



THE

April 2017

# PROPAGATOR

The Monthly Newsletter of the South Orange Amateur Radio Association

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## Meeting

April 17, 2017

7:00 PM

N.P.

Murray Center  
Veterans

Way Mission Viejo

## You and SOARA

The next SOARA meeting will be an open discussion with membership for how to improve SOARA. We have been having difficulty recruiting volunteers for various tasks. One idea is to break up the Activities Director position into three volunteer tasks. First, field Day. Second, the SOARA picnic. and Third, the Christmas party. We are also thinking about a more formal Elmer program. SOARA has many very talented amongst the membership. How could we better help the new hams get started?

Since we don't have an official Field Day organizer, it's prudent to spend part of this meeting on Field Day assignments and set a date to check out equipment. Yes, we need volunteers to help with all aspects of field

Another topic for discussion is to start a training program for Assistants to Officers and Directors. Perhaps, each board member will briefly explain what they do. Some positions are very technical or have important requirements for the health of our radio club. If you are interested in improving SOARA, please attend and offer your ideas and help.

73,  
Ed Barnes, WA6ED

## President's Message

"That's Not Real Ham Radio"

By Bob Witte, K0NR, from AmateurRadio.com, a ham radio blog I subscribe to., April 12, 2017. I found the message to be

very appropriate, given our past, recent, and growing interest in the digital modes, such as DMR (a recent SOARA Saturday topic) D-Star, T65, SDR's etc. While many decry these "impurities" creeping into the hobby, I think Bob, K0NR has the perfect take: Have fun and share it. I couldn't have said it better, so here's Bob's article:

### That's Not Real Ham Radio

Things had been pretty quiet on the ham front lately but then I ran into a string of "That's Not Real Ham Radio" discussions. This happens from time to time...I usually ignore it...but this time I got sucked into the topic.

It started with some HF enthusiasts I know talking about how "digital modes" are just not very satisfying. Their point is that with CW and SSB, there is an audio connection to your ear that makes you an integral part of the radio communication. The extreme-DSP modes such as JT65 insert serious signal processing that essentially removes the human connection. This can quickly lead to the generalization that these digital modes "aren't real ham radio."

I think its fair to say that most hams think of the HF bands as the center of the hobby...getting on the air, bouncing signals off the ionosphere to talk to someone over the horizon. Some hams will go even further and say that CW is the only way to go. Anything less is just phone. FM and repeaters? Forget that stuff...not enough skill required. And certainly, [don't get stuck on 2 meters.](#)

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COMING  
SOON

**SOARA**  
Saturday  
April 22

**High Desert**  
**Trails Rally**  
May 6

**OC Marathon**  
May 7

**Laguna Hills**  
**Half Marathon**  
May 29

**ARRL Field Day**  
Jun 23-25

## VEC License Exams

6pm—before  
the General  
Meeting

Please see our  
[website](#) for  
more info.

Walk-ins ok.

Extra | General |  
Technician

## Raffle Report

This is what we will be raffling off at the next meeting \$5 prize is a **Yaesu FT-65R/E**. We sold 51 tickets for the last \$5 raffle for the same radio. I thought I would try it again.

\$1 prizes. This mostly from HRO and a donation:

- MFJ-108B 12 hour/24 clock
- Gordon West handbook for General class license
- ARRL 2014 Handbook
- Repeater directory
- Cordless drill from HF

If you have any questions, let me know  
73.....Hal WB6WXO



## OC Marathon

Come out and enjoy this great event, while using your HT! We are looking for volunteer radio operators for The Orange County Marathon on Sunday May 7. More info about the event can be found here: <http://www.ocmarathon.com/>

Thanks, Heiko, [ad6oi@soara.org](mailto:ad6oi@soara.org)

(Continued from page 1): *That's Not Real Ham Radio (from the SOARA President)*

In a previous post, I argued we should not [confuse religion with modulation](#). I do occasionally make snarky comments about the continued use of AM (AKA Ancient Modulation), but I've tried to tone that down in recent years.

### What About DMR?

Just last week, I was [playing around with a DMR hotspot](#) on the Brandmeister network. It really struck me that people on the system were having a blast talking to each other across North America and around the world. But then that nagging little voice in the back of my head said "hey, wait a minute...this is not real DX...the RF signal might only be traveling 20 feet or so from an HT to a hotspot."

This caused me to put out a plea for insight on twitter:

I received a lot of good replies with the answers tending to clump into these three categories:

- I don't know ("That's Not Real Ham Radio")
- It's fun, new technology
- It's a digital network that brings ham radio operators together

My interest seems to fall into the second category: *this is fun, new technology*. Which does make me wonder how long this new technology will remain interesting to me. Well, that is difficult to predict but I'll invoke the principle of *try not to overthink it*. The

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### The K7RA Solar Update 4/14/17

Solar indicators, both sunspot numbers and solar flux, both dropped this week, in fact on April 8 there were no sunspots. Average daily sunspot numbers declined from 65.9 to 16.6, and average daily solar flux went from 96.5 to 73.8, compared to the previous seven days, .

Average daily planetary A index went from 15.6 to 10.6, and average daily mid-latitude A index declined from 13 to 9.3.

Predicted solar flux shows 75 on April 14-15, 85 on April 16-17, 80 on April 18, 95 on April 19-21, 92 on April 22-23, 90 on April 24-29, 80 on April 30

[WM7D's Solar resource Page](#)



**DX Operations:**  
[www.ng3k.com](http://www.ng3k.com)

**ARRL HF Propagation Charts**

## High Desert Trails Rally

The event is on May 6th 2017 this year.  
Volunteer Registration is open. [please contact Kris to help]

Thanks!  
- Kris, KI6IUC

**Kristopher Marciniak**  
High Desert Trails Performance Rally - Organizer  
contact: [kris@highdeserttrails.com](mailto:kris@highdeserttrails.com)  
phone: **646-535-4240**



## California's New Hands-free Driving Law

Here's an update on California's new hands-free driving law with a little background for reference.

The prior version of Vehicle Code Section 23123.5, while it contained no specific exemption for Amateur radio, effectively excluded Hams by virtue of the relatively narrow definitions of what that law covered.

Assembly Bill 1785 was introduced in February 2016 by Hayward Assembly Member Bill Quirk, whose district lies in the Pacific Division. In its initial form, there was no adverse impact to Amateur Radio, as it applied only to reading, writing and sending text-based communications.

Over the ensuing six months, however, the language was amended five times, with the end result being much broader in scope and including a prohibition of "specialized mobile radio device[s]" that were not hands-free. This opened the door to widely varying interpretations of what might fall under the umbrella of "specialized mobile radio device[s]".

We were first alerted to this bill by San Diego Section Manager Dave Kaltenborn, N8KBC, in September, by which time it had been passed by both houses in its final form and was less than a week from being signed into law by the governor. Vice Director Woll tried direct outreach to Quirk's office and to other potentially interested parties such as the California Trucking Association, but he received no responses. As this newsworthy change in the law began getting broadcast airtime, ARRL Division and Section officials started receiving many inquiries from concerned members. Woll contacted several of our local Volunteer Counsel attorneys, who did some research. In addition to getting the complete legislative history of the bill, we eventually obtained a statement from a staff member of the Assembly Transportation Committee that the intent was not to include Amateur Radio and the absence of some exclusionary language was an oversight. Meanwhile, private and public statements from members of both law enforcement and the judiciary were coming out with adverse interpretations for Amateur Radio, adding to the level of member consternation and validating our initial concerns.

State government officials will generally not engage in communication with voters outside their respective districts. An exception may be made, however, if the voter's own representative makes an "introduction". Now-retired Volunteer Counsel Len

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### The (ARRL) Doctor is In

Speech equalization, compression and processing is latest the topic of the "ARRL The Doctor is In" podcast. [Listen...and learn!](#)

Sponsored by DX Engineering, "ARRL The Doctor is In" is an informative discussion of all things technical. Listen on your computer, tablet, or smartphone -- whenever and wherever you like!

ARRL EXPO will Anchor League's **Hamvention** Presence

At [Hamvention© 2017](#) in Xenia, Ohio, on May 19, 20, and 21, ARRL EXPO will provide a spacious area focusing on ARRL activities. The ARRL Store will be the central focus of ARRL EXPO in Building 2 of the Greene County Fairgrounds and Expo Center, where visitors will be able to peruse and purchase a wide array of ARRL publications, supplies, and official League merchandise. They'll also be able to join, renew, or extend their ARRL memberships.

## 2017 Prescott Hamfest

June 9th & 10th, 2017

[From Jon, KJ7ON, who moved to AZ] We hope to see some of you guys out this way. They even have dry camping right onsite. Tina and I really like it here. We even had snow flurries yesterday. We love mountain living. Flying may be practical for some. They have direct flights from LAX to Ernest A. Love field (which happens to be directly across the street from my work) Great Lakes is the airline. Not sure on price.

It is 6.5 hours from the Murray Center to the hamfest site.

-Jon, KJ7ON <http://www.w7yc.org/2017-prescott-hamfest-at-erau/>

## From your Communications Director:

As a club of more than 200 members, we have a plethora of repeaters available for our use, two on Santiago Peak, one in Trabuco Canyon, one in San Clemente as well as six on Temple Hill in Laguna Beach. I have noticed that over the past few years our primary repeater has moved from the 147.645 on Temple to 447.180 on Santiago. When any two operators have an extended conversation on Santiago they effectively prevent the rest of the membership from contacting other members. I would like to suggest that, under those conditions, our members make better usage of our other repeaters, all of which have good coverage in Orange County.

If you have any questions about repeater coverages please visit our website at [<soara.org>](http://soara.org) and look under repeaters. Click on the one whose coverage you would like to know about and a map will show up. At the top of the coverage map there is an explanation of the quality of the coverage.

Our repeaters are as follows:

Frequency	Tone	Location	Mode	Notes
145.240-	110.9	Trabuco Canyon	FM	
146.025+	110.9	San Clemente	FM	Echolink Repeater
146.115+		Laguna Beach	DV	D-STAR "K6SOA-C"
147.645-	110.9	Laguna Beach	FM	
224.100-	110.9	Laguna Beach	FM	
224.640	Pvt	Santiago Peak	FM	SOARA MEMBERS & INVITED GUESTS ONLY
445.660-	110.9	Laguna Beach	FM	
445.705-		Laguna Beach	DV	D-STAR "K6SOA-B"
447.180	Pvt	Santiago Peak	FM	SOARA MEMBERS & INVITED GUESTS ONLY
1282.600-		Laguna Beach	DV	D-STAR "K6SOA-A"
1299.900		Laguna Beach	DD	D-STAR "K6SOA-A"

Pick your favorite repeater and put it into your radio or better yet put all of them into your radio and your scanner and listen to what is out there.

Be kind to your fellow operators and they will return the favor.

Thanks, Heiko, AD6OI, Director of Communications for SOARA

## SOARA Saturday April Report

Many enjoy this informal hands-on educational environment. It's easy to walk around and ask questions and see things work. So, attend, ask questions, have fun, share your experiences, and knowledge. SOARA will provide [coffee and donuts](#). Time 9am to noon. Contact: Ed Barnes, [WA6ED@soara.org](mailto:WA6ED@soara.org) suggestions are welcome for future Saturdays. Let me know if you are interested in participating on a SOARA Saturday committee to help guide future events.

Past, **March 25 SOARA Saturday**, Gilleran Park

- DMR Radio, Mikkel NR6E presented and demoed DMR radio. Many brought their DMR radios and shared their knowledge. This was an interactive workshop. About 15 members attended. Lots of Q&A.



### Future, SOARA Saturdays:

- April 22 Murray Center, 100+ Watt Dummy Load Kit  
I have 5 kits remaining at \$10 each. First come first served. You will need to add your own mineral oil. Some pre-soldered resistor modules will be available to save time. The design is based on the article by Ken, K4EAA. <http://k4eea.com/dummy.html>
- May 20, Murray Center, SWR Meter Kit  
I'm working with Horst KD7JHR to build a SWR meter. Similar to Dec 1987 QST page 15, [http://qsl.net/on7eq/pdf/VHF\\_SWR\\_meter.pdf](http://qsl.net/on7eq/pdf/VHF_SWR_meter.pdf)  
Several prototypes will be available for demo. Let me know if you are interested in a kit.
- Jun 24, Gilleran Park, Emergency Battery Box II Build  
Last year this was great fun. Many members now have emergency battery boxes thanks to Tony W6TNY. For Field Day, Tony and I are planning another battery box build on Saturday morning. (Start 8am +/- 3Hz)  
Bring your previously assembled battery boxes for inspiration and demo.
- Jul 22, Gilleran Park, Emergency Power  
Bring your Mr. fusion reactors, battery boxes, solar panels and generators with any radio gear you want to setup and demo  
This is where we share useful ideas for emergency radio go kits, power, and setup tips. Last year this was great fun to see everyone's equipment working without utility power.
- Aug 26, Gilleran Park, Antenna workshop  
I need volunteers to bring and demo various antennas. Any band antenna is okay. HOA stealth antennas would be interesting.  
Open discussion on antenna problems and how they were solved.
- Sep 23, Oct 21, Gilleran Park, TBD
- Nov 25, Murray Center, TBD



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*That's Not Real  
 Ham Radio*

idea that DMR is a digital network that brings ham radio operators together makes some sense. In the past, I have argued that [amateur radio is not for talking.](#) In other words, if you just want to talk someone, there are much more convenient ways of doing that. Still, there is something attractive about this ham-radio-only digital network.

It really is important to not overthink this kind of stuff. Ham radio is supposed to be fun, so if you are having fun, you are probably doing it right. If you are not having fun, then you might want to examine what you are doing. See my post on

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## Membership Report

We have 210 active members and 0 unpaid. All previously unpaid members were made inactive before the ballots were emailed. Let me know if you need a new badge or a membership handbook. Pick them up at the next meeting to save SOARA postage costs. Suggestions to make SOARA better are always welcome. I suggest all members attend and participate in as many events as possible to gain maximum benefit from your membership.

Brian and I (mostly Brian) have been working on a PDF version of the SOARA Repeater User's Guide & Membership Manual. This will be emailed to membership soon. I do have hard copy version 7.0 remaining and I will hand them out until they are depleted. The PDF version of the guide & manual has some sensitive information removed. If you need this information please contact us.

### Field Day:

I need membership table helpers. If you would like to help cover the membership table for a few hours during field day, please contact me. On field days only, we traditionally waive the \$40 initiation fee. If you know someone that want's to join SOARA, have them attend field day and we will start the process!

### Welcome New Members!

1. Jeff Chilton, KM6JSC
2. Dave Ramirez, KM6JSJ
3. Dr. Mike Moran, KM6FPB
4. Dara Nottingham, KM6FPH
5. Henry Truong, KB0OAV

73, Ed, WA6ED, [membership@soara.org](mailto:membership@soara.org).



### April T-Hunt News:

Steve, K6UVR, showing off his winning HT antenna combination hunt setup. K6MSM hid at a park in Tustin. It was a beautiful day for a short hike.



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*That's Not Real  
 Ham Radio*

the [Universal Purpose of Amateur Radio](#).

Sometimes hams can get a little spun up about those other guys that don't appreciate our way of doing ham radio. What the heck is wrong with them anyway? I've always been inspired by the [Noise Blankers Mission Statement](#):

Do radio stuff. Have fun doing it. Show people just how fun it is.

If your preferred form of ham radio is so superior, it ought to be easy to show other hams how cool it is. If not, then maybe you aren't doing it right. Conversely, as long as other hams are having fun and operating legally,

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## AT&T Awarded FirstNet Contract

Dear Members,

Just an update from our SOARA FirstNet Committee (me). Yesterday, AT&T was officially awarded the contract to begin building the FirstNet network. The amount of the contract is the biggest I have ever personally seen, it is a one hundred billion dollar contract, over 25 years. (\$100,000,000,000.00)

What does this mean and why is it important for our club to follow this? As Ham Radio Operators and Emergency Communicators we need to be aware of important news like this that may have some impact on us.

Primarily, it means that FirstNet is real despite the rumors that the government would not be able to pull it off. AT&T has a solid plan and has actually started to build-out pieces of it already. The goal of the new network is to give emergency first responders and public safety organizations their own dedicated broadband network providing blanket coverage over the entire nation including all U.S. territories, commonwealths and protectorates. As is always the case, the Ham Community serves as a backup for the public-safety, emergency and disaster response community so we need to pay attention to this.

Second, the voice/data network requires the use of the 700mhz band and will have proprietary data protocols associated with it. Any existing infrastructure that will tie-in and operate on it will require adopting new equipment or upgrading to be able to operate and support FirstNet traffic. Groups like ARES/RACES, HAMNet/HSMM etc. will probably want to make sure that they are aware of 1) how to monitor, 2) how to use, and 3) how to interoperate with the new network. So expect some re-training and changes in types of equipment that can be used to talk with emergency groups (Police/Fire/Hospital etc.)

Lastly, there will likely be changes made to policies regarding band/frequency use which will impact the rules that tower owners will need to comply with. FirstNet traffic will always be prioritized but will also share bandwidth when available. Without getting into detail, it is a fact that AT&T is already cutting deals and amending agreements with tower-owners which will have an effect on the lease-agreements tower owners have with their customers. Real estate, time-sharing, cabinet space, types of equipment, access & security and thus **pricing** will all be impacted somehow in the coming months. There could also be adjustments made to spectrum-use in general which we are following that closely between ARRL, FCC, NTIA/Dept.of Commerce, and FirstNet.

For now, all the ham bands, operating rules, regulations and practices all remain unaffected, but who knows how things will ultimately take shape and what the FirstNet build-out means for us, especially the Emcomm operators. I will keep you updated as much as I can.

If you're interested, here is the official award notice and commentary. I am sure you will be seeing more articles and news headlines about it too:

<https://www.fbo.gov/notices/6d45e0f8f3f4911f44f9f5b77d614952>

<https://washingtontechnology.com/blogs/editors-notebook/2017/03/att-firstnet-award.aspx?m=1>

Thank you,

Lambert Matias, KK6WOW  
 Board Secretary, South Orange Amateur Radio Association  
 Chair, SOARA FirstNet Committee



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*That's Not Real  
 Ham Radio*

don't knock what they are doing. In fact, encourage them. We need more people having fun with ham radio, even if it's not your favorite kind of fun.

That's my opinion. What do you think?

73, Bob K0NR

[The post [That's Not Real Ham Radio](#) appeared first on [The K0NR Radio Site](#).]

(Continued from page 3): *California's New Hands-free Driving Law*

Shaffer, WA6QHD (Palmdale case attorney), requested and received such an introduction and was then able to schedule a meeting in Sacramento for himself and Vice Director Woll with Quirk's legislative deputy. That meeting took place on Tuesday, March 14, 2017, and future action looks promising.

Woll and Shaffer came armed with specific documentation of inconsistent interpretations, including names, dates and contact information, and the deputy appreciated this level of detail. She advised us that her office had already been approached by lobbyists for several non-Amateur interests which also saw the new law as a threat to mobile radio communications. Their proposed solutions, however, were industry-specific or employment-based, none of which would protect Amateur Radio. We discussed the kinds of public service work Hams do that would be adversely impacted without some form of exemption, and she agreed that broader exclusionary language would be more appropriate than individual carve-outs.

As to the mechanics, we suggested a letter from Quirk to the state government's Legislative Journal clarifying the legislative intent.

That would provide more immediate defense for mobile radio users than would an amending bill, which is in the works (AB-1222) but would not take effect until 2018. She told us that such a letter is being developed and agreed to advise us when it is ready to go. We also suggested adding clarifying language to the Committee's omnibus bill.

The deputy said they would consider doing so but that some procedural pitfalls could eliminate that route.

Finally, the California Highway Patrol is expected to disseminate guidance within a month or two. Through a Ham contact at the Los Angeles County Sheriff's office, Vice Director Woll had already received a preliminary version of that guidance. It states that using wired radio microphones would not be considered a violation but that using hand-held radios would be cause for a citation. If the final CHP guidance comes to a similar conclusion, it will be a less-than-perfect but, in our judgment, somewhat acceptable conclusion. The deputy also promised to advise us when that interpretation is issued in final form.

Of course, CHP guidance will not filter down to all law enforcement agencies in the state, so citations by local police may still occur, and authoritative evidence of legislative intent will still be important for any Amateur who has to challenge a citation in court.

From the above, it appears that no grass-roots action is needed at this time. However, until and unless we receive authoritative guidance to the contrary, we advise against using handheld radios while driving unless they are equipped with external, corded microphones. As always, avoid any radio usage or other activity whenever you feel it detracts from your ability to control your vehicle fully or to maintain awareness of surrounding traffic.

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 ARRL Southwestern Division  
 Director: Richard J Norton, N6AA  
 n6aa@arrl.org



Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
General Meeting 7:00 PM	23	27	20	17	15	19	17	21	18	16	20	-
Program	SOTA	DXp 3Y0Z 2018	EQ Tom Broz	You and SOARA	<a href="#">Spring Auction</a>	<a href="#">Field Day Prep</a>	TBD	<a href="#">SOARA Fair</a>	TBD	TBD	<a href="#">Fall Auction</a>	-
VE Testing	23	27	20	17	15	At Field Day 24	17	21	18	16	20	--
Educational Classes	21	25	18	15	13	17	15	19	16	14	18	-
SOARA Saturdays (9am)	28	Mar 4	25	22	20	-	-	-	-	21	25	-
SOARA T-Hunt	8	5	5	2	7	4	2	6	3	1	5	3
Board Meeting	30	Mar 6	27	24	22	26	24	28	25	23	27	-
Special Events	<a href="#">Quartzfest 22-28</a>	<a href="#">Yuma Hamfest 17-18</a>	<a href="#">Palm Springs Hamfest Feb 4</a>	<a href="#">Visalia Int'l DX 21-23</a>	<a href="#">Dayton Hamven- tion 19-21</a>	<a href="#">ARRL Field Day 23-25</a>	HRO Ham Jam	<a href="#">SOARA Picnic 6</a>		<a href="#">JOTA</a>		<a href="#">SOARA Holiday Party TBD</a>
Ham-Related Swap Meets	<a href="#">TRW 28</a> <a href="#">C.A.R.S. 21</a>	25  18	25  18	29  15	27  20	24  17	29  15	26  19	30  16	21  28	25  18	30  16
Major HF Contests		<a href="#">ARRL DX-CW 18-19</a> <a href="#">CQWPX RTTY 11-12</a>	<a href="#">ARRL DX-SSB 4-5</a> <a href="#">CQWPX SSB 25-26</a>		<a href="#">CQWPX CW 27-28</a>	<a href="#">ARRL Field Day 24-25</a>			<a href="#">CQWW RTTY</a>	<a href="#">CQWW SSB</a>	<a href="#">CQWW CW</a>	
Volunteer Events	<a href="#">OC Chili Run 21</a>	<a href="#">Paws Fur Pink 26</a>  <a href="#">OC Chili Run 25</a>	<a href="#">OC Chili Run 25</a>  <a href="#">Baker to Vegas 25-26</a>	<a href="#">Desert Storm Rally 7-8</a>	<a href="#">HD Trails 6</a> <a href="#">OC Mara -thon 7</a> <a href="#">Memorial Day 1/2 Mara- thon 29</a>	<a href="#">ARRL Field Day/ Setup/ Ops/ Clean 23-25</a>	4th of July Fire -works 4			<a href="#">Vision Quest</a>		<a href="#">Run for a Claus</a>

\*Dates subject to change.  
Check the [SOARA website](#) to verify  
locations and times.

### March's \$5 Raffle Winner

Richard, KB6POE >



**SOARA** meets at the [Norman P. Murray Center](#), 24932 Veterans Way, Mission Viejo, CA on the third Monday of every month at 7:00 PM. For the months of January and February the third Monday is a holiday and the meeting is held on the fourth Monday.



**License Exams:** Amateur License Exams are given prior to SOARA meetings, except June. **Exams are at 6pm.** Prior registration is not required and walk-in applicants are welcome. For June, exams are held at Field Day. For further information, email Sean Reigle, AJ6B, at [aj6b@soara.org](mailto:aj6b@soara.org).

**SOARA Library:** SOARA has many amateur radio related books such as hand books, books about electrical theory, etc. available to lend out to club members. Contact Heiko Peschel [ad6oi@soara.org](mailto:ad6oi@soara.org) for more info.

**Web Site:** SOARA maintains a web site with current club information. The URL is: <http://www.soara.org/>

**Repeaters:** The Laguna Beach, San Clemente, and Trabuco repeaters are open. The Santiago Peak repeaters are closed. For details or questions on the repeaters contact the repeater director, or [repeater@soara.org](mailto:repeater@soara.org).

	2m — 147.645 — (110.9)	Laguna Beach
	2m — 146.025 + (110.9)	San Clemente
	2m — 145.240 — (110.9)	Trabuco
D-STAR	2m — 146.115 + (K6SOA C)	Laguna Beach
	220 — 224.100 — (110.9)	Laguna Beach
	220 — 224.640 — (pvt)	Santiago Peak. (C)
	440 — 445.660 — (110.9)	Laguna Beach
D-STAR	440 — 445.705 — (K6SOA B)	Laguna Beach
	440 — 447.180 — (pvt)	Santiago Peak. (C)
D-STAR	1.2G 1282.600 — (K6SOA A)	Laguna Beach

#### **Nets:**

UHF/VHF (447.180, 147.645 & 224.640): Tuesdays @ 8:00PM

D-STAR (146.115 C module):  
Wednesdays @ 7:30PM

40 meter HF (7.200 MHz +/- for QRM), Sundays @ 8:00AM.

Gordo HF (7.250 MHz +/- for QRM), Weekdays @ 8:30AM



#### **SOARA OFFICERS**

**President:** Ray Hutchinson, AE6H 949-322-8468  
[ae6h@soara.org](mailto:ae6h@soara.org)

**V.P.:** Sean Reigle, AJ6B 714-261-1717  
[aj6b@soara.org](mailto:aj6b@soara.org)

**Secretary:** Lambert Matias, KK6WOW 312-545-2270  
[kk6wow@soara.org](mailto:kk6wow@soara.org)

**Treasurer:** Lori Carey, NI6X 949-444-8190  
[ni6x@soara.org](mailto:ni6x@soara.org)

#### **SOARA DIRECTORS**

**Repeater:** Brian Roode, NJ6N 949-257-2749  
[nj6n@soara.org](mailto:nj6n@soara.org)

**Publications:** Mike Mahan, K6MSM 949-279-9936  
[k6msm@soara.org](mailto:k6msm@soara.org)

**Membership:** Ed Barnes, WA6ED 949-468-7706  
[wa6ed@soara.org](mailto:wa6ed@soara.org)

**Education:** Steve Kuver, K6UVR 949-874-1972  
[k6uvr@soara.org](mailto:k6uvr@soara.org)

**Technical:** Tom Hobbs, AE6SH 949-830-8131  
[ae6sh@soara.org](mailto:ae6sh@soara.org)

**Communications:** Heiko Peschel, AD6OI 949-859-3868  
[ad6oi@soara.org](mailto:ad6oi@soara.org)

#### **SOARA APPOINTMENTS**

**Past President:** Tom Hobbs, AE6SH 949-830-8131  
[ae6sh@soara.org](mailto:ae6sh@soara.org)

**Activities:** *[Open]—Please contact us ([board@soara.org](mailto:board@soara.org)) if you are interested.*

**S. Saturdays:** Ed Barnes, WA6ED 949-468-7706  
[wa6ed@soara.org](mailto:wa6ed@soara.org)

**Raffle:** Hal Silverman, WB6WXO 714-897-5002  
[wb6wxo@soara.org](mailto:wb6wxo@soara.org)

**Testing:** Sean Reigle, AJ6B 714-261-1717  
[aj6b@soara.org](mailto:aj6b@soara.org)

**Website:** Sean Reigle, AJ6B 714-261-1717  
[aj6b@soara.org](mailto:aj6b@soara.org)

**Ambassador:** Spencer Ammermon, NG6K *[In England]*  
[Blog](http://ng6k@soara.org)  
[ng6k@soara.org](mailto:ng6k@soara.org)

**Ham Radio 101  
HW32A Hybrid  
Progress Report  
March/April 2017  
By Hal Silverman WB6WXO**

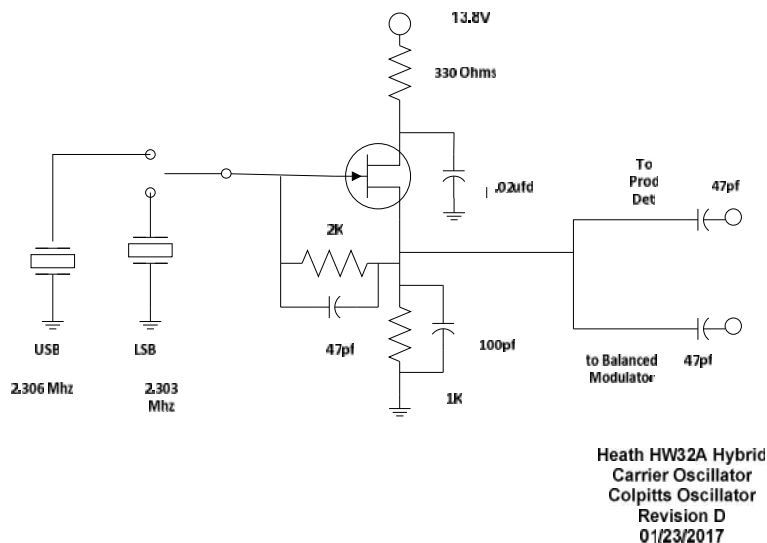
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In the last article, I was going to concentrate on my HW22A and get the intermittent problem fixed. However, well laid plans of mice and men oft times go astray (Of Mice and Men, John Steinbeck).

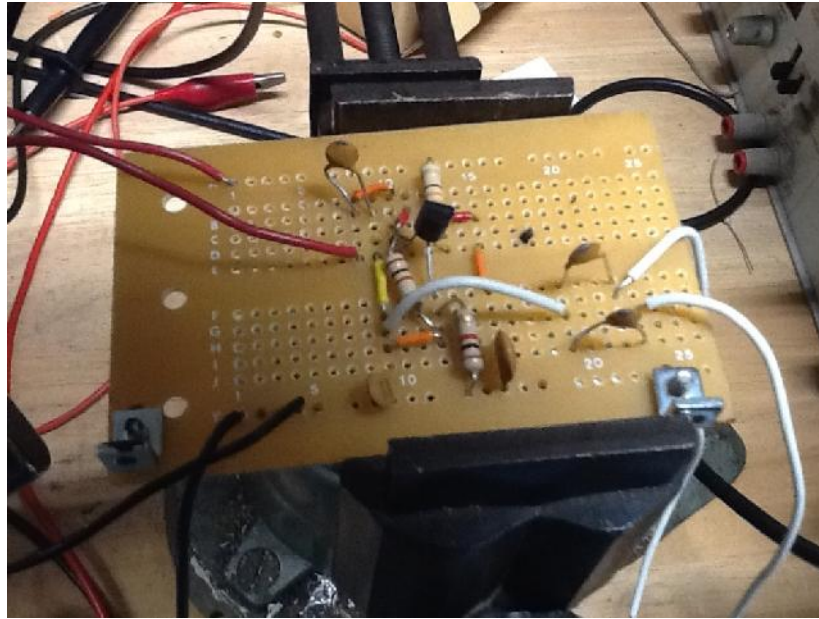
I would up spending the allotted time on my hybrid and I am happy to present an update.

I wanted to get the four oscillators running and install them on the chassis. Some of it got done and will finish it in the next article.

I spent quite a bit of time on the carrier oscillators. They fixed the USB and LSB.



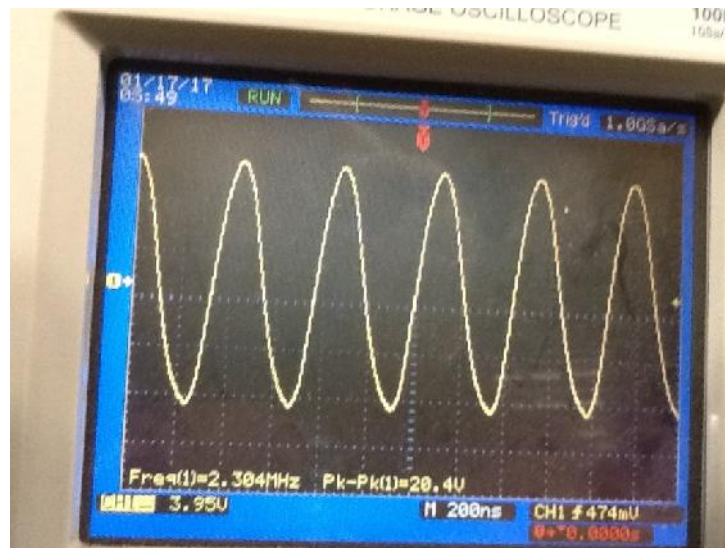
**Figure 1**  
**Schematic Diagram of Carrier Oscillator**



**Figure 2**

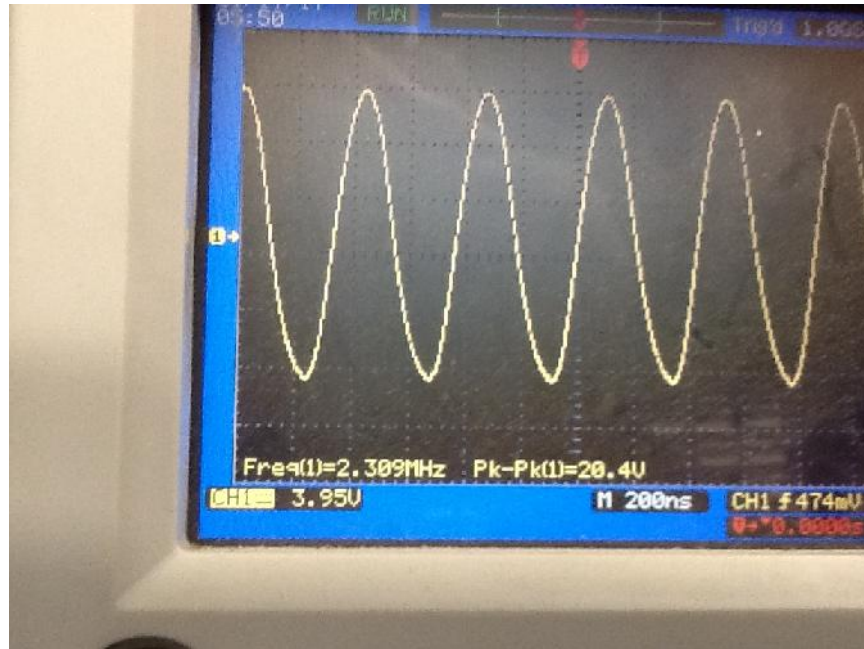
### **Layout of Carrier Oscillator Circuit**

In this figure, the layout shows the circuit. Later pictures show the circuit installed in the chassis.



**Figure 3**

### **LSB signal from Oscilloscope**



**Figure 4**

### **USB signal from Oscilloscope**

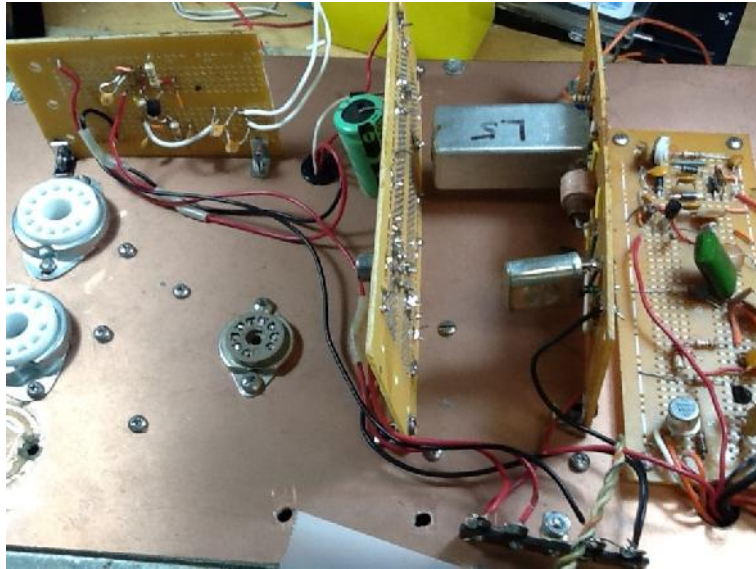
Out of the time spent on this circuit, I developed a little fixture to test crystals. I also found out that the solder type of perf boards with the plated through holes are too close together.

I used my Dremel tool and a grinder to grind away every other set of plated through holes.

For me, it worked a lot better. I used the carrier oscillator circuit and a crystal jack to test the crystals.

See figure 6. The Crystal Jack is shown in the rear of the picture.

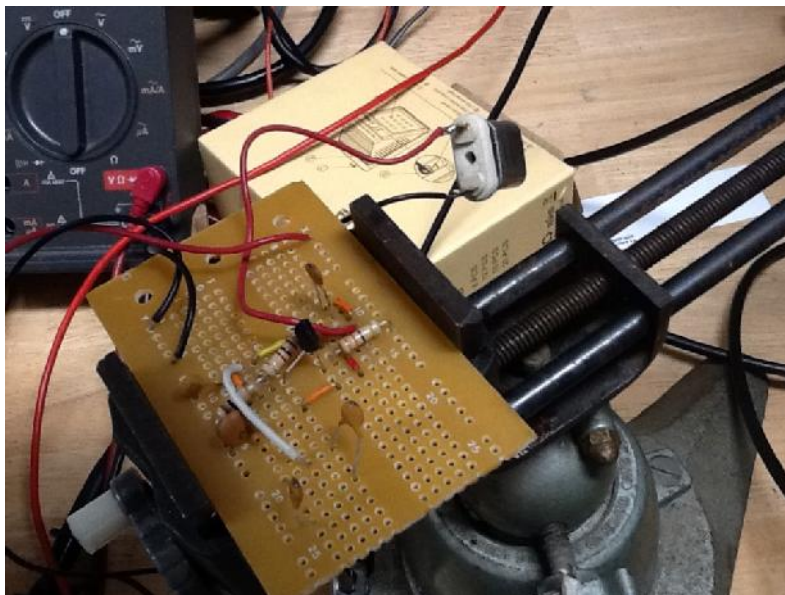
See figure 7. It is the rear of the proto board for the Crystal Jack board.



**Figure 5**

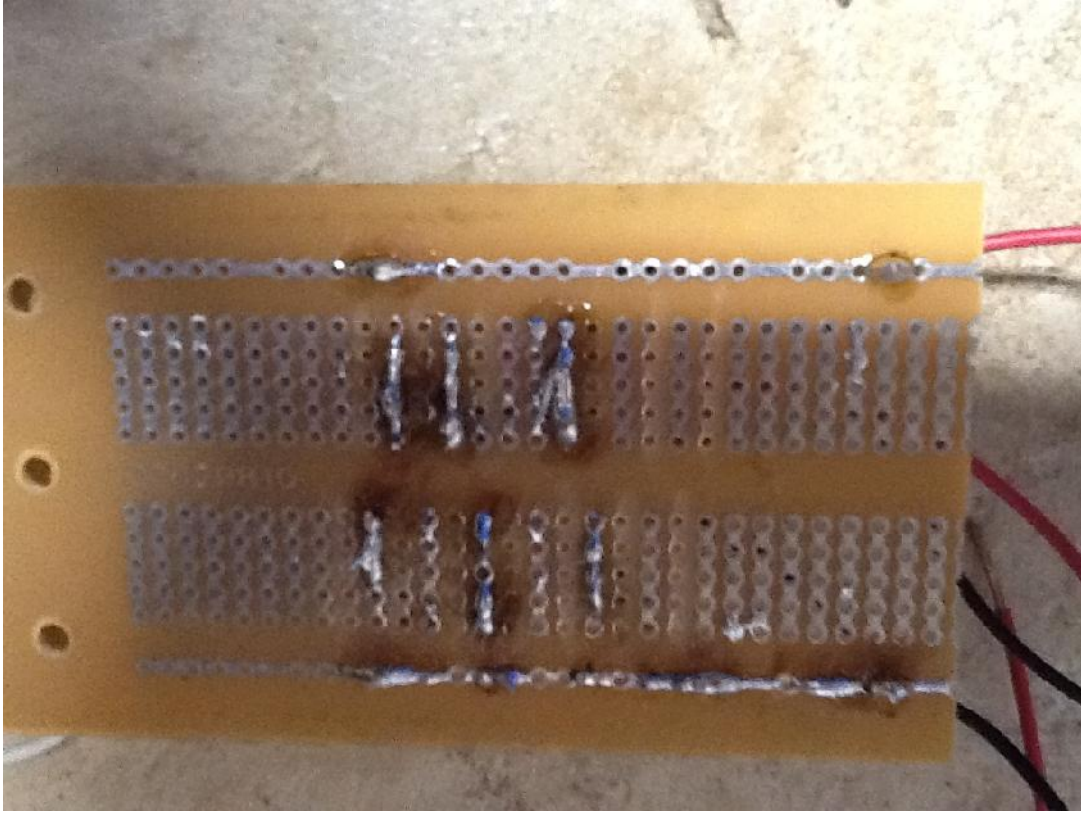
**Carrier Oscillator Installed in Chassis**

The subassembly is installed in the upper left side of the picture.



**Figure 6**

**Crystal Test Fixture**



**Figure 7**

**Rear of Crystal Test Fixture**

This article shows, the following subassemblies have been assembled of the chassis.

**The Carrier Oscillator**

The crystals are on the reverse side of the chassis and are switched the same way they are switched on the Heathkit HW32A

**The Heterodyne Oscillator.**

This is an 18.275 MHz crystal oscillator.

I need to take a picture of the waveform.



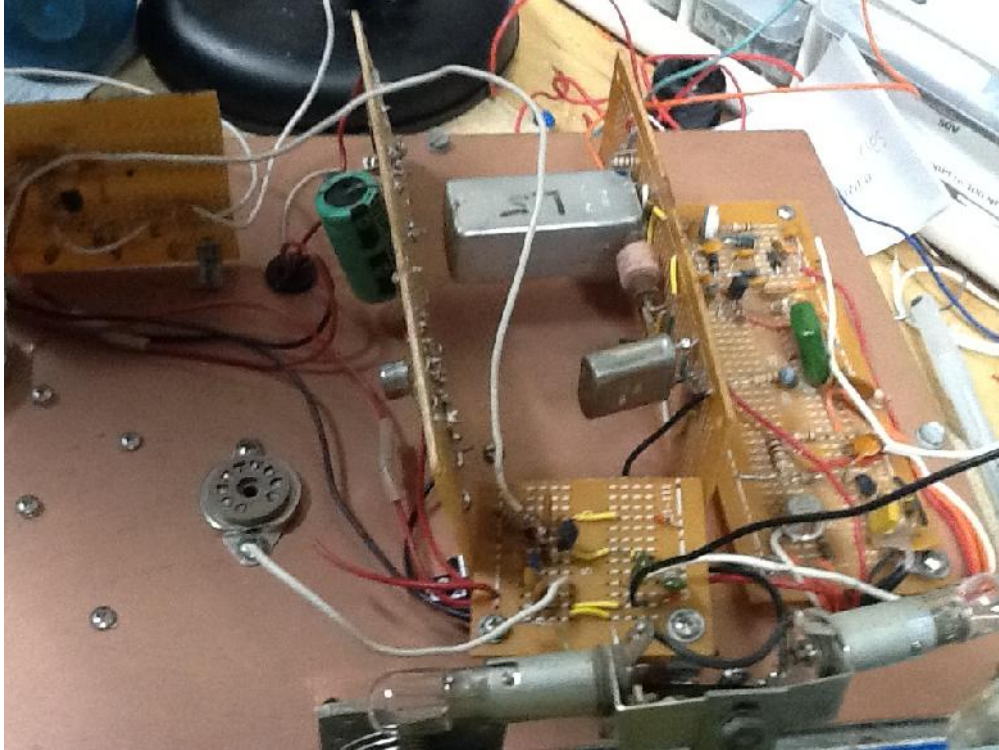
**Figure 8**

**Front Panel assembly**

As you can see from this picture, the hybrid is starting to take shape. I have completed and installed the carrier oscillators and the heterodyne oscillators. I have everything hooked to the 13.2V rail.

Figure 9 is a picture of the assemblies attached to the chassis. The amplifier for the VFO has not been installed. It would have to be tested.





**Figure 9**

### **Internal Assemblies of the Hybrid.**

#### **The 24V power supply.**

The supply actually measures 37Volts. That may be due to the bench power supply that supplies 12Vac. When I hooked this up to a Heathkit power supply and it is the same voltage, I will regulate it down to 24Volts.

#### **The 12V power supply.**

I want to test out the rest of the circuits and consider changing to a three-terminal regulator like a LM317 or a LM7812.

### **The Microphone Circuit:**

That has yet to be tested. It looks like it also has the relay change over circuit. More on the next progress report.

### **VFO Circuit.**

It looks like the circuit has been built but not tested. That is next on my list. I want to install the VFO, frequency dial and variable capacitor.

My plans for the next reporting update is to have the VFO installed and tested.

I also need to look into other circuits and make solid state version.

I also have a harness that was removed from a Junker, and have other parts taken from another Junker.

If I can get the harness installed, then I can attach the HP23 power supply and turn the radio on from the front panel.

If you have any questions, please contact me at

[WB6WXO@SOARA.org](mailto:WB6WXO@SOARA.org)