The ORC Newsletter

Official publication of the Ozaukee Radio Club, Inc. Email all contributions to the editor, Bill Shadid, W9MXQ (newsletter@ozaukeeradioclub.org). Permission to reprint articles published in any issue is granted provided the Author (as shown in the article) and the Ozaukee Radio Club Newsletter are fully credited in any publication.

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Volume XLII	November 2024	Number 11

From the President

de: Bill Greaves, K9GN

The weather this October has been refreshing, if unseasonably, warm, and pleasant. Perfect for outdoor projects before the snow flies.

While the weather back in August did cancel our ORC outdoor radio demonstration at the West Bend Memorial Library, the club successfully conducted two days of FM radio kit-building sessions on Friday and Saturday, October 18-19 at the library. Others will report details of this event in the newsletter. In summary, seventeen middle school students participated (nine on Friday and 8 on Saturday) in the approximately 4 hour sessions. Lead by Pat Volkmann W9JI, STEM Committee Chair, the students were oriented to the project and began with some soldering practice. For most of the students, this was their first soldering experience. They sat at tables in a project room at the library with each student at a station equipped with soldering irons and other equipment in typical fashion set up by ORC members in advance. One or two students were guided by an ORC member through each step of the kit manual. Soldering techniques and results were checked, any problems were addressed, and the students were assisted as needed. The ORC member participants were: Pat Volkmann W9JI, Gary Bargholz N9UUR, Jeananne Bargholz N9VSV, Bill Schnell AC9JV, Gary Sutcliffe W9XT, Scott Galaska KD9YEW, and Bill Greaves K9GN. Pat W9JI and the librarian's middle school son did conduct a practice run with kit-building a few weeks in advance, so this "pilot" test informed how the sessions were conducted.

Overall, many of the students completed their kit in the time available at their session, as the music and talk-radio sounds in the room attested. A brief survey revealed 100% of the responding students enjoyed the experience and would recommend other students

participate as well. I even heard two participants are working on their Technician License. Maybe we will see them at a future ORC meeting!

This program became a success because multiple members participated. The ORC may use this model program to enhance STEM education through other libraries in our area in the future.

The Club membership will gather on Wednesday, November 13th both in-person and on zoom at 7:30pm, with Meet-and-Greet at 7:00pm, at the Grafton Senior Center or on zoom. The program for the meeting will be **"Building a Crystal Radio"** by Stan Kaplan WB9RQR. See you at the meeting.

73,
Bill K9GN

https://www.pixelstalk.net/hello-november-hd-wallpapers/

A Message from the Editor
Newsletter Table of Contents

de: Bill Shadid, W9MXQ, Newsletter Editor

Please note Club President, Bill Greaves, K9GN, on Page 1 for his monthly message. Ikll's comments lead us into the lead article this month, documenting the STEM Event at West Bend Library.

This month I draw your attention to our newest Columnist, Bob Schmid, WA9FBO, who will write a monthly offering called, "The Basics." Bob will bring to us some of the basic terminology and technology we work with every day in this broad based hobby. To introduce Bob, I will use his works to tell you a bit about him, as he writes about himself:

> As a kid growing up in New Holstein, Bob tore apart old radios and TVs to see how they worked. He was lucky enough to catch the ham radio bug early on from generous Elmers like Wally, W9SDH; Otto, WA9CMV; and Warren, W9BTP (all SK). His call was WN9FBO in 1962, then WA9FBO the next year, and he's gotten pretty much used to it.
>
> Bob received his BS EET in 1973 from the Milwaukee School of Engineering and got involved in repeaters, ARES, RTTY, and Navy MARS. He founded S-COM LLC to build repeater and base station control systems for ham and commercial applications. He worked in electronic design and manufacturing for 46 years.
>
> Bob lives in LaPorte, CO, is mostly retired, and enjoys teaching ham classes, working 10M SSB, studying guitar, and heading out to the local gun range with his XYL Donna. He's a member of the Northern Colorado Amateur Radio Club, the WWV Amateur Radio Club, QCWA, ARRL, Ten-Ten International, Alexander SAQ, and others.

Bob was introduced to this Editor by fellow Ozaukee Radio Club member, Fred Schwierske, W9KEY. Thank you, Fred. From what I have seen on initial articles, he brings a lot to the table for our Club and for all Newsletter readers.

Bob's column appears this month on page 22.

Let's make a fast run through the Newsletter. At the beginning, check out a fine article on The Elenco FM-88K Radio Kit Workshops – an ORC STEM program event at West Bend, Wisconsin, Library.

Tom Trethewey, KC9ONY, gives us a look at the JOTA (Jamboree on the Air) 2024 event. Following that, your Editor makes a few notes on some JOTA history at Ozaukee Radio Club.

Tom Ruhlmann, W9IPR, talks about his latest SwapFest find. Treasure? Or not? Let him fill you in on the details.

Don Zank, AA9WP, continues his work detailing ARES and Winlink while Stan Kaplan, WB9RQR, in Computer Chronicles Installment 320 tells us How to Make Your Own Bootable Thumbdrive. Check out both of those informative articles.

Right after Don and Stan, check out Bob Schmid, WA9FBO, as described at the start of this article.

Gary Sutcliffe, W9XT, brings us a look at “On the Air Activities!” for November and early December.

Bill Shadid, W9MXQ, your Newsletter Editor, brings the first of several articles on Hallicrafters “Big Iron” and their large desktop radios from the mid-1950’s and into the 1960’s. Boatanchors for sure!!

Tom Trethewey, KC9ONY, is back with local and regional Upcoming Events. Swapfests are getting scarce as winter approaches – but there are other things to do, we Tom describes.

See the entries in the Classified Advertising section.

Check out Ken Boston, W9GA, and his Secretarial Report for the Ozaukee Radio Club October 2024 meeting for your review – and for discussion at the upcoming November ORC Meeting.

Finally, check out the items from Jeananne Bargholz, N9VSV. Jeananne gives us a window on this month’s program at next week’s regular meeting as well as upcoming programs. Be sure to look at the Swag pages as well!! Say, while you are at it, check out Jeananne’s request for programs at 2025 meetings!!

Need help to get your thoughts on paper for an article? That is what the Editor does!! Let me know how I can help you. newsletter@ozaukeeradioclub.org

Does anybody out there have an interest in writing a regular column on the likes of System Fusion, D-Star, and/or DMR? Popularity is growing in these areas – and I suspect that there is too much to talk about in a single article. What about a column? Maybe separate ones on the three disciplines. Let me know. You do not need to be a member of the Ozaukee Radio Club to be an author or a columnist.

73, Bill Shadid, Newsletter Editor
newsletter@ozaukeeradioclub.org

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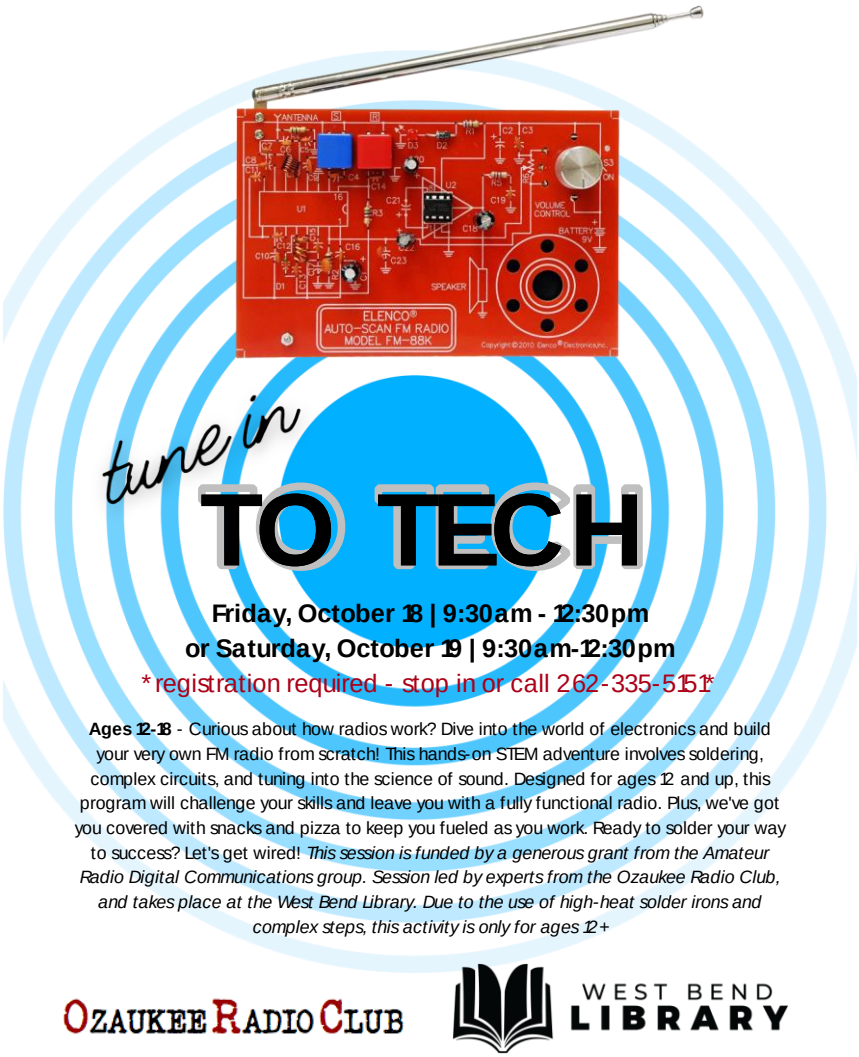
The Elenco FM-88K Radio Kit Workshops

de: Pat Volkmann, W9JI and Jeananne Bargholz, N9VSV

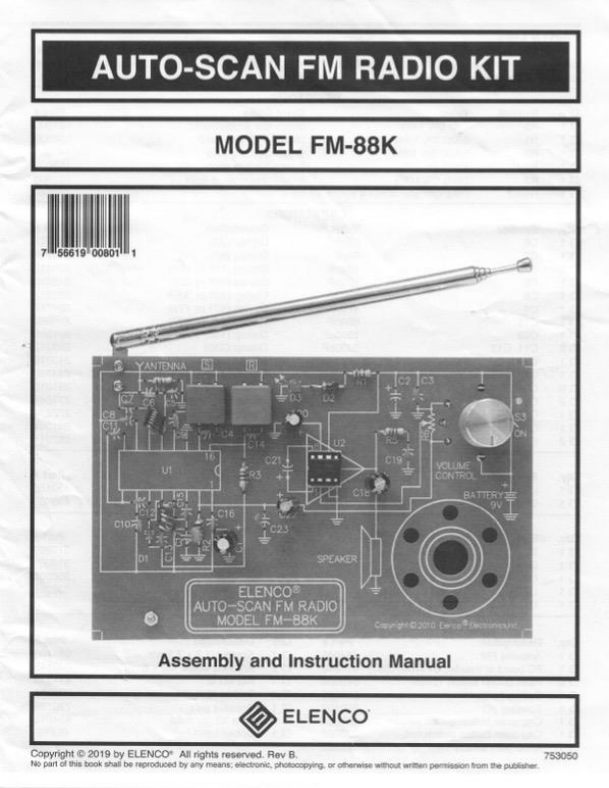
As a recipient of an ARDC (Amateur Radio Digital Communications) grant, the West Bend Memorial Community Library collaborated with the ORC STEM Committee to facilitate a couple of workshops on the assembly of the Elenco FM-88K radio kit. The workshops were held at the Library on Friday and Saturday, October 18 and 19, 2024.



Flier created by the West Bend Library staff (note the reference to “experts from the Ozaukee Radio Club”)!

Friday’s workshop had 9 children in attendance; Saturday had 8. Club participants included Pat Volkmann W9JI, Gary Sutcliffe W9XT, Bill Greaves K9GN, Bill Schnell AC9JV, Scott Galaska KD9YEW, Gary Bargholz N9UUR and Jeananne Bargholz N9VSV.

The Elenco radio kit included very clear instructions (with definitions of the various components) and required clear thinking of the children assembled. A brief introduction to soldering was offered before the kit was opened and each participant had the opportunity to practice soldering. Of the 46 components that needed to be assembled, there were a couple that were somewhat difficult to mount and solder (the audio IC and the potentiometer), Bill AC9JV simplified the process and soldered those to the circuit boards on the kits ahead of time. The children assembled the rest of the kits on their own, with instruction as needed.


AUTO-SCAN FM RADIO KIT

MODEL FM-88K

Assembly and Instruction Manual

ELENCO

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No part of this book shall be reproduced by any means; electronic, photocopying, or otherwise without written permission from the publisher.

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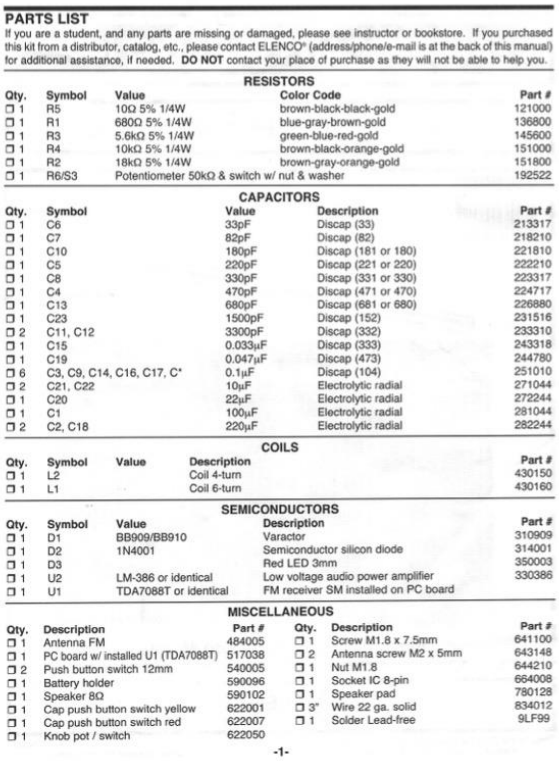

PARTS LIST

If you are a student, and any parts are missing or damaged, please see instructor or bookstore. If you purchased this kit from a distributor, catalog, etc., please contact ELENCO® (address/phone/e-mail is at the back of this manual) for additional assistance, if needed. **DO NOT** contact your place of purchase as they will not be able to help you.

RESISTORS

Qty.	Symbol	Value	Color Code	Part #
❒ 1	R5	10Ω 5% 1/4W	brown-black-black-gold	121000
❒ 1	R1	680Ω 5% 1/4W	blue-gray-brown-gold	136800
❒ 1	R3	5.6kΩ 5% 1/4W	green-blue-red-gold	145600
❒ 1	R4	10kΩ 5% 1/4W	brown-black-orange-gold	151000
❒ 1	R2	18kΩ 5% 1/4W	brown-gray-orange-gold	151800
❒ 1	R6/S3	Potentiometer 50kΩ & switch w/ nut & washer		192522

CAPACITORS

Qty.	Symbol	Value	Description	Part #
❒ 1	C6	33pF	Discap (33)	213317
❒ 1	C7	82pF	Discap (82)	218210
❒ 1	C10	180pF	Discap (181 or 180)	221810
❒ 1	C5	220pF	Discap (221 or 220)	222210
❒ 1	C8	330pF	Discap (331 or 330)	223317
❒ 1	C4	470pF	Discap (471 or 470)	224717
❒ 1	C13	680pF	Discap (681 or 680)	226880
❒ 1	C23	1500pF	Discap (152)	231516
❒ 2	C11, C12	3300pF	Discap (332)	233310
❒ 1	C15	0.033µF	Discap (333)	243318
❒ 1	C19	0.047µF	Discap (473)	244780
❒ 6	C3, C9, C14, C16, C17, C*	0.1µF	Discap (104)	251010
❒ 2	C21, C22	10µF	Electrolytic radial	271044
❒ 1	C20	22µF	Electrolytic radial	272244
❒ 1	C1	100µF	Electrolytic radial	281044
❒ 2	C2, C18	220µF	Electrolytic radial	282244

COILS

Qty.	Symbol	Value	Description	Part #
❒ 1	L2		Coil 4-turn	430150
❒ 1	L1		Coil 6-turn	430160

SEMICONDUCTORS

Qty.	Symbol	Value	Description	Part #
❒ 1	D1	BB909/BB910	Varactor	310909
❒ 1	D2	1N4001	Semiconductor silicon diode	314001
❒ 1	D3		Red LED 3mm	350003
❒ 1	U2	LM-386 or identical	Low voltage audio power amplifier	330386
❒ 1	U1	TDA7088T or identical	FM receiver SM installed on PC board	

MISCELLANEOUS

Qty.	Description	Part #	Qty.	Description	Part #
❒ 1	Antenna FM	484005	❒ 1	Screw M1.8 x 7.5mm	641100
❒ 1	PC board w/ installed U1 (TDA7088T)	517038	❒ 2	Antenna screw M2 x 5mm	643148
❒ 2	Push button switch 12mm	540005	❒ 1	Nut M1.8	644210
❒ 1	Battery holder	590096	❒ 1	Socket IC 8-pin	664008
❒ 1	Speaker 8Ω	590102	❒ 1	Speaker pad	780128
❒ 1	Cap push button switch yellow	622001	❒ 3"	Wire 22 ga. solid	834012
❒ 1	Cap push button switch red	622007	❒ 1	Solder Lead-free	9LF99
❒ 1	Knob pot / switch	622050			

-1-

Remarks from Pat Volkmann W9JI: We started this project months ago, after an initial meeting with Terika Koch, the Youth Services Librarian at the West Bend Library. Our first idea was to organize a project that would have been familiar to most hams of a certain age – the construction of a crystal radio. After some discussion it was apparent that while an easy project, a crystal radio was not likely to be too interesting to today's young people. Terika found a couple of FM radio kits that looked promising. We selected the Elenco FM-88K kit, and it turned out to be a good choice, with one exception. The lead-free solder provided with the kit contained a rosin that was so corrosive that the soldering iron tips were destroyed in about 15 minutes! That caused problems the first day, but we made some adjustments for Saturday and things went much more smoothly.

Friday's session … Photo credit: Jeananne Bargholz N9VSV

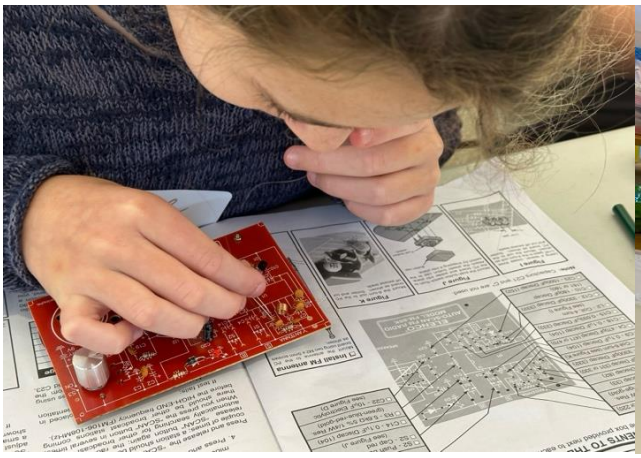
Saturday's session … Photo credit: Jeananne Bargholz N9VSV

Would we be able to teach a group 12- and 13-year-olds how to solder? Would anyone get burned? Would the radios even work? As it turned out, the kids all learned how to solder. There were a couple of burns that were, fortunately, very minor. And most of the radios worked. The first day we had two that didn't work, and one young man didn't finish putting his together. On the second day one kit didn't get finished, but the rest of the radios worked by the end of the session.

Solder Instruction Photo credit: Scott Galaska KD9YEW

Solder Practice Photo credit: Jeananne Bargholz N9VSV

All of the children were enthusiastic and seemed genuinely excited with the idea of building a radio. You should have seen the expressions on their faces when the radios were turned on for the first time! It definitely took me back to the time, many years ago, when a circuit I built with my own hands actually worked.



Part Placement Photo credit: Scott Galaska KD9YEW

Part Placement. Photo credit: Jeananne Bargholz N9VSV

We may get a couple of hams out this event. One boy showed up with a Baofeng HT and told us that he was studying with a friend to get his Technician license. Several others asked a lot of questions about ham radio. Jeananne brought some ORC fliers that went home with all the kids.

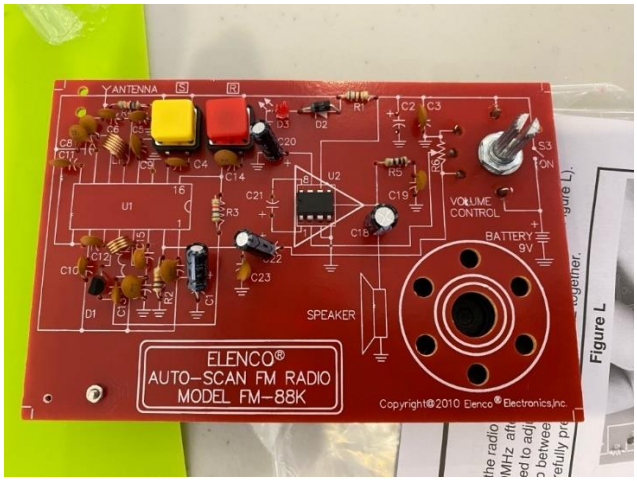


Photo credit: Jeananne Bargholz N9VSV

We had one ORC member for every two kids. If we had had fewer people, it would have been much more difficult to provide the one-on-one supervision that was needed to guide most of the young people through the assembly process. I want to thank all the ORC members that come to event to help out. You made a lot of kids happy, helped them to learn new skills and provided fine examples of the spirit of amateur radio.

Job well done! Photo credits: Jeananne Bargholz N9VSV

I also want to thank Terika Koch for her support in making this project happen. The West Bend Library has a strong STEM program, which is providing the opportunity for many youths to experience the thrill of technology at a young age. I'm pleased that the ORC was able to be a part of that experience.

Remarks from Jeananne Bargholz N9VSV: I was a bit hesitant to volunteer for this workshop. Did I still have it in me to effectively communicate with young teens? Would I even be able to follow along with them, reading the instructions? Yes, and yes! Thankfully, we had enough volunteers on board that I really didn't need to worry. So, what did I do? I talked with very supportive parents about amateur radio and our club, took photos and periodically went around to pick up trash. (I wish I had counted all the empty, tiny plastic bags that once contained components!) And yes, I did talk with the kids.

I was surprised with how quiet the room was on both days. Once the kits were opened, everyone paid attention, followed the instructions, and got to work! Breaks were encouraged and the kids reluctantly left their chairs to stretch and get some snacks, pizza, and drinks. They didn't balk at having to wash their hands before and after the breaks, either!

I learned too that we have some amazingly patient and smart members in our club!

Terika, the Librarian, asked the kids to fill out a survey when their kits were finished. The responses to two questions "Did you have fun?" and "Would you recommend this workshop to a friend?" were overwhelmingly positive! How cool is that?

I am so used to amateur radio community service in times of need, but this was community service at a very different level. I hope to be able to participate in more projects like this.

Listening to JOTA 2024

de: Tom Trethewey, KC9ONY

On Saturday, October 19, 2024, I attended the Hidden Valleys Amateur Radio Club's Inaugural Free Hamfest in Lancaster, WI. Admission was free. Tables were free. Coffee and donuts were free! However, one did have to purchase lunch items.

They also had some club tables with items from a Silent Key, where they were asking for a generous donation. I managed to find a few small items. Most of the big money items were grabbed before I could get there.

The attendance wasn't what I had hoped for being that it was free, but it was their first one. They hope to make this an annual hamfest. I sold a few items of my own and had some nice conversations. All in all, I had a good time. Now it was time for the 3 hour drive back home.

I tuned in to the Baraboo repeater which is part of the FM38 repeater system. They have quite a large system which covers Wisconsin and northern Illinois. If you are not familiar with them, check out their website: https://fm38.org/HomePage for a listing of their repeater frequencies and locations. They also have AllStar linking.

The Baraboo repeater has a pretty large footprint. I don't remember exactly where I started hearing them, but I think it was west of Dodgeville, WI. I heard some chatter going on.

Turns out it was W9EAU operating a special event station for JOTA, which is the Scouting **Jamboree on the Air.**

https://www.scouting.org/international/jota-joti/jota/
https://www.arrl.org/jamboree-on-the-air-jota

Picture of JOTA patch from
https://www.scoutshop.org

W9EAU is a club in Eau Claire, WI. The Scout on the air said his name was Levi and that he had a Technician license. He also said that they were operating from a church parking lot and had three stations set up. At one point, he did mention a 7.2XX frequency but did not elaborate on what the other stations were. Levi was getting contacts from all over Wisconsin and some in Illinois. I also heard a station in Florida and another state, which obviously used the AllStar Link method.

I listened to the Baraboo repeater to well past Madison as I headed east on I-94. I eventually changed to the Milwaukee repeater and listened all the way to I-41/45

northbound before Levi finally closed down the station. I regret that I didn't try to contact him just to see how many contacts they had made using the FM38 system. As I submit this article, I have not heard back on how many contacts were made. However, listening to others chatting with Levi made the long drive seem shorter. Ham radio fun in the car!

Jamboree on the Air and Ozaukee Rado Club

Editor's Note: Bill Shadid, W9MXQ

Jamboree on the Air, known by its acronym, **JOTA**, is an international Scouting and Guiding activity held annually. It is held in the month of October. First held in conjunction with the fiftieth anniversary of Scouting in 1957, it was devised by Leslie R. Mitchel , G3BHK.

It is now considered the largest event scheduled by the World Organization of the Scout Movement.

Amateur radio operators from all over the world participate with over 500,000 Scouts and Guide to teach them about radio and to assist them to contact their fellow Scouts and Guides by means of amateur radio. And, since 2004, by VoIP based Echolink. This provides the Scouts and Guides with a means of learning about fellow Scouts and Guides from around the world.

The above is from Wikipedia™- of which I am a supporter and contributor.

When Bill Howe, KA9WRL, was with us (SK in January of 2017) he had a passion for Jamboree on the Air. Late fall would see Bill getting volunteers to help with the annual activity as it took place here in Wisconsin, nationally, and globally. Below is a picture, from the above mentioned Wikipedia article, showing a group of Scouts circled around a ham working his fellow JOTA participants.

Wikipedia

At a reported 500,000 participants, what other Amateur Radio Event can show that much participation?

A SWAPFEST TREASURE, OR NOT?

de: Tom Ruhlmann W9IPR

We have noticed over the years that at the closing of the SwapFest a few “mystery donations” seem to show up on our Scholarship/STEM table. I guess the donor really did not want to take them home again. Sometimes the donations are useful like the signal generator/test unit that Greg will use in maintenance of our repeater system. Other times the donation is unsaleable because it is no longer useful technology, or it is just old, bulky, and too heavy.

This year at the end of the SwapFest I noticed a mystery 6/12 volt battery charger that was really heavy and capable of 20 amperes. It was identified as a model ATR620. I thought this might be a good battery charger for use with my 1950 Jeepster which has a 6 volt electrical system and battery. Wow, a treasure, or not?

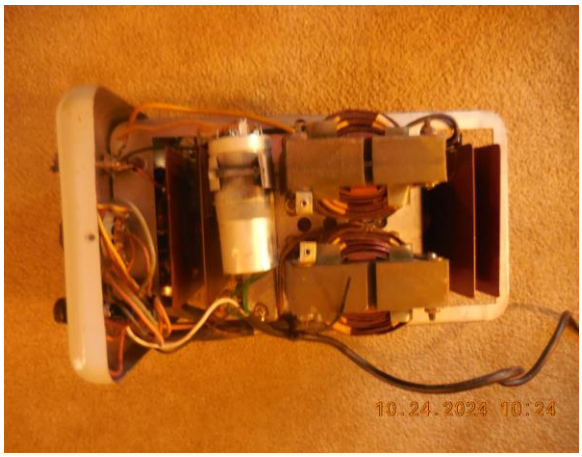
Once at home it was obvious the it should have the line cord replaced with one having a chassis ground (green wire) capability. Upon opening the unit up, I realized it was not a battery charger but as a bench power supply. It had a tapped primary power transformer with dual 6+ volt secondaries. Each of these secondaries fed a large (4”x6”) selenium rectifier in a full wave configuration which was followed by a large filter choke and filter capacitors. Chokes were common in the 50’s as were the large selenium rectifiers. However, it is important to visually inspect these components and especially the selenium rectifier. The rectifiers were not discolored, mechanically damaged or smell, any of which could indicate a problem or complete failure. The rectifiers have a reverse voltage capability of 20 volts so one element (plate) was required per rectifier. The plate acts as an anode as well as heat radiator. Generally, the rectifier is good for approximately 3.5 to. .4 amperes of the plate surface. In this case the 4’ x 6” plate had a surface area of 24” and should be good for 8 to 9 amperes steady state.

I did check the filter capacitors, and they checked OK.

When equipment with selenium rectifiers or filter capacitors have been stored for long periods are reactivated they must be “reformed” by initially applying low voltage (25 to 50 % line voltage) and gradually increasing it over a period of hours.

As long as the case was off I decided to paint it since I have a number of partial cans of spray paint, and I like “good stuff” to look clean.

I was not able to find any schematic diagrams on line, so it was “let’s figure it out.” The full wave (2 plates) selenium rectifiers were used to convert the transformer AC output to pulsating DC since solid state diode rectifiers capable of 10 and 20 amps were not yet available in the 50’s. The 10 amp chokes and filter capacitors were used to smooth the pulsating voltage output of the selenium rectifiers providing true DC to power the load such as an auto radio. It also appeared that the output voltage was varied by a front panel switch that switched between various taps on the primary of the power transformer which would increase the output incrementally. This would accommodate the 1 volt drop in the full wave rectifiers and additional voltage drop due to the resistance of the filter chokes at higher current loads. Note that during this era there was no voltage regulation of consequence.



This was actually two 6 + volt 10 ampere power supplies that could be connected in parallel for 6+ volts at to 20 ampere’s by the 6/12 volt panel switch or in series for 12+ volts at up to 10 amperes. The output voltage would vary with a variation in load current (IR drop) but would remain relatively steady at a specific load current.

Was this a unique treasure? To answer the question, I did a load test at 2 amperes of the 6 and 12 volt supplies.

Panel Voltage Adjustment Switch	DVM indicated voltage	
1 @ no load	7.47	13.17
1	6.17	11.01
2	6.68	12.11
3	7.19	13.15
4	7.94	14.60
5	8.36	15.20
6	8.64	16.00
7	8.97	16.60
8	9.15	17.00

I would appear that this supply would be OK for loads of constant power such as AM and FM radios but not useful to charge my 6 and 12 volt lead acid batteries. With the batteries the charging voltage would be initially adjusted to, for example, approximately 6.9 V while at high charging current but as the battery assumes charge it's voltage rises, and the charging current acceptance decreases. Consequently, the voltage from the power supply will increase and possibly overcharge the battery.

Was this a treasure? Well, not for the intended purpose but it works and looks good. In summary, I think I will just use my battery charger that was designed to charge batteries.

For more information on selenium rectifiers go to Wikipedia.

Ham Radio Operator uses coaxial cable he placed in his garage in 1976 just in case he needed it

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OZARES: Ozaukee Amateur Radio Emergency Services

de: Don Zank AA9WP, OZARES Emergency Coordinator, aa9wp@arrl.net

WINLINK Soundcard

In last month's exciting column, the SoundModem software setup was covered and it up running, and raring to go. The next step is to complete the connection between the radio and the computer, and most often an external sound card is required. There are some newer rigs that contain an internal sound card, such as the FT-991, IC-7300, and IC-7610. Other external devices would include the West Mountain Radio RigBlaster DXPro or RigBlaster Advantage. In this column, the Tigertronics SignaLink USB model will the subject. Because it is the one I am most familiar and comfortable with.

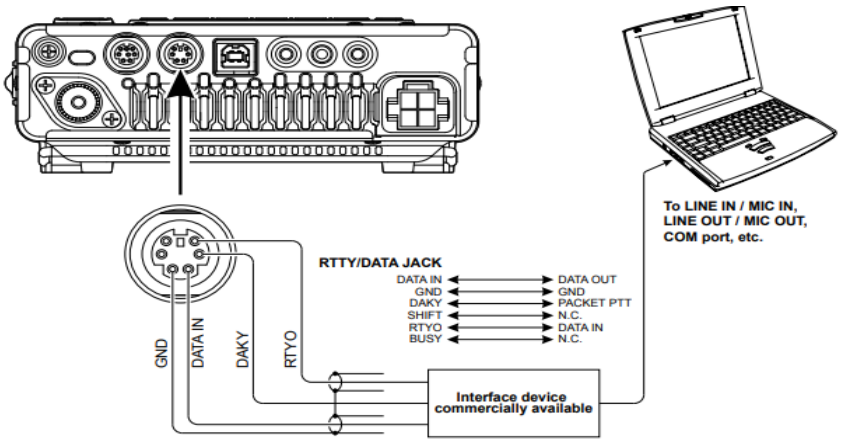
The sound card provides isolation between the computer and the radio, handles the input and output audio signals and controls the push-to-talk on the radio.

The Tigertronics home page is https://tigertronics.com/ . The SignaLink can be ordered for various radio models and computer combinations. Their website provides a guide book for ordering the correct model of Signalink and interconnection cables. The Signalink is "programmed" by internal wire jumper connections. The jumper connections control signal flow, microphone input, speaker output and PTT signals, in and out of the Signalink. A pre-made plug and play module can be ordered or you can install the jumpers yourself.

Most newer transceiver models, such as my Yaesu FT-8900 and FT-891, are made with a six pin data or RTTY connection. My other two rigs, an older Elecraft K2 and a Kenwood TM-732A, do not have data connections available. For these two, the microphone input was used for audio input to the radio and PTT control. The speaker output from the radio was used for audio output to the computer via the Signalink. So, this is a great opportunity to put older model radios to good use as a WINLINK station.

As shown in the Yaesu FT-891 Advanced Manual, there are the connections between the rig, the interface device, in this case the Signalink, and the computer. This same interconnection layout exists with the FT-8900R.

Signalink provides a very helpful 12 page manual to help with adjustments, setup, and troubleshooting.

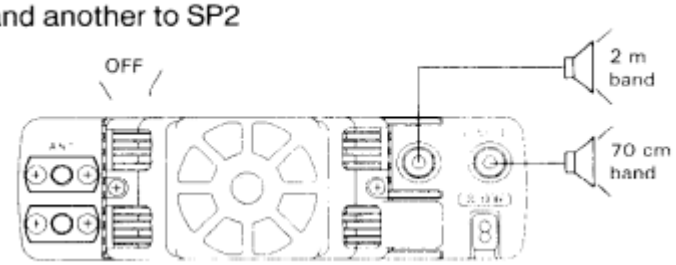


The older Elecraft K2 Transceiver uses an 8 pin round connector for the microphone and PTT input. A cable, SLCAB8R, was used for interfacing.

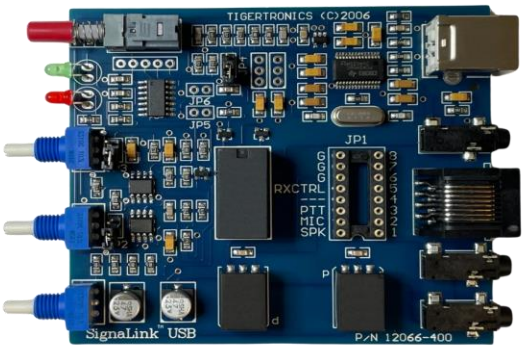
For the Kenwood TM-732 a SL-CABRJ4 cable with a RJ-45 modular connector was used.

An interesting tidbit about the Kenwood. It is two bands, with two speaker outputs. I was having a very hard time getting the Signalink audio connection to work until I read the manual and noted this:

When two external speakers are connected to one SP1 and another to SP2



An internal view of the Signalink from the Tigertronics web page:



Note the JP1 connector. Control signals to and from the radio and computer are “programmed” by either a pre-built plug in module or individual jumper wires. Using this interconnection type the Signalink can be used with a wide range of radios.

There are three adjustment controls on the Signalink: TX transmit level; RX receive level and DLY or delay. This is the fun part. Adjustments for the sound levels can be done in the sound setting in the computer system; if you are not using a data output connection then the radio will adjust to sound levels, and with the Signalink itself.

Next month we will review the setup of the Signalink, the sound levels and the SoundModem software.

73, Don, AA9WP

OZARES Repeaters:

- 147.330 MHz (+ Shift) (127.3 PL)
  - FM Mode Only
- 443.525 MHz (+ Shift) (114.8 PL)
  - FM Mode Only

ORC Repeaters are On the Air Awaiting Your Call:

- 146.97 MHz (- Shift) (127.3 PL)
  - FM Mode Only
- 224.18 MHz (- Shift) (127.3 PL)
  - FM Mode Only
- 443.75 MHz (+ Shift) (127.3 PL)
  - FM & Fusion (C4FM) Modes

THE COMPUTER CORNER
Number: 320
How to Make Your Own Bootable Thumbdrive
(Containing Installation Files for Linux, Windows, plus whatever else you like.)

de: Stan Kaplan, WB9RQR, 715 N. Dries Street, Saukville, WI 53080-1664
wb9rqr@gmail.com

Well, I danced around this topic a bit with No. 317, Wiping Flash Drives, which might be one step in preparation for preparing such drives, but not necessarily so. Here it is in two easy steps.

1. Get a thumbdrive, flash drive, or whatever you care to call these little memory sticks one can put into a USB port. If you buy new ones, they are really inexpensive. As of this writing (Aug 2024) you can get a single 64 GB unit for $8, a pair of 32GB units for $10, a 128 GB unit for $12, three 32 GB units for $20, and so on, all at Amazon. Don't bother buying anything less than about 10 GB so that you can put installation files from several operating systems on the same stick, plus have room for other stuff, too. If you have a used one (minimum 4 GB), use instructions in No. 317 to wipe it clean if you wish, just to make sure it does not have any residual bad stuff on it. Since writing No. 317, I found a neat little free program that does a good job of wiping, even thumbdrives that have previously been divided into two or more partitions. To get a copy, do a search on the single word: "formatusb" and download the following specific program: formatusb_x64.exe. This is version 1.0, released in May 2021, which seems a bit old, but it does just what it says and apparently has not needed updating since it was written! Just stash it on your computer and run it whenever you want to clean up a thumbdrive. Maybe you should keep it in a folder labeled USB Tools.

2. Get the software to make the thumbdrive bootable and install it. There are probably a dozen decent free software packages out there your that can do the job. If motivated, look at them all on Majorgeeks. If you look at more than one, be sure to include Rufus, Yumi and Ventoy, all of which are top-notch. My personal favorite is Ventoy; it is small, and it works. Get at least Ventoy-1.0.99-windows.zip from Majorgeeks.com, the latest version as of this writing. Install it on your machine. It is safe if you got it from Majorgeeks. Once it is installed, if it does not create a shortcut, create your own; Ventoy2Disk.exe is the file you want a shortcut to on your desktop. Or you can go to the Ventoy directory and double click Ventoy2Disk there (don't forget to put your thumbdrive in a USB port first). Running Ventoy2Disk will make the disk bootable, and it will take only a few seconds. Next, close everything and take the thumbdrive out of your computer. Wait a few seconds and put it back in. In File Explorer, it will appear as Ventoy (x:), where x is whatever drive letter your computer has assigned to it. Double-click Ventoy and you should find a folder with just

System Volume Information in it. Transfer your file: linuxmint-22-cinnamon-64bit.iso, or whatever .iso file you may wish to use for installation, to this folder. Note that Linux Mint 22 is almost 3 GB in size, so it may take you as much as 15 minutes to transfer a copy to the thumbdrive, depending on the brand of thumbdrive and the speed of the memory sticks it uses.

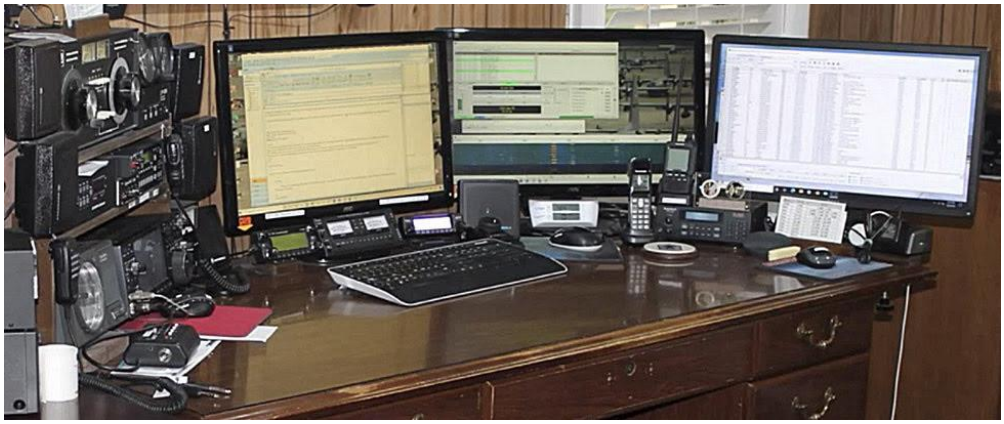
Note also that you can put as many .iso files in that directory as you wish, so long as there is space left. When you boot with this thumbdrive, you will be presented with a list of the .iso files and asked which you want to boot with. Make your selection and off you go! In the case of our Linux example, you should soon have a live copy ("Active Copy") of Linux 22 running on your desktop. Your Windows installation will not have been booted (but all Windows files are still safely stored on your hard drive, untouched). Linux will be up and running for you to play with as much as you desire, and it will let you play without changing any of your Windows installation files. If you shut down after playing with the active copy, remove the thumbdrive after shutting down and the next time you boot, your old copy of Windows 7 or whatever operating system you had will start up.

One thing can interfere with booting the .iso file of your choice. Your BIOS must permit booting from a thumbdrive. If, for security purposes, your computer has been changed to disallow thumbdrive booting, you must first change the BIOS back to permit the boot.

So, assuming all went well, and you now have Linux on the Desktop, play to your heart's content. On the other hand, If you are ready to replace Windows 7 or whatever else was on the hard drive, you need only double click the "Install Linux" icon on the top left of the Linux active desktop to start the process.

All this stuff is fun, and it does not take all that much time to have a new Operating System replacing the old. Remember, YOU are in control of YOUR computer!

Happy Computing!



Computers in the Ham Shack

The Basics

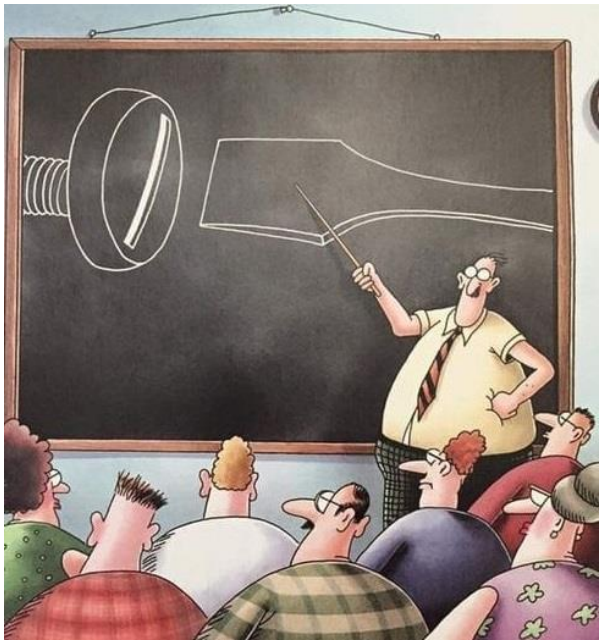
de: Bob Schmid, WA9FBO

Units and Symbols

So, which is correct, ma or mA? How about kw, kW or KW? Is it db, dB, or DB? Should you capitalize “volts”? Who decides? And who cares?

Last question first: There *are* standards, so whether you’re writing for publication or simply corresponding with colleagues (or your boss), you’ll want to get it right.

Who decides? The U.S., Canada, U.K., and nearly every other country follow the International System of Units, also known as SI, in addition to their own customary systems. SI was established in 1960 and is a decimal and metric system.



“The Basics”

The Far Side © – Gary Larson

Here are some of the SI rules we’re likely to encounter in hamming.

The volt, ampere, ohm, watt, hertz, farad, henry, meter, second, gram, and more are called SI *units*. They are not capitalized when spelled out. So, the answer is no, we don’t

capitalize the word “volt” or “ampere” or any other unit – unless it’s the first word in a sentence!

(Of course, countries have “customary units” that are not SI units. Apologies to the acre, AWG, barrel, bushel, fluid ounce, peck, shotgun gauge, tablespoon, and many more.)

Abbreviations such as V, A, Ω, W, Hz, F, H, m, s, g, etc., are SI *symbols*. A symbol is upper case if the unit is named after a person.

So, we have the symbol V for Alessandro Volta, A for André-Marie Ampère, Ω (upper case Greek omega) for Georg Ohm, W for James Watt, Hz for Heinrich Hertz (two letters to avoid confusion with the Henry), F for Michael Faraday, H for Joseph Henry. Units such as the meter, second, and gram weren’t named for people, so their symbols (m, s, and g) are lower case.

Metric prefixes are just as you learned them in ham class. The symbol for milliampere, then, is mA, and for kilowatt is kW. One-tenth of a bel is a decibel, or dB.

Are there more rules? Sure.

Substituting a hyphen for “to” is frowned on because it can be interpreted as a minus sign. For example, “20 °C to 30 °C” is not confusing, but “20 °C-30 °C” could be.

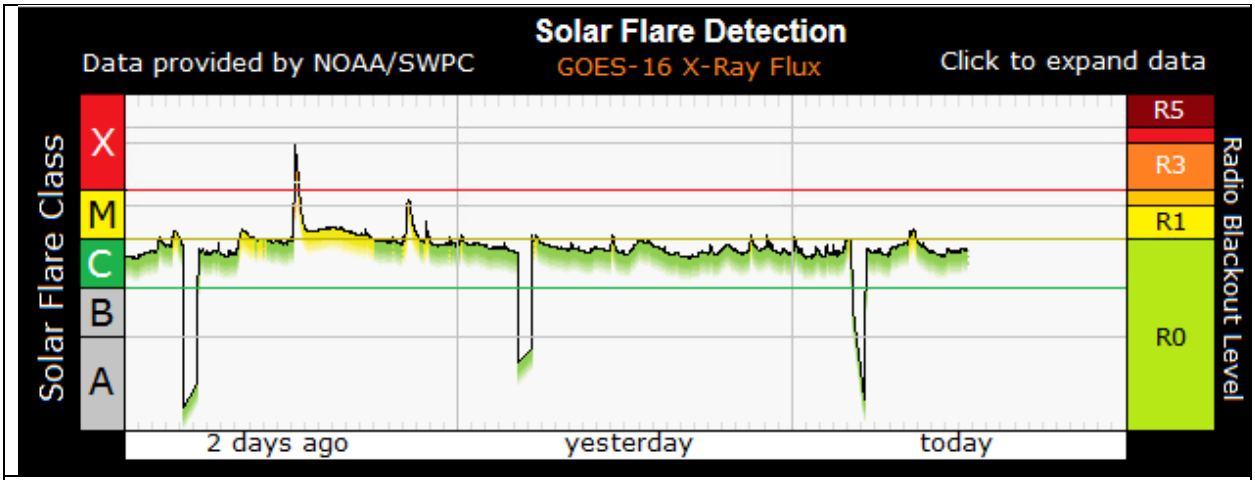
Oh, and while lots of folks place the numeric value up against the symbol (“3mA”), the rule is to use a space (“3 mA”). Check your QST magazine – they get it right!

On The Air Activities!

de Gary Sutcliffe, W9XT

October started with a bang. Literally! On October 1, we had the biggest solar flare in the current sunspot cycle with a class X9 level flare. A coronal mass ejection (CME) was aimed directly at us. It was on the heels of a large flare a couple of days earlier, and the potential for some big aurora activity existed. But the CME was about 36 hours later than expected, and there were not all that many reports of radio aurora.

We had another flare on October 8th. The October 8 flare caused some interesting 6 meter activity. Disturbed conditions can often create openings to the south on the higher bands. We had some strong openings on 6 meters to South America later that day.

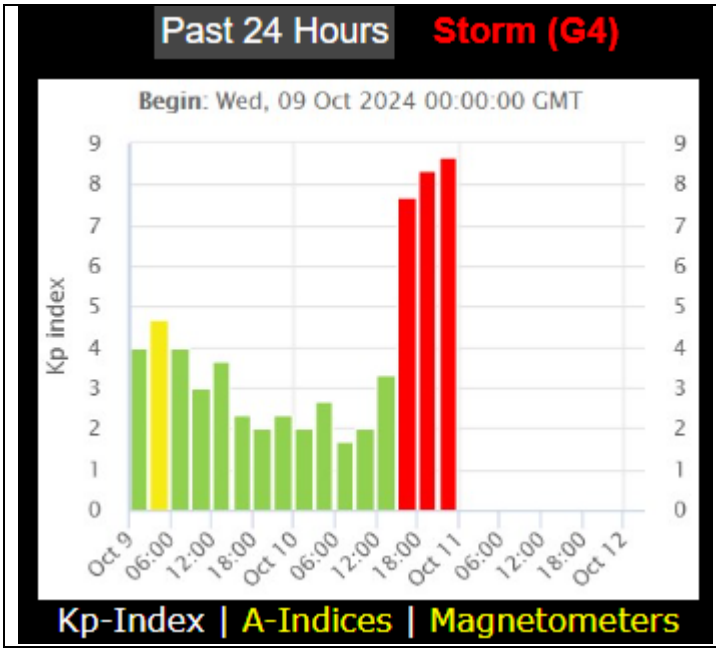


The X9 class solar flare on October 1 was the largest of the current solar cycle.

The coronal mass ejection from the flare arrived on Oct 10. It caused a geomagnetic flare, resulting in some bright aurora activity.

I took some pictures with my cell phone. One is included here. Several other ORC members, including **K9GN, K9QLP, KC9ONY**, and **W9PEM,** also took photos, which they posted on the club reflector. It is amazing what can be photographed with modern cell phones.

Frank, W3LPL, an expert on radio propagation, predicted that we would get good 6 meter F2 propagation starting around the end of October. That prediction has been proven correct. We have been getting some openings into South America just about



The CME from the October 8 flare arrived on October 10, causing a geomagnetic storm and bright auroras.

every morning. Several openings to Europe occurred, and I picked up a couple of new countries on the band from there. We had one morning opening to the Indian Ocean. For about 15 minutes, stations in Reunion Island (FR4) and Maritius (3B8) were worked. Gary, **K9DJT**, picked up both of them. I got Reunion and saw another very strong one, so I worked him as an insurance contact. That might have been a mistake, as the 3B8s faded out at that time. That happens a lot on the band.

There have also been openings to the Northwest. On a couple of days, Alaska came in. That is a really tough state to work on 6 meters. Gary, **K9DJT**, worked one and completed his 6 meter WAS. Along with some of the other new countries worked on the band the past few weeks, Gary worked his 100th DXCC country on six. Only about a dozen stations from Wisconsin have made DXCC on the band. Ken, **W9GA**, was the first person in Wisconsin to accomplish this. I also have it, but I have been waiting for the ARRL to resume DXCC applications following the shutdown after the May cyberattack before applying.

If you are interested in 6 meter DX, now is the time to get busy. These are the best conditions since 2001. That is a long wait.

The CQWW DX SSB contest was the last weekend of October. We had a solar flare on Wednesday before it. The CME hit Sunday morning and caused some degradation of the band. We had another solar flare early Saturday morning, but it was nighttime here and didn't cause a radio blackout over us. Another flare happened in the last hour or so of the contest and hurt propagation to the South Pacific and Asia.

Despite these times of affected propagation, other times, it was excellent. Ten meters is my favorite band, so I went single band, 10 meters, and low power (100 watts). I made 1046 contacts in 126 countries. The band can be amazing when the conditions are good. I'm really looking forward to the CW weekend of CQWW and the ARRL 10 Meter contest in mid-December.

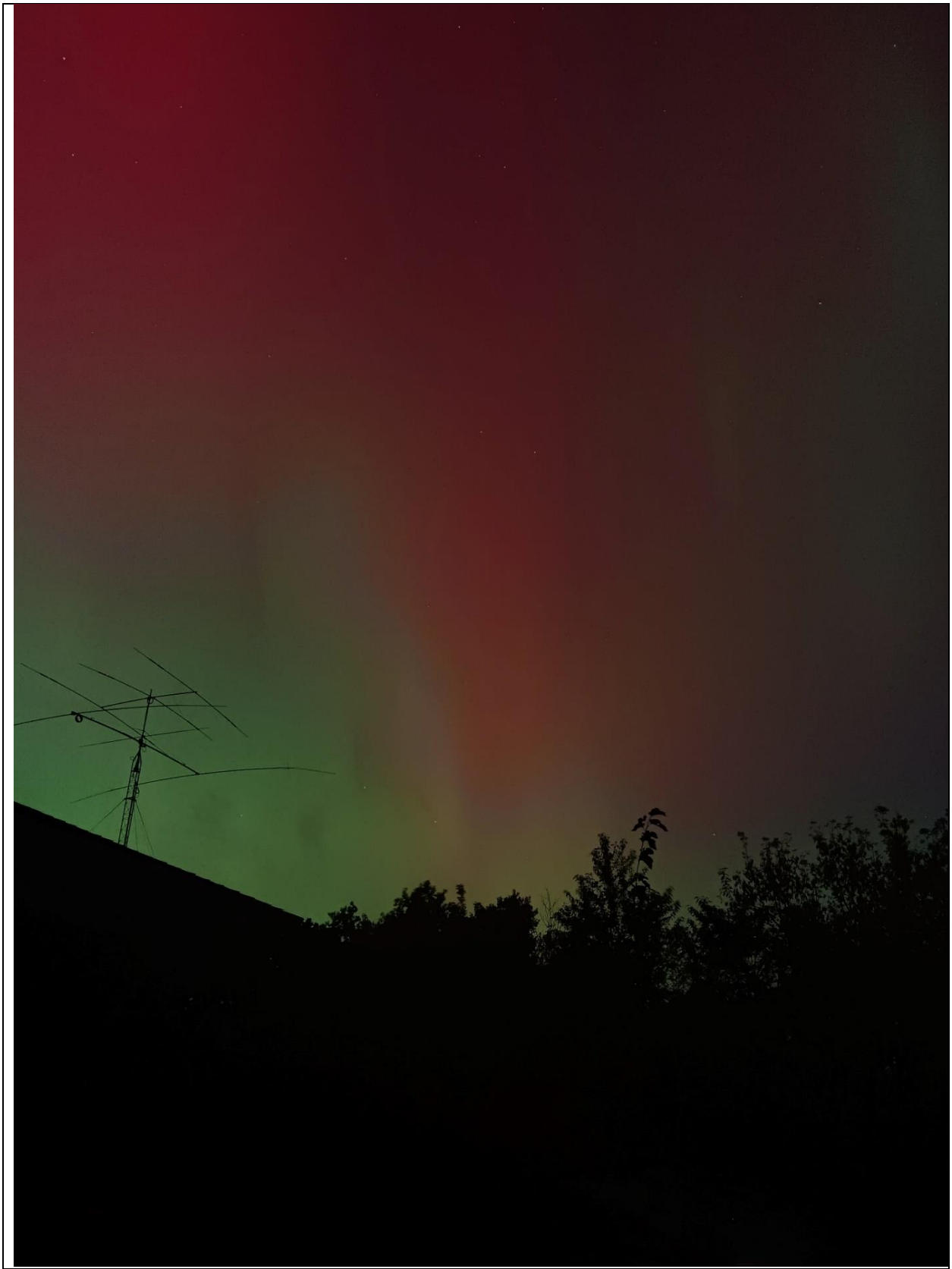


Photo of October 2024 aurora taken from my cell phone

October SET

A lot of ORC members don't reside in Ozaukee County. Many live in Washington County. The ARES is organized by county, so it is no surprise that the Washington County ARES has ORC members. In fact, the ARES Emergency Coordinator (EC) for Washington County is Vic, **WT9Q**.

The Simulated Emergency Test or SET is held each October on Saturday, October 5 this year. Vic did a great job organizing our participation. We had stations active at all three hospitals in the county, as well as at the Germantown Police Department. Scott, **KD9YEW** monitored other two meter frequencies. My apologies if I missed any other ORC members who participated in the Washington County exercise.

Josh, N9STA, operated the Washington County SET exercise under emergency conditions from Waldo, WI. Josh was a bit noisy on the repeaters but was solid into the Badger Emergency Net on 40 meters. N9STA Photo

The net was called to order at 9:00 AM on the 147.210 ARES repeater, and the hospitals and the Germantown PD stations checked in. Then individual stations checked in. We moved to various regional repeaters and simplex frequencies to test our ability to communicate if our repeater went down during an emergency.

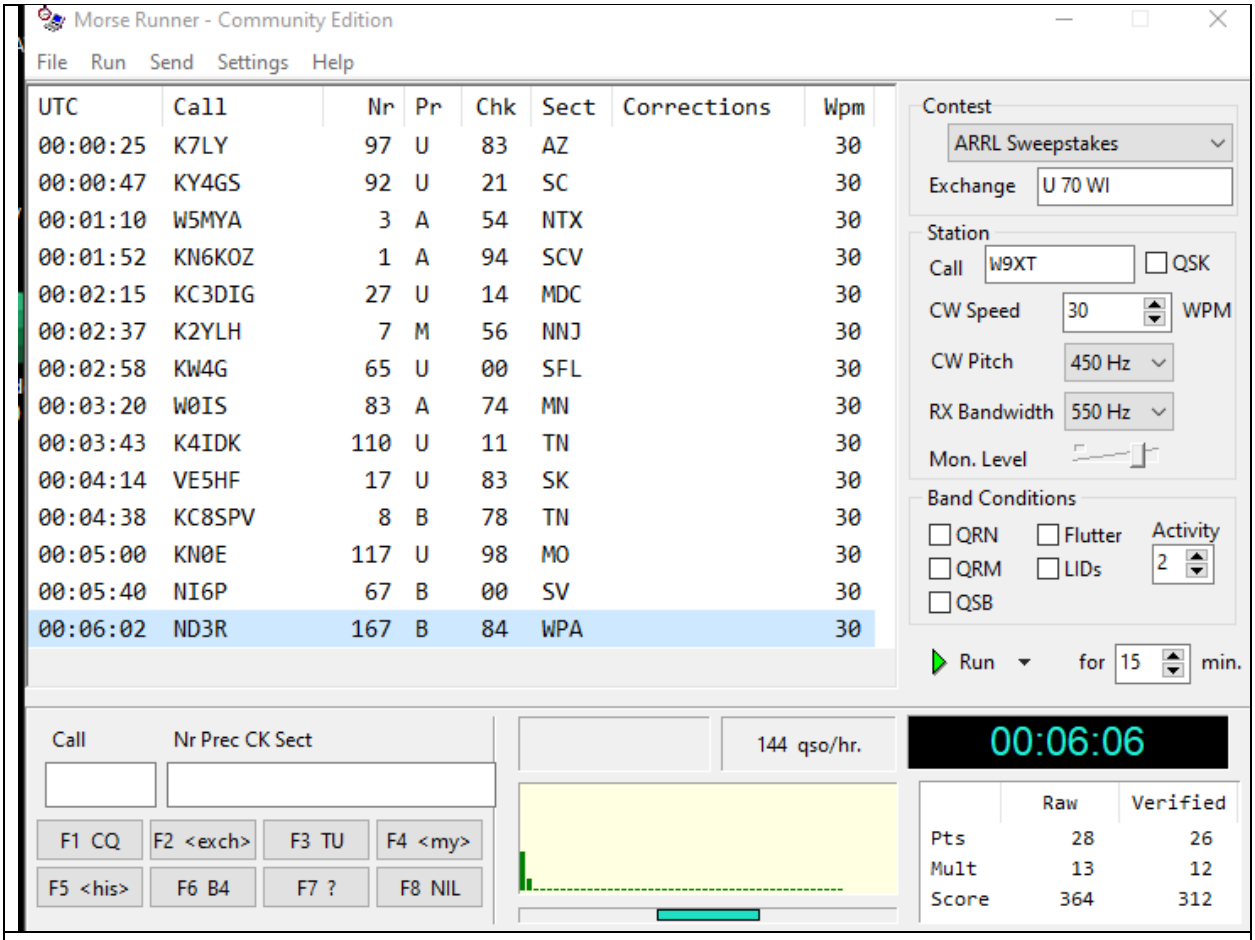
Last year, I was at the Aurora Hartford Hospital, but we had different operators there this year, which was good for cross-training purposes. This year, I acted as a liaison to the Badger Emergency Net. Usually, this net meets on 75 meters, but the band was poor, and they moved to 40 meters. It was tough to find a frequency because the band was so full of other SET nets from surrounding states.

I handled two radiograms, one from the state traffic manager to the county EC (Vic), and his reply. I had never handled a radiogram on HF before. It just proves that even after 54 years as a licensed ham, there are still many things left to be done.

It was very gratifying to see the improvements in the WASHARES in the last few years.

Morse Runner

As most of you know, I am into radio contesting. My favorite mode is CW. CW has a lot of advantages when it comes to contesting. First of all, it has a narrow bandwidth. That means there is plenty of room for all the stations as opposed to phone, which can be a problem for big contests on some bands, especially during times when only one or two bands are open. The other part is that CW signals are more effective than phone signals. That results in more contacts.



A short practice run of Morse Runner for the ARRL Sweepstakes.

But CW skills drop unless you keep them up. Besides Field Day, I don't do many CW contests from May through October. I really feel rusty after not doing a contest for a month or so, and it takes me an hour or two to get back in the grove.

I get around it by practicing with a program called Morse Runner. It is a free program that simulates the CQ WPX CW contest. You call CQ, and stations answer you. You "work" the station, and the program tracks your progress. It shows if you got the call sign or exchange wrong.

The exchange for WPX is a signal report with a serial number. So, you get experience copying numbers and calls. To make it more realistic, you can set parameters to add

QRN, QRM, QSB, and even lids trying to steal your frequency. One selection is "Activity," which sets how many stations will call you. For me, the most valuable part of Morse Runner, other than being able to do it at high CW speeds, is pulling out calls with multiple callers or noise.

Other contests have different exchanges. The ARRL Sweepstakes, in particular, has a very long exchange. It would be nice to practice those exchanges before the contest. Well, a new version, Ver. 1.85, was recently released. It adds simulation for the ARRL DX, Sweepstakes, and Field Day. It keeps CQ WPX and adds the CQWW DX contest. The NAQPs and some other contests have also been added.

The new contest additions in the latest version are nice. If you have thought about trying CW contests but are intimidated, Morse Runner lets you start at your comfort level and gradually improve your skills. No one sees your mistakes, and Morse Runner will show you corrections for your mistakes. Start at a comfortable speed until you get a feel for the program, then gradually increase the speed, and throw in stuff like QRN.

The free download is available at:
https://github.com/w7sst/MorseRunner/releases/download/v1.85/Morse.Runner.1.85.zip
Entering the URL into your browser will automatically download a Zip copy into your download folder.

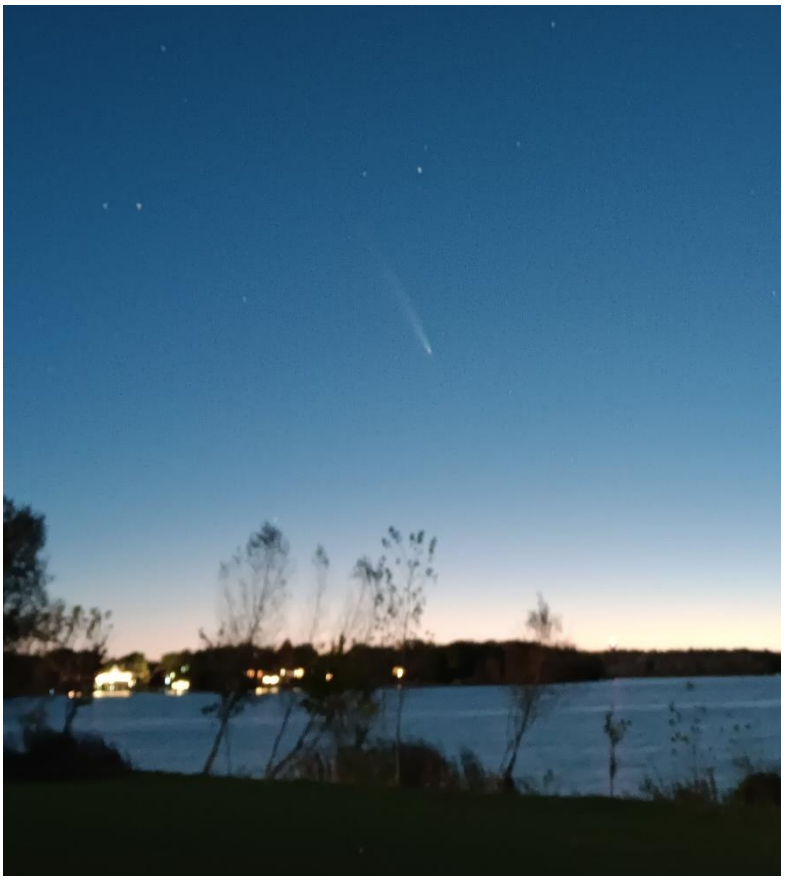
Meteor Showers

There are a couple of meteor showers this year of interest to 6 and 2 meter weak signal enthusiasts. As the meteor enters the atmosphere, it burns up and leaves a trail of ionized gas that we can bounce radio signals off. They are sometimes heard on the higher HF bands where a weak signal suddenly gets stronger for a few seconds. But the real interest is on the lower VHF bands where contacts from 500 to about 1300 miles are uncommon. The signals will be reflected from less than a second up to a minute, depending on the size of the rock and the band. Larger rocks and lower frequencies result in longer bursts. MSK144 is the WSJT mode used most commonly for meteor scatter contacts. The best times are around sunrise, plus and minus a few hours.

Thousands of meteors enter the atmosphere every day, but at times, the numbers get larger when swarms of meteors intersect the Earth's orbit and are called meteor storms. Storms are named after the stellar constellation they seem to come from. Often, meteor storms are the result of debris from comets.

The Leonid shower peaks this year on November 18. Useful meteors for ham communications will occur for several days before and after the peaks.

The Geminid shower will peak the night of December 13-14. This one is known for large, bright, and slow meteors. This one is debris from the asteroid Phaethon instead of a comet. Both of these showers occur near a full moon, so observing them visually will be challenging, with the moonlight covering them up.



Comet C/2023 A3 Tsuchinshan-ATLAS photo taken at Pike Lake State Park. Meteor showers are often debris left over from comets. W9XT photo

Contests

November is a busy contest month. The ARRL Sweepstakes CW has already happened, but the phone version comes up on November 16. This is a domestic contest where you work only US and Canadian stations. It is a good contest for smaller stations with limited antennas. The exchange follows (more or less) the preamble for ARRL radiograms and is much longer than other contest exchanges. Read the rules if you have not operated this contest before.

The CQWW CW contest is a great DX contest. Barring some big solar flares, the conditions will be excellent. I covered the SSB version last month, and the only difference is the mode.

The CW event is the last full weekend of November. Usually, this is the weekend after Thanksgiving, but because November 30 falls on a Saturday, December 1 is on Sunday, which avoids the holiday weekend this year.

The ARRL 160 meter contest starts on Friday afternoon, December 6. This is an excellent time to pick up states and maybe a few countries on the "Gentlemen's Band." With the high sunspot numbers, conditions may not be as good as they were a few years ago.

DXpeditions

There is a good assortment of DXpeditions coming up the next month. In addition to those discussed here, there are many single ops operations from DX locations. Also, the week before the CQWW CW contest, many contest DXpeditions will be active testing their equipment and learning local propagation.

The VK9CY DXpedition is underway and will continue until November 15. This island is located in the eastern Indian Ocean and is a challenging path from Wisconsin. Gary, **K9DJT,** worked them on 12, 15, and 17 meter FT8. So far, I have only managed them on 12 meters. I need them on 10 and 17 on the higher bands. The best time for 10 seems to be in our mornings, according to some Wisconsin DXers I talked to.

A pair of Japanese hams will operate from St. Helena Island in the South Atlantic through November 22. Each has a separate ZD7 call. The operation will primarily be on FT8. St. Helena is famous for being the place Napoleon was sent in exile. Supply ships only come every few weeks.

S9Z is the call sign for a DXpedition to Sao Tome. A huge group of hams will operate 160-10 meters from November 11-20. CW, SSB, and CW. They will also be on 432 MHz EME.

A large group of European hams are heading to Gambia November 25-29. This West African country used to be pretty common, but it has not seen much activity in recent years. Another fairly common West African country in the past is Sierra Leone. A large team will use the call sign 9L5A starting November 27.

St. Martin in the Caribbean is not rare. US hams go down there and operate contests or vacation style all the time. I am including this one because the ops are friends of mine from W9-land. Look for them from November 30 through December 13.

That wraps up November. HF conditions have been excellent most days, and the high bands have been open late into the night.

W9XT's DXpeditions, Contests, and Events for November and early December 2024 Data Sheet follows on the next page . . .

W9XT's DXpeditions, Contests, and Events for November and early December 2024

W9XT's DXpedition picks for November and early December 2024					
QTH	**Dates**	**Call**	**Bands**	**Mode**	**Link/notes**
Cocos Keeling	Through Nov 15	VK9CV	160-10	C/S/D	
St. Helena	Nov 1-22	ZD7G, ZD7SFU	160-10	Mostly FT8	
Sao Tome & Principe	Nov 11-20	S9Z	160-6	C/S/D/R	https://s9z.org
Gambia	Nov 25-29	C5T	160-10		
Sierra Leone	Nov 27-Dec 8	9L5A	160-6	C/S	https://9l5a.wordpress
St. Martin	Nov 30 – Dec 13	TO5W	160-6	C/S/D/R	https://www.k9el.com/TO9W/TO9W.htm

Modes: C = CW, S = SSB, D = Digital, R = RTTY

W9XT's contest picks for November and early December 2024					
Name	**Start**	**Length**	**Bands**	**Mode**	**Link**
ARRL Sweep-stakes Phone	2100Z Nov 16	30, work 24 max	160, HF	Phone	www.arrl.org/sweepstakes
CQWW CW	0000Z Nov 23	48	160, HF	CW	https://www.cqww.com/rules.htm
ARRL 160 Me-ter Contest	2200Z Dec 6	42	160	CW	https://contests.arrl.org/Con-testRules/160M-Rules.pdf

Dates/Times in UTC. Subtract 6 hours from UTC to get local (CST). HF = 80, 40, 20, 15, 10 Meters

W9XT's operating & event picks for November and early December 2024			
Event	**Dates**	**Details**	**Link/notes**
Leonids meteor shower	Peak Nov 18		
Geminids	Peak Dec 13-14		

Vintage Amateur Radio

de Bill Shadid, W9MXQ

I think on various occasions in the past I have expressed very positive feelings about all of the vintage radio manufacturers in the USA, Europe, and Japan from the 1930's up into the 1970's and early 1980's. Focus started in the 1930's with Collins, Hallicrafters, Hammarlund, and National. Those and others went through the war years. They stayed with us into the 1950's and added names like Central Electronics and pre-war E. F. Johnson began making transmitters after the war. Radio Manufacturing Engineers (RME) had been with us through all those years as a player in some unique ways. The 1950's and 1960's saw the old players (above mentioned) blossom into new technology while the likes of Drake, Globe, Swan, and others made significant contributions. In the 1970's, the Japanese, first Yaesu, then Kenwood, and very late comer Icom (as Inoue, at first) came along and are with us to this day. Knowing all of that, there has to be a favorite. For me it is Hallicrafters. I have never been sure why, but it is reality.

In the mid-1950's, Hallicrafters began what would begin a long string of heavyweight ham stations for SSB/AM/CW. Here is the final version of that line as it first appeared in the 1960 (but as it started in the late 1950's):

The Last of the Hallicrafters Premium Class Big Iron Stations
Hallicrafters HT-32B, SX-115, and HT-33B
(All models to follow in this series.)

Hallicrafters Sales Literature - 1961

There were four different Hallicrafters Premium Class Big Iron station offerings starting in the 1950's and into the 1960's. They were as follows:

Hallicrafters Premium[1] Big Iron Mix and Match		
Receivers	**Transmitters**	**Amplifiers**
SX-100 (1955)[2]	HT-30	HT-31
SX-101 (1957)	HT-32	HT-33
SX-101A (1959)	HT-32A	HT-33A
SX-115 (1961)	HT-32B	HT-33B

Shown above are the receivers and their approximate year of release. There were variances where perhaps an SX-101 was matched with an HT-32A, etc., but this list serves more to show times of advertising the complete and matching setup.

All of the transmitters mentioned use the crystal filter method of single sideband generation. However, Hallicrafters used both crystal filter and phasing for generating their signal sideband generation. Initially the premium line radios had crystal filter generation while the budget line used phasing. Later, however, Hallicrafters used phasing in its premium radios as well. After years of this back and forth, Hallicrafters settled on the crystal filter process and the phasing system was abandoned.

The initial offering was the combo of SX-100 Receiver, HT-30 Transmitter, and HT-31 Linear Amplifier. In 1955, the 15-meter band was not really ours – but would shortly appear on the scene. Most manufacturers by then were including that band in their offerings. One of the first things you will notice on the HT-30 is that the 15-meter band is absent.

Hallicrafters HT-30 HF Transmitter

Dachis – Radios by Hallicrafters

The left of the two larger knobs on the front panel (BAND SELECTOR) is hard to see in this picture but there are four positions – 80, 40, 20, and 10 meters. Also check the main tuning dial readout to confirm four readout arcs. The HT-30 produced a relatively low output, by today's expectation at 35-watts CW Carrier. SSB Output power was the same 35-watts as produced on CW. Still a popular option in the 1950's was the AM mode that provided 9-watts of carrier output. Peak output with full modulation on AM was also 35 watts.

Generating the RF output with HT-30 was via a pair of 6146 Tetrodes – a setup that was not changed from the HT-30 right up to the last HT-32B in this series of premium. SSB/CW/AM Transmitters. At 51 pounds, the HT-30 is by far the lightest weight transmitter in the series.

The HT-30 Transmitter was dual-conversion with the first I-F of 50 kHz and a second I-F of either 1675 or 1775 kHz, depending on the band. The system uses a crystal heterodyne mixing setup to get the radio onto the chosen band. This was as seen (with different I-F frequencies) in the Collins 75A-1 Receiver from the late 1940's. In the case of Hallicrafters it was used in this transmitter but not in its matching SX-100 Receiver. Collins, on the other hand, used this frequency generating scheme on its 75A-1 Receiver but not in its matching 32V-1 Transmitter. Collins brought the scheme to both receiver and transmitter together in the game changing S-Line separates (75S-1 Receiver and 32S-1 Transmitter) in 1958. Even earlier, Collins used this scheme in their KWM-1 Transceiver in 1957. For Hallicrafters, this marriage of conversion schemes in both the receiver and transmitter had to wait until after this premium series began to lose its mainstream place. The more modern SX-117 Receiver and HT-44 Transmitter (in 1964) with matching heterodyne schemes that could be synchronized and allow transceiver operation with only one of the two VFO's in the system.

The matching SX-100 Receiver was typical of the day with a fourteen tube, dual conversion design. Here you see its design, a perfect match for the HT-30 Transmitter:

Hallicrafters SX-100 HF Receiver

W9MXQ Photo

The SX-100 Receiver is a particular favorite of mine. Having owned its predecessor, the SX-96, and its successor, the SX-101, I still find the SX-100 to have a smooth and pleasant sound that remains unmatched. I should add that the SX-96 and the SX-100 have general coverage (0.538 to 34 MHz) while the SX-101 is ham band only with coverage of the 160, 80, 40, 20, 15, and 10-meter ham bands plus 10 MHz WWV. (The last version, the SX-101A, omitted the 160-meter band but added a calibrated scale for 6 and 2-meters for use with a receiving converter. The even later SX-115 Receiver in this series was similar in coverage to the SX-101A. (The SX-115 was a completely different design and will be covered in a later installment.

The SX-100 Receiver had I-F frequencies of 50.5 and 1650 kHz. Selectivity control takes place on the 50.5 kHz I-F and is accomplished by tuned circuits as compared to mechanical or crystal filters. Mechanical filters were mostly used on Collins equipment while the others used the crystal filters. Both are much more effective than the tuned circuit filters – but they both lacked the audio fidelity that the tuned circuit filters provided. Hallicrafters used the tuned circuit I-F filters in top line radios until very late in comparison to other manufacturers. My assessment of the performance of the different filters can be shown graphically when looking at bandwidth charts of the various filters' performance. But, at the same time, it is also subjective and based on my own listening preferences. The tuned circuit I-F filter cannot compete nearly as well on today's crowded ham bands.

Dachis – Radios by Hallicrafters

The SX-100, HT-30, and HT-31 were sold successfully as individual units to occupy the desktop in the ham shack. Hallicrafters also sold the trio in a stand-alone rack console and writing desk assembly as shown at the left.

This assembly, which included a speaker was called the SR-500[3]. In later years, the "SR" prefix would become part of the model designation of transceivers. Close to ten years later, in 1965, Hallicrafters introduced a 500-watt SSB/CW Transceiver for the 80, 40, and 20-meter bands that was, coincidently, called the model SR-500, Tornado.

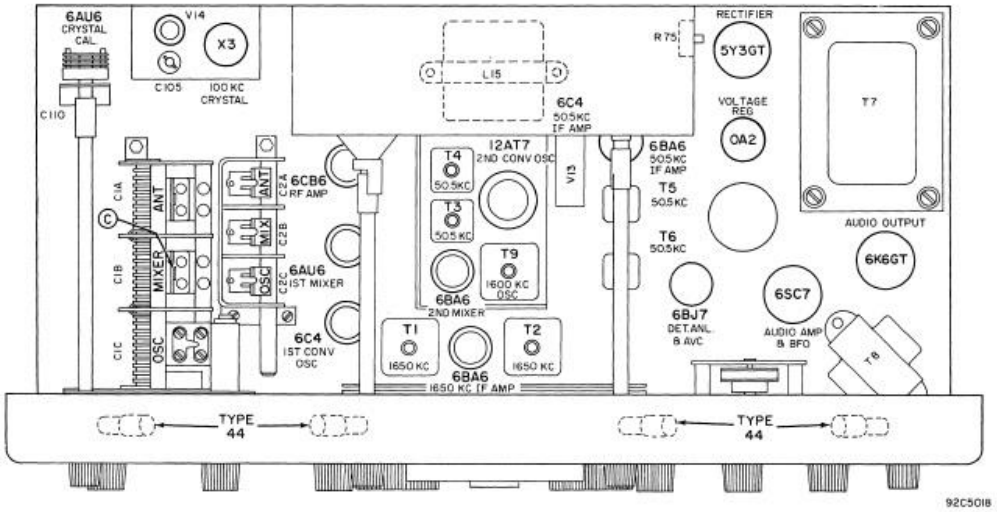
The HT-31 Linear Amplifier was quite different from what we see today in terms of power level. The amplifier used a pair of 811A Triode final amplifier tubes for an output of about 330 watts. However, with the drive level from the HT-30, the output was about 285 watts

SSB (PEP) and CW. The power level, while less than later four tube 811A amplifiers, was correct for two tubes. As an example, the Collins 30L-1 Linear Amplifier, with four 811A tubes, of only a few years later produced an output of 600 watts – nearly double what the Hallicrafters HT-31 produced with two tubes.

Hallicrafters HT-31 HF Linear Amplifier

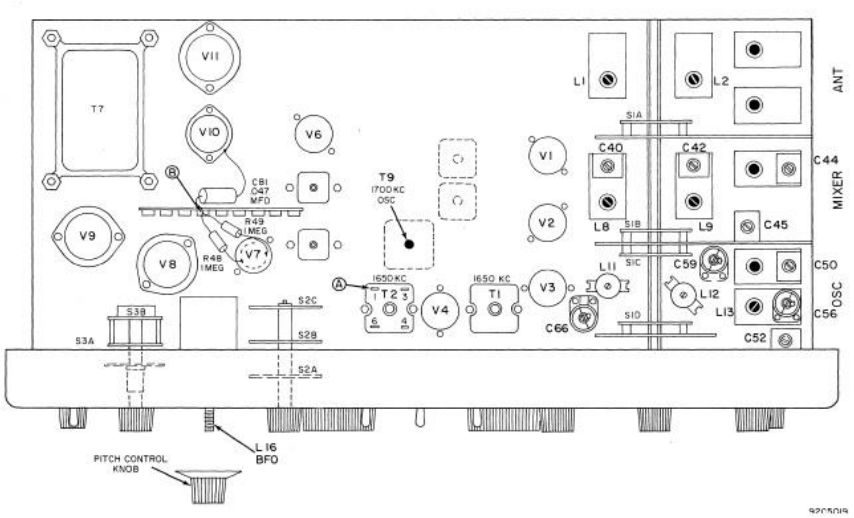
Dachis – Radios by Hallicrafters

While documentation is hard to locate this many years after manufacturing, we will review what is available today showing the interior design of all three of these units, the SX-100, the HT-30, and the HT-31.



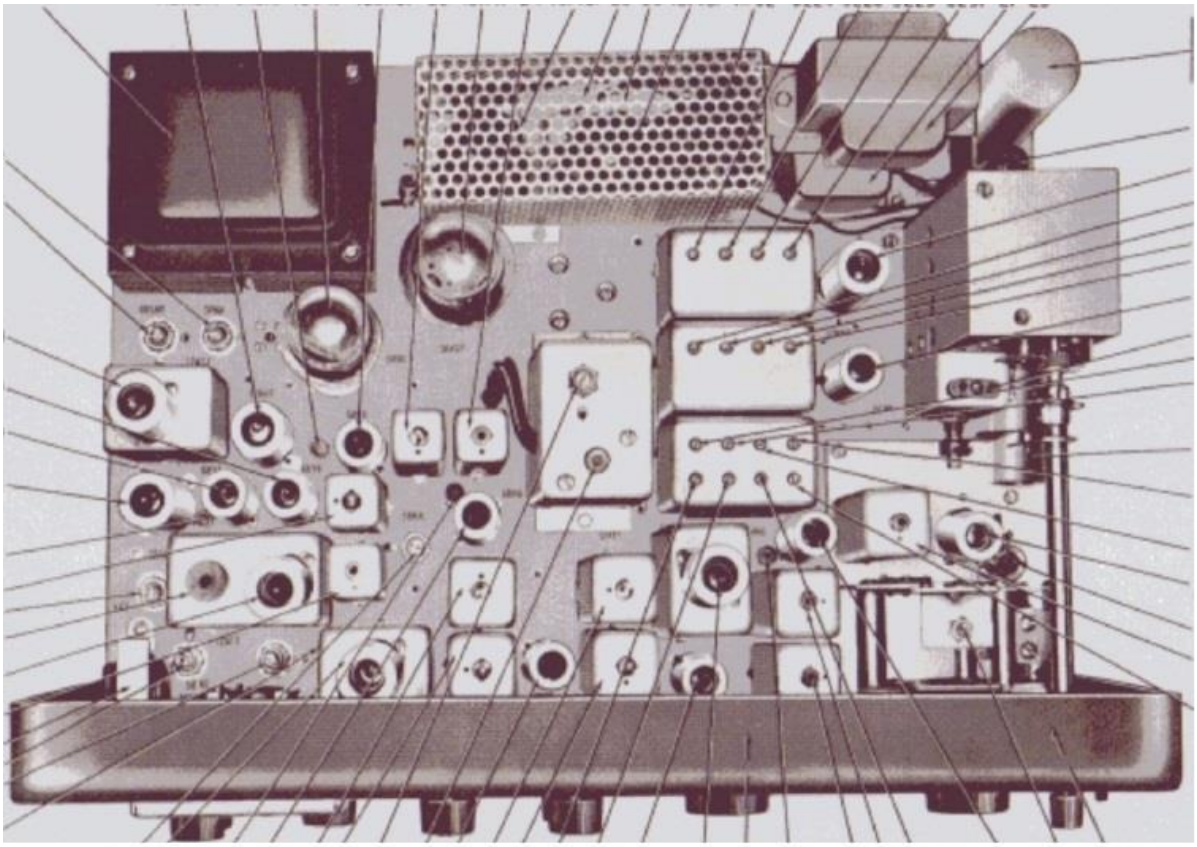
Hallicrafters SX-100 Mark 1B HF Receiver – Top View

Hallicrafters SX-100 Instruction Manual



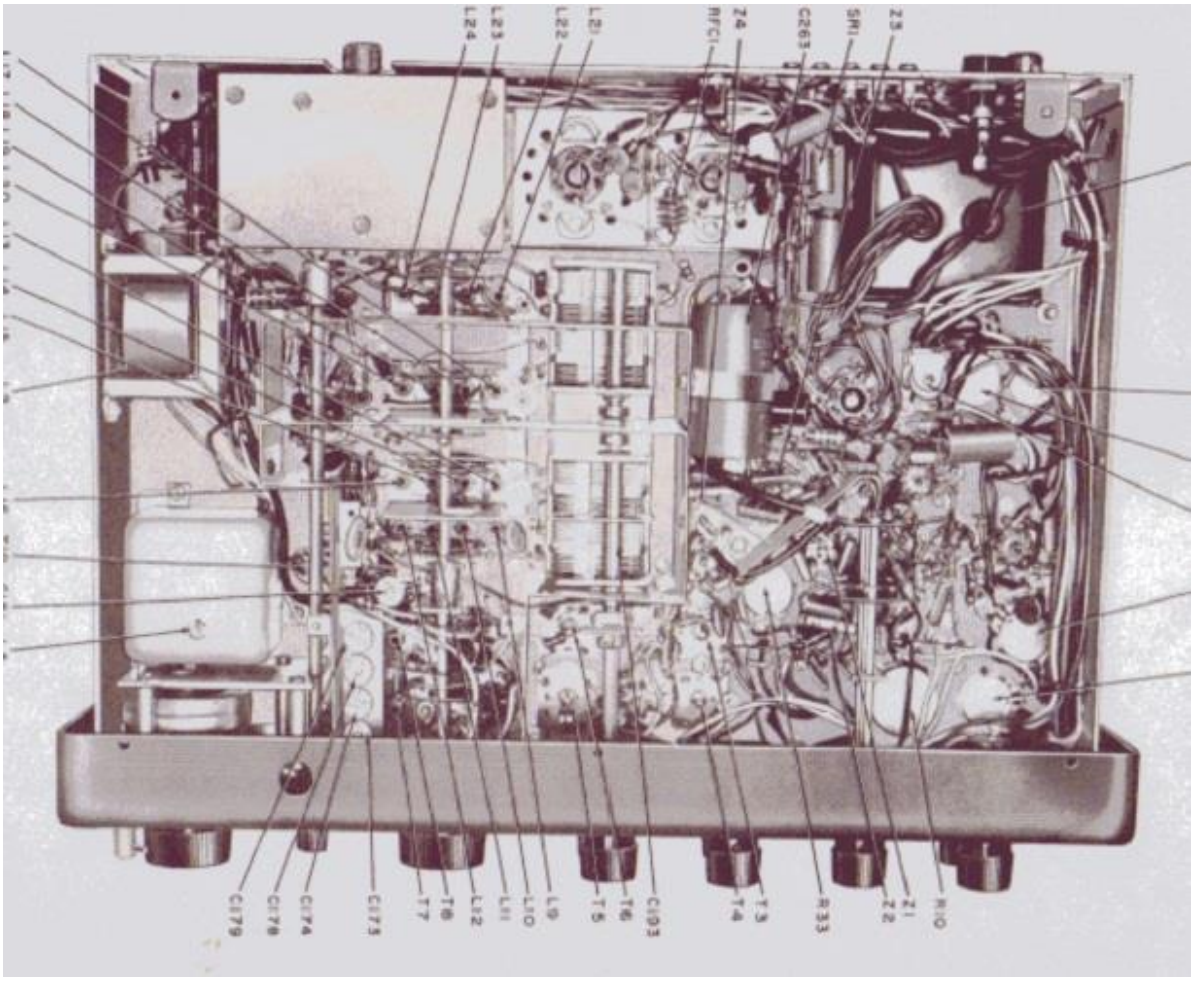
Hallicrafters SX-100 Mark 1B HF Receiver – Bottom View

Hallicrafters SX-100 Instruction Manual



Hallicrafters HT-30 HF Transmitter – Top View

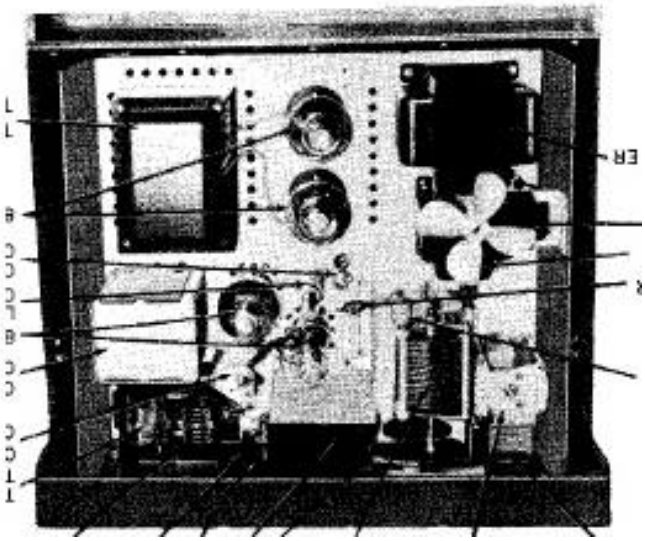
Hallicrafters HT-30 Instruction Manual



Hallicrafters HT-30 HF Transmitter – Bottom View

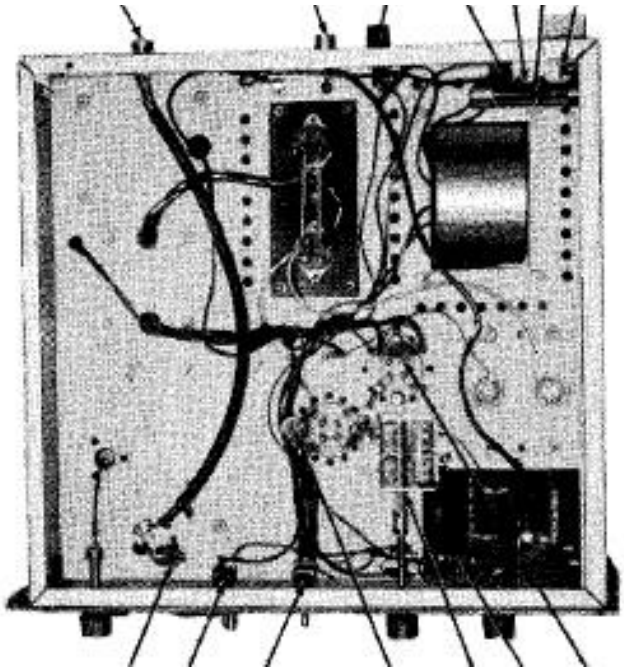
Hallicrafters HT-30 Instruction Manual

Hallicrafters HT-31 HF Linear Amplifier



Top View:

Note the two 866A mercury vapor high voltage rectifier tubes at the top center of this picture. To their lower left are the two 811A Triode RF power tubes. The fan at the right center seems oddly placed for cooling the tubes.



Hallicrafters HT-31 Instruction Manual

Bottom View:

Amplifiers are generally simple in wiring as is evidenced here.

There are several inconsistencies in the SX-100/HT-30/HT-31 tie-up as a product line. First was the confusion at the beginning of the SX-100 vs the SX-96. A few complete setups included the SX-96 in place of the SX-100. The SX-100 matches the HT-30 in appearance and in mode requirements. The SX-96 seemed to represent the last of the AM/CW designs while the SX-100 represented the beginning of SSB focus for phone operation. The SX-96 also lacks many operating conveniences and features of the later SX-100. I can see other reasons for some installations going with the lower cost SX-96 alternative. This will be covered in a later article.

Another inconsistency is the frequency coverage of the three units. They are all different and each of the three has their own unique coverage areas of the HF spectrum. Here is a list as I determined from nearly 70 years after the fact:

1. The SX-100 Receiver was a general coverage high-frequency receiver with coverage from 538 kHz through 34 MHz. It had specific bandspread dials for the 80, 40, 20, 15, and 10-meter bands. It was quite capable of handling SSB, CW, and AM transmissions.

2. The HT-30 Transmitter was a ham band only high-frequency transmitter with coverage limited to the 80, 40, 20, and 10-meter bands. As mentioned before, 15 meters was missing from this transmitter, and it was not possible to add in the field. At 35 watts output, it lacked the power to fully drive the HT-31 Linear Amplifier to full rated output.

3. The HT-31 Linear Amplifier was a HF linear amplifier with operation anywhere between 3.5 and 30 MHz possible. It did not switch bands in the same way as the HT-30 Transmitter. Instead, the manual gave specific inductor settings to start with to begin tuning a particular band. Usually, this inductance was accomplished with a tapped inductor. In the HT-30, the inductor in the tank circuit was a continuously variable inductor driven by a calibrated turns counter/vernier drive mechanism.

4. So why did Hallicrafters choose a rather odd output power level for the HT-31 of 330 watts? Hallicrafters says, in the HT-31 Operating Manual, that the 330 watts maximum output was “equivalent in talk power to a full one-kilowatt conventional AM modulated phone rig.”

As a collector and having an interest in the designs from the various manufacturers, I look for places where product components are shared. In this product line the SX-100 and the HT-30 shared basic cabinet and panel designs – but with different panel and chassis punching. The HT-31 was unique, or so it seemed. Check these pictures:

Hallicrafters HT-20 AM/CW Transmitter

Hallicrafters HT-30 Linear Amplifier

Dachis – Radios by Hallicrafters

You can see the similar cabinets of these two radios. The HT-20 was the last dedicated plate modulated AM plus CW Transmitter. Introduced in 1950, its line was beginning to fade by 1953, but its cabinet, panel, and trim tooling lived on in the HT-31. Even the placement of the tank variable inductor seemed to be similar.

> Author’s Note: My first transmitter, in 1964, was almost the Hallicrafters HT-20. It was owned by a local ham who wanted to move to SSB. I was not so convinced about that mode and preferred, at the time, to be on AM for phone. The owner, as it turned out, changed his mind on SSB, kept the HT-20, and I went for a Johnson Valiant AM/CW Transmitter. I still have a Johnson Valiant Transmitter to this day. Alas, my one today is not the same one I started with. My first one now resides in Italy.

A Really Great Looking Pair Together!!
The Original Hallicrafters Premium Big Iron
The HT-30 Transmitter and SX-100 Receiver

eBay – Unknown Owner

So, here we have the first of the four Hallicrafters Premium Big Iron Stations. We will continue on to the evolutionary designs of the SX-101 and SX-115 Receivers that were built on the design experience of the SX-100. And we will see the evolution of the HT-30 Transmitter into the HT-32 series. Not to be left out are the newer, much higher power HT-33 series Linear Amplifiers with their varied final amplifier tubes as models progressed. Finally, we will discuss the Budget Big Iron station that showed us budget versions of the SX-101 Receiver, in the SX-111. Also, the budget version of the HT-32 Transmitter in what became the HT-37. And, not to be forgotten is the new budget Linear Amplifier, the HT-41, that became the third part of the Budget Big Iron series.

When you read these articles, remember Bob Bailey, W9DYQ, and his work to proof-read the finished work. Not only proofreading, but he also contributes ideas and suggestions as to content. We have collaborated in collecting vintage radios for all of our adult lives.

I appreciate that you read my articles. Remember that I am open to questions and comments at my email address, W9MXQ@TWC.com. This month saw also some input on article content and structure from Evan Rolek, K9SQG. Evan and I are both part of the Drake Technical Net[4] and its weekly on the air session. Evan brings a background in technical writing to the table. Thank you, Evan.

Notes:

[1] The word “Premium” is my own – not something Hallicrafters used. Also, late in the article you will see the reference to the “Budget” series that marketed in parallel to the so called “Premium” radios. Again, “Budget” is my word, not that of Hallicrafters.

[2] For a very brief time, the Hallicrafters SX-96 was the receiver used in this matchup.

Hallicrafters SX-96 HF Receiver

RigPix

This radio, while good for its time, was not the latest technology in the Hallicrafters stable and was very soon replaced with the SX-100. Not only was the SX-100 Receiver a better performing radio, but it was also obvious to the observer that it was physically (styling) matched to the HT-30 Transmitter. I have had both receivers and still have the SX-100. My SX-96 still resides with a local ham radio friend. It came to me from the original owner who purchased it back in the early 1950's. My current SX-100 also came from its original owner.

[3] The SR-500 Console is very rare and perhaps only a few were ever put together. The later SR-500 Tornado Transceiver, from 1965, shares nothing in common with the earlier named assembly. The SR-500 Tornado Transceiver was a high-power version of the nearly identical looking and similar circuit design SR-160, 160-watt SSB/CW Transceiver from 1961.

[4] Drake Technical Net – Sundays at 3:00 PM Central Time on 7.238 MHz. Focuses on users of Drake amateur radio equipment, its maintenance, and its operation.

Upcoming Events

de: Tom Trethewey, KC9ONY

11/09/2024 to 11/10/2024 – Manitowoc, WI – USS Cobia
USS Cobia Special Event Station celebrating Veterans Day weekend
https://www.wisconsinmaritime.org/event/amateur-radio-weekend-aboard-uss-cobia/
https://www.qrz.com/db/NB9QV

11/11/2024 – Manitowoc, WI – USS Cobia – Veterans Day
Free admission for Veterans!
https://www.wisconsinmaritime.org/event/veterans-day-veterans-get-in-free/

1/25/2025 to 1/26/2025 – Winter Field Day
https://winterfieldday.org/
https://winterfieldday.org/downloads/2025-rules.pdf

3/16/2025 – Jefferson, WI – Tri-County Amateur Radio Club Hamfest
https://www.w9mqb.org/SwapFest/

4/26/2025 – Cedarburg, WI – Ozaukee Radio Club Spring Swapfest
https://www.ozaukeeradioclub.org/

5/16/2025 to 5/18/2025 – Xenia, OH – Hamvention 2025
https://hamvention.org/

Classified Advertising
For Sale & Wanted Items
Ozaukee Radio Club Members

de: Bill Shadid, W9MXQ

Classified Advertising for Ozaukee Radio Club Members is a members only feature. (Members may post for non-member friends, however.) Contact advertiser for details. The Newsletter Editor has no knowledge of any sale items (unless he is the seller!!)..

Ozaukee Radio Club is not responsible for any purchases and cannot be involved in any buyer/seller agreements or disagreements – all sales are final other than what you work out between the buyer or seller.

Advertisements will be accepted up to the 10th of the month before Newsletter publication.

Icom IC-751A HF Transceiver

160 – 10 Meters, including 60, 30, 17, and 12 Meter WARC bands. All mode, AM, FM, LSB/USB, CW, and RTTY. 100-watt output on all modes. Icom desk and hand microphones plus all manuals included as is original packaging. Requires 12 VDC Power Supply. Radio is in good operating condition and is clean. Asking price: $350 (NEW PRICE) (Will negotiate for a reasonable offer.)

Contact Jim Albrinck, K9QLP. albrinck@att.net

Classified Advertisements Continued – Next Page

Icom IC-505 6M All Mode Transceiver

Capable of CW, LSB/USB, and FM operation on six-meters. Dual VFO's for FM Repeater operation plus attached PL Deck. Radio has carrying case and self-contained telescoping antenna. Three power levels of 500mw, 3-watts, and 10-watts with 13.8 VDC from vehicle or power supply. Hand microphone is included. The radio has a built-in battery case for type C dry cells which can power radio at up to 3 watts. Batteries not included.

This is a rare radio. Vintage 1980's. I used it to work my VUCC on six meters. Radio is very clean. Asking price: $130. (NEW PRICE)

Contact Jim Albrinck, K9QLP. albrinck@att.net

It worked the last time I used it!!

Ozaukee Radio Club Minutes of Membership Meeting. 10/9/2024

De: Ken Boston, W9GA Secretary

The monthly ORC meeting occurred at the senior center as we have returned to live in-person meetings, along with a streaming version held via Zoom. ORC Pres Bill K9GN began the meeting at 7:30 PM, a go-around was conducted. Zoom attendees were also in attendance and were also introduced.. Bill W9MXQ announced that there is a new columnist for our newsletter, WA9FBO, who will be covering basic electronics practices.

Program:

N9VSV Jeananne opened our annual project night; consisting of several short presentations:

- W9MXQ: Bill showed how he has organized his multiple station set-ups, with various accessory storage ideas and configuration shortcuts.
- W9XT: Gary described his VHF/UHF preamp, using a cheap MMIC, [pga103] and a small PCB.
- W9PEM: Paul has an integrated satellite station using arrow antennas and a TH-D7 H.T.; with some plastic mount components created with a 3D printer.
- W9KEY: Fred showed us his integrated GO pack power system, centered around a large LiFePO battery pack, and power pole 12VDC quick connects, plus ancillary items
- WE9F: John brought a simple CW paddle design, meant for Ops with carpal tunnel issues.
- W9JI: Pat showed pictures of a number of homebrew projects by Paul Ripple W9SIZ (SK) which demonstrated a high level of skill in construction.

50/50 Raffle: This was won by Tom W9IPR; winning an award of $17.00

Scholarship Auction: Gary W9XT auctioned a 15 A Bioenno LiFePO battery for $98

Committee reports: [no reports: Pres, programs, RPT VP]

1st VP: Jeananne N9VSV: reports on the MRAC 'Boot camp' class for new hams, and thanks k9GN for help in bringing the ORC inventory up to date.

Treasurer: Gary N9UUR recent report are on the tables, with cash moved from checking to the MMA because he noticed bylaws restrict cash in checking to $3000 or less. ORC has about $44K in all accounts. W9DHI moved, KC9FZK 2nd to accept, motion carried. He further noted that we have 5 new members, and the budget is solid to E.O.Y.

Secretary: Ken W9GA has minutes posted; a minor change is noted; N9VSV moved to accept, W9DHI 2nd and motion passed.

STEM: Pat W9JI, had a chance to test out the construction project with the West Bend Librarian's son, which identified some things to watch out during the event. The teaching

event is now scheduled for Friday Oct 16 at the West Bend library, and more help would be needed.

TECH: Gregg W9DHI asks that the members go to the link found in their email, in order to re-login to our new groups io account. Our website is now up officially and needs only some further housekeeping to become fully operational.

OLD business: no old business.

NEW business: Tom KC9ONY gave out 2 tickets to the Neenah hamfest to W9KEY and WB9AZH

Adjournment: W9DHI moved to adjourn, motion carried; time end was 9:10 PM. There were 21 in-person attendees, 9 zoom attendees.

Respectfully submitted;

Kenneth Boston W9GA, secretary:

Notes from the 1st Vice-President

de: Jeananne Bargholz, N9VSV

This Month's Meeting:
Wednesday, November 13, 2024, 7:30 PM

This Month's Program:
Building a Crystal Radio by Stan Kaplan, WB9RQR

When I think of building a crystal radio, my mind immediately travels back to the 1960's and the Remco Radio Science Crystal Radio Kit that one could find at hobby shops. I remember those in my class who were Boy Scouts had the opportunity to build these radios. Girl Scouts did not offer any such thing.

Our November program is "Building a Crystal Radio" by Stan Kaplan WB9RQR. The radio he built is most likely considerably better than those kits of yore. Come to the meeting and learn of the process and maybe this could be a project you might want to undertake with your children or grandchildren!

Stan has been licensed since 1979. As a member in the ORC, Stan has held every seat on the Board, except that of Treasurer. Stan has also been involved with RACES, ARES on the local and state levels, and the ARRL.

Be sure to note a Handout to go with Stan's program for the 13 November 2024 Meeting Program. The Handout will be handy for watching the recorded program on YouTube™. (That Handout is include herein – see pages 54 and 55.)

Upcoming Meeting Programs

2024:
December: Gary Sutcliffe, W9XT – Digital Modes

2025:
January: Annual Meeting/Election of Officers and Trivia (if time allows)
February: Pat Volkmann, W9JI – The Collins 310B Exciter
March: Gary Sutcliffe, W9XT – POTA – Radio Fun in the Park

Call for 2025 Programs

Do you have a new or different radio? Are you working with a new mode? Do you have an operating routine? We need presenters for our monthly meeting programs. Programs can be on any ham radio-related topic and are usually 20-30 minutes. Share your stories; share your knowledge! We are fortunate to have many skilled people in our club. Please consider sharing some of your experiences with the rest of us. If you have an idea and would like some help putting a program together, contact me at: iamn9vsv@wi.rr.com or 1stvp@ozaukeeradioclub.org

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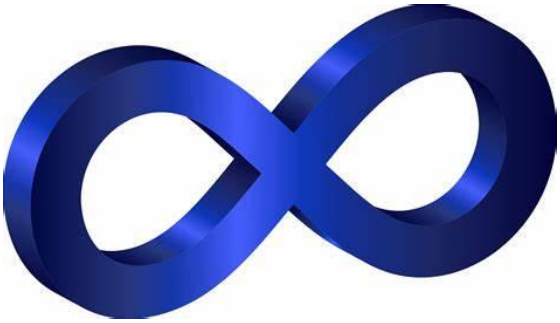
ORC Meeting Agenda

13 November 2024

1. 7:15 – 7:30 PM
   Check-In and Introductions
2. 7:30 PM Call to Order:
   President Bill Greaves (K9GN)
3. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.
4. Program: Stan Kaplan, WB9RQR
   Building a Crystal Radio
5. President's Update:
   Bill Greaves (K9GN)
6. 1st VP Report:
   Jeananne Bargholz (N9VSV)
7. Repeater VP Report:
   Tom Trethewey (KC9ONY)
8. Secretary's Report:
   Ken Boston (W9GA)
9. Treasurer's Report:
   Gary Bargholz (N9UUR)
10. Committee Reports
11. OLD BUSINESS
12. NEW BUSINESS
13. Adjournment



Ozaukee Radio Club Swag Spot

de: Jeananne Bargholz, N9VSV

Listing of available Ozaukee Radio Club Swag Items for your review and selection . . .

Tumbler – Front

Tumbler - Back

Tumbler Caps

Personalized Polar Camel 20oz Tumbler
$33.00 (with standard cap) $36.00 (with slider cap)
9 colors available: black, red, royal blue, teal, purple, dark gray navy blue, maroon, and green. The font is standard; all you need to decide is "just callsign" or "name and callsign." If "name and callsign," then name on line one or on line two?

Name Badge
$10.00
Magnetic "clasp;" one size fits all
The font is standard.

Personalized Cap
Khaki cap is 100% Cotton w/Velcro closure: $33.00
Navy Blue cap is 65%/35% Polyester/Cotton w/plastic snap closure: $30.00
(When limited stock of the blue hat is gone, we will offer a blue that is identical to the Khaki style.) Font is standard; all you need to decide is name on line one or on line two?

We have an ordering option on our Webpage that includes PayPal costs:

https://www.ozaukeeradioclub.org/index.php/orc-gear
This is a great option if you don't attend meetings regularly – or just contact me and save those costs. If you DO attend meetings somewhat regularly, just contact me at and let me know what you want. You can pay me for your items at the next meeting.

Questions? Ready to order? Contact me at:

1stvp@ozaukeeradioclub.org

I'm also in the roster.

The Back Page

This Month's ORC Meeting
Hybrid In-Person/Zoom Meeting
13 November 2024

Program:

Building a Crystal Radio
Stan Kaplan, WB9RQR

7:00 PM – Doors Open
7:15-7:30 PM – Zoom Check-In
7:30 PM – Meeting Begins

NEXT MONTH
Hybrid In-Person/Zoom Meeting
11 December 2024

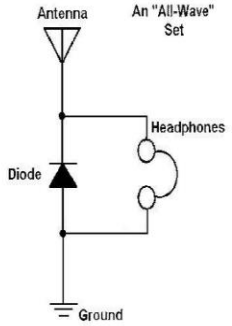
Program:

Digital Modes
Gary Sutcliffe, W9XT

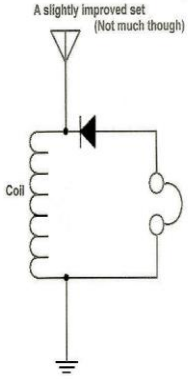
7:00 PM – Doors Open
7:15-7:30 PM – Zoom Check-In
7:30 PM – Meeting Begins

WB9RQR Crystal Radios – Program Handout – Page 1 of 2

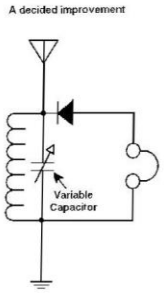
The Simplest



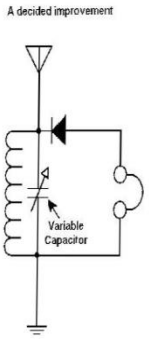
Add a coil



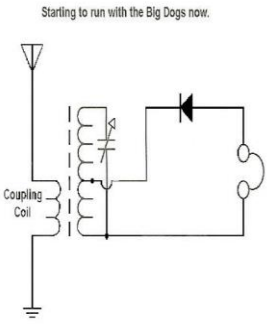
Add a variable capacitor



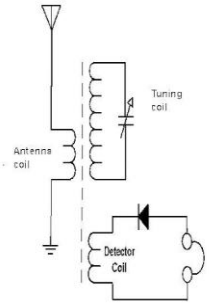
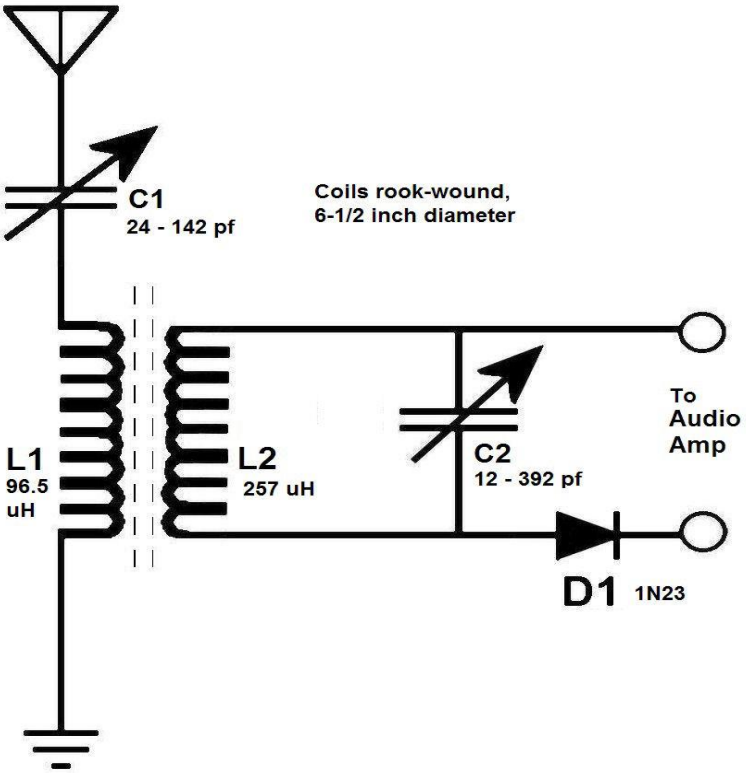
Add a variable capacitor



Split the coil into 2



Split the coil into 3



World's Largest (?) Crystal Radio by Stan Kaplan (WB9RQR) and Bill Howe †(KA9WRL)