the feasibility of design and correct wiring, coupled with the successful SPICE simulation of the buffer amplifier, construction of the final product began. A relatively large enclosure was available, considerably larger than was essential for just the components shown in Figure 1. It was prepared by stripping the contents and front plastic control panel from a decades-old and discarded DirecTV set-top receiver box donated by friend and fellow PVARC member Don WG6E, and spraying the exposed front metal panel with copper-colored paint.

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DDS VFO

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Knowing that future incorporation of other components to create a complete WSPR beacon transmitter might occur someday, only the space necessary for the layout of the six components shown in Figure 1 was allocated inside the enclosure. The front and overhead views of the finished DDS VFO are shown in Figure 4.

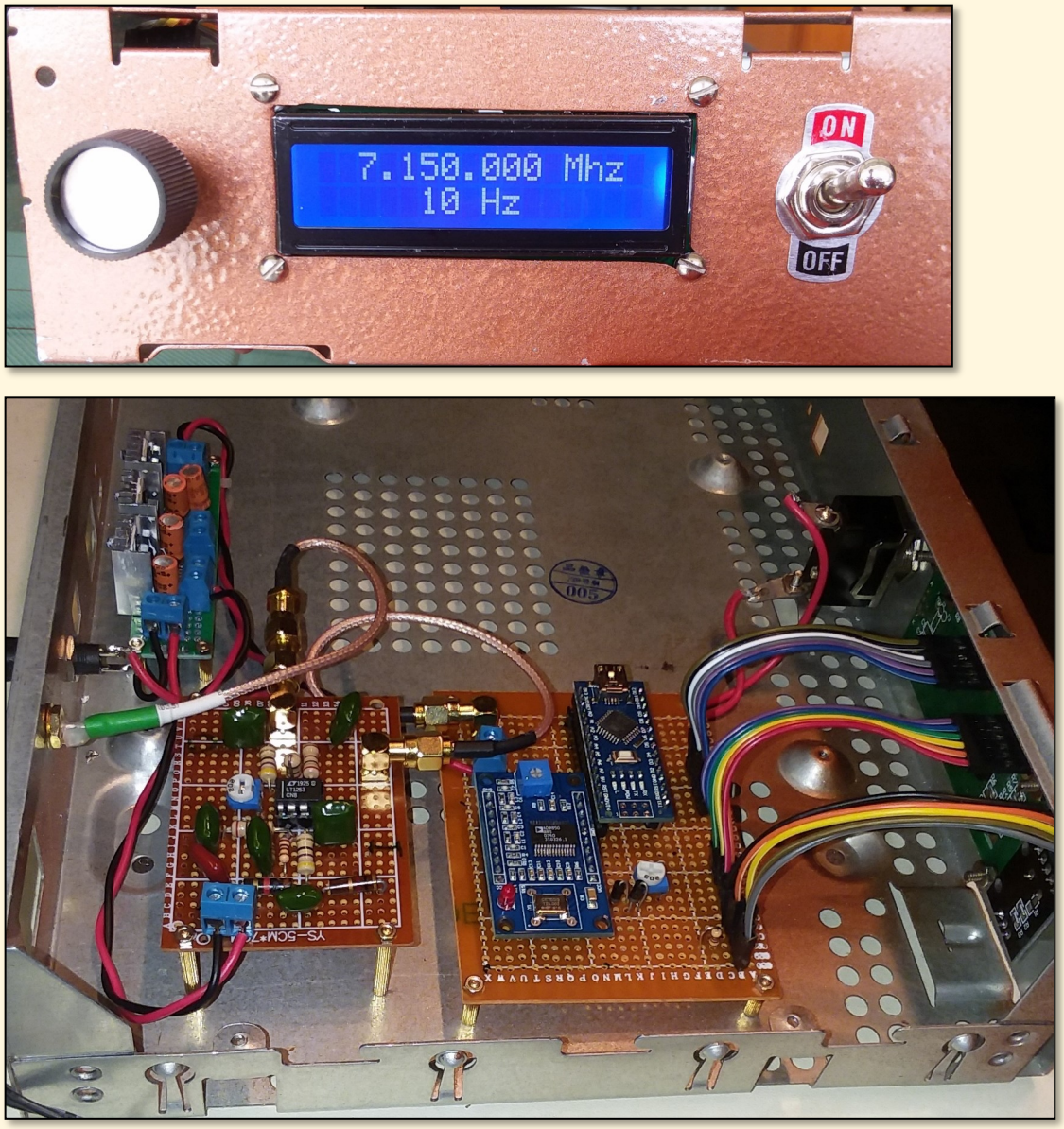

Figure 4. Front panel view (upper) and overhead view (lower) of the finished DDS VFO. Components of the DDS VFO unit occupy less than half the available real estate within the enclosure, allowing room for additional components if/when this unit is converted into a WSPR beacon transmitter. The DDS and Nano microcontroller modules, seated in parallel pairs of single-row IC sockets, are integrated onto a single thru-hole prototyping circuit board (middle of the figure) and wired via ribbon cables to both the LCD and the rotary encoder on the front panel. The op-amp-based RF linear amplifier is shown on the left. Coaxial cable connections to/from this amplifier board are via board-mounted SMA connectors; the RF output exits the rear of the enclosure to provide the sine-wave output from the unit. The board shown in the upper left is a sequence of three voltage regulators: LM7812 for 12V, LM7808 for 8V and LM7805 for 5V. The 12V regulated voltage powers the amplifier board, the 5V regulated voltage powers the Nano module and the 8V output is currently not used. Two voltage-dropping generic diodes (1N4002) wired in series, shown standing upright on the Nano/DDS board, drop the 5V regulated voltage down to ~ 3.6V to power the DDS module. Although the DDS module can tolerate 5V, it operates warmer than desired at the higher voltage, so decreasing its supply voltage to 3.6V using two forward-biased diodes in series enables cooler operation of its AD9850 chip.

DC power for the DDS VFO unit is supplied by a "15V/1Amp" wall wart, whose no-load output voltage is ~19.5VDC. As demonstrated in a previous **QRO** article [13], the output voltage when no load is connected can be considerably higher than the voltage printed on a wall wart's label. The wall wart output voltage will drop as the load increases and, although not tested on this particular wall wart, the output voltage at approximately 1 ampere of current—its stated nominal operating point—will likely be about 15VDC. However, as also shown in Reference [13], undesirable AC ripple voltage increases nearly linearly with increasing load. For that reason, a source of regulated DC voltage is essential.

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DDS VFO

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The circuit shown in Figure 5 was conceived and constructed to provide 12V regulated voltage for the amplifier as well as 5V regulated voltage for the Arduino. As mentioned earlier, to provide DC supply voltage to the more sensitive DDS, regulated 5V was reduced to ~3.6V by using a series pair of forward-conducting diodes (each dropping ~0.7V).

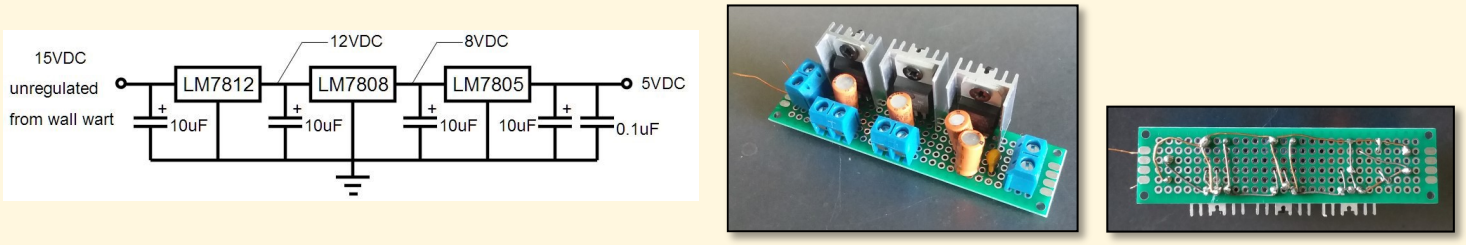

Figure 5. (Left) Schematic of the three-stage voltage regulator board; (Middle) overhead view of its realization in hardware; and (Right) rear of board showing thru-hole component interconnects. Heat sinks were added to eliminate some of the heat created in each of the regulator ICs.

The thru-hole construction method using two-sided prototyping circuit boards was employed for all boards. The rear wiring connections of the Nano/DDS board and the amplifier board are shown in Figure 6 below.

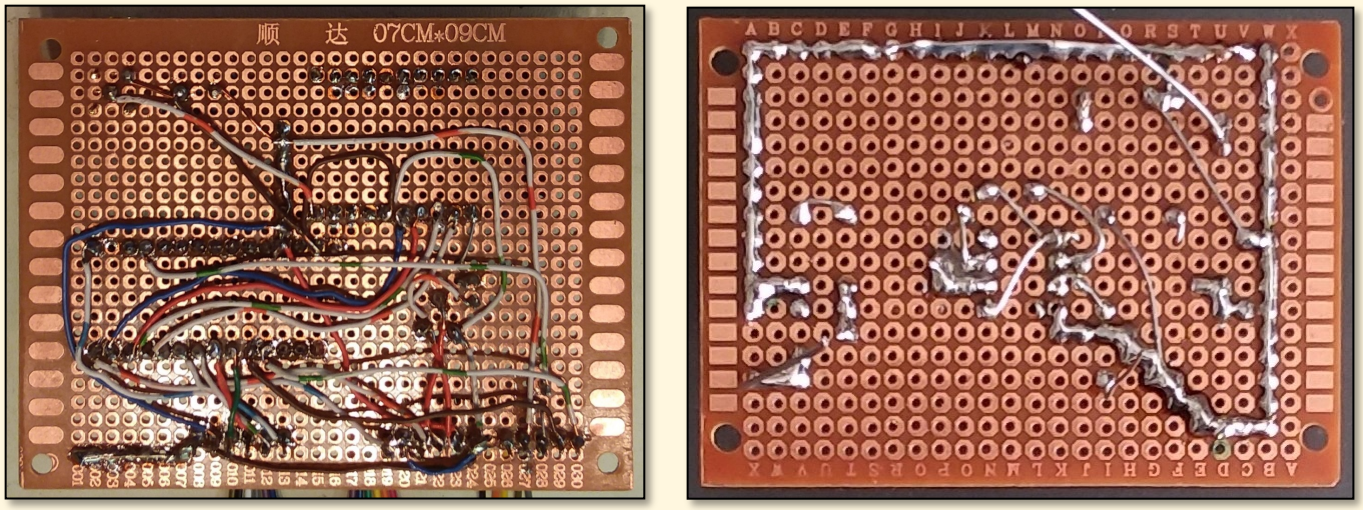

Figure 6. Rear interconnections of the Nano/DDS board (left) and the linear RF amplifier board (right). A continuous wire-embedded perimeter solder bridge is a convenient ground on the amplifier board.

Output RF testing

An oscilloscope was attached to the DDS VFO unit's RF output SMA connector and an arbitrary near-midrange frequency of 14.25 MHz was dialed into the VFO by successively selecting appropriate step sizes [14] and rotating the rotary encoder knob on the front panel. The resulting scope trace is shown displayed on the Rigol DS1054 oscilloscope in the middle of Figure 7. While the sine wave's visual shape looks quite good, it will not be perfect (i.e., with no harmonics) since it was created with physical hardware (and hence is non-ideal). It is important to determine just how extensive are the harmonics, which will reveal just how close to "perfect" is the RF signal. (Recall that should this unit ever be used for ham radio transmissions, regulations require that power from any spurious emissions be 43dB or more below the fundamental [15].) Since the peak-to-peak voltage coming from the amplifier exceeds that allowed by the sensitive spectrum analyzer (SA), a multiple-decades attenuator was then inserted between the unit RF output SMA connector and the Rigol DSA815 Spectrum Analyzer. An attenuation of 20dB was selected, which was sufficient to bring the fundamental signal at 14.25 MHz down below the recommended maximum SA input of 0 dBm (1 mW). For this test, the spectrum analyzer was set up to display a range from 10 MHz to 60 MHz. This range enabled the measurement of the fundamental power as well as the second, third and fourth harmonics, as shown in the lower portion of Figure 7 (next page).

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DDS VFO

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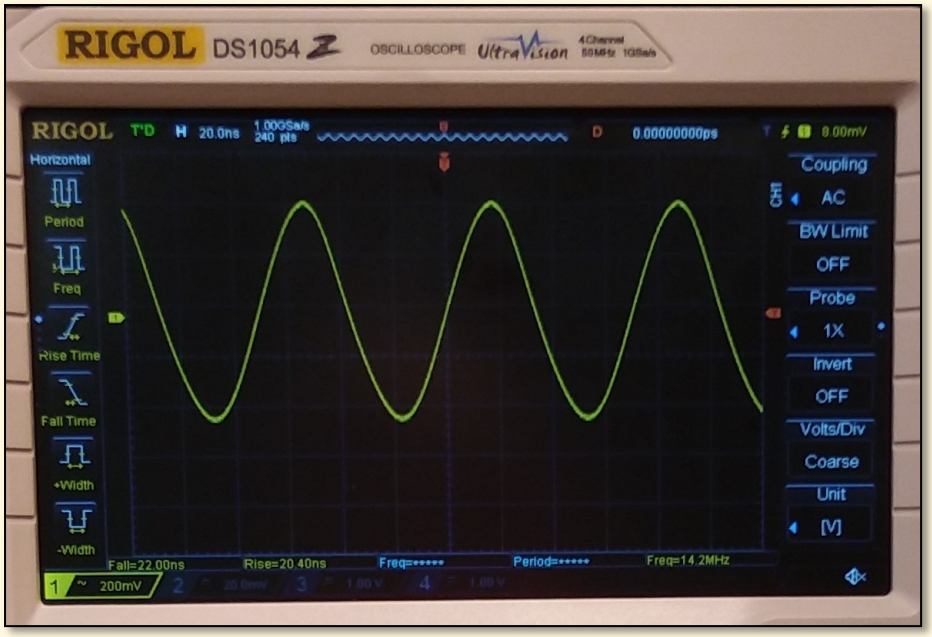

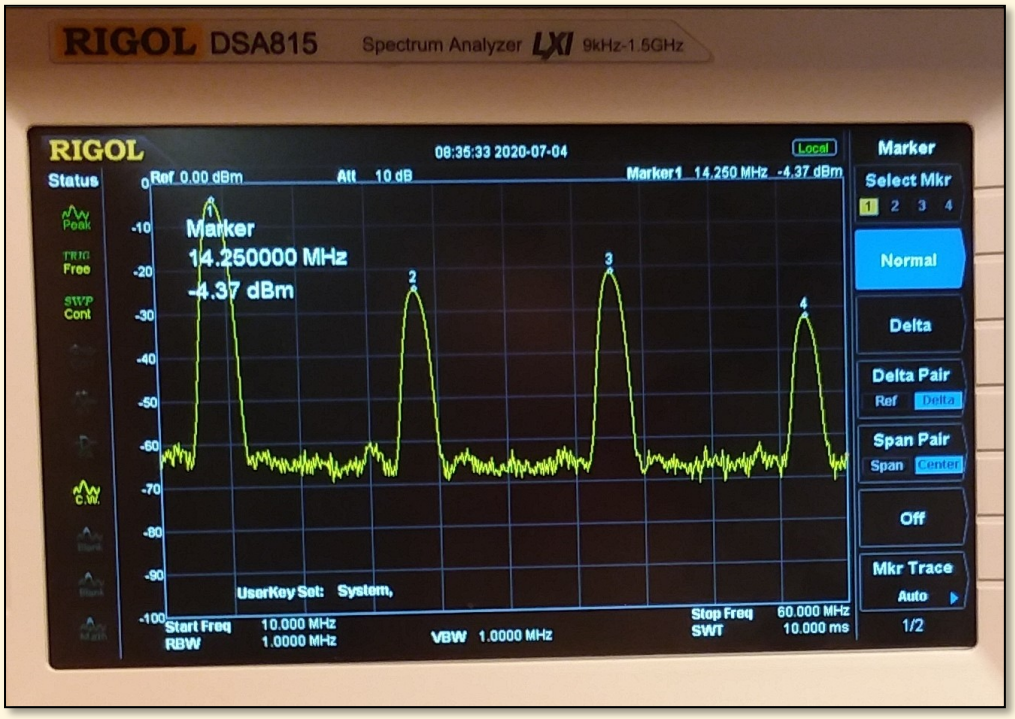

Figure 7. (Upper) A frequency of 14.25 MHz was selected with the front panel rotary encoder knob.

(Middle) The generated sine wave appears visually acceptable, yet the spectral content must be further examined to determine the true quality of the sinusoidal waveform.

(Lower) The harmonic power (through the 4th harmonic) of the generated waveform relative to the fundamental power of -4.37dBm (Marker 1) was measured as follows: second harmonic (Marker 2) -21.1dB; third harmonic (Marker 3) -17.5dB; fourth harmonic (Marker 4) -28.2dB. Additional harmonics (well beyond the 4th harmonic) will be successively reduced in power, eventually trailing off to a negligible level. Clearly, harmonic filtering would be required before this unit could be used for ham radio transmissions [15]. Whether the sine-wave quality and this level of harmonics (without additional filtering) would be considered acceptable for bench testing is a matter of judgment and would depend on the nature of the test(s) being performed.

Summary and conclusions

This project integrates a direct digital synthesizer with a microcontroller in order to manually (or automatedly, with some code modifications not included here) select any frequency from 10 Hz to 30 MHz, amplify that signal and make the resulting sinusoidal waveform available for use as a bench RF source for troubleshooting or circuit assessments.

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DDS VFO

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With additional filtering, this VFO could be used as a very-low-power amateur radio transmitter, suitable as a WSPR beacon transmitter on any of several HF bands.

Demonstrated here is the fact that hardware-based creation of a sinusoidal waveform will manifest harmonics, i.e., multiples of the fundamental frequency. A hardware-created sine wave that looks very good on an oscilloscope will nevertheless have harmonics at some (albeit low) level and may also have other spurious components. Only spectral decomposition of the waveform using an appropriate spectrum analyzer will ensure that the harmonic and spur content is reduced enough to meet the requirements of the intended application.

The sketch loaded into the Arduino Nano for the DDS VFO project was altered minimally from a sketch found on-line. Typical for the author's projects, the Arduino sketch for the DDS VFO is available to any PVARC member who is interested in experimenting with DDS modules and/or WSPR beacon transmitters. ■

References

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2. Conversations with WSPR enthusiast, Doug Johnson, KE6NFH
3. https://en.wikipedia.org/wiki/Direct_digital_synthesis
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13. Page 4, http://www.n6rpv.net/n6rpvpage/pvarc/2019QRO/QRO_Jun_2019.pdf
14. Steps selectable by pressing in the shaft of the rotary encoder: 10Hz, 100Hz, 1kHz, 10kHz, 100kHz, 1MHz
15. Para (d), https://www.law.cornell.edu/cfr/text/47/97.307
16. Conversation with PVARC member Clay AB9A who suggested an increase in R1 from 51 ohms to approximately 1 kilohm; such an increase would better decouple the amplifier effective input load resistance from the DDS module output drive circuitry. The original amplifier schematic from Reference [11] anticipated a different output amplifier-driving circuit (immediately following the AD9850 chip) versus the output circuitry built in to the particular commercial DDS module used in this project. This suggestion resulted in increased amplifier output power. ■

PVARC Club News

Become an ARRL member: Support amateur radio while increasing your learning

Please consider joining the American Radio Relay League (ARRL) if not 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 an ARRL-affiliated club requires at least 51% of club members also 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 a new member benefit: 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: www.arrl.org/ then click "Join/Renew."■

PVARC badges await pickup at another time or by mail

Gary Lopes, WA6MEM, has the following PVARC badge(s) ready for distribution:.

- NA6Q

To make pick-up or mailing arrangements with Gary (or to order a badge) contact him at: wa6mem@cox.net. ■

Embroidered PVARC patches available at monthly meetings

PVARC club patches are available at our monthly meetings or special arrangement for $4 each. They may be sewn on 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
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, kelvin@vanderlip.org

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 in 2020) 7:30 pm via Webex at Fred Hesse Park, 29301 Hawthorne Blvd., Rancho Palos Verdes, CA. Visitors always welcome.

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

To order a Club badge:
Gary Lopes, WA6MEM, wa6mem@cox.net

To order a Club jacket or patch:
Dave Scholler, KG6BPH, 310-373-8166

Front page photo — Pt. Vicente Lighthouse during PVARC's International Lighthouse & Lightship Weekend, August 17, 2018.
PHOTO: DIANA FEINBERG, AI6DF

PVARC Club News

PVARC upcoming dates in 2020

- **PVARC monthly meetings online via Webex**

  1st Thursday each month, 7:30-9:00 pm, except in December.
  (in-person meetings at Hesse Park's McTaggart Hall will resume when permitted)

- **PVARC HF Enthusiasts Group meetings online via Webex**

  2nd Saturday each month, 10:00 am to Noon
  (in-person meetings at Palos Verdes Library main branch's Purcell Room will resume when permitted)

- **PVARC EmComm Interest Group online meetings via Webex**

  3rd Saturday every month, 10:00-11:00 am

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

  Saturdays, Nov. 7 and 14, 2020; exams, Nov. 21.

- **Field Operating Events:**

  (PVARC participation canceled) **International Lighthouse & Lightship Weekend**, Aug. 22-23.

- **Public service events in 2020:**

  (Event canceled) **RHE Hills Are Alive 10K/5K run/walk,** Aug. 8.

  (Event canceled) **Conquer the Bridge race,** Labor Day, Sept. 7.

  Palos Verdes Half Marathon-10K-5K, Nov. 21.

- **PVARC 2020 Holiday Dinner:** Dec. 3 TBA

Non-PVARC Events of Note:

- **W6TRW Swap Meet:** *(when permitted to resume)* last Saturday each month, Northrop Grumman Space Park, North Redondo Beach, 7:00-11:30 am. (Uncertain in August 2020.) ■

All events above subject to modification or cancellation as public health conditions warrant.

WELCOME NEW MEMBERS OF THE PALOS VERDES AMATEUR RADIO CLUB IN 2019-2020

Georgiann Keller, KM6YGM

Annalise Little, KM6YGS

Tim Couture, KM6QWA

Frank Brown, KM6YGQ

Charlie Hansen, AJ6HZ

Diana DiDomenico, KM6IQN

William McClure, W7QLI

Rick Shigio, K6RTS

David Calloway, K6DKC

Jon Kuroyama, K6LDQ

Ray Grace, WA6OWM

Robert Keller, K9BGC

Alex Marko, KD6LPA

Erin Okada, KN6FYV

Derek Okada, K6DMO

Xing Yang, KN6FYX

Stephen Anderson, KN6FZA

Charles Tang, KN6FYY

Ikue Duncan, KN6FYW

Judy Frankel, KN6FYU

Robert Sawyer, KG6SFQ

Heidi Gransar, KN6HVG

Bruce Ward, KN6HVI

David Salazar, KE6GFR

Ed Jenkins, K6EXY

David Hostetler, W6OQ

Robert Rodriguez, KN6FQL

PVARC Calendar August 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4 PVARC analog DMR weekly net on K6PV repeater 7:30-7:55 pm	5 PVARC digital DMR weekly net on K6PV repeater 7:30-7:55 pm	6 PVARC Monthly Meeting 7:30-9:00 pm via Webex	7	8 PVARC HF Enthusiasts Group, 10 am to Noon via Webex QSO Today virtual ham radio convention
9 QSO Today virtual ham radio convention	10	11 PVARC analog DMR weekly net on K6PV repeater 7:30-7:55 pm	12 PVARC digital DMR weekly net on K6PV repeater 7:30-7:55 pm	13	14	15 PVARC EmComm Interest Group, 10:00-11:00 am via Webex
16	17	18 PVARC analog DMR weekly net on K6PV repeater 7:30-7:55 pm	19 PVARC digital DMR weekly net on K6PV repeater 7:30-7:55 pm	20	21	22
23	24	25 PVARC analog DMR weekly net on K6PV repeater 7:30-7:55 pm	26 PVARC digital DMR weekly net on K6PV repeater 7:30-7:55 pm	27	28	29
30	31					

Please tell your friends and family about our November 2020 classes scheduled 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 7 and 14 November 2020
Technician 9:30 AM to 1:30 PM both Saturdays (bring your lunch)
General 1:45 PM to 5:00 PM both Saturdays
The FCC tests will be 10:00 AM to noon on 21 November 2020

At the start of the 7 November Technician course, a member of 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, CA 90275
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 $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.

Palos Verdes Amateur Radio Club
P.O. Box 2316
Palos Verdes Peninsula, CA 90274
www.k6pv.org

NEW MEMBER & 2020 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 $_____

PayPal:_____Cash: _____ or Check #: _____ Date_____ TOTAL $_____

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

PayPal payment: Go to www.paypal.com, enter recipient name: PVARC90274@gmail.com

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.k6pv.org or upon request.)

Signature:_____ Date: _____

Family Member Signature: _____ Date: _____

Family Member Signature: _____ Date: _____