



Official Publication of the
West Allis Radio Amateur Club

Hamtrix

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Volume 70, Issue 12 December, 2021

DECEMBER CLUB HAPPENINGS ELECTION OF OFFICERS

Meeting

December 14, 2021 7pm

New Berlin Community Center

14750 W. Cleveland Ave.

New Berlin, WI

Between Mooreland and Sunny Slope

Vote on scholarship fund

Premeeting dinner

New Berlin Ale House 5:15pm

16000 W. Cleveland Ave

West of Mooreland Rd.



NUT NET

3.985mhz

Monday-Saturday

8:15am CT

NUT NET

Breakfast

8:30am fourth

Tuesday

of the month

Milwaukee-Florida Net

Every Day on 14.290 Mhz

7:00AM - 9:15AM ET

6:00AM - 8:00AM CT

Sunshine Committee

If you know of a member who could use a bit of cheer or support,

Barb Garnier (KD9HPS) is now the Sunshine Committee Chair.

Contact her: 414-529-3536 or barbsewsblue@gmail.com.

The Club election of Officers will be held at this meeting.

Volunteer for any position.

We have no candidates for President

The Club needs YOU!

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Presidents Shack and Editors Corner.

Got good news yesterday! My Yaesu FT-891 which I sent to Hamrepair.com in Texas has been repaired and is on the way home! My gut feeling proved to be right. The sensitivity was way down from what it was supposed to be. Not having the test equipment that I had when I worked, I couldn't test it. Any way my gut reaction was right the radio had taken a RF hit and that burned out a 150 ohm service mounted resistor. The resistor cost 66 cents!

Of course after adding up the time to find the problem and doing a tune up, the cost was a little more than that. I should end up with a radio that is working up to spec! That will be nice. I may have to learn to operate the radio all over. I should be able to hear signals with the pre-amp off which will be a welcome change.

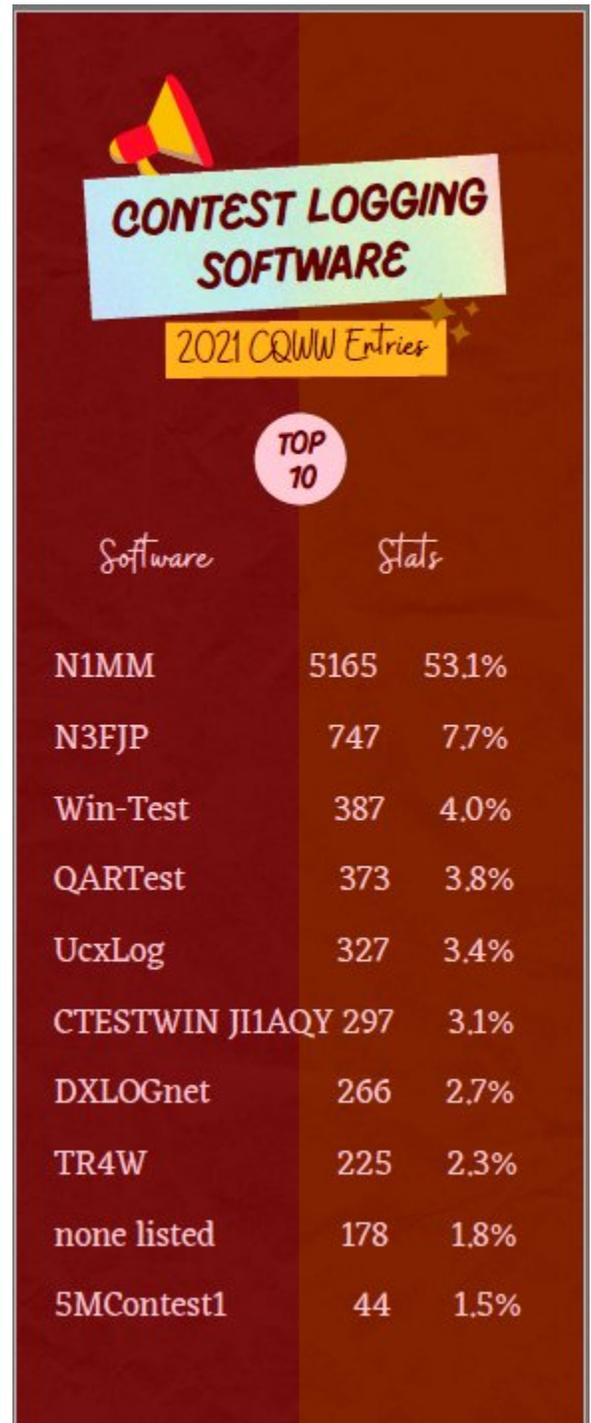
Thank you Paul, W9PCS for loaning me a radio with a little more power so I could run the Nut Net when it was my time.

Other things of interest: It is dues time. Lets see if we can surprise Bill N9KPH and get our dues in by the year end!

Work is proceeding on the remote project. We have checked out a site doing testing so we all may have an alternate to our home rig if we feel we need one. It would be nice to have an option if we needed one. There is a lot of work to do but progress is being made.

We'll see what else comes up.

Frank KA9FZR



WARAC Club Meeting Minutes – November 9, 2021

Meeting called to order at by David Garnier, WB9OWN at 7:05 PM

Attendance was 13 club members and one visitor Rich Hawthorne KD9QLT. Greetings Rich!

Program: “Ohm's Law, It's the Law!” by Dave Garnier

Minutes of October 12, 2021 meeting & Special Board meeting of October 24, 2021 were approved.

Time to renew club dues! Payment can done online through PayPal as: WARACPP@WARAC.ORG – Note, select payment type as “Friends or Family.”

Scholarship fund update by Howard Smith, WA9AXO. Proposal to update scholarship granted to \$3,000 and add \$12,000 to endow the scholarship fund through ARRL. Funds are tied up in CDs which do not mature until January and March, 2022. Taking funds out early would result in penalties. Proposal will be officially published in December 2021 Hamtrix to meet the official requirements and voted on at December 2021 meeting.

Remote station proposal discussed. “Gentleman's agreement Google doc” discussed for signing up for reserving use times for the Flex radio. Site proposed is at Joe Seifert's (N9JOS) place in Raymond in Racine county. Set up deadline is March 2022. There will be a site visit to check internet and other site qualifications. Paul, W9PCS, will be involved, as well as Feroz, W1FM, Dave, WB9OWN, Chuck as a Flex resource. Site visit is first priority.

Field Day discussion led by Dave Garnier. Need estimate of number of people interested. Also need new plan for how it needs to be run. Last organized Field Day had lack of take down personnel.

Weekly park operations are pretty much finished for this year per Mike Johnson WO9B.

Slow speed CW net has been working on 6 meters. Practice net set up on Mondays at 8pm.

Election of officers discussed. Some people still not comfortable with in person meetings due to COVID. Feroz Ghose WU9N was nominated, seconded, and approved for VP. Thank you for stepping forward Feroz.

2022 Wisconsin QSO party discussed. Digital modes PSK & RTTY to be added for 2022. FT8 mode is judged unworkable at this point in terms of mapping county names to grid square substitution. March 12, 2022 is the contest date!

Meeting ended @ 8:17pm

Respectfully Submitted

David Garnier WB9OWN

Secretary WARAC, December 5, 2021 • —• —••

WARAC Special Board Meeting - FD & Remote Radio, Nov 16, 2021

A board meeting was called by Dave Garnier WB9OWN and it was decided this meeting would be a virtual meeting via Jitsi <https://meet.jit.si/waracBoardJuly2021>

The board meeting was called to order 7:05 pm by Dave WB9OWN.

Officers Board Members Present

Frank Humpal KA9FZR, Paul Sperbeck W9PCS, Feroz Ghouse WU9N, Dave Garnier WB9OWN, Mike Johnson WO9B, Tom Macon K9BTQ, Chuck W9WLX, Lee Todd K9HCW, and Phil Gural W9NAW.
There were no visitors.

Meeting began @ 7:07pm

Meeting Agenda - Field Day & Remote Radio

Need a new Field Day (FD) Chairman, "Dave WB9OWN cannot do 3 club tasks."

A new FD Chairman was not found. Dave's still got the FD job.

1) Field Day 2022 by Dave WB9OWN.

Dave WB9OWN & Mike WO9B agreed to meet to explore Mike's knowledge of local parks for "Single day use plus shelter with toilet" FD location. Mike and Dave will explore what's available and report back to the group. Further items to be decided, how many transmitters, how many operators, at what transmit power, AC or battery operation.

2) Remote Radio (RR) The RR committee came up with a list of 5 requirements with #1 being a must. RR committee agreed to meet Saturday with Joe if everyone's schedules permit.

Meeting Ended @ 8:13pm

Respectfully submitted,
David Garnier WB9OWN
Secretary WARAC, December 5, 2021

DXing and Contesting - December 2021

DX UPDATE:

DX Operations: DX ops are a popping!! Grab a fistful of 12, 15 and 17 meters to slake your thirst. K7RA reports the MUF is fluctuating between 12 meters and 10 meters, so this is a great time to put the 24 Mhz band into your daily scan routine. 15 meters is showing constant activity and typical propagation patterns.

DX operations are back with abundance. DXworld.net lists are extensive this DX season. For those with 160 meter capability, K7RA notes that Top Band is having an unusually good ride of late. The winter quiet months are upon us so tracking down to 1.8 Mhz is a great idea.

Solar: Cycle 25 is now 2 years into it's run since the solar minimum. It appears to be slightly ahead of Cycle 24, so too early to tell if it will be an improvement. SFI is hovering

in the 80's and that is expected throughout the month, building slowly. If you are a SF number hawk, don't fret over the variable reports and dips. The SFI is a long term index so watching the 30 and 90 day average SF #'s is the key. A Index in the 8 thru 12's is expected to continue. Solar storms, flares and CME's will continue. Welcome to a woke Sun.



CONTEST UPDATE:

Looks like an easy contesting month. But there are some really good contests to play in. Both the ARRL 10 Meter Contest and the RAC Winter Contest sport CW and SSB activity. So no matter your preference, you will be able to find good activity to keep you busy.

A mention for Straight Key Night, which is fun and laid back. It is really Straight Key Day as the activity goes throughout New Years day. Jump in and flail away. It is a lot of fun not to mention a bit humbling to see what happened to that novice fist..

Major Contests this Month:

- ARRL 10 Meter Contest: Dec 11th-12th
- RAC Winter Contest: Dec 18
- Straight Key Night: Dec 31st - Jan 1st • — • —•



Dec 2021 * Hamtrix * By Michael Johnson, WO9B

DMR Radios

It's December, which has a certain big event associated with it. What could be more appropriate than to dedicate some time to our favorite pastime: Radios. Per the motif of this column, it's time to chat about our area of interest, DMR radios. By now if you've been following along all these months, perhaps your curiosity is piqued just a bit. As hams, we have an almost irresistible need to keep exploring our hobby. Limits of time, money and interest guide those explorations, but in the world of DMR radios, it is pretty easy to jump in and get your feet wet without doing much damage to the monthly budget.

Rather than enter into the mine field of picking a specific make and model, this column is more directed at detailing features and options that you should consider. Most of the major brands all have well functioning gear and you can't go far astray or have a significantly different experience between them. So whether B-Tech, BaoFeng, Anytone, Radioddity, Ailiuance, Alinco....they all are similar in function. Prices will range from \$80 to \$300 with a range of features that only you can provide a value on. Having declared myself neutral, I have cast my fate with the Anytone radios and find them to be an excellent value and performer. That's just me.

What follows are some features that you should consider when purchasing your DMR radio:

1. **Form Factor:** This is pretty obvious and straightforward. Mobile or HT. Pick one, or pick both. I have both and use both a lot. Oddly I use my mobile as my base station radio and the HT is what travels with me. Using DMR repeaters works well, but more often than not I am plugged into a hotspot that gets internet via wireless or cellular. With that setup, an HT does not care what zip code it finds itself in. Your code plug remains happy talking to your hotspot so it really does not matter.

2. **UHF/VHF/Both:** All DMR radios will mix analog and digital modes. The very inexpensive radios will, however, only have UHF or VHF. In our part of the world, UHF dominates DMR repeaters and hotspots, so the decision is easy. That is not the case everywhere however. Our local situation makes a UHF only radio a very legitimate option to consider.

3. **Digital Contact Capacity:** Nobody will have programming capacity issues with things like Channels, Talk Groups and Zones. What will be a problem is the digital contact capacity of your radio. DMR ID's are well over 200,000 and growing. The cheap radios will not have that level of capacity. What that means is you will be able to import only an abridged version of the DMR ID database. Is that a deal killer. Not really, but it is VERY NICE to have the name and callsign of the person you are chatting with splash on your radio screen. It is a big deal for me, but perhaps not for everyone.

4. **Programming Ease:** We are talking code plug here. All code plugs are not equal. None are easy, but some are just ugly to work with. If you are getting a new radio version, then you will most likely have a typical code plug experience. If you are buying an older used radio...YMMV. If you are buying a second

DMR radio, then stick with the same brand. Code plug interchangeability is worth its weight in gold.

5. **Bluetooth, GPS, APRS:** These are all nice features. Bluetooth gives you wireless headphone, mics and PTT. GPS gives you APRS, roaming and time/date sync. APRS gives you tracking and other cool features. All of these are nice, but their value is your choice. I personally like GPS and digital APRS. Bluetooth I do not currently use. APRS I rarely use BTW.

6. **Support:** For any of these radios, I consider them disposable. It is very unlikely that you will successfully have one repaired outside of warranty. Just a fact. Still they all work with codeplugs and firmware that seems to be updated on a sometimes frequent basis. This can influence your brand and dealer decision. If you have a problem, do you know who you will call? Can you gain access to firmware updates easily? Can you talk to them or are you limited to webpages? You need an answer to these questions before you buy the radio.

7. **Battery:** Get one with a big battery. The Anytones most often come with a 3100 mAh battery that seems to run for days and days. Its a big deal. Don't get a small battery.

The good news is whatever you buy, it won't cost you a fortune. If you decide to sell the radio, there is an easy market for them. If you want to try a used radio just to fiddle around with, then you can easily do so for just a few shekels.

Go get one and join the conversation.

Next Month: DMR + Network

WARAC Members:

The club's new fiscal year began November 1st, which means that dues for the 2021 to 2022 year are payable now.

Life Members

Please mail the club (PO Box 511381, New Berlin, WI 53151) a completed application so that we can update our membership records.

Other Members

The preferred method of payment would be via PayPal using the "Friends and Family" option. By using this option, the club does not incur the usual PayPal transfer fee. Use this address: waracpp@warac.org.

Mail a check payable to WARAC at PO Box 511381, New Berlin, WI 53151.

If you prefer, you can mail a cash payment to this address as well. A receipt will be emailed to you at your address of record

Whichever option you choose, we would appreciate having a completed application mailed to us so that we can ensure that our membership records are up to date.

Thanks in advance for your help! • —• —••



West Allis Radio Amateur Club, Inc. MEMBERSHIP APPLICATION

Name		Call	Handle
Address			
City		State	Zip
Phone		Email Address	
Spouse's Name		Wedding Ann.	Birthday
License Class		Expiration	Licensed Since
Membership In	<input type="checkbox"/> ARRL	<input type="checkbox"/> Amsat	<input type="checkbox"/> Other
Operational Station	<input type="checkbox"/> Fixed	<input type="checkbox"/> Mobile	Bands:
Would You Be Willing To Serve		<input type="checkbox"/> On A Committee?	<input type="checkbox"/> As An Officer?
Club Activities You Would Like To Participate In			
<input type="checkbox"/> Field Day	<input type="checkbox"/> Programs	<input type="checkbox"/> Sweepst	<input type="checkbox"/> Hamtrix
<input type="checkbox"/> Elmer	<input type="checkbox"/> Sunshine	<input type="checkbox"/> Education	<input type="checkbox"/> Community Service
<input type="checkbox"/> Public Relations	<input type="checkbox"/> Scholarship	<input type="checkbox"/> QSO Party	
Class Of Membership:			
<input type="checkbox"/> Full	<input type="checkbox"/> Associate	<input type="checkbox"/> New	<input type="checkbox"/> Renewal
Dues Paid:			
<input type="checkbox"/> Full \$15.00	<input type="checkbox"/> Associate \$15.00		
<input type="checkbox"/> Family \$18.00	<input type="checkbox"/> Student \$10.00		
<input type="checkbox"/> Retired \$10.00			

I hereby apply for membership in the West Allis Radio Amateur Club, Inc. in the membership class indicated above. I agree to abide by the Constitution and By-Laws of the club and any rules or conditions that may be set forth in accordance with the Constitution and By-Laws.

Applicant	Date
Secretary	Date
Treasurer	Date
Accepted for Membership	Date

Meetings on the 2nd Tuesday of the month at:
 New Berlin Community Center
 14750 W Cleveland Avenue

Bring your completed application to a club meeting or mail with dues payment to this address:
 West Allis Radio Amateur Club, Inc.
 P. O. Box 511301
 New Berlin, WI 53151-1301



Nut Net Breakfast to start, AGAIN

Several years ago there was talk among Nut Net members that we should get to meet each other. A breakfast get together idea was started. It was open to all hams, XYL/partners and anyone who wanted to learn about amateur radio. Even visiting OM/XYL couples joined us.

So, on the fourth Tuesday each month at 8:30 am we will once again meet at Gensis Restaurant, corner of HWY 100 and Beloit Road, Greenfield, WI. Looking forward to seeing you, mark your calendar.

Phil, W9NAW

A Proposal to increase the Scholarship Endowment to \$50,000

On April 30, 2014, the West Allis Radio Amateur Club endowed the David Knaus Memorial Scholarship with a check for \$38,000 to the ARRL Foundation. This level of endowment would support an annual scholarship grant of \$1,500.

In January, 2018, the Terms of Reference (TOR) was updated to provide for an annual scholarship grant of \$2,000, and the Club would provide the \$500 difference each December.

In July 2021, the TOR was updated to require that the Scholarship Recipient be only from the State of Wisconsin, and in October, 2021, the annual Scholarship Grant was further increased to \$3,000. This would require the Club to potentially have to provide an annual amount of \$1,500 to the ARRL foundation to fully fund a \$3,000 scholarship grant. At this time the secondary fund has sufficient money to provide the additional \$1,500 in funding for at least 4 years.

By 2021, the Club Scholarship Fund has grown to over \$20,000. These funds are currently contained in 3 Certificate of Deposits (CD's), which are making a very small amount of interest.

I am proposing that \$12,000 be given to the ARRL Foundation to complete the initial endowment amount of \$50,000. This transfer would occur in the first quarter of 2022, when the CD's reach their maturity. This proposal has been voted on by the board at the October board meeting, and was approved. This proposal needs to be approved by the general membership. This is the official notice that this vote will occur during the December, 2021 membership meeting as long as there is a quorum of members present.

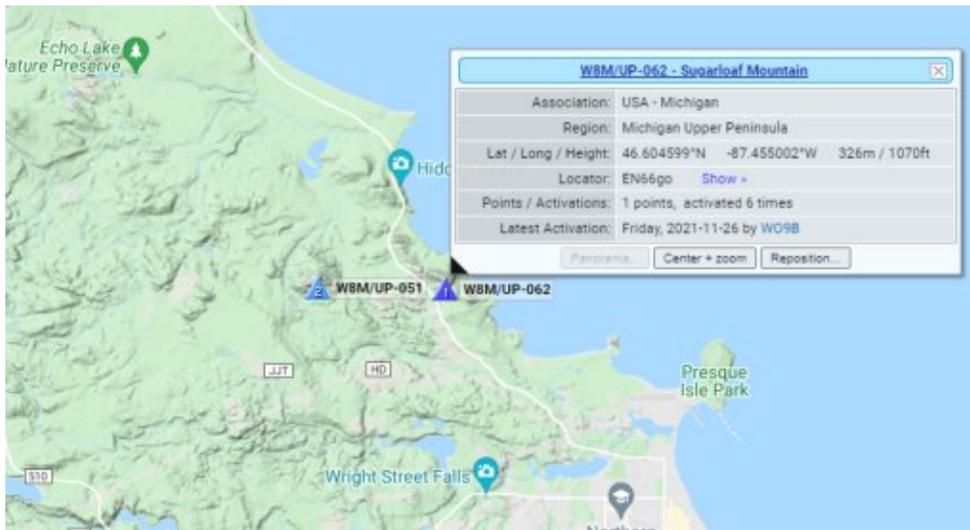
Howard Smith, WA9AXQ
Scholarship Chairman
November 22, 2021

SOTA Activation: WO9B's Black Friday Trip

This year we ventured to the UP of MI for Thanksgiving. The weather can be a variable, but this year it

turned out to be spectacular. By UP standards, it snowed every day we were there, but what we call snow versus their definition, it was just a dusting.

The plan was to head up to Sugarloaf Mountain W8M/UP-062, a very accessible mountain located just a few miles outside of Marquette, MI. It is an all trail ascent and less than a



mile in length. As SOTA peaks go, this one was very easy. As we drove to the parking lot jump off point, the clouds cleared and the sun came out. Perfect. The summit has a couple of observation decks which made operating a breeze. The mountains in the UP all have trees, so getting the Spark Plug set was no problem at all. 8 quick CW QSO's were made and home we went.

⑨ SOTA SUGARLOAF MT 11-26-21
W8M/UP-062 ACTIVATION

TIME	RADIO/MODE	CALL	S	R
20:19	WA	N1AW	559	559
20:20	WA	W47D	WA	559
20:21	IN	KL3PY	AZ	559
		K44R		559
20:23	GA	N1RBD		559
20:24	OR	N57P	559	449
20:25	CA	W86PDJ		559
20:26	DE	AC1Z	559	559 De
20:27	SC	NJ4Z		559 SC
		NJ4Z		

— 8 QSO'S —

Name That Core

Carl Luetzel Schwab K9LA

If you've been active in Amateur Radio for a number of years, perhaps you've accumulated a junk box full of components. These components could be resistors, transistors, tubes (I still have some of these!), capacitors, inductors, knobs, meters, cores, connectors, etc.

Of those components, it's likely that the characteristics of most of them are identified by a color code (resistors, for example), by performing a mathematical calculation (air-wound inductors, for example), by reading labeling (transistors, for example) or by doing a visual inspection (connectors, for example). The one exception seems to be cores – generally ferrite cores have no marking to identify their characteristics (there are iron powder cores that are color coded – more on this later).

A great example of 'no marking' is a box full of half-cores that I have. The idea here is to put a wire or cable in one of these half-cores and then add another half-core to fully encase the wire or cable. But I have no idea what these cores are. One way to answer the 'what are they?' question is to stick a short wire through the core and measure the resulting impedance – its series resistance R_s and its series reactance X_s . You can easily do this with an MFJ-259B (HF/VHF SWR analyzer) or something similar, with one end of the wire to the center conductor of the RF connector and the other end to the ground side of the RF connector.

What you're looking for is the frequency at which the series resistance R_s is equal to the series reactance X_s . Knowing that frequency, you can then go to Figure 1 to estimate the permeability of the core. Also included on the plot is tabular data on various ferrite materials.

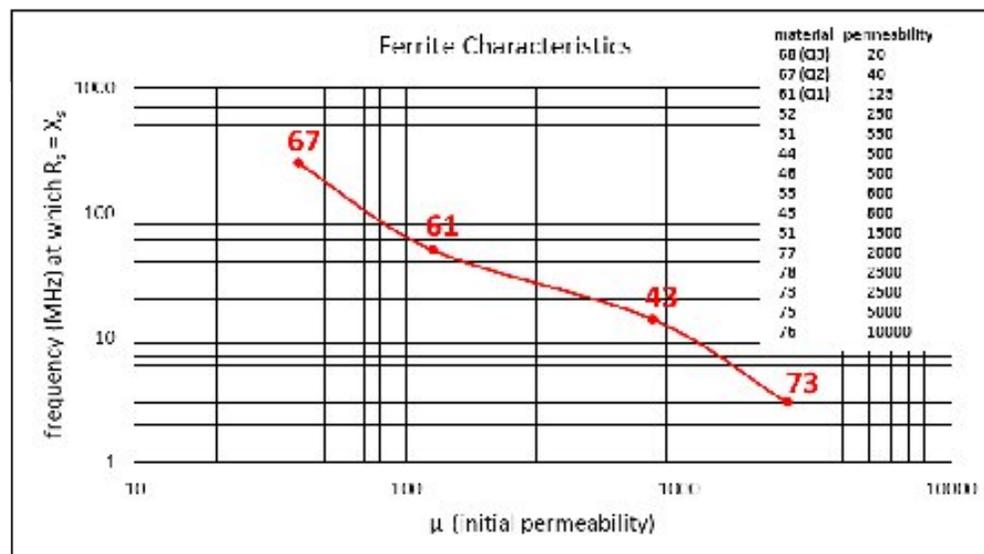


Figure 1

Figure 1 was developed by looking at the data sheets of toroidal ferrite cores of material 67, 61, 43 and 73 and plotting the frequency where $R_s = X_s$ versus the permeability of the core. As can be seen, the higher the permeability, the lower the frequency where $R_s = X_s$. The permeability does have a tolerance, but this plot should get you into the ballpark of the permeability of the unknown core.

I went through this procedure with my box of half-cores. I started at the lowest frequency of the MFJ-259B, which is about 1.7 MHz. The frequency where $R_s = X_s$ was around 17 MHz. That says these cores are probably ferrite material 33 with a permeability of 600. After learning this, the first thing I did was write 'material 33' on the box! I also measured several other cores I have laying around – now I know about what they are in case I need something in the future.

Earlier I mentioned iron powder cores. Iron powder cores have a much lower permeability, and are generally used in high power applications like 4:1 matching transformers at the output of an RF amplifier or at an antenna. I used a big iron powder core in a 4:1 transformer (12.5 ohms to 50 ohms) at the base of a short 80-Meter vertical that I had when we lived in Texas. Table 1 is data from the company Micrometals on their iron powder cores.

mix	permeability	Color code
0	1	tan/tan
12	4	green/white
17	4	blue/yellow
10	6	black/clear
6	8.5	yellow/clear
4	9	blue/white
7	9	white/clear
2	10	red/clear
1	20	blue/clear
15	25	red/white
3	35	gray/clear
8	35	orange/clear
42	40	blue/red

In summary, I hope this helps you sort out some of the stuff in your junk box. It sure has helped me. By the way, this topic came from a question about ferrite cores on the topband reflector.

• —• —••

The ZL2BKC “ZLPLL” ADF5355 Synthesizer board – Dave Garnier - wb9own

There are a couple of GHz PLL synthesizer boards available to the microwave ham community to replace their troublesome drifting crystal control oscillators. I ran across a paper published by W5LUA about ZLPLL boards, where user could program any frequency in the 40 Mhz to 14 GHz range. The frequency range and the ability store frequencies immediately interested me, I could use this in any number of my 10 GHz projects.

https://www.ntms.org/files/Mar2019/ZLPLL_W5LUA_March2_2019.pdf

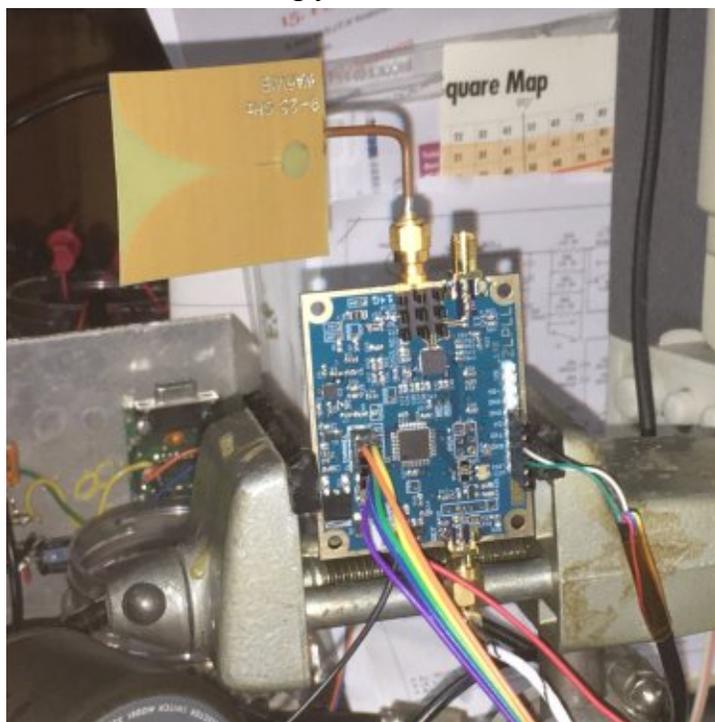
I received the ZLPLL board is about 1 month. I immediately wired up the board, connected an external 10 MHz oven oscillator and began testing... With an “eyeballed in” 10 MHz reference oscillator to ZLPLL board (with programmed operating frequency of 10.3681 GHz) the synthesizer was almost on frequency! Happy dance.

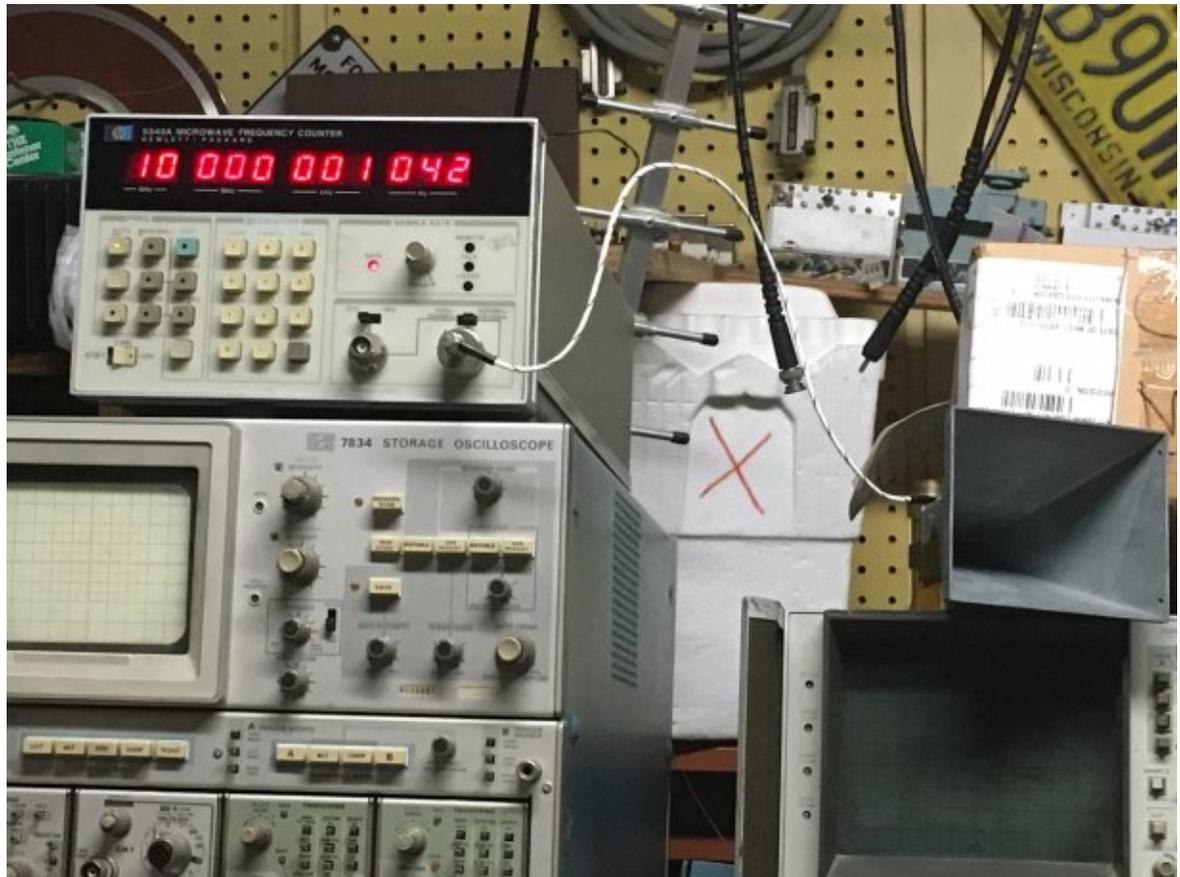
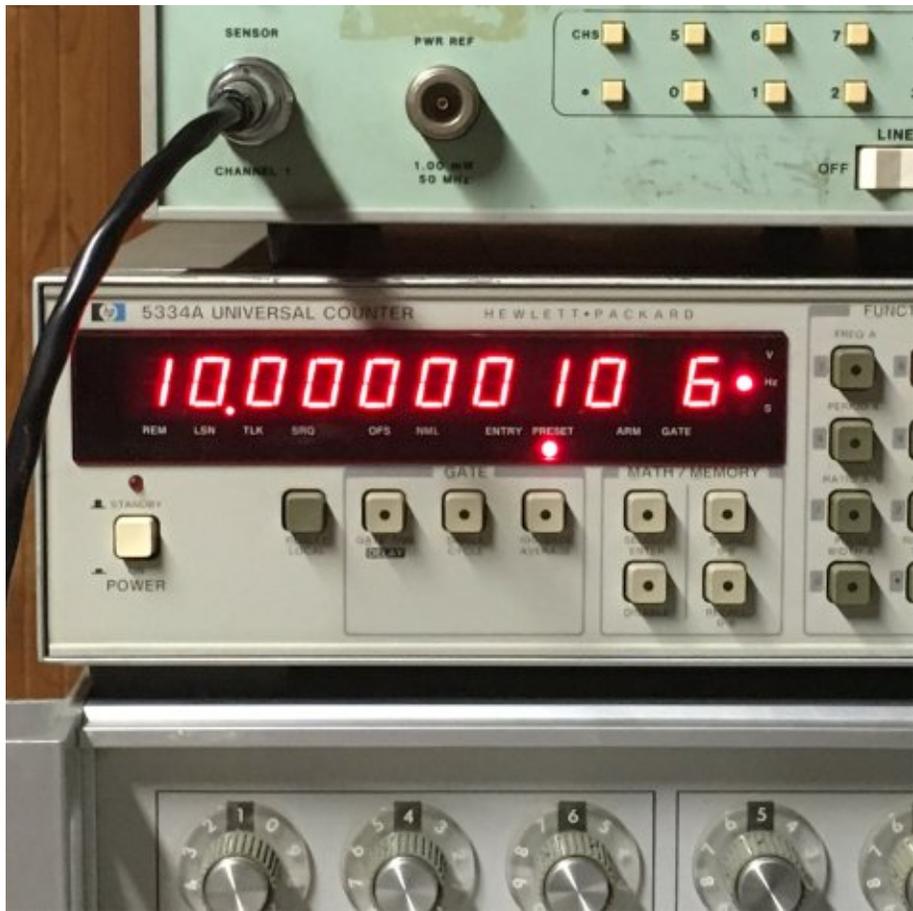
But I had a number of questions about the required stability of 10 MHz reference clock for 10 GHz. Jeff Pawl W9JSP described an experience he had where his oscillator wasn't precisely on frequency resulting in being off many Khz's from 10368.1 GHz. Everything I read & heard confirmed this problem and matter of fact GPS locked local oscillators is pretty much standard practice by some microwave hams... I started to wonder, “Can I accurately measure the drift of the ZLPLL oscillator? I don't have an operational GPS locked 10 MHz source but I do have a 10 MHz rubidium frequency source... The 10 MHz rubidium oscillator was then connected to HF counter HP-5334A and then daisy chained to the microwave counter HP-5343A.

The big question. “What would be the results of 1 Hz frequency shift of ZLPLL 10 MHz reference oscillator at 10 GHz?” Testing began...

The PLL oven oscillator was adjusted to be 1 Hz high on 10 MHz. Amazingly the 1 Hz shift of the 10 MHz reference clock resulted in approximately 1.050 Khz shift at 10.0 GHz! Wow. de - wb9own

PS: Thank you Wayne Knowles ZL2BKC for making your board available to the world community.





Amateur Radio Station
W7FSH
 Phone Test 5251 4445 51st Ave. South West
Seattle, Wash., U.S.A.
 7th July, 1937.

"TAYLOR TUBES ARE POPS"
 "Filtering by Sprague Condensers"



To:- W7FFH;
 Tnx for QSO on 40 mtrs today at
 4:47 P.M. Ur sigs RST 349 es vy
 poor keying. U key like a phone
 man. Rig hr 47X osc 80l final 80
 watts input. Revr E.O.S tube es
 for Pse 2SL.73. Map coming in

SLOW SPEED CW QSO NET
 Monday's - 8:00 PM - N9FSE 147.135 Repeater
Don't Key like a Phone Man!!

CW Practice

One of the best and maybe the only way to get better at CW is practice. Having someone else who also wants to practice also helps. Just makes it more fun.

The West Allis Radio Club is going to try to help. We are running a CW practice net on Monday at 8pm The repeater is 147.135+ 141.35 the CW portion is on HF

Mike WO9B has been joining me and setting up some practice but we are open for suggestions on where to go with this. Come join us.

Officers and Board
 President

Vice President
 Feeroz Ghose WU9N

Secretary
 Dave Garnier WB9OWN

Treasurer
 Bill Reed N9KPH

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