



Official Publication of the
West Allis Radio Amateur Club

Hamtrix

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Volume 67, Issue 11 November, 2019

NOVEMBER CLUB HAPPENINGS



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.

New Location for Club Meeting
New Berlin Community Center 7:00pm
14750 W. Cleveland Ave.
New Berlin, WI
Between Mooreland and Sunny Slope

Swapfest info Erwin von der Ehe W19EV
Tower Safety video Mike WO9B
Membership renewal See page 6

Premeeting dinner
New Berlin Ale House 5:15pm
16000 WCleveland Ave
West of Mooreland Rd.

48th Annual Midwestern
SwapFest
Saturday January 4, 2020
8:00am - 1:00pm
Waukesha County Expo Center Arena

WARAC 2-meter net
Every Wednesday at 8pm
SEWFARS W9TJK Repeater 146.820 standard (-)
offset
127.3 Hz CTCSS
if repeater down try 146.55 simplex

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The President's Shack November 2019

Not long ago if anyone had asked me if I would be writing the President's Shack column for Hamtrix I would have said "No, can't imagine why I would be doing that!"

I still don't know why I would be writing one but here I am!

The November meeting will be November 12 at our new meeting place at the New Berlin Community Center off of Cleveland Rd between Sunny Slope and Mooreland roads. Pre-meeting dinner will again be at the New Berlin Ale house. Hope to see many of you.

At the meeting Erwin W9IV will be talking about the swap fest. Including the fact that this will be his last time running the swap fest for the club. So we will be needing a new swap fest chairman if we want to keep running one. Erwin has done a good job of documenting the procedures and time frame for when things need to be done. He is also willing to be there to help with problems. Think about it.

Another presentation will be one on tower climbing safety. Mike WO9B found it on the Internet looks interesting!

Another thing to think about is where to have our January meeting. This has become a low key get together at a restaurant rather than a formal meeting. Last year we we went to the New Berlin Ale house which worked good but we are now having our pre-meeting meal/get together there. Bring any thoughts to the meeting.

Frank KA9FZR • — • — •



From the Editor

No editorial do to being occupied by the President's Shack

WARAC Meeting Agenda October 8, 2019

Meeting called to order 7:00 pm
Members: 18

Held at new location of New Berlin Community Center!
Get acquainted: Introduction of members and new members

Announcements:

- Tom, K9BTQ, and Irwin, WI9EV to meet with programmer to set up Swapfest Paypal.
- Howard, WA9AXQ, hosted the last midweek park activation in September.
- David, WB9OWN, arranged location for club participation in Wisconsin Parks on the Air at Bong Recreation Area. Chuck, W9WLX, ran second station. Mike, WO9B, Howard and Michael, AA9RK, came down to work the radios and share the food.
- Awards Dinner will be held October 20th. Payment to Bill Reed, N9KPH.

Club elections were held following discussion of positions. Results:

- President: Frank Humpal, KA9FZR
- Vice-President: Steve Dryja, NO9B
- Secretary: David Garnier, WB9OWN
- Treasurer: Bill Reed, N9KPH
- 2 year Director: Tom Macon, K9BTQ
- Continuing Director: Phil Tollefson, WA9AQL

Frank presented information on his circular polarization single band antenna.

Bill presented information on working unusual special event stations.
(October 18th and 19th is the Jamboree on the Air)

Meeting adjourned 8:29pm

Coffee and conversation followed

Respectfully submitted,
Barbara Garnier
KD9HPS • —• —••

Board Meeting Agenda, October 22, 2019

Officers Board Members Present

Mike Johnson WO9B, Tom Macon K9BTQ, Erwin WI9EV, Steve Dryja NO9B,
Frank Humpal KA9FZR, Bill Reed N9KPH, Phil Tollefson WA9AQL, Dave Garnier WB9OWN,
Howard Smith WA9AXQ.

Meeting began @ 7:03 PM

Meeting Agenda

1. Board Chairman Election: “Rustling up” of a candidate occurred, Frank has agreed to accept this position.
2. Swapfest Chairman Report – Erwin, WI9EV: Going live with Swapfest page and PayPal soon. PayPal piece seems to work. Discussion of “missing” special drop down for club renewal. Use PayPal “Family &

Friends to send dues renewal.

3. Treasurer's Report – Bill, N9KPH

- a. Banking: CD Status, No status change.
- b. Financial Reports
- c. 2020 Budget Review and Adoption
- d. 2019 Audit Plan: Al Hovey has agreed

4. Fund Raising: Sendik's again. Mike, “Going to start early next year, maybe run the event multiple times.”

5. Secretary Report – Barb, KD9HPS: Maintenance of the Membership Renewal form was added to the Secretary's job description.

6. Scholarship Chairman Report – Howard WA9AXQ: Report will be delivered in January.

7. Equipment Sales Chairman Report – Steve, NO9B: The shelves are bare need to reassess. Phil has some items.

8. Hamtrix Editor Report – Frank, KA9FZR: Maybe a second editor is in the wind.

9. WIQP Chairman Report – Tom, K9BTQ: FT8 operation isn't going to be permitted for WIQP

10. FD Chairman Report – Chuck W9WLX - Budget request made, nothing further at this point.

WARAC Board Meeting Agenda October 22, 2019

11. Awards Dinner: Broke even with the meal cost increase.

12. Program Committee Recommendations

- a. See attached Schedule
- b. Nov, Dec Programs Needed

13. Club Activities

- a. Summer Local Park Activations: Great time was had by members, lets do it again.
- b. WI POTA Contest: Shall this become an annual event? Yes. Other nearby SP's with shelters mentioned.

14. Goals for 2019, (Mike's swan song:) Board accomplished 3 goals for the year:

New meeting Location. Web Page: Update underway. Presentations for 2019 were partially successful

15. Miscellaneous:

- a. SEWARC meeting is scheduled in Nov.
- b. The box of 2019 Membership Directories box is missing: Mike is going to reprint 20 copies.
- c. Club and Board Meeting Locations: Need to apply for 2020
- d. Elections: Discuss Elections
- e. Club Future Issues:
 - e.i. Swap Fest: Continuance discussed.
 - e.ii. Field Day: Chuck has new ideas for next year. Need more bodies for teardown. Or?
 - e.iii. Awards Dinner: Future subjects are available from “Badger Talks.”
 - e.iv. Club Project: Vague recollection of something.

Meeting Ended @ 9:20pm

Respectfully Submitted,

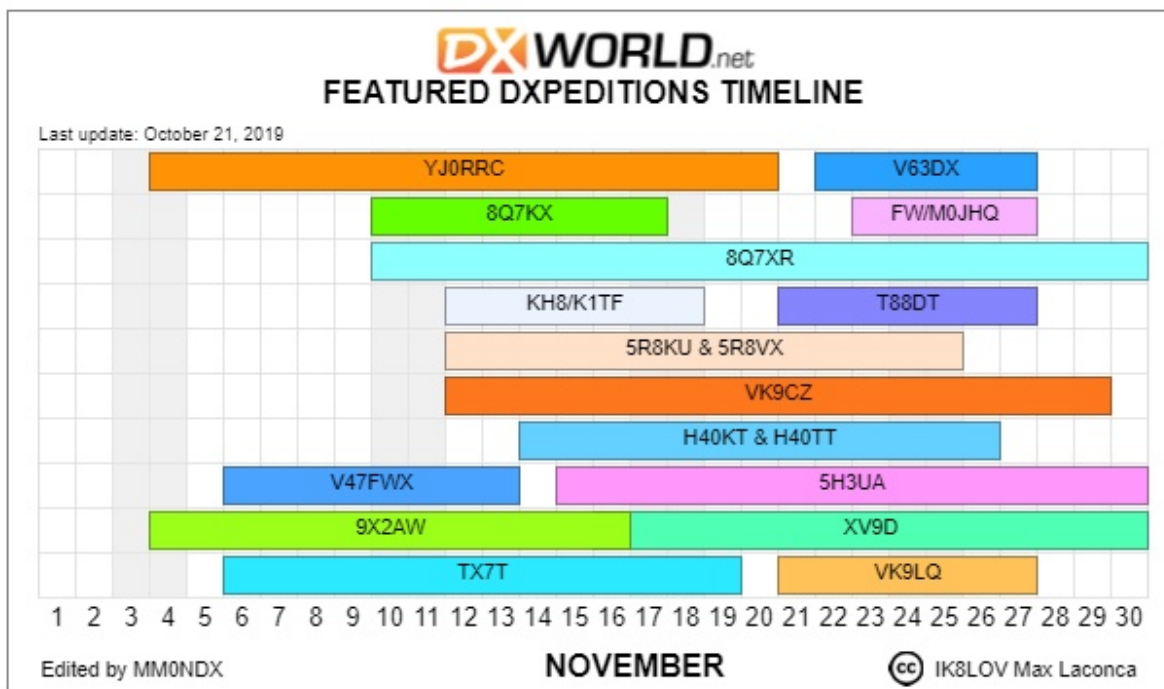
David Garnier

WB9OWN • —• —••

DX / CONTEST UPDATE

http://www.hamradiotimeline.com/timeline/dxw_timeline_1_1.php

DX: November has some big shoes to fill after a welcome October. We say good bye to VP6R, Pitcairn who by any measure did great work. CQWW SSB generated all the usual Caribbean stations as well. But have no fear, those and more will be back in later November with the CQWW CW version. That will keep things lively.



3Y0I, Bouvet: The big news of the week is the re-emergence of, yet once more, the Rebel DX Group for another attempt at the brass ring of DX Peditions. This time they are looking for assistance via a Go-Fund-Me campaign. https://www.gofundme.com/f/3y0i-bouvet-island-expedition?utm_source=customer&utm_medium=copy_link&utm_campaign=p_cp+share-sheet I'll let you decide.

Contests: This is the season. Big contests with the usual mix of domestic and DX

ARRL Sweepstakes CW: Nov 2- Nov 3.

AWA Bruce Kelley 1929 Contest, CW: Nov 9th and 10th.

WAE DX Contest, RTTY: Nov 9th and 10th.

ARRL Sweepstakes, SSB: Nov 17th and 18th

CQWW DX, CW: Nov 23rd and 24th

Granted the Bruce Kelley contest is not a biggie, but it is very heart felt and fun. The participants are easy to spot as their signals are 1929 tube driven unstable and wonderfully warm sounding. Give them a Q if you can.

See David Garnier, WB9OWN, to pick up name badges:

WD9EFN John Tankersley
KD9MFS Marc Schneider
W9JSP Jeff Pahl
KD9NHK Tom Massopust
KD9MUU Bill Guynn
AA9RK Michael Falk
KD9NZB Max Falk



Membership renewal

“Just a friendly reminder that club dues are payable as of November 1st. We’d also appreciate it if each of you would fill out a new application so that we have up to date information to keep the club directory current. Ideally, these along with dues can be turned in at the upcoming meeting. Dues can be paid three ways – cash, check, or via PayPal using the “friends and family” option. The club email address to use is waracpp@warac.org. You can also mail dues and/or the application to the clubs new address: P.O. Box 511381, New Berlin, WI 53151.” **Form on page 7**



RENEWAL OF MEMBERSHIP

ALL MEMBERS WHO JOIN ED BEFORE October 1 ST
MUST RENEW THEIR MEMBERSHIP BY September 30 TH
*****FILL IN ALL INFORMATION PLEASE*****

NAME: _____ CALL SIGN: _____
(As you want it to appear on the roster)

ADDRESS: _____ LIC CLASS: _____

CITY: _____ LIC EXP: _____

STATE: _____ OCCUPATION: _____

ZIP CODE: _____ E-MAIL ADDRESS: _____

HOME PHONE: _____ WORK PHONE _____

CHECK HERE: _____ IF YOU WANT THE CLUB NEWSLETTER EMAILED TO YOU?

CHECK HERE: _____ If you are an ARRL member?

Would You Be Willing To Serve On A Committee? _____ Officer? _____

Club Activities You Would Like To Participate In?

Field Day _____ Programs _____ Swapfest _____ Hamtix _____ Elmer Sunshine _____

Education Community Service _____ Public Relations _____ Scholarship _____

QSO Party _____

Class Of Membership: Full Associate New Renewal

Dues Paid: Full \$15.00 _____ Associate \$10.00 _____ Family \$18.00 _____ Student

\$10.00 _____ Retired \$10.00 _____

*****FAMILY MEMBERSHIP *****

A family member ship includes the individual applying and all members of such person's immediate family residing in the same household who possess an Amateur Radio license.

NAME: _____ CALL SIGN: _____

LIC CLASS: _____ LIC EXP: _____

Date of Application _____ Amount Enclosed \$ _____

FOR WARAC OFFICE USE ONLY
Treasurer Received/ Date: _____
Sec. Add Roster/Date: _____

Mail to
West Allis Radio Amateur Club
P. O. box 511381
New Berlin, WI 53151-1381

Frequency Measurement Testing

By Chuck Dellis, W9WLX

Have you ever looked into participating in the ARRL's bi-annual Frequency Measurement Testing (FMT)? It is a good way to test your rig's frequency calibration, submit your results, and see how you stack up against your fellow hams.

Today's modern radios lend themselves well for precision frequency measurements. Specifically, if they have an external reference signal or a GPS Disciplined Oscillator (GPSDO), both of which will discipline the internal oscillator, improving accuracy and compensating for error as a result of aging. The table below summarizes the accuracy of various time base sources. Amateur radio transceivers typically use a TXCO or OCXO internal oscillator.

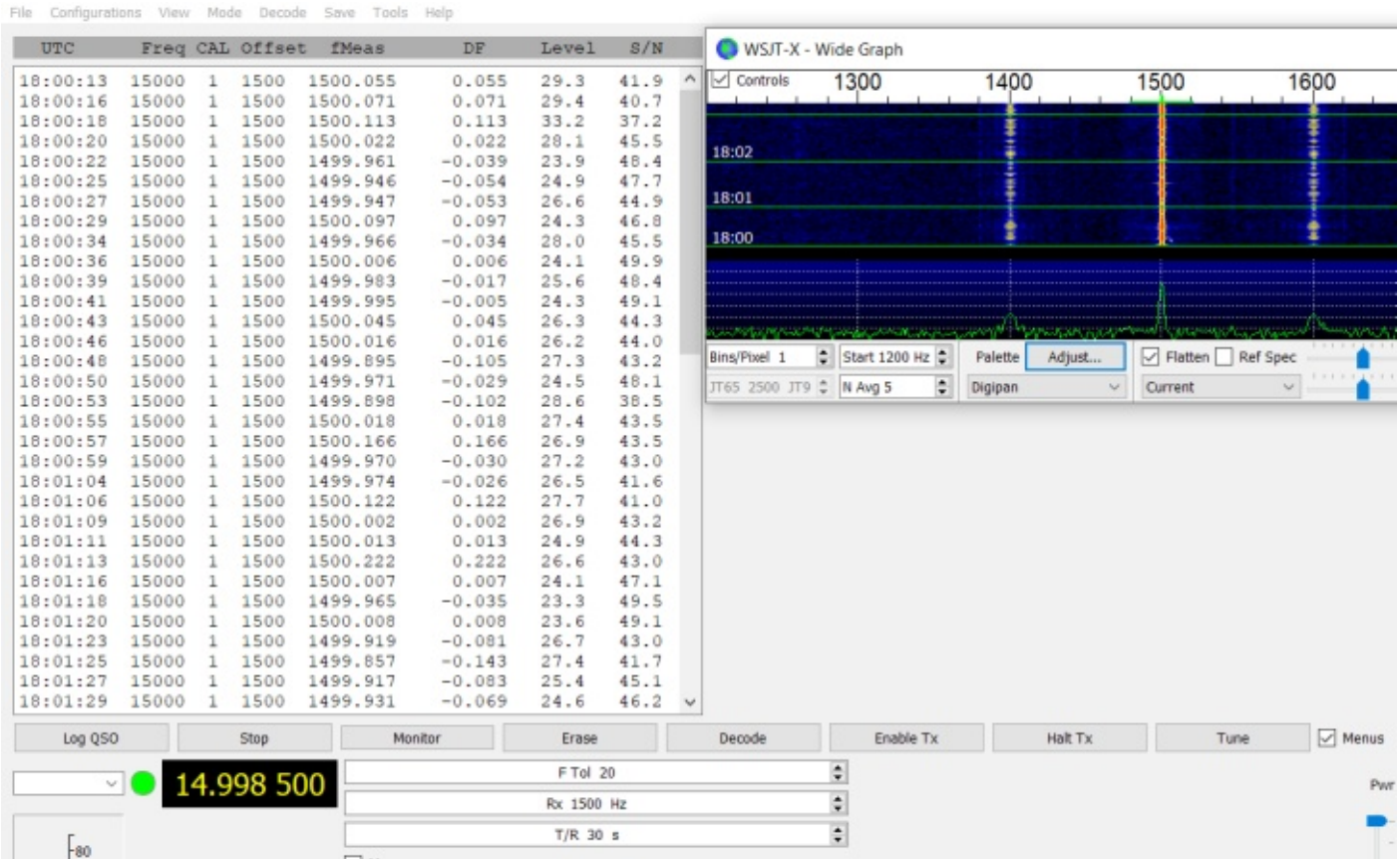
Type	Description	Accuracy per Year (approx.)	Error (Hz) at 10 MHz
XO	Crystal oscillator	1×10^{-4}	1000
TXCO	Temperature compensated crystal oscillator	2×10^{-6}	20
OCXO	Oven controlled crystal oscillator	1×10^{-8}	0.1
Rb OCXO	Rubidium disciplined oscillator	5×10^{-11}	0.0005
GPSDO	GPS disciplined oscillator	5×10^{-12}	0.00005
Cesium	Cesium atomic clock	$>1 \times 10^{-11}$	<0.0001

The following describes how FMT may be done with two configurations of FlexRadio's 6000 Signature series receivers. Frequency measurements were done at four frequencies using broadcast stations WTMJ, WISN, and WWV's 10 and 15 MHz broadcasts. Two receivers were compared, FlexRadio 6500 using only the TXCO internal oscillator and FlexRadio 6600 with a GPSDO. At the time of the testing the 6600 was tracking 11 satellites with 14 visible providing an excellent GPS lock. The 6500 was allowed to warm up for 1 hour and the TXCO was recalibrated prior to testing using the automated routine provided in the SmartSDR for Windows client software. Other tools include the frequency calibration feature in Joe Taylor's WSJT-X software application, telnet client (PuTTY) for logging into the Flex, and Microsoft Excel. Excel use is optional but it streamlines the calculations when making multiple measurements and averaging and reduces the likelihood of mathematical errors.

The basis for measurement is fairly simple. The VFO frequency is set 1500 Hz lower than the frequency being measured in USB mode. The offset is measured using the WSJT-X application and added to the VFO frequency to get the actual frequency.

The Flex 6600 with the GPSDO has a small error that needs to be subtracted from this sum. The Direct Digital Synthesizer (DDS) performs the tuning of receivers in the digital domain. It uses a complex set of DDSs that control the final output frequency. FlexRadio has not disclosed the algorithm, initially developed for a government customer, but they have provided an API which can be run to get the error at the tuned frequency. The reason the error exists is not all tuned frequencies can be represented with 32 bits and become truncated. The error at a given frequency can be queried using the 'get_error' API from the command line using a telnet login. It returns the error in milliHz.

The formula used to calculate the Actual Frequency is:
Actual Frequency = VFO Frequency + WSJT_Offset - (Flex_RX_Error/1000)
Below is an example of the WSJT-X frequency measurement screen:



In an effort to reduce sample variability, 100 measurements of the WSJT_Offset were taken. Samples of fMeas were averaged and used for the WSJT_Offset value.

Frequency Measurement Results Below:
Flex 6500 TXCO

	A	B	C	D	E
1	Slice Frequency	9.998500	in MHz		
2	WSJT_Offset	1500.11912	in KHz		
3	Flex_RX_Error	NA	in mHz (millihertz)		
4					
5	Result	10.0000001	Actual Frequency (MHz)		
6	Error	1.1912E-07			WWV 10 Mhz
7					
8					
9	Slice Frequency	14.998500	in MHz		
10	WSJT_Offset	1500.11195	in KHz		
11	Flex_RX_Error	NA	in mHz (millihertz)		
12					
13	Result	15.0000001	Actual Frequency (MHz)		
14	Error	1.1195E-07			WWV 15 MHz
15					
16					
17	Slice Frequency	0.6185	in MHz		
18	WSJT_Offset	1500.02633	in KHz		
19	Flex_RX_Error	NA	in mHz (millihertz)		
20					
21	Result	0.62000003	Actual Frequency (MHz)		
22	Error	2.6328E-08			WTMJ 620 KHz
23					
24					
25	Slice Frequency	1.1285	in MHz		
26	WSJT_Offset	1497.08393	in KHz		
27	Flex_RX_Error	NA	in mHz (millihertz)		
28					
29	Result	1.12999708	Actual Frequency (MHz)		
30	Error	-2.9161E-06			WISN 1130 KHz

Flex 6600 GPSDO

	A	B	C	D	E
1	Slice Frequency	9.998500	in MHz		
2	WSJT_Offset	1499.943707	in KHz		
3	Flex_RX_Error	38.146973	in mHz (millihertz)		
4					
5	Result	9.99999906	Actual Frequency (MHz)		
6	Error	-9.44397E-08			WWV 10 Mhz
7					
8					
9	Slice Frequency	14.998500	in MHz		
10	WSJT_Offset	1499.996667	in KHz		
11	Flex_RX_Error	-22.88184	in mHz (millihertz)		
12					
13	Result	15.00000002	Actual Frequency (MHz)		
14	Error	1.95485E-08			WWV 15 MHz
15					
16					
17	Slice Frequency	0.6185	in MHz		
18	WSJT_Offset	1499.965105	in KHz		
19	Flex_RX_Error	19.073486	in mHz (millihertz)		
20					
21	Result	0.619999946	Actual Frequency (MHz)		
22	Error	-5.39686E-08			WTMJ 620 KHz
23					
24					
25	Slice Frequency	1.1285	in MHz		
26	WSJT_Offset	1497.060523	in KHz		
27	Flex_RX_Error	-3.813300	in mHz (millihertz)		
28					
29	Result	1.129997064	Actual Frequency (MHz)		
30	Error	-2.93566E-06			WISN 1130 KHz

In conclusion, both FlexRadios performed extremely well in the FMT exercise. While in two cases the GPSDO seemed provide an order of magnitude improvement, a properly calibrated TXCO can also perform well. Due to aging effects on TXCOs and OCXOs, periodic recalibration under stable conditions is recommended. Most modern transceivers have provisions for calibration using WWV and/or an external reference standard. Many submissions to the ARRL's FMT using FlexRadio 6500, 6600, and 6700 GPS locked radios demonstrate errors of <1Hz.

Reference: FlexRadio Systems, Austin, TX.

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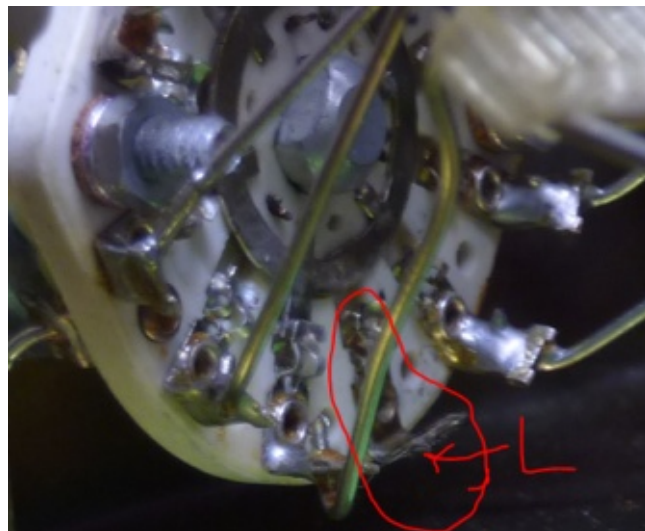
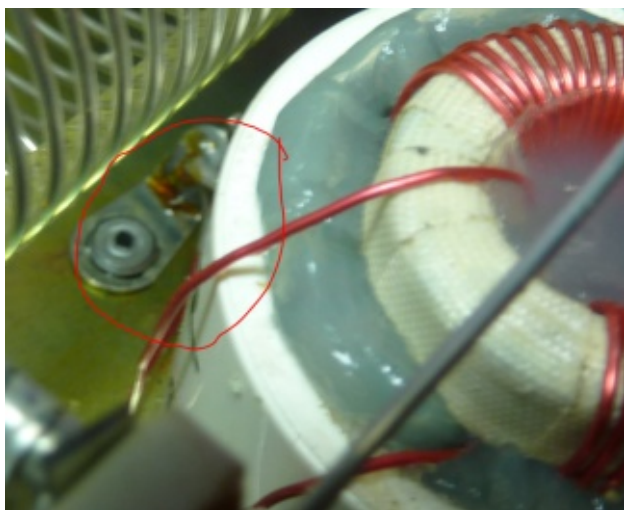
DENTRON JR 160 METER TUNER MOD

By Mike Johnson, WO9B

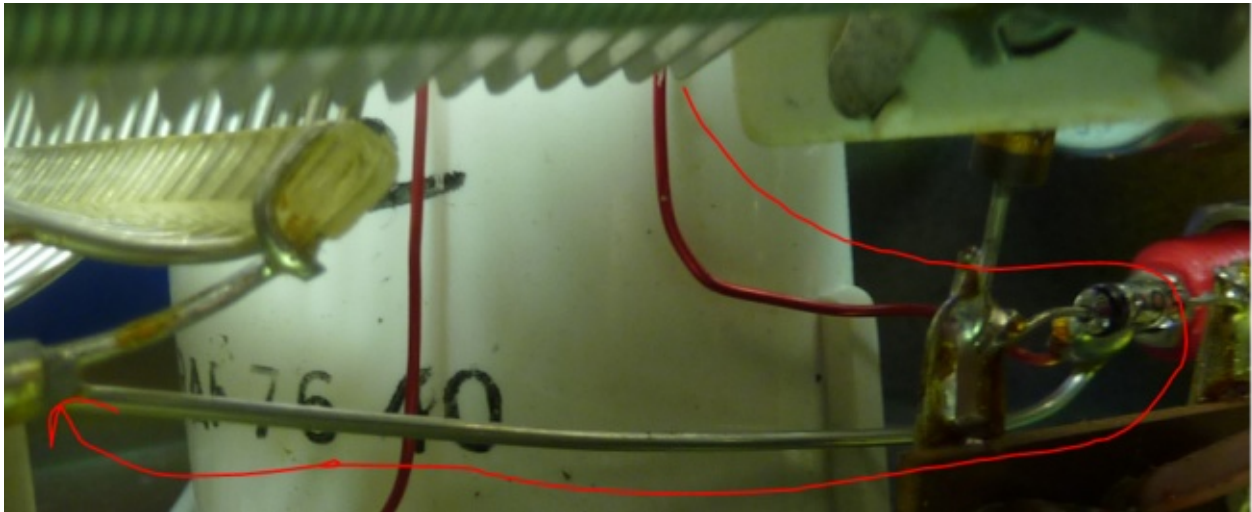
I've owned my trusty Dentron Jr for 35 years. Most of that time it has been in a storage box unseen and mostly forgotten. Since 2015 it has found mostly daily use in my shack as my main HF tuner. Eham.net reviews declared this little 300W tuner a "Tank". Back in the day it was marketed as a mobile tuner and claimed 160 thru 10 meter ability. Except it did not tune my 132' doublet on 160 meters no matter what was tried.



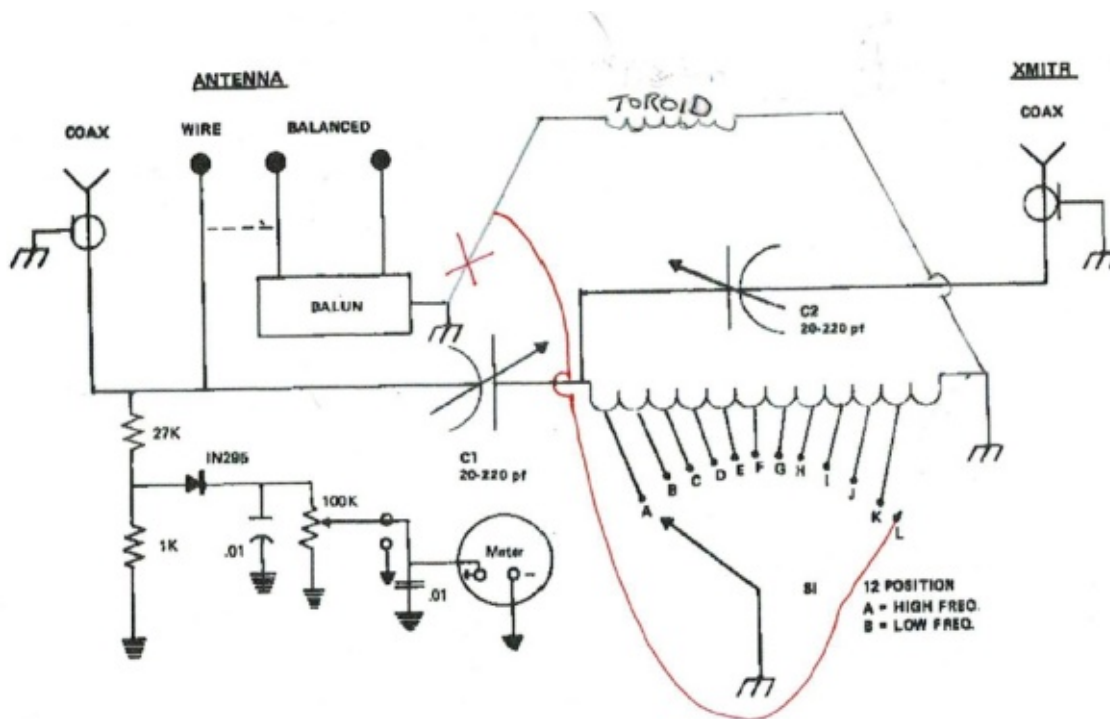
I'm not all that familiar with Dentron, but the feeling I get is they rocked on some products and others were a bit shaky. This tuner has a good reputation. One odd thing: None of the Eham reviews mention 160 meters. I'd pretty much given up on my 160 meter grail quest until I read some off-hand comment in QRZ this week about the 160 meter toroid. What? I've had the box open multiple times and read the "manual" and there is no mention of a 160 meter toroid. I was missing something. The only toroid is the red one shown in the picture perched atop the 4:1 voltage balun. I always assumed it was part of the balun. It was time to check under the hood one more time.



I looked hard at the toroid, which showed one wire going to ground and the other to the base of the main inductor coil. Also, the schematic made no mention of the toroid. One other Dentron miscue was the schematic showed a connection from the switched inductor rotary position "L" (i.e. the 160 meter location) to the base of the main inductor coil....but there was no such connector.



Before committing to surgery, I redrew the schematic and plotted a course of action:



For clarity, I erased the non-existent connection from the “L” lug of the rotary switch to the base of the coil.

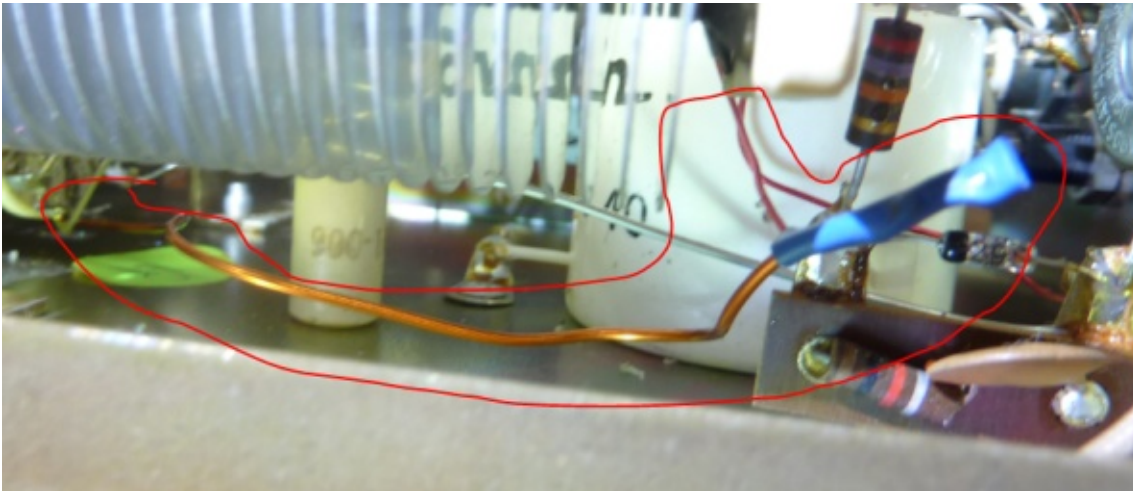
The toroid was added showing the factory wiring which had both leads connected to ground. I then clipped the balun end ground connection and rerouted it to the “L” lug. Now when the “L” position is selected, the toroid inductance is placed in series with the main inductor coil. Just to be clear, the blue wrap in the picture above is not painter’s tape, it is heat shrink tubing. Not to malign painter’s tape, but I thought the heat shrink to be a better choice for this application.

It was literally a 10 minute modification and it brought 160 meters into the game. In short, it worked. I asked some club members their opinion prior to doing this mod. One thought was that there might be some interaction between the 4:1 and the toroid. As a test, I checked the operation of the tuner

using the 4:1 after the change, and can report it continued to work just fine. My normal antenna configuration skips the 4:1 and I utilize just the coax connectors. This tuner has enough range to cover the ladder line impedance mismatch without the 4:1 transformer. It really is a tank.

There are a fair number of photos of these units on the internet. From what I can see, the schematic has not changed though some of the internal wiring has. I am puzzled that this mod has not shown up before. Of all the least likely hams to spot something like this, I'd be at the top of my list.

Bring on the ARRL 160 Meter contest.



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Officers and Board
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Steve Dryja, NO9B

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Dave Garnier KD9HPS

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