The ORC Newsletter

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From the President

de Kevin Steers (K9VIN)

Still tinkering with my tower rotator project, but we won't get into that. What I will say is that my power of procrastination is outstanding, especially in this weather. Absolute embarrassment set in when I recently saw a photo of Gary K9DJT helping his friend Lyle in this weather, as he joked that "at least it wasn't snowing." I'll try to get better.

My recent struggles on the air have to do with the fact that I have a small collection of tuners, all of which are manual – and challenging. My bigger challenge was that my only manual tuner with "indexed" knobs doesn't tune 160M. No problem; I built an OCF Windom for 160 that really shouldn't need tuning, which is true, and does work, which gets me on the air with my small 500W amp. UNTIL frost or something else coats the wire. At least that is my hunch right now. I am now realizing why setting up your station three feet from the back wall so you can easily manage the tangle behind, is such a good idea. I guess I am now in the market for an auto tuner, but 160M is a requirement. Whatadayagot??

I hope some of you partook in Straight-Key Night, which apparently is the only night I am able to somewhat copy code. I still have some work to solidify my shack, before I am able to focus on the code.

My next project is to run RG-8 for my mobile rig, in hopes that it will improve the noise level of my current RF-58, which I know is of sketchy quality. Stay tuned for more trials and tribulations . . . maybe. . .

Cheers and 73,
K9VIN
Kevin

DX'ing & Contesting

De Gary Sutcliffe (W9XT)

Welcome to 2019! 2018 was a year of moving further into the depths of the bottom of sun spot cycle 24. We didn't have any sunspots visible on 61% of the days last year and ended the second half of December with none. This means that the lower bands are going to be where the action is. Don't rule out the other bands though. On New Year's Day, I worked a number of stations in South America on 15 meters. They were all on FT8. This mode allows working stations much lower in the noise than is possible with SSB or even CW.

There was an upgrade to the WSJT-X suite of programs in December. WSJT covers a lot of modes including FT8 and WSPR. FT8 and MSK144 were upgraded in version 2, and the data formats are not compatible. If you were using the older version 1.9 for FT8, it was desupported on January 1. You won't find anyone to work. Upgrade now.

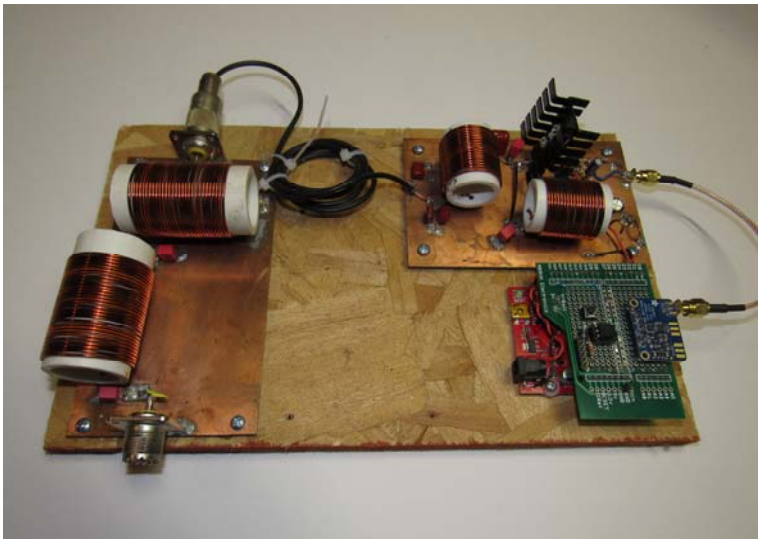
MSK144 was the other mode that got changed. It is used for meteor scatter. You can bounce 6M and 2M signals off the ionized gas that results when a small piece of rock enters the atmosphere. I had not worked any meteor scatter for a few years, and the Geminid meteor shower peaked in mid-December. I decided to give it a try. I used 6M and worked a station in MA. Just after completing that contact, I was called by and worked Joe Taylor, K1JT, who is the one who developed the WSJT modes. That was kind of cool.

Another digital mode I have been using is WSPR, another mode in the WSJT suite. It is a beacon mode and quite popular. Most of them are running low power, and you can tune to the proper frequency on a band and see who you can copy and where the band is open to. Like FT8, it can pull signals way out of the noise. You can see who is hearing who by going to the http://wsprnet.org web page. You can select a map for the band you are interested in and see who is currently on. When running WSPR, you have the option of sending the stations you hear to the web site. These also go into a searchable database.

My interest is on the new 630 meter band, at 476 KHz. Yes, that is KHz, not MHz. I have been interested in the band since it opened up in the fall of 2017. Because of the high noise level, practical antennas are inefficient, and at the FCC limit of 5 watts EIRP, signals are weak, and the digital modes are what most of the operators are using. WSPR beacons are on every night.

Every couple of weeks I would let the rig monitor 630 meters overnight then query the WSPR database to see what stations I picked up. So far I have heard about 85 of them, mostly in the US and Canada. I have also picked up stations in Germany, France, Australia, Hawaii, and Grand Cayman. I only heard the first three countries once. Give it a try some night if your radio tunes below 500 KHz. Most modern rigs do, but some seem to be kind of deaf down there. Listening is fun, but I wanted to transmit and make contacts.

I made the first step with a home brew WSPR beacon transmitter with 12 watts output. The antenna is about 90' long in an inverted L configuration. A full-sized antenna for this band should be about 510' long, so this looked like a big capacitor to the transmitter. I made a big tunable inductor to load it to a 50 ohm antenna. It is not very efficient, and I estimate the effective radiated power to be about 100 milliwatts. Talk about QRP! You can read more about it all at my web site, www.w9xt.com.



W9XT 630M WSPR Transmitter

I got this going the last week or so of December. In the few nights I let it run, it was picked up by 75 stations (as reported to the WSPR server) in 28 states, two Canadian provinces and the Grand Caymans in the Caribbean. The next step is to get something running on a mode that I can make two-way QSOs. It would not be too hard to make the transmitter work on CW, but based on the signal reports I have been getting with WSPR, I doubt many stations would hear me. I have only heard a few stations on 630M CW, and those were big guns. Most of the QSOs are on JT9, another WSJT mode, which is designed for low frequency work. I'm not sure what my next step will be to achieve this.

There are a number of contests in January. Probably the biggest one is the CQ 160 CW Meter contest. It starts at 2200 UTC (4:00 PM local) on January 25 and runs for 48 hours. You can only operate 30 hours, but there won't be anyone on during the daytime anyway. We send a signal report and our state. DX stations send their CQ zone. Multipliers are US states, Canadian provinces, and countries.US stations are worth two points, other countries in North America are worth five points and contacts with other continents are worth ten points.

With the low sunspot counts, conditions can be really good. They were good in the ARRL 160 contest in December. The Stew Perry Top Band Distance Challenge was the last weekend of December. Conditions were a bit disturbed, and long distance contacts to Europe and other continents were way down, but there were plenty of US and VE stations to work. More info at https://cq160.com/rules.htm

The ARRL RTTY Roundup is the first weekend of January, starting at 1800 UTC (noon local) and running until 2359 UTC (6:00 PM) on Sunday with 30 hours maximum operating time. We send a signal report and state. DX countries send a signal report and serial number. Multipliers are states, Canadian provinces, and DX countries.

This year the rules changed to include FT8 and other digital modes. It will be interesting to see how that works out. On the one hand, you can work weaker stations on FT8, but on the other hand, QSOs take longer. You only get a multiplier once regardless of band. If you could get multiplier credit for a state or country on each band, it could be worthwhile being on FT8 on the higher bands just to work multipliers.

I am looking forward to seeing how the winning stations split between RTTY and FT8. Check the rules if you are thinking about operating this one. http://www.arrl.org/rtty-roundup

The ARRL VHF Contest January event starts at 1900 UTC (1:00 PM) Saturday, January 19 and runs until 0359 UTC Monday (9:59 PM Sunday local time). There are a lot of different categories, so check the web page at http://www.arrl.org/january-vhf. Send your grid square for the exchange. You can use a number of modes including CW, SSB, CW, and the various digital modes.

Two North American QSO Parties are this month. These are short, just 12 hours long (operate only 10) and start at 1800 UTC (noon local). Maximum power is 100 Watts. Being a domestic contest with a low power limit takes away a lot of the advantage of the big gun stations. CW is on January 12, and phone is January 19. Send your name and state. Rules are at http://ncjweb.com/NAQP-Rules.pdf.

Last month I mentioned the group planning on going to Bouvet. They have been in South Africa since October training and otherwise preparing for it. They just announced the ship they are going on. It sure looks awful small for that sort of trip. Dates still have not been announced.

January is pretty quiet on the DXpedition front. Most of the announced ones are single hams traveling. The biggest one is to Sierra Leone using the call 9LY1JM January 9-21. The group of European hams will have four stations running on all bands 160-10 meters. The announced modes are CW, SSB, RTTY, and FT8. Even with current conditions, this should be very workable from W9.

That wraps up this month on the air. What are your radio goals for 2019?

THE COMPUTER CORNER
No. 251: Lamp Safety

Stan Kaplan, WB9RQR 715 N. Dries Street Saukville, WI 53080-1664
(262) 268-1949 wb9rqr@att.net

Well, here is something new. This is similar to a safety notice I send to all my lamp customers (I re-wire/repair/rebuild lamps through a hardware store in Mequon). The article may give you something to think about, as well.

Examine the plugs on the ends of all the 2-wire lamp cords in your home. All the plugs should be of the polarized type. Non-polarized plugs have two blades that are identical in size, as shown in the plug on the left, below. Polarized plugs have one blade that is wider than the other, as is shown at the end of the pointer line in the plug on the right.

It is important for all standard two-wire lamps to have polarized plugs installed, for safety. Why? Non-polarized plugs can be plugged into the wall outlet in two different ways, and this means that the hot wire may be connected to the lamp incorrectly. This may lead to the lamp being energized even when the lamp switch is off, and this can lead to possible shock, or even electrocution.

On the other hand, polarized plugs can only be plugged into the wall outlet one way. Assuming the lamp has been correctly wired and the wall outlet has been correctly wired, there is little chance of danger when a polarized plug is used on a lamp. (Of course, a frayed electrical cord can always lead to danger).

Each lamp repair I do finishes with careful continuity testing to ensure that the lamp is correctly wired. Interestingly, I have seen more than one instance when a brand-new lamp was wired incorrectly at the lamp factory, so don't assume a lamp is OK just because it is brand-new! If wired correctly, the black or hot lead in the wall (narrow slot in the wall socket) will supply the center conductor in the lamp socket. The white or neutral conductor in the wall (wider slot in the wall socket) will connect to the socket shell (the threaded part of the lamp receptacle that you screw the bulb into). The path from the white wire in the wall (the wider blade on the plug) should never be interrupted or broken. The path from the black wire in the wall (the narrow blade on the plug) is broken by the switch in the lamp socket or elsewhere on the lamp fixture.

This is the only safe arrangement for household lamps that plug into a wall socket, unless all exposed surfaces are made of plastic or other non-conducting materials.

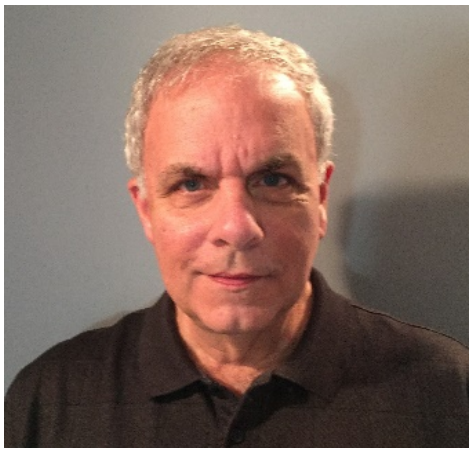
Another source of danger can be chandeliers. These fixtures are often permanently attached to wires in the ceiling and are controlled by a light switch on the wall. When one changes a light bulb in a chandelier, it is common for one to hold the chandelier with one hand to prevent swinging of the whole fixture while using the other hand to unscrew the faulty bulb and screw in the replacement. This is fine if one remembers to turn off the controlling switch on the wall before beginning to change the bulb, *and if the chandelier has been properly connected in the ceiling*. If the chandelier has been wired into the ceiling incorrectly, there is real danger of shock or even electrocution. Why? Assuming incorrect hookup in the ceiling, when the wall switch is on, the shell of the bulbs are energized. One hand holding the fixture to prevent swaying and the other hand unscrewing the bulb provides a perfect pathway across your chest and heart if you should contact the bulb's threaded shell while it is in contact with the socket. This is because code requires all hanging metal chandeliers to be separately grounded (the green wire in your ceiling). Thus, your left hand is holding a grounded metal fixture while your right hand accidently contacts a live (hot) metal electrode, the shell on the bulb and fixture socket. This is a scenario for potential heart stoppage!

Things to do to avoid danger: 1. Always make sure the wall switch is off before changing bulbs. 2: Consider putting on rubber gloves (household dishwashing gloves would be fine) before changing a bulb. 3. Keep your bulb-changing hand away from all metal … just handle the bulb by the glass.

Also on your list: Remember that polarized plugs are good. Non-polarized plugs are <u>bad</u> for most simple desk lamps used in houses. Indeed, very few appliances or lighting fixtures should be used with non-polarized plugs unless they have no exposed metal. Such non-polarized plugs were standard fare a handful of years ago, but no longer. The Electrical Code now takes this into consideration. Be safe!!!

Vintage Amateur Radio

de Bill Shadid, W9MXQ



In the last two installments we talked about the entry into the compact desktop stations market by Heathkit. This was in competition with the Collins S-Line and KWM-2 series separates and transceivers. Those included the SB-300/SB-400 Series Receivers and Transmitters as well as the SB-100 Series Transceivers.

Heathkit followed earlier linear amplifiers[1], the KL-1 and HA-10, with this series that included the SB-200 Series, the SB-220 Series, the HA-14, and the SB-230. We will talk about these SB Series amplifiers and the HA-14 in this article. The group of amplifiers here include Heathkit's most successful products.

Heathkit made its first entry into the desktop compact linear amplifier market in 1964 with the introduction of the very popular SB-200, pictured here:

Heathkit SB-200 80-10 Meter Linear Amplifier
(W9MXQ Shack Photo)

The 1964 introduction of the SB-200, for a kit price of $200.00, was a success from its first shipment. Many specifications of the SB-200 were perfectly matched to its prime competitor, the Collins 30L-1 Linear Amplifier. Physical dimensions were nearly the same. So, it was not unusual to see a fine Collins S-Line station with a 75S-3 Receiver and 32S-1 Transmitter mated to a Heathkit SB-200 Linear Amplifier.

Like the Collins 30L-1, the Heathkit SB-200 included an integral 120/240 VAC Power Supply that resided in the desktop cabinet with the RF components. This made for a compact and convenient installation.

Heathkit made one significant improvement in design of the SB-200 compared to the Collins 30L-1. That was the final amplifier tubes. The Collins 30L-1, used four of the then popular 811A Triodes with 65 watts of dissipation each. Heathkit chose the 572B/T-160L (572B) Triode. The 572B was just over double the plate dissipation of the 811A (160 watts vs. 65 watts, respectively). So, the Heathkit used two of the 572B Triodes compared with four of the 811A Triodes in the Collins 30L-1. The SB-200 had an advantage in dissipation over the Collins with a total of 320 watts of dissipation (2x 160 watts) vs. 260 watts dissipation (4x 65 watts) in the 30L-1. The SB-200 had a rated input of 1,200 watts PEP SSB and 1,000 watts CW. Nominal power output was

about 600 watts in either mode. The Collins 30L-1 has a 1,000-watt input specification in both SSB and CW with power output performance like the SB-200.

One year later, in 1965, Heathkit followed the SB-200 Linear Amplifier with a mobile version called the HA-14. The HA-14 was lower in power specifications, was significantly smaller, and lacked a cooling fan. So, the user had to be careful about running power too high. This is the HA-14 appearing in a modification article some years after its introduction:

Heathkit HA-14 80-10 Meter Linear Amplifier

The small HA-14, marketed as the "KW Kompact," did not have quite the specifications of its big brother, the SB-200. The amplifier carried a 1,000-watt PEP SSB, 50% duty cycle power input rating. While they could be used for CW, they were not rated for that mode by Heathkit. The small size did not leave room for a power supply so two were offered: the HP-24 for AC operation and the HP-14 for DC operation in the car. Due to their limited duty cycle, many of these amplifiers ended up not functioning. Overall, they were not too popular and today are very rare, and even more so in good condition.

Heathkit was a subject to the RF power competition as was any manufacturer of the day, and, the SB-200 came up a bit short in the 2,000-watt PEP competition of the day. To meet the challenge of products like the floor mounted Collins 30S-1, Heathkit introduced the desktop SB-220 Linear Amplifier, with an integrated 120/240 VAC Power Supply in 1970.

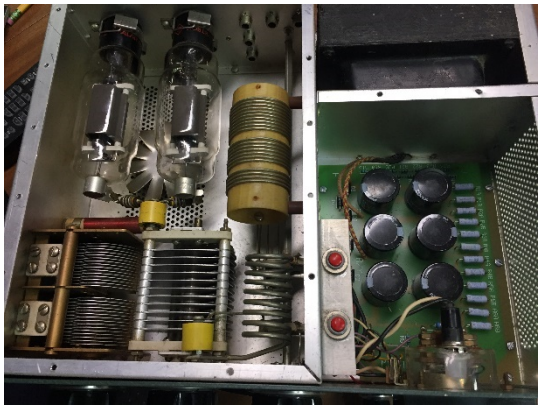
Heathkit SB-200 80-10 Meter Linear Amplifier
(W9MXQ Shack Photo)

The SB-220 used two of the relatively new, at the time, Eimac 3-500z Triodes with 500 watts, each, of plate dissipation. This allowed the amplifier to have an input power of 2,000 watts PEP SSB and 1,000 watts CW. For SSB, the output was generally in excess of 1,200 watts – double that of the lighter SB-200. Like the SB-200, the SB-220 offered a compact package that was same footprint as the SB-200, but taller.

Both the SB-200 and the SB-220 shared the feature of a tuned input that provided an approximately 50-ohm load to the exciter. These amplifiers were designed with the Heathkit SB-100 se-

ries transceivers and SB-300 receiver/SB-400 transmitter setups[6] in mind. However, they worked well with competitors' radios as well – and work well today with solid state radios requiring a consistent 50-ohm impedance load. Unlike a lot of tube transmitters and transceivers of the day, the Heathkit SB-Line transmitter circuits were designed with a narrow range pi-network output requiring a 50 to 75-ohm load. This was identical to the Collins S-Line and KWM-2[5] – but it was unlike National, Drake, Galaxy, some Hallicrafters[7], and other equipment of the day. Today's solid-state equipment is generally specified as requiring a 2:1 SWR (25 to 100-ohm) load. As you can see, the Heathkit amplifiers were compatible with them all.

For your reference, here are interior pictures of the SB-200 and SB-220 Linear Amplifiers:



Heathkit SB-200 Linear Amplifier
(W9MXQ Shack Photo)
It is a bit hard to see but note the graphite plates on the original Cetron brand 572B Triodes in this radio. You can just see the cooling fan under the two tubes, blowing air from the bottom of the chassis.

Heathkit SB-220 Linear Amplifier
(W9MXQ Photo of a W9XT Amplifier)
The Eimac 3-500z Triodes here are cooled by the fan you can see toward the top left center of this picture. At the time this picture was taken these were the original Eimac tubes supplied by Heathkit.

Front Panel is at the bottom of the picture. Both pictures are truncated just a small amount. The perforated RF Shield cover is removed on both amplifiers to view the final amplifier tubes and pi-network circuitry in both pictures.

The above SB-200 picture shows a retro-fit capacitor and diode board (lower right-hand corner of the picture) that is from Harbach Electronics[2]. See below for further details. Also, this SB-200 is an SBW-200, meaning it was wired at the factory. For a time, Heathkit made assembled radios available to the customer base. These are extremely rare as the practice did not last for very long as an option. In addition, back in those days, individuals offered a service of assembling Heathkits for a fee. Many, but not all, of these small service businesses were run by Heathkit employees.

At this point, it is proper to mention that in 1978, Heathkit began to market the SB-200 and SB-220 Linear Amplifiers in compliance with FCC regulations requiring all such linear amplifiers to be unable to operate on the 10-meter band or frequencies close to that band. Read that as unable to operate on the Citizens Band (CB). CB had become a lawless mob on the spectrum, causing problems for the United States in international treaties handling frequency coordination – not to mention interference to other services. Starting in 1978, the SB-200 became the SB-201 and the SB-220 became the SB-221. It was legal, however, to offer kits for amateur operators to modify their radios and activate 10-meters in their SB-201 and SB-221 amplifiers. In the scheme of things, most of the manufacturers offered retro-fit kits requiring varied levels of technical skill

to implement. The conversion of the SB-201 and SB-221 was complicated and involved some serious modification of the radio. As a result, few were done. Making the changes today is difficult, if not impossible, due to required parts. A point to remember is that a SB-201 or SB-221 found not including 10-meters can be a buy – they are worth less on the used market.

In terms of finding a used SB-200/201 or SB-220/221, they are plentiful. But, be careful of some concerns. Early SB-220 amplifiers had a serious problem with their bias cutoff Zener diode and they would fail, causing the failure of the 3-500z final amplifier tubes. Checking the status of all diodes and capacitors in any used SB-200/201 or SB-220/221 is a good idea. Finding a Zener diode defect in a SB-220 in the field would be rare.

The input coil/capacitor assemblies (one for each band) can drift off resonance over time. Checking the SWR in line with the input of the amplifier is a good idea – with adjustment of the slugs in the coils in these tuned circuits. Generally, the process to confirm that the circuits are operating correctly is to watch SWR while adjusting the cores of the individual coils.

A word about third party improvements for the used SB-200/201 and SB-220/221 is in order. One company I am familiar with in this area is Harbach Electronics[2]. My personal SB-200 (also applicable to the SB-201) has the following Harbach modifications installed:

- PM-200 Power Supply Replacement Circuit Board
    - o Replaces the diodes and electrolytic capacitors in the power supply
- SS-201-240 Soft Start Module
    - o Slows the start-up process when turning on AC Power. This is the version for use on 240 VAC power. If using 120 VAC AC Power, there is a SS-201-120 version of this Module.
- SK-201-240 Soft Key Module
    - o Allows the use of modern radio switching of the transmit/receive function of the amplifier. Isolates the switching from the high voltage bias circuit in the amplifier.
- BRK-200 Replacement Circuit Breakers
    - o Replaces defective OEM circuit breakers that have become defective.

I recommend the above items as replacements in a SB-200 or SB-201 that would be found today. Harbach also supplies a replacement cooling fan and a replacement T/R relay if needed.

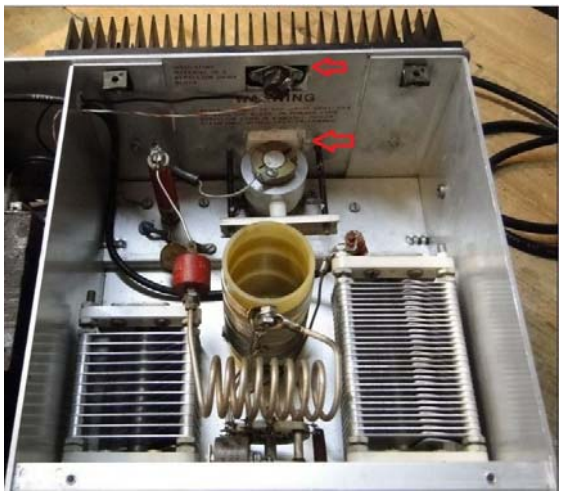
Harbach Electronics[2] has a similar line of replacement and upgrade parts for the SB-220/221 Linear Amplifier. If you find and acquire an SB-220 or SB-221, I recommend a similar approach to what I added to my SB-200.

One third party retro-fit company focusing on the SB-200/201 and SB-220/221 amplifiers is King Conversions[3].They specialize in converting any amplifier to single band six-meter operation. They make this conversion to a wide range of amplifiers but seem to specialize in the Heathkit SB-220 and SB-221. These King Conversion amplifiers are frequently seen for sale at hamfests. King typically modifies and returns an amplifier that you first send to them. However, they sometimes have inventory of amplifiers already converted.

So, we have discussed the very popular SB-200 and SB-201 – the most popular Heathkit ever made up to the time of the end of SB-201 production. We have also covered the little brother of the SB-200, the somewhat limited production HA-14 “KW Kompact.” And, we have discussed the also very popular SB-220 and SB-221, close to legal limit, models. There was yet another amplifier design based on the SB-200. That was the SB-230, introduced in 1974 and marketed with the SB-104 and SB-104A Solid State Transceivers[1]. The colors of the SB-104 and SB-104A

and their accessories kept to the green on green of the initial SB-Line. However, they had more squared edges and some additional black trim not found on the original radios. Here is the SB-230 Linear Amplifier:

Heathkit SB-230 80-10 Meter Linear Amplifier
(K9DTC Photo)



SB-230 Interior – RF Compartment only.
Note the tube at the rear and the visible white colored interface between the tube anode and the heatsink, through the rear panel. Above the tube, on the heatsink, see the heat sensor used to reduce power if the heatsink became too hot.
(PE1GVK Photo)

The SB-230 used a similar circuit and power supply to the SB-200 and shared its physical size. The final amplifier tube was an Eimac 8873 triode that came in three forms. The 8873 used in the SB-230 was heat sink cooled. In operation, the SB-230 was eerily silent with no fan or any other noise. However, one difference between the SB-200 and the SB-230 was that the 572B (in the SB-200) was a directly heated cathode tube while the 8873 (in the SB-230) was an indirectly heated cathode tube. This changed the circuitry in the way RF was delivered. Both amplifiers were grounded-grid but the RF feed was different. If you have questions on this difference, please contact me.

For more of the detail on the SB-230 final amplifier tube series, the 8874 variant of the tube design series was axial cooled (like a 4CX250B), and the 8875 was transverse cooled (air blown sideways across the tube). The three tubes could dissipate 200, 400, and 300 watts respectively. Given that the similarly rated amplifiers using four 811A tubes could dissipate 260 watts; this 200-watt dissipation of the 8873 in the SB-230 was acceptable with a reasonable duty cycle.

The SB-230 had downside issues. One was the mounting of the tube against the heat sink used a very toxic ceramic compound that was extremely dangerous if broken or chipped in any way. This was unlikely but a bit scary at the same time. Also, the heat sink on the back of the amplifi-

er could become very, very hot and dangerous to touch. The SB-230 stayed on the market until 1978 when the SB-200 and SB-220 had to be upgraded to remove 10 meters. The SB-230 was not redesigned – likely due to limited market. The transceivers it matched, the SB-104 and the SB-104A, went on until 1982 – likely using the SB-201 or SB-221 as their matching linear amplifier.

As a collector of a lot of Heathkit equipment it is rare that I avoid one of their products. The SB-230 and its perhaps easy to mitigate foibles is one of those. I have always avoided opportunities to acquire one – most recently within the past two years. Also, the tube never reached critical marketing success and was discontinued after few manufacturers installed them in their products. Today, only "guaranteed, used" 8873 tubes for $395.00[4] seem to be available. The 8874 is also sold only as "guaranteed, used" at a cost of $425.00[4]. The 8874, installed as a pair, was used in a Henry Tempo linear amplifier with a rated input of 2,000 watts PEP SSB. The 8875 tube is completely unavailable and to my knowledge was not used in ham radio and perhaps nowhere else.

We have covered six of the eleven HF linear amplifiers made by Heathkit. Next installment will cover three more. One of them was a reincarnation of the SB-220/221, the second was just "kind of a Heathkit," and the third had a build volume of only ten units. Stay tuned!!

Special thanks go to Bob, W9DYQ for his proof reading. I appreciate that you read my articles. Remember that I am open to questions and comments at my email address, W9MXQ@TWC.com.

W9MXQ

Notes and References:

[1]Subject of a future article.
[2]Harbach Electronics https://harbachelectronics.com/
[3]King Conversions http://qroking.com/
[4]Surplus Sales of Nebraska http://www.surplussales.com
[5]As I write these articles, you will find that I often mention the KWM-2 separately, as if not a part of the Collins S-Line equipment. The KWM-2 is part of the Collins S-Line but nomenclature can be confusing.
[6]Not to be forgotten, and the subject of a future article, were the Heathkit HW-100 and HW-101 Transceivers – they were compatible with the amplifiers in this article.
[7]Hallicrafters had a varied concept on their tank circuits. Many or their radios were reliant on 50-ohm antenna or load impedance. However, later models had a more broad-range tank circuit.

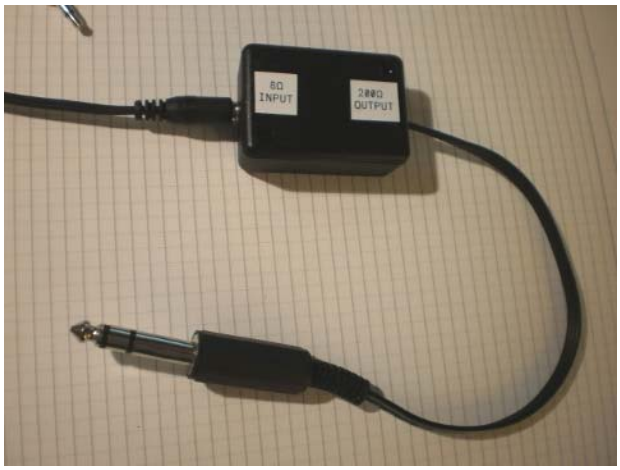
Project of the Month©

de Gary Drasch, K9DJT

As I often do, I was having lunch with my good friend Lyle, WE9R, at the Dockside Deli in Port Washington. We were talking about various radio clubs and our participation. I mentioned I was interested in writing another column for the Ozaukee Radio Club newsletter, but was struggling with the subject matter. He immediately responded saying, "The project of the month." I said, "Perfect!" As you can tell, there wasn't a whole lot of brainstorming involved. "The Project of the Month" was it! The following week, I hooked up with three characters from the Ozaukee Club for lunch at the Crave in Mequon. In the order of trouble, it was Tom, W9IPR; Bill, W9MXQ; and Rick, AB9XI. I brought up the idea of the *Project of the Month*, and everyone agreed I should do it. Hence, the first installment.

Heil Headphone Impedance Matching Box

I took this project on back in 2013. I built it to address a low volume problem using Heil headphones on an FT-2000. The headphone volume was low compared to using the speaker. Meaning I had to crank up the volume when using the headphones, and then getting blasted by the speaker when I pulled the headphone plug.



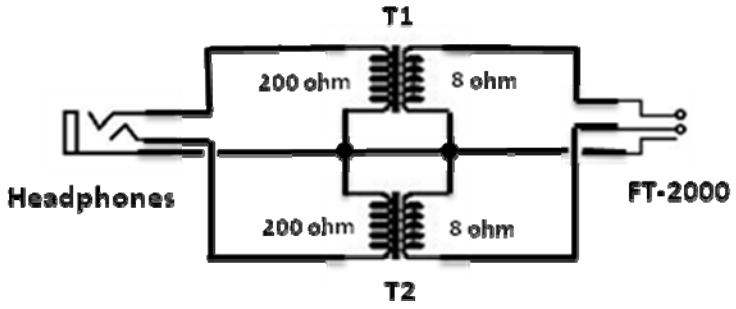
It turned out to be an impedance mismatch. The FT-2000 uses a LM4881 headphone amplifier chip which likes 8 ohm impedance. The following is the power output vs. impedance table of the LM4881:

8 ohms – 200 mW
16 ohms – 150 mW
32 ohms- 85 mW

I opened up the Heil headphones and found each speaker to have 200 ohm impedance (not 32 ohms). I didn't bother to calculate the power output for a 200 ohm match but believe it would be even lower.

The solution I came up with was to purchase a pair of audio transformers having a 200 ohm primary and an 8 ohm secondary (Mouser #42TL004-RC, $1.94 each). I was able to fit them into a small plastic box (Mouser #546-1551GBK) with a cable out to a ¼" stereo phone plug and a 1/8" stereo jack to accommodate the headphones. Because of the small space, I used a hot-

glue gun to mount the transformers and input jacks. The output cable is restrained using a cable tie.



The upshot of all this is that it WORKS! I can now plug in my headphones without having to turn up the volume—and there is much more power available if I need it.

- I placed a pdf file on the Yahoo FT-2000 Fox Tango Users Group in June of 2013.

I now run an Elecraft K3 at my home QTH and continue to use this device just because I know the headphones are properly matched to the radio.

My goal is to make this everyone's column. Share your projects with the club. You may write up your own description of what you did, or call me and explain the project and I'll write it up. Of course, pictures are must. Anything relating to ham radio is welcome. Have you built a kit, homebrewed an accessory, reconfigured your operating table, solved an RFI problem, or installed a new or additional antenna? Give me a call at 262-707-4279. I look forward to hearing from you.

73, Gary
K9DJT

UPCOMING EVENTS

Membership Meeting – January 9, 2019

Nominations are needed for the January officer elections. Be sure to pay your $15 dues and attend the January meeting and cast your vote.

Ken Boston would like anyone who is interested in serving on the board to contact him at 262-352-0658 or email him at kboston6@wi.rr.com.

Ken is particularly looking for a new 1st VP or 2nd VP, and maybe a new president (if I cannot manage to convince Pat W9JI to serve).

Thanks,
Ken B, W9GA

ORC Monthly Program

February 13th - Gary Drash K9DJT - Multimeter Safety

Volunteers Needed for Monthly Programs

The monthly program is the highlight of the Ozaukee Radio Club meeting. We are fortunate to have a number of very talented people in our club, many of whom have shared their knowledge through a presentation. Share your expertise and experience with the club. Programs can be on any topic that is ham radio related. Contact Pat Volkmann W9JI at w9ji@arrl.net to discuss your idea for a program.

Ozaukee Radio Club

December 12, 2018 Meeting Minutes

Ben Evans (K9UZ), Secretary

President Kevin Steers (K9VIN) called the meeting to order at 7:32 PM. All the attendees introduced themselves.

Announcements, Show-and-Tell, Bragging Rights:
Gary (N9UUR): Since getting his general class license recently, he has worked all states on HF.

Tom T. (KC9ONY): Mason Thill (KD9MBI) is a new ham.

Tom R. (W9IPR): Got his digital FT-8 working.

Pat (W9JI): Be aware that a new software update version 2.0 is out for FT-8. The new version is not backwards-compatible with the old one.

Fred (W9KEY): Bought a new amplifier and matching tuner.

Kevin (K9VIN): Announcement from Art Davidson (AC9CD) who was not at the meeting – There are upcoming FEMA ICS instruction courses to be given by Wisconsin ARES/RACES Southeast District for certification and credentialing for Wisconsin ARES/RACES. The instruction will take place at the New Berlin City Hall Common Council Chamber. The first course, ICS 700, will be on January 19, 2019 from 0900 to 1200. Meetings for three subsequent courses will take place over the following three months at the same times, the specific dates to be announced. Attendance limited to 40 students. Contact Art for further information.

Bill S. (W9MXQ) pointed out that you have to RSVP to be accepted into the class.

Program:
Scott Ruesch (W9JU) gave a presentation about the Salvation Army Team Emergency Radio Network (SATERN), which is a network of amateur radio operators who handle emergency communications traffic and generally support emergency services response. Scott is the SATERN coordinator for Wisconsin and Upper Michigan. He talked about what SATERN does and also spoke about SATERN's participation in the Patriot North simulated emergency response exercise held at Fort McCoy and Volk Field last summer.

50/50 Drawing:
Jay Bares (KB9JNJ) was the winner of the 50/50 drawing.

Auction:
Stan (WB9RQR) conducted the auction. Many items were sold, including a container of tubes, a power supply, an SWR/power meter, a Dell Inspiron 530 desktop computer with Linux Mint installed, and a Pyramid PA amplifier.

Officer Reports:
Kevin S. (K9VIN) President – Elections are next month. To vote, you need to be up to date on member dues.

Pat V. (W9JI), 1st VP – No report.

Tom T. (KC9ONY), Repeater VP – There's a minor issue with the 97 repeater. Something is sporadically keying up the repeater for six seconds. Will work through it. Documents were received from WAR, requesting verification of the information regarding the repeater. The notice contains an error which Tom and Nels (WA9JOB) will work to correct.

Ben E. (K9UZ), Secretary – The minutes from the November meeting were distributed by email to members. Motion to accept the minutes was made by Stan (WB9RQR), seconded by Bill S. (W9MXQ) and approved by the members.

Treasurer's Report – Treasurer Robert (K4WTH) could not attend the meeting. The profit and loss report for November was emailed to the members. A motion to accept the Treasurer's report was made by Stan (WB9RQR), seconded by Bill S. (W9MXQ) and passed by the members.

Committee Reports:
There were no committee reports.

Old Business:
Tom T. (KC9ONY): Suggested to Kristian (KC9TFP) to get the spring swapfest up on the ARRL website. Also need copies of the flyer to pass out at the Waukesha swapfest. The flyer is available for downloading from the ORC website.

New Business:
There was no new business.

Adjournment:
A motion to adjourn was made by Kristian (KC9TFP), seconded by Bill S. (W9MXQ) and approved by the members. The meeting was adjourned at 9:00 PM.

Attendance:
There were 37 members and three guests present at the meeting.

A copy of the attendance sheet is available upon request in PDF format. Please contact Ben Evans via email at ben@evansengsolutions.com for a copy.

Respectfully submitted,

B. Benjamin Evans, K9UZ
Secretary

ORC Meeting Agenda

January 9, 2019

I. 7:00 – 7:30 PM – Network & Rag Chew

II. Call to Order & Introductions

III. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.

IV. Officer Elections – Ken Boston (W9GA)

V. Fellowship Break

VI. 50/50 Drawing – Kristian Moberg (KC9TFP)

VII. Auction – Stan Kaplan (WB9RQR)

VIII. President's Update – Kevin Steers (K9VIN)

IX. 1st VP Report – Pat Volkmann (W9JR)

X. Repeater VP Report – Tom Trethewey, (KC9ONY)

XI. Secretary's Report – Ben Evans (K9UZ)

XII. Treasurer's Report – Robert Escola (K4WTH)

XIII. Committee Reports

- A. Spring Swapfest
- B. Other

XIV. OLD BUSINESS

- A. Field Day Tent

XV. NEW BUSINESS

XVI. Adjournment to ?

Return undeliverable copies to

The ORC Newsletter
465 Beechwood Drive
Cedarburg WI* 53012

First Class

Next ORC Meeting:

Grafton Multipurpose Senior Center

1665 7th Avenue, Grafton, WI
Wednesday, Jan. 9th, 2019

7:00 PM – Doors Open

7:30 PM – Meeting Begins

The ORC Newsletter

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Web site: www.ozaukeeradioclub.org **Facebook: facebook.com/orcwi**

Volume XXXI	February, 2019	Number 2

From the President

de Kevin Steers (K9VIN)

From the Prez,

Happy February. Well, I finally replaced the cheezy rg-58 cabling in my car with high quality RG-8, and, boy, what a difference it made with the noise level for my HF mobiling. I bought a stepped drill bit and a rubber grommet to get the cabling out through my spare-tire bay. When I opened up the trunk and looked in my spare-tire bay, there was already a rubber grommet/plug exactly where I needed it. Apparently the first battery (located in the trunk) that came with the car had a breather tube, and is no longer used. Apparently, the shield on the new RG-8 is a heck of a lot better than what it replaced!

Now my nagging problem is with noise when accelerating. When I am cruising at any constant speed, all is quiet, but when I put my foot into it, a noise drowns out any receive until the car comes up to speed, and then all is quiet again. Who has a suggestion?

To make everything perfect for my manually-adjustable loading coil from Wolf River Coils, I used my antenna analyzer to adjust the taps for the lowest SWR in the middle of the bands. I could not get the SWR down below Infinity, and then realized the darned hatchback was open and screwing up the antenna big-time. Rookie mistake, I know. Imagine my surprise when I had it all tuned on 20M, 40M, and 80M, according to my analyzer, but when flying down the highway, my FT-450 would NOT tune, no matter what I did. I even went to each end of the band just to be sure it was not just a minor adjustment. NADA. Apparently, when I adjusted the taps, my car was a wee bit too close to the aluminum gutters, etc, on my house.

I am getting so darned smart after troubleshooting all the problems I make for myself. I love this hobby nonetheless.

Cheers and 73,
K9VIN
Kevin

DX'ing & Contesting

De Gary Sutcliffe (W9XT)

Did you survive the nasty weather to end January? How many of you did antenna work during it? It is a known fact that antennas put up in bad weather outperform those done in nice weather. Well, not really but a lot of hams say so.

Skipping the usual format of focusing on the current month, I'm going to focus on a contest that happens next month. That is the Wisconsin QSO Party which is Sunday, March 10. Years ago, Bob, W9LO (SK), was the one who rallied the troops for a big ORC turnout. In more recent years, few members operated and turned in scores for the club. I am as guilty as any, with a conflict that Sunday.

Last year the contest fell on a different day, and I was able to put in a part-time effort. About that time, a discussion with Gary, K9DJT, and Bill, W9MXQ, led to the decision to try to get a big effort out for the 2019 running of the WiQP. I am focusing on it here because it occurs before our March meeting, and the newsletter will probably come out only a couple of days earlier than the contest. I want to give you time to mark it off on the calendar and get ready.

State QSO parties are special because everyone is looking for you. In other contests, you are just another Wisconsin contact, nothing exciting like Wyoming or Vermont. Other stations will be seeking you out. It can be a lot of fun to have several other stations calling you.

WiQP starts at 1800 UTC on Sunday, March 10. That is 1:00 PM CDT. Yes, CDT. It seems kind of early to be talking about Daylight Saving Time, but we switch over earlier Sunday morning. Make sure you change your clocks before going to bed Saturday night. The contest runs for seven hours, ending at 8:00 PM.

There are many categories in WiQP, including single op fixed, multi-op fixed and various mobile categories. I am assuming that most of us will be fixed. Those who have mobile stations might want to hit the road and operate from a number of counties. This is a VHF friendly contest, and you can make contacts using simplex VHF. You can get additional bonus points for operating from multiple counties.

In this short contest, you want to make as many contacts and get as many multipliers as possible. Of course, that is true of any contest, but a large number of potential multipliers and the short period change strategy a bit. For Wisconsin operators, you get a multiplier for working each state county (72 maximum). US states are also multipliers, with 50 maximum. Yes, 50. Don't forget to include WI as a multiplier. Finally, there are the Canadian provinces for another possible 13. Theoretically, you can get 135 multipliers, but top scoring stations usually get a bit over 100.

The modes are phone and CW/digital. Phone contacts are worth 1 point, and CW and digital contacts are worth 2 points. You can work a station once per band on phone and once on CW or digital. You can't contact the same station on CW and digital on the same band. Because of

the point difference, it makes sense to make CW contacts, but not to the exclusion of phone contacts. I don't know how many stations will be on digital modes. FT8 is not set up to give the proper exchange. RTTY may be your best option if you feel more comfortable with digital.

The exchange is your county. A signal report is optional. Other WI stations will send their county. Other US stations will send their state and Canadian stations their province. If you get a DX station calling, just enter DX. There are specific abbreviations for the counties and other multipliers. The West Allis Club, the sponsor, has a page on their web site with the abbreviations. All states and provinces have two letter abbreviations. All WI counties are three letters. Make sure you review them in advance. You don't want to mix up similarly spelled counties like Washington and Washburn, or Waukesha and Waupaca.

On HF, most of your contacts will be on 40 and 80 meters. Skip gets long early, so be sure to try to be on earlier in the day if you can't operate the whole contest. You will want to spend some time on 20 meters to work some of the further-out states for the multipliers.

Many of our out-of-state contacts, especially on phone, will not be in the contest but will work you to help you out. Call CQ something like this: "CQ CQ for the Wisconsin QSO Party, any call will be appreciated, this is W9XT, W9XT for the Wisconsin QSO party." The call is always given phonetically.

When you work someone out of the state and probably not in the contest, thank them and make a big deal if it is a new state. "Wow! Thanks for Utah! That is a new multiplier!" You will have an audience listening, trying to decide if they will give you a call. You want to be friendly and let them hope they will be a hero by giving you a new state. Some will want to rag chew. If they give their name, give yours then politely say other stations are calling and you want to work them before the contest ends.

Some of the state counties are tough. There might not be any on from some of the rarer ones. Or, they might be briefly visited by a mobile station. You can work mobiles again when they move to another county. You can identify them because they will identify themselves as portable. For example, K9DJT might sign K9DJT/WIN from Winnebago country, and later K9DJT/FON from Fond du Lac.

It is useful to keep track of the mobiles and get them in as many counties as possible. The way the rules work, they are encouraged to hit as many counties as possible. If they make 12 QSOs in a county, they get 500 bonus points. So, it makes sense for them to spend as little time as possible there once the first dozen are in the log. Serious mobiles spend a lot of time planning their routes to maximize the number of counties they visit.

One thing works against the fixed stations. The mobile stations often start at further away rare counties and finish up close to home at the end. So, many of the rarer ones will be only activated at the start. Often they will start on 20 meters. That band will be open, and mobile antennas are much more effective there than on 40 or 80. There are plenty of stations in other parts of the country who want to work them for the contest or possibly to pick up some new counties for the award. We will miss many of them for that reason as their signals skip over our heads. Later when 20 gets long or closes they will move down and give us a shot for their remaining counties.

I mentioned that CW contacts are worth twice as much as phone. Even if you are a hotshot CW op who forgot where the microphone is, spend some of the time on SSB, especially 75 meters. There will be some guys who are the only one on from their county, and they will only operate phone. You will miss a lot of county multipliers by only operating CW. You will probably also have better luck getting some states on phone since it is hard to beg on CW.

As a general rule, I try to jump around between bands and modes whenever the rate drops. I don't stay on 20 meters more than about 20 minutes at a time because I want to check the lower bands for mobiles in new counties.

The WiQP is an opportunity for every member to get on and make some contacts. Even if you only have a 2M FM rig, set it on one of the recommended simplex frequencies. Give out a call every once in a while. Work other ORC members. Mobiles might be passing through your area and put out a call. Work them. The full rules are at HTTP://www.warac.org/wqp/wiqp_rules.htm. The upper right hand corner of the page has links to the multiplier lists and other related info. Can we count on you to make a few QSOs to put the ORC on the WiQP map again?

The big contest for February is the ARRL DX CW contest. This is the second biggest CW DX contest for us. CQWW is bigger, mostly because DX stations can work each other in CQWW. The advantage of the ARRL contest is that the rest of the world will be looking for us, rather than looking for new countries to pad their own DXCC awards. The CW event is February 16-17 (UTC). The Phone weekend is March 2-3, which will be before the next newsletter, so I will cover both here. They start at 0000UTC, on the respective Saturdays, which is 6:00 PM local on Friday night. They last 48 hours.

We will work only DX stations. Hawaii and Alaska count as DX. Canada does not count as DX for this contest, so don't work any VE stations. Send a signal report and our state. Remember, many DX operators may not be real familiar with our states, so on phone I usually say "Five Nine Whiskey Italy." I don't say Whiskey India which is the normal phonetic because sometimes they start thinking I am in Indiana. Of course, on CW you are sending letters anyway, so that is not a problem. DX stations will send a signal report and their power. You can work stations once per band. Each QSO is worth three points, and you multiply it by the total number of band country multipliers you work.

There are many different classes. Single op can go high power, low power, and QRP. Single op does not permit spotting assistance. There is an unlimited single op category, and you can use spotting assistance with the same power categories. You can also operate a single band, but there are no power sub-categories, and spotting assistance is not permitted. Full rules are available at http://www.arrl.org/arrl-dx.

The CQWW 160 Meter phone contest is February 22-24. It starts at 2200Z Friday which is 4:00 PM local on Friday afternoon. The CW version was covered last month. The rules are the same for phone, so I won't bother repeating them. Rules at https://www.cq160.com/rules.htm

The same weekend also sees the North American QSO Party, RTTY version. It starts at noon on February 23 and runs 12 hours, but you can only operate 10 hours, 100 watts. The phone and CW versions were covered last month, so no point in repeating it here. Rules are at http://ncjweb.com/NAQP-Rules.pdf

With the ARRL DX contest this month, you can expect a lot of contest DXpeditions, mostly to the Caribbean. There are a couple of interesting big DXpeditions this month. The most interesting one is to Macao, XX9D. A group of German ops will be there February 11-26. They will be on 160-6 meters, SSB, CW, FT8, and RTTY. This is a tough path for us even in the best of times. They will put a special emphasis on 160-40M for North America. Our best shot will probably be on 40. Long path in the afternoon might be possible. The call is XX9D.

Another group of Germans is heading to Central Kiribati in the Pacific. Look for T31EU February 16- March 5. 160–10M, SSB, CW, RTTY, and some FT8.

Bhutan will be on the air as A5A by a small international group from February 27- March 5. 160-10M, CW, SSB, and FT8. A special focus will be on 160M FT8.

As usual, there are a lot of single op efforts this month. Many of these are on a time available during vacations, work trips, etc. Normally I don't mention too much about them since for the most part you just have to be lucky enough to be on at the right time. One stands out for something different. JI5RPT will be on from Ogasawara as JD1BLY February 15-17. What makes this one different? He will be operating 630 Meter JT9. This is the first DXpedition I am aware of that is including the new band.

Speaking of 630, I have left my 630M WSPR beacon running some more nights. I have been heard as far out as Hawaii so far. I have been off the air the last few days. The thaw changed the antenna tuning a few KHz down. That would not be a big deal on other bands, but here it can move the SWR from about 1.5 to 4:1. I could go out and retune, but I want to see if it comes back when the cold weather returns.

That wraps up February. Don't forget to mark your calendar for March 10 and the WIQP.

EQUIPMENT REPAIR CORNER

ICOM IC-756PROIII Repair Adventure

de Chuck Curran (W9KR)

On January 24th, FEDEX delivered a newly acquired ICOM IC-756PROIII Transceiver. The seller on eBay stated it was 100% functional, and the pictures showed a scratch and dent free radio that would be double boxed on shipping, using the original factory shipping box as the inner container. Sounded and looked good, so I bought it.

Upon its arrival, it proved to be an extremely clean and a well maintained radio. I was very pleased. I took it down to my station and hooked it up for testing. Everything thing seemed to be working, tried as many knobs as I could, notch filter and passband tuning were working fine, and SSB & CW were both working just fine also. Made several contacts, used it to drive my linear to the full 1500 watt output, but that only requires 35 watts input.

ICOM IC 756PROIII Transceiver

I then happened to check my SWR, and noticed I only had about 70 watts output when barefoot. Checked all the bands using my dummy load, seeing power varied from 52 watts on 10 meters to around 70 on 160 meters. I ordered a service manual, but then decided to also look for ICOM service centers. I called ICOM, only to find out they no longer service the 756PROIII, um, not good. I didn't really have the mindset to want to dig into this radio myself, so I then Googled ICOM service, eventually finding www.amateurradioservice.com, located in Tucker, GA. Paul Hansen is the owner, and in reading his website history page, it turned out his specialty area is ICOM radios. He ran the ICOM southeast service center for 10 years. So, I emailed Paul, telling him about the low power output.

Paul emailed back within an hour and listed some suggestions and ideas. His big point was since I was getting power out, the PA board was good. He suggested that I verify what DC voltage I had on the PA board under full power out. I opened up the radio and connected my Fluke

multi-meter to the PA amp board's power studs, which were supposed to show 13.8 VDC under load. Turned on the radio and pressed down the key and got 70 watts output, and showed 10.9 VDC on the power connection to the PA amp circuit board. Paul shared with me that anytime you have less than 12.5 VDC at that test point, you also have low power output. Now Paul seemed very interested. I told him to please keep track of his time and I would pay him at his regular shop rate.

Paul suggested checking the voltage at various points along the ICOM power cord, which ran from my Astron power supply to the back of the ICOM radio. I found that the power cord had a significant voltage drop. Worst voltage drop was from before to after the two fuse holders, one fuse in each of the positive and ground leads. Took that power cable off and took a look, found the fuse connectors were crimped and no solder present. I solder all four connections, cleaned and tightened connections in the six prong plug on the back side of the radio, put the radio back under power, and now DC voltage under load was 12.52 to 12.68 VDC on different bands. All of this was done with the Astron power supply set at 13.8 VDC, and power output was now 88 watts to 97 watts on different bands. Getting Closer!! I still had a voltage drop in the power cable, but I had eliminated about 2.6 VDC of drop.

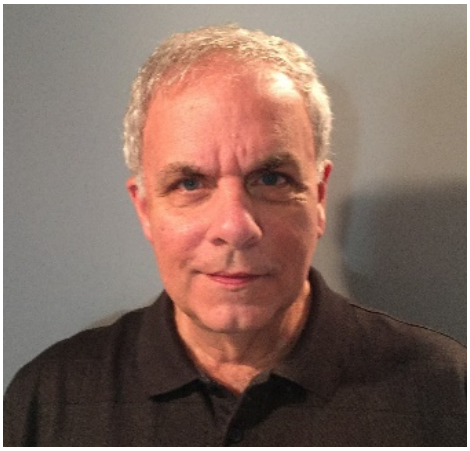
The radio is rated at 13.8 VDC +/- 15%. The high limit works out to 15.87 VDC. I raised the Astron power supply to 14.6 VDC, so the rig wouldn't be so close to that 12.5 VDC threshold for bad transmitter output. The catch is that even after raising the Astron output voltage, I still had only 88 to 97 watts output, when I should have had 105 watts, per the radio's specification sheet.

Digging through the pages in the service manual, I found the adjustments for the drive level setting. It applied to all bands. I changed that, going up just a tweak, and achieved 101 to 111 watts output, again depending on the band measured.

Very happy and grateful to Paul Hansen in Tucker, GA. Asked him again, "What do I owe you?" Paul just ignored my question and simply sent his congratulations!

Vintage Amateur Radio

de Bill Shadid, W9MXQ



Heathkit quite successfully developed and marketed the mostly successful SB-200 Series, the SB-220 Series, the SB-230, and the HA-14 Linear Amplifiers. To this day, ham shacks around the world include these amplifiers – especially the most successful SB-200 and SB-220 models. I wonder: If the last versions of those amplifiers, the SB-201 and SB-221, were built today, would they be successful products? I think they would be. Products like the Ameritron AL-811H and the Ameritron AL-82 show that much of the same circuitry is sellable today.

Not resting on their laurels at the time, however, Heathkit moved onward in their market with effective replacements.

In this installment we will talk about three more Heathkit linear amplifiers. Two are the last Heathkit HF linear amplifier products made in full production. One of those two was perhaps a pretender and not a Heathkit at all. The third model had a production run of only ten units!

When the SB-221 was discontinued in 1983, Heathkit immediately introduced a nearly identical (in circuitry) HL-2200. Like the SB-221, the HL-2200 had a pair of Eimac 3-500z Triodes in its circuitry. It had a tuned input to satisfy 50-ohm impedance exciters and worked on the 80 through 15-meter bands as delivered[4].

Heathkit HL-2200 80-15 Meter Linear Amplifier

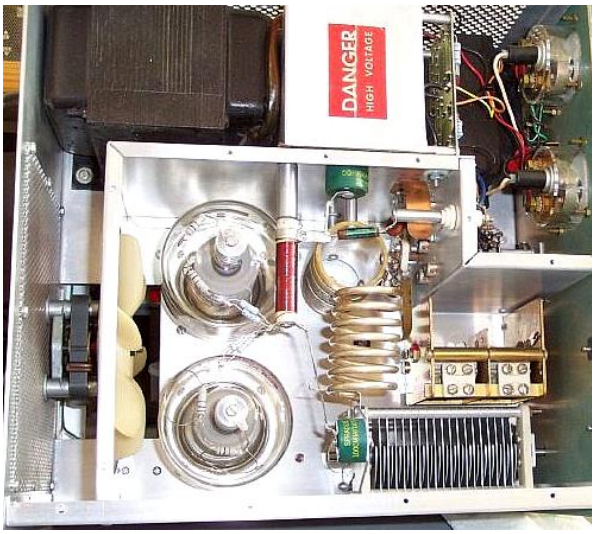
(Heathkit Photo)

Interior views of the SB-221 and HL-2200 were nearly identical. And why not? Heathkit had a worthy competitor in the SB-220 and SB-221. The only reason to repackage the amplifier was to meet styling changes – note more squared corners – and to change the colors to meet new design concepts by the Heathkit HF Transceivers of the day. The HL-2200 looked nice next to the new SS-9000[1] and HW-5400[1], the company moved from green-on-green to more of a brown-tone and bronze color tone.

The HL-2200 had an input power of 2,000 watts PEP on SSB and an input power of 1,000 watts on CW. The radio had an output level of about 1,200 to 1,300 watts on SSB and about 600 watts on CW when set to the CW Mode. When set to SSB Mode, but running CW, with today's maximum legal power, this amplifier, like the SB-220 and SB-221, can put out over 1,200 watts on CW.

Alas, the HL-2200 was not a commercial success. As Chuck Penson, WA7ZZE, relates in his popular book on Heathkit amateur radio history[2], hams seemed to feel it was a rip-off [presumably of their own SB-220/221].

For the sake of the idea that the SB-220/221 and the HL-2200 were nearly identical where it counts, look at these interior pictures:



Heathkit SB-220 Linear Amplifier

(W9MXQ Photo)

Heathkit HL-2200 Linear Amplifier

(Heathkit Photo)

Note what appear to be higher quality variable capacitors in the TUNE and LOAD positions of the later HL-2200 Linear Amplifier. (Left picture is of an SB-220.)

Acceptance by ham operators at the time notwithstanding, if looking for a Heathkit 2,000-watt amplifier from the era (early to mid-1980's) the later HL-2200 would be a good buy. It suffers from less popularity than the SB-220/221 but has the same very good design. That may translate into less money to purchase. While I like the green color scheme of the earlier linear amplifiers, some hams do not. So, the HL-2200 provides good performance with colors more closely matching modern radios. To each his/her own!

Heathkit's last entry in HF Linear Amplifiers was not really a Heathkit at all. At least not in terms of design and in very little in terms of appearance. The SB-1000 Linear Amplifier was a kit version of the by then very popular Ameritron AL-80A Linear Amplifier. Note the return, by Heathkit's marketing, to the long popular "SB" prefix in the model number – with the "1000" no doubt relating to the advertised power output of the single 3-500z Triode tube. The SB-1000 had a lot going for it. For the first time, Heathkit has a linear amplifier designed to not only work on 160 meters but also the new WARC bands at 17 and 12 meters. 12 and 10 meters were not standard with the SB-1000 but could easily be enabled by a licensed amateur operator with components already inside the radio. Instructions were supplied to the user by Heathkit in return for sending in a copy of their amateur radio license.

The HL-2200 front panel added a switch marked AMPLIFIER OUT / IN. The 3-500z tubes in the SB-220/221 and the 572B tubes in the SB-200/201 were essentially “instant on” and required little warmup time. I imagine Heathkit felt the extra switch was unnecessary. I think it was a worthwhile addition – especially with the 3-500z.

The SB-1000 was introduced by Heathkit in 1987, some three years after production of the HL-2200 had stopped. The SB-1000 had a good market life of six years and to this day is relatively common on the used market. With its parts in common with the still popular Ameritron AL-80, AL-80A, and AL-80B, there is little problem with getting replacement parts. MFJ Enterprises, the parent company of Ameritron, openly sells every part of every product it makes. Here is a picture of the Heathkit SB-1000 next to the Ameritron AL-80A:

Ameritron AL-80A Linear Amplifier

(Ameritron Photo)

Heathkit SB-1000 Linear Amplifier

(Heathkit Photo)

So much for the Heathkit that really was not a Heathkit – except to say that while the fact is Heathkit did not design this radio, they did design the concept of making this product a kit. They supplied their time-proven assembly, alignment, and troubleshooting to the successful kit. So, many of the traits of a Heathkit were present. I prefer the Heathkit version of this amplifier as to its appearance. But that is just one man’s opinion!

One more linear amplifier needs to be in this sequence. It came about late in the production of the SB-220 (not the SB-221) that was outlined in last month’s installment. Let’s look at the Heathkit SB-240 – vintage about 1975:

Heathkit SB-240 HF Linear Amplifier
Brown/Beige/Black Prototype

Heathkit SB-240 HF Linear Amplifier
Green/Beige/Black Prototype

Different Color Schemes were Considered – at the time no radios used what was to become the Brown/Beige/Black colors. Apparently change was in the air!

(KC8IV Photo) **(Heathkit Photo[3])**

The SB-240 has a footprint essentially the same as the SB-220. Heathkit, like they later did with the HL-2200, essentially repackaged the SB-220 with a different look. The green base-color and design apparently was to match the SB-104/SB-104A[1] Transceiver of the time. The green color of the SB-220 matched the SB-104 series but details of style were different, as you can see. All RF specifications of the SB-240 matched those of the SB-220 – including the presence of 10 meters.

The SB-240, for reasons unknown to us today, did not go into production. It appears that ten of the units were built, according to KC8IV[3], former Heathkit employee, in an advertisement to sell his SB-240 prototype many years ago. Three of these amplifiers of the original ten are thought to still exist.

I have one additional note on the SB-240. The green version shown is questionable. I have little data that it existed as a prototype and could be a unit cobbled from a SB-220 panel. But that could as well have been done by Heathkit in making the prototype. Suffice it to say this prototype existed and several still do in perhaps one or two colors.

Between this installment and the one last month, we have covered nine of the eleven HF linear amplifiers made by Heathkit. The next installment will cover two more. In fact, those two were the first two. They were made in a time of big radios – like the Heathkit Apache[1,] the Marauder[1] Transmitters and the Mohawk[1] Receiver. Do you remember those boat anchors? All have lived at one time or another at W9MXQ.

Special thanks go to Bob W9DYQ for his proofreading. I appreciate that you read my articles. Remember that I am open to questions and comments at my email address, W9MXQ@TWC.com.

W9MXQ

Notes and References:

[1] Subject of a future article.

[2] Chuck Penson, WA7ZZE, “Heathkit, A Guide to Amateur Radio Products” Electric Radio Press, © 1995.

[3] It is difficult to determine the ownership of this photo. It may well be tied to KC8IV or Heathkit™. At the time the SB-240 was being contemplated, Heathkit was still using the Heathkit Green color scheme.

[4] Like the SB-201 and SB-221, Heathkit provided a 10-meter add-on kit. Also like its predecessors, buyers of the 10-meter add-on kit for the HL-2200 had to provide proof of their amateur radio license. Unlike some of the other manufacturers, there were parts that needed to be added – not just activated in the existing product – in order to enable 10-meters. These parts are extremely difficult to duplicate today. So, if you purchase an SB-201, SB-221, or HL-2200 and need 10-meters, be sure that it has already been added.

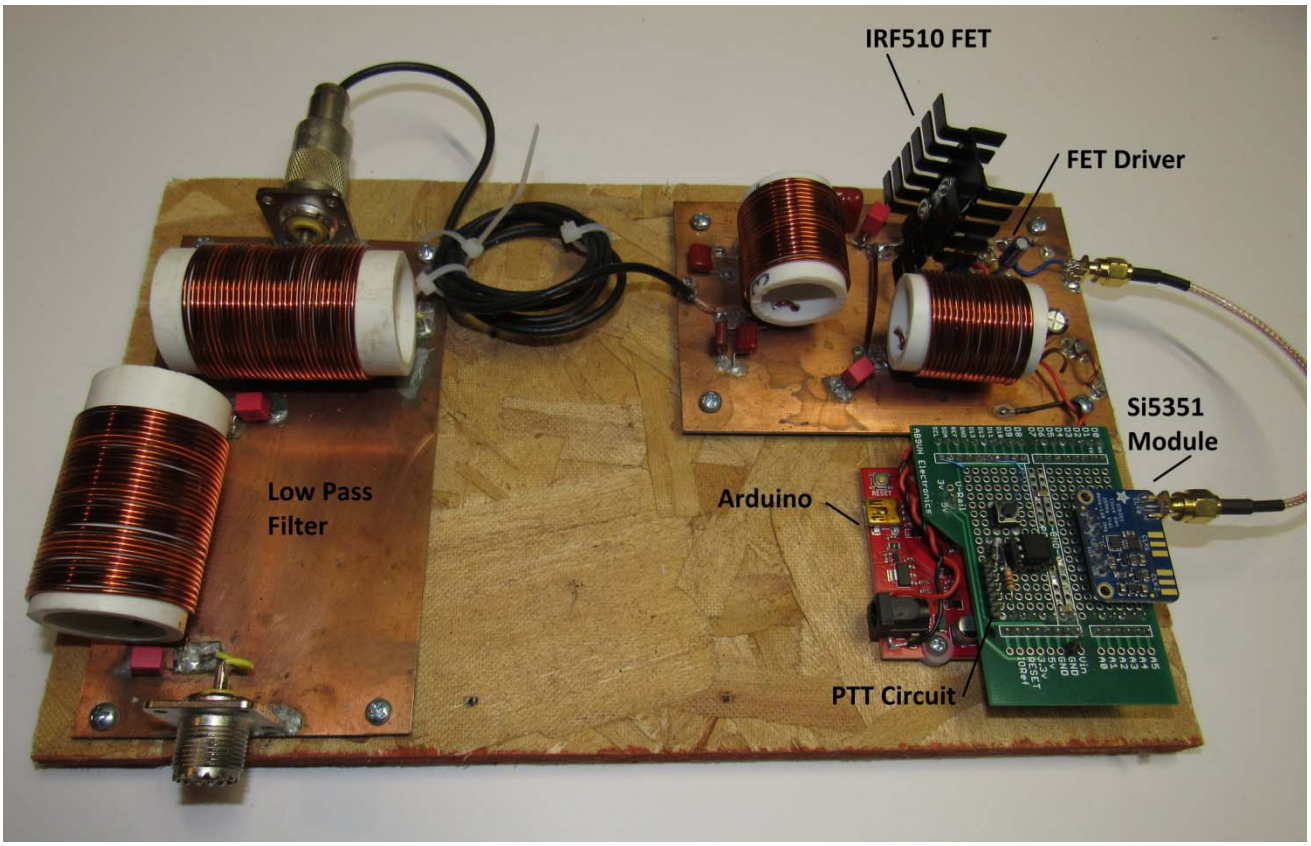
Project of the Month©

de Gary Drasch, K9DJT

This month's project comes to us via Gary Sutcliffe, W9XT. He mentioned it in his DXing & Contesting column last month while talking about the WSJT-X suite of weak signal modes. In particular, it is the WSPR (pronounced "whisper") mode which he uses with this hardware project.

The project is a low power home-brew 630 meter beacon transmitter. The frequency of 472-479 KHz is below our AM broadcast band! We hams haven't had access to this band since the Spark-Gap days. That changed in 2017 when the FCC released it and opened the doors to us for new experimentation. It has heightened our ability to nourish our roots of this great hobby.

630-Meter Transmitter



The core of this 12-Watt transmitter is an Arduino Uno clone micro-controller board driving an Adafruit Si5351 frequency synthesizer chip/module at a cost of about $8. It can generate frequencies between 8 KHz and 160 MHz. The chip is a very small surface-mount chip that would be hard to wire by hand, and the module has the oscillator, voltage regulator, I2C level shifters all on one board. It just made sense to use it to save time. The Arduino uses I2C to tell

the Si5351 what frequency to generate. It generates the different frequencies to meet the WSPR protocol. The output of the Si5351 goes to an FET driver that drives the IRF510 general purpose output FET running class D. The FET is meant for switching things like lamps, motors, etc. It is not a linear amplifier. The way it is used in this design is more like a switching power supply than an amplifier. It is basically either on or off. This generates a lot of harmonics that need to be filtered out by the matching network on the FET board and the low pass filter. Most of the similar designs on the internet drove the FET with CMOS logic chips. The key to efficiency and reliability with switched FETs at high frequency is a solid gate drive. I felt the gate drive circuitry on most of the published designs were a bit soft. I bought a tube of the IRF510s figuring I would blow up a lot of them while getting the circuit going. I'm still using the first one! Not bad for a $1 output final transistor!

From the output, we go to the remaining inductors and capacitors to transform the FET output to 50 ohms and filter out the harmonics. I designed this low pass 5 pole filter with the Elsie filter program. It reduces the harmonics to better than the -43 dBc FCC-required spec.

The Arduino software was found on Github and written by WT7S. I made some changes. The original software only covered the HF bands so I had to make changes to the Si5351 so that it would operate at 475 KHz. The original version used a GPS module to control transmit timing. I changed it to accept an external signal from a PC running WSJT. The PTT circuit uses an opto-isolator to level shift the RS-232 RTS line down to 5V. I use a USB serial cable to the PC to control the timing. The WSPR program generates tones and uses the PTT line to control the SSB transmitter. My design ignores the PC generated tones. The RTS just tells the Arduino to transmit.

As of today it has been picked up by over 90 stations in 32 states and 4 DXCC countries. The furthest station to receive it is Hawaii.

Who's next? Share your projects with the club. You may write up your own description of what you did, or call me and explain the project and I'll write it up. Of course, pictures are must. Anything relating to ham radio is welcome. Have you built a kit, home brewed an accessory, reconfigured your operating table, solved an RFI problem, or installed a new or additional antenna? Give me a call at 262-707-4279. I look forward to hearing from you.

73, Gary
W9XT

ARRL Safety Code

de Patrick Volkmann, W9JI

Since our program this month is about safety when making measurements, I thought it would be interesting to take a look at some of the origins of the safety practices that we use today.

In the 1930's, safety was not much of a priority for most hams--other than common sense precautions like "don't touch a live circuit." That started to change with the death of Ross Hull, VK3JU, on September 13, 1938. Hull was a well-known ham who had moved from Australia to work at the ARRL Headquarters in Newington, Connecticut. At the time of his death, Hull was the editor of the Radio Amateur's Handbook and a QST editor. He was known for his many significant technical innovations including pioneering work on VHF propagation and equipment design. He was an early and vocal advocate of safety practices for amateurs. Ironically, his death came about through accidental contact with a 6,000 volt plate supply for an experimental television receiver he was working on.

Within six months of Hull's death, George Grammer, W1DF, wrote an article for QST magazine reflecting on the death of Hull and introduced the ARRL Safety Code. Entitled "Safety Technique in Transmitter Operation and Construction" (QST, March 1939), Grammer laid out seven points for personal safety and eighteen points for safer transmitter designs. The article acknowledges that hams were not likely to adopt the described practices "when, after all, *he's* not going to be guilty of carelessness in handling dangerous voltages."

Typical construction practices of the late 1930's featured an open design with exposed components. Ross Hull was, by the way, an advocate of metal chassis construction and the use of a front panel as part of safer transmitter design. The transmitter shown in Figures 1 and 2 is a reproduction of a design shown in the 1936 edition of the Radio Amateur's Handbook, edited by Hull.

The transmitter is a "Tri-Tet" oscillator and uses a single tube as a 50 watt, crystal controlled transmitter. The plate voltage could run as high as 1000 volts DC. Construction is of the "vertical open-frame type". The Handbook describes the transmitter as suitable for use on 80, 40 and 20 meters. Band changing is done by moving the tap on the coil in both the cathode and plate circuit. The transmitter layout and construction is very similar to the one shown in the 1936 Handbook photos.

Figure 1 - Front view of transmitter

This design uses series feed for the plate circuit. Series feed is characterized by the plate voltage being applied directly to the plate circuit, causing the tank coil and capacitor to be at the B+ voltage. Modern designs use parallel feed, where the B+ is fed through an RF choke to the tube plate and blocked from the tank circuit with a high voltage coupling capacitor.

There are several obvious safety hazards present in this transmitter. The open construction makes it easy to accidentally touch the high voltage circuits. Band-changing requires reaching into the rig and manually changing the tap on the cathode coil. The plate coil tap is changed with a switch relieving the operator from reaching directly into the high voltage circuit. The plate tuning capacitor shaft, along with the frame and plates, are at the B+ potential. I can assure you from personal experience that touching the set screw that holds the tuning knob onto the shaft can result in a nasty shock.

Figure 2 - Rear view of transmitter

The most significant safety issue is that exposed components are at a very high potential due to the use of series fed plate voltage. The Safety Code addresses parallel and series feed, among many other issues. The article says that parallel feed is recommended for circuits in which coils must be changed manually. Series feed should only be used when the antenna is inductively coupled to prevent the high voltage from getting on the antenna (yikes!). Both the Handbook and QST would continue to feature series feed plate designs and breadboard transmitters for beginners until the early 1950's, almost 15 years after the introduction of the Safety Code.

In the June 1953 issue of QST, Don Mix, W1TS, revisited the ARRL Safety Code. Entitled "How to Live Longer" the article amplifies the points of the earlier version of the code with some circuit diagrams and additional text describing safety practices. Mix points out that the requirement to reduce television interference has resulted in the use of shielded enclosures which "has made ham rigs vastly safer to operate and work around". The ARRL subsequently released the ARRL Safety Code as a legal sized poster, publication CD-84, "available to you upon request, by card or radiogram, to the Communications Department".

The poster and the 1953 article are both illustrated with cartoons by Phillip "Gil" Gildersleeves, W1CJD. Gil created more than 1500 illustrations for QST over a 40 year period. You may remember seeing Jeeves cartoons in the *How's DX* column or the *Podunk Hollow Radio Club Field Day* covers on QST. These cartoons added some visual appeal and a bit of humor to an otherwise dry list of safety practices.

Safety practices have certainly changed for the better since 1938. If Ross Hull's 6,000 volt power supply was built anything like the transmitter in the photos, we can see how he might have inadvertently gotten into trouble. In the years following 1953, safety became a much more prominent and important subject in amateur radio literature. Equipment designs changed too, with transmitters moving to parallel feed tank circuits and fully enclosed chassis. Safety information and education is now readily available. The 2019 version of the Radio Amateur's Handbook, for example, has an entire chapter devoted to safety.

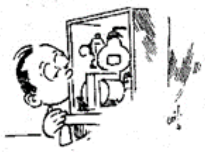
A copy of ARRL Safety Code CD-84 (Rev. 7/53) is reproduced here, courtesy of ARRL.

A.R.R.L. SAFETY CODE

SAFETY RULES FOR: THE AMATEUR RADIO OPERATOR

1. KILL ALL POWER CIRCUITS COMPLETELY BEFORE TOUCHING ANYTHING BEHIND THE PANEL OR INSIDE THE CHASSIS OR ENCLOSURE.

2. Never allow anyone else to switch the power on and off for you while you are working on equipment.



3. Don't shoot trouble in a transmitter when tired or sleepy.

   Mental or physical fatigue may be accompanied by a certain amount of absentmindedness. Wait until you're fully alert before changing plug-in coils or start working on equipment.

4. Never adjust variable links by hand.

   Use special care when checking energized tank circuits with absorption-type wavemeters.

5. Avoid bodily contact with grounded metal (racks, radiators) or damp floors while working on the transmitter.

6. Never wear 'phones while working on gear.

7. Follow the rule of keeping one hand in your pocket.

8. Never pull test arcs from transmitter tank circuits.

9. Instruct members of your household HOW to turn the power off, and HOW to apply artificial respiration.

   Instruction sheets on the latest approved method of resuscitation can be obtained from your local Red Cross office.

10. Develop your own safety technique. TAKE TIME TO BE CAREFUL. DEATH IS PERMANENT.

SAFETY RULES FOR EQUIPMENT DESIGN AND CONSTRUCTION

ONE DISCONNECT SWITCH: A single plainly-labeled main switch should be provided to cut off all power from the equipment.

POWER SUPPLIES: All power supplies should be so enclosed or constructed that accidental bodily contact with power circuits is impossible.

All negative plate-supply and positive bias-supply terminals should be connected to the chassis and the chassis connected to a water pipe or other good ground connection.

Every power supply should use a conservatively-rated bleeder resistor. If it is placed on top of the chassis for ventilation, cover it with screening or perforated metal.

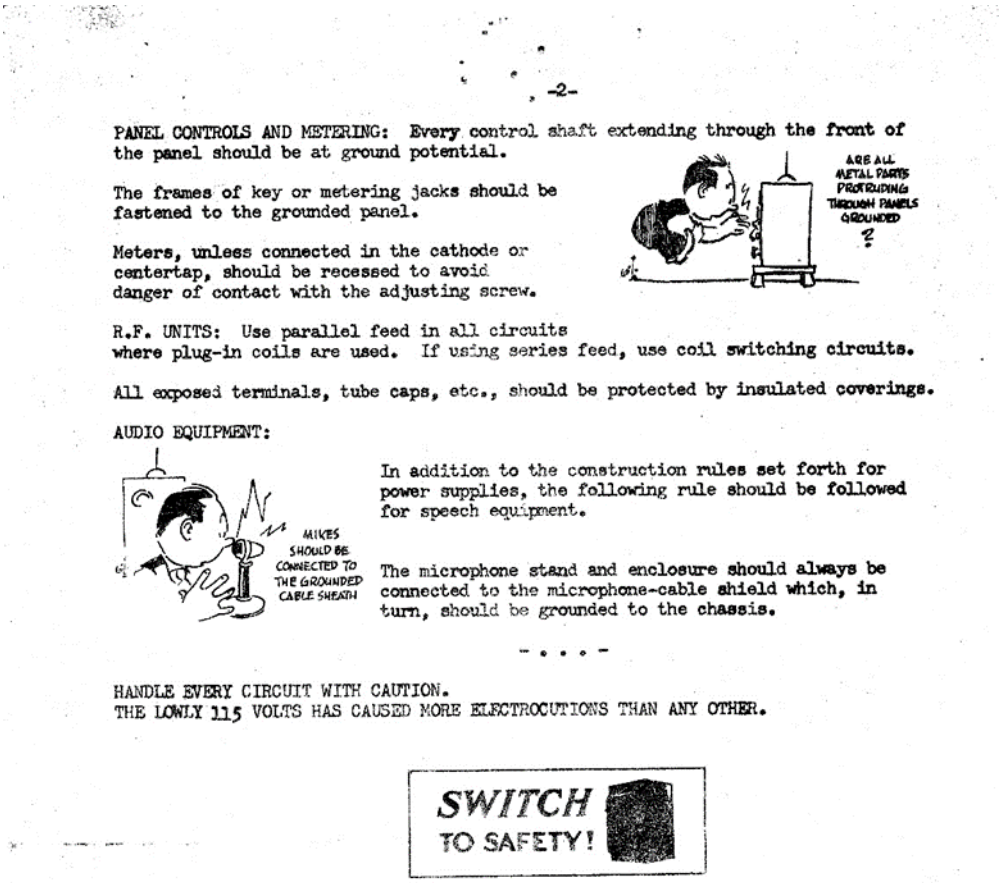
When using shielded wire for external power cabling, make sure the shielding is grounded to protect you in case of insulation breakdown.

CD-84 (Rev. 7/53)

-over-

Printed in U.S.A.

Figure 3 - ARRL Safety Code from 1953, Page 1



-2-

PANEL CONTROLS AND METERING: Every control shaft extending through the front of the panel should be at ground potential.

The frames of key or metering jacks should be fastened to the grounded panel.

Meters, unless connected in the cathode or centertap, should be recessed to avoid danger of contact with the adjusting screw.

R.F. UNITS: Use parallel feed in all circuits where plug-in coils are used. If using series feed, use coil switching circuits.

All exposed terminals, tube caps, etc., should be protected by insulated coverings.

AUDIO EQUIPMENT:

In addition to the construction rules set forth for power supplies, the following rule should be followed for speech equipment.

The microphone stand and enclosure should always be connected to the microphone-cable shield which, in turn, should be grounded to the chassis.

- . . . -

HANDLE EVERY CIRCUIT WITH CAUTION.
THE LOWLY 115 VOLTS HAS CAUSED MORE ELECTROCUTIONS THAN ANY OTHER.

Figure 4 - ARRL Safety Code from 1953, Page 2

UPCOMING EVENTS

Membership Meeting – February 13, 2019

ORC Monthly Programs

February - Gary Drasch K9DJT – The Safe Use of Digital Multimeters

March - Bill Shadid W9MXQ - An overview of Bill's radio collection as presented on Ham Nation

April – Peter Chow W0NG – Assembling a Go-Kit

Volunteers Needed for Monthly Programs

The monthly program is the highlight of the Ozaukee Radio Club meeting. We are fortunate to have a number of very talented people in our club, many of whom have shared their knowledge through a presentation. Share your expertise and experience with the club. Programs can be

on any topic that is ham radio related. Contact Pat Volkmann W9JI at w9ji@arrl.net to discuss your idea for a program.

New "Home-Brew Night" at August meeting

At the January meeting, there was some discussion on the monthly program. A suggestion was made by Peter Chow, W0NG that we try a "Home-Brew Night." The suggestion met with approval so we are going to give it a try at the August meeting.

This will be a chance to show off something that you have built. It can be anything radio-related. You can bring your project in to show it off or just bring a couple of pictures and talk about it. There is plenty of time until the August meeting, so you can start building something if you don't already have a project on the shelf.

Ozaukee Radio Club

January 9, 2019 Meeting Minutes

de Chuck Curran (W9KR), Acting Secretary for the Meeting

President Kevin Steers (K9VIN) called the meeting to order at 7:31 PM. All present introduced themselves.

Announcements, Show-and-Tell, Bragging Rights:

Bill Shadid, (W9MXQ) related a Drake TR-4 experience he had. It came with a rather rare noise blanker he was happy to get.

Gary Sutcliffe, (W9XT) told the club about a low-frequency low-power transmitter he recently got on the air. His beacon signal has been copied by many stations as far away as Hawaii, and he is pleased with the results.

Gary Drasch, (K9DJT) mentioned he has started a "Project of the Month" posting for the club newsletter. He is hoping that club members will provide him with a short article on any simple project that improved something in their ham station.

Peter Chow, (W0NG) mentioned that a Home-Brew Night might be a good topic for a future meeting, or meetings.

Jeff Whisler, (WV9X) shared with the group that he has received a new vanity call sign, W9KW. Jeff also expressed an interest in putting together a group that is interested in learning more or sharing HT programming methods. Contact Jeff if you are interested.

ELECTIONS:

The following slate of candidates ran for office on January 9, 2019:

President: Kevin Steers (K9VIN)

1st VP: Pat Volkmann (W9JI)

2nd VP: No Candidate

Repeater VP: Tom Trethewey (KC9ONY)

Secretary: Ben Evans (K9UZ)

Treasurer: Robert Eskola (K4WTH)

President Kevin Steers (K9VIN) asked for nominations from the floor three times, with no added nominations being made. The vote was then held and all candidates as listed above were voted into office for 2019.

Late Announcement:

Ken Boston, W9GA made an announcement for the club members. He asked that we remember to consider who would be a good candidate for the various club awards, such as Ham of the Year and Turkey of the Year. Ken is hoping to get suggestions on any of the awards as listed and described in the club by-laws.

Auction:

Pat Volkmann, W9JI ran the January 9th Club Meeting Auction, with Ed Rate, AA9W. The items listed below were up for purchase.

2.4 GHz 13 element beam, SWR Bridge, Kenwood Rapid Charger, Dell docking station, wire ties, 12" copper bus bar, Pyramid Power Supply-13.8 VDC 6 amps, Midland Power/SWR Bridge, Drake TR-72 2-meter Transceiver, Realistic Transceiver, Yaesu Memorizer FT-227R VHF-FM Transceiver, Cobra 200 VHF 220 MHz Transceiver.

Officer Reports:

President: None

1st VP: None

Repeater VP: Tom Trethewey, KC9ONY indicated the 2-meter repeater was working well except for a hum that is being worked on.

Secretary: Pat, W9JI made a motion to accept the minutes, with a second from Todd, N9DRY. Approved by member vote.

Treasurer: Jim Albrinck, K9QLP motioned to accept the treasurer's report, seconded by Jeananne, N9VSV. Approved by member vote.

It was announced that the Fall Swapfest will be on 9/7/2019.

Old Business:

Ken Boston, W9GA provided an update on the Field Day tent, which is being shortened. Tent has still not been completed, but is expected soon. Ken plans to perform a test setup when he picks up the tent. Others will be needed to help with the test setup.

New Business:

None

Adjournment:

Ken, W9GA made the motion to adjourn the meeting, seconded by Tom, KC9ONY. The meeting was adjourned at 8:58 PM.

ORC Meeting Agenda

February 13, 2019

I. 7:00 – 7:30 PM – Network & Rag Chew

II. Call to Order & Introductions

III. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.

IV. Program: Gary, K9DJT - Multimeter Safety

V. Fellowship Break

VI. 50/50 Drawing – Kristian Moberg (KC9TFP)

VII. Auction – Stan Kaplan (WB9RQR)

VIII. President's Update – Kevin Steers (K9VIN)

IX. 1st VP Report – Pat Volkmann (W9JR)

X. Repeater VP Report – Tom Trethewey, (KC9ONY)

XI. Secretary's Report – Ben Evans (K9UZ)

XII. Treasurer's Report – Robert Escola (K4WTH)

XIII. Committee Reports

A. Spring Swapfest

B. Other

XIV. OLD BUSINESS

XV. NEW BUSINESS

XVI. Adjournment to ?

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465 Beechwood Drive
Cedarburg WI* 53012

First Class

Next ORC Meeting:

Grafton Multipurpose Senior Center

1665 7th Avenue, Grafton, WI
Wednesday, Feb. 13th, 2019

7:00 PM – Doors Open

7:30 PM – Meeting Begins

The ORC Newsletter

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Volume XXXI	March, 2019	Number 3

From the Prez

de Kevin Steers (K9VIN)

Well, hopefully you'll all participate, or have participated, in the Wisconsin QSO Party depending on when you receive this newsletter. I hope we get a slew of participants who log their contacts and submit them via e-mail on behalf of the ORC!

I'm hoping to get my HF antenna happy before Sunday, March 10, so it resonates on at least one band. I'm going to disassemble and rinse it down as I think the salt weighs heavily on resonance, etc. If my daughter is patient enough, and the bands are good, I hope to pull over and work a handful of stations from a number of counties on my way home from the cottage. Better yet, I may play the 'snowed in' card and stay up through Monday, as we truly are expecting bad weather and snow up north, rain in Cedarburg and, I trust, icy conditions somewhere in the middle.

In prep for the Contest, I'm playing with my HamLog app on my iPhone. I realized it has a number of features I'd never used, so I just found that I have 12 countries under my belt, and all on SSB. I'm sure it will show me a US Map, but I digress. This app will help me to do quick logging while mobile and will e-mail me a list of contacts, if given a timeframe. Easy peasy.

Speaking of icy roads, a few weeks back, I was approaching Green Bay, southbound, and was tuned into the 2M repeater there. I overheard folks discussing bad roads, and an awful accident on I-41 Southbound. Sure enough, when I got to Green Bay, the overhead electronic billboards warned of travel on I-41 South. Granted I-43 was my typical route, and even that road was closed for a stretch due to the number of cars in the ditch. That was the first time I had set my cruise control at 20mph, and I was happy to do so. Most made it home fine, but many hit the ditch.

There's an upcoming meeting of local Ham Radio clubs, where we will discuss the state of the hobby, and any ideas folks have to influence that, and how clubs may seek to work together to continue to better the hobby. Stay tuned for an update on that soon.

BTW, if you're not an HF person, please get on the air using our 2M repeaters, or even simplex stations. I'm hoping to hear folks calling CQ all across the 2M band during the contest. I hope to learn more about 2M during this event, for sure!

Cheers and 73,
K9VIN, Kevin

DX'ing & Contesting

De Gary Sutcliffe (W9XT)

First off, depending on when the newsletter is published, the Wisconsin QSO Party is either coming up or is just over. It starts at 1:00 PM on Sunday, March 10 and runs until 8:00 PM local time. Check last month's column for details and https://www.warac.org/wqp/wqp.htm for rules. Get on! Let's create a big score for the ORC! If it is over when you read this, hopefully, you did make some contacts. Be sure to send your logs in before the deadline (March 24). Make sure the ORC is listed as your club. To avoid possible confusion, put Ozaukee Radio Club in the form instead of just ORC.

For the FT8 fans, note that there is a new version out, Version 2.01. It corrects some bugs. I have not noticed any real changes, but the irritating notice at startup to tell everyone to switch to version 2.00 by December 10 no longer appears.

One of the features introduced in Version 2.00 was the special Fox/Hounds (F/H) mode for DXpeditions. There seems to be a bit of misunderstanding on this mode. The goal of DXpeditions is to make as many contacts as possible. FT8 is not exactly a mode for quick QSOs. The F/H mode allows the DX station (the fox) to make several contacts (the hounds) at the same time. Also, it minimizes the number of transmissions needed for a QSO, further reducing the time per contact. The fox and hounds operate in different parts of the pass band to minimize QRM that slows down contacts.

The fox will be transmitting on a frequency below 1000Hz in the pass band. The hounds call above 1000 HZ. When the fox decodes the call of a hound, it will instruct the hound to transmit on some frequency below 1000HZ. From there, the QSO continues.

To do this requires special configuration. The first step is to allow WSJT to control your rig. Most logging programs allow you to set it up so the program talks to the radio. When you make a contact, the program will know the frequency and mode you are using and automatically enter that into the log for the QSO. If you are connected to a spotting network, you can just click on a call sign, and the radio will go to that frequency and be in the right mode.

The problem is that it does not work well to have two programs trying to use the same serial port to talk to another device. You have to disable that on the logging program and then enable it in WSJT. I use Logger32 so I go to Setup | Radio | Close Port. Then I go into WSJT and click on File |Settings | Radio. Normally the radio type will be set for "None" so I change it to my radio type. It sometimes does not start communicating, so I click on Test CAT to get it started. Of course, you would have had to previously configure the COM port and port settings. Check on the WSJT instructions on all that.

Then you need to go set up for F/H mode. Go to Settings| Advanced. About halfway down there is a "Special Operating Activity" checkbox. Click on that, then click on being a Hound. Go back to the main screen. When you have your radio set to the frequency, look for the fox on the left decode screen. If you see him, you can enter his call in the call sign field and then click to gen-

erate the messages. Set your transmit frequency above 1000 HZ and enable transmitting. You don't have to worry about which period to transmit on. The fox always transmits on even periods, and the program automatically handles all that.

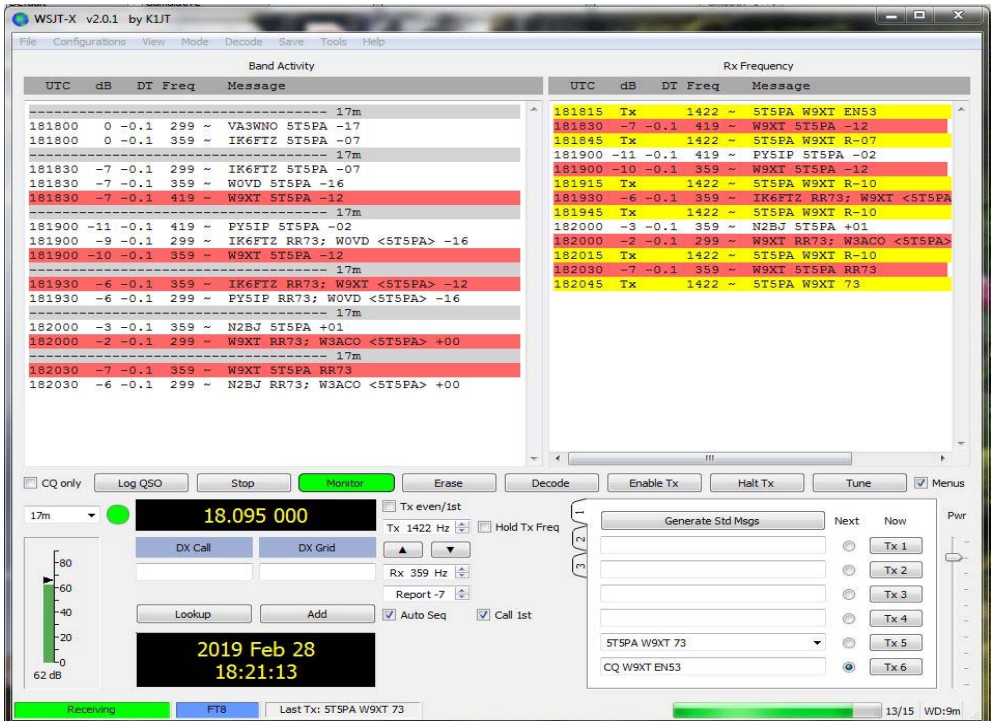
Sit back and relax. The only thing you might want to do is change your transmit frequency if you don't get a response after a couple of minutes. There might be others calling on the same frequency covering you up. You can follow along with what the fox is doing by looking at the left decode screen. You will often see him sending signal reports and confirming the QSOs for one or more stations each period.

When the fox copies you, you will see a signal report to your call on the right decode screen. You might also notice that your transmit frequency has moved down below 1000 Hz. The program will send your signal report back, and the fox will respond with RR73. The QSO is done. Log it!

One thing that is a bit different about F/H mode is that is not supposed to be used on the regular FT8 frequencies, although you might see it there once in a while. The tough part is to know when there is a rare one on the air. The DX spotting networks are your friends here. The spots will give the frequency, and the spotter will normally put F/H in the comments.

If you use a logging program with spots set up, you are all set. If you don't, DXSummit, http://www.dxsummit.fi is a good site. You don't need a special program to view the spots for this web site. Note that this is a worldwide listing, so you might not have propagation to a spot made by someone from Europe. Another nice feature of this site is you can enter one or more calls in the search box (upper right), and you will only see spots for that station(s). That is good if you are looking for a specific Dxpedition.

F/H mode is a great way to add some rare ones. It takes a bit of learning and effort to use, but it is worthwhile. In the last couple of days, I worked two new FT8 countries using that mode, bringing my FT8 DXCC list to 170 countries worked. Check out the WSJT-X instructions to get more detailed instructions.



WSJT screenshot of W9XT working 5T5PA with FT8 F/H mode. Note how the DX station is working multiple stations in each transmission.

There are a few big contests this month. The ARRL DX Phone weekend and maybe the WiQP will be over by the time you read this. They were covered last month. If you missed the CW weekend, you missed something special. In almost 50 years of contesting, I never heard conditions on the low bands so good. Tuning 80M CW almost sounded like 20 Meters. I worked 78 countries on 80M and 50 countries on 160M, *low power with vertical antennas*.

The other big contest this month is the CQ WPX Phone contest. It starts at 0000 UTC on March 30 and runs for 48 hours, but you can only work 36. Use the normal contest bands, 160-10 meters. The exchange is a signal report and an incrementing serial number starting with 1. Multipliers are the call sign prefixes. With a W9 prefix, I don't generate a lot of pileups from people looking for a rare multiplier. In fact, you really should not worry about multipliers. About every second or third contact will naturally be a new multiplier.

QSO points for a given contact will depend on the band and location. Working your own country on a higher band is not worth as much as working one on a different continent on a low band. Check out the rules at https://www.cqwpx.com/rules.htm. Of course, your logging program will automatically enter the correct number of points. As with most CQ sponsored contests, there are a lot of different categories. High power, low power, QRP, assisted, non-assisted, all band or single band, etc. Again, check out the rules. You can also check out results from previous years. With a little searching, you can probably find a category that you can win and get a nice piece of wallpaper.

There are some interesting DXpeditions this month. PJ4AA will be on the air from March 3-30. Sint Maarten is not particularly rare, but the op is Tom, AA9A, someone I have known for years, and he is a bigtime contester and DXer from up near Green Bay. Say hi if you happen to hear him.

Guantanamo Bay will be activated with the calls KG4AS and KG4SC March 6-13. Gitmo is a US naval base on the island of Cuba. From my understanding, it is difficult for civilians to go there. I know some exceptions have been made for military veterans. Because of that, operations are somewhat sporadic. Work them when they are available.

Ghana will be activated by a group of Israeli hams March 9-20 as 9G2DX. They will be concentrating on the lower bands, 160-30 meters, CW, SSB, and FT8. Ghana has been unusually active lately, and I have worked a couple of them in the last few weeks.

Maybe the most interesting operation this month is from Lesotho. Lesotho is a landlocked country inside of South Africa. There was a ham there years ago that could be counted on for the multiplier in most DX contests, but has been relatively rare for quite a while. I have not worked one since 2016. A large group of mostly Norwegians will focus on the low bands using FT8 with some SSB and CW. They will be there on March 8-16.

Another good one in March is from Togo by a large group of Irish hams. They will be using the call 5V7EI March 14-26. They will have five high power stations on 160-10M, SSB, CW, and digital. They should be filling a lot of band/mode slots for DXers who take the time to seek them out.

Another African operation for March is from Uganda by a group of Italian DXers. The dates are March 13-25. They plan to be on all bands, 160-10M. They will be on RTTY on 20 meters only, but have published FT8 frequencies for all bands. Note they will be using F/H mode on FT8 except on 160M. The calls will be 5X3C for CW, SSB and RTTY, and 5X3E for FT8.

That wraps up March. Usually, we start thinking of spring by now. With the weather this year, if it continues, we will be spending most of the month indoors. You might as well spend it in front of the radio!

THE COMPUTER CORNER
No. 252: VLC

Stan Kaplan, WB9RQR 715 N. Dries Street Saukville, WI 53080-1664
(262) 268-1949 wb9rqr@att.net

Did you miss the Computer Corner last month? (I did not submit an article for the Feb 2019 newsletter.) You missed it for two reasons: 1. There has been no feedback (positive or negative) for at least a year now, making me wonder if anyone likes the articles or even notices them; 2. In keeping with the lack of feedback, I have had no suggestions for articles until now, and that came from our newsletter editor (thanks, Tom). The message is, if you want me to keep going, or even if you don't, let me know. If you have a need that might be addressed in this article, for sure let me know. Although I do not know everything about computing, at least I know how to research a subject and produce a one-page knowledge byte that might help you.

The following is one of them in response to Tom's need. Tom asks: *How about something on the app that runs videos embedded in a powerpoint? I am having a problem with a powerpoint that has an embedded video and it won't start.*

VLC should solve Tom's problem, and more. It is worthwhile installing it on *any* computer, even if you only occasionally view or listen to multimedia files. That "any computer" refers to Windows machines (XP, 7, 8, 10, Windows Mobile and Windows Phone), Macintosh, Android, IOS, Tizen, and probably others. In other words, it is a CROSS-PLATFORM media player and streaming media server. The cross-platform moniker refers to the fact that it will work across brands, and even styles (desktops, laptops, mobile platforms, and even phones). It will play DVDs, audio CDs, video CDs and so on). Authored by a non-profit organization (the VideoLAN Project), it was first released in 2001, and it continues to be updated by them. And how about this? It is free to download and use. Furthermore, if you download and install it, you may never need to invoke it. It may well just begin to play some file that would not play before. In worst cases, you may need to invoke it when PowerPoint does not have the proper built-in tools (see Tom's example, above).

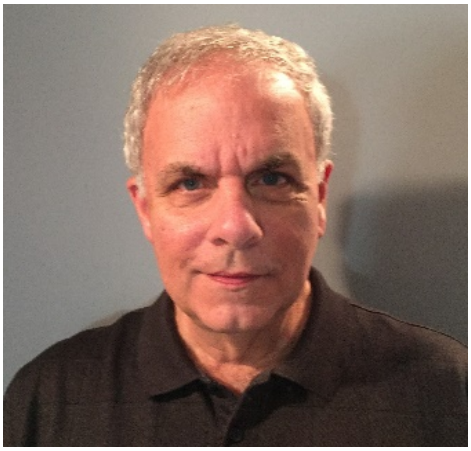
This is one of those examples where a dedicated group of programmers saw a need and filled it. That leads to the question of why it is not already part of the Windows programs in all their varieties. It should be, but Microsoft never came up with a comprehensive solution as part of its operating system. So, a group got together, wrote it, and made it free for all to use. Sweet!

Where to get it? Stay away from FileHippo and other servers that want to tangle you up into buying something they or one of their customers sell. Go to my favorite and safe source: https://www.majorgeeks.com/. Scroll down the panes on the left side, past the FILES pane, past the SPREAD THE WORD pane and find the SITE INFO pane. It this pane, find Top Freeware Picks and select Multimedia. Find VLC Media Player, then download and install it.

Expect this: VLC will prompt you to update if you are using an old version. That will only happen now and then (maybe once a year, maybe twice). Worth the effort! Happy Computing!

Vintage Amateur Radio

de Bill Shadid, W9MXQ



Here we go into the third and final article on Heathkit Linear Amplifiers. As I believe I mentioned before, there were eleven linear amplifiers that Heathkit offered, or were prototyped in enough volume to have some in the field. Before the nine models we talked about in the past two months, there were two other models. The first, the KL-1 Chippewa, even had a model option to operate in Class C – which is non-linear. The second was the HA-10 Warrior Linear Amplifier – which was as economical as the KL-1 was expensive.

Please see the pictures below of these two, now classic, Linear Amplifiers . . .

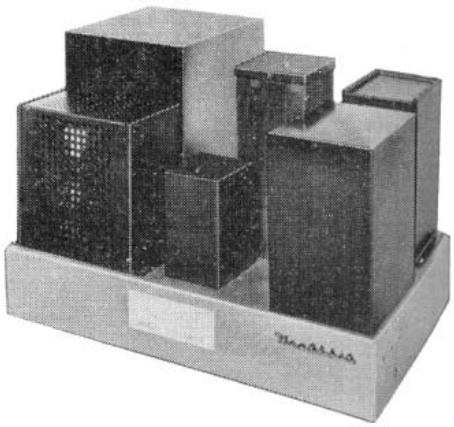
Heathkit KL-1 Chippewa Linear Amplifier

Heathkit Photo

Heathkit HA-1 Warrior Linear Amplifier

W9MXQ Photo

In addition, it should be noted that the KL-1 Chippewa had a second chassis that included the KS-1 Power Supply for all amplifier functions. The HA-10 Warrior was self-contained.



Heathkit Photo

The Heathkit KS-1 AC Power Supply for the KL-1 Chippewa Linear Amplifier. At 105 pounds, this was a monster but duly supported the power requirements of the amplifier in Class AB1 and Class C operations. The KS-1 Power Supply had a slightly smaller footprint compared to the KL-1 Amplifier and was designed to be placed separately.

The KL-1 Chippewa Linear Amplifier was introduced to very positive reviews in 1960. It was an incredible piece of hardware at 70 pounds, not including the 105 pound weight of the matching, and required, KS-1 AC Power Supply. The KS-1 was on a similar sized chassis to the KL-1 Amplifier but it lacked the outer cabinet. The components on the chassis of the power supply came out to be about a half-inch taller than the fully enclosed amplifier.

In the late 1950's, Heathkit was coming off many years supporting the ham radio community with the successful DX-series Transmitters. The DX-100[1] and DX-100B[1] transmitters led to the popular TX-1[1] Apache Transmitter. The DX-100 series and the Apache formed the deluxe Heathkit AM/CW line of amateur transmitters of the 1950's. However, Heathkit's marketing planners could see the coming of the popularity of SSB in amateur operation. To stay competitive with customers wanting SSB capability, Heathkit began to develop SSB-related products and in 1958 introduced the RX-1[1] Mohawk HF SSB/AM/CW Receiver. The Mohawk was the first of the "Green Machines," in reference to their green on green color scheme. For a short time, the DX-100B Transmitter, along with the Mohawk Receiver formed the basis for Heathkit's premier station. Also in 1958, to keep up with others in the field - or perhaps to lead them – Heathkit introduced the SB-10[1] Single Side-band Adapter that allowed a properly modified DX-100 or DX-100B to run SSB as well as their traditional CW and Plate Modulated AM. Introduction of the much refined TX-1 Apache provided for plug-n-play connection to the SB-10 Adapter. But, the TX-1 Apache was still basically an AM/CW Transmitter.) In 1960, Heathkit moved further in the SSB market with the introduction of the KS-1 Linear Amplifier. Below is a picture of a top of the line Heathkit SSB/AM/CW station from the early 1960's.

SB-10 Adapter, TX-1 Apache Transmitter, RX-1 Mohawk Receiver, KL-1 Chippewa Linear Amplifier, and AK-5 Speaker (L to R)
(The KS-1 Power Supply for the Chippewa is mounted elsewhere)
(Shown also are the much later Heathkit HA-1410 Keyer, an Electro-Voice 911 Microphone, and a Vibroplex Original "Bug" Keyer)

Heathkit Station at W8SA

I don't want to get too far ahead of myself here, but this was an interesting time, as ham radio had many users of AM as well as a growing number of proponents of SSB. At the time, Barker & Williamson (B&W) offered the B&W 5100[1] and 5100B[1] AM/CW Transmitters that could utilize their 51-SB[1] and 51-SB-B[1] SSB Adapters. And E. F. Johnson offered their Viking Valiant[1], Viking Valiant II[1], and Viking 500[1] AM/CW Transmitters as well as a Viking Single Sideband Adapter[1]. The SB-10, 51-SB, and 51-SB-B Adapters were easily adapted by ham operators of the day to existing transmitters of the time. The user had to develop an insertion point in the signal path and provide necessary modifications to the final amplifier to allow class AB1 operation for SSB use.

Specifications for the KL-1 Chippewa Linear Amplifier were impressive. In my opinion, the only other popular and competitive amplifiers of the time were the Collins 30S-1 (covered in an earlier article) and the E. F. Johnson Viking Thunderbolt[1] amplifiers. However, only the Chippewa offered both Class AB1 and Class C operation. The duty cycle and power of these three amplifier products were not equaled in too many cases at the time.

The RF Drive plus Final Amplifier Input and Output Levels are as shown here:

RF Drive Power Required	
Class AB1 (Tuned Grid)	10 Watts Peak
Class C (Tuned Grid	40 Watts Peak
Class AB1 (Swamped Grid)	60 Watts Peak

Final Amplifier Power Input	
Class AB1 (SSB Voice Modulation)	2,000 Watts PEP
Class AB1 (SSB Two-Tone Test)	1,300 Watts
Class AB1 (AM Linear)	1,000 Watts
Class C (CW)	1,000 Watts

Final Amplifier Power Output	
Class AB1 (SSB Voice Modulation)	900 Watts PEP
Class AB1 (SSB Two-Tone Test)	550 Watts
Class AB1 (AM Linear)	300 Watts (Carrier)
Class C (CW)	750 Watts

Source: Heathkit KL-1 Operating Manual

The KL-1 Chippewa accomplishes its task with a pair of 4-400 Tetrodes – a popular Tetrode tube of the time for both amateur and broadcast use. The tube provided for 400 watts of plate dissipation (800 total) for more than adequate operation in the duty cycle demanded. Class AB1 operation netted 50-60% efficiency and Class C commonly attained 75% efficiency.

It must be remembered that in the world of RF power in the 1950's there was some "discussion" going on as to legal power levels on SSB. This amplifier would seem to be more than capable of running 1,500 watts output, as we are allowed today – and in fact, the power supply is rated to that end.

The 4-400 final amplifier tubes were cooled in somewhat different fashion from the norm at the time. The cabinet chamber below the tube sockets was pressurized by a squirrel cage blower. That blower forced air through the sockets holding the tubes. Unlike most other manufacturers using these tubes, there was no chimney around the tube, so the air simply blew through the sockets around the tube base. Holes in the outer cabinet allowed for the air to move inside the cabinet and thus move air along the tube envelope. In the end, this system seemed to work well, and the Chippewa is well known as a dependable product. The critical cooling issue with these tubes was to keep the vacuum seal area cool. That seal is located at the very bottom of the envelope – an area in the direct path of the cooling air.

Like many power tubes, the 4-400 Tetrode takes about 60-seconds to warm up to proper operating temperature. This wait was accomplished by an internal timer that would only allow high

voltage to become available after a delay of 60 seconds from the time the main power switch was engaged.

The KL-1 Chippewa included several other tubes. In a tube amplifier today, these functions would be handled by solid-state devices. It had a 6DQ6 Clamp Tube plus six Regulator Tubes (four OD3's and two OC3's). The Clamp tube was for proper cut-off at key-up when running in CW. The separate KS-1 Power Supply had two 866A Mercury Vapor Rectifier Tubes.

Cost of the KL-1 Chippewa Linear Amplifier, in 1960 was $399.95. The necessary KS-1 Power Supply was an additional $169.95. That totaled $569.90. A lot of money in 1960. That was a problem and sales were low while the amplifier drew very good reviews from its users. Heathkit saw the error of their marketing target and discontinued the product in the same year it was introduced – 1960. These amplifiers are very rare today and the only one I have recently seen for sale is posted for a total price (KL-1 and KS-1) of $1,799,99. That is over three times its original selling price. It is the only one I have ever seen for sale. Very few were made. As you will see in later installments, this is not the only time Heathkit over designed a product for their intended market.

Only a year later, in 1961, Heathkit recovered from the marketing error with an amplifier that is the second one in this article. This was the popular Heathkit HA-10 Warrior Linear Amplifier. The amplifier cabinet was nearly identical in size to the KL-1 Chippewa but was self-contained in that one cabinet. The HA-10 Warrior was every bit as simple as the KL-1 Chippewa was complex. The Warrior was on the market for the rest of the time Heathkit made the likes of the TX-1 Apache Transmitter, the RX-1 Mohawk Receiver, and the soon to arrive HX-10[1] Marauder SSB/AM/CW Transmitter.

The HA-10 Warrior used a much lower cost 811A Triode. The 811A is still in production and installed in new amplifiers, today. Four of them run in a Grounded-Grid, Class AB1 design in the Mohawk. Unlike in 1961, the tubes today are made in either China or Russia and no longer carry such names as RCA, Cetron, or General Electric.

Using the same format as shown with the KL-1 Chippewa Linear Amplifier, here are the operating input and output power levels of the HA-10 Linear Amplifier:

RF Drive Power Required	
Class AB1 (SSB/AM/CW)	100 Watts Peak

Final Amplifier Power Input	
Class AB1 (SSB Voice Modulation)	1,000 Watts PEP
Class AB1 (AM Linear)	400 Watts (Carrier)
Class C (CW)	1,000 Watts

Final Amplifier Power Output	
Class AB1 (SSB Voice Modulation)	500 to 600 Watts PEP
Class AB1 (AM Linear)	200 Watts (Carrier)
Class C (CW)	500 to 600 Watts

Source: Heathkit HA-10 Operating Manual
(By Calculation of Values Shown)

In addition to the 811A Triodes operating in the power amplifier, the HA-10 Warrior had two 866A Mercury Vapor Rectifiers in its power supply. The amplifier is quite heavy at 92 pounds. That is far lighter than KL-1/KS-1 Chippewa's combined weight of 175 pounds.

The 811A tube requires no perceptible warm-up. In fact, it was designed for applications where the filament power was controlled by the PTT button on the microphone. That pretty well defines "short warm-up!"

Several HA-10 Warrior Linear Amplifiers are in the hands of friends of mine - running in regular service in their ham stations. One oddity is that their primary transformer is 120VAC only.

Both the KL-1 and HA-10 work well with today's 50-ohm exciters. It may be necessary in some instances, however, to use some sort of input matching with modern radios.

Are you looking for the big iron Heathkits? Here is a table of when they were made and what models went together in what year. I find it interesting that the HX-10 and HA-10, Marauder and Warrior, respectively, went on for a year without their matching RX-1 Receiver. By then, the main line Heathkit SSB/AM/CW Receiver was the excellent SB-300. The SB-300 was covered in a past installment of these articles. As will be covered later, the RX-1 Mohawk was costly to manufacture, so Heathkit may have been only too happy to move it aside when the SB-300 became available. In no way is that any indication that the Mohawk was anything but a fine receiver – but it did suffer from fast-moving receiver technology of the time.

Year	RX-1 Mohawk Receiver	TX-1 Apache Transmitter	HX-10 Marauder Transmitter	KL-1 Chippewa Amplifier	HA-10 Warrior Amplifier	SB-10 SSB Adapter
1958	X	X				
1959	X	X				X
1960	X	X		X		X
1961	X	X	X		X	X
1962	X	X	X		X	X
1963	X	X	X		X	X
1964	X	X	X		X	X
1965			X		X	

Special thanks go to Bob, W9DYQ, for his proofreading. I appreciate that you read my articles.

Remember that I am open to questions and comments at my email address, W9MXQ@TWC.com.

W9MXQ

Notes and References:

[1] Subjects of future articles.

Some statistical information comes from the book, by Chuck Penson, WA7ZZE, "Heathkit, A Guide to Amateur Radio Products" Electric Radio Press, © 1995. Contact Chuck at WA7ZZE@gmail.com for purchase options on this and other books he has authored.

Project of the Month©

de Gary Drasch, K9DJT

I built this month's project a little over three years ago. It sprouted because I was switching between two different microphones and an external voice-recorder for contesting. The first mic is part of my headset which has a 1/8" plug at the end of the cable. I could have plugged it into the back of the Elecraft K3 and selected it through a sub-menu on the radio, but when I wanted to use my Yaesu MD-100 desk mic through the front panel connector, the menu became a hassle. In addition, when using the voice recorder, I needed to connect that between the microphone I was going to use and the radio. The other part of the problem was that there wasn't any commonality between any of the connectors. I had been switching the three through the front mic jack on the radio which required me to build two adapters - one to accommodate the 1/8" plug and another to accept the desk mic and my Unified Microsystems VK64 voice-recorder to the K3. All this required me to unscrew and unplug the adapter on the radio, swap adapters, re-plug and tighten. Besides being a pain, it was stressing my adapters and associated cabling each time I did it. What I wanted to do was to be able to flip a single switch between one mic and the other and quit the adapter swapping. I also wanted to keep the voice recorder in-line to eliminate some of the frustration in setting up for a contest.

So I'm thinking; how hard can it be to make a *Microphone Selector Switch*? I took a pad of paper and started to scribble a schematic. HA! I couldn't believe what I came up with. Hey, it's only transfer switch; isn't it?

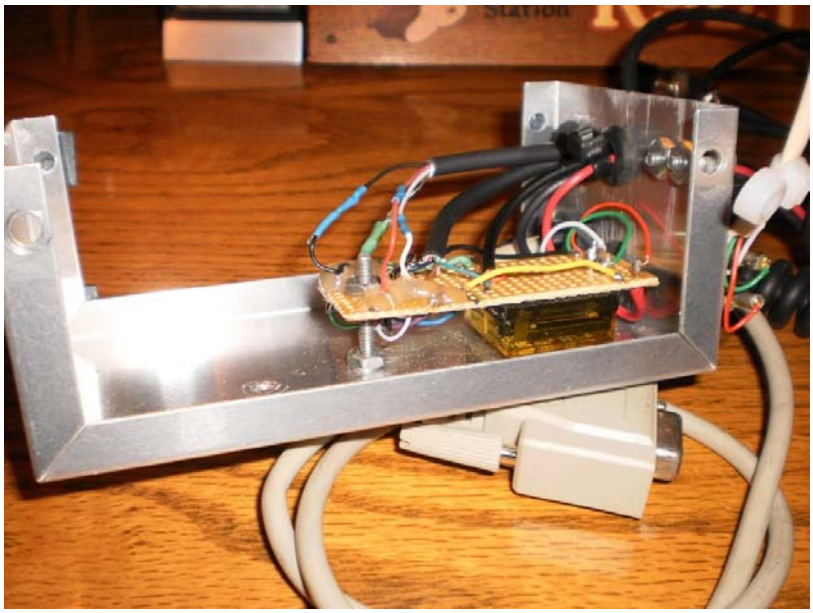
Microphone Selector Switch

After finishing a more formal schematic from my hen-scratching, I began making the hardware components. The first was an L-shaped bracket which ultimately was screwed to the side of a shelf over the radio. I drilled the mounting holes on one side and then the holes to accommodate a small SPDT (single pole, double throw) switch and two LEDs (resistors are built-in which enabled them to be fed with 12VDC). It was then painted black, lights and switch were mounted and labeling applied. This toggle switch not only selects the appropriate LED, but activates the *actual* microphone switch, i.e., a relay located in a remote aluminum box. The relay is a DPDT (double pole, double throw). The centers of the two poles are fed directly to the voice-recorder through a DB-9 cable. This means the voice-recorder is permanently in-line with the radio. The microphones are fed into the relay using the outside pins of each pole. The shield and center conductor of each is therefore switched.

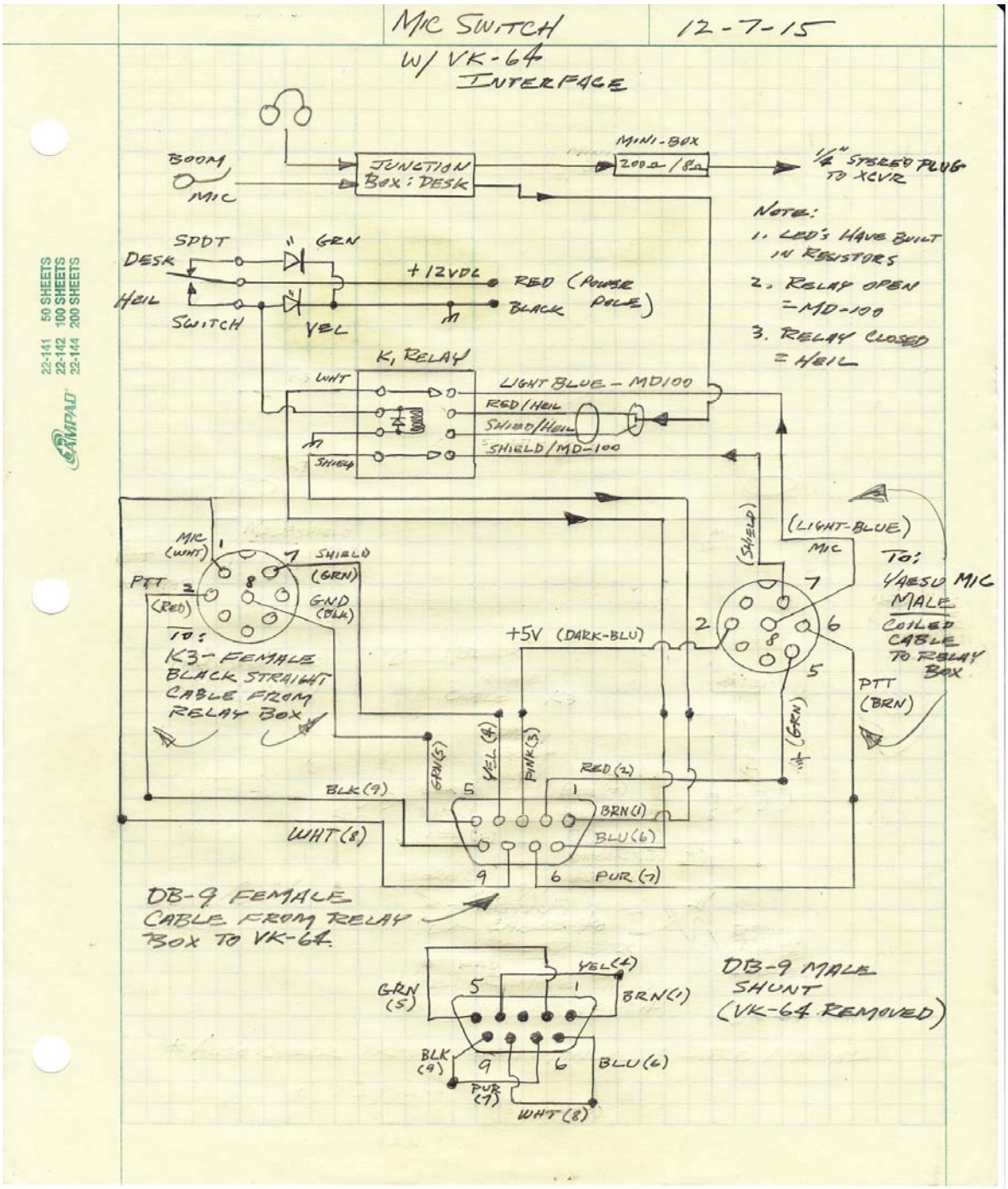
Looking at the completed unit below, the Yaesu MD-100 desk mic plugs into the connector on the coiled cord, and the Heil headset mic plugs into the black cable at the top of the picture with the red female mini-connector. The black cable with the 8-pin mic connector goes to the K3 mic connector on the front of the radio. It comes from the voice-recorder via the DB-9 cable. The beige cable at the top of the picture goes to the switchplate and the black-red cable with the Power-Pole® connectors goes to a 12VDC accessories power supply.

The picture below shows the construction using perfboard almost like a terminal strip. The relay is on the bottom with its terminals protruding at the top. (Technically, the relay is on the top of the board and we are looking at the bottom.) I'm holding the board in place with a single machine screw and nuts. All cables come into the box through rubber grommets and restrained with cable ties on the inside. The screw terminal strip on the outside is used for the toggle switch wire connection.

Not only did this project solve my problem, but it cost me next to nothing. Obviously, the box is way too big but it was left over from a previous project and fit my needs. I didn't need to go out and specifically purchase anything. Everything was in my shop. At some point, I purchased miscellaneous stuff like Power-Poles, cable ties, and solder. But overall, it came out cabinets and/or boxes of what most people would call junk—at the club auction for only a couple of bucks.



The schematic is on the next page. You will notice two things I didn't mention earlier. One is that I pulled +5VDC off of the VK64 to power the Yaesu mic emphasis controls. Normally that's taken from the radio. The second thing is a DB-9 male emergency shunt device. I made the shunt in order to enable the mic selector switch in the event the VK64 failed, or if I took the recorder to my cabin and forgot to bring it home. You know the saying, "stuff" happens. I purchased the VK64 from the K9GCF estate and needless to say it's been performing flawlessly. Unified Microsystems make great products! I think W9XT might have had something to do with that.



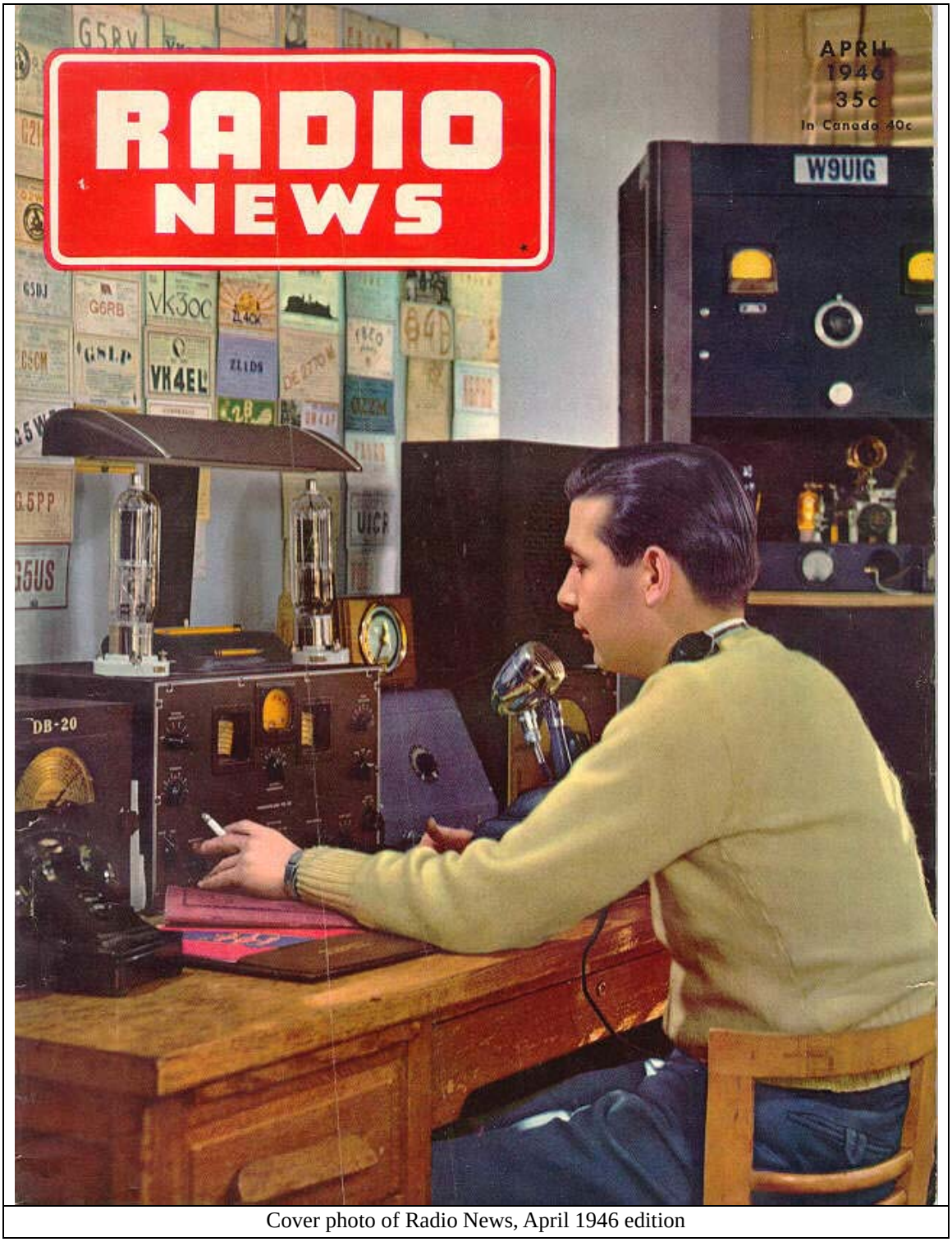
As I've mentioned before, this is your column—I'm only managing it. Please send me info on any project you might be working on relating to ham radio. It can be anything from a kit to a home-brew. A new antenna, a repair to a radio, or an accessory. Maybe you've rearranged your shack or implemented some new grounding. Please share it with us. If you like, I will write it for you. Just call me with the details and provide some pictures.

Go make something!

73, Gary K9DJT

The Amateur Radio Station of W9UIG

By Patrick Volkmann W9JI



Cover photo of Radio News, April 1946 edition

I have always loved the cover photo on the April 1946 issue of *Radio News*. The photograph shows Bill Shaw, W9UIG, using his radio station. It is one of the few color photos of a ham shack from this era. I have always wondered, who is this guy? What is all the equipment shown in this picture? How well did this station work? I thought that it would be interesting to take a closer look at Bill

Shaw and his station to see if we could learn something about the man and the state of ham radio in 1946.

At the time the magazine was released, World War II had been over for about six months. Hams had been off the air since the attack on Pearl Harbor in December of 1941. The FCC lifted the ban on amateur radio operation on August 21, 1945, and authorized the use of the old 2 ½ meter band. Hams were gradually allowed to resume operation on the lower bands as the military abandoned their use of the HF spectrum. Since the production of radio equipment for personal use was suspended during the war years, hams had to return to their pre-war equipment. After a four-year hiatus, many were eager to back on the air. Bill Shaw was ready to go.

The caption for the cover, on Page 4 of the magazine, says:

> "Bill Shaw, W9UIG, among the first hams back on the air, operates with 500 watts phone using a 3-element beam antenna. His receiver is a Hammarlund HQ-120X. Other equipment includes a Meissner Signal Shifter and an RME DB20 preselector."

A search for information on Bill Shaw did not turn up much. He is listed in the Callbook as living in the Chicago area in the 1940s and '50s. The January 1946 edition of Radio News says:

> "TAYLOR TUBES, INC. has announced the appointment of William Shaw, W9UIG, formerly an engineer for General Electric X -Ray Corporation, to the post of Chief Inspector for the company. Mr. Shaw will assume some of the duties now being cared for by Mr. James Fillmer, Chief Engineer. Due to the company's expanded production of tubes, this addition to their engineering staff will permit Mr. Fillmer to devote his time to development work."

The January 1945 edition of QST in Strays on Page 94 states that "Bill Shaw, W9UIG, was recently was appointed Chief Inspector of Taylor Tubes, Inc."

So, Bill Shaw was an engineer, working in the tube industry, and had been a ham for several years when the photo was taken. That's about all I was able to learn about the man. Let's see what we can discern about the radio station that he used.

<u>HQ-120X Receiver</u>

Prominently featured in the photo is the Hammarlund HQ-120X receiver. Introduced in late 1938, the general coverage HQ-120X was targeted at the ham market and was less expensive than Hammarlund's signature Super Pro receiver. The single conversion HQ-120 has 12 tubes, one RF stage and three IF stages. The "X" denotes the inclusion of a crystal filter to reduce interference. The band spread dial is calibrated, allowing the frequency to be directly read. This was the first receiver to use a calibrated bandspread. The S-meter is different than most receivers of the time, reading 0 - 9 and dB over S9. The Allied Radio ad lists the features of the radio and shows that the street price was $129 by 1940.

HAMMARLUND MODEL HQ-120

The Hammarlund HQ-120 was designed to meet the most critical demands of both the Amateur and the professional operator. This ultra-modern 12 tube receiver covers a continuous tuning range of from 540 KC to 31 MC in 6 bands. Precise workmanship and selectivity, sensitivity, and stability are exceptionally high. Every feature essential for top performance has been incorporated. Special tuning condenser construction permits 0 degrees of bandspread for each Amateur band; direct calibration of tuning dial permits accurate logging. A new type of crystal filter giving six positions of selectivity for 'Phone or CW makes operation a pleasure even under unusually crowded conditions of reception on Amateur bands. Built-in noise limiter circuit overcomes objectionable noise disturbances; operates with or without AVC on and is controlled by panel on-off control. "S" meter indicates in "S" units and is calibrated S1 to S9 and up to 40 DB above "S9." Tuned preselector stage with three high gain IF stages produce highest possible signal-to-noise ratio with maximum attenuation of image frequencies. Panel control of antenna compensator permits adjustment for peak performance on each band. Send-Receive switch with external break-in relay terminals. Automatic voltage regulator compensates for line variations. With 8" P.M. type speaker. Write for complete descriptive literature. For 110 volts 50-60 cycles AC. Wt., 47 lbs.

A14815. HQ-120, with tubes and speaker, less crystal. **$117.00**
TERMS: $11.70 down, $9.30 mo. for 12 mos.
CASH PRICE

A14816. HQ-120-X, with tubes, speaker and crystal.
TERMS: $12.90 down, $10.26 mo. for 12 mos.
CASH PRICE **$129.00**

Housed in sturdy black wrinkle finish cabinet. Size, 17⅛" long, 10" high, and 12¼" deep; with carrying handles. Handsomely built.

Regularly supplied for operation from 105-120 volts, 50-60 cycles. Available for use on other voltages on special order. Write for prices.

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Allied Radio Catalog ad for Hammarlund HQ-120 from 1940

The HQ-120 was sold with a 10" 8 ohm speaker, but no enclosure. The speaker cabinet was an option. In the photo, the SC-10 speaker cabinet is visible to the right of the receiver.

Hammarlund HQ-120X Receiver, manufactured in 1941. The front panel does not have the "X", the model number is marked on the chassis. Crystal filter controls in upper left. Calibrated bandspread dial on right. The front panel is black; the lighting makes it look blue. Photo credit: W9JI

The HQ-120 was not the best receiver available but the performance was pretty good. The innovative features and affordable price made it very popular. After WW II, Hammarlund released the HQ-129, which was of a very similar design to the HQ-120. Hammarlund continued to produce the HQ series of receivers until the early 1970s.

DB-20 Preselector

Perhaps the most unusual piece of equipment, to a modern ham, in W9UIG's shack is the DB-20 preselector. Manufactured by the RME company in the late 1930s, the DB-20 was designed to ad-

dress the “image problem” (see below) and provide some additional gain for the receiver. The HQ-120 receiver pictured was a single conversion superhetrodyne and would benefit from the improved image performance and extra gain offered by the DB-20.

The RME DB-20 covers 550 KHz to 36 MHz. This unit provides about 20 dB of gain with 2 RF amplifier stages and three tuned circuits. When paired with the HQ-120, this placed five tuned circuits and three RF stages in front of the mixer. The result would be improved sensitivity on the higher bands and excellent image rejection.

The Image Problem

Just what is this “image problem”? The superhetrodyne receiver works by combining the incoming signal with a local oscillator (LO) signal in a mixer stage. Most receivers from this time have an IF frequency of 455 kHz. Assume we wanted to tune in a signal at 14.2 MHz, and the LO frequency is higher than the desired frequency. The LO would be set to 14.655 MHz (14.2 MHz + 455 kHz) to create the desired IF signal at 455 kHz. However a signal at 15.110 MHz (LO + IF) would also produce a signal at the IF frequency. This undesired response is called the “image” and can cause interference problems if it’s not eliminated.

Adding additional stages of RF amplification before the mixer is the classic way of dealing with the image problem. The extra RF stages improve the selectivity of the receiver and increase the ability to reject images, while adding cost and complexity to the design. The addition of an outboard preselector was one way to improve image rejection and provide some additional gain at a reasonable cost. The eventual solution to image rejection was the use of double rather than single conversion superhetrodyne circuits. Double conversion did not become common until after World War II.

Meissner Signal Shifter

The Meissner Signal Shifter is barely visible in the photo, underneath the SC-10 speaker. While perhaps not obvious from the name, the Signal Shifter was a low-powered transmitter that could be used as either a VFO or as an exciter to drive an amplifier. Meissner made high quality equipment which was widely used at the time, including use by the US military in WW II. The unit shown in the photograph looks like the original Signal Shifter model from 1938. The Signal Shifter covered 160 through 10 meters, using three plug-in coils per band.

The circuitry used was a 6F6 as an electron coupled oscillator driving a 6L6. The 6L6 works as an amplifier or buffer / multiplier, depending on the band. The manual claims that the output power was about 7.5 watts. The schematic for the Signal Shifter shows how to use a twisted pair transmission line to link-couple to the grid of an amplifier.

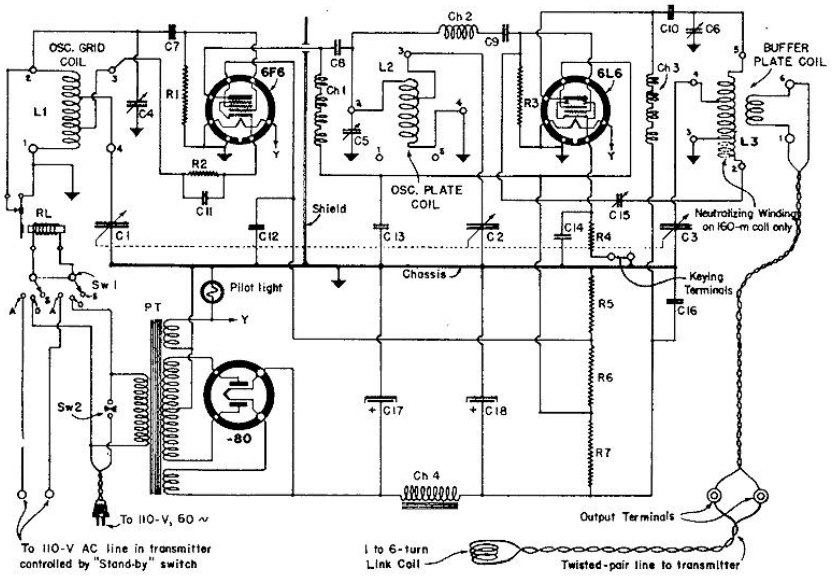
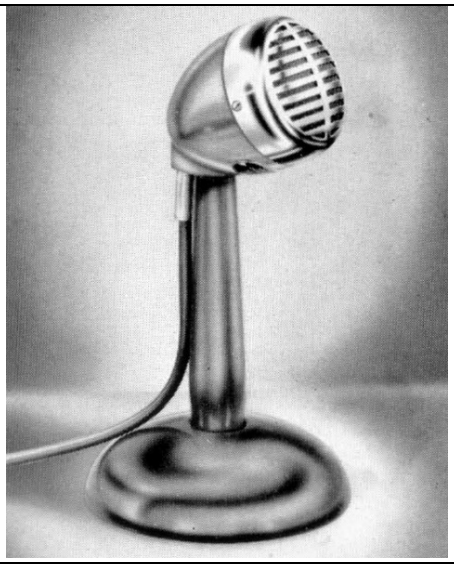


Figure 2 — STANDARD MODEL — CIRCUIT DIAGRAM

Meissner Signal Shifter schematic

Microphone

Not knowing anything about old microphones, I asked Bill Shadid, W9MXQ, for some help in identifying the microphone in the cover photo. After some investigation, Bill concluded that the microphone pictured is probably a Shure Model 707A. The Model 707A is a high impedance crystal mike. The Shure data sheet describes it as "...ideal for amateur communications…" and finished in "iridescent gray and chrome". Bill also pointed out the mounting and connection holes in the bottom of the microphone could be interchanged to suit the individual needs of the user.

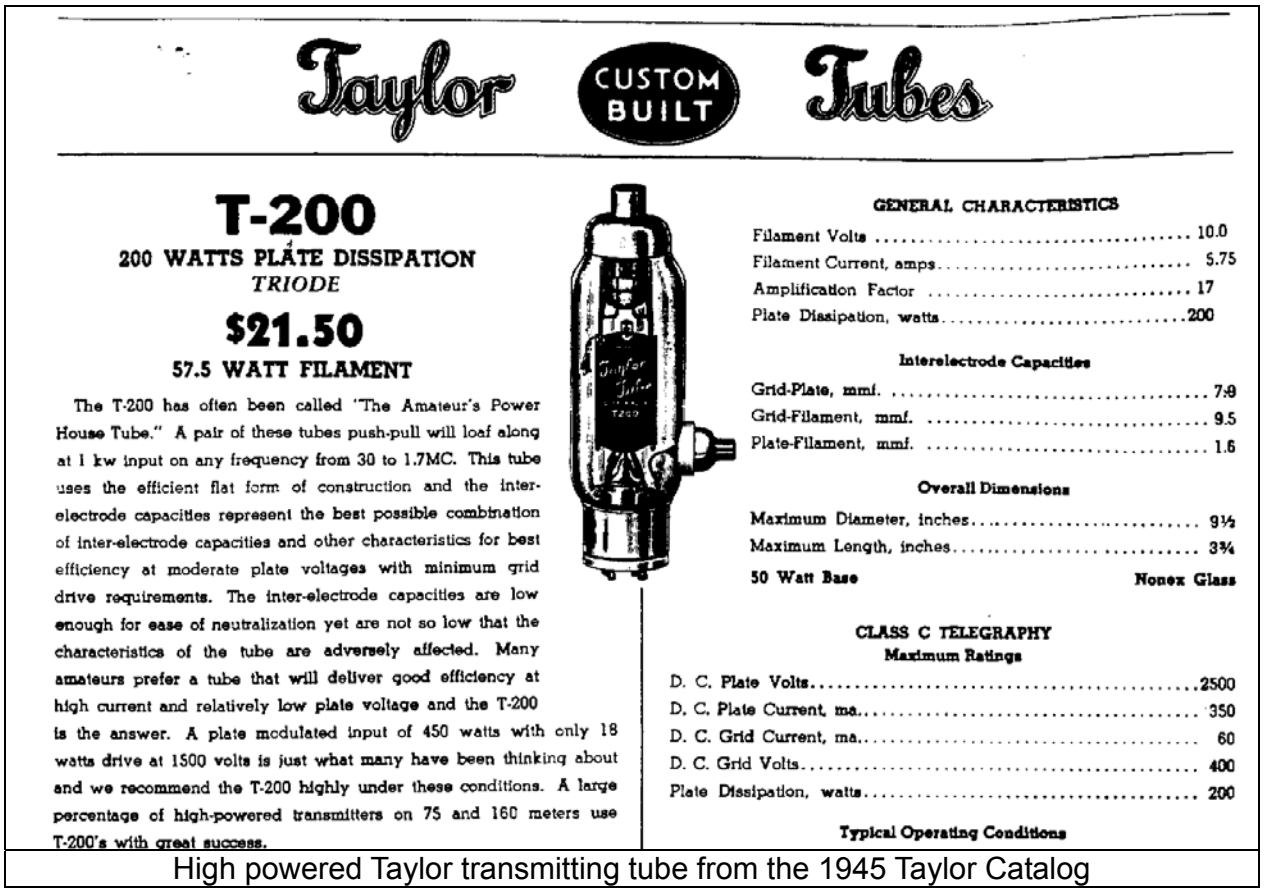


Shure Model 707A Microphone as shown in the 1949 Shure catalog

Transmitter

The caption for the photo doesn't give us much to go on, describing the transmitter as "...500 watts phone…" The somewhat blurry image in the background shows a link coupled tuned circuit and a tube glowing brightly. Since we know that Bill worked for Taylor tubes at this time maybe the trans-

mitter used some of their products. A pair of Taylor 813s in push-pull? Or perhaps a single Taylor T-200, which the Taylor catalog says "...has often been called the Amateur's Power House Tube." We'll probably never know.



Taylor CUSTOM BUILT Tubes

T-200

200 WATTS PLATE DISSIPATION

TRIODE

$21.50

57.5 WATT FILAMENT

The T-200 has often been called "The Amateur's Power House Tube." A pair of these tubes push-pull will loaf along at 1 kw input on any frequency from 30 to 1.7MC. This tube uses the efficient flat form of construction and the inter-electrode capacities represent the best possible combination of inter-electrode capacities and other characteristics for best efficiency at moderate plate voltages with minimum grid drive requirements. The inter-electrode capacities are low enough for ease of neutralization yet are not so low that the characteristics of the tube are adversely affected. Many amateurs prefer a tube that will deliver good efficiency at high current and relatively low plate voltage and the T-200 is the answer. A plate modulated input of 450 watts with only 18 watts drive at 1500 volts is just what many have been thinking about and we recommend the T-200 highly under these conditions. A large percentage of high-powered transmitters on 75 and 160 meters use T-200's with great success.

GENERAL CHARACTERISTICS

Filament Volts	10.0
Filament Current, amps	5.75
Amplification Factor	17
Plate Dissipation, watts	200

Interelectrode Capacities

Grid-Plate, mmf.	7.9
Grid-Filament, mmf.	9.5
Plate-Filament, mmf.	1.6

Overall Dimensions

Maximum Diameter, inches	9½
Maximum Length, inches	3¾

50 Watt Base **Nonex Glass**

CLASS C TELEGRAPHY
Maximum Ratings

D. C. Plate Volts	2500
D. C. Plate Current, ma.	350
D. C. Grid Current, ma.	60
D. C. Grid Volts	400
Plate Dissipation, watts	200

Typical Operating Conditions

High powered Taylor transmitting tube from the 1945 Taylor Catalog

QSL Cards

Propagation in the mid-20th century was pretty darned good most of the time, with worldwide openings on the upper bands happening daily. The QSL cards shown on the wall behind the receiver are from Europe, Australia and Asia, with a couple of notable calls. Just above the *Radio News* logo, we can see the QSL card of G5RV. Louis Varney (G5RV) invented his famous antenna in 1946. Perhaps he worked W9UIG on an early G5RV? E. J. Lake (VK4EL) designed several radio kits sold by Arcadian Radio Ltd. of Brisbane, Australia in the 1930s. K. L. Ewald (OZ2M) earned the first Danish Worked All Continents award and was the high-scoring Danish entry in the 1936 DX contest.

Station

Overall, Bill Shaw's station is a well thought out, professional looking assemblage of quality pre-WW II radio equipment, topped off with a homebrew (?) amplifier. The three-element beam antenna mentioned in the photo caption appears to work pretty well with the station equipment - take a look at the QSL cards on the wall!

If you would like a high resolution copy of the cover photo, you can download this issue of Radio News at: https://www.americanradiohistory.com/Radio_News_Master_Page_Guide.htm

If you knew or have any information on Bill Shaw, W9UIG, please contact me at w9ji@arrl.net.

Remember to pay your ORC member dues!

UPCOMING EVENTS

Wisconsin QSO Party

March 10, 2019 - 1800Z to 0100Z March 11

1:00PM CDT to 8:00PM CDT on Sunday, March 10
The first day of Daylight Savings Time
Seven hours of contesting fun!

Membership Meeting – March 13, 2019

ORC Monthly Programs

March - Bill Shadid W9MXQ - An overview of Bill's radio collection as presented on Ham Nation

April – Peter Chow W0NG – Assembling a Go-Kit

Volunteers Needed for Monthly Programs

The monthly program is the highlight of the Ozaukee Radio Club meeting. We are fortunate to have a number of very talented people in our club, many of whom have shared their knowledge through a presentation. Share your expertise and experience with the club. Programs can be on any topic that is ham radio related. Contact Pat Volkmann W9JI at w9ji@arrl.net to discuss your idea for a program.

New "Home-Brew Night" at August meeting

At the January meeting, there was some discussion on the monthly program. A suggestion was made by Peter Chow, W0NG that we try a "Home-Brew Night." The suggestion met with approval so we are going to give it a try at the August meeting.

This will be a chance to show off something that you have built. It can be anything radio-related. You can bring your project in to show it off or just bring a couple of pictures and talk about it. There is plenty of time until the August meeting, so you can start building something if you don't already have a project on the shelf.

Ozaukee Radio Club

February 13, 2019 Meeting Minutes

de Ben Evans (K9UZ), Secretary

President Kevin Steers (K9VIN) called the meeting to order at 7:32 PM. All the attendees introduced themselves.

Announcements, Show-and-Tell, Bragging Rights:

Robert (K4WTH): We have a new member – Mason Thill (KD9MBI).

Stan (WB9RQR): Stan brought some hard drive platters to the meeting for anyone who wants one as a curio. Also, there was no Computer Corner column in the February newsletter because there was no feedback about whether or not members liked the articles. Stan said he would continue writing the Computer Corner only if members tell him from time to time they enjoy the articles and also give him suggestions for topics to write about.

Pat (W9JI): If there's something you'd like to see in the newsletter, let Pat know and he'll write something up if the topic is something he knows about. Also, if you have an idea for a presentation at a meeting, let him know.

Gary S. (W9XT): The Wisconsin QSO Party contest is on Sunday, March 10th. Details are in the February newsletter. You may have to use a logging program. They may not accept paper logs. Kevin has an app for iPhone called HamLog which he finds very easy to use.

Program:

Gary D. (K9DJT) gave a presentation on safety practices to observe when using a digital multimeter.

50/50 Drawing:

Chuck M. (KC9YEP) was the winner of the 50/50 drawing.

Auction:

Stan (WB9RQR) conducted the auction. Many items were sold, including two digital multimeters, a 100-channel scanning radio, a 6-channel scanning radio, 12-volt fans, power supplies, a homemade 2-meter slot cube antenna that's supposed to work, but doesn't, a light stand, and various publications on ham radio and other subjects.

Officer Reports:

Kevin S. (K9VIN) President – Kevin needs to get on the Educator's Credit Union accounts as a signatory.

Pat V. (W9JI), 1st VP – No report.

Tom T. (KC9ONY), Repeater VP – No report.

Ben E. (K9UZ), Secretary – The minutes from the January meeting are in the newsletter. Motion to accept the minutes was made by Pat (W9JI), seconded by Ken (W9GA) and approved by the members.

Robert E. (K4WTH) – The profit and loss report for January was passed out to members at the meeting. A motion to accept the Treasurer's report was made by Stan (WB9RQR), seconded

by Ken (W9GA) and passed by the members. Please pay your dues for 2019, otherwise you'll be dropped from the member list.

Committee Reports:

Ken (W9GA), Field Day – Still in a go-around with Ken at K&D, trying to complete the procurement of a new Field Day tent. Will pick up the subject again in March.

Ken (W9GA), Nominations – Ken passed out ballots for Ham of the Year and Turkey of the Year. Would like to give out the awards in April, so all ballots should be turned in by the March meeting. Nominations for other awards are solicited, such as Program of the Year and Contester of the Year.

Old Business:

There was no old business.

New Business:

There was no new business.

Adjournment:

A motion to adjourn was made by Stan (WB9RQR), seconded by Tom T. (KC9ONY) and approved by the members. The meeting was adjourned at 8:41 PM.

Attendance:

There were 25 members and one guest present at the meeting.

A copy of the attendance sheet is available upon request in PDF format. Please contact Ben Evans via email at ben@evansengsolutions.com for a copy.

Respectfully submitted,

B. Benjamin Evans, K9UZ

Secretary

ORC Meeting Agenda

March 13, 2019

I. 7:00 – 7:30 PM – Network & Rag Chew

II. Call to Order & Introductions

III. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.

IV. Program: Bill S., W9MXQ – Bill's Radio Collection as presented on Ham Nation

V. Fellowship Break

VI. 50/50 Drawing – Kristian Moberg (KC9TFP)

VII. Auction – Stan Kaplan (WB9RQR)

VIII. President's Update – Kevin Steers (K9VIN)

IX. 1st VP Report – Pat Volkmann (W9JR)

X. Repeater VP Report – Tom Trethewey, (KC9ONY)

XI. Secretary's Report – Ben Evans (K9UZ)

XII. Treasurer's Report – Robert Escola (K4WTH)

XIII. Committee Reports

- A. Spring Swapfest
- B. Other

XIV. OLD BUSINESS

XV. NEW BUSINESS

XVI. Adjournment to ?

Return undeliverable copies to

The ORC Newsletter
465 Beechwood Drive
Cedarburg WI* 53012

First Class

Next ORC Meeting:

Grafton Multipurpose Senior Center

1665 7th Avenue, Grafton, WI
Wednesday, March 13th, 2019

7:00 PM – Doors Open

7:30 PM – Meeting Begins

The ORC Newsletter

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ORC Repeaters on 146.97, 224.18 and 443.750 MHz - Call Sign W9CQO

Web site: www.ozaukeeradioclub.org **Facebook: facebook.com/orcwi**

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Message from the President

de Kevin Steers (K9VIN)

If you didn't participate in the recent Wisconsin QSO Party, I hope you picked up on the excitement and activities of others in the club. It is fun and easy, and next year we hope to have a number of folks who'll make a concerted effort to work and log on that weekend in March. Please put it on your calendars.

I intended to work mobile from northern Wisconsin, but that was not to be. I spent over an hour tuning around 20M and only made 2 contacts in that time, as the band was not in good shape. I even drove to the top of Sugar Bush Hill, in Forest County, one of the highest points in Wisconsin, and still nothing.

I then decided to head home and pitch those contacts, and start over as a portable station in Forest County. I could only work sporadically, so I only made 20 or so contacts later in the day, but it was nice to hear how rare Forest County was. I am sure if I had just sat on one frequency, eventually many would find me, but I could not dedicate that much time.

Finally, with no wifi, and a slight snafu with a recently-changed password on my iPhone, the phone thought it was being compromised, so it wiped itself clean. When I was back home on Tuesday, I was able to completely recover my iPhone from a backup, but not the valuable few QSO's that were stored there. I really wish I could make 2019 my first foray into a CLUB effort, but it was not to be.

I am currently waiting for the snow to melt, and hope to bury some radials below my tower. I intend to use an electric edger to cut slots in the turf, before it gets green and lush. I am going to try to time it to when my neighbor is home, in hopes he welcomes me to lay some under his lawn to make it as complete as possible. A tip I picked up from K9DJT.

Lastly, last fall I had installed a 20m vertical on my pontoon, and hope to make a few QSO's while fishing or just drifting, just to prove I can make a few K9VIN/MM QSOs, as in maritime mobile. I sure need the ice on the lake to melt.

Cheers and 73,
K9VIN
Kevin

DXing & Contesting

de Gary Sutcliffe, W9XT

Radio Contesting is kind of an unusual sport. Although there are multi-op efforts where several hams will get together and operate a contest with more than one transmitter, most hams operate contests by themselves. Most of the time you don't really know how you are doing. Maybe you get a clue when you hear your archrival send his serial number as he works another station. For the most part, you don't really know how you did until the scores come out, maybe close to a year later.

In other sports, everyone in the stadium, listening on the radio or watching the game on TV, and certainly the players know who is winning and by how much. Competitive runners and swimmers can see who is ahead of them. Marathon runners in the lead can hear footsteps as someone catches up. As a lone ham operates, you continue not knowing if your nemesis has given up and shut down or leaving you in their dust.

In the early, prehistoric BC days (before computers), contesters logged on paper logs. They kept something called a dupe sheet to ensure they didn't work a station a second time. There were a few different styles, but they split up a sheet in some ways to separate the calls into different areas for quickly seeing if a call was good or not. A common dupe sheet for domestic contests had columns for A-Z. One side had rows for 1-5 on one side and 6-0 on the other. So you had a box for every number in the prefix and the first letter of the suffix. If you worked W9ABC, you would go to the number 9 row and then to the A column and write ABC. If you worked WA9ABC, you would write ABC and circle it. K9ABC would show up as ABC with a line under it, and WB9ABC would have a double underline. Then in 1976 the FCC opened up a lot more prefixes and it was best to just write the whole call sign.

It would be difficult to keep the dup sheet up if you had a good CQ run. Often you had to let the dupe sheet get behind, so it didn't hurt your rate. You hoped the guys answering your CQ were good at duping,

Contest Online ScoreBoard

04 Mar 2019 00:01 UTC ARRL DX SSB

Closed: ARRL DX SSB ▾ Go

Highest rate: 291 q/h by W1CTN

Home	Profile	Filter	View	Clear Filter	Breakdown	Clubs
65		AF3K	6,864		52	44
66		KI9A	6,552		56	39
67		PA5KT	5,445		55	33
68		K2KXK	2,673		33	27
69		NR9Q	1,932		28	23
70		G0HEU	1,287		33	13
71		AA3K	966		23	14
72		K2ADA	798		19	14
73		K3PA	507		13	13
74		KP4/K6DTT	231		11	7
75		K9DUR	144		8	6
76		AD9I	12		2	2
77		NP4Z	12		2	2
78		VY1AAA	3		7	1
79		K1IR				

SO-ALL LP (A) PHONE		Score	QSOs	States/Prov./Countries
1	K2XR	402,192	532	252
2	W9XT	348,582	533	218
3	W3KB	336,000	500	224
4	PY4XX	253,890	653	130
5	VA2CZ	187,398	362	174
6	W9AV	137,592	313	147
7	AA4NP	79,248	213	127
8	VE3RZ	58,140	170	114
9	K1NZ	56,088	164	114
10	KF4WLS	44,982	153	98
11	W1DYJ	44,064	144	102
12	KU7T	42,387	200	71
13	WA2DNI	35,343	154	77
14	WE1SAX	18,228	99	62
15	AA4LS	18,060	87	70
16	G4PVM	17,145	127	45
17	K4LDC	13,098	74	59
18	K8BKM	8,892	57	52
19	OL5Y	7,548	68	37
20	OZ4MU	6,318	78	27
21	K9QQ	5,508	51	36
22	WB9VPG	3,264	34	32
23	KW9U	1,944	27	24
24	K9NW	1,188	22	18
25	SV3RPQ	882	21	14
26	KG5WJZ	624	16	13
27	G3KNU	147	7	7
28	DO4OD	144	8	6
29	G3K	48	4	4
30	YC0MAT	18	3	2
31	OM0WT	3	1	1

SO-ALL QRP (A) PHONE		Score	QSOs	States/Prov./Countries
1	LZ1KTR (LZ1YE)	6,840	76	30

so you didn't introduce any during your run. You would try to get the dupe sheet up to date when things slowed down a bit.

After the contest, you would go through and dupe the contacts again. It was easy to make a mistake and work a station twice. There were penalties for having dupes in your logs, so you wanted to be sure you got them all out. It could take several hours to dupe the log again and clean up your handwriting so it would be legible to the contest sponsors.

Since it took so long to do that, you usually had 30 days to mail in your logs. Volunteers would then go through the logs looking for dupes, busted calls, incorrectly identified multipliers, etc. They would need a few months to do this. It was a boring and thankless job. Then the results would be published in the magazine. Because of lead times, the results were often not published for almost a year after the contest ended. You had to be patient back then!

Everyone wanted to know how they did, so serious contesters would tune into 3830 KHz afterwards. A couple of stations, usually on the coasts would run a net. Contesters would call in with their scores. You had an idea of where you stood. Still, with log checking ahead, it is possible you or your competitor might have some sizable score reductions.

Then came computers and later the Internet. Computer logging started to get popular in the early 1990s. K1EA released a program called CT. It was mostly for international contests. Ken did not want to support contests like Sweepstakes and Field Day. So, K8CC released a program called NA that supported the domestic contests. Eventually, both programs started supporting most of the contests, and they competed against each other. There was kind of a religious debate on which was better. Not too long later, N6TR came out with TRLog. All these programs ran on PC's running DOS, but things in TRLog showed that Tyree was a Unix programmer. It had some different philosophies, and if you thought the arguments were strong between CT and NA, it was nothing once TRLog joined the mix!

The advantage of computer logging is that it would tell you if a station was a dupe. If you only copied a partial call like 9AB, a window would show similar calls you worked like W9ABC, K9ABX, etc. Often that would be enough to let you know you had probably worked them already. It also showed your current score. You didn't calculate your score much during the contest. It took too much time. You just went by feel based on the number of contacts and multipliers you worked. It took extra time to keep track of multipliers with paper logging, and you might not realize you didn't work some common country on some band. The computer kept track of the multipliers, and when you entered a call, it would tell you if it was a new mult. There might also have been a window of all multipliers worked by band. That was very helpful.

The best part of computer logging was that the dupes and new multipliers are automatically flagged. You just copied your file to a floppy (remember those?) and mailed it off. Eventually, the log checkers wrote programs to cross-check logs. That improved accuracy. These days you don't have to mark dupes. The log checkers do it automatically. You are not docked points for dupes anymore. Although you don't want to intentionally fill your log with dupes, if any get in there, you should leave them in the log.

Even though we used computer logging, everyone still got on 3830 to give their score and see how they did. Then came the Internet. Rather than having to be at the radio after 48 hours of contesting, you could go to a web site and enter your claimed score. Come back later, and you can see where you stand. We got on 3830, so naturally, the web site was named after that frequency and is www.3830scores.com.

It was easier to see how you stood, but it was not official, and some stations don't post their scores. It still didn't give you a clue during the contest. Now, there is a new thing in contesting: real time scoring. Essentially your logging program sends updates with the number of contacts, multipliers, etc. to a server, and you can see how you stand in real time. At this point, only a small percentage of contesters are using it. ORC members Vic, WT9Q, and Gary, K9DJT, and I have tried it. It is interesting to see how a station will move up or down in the standings as the contest progresses. It can certainly be motivating. You see someone ahead of you, and you work a little harder to catch up. Of course, they see you moving in, and it gets them motivated to stay ahead of you. Maybe you don't want your competition to be motivated.

I have been in a few contests where I was in a race between one or two other stations with several lead changes. It can also be interesting to watch the big gun multi-op stations battle it out. I also know it can be depressing to see you are a couple of hundred QSOs behind. It is real tempting just to quit. In other sports, you go somewhere and compete in person. You don't walk off the field because the other team is up 20 points. When operating from home, there is less to keep you from just pulling the plug. While it is depressing, you must keep plugging. You might get some better propagation or have some rare multipliers answer your CQ but not work him. Maybe they still have to take some more required time off. Or maybe they have something else they need to attend on Sunday afternoon and are about to shut down.

You can check it out at https://contestonlinescore.com during the next contest. There are discussions about eventually requiring contesters to be logged in during a contest. The winner could be announced minutes after the contest ends. Some people think that would bring new life into the sport. If you ever explain contesting to a non-ham, they will often think it is pretty interesting. Then they ask, "when do you find out if you won?" They lose interest real fast when you say it will be published in a magazine in about a year.

I am currently against requiring contesters to use this. Not everyone has a good Internet connection. What happens if you lose your connection? Are you disqualified? Some also advocate real-time feedback. It could tell you if you incorrectly copied the serial number the other guy sent. I don't think that should happen. The server can correct your score at the end of the contest.

So far, using real-time scoring is optional. The people who run the site say there are a lot more people watching the scores than are contributing. I think that is unsportsmanlike. Knowing how the other guy is doing is an advantage, and all should be playing on the same level. Real-time scoring is going to be a big change in contesting. Will it hurt or help? That will be a matter of opinion. It will evolve, and at some point, those not using it will be as rare as those who still log on paper.

Back in January of 2018, the big story in the DX world was the DXpedition to Bouvet Island, 3Y0Z. It is one of the most remote places on earth. Planning took years, and the budget was around $800,000. It was going to take over a week to get there by boat. They arrived at the island, but the weather was too bad for the helicopters to ferry the team and equipment to the island. After a couple of days, one of the engines failed, and the captain was forced to abort the operation for safety reasons. They started heading back to port in Argentina, but after a couple of days, they changed course and headed for South Africa because the ship could not handle the seas in that direction with only one engine. The ops endured a terribly uncomfortable month on the boat in very heavy seas.

Soon after that, a group from Poland announced they were going to Bouvet. It was very strange. They didn't announce when they were leaving, and they didn't ask for contributions, something

extremely unusual for DXpeditions of that size. They had a web site and would from time to time announce they were in Cape Town getting equipment ready, going through emergency and arctic training, etc. They were down there while their ship was getting refurbished. It was a pretty small ship. I'm not sure I would want to cross Lake Michigan in it, let alone endure the terrible conditions in Antarctic waters.

Well, a little over a week ago they announced they were leaving for Bouvet. There was a site you could use to track them. Well, their luck ran out, and they ran into a typhoon. It was so bad that they were forced to turn back. They say the DXpedition has been postponed, not canceled. There has not been an announcement when they will try again. Most likely it won't be until next year. While it is warming up around here, winter is approaching down there, and the weather is not nearly as nice as it is during January through March.

Although you won't be hearing any signals out of Bouvet in April, there are a few DXpeditions of interest. VK9NI from Norfolk Island will be on, using the call VK9NI by the time you read this. They will be operating 160-17 Meters, CW, SSB, and FT8. They will focus on low band CW. They are there until April 14.

Another one that will be underway when the newsletter comes out is The Gambia in West Africa. A group of German hams will be there until April 15 using the call C5DL. 160-10 Meters, CW, SSB and digital.

Reunion Island will be activated from April 27 through May 8 with the call TO19A. They will focus on the low bands.

As usual, several one-man operations are going on this month. Because they are mostly operating between vacation activities or work commitments, operation is often sporadic. You need to be in the shack to catch them.

April is a quiet month for contests, and no big ones stand out. After working two 160M contests, two DX contests, three NAQPs, two RTTY contests, and the Wisconsin QSO Party so far this year, I am pretty contested out. So, it is time for a break. I need to do a lot of stuff outside in preparation for gardening and antenna farming anyway.

Enjoy the spring. It is going to fall on a Thursday this year.

The Computer Corner
No. 253: URLs, IPv4 and IPv6.

Stan Kaplan, WB9RQR 715 N. Dries Street Saukville, WI 53080-1664
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Our ORC Secretary Ben Evans (K9UZ) mentioned a problem he had recently with getting into a site he was supposed to have access to. It seems that the server that gives access was looking at his IPv6 address and not his IPv4 address. What is that all about?

IPv4 just means Internet Protocol Version 4. As explained in my February 08 article ("URLs and the Hosts File", Computer Corner Article #141, Feb 2008), when you want to visit a site, normally you type in the URL (Uniform Source Locator) address, such as https://www.majorgeeks.com. That address is partially letter abbreviations and partially names, and you can pretty much understand it. Many people understand it all. On the other hand, when you type in that address, your computer makes a request to a server somewhere on the web to translate that address into an IP (Internet Protocol) address. The IP address is unique, expressed in numbers, and it is what computers and smart electronic devices use to communicate with each other. The IPv4 address is always just a number like this: 208.101.7.150. Each of the four groups of numbers can be zero to 255, written in decimal and separated by a decimal point. The URL is sort of like the words Stan Kaplan, while the IP is sort of like (262) 268-1949 (my unique telephone number).

So, how can those four groups of numbers (208:101.7.150) handle all the Internet addresses in the world? They can't anymore. Those four numbers are a 32-bit (4 byte) value, so there are only 2^{32} possible addresses, or roughly 4.3 billion. We have already run out of addresses, so some time ago a new standard, IP Version 6, using 128 bits (16 bytes) was instituted. These are written in hexadecimal and are separated by colons. A valid IPv6 address might be all this between parentheses (3ffe:1900:4545:3:200:48ff:fe21:67cf). This gives us 2^{128} possible unique addresses, or about 3.4 X 10^{38} total. Someone computed that this would provide about 5,000 addresses for every square micrometer on the earth's surface, surely enough for the foreseeable future! At least it will work well until we need to provide addresses for other intelligent life forms on other worlds in addition to ours!

So, the server that Ben was trying to access wanted an IP of something like this: 3ffe:1900:4545:3:200:48ff:fe21:67cf, instead of something like this: 208.101.7.150. Basically, the server refused Ben's request to connect as an administrator and returned a 401 error.

It is a good thing these huge, hexadecimal-format IPv6 numbers can be translated to URLs employing groups of letters that are somewhat understandable to us humans!

Happy Computing.

Project of the Month©

de Gary Drasch, K9DJT

This month's project is non-technical of sorts. It pertains to, "What do we do with all those QSL cards?" I have collected a fair amount of them. Originally, I started standing them up against stuff, like the PC monitor, the edge of the radio, or books on the shelf. Some guys tape or even pin them on the wall. Others put them around the perimeter of a map or bulletin board. All methods work just fine depending on the type of shack you have. I have what Chuck, W9KR, refers to as a "nice" shack. I'm guessing he says that because I have a finished-off room, sporting carpeting, a decent desk, and bookshelves. Of course, that is all relative. At the point in which my QSL display started to tumble from their positions on a regular basis, I decided to put them all in a plastic box in alphabetical order by call signs. But when going through them, or filing newly received cards, I would tend to reminisce about many of the QSO's—what it took to make that contact. In addition to that, some of the cards are literally pieces of art. That was it. I needed to get some of them on display. But how? I didn't want to damage them in any way, and the only thing I ever saw to accomplish that was using those dreaded plastic sleeves of two across and ten down. You usually see them advertised in ham radio catalogs. I wanted something different.

QSL Card Display

Ah…Facebook to the rescue, i.e., I follow several ham radio groups on Facebook, and one day a guy in Europe showed how he displayed QSL's using miniature clothespins and some small gauge wire. I wish I could remember his call sign so that I could give him the credit he deserves. Basically, he resurrected the old darkroom days. Remember what used to be involved in developing film? The paper photos would be hung by (real) clothespins on a sturdy wire to dry. Well, we're kind of doing the same thing here with the QSL's—not drying—but instead displaying!

I was able to find the miniature clothespins at Michael's in Grafton, but I would expect to them to be found at other craft stores too. They came in bags of 50, so I bought a few of them. You'll also need a pair of small finishing nails for each wire you want to run, and of course some #22 gauge wire. I pulled my wire out of a discarded, 50 pair, telephone bundle I have in the workshop.

I used long nose pliers in order to hold the nail close to the corner of the wall while trying to hammer it. You will be drawing the wire tight between the two nails, and therefore want to be sure to strike the drywall nailing strip (2X4) with the nail. And by all means, don't forget to put an adequate number of clothespins on the wire before tying it off. I actually measured my wall

space in inches, divided it by 5-1/2 inches, and multiplied by two, to determine the number of clothespins needed. Snip the excess wire off and you're ready to start selecting the cards you want to display. The other neat thing about this system is that as you acquire more cards, you can change them at will.

My goal is to make this column everyone's column. Share your projects with the club. You may write up your own description of what you did, or call me and explain the project and I'll write it up. Of course, pictures are a must. Anything relating to ham radio is welcome. Have you built a kit, home-brewed an accessory, reconfigured your operating table, solved an RFI problem, or installed a new or additional antenna? Give me a call at 262-707-4279. I look forward to hearing from you.

73, Gary,K9DJT

Vintage Amateur Radio

de Bill Shadid, W9MXQ

I am going to jump out of order within the history of a manufacturer this month – beginning in the middle of the company's time in the ham radio business. We are going to cover one of the most successful pair of transceivers in ham radio history – made at the pinnacle of operations for Swan Electronics of Oceanside, California. Any ham around in the 1960's and 1970's knows and remembers Swan, one of the dominant ham radio manufacturers. They remain with us to this day as the current and successful, Cubic Corporation.

As a young ham in the 1960's, I had a keen interest in the Swan 350 and 500 series transceivers. This month we will look at the genealogy of these two much related transceivers. Let's move back to the times when main stream ham radio technology was just beginning to incorporate some solid-state circuity. Swan's engineering department was moving along, like Drake and Hallicrafters, to take sections of established tube designs (VFO's, carrier oscillators, i-f stages) and moving them to solid-state circuitry. Here are the last versions of the original design 350 and 500 transceivers that are part of the W9MXQ collection of vintage ham radio equipment:

Swan 350c HF Transceiver with 117xc Speaker/PS
(Shown with Turner 454C Microphone)

Swan 500cx HF Transceiver with 117xc Speaker/PS and 508 VFO
(Shown with Turner 254C Microphone and Johnson Speed-X Key)

The Swan 350 Transceiver was introduced in 1964 as a deluxe HF Transceiver to replace Swan's previous lines of single band transceivers (SW-175, SW-140, SW-120, and SW-115 – 75, 40, 20 and 15 meters, respectively) and single tri-band transceiver (SW-240 with 80, 40 and 20 meters). The single band units were essentially SSB Transceivers – with no way to even switch sidebands. The triband SW-240 did offer both CW and AM to their SSB focused design. Swan never made radios that did not include single sideband.

As originally released – here is the Swan 350 Transceiver:

Swan 350 as originally released in 1964

Looking at the 350 Transceiver you can see a nice looking anodized and screen panel (the same paint system used by Drake and a few others) to give a nice appearance in keeping with

design at the time. Swan, who had based their marketing on performance with few thrills, did not offer extra features on the radio. Note that there was no standard selectable sideband (an add-on kit was marketed for that) and no crystal calibrator (another add-on kit). The radio offered SSB and CW modes. It also offered AM but only as a carrier inserted into the SSB signal. Unlike the Drake TR-4, there was no AM detector so the SSB receiver section was also used for AM. CW was possible but as in the Drake TR-3 and TR-4, there was no separate receiver tuning (RIT) to make listening more comfortable. Like Drake and Collins – CW was an afterthought. Swan did not even offer a CW sidetone in the 350.

In 1967, Swan added the more feature-rich, model 500 Transceiver to their lineup. Here is the Swan 500:

Swan 500 as originally released in 1967

Apparently, sales of the options to add selectable sideband and a crystal calibrator on the 350 were strong. Or perhaps customer feedback was telling Swan that a more complete transceiver was desired. Thus the 500 came to the market.

Both the 350 and 500 used 6HF5 final amplifier sweep tubes in matched pairs. In fact, the 350 and 500 shared many, if not most, circuitry and mechanical components. The 500 added such niceties as an Automatic Noise Limiter (ANL), Selectable Sideband, a 100kHz Calibrator, and CW sidetone to the standard features offered to the buyer of the 350 model.

It is interesting to note that while the power amplifier circuitry and power supply were the same for the Swan 350 and Swan 500, they had different power specifications. Remember that in those days, radios were shown with power input specifications. They did not show power output specifications. For comparisons I have added expected power output information to the chart, below:

Swan Model	Mode	Power Input (Watts)	Power Output (Watts)
350	SSB	400	200
	CW	320	160
	AM	125 (Carrier)	60 (Carrier)
500	SSB	480	240
	CW	360	180
	AM	125 (Carrier)	60 (Carrier)

In 1968, Swan made some significant upgrades to the two flagship models. Conversion schemes were changed to correct older issues with VFO stability. To designate this change,

most post-update models of Swan radios added a suffix of “c” to the models. So, the Swan 350 became the Swan 350c and the Swan 500 became the Swan 500c. In addition to the incorporation of improved stability, Swan upgraded the power amplifier tubes in the 350c and the 500c and changed to the more robust 6LQ6 final amplifier sweep tubes in matched pairs. Later versions of both of the “c” version transceivers moved to a solid-state carrier oscillator for even more stability.

The net result – in power amplifier power – of the upgrade to the 6LQ6 final amplifier can be seen in the chart below that shows the increased input and output but also that Swan abandoned the idea of making the 500c look more powerful than the identical amplifier in the lower cost 350c.

Swan Model	Mode	Power Input (Watts)	Power Output (Watts)
350c	SSB	520	260
	CW	360	180
	AM	125 (Carrier)	60 (Carrier)
500c	SSB	520	260
	CW	360	180
	AM	125 (Carrier)	60 (Carrier)

The Model 350c retained the spartan offering of the 350 with no selectable sideband, no crystal calibrator, no noise limiter, and no sidetone for CW. It did, however, provide the most power for the lowest cost in the industry.

As we talk about powerful transceivers of the day, it must be remembered that average talk power from these radios may not have equaled what we see today with fully equalized and compressed transmit audio for today’s sophisticated 100-watt radios. The Drake TR-3 and TR-4, the Swan radios in this article, the Galaxy Transceivers, the British KW Transceivers, and the National NCX-500 lacked the overhead in their power amplifiers to use relatively high levels of compression and other means to increase talk power.

Another change came in 1970, when Swan responded to Incentive Licensing and license privileges tied to license class. Now the HF bands were divided into separate areas for Novice, General, Advanced, and Extra Class licensees. Before that, the bands were divided into Novice and then identical frequency privileges for General, Advanced, and Extra Class licensees. These involved some divisions requiring a crystal calibrator on multiples of 25 kHz, rather than the long traditional 100 kHz. Swan used that change to be part of the justification of the newer Model 500cx HF Transceiver. The 500cx looks nearly identical to the 500c but includes a selectable 100 or 25 kHz calibrator, general stability improvements at the component level, and a very much improved CW monitor.

At the time of the release of the 500cx, Swan had seen fit to squeeze another 30 watts input on SSB out of the hard working 6LQ6 final amplifier tubes as you can see here:

Swan Model	Mode	Power Input (Watts)	Power Output (Watts)
500cx	SSB	550	275
	CW	360	180
	AM	125 (Carrier)	60 (Carrier)

By this time, the place for the economical 350c had run its course on the premium market for Swan – and it was discontinued. Not to be left out, however, because about that time along came the Swan 260 and deluxe version Swan 270 Cygnet Transceivers. They were 260-watt input SSB Transceivers using a single 6LQ6 final amplifier – and came with an internal AC Power Supply that offered a truly cost reduced product to attract entry level ham radio operators.

Swan offered many accessories for the 350, 500, 350c, 500c, and 500cx models. While not a subject for this article, Swan was also very successful in the VHF market with two SSB/CW/AM transceivers for 6-meters and even 2-meter FM Transceivers.

The accessories for the transceivers in this article include two linear amplifiers for which I have little information. They were the Swan Mark I and the Swan Mark II, as shown here in these pictures:

Swan Mark I HF Linear Amplifier
(with built-in AC Power Supply)

Swan Mark II HF Linear Amplifier
(shown with separate Power Supply)

The Mark I used a pair of Eimac 3-400z triodes. The Mark II changed to using Eimac 3-500z triodes in the final amplifier. You can see that the two amplifiers were configured differently and represented a complete re-design. Unlike some amplifiers of the time, the design of the Mark I allowed for installation to replace the now impossible to replace 3-400z tubes. Both amplifiers lacked a tuned input circuit so are somewhat difficult to use with today's solid-state exciters.

Swan offered a variety of External VFO units for the 350 and 500 transceivers and separate offerings for the 350c and 500c. The later units had to be changed due to Swan's change of conversion frequencies in the "c" model radios. You can see the last of these VFO's in the picture on the first page of this article – pictured next to the W9MXQ Swan 500cx station. This is the model 508 that includes all necessary switching for using the transceiver's internal VFO, or the 508 external VFO, or a split between the two.

The 508 External VFO was a great improvement in implementation because the previous units did not include any way to switch the VFO into the circuit. That was accomplished by a plug-in accessory (Swan Model 22 Adapter) that was installed using the rear panel External VFO socket. The Model 22 cabinet extended to be just above the radio and the user would reach to the back side of the transceiver to access a switch to allow operation from the Transceiver VFO, the External VFO, or a split between the two.

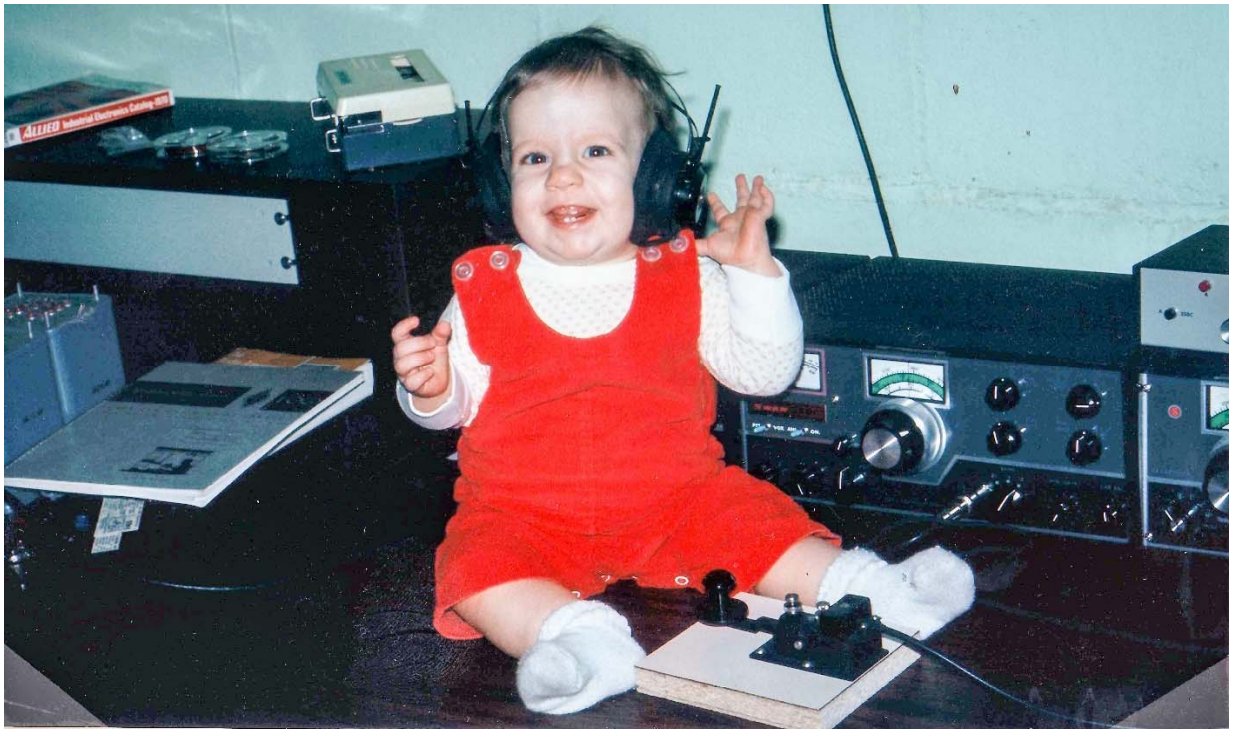
Many hams at the time would build their own switching for the External VFO. Below is my own 1970 vintage station, in Quincy, Illinois, when I was WA9MXQ:

Here is a 1970 Vintage Swan Station at W9MXQ (then WA9MXQ)

You can see, left to right, the Swan 117xc Power Supply/Speaker Console, the Swan 350c Transceiver, and the Swan 410c External VFO. Sitting on top of the VFO is the homebrew switch box that allowed VFO A (Transceiver), split with VFO A on Receive and VFO B on Transmit, or VFO B (External VFO). Also, in that picture – to the right, bottom to top, are a home brew 500-watt antenna tuner, a home brew SWR Bridge/Power Meter, and a home brew Audio Speech Processor. Also shown are a US Navy surplus Morse key and a Turner 254C Microphone. The key and microphone are still with me. I can only wish the home brew items were still part of my station. Incidentally, look carefully at the Swan 350c, above, and compare it to the one on the first page of this article. In the picture from 1970, notice just under the "Swan 350c" nameplate (below the meter) that I had added switches for VOX/PTT selection and an on off switch for ANL (Automatic Noise Limiter). I copied the circuitry from the Swan 500c and added that to my radio. Also, I added a 100kHz Crystal Calibrator to my Swan 350c.

The Model 410c External VFO was a modification of the original Model 410 External VFO that worked with the original 350 and 500 (not "c") radios. They looked very much like the Model 508 VFO that I use now, except that the Model 508 includes the features of the Model 22 Adapter – no more need to home brew that feature!

As a proud father, I would be remiss in not showing you the other picture that I snapped the same day as the one above. This is our daughter, Bonnie, as she was making a visit to the basement shack, back in 1970. She is now a lawyer plying the floors of the Illinois General Assembly and is the former N9OIE . . .



This is Bonnie, sitting at that same Vintage Swan Station. See the home brew VFO Adapter on top of the 410c VFO, and check out the Trimm Headphones on that ham radio debutant's head. Also in view are the vintage Sony Reel Tape Player/Recorder, an ARRL Log Book (sitting on top of a 1969 ARRL Handbook), an Allied Radio Catalog, and a pair of HV Transformers soon to be included in a home brew linear amplifier using a pair of 833A Triodes. The Sony Tape Recorder is sitting on an Ampex Reel to Reel Console (absent the Ampex machine!!). The Log Book and the Handbook are still here at W9MXQ, the key remains here, and ex-N9OIE is here several times a year. The 833A Linear Amplifier, at last report, is still in operation and still says, "Contempora Seventy" (my home brew equipment "brand") on its front panel.

Okay, so I drifted off a bit – but these articles are about nostalgia, are they not?

Swan marketed a lot of other accessories with Phone Patches, Antenna Tuners, Antennas (mobile and fixed station), AC and DX Power Supplies, Noise Limiters, Noise Blankers, and other transceivers in the mix. Swan even made a line of separate receivers and a transmitter. Other Swan products will be the subject of a future article or maybe a few articles.

At the time of these products' heyday, the ham radio industry was in a power race that ran to the point where Swan had a version of the 500cx, called the 700cx, with 700 watts PEP SSB input power. It is interesting to check the competition at the time. Swan always led the pack in maximum power. But, the others played in the game as well with Drake, Galaxy, Hallicrafters, KW Electronics, and National in the game along with Swan to see who could get the most power out of a table top, single box (plus power supply) cabinet. For a look at the contenders, check this group of pictures from the time of the Swan transceivers in this month's article:

Swan 500cx *
(550 Watts PEP)

Drake TR-4 *
(300 Watts PEP)

Galaxy GT-550
(550 Watts PEP)

Hallicrafters SR-400 *
(400 Watts PEP)

National NCX-500 **
(500 Watts PEP)

KW Atlanta
(500 Watts PEP)

Three of the above are in the W9MXQ collection right now (*). One of them (**) lives here in an earlier version (the NCX-200). But, all of them have been here at one time or another. How many of these do you remember? These were fine radios. I add these comments about them (strictly from personal experience, mind you):

1. Best and most robust construction – the Hallicrafters SR-400.
2. Best receiver – the Hallicrafters SR-400. (Also, most expensive.)
3. Best able to run at high power for long periods of time – the Swan 500cx.
4. Best mechanical/tactile “feel” to operate – the Swan 500cx.
5. Most exotic – the KW Atlanta.
6. Most nostalgic – the National NCX-500.
7. Most successful – the Drake TR-4.
8. Most design generations – the Galaxy GT-550.

Swan enjoyed a wide following and once dominated the ham radio marketplace.

Special thanks go to Bob, W9DYQ, for his proof-reading. I appreciate that you read my articles. Remember that I am open to questions and comments at my email address, W9MXQ@TWC.com.

W9MXQ

UPCOMING EVENTS

Membership Meeting – April 10, 2019

ORC Monthly Programs

April – Peter Chow W0NG – Assembling a Go-Kit

May – Gary Sutcliffe W9XT – Construction Techniques for Electronics Projects

Volunteers Needed for Monthly Programs

The monthly program is the highlight of the Ozaukee Radio Club meeting. We are fortunate to have a number of very talented people in our club, many of whom have shared their knowledge through a presentation. Share your expertise and experience with the club. Programs can be on any topic that is ham radio related. Contact Pat Volkmann W9JI at w9ji@arrl.net to discuss your idea for a program.

New "Home-Brew Night" at August meeting

At the January meeting, there was some discussion on the monthly program. A suggestion was made by Peter Chow, W0NG that we try a "Home-Brew Night." The suggestion met with approval so we are going to give it a try at the August meeting.

This will be a chance to show off something that you have built. It can be anything radio-related. You can bring your project in to show it off or just bring a couple of pictures and talk about it. There is plenty of time until the August meeting, so you can start building something if you don't already have a project on the shelf.

A reminder to members to renew that license…

W9FAD (expires 4/21/2019)

Ozaukee Radio Club

March 13, 2019 Meeting Minutes

de Ben Evans (K9UZ), Secretary

President Kevin Steers (K9VIN) called the meeting to order at 7:31 PM. All the attendees introduced themselves.

Announcements, Show-and-Tell, Bragging Rights:

Ken B. (W9GA): Be sure to fill out and return ballots for Ham of the Year and Turkey of the Year.

Jim A. (K9QLP): Ron Yokes (W9BCK) was on the Net last night. Jim recently saw Ron and he's doing very well. Ron would very much like to see more people he knows from the club. He's living at Lincoln Villages in Port Washington, behind the Culver's. The best visiting hours for him in the morning and afternoon are 9-11:30 AM and 1-4:30 PM.

Dave C. (KC9REP): Dave had a health setback last month but is on the road to a complete recovery. His son, who is 20 years old, will this year be renewing his ham license for the first time.

Gary D. (K9DJT): Gary is writing another book about ham radio and he'd like people to send him photos of simple HF shacks.

Mike H. (KD9GCN): There was a lot of island radio traffic a couple weeks ago.

Program:
Bill S. (W9MXQ): Bill gave a presentation about the radios that he had collected during the 55 years of being a ham.

50/50 Drawing:
The winner of the 50/50 drawing was Peter C. (W0NG).

Auction:
Stan (WB9RQR) conducted the auction. Many items were sold, including a 12-volt fan plus power supply, a bucket of power supplies, an SWR/Field Strength meter, and a box of connectors.

Officer Reports:
Kevin S. (K9VIN) President – The Wisconsin QSO Party was last Sunday. He reports that 20M mobile wasn't good. Gary S. (W9XT) and Bill S. (W9MXQ) reminded those who made contacts to send their logs in under the name of ORC.

Kevin asked for a report on the club's shed. Nels (WA9JOB) reported that the farm where the shed is located has been sold. The rent for the shed is paid up to October 15th of this year, so we have until then to move our stuff out and arrange for storage at another site. Currently we have two trailers at this shed. The rent was $200 per year.

Pat V. (W9JI), 1st VP – No report.

Tom T. (KC9ONY), Repeater VP – The 2-meter repeater amplifier wasn't working, so Tom and Nels bypassed it to keep the repeater going. It seemed to work well during the Net. The Mequon site is still down. Nels is working on a refurbishing of that system. Naomi B. (KC9YES) thanked the ORC for allowing OZARES to use the repeater as a backup for the times when the OZARES repeater had failed.

Ben E. (K9UZ), Secretary – The minutes from the February meeting are in the newsletter. Motion to accept the minutes was made by Stan (WB9RQR), seconded by Robert (K4WTH) and approved by the members.

Robert E. (K4WTH) – The profit and loss report for February was passed out to members at the meeting and also had been emailed. A motion to accept the Treasurer's report was made by Stan (WB9RQR), seconded by Todd (N9DRY) and passed by the members. Dues for 2019 are due March 31st. Also, Robert is looking to update members' information for the new ORC roster. He has 76 members that he wants to confirm the information for, so please help him out. Also, if there are any open projects that involve club expenses, give Robert those dollar amounts.

Committee Reports:
There were no committee reports.

Old Business:
There was no old business.

New Business:
Tom T. (KC9ONY): WWV will be running special event stations September 28th through October 2nd for WWV's 100th anniversary. They are in need of operators for the event. Go to wwv100.com to get an application and for details on the event. Applications are due the end of April.

Robert (K4WTH): We need a representative from the club to man a table at this year's HRO Superfest. Also need to reserve the table. Kevin will go to HRO to inquire.

Kevin (K9VIN): There was a gathering of representatives from local ham radio clubs on Saturday, March 9th at HRO. Tom (KC9ONY) and Robert (K4WTH) attended. The focus of the meeting was to kick off a discussion of the state of ham radio and how to generate more interest and participation, and how to promote the clubs.

A lengthy discussion followed about what has been done and what could be done in the future to get young people interested in ham radio. One idea was for club members to reach out to high school and grade school classes to talk about ham radio and demonstrate the hobby. This ties in with Tom W9IPR's initiative to direct scholarship money to local school STEM programs. No action by the members was taken on this subject.

Adjournment:
A motion to adjourn was made by Stan (WB9RQR), seconded by Nels (WA9JOB) and approved by the members. The meeting was adjourned at 9:20 PM.

Attendance:
There were 39 members and three guests present at the meeting.

A copy of the attendance sheet is available upon request in PDF format. Please contact Ben Evans via email at ben@evansengsolutions.com for a copy.

Respectfully submitted,

B. Benjamin Evans, K9UZ
Secretary

ORC Meeting Agenda

April 10, 2019

1. 7:00 – 7:30 PM – Network & Rag Chew
2. Call to Order – Kevin Steers (K9VIN)
3. Introductions
4. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.
5. Program: Peter Chow, W0NG – Assembling a Go-Kit
6. Fellowship Break
7. 50/50 Drawing
8. Auction – Stan Kaplan (WB9RQR)
9. President's Update – Kevin Steers (K9VIN)
10. 1st VP Report – Pat Volkmann (W9JI)
11. Repeater VP Report – Tom Trethewey (KC9ONY)
12. Secretary's Report – Ben Evans (K9UZ)
13. Treasurer's Report – Robert Eskola (K4WTH)
14. Committee Reports:
    A. Spring Swapfest
    B. Other
15. OLD BUSINESS
16. NEW BUSINESS
17. Adjournment to ?

Return undeliverable copies to:

The ORC Newsletter
465 Beechwood Drive
Cedarburg WI 53012

First Class

Next ORC Meeting:

Grafton Multipurpose Senior Center

1665 7th Avenue, Grafton, WI
Wednesday, March 13th, 2019

7:00 PM – Doors Open

7:30 PM – Meeting Begins

The ORC Newsletter

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Web site: www.ozaukeeradioclub.org **Facebook: facebook.com/orcwi**

Volume XXXI	May, 2019	Number 5

From the President

de Kevin Steers (K9VIN)

Welcome to spring in Wisconsin. I am looking forward to the ORC Swapfest and hope to see you all there. I will be there Friday noon, and could use help in setting up the vendor stalls.

Well, I finally have had some luck on 2 meters on my drive up north on Friday evenings. One evening, I passed another ham and motioned 146.52 to him, and low and behold, about 10 minutes later, he joined me on simplex for a 20-minute QSO (his wife needed to find his mic under the seat). More recently, about 50 miles south of Green Bay, I was not only able to hit the 147.12 repeater (antenna is up 600+ feet) and had a pleasant QSO with a bus driver killing time waiting for his Wausau track meet to end. What are *you* doing to drive 2-meter traffic?

My HF antenna on the car has challenges most of the winter, and I think I found the problem. There is an aluminum 90-degree PL-259 elbow at the bottom of my setup, and it hits concrete occasionally when aprons are steep. Well, it recently disintegrated from all the salt and water that got under my coax wrap. I am now looking for a steel PL-259 that will do a better job of sealing out the elements. Now it works like magic every time I press the tune button. I recently had a mobile contact with Madrid, and I am certain it was because of the other guy's stellar antenna and power, certainly not mine!

I picked up a dual-receive mobile rig at a recent ORC auction, and will be trying to use it as a cross-band repeater to see if I can simply use an HT on my pontoon to hit the house, and have the signal re-broadcast to a local repeater in northern Wisconsin. Then I can focus my attention on toying with HF on the pontoon. Maritime Mobile /MM!

Last note, please think about options for a replacement for our shed. We are losing three stalls of storage for trailers, and we are desperately seeking a new home for that field day equipment. Consider any empty garage space you may currently have.

Get on the Air!

Cheers and 73, K9VIN
Kevin

Silent Key: Robert (Bob) Krubsack, WQ9N

Bob was one of the very early members of the Ozaukee Radio Club and continued as a member after he moved to Brookfield. He was part of that era of Bob Truscott, Gary Sharbuno, Sus Musashi, Dave Knaus, Dick Scarvaci, Hal Geise, Roger Zaun, Tom Oehler and Leon Rediske, all of whom were instrumental in shaping the ORC into what it is today.

Bob passed away at age 88 due to complications of cancer. He was a graduate of Lutheran High and UW-Milwaukee. He retired after 35 years as an electrical engineer at Wisconsin Electric.

Beyond his amateur radio activities Bob was a volunteer at Habitat for Humanity, Meals on Wheels, Elmbrook Hospital, Lindenwood Farms and his church.

DX'ing & Contesting - New digital mode! FT4!

De Gary Sutcliffe (W9XT)

Well, just when you figured out FT8, a new one comes out. Joe Taylor, K1JT, along with K9AN and G4WJS, are at it again, this time with FT4. FT8 has been a boon for making contacts when conditions are unable to support traditional CW or SSB contacts. It has opened the door to successful DX'ing for hams with minimal stations.

It is not uncommon to work stations close to 20 dB below the noise with FT8. With JT65 I have worked moon bounce stations with signals approaching 30 dB below the noise. You might be able to detect a signal by ear at around -12 dB, and a few very good ops can copy slow CW down to about -10 dB, so you can see that run-of-the- mill FT8 signals are very, very weak. One of the ways this is accomplished is by low signal rates and long transmission periods, along with accurate timing and short, fixed format exchanges and forward error correction techniques.

These techniques are okay for casual contacts and picking up new DXCC countries. What didn't work so well with FT8 was its use in contests when you want to make contacts quickly. The long transmission periods meant low rates. FT8 was allowed in a recent RTTY contest. Although preliminary indications showed more ops were using FT8 than RTTY, RTTY operators had much higher scores because they could work stations faster, and thus make more contacts. FT4 is designed for contesting. It fixes some of the issues that hindered FT8 in contests.

The transmission time sequence for FT4 is 6 seconds compared to 15 for FT8. It uses 4-tone frequency shift keying. The bandwidth is only 90 HZ, less than the 500 Hz or so for FT8. It is

much less than the 2 KHz or so bandwidth of conventional RTTY. The downside is that the shorter period means that it won't dig into the noise as far. Still, it will be about 10 dB better than conventional RTTY, helping smaller stations. The narrow bandwidth will also help smaller stations because the band won't be dominated by a relatively small number of big guns. All in all, it should be possible to make around 100 QSO/hour under the right conditions with FT4.

A beta version was released on April 29. I installed a copy that night and found some other stations running it on 14.080. I made a couple of contacts. Since I am used to 15 second transmission periods, it was kind of weird to see the QSOs completed so quickly. One thing I noticed was that when I heard a station calling CQ and double clicked on his call, I had to call him a few times before he came back to me, even though no one else was calling. I'm sure that will be fixed by the time of general release in the middle of July.
I'm sure this is going to be a lot of fun in contests. It may also become a partial replacement for FT8 in casual operation. It will be a tradeoff between ops who want to make a lot of contacts versus work weak ones.

If you are interested in testing FT4, you can download a copy from the WSJT-X site. Since it is a pre-release version, I put it in a directory separate from the last general release. Practice "contest" sessions for FT4 are scheduled for May 9, May 14 and June 5 at 0100 UTC on 7.090. Before trying it on the air, read the info at http://physics.princeton.edu/pulsar/k1jt/FT4_Protocol.pdf. K1JT also gave a talk at a radio club recently where he talked about FT4 and some other interesting things. You can view it at https://www.youtube.com/watch?v=2Pd7zB40xdY. It is well worth watching even if you are not interested in getting on FT4.

May is not a big contest month. The one big one is the CQ WPX contest. It starts at 0000 UTC on May 25 (7:00 PM Friday, May 24 local time) and ends 48 hours later. Single ops can only operate 36 hours. You send the signal report and a serial number. The multipliers are the call sign prefixes, like W9, WA9, WB9, K9, KA9, KB9, etc. There are a lot of them so don't spend much time trying to work a strange one. There are plenty of common ones that are worth just as much. QSO points depend on if the QSO is between stations in the same country, different countries on the same continent, or separate continents. It also depends on the band. Check out the rules at https://www.cqwpx.com/rules.htm for full details. This can be a fun contest, but I have a hard time spending a lot of time on the radio on a holiday weekend at the start of the summer season.

Another interesting May operating event is Armed Forces Day. This event allows hams to contact military stations. The military stations will transmit on frequencies outside the ham bands. We, of course, must stay inside our bands. Armed Forces Day is May 18, but the radio event will be held on May 11 to avoid the Hamvention®. You can get a list of the military stations on the air at http://www.usarmymars.org/events/armed-forces-day. They will announce what frequency they will be listening to.

DXpeditions are a bit light this month too. The Maldives in the Indian Ocean will be activated by a pair of Japanese hams using separate 8Q7 calls May 7-10. They plan on using CW and FT8 on 160-8M.

Several single op efforts are often part of a vacation or business trip, and operation is often sporadic. I usually don't go into detail on them for that reason.
During May, we get some interesting propagation over the pole to Asiatic Russian and a number of the former Russian republics on 20 meters. I spent many fun nights on CW working one station after another. It would start at around 10:00 PM or so local time and would sometimes last

well after midnight. There seemed to be an unending supply of stations waiting in line to work me. But, alas, that was at times when we had sunspots, so it has been a few years since I did this. Well, FT8 to the rescue! I have been on a couple of nights recently and had the same thing happen, but with FT8 and its ability to open bands closed to other modes. I worked one Asiatic Russian station after another, along with a few Kazakhstan and some other former Russian republics. Even with FT8, the openings don't happen every night but check the band once in a while, and you might hit a good night.

The other big thing in May is when the spring sporadic E (Es) season starts. This allows QSOs on 6 meters to go out to about 1200 miles. Es does not require sunspots to occur. Sometimes there will be multi-hop conditions, and it is possible to work into South America and Europe. Signals can be strong on single hops, but multi-hop paths can be weak and short lived. The different Es patches must line up just right for it to happen. W9GA compares them to a multiple ball pool shot.

FT8 makes it much more possible to work the multi-hop QSOs. I originally got on FT8 to work new countries on 6M. I had been stuck at about 50 countries since the early 2000s, the last time we had enough sunspots to support F2 propagation on the band. I hoped this might be my shot to complete DXCC on the band. Last year I worked 19 different countries on 6M with low power and a small three element beam. I'm looking forward to picking up some more this spring.

If you don't have 6M, you can also do it on 10M. That band will be open more often than 6M. If you are chasing WAS on the band, this will be a good place to start. If the band opens up well, drop down to CW and SSB. You will be able to work stations faster along with rag chew contacts.

So, even without a lot of DXpeditions and contests, there is a lot to try out this month.

See you on the air.

THE COMPUTER CORNER - No. 254: IPv4 and IPv6 (revisited)

Stan Kaplan, WB9RQR 715 N. Dries Street Saukville, WI 53080-1664
(262) 268-1949 wb9rqr@att.net *and Ben Evans, K9UZ, Secretary, Ozaukee Radio Club*

Last month, our ORC Secretary Ben Evans (K9UZ) mentioned a problem he had recently with getting into a site he was supposed to have access to. It seems that the server that gives access was looking at his IPv6 address and not his IPv4 address. It turned out that server wanted an IP something like this: 198:103:99:16:33:100:17:3, an IPv6 number. Instead, the server got an IPv4 address, like 208.101.7.150. Basically, his computer just gave the wrong address to the server. Ben did some additional research and sent me the following in a recent email. This clears it up, partially, and gives us all a way to check our IPv6 connection (see below). Thanks, Ben, for the extra work. You deserve the by-line I have added for you.

Stan: Earlier this week, I was again prevented from accessing the administrator part of our ORC website because something changed my IPv6 address. Brian (N9LOO) suggested disabling IPv6 connections, which I did, and my connection was immediately restored.

I researched this problem as much as time allowed, and apparently IT administrators have run into internet connectivity problems ever since IPv6 began to be used. Their short-term solution is to disable IPv6 on their computers, just as I did on mine.

I don't know who or what is to blame. Microsoft Windows? My router? My ISP (which is Spectrum)? Or maybe the webhost?

Apparently, the computer user that uses the internet only to browse is unaffected. I should add that Microsoft discourages Windows computer users from outright disabling IPv6 connections because doing so might cause certain components of Windows not to function properly in addition to losing access to websites that use only IPv6. Microsoft prefers that you download a fix from their website which tells your computer to "prefer IPv4 over IPv6". You can test your IPv6 connectivity and check your IPv6 address (if you have one) by going to this website: https://test-ipv6.com/.

Although most of us have dynamic IP addresses for the old Version 4 protocol, it sometimes happens that they don't change very often. My IPv4 address has been the same since I took over the club website administrator duties, 15 months ago. However, IPv6 addresses change regularly, as this evidently is a privacy feature of the new protocol. But what website administrator wants his/her connection to the webhost server to be constantly interrupted by IPv6 address changes? This requires changing the IP address specified in the administrator directory in order to maintain access to the administrator part of the website.

Before IPv6 takes over completely, although it may not get there for some years, we can only hope administrators get useful guidance from someone, anyone (be it Microsoft, our ISP or our webhost) to keep us connected.--Ben

---

Happy Computing.

Vintage Amateur Radios

de Bill Shadid, W9MXQ

This month we are moving back to a classic brand in ham radio through the early 1980's, the R. L. Drake Company of Miamisburg, Ohio. Drake, widely known for the very popular R-4 and T-4X series separate receivers and transmitters and perhaps even more so for the TR-3 and TR-4 series Transceivers. We have covered those models in earlier columns[1]. This month I want to talk about one of Drake's last high frequency transceivers and their first one using all solid-state circuitry. This would be the very popular model TR7.

The TR7 was rather revolutionary in appearance back at the time of its introduction in 1977. It had clean lines, an uncomplicated front panel, and all solid-state design with a very durable final amplifier. Compared it to its competition, the TR7 was a step in a new direction:

Drake TR-7 Transceiver

(One of two working TR7s – plus a TR7A – in the W9MXQ Collection)

Drake was well known not only for its receivers, transmitters, and transceivers but also for a fine line of accessories to complement their radios and those of other manufacturers as well. Drake's Linear Amplifiers – like the L-4 and L-4B models – were known for being some of the best in the industry. They also offered a line of Antenna Tuners – like the MN-4, the MN-4C, and the MN-2000. As you have seen in earlier installments about Drake equipment[1], these accessories also included Dummy Loads, and Remote Antenna Switches. Drake even entered the VHF and UHF-FM transceiver market with their own designs as well as equipment from partner in Japan. Some of you may remember such radios from Trio (Kenwood) (TR-22. TR-22C, TR-33C, and TR-72) and Marker Luxury (ML-1).

Drake marketed a complete line of accessories to match their new solid-state TR7 Transceiver. They duplicated the accessories they manufactured in the days of the R-4 Series Receivers, The T-4X series transmitters, and the TR-3 / TR-4 / TR-4C series transceivers. Here is a look at a fully equipped Drake TR7 station that is typical of the late 1970's and early 1980's. This station is in regular operation, today, at W9MXQ:

Drake TR7 Line Station with Accessories
Left to Right – MN-2700 Antenna Matching Network, TR7 Transceiver, RV7 External VFO, and Drake L7 Linear Amplifier
Also Shown Left to Right – P75 Phone Patch, WH7 Wattmeter, MS7 Speaker SP75 Speech Processor – along with 7077 Desk Microphone (W9MXQ Collection)

Not shown above in the complete station picture are other accessories that complimented or replaced what is shown. The 300-watt Drake MN75 Antenna Matching Network was an alternative to the 2,000-watt MN2700. The 1,000-watt Drake L75 Linear Amplifier (with an internal AC Power Supply) was an alternative to the 2,000-watt L7 (that had a floor mounted AC Power Supply). Drake also marketed a PLL based, external VFO called the RV75 that was a step ahead of the RV7 in stability. See pictures, below:

Other Drake Accessories:

- **Upper Left: Drake L75 Antenna Matching Network**
- **Above: Drake L75 Linear Amplifier**
- **Left: Drake RV75 External VFO**

Going back a bit, now, by the mid-1970's the domestic (USA) manufacturers were getting concerned about the move to all solid-state radios – at least in the concept. By that time, Swan/Cubic, Drake and Heathkit were the market leaders. Collins was playing along with successful, if dated, designs. At that time, I was a Drake user with a new R-4C Receiver and T-4XC Transmitter. But those radios were aging in design – even though the much touted (to this day) R-4C Receiver a mostly solid-state design and very competitive. In the mid-1970's, Drake was working hard to replace its aging TR-4 series transceivers. The Drake TR-4C, the last model series of that transceiver, did not share the advanced design of the separate R-4C and T-4XC radios. Drake was fast losing market share to more modern designs from other manufacturers.

The TR-4C series was a mostly vacuum tube design with the only real significant move being the change from a vacuum tube permeably tuned VFO in the TR-3 to the more modern and stable solid-state version in the TR-4 line. To be sure, Drake was trying to keep the TR-4 competitive as they came out with a version (TR-4CW) that added a switchable CW Filter, and later a version (TR4CW/RIT) that added Receiver Incremental Tuning to make operating more convenient.
Drake was seeing significant “feature competition” from the Japanese products coming from Kenwood, Yaesu, and soon from Icom. The result was a revolutionary design – the concepts of which are with us to this day from many manufacturers.

The step to a complete solid-state design was fraught with risk, or so Drake thought. Fears of problematic and/or failed designs that had already been seen on the market from others were in front of Drake’s management. Drake’s engineers were heavily into vacuum tube designs and lacked the expertise to give the company’s management confidence in managing the risk of such products. Those issues were seemingly solved by hiring the Designer of the solid-state Heathkit SB-104 Transceiver from the Heath Company as well as another fellow who would later be the founder of Cincnnati Microwave (maker of the Escort Radar Detector) to lead the TR7 design[2, 3].

Drake’s TR7 final amplifier was exceptionally well designed and stood the test of time. Likewise, the matching PS7 AC Power Supply was a massive analog unit that was virtually indestructible – and very heavy. Both the TR7 and the PS7 could be equipped with the plug-in FA7 Fan unit to allow the transceiver and power supply to run full power, continuously.

The real claim fame with the TR7 was “Up Conversion” in the radio’s i-f circuit. The TR7 has a first i-f in the 40 MHz range that virtually eliminated “birdies” in the conversion process and even eliminated the old 9 MHz i-f so common in early SSB designs that were the reason that 160-80-40 meters were lower sideband and 20-15-10 meters were upper sideband. (That is, either side of a first i-f of 9 MHz, if you will.) If you ever wondered why we have the LSB and USB split the way we do, you heard the answer here! You might also credit McCoy Electronics – makers if some of the first commercially available 9 MHz center frequency Crystal I-F Filters used in very early SSB Transmitters. There will be more about the TR7 conversion scheme in a follow-up article.

As the market for the TR7 matured and the competition was increasing, Drake made a marketing decision to move to the TR7A model. There was essentially no difference from very late TR7’s and the newer TR7A – and actually, for some reason lost to time, the two were made in parallel for a time. The TR7A was a TR7 with the following options made standard equipment (as noted by WB4HFN[5]):

1. The NB7 Noise Blanker was included.
2. The SL500 500 Hz CW Filter was included.
3. A by-pass resistor was added to allow for AM operation using the Roofing Filter for bandwidth control.
4. A surge protector was added to the receiver front end to protect the radio from static charges.
5. An unused Phono Connector on the back panel was wired to provide low level audio input.

Here are a couple of pictures of the TR7 and TR7A models to show the minimal outward difference between them:

Drake TR7 HF Transceiver

(W9MXQ Collection – and like the one in the W9DYQ Collection)
(This W9MXQ TR7 is mid-production cycle – the W9DYQ TR7 is very late in the production cycle)

Drake TR7A HF Transceiver

(W9MXQ Collection)

If you noted that nothing is different besides the model number (upper right-hand corner) you would be correct. (Well, you sharp eyed readers might notice the two radios are on different bands and modes!!) For the most part – with a few exceptions, like an updated and more linear PA Pre-Driver and a redesigned Noise Blanker on later TR7's and all TR7A's. All TR7's from the first ones to the very latest TR7A's are nearly identical with those exceptions – other than standard equipment as described earlier.

It would be incorrect in these model and time comparisons (that is, TR7 compared to the TR7A or a very early TR7 to a very late TR7) not to consider that technical updates are done with any brand or model of radio without announcement. So, it is incorrect, across the board, to assume that an early serial number TR7 is the performance equivalent of a very high number TR7 or a TR7A.

As a user of several TR7's and TR7A's in my time collecting it appears correct to look for a unit perhaps several thousand into the production cycle. But, I must also say I have known users of very low serial numbers that experience no problems. Serial numbers of the TR7 do not end and restart with the TR7A. They progress as if the model never changed from one to the other. There appear to have been 10,800 to 10,900 TR7's built with another 1,400 to 1,500 TR7A's following that. So, while TR7's in general are perhaps easy to find, it may be just as true that TR7A's are a bit rare. This is according to information on the WB4HFN website[5].

At the time of the TR7's introduction the TR-4 series were certainly highly respected products in the marketplace. They may have been old school designs, but they worked very well and had a following that gave credit to the Drake name. To give you an idea of how Drake met that product challenge – that is, competing with its own existing reputation, here is a chart to show the differences in common specifications between the very popular TR-4 / TR-4C and the TR7 / TR7A:

Specification	TR-4 / TR-4C	TR7 / TR7A
RF Power Input (SSB)	300 watts PEP	250 watts PEP
RF Power Input (CW)	260 watts (Key Down)	250 watts (Key Down)
RF Power Input (AM)	100 watts (Carrier)	80 watts (Carrier)
Sensitivity	<0.5 uV for 10 dB S+N/N	<0.5 uV for 10 dB S+N/N
Frequency Coverage	80-10 Meter Ham Bands (No WARC Bands)	160-10 Meter Ham Bands (With WARC Bands) (0-30 MHz Receive Only)
Duty Cycle	Not Specified	Continuous (with FA7 Fan)
Selectivity[6]	2.1 kHz (Standard)	2300 Hz (Standard) 1800 Hz (Optional) 500 Hz (Optional) 300 Hz (Optional) 4000 Hz (Optional) 6000 Hz (Optional)

Drake changed its product nomenclature with the release of the TR7. See that there is no "dash" in the model number – that it, it is TR7, not TR-7. Drake struggled with this nomenclature internally because it is not unusual to see the old "dash" appear in Drake literature and even some advertising with the TR7 or its accessories. So, where the old model was the TR-4, the new model was the TR7. Where we would see model number MN-2000 written, we see model MN2700 in the new model. This went on throughout the model line. Also, Drake had a lower cost HF transceiver (a subject for next month) called the TR5. Drake tried in many cases to show accessories that were intended for both lines by using model numbers showing both the "7" and the "5" in the number. That gave us the RV75 External VFO, the MN75 Antenna Matching Unit, the L75 Linear Amplifier, the SP75 Speech Processor, etc. But other products intended for both lines were not so marked. That would include, for instance, the L7 Linear Amplifier that worked perfectly well with the TR7 or the TR5 Transceivers. Or, similarly, the RV7 External VFO that worked with both models. It is pretty darn confusing if you ask me! (But, alas, nobody ever did ask me!)

Next month we will do a part 2 of this story with information about:

1. More functional details on the TR7 line – including its conversion scheme.
2. Information about the TR5 Transceiver.

Special thanks go to Bob, W9DYQ[7], for his proof reading and reference to his very late production TR7. Bob is also owner of a fine set of Drake C-Line separates. I appreciate that you read my articles. Remember that I am open to questions and comments at my email address, W9MXQ@TWC.com.

Reference Notes:

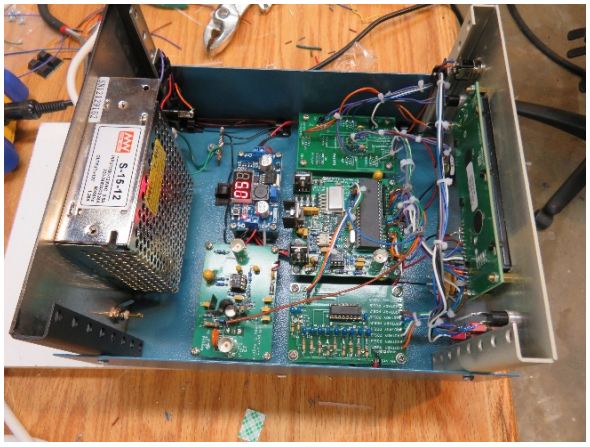
1. See previous articles in the ***Ozaukee Radio Club Newsletter*** about the Drake R-4 and T-4X (August 2018), the Drake R-4C and T-4XC (September 2018), the Drake TR3 and TR-4 (June 2018), and the one about the Drake TR-4 and TR-6 (July 2018).
2. Book Reference: ***A Family Affair, The R. L. Drake Story***, by John Loughmiller, KB9AT. ©2000 by Loughmiller.
3. A small note about John Loughmiller, KB9AT. I (W9MXQ) once Illustrated and did schematic diagrams for articles in ***Ham Radio Magazine***. In that past life I have done such documentation for articles that Loughmiller did for that magazine.
4. "Antenna Matching Network" was Drake's fancy name for Antenna Tuner.
5. http://www.wb4hfn.com/DRAKE/DrakeArticles/TR7_Comparison_Article/TR7_Idenity-03.htm
6. The TR-4 Transceiver had only the 2100 Hz filter for all modes. The TR-4CW and later TR-4CW/RIT had an added, selectable 500 Hz CW Filter. The TR7 / TR7A Transceivers allowed for the SSB Filter (2300 Hz) (Standard on all models) and any of the five other (optional) filters shown up to a total of three. There are two operating TR7 Transceivers at W9MXQ plus one TR7A. One TR7 and the TR7A have optional filters including the 1800, 500, and 4000 Hz units. The other TR7 has no options installed at this time – this unadorned TR7 is the one pictured at the opening of this article.
7. Bob, W9DYQ, and I have had a strong personal, radio, and family relationship for most of our adult lives. We collect vintage radios in tandem and openly share items that, at any one time, seem of most interest to one or the other of us. Bob, and is XYL, Deb, KAØPBV, are accomplished CW DX'ers. During our too infrequent visits together, I am sure my nonham XYL, Jean, feels she is soundly outnumbered! At least at my QTH, there are no arguments over who gets access to the radio! Adding to this closeness, my early career work was with Bob's father, Ted, the original W9DYQ. My XYL, Jean, worked with Bob's mother, Elizabeth, for many years.

Project of the Month© *DDS-VFO Project*

de Gary Drasch, K9DJT and Chuck Curran, W9KR

Our contributor this month is Chuck Curran, W9KR. He did a beautiful job in constructing a solid state VFO for his Collins KWM-1 which he describes below:

I have always enjoyed operating the older vacuum tube Ham gear from the 1950 to 1970 time period. The big drawback I was constantly facing was needing to have the gear turned on and warmed up, so that it wasn't drifting all over the place. Most of the gear required no more than 25-30 minutes to become stable, but my Gold Dust Twins would drift, especially the transmitter. It would take up to eight hours for it to calm down and stay on one frequency! That was my favorite equipment, so a solution was needed to this problem.



A discussion took place in early March during several emails on the Collins Collectors List Server. It was on several people who had made circuit boards to allow Hams to build a modern, solid state VFO that was drift free. One person mentioned was Jim Hagerty, WA1FFL, who had designed a nice VFO and sold circuit boards and parts he had bought in volume. Just Google WA1FFL and see his web site. I thought about it and then decided to build a new VFO for my Collins KWS-1 transmitter. I had to do this without modifying the KWS-1 in any way, otherwise it would become almost worthless to a true, died in the wool Collins collector. Collins made this new VFO goal very easy. All I had to do was pull out the KWS-1 VFO tube, then plug the new VFO into a BNC test jack located on the output of the original tube based VFO! Very easy with no modifications required.

The above is a picture of the completed VFO, which I completed the week of April 15th. This VFO is built on one circuit board, but since I wanted to drive vacuum tubes, needed a larger display, and wanted to cover 80-10 meters, the result was a five circuit board assembly. The resulting assembly is shown below, a few days before it was completed.

The construction effort was fun and at the end it actually worked, with a measured drift of 0.31 Hertz over a 6-hour period. That check was done with a HP 5335A Frequency Counter. I will be doing a club presentation later this year, showing all of the steps required to build this unit. In the meantime I will be using it when I don't have the time to let the original VFO warm up!

73, Chuck (W9KR)

UPCOMING EVENTS

Membership meeting – May 8, 2019

ORC Monthly Programs

May – Gary Sutcliffe W9XT – Construction Techniques for Electronics Projects

Breakfast at Jim's Grille – Saturdays at 7:00 AM

A Notice from Tom, KC9ONY

There will be a FREE Storm Spotter Training Class at HRO Milwaukee. This class is for Hams Only! No registration needed, but again for **Hams Only**.

Presented by: Milwaukee Area Skywarn Association
http://www.mke-skywarn.org/schedule.htm

Where: Ham Radio Outlet, 5710 W. Good Hope Road, Milwaukee, WI
https://www.facebook.com/HROMilwaukee

When: Saturday, May 11, 2019, 1 pm - 3 pm, including 10 - 15 minute break

Class conducted by Skip Voros WD9HAS and Gregg Schulz W9AWX. Other training events are being scheduled around the area by the National Weather Service. You can find local NWS training events here: https://www.weather.gov/mkx/spotter-schedule

Peek at the 2019 ORC Spring Swapfest

Ozaukee Radio Club
April 10, 2019 Meeting Minutes

de Ben Evans (K9UZ), Secretary

President Kevin Steers (K9VIN) called the meeting to order at 7:36 PM. All the attendees introduced themselves.

Announcements, Show-and-Tell, Bragging Rights:
Bill S. (W9MXQ): Found a new Drake TR7A still in the box.

Jim A. (K9QLP): Contacted Tom (W9IPR) at Sun 'n' Fun on 14.245.

Kevin S. (K9VIN): While driving north on I-43, passed a ham, directed him to 146.52 and had a 20-minute QSO. The man was a friend of Leon Rediske (K9GCF/SK).

Program:
Peter C. (W0NG): Peter discussed and showed pictures of the grab-and-go ham radio kits that he put together. Peter also talked about how he converted portable gasoline generators to propane.

50/50 Drawing:
There was no 50/50 drawing.

Auction:
Stan (WB9RQR) conducted the auction. Many items were sold, including a ladder line, Cat 5 cable, a power/SWR meter, a "can-tenna", and three mag-mount antennas.

Officer Reports:
Kevin S. (K9VIN) President – Nothing to report.

Pat V. (W9JI), 1st VP – No report.

Tom T. (KC9ONY), Repeater VP – Nels, Jim and Tom checked out the Mequon receiver site. There was a bad hum in the audio, probably induced by a power supply somewhere in the shack. Nels did what he could to reduce the noise, but another visit is necessary. The Germantown site isn't working. A visit will have to be coordinated, as this site is on private property.

Ben E. (K9UZ), Secretary – The minutes from the March meeting are in the newsletter. Motion to accept the minutes was made by Bill S. (W9MXQ), seconded by Gary D. (K9DJT) and approved by the members.

Robert E. (K4WTH), Treasurer – Ben (K9UZ) gave the Treasurer's report, as Robert wasn't in attendance. Stan (WB9RQR) moved to accept the report, which was seconded by Bill S. (W9MXQ). The motion was approved by the members.

Committee Reports:
Spring Swapfest – Kristian (KC9TFP) said the swapfest plans are ongoing. Jim (K9QLP) pointed out that the next ORC meeting isn't until after the swapfest, so planning has to be completed with a meeting of volunteers if necessary.

Old Business:
There was no old business.

New Business:
Tom T. (KC9ONY): The severe weather test alert scheduled for Thursday is postponed until Friday due to a severe weather threat on Thursday. Maker Faire Milwaukee runs from September 13 through 15, 2019. It would be a good idea to have a ham radio booth there.

Adjournment:
A motion to adjourn was made by Nels (WA9JOB), seconded by Stan (WB9RQR) and approved by the members. The meeting was adjourned at 9:15 PM.

Attendance:
There were 28 members and three guests present at the meeting.

A copy of the attendance sheet is available upon request in PDF format. Please contact Ben Evans via email at ben@evansengsolutions.com for a copy.

Respectfully submitted,

B. Benjamin Evans, K9UZ
Secretary

ORC Meeting Agenda

May 8, 2019

1. 7:00 – 7:30 PM – Network & Rag Chew
2. Call to Order – Kevin Steers (K9VIN)
3. Introductions
4. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.
5. Program: Gary Sutcliffe W9XT – Construction Techniques for Electronics Projects
6. Fellowship Break
7. 50/50 Drawing
8. Auction – Stan Kaplan (WB9RQR)
9. President's Update – Kevin Steers (K9VIN)
10. 1st VP Report – Pat Volkmann (W9JI)
11. Repeater VP Report – Tom Trethewey (KC9ONY)
12. Secretary's Report – Ben Evans (K9UZ)
13. Treasurer's Report – Robert Eskola (K4WTH)
14. Committee Reports:
    A. Spring Swapfest
    B. Field Day
    C. Other
15. OLD BUSINESS
16. NEW BUSINESS
17. Adjournment to ?

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The ORC Newsletter
465 Beechwood Drive
Cedarburg WI* 53012

First Class

Next ORC Meeting:

Grafton Multipurpose Senior Center

1665 7th Avenue, Grafton, WI
Wednesday, May 8th, 2019

7:00 PM – Doors Open

7:30 PM – Meeting Begins

The ORC Newsletter

Official publication of the Ozaukee Radio Club, Inc. Email all contributions to the editor, Tom Ruhlmann, W9IPR, (phone 262-377-6945). Permission to reprint articles published in any issue is granted provided the author and the Ozaukee Radio Club Newsletter are credited.

ORC Repeaters on 146.97, 224.18 and 443.750 MHz - Callsign W9CQO
Web site: www.ozaukeeradioclub.org **Facebook: facebook.com/orcwi**

Volume XXXI	June, 2019	Number 6

From the President

de Kevin Steers (K9VIN)

Well, Folks, it is now June, and it is just feeling like spring; sure am hoping for some consistently warm days, though. Thank you to the many people that helped pull off our SwapFest. I hesitate to call out names, in fear of missing someone, but special thanks go out to Messieurs Moberg, Ruhlmann, Tretheway, Evans, Rate, and Volkmann for all of their help. See, I knew I would miss your name if you helped out!

I would like to switch up next year's Swapfest by having two or three of our most popular presentations given later in the day, and will set up a public meeting to discuss with the core nucleus of players. We need to choose the presentation sooner than later, so we can advertise. Recently the Cedarburg Fire Department had an open house on a Wednesday evening. I ran into a CFD friend and asked why, and he said it is nearly the only night that people are free. Weekends are changing, and with kids' sports these days, weekends are for family. Perhaps it's time for a change. Stay tuned.

Typically, I would have a grand update from Dayton, but not this year. We will have to solicit weather and gadget insights from Mr. Schnell and Mr. Drasch at the next meeting, for sure! Ask them about Contest University, too.

If you ever walked around the back of your vehicle and struck your shin on the trailer hitch, I found the Next Worst Thing. I hit the piece of steel holding my HR antenna, which is bolted to my trailer hitch. When I did that, it vibrated and left a very neat 14-inch scar on my shin that looked like a vertical perforation. I will stop short of posting a pic!

Speaking of my HF antenna, I recently removed the 80-inch stinger to move furniture. Unfortunately, I laid it on the terrace and forgot it there. That was the night before garbage day. Yup, back to the local Truckstop to replace it.

Lastly, Field Day is almost upon us. Please make every effort to help or participate. More to come at our upcoming meeting, but make plans to be at the Pleasant Valley Nature Preserve on the June 22-23 weekend. I shamelessly stole this from the ARRL website:

> *Every June, more than 40,000 hams throughout North America set up temporary transmitting stations in public places to demonstrate ham radio's science, skill and service to our communities and our nation. It combines public service, emergency preparedness, community outreach, and technical skills all in a single event. Field Day*

has been an annual event since 1933, and remains the most popular event in ham radio.

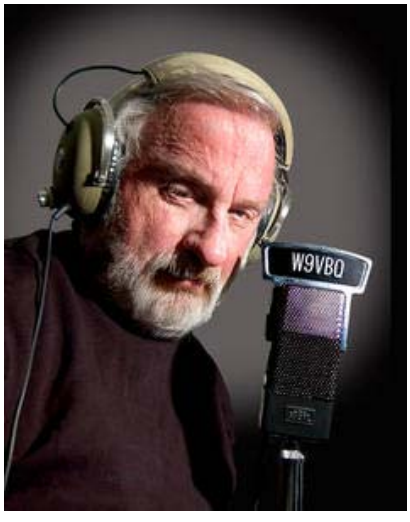
Cheers and 73, K9VIN
Kevin

And the Ham of the Year is…

Tom Trethewey (KC9ONY)

Tom is a major contributor to the success of the ORC as our Repeater VP and as Net Control of our Tuesday evening net. Congratulations, Tom, and thank you!

Tom Murtaugh, W9VBQ - SK



Tom passed away on June 3rd. He was a founding member of the LEFROG Radio Club and a past member of the ORC. Visitation and funeral mass will be on Friday, June 14, 2019 at St. James Catholic Church, W220 N6588 Town Line Road, Menomonee Falls, WI 53051 (https://www.stjames-parish.com, Google map: https://goo.gl/maps/Kqkkok8U9oF5Hc6d8).

10 am - 12 pm: Visitation in the **Chapel** (the church has a wedding)
12 pm: Funeral Mass

Friday, June 21, 2019
Burial at Veterans Memorial Cemetery in Union Grove (if they are able).

More information to follow in the July Newsletter.

DX'ing & Contesting

De Gary Sutcliffe (W9XT)

Last month I mentioned the new FT4 contest mode. It is similar to FT8 but optimized for contests. The big difference is that the transmit periods are shorter. Some people tested it, including me. There was a simulated contest period, but it was at the same time as the May Ozaukee meeting, so I was unable to try it in contest conditions. Several issues came out. I ran into K1JT at Dayton and talked to him a bit about FT4. He mentioned there would be some changes to the format.

A new version came out on June 3. It is incompatible with the older version, so if you downloaded a copy, delete it. The new version, release candidate 7, will expire in July. If you do download a copy, put it in a different directory than your regular WSJT stuff.

One thing that changed is the transmit period was increased from 6 seconds to 7.5 seconds. The bandwidth is also slightly decreased, and the sensitivity has been improved a bit. This version will be usable until late July when it is hoped that a general release will be available. Note that FT4 will not work during the ARRL VHF contest or Field Day. It is not ready for prime time, and they don't people trying to use it during these contests.

Another update to the FT4 story is the organization that oversees the ADIF file format has updated it to include FT4 as a valid mode. ADIF is the file format that most logging programs use for exchanging log data including upload to the ARRL Logbook of The World. They had a mock contest to test out the new version on June 4. I got on for a while and made a bit over 50 contacts. I had problems working stations weaker than about -8dB. I don't know if it was me, conditions, or limitations with the mode. It is really fast with strong signals, about the same with a couple of good CW ops at a moderate speed. Even at this limit, it is an improvement over RTTY, especially for low power stations. I am looking forward to this getting to general release.

I don't think FT4 will replace FT8 for general operating. It is usually not difficult working stations down around -18 to -20 dB on FT8. I think the extra 10dB or so is well worth the extra time in making general contacts. If you are planning on using FT8 during Field Day, be sure to get the latest general release version. There were some issues with some FD classes with the older version.

Another mode under development is for the new low bands, 630 Meters and 2200 Meters. Most QSOs on those bands are with the JT9 mode which is optimized for those frequencies. Joe is working on a new mode for those bands. In my conversation with K1JT, I asked him about it. He said that development on it will probably be delayed until FT4 is put to bed, but he was glad that others are interested.

The new mode will take much longer to make a QSO. I have heard 15 minutes and -35 dB decoding, but that may not be correct. At any rate, the slower the bit rate, the deeper into the noise signals can be detected. Some LF and VLF experimenters have been using very slow speed CW. It is so slow that a dit lasts a full minute. QSOs take a long time at those speeds! Currently, I have a WSPR system that transmits a beacon signal on 630 M. I hope to be able to transmit other digital modes by the fall season which will allow me to make QSOs. I am looking forward to the new mode.

There are two big contests this month. The first is the June ARRL VHF event. It starts at 1800 UTC (1:00 PM local) on Saturday, June 8 until 0259 UTC Monday (9:59 PM Sunday night local). Basically, you contact stations on the VHF and UHF bands starting with 6 meters. The exchange is the grid square. Signal reports are optional. You can work a station on phone, CW or digital. You only work a station once per band regardless of the mode. Note that you should log all digital modes as DG. QSO points depend on the band. Multipliers are the sum of grids worked on each band. There are a lot of different classes, including FM only, portable and rover classes. Check them out at http://www.arrl.org/june-vhf.

Of the three ARRL VHF events, the June one is the most popular. It occurs during the spring Es season, and 6M can open up. There will be a lot of FT8 and other digital mode activity. Digital modes will allow contacts during conditions that won't sustain contacts with CW or SSB. If 6 meters opens up with strong sporadic E signals, switch over to CW or SSB. You will make QSOs much faster.

The other event is Field Day, June 22-23. Plans for the ORC effort should be pretty firm by now, and that will be the program topic at the June meeting.

There are some interesting DXpeditions scheduled for June. Currently, 3D2CR is on the air from Conway Reef, in the region around Fiji. Earlier their boat was forced to return to Fiji from because of bad storms, but they finally made it. They have been active on the higher bands and running a lot of FT8 in the Fox/Hound mode. I worked them on 30M for a new band country. I also worked them on 17M FT8 and 15M CW. The interesting thing is that those last two QSOs happened about 11:00 PM local time. I would have expected the bands to close long before that with our low sunspot numbers.

Another reef, this time in northern Europe, is Market Reef. A group of Finish hams will be activating OJ0AW on June 8-14. They will operate the usual HF bands with CW, SSB, FT and other digital modes.

A group of mostly Spanish ops will be heading to Sao Tome June 6-19 using the call S9A. HF, CW, SSB, and FT8.

There are currently two groups in Viet Nam. HB9DXB is there using XV8DXB concentrating on 20 M CW & SSB. A group of Russians is using XV9DF on 40-10M, CW, SSB, and FT8. These are expected to be active until June 15.

There are many one-man operations this month, including 9G5GS, OX3LX, KH0N, 6O1OO, V6K, V63PSK, and a couple of guys from Svalbard (JW) using JW/home call. Some of these are

holiday style and the hours of operation may be limited or during hours of poor propagation to us. You have to stumble across them.

That wraps up June. Have fun at Field Day!

FIELD DAY 2019 ANNOUNCMENT

Weekend of June 22-23, 2019

I would like to invite the club members, both old and new, to join us in participating in our annual Field Day activities, once again to be held at the Pleasant Valley Nature Park, 5100 Pleasant Valley Road, north of Cedarburg. We will meet on Thursday afternoon, June 20th, at our storage shed, located on Hawthorne Drive, and pick up the tower trailers and storage trailer and tow them to the park, where we will unload and erect the 20' x 30' canopy. We could sure use your help in this crucial opening activity of the FD weekend. We will be at Pleasant Valley Park on Friday the 21st, working on antennas and beginning to set up our multiple stations. The highlight of the day will be held late that afternoon, which is a roasted turkey dinner, thanks to Stan WB9RQR and others, and we ask you to bring a dish to pass, such as salad, veggies, snacks or a dessert. The club will provide the turkey, baked potato and drinks such as soda, beer and water. You would also want to bring a lawn chair, as well as a food item, and don't forget your appetite.

Saturday morning, the 22nd, we will finalize our station setups, and hit the airwaves at 1800Z for the 24 hours of the event, with teardown and towing of the trailers back to our shed on Sunday afternoon. We plan to activate four main stations and a VHF station. Any and all in the club are encouraged to get involved and play some radio this weekend. If you are a seasoned operator, you should jump in and get some 'chair' time on HF, and if you are new to radio, come on in and get acquainted with one of the fun facets of our hobby. Here are the band captains of our planned station configuration:

W9IPR Tom;	40 meter SSB
W9GA Ken;	20/75 meter SSB
WT9Q Vic;	20/40/80 meter CW
K4WTH Robert	Digital on multiple bands
N9VSV Jeannanne	VHF station, 6 meters

We encourage all of you to talk to these captains if you would like to join them at their operating positions. We will discuss the operating parameters and other functions at our upcoming meeting this Wednesday, so please plan to attend!

Ken W9GA

THE COMPUTER CORNER

No. 255: Windows as a Service

Stan Kaplan, WB9RQR 715 N. Dries Street Saukville, WI 53080-1664
(262) 268-1949 wb9rqr@att.net

We've had about a dozen major Windows versions with several more sub-versions. Win 3.1, NT, 95, 2000, ME, XP, Server, VISTA, 7, 8 and 10 pretty much covers them, pretty much in chronological order. But apparently Windows 10 is the end. At least according to Ted Eiler, a computer service consultant right here in Greenfield, WI. You can read his latest blog and even subscribe to it (free), by going to https://www.tecs-onsite.com.

In the past, new designs and functions of the Windows operating system (OS) were incorporated into a completely new release (and new release name or release number) every couple of years. Instead, Microsoft is now simply going to keep Windows 10 and add new stuff about twice a year. So, you can expect no Windows 11 or 12 or 13. Rather, look for updates to Win 10 in the spring (March or April) and in the fall (September or October), and a bill one of those times for the annual "service fee". Key performance changes such as security updates will continue to be released each month.

So, here is what you really want to know. Everything before Windows 7 is dead (including XP), and you would be foolish to have a machine with these early versions on any machine that you even occasionally connect to the Internet. Mainstream support for Windows 7 ended on 13 Jan 2015 (product design features and complementary support ceased that day). While extended support (security updates to keep the OS safe) are still being released as of now, they will end totally in just a couple of months, on 14 Jan 2020. You don't have much time!

You can get a copy of Win 10 Professional at https://softwarelicense4u.com/ for only $29.99 as of this writing. For their fee, they send you only the software key and instructions for how to download the software itself from Microsoft. I have used them on at least four occasions with no problem. Most important, the key was accepted by Microsoft when submitted, resulting in proper activation of the OS.

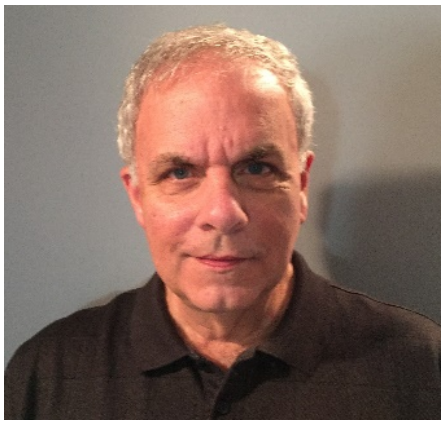
On the other hand, you might elect to not purchase Windows at all. Linux Mint 19.1 Cinnamon 64-bit is a very fine OS that works just like Windows. It comes with an office suite that is a great substitute for Microsoft Office. It includes a spreadsheet, presentation, drawing, formula, word processor, database and other items. It can open and save .doc, .docx formats in the word processor and comparable formats in the other software. Best of all, it is FREE and is installed automatically with Linux Mint 19.1 Cinnamon (as is the Firefox browser and a whole bunch of other goodies).
Bonus: If you have a bootable thumb drive that you want to use, turn off your computer, plug it into a USB port and power on the computer. If it doesn't work, your computer might require you to press a boot menu key to tell it to boot from the thumb drive. Common boot menu keys are:

Acer	ESC, F2, F9 or F12	Lenovo, Samsung, Toshiba	F12
Asus	ESC or F8	Sony Vaio	F11
Dell	F12	HP	ESC or F9

Clip the above out and save it for future reference. Happy Computing!

Vintage Amateur Radio

de Bill Shadid, W9MXQ



This month we are staying a little longer in the 1980's with the R. L. Drake Company of Miamisburg, Ohio. Last month we covered the revolutionary, for Drake and the ham radio industry, TR7 High Frequency SSB/CW/AM General Coverage Transceiver. This month we move on in discussion of the conversion scheme of the TR7, its major, but rather rare, partner receiver, the R7, and a bit into how the market changed before Drake's eyes. We will also touch on an ill-fated attempt to step into a lower cost market with the TR5 Transceiver. In an upcoming third installment we will talk about the prototyped successor to the TR7A, some planned accessories, as well as other products in the incomplete "8-Series" Drake amateur radio equipment lineup.

Drake had hit the market by storm with the TR7. A bit like Collins, they were expensive, but they made huge gains in technology with the model – just as Collins had large technology gains with the S-Line separates and transceivers. To keep up with their very popular R-4C Receiver and T-4XC Transmitter and their similarly popular TR-4C Series Transceivers, Drake offered a receiver partner for the TR7 – that being the matching R7 Receiver. Unlike the unfortunate difference in the R-4C and TR-4C conversion schemes preventing a complete, transceive enabled pair, the TR7 and R7 could be interconnected in full transceive operation. Here are pictures of the TR7 and R7 for comparison:

Drake TR7 HF Transceiver **(W9MXQ Shack Photo)**

Drake R7 HF Receiver **(RigReference Photo)**

There once was a Drake R7 Receiver (R7A, actually) at W9MXQ, but it has not been here for many years. To say the R7 was a TR7 without a transmitter is a bit of a simplification to some

unique features of the receiver. However, the conversion schemes were the same and the TR7 alone offered virtually all the features of a TR7 paired with the R7 except for these items . . .

1. There was a lack of a separate receive and transmit frequency separation beyond the RIT (Frequency Offset) feature of the TR7. This could be handled by using the optional RV7 External VFO, however.
2. The TR7 / R7 pair could allow for dual receive – a feature unavailable at the time in other radios. We covered dual receive in the past article covering the Hallicrafters SR-400 Transceiver (off the market by the time of the TR7 and R7.) This feature later came from Ten-Tec in the Corsair Transceiver and External VFO, three years after the TR7 and R7 were introduced.
3. The R7 Receiver offered a Notch Filter Circuit that was absent from the TR7. (Actually, I use a JPS NIR-12 Dual DSP Unit with my TR7A to add this feature.)

If it was 1980 again, and I was still using the TR7A and R7A Receiver in that long-ago station, I think I would certainly miss dual receive. In 2019 as I write this article, such requirements are satisfied by more advanced equipment at W9MXQ. In 1980, this was remarkable! I must be honest and say that I am not so sure that in 1980 I would have been the kind of operator that could appreciate the power of such things as dual receive. Thanks to some well-intentioned friends (primarily K9DJT[2] and W9XT[3]) who have coaxed me into the Contesting and DX worlds.

Let me inject a note here – the TR7 and TR7A as well as the R7 and R7A are nearly identical except for standard equipment from the factory. The “A” versions of both radios merely met a marketing challenge against the competition who included these features in their base price – there are very few technical differences other than a front-end protection circuit that would have meant very little to most operators.

Like the earlier R-4 / T-4X line of Receivers and Transmitters as well as the TR-3/4 series Transceivers, the TR7 and R7 used a permeably tuned oscillator – PTO – to tune the radio. I will use the term VFO. The analog dial mechanism appears as a slightly smaller version of the dual clear disk readout on the R-4C Receiver, T-4CX Transmitter, and TR-4 series Transceivers. No digital readout was necessary to read to an accuracy of less than one kHz. Both the initial TR7 and R7 products came in two forms – one with and one without the digital readout. The digital readout board in both the TR7 and R7 was called the DR7 Readout Board. Officially, Drake had these models available at introduction:

- Drake TR7 Transceiver Model 1337– with Analog Readout
    - o List Price of $1,200.00 in 1979[1]
- Drake TR7/DR7 Transceiver Model 1336 – with Analog and Digital Readouts
    - o List Price of $1,395.00 in 1979[1] (TR7A $1,839.00 in 1984[5])
- Drake R7 Receiver Model 1241 – with Analog Readout Only
    - o List Price of $1,100.00 in 1979[1]
- Drake R7/DR7 Receiver Model 1240 – with Analog and Digital Readouts
    - o List Price of $1,295.00 in 1979[1] (R7A $1,649.00 in 1984[5])
- Drake DR7 Digital Readout Model 1550 – for retrofit in Models 1337 and 1241
    - o List Price of $195.00 in 1979[1]

The marketing of the Model 1337 TR7 Transceiver and Model 1241 R7 Receiver, as well as the separate Model 1550 DR7 Digital Readout, ended very early in the life of the products. Few, if

any, radios left Drake without Digital Readout. Personally, I have never seen a TR7 or R7 without the DR7 Digital Readout installed.

The remarkable thing (one of two) about the TR7 and the R7 was what we now call, "Up-Conversion." As mentioned in passing in last month's installment, the first i-f of the radios was outside of the HF spectrum, into the VHF range. Early SSB radios focused on a 9.000 MHz i-f with variances over time, by brand – but all in HF. Drake, in fact, used 9:000 MHz as the i-f frequency in the TR-3 and TR-4 Transceivers that were predecessors to the TR7. The TR7's first i-f was moved to 48.050 MHz. That placed images outside the tuning range of the TR7 and R7 receiving range. Images in conversion schemes had long been a major problem for radio designers.

The other remarkable thing (two of two) about the TR7, and the R7, is that there is an 8 to 12 kHz wide crystal filter at that 48.05 MHz i-f. Drake inserted it for what were good design reasons. But, does anyone have an idea of what we call that filter, today? It is now called a Roofing Filter. I must say, however, that this "second remarkable thing" was not unique in the TR7 and R7 at Drake. That early stage filter, before the traditional i-f bandwidth filters, existed also on the R-4 series receivers – far ahead of others in the ham radio market. The R-4 series filter, in the 5 MHz range, was also what we would call a Roofing Filter. Even though it was only a four-pole crystal filter, it allowed better performance than could be expected from the tuned circuit bandwidth filters in the R-4, R-4A, and R-4B Receivers. Those tuned circuit filters were replaced in the R-4C with eight-pole crystal filters for each bandwidth position for even better performance.

Repeating from last installment, here is a look at a fully equipped Drake TR7 station that is typical of the late 1970's and early 1980's. This station is in regular operation, today, at W9MXQ:

Drake TR7 Line Station with Accessories
Left to Right – MN-2700 Antenna Matching Network, TR7 Transceiver, RV7 External VFO, and Drake L7 Linear Amplifier
Also Shown Left to Right – P75 Phone Patch, WH7 Wattmeter, MS7 Speaker, SP75 Speech Processor – along with 7077 Desk Microphone
(W9MXQ Collection)

We talked last month about market pressures that pushed Drake to offer some basic options in the TR7 as standard equipment in a "marketing upgrade" called the TR7A. At that time, the feeling was that the high market price of the TR7 could not continue without features that less costly competition offered. My personal feeling is that Drake still had a superior performing radio – but money talks and a lower price in ham radio can garner a lot of business.

In 1981, four years after the introduction of the TR7, Drake introduced the lower cost TR5 HF Transceiver. At $799.95[5], it was a considerable savings over the TR7A. The radio came in a cabinet the same size as the TR7A – absent only the punched grill area, for a left side mounted

speaker – a feature omitted from the TR5. Let's take a different approach in describing the differences between the TR5 and TR7A and start with a list of the most important reasons a person bought a Drake TR7A:

- Digital Readout (not universally available when the TR7 was introduced in 1977)
- Digital Readout useable as a utility 150 MHz Frequency Counter
- Passband Tuning
- SSB/CW/AM Coverage
- Coverage from 0 to 30 MHz (yes, that is ZERO)
- Programmable, with appropriate proof of license) transmit segments in HF from 1.5 to 30 MHz – no gaps
- 240 watt (and more) input final amplifier (100 to 150 watts output)

Much of this was becoming standard equipment on the competition. So, how did the TR7A and the TR5 stack up to each other in a common market:

TR7 to TR5 Important Feature Comparison		
Feature	**TR7 Transceiver**	**TR5 Transceiver**
Digital Readout	Yes	Yes
Utility Frequency Counter	Yes – to 150 MHz	No
Passband Tuning	Yes	No
Modes	SSB/CW/AM	SSB/CW
General Coverage	Yes	No
General Coverage Transmit	Yes	No
Power Output (SSB PEP & CW)	100 to 150 watts	80 Watts

Several points here:

1. Drake's two Linear Amplifiers, the L7 and the L75, required a drive level of at least 100 watts for full output. The TR5's 80-watt final amplifier was widely criticized by owners and potential owners alike. What were they thinking?
2. Even low-cost competitors were trending to general coverage receivers – and therefore there was a need for AM mode capability.
3. The band coverage issue strictly for ham radio use was not so bad – even the upcoming WARC bands were covered on the bandswitch. Band heterodyne crystals were optional for the additional bands – a common practice in the marketplace. But, CAP, MARS, and other legal uses of ham radio equipment could not be accommodated.
4. The absence of not only Passband Tuning but also more than a single selectable, optional crystal filter made for an inflexible radio.

Drake promoted QSK (full break-in CW) as an important feature of the TR5. But this was at a time when Ten-Tec had truly outstanding, and quiet QSK circuitry in radios in the TR5's price class. These Ten-Tec radios included the respected Omni A and D. (Ten-Tec, like Drake with the TR5, did not provide for General Coverage Receive.) The TR5, however, really did not have quiet QSK and users complained that the fast switching antenna relay was too noisy. Third party QSK modifications for the TR7 and TR5 were published at the time. None of these were sanctioned by Drake – at least not outwardly.

I think it is difficult for deluxe manufactures of any product to design a low-price version of the product(s). The TR5 may have been a case in point once it was determined what in the TR7

must remain unique to that product. Drake had never produced multiple price levels of transceiver at the same time – and likely should not have done so in 1981.

All comments aside on the TR5, many did like its simplicity – and that kind of customer thinking is around even now, just as it was then. The TR5 was more traditional in design and that also suited some potential customers. The most common negative comments were that its RF power level was too low and the receiver "had too many birdies[4]."

Today's users certainly mention simplicity as part of their love their TR5's, TR7's and TR7A's – simple to use in comparison to the modern day, memory intensive, microprocessor controlled, radios from Japan and the USA.

So, in closing, let me bring up one point on the TR7 and TR7A that might come to light if you buy one of these fine units. The transceivers include a feature to use the digital readout system as a 150 MHz Frequency Counter. This is quite handy, as mentioned earlier in this article. In at least two occasions when I acquired a TR7 Transceiver that was advertised as having a "non-working" frequency readout, I found that the switch on the rear panel, marked NORM-EXT, was in the EXT position. That meant the radio was setup in "Frequency Counter Mode." On occasion, I have found the NORM-EXT slide switch to be defective, or at least has dirty contacts. This counter feature exists in the R7 and R7A Receivers as well. However, in the receiver, the Counter function is engaged differently and is not so problematic. Do you have a TR7 that seem to receive and transmit but with the readout showing only a single decimal point? Check that switch!

Next month we will talk about the unique end of the line for the TR7 and the TR5. We will also talk about efforts to replace the design with a more modern radio of similar concept, the Drake "8-Series" products, as well as accessories to match that effort.

A special thanks go to Bob, W9DYQ, for his proof reading. Remember that I am open to questions and comments at my email address, W9MXQ@TWC.com.

Reference Notes:

1. Source – 1979 R. L. Drake Price List. (Prices List original documents on file at W9MXQ.)
2. K9DJT is Gary Drasch.
    - Look for Gary at https://www.k9djt.com/
3. W9XT is Gary Sutcliffe.
    - Look for Gary at http://www.w9xt.com/ and https://www.unifiedmicro.com/
4. A "birdie" is an extraneous/undesirable signal generated within the receiver circuitry.
5. Source – 1984 Amateur Electronic Supply Catalog (Drake List Price). (AES Catalog original documents on file at W9MXQ.)
6. Circuit details for Drake and other radios are taken from their respective Operating Manuals. (Manuals are on file at W9MXQ.)
7. For references to earlier R. L. Drake products, see previous articles about the Drake R-4 and T-4X (August 2018), the Drake R-4C and T-4XC (September 2018), the Drake TR3 and TR-4 (June 2018), and the one about the Drake TR-4 and TR-6 (July 2018).
8. There are three operating TR7's Transceivers at W9MXQ – two TR7's and one TR7A. One TR7 and the TR7A have optional filters including the 1800, 500, and 4000 Hz units plus the NB7 Noise Blanker. The other TR7 has no options installed at this time and "seems to operate when and if it pleases" due to numerous internal issues.

W9MXQ

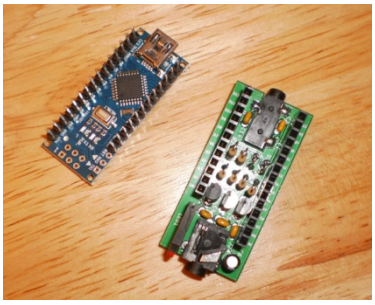
Project of the Month©

de Gary Drasch, K9DJT

MORTTY Keying Interface Kit

I had recently started questioning the use of a WinKeyer. Many contesters use them but I didn't know its purpose. I discovered that it is used to offload the CW and/or RTTY keying of the radio from the PC during a contest. The keying of the transmitter and sending of CW or RTTY signals during a contest is done via the function keys on the PC. A foot switch or actual code-key isn't used. Therefore, the PC is not only managing the overhead of the contest software, real-time logging, and the cluster, but it is also keying the radio and sending data through it. A WinKeyer, or similar device, will take the responsibility of keying the radio and doing the data transfer. Supposedly, the CW and RTTY signals sent are also cleaner compared to the PC sending them.

Because I experienced my PC locking up on me during two different RTTY contests, I decided to look into the cost of a WinKeyer. As so many things, it was more expensive than what I was hoping for—$99 for a kit—$129 assembled. Just then I discovered an article in the April 2019 issue of QST. It was titled, "Mortty Morse Code and RTTY Keying Interface Kit." It is based on an Arduino NanoIO and somewhat emulates a WinKeyer. The big difference between the two is that Mortty requires the changing of a "Sketch", which takes about a minute, to change from CW to RTTY or the reverse. The cost? A Mortty kit is only $18 plus shipping, so I ordered one.



It arrived in the mail in a small envelope. Upon opening it, I was instructed to download and print out the instructions. All the parts, case, and NanoIO were there including the USB cable to the PC. All the parts and Mortty circuit board were through-hole construction which made soldering pretty easy. The part IDs were all silkscreened on the circuit board which almost caused me to assemble it without the instructions, but I didn't. It wasn't a surprise when I did find a unique construction technique in the instructions. It took about an hour to complete the kit, and maybe another hour to gather parts and wire to make the interface cable to the radio. (I found it refreshing that the instructions EXPECTED me to make the cable rather than purchasing one off the shelf. That's ham radio! And to that point, I'm proud to say that I have always made up my own.)

I needed to dink around a little with my N1MM+ contest software settings to get it to play correctly, but once that was done, everything worked as expected. I ordered my unit with the CW "Sketch" already installed (you have a choice of CW or RTTY at the time of order), and haven't tried it on RTTY yet.

My hope in writing the ***Project of The Month*** article for each newsletter is to renew the "building aspect" to this great hobby. If you are interested in learning how to solder, make a wire antenna, or an accessory cable, don't be afraid to ASK someone in the club to help you.

Until next month, 73. – Gary K9DJT

Bad Power Cable?

Pat Volkmann (W9JI)

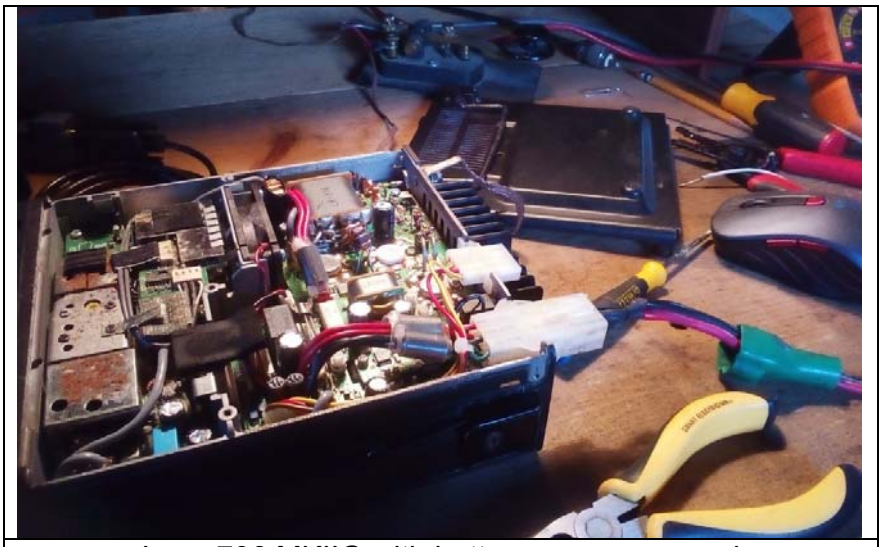
My wife and I were at our cabin in northern Wisconsin for Memorial Day weekend this year. We were there to open up the house for the season, lay out a new deck and clean up after some logging that was done over the winter. I brought along my Icom 706 Mark IIG with the usual collection of cables, antenna tuner and accessories. I expected the antenna to be down (and it was) so I had brought along a Hamstick vertical. The vertical could be clamped to a saw horse and is adequate to make some FT-8 contacts.

The station was set up in the garage and was soon on the air. Power was supplied by my Generac iQ2000 generator as the garage does not have power. Everything was working fine and I was able to make occasional contacts throughout the day, as work breaks allowed.

After a couple of hours, the radio turned off. This was not too unusual, as it had happened several times before. The problem was usually that the detachable faceplate needed to be removed and then reconnected. This would remake the connections and restore normal operation. This time, however, reseating the faceplate did not fix the problem.

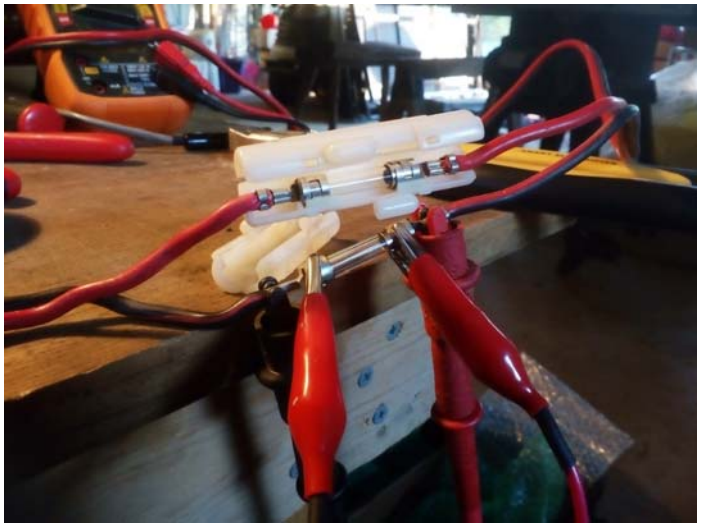
Fortunately, I had brought along a digital multimeter. The first check was the power supply. Output voltage was normal, at 13.8 volts. It seemed that the problem should be in the Molex power connectors on the radio or the internal fuse. I removed the bottom panel from the radio and started making some measurements. Power was applied and the voltage measured at the circuit board where the power leads connect was about 4 volts. Rechecking the power supply showed that the voltage remained at the normal 13.8 volts. The power cable was dropping almost 10 volts between the power supply terminals and the circuit board. After unplugging the power supply cable from the radio, I measured 13.8 volts on the connector terminals.

This cable has a fuse in both the positive and negative lead. The fuse holders were opened up and the resistance of both fuse holders and fuses were checked. Everything looked good.



Icom 706 MKIIG with bottom cover removed

The Molex connectors seemed the most likely suspect but the meter probes would not fit into the connector housing. After some scrounging, I found a short piece of telephone cable and pulled out a couple of fine wires. The wires were shoved into the Molex connectors on the radio and the power cable, allowing the DMM to measure the voltage in the connector. Power was reapplied and the connectors measured about 4 volts, indicating that the voltage drop was between the Molex connector and the power supply terminals.



Bad fuse bypassed with a clip lead

The fuse holders were opened up again and the voltages measured. The negative lead fuse holder measured 13.8 volts on one side and 4 volts on the other. A clip lead was used to bypass the fuse. The radio now operated normally.

Examination of the fuse showed that the solder joint on one end had an unusual, lumpy appearance. The fuse still measured a very low resistance. The lumpy appearance was a bad solder connection between the end cap and the fuse wire. After some pushing and twisting, the fuse measured about 10 megohms.

It seems that it should have been simple to find the cause of the voltage drop in a cable. But, there are 32 connections between the circuit board and the power supply, and only 12 of them are accessible without dissecting the cable. Any one (or more) of the connections can be bad. Fuses are supposed to be either open or short, not in between. This is the second time I have found a bad fuse that was not blown. It's rare, but it does happen.

After forgetting some key items on previous trips, I developed a checklist that I use to ensure that I take everything I need for a trip to the cottage. That checklist includes a spare power cable and spare fuses, neither of which I had packed this time. The main reason for not packing them – I didn't look at my checklist. Everything turned out OK because I had enough other parts to work around the problem. With Field Day coming up, this is a good time to look at how we plan for a successful outing and be sure to read the checklist!

UPCOMING EVENTS

ORC Membership meeting – June 12, 2019 - Field Day Planning

ORC Monthly Programs

June - Ken W9GA, Field Day
July - Tom W9IPR, Sun-N-Fun
August - Homebrew Night

Breakfast at Jim's Grille – Saturdays at 7:00 AM

Field Day Activities – June 21-23
Pleasant Valley Nature Park

A Notice from Vic WT9Q

Do you want to learn more about operating HF? There will be free lessons at the Field Day site on Friday through Sunday, June 21-23 at Pleasant Valley Nature Park. Learn how to run coax, assemble HF antennas, attach a rotor, and operate various HF Radios.

Field Day is a great opportunity for newly licensed hams to expand their knowledge of ham radio.

All you have to do is show up and start asking questions.

Vic WT9Q

Homebrew Night

The August program will feature projects by club members. If you have made something that you would like to share with the club, please let Pat W9JI (w9ji@arrl.net) know ahead of time. You can bring the item in for show-and-tell, have a brief presentation (three slides maximum) or both. Plan on about five minutes to discuss your project. The project doesn't have to be huge or grand– just let us know what you have been doing.

Volunteers Needed for Monthly Programs

The monthly program is the highlight of the Ozaukee Radio Club meeting. We are fortunate to have a number of very talented people in our club, many of whom have shared their knowledge through a presentation. Share your expertise and experience with the club. Programs can be on any topic that is ham radio related. Contact Pat Volkmann W9JI at w9ji@arrl.net to discuss your idea for a program.

Ozaukee Radio Club
May 8, 2019 Meeting Minutes

de Ben Evans (K9UZ), Secretary

First Vice President Pat Volkmann (W9JI) called the meeting to order at 7:32 PM, as President Kevin Steers (K9VIN) was delayed in arrival to the meeting. All the attendees introduced themselves.

Announcements, Show-and-Tell, Bragging Rights:
Jon M. (KD9GAE): A good time was had last week at SIMCOM, the annual communications interoperability exercise put on by state and county Emergency Management and the Wisconsin National Guard.

Tom R. (W9IPR): There is a 6-meter contest on May 11th. You can read about this and other events on Wisconsin Ham by getting on their email distribution list.

Robert (K4WTH): There was a good turnout at the Spring Swapfest.

Programs:
Vic (WT9Q) reported on his mostly successful experience with remoting his home station from Florida. He said it worked, but there was room for improvement. While in Florida, Vic joined a radio club there and did a good amount of contesting.

Gary S. (W9XT) gave a presentation on techniques for homebrew projects.

50/50 Drawing:
Dick (AB0VF) was the winner of the 50/50 Drawing.

Auction:
Stan (WB9RQR) conducted the auction. Many items were sold, including mini-CDs for wiping a computer clean, a Windows 7 rebuilt Compaq computer, an SWR/power meter, two 19-inch rackmounts, a 2-meter transceiver with area repeaters already programmed into it, and a matching network.

Officer Reports:
Kevin S. (K9VIN) President – Thanks to everyone who helped with the Spring Swapfest. We have five months left to find another home for the club trailers and other items in the shed.

Pat V. (W9JI), 1st VP – No report.

Tom T. (KC9ONY), Repeater VP – There is a hum issue in the audio of the Mequon park remote site. We pinpointed the source to a power transformer for a paging system whose equipment is in the same rack, above the club equipment. The County and the paging company came out and verified that the transformer was the source of the hum. The paging company replaced the power supply and there was still a hum. The County is willing to let us move to a rack in another part of the equipment room so the hum in our system goes away or is at least greatly reduced.

Ben E. (K9UZ), Secretary – The minutes from the April meeting are in the newsletter and were also distributed by email. Motion to accept the minutes was made by Stan (WB9RQR), seconded by Robert (K4WTH) and approved by the members.

Robert E. (K4WTH), Treasurer – April was a quiet month for finances. The rent for the meeting room for 2019 was paid in April, but the Senior Center, not realizing we are a 501(c)(3), charged us sales tax on the rent, so we will be getting a check back for the sales tax amount. Stan (WB9RQR) moved to accept the report, which was seconded by Vic (WT9Q). The motion was approved by the members.

Robert E. (K4WTH), Treasurer – Spring Swapfest I&E – The Scholarship Fund made $187.50 from the swapfest. Anyone who's holding a receipt related to the swapfest should turn it in to Robert for reimbursement. Ticket sales were $855, food sales were $187, and table sales were $935. Minus expenses, the net revenue was around $800.

Kevin (K9VIN) commented that in order to induce people to stay longer at the event, we should hold presentations on various ham radio topics similar to the Dayton Hamvention. Perhaps the prizes should be given out later in the day. A short discussion ensued about whether the rules of having to be or not be present to win the prizes should be changed. Pat (W9JI) suggested that the event have a later start time because of the time needed by some attendees to travel from long distances. Tom R. (W9IPR) commented that concessions sales were disappointing, however the soda and coffee that was left over can be used for Field Day. Kevin felt that outside groups we bring in to do concessions make little to no money so it may be hard to convince them to come back to an event lasting only a couple hours. A few of the members suggested a meeting on how to improve the swapfest.

Committee Reports:

Ken B. (W9GA), Nominations – ORC Awards – Ken gave out the awards to members that exhibited exceptional dedication to the club and to amateur radio during the past year. The award winners are as follows:

President's Award – Pat Volkmann, W9JI
Program of the Year – Bill Shadid, W9MXQ
Turkey of the Year – Bill Shadid, W9MXQ
Ham of the Year – Tom Trethewey, KC9ONY

Tom R. (W9IPR), Scholarship – Tom said he will go out to the barn tomorrow at 10:00 AM to do come cleaning out. Anyone who'd like to help is welcome, and if you see something in the barn you'd like that would otherwise be thrown out, you can take it for free.

There will be a Scholarship Committee meeting this month to make a recommendation of how to disperse funds to the ARRL Endowment and to discuss and adopt criteria for potential localized STEM grants.

The Fall Swapfest is September 7th. Flyers have been printed and will be distributed. The first Saturday in September seems to be the Saturday in September that's clear of conflict.

Old Business:
There was no old business.

New Business:
Tom R. (W9IPR): Tom made a motion to have the nominating committee review the meeting attendance sheets and the club membership roster and at an upcoming meeting nominate a competent individual for Second Vice-President to be voted on by the membership. Tom said that the vacancy of the 2nd VP office that we've been experiencing has serious consequences as demonstrated by the Spring Swapfest. The motion was seconded by Pat (W9JI), and approved by the membership.

Ken (W9GA): At the next meeting, Ken will do the presentation on our Field Day, a little about the history of Field Day, and to look for participants to fill out the work chart. Ken will also be picking up the canopy next Wednesday. We probably would move the old heavy tent back to the shed and eventually move it to some other site yet to be determined. Tom (W9IPR) asked if we could give it back to OZARES. Ken said maybe we could, but the complication with that is we will be taking parts from the old tent to use with the canopy. We could replace the items taken from the old tent and return those and the rest of the old tent to OZARES. If anyone is available to come along on the canopy run, talk with Ken after the meeting. The dates for all activities are Thursday through Sunday, June 20-23. The pre-field-day activities are scheduled as follows:

> Thursday – Move items from the shed to the park and set up the canopy.
> Friday – Erect antennas. Dinner in late afternoon featuring Stan's barbequed turkey. All others bring dish to pass.

The Field Day activity details will be presented at the June meeting

Adjournment:
A motion to adjourn was made by Stan (WB9RQR), seconded by Robert (K4WTH) and approved by the members. The meeting was adjourned at 9:41 PM.

Attendance:
There were 41 members and two guests present at the meeting.

A copy of the attendance sheet is available upon request in PDF format. Please contact Ben Evans via email at ben@evansengsolutions.com for a copy.

Respectfully submitted,

B. Benjamin Evans, K9UZ
Secretary

ORC Meeting Agenda

June 12, 2019

1. 7:00 – 7:30 PM – Network & Rag Chew
2. Call to Order – Kevin Steers (K9VIN)
3. Introductions
4. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.
5. Program: Ken Boston W9GA – Field Day
6. Fellowship Break
7. 50/50 Drawing
8. Auction – Stan Kaplan (WB9RQR)
9. President's Update – Kevin Steers (K9VIN)
10. 1st VP Report – Pat Volkmann (W9JI)
11. Repeater VP Report – Tom Trethewey (KC9ONY)
12. Secretary's Report – Ben Evans (K9UZ)
13. Treasurer's Report – Robert Eskola (K4WTH)
14. Committee Reports:
    a. Scholarship
    b. Other
15. OLD BUSINESS
16. NEW BUSINESS
17. Adjournment to ?

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465 Beechwood Drive
Cedarburg WI* 53012

First Class

Next ORC Meeting:

Grafton Multipurpose Senior Center

1665 7th Avenue, Grafton, WI
Wednesday, June 12th, 2019

7:00 PM – Doors Open

7:30 PM – Meeting Begins

The ORC Newsletter

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ORC Repeaters on 146.97, 224.18 and 443.750 MHz - Callsign W9CQO
Web site: www.ozaukeeradioclub.org **Facebook: facebook.com/orcwi**

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From the President

de Kevin Steers (K9VIN)

Happy July, everyone! Hope you are not complaining about the hot weather. Finally, some swimming weather! From all reports, field day came off without a hitch. I unfortunately could not attend this year, due to family scheduling, but look forward to the reports from Ken, and the scores from Gary, etc.

Well, with the help of Tom Ruhlman W9IPR, the mystery of my Rotator has been solved. I noted to Tom that it would not rotate fully, and he and I looked at it and resorted to following the manual's instructions to reset the ring gear and 'stops'. Low and behold, when we tested it, it appeared that the dial on the rotator controller was giving exceedingly false readings the further it's rotated. With some schematic reading and sleuthing on Tom's part, he noted that two diodes were the culprit. The needle of the controller was pegged, and the antenna only was 180 degrees rotated. I never thought of continuing to hold the button and see if it kept going; it would have. Apparently, Tom corrected the diodes, and I hear that it reads correctly now.

So back up the tower for me! Thank you, Tom!

I am hoping to soon get my cross-band repeater set up so I can do some pontoon contacts to local repeaters, etc. I still have a few snags to work out, like an HT charger that needs some attention, and a replacement antenna also.

Recently, at a rummage sale, I couldn't help but buy a vintage multimeter needing fuses and two batteries replaced. Still not convinced it works, but will bring it to the next meeting to get input.

Lastly, be sure to finish those ham shack projects, and bring them for a brief show-and-tell at our meeting on August 14th.

Let's get ham radio out into the public. If you have an idea on how to do so, just let me know.

Cheers and 73,
K9VIN
Kevin

Obituary

Tom Murtaugh, W9VBQ – Silent Key

de Tom Trethewey (KC9ONY)

Thomas Rawson Murtaugh, W9VBQ, aged 82, became a Silent Key peacefully, with family by his side, on June 3, 2019. He was born in Milwaukee on July 25, 1936.

Tom's daughter Heather said that his favorite book was "Kon-Tiki: Across the Pacific by Raft", written by Thor Heyerdahl in 1948. In the book, a crew crosses the Pacific Ocean, landing on a Polynesian island. Then the crew revives their radio, and makes contact with Hal in Los Angeles, a ham radio operator who had been receiving transmissions from the raft through most of its voyage. This book apparently sparked Tom's interest in Amateur Radio. He acquired his Novice license, WN9VBQ, in 1952, at the age of 15. That same year, he was pictured in a newspaper article about the MRAC (Milwaukee Radio Amateurs Club) during ARRL Field Day 1952.

Upon graduating high school at St. John's Cathedral in Milwaukee, Tom went on to get an Associate Degree in Telecasting at the Milwaukee Institute of Technology and worked as a TV floorman. He then served in the Army, where he operated an Amateur Radio station under the Military Affiliate Radio System in Germany and was honorably discharged as SPC. While in the 123d Signal Battalion, he received a Good Conduct Medal as an Enlisted Man "for exemplary behavior, efficiency, and fidelity for the period" 19 Sep 58 to 22 Aug 60 at the rank of SP4.

Tom had many interesting jobs throughout his life, had a great work ethic and was a very creative man. He loved, and was proud of, being a television Director and Producer at WISN, a manager at Business Office Furniture, and a photographer. While working at WISN, Tom produced a two-hour stage show and raised money for wounded Marines and Navy personnel at the Great Lakes Hospital in Chicago for three years. An Amateur Radio Operator since 1952, Tom was a member of various radio clubs and was a founding member of LEFROG Radio Club. He was granted Amateur Extra Class Radio Operator Privileges from the ARRL and was always looking for the best place to put up an antenna. Tom, along with other ORC and LEFROG members, visited local schools to show students Amateur Radio and Morse code. Tom was the main CW operator during LEFROG Field Day.

Tom was a passionate semi-professional photographer, a job from which he never retired. At one point, Tom was taking pictures of ORC members, including new members, for the newsletter and club website. Tom loved to grill in any season, tell stories, make people laugh and listen to classical music while enjoying a glass of wine. One story he told me a few times was that he had a contact with an amateur radio operator in Russia. I can't remember if it was CW or SSB. The Russian operator ended the QSO with "Das Vedanya". He asked Tom if he knew what that meant, and was surprised when Tom told him he did know! It is a Russian parting phrase meaning "goodbye".

Das Vedanya, Tom. You will be missed by so many.

DX'ing & Contesting

De Gary Sutcliffe (W9XT)

Last month I discussed the new FT4 digital mode, designed for fast contest QSOs. I have not heard too much since the simulated contest a few days after the new release. If it remains on schedule, the general release version should be available by the end of the month.

As an indication of the interest in the newer digital modes for contesting, the World Wide Radio Operators Foundation (WWROF), and the Slovenia Contest Club (SCC) have announced the World Wide Digi DX Contest. The first running will be starting at 12:00 UTC on August 31 and run 24 hours. The backing of these organizations should ensure a good turn out right off the bat.

This contest will use the distance scoring method for determining QSO points. This scoring system is used for the Stew Perry Top Band Distance Challenge. The exchange is the grid square, and your computer calculates how many points a QSO is worth. It encourages working the weak, long distant stations. Many contesters feel more contests should use a system like this. I will go into more details in next month's column, but if you can't wait, you can read more at https://ww-digi.com/

The first few weeks of July are the prime season for 6 Meter sporadic E (Es) propagation. Small sections of the E layer get ionized, and it provides propagation out to about 1400 miles. Affecting the 20M and above bands, it is not noticed too much below 10M since other propagation modes are often in play.

Es can provide very selective propagation to a small area, or wide areas encompassing many states. Higher frequencies require more ionization, so it is more common on 10M than 6M. On rare occasions, it might extend to 2M.

Although single hop is only 1200-1400 miles, sometimes two or more Es clouds properly placed can provide longer distances and even intercontinental contacts. Longer contacts require several clouds to be in exactly the right positions. Ken, W9GA, compares making these contacts to a complex billiard shot. Tough shot or not, Ken added SV9 (Crete) to his impressive 6M country total at the end of June.

In the bad news department, a paper in Nature magazine came out that predicts we will stay in a solar minimum from 2020 to 2055. The paper discusses a theory that two layers inside the sun rotate at different speeds. The moving materials generate separate magnetic fields. These fields interact and have different cycles, the 11 year cycle being the most noticeable. Other cycles last hundreds of years.

The last time we had a long period of no sunspots was the Maunder Minimum from 1645-1715. Since radio would not be around for another couple of centuries, it was not a big deal. The authors have back tested it against geological records going back over 10,000 years and claim good correlation.

The article can be found at https://www.nature.com/articles/s41598-019-45584-3 . It is long and pretty dry, but if you are interested, the abstract and summary are approachable

The main stream predictions are for the current minimum to be in late 2019 or 2020. It will take six or more months to know we are past the minimum, so it might not be until 2021 before we

find out if this new theory is correct. I hope they are wrong. Not many of us can wait that long for 10 Meters to start opening up again.

DXpeditions are light in July. Not many big ones are scheduled in July since HF conditions are typically poor in the northern hemisphere. The exception is locations that are difficult to travel to in other months. The most interesting DXpedition this month is one of them.

A group of US hams will be going to St. Paul Island July 31-August 8 using the call CY9C. They will be on 160-2 Meters. The location is a small uninhabited island east of Canada's Prince Edward Island. Ranking #69, on the wanted list, it is not real common because it only activated every few years on average. They will be on CW and SSB, but it seems that they will be putting a lot of focus on the digital modes. There has never been a digital contact from the island on 160M according to ClubLog. They are also bringing gear for 6M and 2M. Two meters will be EME. 6M will be either EME or terrestrial depending on conditions. There is a reasonable chance of working them on 6M Es although the dates are near the end of the Es season. Keep your fingers crossed.

Contests are light in July as well. The biggest one is the IARU HF Championship contest. It starts at 1200 UTC (7:00 AM) July 13 and runs for 24 hours. You can work CW, phone, or mixed mode. There are high, low, and QRP levels for each one There are separate categories for single op and single op unlimited for those who like to use packet.

You send a signal report and your IARU zone. That is zone 8 for us, not zone 4 as used in the CQWW contests. You can work a station on each band and mode. Depending on the location of the other station, each QSO is worth 1, 3, or 5 points.

Multipliers are the number of zones worked per band (not band/mode) plus IARU HQ stations. Member societies will often have a station on for this. Often they have the suffix HQ. The ARRL is the US member society, and the call sign is NU1AW. Last year I was invited to operate from NU1AW/9 for this contest. It was quite a thrill.

The weekend of July 21 is busy. Both the CQ WW VHF contest and NAQP RTTY contests are this weekend. I have never operated the CQ VHF contest, but apparently is has its following. You can read about it at https://www.cqww-vhf.com/

I will be on for the NAQP contest. I have talked about those frequently. It is hosted by the National Contest Journal (NCJ) which I have been writing a column for over 30 years. Info at http://ncjweb.com/NAQP-Rules.pdf

A big thank you goes out to Tom Ruhlmann, W9IPR. Tom is retiring as the newsletter editor. He recruited me to write this column about 6 or 7 years ago. Tom really grew it into a first class ham club publication. If you think ORC members are the only readers, you are wrong. Bill, W9MXQ reports having a QSO with a ham on a small island in the Pacific. The DX station said he really enjoyed Bill's columns on old radios! Best of luck and a big thanks to Ben Evans, K9UZ for taking over the job as editor. I know Ben will do a superb job.

That wraps up July. Summer has finally arrived!

THE COMPUTER CORNER

No. 256: Windows vs. Linux Presentation

Stan Kaplan, WB9RQR 715 N. Dries Street Saukville, WI 53080-1664
(262) 268-1949 wb9rqr@att.net

Our Bill Shadid (W9MXQ), recently asked me to present a talk on **Windows versus Linux** at WiARC, the Wisconsin Amateur Radio Club (formerly the Falls Radio Club) in Germantown. Bill, an ORC member, is also the President of the Germantown-based club. So, I prepared and gave the talk to approximately 40 members on Wednesday, 26 June. It was great fun and they were cordial hosts. They have a good series of talks coming up, a few of which are listed below with dates. You will note that Gary Drasch (K9DJT) is giving two, so with Bill Shadid, the presentations are well represented with ORC members. For more info, look at their website: https://www.wiarc.org and try to attend those that interest you.

31 Jul	Bill Shadid, W9MXQ	Tuning a Vacuum Tube Radio Final Amplifier
28 Aug	Gary Drasch, K9DJT	Using a Digital Voltmeter in the Shack
25 Sep	TBA	
30 Oct	Gary Drasch, K9DJT	Features and Use of ClubLog
27 Nov	TBA	Using an Oscilloscope in the Ham Shack
18 Dec	Patrick Moretti, KA1RB	ARRL Update (Patrick is ARRL Wisconsin Section Manager.)

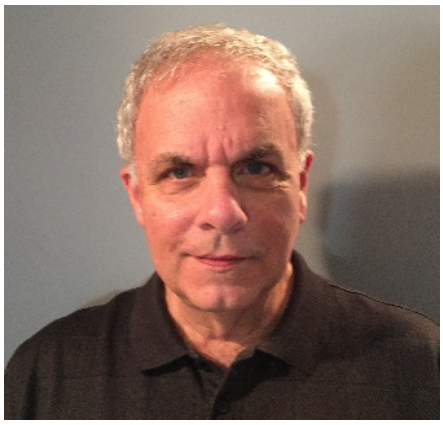
So what did I talk about? First, I explained my computer credentials, including the rebuilding and distribution of over 700 units (Windows and Linux) to Wisconsin ARES/RACES groups between 1995 and 2015. Then I covered the upcoming changes in Windows – to a rental fee basis – and some of the other Microsoft changes in store. I spoke briefly about the origin of Linux, and how widely it is found today (it is now the largest installed base of all general-purpose operating systems). Linux Mint 19.1 Cinnamon, nicknamed “Tessa”, is the most popular version today.

Next, I compared the differences and similarities of Linux and Windows, especially how Linux can now handle most any Microsoft Office chores with nearly perfect compatibility, thanks to the Libre Office that comes with the Linux package. I showed pictures of the Windows and Linux desktops to point out how similar they are, and therefore how easy it is to use Linux or even switch to it. We explored the minimum hardware necessary to run Linux, including memory and hard drive space needs. I pointed out how easily updates are done (reboots rarely needed!) when compared to Windows.

Finally, I finished up with the three ways to get it. 1. A completely free method, by downloading a file from the web which you use to burn a boot “live” Linux disk. 2. By ordering a boot disk for under $6, plus $3 shipping (no shipping charges for orders over $20, so groups can get together to order several and save some bucks). 3. By ordering a bootable thumb drive with the installation files on it for $14.95 plus shipping (again, no shipping charges for orders over $20. By edict of Linus Torvalds, the original writer of Linux, the operating system must remain completely free. The charges noted above are just payment for preparation and shipping of the media. Happy Computing!

Vintage Amateur Radio

de Bill Shadid, W9MXQ



This month we talk about the planned replacement for the Drake TR7/TR7A. The TR8 Transceiver was developed to complete in a market dominated by the Japanese manufacturers. This article is about a line of transceivers that were never made even though far enough along in development to be prototyped. Two examples of the TR8 exist today according to a well-known Norwegian[1] collector of Drake radios.

As microprocessors and more advanced frequency generation techniques became common, Drake sought to bring this advanced technology into their product line. Some parts of this "8-Series" product line made it to market. While not part of this article, those of you that followed Drake products recall that the R8 Receiver (followed by the R8A and R8B) came on the market about 1991. It included several accessories, including the MS8 Speaker Console and a VHF Converter for the 35-55 MHz and 108-174 MHz bands.

The Drake TR8 HF Transceiver Prototype

For reference through the article, here also is a repeat picture of the TR7 (a TR7A, in this picture) to use in making comparisons. This TR7A resides at W9MXQ.

W9MXQ

Most important are two areas of obvious design upgrade. The first is Frequency Control:

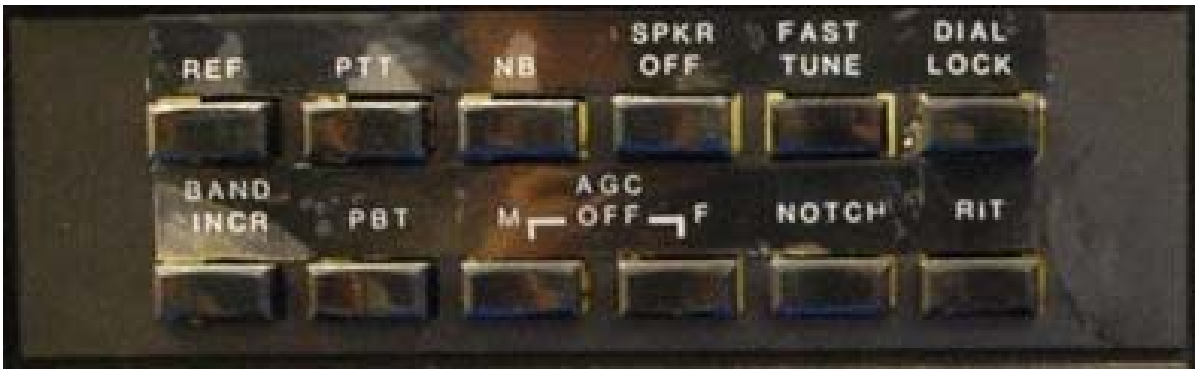
Check the Frequency Control area of the TR8 Front Panel to see the evidence of dual internal VFO's. To the left is a blown-up view of the area showing that there was a wide selection of Receive (RX) and Transmit (TX) control options. It is seemingly understood that Drake had the circuitry of the PLL RV75 External VFO – or a more advanced version of that product – included in place of the analog PTO and DR7 frequency display apparatus from the TR7. This would have made the TR8 competitive with the more stable Japanese radios of the day. But, not quite as stable as today's TCXO equipped radios made in the USA and elsewhere. Note separate power switch in what appears to be a push-push device.

The second area of improvement is the change in several features that were not seen in the original TR7 and TR7A. Check this insert from the front panel view of the TR8:

Here are a lot of important features of the TR8 that many felt were omitted in error from the TR7 and TR7A. Those include the FM Mode and a dedicated TUNE position on the MODE switch. (I use CW mode for tuning my L7 Amplifier with my TR7 and TR7A.) However, perhaps the most desirable feature added was the humble NOTCH filter – long a main-stay of the previous generation Drake 4-Line separates. Note the repeat bandwidth selections (concentric with the Passband Tuning (PBT) control from the TR7 and TR7A. (The TR8 added a fifth bandwidth position.) It appears that Drake continued to use the proven crystal filter bandwidth control as did their competition.

Next we will look at the center of front panel push buttons for further evidence of the inner workings of the TR8.

The buttons used on the TR8, while more numerous, followed the design used on most of the 7-Series products. They seem from my experience to be convenient and durable.



I offer apologies for the poor picture quality – but this TR8 was an engineering "mule" and never was intended as a marketing piece. I think I could duplicate the above panel lettering with the Casio Label Maker in my toolbox.

Let's now go through the different buttons on the top row:

- REF – switches the meter to Reflected Power – same as TR7/TR7A
- PTT – switches between PTT and VOX transmitter control – same as TR7/TR7A
- NB – switches on the Noise Blanker – same as TR7/TR7A
- SPKR OFF – disables the speaker – the same process used on the Drake R7/R7A Receiver where the insertion of the headphone plug did not automatically disable the internal speaker
- FAST TUNE – allowed the digital VFO to go into fast slew mode.
- DIAL LOCK – disabled the VFO encoder so tuning was locked out

Now for the bottom row:

- BAND INCR – this control seems lost to history – but may have been some feature used with the general coverage receiver band selection or in a way similar to the UP and DOWN buttons on the TR7/TR7A
- PBT – turned on and off the Passband Tuning – as on the TR7/TR7A
- AGC M-OFF-F and S – this was the AGC feature switch, not unlike the bandwidth switching control on the TR7/TR7A – both buttons out was Slow Speed AGC, Left Button pressed was Medium Speed AGC, Right Button pressed was Fast AGC, and Both Buttons pressed was AGC OFF
- NOTCH – turned on the NOTCH feature in the TR8
- RIT – turned on the RIT (Receiver Incremental Tuning) feature in the TR8

Finally, we will look at the lamp panel – which is much expanded from the TR7/TR7A:

The TR7/TR7A had equivalent lamps for PBT and RIT. They also had two different lamps (SETBAND and FIXED) that had no equivalent with the more advanced frequency and band switch control of the TR8. The ALC lamp on the TR7/TR7A was in a different location.

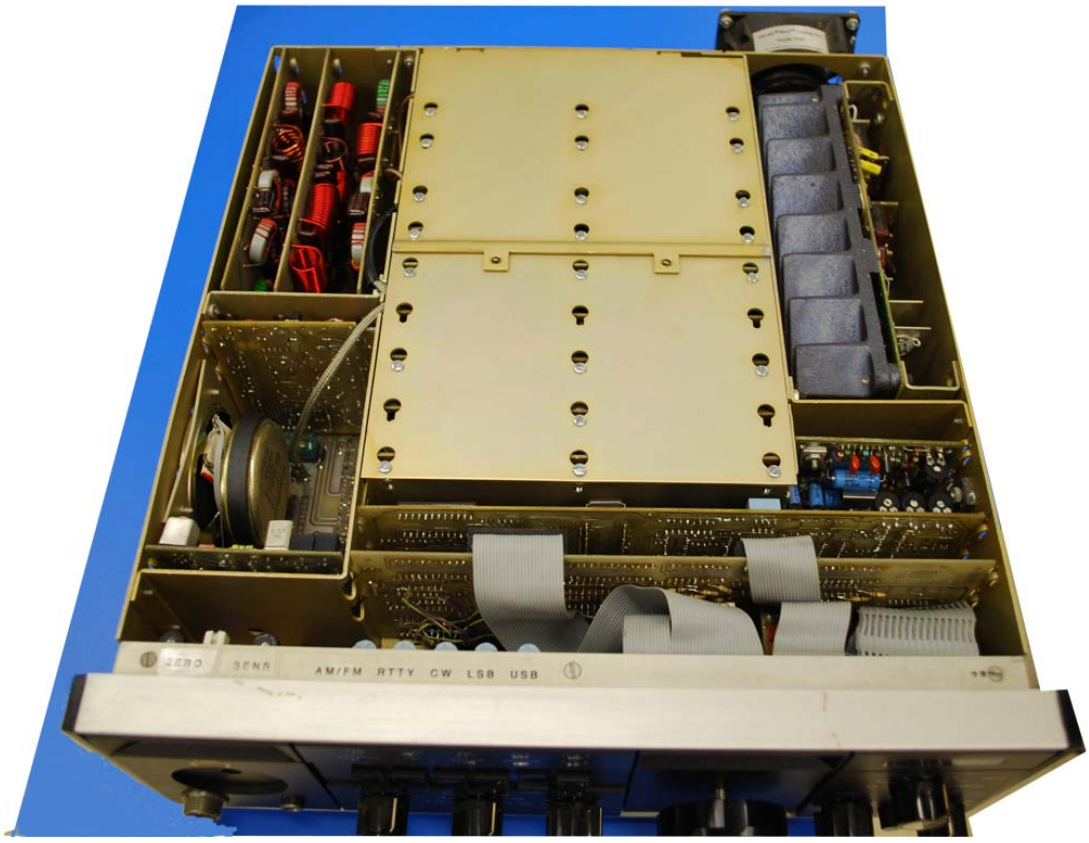
Lamps on the top row:

- ALC – indicates peak modulation buy just flickering with modulation
- LOCK – indicates that the tuning dial encoder was locked
- RIT – indicates that the RIT is engaged – same as on the TR7/TR7A
- RCT – feature on the TR8 is not identified in my information
- VFO A – indicates that the frequency readout is showing VFO A frequency and that VFO A is controlling the transceiver (if the radio is in transmit)

Lamps on the bottom row:

- SETBAND – it is assumed this was a term to indicate PLL Unlock Condition – or it could have had some feature set tied to the unexplained BAND INCR button
- PBT - indicates that the PBT is engaged – same as on the TR7/TR7A
- NOTCH – indicates that the NOTCH is engaged – same as on the TR7/TR7A
- REMOTE – indicates remote frequency control – but not clear from where
- VFO B – indicates that the frequency readout is showing VFO B frequency and that VFO B is controlling the transceiver (if the radio is in transmit)

The inside of the TR8 was a rather expanded version of the TR7/TR7A:



The TR8 was some three inches deeper than the TR7/TR7A. Note the continued use of the FA7 Fan and what appears to be the same Power Amplifier Assembly and Bandpass filters. The area where the DR7 Board used to reside in the TR7/TR7A is now taken up by vertically mounted boards that included the PLL Dual VFO Circuitry. It has always been my thinking that the TR8 had an automatic antenna tuner but no controls for one exist on the front panel nor does this view shown any evidence of such a feature. Perhaps it was somehow mounted separately – like an accessory.

The rear panel of this prototype has its own mysteries:

You can see the FA7 Fan in place. And you will note connectors for a remote receiver (which could have had some relationship to the REMOTE lamp if it could be allowed to control the transceiver). The Jones four-pin and Jones ten-pin connectors seem to indicate the reliance on a PS7 (or new version PS7) Power Supply – or could simply mean that this was a TR7A back panel from stock at the time. Note the reference to the "XXX2" number at the right. This is supposed to be the second prototype – so the "XXX" is a reference to the TR8 and the "2" is the number.

Here is an internal top view of the TR7A at W9MXQ. Note the FA7 for size reference with the TR8, above. The TR8 is a deeper and therefore larger. The TR7's complicated DR7 Digital Readout board in front of the circuit board enclosure is gone from the TR8. Also note the fewer boards in the board enclosure of the TR7/TR7A compared to the TR8:

W9MXQ

There are two more areas of the front panel for review:

The left picture shows the extreme left side of the Front Panel. Here you see the same meter as used in the TR7/TR7A plus the location of the Band Switch. The Band Switch appears this way in any picture I have seen. Careful examination shows the hole to be open with no visible shaft. Perhaps at this prototype level (XXX2) the radio was hard wired to a single band and the switch layout had not been developed. Like on the TR7/TR7A, the silk-screened BAND callout and the printed “bracket” seems to indicate that the Band Switch might have shown a range. See the continued reliance by Drake on the four-pin Foster microphone connector.

The right picture shows the area just to the right of center area of the TR8 and shows the main tuning knob (the same knob as used on the R8/R8A/R8B Receiver) and the readout window. Careful examination would seem to indicate that the readout itself, while still made of seven-segment LED unit(s) it did show nine segments as in 14250.00 format. This means two digits to the right of the decimal point. This is an improvement over the eight segments of the same readout on the TR7/TR7A – as in 14250.0 format.

As hinted above with several buttons and lamps, the complete information package on this radio is limited and incomplete. So, my quest to find answers is ongoing. The TR8 design appears to have taken place before the final plans for the R8 Receiver were finalized and then put into production. The designs (TR8 vs R8) evolved after the idea of an R8 Receiver was finalized.

I will end this article at this point – after having found a good deal of information on a matching Linear Amplifier and even what appears to be a matching transmitter (note I said “transmitter,” not “transceiver”) for the R8 Receiver. So, the final article in this series of Drake radios will come next month.

Please understand that much information about the elusive design specifications of the TR8, its accessories, and other related products are lost to history. Much of what I have written is con-

jecture on my part from very limited information and the interpretation of controls on the panels of subject equipment. My research in this subject is ongoing and may generate information for a more detailed article on the TR8 Transceiver. I am looking for details of QSK operation of the Transceiver, an internal or external automatic antenna tuner, the possibility of any planned "RV8" external oscillator, etc. Some other accessories are better known – and will be the subject of next month's article. Next month we will also talk a bit about a possible TR7B Transceiver that may have been planned – or that was perhaps an even earlier concept of the TR8 Transceiver. Another item for further detail is the final ending for the TR7 and TR7A – it is a story that has a Milwaukee connection..

Special thanks go to Bob, W9DYQ, for his proof reading. Remember that I am open to questions and comments at my email address, W9MXQ@TWC.com.

Reference Notes:

1. Sindre Torp, LA6OP – who further credits Bill Frost, former Drake Service Manager. All pictures, except the two covering the TR7/TR7A, are credited to Mr. Torp.

W9MXQ

UPCOMING EVENTS

Breakfast at Jim's Grille – Saturdays at 7:00 AM

Upcoming ORC Monthly Programs

July - Tom W9IPR, Sun-N-Fun
August - Homebrew Night
September – Chuck W9KR, Direct Digital Synthesized VFO

Homebrew Night

de Pat Volkmann, W9JI

The August ORC Meeting will give you a chance to show off one of your projects. You can bring anything that is ham radio related. If it's too big to bring in, bring some pictures. Please let me know if you are bringing something so that I will be able to budget the time accordingly. For now, plan on 3 to 5 minutes to talk about your project. Send me no more than 3 PowerPoint slides. If you don't use PowerPoint, send me some photos and information and I'll put it together for you.

I recently attended a similar program at the Wisconsin Amateur Radio Club meeting. The projects were all very interesting and very well done. It was a lot fun looking at and talking about the various projects the members brought in. I'm looking forward to talking about YOUR project at the ORC meeting in August.

Presenters Needed!

de Pat Volkmann, W9JI

The monthly program is the highlight of the Ozaukee Radio Club meeting. We are fortunate to have a number of very talented people in our club, many of whom have shared their knowledge through a presentation. Share your expertise and experience with the club. Programs can be on any topic that is ham radio related. Contact Pat Volkmann W9JI at w9ji@arrl.net to discuss your idea for a program.

Ozaukee Radio Club
June 12, 2019 Meeting Minutes

de Ben Evans (K9UZ), Secretary

President Kevin Steers (K9VIN) called the meeting to order at 7:30 PM. All the attendees introduced themselves.

Announcements, Show-and-Tell, Bragging Rights:
Members told of the countries they worked during the recent 6-meter contest.

Program:
Ken (W9GA) gave his presentation about the club's activities for the upcoming Field Day weekend. Ken talked about the ORC's plans for Field Day 2019 and highlighted the club's past Field Day activities with contact statistics and photographs. Ken also talked about the setup Thursday and Friday, and the turkey roast dinner Friday night.

50/50 Drawing:
Jon (WW9JON) was the winner of the 50/50 drawing.

Auction:
Stan (WB9RQR) conducted the auction. Many items were sold, including a book titled "Thunderstruck" by Erik Larson, an RCA speaker and a Dell Studio XPS 8100 desktop computer with the latest version of Linux installed.

Officer Reports:
Kevin S. (K9VIN), President's Update – None.

Pat V. (W9JI), 1st VP – No report.

Tom T. (KC9ONY), Repeater VP – Hopefully got rid of the hum problem at the Mequon site by relocating to another equipment rack. The amplifier at the main site has issues so it's being bypassed resulting in lower power. Working on a replacement amplifier.

Ben E. (K9UZ), Secretary – The minutes from the May meeting are in the newsletter. Motion to accept the minutes was made by Stan (WB9RQR), seconded by Robert (K4WTH) and approved by the members.

Robert E. (K4WTH), Treasurer – The treasurer's report was handed out to members prior to the meeting. The final net income for the Spring Swapfest was $827.28. The Scholarship made $187.75. Everyone was reimbursed so there should be no outstanding receipts. The May profit/loss report was in the handout. Motion to accept the treasurer's report was made by Vic (WT9Q), seconded by Ken (W9GA) and approved by the members. Tom R. (W9IPR) commented that the written report is nicely presented.

Committee Reports:
Ken B. (W9GA), Field Day Committee – Ken, with the help of others, will be putting up the canopy at his house Thursday afternoon to make sure there's no trouble with it. Ken called for additional people to help out in that effort.

Tom R. (W9IPR), Scholarship Committee – There were several individuals who showed up to clean up the barn. About five paging systems were gotten rid of, but the power supplies were removed and saved. Each power supply appears to be good for 50 amps. If anyone is interested in these power supplies, let Tom know. Tom thanked those that came to help clear the barn.

Tom is looking for an "assistant editor" to help with the newsletter after being the editor for 18 years. Ben (K9UZ) volunteered for the position.

Jim (K9QLP) had a question about the treasurer's report. The check numbers appeared to be out of sequence. Robert (K4WTH) explained that the check numbers are randomly generated when they are cut by the bank.

Old Business:
There was no old business.

New Business:
There was no new business.

Adjournment:
Stan (WB9RQR) made the motion to adjourn the meeting, which was seconded and was passed by the members. The meeting was adjourned at 9:00 PM.

Attendance:
There were 29 members and five guests present at the meeting.

A copy of the attendance sheet is available upon request in PDF format. Please contact Ben Evans via email at ben@evansengsolutions.com for a copy.

Respectfully submitted,

B. Benjamin Evans, K9UZ
Secretary

ORC Meeting Agenda

July 10, 2019

1. 7:00 – 7:30 PM – Network & Rag Chew
2. Call to Order – Kevin Steers (K9VIN)
3. Introductions
4. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.
5. Program: Tom Ruhlmann W9IPR – Sun 'n Fun
6. Fellowship Break
7. 50/50 Drawing
8. Auction – Stan Kaplan (WB9RQR)
9. President's Update – Kevin Steers (K9VIN)
10. 1st VP Report – Pat Volkmann (W9JI)
11. Repeater VP Report – Tom Trethewey (KC9ONY)
12. Secretary's Report – Ben Evans (K9UZ)
13. Treasurer's Report – Robert Eskola (K4WTH)
14. Committee Reports:
    a. Scholarship
    b. Other
15. OLD BUSINESS
16. NEW BUSINESS
17. Adjournment to ?

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465 Beechwood Drive
Cedarburg WI* 53012

First Class

Next ORC Meeting:

Grafton Multipurpose Senior Center

1665 7th Avenue, Grafton, WI
Wednesday, July 10th, 2019

7:00 PM – Doors Open

7:30 PM – Meeting Begins

The ORC Newsletter

Official publication of the Ozaukee Radio Club, Inc. Email all contributions to the editor, Ben Evans, K9UZ. Permission to reprint articles published in any issue is granted provided the author and the Ozaukee Radio Club Newsletter are credited.

ORC Repeaters on 146.97, 224.18 and 443.750 MHz - Callsign W9CQO
Web site: www.ozaukeeradioclub.org **Facebook: facebook.com/orcwi**

Volume XXXI	August, 2019	Number 8

From the President

de Kevin Steers (K9VIN)

Well, I tinkered with my new MultiMeter, and turns out it takes two different batteries and two different fuses, from what I can tell. I'll be sure to bring it to our August meeting to entertain.

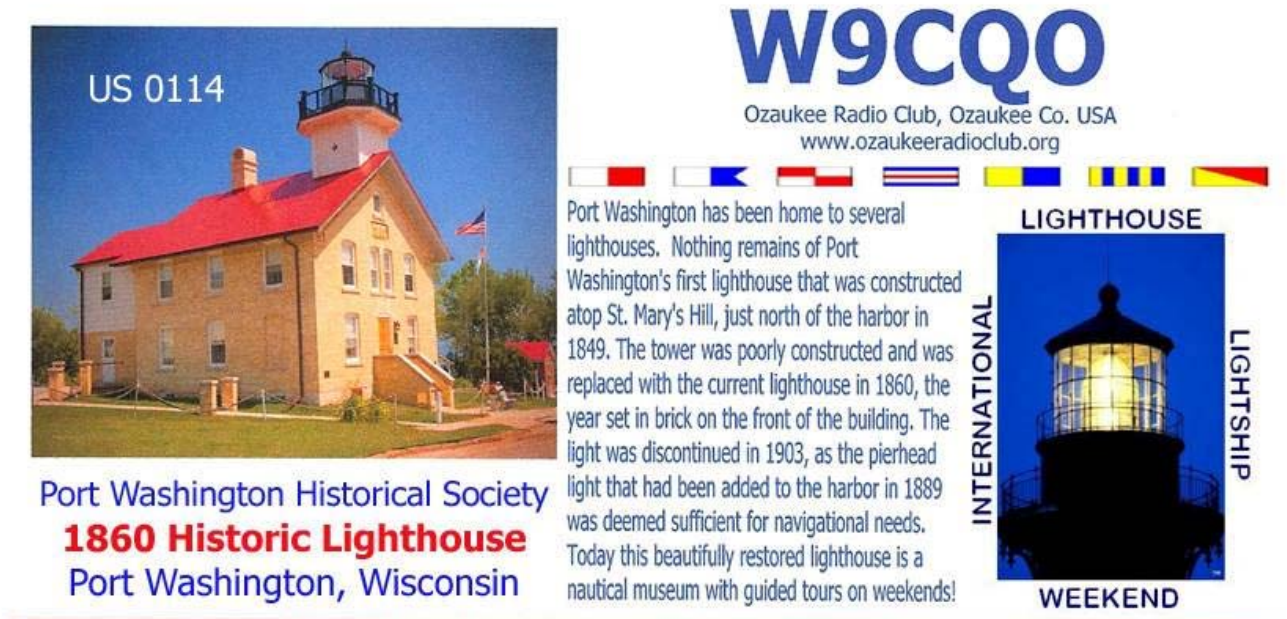
I recently went on a family vacation to Nova Scotia. I struggled with my HT and charger before leaving, so I borrowed one from Tom T. KC9ONY. He was even kind enough to use CHIRP to program in frequencies for the cities I would be staying in.

Apparently, 2 meters is as popular in that maritime province as it is here. I did join in a morning coffee Net, which was nice. I had hoped to work more 2 meters, but it is a remote region, and I was doing a bunch of busy family stuff to boot. I certainly didn't want to wake anyone up during the four-hour drives that we did on two different days☺ A side note to anyone with teenagers: their AT&T phones don't work in Canada, so it was kind of nice with them only having texting abilities when in WiFi areas. Funny when they texted me from in front of a BMO Harris bank that had WiFI . . .modern day foxhunters I guess.

I heard from Jeff Whisler WV9X recently, and he is close to having his new tower up in northern Wisconsin, Langlade County. He should be getting concrete poured soon, and hopefully the tower erected as soon as the concrete fully cures. His ambition is to use this northern location as a remote ham shack. I certainly hope we can hear from his trials and tribulations, and ultimate success.

Let's get ham radio out into the public. If you have an idea on how to do so, just let me know.

Cheers and 73,
K9VIN
Kevin



International Lighthouse Lightship Weekend - ILLW

de Tom KC9ONY

Once again, members of LEFROG and the Ozaukee Radio Club will join together to participate in the International Lighthouse Lightship Weekend (ILLW), which started in 1998. In 2018, there were over 49 countries and 440 lighthouses signed up. Amateur radio clubs and amateurs across the globe will be doing the same type of thing as we attempt to contact other lighthouses. This is to bring awareness and recognition of the importance of lighthouses, their restoration, and maritime heritage. See https://illw.net for more information.

We are registered as US0114 and will be using the W9CQO call sign. Our event station will be set up on the property of the 1860 Light Station & Museum located on the top of the hill in Port Washington, WI (near St. Mary's Church). See http://pwhistory.org/visit/lightstation.

Friday, August 16, 2019, we will be erecting a 30' tower and a Cushcraft AS4 tri-band beam. We will operate mainly on 20 meters, depending on band conditions, but are also considering putting up a 40-meter dipole.

The ORC will be setting up one 10' X 10' tent, club banner, and operating table next to the Lighthouse, and LEFROG will be doing the same. LEFROG will supply an Icom IC-9100 and possibly an Icom IC-7600, along with a logging computer. We will also have D-STAR.
We could use your help setting up on Friday afternoon, and tearing down on Sunday as well.

All are welcome to join us. If you don't own HF equipment nor have any experience operating HF, don't let that stop you from coming out. We will get you on the radio to try it out. This is not a contest, so there is no pressure! It's about having fun and learning!

Bring your own cooler with drinks, and maybe something to eat. However there are several restaurants in the area. You might consider bringing a chair if you want to ragchew when not on the air.

If you need directions or talk-in, someone will be monitoring the ORC 2-meter repeater, 146.970 MHz, (- offset), CTCSS 127.3 Hz.

WHO: Ozaukee Radio Club and LEFROG (Local Emergency Field Radio Operating Group)

WHAT: International Lighthouse Lightship Weekend special event station

WHERE: 1860 Light Station & Museum
311 Johnson Street, Port Washington, WI
http://pwhistory.org/visit/lightstation

MAP: http://tinyurl.com/1860-Light-Station-Museum

WHEN:		
	Friday, August 16th:	Setup 1pm - 5pm? (until tower is set up, radios tested)
	Saturday, August 17th:	Operating 9:00 am - 5 pm
	Sunday, August 18th:	Operating 9:00 am - noon
	Sunday, August 18th:	Teardown noon – 5 pm

If band conditions are good, we might continue operating past those times.

If you do come out, please **DO NOT park in front** of the 1860 Light Station Museum, as those parking spaces are meant for visitors to the museum. We want to maintain a good relationship with the folks at the Port Washington Historical Society.

DX'ing & Contesting

De Gary Sutcliffe (W9XT)

The results of the Wisconsin QSO Party (WiQP) were just released. The ORC did pretty well. It has been several years since the club had a presence in the WiQP. Bob, W9LO (SK), used to be the sparkplug to get everyone motivated to get on and make a few contacts for the club. The ORC did very well for many years. Since Bob's passing, we haven't had much of an effort.

Early this year I talked to a couple of members who are into radio contesting and we decided to talk up the WiQP and see if we could generate some interest in the club. The WiQP was promoted in this column and at the meetings for the March 2019 event.

AC9IV, K9DJT, K9QLP, AA0WP, W9MXQ, WT9Q, and W9XT operated. We missed being the winning club by about 20,000 points. Looking through the results in more detail, I saw that Gary, K9DJT's score didn't get included with our club score. A computer glitch apparently didn't change the club from the SMC, which he normally is submits his score to, to the ORC which was what he wanted.

Gary's score would have put the ORC into first place! Well, there is only one thing to do. Next year we get more members on, so if there is a problem we still win! The WIQP is normally the second Sunday of March. Mark the 2020 date on your calendar now. You can see the results at https://www.warac.org/wqp/2019/results2019.pdf.

The new version of WSJT is out. It is version 2.1.0. The biggest change is that it makes the new FT4 mode a general release. FT4 is similar to FT8, but is designed for faster QSOs for contests. It trades speed for the ability to dig out weaker stations. I discussed my experience with the FT4 Beta versions in the Beta versions in previous columns. I have not installed 2.1.0 at this time, but will definitely do it before the meeting.

A new contest to take advantage of FT4 (and FT8) has been created by the World Wide Radio Operators Foundation (WWROF). This organization was created several years ago to promote contesting. They are sponsoring the first annual World Wide Digi DX Contest (WW Digi). It starts at 12:00 UTC (7:00 AM local) on Saturday, August 31 and runs for 24 hours. You contact other stations and send your grid square.

The score is QSO points times multipliers. QSO points are distance based. You get one point per QSO, plus an additional point for each additional 3000 KM between the stations. Thus, long contacts are worth more points. Don't worry about calculating the point value. The logging programs will be updated to do that for you.
The multipliers are the two letters at the start of the grid square. Most ORC members are in grid EN53 or EN63. They will provide the EN multiplier. Total multipliers are the number of grids per band, 160-10M, excluding the WARC bands. More information is on their website at https://ww-digi.com/rules.htm.

The WWROF is also putting on a webinar on how to operate digital contests. The live events will happen before the newsletter is published, but WWROF seminars are typically recorded and available a few days later. I have found their past webinars to be excellent. Information on the webinar can be found at https://wwrof.org/webinars/. Be sure to check out the archives for other past webinars.

Other larger contests this month are the North American QSO Party – Phone. That starts on Saturday, August 17 at 1800 UTC (1:00 PM local) and runs for 12 hours with two off hours required. The exchange is name and state. The NAQPs have been covered many times before in this column. More info at https://ncjweb.com/naqp/.

I have heard several hams recently saying they need KH6 (Hawaii) for the Worked All States (WAS) award. The path to KH6 is generally pretty good if you are around at the right time. Your best shots will be on 40-20M. Forty will be best a couple of hours before sunrise to may a half hour after. The next band up, 30M will be best between around 9:00-midgnight. Maybe the best band will be 20 Meters, starting around 3:00 PM until around 9:00 PM, or a bit later. Evening openings on 17M are also possible.

Then, there have to be stations from Hawaii on the air. Well, there is the Hawaiian QSO Party this month. It is not going to be the biggest state QSO party, but if you want to make a contact with the state, this will be a good time. Note that they will not be on 30 or 17M for the QSO party. You should concentrate on 20 and 40M. It starts at 0400 UTC (11:00 PM local) Saturday, August 24, and runs for 48 hours. More info can be found at http://www.hawaiiqsoparty.org/.

A premier event for contesters in the 9th call district and surrounding area is the SMC Fest. It is August 24 in Bloomington IL. and is an all-day event. I know there will be at least four ORC members attending. I will be one of the speakers this year. https://www.w9smc.com/smc-fest/

There are not a lot of big DXpeditions this month. Maybe the biggest is to St. Pierre and Miquelon. These islands are just south of Newfoundland but are not part of Canada, but of France. Hence they are separate DXCC entities. They will be using the call TO5M from August 10-18. They plan to be on all bands, 6-160M.

A multinational group will be activating Market Reef on August 17-24 for the International Light House Weekend. The call sign for Market Reef will be OJ0O.

Several ORC members participate in the Light House Weekend, operating near a light house in Port Washington. The Light House Weekend starts at 00:01 August 17 (7:01 PM Friday, August 16 local) and runs for 48 hours. The ORC group will be using the W9CQO call. They are always looking for members to stop by. More information on ILHW can be found at https://illw.net/index.php/entrants-list-2019.

That wraps up August. Enjoy the rest of the summer!

THE COMPUTER CORNER

No. 257: You and Your GPS

Stan Kaplan, WB9RQR 715 N. Dries Street Saukville, WI 53080-1664
(262) 268-1949 wb9rqr@att.net

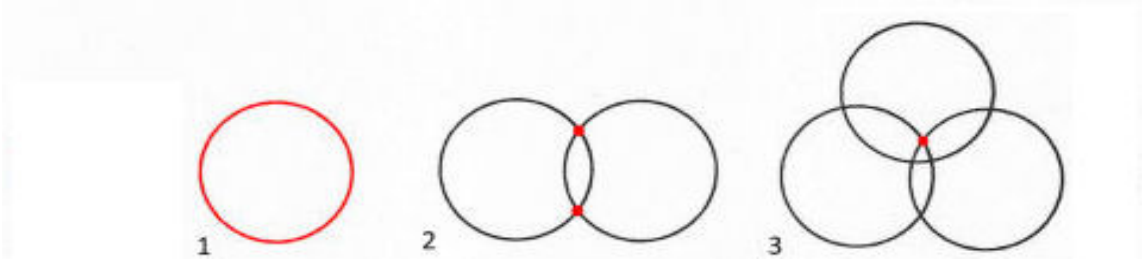
Did you ever wonder how your GPS or device with a GPS in it (smartphone, laptop, desktop, tablet, car or even running shoes) knows where you are (i.e., can pinpoint your location)? It is an amazing feat of modern electronics and space technology. By the way, GPS stands for Global Positioning System.

Until recently, 31 satellites covered the entire earth at any one time. Originally, it was thought the best way was to fly the satellites in geosynchronous orbit, which means they are each positioned about 22,000 miles above a single fixed point on the surface of the earth, never changing that distance or speed with relation to that point. So, if one were directly above Milwaukee right now, it would continue to be directly above Milwaukee 12 hours from right now, and 24 hours from now as well. No easy feat to fire one up there the right distance and speed to do this! Like many existing concepts in technology, a geosynchronous orbit was first conceived by a science fiction writer – Arthur C. Clarke (1917-2008) – back in 1945.

But a geosynchronous orbit is not how it is done now (thanks, Ben Evans, for catching this error in an earlier draft). Rather, they fly in medium Earth orbit at 12,550 miles up and each satellite circles the Earth twice a day. Flown by the US Air Force, at least 24 of these "birds" were needed to maintain complete coverage of the globe, and 31 was the magic number to include serviced and decommissioned units. Recently, they juggled and adjusted flight paths so that only a 27-slot constellation improved coverage in most parts of the world, and users can view at least four birds from any place on the planet.

Every thousandth of a second, the satellites broadcast a signal that identifies themselves and the time the signal was sent. A ground station constantly updates this info and applies corrections to the satellite's time signals to keep them ticking correctly.

On earth, your GPS device listens to these signals coming from different satellites, and how long each signal took to get to it. Now, look at these sketches:



If the signal was broadcast from a single satellite (a single point), it would cover a circle on the earth as shown in Sketch 1. This is a circle, whose radius has the overhead satellite at its center and whose circumference shows all the possible locations of the receiver (your GPS) on the

earth. All these possible locations are shown in red (the entire circle), since there are an infinite number of locations around the circle of possible positions.

On the other hand, if two satellites are involved as in Sketch 2, there are only two possible positions, and these are shown as red points. Your GPS could be at either point. This is a much smaller area than the whole circle circumference shown in Sketch 1, but it is still not a very accurate description of your location.

Now, with three satellites as in Sketch 3, there is only one point (the red dot) where all three circles intersect. This pinpoints your position to within a few yards. Since any point on earth has between 5 and 8 satellites "visible" at any one time, we can add a fourth or even a fifth satellite to improve accuracy to within a few inches or less. How cool is that?

Next time you are tooling down the road in your car, glance at the little car (you) on your GPS screen. Watch it moving down the road as you do. Think about the (usually) four satellites, 12+ thousand miles above your car, that are transmitting data to your GPS to make that possible. Wow!

LINUX UPDATE RELEASED!

The most popular brand/version/release of Linux (Linux, Mint, Version 19.2, Cinnamon, "Tina") was released at the beginning of August. Interestingly, this release was named after Tina Turner, the singer! You can read about it and even get a copy of the .iso file at http://www.linuxandubuntu.com/home/linux-mint-19-2-tina-released.

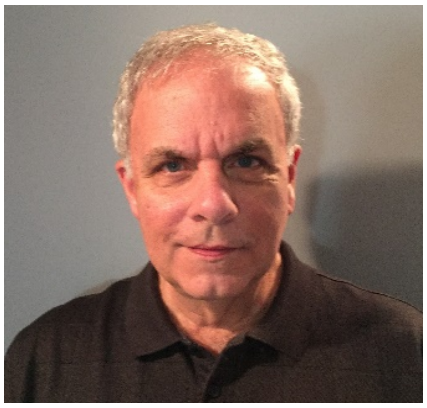
To make a bootable disk, you need to download this .iso file and use it to burn a bootable installation disk using your burning software. Alternatively, you can order a disk at https://www.osdisc.com/ for as little as $6 plus $2 shipping. They also have bootable thumb drives with the operating system installed. Make sure you get Version 19.2.

BUT, if you already have 19.1 on your machine, you do NOT need to get a disk. Go to your Update Manager (click the green shield in your tray) and make sure all updates have been downloaded and installed. It might even be best to reboot after this, though not strictly necessary. Then open the Update Manager again and click Edit at the top of the Update Manager box. Then select Upgrade to "Linux Mint 19.2 Tina" and you are on your way. Follow all instructions and you should come up with "Linux Mint 19.2 Cinnamon" when you search for and click System Info in the Menu (the green Linux icon on the left side of the tray). It might take as much as an hour to accomplish this major update.

Happy Computing!

Vintage Amateur Radio

de Bill Shadid, W9MXQ



This month's article was scheduled to be Part 4 of my series on the Drake TR7 / TR5 / TR8 Transceivers. However, due to some copyright issues on some of the material, I am moving that article out a month, at least. Meanwhile, I want to talk a bit about a new item in the W9MXQ Radio Collection. That would be a meticulously restored Johnson Viking Valiant Transmitter. The Viking Valiant plays an important part in my ham radio history. I never held a Novice license – I started as a General – so the VFO equipped, high powered Johnson Viking Valiant was my first ham radio transmitter.

This installment documents my experience with several Valiant transmitters in my ham radio lifetime. It was not only my first transmitter used on the bands, right now it is also my most recent addition to my collection. Now, however we need to go back to 1964 for my first Valiant:

Johnson Viking Valiant 160-10 Meter CW/AM Transmitter Similar to one Purchased Used/Reconditioned from Amateur Electronic Supply, Milwaukee, Wisconsin in 1964 (Very nice condition – but only about five years old at the time.)

One of my best friends – in those days, and still today, is Gary Frankeberger, WA9BJU. At that time, we both lived in Normal, Illinois – being friends and schoolmates starting in the fifth grade. We got interested in ham radio about the same time, but Gary received his license about two and a half years before it was my turn – model railroading, at that time, was ruling my life. When my license, WA9MXQ, came along in 1964, Gary was using a Valiant for his transmitter with a Hammarlund HQ-100 Receiver and Gotham Vertical Antenna. (Do any of you remember the Gotham Vertical?) After several overnight operating sessions at Gary's shack, running the Valiant, I decided it was also the transmitter for me. I bought a used Valiant from Amateur Electronic Supply, in Milwaukee, and a used Hallicrafters SX-101 Mark III Receiver from Klaus Radio in Peoria, Illinois. At the same time, I bought my first antenna, a HyGain 14-AVQ Vertical – also coming from Klaus Radio. My first contact was with a station, on 40-meter CW, only blocks

away. But to me, it was real DX. DX, after that, was defined a bit further away – but, we all remember that moment when we first knew – it works!!

The Valiant was a superb radio for CW and AM. It ran 275 watts input on CW with a bit over 200 watts output. And, it ran 200 watts input of plate modulated AM with a 150-watt output. If you calculate that at about 75% efficiency, you are correct. The transmitter ran Class C Amplification – the final was not a linear amplifier. Those of you that do not understand the difference have perhaps a bit of reading to do. The Valiant had the ability to switch its final amplifier to Class AB1 to allow for the insertion of a low power (2 to 5 watts) of excitation from an SSB Exciter to allow for 275 watts PEP input (for an output in Class AB1 of about 130 watts). Exciters like the Central Electronics 10A, 10B, or 20A were widely used with the Valiant for such purposes. In that kind of operation, only the driver and final amplifier section of the Valiant were utilized. The Valiant would be set to the proper band with the lower stages disabled.

The Valiant used three 6146 tubes in the final amplifier that were modulated by two more 6146 tubes in the plate modulation circuit. The modulator had the ability to produce more than 125 watts of audio. At 200 watts of RF input there would have been a requirement of 100 watts, or more, of audio. The radio was no light-weight design. It was constructed of steel, painted like an automobile (I used to wax my Valiant!), and was massive at 21 x 11-5/8 x 16-1/4 inches (WHD) and with a shipping weight of 83 pounds. One of its many talents was to hold down the operating desk in a windstorm!! Mind you, the Hallicrafters SX-101 I was using at the time was no lightweight either – it was 20 x 10-1/2 x 16 inches (WHD) and weighed in at 74 pounds, shipping weight.

I continued with my Valiant into 1965 and added the Viking SSB Adapter to the operation that year. The SSB Adapter was different than the idea of an outboard exciter, it used the VFO and lower level stages in the Valiant. But the Valiant had to be modified with a special kit to allow such operation. Here is a picture of the SSB Adapter, taken from the 1965 Johnson Amateur Products Catalog:

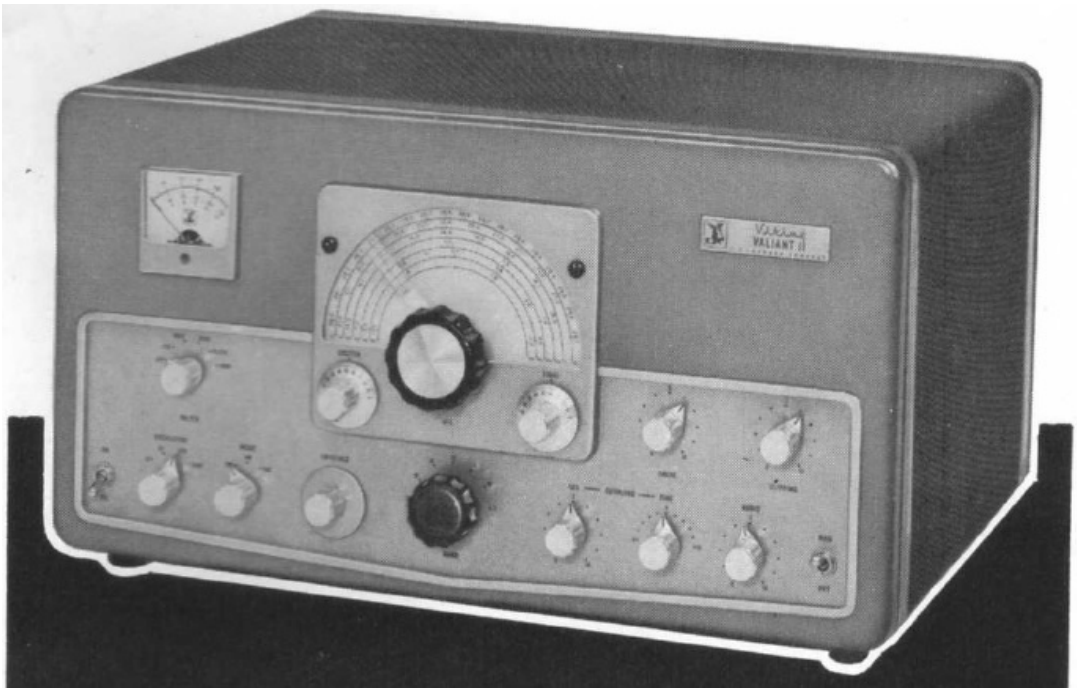
The Viking SSB Adapter matched, and was plug and play with, the later Valiant II Transmitter. However, the original Valiant could be modified to accept the Adapter. This modification made the Valiant (by then referred to as the Valiant I) the electrical equivalent to the Valiant II.

The modification was extensive. It involved adding connectors to the back panel and required numerus internal alterations and connections. I was pleased with the results. When finished, it worked perfectly and the SSB Adapter and the Valiant came to life on SSB. Tuning the pair was a nightmare compared to what we experience today.

If there was ever a shortcoming with me and equipment it was my desire to have pieces from a manufacturer match each other. The Valiant and the SSB Adapter did not match each other. In my mind, that was a problem. (In reality, it made no difference – a point that never held much water in my thought process.)

To slake that thirst for matching equipment, in 1966, I sold the Valiant and bought a brand-new Johnson Viking Valiant II – in kit form – again from Amateur Electronic Supply. My AES salesman then, as he is now at Ham Radio Outlet, was Paul Szczerbinski, K9KHO. I remember waiting what seemed like an eternity for the kit to arrive from Milwaukee, via Railway Express. In kit form, the box approached 100 pounds and I can still remember he Railway Express agent wheeling up to my parent's house. Those days were well before the instant gratification, one or two day (order to delivery), of our Amazon crazed world.

Doing the modification on the original Valiant to use the SSB Adapter had prepared me for the kit approach from Johnson. So, the complexity of the Valiant II kit was no surprise. Believe me when I say that Johnson was certainly not Heathkit. The kit took many hours, a lot of thinking, a lot of learning, and was very satisfying to complete. When done, however, it did not work!! But, in short order, retracing my footsteps I found the problem to be an incorrectly wired terminal strip. I had wired one side correctly (pins 1 through 8 on one side were wired 8 through 1 on the other side). It was a wonder I did not blow up the radio!! Over the years, I have found several other hams who assembled the kit and made the same error. Here is the Valiant II as shown in the 1965 Johnson catalog:



Johnson Viking Valiant II 160-10 Meter CW/AM Transmitter
From the 1965 E. F. Johnson Amateur Equipment Catalog

By that time, the original SX-101 Mark III Receiver was gone from the shack. It was replaced by a Hammarlund HQ-170AC Receiver[4]. A three-element triband HyGain TH-3 beam had been added on a 50-foot tower. But, alas, that all ended in late 1966 when Jean (my XYL) and I got married and moved into an apartment. The Valiant II, the SSB Adapter, and the HQ-170AC quickly morphed into a tiny Sideband Engineers SB-34 Transceiver. The tower and beam came down and were replaced by an end fed wire and home brew antenna tuner.

Many pieces of gear have come and gone since then – along with the development of my radio collection. But the fun that I had with the Valiant was not to be forgotten.

Back in June of 2017, another very nice Valiant came into the shack by way of Pat Volkmann, W9JI, in the form of a trade. I guess I was not ready to tackle that beast at the time, and about a year later it went back to Pat in yet another trade.

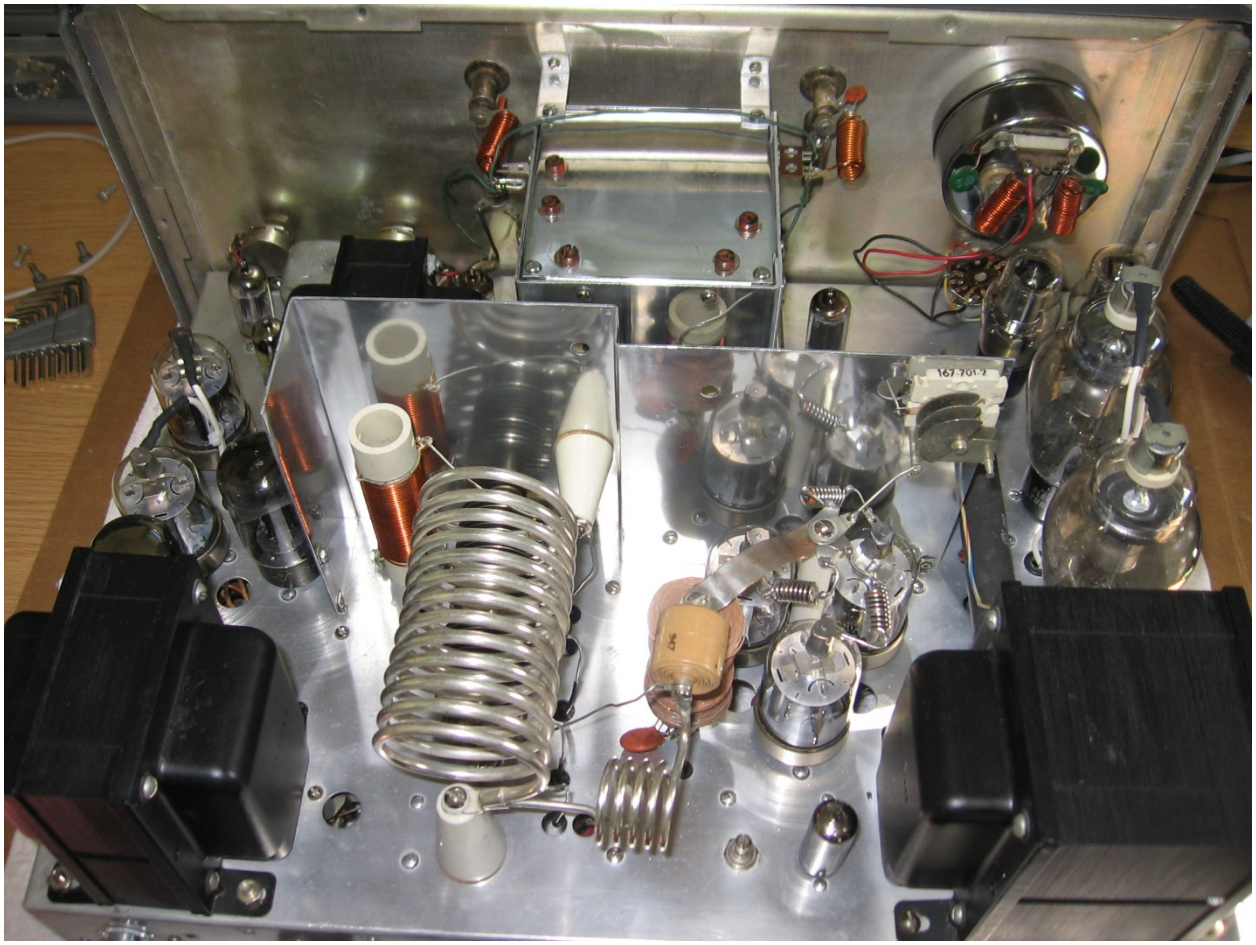
This is the Johnson Viking Valiant from W9JI. My intention at the time was to fully restore it. I have been thinking of late that I would like to attempt that again. Many of the big CW/AM Transmitters from the 1950's and 1960's are open and accessible in most areas. A significant exception to that statement are the 32V series transmitters from Collins. A nightmare!

Very recently I had the opportunity to secure yet another Valiant – and this time I hope that I am smart enough to keep it in the collection as long as I can keep radios here. This is an original Valiant (not a Valiant II) and has been restored to original condition – it appears to have come of the assembly line just today. Here it is:

Fully restored Johnson Viking Valiant 160-10 Meter CW/AM Transmitter sitting in the shack at W9MXQ in August of 2019 (If you see a mark on this radio it IS a reflection!)

This fine example was meticulously restored by one or both well-known restorers, Howard Mills, W3HM, and/or Chuck Hurley, K1TLI[1]. Both of their names appear on documentation and packing of this radio. It currently does not work, due to an issue caused by the shipper in getting it to Milwaukee. It is certainly repairable, and it will soon be on the air.

All Valiant and Valiant II Transmitters are essentially the same – with only cabinetry and the SSB Adapter circuitry changing over a long span of production[2]. Here is an internal picture, provided on-line by Chuck Hurley, K1TLI. It is identical to the interior of the recently acquired Valiant at W9MXQ:



Interior View – Johnson Viking Valiant Transmitter

Looking toward the interior side of the Front Panel, from the rear. To the left are the two 6146 Modulators. Just left of rear center is the Tank Coil in the Pi-Network Output Circuit. To the right of the coil are the three 6146 Final Amplifier tubes. To their right is the HV Power Transformer. To the right center are the two 866A Mercury Vapor Rectifier Tubes. Those rectifiers glow in "electric blue" flashes as CW is sent. At the lower left is the Power Transformer for filament, bias, and low high-voltage requirements of the radio. The power supply chokes are under the chassis.

This radio came to W9MXQ in a radio trade with John Schroeder, KB9PBM, a fellow member of the Wisconsin Amateur Radio Club. John is a fellow appreciator of vintage radios.

As a final item, I want to share with you a story about the first Valiant. That was the one mentioned first in this article, from 1964. As a collector, I always wonder what happened to radios that are no longer in my collection. Some come back! But many are gone like a lost family member or friend and I wonder what became of them. I had especially wondered about this one since it was my first transmitter. But, in a lucky break, I received this message from Italian ham operator, Roberto Lucarini, IKØOKT:

Hi William,
I found the callsign WA9MXQ written on the frame of this Johnson Valiant, here you see that before the restoration.

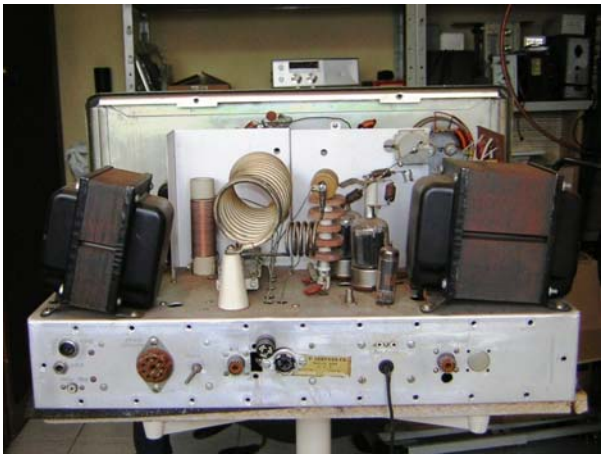
It was by chance really yours?
If so, from United States it's arrived in Germany and later in Italy …
Greetings from Rome.....
Roberto, IKØOKT

Wow, what a great piece of news!! Back in those days, I would scratch my name[3] into the chassis of radios I had owned. Here is how that appeared to Roberto:

This may be hard to see, but here is the "hen scratching" showing "WA9MXQ." (My call until only a few years ago.)

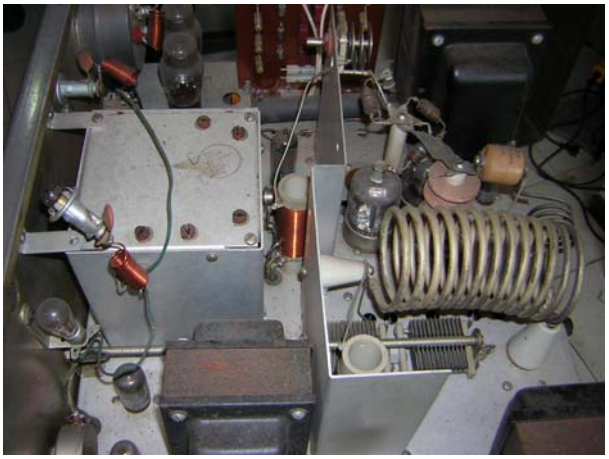
Roberto found the Valiant in Germany and had it shipped to his QTH, in Rome. The radio was inoperative, and it was not known at that time if it could be restored to full operation. Its story – how it traveled from the USA to Germany – is still unknown.

Picture details of my once beautiful, 1964 edition Valiant, as Roberto received it, are shown, below. It is evident that the transmitter had been dropped on its left side (when viewed from the front). The inertia of the two power transformers and the tank coil is evident in the overall picture. The close-up picture of just the lower voltage power transformer shows even more detail. If either of these transformers had broken away from their mounts the interior damage could have been much worse. The integrity retained by the chassis is a tribute to Johnson's all steel construction:



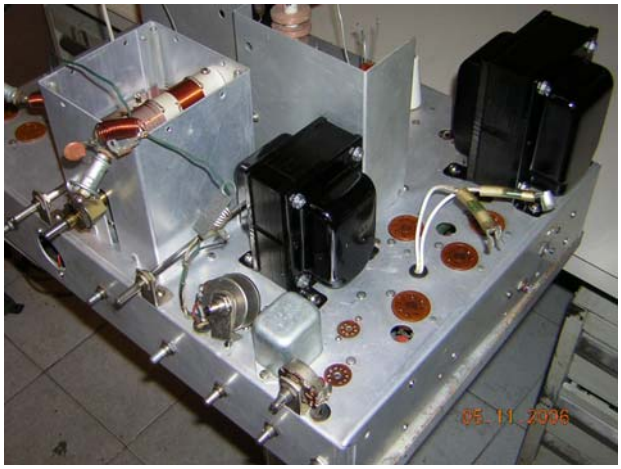
Views showing that the transmitter had been dropped (close-up detail at the right).

Front of Transmitter – Note thermometer!



Interior view – See distorted tank coil.

Now, here is the same Valiant as restored by Roberto:



Cleaned up Chassis and Completed Transmitter

And, my old Valiant in Roberto's ham station: (Also see the IKØOKT QRZ page.)

The before and after pictures of the Valiant (above and below) are a tribute to Roberto's restoration ability. It appears, but is not confirmed, that Roberto returned the very visual 866A Mercury Vapor Rectifiers to their rightful place in the Valiant.

IKØOKT Shack – Left to Right:
Johnson Viking 500, Drake R-4B Receiver on top of Drake MN-2000 Antenna Tuner, Johnson Ranger on top of National HRO-60 Receiver, and…. the Johnson Valiant (ex-W9MXQ Valiant) at the very right side. (A somewhat newer picture appears on IKØOKT's QRZ page, today.)

A special thanks go to Bob, W9DYQ, for his proof reading of my articles. Remember that I am open to questions and comments at my email address, W9MXQ@TWC.com.

Reference Notes:

1. I am in the process of sorting out the involvement of Howard Mills and/or Chuck Hurley in this radio. I have a work sheet of what was done to the radio as provided by Hurley. But, the appearance of Howard Mill's call letters on the packing leads me to believe that there was some cooperative effort involved.
   Howard Mills is best known for his Collins Restorations with a good reputation for some Johnson equipment. Chuck Hurley owns a Score Board Sign Company. He also restores collectable automobiles – in addition to his exclusive Johnson restorations of Rangers, Valiants, Pacemakers, 500s, Couriers, Thunderbolts, Challengers, and Matchboxes.

2. There is another difference in the Valiant and the Valiant II that is a real surprise when moving from the original to the "II" model. Just to the right of the FINAL control on the front panel, immediately to the right of the VFO knob, is the DRIVE control. That control was on the front panel, just outside the chassis mounted 6AL5 Dual Diode, Audio Clipper Circuit Tube, V13. The heat from V13 transferred to that the DRIVE potentiometer was substantial. The original Valiant had Bakelite knobs that did not transfer heat to the fingers. On the Valiant II, the knobs were aluminum and that knob became too hot to touch. Johnson supplied a replacement knob that was drilled out and with a cardboard tube installed to isolate the knob from the heat of the potentiometer shaft. That was only partially successful – the knob still became a bit too warm.

3. Hey, ever bought a radio from me? My call letters are in there somewhere!

4. As it turns out, Gary Drasch, K9DJT, used the same receiver and transmitter when he was a young ham. We both had the Johnson Viking Valiant Transmitter and the Hammarlund HQ-170 Receiver.

W9MXQ

ORC Field Day 2019

de Robert Eskola, K4WTH

ORC memory boards

It's a wrap! 2019 ARRL Field Day is now history, and while we reminisce by looking at photos posted on Facebook, we begin making notes for 2020 (constructive self-criticism on what to do better, what additional research needs to be done and what items get added to the toolbox, to name a few).

Field Day setup

Some bands were wide open and kept operators quite busy and then some bands were full of hash, where each contact was a real struggle. Those of us who weren't as busy as we had hoped to be ON the radios experienced the rare commodity of spending a lot of time talking with visitors. The history of ham radio is important but only if it gets shared. We were also coaching and instructing visitors not only on how to "work" a radio or make a contact, but why we do what we do while operating. Time well spent!

Patrick Moretti of ARRL visits our tent

If you weren't able to attend, there's always next year … mark your calendar now for June 27 and 28, 2020. Posts will probably begin sometime in early May about location and such. #arrlfd

Julia's painting of our Field Day site

If you attended Field Day -- ANY Field Day -- this past June, what was your highlight? Learn anything new? Farthest contact? This is your opportunity to share! #arrlfd

Says Jeananne, N9VSV:

1. After 26 years, I'm still amazed by how many hands drop what they're doing to help others.
2. Best roast turkey on Friday night after set up. Thanks, WB9RQR and KC9FZK for all your hard work in preparing the feast.
3. Gear breaks … special thanks to KD9KOY, AE9MY and N9UUR for everything you did to replace/repair my rotator control box!
4. Computer networks are beyond me; having 6+ computers networked in a field? Way to go, K4WTH!
5. Band conditions on 6m weren't the best but we had brief bouts of sporadic e! Quebec, Ontario, New York and Texas!
6. Meeting a ham from the Netherlands who was here in Wisconsin, on vacation!
7. Seemed like the forecasted rains waited until we were almost packed up on Sunday.

UPCOMING EVENTS

Breakfast at Jim's Grille in Cedarburg – Saturdays at 7:00 AM

International Lighthouse Lightship Weekend, August 16-18, 1860 Light Station & Museum, Port Washington, WI

Upcoming ORC Monthly Programs

August - Homebrew Night
September – Chuck Curran W9KR, Direct Digital Synthesized VFO
October – Bill Shadid W9MXQ, The Hallicrafters Twins

Homebrew Night

de Pat Volkmann, W9JI

The August ORC Meeting will give you a chance to show off one of your projects. You can bring anything that is ham radio related. If it's too big to bring in, bring some pictures. Please let me know if you are bringing something so that I will be able to budget the time accordingly. For now, plan on 3 to 5 minutes to talk about your project. Send me no more than three Power-Point slides. If you don't use PowerPoint, send me some photos and information and I'll put it together for you.

No pictures? No problem! Just bring your project in and tell us about it.

I'm looking forward to hearing about YOUR project at the ORC meeting in August.

Presenters Needed!

de Pat Volkmann, W9JI

The monthly program is the highlight of the Ozaukee Radio Club meeting. We are fortunate to have a number of very talented people in our club, many of whom have shared their knowledge through a presentation. Share your expertise and experience with the club. Programs can be on any topic that is ham radio related. Contact Pat Volkmann W9JI at w9ji@arrl.net to discuss your idea for a program.

Sailing the Airwaves?

de Tom KC9ONY

I was sailing the airwaves using WebSDR (http://websdr.org/). If you aren't familiar with WebSDR, here's an explanation from their website: "A WebSDR is a Software-Defined Radio receiver connected to the internet, allowing many listeners to listen and tune it simultaneously." So basically you just go online with your computer to listen in with someone else's SDR station that's connected to a server. Lots of fun, as you can choose different bands and different parts of the world.

I'm not sure which SDR I was on, whether in Utah or San Francisco, but I heard a really strong signal from Jim WB2REM, based in Florida. At one point, there was a gentleman from the US traveling in Paris, France. From his hotel, he was using the internet to remotely transmit from his house in the US. I didn't hear if he was using a Flex radio or what. Then I heard them talking with Jeanne (Jan) Socrates VE0JS via a satellite phone that Jim was putting on the air. They were congratulating her on crossing the equator in the Pacific Ocean. What?! Was this on a cruise ship or something?

After listening for quite a while, I had to learn more about VE0JS, so went to her QRZ page. Jeanne is attempting to be the oldest person to circumnavigate the world solo, unassisted, nonstop. This would be her third time. She is already the oldest woman to sail solo, unassisted, nonstop around the world, as well as the first woman to sail solo, unassisted, nonstop around the world from North America! She is currently 76 years old. Can you imagine packing a sailing vessel with necessary items to go nonstop around the world? Jeanne left Vancouver, B.C. on October 3, 2018.

What's this have to do with amateur radio if she was using a satellite phone? Well, just listen to a recent QSO Today podcast: https://www.qsotoday.com/podcasts/VE0JS or go to Youtube: https://www.youtube.com/watch?v=wcKkLND5HjM. Jeanne became aware of amateur radio from other sailors. She also found the value of using Winlink to send and receive e-mails. Jeanne's call sign VE0JS is a maritime mobile call. She holds a few other calls, including one from the US. She can be heard sometimes on 7.163 MHZ at 1100Z and 14.183 MHz at 0515Z. As time and weather permit, she tries to get on various Nets, too.

Speaking of weather… At the time I am submitting this article, S/V Nereida, Jeanne's vessel, is dealing with Hurricane Erick and Tropical Storm Flossie to the north of her, as she is ESE of Hawaii. Now I see there is also a new Tropical Depression named Gil in the Eastern Pacific, heading west. These storms have forced her to heave to or hove to. Yeah, I had to look that one up, too, as I'm not a sailor! It's a way of slowing the vessel down to avoid the storms.

If you want to read more about Jeanne VE0JS, go to https://www.svnereida.com/ and click on the various links about the boat, equipment, etc. You can even find her current position by using the links on the right of that page. The one I like is the Via Aurora GPS Tracking. Once that page opens up, you can put the mouse on lines and see her course direction and speed. On the upper right of that page, you can also layer over the World Satellite Infrared, so that when you zoom out, you can see what storms are around her. Amazing technology. Lots of good information is on VE0JS's Biography tab on her QRZ profile page, including maps.

Jeanne is hoping to arrive back in Vancouver, B.C. by the end of August 2019.

Ozaukee Radio Club

July 10, 2019 Meeting Minutes

de Ben Evans (K9UZ), Secretary

President Kevin Steers (K9VIN) called the meeting to order at 7:30 PM. All the attendees introduced themselves.

Announcements, Show-and-Tell, Bragging Rights:
Jim (K9QLP): Ron Yokes (W9BCK) is in the Heritage nursing home in Port Washington following a bad fall that resulted in a broken rib and other injuries. He wants company and to talk to people, and he's anxious to get back on the 9-7 repeater, so if you ever hear him on the repeater, please give him a shout.

Robert (K4WTH): Julia (KB9WBQ) made a painting of our Field Day site which is being considered for inclusion in QST Magazine's Field Day scores issue.

Tom T. (KC9ONY): Cindy is asking for volunteers to provide radio communications for a ladies-only cycling event on July 27th, west of Big Cedar Lake.

Fred (W9KEY): Fred and Bill Schnell (AC9JV) have been selected to be operators for the WWV 100-year anniversary special event station at the end of September in Fort Collins, Colorado.

Program:
Tom R. (W9IPR) gave his presentation about the Sun 'n Fun Aerospace Expo Center near Lakeland, Florida.

50/50 Drawing:
Ken (W9GA) was the winner of the 50/50 drawing.

Auction:
Stan (WB9RQR) conducted the auction. Many items were sold, including a Dell Dimension E3-10 computer with Linux Mint 19.1 installed, a jump-start battery charger, a trans-match that Stan built, and some whip antennas.

Officer Reports:
Kevin S. (K9VIN), President's Update – None.

Pat V. (W9JI), 1st VP – Not at the meeting. No report.

Tom T. (KC9ONY), Repeater VP – No report.

Ben E. (K9UZ), Secretary – The minutes from the June meeting are in the newsletter. Motion to accept the minutes was made by Stan (WB9RQR), seconded by Art (AC9CD) and approved by the members.

Robert E. (K4WTH), Treasurer – The financial report for June was handed out to members prior to the meeting. If anyone hasn't submitted receipts for Field Day, please do so and they will be covered.

There was a $50 donation from the Sunshine Fund to the American Cancer Society. Motion to accept the treasurer's report was made by Stan (WB9RQR), seconded, and approved by the members.

Committee Reports:

Ken B. (W9GA), Field Day Committee – Ken gave his preliminary report on the results of Field Day. He thanked those that showed up to help set up and tear down. He commented on the good participation of ORC members, many of whom attended Field Day for the first time. We could have used a few more operators, however.

The raw numbers are as follows: Total contacts – 1829; 40 meters phone – 248; 20 meters phone – 929; 6 meters – 49; digi-station – 135; 20-40-80 meters CW – 661. There were three active contesting stations throughout the event. The fourth station was split between GOTA with about 100 contacts, and contesting with around 200 contacts.

We had issues with the computer network and hope for a better networking solution in the future. The white canopy tent worked well. Ken will do a full presentation on the results at an upcoming meeting.

Tom R. (W9IPR), Scholarship Committee – A letter from ARRL Scholarship was received, saying that Adam Johnson (KD9KIS) of Ellsworth, Wisconsin was selected to receive the 2019 ORC Scholarship Award in the amount of $2,000.

The scheduled transfer of money from the Money Market to the Endowment Fund has not been done as yet.

Tom highly recommended that members over 60 years old have themselves checked out by the Life Screening preventive testing outfit. Tom was checked out by them recently and was alerted to a serious medical condition which he then had taken care of.

Old Business:

There was no old business.

New Business:

Tom T. (KC9ONY): There's a lot going on in the months of July and August. The World Scout Jamboree July 21 – August 2, the EAA special event station July 22 weekend, and the Lighthouse Event August 16-18. Regarding the Lighthouse Event, the Historical Society has purchased the vacant lot next to the museum and they did some landscaping on it. It is hoped that the vacant lot can once again be used to erect the antenna for the event station. Setup is August 16, operation is 17 through 18, and teardown is August 18.

Tom R. (W9IPR): There will be a Fall Swapfest organizational meeting on a date in August to be announced. Everyone who wants to help with the swapfest is invited to come to this meeting.

Gary D. (K9DJT): There's eighteen thousand dollars in the club's operating account. What are we doing with it? Nels (WA9JOB) responded that the operating fund is divided up and earmarked for various uses, such as the repeater improvement fund.

Gabe (WI9GC): There should be sandwich board signs set up at all the stations at Field Day, each describing what the station is about, for the benefit of visitors to Field Day. Other members agreed this was a good idea.

Jim (K9QLP): Our lease runs out on the storage shed in October. Perhaps we should look into a commercial storage unit. Ken (W9GA) responded with a report of possibilities for storage. He talked to the buyer of the property who is currently renting the property. The buyer is planning to convert the shed, which now houses our trailers and other equipment, into a shop. But there's a barn to the south of the shed. If there's room in the barn after the seller vacates the property, the buyer is willing to lease space to us in the barn. If this doesn't work out in the way desired, one or both trailers will have to be stored outside. Nate Seidler's grounds could probably be used for parking the trailers; the white trailer from Leon Rediske is currently there. The yellow trailer has to be sealed up from adverse weather if it has to be parked outside. Ken has convened a committee of himself, Mike York and Vic Shier to deal with the trailer issue. They will work to clean out the white trailer as well. Jim (K9QLP) commented that we should look into casualty insurance for the club's equipment.

Adjournment:
Stan (WB9RQR) made the motion to adjourn the meeting, which was seconded by Bill Shadid (W9MXQ) and was passed by the members. The meeting was adjourned at 9:12 PM.

Attendance:
There were 35 members and five guests present at the meeting.

A copy of the attendance sheet is available upon request in PDF format. Please contact Ben Evans via email at ben@evansengsolutions.com for a copy.

Respectfully submitted,

B. Benjamin Evans, K9UZ
Secretary

ORC Meeting Agenda

August 14, 2019

1. 7:00 – 7:30 PM – Network & Rag Chew
2. Call to Order – Kevin Steers (K9VIN)
3. Introductions
4. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.
5. Program: Homebrew Night
6. Fellowship Break
7. 50/50 Drawing
8. Auction – Stan Kaplan (WB9RQR)
9. President's Update – Kevin Steers (K9VIN)
10. 1st VP Report – Pat Volkmann (W9JI)
11. Repeater VP Report – Tom Trethewey (KC9ONY)
12. Secretary's Report – Ben Evans (K9UZ)
13. Treasurer's Report – Robert Eskola (K4WTH)
14. Committee Reports:
    a. Fall Swapfest – Tom W9IPR
    b. Scholarship – Tom W9IPR
    c. Field Day – Ken W9GA
    d. Trailers – Ken W9GA
    e. Other
15. OLD BUSINESS
16. NEW BUSINESS
17. Adjournment to ?

Return undeliverable copies to:

The ORC Newsletter
465 Beechwood Drive
Cedarburg WI* 53012

First Class

Next ORC Meeting:

Grafton Multipurpose Senior Center

1665 7th Avenue, Grafton, WI
Wednesday, August 14th, 2019

7:00 PM – Doors Open

7:30 PM – Meeting Begins

The ORC Newsletter

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ORC Repeaters on 146.97, 224.18 and 443.750 MHz - Callsign W9CQO
Web site: **www.ozaukeeradioclub.org** **Facebook: facebook.com/orcwi**

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International Lighthouse Lightship Weekend

De Tom KC9ONY

The ORC and LEFROG clubs joined together to operate the Lighthouse event station for the 2019 International Lighthouse Lightship Weekend on August 17th and 18th (https://illw.net/).

ILLW Station setup at the 1860 Light Station & Museum – Port Washington, WI
http://pwhistory.org/visit/lightstation/

According to the ILLW website, there were 426 entrants worldwide and 62 entrants from the USA for the 2019 International Lighthouse Lightship Weekend.

The very first 20-meter contact we made on Saturday, August 17, 2019 was the Cape Canaveral Lighthouse, US0099, the Kennedy Space Center Amateur Radio Club, N1KSC. The very first

40-meter contact was also a lighthouse, the Port Clinton Lighthouse US0228, near Port Clinton, OH. It's the last remaining timber-frame lighthouse on Lake Erie.

Going through the log file, it shows we contacted 17 US lighthouses, which included one US lighthouse that did not meet the guidelines (W8FTC), one Canadian lighthouse and one ARLHS Lighthouse (USA 1837). ARLHS stands for Amateur Radio Lighthouse Society.

We also had one lightship, the Lightship Huron Museum (LV-103), US0229, in Port Huron, MI. We had one maritime mobile on a cargo ship at the Port of Houston, TX, in the Gulf of Mexico, who was from the Netherlands, (PE1OAD). There was one portable summit checking in, KB1HXO on W1/GM-007 Stratton Mountain, ME, and one battleship, the Battleship New Jersey, operating from the radio room. We had several QRP stations, some mobile stations, and at least one station on solar battery. The log also shows we had one contact in France, one in Panama, one in the British Virgin Islands, and four in Canada. We logged 319 total contacts for the weekend.

Fred W9KEY and Mike K9EMD

Mark KD9NOO

Mike K9EMD celebrated part of his birthday by operating on Saturday. He ended up operating the most contacts (61) on 20 meters and one lighthouse. Mark KD9NOO operated the most contacts (20) on 40 meters and four lighthouses.

Band conditions were up and down all weekend. We did encounter some noise or interference when pointing the tri-band beam to the West. Gary K9DJT said he also gets this at his house in Port Washington. On Sunday, there were storms in the morning, but the worst were to the south of us. We did sustain some minor wind damage to one of our tents. Thankfully, the weather cleared and dried up things for an easy tear-down of all the equipment.

Thank you to all the ORC and LEFROG members that came out to safely help set up, operate, and tear down. Thanks also to those members that came out to observe, as well as those who made contact with us from their QTH or mobile. Another successful year in the books.

DX'ing & Contesting

De Gary Sutcliffe (W9XT)

Summer is over, at least if one considers the summer to be between Memorial and Labor Days. Officially we have a few more weeks. That means cooler temperatures, which is fine with me, but also shorter days. Or, rather fewer daylight hours. To the best of my knowledge, days are still 24 hours long.

The length of the day, of course, is due to the earth's tilt. The northern hemisphere points towards the sun from late April through late September and points away from the sun during the rest of the year. Of course, it is the opposite in the southern hemisphere. The length of day light varies like a sine wave (almost). Remember those? That is the form of AC (and RF!) signals. The daylength (or voltage) changes fastest around the zero crossings. The equinoxes are the annual solar zero crossings, and we will be making the negative going one on September 23. Around that date, we will be losing almost three minutes of daylight each day. That is about 20 minutes per week! It is going fast!

The longer days and the equinox mean the HF bands will be getting out of the summer doldrums. The higher HF bands tend to open more. The longer nights give us better low band conditions, further aided by a decrease in thunder storms and the resulting static.

So, just how good will the HF bands be this fall? Along with Bill, W9MXQ, Vic, WT9U, and Gary, K9DJT, I attended the Society of Midwest Contesters annual SMC Fest in August. They always reserve a segment of time for our Central Division leadership to give us an update on the recent developments at the ARRL. The Vice Director is Carl Luetzelschwab, K9LA. Carl is a propagation guru and my go-to guy when I have a question on the subject. He slipped in some slides showing where we are at the bottom of solar cycle 24 while we anxiously wait for cycle 25 to start. A couple of his slides are presented at the end of this article with his permission.

The first slide (Figure 1) shows the solar flux for cycle 24. The solar flux index is a proxy for sunspot counts. One curve shows the monthly counts. Monthly averages are pretty noisy, so we usually look at the smoothed numbers. The smoothed count is the average of the month and the six months before and after the month. The red line is the prediction going forward. It is not pretty.

The recent solar flux index has been very low. We have hit 66 a lot this summer. That is about the lowest it gets. It got to 64 at the bottom of the previous cycle, but only for a few days. We have had 163 spotless days so far in 2019. That is about 2/3 of them.

The second slide (Figure 2) is very interesting. It shows curves with smoothed sunspot counts under 20 for the last seven solar cycles. The red line is the current one and the green line the last one. You will notice that the others are not as deep or as long. History shows us that the longer and deeper the minimum is, the smaller the next peak is. The minimum between cycles 23 and 24 was the longest in 100 years. The peak for cycle 24 was pretty poor. The current minimum is looking very similar to the last one. That predicts the next peak is likely to be similar to the last one.

So, when will be out of this? A few cycle 25 sunspots have appeared, but they have been very brief. New cycle sunspots tend to appear at high solar latitudes and have the opposite magnetic polarity of the last cycle. Most predictions have the minimum ending in 2020 or maybe early 2021, but we don't know. Only time will tell. In the meantime, my 10 Meter Yagis will stay in the shed.

There are not a lot of major contests in September. The Worked All Europe (WAE) SSB contest and Scandinavian Activity Contest (SAC) can provide a lot of fun when the higher bands are open. There should be a fair amount of activity on 20M for them. The WAE contest starts at 0000 UTC September 14 (7:00 PM September 13 local) and runs for 24 hours. The rules are kind of complex because of QTCs. A QTC is a report of a previous QSO to a European station. If you are interested, check out their web site. https://www.darc.de/der-club/referate/conteste/worked-all-europe-dx-contest/en/

The SAC CW contest starts on Saturday, September 21 at 1200 UTC (7:00 AM local) and runs for 24 hours. Send a signal report and serial number starting with zero. For a list of the countries you can work and the rules, go to their web site. https://www.sactest.net/blog/rules/

The most interesting contest is the ARRL September VHF Contest. It starts at 1800 UTC (1:00 PM local) September 14 and runs to 0259 UTC Monday, September 16 (10:00 pm Sunday local). You can work a station once per band using any mode. FT8 has become a popular mode for working distant weak stations in the VHF contests. Now that FT4 is released it will be interesting to see if the fast speed is a worthwhile tradeoff for requiring stronger signals than FT8. Other modes like MSK144 are also used for working stations on meteor scatter. Of course if we get Es or tropo, you should be on SSB or CW because you will be able to work stations much faster with these modes. Use the digital modes as a fill in between band openings. Full rules at http://www.arrl.org/september-vhf.

With better propagation, more DXpeditions start up this month. An interesting one is to Kyrgyzstan by a group of Polish hams. They are there now through September 12. The call is EX0QP, and they will be operating the HF bands, SSB, CW, RTTY, and FT8.

Mongolia will be activated by some Russian hams September 5-9 using the call JT7A. They will be using the HF bands, with SSB, CW, FT8 and will be giving a shot at FT4. West Kiribati will be represented by a group from Latvia September 6-15. They will be on 160-6M, CW, SSB, RTTY, and FT8. From there they will go to Nauru with the call C21WW September 16-25.

A group of Japanese hams will be on Palau September 14-25. 160-6M, CW, SSB, RTTY. No call has been announced, but the prefix for the island is T8. Yet another Pacific Island operation will be Tonga, A35JT, by an Australian team September 24-Oct 6. 160-6M, SSB, CW, FT8, RTTY, and especially for Ken, W9GA, they will be on 6M EME.

The one that really has my attention is Minami Torishima, JD1BNA. I only have this on one band and don't even have a QSL. I have confirmation from an old rule where you could get a confirmation if you worked a DX country in an ARRL DX contest and you were in their log. This rule was discontinued a long time ago.

JD1BNA gets on from time to time. I believe he does scientific work there. Usually, he gets a little operating in between work. His operating is usually at times we don't have propagation. I did hear him last winter. I heard him make one QSO before he went QRT. He is scheduled to be there September 25-30.

The island is used as a training base for the Japanese military and is off limits with a few exceptions. There are reports of huge quantities of rare earth elements there, like Lithium and materials used in high strength magnets. Lithium is, of course, the material in so many batteries. Electric vehicles use huge quantities of it. China currently produces most of the rare earth materials. China has been cutting back on exporting some of its raw earth materials, causing concern to the rest of the world. Hopefully there will be mining there soon, and more opportunities for hams.

As usual, there are many single op DXpeditions. These are usually part of a vacation or business travel, with limited operating. You need to be on the bands to catch them.

The same weekend as the WAE and VHF contests is the W9DXCC convention. I have attended this from the early 1980s and have missed it only once or twice. It is held in the Chicago area. The convention is Saturday, but there are other activities on Friday including Contest University and DX University. These are a series of programs aimed at teaching beginning contesters and DXers. The banquet speaker is Martin Jue, K5FLU. He is the founder and owner of MFJ. I think the lineup of speakers is especially good this year. www.w9dxcc.com

The last weekend of the month is the HRO Superfest. It opens at noon Friday, Sept 27. Saturday hours are 9:00 AM to 4:00 PM. It is also the ARRL Central Division Convention. That means a lot of ARRL HQ people will be there, including the new ARRL CEO, Dr. Howard Michel, WB2ITX.

Superfest has dwindled in size the last few years, but this year it is much bigger with lots of major vendors present. Speaking of major vendors, Slinger's largest ham radio manufacturer will be giving the debut of an exciting new product.

That wraps up September. There sure are a lot of radio related things to do this month. Don't forget to get busy on those fall antenna projects. There are not too many days of nice weather left this year.

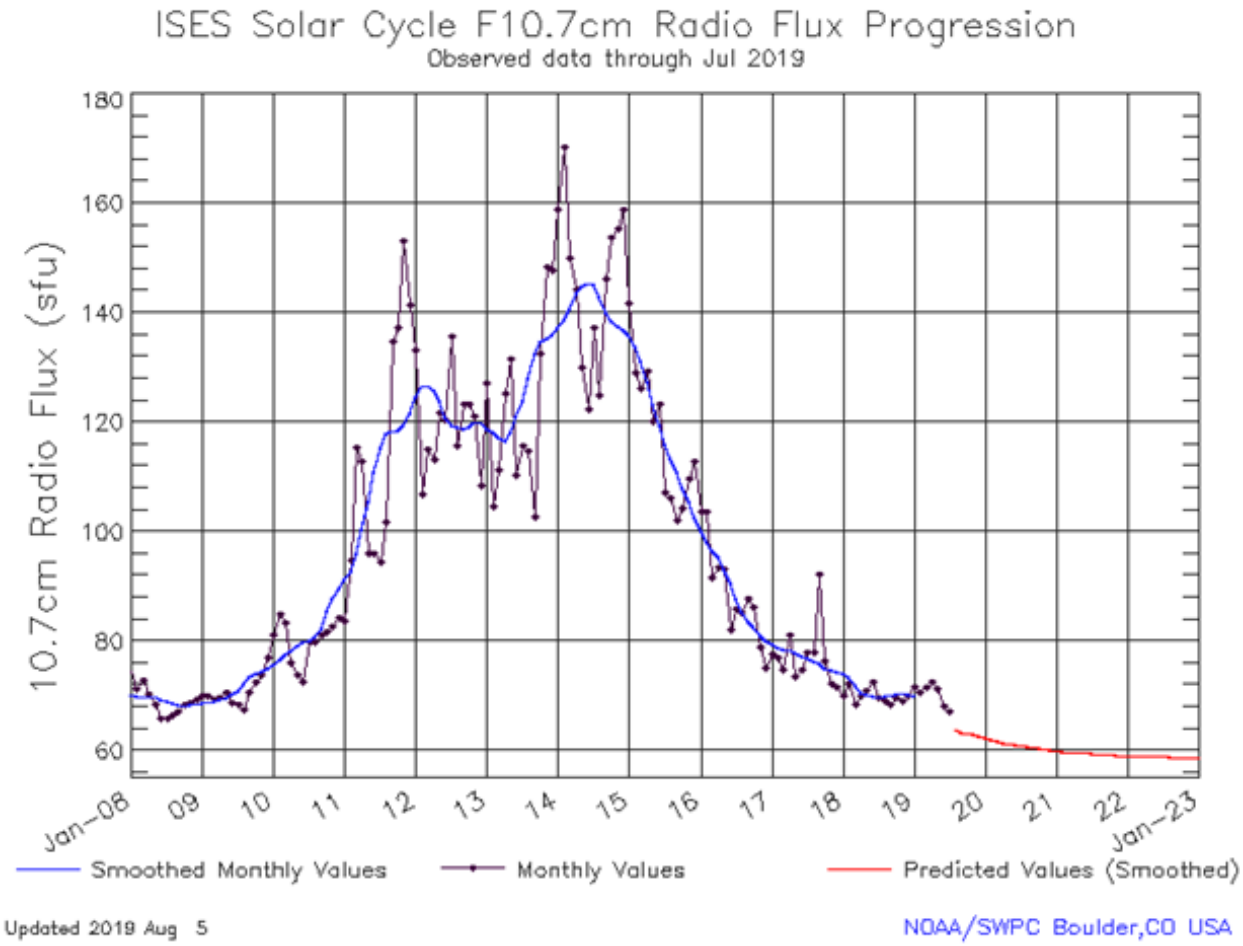


Figure 1. Solar Flux for Cycle 24

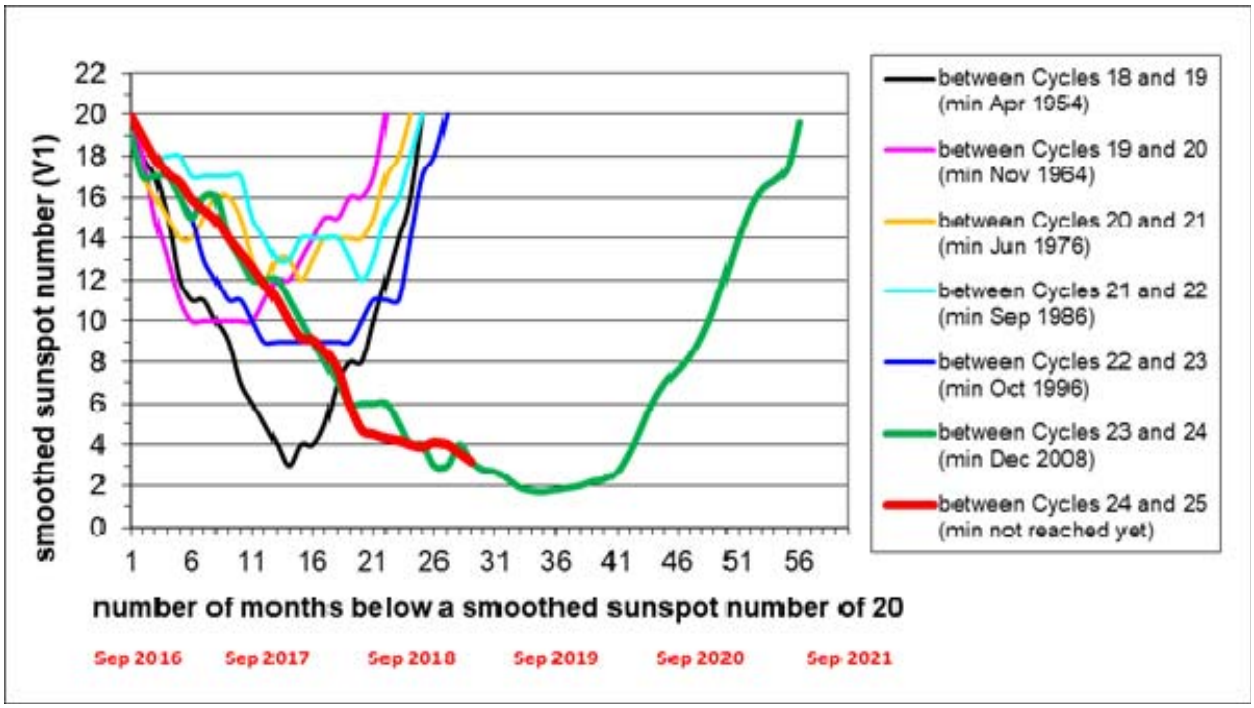


Figure 2. Smoothed sunspot numbers for last 7 solar minimums - Courtesy of K9LA

THE COMPUTER CORNER

No. 258: Libre Office

Stan Kaplan, WB9RQR 715 N. Dries Street Saukville, WI 53080-1664
(262) 268-1949 wb9rqr@att.net

Well, I bit the bullet. Here is how it played out.

Yesterday, Nancy's (my wife, KB9FZK) copy of Microsoft Office 2000 Professional died. She could not open her birthday list, recorded in Excel, or any spreadsheet (.xls) file. I convinced her to let me uninstall all of Office 2000 and install Libre Office. I convinced her by showing her on a different machine that the Libre Calc spreadsheet program would open her birthday list and other .xls files just fine, and that the Libre Writer program (equivalent to Microsoft Word) would open her letters and other documents just fine, too. In a few minutes, she was up and running with the new software on her Windows 10 machine, happily updating and printing her birthday list file. She likes it.

Then came my turn. Today, on my main machine (also Windows 10, Home Edition, just like Nancy's), my Microsoft Office 2016 failed – it would not open a thing. So, in the period of about half an hour, I uninstalled Microsoft Office and installed Libre Office 6.2.5. My first job was to compose this article. I found it a snap to use, and I really do not notice a difference between it and Microsoft Word in the way it feels and works. If anything, it looks even more efficient than Word in the icons and controls at the top of the editing page. I recommend it highly as another way to get out from under Microsoft.

So, what version should you look for and where? Go to https://www.libreoffice.org/ and seek out version 6.3 or higher (version 6.3 is scheduled for release in early August 2019 while this article being written on 30 Jul 2019). To give you a feel for size, version 6.2.5 is a 282 MB download. The installation file, named LibreOffice_6.2.5_Win_x64.msi, is so named for 6.2.5, for Windows 64-bit, so yours will be a little different depending on the exact version you encounter. Double-click the .msi file and you will be on your way to installation, which takes only a couple of minutes at most. Here is the line up:

MICROSOFT OFFICE COMPONENT		**LIBRE OFFICE COMPONENT**
Word	DOCUMENT	Writer
Excel	SPREADSHEET	Calc
PowerPoint	PRESENTATION	Impress
Access	DATABASE	Base
---	DRAWING	Draw
---	FORMULA	Math

Happy Computing!

Vintage Amateur Radio

de Bill Shadid, W9MXQ

This month we will be back in the 1960's with the desktop, heavy weight offerings from Hallicrafters. I call this one, "Hallicrafters Big Iron!!" Hallicrafters held a place of honor with their SX-101 Receiver, HT-32 Transmitter, and HT-33 Linear Amplifier station. These radios were some of the first of the many new technology SSB/AM/CW radio stations of the time. They did not really fit the marketplace created by the Collins S-Line but there was still at that time a good base of customers looking for full sized separate receiver, transmitter, and linear amplifier stations. Hallicrafters did well in that market. But, at the same time, there existed a market for a lower cost station with a similar footprint. The answer from Hallicrafters was the popular SX-111 Receiver, HT-37 Transmitter, and HT-41 Linear Amplifier. Depending on how we define "full power" this combination provided 1,000 watts input on the then popular 80, 40, 20, 15, and 10-meter bands.

SX-111 Receiver

HT-37 Transmitter

HT-41 Linear Amplifier

The radios above were lower cost versions of the set radios shown here – and mentioned above:

SX-101 Receiver

HT-32 Transmitter

HT-33 Linear Amplifier

These radios have a long history with me. In fact, the SX-111 Receiver and HT-37 Transmitter were in my station in the 1970's and they have been through several owners since then, always known to me, as they are to this day. I followed them after they departed WA9MXQ (my call in the 1970's) and they finally went to Ed Fischer, KC9LRJ, now a Silent Key. After Ed Fischer, they went to Bill Schnell, AC9JV, where they remain.

Their most recent long operating period was in an operating event setup by Ed Fischer in early 2014. In a one-week period, Ed and I worked close to 200 stations in what was to be his last major ham radio adventure. All but about 15 QSO's that we made from Ed's shack were on SSB – with the balance being CW. We ran the station with the HT-37 Transmitter driving the HT-41 Linear Amplifier to about 600 watts PEP output on SSB and CW. We also used a Barker & Williamson Speech Processor. Later that year the SX-111 and HT-37 were sold to AC9JV and the HT-41 to a ham whose name is lost to history.

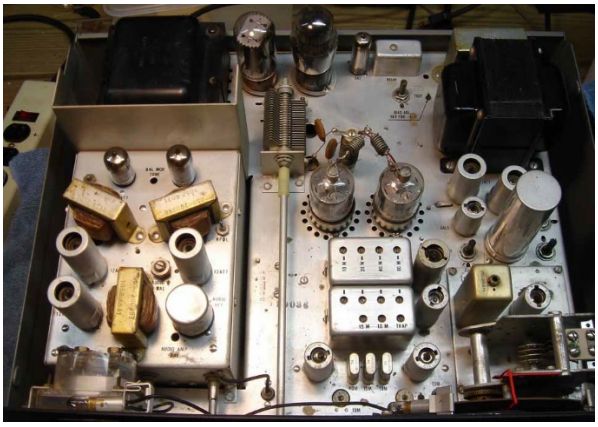
The designs of the two radio lines from Hallicrafters were more alike than different in the SX-111 vs the SX-101 and in the HT-37 vs the HT-32. Here are a few details:

Parameter	HT-37	HT-32
Final Amplifier Tubes	6146 (2)	6146 (2)
SSB/CW Input Power	144 Watts	144 Watts
SSB Generation	Phasing	Crystal Filter
Cabinetry	Wrap Around, Perforated, with no access without disassembly.	Rack Style Enclosure with a Top Access Door.

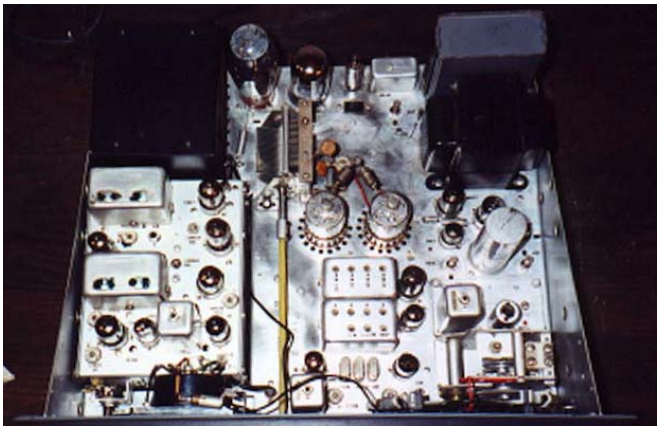
The difference in SSB Generation was a separate sub-chassis that was inserted into the HT-37 or HT-32 Main Chassis – otherwise the Main Chassis was the same on both units. The HT-37 was open inside with the final amplifier tubes in the middle of the chassis. The HT-32 layout was identical but with a shield cage around the finals and a small fan to cool the enclosed tubes. Perhaps Hallicrafters felt that if you did not want to spend the extra money for the HT-32 then you did not deserve the extra interference filtering.

There may be more of these radios in our midst. I know, for instance of at least one other SX-101 and HT-37 pair among the members of the Wisconsin Amateur Radio Club. Both of those pairs used to reside at W9MXQ. There is an SX-101 and HT-32 pair in Ozaukee Radio Club in the shack of Tom Ruhlmann, W9IPR.

To get an idea of the modular construction shared on the Main Chassis between the HT-37 and HT-32 Transmitters, please see these pictures:

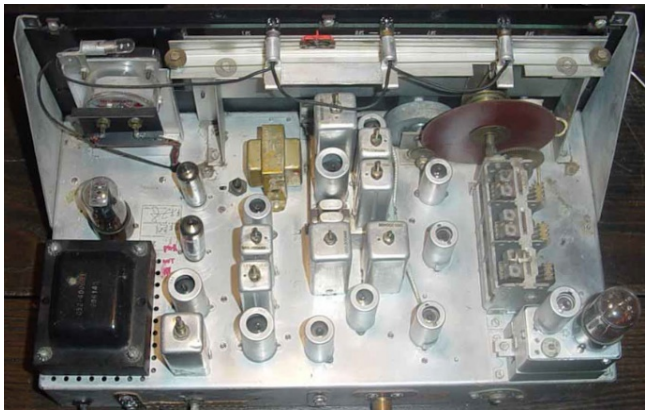


HT-37 Transmitter (Front at Bottom)

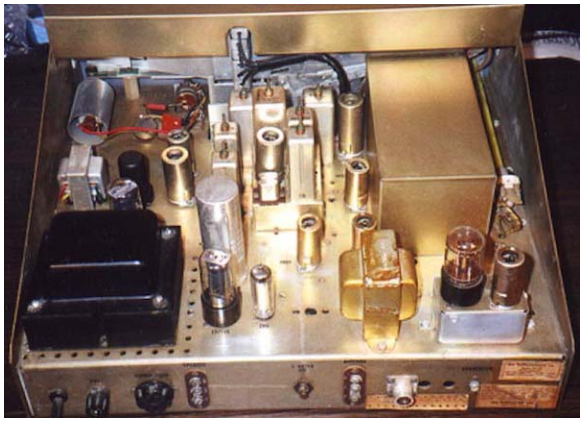


HT-32 Transmitter (Front at Bottom)

See similarities in Main Chassis – but the Phasing SSB Sub Chassis to the left on the HT-37 and the Filter SSB Sub Chassis in the same place in the HT-32.
(Photograph angles make it difficult to see just how similar these radios were.)



SX-111 Receiver (Front at Top)



SX-101 Receiver (Front at Top)

"Matching" was not in the design concept of the SX-111 Receiver to its partner Transmitter, the HT-37. The cases were painted similarly but the designs were different.

The SX-111 was a good deal smaller and lighter than the SX-101 from where it took its design concepts. Chassis layout was slightly different but if you look carefully you can see many similarities. The simple readout dial illumination on the SX-111 was much more complex on the SX-101 with its feature of only illuminating the band in use. Circuitry was very similar but the extra heavy chassis on the SX-101 made it more stable in a day when bulk meant less stress on the mechanical frequency determining elements (variable capacitors, primarily) and therefor better stability.

See the Illuminated 20-Meter Band on this SX-101. The entire dial on the SX-111 is always illuminated. 1960's high tech!!

Let's discuss the rarer part of he SX-111/HT-37 and SX-101/HT-32 Stations – their matching Linear Amplifiers. Those would be the HT-41 (which has been a part of my station) and HT-33, respectfully.

Check these pictures of these fine amplifiers with the HT-41 being in a cabinet to match the HT-37 and the HT-33 being in a cabinet to match the HT-32:

HT-41 Linear Amplifier
Front View and
Interior View (Front at Bottom)

HT-33 Linear Amplifier
Front View and
Interior View (Front at Bottom)

You can see the more complex construction in the HT-33 amplifier with its forced air-cooling system vs the small fan – extreme rear – blowing air at the two final tubes.

The HT-41 used a rather novel tube in the 7094 Pentode – two of them working together in parallel. “Novel” is my word for this final extension of the design of the 6146 tube we see commonly in radios of the time. The 7094 had a dissipation of 125 watts[1]. This was tight for use in a Class B Linear Amplifier at the 1,200 watts input of the HT-41. Two tubes could dissipate 250 watts (2 x 125) while at 50% Class B efficiency the 1,200-watt HT-41 would want to handle 600 watts of waste heat. However, with SSB and CW duty cycle of well under 100% the heat was handled in fine fashion. The HT-41 required only 40 watts to be driven to full power input of 1,200 watts SSB and 1,000 watts CW (600 watts and 500 watts, respectfully).

The HT-33 was a different story in that the PL-172 Final Amplifier Tube was a 1,000-watt dissipation Pentode that could loaf along at 1,000 watts input on CW or as much as 2,000 watts PEP input on SSB. That netted 500 watts output on CW and probably over 1,000 watts PEP output on SSB. The pictures above show the much more powerful components in the HT-33. These were earlier days and high voltage solid state rectifiers were expensive. The HT-41 used two 866AX Mercury Vapor Rectifier tubes while the HT-33 used the more powerful 866A Mercury Vapor Rectifier tubes in a similar circuit. The HT-33 later switched to 3B28 High Vacuum Rectifier Tubes. The HT-33 also added four regulator tubes in the internal power supply making a tube compliment of eight tubes.

Page 6 the 1964 Hallicrafters Catalog showcasing the HT-37 and the SX-111 along with Hallicrafters own version of he Astatic 10-D/TUG-8 Microphone and PTT Base. Also, the Hallicrafters R-48 Speaker Console sitting atop the SX-111. Just at the far left is a Vibroplex VibroKeyer that must somehow be feeding an off screen Hallicrafters HA-1 'TO Electronic Keyer.

As time went on and more sophisticated radios came from other manufacturers, the SX-111 (most certainly) and even the mighty SX-101 lost their luster. The SX-111 gradually faded away – knowing in its heart it was simply an SX-101 "want to be." But, even the SX-101, which had morphed by then to the SX-101A, was getting long in the tooth. The market was being eaten up by the Hammarlund HQ-170A, the National NC-303, the Collins 75A-4 and 75S-3, and even the Drake 1-A, 2-A, and 2-B. Hallicrafters responded in what was to be their finest receiver. The SX-115.

The SX-115, shown on the left, pictured next to the last of the SX-101 series, the SX-101A. By that time, the SX-115 was the main piece in the final "big iron" picture from Hallicrafters. Time

moved on and the SX-111, HT-37, and the HT-41 were gone. The new breed was already on-line in the form of the SX-117 Receiver, HT-44 Transmitter, and the matching HT-45 Linear Amplifier. In their last form, here is the big iron Hallicrafters station, and my longtime favorite:

Left to Right
Hallicrafters HT-32B Transmitter, SX-115 Receiver, and HT-33B Linear Amplifier

Notice the somewhat smaller size (in width) of the SX-115. The SX-101 was the same size as the HT-32 and HT-33 series radios. The SX-115 was not. The SX-115 had a transmitter type VFO and had it been wired that way it is possible that the SX-115 and HT-32B could have been made to transceive. Technically, the SX-115 was ahead of the game – within Hallicrafters. Compared to the likes of the Collins 75A-4, the Collins 75S-3, and perhaps even the Drake 2-B, it was not quite the superior receiver that Hallicrafters had needed. This deficiency was moved forward in the next Hallicrafters series which used the similar design and feature set, SX-117, as its receiver

But, feature set aside, those of you that know this author have often heard him say that from this series of products come his favorite Vintage Ham Station. My idea of a perfect station is centered on an SX-115 receiver, just as you see, above. After all these articles on great radios – my favorite is on this page. To me, it just says, “Vintage Ham Radio.”

Special thanks go to Bob, W9DYQ, for his proof reading of my articles. Remember that I am open to questions and comments at my email address, W9MXQ@TWC.com.

Notes:

1. By comparison to the 125-watt dissipation of the 7094, other tubes of the day in amplifier use that were similar in capability were:
    a. the 4X125 with 125-watts of dissipation.
    b. The 813 with 125-watts of dissipation.
    c. The T-160L/572B with 160-watts of dissipation

W9MXQ.

Remote Station Building, Part 1

De Jeff Whisler W9KW

The project started in 2014, when we finished building our second home in Northeastern Wisconsin. We have eight heavily wooded acres that border the Chequamegon-Nicolet National Forest. Because our primary home in Jackson is located in an HOA-controlled subdivision, the only antennas I have are “stealth” types. For years I longed for a tower and much more substantial antennas. Building a station up north felt like a good option but it would also require remote operation capability.

At the time I began my research, I was very fortunate that Chuck, W9KR, offered me a tour of his tower and shack. Chuck has superb shack and a US Tower crank-up that I really envied. I looked at a number of other tower options but decided on the US Tower TX-455 in late 2014. The price was sporty but just doable. Life intervened and my plan to order the tower was delayed for about eight months. When I called HRO for an updated quote, I got a rather rude shock. The price increased over 100%! Disgusted, I turned back to the drawing board.

Over the next several years, I considered and rejected several different tower options. Due to a mountain climbing accident in 2000, my wife instituted a strict “no climbing” policy. On occasion I surreptitiously violate this edict but at my considerable peril. Many conventional options, such as a Rohn 25 guyed tower, were rejected because I would need to rent a bucket truck or hire someone to climb anytime the tower or antennas needed work. My past history portends I will frequently tinker with the antennas. Also, building the guy anchor points and clearing the huge trees for the guy wires would be a major project and a costly exercise. Finally, guy wires offended my wife’s keenly honed sense of aesthetics. Freestanding towers offered no good way to tilt them over for maintenance, again requiring a bucket or climber. In addition, some freestanding towers have significant limitations on antenna boom length. During this period, I was actively looking for a used crank-up tower. While I did locate several used towers over the years, most all had significant issues of distance to pick up, de-installation challenges, as well as transportation cost back to my job site. In the end, the initial cost savings were outweighed by these other considerations.

In mid-2018, I became aware of Tashjian Tower. They make a variety of crank-ups for amateur use which are very similar to US Tower products. The price for a 70 foot crank-up with a tilt-over fixture came in only slightly above the original quote from US Tower. The shipping cost was greater because Tashjian is based in California. I ordered the tower in late January of 2019, and while waiting for the tower delivery, I began planning the rest of the project in earnest.

Over my ham career I have had two other towers at different QTHs. My first tower was a freestanding Rohn HDBX-48 when I lived in Madison. I also had a fifty-foot Rohn 45 for a short time at our home in Sussex. Building on that experience, I subscribed to several email lists and acquired two books on tower construction. I will list the specifics of each at the end of this article.

It took a bit of cajoling with Tashjian to facilitate delivery as they were busy with a number of large projects. Finally, on July 12th, I took delivery of my new tower. Getting the tower off the delivery truck was challenging and took some creativity. At the suggestion of an email forum, I

engaged a local tow truck operator to do the job. He suggested we use his flatbed truck. The tower was collapsed, of course, and wrapped in a heavy-duty shipping crate. The package was 24 feet long and weighed 1800 pounds. He carefully slung the load inside the truck and dragged it from the delivery truck to his truck bed. He was able to tilt the bed of his truck to exactly match the end of the delivery vehicle. He then maneuvered his truck near the job site and tilted the bed again and we slide the tower off.

I also began working to improve the site by removing some trees as well as excavate for the tower base. I spent quite some weeks trying to find someone near the job site to excavate the hole for the tower base. I contacted more than twenty different companies with negative results. At the suggestion of several members of the Tower Talk forum, I decided to rent a mini-excavator and dig the hole myself. A local company delivered the excavator and Chris, the driver, gave me a crash course in excavator operation. Chris was very kind and very patient with me. I dug a smaller test hole off to the side to practice and then filled it in. It took me, working very slowly and carefully, about two hours total to dig a 4' long x 4' wide x 6' deep hole. I would love to report it was a perfectly shaped hole but I cannot. The hole ended up being about fifty percent larger than the specifications called for. It was a bit nerve wracking but also fun. I also used the excavator claw to move some large rocks, with the grandkids helping at the controls.

Next, I engaged my next-door neighbor Bob Tegan to help me build the concrete forms and set the base fixture in the hole. We spent a hot sweaty morning completing this step. I am very grateful for Bob's help. Bob spent more than twenty years in the military doing various construction jobs and his expertise really showed. I called the local concrete batch plant and scheduled four yards of concrete for delivery. The night before the delivery we had a torrential downpour, and despite my careful preparations, the hole nearly filled with water from the storm! With the concrete due in about three hours, I was anxious, to be sure. I quickly jury-rigged an old sump pump and dropped it into the hole. Thankfully the hole pumped dry fairly quickly. The

concrete delivery was very smooth and the driver put the load right on target. Bob again helped get the concrete struck off and somewhat finished. It's nothing fancy, but it will do the job. Here is the finished base:

I have many tasks yet to accomplish before the weather turns. I need to trench and lay conduit about 100 feet from the house to the tower base for the feedlines and control cables. I need to mount the tower to the base and build and attach the beam. We have a raising party scheduled for September 14th.

There are also several other design details that need to be resolved, including what software and hardware will be used for remote operation. I also need to upgrade my internet service.

I hope someday, after the project goes live, to deliver a presentation to the club on the project. Regretfully, I struggle to make club meetings due to work conflicts.

Please stay tuned for Part 2 of my story.

UPCOMING EVENTS

Breakfast at Jim's Grille in Cedarburg – Saturdays at 7:00 AM

Upcoming ORC Monthly Programs

September – Chuck Curran W9KR, Direct Digital Synthesized VFO
October – Bill Shadid W9MXQ, The Hallicrafters Twins.

Presenters Needed!

de Pat Volkmann, W9JI

The monthly program is the highlight of the Ozaukee Radio Club meeting. We are fortunate to have a number of very talented people in our club, many of whom have shared their knowledge through a presentation. Share your expertise and experience with the club. Programs can be on any topic that is ham radio related. Contact Pat Volkmann W9JI at w9ji@arrl.net to discuss your idea for a program.

Wisconsin Parks on the Air (WIPOTA) Contest

Saturday, September 21, 2019

11:00 am – 6:00 pm CDT
16:00 – 23:00 UTC

Bands: 75, 40, 20, 15, 10 and 2 meters

Suggested Frequencies:
SSB: 3.860, 7.220, 14.260, 21.350, 28.400 MHz
FM: 146.55 and 146.58 MHz

More information and contest rules: http://wipota.com/

Ozaukee Radio Club
August 14, 2019 Meeting Minutes

de Ben Evans (K9UZ), Secretary

Note: I lost both my hard notes and iPhone Voice Memo recording of the meeting. The following are the happenings to the best of my recollection.

President Kevin Steers (K9VIN) called the meeting to order at 7:35 PM. All the attendees introduced themselves.

Program:
The program of the evening was "Homebrew Night." Many members gave a short presentation on their own ham projects.

50/50 Drawing:
Adam (KD9NRG) was the winner of the 50/50 drawing.

Auction:
Stan (WB9RQR) conducted the auction. Many items were sold.

Officer Reports:
Kevin S. (K9VIN), President's Update – None.

Pat V. (W9JI), 1st VP – No report.

Tom T. (KC9ONY), Repeater VP – Tom reminded members about the upcoming International Lighthouse Lightship weekend on August 16-18. Members from ORC and LEFROG will collaborate on operating an event station at the 1860 Light Station & Museum in Port Washington.

Ben E. (K9UZ), Secretary – The minutes from the July meeting are in the newsletter. Motion to accept the minutes was made, seconded and approved by the members.

Treasurer's Report – Ben (K9UZ) gave the treasurer's report in Robert's (K4WTH) absence. The financial report for July was handed out to members prior to the meeting. There were no unusual transactions for the month of July. Motion to accept the treasurer's report was made, seconded, and approved by the members.

Committee Reports:
Ken B. (W9GA), Field Day Committee – Ken passed out copies of the official Field Day report for the ORC that was submitted to the ARRL.

There is no update on the storage shed issue.

Tom R. (W9IPR), Scholarship Committee – Tom reported that a $34,000 check was mailed to the ARRL Endowment Fund. The money was drawn from Scholarship's two money market accounts.

Old Business:
There was no old business.

New Business:
There was no new business.

Adjournment:
A motion was made to adjourn the meeting, which was seconded and passed by the members. The meeting was adjourned at 9:20 PM.

Attendance:
There were 44 members and three guests present at the meeting.

A copy of the attendance sheet is available upon request in PDF format. Please contact Ben Evans via email at ben@evansengsolutions.com for a copy.

Respectfully submitted,

B. Benjamin Evans, K9UZ
Secretary

Kristian Moberg Award

Below is the citation on an award that has been given by Homestead High School each year starting with the 2017–2018 school year. Yes! This is our own Kristian, KC9TFP, who received the award for this year. You might want to send him a congrats – consult your ORC Roster or send it to KAM53012@yahoo.com. The award was given in 2017–2018 to Declan Ciurlik and Michael Kennedy, and in 2018–2019 to Declan Ciurlik.

"Kristian Moberg **IS** Homestead basketball. Known affectionately as "Moe" by all people who know him well, Moe has dedicated much of his life to Homestead athletics but an even greater amount of time to Homestead basketball. Regardless who was coaching Homestead basketball, Moe has always been a part of the program. Moe, a former student manager who graduated from Homestead in 1992, performs many duties for the program. His main duty is filming home and away games. Never one to miss the team dinner, Moe is a person who is always willing to help, and give advice either warranted or unwarranted to coaches when needed. In honor of Moe's love of, dedication and loyalty to the program, a Homestead Boys Varsity Basketball player who shares the same passion for Homestead Basketball will be awarded the Kristian Moberg award each year."

ORC Meeting Agenda

September 11, 2019

1. 7:00 – 7:30 PM – Network & Rag Chew
2. Call to Order – Kevin Steers (K9VIN)
3. Introductions
4. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.
5. Program: Chuck W9KR, *Direct Digital Synthesized VFO*
6. Fellowship Break
7. 50/50 Drawing
8. Auction – Stan Kaplan (WB9RQR)
9. President's Update – Kevin Steers (K9VIN)
10. 1st VP Report – Pat Volkmann (W9JI)
11. Repeater VP Report – Tom Trethewey (KC9ONY)
12. Secretary's Report – Ben Evans (K9UZ)
13. Treasurer's Report – Robert Eskola (K4WTH)
14. Committee Reports:
    a. Fall Swapfest – Tom W9IPR
    b. Scholarship – Tom W9IPR
    c. Other
15. OLD BUSINESS
16. NEW BUSINESS
17. Adjournment to ?

Return undeliverable copies to:

The ORC Newsletter
465 Beechwood Drive
Cedarburg WI* 53012

First Class

Next ORC Meeting:

Grafton Multipurpose Senior Center

1665 7th Avenue, Grafton, WI
Wednesday, September 11th, 2019

7:00 PM – Doors Open

7:30 PM – Meeting Begins

The ORC Newsletter

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ORC Repeaters on 146.97, 224.18 and 443.750 MHz - Callsign W9CQO
Web site: www.ozaukeeradioclub.org **Facebook: facebook.com/orcwi**

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From the President

de Kevin Steers (K9VIN)

Not a lot to report on this month, as the weather is still too nice to do antenna repairs before winter. I like to wait until it is just above freezing with snow in the forecast. I am hopeful to get my Butternut Butterfly two-element beam moved up my mast, and install an 11-element 2-meter beam just below it. I am being coached that perfection is the enemy of 'good enough'. I was not able to work the WWV 100 Year Anniversary Special Event Station, what with my work schedule and the band conditions. Fred W9KEY and Bill AC9JV put in the effort to travel to Colorado to cover portions of the operating schedule. Thank you both and I hope to hear the fruits of your labor at our meeting.

I have been trying to get on our Repeater around 5 or 5:30 pm, during my short drive time home. I have had nice conversations with a few, but hope more folks can jump on .97 during their drive time. Also be sure to join our Tuesday evening nets, at 8:00 PM. You can even join late, as they stop for late check-ins, like me.

Lastly, I was not able to help Jeff WV9X with his tower project up north, though I was in the neighborhood though I was entertaining guests. I promise to stop over to lend a hand sometime soon, since I am always looking for ideas, improvements, and advice. If anyone has projects or two-man tower chores to get done before the weather turns, now is your time to speak up.

Be sure to get on the air!

Cheers and 73,

K9VIN
Kevin

The 2019 Fall Swapfest Was a Success!

de Tom Ruhlmann, W9IPR

This photo was taken around 11 AM on September 7th at Firemen's Park, when many had already bought their treasures and left, but we had 165 paying attendees, so we figure about 180 in total (counting the volunteers) were there. The number of vendors was down somewhat but the number of browsers and buyers was up noticably.

As a result, we volunteers had a great time and added about $535 to the club treasury and $449 to the Scholarship Fund. Not bad for a morning's worth of fun!

Many thanks to Jim Albrinck (our volunteer fireman) who was responsible for the grounds and all the volunteers who made this event a success. Special thanks to those who helped load and transport the scholarship fund inventory to and from the fairgrounds. We really missed Tower ElecIronics but we think the door prize of a gift certificate from Ham Radio Outlet helped with the attendance.

Again, thanks to all for making the 2019 Fall Swapfest a success!

DX'ing & Contesting

De Gary Sutcliffe (W9XT)

As you progress as a DXer, you keep track of how many countries you have worked and confirmed. You work hard to get the first 100 countries to earn the DXCC Award. Then you continue to keep trying to work ATNOs (All Time New One). The first 250 or so come in a few years if you are active. After that they come more slowly, and an ATNO is a reason to celebrate.

If you keep at it, you reach the DXCC Honor Roll, which is confirmed contact totals within 10 of all the current countries. There are currently 340 countries, so you need at least 331 to reach the Honor Roll. If you stick with it, you get them all and are in the #1 Honor Roll. It took me over 40 years to accomplish that.

When you get down towards the end, ATNOs come slowly. You need to wait until there is a DXpedition to some rare island, or some country like North Korea opens up and allows ham radio. The last ones can take a decade or more to show up.

So what do you do to keep the DX juices flowing while you wait for one of the last ones to show up or a new country to be created? You can go back and try to work each country on phone, CW, and a digital mode. There is the DX Challenge where you try to work each country on each band, 160M-6M, except for 60 Meters.

One thing I have been doing for a few years is to see how many countries I can work in each calendar year. There is an award called the DX Marathon that runs each year. Last week I worked #200 for 2019 and was looking through the countries I worked and the bands I worked them on. The one that stuck out was 10 Meters, my favorite band. Pickings are very slim there when we have sunspot counts like we have experienced the last few years.

I thought it would be interesting to plot the number of countries I worked on 10 Meters vs. the sunspot count each year of the last cycle or so. Figure 1 shows the totals. The solar data was from the World Data Center SILSO, Royal Observatory of Belgium, in Brussels. It is the mean sunspot number for each year except for 2019. We obviously don't have that number for all of 2019, so I used the average of the mean sunspots counts for each month, January-September 2019.

Since 2019 is not over, and we are just reaching the fall contest season, it is likely that a few countries will be worked. I have been on FT8 since mid-2017. Some of the countries I worked on 10M were only worked by FT8. Those countries have were deleted from the totals be consistent with the previous years. As you can see, the 10M country totals correlate very well with the sunspot count.

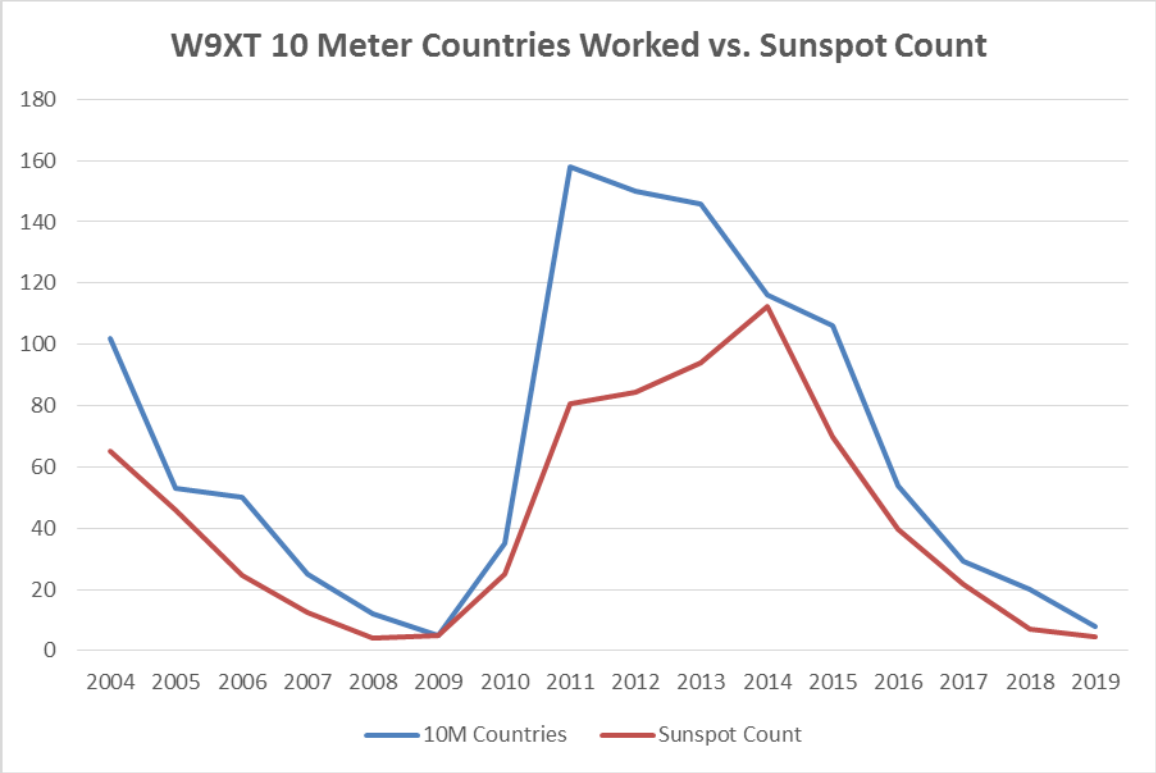

Figure 1

The country totals really went up fast in 2010-2012. I suspect this is because, after so many years of poor conditions, I was so happy to see good conditions after such a long drought, and was much more active.

The country totals probably could have been higher during good years because of DXpeditions. I try to work them on new bands and modes. I had collected a lot of countries on 10M over the years, so had many of them already confirmed. If a rare one showed up, but I already had it confirmed, I might not have bothered trying to work it if the pile up was big. I may not have wanted to spend the time to get through. Also, my QSO might have been at the expense of another DXer who really needed it. No need to be a hog.

So, when can we start expecting better conditions on the higher bands? That, of course, depends on when the sun starts producing sunspots again. Most estimates are that the minimum will occur this year or 2020, but we really don't know.

We have a much better handle on how the bands will behave for a given level of sunspots or solar flux. My rule of thumb is you can work western and southern Europe when the solar flux reaches 100 and the geomagnetic field is quiet for a couple of days. Stations further north and east require better conditions.

Spain is probably the easiest country on the European mainland to work being so far west and south. Looking at my logs, the last Spanish station I worked on 10M F2 skip was in February 2016. Japan is another area important for contesting but a more difficult path. My last 10M QSO with a JA was in March of 2015. That is over four years ago!

We are past the equinox, and conditions in the northern hemisphere are improving. Some believe October is the best month of the year for working DX from our area. Seasonal improvements are under way. I have been working and seeing more stations on 15 and 12 Meters.

These openings are typically to the south, and maybe to the southeast to South Africa, or southwest to some South Pacific islands. You just need to be there to catch the infrequent openings. I'm sure these bands are open more often than we think, but ops go up there, turn the knob, don't hear anything, and QSY to a different band. Everyone is listening and no one talking.

FT8 gives us a chance to avoid some of that. Besides enabling contacts during conditions too poor for SSB or even CW, the operations are confined to a small frequency range, so you know where to listen and transmit. I'm trying to encourage everyone to regularly listen on 15, 12, and 10 meters on the FT8 frequencies. If you don't see any signals, send some CQs. Let it run a few minutes. You might be surprised what shows up.

The big contest for October is the CQWW Phone event. This is the most popular radio contest based on participation. It runs October 26-27, 0000 UTC. That is 7:00 PM on Friday, local time. The exchange is a signal report and CQ zone. We are in Zone 4, so we give out 5904. Multipliers are zones and countries per band. QSOs with other continents are worth 3 points. Contacts with other North American countries are worth 2 points. US to US contacts are zero points but can be worked for zone and country multipliers.

There are lots of categories you can operate. Check out the rules and find the one best for you. https://www.cqww.com/rules.htm

The ARRL CW Sweepstakes takes place on the first weekend of November. The exchange is rather complicated, and rather than spelling it out here, check out the November newsletters from past years, or better yet, the ARRL page. http://www.arrl.org/sweepstakes

They have a lot of information and suggestions for operating. The ARRL CW SS is probably the best big contest for smaller stations. Back when I had a very limited station, it was one of my favorite contests. Unfortunately in recent years I have had a conflict which limited how many hours I was able to put into it.

The big DXpedition this month is to Pitcairn Island. It was made famous by the "Mutiny on the Bounty" incident. A large group of very experienced DXpedition ops will be on from October 18-November 1. They will be active in the CQWW contest. Apparently, this will be the first time the VP6 multiplier will be available in this contest. They are on all bands, including 6 Meter EME. Their web site is https://pitcairndx.com/.

Norfolk Island will be activated by a small group of Polish ops October 18-November 4. They will be on SSB, CW, and digital modes. This used to be put on regularly by VK9NS until he became a silent key about ten years ago. Now operation is sporadic.

A really rare DXpedition will be active October 19-31 from the Lakshadweep Islands. These Indian Islands are not on often, and we have a really tough path. The call is VU7RI. They will be on 80-6m, SSB, CW, and FT8. Our best shot may be on 40 Meters around sunset. We have a grey line path to that part of the world during those dates.

The “grey line” is the ring around the earth that is in twilight, either at sunset or sunrise. Low band signals often propagate along this path. FT8 might just provide the edge on this one.

There will also be a lot of CQWW contest DXpeditions. They often show up a week in advance and are active in testing equipment and learning propagation from their location.

Those are the highlights for October and early November. Now is the time to finish up on those last-minute antenna projects before the snow arrives.

Ham Radio & Real Estate

de Andy Bretl, W9ASB

Not only is this my first article published in the newsletter, it’s also the first article I have ever written. So I’m hoping it will only get better. Right off the bat, I have to give some of the credit to Gary Drasch (K9DJT) for helping me come up with this idea. The hope is to provide you with some “food for thought” as to how real estate can impact ham radio when you make the decision to relocate. I am sure many of you at this point have awesome ham shacks, towers setup, wires run everywhere, neatly, but everywhere. Maybe some of you have even been allowed to move out of the basement, to the main level of the house. I personally was able to do that a few years ago. The nicer the shack, the more time you will want to spend with the hobby. Then you start to think... This lawn mowing, weed whacking, trimming and snow removal are all getting in the way of my time on the air. If I would move to a condo, someone else would do that for me!! I could spend all that extra time rag chewing or working DX!!

Well, let’s slow down there for a minute. While condo living sounds great, there is a lot that needs to be considered:

Will they allow you to put up a tower? What about wire antennas? Will the association permit a flagpole (to use as an antenna)? Are you able to put an antenna(s) in the attic?

What are you willing to give up in order to live in a condo? In many cases, not even TV antennas or satellite dishes are allowed. That means you are forced into using cable TV. On the ham radio side, the only alternative might be renting “air-time” on a remote station via the internet.

Most condo fees will range from $150 - $350 or higher. Now, most of the time, that fee covers all the outside maintenance and the roof, so no more mowing, weed whacking, trimming and snow removal. Remember that you might need to add remote “air-time” fees to that too.

Now, let’s throw a very simple twist on that. If you would take the condo fee money, set it aside each month, and pay someone to do the mowing, weed whacking, trimming and snow removal, you now basically live in a condo with a great ham shack and the antennas you like. There should be enough money left to maintain your roof and other repairs too. Yes, it is as simple as it sounds. Why not look into the same lawn maintenance/snow removal companies that condo associations use? They would love to have you as a customer!

Stand by for some more hints next month!

THE COMPUTER CORNER

No. 259: When's The Last Time You Did Maintenance?

Stan Kaplan, WB9RQR 715 N. Dries Street Saukville, WI 53080-1664
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I consider this a favor to you. Nancy (KC9FZK) did me a favor the other day. She said "your machine is getting pretty dusty … when is the last time you cleaned it?" So, today I did. And you should, too. Nancy said my computer sounded quieter when it was all cleaned and back in service.

In April 2007, CC137, I reminded you to clean your devices with an article called Physical Maintenance. The article still applies, whether you have a desktop, laptop or even an IPad. Clean it up to the best of your ability to make sure it continues giving you good service. You can do it even if you are a beginner. You will need a vacuum cleaner with a hose (a Shop Vac is perfect, but your household vacuum will do the job, too, so long as it has a plastic "sucky" hose), a soft-bristle brush (a basting brush from the kitchen will do nicely, and you can replace it later or put it in the dishwasher for a cleaning), and (ideally) a can of compressed air. You can get the air at your hardware store. The aim is to remove the dust and dust bunnies. Why? Dust prevents air circulation inside your computer. If air circulation is impeded, the temperature will go up. High temperature is the most destructive factor in electronic devices in general, including computers of all kinds.

Unplug all the cables and move the box or laptop down to your workbench. If it is a laptop, find the vent area (the tiny grill, usually near a back corner). Put the vacuum hose up to it for a full minute and suck out what you can. Now use the air can to blow into that grill to dislodge whatever possible, and follow with another vacuum treatment. You might want to clean up the screen – use an old t-shirt moistened with plain water. A well-worn t-shirt is as good as microscope lens paper for non-scratch cleaning of soft microscope lens glass, so it is fine for a computer screen. Now clean the case as best you can, and blow the hair and dust out of the keyboard. You are done with the laptop.

If the computer is a tower or mini-tower, pop the removable cover (most often on the left side of the machine - your left as you face the front of the machine). Lay the machine on the covered side. Make sure your lighting is good, and examine the inside of the case. You will see a myriad of cables. Move them gently to the side as you examine each component. Identify the motherboard, the memory stick(s), the power cables that plug into the motherboard, the little twisted cables that fit on motherboard header pins for the speaker, power switch, power LED, hard drive LED, and so on. The connectors at the end of twisted cables usually have a printed label on the black plastic of the connector, and the motherboard usually has a (hard to see!) label by each set of pins that the connectors attach to. Right now! Make a sketch of the motherboard and, especially, those connectors and pins. If you inadvertently disconnect anything, that sketch will save you from grief. If you are lucky enough to have a manual for the motherboard, examine it for a nicely made road map of all these connectors.

Continue to examine. Note what is plugged in to any of the slots, and write it down or sketch it. You cannot record too much, though you certainly can write down too little! Document, document, document. Find the DVD and hard drive connectors. Follow them up to the device they control. When you have a pretty good idea of what goes where, it is time to clean.

Turn on the vacuum and carefully put the hose end inside the case. Use the paintbrush to dislodge any dust bunnies, and keep the vacuum hose end close to suck up the dirt you free up. Pay particular attention to the interior air slots in the power supply case, to the spaces between memory sticks, and to the fan on top of the CPU heat sink. If you have a can of compressed air, blow between the slots of that heat sink to get the dust out. Also give a blast or two of air in the slots of the power supply. Keep the vacuum going all the while, to suck up the dirt. Now set the machine on its bottom, and use the brush to clean up the inside bottom of the case. Suck it up, suck it up, and suck it up. Turn the case around so you can see the power supply fan blades on the back. Blow them clean from the back. This will likely blow dust into the case through the interior slots in the power supply, so go back inside and vacuum it all again. See if you can use the brush to dislodge dust from the fan blades of the power supply from the outside, keeping the vacuum hose nearby to suck the dirt up. Blow air into the corners of the inside of the case to release dust bunnies you may have missed. Suck everything up. When you are satisfied that the dirt is gone, it is time to renew contacts.

The easiest and safest way to renew the electrical contacts in a computer is to partially disconnect them, then re-seat them. This renews the contacts at the molecular level, as the metal contacts slide over each other. Start with the DVD cable. At the motherboard end, slightly raise the connector on the mating pins, then push it right back down until it is completely seated. Do the same with the hard drive connector. Now do the other ends of each cable, where the cable connects to the device. No need to completely remove the connectors. Just partially raise them, then re-seat them. This will significantly reduce the resistance of the metal-to-metal contacts. Now do the same for the power cable going to each device (one yellow, one red and two black wires, each). If you wish, you can completely remove these and then plug them back in. You cannot plug them in incorrectly, since they will only go in one way, and they are interchangeable.

Now apply the same procedure for the power supply connector on the motherboard. Use care here – modern systems have a little latch on this connector that you must depress to get it loose. Plug it back in, and make sure the latch is latched (you will likely hear an audible click when it seats properly). Use care not to flex the motherboard much. Motherboards can crack, in which case, they may well be rendered useless.

Now, move on to any video or other cards that may be present. PCI cards typically plug into those whitish slots on your motherboard, while AGP (video) cards plug into a dark-colored slot. Remove the retaining screws from any cards plugged in and raise them a bit (one at a time). Blow any dust out of the slot, then re-seat the card and replace the retaining screw. Use care not to touch any of the gold contacts on the card bottom. Oils in the fingerprints you leave will increase the resistance of the contact with its slot. Follow the same procedure for the memory stick(s). Be sure to keep fingers off those gold contacts! Do memory sticks one at a time to be sure you get them in the same slot.

Now renew the metal-to-metal contacts at the end of those twisted wires for the speaker, power-on cable and the like. Raise them just a tiny bit, then re-seat them. If your computer could talk, you would hear it say “Ooh, that feels good!”

Now give a blast or two of air to the top surface of the hard drive, and DVD. Dust bunnies like to hang out up there. Next, pay some attention to the front panel. Blast out any dust or dirt there, typically lurking in slots or vents. Sometimes, there is a big vent at the bottom of the front panel. Tip the computer up on its back to get to that one.

All done? Typically your workbench will be covered with dust and debris, including some bits of paper. Hopefully there will be no paper clips or other such conductive bits of flotsam and jetsam.

Save your notes and sketches! Put back the side panel and mount the computer in its proper place. Plug in all the cables, but before you power up, take a moment to clean your keyboard and mouse. Q-tips are great for both. Moisten the Q-tips with Sparkle (my favorite) or Windex to clean the dirt off of keys and in between. A blast of canned air will help, too. Power up! Maintenance is done!

Happy computing!

SILENT KEY

Tim Boppre (KA9EAK)

On August 6th, Tim KA9EAK, became a Silent Key after an 18-month battle with Non-Hodgkin's Lymphoma. He was 56.

Tim earned an electrical engineering degree from Marquette University and was hired by Allen Bradley in the drives division.

In 1987, Tim went to work for Square D, where he was an applications engineer. Later on, he joined the ICOM software company in West Allis in 1991, which was acquired by Rockwell Automation in 1994. Tim continued on with Rockwell Automation and became the software manager. While there, he took an interested in patent law, and as a result, he became a patent agent for Rockwell.

Always active in scouting, Tim became an Eagle Scout, as did his sons with his encouragement.

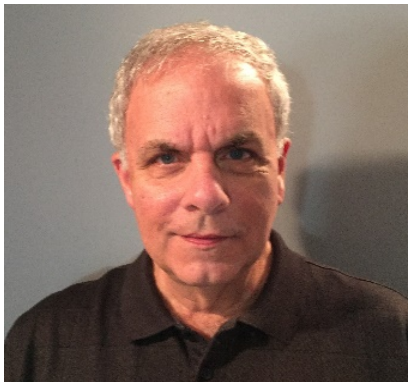
Tim enjoyed bluegrass music and taught himself to play the banjo, the guitar, the mandolin and the Dobro. This led him into instrument repair and building his own instruments. He chronicled these activities on his blog at outbackofbeyond.wordpress.com.

Among his many interests was amateur radio, and he earned his first amateur radio license at age 16. Tim was active in the Ozaukee Radio Club and gave several presentations on various topics. He will be missed by all who knew him.

Tim is survived by his wife Dawn and their children Danielle, Dominic (W9KKX), and Benjamin.

Vintage Amateur Radio

de Bill Shadid, W9MXQ



Always a mainstay in the ham radio business into the 1970's, Hallicrafters was certainly a market leader in a lot of areas. They were very close in timing to Collins Radio Company in the move to Single Sideband (SSB) equipment in the 1950's. In fact, they may have actually preceded Collins in an initial move to more compact radios with the 1954 introduction of their first tabletop SSB station – the HT-30 Transmitter and the short lived SX-96 Receiver. (The SX-96 Receiver was soon to be replaced with the now iconic SX-100.) Hallicrafters did incredible things in the 1950's with the introduction of the very first hybrid SSB Transceiver, the FPM-200[1]. While introduced after the industry leading Collins KWM-1, the FPM-200 included full HF coverage (80-10 meters) while the all vacuum tube KWM-1 included only 20, 15, and 10 meters. Hallicrafters was, as they said at the time, "The Radio Man's Radio[2]."

Hallicrafters HT-30 HF SSB/CW/AM Transmitter

Hallicrafters SX-100 HF SSB/CW/AM Receiver

Shown above is the Transmitter/Receiver pair most well known in the Hallicrafters line at the time. Shown below is the initial receiver that was introduced with the line in 1954, the Hallicrafters SX-96. The SX-96 was a fine receiver but not up to the performance levels of its successor, the SX-100. Perhaps Hallicrafters marketing was ready to go to market with the revolutionary HT-30 Transmitter but that the SX-100 Receiver was just not quite out of the laboratory and ready for production. The reasoning is lost in history.

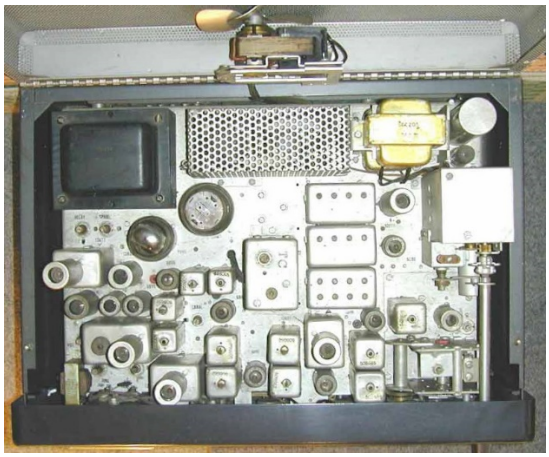
Hallicrafters HT-30 HF SSB/CW/AM Transmitter

Hallicrafters SX-96 HF SSB/CW/AM Receiver

You can clearly see, in the above two station offerings, that the SX-96 was not an appearance match for the HT-30. Both the SX-96 and the SX-100 have been a part of the W9MXQ collection of Hallicrafters radios. Today, the SX-100 remains and the SX-96 resides with good friend, Bill,

AC9JV. While not a worthy partner in the SSB market with the HT-30, the SX-96 is a very fine receiver. In fact, the SX-96 mentioned here was owned initially by a now silent key friend in Quincy, Illinois. He had attempted to add the features to make the SX-96 perform like the SX-100. He later removed that modification, but to this day that SX-96 has a place in its chassis where an extra i-f tube and circuitry was added. The necessary opening for the tube socket was neatly done by my Quincy friend who was a fine technician.

Here is a look inside the HT-30 Transmitter (left) and the SX-100 Receiver.



Top Inside View – HT-30 Transmitter (Front at Bottom of Picture)

Top Inside View – SX-100 Receiver (Front at Bottom of Picture)

The small shielded cabinet at the top of the HT-30 picture is the enclosure for the two 6146 final amplifier tubes. The receiver was identical in overall front panel dimensions but not as deep – front to back. Shipping Weight of the two units was 34-1/2 pounds for the receiver and 51 pounds for the transmitter. The heavier power transformer, the added weight of the larger cabinet, and the addition of the synchronous motor fan in the transmitter made for the increased weight. The fan cooled the rather tightly enclosed final amplifier tubes. The enclosure similarly located in the SX-100 Receiver enclosed the Notch Filter circuitry. (That Notch Filter feature was not present in the SX-96 Receiver.)

Frequency coverage of the HT-30/SX-96 or the final HT-30/SX-100 package was somewhat different than the competition. The SX-96 and SX-100 Receivers covered the HF spectrum from 0.538 to 34.000 MHz. The HT-30 Transmitter covered the entire 80, 40, 20, and 10-meter bands – with no coverage provided for the 15-meter band. At the time, the 15-meter ham band had not been officially released for amateur use. Some manufacturers included it and some – like Hallicrafters – did not. Hallicrafters used a frequency quadrupling circuit to allow coverage of the entire 10-meter band with a single range VFO tuning range.

RF power in the HT-30 was certainly less than hams today would expect. The two 6146 amplifier tubes in the PA system provided an output power of just 35 watts – with a rated input of about 70 watts. Hallicrafters did not provided the expected 180 to 200 watts input in a transmitter until the later advent of the HT-44 Transmitter about ten years later. Even the much-touted HT-32 and HT-37 transmitters had an input power of only 144 watts that provided about 70 watts of output.

For these articles we do not generally get into deep technical discussions but the differences in the SX-96 and the SX-100[3] are substantial. Just the added tubes in the SX-100 over the SX-96 (14 vs 12) suggests circuitry differences (because front end and audio circuits are little different

between the two radios. The addition of an i-f stage, a complete notch filter system, and antenna trim features made for better performance in the more evolved SX-100 receiver.

The HT-30 Transmitter was the first of several Hallicrafters Crystal Lattice Filter SSB Generation Transmitters that included the HT-30, the HT-32, the HT-32A, the HT-32B, and the HT-46. (The popular HT-37 and HT-44 Transmitters utilized Phasing SSB Generation that Hallicrafters perfected to an artform, in my opinion[4].)

No mention of the HT-30 and SX-100 station would be complete without a mention of the linear amplifier that was part of the system. To compliment the HT-30 power amplifier Hallicrafters designed and introduced the HT-31 Linear Amplifier. True to its boatanchor heritage, the HT-31 weighs in at 92 pounds as it sits on the operating table. That is a lot of bulk (20" wide x 12-1/4" high x 17-1/4" deep) for an amplifier with a rated input power of just 510 watts. See the picture – on the left, below. The amplifier provides respectable power for the HT-30 station with a maximum output of 330 watts SSB/CW. Required driving from the exciter[6] (HT-30 or any other transmitter) ranges from 8.5 watts at 80 meters to 20-25 watts at 10 meters. The amplifier used two 811A Triodes in the amplifier circuitry and a pair of 866A Mercury Vapor Rectifiers in the power supply. The HT-31 Linear Amplifier was not grounded-grid as we are used to seeing today. Instead it was grid-driven which explains the very low drive requirement from the exciter.

Hallicrafters HT-31 Linear Amplifier[5]

Hallicrafters SR-500 Console[8]

Above and to the right is a rather special product from Hallicrafters from the mid to late 1950's that was called the SR-500 Console[7]. Hallicrafters incorporated the HT-30, the SX-100, and the HT-31 into an assembly that also included interconnection wiring and other switching and accessories. This idea appeared again later with the HT-32 Transmitter, the SX-101 Receiver, and the HT-33 Linear Amplifier. In keeping with its higher power input, this assembly was called the SR-1000 Console.

Today it is easy to find the SX-100 Receiver but a bit harder to find the SX-96 Receiver because not many were made. However, good SX-100 Receivers, while plentiful, are in demand. Even though they are a lot of them around, good ones are expensive. This is a good example of rarity not necessarily determining value in today's market.

The HT-30 Transmitter is a bit rare but does appear from time to time. The HT-31 Linear Amplifier is extremely rare, and the SR-500 Console is almost, as we collectors say, "unobtainium."

Most of my articles on radios that you have read are written from my own experience with only a few examples otherwise – which are always identified. The article on the HT-30 is one of those

products that I have never owned. However, my collection currently includes an excellent SX-100 Receiver, has included the SX-96 Receiver mentioned herein, and I have had access to an HT-31 Amplifier in the past. I regret not having that experience with the HT-30 Transmitter. However, good friend and fellow collector, Pat Volkmann, W9JI, owned an HT-30 early in his ham radio career. Here is a short story, written by Pat, of his experience with the transmitter. And I quote:

In the summer of 1973, I was 16 and had been a ham for about a year. I had just passed my General exam and was looking for some better equipment, even though I had very little money. My main rig was a Heathkit HW-16 that I had purchased with the proceeds of my part time jobs. The transmitter was crystal-controlled and the receiver was so-so. Band coverage was limited to CW on 80, 40 and 15 meters. I wanted something with a VFO that covered all the bands.

A fellow member of the Wisconsin Valley Radio Association in Wausau, Wisconsin had some equipment for sale. I didn't know much of anything about the radios, but they met my criteria – VFO controlled transmitter and within my budget (cheap!). Ron Dickman K9EYA (now KT9W) was the owner of an RME 4530A[9] receiver and a Hallicrafters HT-30 transmitter. A deal was made, and the radios moved into my shack. With my newly issued General class license, I made my first-ever sideband QSO using the HT-30 on August 31, 1973 when I checked into the Wisconsin Sideband Net as WB9JIC.

This was real radio equipment! The Hallicrafters HT-30 was a solidly built, heavy transmitter, weighing in at just over 50 pounds. Power output was about 30 watts from a pair of 6146 finals. The HT-30 covered all the HF pre-WARC bands except for 15 meters. The VFO was accurate and stable and was much nicer to use than the rock-bound Novice transmitters I had started with. During the 1970s, HF propagation was extremely good. The HT-30's modest power output was able to regularly work DX on 20 and 10 meters.

I don't know how many hours I put on the radio, but it was on pretty much any time I was at home. Fortunately, there was never any problem. The HT-30 was a pretty complicated device and I expect most repairs would have been beyond me. I used this pair for the next two years, until I left home for a stint in the US Air Force. At that time, I sold them to a friend who was interested in getting his ham license. I don't know where they ended up but hopefully they are still glowing today in someone's shack.[10]

Pat further comment on something that we both share regret over – the fact that neither of us took pictures of our equipment in those early days in ham radio.

I appreciate that you read my articles. Remember that I am open to questions and comments anytime at my email address, W9MXQ@TWC.com.

A special note of thanks to my proofreader, Bob Bailey, W9DYQ.

Credits and Comments:

[1] Subject of a future article, the reference to the "hybrid" FPM-200 references its solid-state design except for the final amplifier and power supply regulator tubes.

[2] Reference Hallicrafters' advertising copy from the 1950's. Maybe a bit sexist but this was the 1950's.

[3] The SX-100 in the W9MXQ collection is a Mark 1B model – and comparisons are to this model.

[4] It is worth noting that all of Hallicrafters' SSB Transceivers utilized Crystal Lattice Filter SSB Generation.
[5] The Hallicrafters HT-31 picture is from Hallicrafters publication 94X1403.
[6] The term "exciter" is not so much used today (in ham radio) but it refers to a low power RF generator used to drive (or "excite") an amplifier. Research will show many such combinations such as the rather low power HT-30 Exciter used to drive the likes of an HT-31 Linear Amplifier.
[7] The SR-500 Console uses a prefix ("SR") later used by Hallicrafters for Transceivers. This SR-500 console is not to be confused with the Hallicrafters SR-500 "Tornado," 80, 40 and 20-meter transceiver that dates from 1964 – many years after the short lived SR-500 Console. The SR-500 Console referenced this product as the HT-30, SX-100, and HT-31 mounted in a single, floor mounted cabinet.
[8] The SR-500 Station Console shown here is the property of N9CQX.
[9] The RME 4350A Receiver was a ham band only (160-10 meters) product of Radio Manufacturing Engineers of Peoria, Illinois. RME, as it was called has a very interesting history that will be the subject of a future article. I was once the proud owner of an RME-4350A as well as several other RME models.
[10] Patrick (Pat) Volkmann, W9JI, frequently writes articles for the Ozaukee Radio Club. While, like this author, Pat has respect for many pre- and post-WWII amateur radio brands, he seems to look with special favor on vintage Collins Radio Equipment. I am proud to call Pat a friend and co-conspirator in this hobby!

W9MXQ

2019 Training Corner

de Tom Ruhlmann, W9IPR

The Extra Class training sessions have started (October 5th) at my home. There are six people taking the sessions, and we are following the ARRL Extra Class License Manual. The PowerPoint presentations are interesting but we are learning just as much from the group discussions.

The individuals taking the sessions are:

Bill Church (KD9DRQ)
Roland Chaloupka (KB9WHV)
Michael Eibs (K9EMD)
Fred LeMere (KD9IOO)
Mark Heleniak (KD9NOO)
Bill Bischoff (KD9FGB)

Ozaukee Radio Club
September 11, 2019 Meeting Minutes

de Ben Evans K9UZ, Secretary

First Vice-President Pat Volkmann (W9JI) presided over the meeting, as President Kevin Steers (K9VIN) could not attend. Pat called the meeting to order at 7:32 PM. All the attendees introduced themselves.

Announcements, Show-and-Tell, Bragging Rights:
Tom R. (W9IPR): Worked Italy tonight as he demonstrated ham radio to his grandson.

Gary S. (W9XT): Unified Microsystems is introducing a new low-band receive antenna that is an improvement over the latest Beverage antenna design. It's called the BevFlex-4X.

Program:
Chuck (W9KR) gave his presentation on the Direct Digital Synthesized VFO that he built.

Auction:
Stan (WB9RQR) conducted the auction. Many items were sold, including an HP Pavilion 400-224 desktop computer with Linux Mint 19.2 installed, a 500 MB external hard drive, a trans-match that Stan built, and two Linux Mint 19.2 installation CDs.

50/50 Drawing:
Bill Shadid (W9MXQ) was the winner of the 50/50 drawing.

Officer Reports:
Kevin S. (K9VIN), President's Update – Not at the meeting. No report.

Pat V. (W9JI), 1st VP – No report.

Tom T. (KC9ONY), Repeater VP – No report.

Ben E. (K9UZ), Secretary – The minutes from the August meeting are in the newsletter. Motion to accept the minutes was made by Stan (WB9RQR), seconded by Bill Shadid (W9MXQ) and approved by the members.

Robert E. (K4WTH), Treasurer – Robert was not at the meeting, so Ben (K9UZ) gave the financial report for August which was handed out to members during the meeting break. The only transaction of special note was a transfer of $34,000 from the Scholarship accounts to the ARRL Endowment Fund. This transfer was announced by Tom R. (W9IPR) at the August meeting. Motion to accept the treasurer's report was made by Bill Shadid (W9MXQ), seconded by Stan (WB9RQR), and approved by the members.

Committee Reports:
Tom R. (W9IPR), Fall Swapfest – Tom gave a report on the outcome of the Fall Swapfest held the previous Saturday. He said it "overall went great", and acknowledged the individual members that helped with the event, from setup to tickets, parking, concessions, raffle tickets table, to tear-down.

The Swapfest put $535.12 into the regular Club account, and the Scholarship table made $449.50, for a net income of about $984. Ticket sales were $835, or 165 tickets at $5.00 each, which represents a better attendance than in previous years. Advertisements for the Swapfest were sent to various email lists for ham radio clubs in Milwaukee and Madison.

A few members commented that the 6:00 AM start time is way too early. Tom responded that an early start time has always worked best all around. One member suggested giving away the door prize later in the morning so people would stick around.

Tom R. (W9IPR), Scholarship Committee – Tom commented on the first transfer of money, $34,000, to the ARRL Endowment Fund. He acknowledged that the amount of the transfer was more than the amount specified in the motion that was approved by the members, but the end result will be the same as was approved, namely that the total donation to the Endowment Fund will be $60,000. Under "New Business", Tom will make a motion to approve, retroactively, the $34,000 transfer to the ARRL Endowment Fund

Ken B. (W9GA), Field Day Committee – Ken said nothing yet is happening with the trailer storage issue.

Ken B. (W9GA), Nominations Committee – Ken reminded the members that the club has been without a Second Vice-President for many months. However, a member has been found who is willing to serve in that capacity until the end of the calendar year. Ken placed in nomination Bill Church (KD9DRQ) for 2nd VP, but will wait for "New Business" to make a motion.

Tom R. (W9IPR), Ham License Classes – Tom will be starting a class for FCC General and Extra Class ham licenses. It starts Saturday, October 5th and will run for approximately seven sessions, all on Saturday at 9:00 AM at Tom's house. Those who intend to take the class should procure an ARRL study guide for either the General or Extra Class license, depending on the class they are working for.

Old Business:
There was no old business.

New Business:
Tom (W9IPR): Tom moved to approve the $34,000 transfer from the Scholarship Fund to the ARRL Endowment Fund. Stan (WB9RQR) asked if this went through the Scholarship Committee and Tom said it did. Ben (K9UZ) seconded the motion, and the motion was approved by the members.

Ken (W9GA): Ken moved to approve the appointment of Bill Church (KD9DRQ) as Second Vice-President of the ORC, to serve until elections in January 2020. Motion was seconded by Tom (W9IPR) and approved by the members.

Stan (WB9RQR): Stan asked when the ORC roster will be coming out, pointed out that it is the job of the secretary, according to the By-Laws. Ben (K9UZ) responded that he'll talk to Robert (K4WTH) and push to get it out. Pat (W9JI) said that a board meeting will be held hopefully in the next two weeks to deal with this and other issues.

Tom (W9IPR): We have to make sure that all our charge accounts are updated with the new mailing address. A bill from the Mequon printer was misdirected to Dave Barrow.

Nels (WA9JOB): Nels asked what the status is of the Field Day storage project. Ken (W9GA) responded that the new owner of the property hasn't contacted him about possibly letting us use a space in the old barn to store the trailers. If we lose the property, then we'll move the trailers to Big Nate's property.

Tom (KC9ONY): Tom reminded members about the Wisconsin Parks on the Air event station on Lapham Peak near Delafield on September 21st. Either come to Lapham Peak to participate, or work some park stations from your mobile or home rig.

Adjournment:
Stan (WB9RQR) made the motion to adjourn the meeting, which was seconded by Bill Shadid (W9MXQ) and was passed by the members. The meeting was adjourned at 9:21 PM.

Attendance:
There were 29 members and no guests present at the meeting.

A copy of the attendance sheet is available upon request in PDF format. Please contact Ben Evans via email at ben@evansengsolutions.com for a copy.

Respectfully submitted,

B. Benjamin Evans, K9UZ
Secretary

UPCOMING EVENTS

Breakfast at Jim's Grille in Cedarburg – Saturdays at 7:00 AM

Upcoming ORC Monthly Programs

October *– Tom Ruhlmann W9IPR - Station Grounding: What I Did & Should Have Done*

November *- Vic WT9Q - Vertical Antenna Project: Selecting & Installing a Vertical Antenna*

December *- John Schrader W9NRG - Emergency Communications for Firefighting*

January *– Elections*

Presenters Needed!

de Pat Volkmann, W9JI

The monthly program is the highlight of the Ozaukee Radio Club meeting. We are fortunate to have a number of very talented people in our club, many of whom have shared their knowledge through a presentation. Share your expertise and experience with the club. Programs can be on any topic that is ham radio related. Contact Pat Volkmann W9JI at w9ji@arrl.net to discuss your idea for a program.

ORC Meeting Agenda

October 9, 2019

1. 7:00 – 7:30 PM – Network & Rag Chew
2. Call to Order – Kevin Steers (K9VIN)
3. Introductions
4. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.
5. Program: Tom W9IPR, *Station Grounding: What I Did and Should Have Done*
6. Fellowship Break
7. 50/50 Drawing
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Cedarburg WI* 53012

First Class

Next ORC Meeting:

Grafton Multipurpose Senior Center

1665 7th Avenue, Grafton, WI
Wednesday, October 9th, 2019

7:00 PM – Doors Open

7:30 PM – Meeting Begins

The ORC Newsletter

Official publication of the Ozaukee Radio Club, Inc. Email all contributions to the editor, Ben Evans, K9UZ. Permission to reprint articles published in any issue is granted provided the author and the Ozaukee Radio Club Newsletter are credited.

ORC Repeaters on 146.97 (-127.3PL), 224.18 (-127.3PL), 443.75 MHz (+127.3PL) - Callsign W9CQO
Web site: www.ozaukeeradioclub.org **Facebook: facebook.com/orcwi**

Volume XXXI	November, 2019	Number 11

From the President

de Kevin Steers (K9VIN)

As my tenure as president draws to an end, I want to encourage you all to play a larger role in leading this club into the future. Certainly my awe-inspiring leadership has convinced you that even you have what it takes to be President, or Board Member. All joking aside, with such strong and seasoned Committee Chairs and fellow Board Members, it certainly makes running the club a breeze. It really takes very little time, and now is the time to see our younger members step into the ranks that so many of our elder members have already filled.

Most recently, the only RF or tower work I have done is installing a cellular signal repeater up at the cottage. I am in a hole, with virtually no cell reception, especially when trees are in full foliage. Thanks to Nels WA9JOB, who helped me to crimp a small SMA connector that I accidentally separated from the coax, I was able to increase my download speed from 5Mb to 17Mb. Backyard discussions have still not determined the best of three possible directions to aim the antenna, so I am sure I will be up and down some more.

On the Bench (asphalt) is my Wolf River HF antenna which had detached from my mobile rig. When a neighbor commented that the antenna wobbled, I assured him it was fine. Five minutes later, when I arrived at the recycling center, my Wolf River coil was gone. I raced back along the same route, and sure enough, there it laid on the ground at the only stop sign I had to stop at. With tail between legs, I pulled over and quietly slid the 8 foot antenna into my station wagon, and quietly parked elsewhere in the neighborhood that evening.

Lastly, I am using some of my electrical awareness in repairing my home's furnace (one of two, thankfully). With the help of Youtube, I removed the blower fan by removing two sheet metal screws, and pulling a few connectors. I believe the capacitor (4uf 370v) is bad, and ordered a $12 replacement. I will be cleaning out 30 years of grime from the squirrel cage fan and motor while I wait for the capacitor to be delivered.

Cheers and 73,

K9VIN
Kevin

DX'ing & Contesting

De Gary Sutcliffe (W9XT)

Although the weather outside is more like January, we are still in the fall season, which many consider the best time to work DX on HF. Even though the solar flux has touched near record lows of 64 a few times, there have been times with interesting openings.

The recent VR6R DXpedition to Pitcairn Island shows what can happen when hams listen on the bands. The DXpedition made over 87,000 QSOs on 160-6 Meters. They only made a bit over 50 contacts on 6M, which was via EME. The rest were F2 ionospheric propagation. I was surprised to be able to work them on 10 and 12 Meters. I worked them on all bands 160-10M, running no more than 200 watts. Most were CW, followed by FT8 and a few phone contacts. Gary, K9DJT, missed them only on 10 Meters. Bill, W9MNQ, got them on two bands. I don't know if other ORC members worked them. It was a very well-run DXpedition.

While the solar flux, a proxy for sunspot count, has been very low, from time to time it pops up to 70 or 71. If the A and K indices are also low for a few days, that often indicates possible openings the higher HF bands. When that happens, check 15 and 12 Meters. You might be surprised at what you hear.

This is an interesting time of year for grey line propagation. Grey line is the circle around the planet that is in twilight from either local sunset or sunrise. Signals on the lower bands (160M – 40M) often propagate along the grey line, offering short but interesting openings. Often these openings only last a few minutes. Right now, around our sunset, the grey line passes through Southeast Asia, a normally difficult path. Forty meters is especially interesting and often has longer openings. Using FT8 will certainly open this interesting propagation mode to smaller stations.

Some good news from the sun! SpaceWeather.com announced a sunspot from Cycle 25, the new one. It is pretty small, so it won't affect propagation much. The sunspot was identified as one from the new cycle because of its high latitude and opposite magnetic polarity than those from Cycle 24. Despite the new spot, Spaceweather.com said we have at least another year of very low sunspot activity.

There are a lot of contests between now and mid-December. The next one is the ARRL Phone Sweepstakes. The ARRL says this is the oldest domestic contest, with the first one held in 1930. It starts at 2100 UTC (3:00 PM local time) on Saturday, November 16 and runs for 30 hours, but you can only work 24 hours. This contest has a long exchange for a contest. It has been discussed many times in the past in this column. The ARRL has a package with rules and operating info at:

http://www.arrl.org/files/file/ContestResults/2019/2019%20ARRL%20November%20Sweepstakes%20Package%20(Rev%20A%20-%20December%202018).pdf

My favorite DX contest is the CQWW CW contest. Usually, it starts Friday night after Thanksgiving, but a quirk in the calendar has it the weekend before the holiday this year. It starts at 00:00 UTC on November 23 (6:00 PM Friday night local time) and runs for 48 hours. You are allowed to work for as many hours as you can stay awake. One reason I like this DX contest is that DX can work DX as opposed to just working one country or group of countries. That makes it more interesting for DX stations and generates more activity.

The exchange is the signal report and CQ Zone. We are in Zone 4, so we send 599 04. You can work everyone, but contacts with your own country have zero QSO points. So, only work US stations once per band to get the multiplier. Last year I placed #5 in the USA in my category and will see if I can duplicate that this year.

Rules are available at https://www.cqww.com/rules.htm.

Normally the weekend after CQWW CW is the ARRL 160 Meter Contest. The same calendar quirk that has CQWW CW before Thanksgiving gives us a week off. The 160 Meter contest starts at 2200 UTC (4:00 PM local) Friday, December 6 and runs 42 hours. You can work as many hours as you want, but the bands will be dead during the day, allowing you to catch up on sleep.

With our low sunspot count, this should be a good year with lots of activity. Work everyone. US and Canadian stations send a signal report and their ARRL section. KP4, KH6, KL7 are in ARRL sections. Contacts with stations in ARRL sections are worth two points. DX stations send just a signal report and are worth five points. Multipliers are sections and DXCC countries. This is a CW-only contest.

Rules are available at http://www.arrl.org/160-meter.

Many of the DXpeditions for November and early December are one-man operations, often operating around vacation or work activities. A big one that is on right now is to the Marquesas by a group of primarily US and Canadian hams. This is an island in the Pacific. They will be on until November 19 with 3-4 stations 160-6 Meters, CW, SSB, and FT8. I was able to work them easily on 20 CW so far. The call sign is TX7T.

Another Pacific Island, Cocos Keeling, will be activated by a couple of Scottish hams on November 12-29. They will be using the call VK9CZ November 12-20. The plan is to focus on the low bands but will be on 160-10M. CW, SSB, and FT8. They will also be on for the CQWW CW contest. This is high on my list for November. It has been a hard luck country for me, and I need it on a lot of bands for some reason.

An interesting operation will take place from Tanzania on November 16-28. This is being put on by a mostly Russian group. They will be on the HF bands CW, SSB, and digital as 5H3UA. They will also be on 6 and 2M EME using the call 5H3EME. They will be on for both the CQWW CW contest and ARRL EME contests.

That wraps up November and early December on the HF bands. I hope you can find some time to get on the air.

THE COMPUTER CORNER
No. 260: Libre Office for Windows, Revisited

Stan Kaplan, WB9RQR 715 N. Dries Street Saukville, WI 53080-1664
(262) 268-1949 wb9rqr@att.net

It has not been long since I wrote about Libre Office. It was in Computer Corner No. 258, September 2019, in fact. But I thought I would expand a little on that past article to make it easier for you to get and install the package. The latest and greatest is Libre Office 6.3.2.2, and I recommend that you also get the Help Pack v.6.3 at the same time. You can download both at https://www.libreoffice.org/. Be prepared to take a bit of time in downloading – the Office installer, named LibreOffice_6.3.2_Win_x64.msi, is fairly large at 286 MB (300,670,976 bytes). You simply download that and double click it to begin the installation process. The Help Pack (LibreOffice_6.3.2_Win_x64_helppack_en-US.msi) is only 1.99 MB (2,093,056 bytes). To save some of you the trouble of downloading, I will have three copies on CD for sale at our next meeting on 13 November, with proceeds going to the usual pots (50% each to the Scholarship Program and to OZARES). The "burns" on CD are verified.

Once again, the copies of Libre Office do not just install Writer (the equivalent of Microsoft Word). They also install a spreadsheet just like Excel, a presentation program just like PowerPoint, and a database program just like Access. Plus, there are two programs unlike anything included in Microsoft Office. One is a drawing program named Draw, and the other is a math manipulation program named Formula. The best part of all of these is that they can handle (open or edit and save) any preexisting Microsoft files and even write new ones in Microsoft-compatible formats. More or less complete interchangeability, and unlike Microsoft Office (about $300 currently), Libre Office is totally free! How can you beat that?

Remember, this article is about Libre Office for ***Windows***. The msi files you need to download or obtain otherwise listed above are for Windows, not Linux. The same Libre Office is also installed when you install Linux Mint Cinnamon (the latest is 19.2, "Tina"), but the installation files are different so as to work with the very different operating systems, and the programs are different for the same reason. But, the programs in the Windows suite and the Linux suite will accomplish the same things, and files created with one can be edited and saved with the other. To make that clearer, create and start a letter in Writer on a Windows machine, then save it on a thumb drive. Put the thumb drive in a Linux machine and copy the letter to the Linux machine. Finish the letter using Writer in the Linux machine, save it and print it. All that will work just fine.

The really neat thing is it will work between Word and Writer in pretty much the same way! Take a letter started in Microsoft word and transfer it to a Linux Machine. Open it with Writer and finish it. Then save the completed letter to the thumb drive, put the thumb drive in a Windows machine, and copy the letter to the Windows machine. Then use the Windows machine to print the

letter, and that will work. All you have to do is to be sure and save the letter as a .doc file whenever saving it in Writer. Try it. It's easy to figure out.

Have fun, and happy computing!

UPCOMING EVENTS

Breakfast at Jim's Grille in Cedarburg – Saturdays at 7:00 AM

January 4, 2020 – 48th Annual Midwinter Swapfest
Waukesha County Expo Center, 8 AM to 1 PM

Upcoming ORC Monthly Programs

November *- Fred W9KEY – WWV Centennial Special Event Station Recap*

December *- John Schrader W9NRG - Emergency Communications for Firefighting*

January *– Elections*

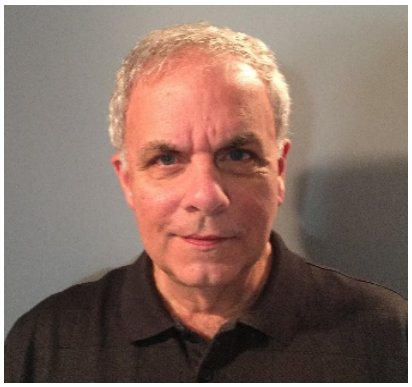
Presenters Needed!

de Pat Volkmann, W9JI

The monthly program is the highlight of the Ozaukee Radio Club meeting. We are fortunate to have a number of very talented people in our club, many of whom have shared their knowledge through a presentation. Share your expertise and experience with the club. Programs can be on any topic that is ham radio related. Contact Pat Volkmann W9JI at w9ji@arrl.net to discuss your idea for a program.

Vintage Amateur Radio

de Bill Shadid, W9MXQ



This is the final (for now!) installment on the last of the Drake High Frequency Amateur Radio Transceivers and Accessories – the TR7 and TR7A. It is interesting to note that nearly to the end of the product life cycle of these radios, they both remained in production. Perhaps this is supported with the knowledge that with some small exceptions the TR7A was a TR7 with most options installed as standard equipment. The previous article in this series also included information on the never produced TR8 Transceiver. We pick up this discussion with information about the final disposition of TR7/TR7A production units and some information about at least one accessory that would have accompanied the TR8 to market. And then, a complete surprise. A surprise that could have been one further amateur radio opportunity.

Let us not forget where we left off – with Drake's last major players in the market.

Drake TR7A Transceiver – Equipped with All Options
Collection of W9MXQ

Drake TR7 Transceiver – Equipped with All Options
Collection of W9MXQ

The beautiful Drake TR7 – shown above as it began and in its final TR7A form – finally came to a rather inglorious end when Drake found itself with a very high number of both TR7's and TR7A's in inventory that were seemingly overtaken by the Japanese competition. According to John Loughmiller, KB9AT[2], the end came with TR7 and TR7A inventory stacked in every corner of the plant. Loughmiller further notes that total production of TR7 Transceivers was about 10,300 and the TR7A accounting for another 2,500, or so. Loughmiller noted that Drake, by that time, was making Satellite Downlink Receivers at a rate of 15,000 per month.

So, how did Drake dispose of these radios that by then were taking a lot of inventory space? According to Ray Grenier, K9KHA[3], who at the time was leading sales and marketing for Milwaukee based, Amateur Electronic Supply (AES), the inventory was purchased by Terry Sterman, W9DIA, the founder and then owner of the AES stores. AES catalogs of the day show sales of both transceivers and all accessories for some time after this bulk purchase[4].

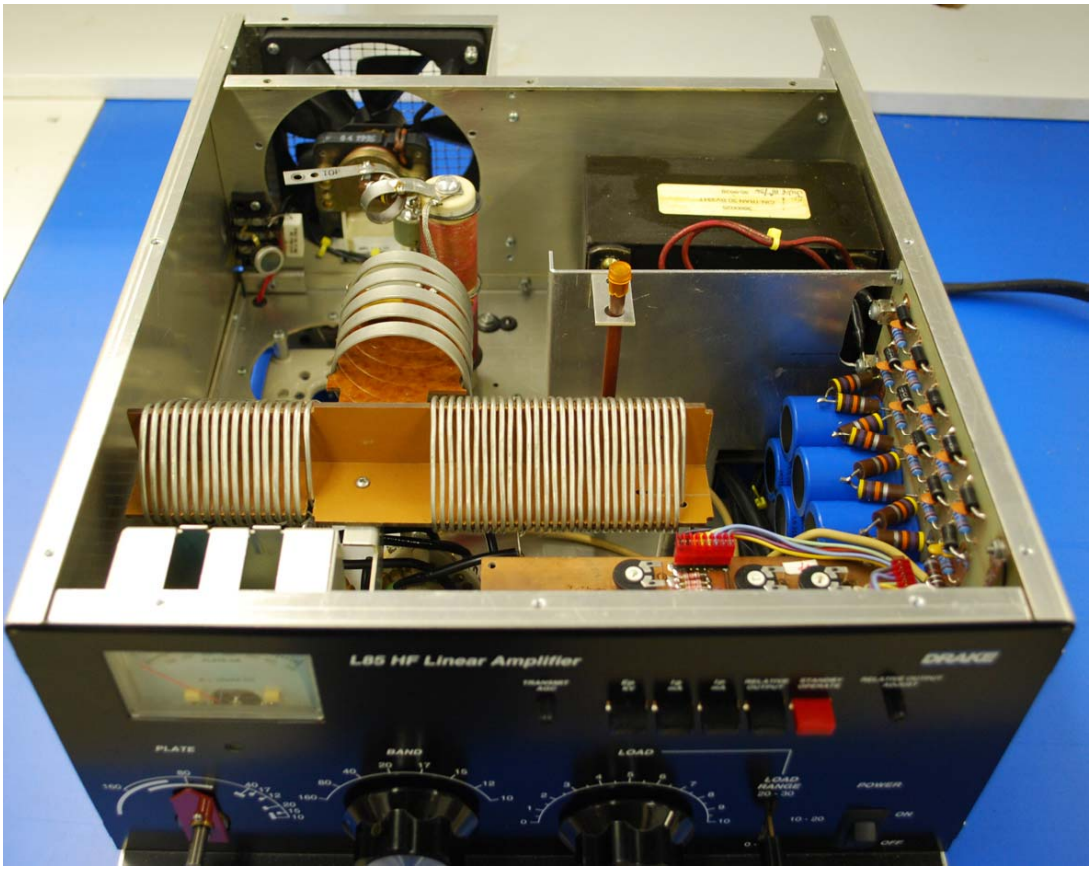
One very nearly forgotten, never produced radio from Drake was the L85 Linear Amplifier. Based heavily on the L75 Linear Amplifier, the L85 was styled to match the TR8 Transceiver, in many ways. In other ways it seemed to be a product that could have stood on its own in terms of styling.

Drake L85 HF Linear Amplifier
Note the missing Plate Tune Knob – and presence of L7 / L75 Style Knobs on the Band Switch and Load Controls. These were perhaps not the final planned style.
LA6OP

This amplifier used a single 3-500z triode in the final amplifier that implied it was able to run about 600 to 700 watts output – just like the similarly equipped L75 Linear Amplifier. There was never any mention that I can find that indicated a closer to full power product such as an "L8" – in keeping with the L7 and L75 model numbers that matched the TR7, TR7A, and TR5 Transceivers.

It is interesting to note that the tank coil in the final amplifier of the L85 was not a round coil – it was wound as a square with four equal sides on an ass embly of Phenolic sheet. This was a unique approach that allowed Drake to manufacture the coil without rather sophisticated coil winder tooling. My good friend, Bob, W9DYQ, fellow collector for most of our lives, (and proofreader of my articles) surmises that Drake used the square coil design as a fast way to fabricate

a physically stable prototype. Bob may well have a point. His engineering development background earns him respect for understanding that process very well.



Drake L85 HF Linear Amplifier
This interior view shows the square wound tank coil. Was the convenience for making a prototype or a design to avoid coil winding tools?
LA6OP

The L85 Linear Amplifier seems to be in a gray area of Drake design. The prototype shown here exists and so does at least one prototype of the TR8 Transceiver. But, even with the careful watching that I do for such things, I had missed the L85 until relatively recent times. To my way of thinking it did, in fact, match a lot of radios on the market and could well have stood alone as a single product to succeed the well-respected L7 and L75 products. Likely we will never know the answer to that thought.

We already know from a previous installment that Drake had nearly finished development of the significantly upgraded TR8 HF Transceiver. But, by that time it appears that Drake had lost interest in the idea of continuing in that market. Many of you reading this know of the successful line of shortwave receivers that Drake manufactured after TR7/TR7A production ceased. I refer to the Drake R8, R8A, and R8B Receivers. These were sophisticated designs that went further than the receivers in the excellent TR7, TR7A, and TR8 designs. (Not to be forgotten are the very capable R7 and R7A Receivers that were marketed at the same time as the TR7 and TR7A Transceivers.)

While not a topic at this time, Drake apparently wanted to exit the amateur radio market, but they were not ready to abandon world band radio receivers. Drake went on to produce some very fine receivers for the HF spectrum. These radios, however, did not match the styling concepts seemingly developed for the TR8 Transceiver.

Those world band receivers were led by the R8 series radios[5]. They were excellent performers. Unlike many such radios, these were competitive and could hold their own against the best available transceivers in the amateur radio market at the time. (Reference here is to receiver performance – the R8 was a receiver only.)

Drake R8B HF Communications Receiver
R. L. Drake Advertising Literature

Of interest to us is that somewhere in the life cycle of the R8 series radios, Drake made an engineering attempt to re-enter the amateur radio transmitter/transceiver market using the R8 Receiver as the basis. Enter here the T8 Transmitter – but keep in mind that this is my name assumption and not necessarily a model number released by Drake. Like the days of the T-4 and T-4B Reciter that could transceive with the R-4A and R-4B, respectively, the T8 would have become a transceiver with the R8 Receiver. (So, my naming convention it means that the prototype would have been a T8 or a T8X, depending on if it had its own VFO.

As far as we know, these pictures[1] show the prototype of the T8 Transmitter, or perhaps Transceive Adapter, for use with the R8, R8A, or R8B Receiver.

Drake R8A Receiver, Prototype T8 Transceiver, and TR7 PA Unit
LA6OP

The picture above shows a production R8A Receiver with a Prototype T8 Transmitter to its right (center, above). The T8 is meant ultimately to match the R8 Series Receiver. The PA unit shown to the right was taken stock from a TR7 Transceiver but would have been incorporated into the T8 cabinet in production. Alas, this was never to be, But what a nice concept. Timing had to be roughly 1995 to 1997 since the receiver pictured here is the R8A, which started production in 1995 and ran until the R8B was introduced in 1997. It could, however, have been somewhat later.

It is nice to think about what could have been with Drake radios. Suffice it to say that I thoroughly enjoy the Drake TR-3 Transceiver, TR-4 and TR-4C Transceivers, B-Line and C-Line Separates, and the TR7 and TR7A Transceivers (along with all the important accessories) here in the W9MXQ Collection. Drake was, and is, a high-water mark in American-Made Amateur Radio Equipment. But, gee, so are Collins, Hallicrafters, Hammarlund, National, and all the rest – other stories for another time!

As with the last installment about post 7-Line Drakes, I draw heavily on the established collection and documentation of a Norwegian collector and his connections with former Drake staff[1].

Special thanks go to Bob, W9DYQ, for his proof reading. Remember that I am open to questions and comments at my email address, W9MXQ@TWC.com.

Reference Notes:

1. Sindre Torp, LA6OP – who further credits Bill Frost, former Drake Service Manager. Mr. Torp is credited with his call sign, LA6OP, where applicable.
2. Reference: “A Family Affair – The R. L. Drake Story” John Loughmiller, KB9AT, © 2000
3. Ray Grenier, K9KHA[3], interview with W9MXQ in November of 2019, and other occasions. This writer is proud to call Ray a friend.
4. Source is a W9MXQ collection of Amateur Electronic Supply catalogs for the period.
5. There were less costly (and lower level performance equipped) radios in the “8” line of radios. Those included the SW8, for instance. Drake, at the time, also produced short wave receivers under contract to others – some of which were totally different design concepts.

W9MXQ

Ozaukee Radio Club
October 9, 2019 Meeting Minutes

de Ben Evans K9UZ, Secretary

The meeting was called to order at 7:31 PM by President Kevin Steers (K9VIN). All the attendees introduced themselves.

Announcements, Show-and-Tell, Bragging Rights:

Nels (WA9JOB): Nels announced that someone with nearly the same call as the repeater was present at the meeting. It was Bob Hoffman (K4CQO), and he told the story of how his father, George Hoffman (W9CQO, SK), gave his call sign to the club. Last year, Bob decided to get back into ham radio and he took a call sign that was similar to his dad's. The "4" in the call sign is because Bob resides in the Atlanta area which is in Region 4.

Bill Shadid (W9MXQ): Bill got an offer from the editor of CQ Magazine to be the "vintage radio editor" for the magazine to write a monthly article, and it was because of someone sending the editor an article from the ORC Newsletter that Bill wrote.

Stan (WB9RQR): Stan worked WWV during the Centennial Special Event. Kevin called on Fred S. (W9KEY), who worked the event with Bill Schnell (AC9JV), to tell the group all about their experiences in Colorado.

Ben (K9UZ): The ORC Club Roster is finally coming. Ben passed around a prototype with all current members' information.

Program:

Tom R. (W9IPR) gave his presentation on "Station Grounding: What I did and should have done."

50/50 Drawing:

There was no 50/50 drawing.

Auction:

Stan (WB9RQR) conducted the auction. Many items were sold, including a Yaesu FT-8800 2M/440 transceiver that doesn't power on, an Electro-Voice microphone, an Acer Aspire notebook computer with Linux (needing a new battery), a new Milwaukee PC computer with Linux including monitor, mouse and printer, and an amplifier.

Officer Reports:

Kevin S. (K9VIN), President's Update – A board meeting is planned for Tuesday, October 22nd in the Community Room of the Cedarburg Public Library.

Pat V. (W9JI), 1st VP – No report.

Bill C. (KD9DRQ), 2nd VP – No report.

Tom T. (KC9ONY), Repeater VP – Not present, no report.

Ben E. (K9UZ), Secretary – The minutes from the September meeting were distributed to members by email. The newsletter isn't finished yet. Motion to accept the minutes was made by Stan (WB9RQR), seconded by Bill Shadid (W9MXQ) and approved by the members.

The upcoming Club Roster was discussed. It was decided to have the short list in the front of the book be alphabetical by last and first name and the back part be alphabetical by the last letters of the call sign, as was done in previous years.

Robert E. (K4WTH), Treasurer – Robert was not at the meeting, so Ben (K9UZ) gave the financial report for September which was handed out to members during the meeting. The only things of note were credits and debits from the Fall Swapfest. Bill Shadid (W9MXQ) reported that a $95 check sent to us by the Wisconsin Amateur Radio Club for tickets and tables for the last Spring Swapfest was never cashed. Ben said he would contact the treasurer and Kristian (KC9TFP) about it. Motion to accept the treasurer's report was made by Bill Shadid (W9MXQ), seconded by Ken B. (W9GA), and approved by the members.

Committee Reports:
Tom R. (W9IPR), Ham License Classes – Extra Class license training started last Saturday, and Tom will try to do it in seven sessions but it will probably be eight. He made PowerPoint presentations for the classes.

Ken B. (W9GA), Field Day Committee – Ken spoke to the buyer of the property where the club trailers are stored. He says that the closing date has been pushed back past January 1st. The buyer is willing to rent us another area, but nothing on that will be known until after the property is sold. Ken has been cleaning stuff out from the shed and one of the trailers.

Old Business:
There was no old business.

New Business:
There was no new business.

Adjournment:
Stan (WB9RQR) made the motion to adjourn the meeting, which was seconded by Bill Shadid (W9MXQ) and was passed by the members. The meeting was adjourned at 9:32 PM.

Attendance:
There were 29 members and one guest present at the meeting.

A copy of the attendance sheet is available upon request in PDF format. Please contact Ben Evans via email at ben@evansengsolutions.com for a copy.

Respectfully submitted,

B. Benjamin Evans, K9UZ
Secretary

ORC Meeting Agenda

November 13, 2019

1. 7:00 – 7:30 PM – Network & Rag Chew
2. Call to Order – Kevin Steers (K9VIN)
3. Introductions
4. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.
5. Program: Fred W9KEY, *WWV Centennial Special Event Station Recap*
6. Fellowship Break
7. 50/50 Drawing
8. Auction – Stan Kaplan (WB9RQR)
9. President's Update – Kevin Steers (K9VIN)
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First Class

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7:00 PM – Doors Open

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Web site: www.ozaukeeradioclub.org **Facebook: facebook.com/orcwi**

Volume XXXI	December, 2019	Number 12

From the President

de Kevin Steers (K9VIN)

Furnace just went out! No joke. 10 PM and one of my two furnaces quit. The new furnace on this side of the house will suffice for a few days until I figure it out. I had replaced the blower last month, but tonight it seems to have quit. Weird. I am going to replace the wall thermostat first, since that is 50 years old, and needs replacement, no matter what.

I occasionally drop my kids off at school, and the teens know I am a ham, but never a word of it to my daughters in school. Abby had gone through the Technician class but never went through with testing. Recently, one of Abby's classmates arrived late to class due to physical therapy and had been driving behind me on his way to school. When he arrived, they were on break and he mentioned out loud that he had followed K9VIN (which they pronounce 'kay-nine-vin', which is funny in itself). They talked about why I have an antenna, and the very young teacher's ears perked up at the mention of the topic, which he actually happened to know a bit about, and they were able to inform the class how ham radio is very cool and helpful in emergencies.

My last topic is my recent realization that my HF coil on my car is sketchy in salty winter weather. Well, I now order a free glass of water when stopping at a fast food restaurant, then I pour the water over the knee high coil to rinse off the salt water spray which might otherwise short out the antenna. If I am not correct, please let it go, but that is my experience.

I will say that I listen mostly on my mobile rig. I have made contacts afar, and also had fun on the Wisconsin QSO Party, so please tune in to HF, folks! ☺

Cheers and 73,

K9VIN
Kevin

DX’ing & Contesting

De Gary Sutcliffe (W9XT)

We will be close to the official start of winter by the time you read this, although it seems we should be half way through it by now, considering the cold and snow we have been having. Still, it is not too late to do antenna work. Yesterday I trenched in a control cable for a remote Beverage antenna switching system I am putting up. I was somewhat surprised the ground had not yet frozen as I cut a slit in the ground to bury the cable.

The start of winter is, of course, the winter solstice, which this year occurs on December 21 at 10:19 PM local time. It marks the time the sun reaches its most southern point. It also means the fewest hours of daylight in the northern hemisphere. The long nights are good for low band operation. The current low sunspot levels also improve propagation on the low bands.

Low band operators are aware of another propagation phenomenon, grey line propagation. From space you would see an area where the earth is lit by the sun. The rest of the planet is in darkness. The ring between the day and night sections is called the terminator.

During the day, the D-layer of the ionosphere forms, and that absorbs the skywave of low frequency signals. The D-layer dissipates at night. That is the reason you only hear local AM broadcast signals during the day. At night it is possible to hear more distant stations, often covering up local stations, especially those that are required to cut power at sunset.

The F-layer, which is the reason for our HF propagation, forms during the day and dissipates at night. Along the terminator, the D-layer is not as big a factor and may actually help a bit by refracting the signal to a lower angle. Meanwhile, the F-layer still may have enough ions to support lower frequencies. Signals can travel along the terminator long distances. Hams call this grey line propagation.

Because the nights are so long right now, the grey line extends the furthest when both stations are in the northern hemisphere. The figure below shows the grey line for December 5 around our sunset. Note that it extends all the way to Southeast Asia. As the days get longer, the curve will change, and the maximum distance will decrease.

Another advantage of this time of the year is that sunset and sunrise happen at more convenient times. It may not be so convenient for driving to and from work in the dark, but it is nice that you don’t have to get up at 5:00 AM to work DX on the sunrise grey line path.

The contests of interest are at opposite ends of the band switch this month. The ARRL 10M contest starts at 0000Z Saturday, December 14 (6:00 PM local Friday), and runs 48 hours. You

can only work 36 of those hours, but with no sunspots there will be a lot of time with no stations heard.

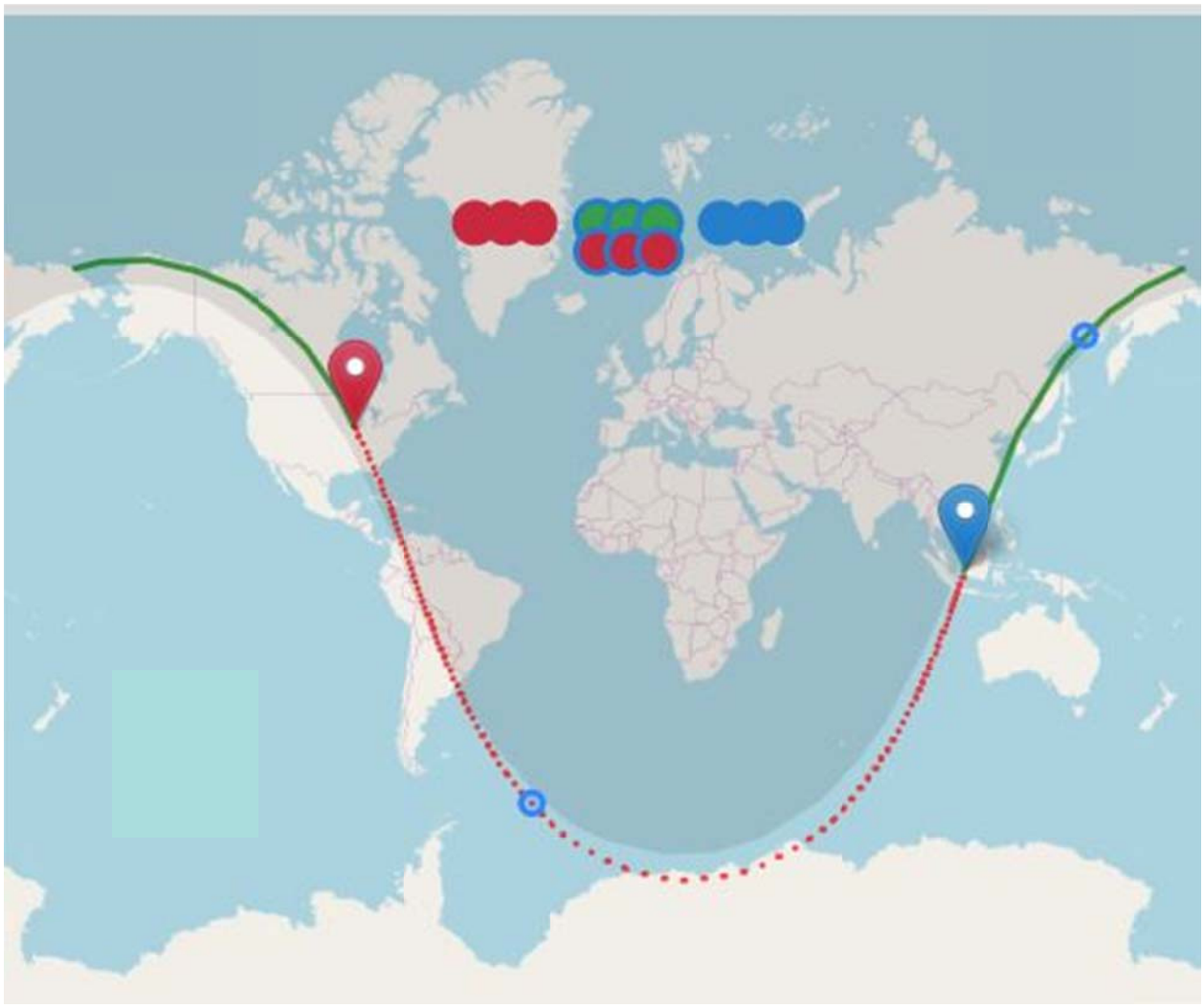


Figure 1. Grey line for December 5 at our sunset. From https://www.voacap.com/hf/

This is one of my favorite contests, and is my favorite during sunspot maximums. It is not so much fun at the bottom of the cycle. Still it is interesting to pick up stations via tropo scattering, Es, and maybe a few meteor scatter contacts during the minimum. We will probably get a shot at some South American stations using Es to couple into Trans Equatorial Propagation (TEP).

It is interesting to note my best ever rate in a contest, 250 contacts per hour, occurred during a sunspot minimum during a massive Es opening to the south. You never know when they happen. I have pulled ahead of my rivals in a few years during the last hour or so when the band opened up after my competition shut down the rig in disgust.

The exchange is signal report and state. DX stations send serial number and a serial number. CW contacts are worth four points and phone contacts are worth two points. Multipliers are states, Canadian provinces, Mexican states, and DXCC countries. There are a lot of classes, including mixed mode, phone only, and CW only. Each of these are subdivided into high, low, and QRP power, and each of those are subdivided into unassisted and unlimited. Pick a less

competitive class and put in the time and you have a very good shot at some wallpaper. Also note that 10M is the only HF band where Technician class ops can use phone.

The full rules for the ARRL10M contest are at http://www.arrl.org/10-meter.

The other contest is the Stew Perry Top Band DX Challenge. It starts at 1500Z (9:00 AM local) Saturday December 28 and runs for 24 hours, but you can only operate 14 hours. Since 160M is mostly dead during the day, you would not want to sit in front of the rig for 24 hours anyway.

The exchange is the grid. That will be EN53Ffor most of us. QSO points are based on the distance of the QSO. Longer QSOs are worth more points. There are no multipliers. The final score is the sum of all QSO points. There are QRP, low, and high power categories. You get more points if you operate at lower power levels. For a given distance, you get 2X as many points if you operate low power, and 4X if you are QRP.

There is another interesting twist. If the other station is low power or QRP, you get extra points. Logging programs will calculate how many points your QSO is worth. It won't know how much power the other station is running, so it assumes it is high power. After you send in your logs, the contest sponsor checks your contacts against other received logs. If the other guy sends in his logs and is in one of the lower power categories, you get extra points. It is interesting to look at the web page and watch your score go up, and your standing going up or down as more logs are received. Full rules are at https://www.kkn.net/stew/stew_rules.html

Moving into next year, the ARRL RTTY Roundup starts January 4 at 1800 UTC (noon local) and runs 30 hours. You can only operate 24 hours though. Although it is called the RTTY Roundup, you can use a variety of modes, including RTTY, PSK, Packet, and FT8. The rules do not mention FT4, which is the new mode designed for contesting. If you plan to operate, this I would check to see if there is an announcement on FT4 as we get closer. You can work a station once per band regardless of the digital mode. The exchanges and multipliers are the same as the 10M contest, except Mexican states are not separate multipliers. The entry classes are high, low, and QRP power with the unlimited and unassisted options. Do check out the rules regarding off-times if you plan on making a serious effort.

Based on previous contests allowing FT8 and RTTY, it seems the highest scorers operated RTTY predominately, reserving FT8 for times the bands were too poor for RTTY. If you are considering operating this one, expect some tough competition. Gary, K9DJT, was #1 in Wisconsin, #2 in Region 9, and #13 in the USA in this contest this year. My guess is Gary will be loaded for bear for the 2020 running.

Major DXpeditions are not common around the Holidays, but there are a lot of casual operations from hams going someplace warm. Operating usually takes a back seat to other vacation activities, and operation may be sporadic.

There is a planned operation from Goree Island from December 13-15 using the call sign 6V1A. The group of Senegalese ops will use SSB and CW. Goree is an island off the coast of Senegal. It was a major staging point during the slave trade. There is a big museum on the slave trade

on Goree. I spent a summer in Senegal while in college as WB9FRG/6W8. It was a very interesting experience.

DXpeditions pick up in January. A group of Russian hams will be on from Palestine with the call E44RU. The plan is to operate 160-10 Meters, CW, SSB, and FT8. The dates are January 6-12.

That wraps up December on the band. Have a Merry Christmas!

THE COMPUTER CORNER

No. 261: Malwarebytes Update

Stan Kaplan, WB9RQR 715 N. Dries Street Saukville, WI 53080-1664
(262) 268-1949 wb9rqr@att.net

It If you paid for a copy or two of Malwarebytes (as have I, for two of my five computers), chances are you are running Malwarebytes 3.x. It would be a good move, and it is free, for you to upgrade to the new version 4. Version 4 sports a new detection engine that is improved over the old model. The new version also has a redesigned interface that seems cleaner and simpler than the old one. And they claim improved performance and efficiency. Here is how to do a really clean install of the new version.

Before you do anything else, find your license key. That is a 20-character key that you got when you ordered and paid for your old version. It looks something like this: AB5CD-EF7GH-I8J9K-L2MNP. If you can't find it in your records, double-click the icon for your old version and look for Account or Account Details; it will be there. Print or record that key carefully. Do not proceed without a copy of that key or you will have to pay for a new version. With the key, it is free.

Next, go to MajorGeeks (https://www.majorgeeks.com/). On the first screen you see will be FEATURED SOFTWARE, and below it will be NEW VERSION 4-Malwarebytes; click the latter. That will get you to a choice of download sites: Download@Authors Site or Download@MajorGeeks.

Choose one or the other and download the installation program, MBSetup.exe, about 1.8 MB in size. (By the way, I always have all my downloads saved to my desktop so that I do not lose them in the bowels of Windows.) Now, with your license key in hand and a copy of the installation program on your desktop or in another known site, you can delete the old version. Deleting the old version first will give you a much cleaner, trouble-free installation.

You can use Control Panel, Add or Remove Programs, to delete the old version. A much better choice is to use HiBitUninstaller, which you can get (free) at MajorGeeks. You can get a regular

installable version or a portable version. The latter needs no installation. You just download a zip file, shuck out the .exe file and click to use it. It will scan your Registry and other sites for bits and pieces, something the Control Panel uninstaller will do poorly, if at all.

Now run the MBSetup.exe installer program. Tell it you want private use, and when it gives you the option to register the license key, take it. Type in that 20-character key that you have from your search; make sure your typing is accurate. Type in the dashes, too. You are now home free. If you purchased a two-computer license for Version 3.x, repeat the process with the second computer. Use the same license key.

Malwarebytes is regarded by all the experts as the best antivirus protection available at present (except for those experts who want to sell you some other brand). I purchased a two-computer license, one for my main machine and one for Nancy's, for super protection, some time ago. My other machines are protected with Microsoft's antivirus package, Windows Defender. That is really quite good and sufficient; Malwarebytes is just my compulsive need for extra protection.

Happy computing!

Editor's Note: If you prefer, you can now update to the new Malwarebytes version by opening the Malwarebytes dashboard on your computer and clicking "Free Upgrade", like I did.-Ben K9UZ

UPCOMING EVENTS

Breakfast at Jim's Grille in Cedarburg – Saturdays at 7:00 AM

January 4, 2020 – 48th Annual Midwinter Swapfest
Waukesha County Expo Center, 8 AM to 1 PM

Upcoming ORC Monthly Programs

December *- John Schrader W9NRG - Emergency Communications for Firefighting*

January *– Elections*

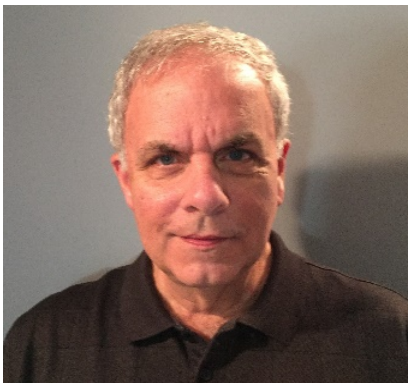
Presenters Needed!

de Pat Volkmann, W9JI

The monthly program is the highlight of the Ozaukee Radio Club meeting. We are fortunate to have a number of very talented people in our club, many of whom have shared their knowledge through a presentation. Share your expertise and experience with the club. Programs can be on any topic that is ham radio related. Contact Pat Volkmann W9JI at w9ji@arrl.net to discuss your idea for a program.

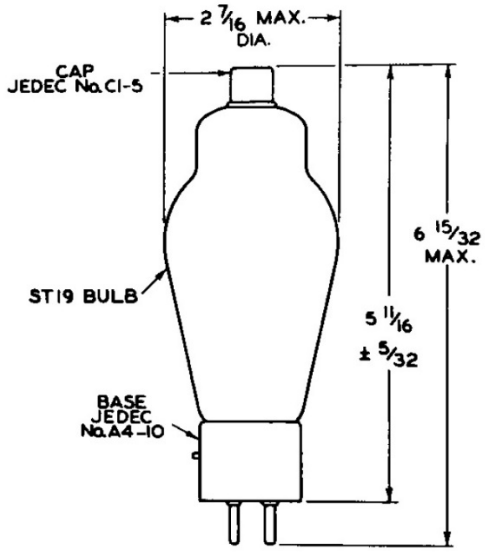
Vintage Amateur Radio

de Bill Shadid, W9MXQ

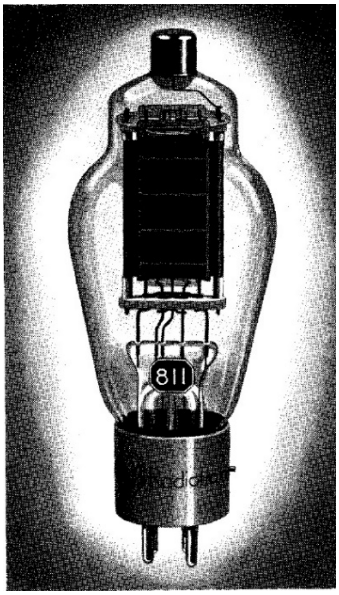


In the late 1930's, Radio Corporation of America (RCA) announced a new RF Triode called the 811. That tube lives on today. We now know it as the 811A. This installment of Vintage Amateur Radio will discuss the 811, the 811A, and modern amplifiers using this vintage tube. This will be the first of three articles on this very popular tube. Products using the 811 or 811A were in ham radio products beginning in the early 1940's (first in WWII military equipment) and right into modern linear amplifiers available on the market, today. The original 811 and is successors over the years carry a reputation not unlike the other popular transmitting tubes over the years' such as the 6L6, 807, 1625, 2E26, and 6146 – just to name a few. While all these tubes are reasonably well known, the 811, and it's 811A successor, have shown a much longer product life cycle with them being the only ones of this group still used in new equipment, today.

Pat Volkmann, W9JI, a good friend, fellow vintage radio collector, and fellow radio historian/restorer advises that he found the RCA 811 in a 1938 RCA Transmitting Tube Catalog. Assuming for the moment that was its time of introduction, that means it is now in its 81st year of production. A good run – and still going forward.



811 Line Drawing (1963)
RCA Technical Sheets



811 Sketch (1941)

811A Photo (2019)
Internet Photo

The major difference in ham radio use of the 811 and the 811A tubes relates to Plate Dissipation. In Intermittent Commercial and Amateur Service (ICAS) these tubes are rated at 50 and 65 watts, respectively – indicating a 30% increase in power capability for the 811A over the 811. Both are rated at a nominal 1,500 volts of Plate Voltage but technical sheets show examples of 1,250 and 1,750 volts, nominal on the plates. Examples of amplifiers in this series of articles will show the use of two, three, and four of these tubes used together. Good operation, within technical limits for dissipation and distortion products would see these tubes used in products

providing linear amplifiers with outputs of 110 watts per tube with the 811 and 160 watts per tube with the 811A. A fine example of a good quality, properly rated 811A Linear Amplifier would be the four 811A tube equipped Collins 30L-1.[1] The 30L-1 has a rated output of 500 to 600 watts. That is well within the bounds of good operation of the 811A at 150 watts per tube SSB and CW RF output. Some modern amplifiers exceed these specifications – but at the penalty of shorter tube life and somewhat increased distortion.

While it is well known that the 811 and 811A could handle full specifications to 30 MHz, it may be less well known that both tubes can attain these ratings to 60 MHz. These tubes are good to 80 MHz at 80% of specifications and can hold to 60% of specifications at 100 MHz.

A relatively unknown trait of both the 811 and the 811A is their fast heating filaments. The filaments could heat so fast that they could illuminate, heat up, and reach full operation in about three seconds. This made it possible to have the filaments off in a portable or mobile installation when in receive. Activating transmit with a microphone button (PTT switch for example) would also turn on the tube filaments. This would greatly reduce current consumption while just listening. [2]

In current times here are four amplifiers that use these tubes. Two of them are current, one has been off the market for a short while, and the last one several years but is of modern design. Three of them are, or were, made in the United States and one was manufactured in the United Kingdom. All four are from manufacturers still active in the ham radio business. We will start with two well-known amplifiers from Ameritron:

Ameritron AL-811 Linear Amplifier[3]
Front and Interior Views
Interior view has front to the right

Ameritron AL-811H Linear Amplifier[3]
Front and Interior Views
Interior view has front to the right

The self-contained Ameritron amplifiers are of good design with the AL-811H being one of the most popular amplifiers on sale to amateur radio operators in the current time[4].

The AL-811 has three 811A tubes while the AL-811H has a complement of four 811A tubes in its amplifier. The interesting part of this amplifier is that the only difference in the two is the vacuum tube area of the chassis. All power components, control circuitry, meters, etc., are the same. The front panels are slightly different in that one says “AL-811” and one says “AL-811H.”

Ameritron rates these amplifiers rather aggressively. Check these specifications:

Ameritron AL-811 Linear Amplifier with 3x 811A Tubes

Mode	Power Output
SSB	600 Watts[5]
CW	600 Watts[5]
RTTY	400 Watts[6]

Ameritron AL-811H Linear Amplifier with 4x 811A Tubes

Mode	Power Output
SSB	800 Watts[5]
CW	800 Watts[5]
RTTY	400 Watts[6]

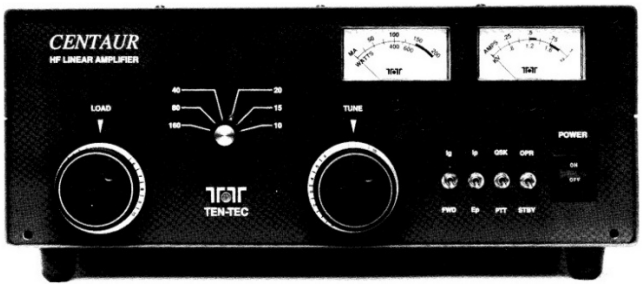
I am referencing the “aggressively” rated by virtue of printed specifications of the tubes which imply that the tubes should be expected to provide 160 watts output, per 811A tube in linear amplifier service on SSB and CW. With three 811A tubes one would expect an output power of perhaps 480 watts and with four tubes one would expect an output power of perhaps 640 watts. For my personal use I would follow those lower numbers using either of these amplifiers. That said, these amplifiers are known for clean and dependable operation so I will remain respectful of Ameritron’s specifications.[7]

Both the AL-811 and AL-811A Linear Amplifiers have a tuned input circuit providing a 50-ohm load to the exciter. These amplifiers require 80-100 watts of drive to get full rated power out. They operate from 160 through 10-meters, including the 17 and 12-meter bands (10 and 12-meter operation required an internal modification).

Both the AL-811 and the AL-811H are desktop units, as noted, with exterior dimensions of 8 x 13.75 x 16 inches (HWD) with both units 30 pounds, according to Ameritron literature.

Hinted above but not said, is that the two Ameritron amplifiers are more alike than different. Essentially all components are identical except that the mounting area for the tubes is different. The AL-811 has a three tube sub-chassis while the AL-811H has a four tube sub-chassis (AL-811H). In terms of weight, the AL-811H should be slightly heavier than the AL-811 model. I think the manuals are in error here – but I am not sure which is correct.

The other domestic manufacturer that made a recent vintage 811A Linear Amplifier was Ten-Tec. The product is not currently manufactured but is supported. It was known as the Ten-Tec Model 411 Centaur Linear Amplifier. It used three 811A final amplifier tubes in a circuit that functionally was like the Ameritron AL-811. Power ratings, however, were slightly different. Here is a picture of this attractive, self-contained amplifier:



Ten-Tec Model 411
Centaur Linear Amplifier

Specifications for the Centaur were as follows:

Ten-Tec 411 Centaur Linear Amplifier with 3x 811A Tubes

Mode	Power Output
SSB	500-600 Watts[5]
CW	500-600 Watts[5]
RTTY	350-400 Watts[6]

Lower power levels shown are for operation on 160 and 10 meters. The Centaur had a tuned input circuit providing a 50-ohm load to the exciter. These amplifiers required 90-100 watts of drive to get full rated power out. They operated from 160 through 10-meters, including the 17- and 12-meter bands (10- and 12-meter operation required an internal modification). The Centaur is 6 x 15.5 x 13 inches and weighs 40 pounds.

I do not have access to a good quality internal picture of the Centaur but unlike the Ameritron AL-811 and AL-811H Linear Amplifiers, the Ten-Tec horizontally mounts the tubes to get a more-low profile look to the cabinet. This horizontal mounting requires an 811A tube that is specially made for this service. It is worth remembering that only certain 811A tubes in today's market can be mounted horizontally. Improperly supported grid structure in some tubes allows them to sag when warm and then touch the plate structure. That causes a catastrophic internal tube failure. RCA, GE, and Cetron tubes from the USA were made for vertical or horizontal mounting. Svetlana tubes from the Russian Republic were also able to handle mounting in either orientation. However, some Chinese tubes are not constructed for horizontal installation. Be sure you check with the North American distributor on this point before buying replacement tubes.

There is another current vintage 811A amplifier that is rarely seen in North America. Linear Amp UK manufactured a modern 811A Linear Amplifier until very recently.

Linear Amp UK Ranger 811H Front

Linear Amp UK Ranger 811H Interior

The Ranger 811H is similar in specifications to the Ameritron AL-811H but front panel and interior layout is different. The completely self-contained design includes a toroidal power transformer that is just visible under the capacitor and diode board in the interior view of the amplifier. The product, unlike USA products, comes ready to operate on all bands, including the WARC bands, from 160 to 10 meters. (European amplifiers not destined for USA sales do not have to inhibit operation on 10 meters.)

Linear Amp UK Ranger 811H Linear Amplifier with 4x 811A Tubes

Mode	Power Output
SSB	800 Watts[5]
CW	800 Watts[5]
RTTY	400 Watts[6]

The Ranger 811H has a tuned input circuit that provides a 50-ohm load to the exciter. This is essential with today's solid-state transmitters. The amplifier is 9.5 x 14 x 16 inches (HWD) and weighs in at about 55 pounds.

If weight is any factor in linear amplifier performance then the Ranger 811H at 55 pounds would seem to possess much more power supply iron and therefore more inherent power capability. However, this could be tied to transformer core material and material used in chassis construction. This is all part of further analysis not complete as this is writing.

In the next installment of this series, we get more into the vintage era with amplifiers many readers will recognize, many may still use, but have not been in production for many years.

I appreciate that you read my articles. Remember that I am open to questions and comments anytime at my email address, W9MXQ@TWC.com.

A special note of thanks to my proofreader, Bob Bailey, W9DYQ. Bob is a bit more than a proofreader as he often adds commentary that makes it into the article.

Credits and Comments:

[1] Subject of a future article.

[2] I have given the reader a little review of ham radio use of these tubes. Further analysis may be had by reviewing applicable vacuum data sheets as available online.

[3] These pictures are from Ameritron literature on the respective amplifiers shown.

[4] "Best Selling Amplifier" quote is from a video on the manufacturing process for the AL-811A amplifier produced by Ameritron. So, this statement is Ameritron's opinion which may well be based on some market measurement process. I have no reason to doubt Ameritron's claims.

[5] Typical SSB and CW Operation. (CW at 50% duty cycle.)

[6] Typical RTTY or Data Operation – at approximately 50% duty cycle.

[7] In fact, Collins Radio Company in their very popular and great performing 30L-1 Linear Amplifier[1] were held to the lower power levels shown on 811A specifications and netted many years of dependable operation. In act I have one such 30L-1 amplifier that is over 60 years old and is still running on its four original 811A final amplifier tubes.

W9MXQ

Remote Station Building, Part 2

De Jeff Whisler W9KW

At the end of Part 1 of this series (in the September issue of this newsletter), I had taken delivery of my new tower and had the tower base in the ground, ready for the tower. The next major step was trenching for the feedlines and laying some chase pipe for the cables. Although I was using coax rated for direct burial, I want to be able to add or replace cables in the future. I would have preferred hardline for the 100-foot runs from our cottage to the tower but I just couldn't afford it. I elected to use 3-inch sewer drain pipe for the cable chase. Other options such as electrical conduit would have been significantly more expensive and my budget was already very strained. I purchased the pipe and fittings from Menards. I used 45-degree elbows to create more gentle turns for the heavy cables. Initially I will have two HF, one VHF/UHF and one rotor control cables. As time and budget allows, I want to add another HF cable for a 160 meter receive antenna.

As with the excavator, I ended up doing the trenching myself. This was due in part to the very severe storms that rolled through the area a week before. The storms did significant damage, and local landscape crews were completely booked and working furiously to help folks with downed trees and all other types of storm wreckage. Looking back, I wish I was a bit more patient and found someone experienced to do the job. As it was, on September 4th, I rented a trencher from a hardware store in Green Bay and towed it 85 miles to the jobsite. I rented the largest machine they had, for 24 hours. It was track-driven and could trench a line 48 inches deep. If you've never seen one, it has a huge chain saw style bar and a giant chain. Hydraulic controls move the bar up and down and also drive the chain and tracks. There is also an auger, perpendicular to the trench line that moves the spoil from the chain off to either side.

I got the machine to our cottage from Green Bay at 6 PM on Tuesday evening. I unloaded the machine and briefly tested it out.

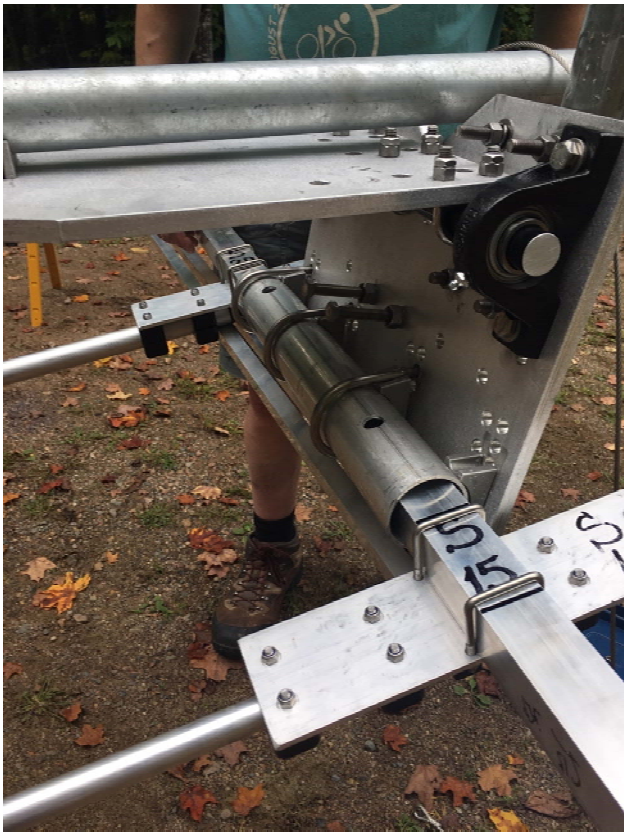
The next morning, I began trenching. It took me twenty feet or so to get used to the machine. Much of the first eighty feet went without a hitch. The final twenty feet were brutal. The machine began spitting up baseball sized rocks, then softball sized rocks, then finally melon sized rocks. I had to stop the machine every foot or so to clear the larger rocks. It took several hours to trench the last twenty feet.

Next, I quickly laid the PVC and backfilled the pipe. It was a sweaty blur of shoveling and raking. Finally, I loaded the machine back on to its trailer and drove like a madman back to the hardware store in Green Bay, just under the 24-hour deadline. The day before the raising party, I spent some time preparing the site, staging parts of the tower packing crate to help skid the tower into position.

On September 14, 2019 I held a tower-raising party at my new station. In attendance and helping were KD9CCE, Fred KB9QDC, Matt and a new friend, Mike. Mike brought a very heavy-duty winch that proved invaluable. We used my truck hitch as a pivot point and carefully moved

the tower sideways into alignment with the base. A bit of re-rigging with some fulcrum and lever work and we had the tower bolted to the base. We carefully raised it to full extension and back again. A major milestone achieved.

We had hoped to make progress building the Optibeam Yagi and installing the rotor and mast, but, alas, Murphy raised his ugly head. The rotor plate provided by the tower manufacturer (yikes!) didn't fit. The crew working on the beam struggled throughout the build process with instructions originally written in German and unartfully translated into English, including metric measurements for everything. We finally called it a day and the crew left late afternoon with my very grateful thanks.



On September 20th Fred KD9CCE returned for Round Two with the rotor, mast, Yagi and TiltPlate. Part of our struggle initially was the integration of the NN4ZZ TiltPlate with the beam. It was a sticky knot to unravel, visualizing how the beam would mount to the TiltPlate and also to the mast. The TiltPlate allows the beam to stay horizontal even as the tower is moved from vertical to horizontal. This allows you to work on the beam at waist level with your feet on the ground when the tower is horizontal. Everything went pretty well.

We didn't quite finish building the beam but the other issues were resolved, and I felt like I would be able to finish before the winter weather closed me out.

On October 4th I returned alone to the jobsite for some additional work on the project. I spent most of that day completing the build of the Optibeam. At the end of the day I was very tired but happy it was completed.

On October 5th, I awoke early. The weather forecast was not good at all—rain all day beginning around 10 AM. I had a small chore to do before the rain hit. I wanted to remove a VHF/UHF beam from the chimney chase of our cottage. The beam would be reinstalled on the mast of my new tower.

Since my early childhood I have been a climber. I climbed many different trees, towers, structures and even mountains. Climbing and heights just don't bother me. They are simply obstacles to be overcome. That morning I set up an extension ladder on the rear deck of our home. I intended to go up on the roof to inspect the job and return with the necessary tools, something I had done many times before. I got up on to the roof without a problem and inspected the job. With a tool list in mind I made my way back to the ladder. I reversed myself for the descent. I set my right foot carefully on a rung to test the ladder's stability. All seemed well. I swung my left foot and body weight over to the ladder. At that moment the ladder seems to have completely disappeared beneath me. I freely fell ten feet to the deck, landing with a violent liquid thump on my left hip and back. I didn't know it at the time, but I broke my pelvis in three places and had two factures in my spine.

Please stay tuned for Part Three….

Ozaukee Radio Club
November 13, 2019 Meeting Minutes

de Ben Evans K9UZ, Secretary

The meeting was called to order at 7:31 PM by President Kevin Steers (K9VIN). All the attendees introduced themselves.

Announcements, Show-and-Tell, Bragging Rights:

Bill S. (W9MXQ): There is a display by WiARC dedicated to ham radio at the Port Washington public library, so check it out. It will be there through November, but the library might let it stay until the end of December.

Stan (WB9RQR): Stan received a QSL card from WW0WWV for the contact made during the WWV Centennial Event, which will be the subject of Fred's (W9KEY) presentation.

Tom R. (W9IPR): The Extra Class License study sessions are up through the end of Chapter 6 and halfway through Chapter 7 of the ARRL book. The sessions are on Saturday mornings at Tom's house if anyone wants to drop by.

Program:

Fred S. (W9KEY) gave a presentation on his and Bill's (AC9JV) trip to Fort Collins, Colorado to the WWV shortwave radio station site and operating on the WW0WWV Special Event Station for the WWV Centennial.

50/50 Drawing:

There was no 50/50 drawing.

Auction:

Stan (WB9RQR) conducted the auction. Many items were sold, including boxes of parts, magnets, an ARRL antenna handbook, a signal generator, a flat monitor, power supply & tuner, and three Libre Office for Windows CDs.

Officer Reports:

Kevin S. (K9VIN), President's Update – No update, except that elections are coming up.

Pat V. (W9JI), 1st VP – No report.

Bill C. (KD9DRQ), 2nd VP – No report.

Tom T. (KC9ONY), Repeater VP – There was a failure of the RF amplifier for the 146.97 repeater. The amp is old and may not be worth fixing, plus others have had problems with amps from the same manufacturer. A new amp would run about $1,000.

Ben E. (K9UZ), Secretary – The minutes from the October meeting were distributed to members by email. Motion to accept the minutes was made by Stan (WB9RQR), seconded by Gary S. (W9XT) and approved by the members. The rosters are still not ready.

Robert E. (K4WTH), Treasurer – Robert was not at the meeting, so Ben (K9UZ) gave the financial report for October which was handed out to members. Motion to accept the treasurer's report was made by Nels (WA9JOB), seconded by Todd (N9DRY), and approved by the members.

Fred S. (W9KEY) asked whether money has been approved to buy a new amp for the repeater, but it has not. Gary D. (K9DJT) moved to have Tom (KC9ONY) look into a new amp not to exceed $1,000. Nels (WA9JOB) seconded the motion and it was approved by the members. Dave C. (KC9REP) asked what the maximum output power was for the existing amp and Nels (WA9JOB) responded it was 120 watts. We are licensed for 100 watts TPO, but the existing amp never managed more than 90 watts. Ken (W9GA) suggested buying a 150 watt amp to run at the authorized 100 watts so that it would run cooler.

Ben (K9UZ), as an additional comment regarding the rosters, suggested leaving the current officers' names off the cover since we're so close to electing a new slate of officers. Kevin (K9VIN) and Tom (W9IPR) suggested instead to delay publication until the new officers are elected, which Ben agreed to.

Committee Reports:

Tom R. (W9IPR), Fall Swapfest – The Fall Swapfest would normally be the first Saturday of September, but in 2020, the first Saturday falls on Labor Day Weekend, conflicting with Maxwell Street Days for the use of the park. Other Saturdays in September create conflicts with other area swapfests, so Tom suggested August 29th instead. Kevin suggested that Tom check with Jim A. (K9QLP) to make sure that August 29th is good for him.

Ken B. (W9GA), Field Day Committee – Something has to be done to have a fully functioning network for logging at the next Field Day. He will leave it up to the operators to find a solution. It may involve having to buy a set of new computers. Stan (WB9RQR) suggested installing Linux on the computers instead of buying new ones. Ken responded that would be okay if someone can find a compatible logging program that people could understand how to use. On the issue of cable versus wireless, Stan said we never went wireless because of the possibility that the HF stations could cause interference to the network. Someone will have to step up and be a technical consultant for the network, perhaps Vic S. (WT9Q).

On the subject of the shed, Ken is still waiting to hear from the buyer of the property. The buyer had previously said he's willing to rent us space in the other building on the property if there's room. The closing has been pushed back past the first of the year.

Old Business:

There was no old business.

New Business:

There was no new business.

Adjournment:

Stan (WB9RQR) made the motion to adjourn the meeting, which was seconded and passed by the members. The meeting was adjourned at 8:55 PM.

Attendance:

There were 20 members and four guests present at the meeting.

A copy of the attendance sheet is available upon request in PDF format. Please contact Ben Evans via email at ben@evansengsolutions.com for a copy.

Respectfully submitted,

B. Benjamin Evans, K9UZ
Secretary

Straight Key Night 2020

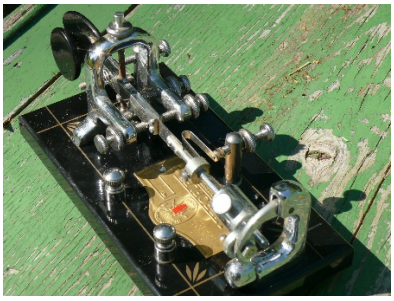
De Pat Volkmann, W9JI

It's almost time, once again, for Straight Key Night. SKN starts on New Year's Eve at 6 PM and runs for 24 hours. Any band can be used, but most of the activity is on the CW portion of the lower HF bands. As the name of the event implies, a straight key (or bug) is preferred, but participants can use any type of key. Straight Key Night is not a contest and there are no scores. You will hear people calling CQ SKN and perhaps substituting SKN for RST in the QSO. You can nominate someone for "Best Fist" and "Most Interesting QSO". Speeds are usually on the slow side, so don't worry if your code is a bit rusty. Jump in and have a good time!

NYE Viking Straight Key

Many people bring out their vintage radio equipment for SKN. All manner of old radio equipment will be put to use, both transmitters and receivers. I usually try to have at least one vintage station running, preferring to use some of the gear that may not have been on the air for a while. This year I am setting up a Hammarlund HQ-129X with an RME DB20 preselector for receiving and a Meissner Signal Shifter as the transmitter.

So get on the air and enjoy a few CW contacts. If you participate, send me your comments at w9ji@arrl.net. I'll collect your observations and publish them in the next newsletter.



Vibroplex Semi-Automatic Key or Bug

JAN, 1974

DATE TIME	STATION CALLED	CALLED BY	HIS SIGNAL RST	MY SIGNAL RST	FREQ.	EMISSION TYPE	POWER INPUT WATTS	TIME OF ENDING QSO	OTHER DATA WB9JGV - Best fist	NAME	QSLs S	QSLs R
Dec31,1973	SKN											
8:14	W3ZJ	WB9JIC	589	579	3530	A1	60	8:22	PILA	ED		
8:23	K3OIO	"	"	"	"	"	"	8:32	NORTH of PILA, PA	RICHARD		
8:35	WB8LWV	"	559	559	"	"	"	8:46	QRM	PETE		
8:46	WB9JGV	"	599	599	3540	"	"	9:04		BILL		
9:45	CQ SKN	W2LYH	579	559	3530	"	"	9:59	RIVERSIDE NY	BOB		
10:30	W4HIR	"	579	589	3530	"	"	10:50	NORTH of NORFOLK, VA.	CAREY		
11:48	K2DW	"	569	559	"	"	"	11:50	NY QY	BILL		
1974 JAN												
12:25	CQ SKN	K4BO	569	469	3532	"	"	12:32	LYNCHBURG, VA	JARED		
5:05PM	WB9BPO	"	599	599	3552	"	"	5:16	MADISON WI (QSL Cont. MIKE X			

Log Excerpt from WB9JIC's (now W9JI) First Straight Key Night

For more information, see http://www.arrl.org/straight-key-night

ORC Meeting Agenda

December 11, 2019

1. 7:00 – 7:30 PM – Network & Rag Chew
2. Call to Order – Kevin Steers (K9VIN)
3. Introductions
4. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.
5. Program: John Schrader W9NRG - Emergency Communications for Firefighting
6. Fellowship Break
7. 50/50 Drawing
8. Auction – Stan Kaplan (WB9RQR)
9. President's Update – Kevin Steers (K9VIN)
10. 1st VP Report – Pat Volkmann (W9JI)
11. 2nd VP Report – Bill Church (KD9DRQ)
12. Repeater VP Report – Tom Trethewey (KC9ONY)
13. Secretary's Report – Ben Evans (K9UZ)
14. Treasurer's Report – Robert Eskola (K4WTH)
15. Committee Reports:
    a. Scholarship – Tom W9IPR
    b. Field Day Storage – Ken W9GA
    c. Other
16. OLD BUSINESS
17. NEW BUSINESS
18. Adjournment to ?

Return undeliverable copies to:

The ORC Newsletter
465 Beechwood Drive
Cedarburg WI* 53012

First Class

Next ORC Meeting:

Grafton Multipurpose Senior Center

1665 7th Avenue, Grafton, WI
Wednesday, December 11th, 2019

7:00 PM – Doors Open

7:30 PM – Meeting Begins