



The ORC Newsletter

Official publication of the Ozaukee Radio Club, Inc. Mail all contributions to the editor, Tom Ruhlmann, W9IPR, 465 Beechwood Dr., Cedarburg WI 53012 (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

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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.

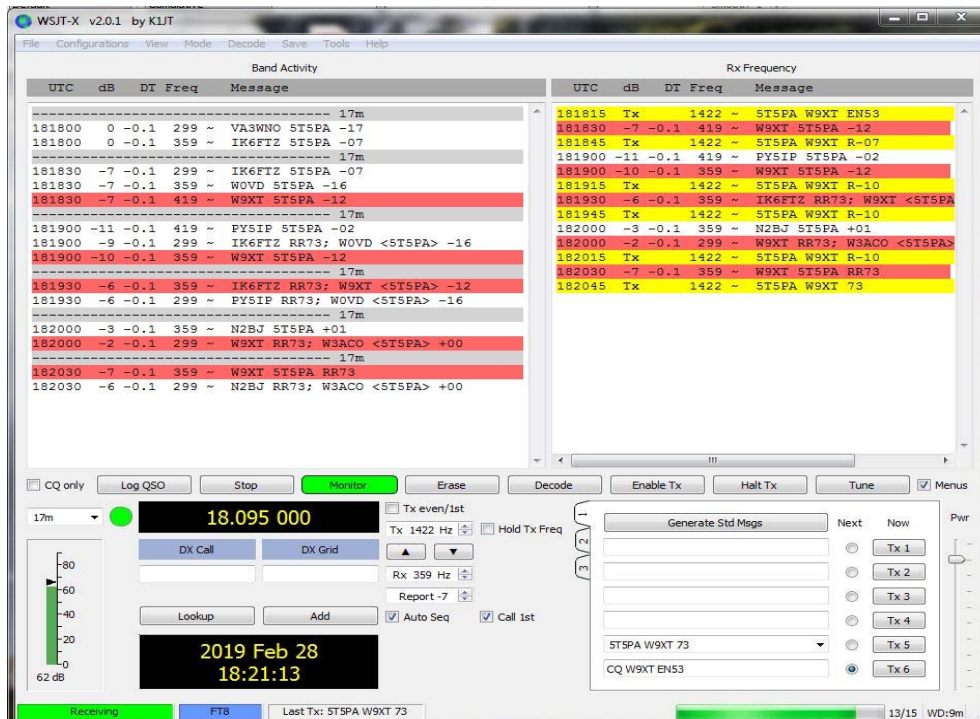
Sit back and relax. The only thing you might want to do is change your transmit frequency if you don't get a response after a couple of minutes. There might be others calling on the same frequency covering you up. You can follow along with what the fox is doing by looking at the left decode screen. You 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.cqwpw.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 contesteer 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

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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).

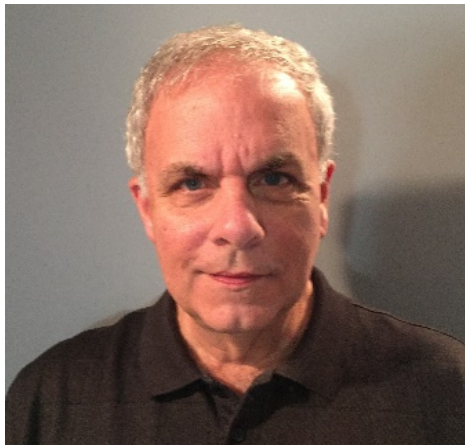
This is one of those examples where a dedicated group of programmers saw a need and filled it. That leads to the question of why it is not already part of the Windows programs in all their varieties. It should be, but Microsoft never came up with a comprehensive solution as part of its operating system.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

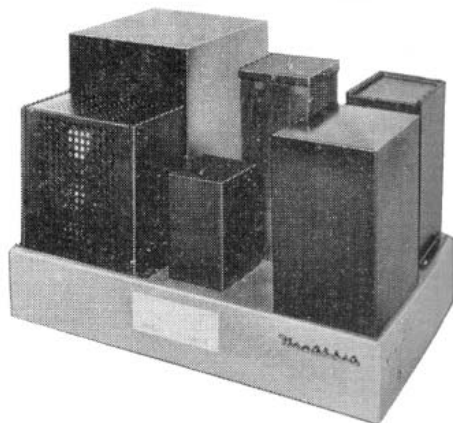
Heathkit Photo



**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-100¹ and DX-100B¹ transmitters led to the popular TX-1¹ 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-1¹ 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-10¹ 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 5100¹ and 5100B¹ AM/CW Transmitters that could utilize their 51-SB¹ and 51-SB-B¹ SSB Adapters. And E. F. Johnson offered their Viking Valiant¹, Viking Valiant II¹, and Viking 500¹ AM/CW Transmitters as well as a Viking Single Sideband Adapter¹. 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 Thunderbolt¹ 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-10¹ 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 henscratching, 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

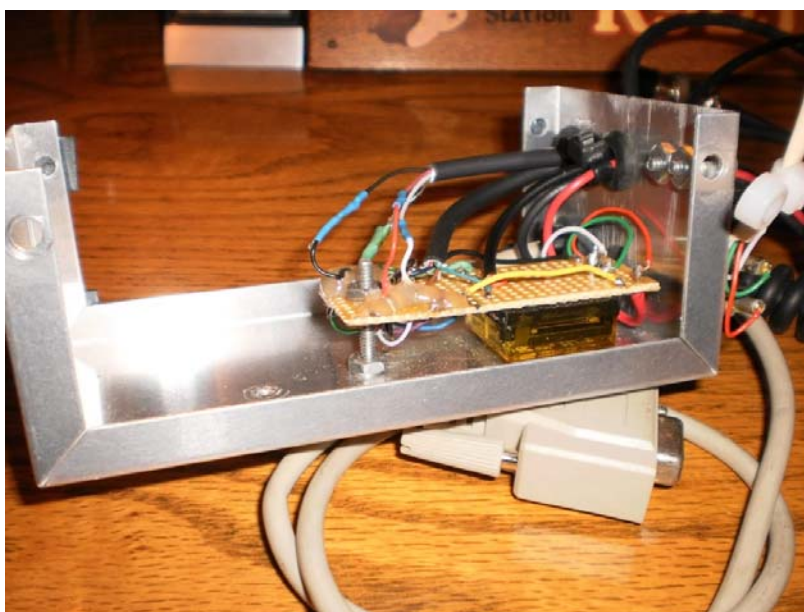


The black cable with the 8-pin mic connector goes to the K3 mic connector on the front of the radio. It comes from the voice-recorder via the DB-9 cable. The beige cable at the top of the picture goes to the switchplate and the black-red cable with the Power-Pole® connectors goes to a 12VDC accessories 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

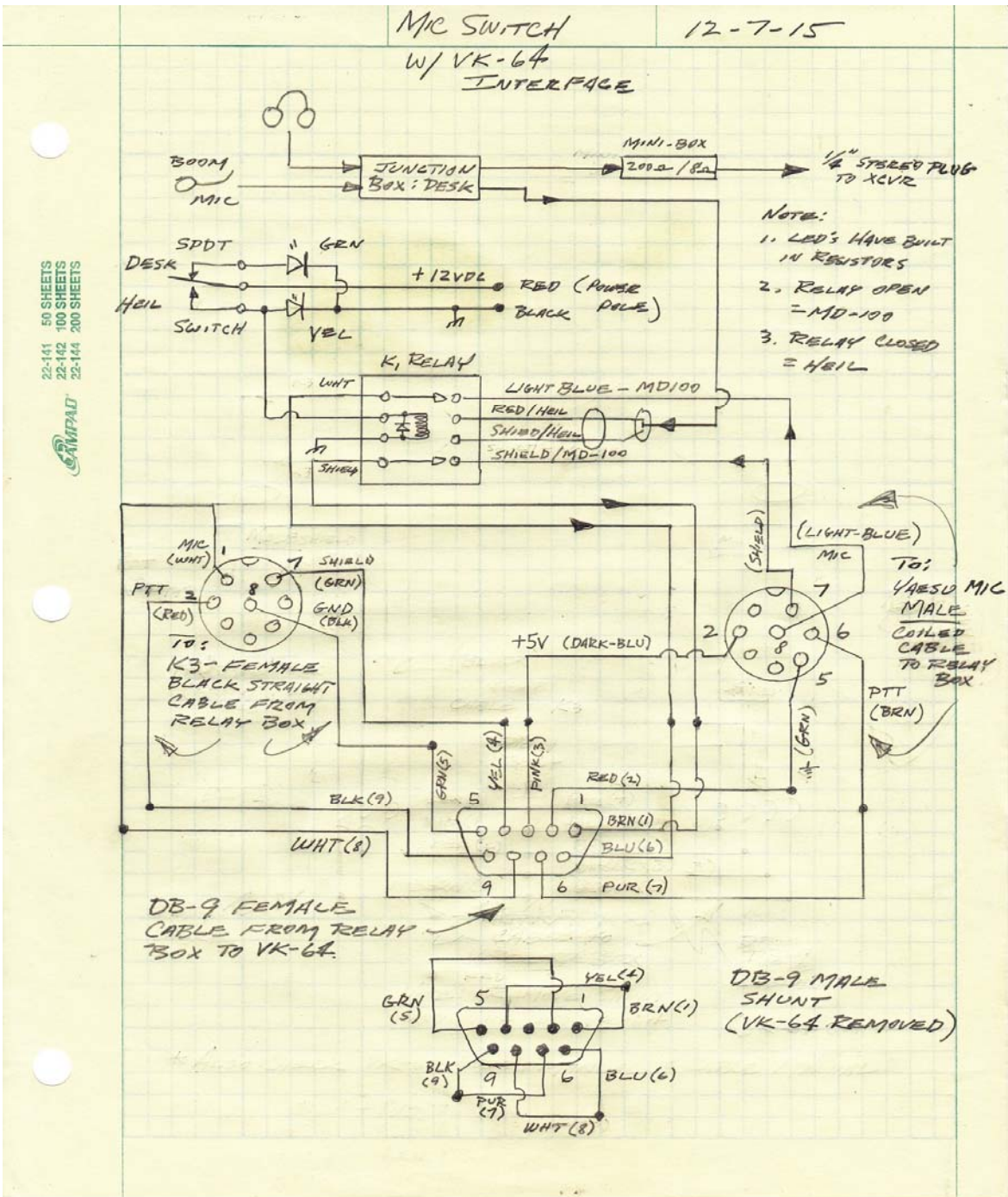
relay is on the top of the board and we are looking at the bottom.) I'm holding the board in place with a single machine screw and nuts. All cables come into the box through rubber grommets and restrained with cable ties on the inside. The screw terminal strip on the outside is used for the toggle switch 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.



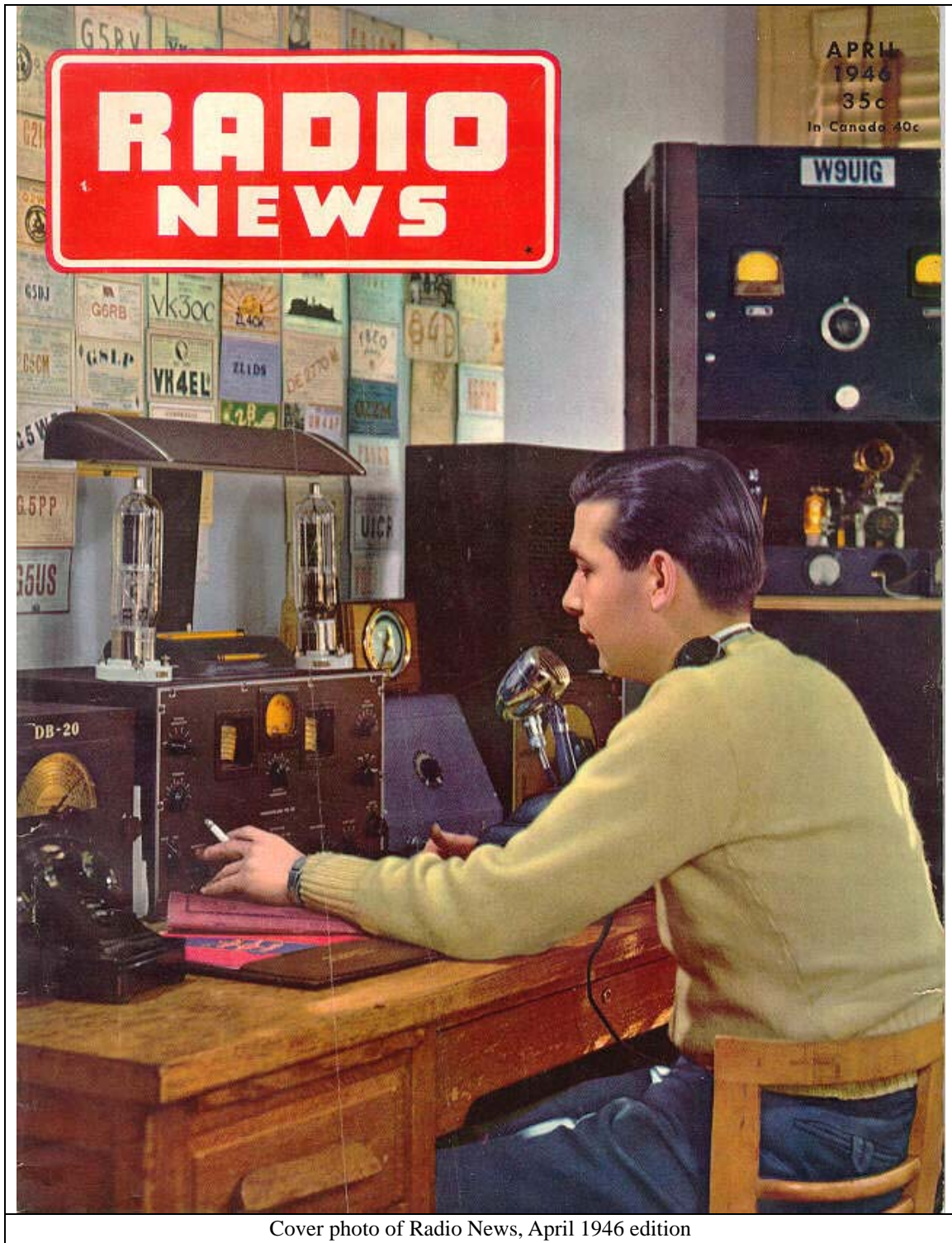
As I've mentioned before, this is your column—I'm only managing it. Please send me info on any project you might be working on relating to ham radio. It can be anything from a kit to a home-brew. A new antenna, a repair to a radio, or an accessory. Maybe you've rearranged your shack or implemented some 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.

HQ-120X Receiver

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 handsread 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.

Housed in sturdy black wrinkle finish cabinet. Size, 17 1/4" long, 10" high, and 12 1/2" 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.

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. \$129.00 141
TERMS: \$12.90 down, \$10.26 mo. for 12 mos.
CASH PRICE.....

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 band-spread dial on right. The front panel is black; the lighting makes it look blue. Photo credit: W9JL

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

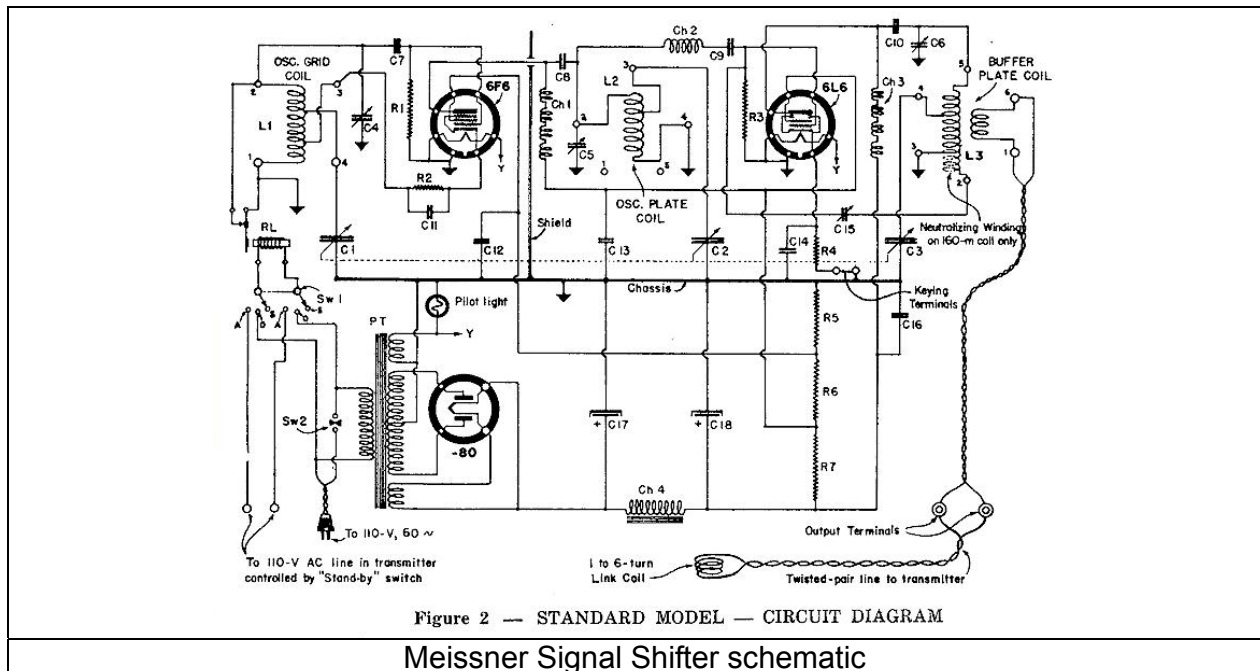
Just what is this “image problem”? The superhetrodyne receiver works by combining the incoming signal with a local oscillator (LO) signal in a mixer stage. Most receivers from this time have an IF frequency of 455 kHz. Assume we wanted to tune in a signal at 14.2 MHz, and the LO frequency is higher than 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 pre-selector 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

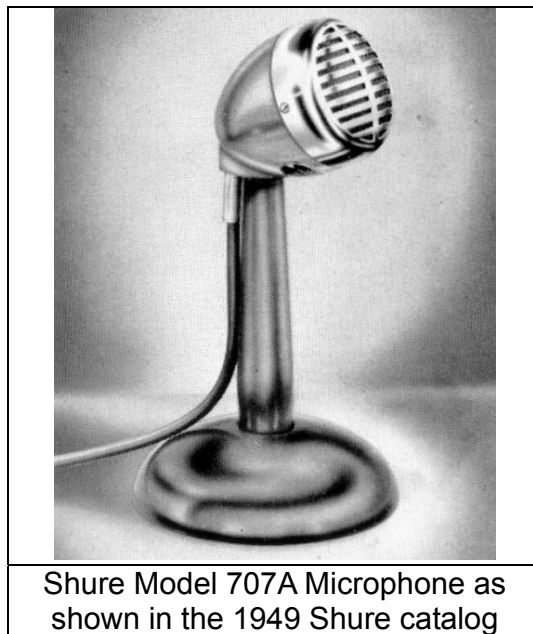
The Meissner Signal Shifter is barely visible in the photo, underneath the SC-10 speaker. While perhaps not obvious from the name, the Signal Shifter was a low-powered transmitter that could be used as either a VFO or as an exciter to drive an amplifier. Meissner made high quality equipment which was 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.



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.



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.....	9 3/4
Maximum Length, inches.....	3 3/4

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@arrrl.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 Contest-er 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