



The *ORC* Newsletter

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ORC Repeaters on 146.97 (-127.3PL), 224.18 (-127.3PL), 443.75 MHz (+127.3PL) - Callsign W9CQO

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Volume XXXII

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Number 11

From the President

de Pat Volkmann, W9JI



The FCC has proposed a \$50 fee for each amateur radio application for new licenses, license renewals, upgrades to existing licenses, and vanity call sign requests. The FCC proposal is detailed in a Notice of Proposed Rulemaking MD Docket 20-270, which was published in The Federal Register on October 15, 2020. The deadline for comments is November 16th. The ARRL website has complete information on the proposal. They have also prepared detailed instructions on how to file your comments in the FCC system. Search for "Steps to Submit an Online Filing" on the ARRL website.

If you have never filed comments with the FCC, it pays to read the ARRL guide first. The ARRL has a number of suggestions for arguments that they believe will work. Complete information can be found here: <http://www.arrl.org/news/arrl-urges-members-to-join-in-strongly-opposing-fcc-s-application-fees-proposal>

The Germantown receive site for the 2M repeater has been down for some time and we have been unable to access it to make repairs. Several club members took the initiative to set up some equipment to duplicate the function of the Germantown site. The new site is now on the air. Special thanks to Nels Harvey, WA9JOB, Gregg Lengling, W9DHI, Nate Seidler, KC9TSO, and Tom Trethewey, KC9ONY.

Gary Sutcliffe, W9XT, received Special Service Award from the ARRL citing his contributions to the National Contest Journal. Gary has authored a regular column in the NCJ for over 18 years. Gary was also featured on the cover of the November issue of the NCJ. You can see both in this month's newsletter.

See you at the meeting.

Pat Volkmann, W9JI

THE COMPUTER CORNER

No. 272: The Microcutter

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There is no doubt that proper tools can make jobs easier. A good tool can make the swearing level as small as zero, while a poor tool or the wrong tool can escalate the swearing level considerably. Let me share a recent discovery of mine, at the risk of hearing from some of you that “Oh, I have been using those for years!”.

Most of us cut wires in our ham radio pursuits, and sometimes this requires cutting precisely and working in tight spots. I do even more cutting than the average ham, in connection with my rewiring of lamps as a hardware store service – many of you know about this pursuit of mine. Proper

trimming of wire leads in this case is especially important, since tolerances are often tight and 110 VAC is unforgiving. The old, clunky side cutters of past years sort of work OK, but now there is a new kid on the block that makes the job easier. Microcutters.



Here is a picture of one. These CHP-170 microcutters can be purchased on Amazon for about \$13 for two units, including shipping and sales tax. The cutting head is only about 8 mm long, so it will fit in tight spaces. The steel

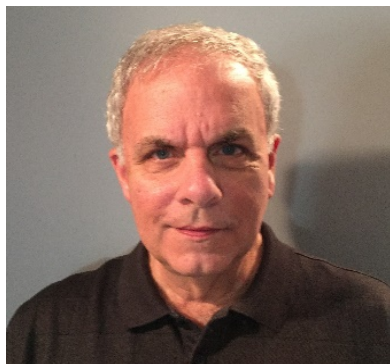
jaws are heat-treated carbon steel, angled at about 20° and will flush-cut wires made of soft copper or aluminum up to about 16 AWG. They are not made to work with larger diameter wire or wire that has been hardened in some way. But they are just right for the smaller stuff, down to and including your grandchild’s battery-powered device that you just have to fix! I can attest to the fact that they are just perfect for trimming wire ends coming from underneath terminal screws in lamps and other devices.

That is it! Just a tip. Oh, yes, I have found another use for them. They are great for removing that split fingernail fragment that is driving you crazy! But, please take my advice from a previous life of mine. Dip them in ordinary rubbing alcohol (70% isopropyl alcohol) before operating on yourself. That concentration of alcohol (70% only, not less and NOT more) kills all bacteria and inactivates all viruses.

Happy computing!

Vintage Amateur Radio

de Bill Shadid, W9MXQ



If you have been in amateur radio since the 1960's, or before, you can remember Hammarlund Radio Company. They were a global player in the radio component and later the receiver, transmitter, and accessories part of the market. Tracing its origins back to around 1910, Hammarlund was one of the oldest entities in the radio communication field when its factory closed forever in 1973.

The history of the Hammarlund Radio Company is an interesting, separate topic¹. It certainly parallels the development of radio communication and technology as a whole – but for me and the readers of this column, Hammarlund had significant impact on amateur radio throughout its history. The radios we ham radio operators used – and still use – owe their heritage to such famous radio names as Comet, Comet-Pro, and Super Pro from the Hammarlund product offerings over the years. The radios we will discuss in this article owe their heritage to all those predecessors.

The first Hammarlund items to discuss are very nearly the last products produced in large volume. These are the HQ-170 series Ham Band Only and the HQ-180 series General Coverage High Frequency Receivers. Shown below are these last of the “big iron²” Hammarlund receivers. The HQ-170AC-VHF (on the left) is the last, version of the HQ-170 – this one being the HQ-170AC-VHF. The HQ-180 (one the right) is the first version, of two (HQ-180 and HQ-180A). This one is an HQ-180C.

**With affection, these are known as the
Last of the Hammarlund “Big Iron.”**



Hammarlund HQ-170AC-VHF Receiver



Hammarlund HQ-180C Receiver

W9MXQ Collection

Just a note for clarity in Hammarlund model numbers, the “C” in the model number merely means that there was an optional front panel Clock installed, as you can see in both examples, above, mounted in the upper left hand corner in both models.

Understanding of Hammarlund model numbers is important from a historical standpoint. For that, check the following chart showing the different versions of both receivers.

Hammarlund Model	Years Produced	Band or Frequency Range
HQ-170 / HQ-170C	1958-1962	160, 80, 40, 20, 15, 10, & 6 Meters
HQ-170A / HQ-170AC	1962-1968	
HQ-170A-VHF / HQ-170AC-VHF	1964-1967	160, 80, 40, 20, 15 10, 6 & 2 Meters
HQ-180 / HQ-180C	1959-1962	540 kHz through 30 MHz, Continuous (80, 40, 20, 15, and 10 Meter Ham Radio Band Spread)
HQ-180XE	1959-1962	
HQ-180A / HQ-180AC	1963-1972	
HQ-180AX	1963-1972	

The model breakdown can be a bit confusing. As noted above, the suffix letter “C” merely means the radio has an internal Telechron™ Clock installed. That “C” is a reference only and not really a model designator – none of the radios had the clock as standard equipment. Models with an internal Crystal Oscillator to allow crystal control of the radio (HQ-180 and HQ-180A models only) were designated with the “XE” (for the HQ-180) or “X” (for the HQ-180A). The Crystal Oscillator was installed in the clock location. Here are some additional variations in the appearance of these radios with HQ-180 models. The HQ-170 appearance without a clock would be like what is shown below in the HQ-180 . . .



HQ-180 Receiver
(No Optional Clock Installed)
RigPix



HQ-180XE Receiver
(Showing Optional Crystal Oscillator)
RigPix

The missing clock, when that option was not chosen, was a simple panel with the Hammarlund logo covered by the same plastic lens used to cover the clock. Clocks were installed in the field by the dealer or the user. They were more than a simple convenience to tell the time of day – they could be set to turn the radio on at a predetermined time. In my early days of ham radio, my main receiver was a Hammarlund HQ-170AC. I was a college student at the time, and I would set the radio to power itself on at a time about an hour before I would return home from classes for a schedule on the bands. The radio would be warmed up and stable by the time I arrived³.

Clocks were different over time – but always Telechron. The initial non-“A” models of the two receivers had a 12-hour clock while some late non-“A” models and all “A” models with clocks had a 24-hour clock. The 24-hour clock was that rather rare face design that had 24 hours in the rotation for hours. Here are both versions for reference . . .



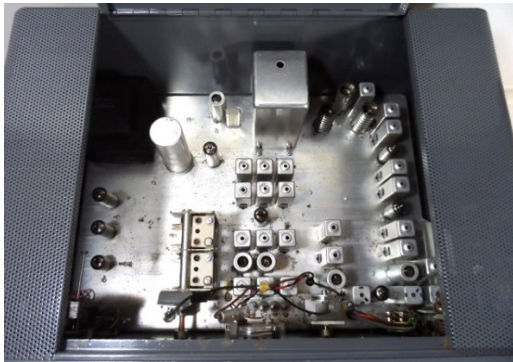
**12-Hour Clock
W9MXQ**



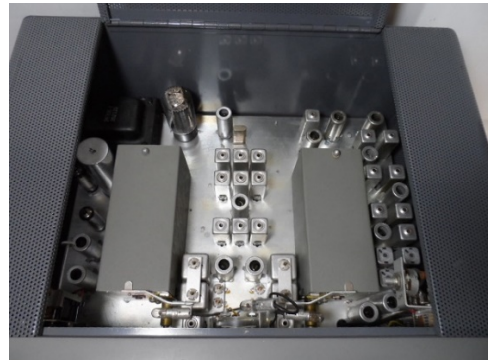
**24-Hour Clock
RigPix**

The Hammarlund HQ-170 and HQ-180, in their original form, tended to drift more than some of their competition. As I say that, I must add that all radios of the time drifted to some degree and virtually all of them were quite stable after about an hour of warm-up. Hammarlund tried to assist in this area using the clock to power up and pre-warm the radio before a scheduled use. The move to the “A” version of both radios – both versions of which had nearly identical circuitry – was directed to frequency stability. In both radios, these were the primary changes made in the “A” version products:

1. The heat generating 5U4 High Voltage Rectifier was removed and replaced by silicon diodes. The solid-state components produced negligible heat, so they did not heat stress adjacent components within the cabinet and cause frequency instability. While this would stabilize, given time, the reduced heat allowed that stability to be attained quicker.
2. V2, the First Mixer tube, and V12, the HF Oscillator tube, were connected to filament power if the radio was connected to AC power – no matter if the radio was switched on, or off. This allowed these two critical frequency stability tubes and their internal components to always be at correct operating temperature. That meant that they did not have to warm up and become stable right after powering on the radio. This technique was also used by Hallicrafters in the SX-101 series receivers.



**“A” Series, HQ-170AC-VHF
Open area to the left rear is made possible by the silicon diodes.
W9MXQ**



**Non- “A” Series HQ-180C
See the 5U4 Rectifier at the left rear, the heat generator!
W9MXQ**

Another visible difference in the 170 and 180 versions of this basic chassis were the large tuning capacitors in the HQ-180 (above, right) shown covered with large plastic enclosures vs the open single capacitor (left of center) in the HQ-170 (above, left). Later productions of the HQ-180, and especially in the HQ-180A, these covers were removed as they seemed to trap moisture and encourage the formation of mildew in tropical climates. The HQ-180 radios were used in many applications other than ham radio. They were also used as laboratory instruments and other applications where

HF Radio Reception was required. General Coverage receivers produced at that time were not necessarily the most convenient for ham radio use. This is despite the HQ-180 and HQ-180A having ham radio Band Spread. However, these general coverage receivers were manufactured for years after the ham band only HQ-170 series was replaced by more modern designs.

Hammarlund did a major cabinet redesign in late non- "A" production. Here is an example of both the HQ-170C and the HQ-170AC-VHF cabinet and the improved access in the later version. This also applied to the HQ-180 cabinet.



Hammarlund HQ-170C
Note closed top – no chassis access.
W9JI then W9MXQ



Hammarlund HQ-170AC-VHF
Note door access to chassis.
W9MXQ

The above noted update is not easy to determine as to implementation, however. This HQ-180C is the original design yet check its cabinet:



This HQ-180C should have a closed cabinet – no top access. But, as you can see, the cabinet has a door. Was it a replacement cabinet? Perhaps, but the chassis layout decal on the back panel clearly shows it as a HQ-180, not a HQ-180A. Also, it has a 24-hour clock. Since the HQ-180 was widely used, as mentioned, in specialty applications, it is possible that the cabinet was at the time offered as an option from Hammarlund. Just one of the many mysteries of second guessing the decisions of a manufacturer now silent for nearly 50 years!

As an appreciator and user of both the HQ-170 and the HQ-180 series Hammarlund receivers, I will detail some differences in Single Sideband and CW tuning. Over time there were changes as the original series in the HQ-170 and HQ-180 moved to the "A" series:



**HQ-170 (HQ-180 was similar)
SSB and CW were the same mode
switch position (see upper left)
WØUI**



**HQ-170A (HQ-180A was similar)
SSB and CW were separate mode switch
positions (see upper left)
W9MXQ**

For the earlier (non-“A”) models of the HQ-170 and the HQ-180, one would access Single Sideband signals by switching to the CW/SSB position on the MODE switch and using the BFO KCS knob to tune the proper offset for USB or LSB. In addition, the SIDE BANDS switch was switched to the correct L (Lower) or U (Upper) Sideband position. BOTH could be selected when in AM or CW. CW could certainly be received in the Lower or Upper Position, as done in today’s radios.

For the later (“A”) models, Single Sideband was selected on the MODE switch (CW was a separate position), the BFO KCS control was set to mid-point, and the SIDE BANDS switch was selected for Upper or Lower Sideband. Or the SIDE BANDS switch would be set at BOTH for AM – and for CW, if desired. While the use of the BFO KCS knob was not necessary for adjustment, it could be used for touchup tuning and for general use in the CW mode.

For users of more modern equipment, the mode setup and tuning were much more complex than today. However, it remains that a lot of flexibility was available compared to today’s radios. Selectivity, however, was much wider, even at narrow positions, on these older radios that lacked mechanical or crystal filters (or today’s digital filters). However, proper use of the BFO and Vernier Tuning (see below) could give response like what we today refer to as I-F Shift⁴.

Frequency tuning of the HQ-170 and HQ-180 series receivers (both non- “A” and “A”) were somewhat different from each other.



**Frequency Tuning – HQ-170AC-VHF
W9MXQ**



**Frequency Tuning – HQ-180C
W9MXQ**

For the HQ-170 – any model – both tuning dials (to the left and right of the S-Meter) turn at the same time with the left main knob (TUNING). The left readout dial covers 160, 40, 20, and 80 meters (bottom to top of the opening). The right readout dial covers logging (0-100), 15, 20, and 6 meters (again, bottom to top of the opening). Exact band (160-6 meters) is selected with the TUNING RANGE MCS switch in the center. Once the signal for Single Sideband or CW is roughly tuned, the right tuning knob (VERNIER TUNING) is used for fine tuning. The manual cautions the user to use the vernier tuning for smoothest tuning on those modes. With its wider signal bandwidth, AM tuning is accomplished for the most part with just the left knob. Note that on the HQ-170A, the mentioned logging scale on the right dial was replaced with the 2-meter band for converter use (and 2-meters on the VHF model.)

For the HQ-180 – any model – the left (MAIN TUNING) knob tunes the entire band in ranges set by the TUNING RANGE MCS knob, in the center of the panel. The range selection, on the left readout window includes 0.54-1.05, 1.05-2.05, 2.05-4, 4-7.85, 7.85-15.35, 15.35-30 Mcs (MHz, today). Tuning the ham bands is a bit more difficult with the HQ-180 series (and most such two dial general coverage receivers of the day). For the HQ-180, there are markings in the left dial for the ham band set points. You will see them at 4.04, 7.3, 14.425, 21.6, and 29.7 Mcs (MHz). These relate to BAND SPREAD dial positions for 80, 40, 20, 15, and 10-meter dials, respectively, on the right readout. This is a bit more involved than what I have shown here. See Operating Manuals for details.

Hammarlund was quite specific in the HQ-170 series Operating Manuals about using the VERNIER TUNING on Single Sideband and CW. That was also true in the HQ-180 series receivers – but the control was in a different place and was smaller in size:



Earlier, the Sideband Selection and Mode switching in the HQ-170 was described. That also is similar in the HQ-180 and HQ-180A Receivers. However, the control layout is different. The VERNIER TUNING control for the HQ-180 series radios is to the right of the right main tuning window and is a smaller knob than on the HQ-170 series. The VERNIER TUNING knob location on the HQ-170 is the BFO KCS.

A feature of many radios of the time of the HQ-170 and HQ-180 was the use of what was called a Slot Filter – also often called a Notch Filter. This circuit allowed the user to eliminate a carrier in the receiver passband – such as a close by interfering CW signal, without affecting the signal being

tuned. While a good deal more complicated than this brief description, it was a good tool and is with us today as the Automatic and Manual Notch. In the case of the HQ-170 and HQ-180 Receivers, the Slot Filter was always in circuit but disabled by tuning it out of the passband when not needed. The Slot Filter was effective for removing interfering carrier heterodynes in the passband when in AM Mode.



**HQ-170 Slot Filter Location
W9MXQ**



**HQ-180 Slot Filter Location
W9MXQ**

Note the SLOT DEPTH knob on the HQ-170. This is generally a “set and forget” control. On the HQ-180, this control is inside the cabinet, behind the SLOT FREQ control. Hammarlund used the same punch pattern on both the HQ-170 and HQ-180 receiver front panels and sometimes that meant a bit of compromise from one model to another.

One feature of the VHF model of the HQ-170A – that is, the HQ-170AC-VHF – was 2-meter coverage without a converter. This model included a Nuvistor⁵ tube converter and pre-amplifier for the 2-meter band and used the 2-meter calibration on the right tuning window. It converted 2-meter signals to 6-meters and then fed signals into the 6-meter band signal path in the receiver.



This large assembly in the back center of the radio chassis – reference the red arrow – is absent from HQ-170 and HQ-170A Receivers. It is present only in the HQ-170AC-VHF. Contained therein is a converter and pre-amplifier for 2-meters. The converter and pre-amplifier use the then new, and revolutionary, Nuvistor vacuum tube from RCA. Not much larger than a transistor, it was designed with its tiny internal elements to be effective at VHF and UHF frequencies.

There were other features offered by Hammarlund in its product life cycle. One rather rare item was an i-f Noise Blanker – different from the Noise Limiter included as standard equipment in both the HQ-170 and HQ-180 receivers. The NS-1 Noise Silencer was added as shown here:



HQ-170 or HQ-180 Receiver
Lower left corner of Front Panel
This radio has no NS-1 Noise Silencer,
only the standard NOISE LIMITER
W9MXQ



HQ-170 or HQ-180 Receiver
Lower left corner of Front Panel
See Maroon concentric NS-1 Level Knob
on the NOISE LIMITER knob.
W9MXQ

Hammarlund advertised but never released a product called ZBZ, Zero Beat Zero, that was to allow the HQ-170 series receiver to transceive with the Hammarlund HX-50 or HX-50A Transmitter. The ZBZ or Zero Beat Zero concept was later used to describe a feature of the Hammarlund HX-50A Transmitter to make zero beating the transmitter. So, for the purposes of this writing, we will leave the ZBZ product as a bit of a mystery.

Finding a good HQ-170 or HQ-180 is not difficult, even today. Finding them in pristine condition is a bit harder. The version of the HQ-170 shown in this article, the HQ-170AC-VHF is rare. However, finding and appreciating the look, feel, and sound of any of these radio model series is an attainable goal.

Hammarlund has a following in the Ozaukee Radio Club that I do not want to fail to mention. Pat Volkmann, W9JI, has several Hammarlund receivers – all are older vintage than the HQ-170 and HQ-180 series of radios. Nothing quite matches being in Pat's shack and listening to the sweet sounds of CW coming from one of his Hammarlund HQ or SP series receivers. The older Hammarlund receivers are identical in circuitry but as they go back in time the tube types are different – in keeping with tube development and the move to miniature tubes in the later years.

Another Hammarlund aficionado in our ranks is fellow member Mike, AE9MS. Mike has a very nice-looking Hammarlund HQ-180C that has a prominent place in the picture on his QRZ page. That Hammarlund is joined by some other fine vintage equipment.

Very good friend, Bob, W9DYQ, in Minnesota, is a Hammarlund owner with a receiver in the Super-Pro model line – the SP-200-SX. Bob and I have compared notes on how the SP line of receivers developed into what ended in the HQ-180 (and the HQ-170) series.

It is always nice to see how these old radios looked in a station setup. Here is one example of a set-up from E. F. Johnson and Hammarlund (with a National Speaker). Back at that time, E. F. Johnson was known for transmitters and Hammarlund was known for receivers⁶. But it was common then to mix manufacturers in a station setup.

Ham Radio Station from the 1960's
As used in the QTH's of current Ozaukee Radio Club members,
Gary, K9DJT, and Bill, WA9MXQ (now W9MXQ)
"Those were the days!!"



**Johnson Valiant
AM/CW Transmitter**



**National HRO-60TS
Speaker**



**Hammarlund HQ-170AC-VHF
Receiver**

Pictures – W9MXQ in 2020

I appreciate that you read my articles. 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.

Notes:

¹ Subjects for a future article.

² "Big Iron" is an affectionate term used by vintage radio collectors about radios made from the 1920's well into the 1970's that were physically large and heavy. At 10-1/2" High x 19" Wide x 13" Deep, and weigh in at over 40 pounds, shipped, these radios qualified as "Big Iron." However, their competition from Hallicrafters could weigh nearly twice as much.

³ Vintage radios tend to drift – and in fact were quite unstable by today's standards. However, most of that lack of stability was mitigated by including warm-up time in operating plans.

⁴ Users of the Collins 75A-4 can attest to this I-F Shift technique. The front panel 75A-4 control for I-F Shift actually, mechanically, tuned the VFO one direction while tuning the BFO in the opposite direction. Many radios of the day had separate BFO controls that allowed this interference fighting trick. Another example would be the Hallicrafters SX-115 and SX-117 Receivers. However, in the case of the SX-117 this was not possible when the SX-117 was mated to the HT-44 Transmitter and used in transceive mode as a pair. Many other receivers also shared this ability.

⁵ "The nuvistor is a type of vacuum tube announced by RCA in 1959. Most nuvistors are basically thimble-shaped, but somewhat smaller than a thimble, and much smaller than conventional tubes of the day, almost approaching the compactness of early discrete transistor casings. Triodes and a few tetrodes were made. The tube is made entirely of metal with a ceramic base. Making nuvistors requires special equipment, since there is no intubation to pump gases out of the envelope. Instead, the entire structure is assembled, inserted into its metal envelope, sealed, and processed in a large vacuum chamber with simple robotic devices". The HQ-170AC-VHF was one of several ham radio receivers using this rather revolutionary device. Ultimately it did not win out over solid state devices.

<https://en.wikipedia.org/wiki/Nuvistor>

⁶ Johnson did not make ham radio receivers but at the end of ham radio equipment manufacturing made a few 80-10 meter Avenger HF SSB/CW Transceivers – but only a very few. Hammarlund made several transmitters over the years but none that ever became market leaders.

Gary Sutcliffe, W9XT, Recognized by ARRL and NCJ



Gary Sutcliffe, W9XT, received a Special Service Award from the ARRL for his many years of contribution to the National Contest Journal. Gary's picture also appeared on the cover of the November issue of the NCJ. Congratulations Gary!



Banner: Contest Results, Roving, Mentoring, and More!

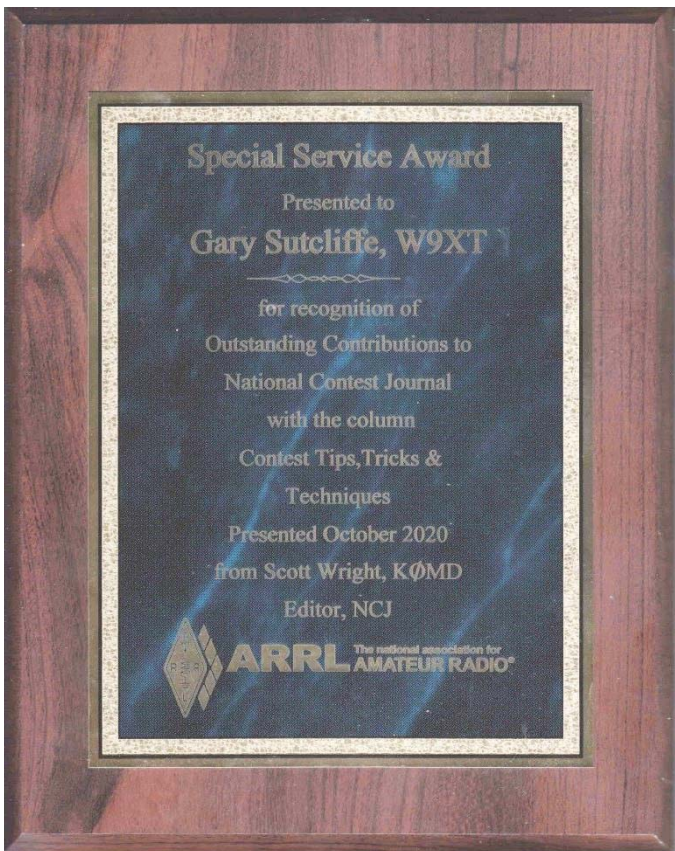
- An Arduino-Based Remote Antenna Switch You Can Build
- Choosing Your Next Contest Station PC
- An In-Depth Look at the K5ND VHF Rover Setup – Part 2
- Results: NAQP RTTY – July 2020
- Results: NAQP SSB – August 2020



Top Photo: Jim Wilson, K5ND, a serious VHF contester and roving enthusiast. [Courtesy of Jim Wilson, K5ND]
Bottom Photo: Gary Sutcliffe, W9XT, a veteran contester, NCJ columnist, and engineer in his shack. [Gary Sutcliffe, W9XT, photo]

Top Photo: Jim Wilson, K5ND, a serious VHF contester and roving enthusiast. [Courtesy of Jim Wilson, K5ND]

Bottom Photo: Gary Sutcliffe, W9XT, a veteran contester, NCJ columnist, and engineer in his shack. [Gary Sutcliffe, W9XT, photo]



Upcoming ORC Monthly Meeting Programs

de Pat Volkmann, W9JI

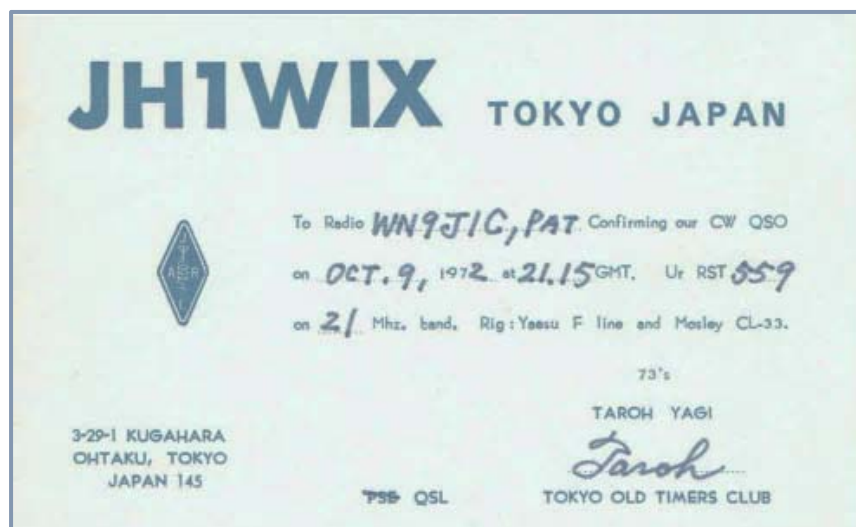
December – Open
January – Elections
February - Open

Creating a Presentation

Almost all of our presenters use Microsoft's PowerPoint to organize and present their information. If you don't have access to or aren't familiar with Power Point, there is an alternative. The Open Office package contains Impress, which is similar to PowerPoint. Impress is easy to use and available at no charge. You can check out OpenOffice here: <http://www.openoffice.us.com/>

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.

Last month, Gary, W9XT, showed us his first DX QSL card. I looked back through my collection and found, if not the first, certainly one of my earliest DX cards. It was October 1972 and I still remember the thrill of working Japan for the first time. I was using my Heathkit HW-16 on 21129 MHz, running 75 watts to a 15 meter dipole in the attic of my parent's house. The only piece of coax that I had was too short to reach my desk, so I had to set the HW-16 on a chair on the other side of the room to get on 15 meters. Years later I learned that Taroh Yagi, JH1WIX, was well known for being the first JA contact for many novices. Taroh passed away in 2001 at the age of 93. – Pat, W9JI



DX'ing & Contesting

De Gary Sutcliffe (W9XT)



We are heading towards winter propagation. The clocks got moved back an hour to standard time, and sunset will be around 4:30 PM by the time you read this. The long periods of darkness help the low bands.

Indeed the low bands have been pretty good. I worked Japan on 160M on October 20. That is the earliest in the season I ever worked Japan on the band. In the past, I don't think I worked Japan on 160 meter before December. But, that was CW, and the October QSO was FT8, which gives a significant advantage. But, the CW contacts were with 1500W, and the FT8 contact was low power, so some of the difference

is reduced.

The high bands have been improving. As noted before, it was likely the sunspot minimum occurred last December. While sunspot numbers increase more quickly from the bottom than they decline from the peak, it will take some time to get really good. We will get some tastes of better days from time to time.

We had one the last week of October when a large group of sunspots appeared. The solar flux, which is a proxy for the number of sunspots, hit 88. While this is a long way from numbers over 200, which we sometimes get at the peaks, it is a refreshing change from the mid-60s we experienced in the last few years. In fact, it was the highest we have seen in about three years.

I was on a bit. There was a lot of activity on 15M and above. I worked quite a few Europeans on 12M using FT8. The east coast was working a lot of Europeans on 10M. I didn't hear any out here. My experience says the solar flux has to be up to at least 100 for 10M openings to Europe on CW. Maybe there were a few chances for us using FT8, but I missed them.

Unfortunately, the solar flux is dropping again, and on Halloween day it was down to 80. Still a good number compared to the last few years.

One of my favorite contests is the CQWW CW DX contest at the end of November. I would sure like to see a higher solar flux for it. But what are the chances of that?

Well, maybe better than we thought. The sun rotates. Sunspots can last for more than a rotation. Could the big sunspot come back for the DX contest?

The sun is not solid like the earth. Regardless of where you are on earth, a day is 24 hours. The rotational period varies with latitude on the sun. The equator rotates in about 24.5 days. It takes about 30 days as you get near the poles.

This sunspot group is from the new cycle. New cycle sunspots appear at mid-latitudes and appear near the equator as the cycle progresses. So these new cycle spots should complete a rotation in about 27 days, assuming they live that long.

The peak solar flux occurred on October 28. CQWW starts on November 28 (UTC), so it will be 31 days later. Furthermore, this sunspot group is about to rotate out of view. So, assuming the group survives, it will have rotated out of view again by the start of the contest. Oh well, maybe a new group will pop up for the contest.

If you are interested in following activity on the sun, a great website is <https://www.solarham.net/>

Just when you think you have figured out the latest digital modes, FT8 and FT4, out comes some new ones, FST4 and FST4-W. You can download the beta version of WSJT, V2.3.0-rc-1, to try them out. This version expires on November 17, so by the time you read this there might be a version for general release or a new test version.

These new modes are designed for the lower frequency bands. Joe Taylor, the principal person behind the WSJT modes, mentioned to me that he was working on a mode for the low bands back at the 2019 Hamvention®. The recommended frequencies are 160M, 630M, and 2200M. I have only listened to it on 630M.

FST4 is different because it has multiple transmit/receive periods. Each of the different WSJT modes have different, but fixed periods. For example, FT8 is 15 seconds, FT4 is 7.5 seconds, and WSPR is 120 seconds. As a rule, the lower the data rate, and the longer you have to detect the signal, the lower the minimum signal strength needed for communications.

FST4 has selections from 15 seconds up to 30 minutes! The message sequence is the same as FT8 and other WST modes, so it would take a minimum of a couple of hours to complete a QSO with the longest periods. But, in theory, the signals could be about 45 dB under the noise level. That means the signal is 1/100,000 the level of the background noise. There are reports of stations making intercontinental QSOs on 2200M with 5 minute periods. Keep in mind that on 2200M the power limit is 1 watt EIRP. With 5 minute periods, signals as low as 35dB should be possible.

FST4 has replaced JT9 as the QSO mode for 630M. From what I have seen, most are using a default value of 60 second sequences. I'm sure stations really wanting to work long distances set up a schedule and agree on a longer period.

FST4-W is a WSPR replacement, but most of the band's beacons are using the old WSPR standard. One reason is that many beacons, including mine, are hard coded using Arduinos and other standalone microprocessors to generate the signals.

Another new feature of FST4 is that you can select the frequency range to detect signals. Reducing the bandwidth of the receiver increases the signal to noise ratio.

Are there any QRPer in the ORC? The first week of November kicks off the Winter QRP Fox Hunts. I have not done them in a couple of years, but I plan to do it this year. Every week two stations are designated as "Foxes". The "Hounds", the rest of us, try to work them. The fox stations change each week. The 40 Meter versions are on Tuesdays, and the 80 Meter versions are Thursdays. They start at 8:00 PM and run for 90 minutes.

Everyone runs 5 watts or less. The foxes will be calling CQ Fox. They work split most of the time since there may be quite a few calling. The exchange is RST-State-Name-Power. A typical exchange for me would be "559 WI Gary 5W".

You don't have to register or send in your logs. If you get in the log of a fox you will show up in the standings. More info on their website: <http://www.qrpfoxhunt.org/>

Two big November contests are the ARRL Sweepstakes. The CW portion starts November 7 and the phone event on November 21. I mentioned them last month. Rules are available at <http://www.arrl.org/sweepstakes> Be sure to read them carefully if you are not familiar with it. The exchange is very long and needs an explanation.

CQWW DX CW is the last weekend of the month. As usual, this is the weekend after Thanksgiving. That holiday is likely to be less of a conflict this year with many families skipping the traditional get together. I mentioned the CQWW phone version last month, so there is not much point in repeating it here, except that with luck, we will have some more sunspots than last year. Rules at <https://www.cqww.com/rules.htm>

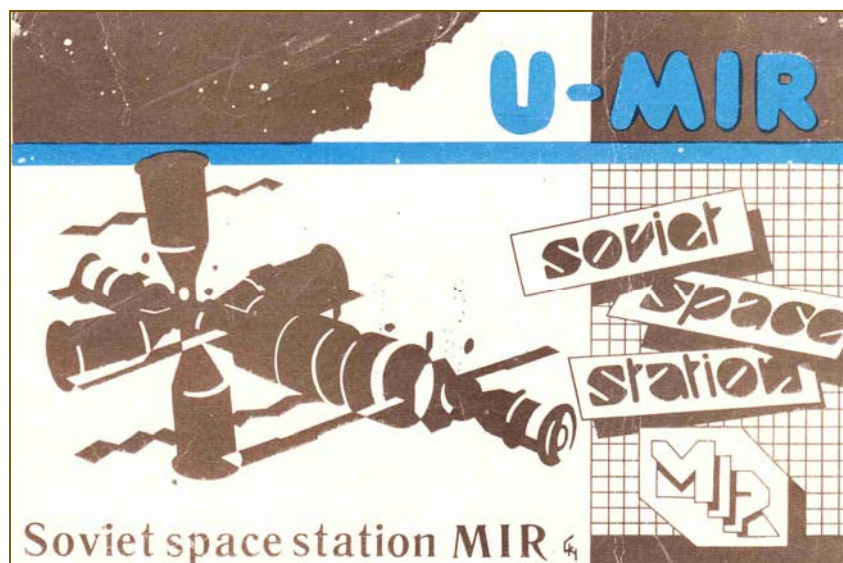
Coming up in early December are the ARRL 160 Meter and 10 Meter Contests. The 160M Contest starts on December 4 at 2200UTC (4:00 PM local) and runs 42 hours. The exchange is signal report and ARRL section. We are in the Wisconsin Sections. We can work anyone. DX only works W/VE stations. This is a CW contest and is a lot of fun. Full rules at <http://www.arrl.org/sweepstakes>

The following weekend is the ARRL 10 Meter Contest. This has always been one of my favorites since it started in the mid-1970s. At the time, there was a threat to our 10M band, and the ARRL wanted to protect it by increasing activity. We were at the bottom of the sunspot cycle, and not many hams bothered to check the band. We are just past minimum now, and except for some brief opening to South America, this will primarily be a VHF-like contest. There are many entry categories, CW, phone, or mixed mode, along with high, low, and QRP power, assisted and non-assisted. <http://www.arrl.org/10-meter>

Last year I operated CW only, low power, assisted. I took first place USA, and 2nd place World. Right behind me in second place USA was Vic, WT9Q. He came uncomfortably close to beating me. I'm sure there will be a rematch this year.

DXpeditions are still on hold for the most parts, but once in a while someone shows up someplace, often traveling on a work assignment and operating during free times. I expect this to continue. My local DX club, the GMDXA, recently received notice that a planned DXpedition for the fall of 2021 was canceled and they were returning our donation. They felt that travel issues due to COVID-19 were unlikely to be resolved by then, so they canceled it.

Last month I included a scan of the QSL of my first DX contact. I got an overwhelming response to that. Well, maybe one response. So, I will include an interesting QSL from time to time. This one is for a 2M packet QSO I made in 1992 with the Soviet Space Station Mir.



That wraps up November. As the cold weather approaches, there are lots of reasons to get on the air.

Ozaukee Radio Club

October 14, 2020 Meeting Minutes

de Ken Boston W9GA



This ORC meeting was conducted via an online (internet) connection using the ZOOM app. Prior to the meeting start, those members who were able to access the “waiting room” via phone or computer/webcam were then introduced into the meeting space hosted by Pat W9JI. At that time various audio and video connection issues were addressed for the members before the meeting began.

ORC President Pat W9JI officially initiated the meeting at 7:34 PM. As introductions were recognized when members checked into the meeting, a go-around was not conducted. Pat welcomed a new member; Todd KD9QLJ to the meeting.

Vic WT9Q thanked Greg WD9LHI and Gary K9DJT for help with his Low Band vertical.

Bill W9MXQ has gotten a Hallicrafters SR150 restored and ready for the “classic exchange”.

Gary W9XT recently received a plaque he won as a special service award from his hosting of the ‘Tips, Tricks & Techniques’ column in NCJ. (ARRL)

Peter W0NG states that he has posted a video of his solar project program, accessible from his website. Check the link from his QRZ.COM page.

Gary N9UUR has experienced good HF conditions, with Digi QSOs up to 15 meters, and even some 10 meter propagation.

Program:

Pat W9JI gave a presentation on the Hallicrafters SX-11 Super SkyRider receiver, and included some early pre-WW2 history of the Hallicrafters company, and its heavy presence in the early Ham radio equipment market. Pat had obtained a nice condition radio set, and performed a restoration to a fairly high standard. A particular discussion was made about switching components from vacuum tubes to solid state with resultant problems. The talk concluded with a number of comments on performing restorations, refurbishments and reaching Original or Museum quality of an older radio targeted for restoration.

Committee reports: (after a short break at 8:35 PM)

KC9ONY Tom; reminds everyone of the Tuesday night net, and that the noise issues persist on the 222 system. A team will be investigating more closely very soon.

Gary N9UUR indicated that the donation program had reached \$1357.60, which is over the goal set by the board. Bills are paid, and we are still solvent.

Ken W9GA had distributed the minutes of the September meeting via email. Bill W9MXQ moved to accept and Ben K9UZ seconded, motion carried.

Tom W9IPR updated the members on the scholarship fund and the S.T.E.M. program funding. ORC still has a large balance of funds in a CD, which will be transferred to the ARRL program when it matures (a renewal date was recently missed). Tom also proposed that some of the scholarship items held in the barn may be put up in a silent auction for the membership.

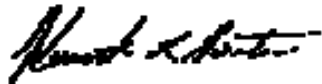
OLD business; Mention was made about the club newsletter distribution running late.

NEW business: Tom KC9ONY mentioned a QST article about the "QSO virtual hamfest" which included a quote from the president of the Largest Ham Radio Manufacturer in Slinger, Wisconsin, Gary W9XT, about the trials and tribulations of doing a virtual sales booth. He also mentioned that the Boy Scouts Jamboree for the local area, Metro Milwaukee has been cancelled.

Adjournment:

36 members (unique callsigns) were on the ZOOM site. Contact Ken W9GA to obtain the list. Bill W9MXQ moved to adjourn, Bill AC9JV seconded the motion, and motion carried. Meeting ended at 8:58 PM.

Respectfully submitted,



Kenneth Boston W9GA
Secretary

ORC Meeting Agenda

December 9, 2020

1. 7:20 – 7:30 PM – Check-In and Introductions
2. 7:30 PM Call to Order – President Pat Volkmann (W9JI)
3. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.
4. Program – TBD
5. President's Update – Pat Volkmann (W9JI)
6. 1st VP Report – Ben Evans (K9UZ)
7. 2nd VP Report – Bill Church (KD9DRQ)
8. Repeater VP Report – Tom Trethewey (KC9ONY)
9. Secretary's Report – Ken Boston (W9GA)
10. Treasurer's Report – Gary Bargholz (N9UUR)
11. Committee Reports
12. OLD BUSINESS
13. NEW BUSINESS
14. Adjournment

Meeting Note:

For the foreseeable future, we will be holding the meetings via the Zoom Videoconferencing platform on the same evening and time as we had the in-person meetings. Sign-in info will be emailed via the ORC remailer usually about an hour before the start of the meeting.

Return undeliverable copies to:

The ORC Newsletter

524 Alta Loma Drive
Thiensville, WI 53092

First Class

**Next ORC Meeting via Zoom
December 9, 2020**

7:20-7:30 PM – Check-In
7:30 PM – Meeting Begins