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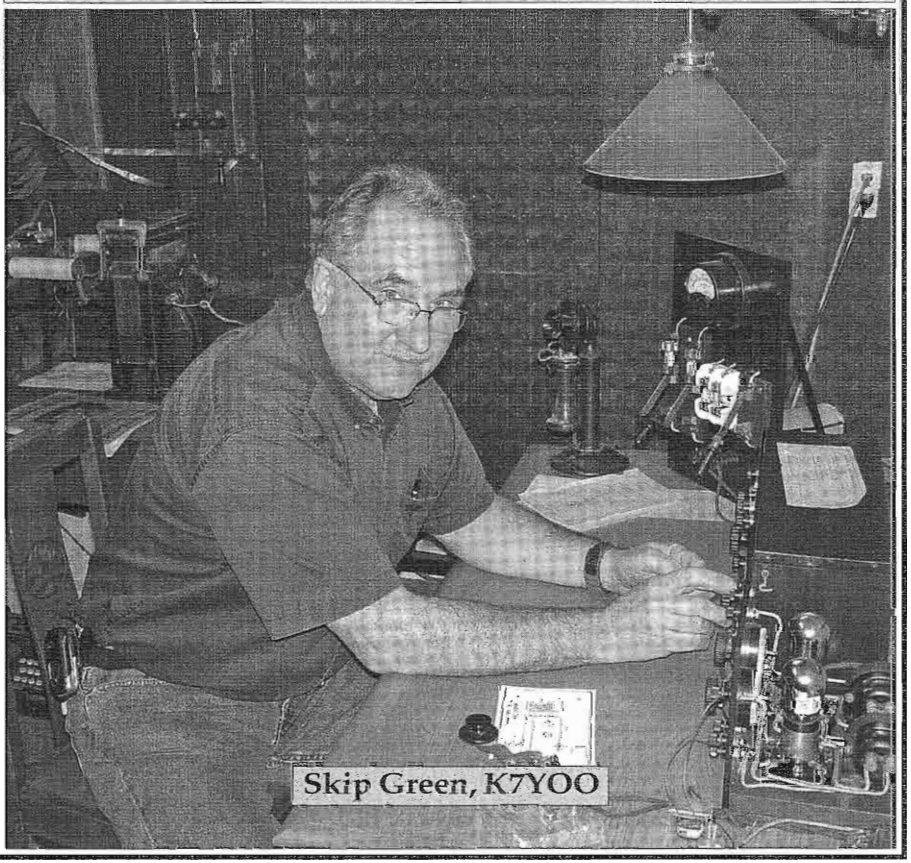
ELECTRIC RADIO

celebrating a bygone era

Number 205 June 2006



Skip Green, K7YOO

ELECTRIC RADIO

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Electric Radio is all about the restoration, maintenance, and continued use of vintage radio equipment. Founded in May of 1989 by Barry Wiseman (N6CSW), the magazine continues publication for those who appreciate the value of operating vintage equipment and the rich history of radio. It is hoped that the magazine will provide inspiration and encouragement to collectors, restorers and builders. It is dedicated to the generations of radio amateurs, experimenters, and engineers who have preceded us, without whom many features of life, now taken for granted, would not be possible.

We depend on our readers to supply material for ER. Our primary interest is in articles that pertain to vintage equipment and operating with a primary emphasis on AM, but articles on CW, SSB, and shortwave listening are also needed. Photos of Hams in their radio shacks are always appreciated. We invite those interested in writing for ER to write, e-mail, or call.

Regular contributors include:
Chuck Teeters (W4MEW), Jim Hanlon (W8KGI), Tom Marcellino (W3BYM), Bruce Vaughan (NR5Q), Bob Grinder (K7AK), Bill Feldman (N6PY), Dave Gordon-Smith (G3UUR), Dale Gagnon (KW1I), David Kuraner (K2DK), Larry Will (W3LW), Gary Halverson (K6GLH), Brian Harris (WA5UEK), John Hruza (KBØOKU), Hal Guretzky (K6DPZ)

Editor's Comments

More BPL Developments

There have been recent important developments in the Broadband Power Line vs. HF spectrum compatibility issue. It is interesting to study them from two perspectives; that of a user of the HF spectrum and that of an industry lobby group.

The Amateur Radio Newsline™ Report 1499 of May 5th, 2006 carried the headline "COPE ACT MAY FORCE FCC BPL INTERFERENCE STUDY." Quoting from this report in part: "...There has been a big win in Congress for Amateur Radio in its crusade to stop Broadband Over Powerline Internet access from destroying the High Frequency airwaves....The House Energy and Commerce Committee's version of the Communications Opportunity, Promotion and Enhancement or Cope Act of 2006 includes such an amendment, one requiring the FCC to study the interference potential of B-P-L systems. According to a bulletin sent out by the ARRL, the panel voted on April 26th to send the much-talked-about telecommunications rewrite bill to the full House for its consideration. Representative Mike Ross, WD5DVR, of Arkansas proposed the amendment. With the support of Committee Chairman Joe Barton of Texas, the committee agreed by voice vote to include it in the bill. A statement later released by Representative Ross's office notes that his amendment, which received unanimous committee support, would guarantee that valuable public safety communications

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Cover: While out West on a business trip, Skip Green (K7YOO) paid a visit to Gary Halverson (K6GLH). Skip is seated in front of a one-tube Kennedy 281 regenerative Ham receiver from 1921. To the right of the Kennedy 281 is a two-step audio amplifier and a marble-base "Boston" key. On Skip's left is the control panel for the 1-kW rotary spark gap behind him. The spark gap consists of a Thordarson "Flexible" transformer, a bank of photographic glass as the oscillation condenser, a pancake oscillation transformer, and the rotary gap enclosed in a wooden box. Several of these components came from 8NO of Clarksburg, West Virginia. Other period pieces complete the scene, such as a dividend check on top of the receiver from the Marconi Wireless Telegraphy Company of America in the amount of $50, dated January 2, 1920. Contrasting the classic wireless equipment is Skip's cell phone on his belt!

The All-Star Receivers

By Mike Bittner
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There are two All-Star receivers, namely the original All-Star Receiver (later dubbed the All-Star Senior) and the All-Star Junior. There is also a seldom seen version of the All-Star Junior with a regenerative IF. I had never heard of these receivers until finding sets of plug-in coils at several different swap meets, some of which were labeled for the All-Star and some for the All-Star Junior. I am always on the lookout for plug-in coils for building regenerative receivers, but some of these coils were labeled ANT while others were labeled OSC. Clearly these coils were meant for some kind of superhet. It was the discovery and subsequent purchase of these coils that led me to research their origin and find the information presented herein.

Introduction of the Original All-Star Receiver

The September 1934 issues of *Radio News* and *Radio Craft* had construction articles describing a 6-tube (7-tube with optional BFO), all-wave superheterodyne called the All-Star Receiver that used plug-in coils. These seminal articles introduced the radio with glowing descriptions of its performance, ease of construction and claimed ease of operation. Subsequent issues of the magazines provided more complete construction and operation details and articles on improvements such as the addition of AGC and tuning indicator.

All-Star Kits

Unlike other radio construction projects featured in these magazines which could be built from complete kits or individual

Figure 1: Meissner coil kits for All-Star and All-Star Jr. As found, my Jr. coil kit was missing the two IFs and BFO. For the photo I have filled in the box with the Senior's IFs and BFO.

components obtained by the builder, the All-Star receiver was intended for assembly from kits of component parts sold by various component manufacturers. Meissner produced a coil kit, Thordarson produced a transformer kit, the Crowe Nameplate Mfg. Co. (later called Croname) a dial and knob kit, Electrad a potentiometer kit, Ohmite a resistor kit, Hammarlund a variable capacitor kit, Cornell-Dubilier a fixed capacitor kit, and Belden a wire and antenna kit. Tobe-Deutshman offered an alternate double-doublet antenna kit. Originally, no specific loud speaker was offered but an 8-inch dynamic speaker with a matching transformer was recommended. However, most mail order catalogs and other All-Star component kit suppliers specified an Oxford 6-inch speaker. Other suppliers offered 6-inch speakers by Wright-DeCoster and Lansing. Allied Radio, of course, offered their Knight-brand speaker as an alternate to the Oxford speaker. The complete speaker kits included the audio output transformer and a 4-foot long cord and plug that plugged into a socket on the back of the All-Star chassis. The keystone to the whole affair was a chassis and panel kit, offered by the Premier Metal Co., with all the socket holes and other holes pre-punched and ready for assembly. This could be obtained for $2.50 and may explain the popularity of this receiver since chassis fabrication was then, and still seems to be, the big stumbling block for many would-be radio builders. No hack sawing, filing or drilling was needed, just assembly with screwdriver and pliers, and wiring with a soldering iron.

Promotion

Advertisements for the various component kits just happened to appear in the same issues of *Radio News* and *Radio Craft* that introduced the radio, indicating a cozy arrangement between

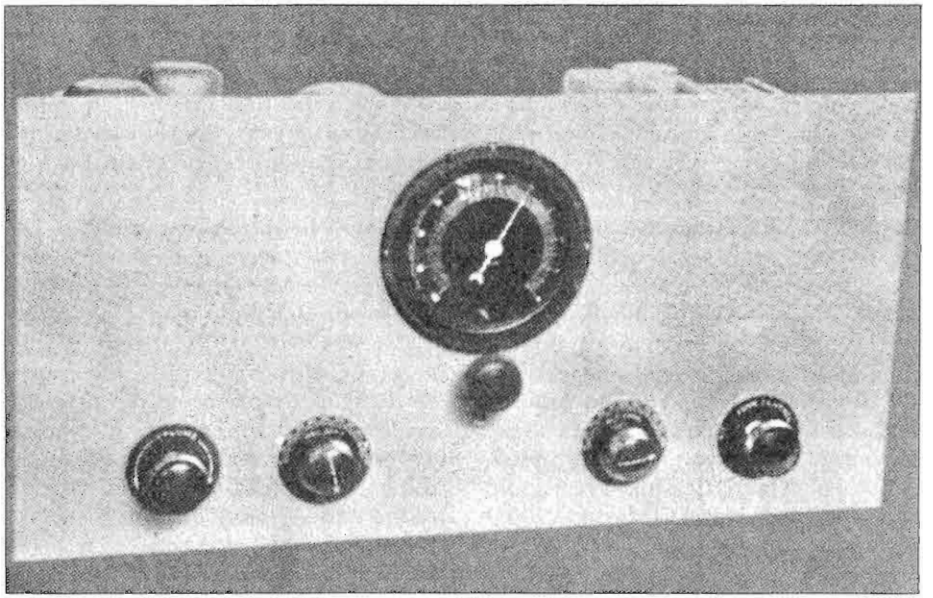

Figure 2: All-Star front view. Controls from left to right are; Volume, Local Oscillator Bandset, Bandspread, Antenna Bandset and Tone/Power On-Off. When a BFO is provided, its only control is an on-off toggle switch located below the bandspread knob.

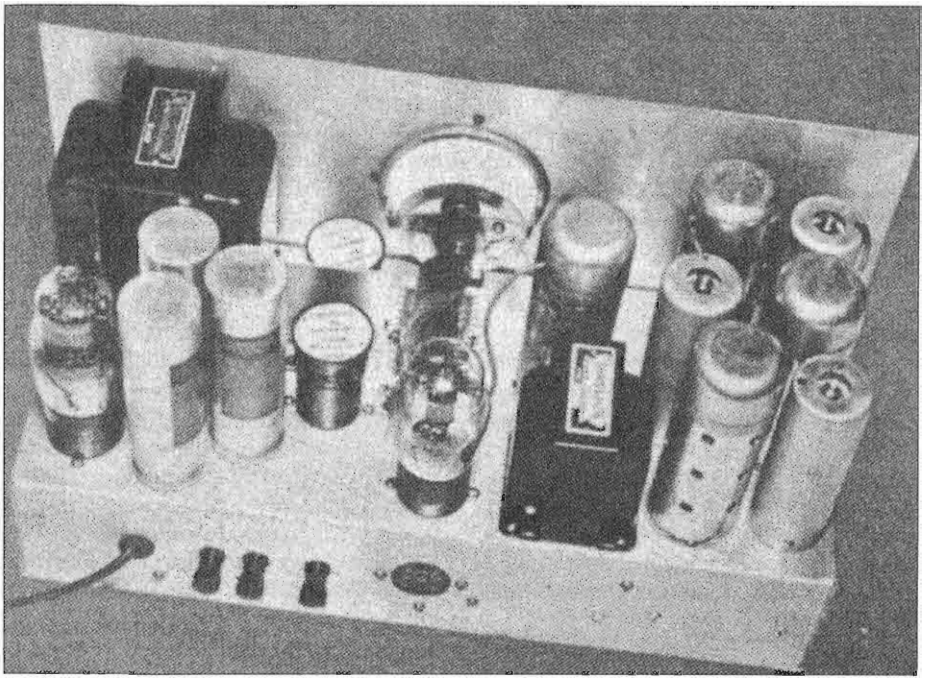

Figure 3: Rear view of All-Star receiver. Power supply and plug-in coils at left; converter, IF and detector stages at right. 2-gang bandspread capacitor and the 2A5 audio output tube in center. The IFs have concentric tuning with primary tuned by a central slotted set screw, secondary tuned by a hex nut surrounding the primary's set screw. Meissner supplied a special tool for this. Antenna connections accommodate long-wire or doublet antennas. Speaker socket for connecting voice coil and field coil of external dynamic speaker on back of chassis.

the publishers and the advertisers, since the contents of these particular articles directly supported the relevant advertisers and vice-versa. At the same time, many of the big radio parts supply houses jumped on the band wagon and listed all the kits in their catalogs both individually and also in package deals whereby all the kits could be ordered as one complete set. As listed in the 1935 Mid-West Radio Mart mail order catalog, the individual kits, added up to a total cost of $31.28 less BFO, tubes and speaker. The complete package deal consisting of the same kits listed at $31.18. Such a deal! Well maybe the 10-cent saving meant something during the depression (I can still remember the Bing Crosby song "Brother can you spare a dime"). The cited articles were not the only ones featuring the All-Star receiver. Nearly all of the popular radio magazines of the mid-1930s had feature articles on this receiver with schematic diagrams, construction information, performance reviews, and of course, numerous advertisements for the kits. Many of these articles include a pictorial diagram of the under-chassis wiring. I suspect that anyone who attempted to wire the receiver based on this diagram became confused as it bears little relationship to the under-chassis layout of the actual receiver. While the various sockets are shown correctly as bottom views, the overall parts placement is mostly based

on a top view of the chassis, and partly as a figment of the artist's imagination. A good old Heathkit-like wiring diagram, this is not. In addition to the magazine articles, a newsletter-like brochure titled *The All-Star News* was available free on the counters of radio parts stores, or could be obtained free by writing to the blueprint department of *Radio News*. It contained much of the information in the magazine articles and included an order blank for purchasing the various kits and parts. The apparent purpose of this "newsletter" was to stimulate direct over-the-counter sales to fellows who couldn't wait for their All-Star parts to come from a mail-order firm. It was quite possible to build an All-Star receiver out of standard, generic radio parts that were readily available in radio parts stores. Note that there is not even any silk screening on the front panel. Instead, designation of the various control functions was accomplished by round nameplates from the Crowe Nameplate Mfg. Co. The single exception to the use of generic parts was the plug-in coils. However, even these could be hand-wound on standard Meissner or Alden coil forms if you were willing to experiment. As far as I have been able to determine, no winding data for any of the All-Star coils were ever published.

Description

Construction was of the classic chassis and panel type. The metal used for the chassis and panel was called Eraydo, [obviously a play on the word ray-dee-o] "—a new nonmagnetic alloy that does not rust or corrode and retains an attractive silver finish". The chassis and panel were left unpainted, while the tuning dial bezel had a black finish. Initially, no cabinet was provided, but eventually the Crowe Nameplate Mfg. Co. and several aftermarket firms advertised cabinets with hinged tops for easy access to the plug-in coils. The set used 2.5-Volt heater tubes with the following line up: 2A7 converter, two 58 IF amplifiers, 58 BFO (if included), 56 power detector, 2A5 audio power amplifier and 80 or 5Z3 rectifier. The text of the initial article says 80, but the schematic shows 5Z3, one of several discrepancies found between the various references on these sets. There were three sets of plug-in coils that were respectively labeled 20, 40 and 80 meters and covered 30 through 3 MHz with the specified bandset capacitors. The Meissner Co. made optional coil sets to expand the low frequency end of this tuning range down to 540 kHz. Complete coil kits including the IF transformers, BFO coil and RF chokes were available in the Meissner Products catalogs through 1938. The basic circuit architecture was similar to many communications receivers of that time but with one advanced feature. This was the use of the then recently introduced 2A7 converter tube as combined local oscillator and mixer, whereas most other communications receivers at that time used separate tubes for the local oscillator and mixer functions. Typical examples were a 56 triode or triode connected 58 as local oscillator working into a 57 or 58 pentode mixer. The IF stages used the somewhat odd-ball frequency of 370 kHz, a not all that uncommon frequency at the time, but quite uncommon now. Overall gain was controlled by varying the cathode bias on the two 58 IF amplifier tubes with a panel mounted potentiometer. Although actually an IF gain control, this control was labeled Volume. There was no gain control in the audio circuits. Transformer coupling was used between the 56 power detector tube and the 2A5 power output tube, all the better to sell more Thordarson transformers. The set had no RF amplifier stage and initially, no BFO. When included, the BFO had no pitch control but only an on/off toggle switch. Several other items that one might normally expect to find in a communications receiver were also omitted including AGC, tuning indicator or S-meter, an RF

amplifier stage, and any sort of narrow-band filter. No doubt these omissions were in keeping with the general goals of the design which were simplicity, ease of construction and low cost (again, keep in mind that the depression was happening). However there was a simple tone control. I suspect this was included merely to balance out the symmetry of the front panel layout. The first few degrees of its rotation serve to actuate the power on/off switch. A feature common to receivers of the time and incorporated in the All-Star design was the use of the field coil of the "dynamic" loud speaker as one of the filter chokes of the power supply. The speaker itself was to be housed in a separate cabinet along with a transformer to match it to the 2A5 audio output tube.

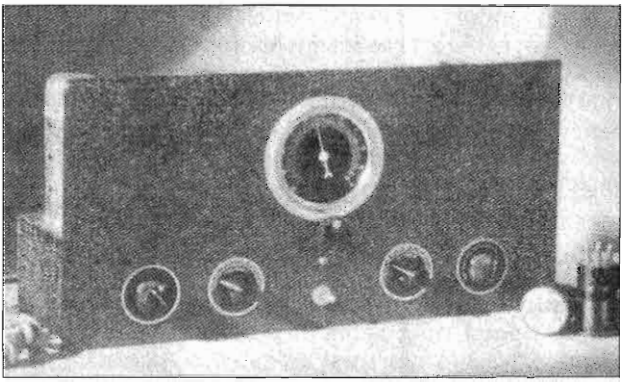

Figure 4: Front view of All-Star Junior. Controls from left to right are; rotary Local/Distance switch, Local Oscillator Bandset, BFO On/Off toggle switch, Antenna Bandset, and IF Gain/ Power On-Off switch. Bandspread dial in center above BFO switch. Black wrinkle finish on the Junior replaces unpainted "Eraydo" chassis and panel of the Senior, and bandspread dial bezel is now chrome instead of black.

Operation

One of the claims made for the receiver was ease of operation. However, it appears to me that this was more hype than reality although the procedure for tuning the All-Star was used in many other communications receivers of that period. This involved first inserting two plug-in coils for the desired band (after extracting the coils for the previous band) and then adjusting three variable capacitors. First, the local oscillator band-set capacitor had to be set to the desired spot in the band. Although this control was the most critical one for calibration and logging purposes, it was just a knob with an uncalibrated 0 to 100 dial scale over 180 degrees of rotation and no vernier drive. Next, the antenna band-set capacitor was tuned for maximum signal (or noise) and with these two tuning controls set, the main dial tuning knob, which functioned as a bandspread control, was adjusted as required. This setup avoided the whole problem of accurate tracking between the antenna coil and the oscillator coil by having the user tune them separately. However it would seem to be a difficult proposition to achieve repeatability of readings on the band-spread dial due to the requirement for critical tuning of the local oscillator band-set capacitor. Nevertheless, the low cost and ease of construction must have made this receiver appealing to Hams and SWLs. The 1935 *Thordarson Transmitter Guide* claims that over 6000 All-Star receivers had been built at the time of its publication.

The All-Star Junior

This radio was introduced in the January 1935 issue of *Service* magazine and subsequently in the March 1935 issue of *Radio Craft*. As one might expect, these issues and subsequent issues contained advertisements for the applicable kits. The basic facts concerning the All-Star Junior are the same as the original All-Star except that its chassis and panel had a black wrinkle-paint

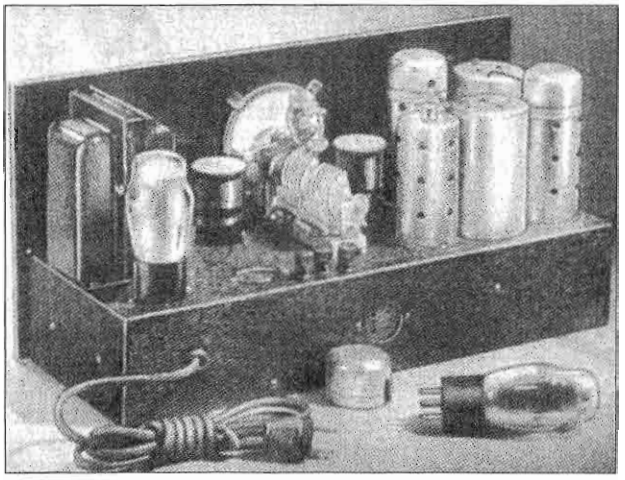

Figure 5: Rear view of All-Star Junior. Note IF transformers are shorter, larger in diameter and have standard screwdriver adjusted trimmers. Antenna and ground connections have migrated from back to top of chassis. In this photo, the 42 audio amplifier tube has been removed to allow viewing the antenna plug-in coil.

finish, its tuning dial bezel had a chrome finish, and there were certain physical and circuit differences. Some versions of the dial and knob kit from the Crowe Nameplate Co. included a wood cabinet. Circuit differences were; BFO as standard equipment, the use of 6.3-Volt tubes, and two fewer tubes as compared to the Senior with BFO. This was due to the use of one two-section tube and higher gain IF transformers that allowed eliminating one of the Senior's IF transformers, its separate BFO tube and one of its IF amplifier tubes. The Junior's tube lineup was: 6A7 converter, 6F7 IF amplifier and BFO, 77 detector, 42 audio power amplifier and 80 rectifier. Also, the Junior dispensed with the tone control of the Senior and replaced it with a rotary switch labeled LOCAL-DISTANCE. This changed the gain of the 6A7 converter tube by switching, in or out, an extra cathode bias resistor. The power on/off switch was moved from the, now missing, tone control and placed on the IF gain control. The plug-in coils for the Junior spanned the full range from 540 kHz through 30 MHz in six bands. I have not found any figures on the number of All-Star Junior receivers built. However, at the present time, more of the Juniors seem to turn up at swap meets, Ham fests and on eBay than the Seniors. The 1935 Federated Purchaser mail order catalog listed all the various kits required to build the Junior both individually and as a complete package deal at $26.37 less tubes and speaker. The 1935 Spokane Radio Co. catalog listed the complete Junior package deal at $33.85 including tubes and speaker.

All-Star 3rd Version

This All-Star version could be made by modifying an All-Star Junior for "single-signal reception" with a kit of parts made available for $2.25 by Leeds Radio of New York City, a place I visited often as a teenager. I have not found any definitive data on this third All-Star version other than a Leeds Radio ad from the April 1935 issue of QST.

Selected References

Cockaday, Laurence M. All-Star *All-Wave Receiver* (introductory story with photos and schematic diagram). Radio News, September 1934, Pp. 146. All-Star ads by mail order firms: Allied Radio, Chicago Radio Apparatus Co., Newark, NJ, Walter Ash, and All-Star component manufacturers, pg. 188, 189, 190, 191.

The All-Star Junior (write up, photos and schematic diagram). Service, January 1935, pg. 9; Advertisement pg. 42.

A more complete list is available from the author by email request.

ER

The AM Broadcast Transmitter Log

Part 11, The DX-100 *Broadcast* Transmitter

By David Kuraner, K2DK
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Up to now we have described how to convert surplus AM broadcast transmitters for Ham band use. Now we "turn the table" and show how the commercial AM broadcasters have used surplus Ham rigs. There are several Ham rigs known to be in this service. We are not about to convert Ham rigs to AM broadcast. We are going to show how to bring the DX-100 up to broadcast standards. Let's face it; not everyone can have over one thousand pounds of rig in the shack. But, we can make it sound like you do!

Two of the classic large and heavy amateur transmitters from the 1950s are the Viking II and DX-100. They are quite popular with classic AMers. Both are heavy and weigh in at 70 and 100 pounds respectively. Surely these classics are the inspiration for the term "boat anchor."

Both used heavy duty overrated components with similar designs. Because the modulation transformers can pass full-spectrum audio, the audio sections can be greatly improved with numerous modifications. By doing these mods, you can achieve true broadcast quality audio. So, if you can't find or don't have room for a big broadcast transmitter, with these mods you can have the same sound at lower power.

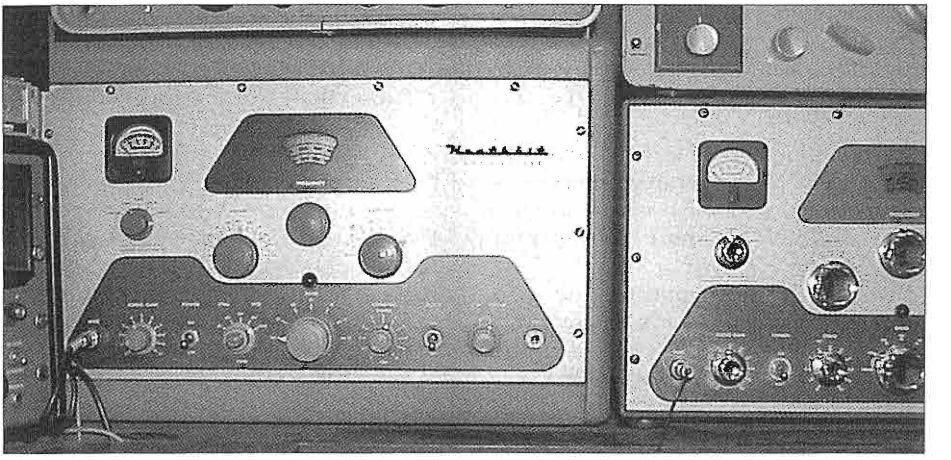
I once did an A/B comparison between my Collins 20V-2 broadcast transmitter and a modified DX-100. Using the same professional audio processing equipment, no one could tell the difference except for the signal level. These rigs are so good that often I have people comment that the BC rig is sounding good tonight, when I'm on a DX-100.

ER #24, April 1991, featured a broadcast station in South America that used a Viking II supplied by Barry Wiseman, N6CSW. Broadcast Engineering Magazine showed a Viking II being used on the top end of the AM broadcast band back in the 1960s. Ham radio "obsolete surplus" was actually finding its way into commercial service. And, just to reinforce the Viking II's overkill components, 25 years ago with a damaged modulation transformer (a rarity) I used one as the basis for a parallel 811A linear amplifier. The tank circuit and high voltage power supply components were loafing.

E.F. Johnson records indicate that over 17,000 Vikings were sold either as kits or wired. While the Vikings sold for about $250, the DX-100 kits sold for $189 so it can be assumed that there were more Heathkits sold. The Vikings came out in the early 1950s while the DX-100 first appeared in 1955. Because they are similar, and the Heathkit was the later entry, surely Heath borrowed ideas from the Viking but made significant feature enhancements.

They were supposed to be affordable by the average Ham. Compared to the other commercial rigs available in the medium power range of 100 watts they were bargains, but hardly inexpensive. Perhaps the reason that so many survive is due to the fact that the cost may have been a month's salary back in the fifties. Somewhere between $2,500 and $4000 in today's currency is about right and reason enough not to scrap this equipment even when made obsolete by advancing technology.

Over the years, I have had close to a dozen DX-100s or DX-100Bs come through my hands. An "A" model was never marketed. I currently own four



The DX-100 is the transmitter on the left, and a DX-100B (with the chrome Apache knobs) is on the right. The cabinet on the DX-100 is 2 inches taller. The drive control is the small knob overlaid on the crystal/VFO selector switch, third control to the right of the mic jack. This switch is internal on the B model.

working transmitters and one parts rig. Each one is unique with its own story. The first was purchased with the full audio treatment performed by Ray Perez, WD2AFJ. The second was a DX-100B with the gray knobs replaced by chrome Apache knobs. It really looks sharp. This one had the panel buffered to a high gloss and the chassis was chrome plated.

Number three was going to be the parts rig. Looking sad and without a cabinet, it said "buy me." Well, it cleaned up and fired up, so there went the parts rig, and now I needed a cabinet. A little over a year later, I found an ad in ER for a DX-100 parts rig with a cabinet and it was local. Same thing! It cleaned up beautifully and with a little work, also fired up. Now I had four working rigs and three cabinets.

Finally I ran into a friend with another DX-100 with the cabinet for parts. This one was definitely for parts as the tubes and meter were gone. I pulled a few things off for the other rigs. This is how the herd increases, and each one has its own personality.

Finally, I must recount the story of the DX-100B laying on its side in the grass at a hamfest for $20. Those days are long gone!

What is a DX-100?

To start with, it is probably one of the most popular kits made by Heath and rocketed them forward with enough capital to produce the many fine products they eventually offered to the radio amateur. Did I say it is big and heavy? The steel cabinet alone weighs 25 pounds. The steel chassis with all components is 75 pounds. It's roughly 21 inches wide, 14 inches high and 16 inches deep. Most cabinets are simply not deep enough to accommodate the chassis. The shipping weight was listed at 107 pounds. (Heath had a network of dealers and factory stores so, unlike today, shipping may not have been a major expense.) The DX-100B reduced the cabinet weight by about 15 pounds. Its 2 inches shorter and has a trap door on top which facilitates tube and crystal changes.

Electrically, they use parallel 6146s in the RF final with war surplus 1625s (12-volt version of the 807) as modulators. Heath was known for using WWII-surplus components. The 6146 was new, having been introduced about 1952. They most likely had chosen this tube because, as the DX-100 was being designed, E.F.

Johnson changed from a 4D32 to the 6146 when they went from the Viking I to the Viking II model. It's interesting to ponder over Heath's fortunes if they had chose to use the war surplus tubes in the final RF final stage. The 6146 became a mainstay for Heathkit transmitters in the following decades and became a de facto standard even for the early Japanese equipment.

The DX-100 incorporates the VF-1 VFO. The Vikings needed a separate unit. The DX-100 included 4 internal crystal positions which could only be changed by removing the chassis from the cabinet. The '100B has only one internal crystal position, but the trap door makes it easy to change. The improved 100B only matches 50 to 75 ohms. The '100 used a stepping switch to cut in or remove fixed capacitors in the loading circuit and then a 250-pf variable for fine adjustment as did the Viking. The original '100 matches 50 to 600 ohms. The '100B just uses a large, geared, three-section variable capacitor totaling about 1200 pf or so. Heath thought that this was so great that they offered a retrofit kit to owners of the original DX-100s. Many were so modified, forfeiting the greater antenna impedance matching ability. But, it did eliminate any arcing at the loading switch.

When the DX-100B was introduced in 1958, SSB was just getting started, so they placed two cutout holes for SO-239 panel connectors. This permitted a no-hole modification to attach their SB-10 side band generator. You effectively turned the DX-100B into a linear amplifier when using this adapter. E. F. Johnson did this with at least one of their premium transmitters, the Viking 500.

The '100s had plenty of audio —up to 120 watts—which could be used to drive a higher-power modulator for that 1-kW rig, while the RF section excited the high-power RF stage. The only bad feature was the restricted audio range. They intentionally used very small interstage coupling capacitors to reduce low frequency response and a low-pass filter made with a capacitor and the modulation transformer restricted the highs.

What May Need to be Fixed

Rather than go into detail about every DX-100 I—or any one else—ever had to repair, I'll describe what you can expect based on my own experiences. The reward for the ultimate DX-100 repair goes to Frank Esposito (KB3AHE) when he completely reworked one that shot up in flames. What follows is not quite that radical and much of it is applicable to many transmitters of this vintage.

Let's start with the "Happy Wanderer," the VFO that starts on one frequency and changes 1 kHz with the first 10 seconds and tests the band pass of the other guy's receiver as it slides up and down 5 kHz and never settles. They just chase you up and down during an old buzzard transmission. The standard cure for a wandering VFO was to replace the silver mica caps in the oscillator circuit using temperature compensation to minimize drifting. Unfortunately, selecting the compensating components can be frustrating and time consuming, but it can be done with patience. I was prepared to do all this to tame this thing, but the cure was much simpler.

I began to realize that this may be a voltage problem, so I checked the VR tube. It was good. The 6AU6 VFO oscillator checked good on the tube tester, but when a new one was popped into the socket, the Happy Wanderer stayed home.

Electrolytic Capacitors

Be prepared to change them. Sometimes you can get away without it, but I ran into a few cases where it had to be done. Many people just change them regardless, which is the best long term approach. One suggested modification is to replace the HV caps with significantly greater value.

Switch Contacts

Spray them with Caig DeOxit®. Also, be prepared to change the power switch or the plate toggle switch. I had one appear to be good but shorted the hot

lead to chassis ground. It's just a little disconcerting as sparks fly and you're holding the handle.

Should you retain the existing AC plug or change to a modern three-conductor grounded line cord? Different thoughts exist on this subject as to whether to keep the unit original or modernize it, bringing it up to modern safety standards. I'm split on this issue, and two have been changed while two remain original. The two that were changed clearly needed new line cords, and that left the issue of where to place a fuse. Fortunately, there are vent holes near the low-voltage supply that will accommodate a twist-cap, panel-mount fuse holder. The only drawback is that if the fuse goes bye-bye, on the DX-100, you will have to take the chassis out of the cabinet to change it. I had one strange experience where the short occurred before the fuse and the panel box breaker tripped. The fuse never did blow and I could not track down the point of the short. It never happened again, and I made sure nothing could possibly cause a repeat. Still, I wonder why it happened, and I am grateful for panel circuit breakers.

Check for a misadjusted clamp-tube pot. Some people will turn the pot down, reducing the output to drive an amplifier. The rig may only put out a few watts and not load properly. Also, I found one bad 5R4. The second one was doing all the work.

One "fix" people like to do is to replace the rotary meter switch with a non-shorting one. For some reason, Heath provided a shorting-type switch with the kit, and when you move positions while in transmit, at best you transmit a pop. At worst, you inadvertently connect two circuits that were never meant to be interfaced. One rig protested by blowing the fuse I just installed. So either replace it or, for insurance, cut the plate switch before moving the meter switch.

Erratic Loading

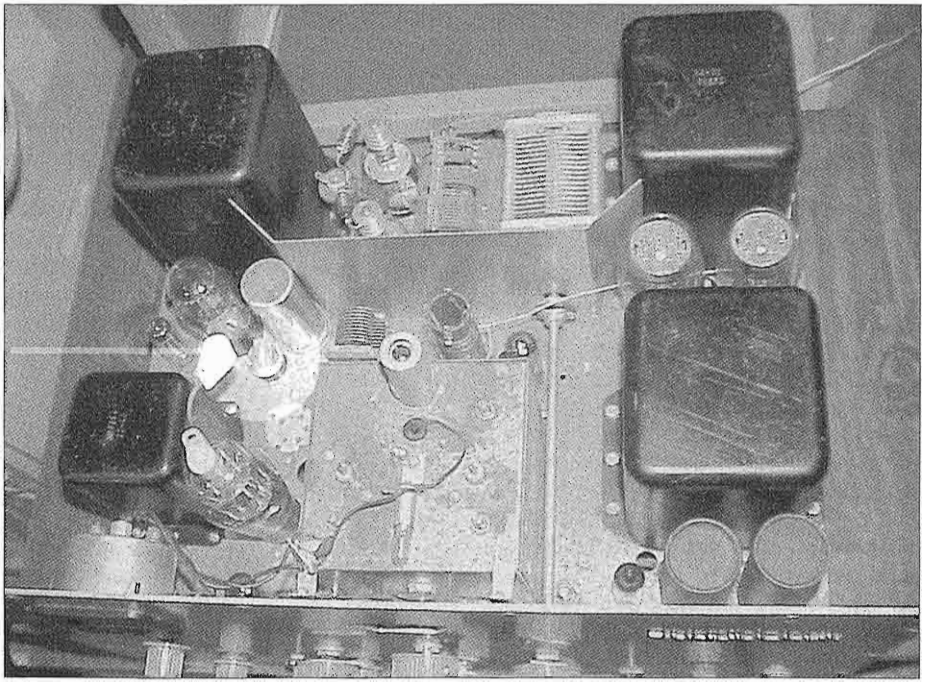
Should you make the modification to replace the stepped loading control with the continuous loading variable capacitor? It's a hard call on this one, especially if you need to match a wide range of antenna impedances. When my antennas were damaged by a wind storm in mid-January 2006, I took advantage of the flexibility of the matching network. One rig's step switch was erratic, so a three-section variable was placed in with the stepped switch. All but one fixed capacitor was removed. It became confusing as to whether the fixed cap was in the circuit and I didn't care for the way it operated.

I eventually did the Heath modification by removing the loading capacitor from the parts rig, but was not happy with the range of matching, even into a dummy load. I added capacitance to the loading with fixed caps. This seemed to give a much better range for 160 through 40 meters. It disabled 20 through 10 meters, but at this moment in the current sunspot cycle, this is no great loss and I have plenty of other rigs to cover those bands.

VFO Calibration

Well, usually it's adequate, but if needed, be patient. I always prefer to see a digital readout into a frequency counter. Now, if you try to take a sample off the air with modulation, you just see meaningless digits as the transmitter is modulated. A far better way is to take the frequency sample from the low-power stages. This way, when you place the switch in the CW position, you can both zero beat and see a direct readout of the frequency. Simply wrap one turn of wire around the driver coil and work it out of the cabinet. Route the wire under the chassis and leave off one of the rear screws securing the chassis to the cabinet so the wire can protrude through its hole. This gives you more signal into the receiver when you zero beat. Just by wrapping another wire around the protruding one which then feeds the frequency counter, you get enough signal to get a good stable frequency display without interference from the modulation.

Is the meter telling the truth? After



Top interior view of the DX-100. A modulator tube is removed to view the fuse holder between the LV rectifier and filter capacitor in the highlighted area. The wire loop for the frequency counter is leading away from the driver coil toward the HV rectifiers and out the back of the chassis. Discoloration is common with the DX-100 chassis. Notice the vacant tube socket. The original modulators were WWII war surplus 807s. It's a five pin socket, and I think this is original.

fifty years, resistors can go out of tolerance and shunt resistors are no exception. In one case, the only way to get 100 watts out was to load up to 300 mA. Normal loading is 250 mA. I was confident that the finals were good since the modulation was 100% and not distorted. You could replace the resistor with one from a parts rig, but that component is also 50 years old. The only way to really know is to break the plate or cathode line and insert a known-good meter. Suspect an errant meter reading if the plate transformer is groaning and the meter is showing only 100 mA, and likewise if the meter is pinned and the transformer is quiet with low output. Faulty meter readings lead to the question of poor, or no grid drive. Is it the meter or for real? If it's for real, usually the cure is a shot of cleaner on the drive pot control and the crystal/VFO switch. The manual suggests setting the drive at 5 mA. I prefer to use 6 mA. And, when initially tuning, I will set it at 7. When the plate is on, it usually drops below 6.

Controlling the DX-100

One of the best methods for PTT control was given by Martin Heiman (K7BDY) in ER #24, April 1991. A variation is reproduced in **Figure 1**. It basically uses a low-voltage relay to control the plate-on function and the key line from the accessory socket. I modified this by using a 12-volt coax relay with additional contacts. The coax relay controls the plate transformer's primary and the key line. An additional relay is needed to control muting the receiver. (Occasionally the contacts associated with the key line need

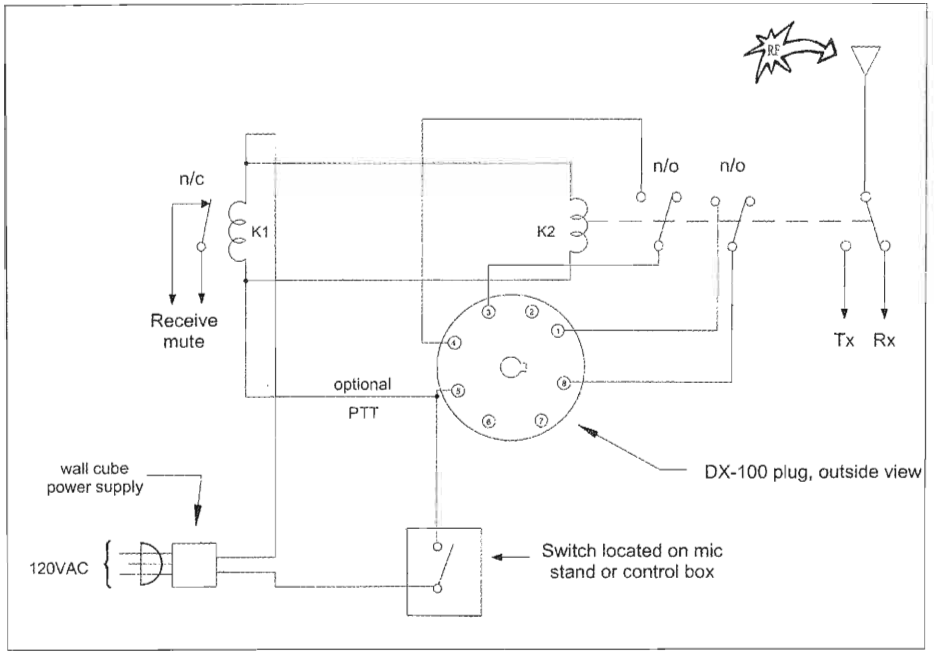


Figure 1: Recommended PTT control circuit for the DX-100. Relays shown above are 12-volt types powered by the wall cube.

cleaning. The HV would come on but not the carrier.)

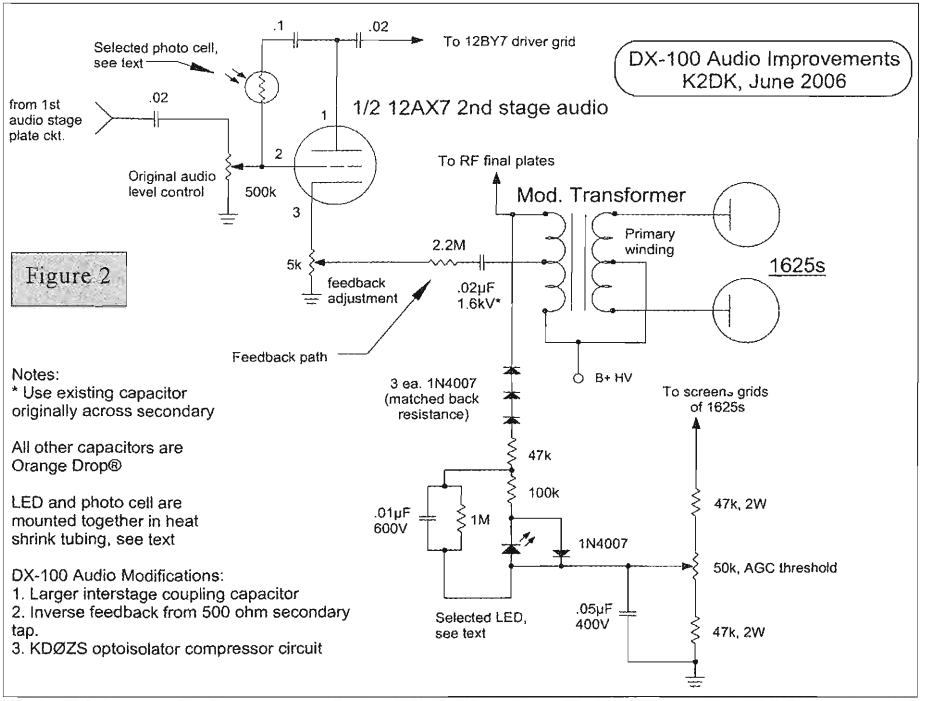
To obtain the voltage for the relays, I found it expedient to use a wall cube power supply. The PTT line comes to a switch located on a modified stand for a desk mike, or at a control box mounted under the top surface of the operating desk. Using this box, I control the PTT lines for up to six transmitters. You could also fabricate an adaptor for a mike already having the PTT function which would separate the control and audio. I prefer not to modify the front panel to accept a 1/4-inch phone plug although that is also an option. Pin 5 on the accessory socket is vacant and can be used for the PTT line brought out to the relays.

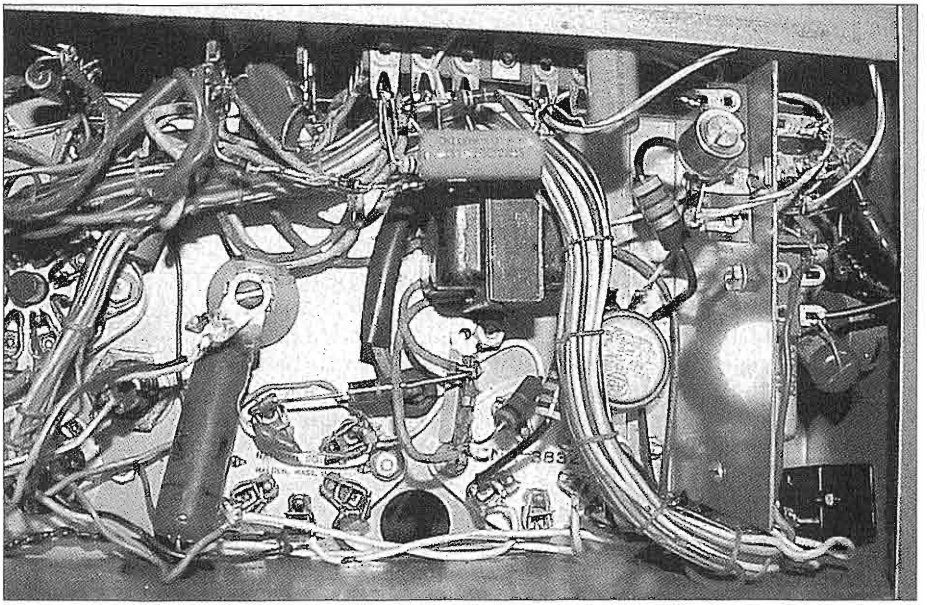
The Audio Modifications

There are numerous modifications which can be made and posted on the Internet. The simplest and absolutely essential mod is to "fatten up" the audio interstage coupling capacitors. The original ones are 500 pf. Just place a .01 to .05 µF in parallel to get low-end bass response. If you do nothing else, do this. To get a better high end response, remove the .02 µF capacitor on the modulation transformer's secondary. This is the low pass filter consisting of the capacitor and the modulation transformer's winding inductance on the secondary.

If you are using a high-impedance crystal mike, change the 470-k resistor on the grid of the first audio stage to 5-10 Megohm. A 100-pf capacitor is suggested across this resistor for RF insurance. These first three changes will make a vast improvement in the audio response. Dismount the audio shield and tie-point posts to make it easier to reach these components.

One of the design trade-offs in the 1625 stage is the screen voltage. The tubes want to see about 300 volts here, but they are fed from the HV power supply's voltage divider resistors. Thus, half of the plate voltage is on the screen, which is about 350 to 400 volts. The screen draws between 5 and 10 mA. So, just adding a dropping resistor will have the voltage





The DX-100 modulator section showing the added fuse (lower left) and feedback components (upper left and right). Dismount the audio shield for easier access to all components. This unit was modified for 807s; note the 5-pin sockets. The 1625 uses a 7-pin socket.

changing, which defeats the purpose of trying to get less distortion by dropping the screen voltage. The way people have done this is to also use two 0A2 voltage regulators. Many feel that this modification is just as important as the fatter coupling capacitors.

Implementing negative feed back really gets you into the broadcast transmitter realm. One way to accomplish this is to connect the .02µF, 1.6-kV capacitor previously removed to the 500-ohm tap of the modulation transformer. The other end goes to a 2.2-Meg resistor. Next remove the 4.7 k and 2-µF capacitor from pin 3 of the 12AX7 audio stage (cathode of second section). Replace this with a 5-k pot and connect the other end of the 2.2-Meg resistor to the wiper. You will now have a degenerative feedback loop from the modulators to the second audio amplifier. Adjust the 5-k pot for the desired amount of feedback and expect the audio input voltage requirements to increase as more feedback is used.

I compared one having just the screen grid voltage regulation modification with one using only the feedback modification. Each one appeared to have identical audio characteristics and really sounded great! I concluded that either modification will do the job and that incorporating both would be redundant. My preference would be for the feedback as that is easier and cheaper.

And, one last modification to really do this right is to include Chuck Felton's optoisolator compressor as described in ER #203 and #204 [see page 61]. In my version, the neon bulb circuit and the clipper are not used and a few minor component changes were made. See the original article for details about the selected photo cell and LED combination. With a simple crystal mike element, I defy anyone to tell the difference between this DX-100 and a full-blown broadcast rig and professional audio chain. See **Figure 2** for my as-built incorporation of this compressor into the DX-100 audio stages. If, for some reason the feedback is positive, try switching the plate leads of the modulator tubes.

There are many more tortures you can inflict on the audio section and the transmitter, but these are the best of the lot and produce "the most bang for the buck." We have plenty of other mods and variations to choose from, but now you definitely enter the diminishing returns zone.

Lastly is the modification people suggest of going to solid-state rectifiers. If you must, remember that the power supplies are designed for the inherent voltage drop in hollow-state rectifiers. Going solid state will boost the voltage of the supplies. To compensate, rewire the filter as a choke input, which then reduces the voltage. Use highly overrated diodes if you go down this path as you have now introduced another problem. Choke input with solid state diodes can be deadly when power is shut down and the field collapses, sending a back EMF to the diodes. A .02-µf capacitor and a 300 to 500-ohm, 2-watt resistor across the chokes is suggested to dissipate these transients.

The HV is going to be a problem since it already is choke input. You just may have to run it at the higher voltage at the risk of pushing the limit. Consider a fan or blower here. And all these mods can be applied to many vintage rigs.

Conclusion

There is great pleasure in restoring and operating a classic. It's even better to receive great audio reports with a piece of equipment that you put time and effort into. The guy on the other end can not see how much you polished or chrome plated it. He can only hear it and judge your efforts on that alone. If you expend the effort to have it produce broadcast quality audio, it "shows" as pristine on the Ham bands regardless of its true condition.

Next month we get back to broadcast transmitters that originally started out as broadcast transmitters!

ER

The Central Electronics 20A Exciter and L.W. Mabbot, a Man of Mystery

By James "JeRB" Buchanan, K8WPI
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Kalamazoo, MI 49009
Oldbugger@earthlink.net

The Central Electronics 20A multi-phase exciter is a true technological breakthrough in radio. This, the first commercially made band switching SSB transmitter, was released in 1954. A small, light weight unit, it embodied the ultimate technology available. Offering SSB, AM, CW, and PM operation from 1.8-30 MHz, it was a very capable radio and lead the way for other manufacturers who would eventually place the new technology in the hands of Hams and others, but at much greater expense and bulk. This is the story of CE-20A, serial number 2, and L.W. Mabbott, man of mystery: a radio drama in far too many acts.

Cast of Characters
(and they certainly are!)

- Tim Martin, WA1RGS, West Ira, VT
- Jay Martin, KA7LRK, Englewood, CO, Los Angeles, CA, Exeter, NH.
- JeRB, K8WPI, Kalamazoo, MI
- David Watt, WA8TT, retired to the first call district, Old Mystic, CT

Late 2003

"Hi, JeRB. Tim. Jay has a bunch of radio gear in his basement and is cleaning out the house for a move to California. Should he dump it or do we want it?"

"What is it?"

"Don't know; he didn't say other than it is heavy, really heavy. He thinks a transmitter or two and a couple of receivers, maybe some miscellaneous parts or parts required to make the stuff work."

"Well, is it his old radio gear?"

"No, it's stuff his neighbor deposited on the back porch when he moved away, saying he didn't want to move it."

"Oh! I think it would be wrong to trash it without knowing what it is. If it is a simple matter of giving him the word, I say keep it."

"Ok, I'll tell him to hold onto it."

Spring 2004

"JeRB, Jay has a new position in New Hampshire. What do we want to do with the radios he's been sitting on?"

"Don't know; what are they?"

"Still don't know, but they're really heavy. He says he doesn't trust the movers, so he will put them in the back of his pickup and drive them to New Hampshire, then bring the lot over here when he gets a chance. It will hold down the floor in the shop until you come out this summer and take it with you for whatever it needs."

"Gee, too bad we can't get better coordinated, you can't get from Denver to New Hampshire without driving past Michigan, within 60 miles of my house, I could meet him and we could save a few thousand miles of travel."

"That won't happen; just put a pickup on your itinerary for this summer's swing through the east, OK?"

"OK, let me know how much room I need to leave in the back of my wagon after you check the inventory."

A Bit Later

"Jerb, the pile for Michigan includes an NC-300, CE-20A, actually two of them, some sort of converted military transmitter, and a CE-600L, boy that one is heavy."

"Ooh...I don't think I can come up with that much space. I have stuff, including furniture, to take to our daughter on Long Island, and a box of antennas and parts for David in Connecticut. We have to stop at David's and see their new house and put up antennas for him. Karen has promised us a great dinner, even if David cooks it, and it's just across the Sound from Long

Island, so we have no excuse for not showing up."

"Well, whatever you can fit will be fine; it ain't goin' anywhere."

Even Later

"Yo! Timmy, here's the plan. We will stop in Rutland on the return trip, that way everything will be off-loaded and I'll have as much room and weight capacity as possible. Plan on us in July; we will be on the Island for the 4Th, take the ferry over to Old Mystic probably on the 6Th for a day or two, then head your way—best guess, the 8Th."

Early July at Tim's, West Ira, Vermont

"Wow, that 300 is the nicest one I've ever seen, and that 20A is just like new; the 600L is also very nice."

"Don't forget the second 20A; it sort of looks like a junker though, and then what do you suppose all of this other stuff is?"

"I don't know what it is all about. Here's the deal, I would really like to take the 300, but I've done at least three of them already, so it stays—maybe on the next trip. I've always wanted to play with a 20A, although I had no interest in them when I was younger, and let's face it, it's not known as a CW rig. It does hold a spot in history and is an engineering feat, so I'll take it. The 600L is just such a classic piece, I'll take it, too."

"Boy, this 20A has parts missing and stuff just sitting inside."

"Yeah, that one stays here; it's for parts if I need them. You can ship it or anything out of it by mail, it won't matter if it gets bunged up."

"You still have just a bit of room left, and you're not quite on the axle yet, so stick these transformers and whatever this stuff is in that corner over there."

"OK, Tim. It's been great. See you on 40, or the phone, or whatever; I'll be in touch."

"Bye, JeRB, Pam."

Mid August

"Hey, JeRB, Jay sent the manuals over, I'll get them off to you tomorrow, and there is a little surprise in the package for you."

"Thanks, I'll wait by the mailbox."

A Few Days Later

A package from Vermont arrived, and I took it to the front porch for an evening's reading. Upon opening the large envelope, I found quite a collection of manuals. There was a manual for the 600L—pretty straightforward. Also, there was a very rough, almost homemade looking manual for the 20A. The binder had a typical-for-the-era cutout, and there was a piece of yellow paper as the first page, lettered by hand using a template with "Multi Phase Exciter Model 20A" visible through the window. The binding did not use the 3-hole internal tabs provided, but was stapled together with no less than 8 staples. The window cutout was reinforced with tape. Behind the cover page were very poorly mimeographed pages of text and the requisite schematic, all on yellow paper, not yellow with age, but actual canary paper.

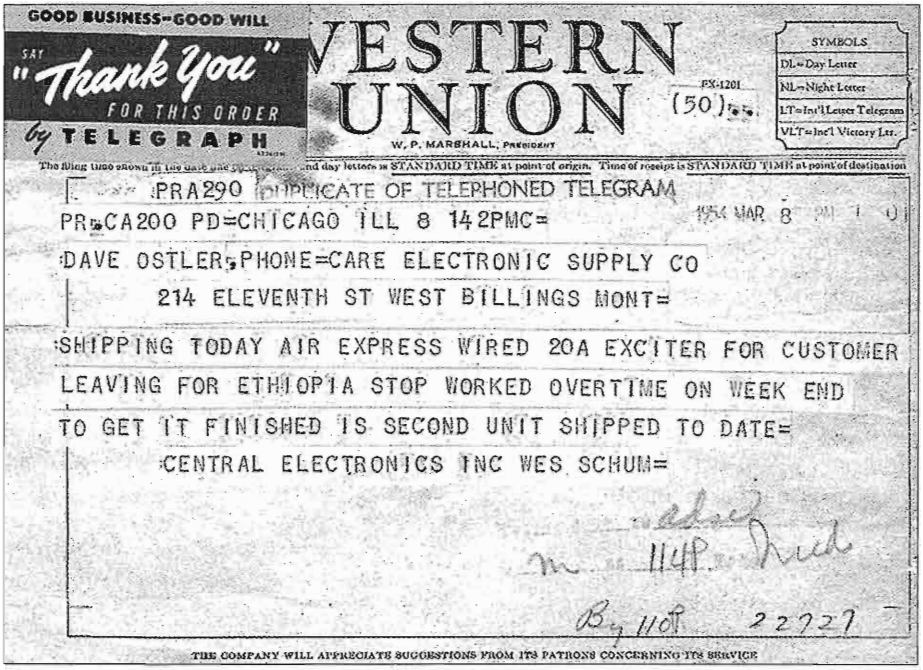
Behind this manual was another manual, a bit more professionally made, but in the same style. Instead of a cutout, this manual had an embossed front with a label indicating the equipment. The remainder of the manual was about like the first, but on white paper, and it seemed more professional, less homemade.

I started combing through the rougher manual, page by page, and near the end of the manual I encountered an original telegram addressed to:

Dave Ostler
Electronic Supply Co.
214 Eleventh St. West.
Billings, MT

"Cool," I said to myself, musing at this artifact dated March 8, 1954 at 1:10PM. The text read:

"SHIPPING TODAY AIR EXPRESS WIRED 20A EXCITER FOR CUSTOMER LEAVING FOR ETHIOPIA STOP WORKED OVERTIME ON WEEK END TO GET IT FINISHED IS SECOND UNIT SHIPPED TO DATE=CENTRAL


GOOD BUSINESS—GOOD WILL
SAY "Thank You" FOR THIS ORDER BY TELEGRAPH
WESTERN UNION
W. P. MARSHALL, PRESIDENT
SYMBOLS
DL=Day Letter
NL=Night Letter
LT=Int'l Letter Telegram
VLT=Int'l Victory Ltr.
PRA290 DUPLICATE OF TELEPHONED TELEGRAM
PR CA200 PD=CHICAGO ILL 8 142PMC=
1954 MAR 8
DAVE OSTLER PHONE=CARE ELECTRONIC SUPPLY CO
214 ELEVENTH ST WEST BILLINGS MONT=
SHIPPING TODAY AIR EXPRESS WIRED 20A EXCITER FOR CUSTOMER
LEAVING FOR ETHIOPIA STOP WORKED OVERTIME ON WEEK END
TO GET IT FINISHED IS SECOND UNIT SHIPPED TO DATE=
CENTRAL ELECTRONICS INC WES SCHUM=
THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

The 1954 telegram from Wes Schum confirming shipment of the 20A to Ethopia.

ELECTRONICS INC=WES SCHUM"

The date on the manual is March 17, 1954, a week after the telegram indicated shipment of the rig. Evidently the "hand made" manual was made after the radio, and caught up with the rig at the dealer. Freight travel was not quick in the early '50s, the manual could easily have beat the radio to Billings. Now that is WAY COOL!

Stapled behind the telegram was an invoice dated November 22, 1954, from Central Electronics, Chicago, IL, for a BC-458 VFO conversion kit and a QT-1 anti-trip unit. The "sold to" field was completed with:

L.W.Mabbott
U.S.O.M.
C/O U.S. Embassy
Addis Ababa, Ethiopia

Holy Cow! What's going on here? The phone rang.

"JeRB, so what do you think?"

"Well, Tim, I know what you mean by a surprise, but it wasn't at all what I was expecting ... I thought maybe a block of maple sugar or something."

"Yeah, I thought that would get your motor running. So, did you confirm the radio?"

"No, I was just reading the manuals; let me head to the radio room and look... Oh, my God, it is serial number 2! Boy, this rig is so clean, it could pass for leaving the factory last month, not 50 years ago, and considering it's been around the world, it's amazing!"

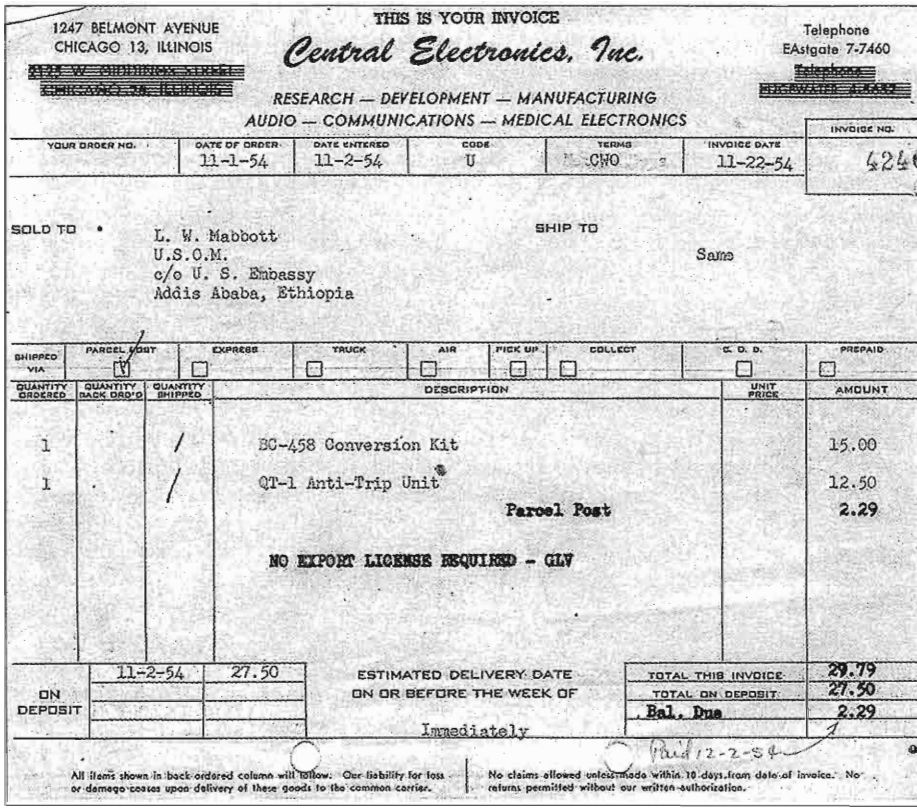
Just as impressive is that the rig and all manuals have remained in good condition and haven't been separated after all these years.

"So, what do you suppose Mabbott was doing in Ethiopia?"

"I haven't a clue, but I'll start to track him down and see what we can learn. Film at eleven."

The Mystery Begins

And so began the quest for knowledge and the beginning of the intrigue, if not mystery. I wouldn't say that we got carried



1247 BELMONT AVENUE
CHICAGO 13, ILLINOIS

THIS IS YOUR INVOICE

Central Electronics, Inc.

RESEARCH — DEVELOPMENT — MANUFACTURING
AUDIO — COMMUNICATIONS — MEDICAL ELECTRONICS

Telephone
EAstgate 7-7460

YOUR ORDER NO.	DATE OF ORDER	DATE ENTERED	CODE	TERMS	INVOICE DATE	INVOICE NO.
	11-1-54	11-2-54	U	CWO	11-22-54	4246

SOLD TO
L. W. Mabbott
U.S.O.M.
c/o U. S. Embassy
Addis Ababa, Ethiopia

SHIP TO
Same

SHIPPED VIA	PARCEL POST	EXPRESS	TRUCK	AIR	PICK UP	COLLECT	C. O. D.	PREPAID
	☑	☐	☐	☐	☐	☐	☐	☐

QUANTITY ORDERED	QUANTITY BACK ORD'D	QUANTITY SHIPPED	DESCRIPTION	UNIT PRICE	AMOUNT
1		1	BC-458 Conversion Kit		15.00
1		1	QT-1 Anti-Trip Unit		12.50
			Parcel Post		2.29
			NO EXPORT LICENSE REQUIRED - GLV		

	11-2-54	27.50	ESTIMATED DELIVERY DATE ON OR BEFORE THE WEEK OF	TOTAL THIS INVOICE	29.79
ON DEPOSIT				TOTAL ON DEPOSIT	27.50
			Immediately	Bal. Due	2.29

Paid 12-2-54

All items shown in back ordered column will follow. Our liability for loss or damage ceases upon delivery of these goods to the common carrier.

No claims allowed unless made within 10 days from date of invoice. No returns permitted without our written authorization.

The factory order for a BC-458 VFO Conversion Kit and a QT-1 Anti-Trip Unit that was sent directly to L.W. Mabbot in Ethopia, November 1954.

away with the provenance of the rig, but I will admit even as I write this, the rig has not been powered up.

It was odd to me that there were no personal markings on the manuals. Many old manuals have become nothing more than note pads at the operating position, but not only is this one pristine, old LW never bothered to jot his name or call on it—quite odd we thought. So, we know the rig was hand built by Wes Schum, shipped to a dealer in Billings, Montana, made its way to Addis Ababa, returned to the states, and ended up in the Denver area, eventually in Jay's basement. We needed to track LW down, but how?

I took advantage of modern technology (devil Internet) and searched for the store where the radio was purchased in Billings, Montana. Jeez, oh Pete; the store is still listed in the white pages, although the address has changed by two numbers. I called the store and talked with Mr. Blain Ostler, really? I learned that his father started the radio store in the early '50s. A grocer by profession, he became so involved with Ham radio that he cordoned off a portion of the grocery store he opened in 1947 and a separate entrance accessed the electronics store. I learned a lot about Ham radio 50 years ago in Billings, but not much about Mr. Mabbott. The elder Ostler had passed on, but his widow (Blain's mother) was still working in the store part-time, I wasn't too surprised when she had no information to add. Unfortunately, I did not acquire Mr. Ostler's call sign.

Success in locating the dealer fostered false hope in tracking down Mabbott on the Internet. In any variation, he was not listed in any phone search with credibility. One listing did show his name, but it was nearly ten years old. We weren't too surprised; as it is quite possible his age would qualify him for SK status by now.

In a conversation with Tim, we concluded that LW must have lived somewhere close to Billings. In those days, you always dealt with the closest dealer. We knew he bought the radio in 1954, and let's face it, the 7th call district, although large in land, has a small population—even smaller 50 years ago. All we needed was a Callbook from the early '50s, and we could just run down the columns and find LW. We were sure that if we had his call, therefore completing his identity, we could easily find out anything we wanted about him. A call to friends on the local repeater landed such a Callbook, and I picked it up a few days later from Jim Steffey, WB8TNN. During a lazy Saturday afternoon, I took the Callbook to the back yard with a Frappuccino and a cigar. I opened the book to the seventh district and peered ahead to the end of the list. Hey! Thirty-four, double-sided, triple-column pages of no more than 6-point type? Oh man, this will take a while. Fortunately the column layout separates the state at the far right, well spaced from any call, name or address area, so I decided to limit my search to only the MT entries. Persistence paid off. I found David Ostler, W7KJS of Billings, and only twelve Montana listings later, there was W7KMF, L.W. Mabbot, not quite half way through the alphabet. The listing indicated his residence in a very small, remote village near the Idaho state line. This seemed like progress, but this guy was like a ghost, still not even a first name was garnered. We just couldn't get anything firm on him, and by now we had included web searches of any "Mabbott" and sent letters or made phone calls, but no positive response. No one seemed to know anything about L.W. Bizarre.

My next thought was to track down whoever gave the equipment to Jay; perhaps he would know something. Jay supplied Fred Fiendel (WDØCHX) as his source of equipment, so at least we didn't have to refer to him as Deep Throat. Jay believed Fred moved to New York, and that was about two years ago. A quick check of the FCC database showed Fred in Englewood, Colorado, he never filed notice of moving with the FCC! I began to walk in circles, head slumped down, mumbling. I had a few more conversations with Tim about every lead seeming to drop off the end of the world, which bothered both of us. I figured we were looking the wrong place and decided to track down LW in Ethiopia. First, what is this USOM stuff all about? I knew that '54 was a significant year for Ethiopia, as Emperor Haile Selassie was garnering great strength and aid from the USA. A Google search on "USOM" returned a home page with a familiar image of a Huey hovering over the jungle in Vietnam in 1968 and harangued the United States Operational Missions (USOM) as being nothing more than a cover for the CIA and other covert agencies. Oh, man, can this be true? Was LW a spook, and if so, how did our little 20A fit into the picture? I learned, even though the web is a highly dubious source of factual information, that in the olden days, USOM was basically a cover for putting people in countries where they didn't belong. In more modern times, USOMs are considered development missions, assisting with roads, public utilities and economic packages to desperately needy countries but still, in the '50s, they were different.

A Break, it Seems

Another month passed, and yet another check was made to the FCC database to find Mr. Fiendel. Bingo: Pawling, New York. An evening phone call connected me with Fred, who was amazed I found him. Yes, he forgot to notify the FCC of his move, and since it now must be done

on the Internet, he didn't want to get involved. He read the ARRL will perform such functions and had them do it. He contacted them only about a week earlier and was surprised the update was done so quickly. I told him I had his former radio gear from Jay Martin and asked him if he remembered where he acquired it. Quickly, he said, "From Central Radio in Denver." He reminisced about how Saturday mornings were spent at the radio store as a social event; most local Hams stopped by on Saturdays, whether for camaraderie or to make a purchase. One day, he saw the 20A with the converted BC-458 VFO; it was like new and he decided he wanted it. A new arrival, as it wasn't there the previous week, he inquired where it came from. He was told a Ham from Wyoming drove down and traded it in on a new Drake C line, paid cash for the balance and slipped out the door, never to be seen or heard of again. I asked about the 600L and the other 20A.

"I bought those at a Hamfest a few years ago. I wanted the 600L, but had to buy the 20A which obviously didn't work with the amp."

"So, how does the amp work, Fred?"

"You know, I never got around to hooking it up. It's pretty complicated with that exciter, the VFO and all of the switching, just never got around to it, that's why I gave it to Jay on my way out of town. I figured he'd get it to his brother, sell it or something; it wouldn't be my problem."

This was progress, it seemed. I now had reason to believe that LW was, at least by then, in Wyoming, but again seemed to leave no tracks behind.

Sharing my new-found wisdom with Tim; he also believed that there was far too much information, or disinformation, which didn't seem to lead to anything in particular, other than LW was possibly "not one of us." I have a friend I've known for 30 years, who was retired when we met. I decided it was time to ask him if he could learn anything about LWM for us. I was never sure where my friend worked or what he did, he was always nonresponsive to any such questions so I gave up asking about 29 years ago. He lived in the Washington DC area and seemed to know a lot of things. He agreed to "ask around" and see if he could come up with anything on LWM. I also decided to put out feelers to anyone I thought may be of help, the older the better. My source in DC, who told me he checked, found no record of LWM listed in employment records during the time in question. Again, the spook theory was at the top of our list.

Meanwhile, back in Vermont, Tim was spending his spare time on the computer in his office. He has access to high speed stuff, which is a world I've only heard of. One Saturday afternoon he called, barely able to speak English.

"JeRB, I've got him."

"Oh yeah? Tell me more."

"Well, I have a document on my computer screen, its in either Vietnamese or perhaps Cambodian, I can't read it, but I can tell you three things which don't translate into foreign languages, Lyle W Mabbott; DuBoise, Wyoming; and Volkswagen. JeRB, this thing goes on for pages and pages, I think I've hit the mother lode."

"You have to be able to find the original source document in a language we can understand, keep looking."

In a few minutes, tracking back through sub-links and additional searches, it was determined to be a translation of the article, "The Mekong, River of Terror and Hope," originally published in National Geographic, December 1968.

"OK, Tim, I'll call the library, I know I can get my hands on it."

A trip to the reference department resulted in my holding the magazine, and a quick thumb-through of the article, all 57 pages of it, showed a photo of old Lyle W., shaded by a tent in the jungle. Eureka! Now we had a name and another piece of the puzzle. A quick scan to another page also found the word

"Volkswagen," so I shelled out my week's allowance to have the entire article photocopied (research work, OK for copyrights) and headed home.

The evening Gazette contained an article from one of the national services offering additional information on the then-hot topic, casting disparaging shadows on opposing political parties as the 2004 Presidential election was just around the corner. As a draft-age kid during the Vietnam War, and literally having it affect my entire life so far, I always listened to or read what was presented in the media. The current flap was about Senator Kerry's medals while serving in Cambodia, while our President and his men had been insisting the US was not in Cambodia during 1968, when Mr. Kerry's actions supposedly took place. If it could get better, the article I was reading indicated reviewing tapes from the Nixon White House disclosed that the very person who was on the witch hunt for Kerry, was on the tape telling Nixon how we were completely immersed in Cambodia and were gathering intelligence which would, no doubt, lead to a quick end of the war. I glanced to the stack of photocopied pages beside me with the image of LWM, who was photographed in an undisclosed location near the Mekong in a 1968 issue of National Geographic and figured I'd better read the whole 57 pages right then!

The article details a plan, initiated by the United Nations and heartily endorsed by President Johnson, to assist the countries of Cambodia, Laos, Thailand, and Viet Nam by developing water management of the Mekong River and offering electrical power generation, power distribution and flood control. It seems this USOM had been going on for quite a while, and studies had been done on how American hybrid rice varieties, assisted by proper water control, could grow up to three crops per year, where presently only one crop was raised. You know, you can put a lot of information in 57 pages. Although LWM is described as being a hydraulic/geological engineer for the US Bureau of Reclamation (dams and stuff), and credited with previous work in Arizona, and on the Blue Nile, which flows through Ethiopia, I couldn't help but think that a 57-page article in National Geographic makes one heck of a cover story, perhaps offering justification why there are so many Americans in areas of the world where we are not supposed to be. I was trying to place in my mind President Johnson promoting such large scale economic and technological aid project, offering "Food, water and power on a scale to dwarf even our own Tennessee Valley Authority" to a portion of the world where he was sending so many troops and bombs. I also found very interesting comments in the article about canoeing up the Mekong to nearly the China border, which would dare not be crossed, as the river was so narrow and shallow that boats could not be turned around for a hasty exit if needed. The crews were quite concerned. Somehow, I saw Kerry's face in one of those photos! Anyway, it was becoming even more obvious that the plain and simple truth of LWM was becoming harder to establish.

The good news was, more "factual" data on LWM had been learned, or at least there were more leads to chase down, and perhaps a new direction to head. Mabbott was in Ethiopia in 1954, and by '68 he was in Vietnam and surrounds. The Mekong project had been going on for at least 3 years, the Johnson quote was from 1965. Mabbott seemed to be most recently from DuBoise, Wyoming and must have had at least professional ties to Arizona, where the article stated he sent soil and rock samples for analysis. By now, Tim and I were just begging for a photo of old LW sitting in a tent, hopefully in a jungle, with a 20A and a still undefined receiver (probably a Drake 2B; it's small, you know), either working the world or checking into headquarters.

The Mountain Sheep and Information Center of the World

I decided to continue with the DuBoise

tie while I awaited returns of inquiries to the Hydrology Department at Arizona and the BLM office in Denver. DuBoise is a beautiful little community on the east slope of the Rockies. As the Mountain Sheep Capitol of the world, it has a charm, warmth, and an isolation which I find quite appealing. It is a good place to just go hide, becoming a member of a quiet remote community. After starting at the wrong end of the spectrum (Land Office, Assessor's Office, etc.), I eventually ended up at the Senior Center in DuBoise. After explaining my interest in tracking down LWM to learn more about the man behind the radio, the manager immediately began to unfold tales of not only LWM, but his gracious and hard working bride, Maggie, who were the "nicest people you ever met." Wow, a break at last. I found someone who actually met Mabbott. Nirvana!

I was told Lyle and Maggie lived on the edge of town in a very nice home. They had no children. Lyle was "something for the Government" and traveled all over the world. Their home was like a museum of natural history and culture, filled with souvenirs from various trips. Maggie was very interested in the arts and was the cultural hub for the community. Lyle died about ten years ago, and one of Maggie's good friends moved into the house to keep her company. Eugeina lived with Maggie for a few years, but had to move to a better climate for her health; she is currently in California. Maggie passed about five years ago. There was a niece, Maggie's sister's daughter, who lives somewhere in Kansas or South Dakota, but no details were offered.

"If you would like, I'll contact Maggie's friend in California, she is 92 years old but sharp as a tack. I'll tell her what you are doing, and if she agrees, I'll give you her phone number and address so you can contact her. But, only if she says it's OK".

Well, finally, a real break in the case. The next day, Nancy from the Senior Center called, and I was informed I could call Maggie's old friend and former roommate, Eugeina. As promised, Eugeina certainly has all of her wits about her. She told me of beautiful afternoons spent on the front porch of the Mabbott home in DuBoise, drinking scotch with Lyle while he enjoyed a cigar. Maggie let them alone; she didn't appreciate Lyle's cigars, nor the scotch.

"Evening was the time for all of us," she said. "Mornings Lyle spent at his radio. Every morning, seemingly without exception, he would get on his radio and talk with friends all over the world; that's what he did."

It seems that in the early '80s, after retiring, LWM was involved with installing a VHF repeater in the DuBoise area and was involved with data (probably packet) transmission using his Tandy computer.

I asked if by any chance she had a photo of Lyle, perhaps with one of his radios (praying it would be the 20A), and she said no, there weren't any photos, she never saw one in the house; camera shy she thought. I'll bet, I thought. Her indication was that all of Lyle's papers were donated to the University upon his death. I asked which University, and her response was WSU.

Oh, Wyoming State University in Laramie, which should be easy!

"So, you believe his papers are at the University?" I cautiously queried.

"Oh, yes. A big truck showed up, emptied out the place and took them away."

"Then all traces of LW have disappeared off the face of the earth?"

"Well, it seems so. Maggie's niece may have a photo or something; they weren't too close, but she may have something".

Eugeina then advised me of Maggie's niece, and offered to send her a note explaining my interest and questions, and I could call her in about a week—it would take that long for mail to notify Joanne of the situation. With this development, Tim and I agreed, we heard the orchestra tuning, and it wouldn't be long before

the fat lady would take to the stage.

I sent an email to Wyoming State University, which is in Laramie, asking about LW. A response indicated they never heard of him. No surprise there.

At precisely a week, I called Joanne. A young (age 30-40) sounding male answered the phone and indicated she was not there at the time, but he would leave a message for her; it may be a while. Two weeks later I called again, same guy, no help, but he advised me that the note from Eugeina arrived, and it was forwarded to Joanna. Forwarded, eh? I pried out his response of being Joanna's son-in-law and that she was at his brother's. I asked if I could reach Joanna, and was again given the cold shoulder after being told she was in South Dakota; the phone went dead. South Dakota. Yeah, I know, it is a state, but who in their 90s takes summer vacations to undisclosed locations in South Dakota? Now, perhaps I am getting caught up in the end run of what certainly seems to be a cloak and dagger chase, or my other thought was that this "son-in-law" had already "offed" the old lady for whatever reasons and was laying low. I also thought it was possible my calls were being rerouted to a basement office in Washington.

A couple of weeks later, I received a phone call from Joanna. She also said all of LW's papers were left to the University upon his death, WSU, she believed. A truck showed up one day and carted everything away.

I asked about the papers, and exactly what is WSU? She stammered and said, "Well, aren't you from Michigan? Don't you know about WSU?"

"Wayne State University?"

"Yes, that's it; he graduated from there".

Oh, Wayne State, no wonder Wyoming never heard of him!

I inquired if there were any photos, perhaps of Lyle, his radios, or from any of his adventures, and was told, "No, there are no photographs. But you know, I have his radio console."

"What!"

"Oh, yes. He had a very beautiful cabinet made for his radios, so they wouldn't be seen. He had it made when he was in Thailand and brought it back with him. It is a very light wood; what's that wood they use over there?"

"Teak?"

"Yes, that's it, teak. Anyway, it looks like a secretary. Do you know what a secretary is?"

"Yes."

"Then you know when you close the front panel, which drops down to make a writing surface, it just looks like a little cabinet for whatever." Lyle sat his microphone on it, and all of those papers he filled out.

"He had this made specifically for the radios?"

"Oh, heaven's yes, a perfect fit for every piece. It is right here, you know."

"You have it?"

"Yes, Maggie gave it to me. It was so special to Lyle. It's now in my living room; it's beautiful with all the intricate carving. I don't have much company, but when someone shows up, visiting nurses or meals on wheels, they always comment on it"

This was very exciting information, but I felt like I found the coaster for the Holy Grail.

I started to pursue the paper legacy again. Silly me, WSU in Laramie is so close to LW's home, and Eugeina mentioned Laramie which does offer geology engineering degrees. The comment regarding Wayne State University was great news, as WSU is only 150 miles away, while the other WSU is 1500 miles away. Checking the WSU (that would be Wayne State University) library system web site indicates they offer no information from archives to the general public, they won't even search material to advise if they have it. Faculty, Staff and Students are the only ones allowed access the archives. As my wife teaches at Western Michigan

University, I queried to see if professional courtesies are offered. No.

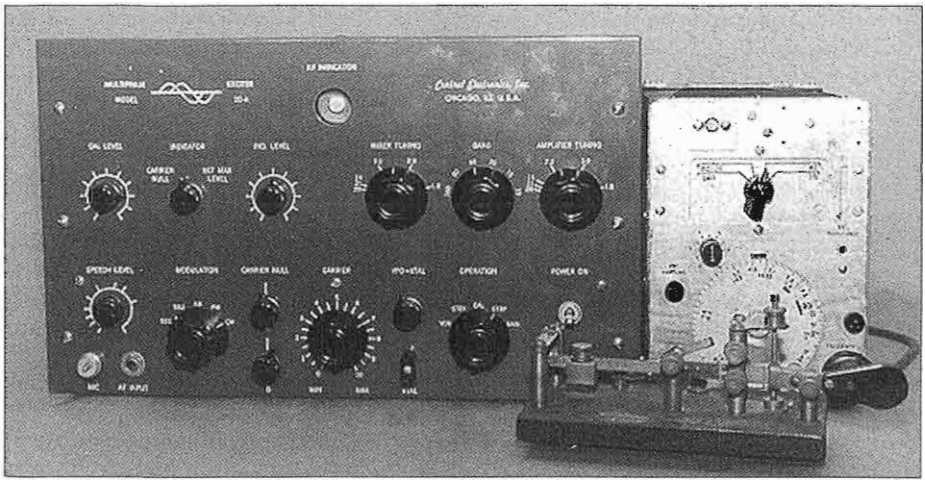
Two sources have indicated that all physical traces of Mabbott were "packed up and hauled away" in a large truck, although the destinations may not agree, in either case the information seems to have disappeared. Once again the elusive Mabbott slips through our grasp.

Time for a Change of Approach

Tim and I reconnoitered to establish a new plan; what we were doing wasn't working. We figured somehow there must be a trace of W7KMF in some literature. Also, maybe Mabbott held a license in Ethiopia, or perhaps Eritrea was a sovereign country back then, although the two countries combined their amateurs in 1953, according the DX column in August '53 CQ Magazine. Fortunately, call books were a single volume for both US and foreign in those days, so a search was on for call books in the general time frame. Tim had the ability to search through archived QSTs by selected phrases, so we went our separate ways with our charge. Mabbott would have to surface in a DX column, even if only as a footnote, or so we thought. I found nothing in the few Callbooks I could garner, and Tim found nothing in QST.

Again, stories of "Engineers" for Radio Free Europe being CIA operatives kept creeping into our conversations, usually at the initiation of others we discussed our challenge with. Tim lives in rural Vermont, as if there is any other kind. Actually, I guess I am fortunate to know him, not being a "Vermonter" or blood relative, yet he seems to accept me even though I am an "outsider." The point is, there is a Ham who lives on "the other side of the mountain," and although Tim knows who he is, they had never met, talked, or anything else; that's sort of the Vermont way, I guess. Tim figured this was the inspiration needed to call his neighbor and start a dialogue. It seems the sunrise side of the hill is occupied by a big time DXer, who is a good friend of Rod Newkirk, the former editor of the "How's DX?" column for QST magazine, who after many years as editor knew everyone and everything DX. Tim contacted Mr. Newkirk in Ottawa, and received a very interesting written response. The bottom line of the information garnered was that ET3US had an open door policy for any American with a valid license. However, in those days just about anyone who was in that part of the world with a valid amateur license was an operative of some governmental agency. Another spook lead!

Tim remembered a law school friend who, although much older than Tim, was a classmate. It seems he spent a number of years in the military before entering college. He was ... well, he had waterproof radios which you buried in the bottom of the mire so they wouldn't be found, and collected popsicle sticks to use as feed line spreaders ... you have the picture. The radio would be unearthed to contact the necessary officials at scheduled check-in time, or if there was information to report. It was also mentioned that most clandestine radios would hit at least one Ham band, and being pre-synthesizer, most Ham rigs would work outside of the Ham bands. This source indicated he was in Cambodia and Vietnam in 1968, hmmm. One other item of note was mentioned. A good operative always has highly visible cover stories for wherever he is at any time. Any and all of the leads may be followed, and if they lead anywhere (which is doubtful), they will never lead to a set of points which can be connected to draw a line leading to anything in particular. Also mentioned was the communication facility in Ethiopia, which was one of the largest in the world during the 1950s. Checking on this lead, information sourced to the CIA World Factbook indicated that, yes, in May of 1953, the USA concluded an agreement with Ethiopia for the Kagnew communications station in Asmera, one of the largest radio relay and



L.W. Mabbot's CE-20A exciter and BC-458 VFO.

communications monitoring stations in the world, which was manned by 4000 American personnel. That does sound large, doesn't it?

The Dead and the Doors

So, here we are, nearly two years after this ordeal started, and a full year after the intensive search for the elusive LW Mabbott began. Although quite a bit of money was spent tracking down what we could, considering how many hundreds of hours were involved, it's been cheap entertainment. We have an absolutely mint CE-20A, serial number 2 with matching manuals, none of which bear any direct identification of the owner. We have a stack of provenance showing the specific construction of the rig by no less than Wes Schum, the recently-late founder of Central Electronics. We have an iron clad track of the rig through its entire life. From the Chicago factory where it was made, to the dealer in Wyoming, to the options ordered from the factory and shipped to the owner in Ethiopia. The radio console is confirmation of radio operation in the Mekong river area and we know of the return of the rig to Wyoming, subsequently traded to a radio store in Denver, then being purchased by Mr. Fiendle, given to Jay, transferred to Tim, and currently in my possession. As Jerry sang...."what a long strange trip it's been!" We seem to have contacted everyone but Tukufu for assistance in this matter.

Not being able to prove Mabbott an active Ham in Ethiopia or the Mekong does not make him an operative. However, according to CQ magazine there were no confirmed SSB contacts between the US and Ethiopia until 1959, which is five years after LWM's arrival. If Mabbott just didn't get on the air that much, why did he order the VOX anti-trip option and a factory made VFO after he arrived on the Dark Continent? Other than keeping radio equipment out of sight yet orderly for quick use, why a custom made secretary while in the Mekong area?

It seems there are still many questions regarding CE-20A S/N 2 and its interesting owner, Lyle W. Mabbott. Perhaps there is an answer out there we just have not found yet, or perhaps the answers are still with Lyle.

The End

ER

The American VHF-AM Equipment Gallery

Part 4, The Lafayette HA-1200 2-Meter Transcever

By Jim Riff, K7SC
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When the well-known and common Gonsets came on the market in the 1950s, it established the standard for compact VHF transceivers. The combination of receiver, transmitter, and power supply in one package was a new and exciting concept. Many companies offered 2-meter components, but Faust Gonset (W6VR, SK) combined them into one system, and made mobile and base operation possible with one compact package. These Gonset Communicators have been written about extensively, so we will focus on the other companies who challenged this technology with their own designs.

In the remaining series of articles I will cover 3 more of the next generation 2M AM tube transceivers that competed for market share in the then fast growing 2M markets. Today, with the fast growing interest in 2M AM activity here in the US these old tubed boatanchors have become increasingly popular. The operation, maintenance, repair, and just collecting of these giants has become easy and fun. With the increased use of AM on the VHF bands, our ability to preserve this mode will hopefully be noted if any move is made to eliminate AM from our band plans.

Figure 1: The unique style of the HA-1200 creates an interesting looking transceiver, and the simple layout is easy to operate.

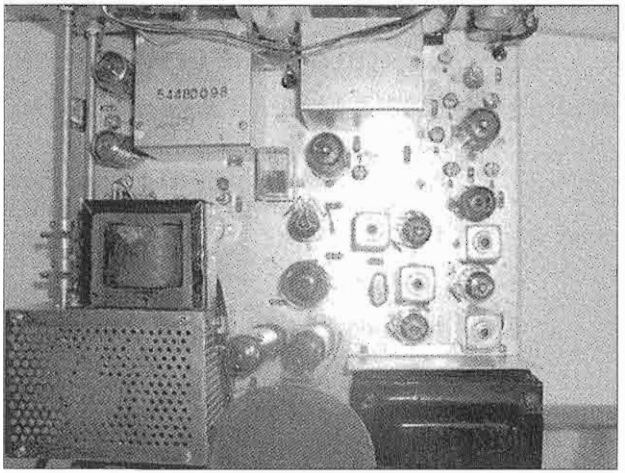

Figure 2: clean and spread out chassis is easy to service and adjust when needed, but this reliable design needs very little attention.

As the mid 1970s approached, Lafayette Radio Company increasingly turned to Japan for their products. Their 2M HA-1200 was an example of this private label program. Lafayette contracted Kenwood Trio to design and build this one-of-a-kind product, as there was no equivalent Kenwood example at the time. The HA-1200 had a unique aircraft dial design, **Figure 1**, with simple and easy to operate controls. Again caught in the transition to FM and solid-state designs, this expensive and very heavy unit was soon obsolete. A full 16 tube design with both VFO and crystal control, the receiver featured a sensitive nuvistor front end, selective triple conversion. Although the design contained features like a mechanical filter it lacked a built-in speaker. Cost in 1968 was $389.95. Of the series of 2M transceivers reviewed here; the HA-1200 is the only model that did not have a 6-meter counterpart. With strong push-pull modulation and a nuvistor RF stage, this package although very heavy is a solid well engineered unit. Although the 7-watt output is relativity low compared to current solid-state equipment, it is more than adequate to cover most large cities with just a simple vertical antenna. Service is usually not needed, but tube replacement, **Figure 2**, and under-chassis service are very accessible and straightforward. Kenwood was showing it's design skills early in the development of private label products for Lafayette, and soon began importing their own line of communication equipment to the US that eventually forced the demise of domestic made products. These unique transceivers are not easily found at hamfests, as their good looks and low production numbers usually make them museum quality keepers for collectors.

- **Pros:** Powerful push-pull 6AQ5 (6005W) high-level plate modulation, reliable Kenwood design, unique front panel design, stable VFO, smooth tuning controls.
- **Cons:** Very heavy, power transformer may not be reliable, owners manual hard to find. Tolerable receiver and VFO drift on startup. Single crystal socket.
- **Specifications:** 117V and 12V operation, 7-watt, push-pull RF output (6360A), VFO and crystal transmit operation; receiver selectivity 10 kc, nuvistor front end with 1μv sensitivity, size 12 X 12 X 6 inches, weight 25 lbs.
- **Conclusion:** Beautiful, heavy, smooth, reliable, and well designed. A good performing import that is a joy to look at and operate. This 2-meter AM transceiver gets "great audio" reports from all who hear it, and it is fun to use on the popular 2M nets on 144.450MHz.

ER

Milestones in the History of Amateur Radio

Irving Vermilya, 1ZE, Amateur Number One

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Irving Vermilya, 1ZE-1XAL, ex-VN, merited a larger-than-life image in the minds of early twentieth-century amateurs. His accrual of feats and accomplishments and his proficiencies as an operator had become legendary as early as 1923, when he was only 33 years of age.

Figure 1: Irving Vermilya, 1ZE. From CQ Magazine, April 1964, page 41.

Hiram Percy Maxim, ARRL Board members, and other leading amateurs referred often to Irving Vermilya (1890-1964) as "amateur number one". The appellation was ascribed to him on the basis of four, interrelated reasons: (a) he was recognized as the first amateur officially licensed in the United States following the Radio Act of 1912; (b) he was said to be the first amateur operator in the United States; (c) he was a superb wireless telegraph operator— his listening skills were so keen that he was capable of copying signals off the air that other amateurs found unreadable; (d) he was never satisfied with his apparatus, refined it ceaselessly, and was reputed to have one of the strongest signals on the air.

Bill Halligan (1923) acknowledged Vermilya's prominence in his columns for the Boston Telegram. In one of them, he wrote: "1ZE is working this week on his 500 watter in an effort to reach 2KW in Manchester, England. If the trick can be done, VN's the boy to do it. Hiram Percy Maxim, president of the American Radio Relay League, characterized Vermilya as 'amateur number one'. If VN gets across [the Atlantic Ocean] with his phone set, he'll have still another claim to that title".

In another column, written about a year later and a month before he left his job with the Boston Telegram, Halligan (1924) stated: "thousands of amateurs envy Irving Vermilya, 1ZE, of Mattapoisett, Mass... Vermilya is known throughout the length and breadth of the land as 'Amateur No. 1', he being the first in the country to own and operate a radio transmitter. So far as radio experimentation is concerned, he is still 'Amateur No. 1,' for he far and away leads any other individual in point of radio operation.... One example of his activities is the Saturday night radio-phone schedule he maintains with another station in England.... Thousands of fans have heard his signals and wondered as to their origin, but few have known the history of the operator".

Vermilya, who lived in Mt. Vernon New York as youngster, also described himself as the first radio amateur licensed in the United States. The U. S. Congress passed the Radio Act of 1912 to regulate radio communications in the country. The Act provided for licensing and issuing call letters for all government, amateur, and commercial land and ship stations. It was administered by the Bureau of Navigation, Department of Commerce. Procedures for administering government and commercial services commanded attention initially. When Vermilya learned that examinations for amateurs were about to commence on 12-12-12, he maintained that he was first to show up for the tests at the Brooklyn Navy Yard. (Vermilya, 1917a; "Vermilya", 1964). Perhaps, Vermilya was in fact first in line; no one ever challenged his claim, and consequently he wore the mantle of "amateur number one" comfortably his entire life.

Vermilya laid claim, as well, to being the first amateur in the United States. He included the following statement in a fanciful autobiographical account of his boyhood adventures as an experimenter: "Now, boys, I don't want to make too much noise, and I want you to holler if I go too far—I am going to start off with a claim that's going to be a big one.... Here it is: I was the first amateur in this country to get an aerial up and investigate into the mysteries of wireless" (Vermilya, 1917a, p. 8). He insisted, too, that "at least one gentleman" could back him up, if only he could find him. No such gentleman, however, ever turned up.

A few, unsubstantiated, incidences support Vermilya's claim of being the first amateur in the country. Marconi's exploits had attained around 1900 worldwide attention. Vermilya remembers seeing the "big headlines" and saying "right then and there, 'Me for this wireless. That's the stuff.'" Vermilya turned to pestering the minister of his church, Reverend Charles Tyndal, "to help me become acquainted with Marconi". A few months later Rev. Tyndal reported that he had "succeeded in seeing" Marconi and that he had been given by him a "cohera [sic] and tapper," which in turn, he gave to the youthful Vermilya. The latter was ecstatic! "Well!" he said, "when I got my hand on these—fellows—you can believe me, the world wasn't large enough to hold me. I wish you could have seen me paw over the old blue prints and dope on the 'how and why,' which Marconi had also sent".

Vermilya needed aerial wire, so he acquired a few dollars from his father, took a train into New York City, and made his way to the J. H. Bunnell & Company. When he asked for wire for use in "wireless telegraphy", the Bunnell clerks, who had never heard of "aerial wire", sold him insulated bell wire. Vermilya thus obtained material for setting up an aerial 12 feet long, without insulators, since Marconi's blue prints mentioned neither aerial length nor insulators.

Vermilya reported that he heard nothing after listening for several days; yet when he read in a newspaper that Marconi was going to send "some dots—the letter 's' to be exact—across the 'pond'", he was so certain that he would hear the signal that he invited neighbors over to listen to the reception. As he listened intently for Marconi's signal, two dots eventually set off the tapper. Excitement filled the house until Vermilya learned that a spark from a neighbor's doorbell had energized the coherer. The youngster was so embarrassed that he recalled his struggle to copy Marconi's historic transatlantic wireless signal in front of his neighbors as "the biggest mistake of my life" (Vermilya, 1917a).

Two aspects of Vermilya's recollections are troublesome. First, did Rev. Tyndal's meeting with Marconi occur? Marconi made only two trips to the United States prior to his one-way transatlantic tests from England to Newfoundland on

December 11-13, 1901. Marconi visited Cape Cod for a brief period, Spring, 1901, to arrange for the construction of a powerful land station. More significantly, he was in New York City, October 1899, to report the progress of a yacht regatta and to demonstrate wireless technology for American military services, Marconi met with several dignitaries, and one of them might have been Rev. Tyndal. The military brass rejected Marconi's metal-filings coherer, because it was unselective; therefore, Marconi, having on hand an extra version of the unmarketable model, may have given it to Rev. Tyndal?

Second, Vermilya could not have read of Marconi's transatlantic tests in the newspaper before they occurred. Marconi deliberately made no announcement of them. He had proposed to the Board of his Company that it build a powerful land station on each side of the Atlantic; each station would have sufficient range to reach the mid-Atlantic, which would ensure that vessels in the shipping lanes would always be in contact with one continent or the other. However, in truth, Marconi aimed to build two stations, each of which would have the power to reach across the Atlantic. The transmitter was ready at Poldu Point, on the southern coast of England, when storms destroyed Marconi's massive aerials on both continents. The oncoming winter forced Marconi, who was impatient to get his tests underway, to settle on one-way transmissions from England to Signal Hill, St. Johns, Newfoundland. Marconi told Canadian authorities in St. Johns that he was on site with makeshift aerials to copy the signals of passing ships. As the tests ensued, neither his Board nor the Canadians were aware that he was really listening for a signal, namely the letter "S", from Poldu Point. The entire world was astonished when he announced on December 14, 1901, that he had actually heard on Signal Hill a transmission from across the Atlantic. When the eleven-year-old Vermilya read of Marconi's achievement, perhaps he misconstrued it as a forthcoming attempt rather than as an accomplishment?

Vermilya—to his credit—never asserted that he was with Marconi on Signal Hill to witness the historic reception from Poldu Point. Yet this extravagant embellishment of his association with Marconi has crept into the historical literature, to wit: "At 12, the Rev. Charles Tyndall [sic], of Mt Vernon, escorted him [Vermilya] to 'Signal Hill' in St. John's, Newfoundland, where they witnessed the then young Marconi's historic transatlantic communications test" ("Vermilya," 1964). The statement is a concoction of a naive admirer. Marconi and an assistant, George S. Kemp, were alone in a drafty room of an old, abandoned hospital atop Signal Hill when they heard the letter "S". Marconi has been criticized for not having additional witnesses available to provide incontrovertible proof of the reception. Indeed, Thomas Edison characterized the event in the press as a "newspaper fake," however, he recanted shortly thereafter, saying that he had faith in Marconi's integrity (See Grinder, 2002).

Vermilya's debacle with the coherer convinced him that he should learn the Morse code. He was determined to become a wireless telegraph operator. He and friends hung telegraph wires between their homes in April 1903 for practicing code with each other. He signed "VN" to identify himself, and the letters became subsequently the suffix of his self-assigned amateur call designation. The Rev. Tyndal shared with him plans for building Marconi's new magnetic detector, a local engineer helped him build a crude spark-coil transmitter, and he constructed an aerial with twelve parallel wires, 400 feet long and seventy feet high (Vermilya, 1917b).

Code practice enabled Vermilya to emerge into the world of wireless "a full-fledged, fairly good Morse operator". With the coming of a "raft of ship

stations", he decided in 1904 that "I was not making enough noise", so he asked his father for money to purchase a kilowatt spark transmitter. When he discovered that a nearby amateur was operating a two-kilowatt transmitter, Vermilya also advanced to a two-kilowatt transmitter; his neighbor then jumped to a three-kilowatt job. After both had progressed to five-kilowatt spark transmitters, they settled on a standoff. Neither amateur could hear anything when the other opened up.

Commercial traffic was conducted with coherers and spark transmitters when Vermilya adopted the call sign "VN" and started sending wireless transmissions from Mt Vernon. At the same time the prospect of sending messages began to attract a small group of boys, about Vermilya's age, who lived in New York City. Burghard (1923, p. 291) has argued that "the real radio amateur had his beginning in the end of 1904 to 1905". At first equipment was crude, and signals carried only a mile or two. The cohort size grew swiftly, however, and in 1909, eleven members of the group formed the "Junior Wireless Club, Limited".

In 1910, under the auspices of the Club, they published "the father of all radio call-books" (Burghard, 1923, p. 293); it consisted of a single mimeographed sheet with about thirty names and self-assigned two-letter calls. The list included "VN Irving Vermilya, Mount Vernon". The size of the Club continued to expand, and in 1911, the members changed its name to "Radio Club of America". It is noteworthy that Edwin H. Armstrong, who was the same age as Vermilya, and soon to become famous as the inventor of the regenerative receiver, had set up his first station in Yonkers in 1908. Armstrong, perhaps because of a childhood illness, became an amateur later than Vermilya. He joined the Radio Club of America in 1912, and hence, he was not listed in its 1910 "callbook".

Assuming that the birth of amateur radio occurred in the environs of New York City, the historical record suggests that Vermilya was one of several young men qualified to lay claim to the distinction of setting up the first amateur station in the United States. Vermilya claimed explicitly, however, that he should be ranked as the first amateur in the country, and in 1917 he invited anyone who disputed him to "holler if I go to far". No one hollered! Importantly, no one else has claimed the distinction; conversely, no person has stepped forward to confirm Vermilya's declaration. Whether Vermilya was actually the first amateur in the United States probably will never be known for certain, but the available evidence points to that possibility.

One day, about 1906, after "very strenuous work" with his five kilowatt spark transmitter, Vermilya received a call from "NY", which asked him if he wanted "a job on a boat as an operator." When he inquired in person for details, he was told that he could have a job as a United Company wireless operator on a ship going to South America if "I would guarantee to shut up that d—— blunderbuss of a spark of mine while I was away" (Vermilya, 1917b). Vermilya stayed with United until Marconi's enterprises hired him when it bought out United. Vermilya was promoted in 1917 to manager of "WCC" ["Wireless Cape Cod"], South Wellfleet, MA. He was only 27 years of age, and he was now in charge of Marconi's flagship station, which at the time possessed the most powerful transmitter in the world.

Vermilya (1942) recalled fond memories of his years at WCC. It was a "majestic station", he said, which was established mainly to broadcast material to ships at sea. The antenna was a tremendous fan-shaped array on four wooden towers that rose 210 feet in the air. The huge, 30-kilowatt, rotary-gap transmitter was propelled by a big AC motor driven by a kerosene engine—the nearest electric

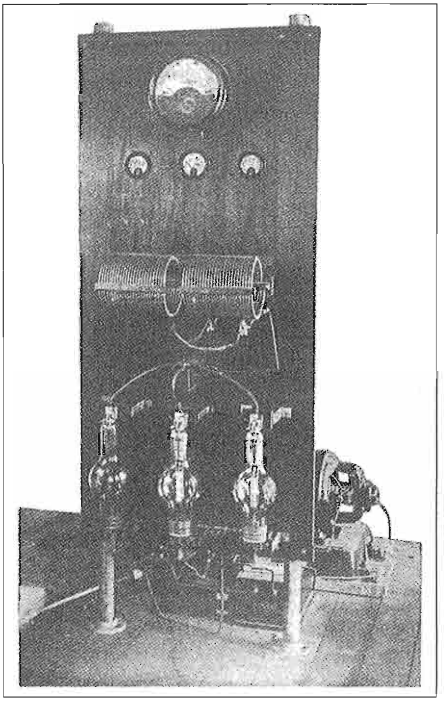

Figure 2. The transmitter at 1ZE, one of the best stations in the transatlantic tests. This set put fourteen complete messages over to England one night without repeats. The antenna current on 225 meters was 18 amperes. From QST, February 1923, p. 12.

lines being twenty miles away. The noise from the spark was so deafening that the crew had to work in a soundproof room. The flash from the spark could be seen a mile away when the window was open. Messages and press releases were put on a paper tape. The transmitter was keyed on 1,500 meters in the secondary or high-voltage end of a 50-kW transformer. The key was a big, double-barrel affair with huge contacts—a strong blast of air on both sides blew out the arc as the key closed. The transmitter sent at 15 to 17 words a minute, which led Bill Halligan (1924) to observe: "The station served the far more important purpose of training youthful radio operators in code reception".

As he reminisced about the setting at WCC, Vermilya (1942, p. 32) asked rhetorically "Is it any wonder, then, that amidst such romantic settings that my story 'Amateur Number One' should have been born? Is it any wonder that I went in for high power"?

Following service in the U.S. Navy during WWI, Vermilya returned to his responsibilities at WCC. When RCA, a new conglomerate formed explicitly to drive Marconi enterprises out of the United States bought WCC (see Grinder, 2003), Vermilya stayed on the job as an employee of RCA. Vermilya's intense involvement in amateur radio, however, never abated while he worked for WCC and RCA. He transitioned effortlessly from a series of spark transmitters in his early days to building in 1921-22 perhaps the most powerful, vacuum-tube, amateur transmitter in the nation. A QST editorial (Warner, 1923a), for example, published a list of the 100 "best American amateur sending stations" that were heard in Europe during the east bound Transatlantic transmission tests, December 12 to 21, 1922. The list shows that the amperes loaded into the antenna of 1ZE were 8 to 10 amperes higher than the amperes loaded by any of the other 99 amateur stations.

Figure 2 shows that the transmitter at 1ZE consisted of three 250 Radiotrons in parallel with an output of 750 watts; power was supplied by a 2000-volt, 1500-watt D.C. generator, which Vermilya keyed in the high voltage line. **Figure 3** shows the aerial at 1ZE. It was constructed using 20 wires, spread out 54 feet, 110 feet long. The array was supported on poles of 100 and 65 feet, respectively. A counterpoise contained 50 wires, each 100 feet long.

The day before the transatlantic tests began, December 11, 1922, Vermilya presented a talk on the accomplishments of amateur radio at a gathering of business men in New Bedford, MA. He "knew" that his apparatus would bridge the

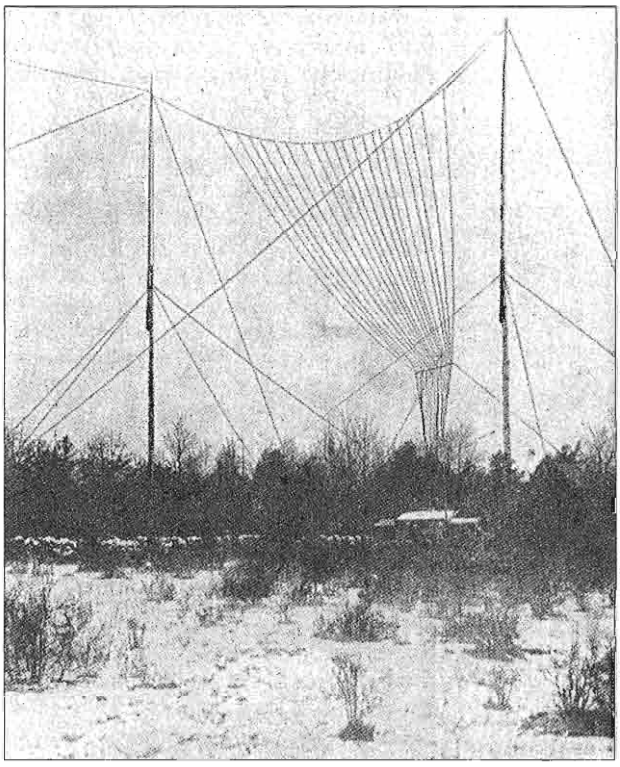

Figure 3: The big fan at 1ZE, Marion Mass. From QST, 1923, February 1923, p. 12.

Atlantic, so he offered on the spot to deliver to England a message from every person in the audience. Fourteen messages came forth, which he broadcast unscheduled on December 12, at 11:35pm, the first day of the tests. He opened up his transmitter to the limit of its power on 225 meters; for four minutes he called "'English 2KW'". After he signed "'Yankee 1ZE'", he immediately sent the 14 messages, one at a time, over a period of 37 minutes. When he was done, he asked for a cable QSL. The next day a cable arrived from Manchester, England, which confirmed receipt of all 14 messages (Warner, 1923b, pp. 18-19).

No wonder, then, that at the second ARRL National Convention, September, 1923, Vermilya was an invited speaker at the first technical session. His task was to describe his amateur station. "The gang learned there exactly how high the antenna is at 1ZE, [and] Vermilya gave them all the inside dope about his marvelous station" (Bolles, 1923, p. 17).

When the broadcast era dawned in 1921-22, Vermilya adapted his amateur station to provide broadcast entertainment to citizens and neighbors in the Cape Cod area. A local Company then enabled him to launch WDAU in 1922, and when financial exigencies arose, he acquired the station equipment, which he moved into his own home; from there he operated WBBG until 1925. Subsequently, with financial backing, he founded station WNBH, New Bedford, MA, where for years he served as General Manager. He sold WNBH to a newspaper in New Bedford in 1934; nevertheless, he continued to serve the station as chief engineer until he retired in 1955.

Vermilya from the beginning of the broadcast era invested his career in different dimensions of the profession, ranging from station announcer to engineer, and from program director to advertising fund-raiser. A livelihood in broadcasting, notwithstanding, amateur radio always commanded a great deal of his attention. For example, in 1947, he and two other amateurs formed the "Old Old Timers Club" (OOTC)—an organization for career commercial radio operators who had worked on board ships and in land stations during the early days of wireless. Vermilya became the first OOTC president, and he steered the organization toward rapid growth in membership. On its fiftieth anniversary

in 1997 the OOTC peaked in size with about 3,700 members.

Sadly, Vermilya committed suicide in 1964. He was 74 years old and in poor health. Vermilya had been involved in numerous momentous events in the early history of amateur radio, and during the post-WWII era, maybe he realized that never again would he be at the vortex of the kind of adulation and idolization to which he was once accustomed. Perhaps, on the other hand, he recognized that he had earned thoroughly the "larger-than-life" image that for most of his life he had projected in the amateur community, and therefore, that he had wholly fulfilled the mission in life that he had envisaged for himself.

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ER

[Comments, from page 1]

and Amateur Radio operators are not subject to interference. If the Cope Act is eventually passed into law as now written, it could conceivably lead those wanting in on the BPL business as well as current providers to make certain that their systems cause little or no interference to those using radio communications in the same spectrum...."

Contrast the same discussion of the COPE bill by the industry lobby group, United Power Line Council, of Tuesday, May 16, 2006: "FEDERAL: CONGRESS CONSIDERING BPL INTERFERENCE STUDY; ARRL LOBBYING SENATE: The House Commerce Committee accepted an amendment to the...(COPE) Act of 2006 (HR 5252), which would require the FCC to conduct and submit a 90-day study of the interference potential of BPL. The amendment was introduced by Rep. Ross (D-AR), who stated that 'as one of only two licensed amateur radio operators in the U.S. House of Representatives, I believe it is imperative that the interference potential is thoroughly examined and comprehensively evaluated to ensure that deployment of BPL, which I do support, does not cause radio interference for amateur radio operators and first responders who serve our communities.'...It was surprising that the amendment was accepted by voice vote, which is generally reserved for uncontroversial issues. *There was plenty of opposition to the amendment by utilities and technology providers beforehand. The UPLC will continue to oppose a further BPL study, which is redundant considering the extensive study that went into the FCC rules, and would create regulatory uncertainty that would chill investment in and deployment of BPL....The UPLC urges its members to contact representatives in the House and the Senate — particularly those on the Committees — to oppose the amendment....*"

Department of Corrections

ER #204, p. 24, the LED is upside down. On p. 41, the 6BZ6 screen supply should not connect to the suppressor grid!

73, Keep those Filaments Lit! NØDMS

The W5CZ Heavy Metal Museum

By Rod Perala, W5CZ
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www.w5cz.com

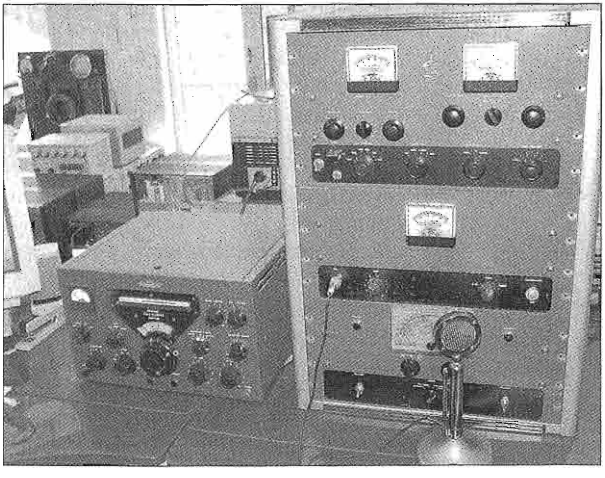
My dictionary defines a museum this way: "A building, place, or institution devoted to the acquisition, conservation, study, exhibition, and educational interpretation of objects having scientific, historical, or artistic value." This boring academic statement is uninspiring; it does not describe The W5CZ Heavy Metal Museum, which is mostly a lot of fun.

It all began with Bob (WØTUS) in Backus, MN who, in 1958, had the biggest AM signal you could imagine on 75 meters. If I would have owned an S meter, I am certain it would have been ruined. As it was, I was starting out in ham radio as a teenager in rural northern Minnesota, with a Knight-Kit Ocean Hopper and a Heathkit DX-20. The possibility of my getting a Globe King 500 like that of WØTUS was unthinkable.

Until about 5 years ago. Still possessing the desire, I managed to buy a Globe King 500B, which I promptly put in storage because I didn't have room in my shack for it. This unfortunate situation bothered me greatly, and the only possible solution was to build an addition onto my house for it; thus the W5CZ Heavy Metal Museum was born.

The objective of the W5CZ Heavy Metal Museum is to collect, restore, share and enjoy vintage amateur radio equipment. The focus is on AM tube-type equipment, but there are important exceptions to this rule. The goal is to create about 40 fully operational amateur radio stations that are representative of important aspects of amateur radio history. It is a relatively new creation; the facility was completed in July 2005. It is located in the foothills of the Colorado Rocky Mountains, at an elevation of about 7400' about 25 miles SW of Denver.

The museum consists of two parts, the operating room and the workshop. The operating room is a 625 square foot room of contemporary mountain architecture. It is located on the 2nd level, and is connected by an outdoor 2nd level bridge/deck to the workshop, which is located on the 2nd floor of an also newly constructed 3-car garage.

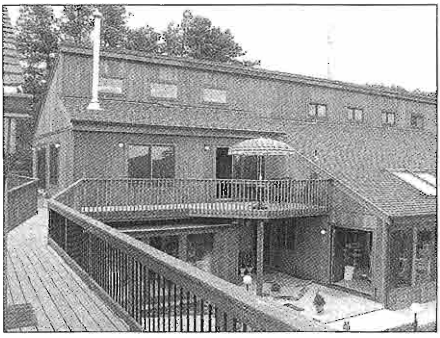


The Globe King 500B at W5CZ

The operating room was built with the museum in mind. The floor is similar to a raised computer floor that allows RF, power, and other cables to be routed underneath to several selected locations within the room, thereby minimizing the inevitable wiring rat's

nest.

The operating room has an entry vault for antenna cables, with a coaxial switch array to route antenna feed lines under



View from the workshop looking towards the operating room on the upper left, under the stove pipe.

the floor or to the workshop. Hard line, RG-8, CAT-5 and other cables route to the workshop allowing the workshop access to all antennas and other data.

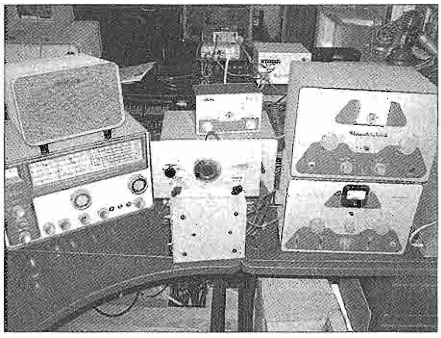
The equipment is loosely organized into several groups.

The Novice level is the first group. It includes an Ocean Hopper, Hallicrafters S-19R, Sky Buddy, EICO, Johnson and the Heathkit line from the AT-1 to the DX-60. This level emphasizes equipment that was inexpensive, not sophisticated, but still a lot of fun.

The second group includes the popular AM/CW equipment used by thousands of amateurs, manufactured by Hallicrafters, National, E.F. Johnson, Heathkit, Hammarlund, RME, Barker and Williamson, World Radio Laboratories, and many others.

There is also an SSB group, with equipment made by those same manufacturers, but including some others, such as Drake and Signal One.

The mobile group includes equipment made by Elmac, Gonset, Morrow,

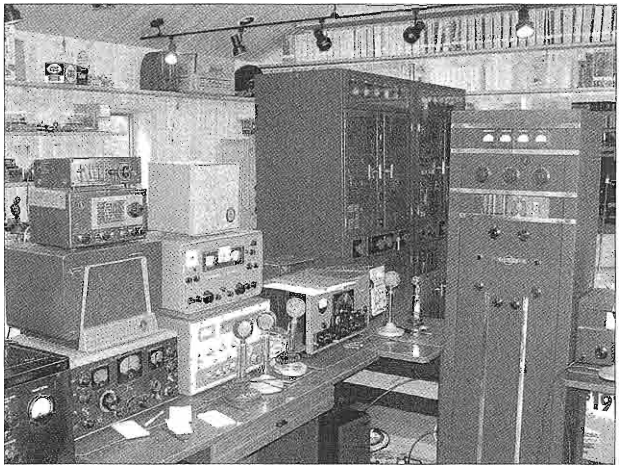


The Novice corner

Johnson, etc.

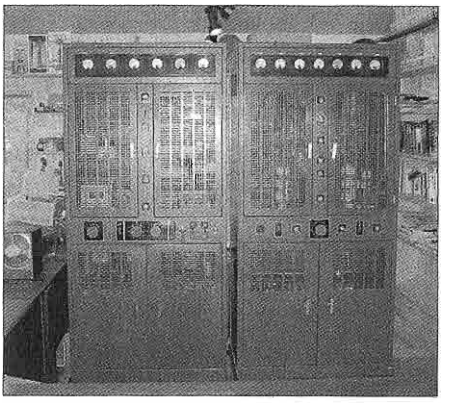
Finally, there is the equipment that represents the very best of amateur radio. Examples include several Collins pieces (30H, 30J, 30K-1, S-Line, 75A-4, 75A-3, 75A-2, 32V-2, KWM-1, KWM-2A, 30-L1, R-390A, etc.). Other favorites include a BC-610 paired with an SX-28, and the notorious Globe King 500B paired with a 75A-4. A 1920's spark station is also included.

The real eye-catcher in the operating room is the 1937 Western Electric 353 broadcast transmitter that has been



The popular AM group

The Hallicrafters station consists of famous equipment such as an SX-117 and HT-33A (left) and the SX-115/HT-32 combo on the right.

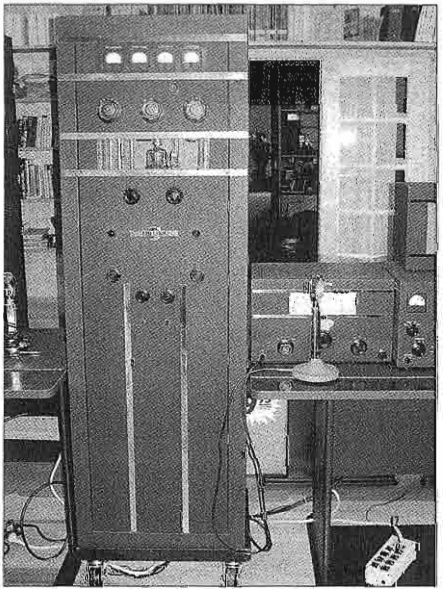


The 1937 Western Electric 353-E1 broadcast transmitter.

converted to 160 m. This transmitter has been presented previously in ER when it was owned by W6THW and more recently by WA9MZU (now K6GLH). It exhibits

of Gary Halverson, K6GLH, who lives near Sacramento. Gary advertised some of his collection in ER, and over a period of several months and a trip to

The BC-610 and SX-28 station.



A fully operational Collins 30K-1.

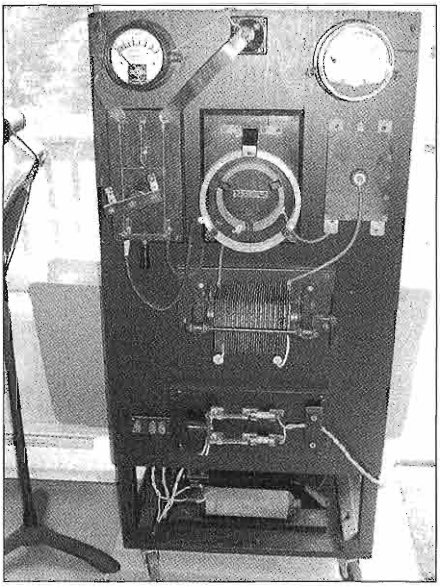
exceptional mechanical and electrical engineering design, as well as a stunningly stylish exterior.

The most exciting occurrence so far in the life of the museum was the recent acquisition of a portion of the collection

Sacramento, Gary and I reached a purchase agreement.

I rented a 17 foot U-Haul truck to carry the loot back home. At his QTH, Gary arranged for an exceptional crew of local amateurs and non-ham neighbors plus a

In the workshop area more Collins transmitters are being restored. On the left is a 30-J, and to the right is a very rare 30-H. On the bench is a Collins-produced R-390A.



A spark gap transmitter made by K6GLH from period components.

forklift to load the truck. The forklift was absolutely essential to load the floor model transmitters (each WE rack was ~600 lbs). Everybody had a great time because Gary had bribed everyone with food, door prizes, and the comradeship of heavy metal.

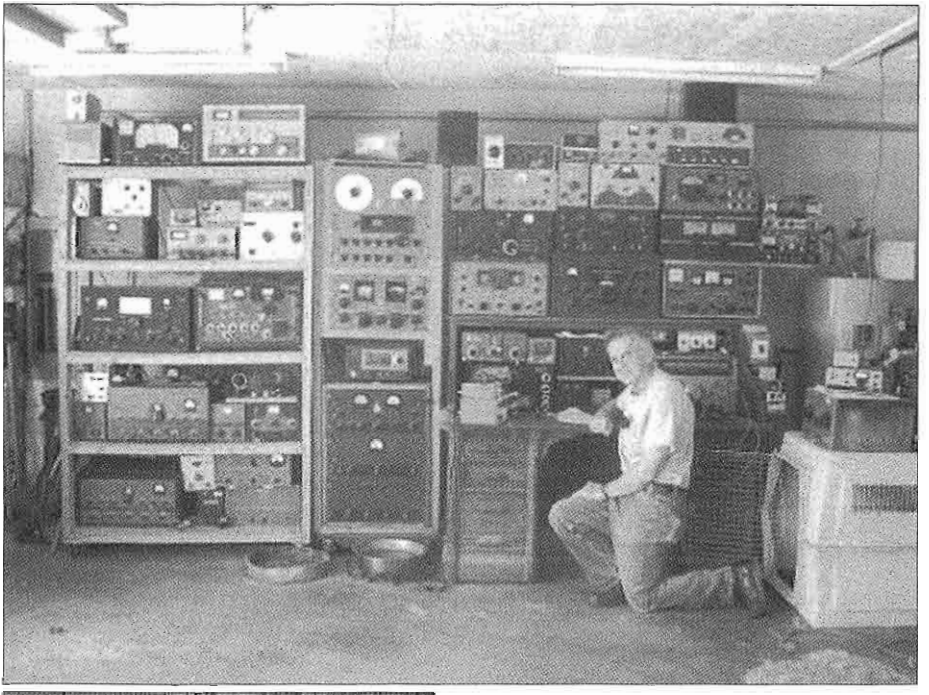
The trip back to Colorado went surprisingly fast. I left K6GLH on a Sunday morning at 09:00 MDT, and arrived home in Indian Hills, a distance of 1300 miles, at 15:00 MDT on Monday afternoon, just at the beginning of a spring snowstorm. It is amazing how quickly one can drive across Nevada and Utah on I-80.

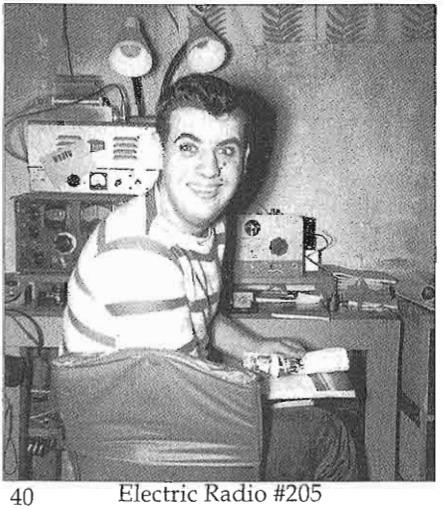
After one day of rest, I organized a crew of 4 persons plus a crane and operator to get the equipment into the museum and workshop. The process went well except for the WE 353, which because of its size and weight, presented special problems, such as knocking out a portion of the new deck surrounding the museum.

An opening bash barbecue is planned for Saturday August 5. Door prizes, a swap table, and special speakers are planned. Details will be mentioned again in the July issue of ER, or else contact W5CZ.

In 1958, neither WØTUS nor I could ever have imagined that his big signal would propagate into the 21st century, but its echoes are now to be found in Indian Hills. This is part of the mystery of *Amateur Radio*, which has empowered the imagination of many young men, including this one. It challenged me to pursue a career in electromagnetics and, after 45 years, to finally purchase a Globe King 500B and build a special place for it and its colleagues. There are many other items yet to be added to this place and put on the air. The fun is in the process of learning about the equipment, repairing it, operating it, and most of all celebrating the bygone era with friends of like mind. This is what the Heavy Metal Museum is for! ***ER***

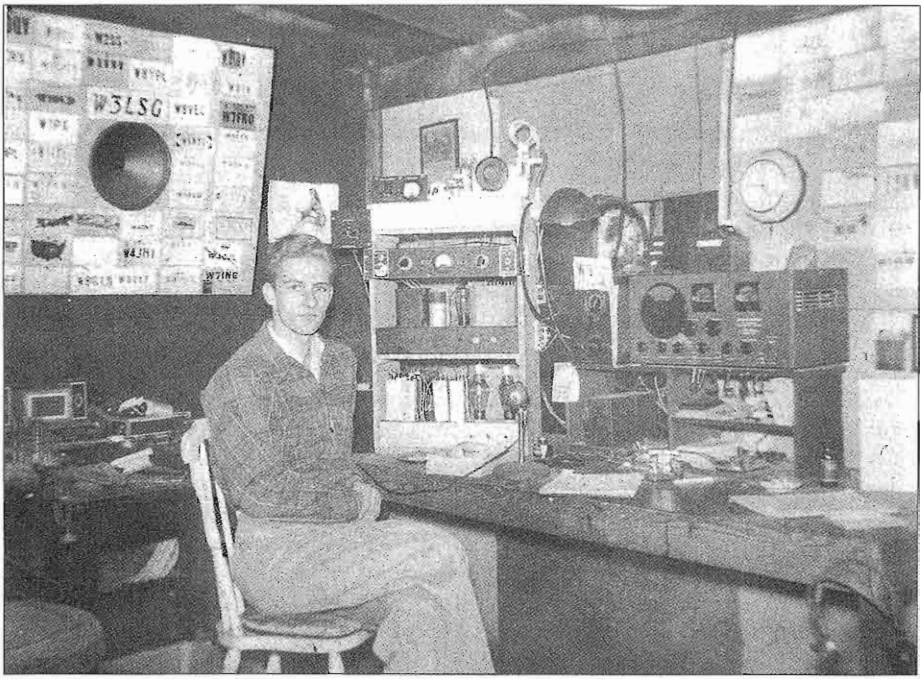
PHOTOS





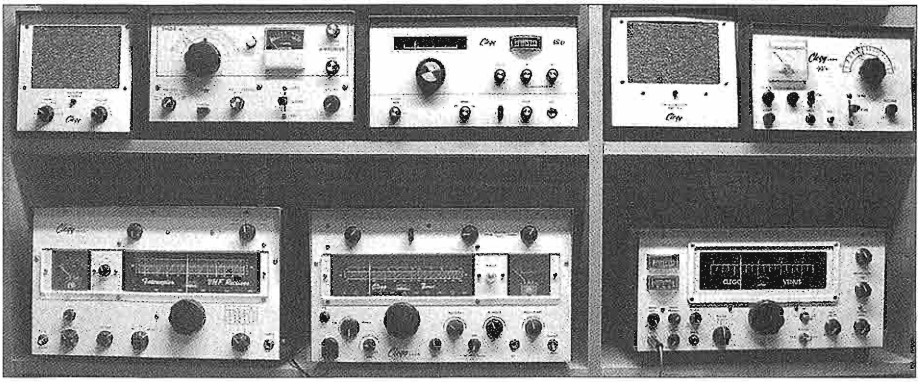
Above: Jim Hanlon (W8KGI) poses in front of a sturdy oak desk that is capable of supporting just one part of Jim's collection, which is either waiting for restoration or is in the process of returning to the air. He is not in the "dog house" for bringing home more gear!

Left: George Portell (W8QBG) has been licensed since the early 1950s, and here Geo is shown in his shack in the late 50s. He can be heard on 7293 kc almost daily, and has a great assortment of homebrew and restored military equipment. His homebrew rig is a 450TL modulated by 810s.

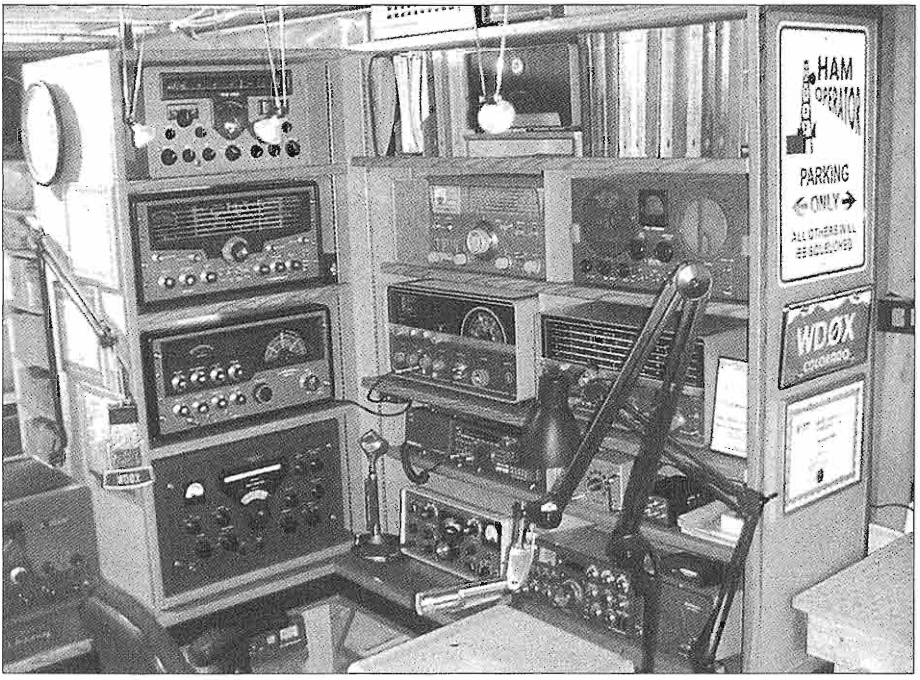


In 1947, ER reader Dave Wilke (W3LSG) was on the air with a Millen 6L6/807 exciter, and homebrew 866A power supply, and a 9-tube, 4-band Hallicrafters SX-24 Skyrider Defiant. Presently, Dave is on the air from York, PA with equipment that has been restored to top operating condition. Included in the receiver lineup at W3LSG today are an S-17, HRO-60, R-390 and R-390A, a TMC GPR-90, and National's NC-303 and NC-183D. Available transmitters are a Collins KWS-1, a B&W 5100, and ubiquitous Johnson Viking IIs.

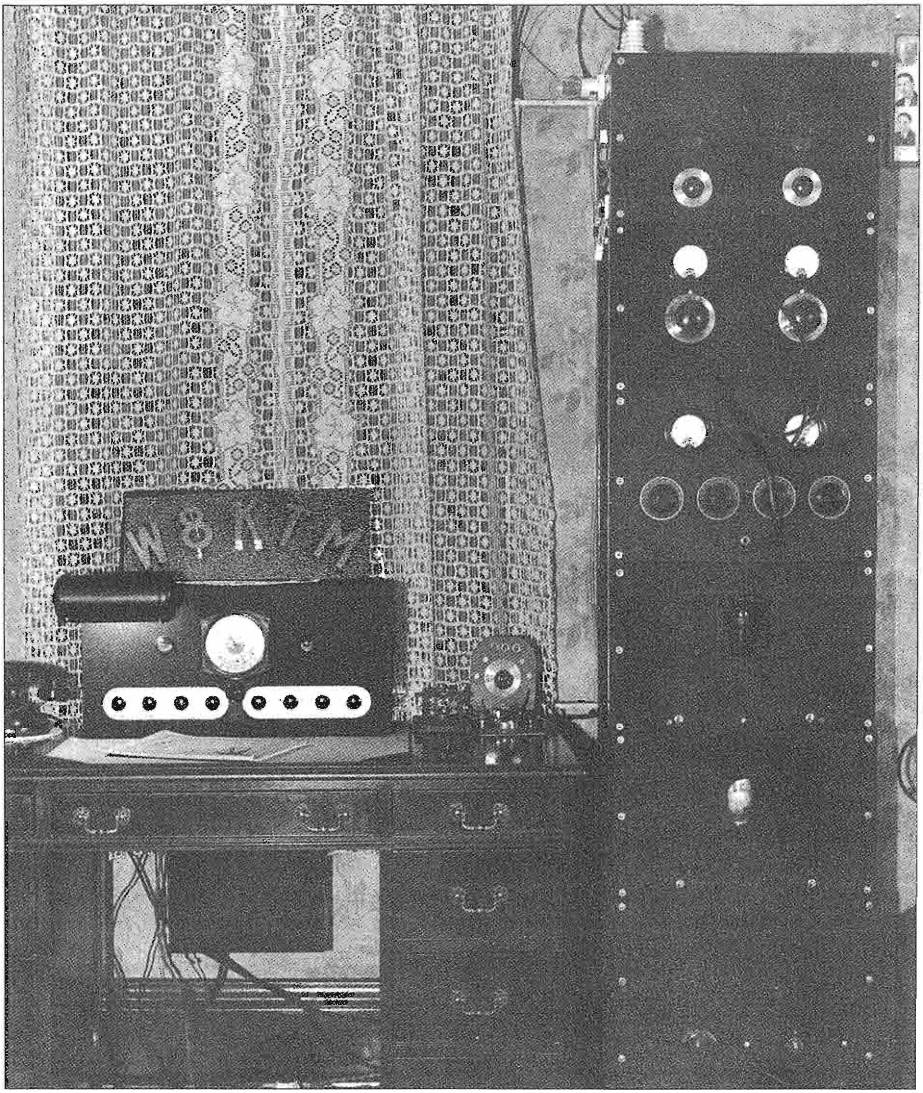
Left: Clyde Frolich (W7QHH) and his sister Marian (W7RHV) were first licensed during 1951 as novices. They started out on 80 CW, as many new Hams did, with a military surplus command set receiver and a 6AG7/6L6 transmitter from the handbook. Both were active for many years, but presently Marian is not active, while Clyde enjoys restoring classic American-made equipment and checking into the various AM nets.



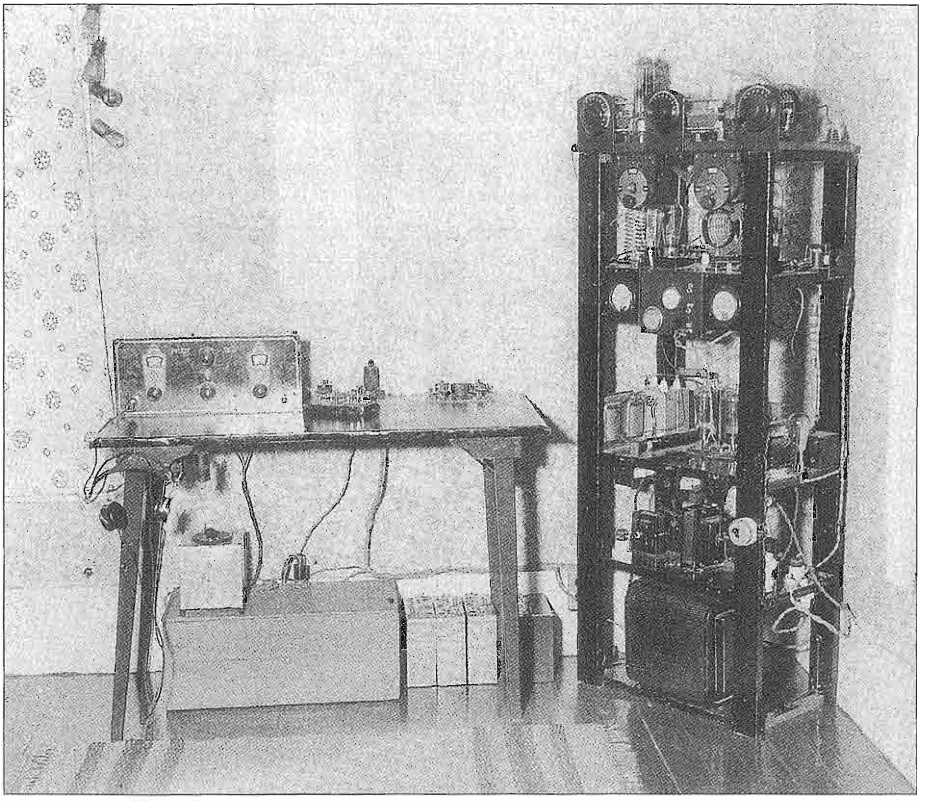
Mark Mandelkern (K5AM) has an extensive Clegg 6-Meter collection in Las Cruces, New Mexico, and it is shown in the photo above. As Mark describes his collection: "During the 1960s, Clegg equipment was highly regarded by VHF operators. The Clegg gear was known for innovative designs and high quality workmanship. Nearly all of the 6-meter Clegg radios are in this photo. All of these Clegg radios have been overhauled, are in excellent condition, and are on line for instant use whenever the 6 meter band opens up for short skip. Look for me on 50.4 MHz on AM. Top row, left to right: Allbander, Thor 6, 66'er, Venus power supply, 99'er. Bottom row, left to right: Interceptor, Zeus, Venus. "



Bill Pancake (WDØX) has built custom cabinets to hold part of his equipment collection that's located in Fountain, Colorado, south of Colorado Springs. Bill has many fine vintage pieces, from his RME-6900 on the top left, to National, Collins and Hallicrafters examples. Notice the boom-mounted microphones.



You never know what might be found in an old book! Recently, Clyde Sakir (N7IOK) found this great photo in just such an old book, and sent it to ER. This is the late-1930s shack of W8KTM. This call is currently held by Dean Kimball, born in 1912, so it's possible this was Dean's station during that period. His receiver looks like a RCA ACR-175, which came out in 1936 as a general-coverage, 11-tube, 4-band superhet with a crystal filter, dual magic eye tuning indicators, and single-ended audio. Not much can be determined about the transmitter because the photo is rather dark, except to note that it looks fully metered with matching controls, and probably has a modulator because there is a carbon-button microphone on the lower right of this picture.



In another old book, Mike Beachy (N8ECR) recently found a vintage QSL card in and scanned the photo so ER readers could see a Ham station from the 1920s. This open-rack style of transmitter construction has been very popular in recent issues of Electric Radio. The station was owned and built by Willis Haufman (W8BUH, SK) of Fairgrove, Michigan. Fairgrove was a small town not far from Mike's QTH. As Mike mentions in his email, "Bill worked for the Post Office there for many years; I didn't know him well, but wish I had because he was a very active ham op. He passed away back in the early '90s. I believe he built many fine rigs, as in his log books, it appeared that his rig was always changing. I think he was first licenced in 1922. 73 and gud Am'ing, Mike/N8ECR." The photo isn't quite sharp enough to tell for sure, but the receiver looks like a Pilot Wasp. The tranmitter looks like it is running a single type 10 in the RF deck. W8BUH's shack has been converted to AC wiring, although he still has B batteries under the table.

ER

VINTAGE NETS

AM Carrier Net: Sunday mornings, 8:30AM local Eastern time, 3835 kc. QSX W2DAP. Friendly format.

Arizona AM Nets: Sat & Sun: 160M 1885 kc @ sunrise. 75M 3855 kc @ 6 AM MST. 40M 7293 kc 10 AM MST. 6M 50.4 Mc Sat 8PM MST. Tuesday: 2M 144.45 7:30 PM MST.

Boatanchors CW Group: QNI "CQ BA or CQ GB" 3546.5, 7050, 7147, 10120, 14050 kc. Check 80M winter nights, 40 summer nights, 20 and 30 meters day. Informal nightly net about 0200-0400Z.

California Early Bird Net: Sat. mornings @ 8 AM PST on 3870 kc.

California Vintage SSB Net: Sun. mornings @ 8AM PST on 3860 +/-

Colorado Morning Net: Informal AMers on 3875 kc daily @ 6:00 to 6:15 AM, MT. QSX KØOJ

Canadian Boatanchor Net: Daily 3725 kc (+/-) @ 8:00 PM ET. Hosts are AL (VE3AJM) and Ken (VE3MAW)

Collins Collectors Association (CCA) Nets: Tech./swap sessions every Sun. on 14.263 Mc @ 2000Z. Informal ragchew nets meet Tue. evening on 3805 kc @ 2100 Eastern time, and Thu. on 3875 kc. West Coast 75M net is on 3895 kc 2000 Pacific time. 10M AM net starts 1800Z on 29.05 Mc Sundays, QSX op 1700Z. CCA Monthly AM Night: First Wed. of each month, 3880 kc starting @ 2000 CST, or 0200 UTC. All AM stations are welcome.

Drake Technical Net: Meets Sun. on 7238 kc, 2000Z. Hosted by John (KB9AT), Jeff (WA8SAJ), and Mark (WBØIQK).

Drake Users Net: Check 3865 kc, Tue. nights @ 8 PM ET. QSX Gary (KG4D), Don (W8NS), and Dan (WA4SDE)

DX-60 Net: Meets on 3880 Kc @ 0800 AM, ET on Sun. QSX op is Mike (N8ECR), with alternates. The net is all about classic entry-level AM rigs like the Heath DX-60.

Eastern AM Swap Net: Thu. evenings on 3885 kc @ 7:30 PM ET. Net is for exchange of AM related equipment only.

Eastcoast Military Net: Sat. mornings, 3885 kc +/- QRM. QSX op W3PWW, Ted. It isn't necessary to check in with military gear, but that is what this net is all about.

Fort Wayne Area 6-Meter AM net: Meets nightly @ 7 PM ET on 50.58 Mc. Another long-time net, meeting since the late '50s. Most members use vintage or homebrew gear.

Gulf Coast Mullet Society: Thu. @ 6PM CT, 3885 kc, QSX control op W4GCN in Pensacola.

Gray Hair Net: One of the oldest nets, @44+ years ,160 meter AM Tue. evening 1945 kc @8:00 PM EST and 8:30 EDT. Also check www.hamelectronics.com/ghn

Heathkit Net: Sun. on 14.293 Mc 2030Z right after the Vintage SSB net. QSX op W6LRG, Don.

K1JCL 6-meter AM repeater: Operates 50.4 Mc in, 50.4 Mc out. Repeater QTH is Connecticut.

K6HQI Memorial 20 Meter Net: Flagship AM net 14.286 Mc daily for 25+ years. Check 5:00 PM Pacific Time.

Lake Erie Boatanchor CW Net: Sat. mornings, 7143 kc, 10:00 Eastern time. QSX op Steve (WA3JJT) or Ron (W8KYD).

Midwest Classic Radio Net: Sat. morning 3885 kc @ 7:30 AM, CT. Only AM checkins. Swap/sale, hamfest info, tech. help are frequent topics. QSX op is Rob (WA9ZTY).

Mighty Elmac Net: Wed. nights @8PM ET (not the first Wed., reserved for CCA AM Net), 3880 +5 kc. Closes for a few summer months QSX op is N8ECR

MOKAM AM'ers: 1500Z Mon. thru Fri. on 3885 kc. A ragchew net open to all interested in old equipment.

Northwest AM Net: AM daily 3870 kc 3PM-5PM winter, 5-7 PM summer, local. 6M @50.4 Mc. Sun., Wed. @8:00 PM. 2M Tues. and Thurs. @ 8:00 PM on 144.4 Mc.

Nostalgia/Hi-Fi Net: Started in 1978, this net meets Fri. @7 PM PT, 1930 kc.

Old Buzzards Net: Daily @10 AM ET, 3945 kc in the New England area. QSX op George (W1GAC) and Paul (W1ECO).

Southeast AM Radio Club: Tue. evening swap, 3885 @7:30 ET/6:30 CT. QSX op Andy (WA4KCY), Sam (KF4TXQ), Wayne (WB4WB). SAMRC also for Sun. Morning Coffee Club Net, 3885 @ 7:30 ET, 6:30 CT.

Southern Calif. Sun. Morning 6 Meter AM Net: 10 AM on 50.4 Mc. QSX op is Will (AA6DD).

Swan Nets: User Net Sunday 2200z winter 14.250Mc ±QRM. QSX op rotates Jim (WA5BDR), Jay (WB6MWL), Norm (W7RXG), Bill (W4WHW). Tech Nets: Wednesday 2300z 14.251Mhz / Saturday 1900z 7235 kc QSX op Stu (K4BOV)

Texoma Trader's Net: Sat. morning 8:00AM CT 3890 kc, AM & vintage equip. swap net.

Vintage SSB Net: Sun. 1900Z-2000Z 14.293 & 0300Z Wed. QSX op Lynn (K5LYN) and Andy (WBØSNF)

West Coast AMI Net: 3870 kc, Wed. 8PM Pacific Time (winter). Net control rotates between Brian (NI6Q), Skip (K6LGL), Don (W6BCN), Bill (N6PY) & Vic (KF6RIP)

Westcoast Military Radio Collectors Net: Meets Sat. @ 2130 Pacific Time on 3980 kc +/- QRM. QSX W7QHO.

Wireless Set No. 19 Net: Meets second Sun. every month on 7270 kc (+/- 25 Kc) @ 1800Z. Alternate frequency 3760 kc, +/- 25 kc. QSX op is Dave (VA3ORP).

CLASSIFIEDS

Advertising Information

Subscribers receive 1 free 20-word ad per month. **Extra words are 20 cents.** Here is how to count the words in your ad: "For Sale" or "Wanted" and your contact information counts as 7 words. Hyphenated words count as 2 words. **Please count the words in your ad as described above, and if you are over 20 words, send payment for the extra words at .20 each.** Note: Not all readers use e-mail, so it is a good idea to include phone numbers. Non-subscribers: $3.00 minimum for each ad up to 20 words. Each additional word is 25 cents. E-mail ads are fine.

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Deadline for the July 2006 issue: Wednesday, June 28!

SERVICE FOR SALE: Repair and restoration on all vintage equipment; over 50 years of experience. Barney Wooters, W5KSO, 8303 E. Mansfield Ave., Denver, CO 80237. 303-770-5314

MANUALS FOR SALE: Military Radio manuals, orig. & reprints. List for address label & $1. For specific requests, feel free to write or (best) email. Robert Downs, 2027 Mapleton Dr., Houston, TX 77043, wa5cab@cs.com

SERVICE FOR SALE: COMPLETE SERVICE JOHNSON "TURBO" RANGER, Valiant, Viking 500, Viking II, include panel and cabinet refinish. Hammarlund 180(A), National 300, 303, R390(A), Collins. Powdercoating. http://w4pnt.8k.com Patty & Dee's Marina: 534 W. Main St. Waynesboro, Va. 22980 w4pnt@highspeedlink.net 540-249-3161 Cell: 540-480-7179

FOR SALE: Tempo RBF-1A, dual meters, pwr and SWR bridge, Tempo accessory $19+ shpg. Henry Mohr, 1005 W. Wyoming, Allentown, PA 18103-3131

FOR SALE: Swan Cygnet xcvr with matching 1200-w linear amp plus extra 270 xcvr parts rig. Package deal only, $275 shipped to lower 48. For more info call Doug Carter, W5AAO, 830-990-7548

FOR SALE: Collection of Taylor tubes, $175. Five 6KD6 pulls $30. Richard Cohen, 813-962-2460

FOR SALE: Collins 20V-2 broadcast transmitter southeast Colorado cosmetically nice, complete, needs some work, owned 20 years never powered up, $1,950. Robert, NØNFI, 719-846-6265 redchile@hughes.net

FOR SALE: WRL Sidebander Model DSB 100, collector's item, 100 watts 80-10 meters very nice condition $50 plus shipping. John Snow, W9MHS, 316-733-1856 1910 Remington Ct., Andover, KS 67002

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Radio Auction

The Fred Bright Collection Vintage Radio Auction

Saturday, June 24th, 2006 at 10 am EST
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(From Interstate 71 Exit 204, South on SR #83, left on Garmon Rd)

We are pleased to offer the collection of Fred Bright from Oalahoma City, Oklahoma. Fred was an avid collector of many years and became well known in the southwest area buying and selling radios. He has selected us to sell the collection at our Burbank, Ohio site. This sale will include the following items. A Atwater-Kent Model 9 Breadboard, Atwater-Kent Model 10 Breadboard, Atwater-Kent Model 12 Breadboard, Atwater-Kent Neon Sign, Atwater-Kent Paper Mache Crest Emblem, Atwater-Kent Back Lit Signs, Howard Radio Neon Sign, Deforest F-5, Deforest D-10, Deforest 7-A, Deforest Interpanel MR-6, Deforest Interpanel D-2, ERLA One Tube, Bristol One Tube Amp., A very nice Nesco BC-131, Kennedy Type IV, Kennedy Type V, Kennedy Type VI, Kennedy Type 521 Amp., Kennedy Type 525 Amp., Kennedy Type 220, Kennedy Type 110, Kennedy Type 281, Rare Kennedy One Tube Receiver Type 311, A beautiful Grigsby Tortoise Shell Orange Celluoid Horn Speaker, Rare like new "Amplion Dragonfly" Minature Horn Speaker, Burns Petal Speaker, Frame for a Cone Speaker featuring a ANGEL and other Cone Speakers. Many Horn Speakers including, Music Master and Orchestron, Western Electric Type 7-A Amp., Western Electric 2-A Power Supply, Lincoln Loop Antenna w/ Box, A UTT-Williams Loop, Fiat Loop Antenna, Echo Phone DA-31, Radio Shop 3 Tube-Pramount, Zenith 3R, Neutrowound w/ Black, BC-14 A W.WI Crystal Radio, Melody King Crystal Set, Lamp Crystal Set , Beaver Baby Grand, Pal Crystal Set, Howe, Philmore Blackbird and other Crystal Sets, Murdock Loose Coupler, Ware 3 Tube, Ware 4 Tube, Music Master 4 Tube, RCA Tubes Advertising Clock, Crosley and Philco Grandfather Clock Radios, A Majestic Antenna Lamp Base, A Crosley "Pup", Crosley 50, 50 A, 51, 52, Crosley VI, Crosley X, Crosley XJ, Aeriola Jr., Aeriola Sr., Radiola III, IIIA, Radiola IV, Radiola V, Radiola 16, 20, 25, A Chalk Nipper Dog, Atwater-Kent Tapestry, This sale includes a variety of Cathedral and Tombstone Radios, Lots of Wood and Bakelite Table Top Radios, Many Parts, A large collection of Headphones, Several Thousand Tubes to include many Early Type, A large selection of Radio Magazines and Books, Nice Old Sylvania Radio Thermometer. This will be a good auction with many scarce pieces, so make your plans to join us.

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Call Us to Sell One Radio or Your Entire Collection!

We offer pick-up service for your collection.

FOR SALE: Collins S-Line package/75S-1/32S-1/516F2. Receiver has Waters Q-Multiplier/Notch Filter installed. With manuals, vgc, $1200/swap. Collins KWS-1 plate transformer, used, $100/swap. Collins 51S-1 power transformer, NOS, $75. HP 141T Spectrum Analyzer w/plug ins from audio to 18GHz and TG, $900/swap. Gary, K6GLH, 209-286-0931 or k6glh@volcano.net

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FOR SALE: Sideband Slicer Model A by Central Electronics. With attachments, looks never used, $35. John Snow, W9MHS, 1910 Remington Ct., Andover, KS 67002 316-733-1856

FOR SALE: EICO 465 Professional Oscilloscope with manual and probe in exc cond $75 plus shipping. John Snow, W9MHS, 1910 Remington Ct., Andover, KS 67002 316-733-1856

FOR SALE: Sencore probes for test equipment, Model 39G41 demodulator probe $10; Model 39G144 test lead adapter $5; Model SCR224 for SCR & TRIAC test accessory to be used on Sencore LC53 or CS55 $15. John Snow 1910 Remington Ct., Andover, KS 67002 316-733-1856

FOR SALE: R-390A/URR field and depot maintenance manual (not a copy). TM 11-5820-358-35 $35 postpaid. John Snow 1910 Remington Ct., Andover, KS 67002 316-733-1856

FOR SALE: ITT Mackay 1970's rcvrs, xmtrs, rf amps, SSB exciters and parts. Model 3020 receiver and others of that vintage. See website: http://home.comcast.net/~k7rld or call John, K7RLD. 425-785-6111

FOR SALE: Viking Invader 2000 transmitter in good shape, 80 thru 10 meters, 2kw filter type SSB/CW/AM. With supply. You ship. $750. Heathkit HW-101, 80 thru 10 meter SSB/CW transceiver with PS-23 power supply. You ship, $185. Heathkit twins SB-300 and SB-400(built in supply) good condition physically and operationally. You ship, $275. **WANTED:** Hallicrafters SR-400 transceiver with PS-150 power supply. I will consider trades for other equipment. Ken Sands, K8TFD, ken.sands@juno.com, 505 Parkview Drive, Plymouth, MI 48170. 734-453-7658 734-564-0316 313-917-0144

FOR SALE: 1945 Maintenance handbook for test set TS-287/AP. $20 + shpg. Jerry Miles, WA4KJK, 3349 Percy Priest Dr., Nashville, TN 37214 615-889-4398

FOR SALE: Huge Vintage Estate Sale. SASE for complete list of rare Transmitters, Receivers, Accessories. David, PO Box 323, Metamora, Michigan 48455

FOR SALE: Heath AR-1 Receiver, $100. National NFM-83 NBFM Adapter, $125. Vibroplex J-36 Bug, $125. Richard Prester, 131 Ridge Road, West Milford, NJ 07480. 973-728-2454. rprester@warwick.net

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FOR SALE: Multi-Elmacs: One-Of-A-Kind AF-68A (**NIB!**) $395; VNice PMR-8 $135. AF-67 $85. M-1070 (6/12/115V PS) $125. Package offers considered. Estate items/untested +UPS. MultiElmac@aol.com

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FOR SALE: Mint SBE34 w/Vox, calibrator,very rare Codapter, inverter $250 Yaesu FT-One $500 Chuck; n6fx@aol.com 909-593-861

FOR SALE: Electronics magazines 1930s to 2006. If interested call Hank, 570-654-2347

FOR SALE: Simpson meters: 373 DC milliammeter, 370 AC milliameters $25 each. Manual copy included. Ross Wollrab 229 N. Oakcrest Ave, Decatur, IL 62527. 217-428-7385 REWollrab@aol.com

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FOR SALE: Battery charger Model SE 20MA solid state twin rate auto-manual $25 plus shipping. John Snow, W9MHS, 1910 Remington Ct., Andover, KS 67002 316-733-856

FOR SALE: Heathkit HA-10 Warrior amp, in 9 out of 10 condition for $300. Bob, W1RMB, 508–222–5553.

FOR SALE: Antique radio jacks Federal Standard No. 1423-W & 1435 new in original boxes. $3 each plus shipping. John Snow, W9MHS, 1910 Remington Ct., Andover, KS 67002 316-733-1856

FOR SALE: LS-3 Loudspeaker. Condition NOSB, tested/working. Black wrinkle finish US WWII dated $55. MFP'd and repacked in the early fifties. May have minor chips/scratches. Smooth black finish US Korean War dated $50. All plus shipping. Robert Downs, 2027 Mapleton Drive, Houston TX 77043 wa5cab@cs.com

www.wa5cab.com

FOR SALE: Heath SB104A, SB604 pwr supply speaker. Beautiful, like new. Desk mic SB 614. HWA 2036A, HWA 2036-3. SB 614 monitor. Manuals for all. Andrew, W8DIR, 330-455-1846

FOR SALE: Tektronics 221 hand held oscilloscope, works great, ni-cad pack no good, service and operators manual on CD. $135. plus UPS. Johnny Umphress, 1415 Moore Terrace, Arlington, TX 76010 www.jgumphress@yahoo.com 817-915-4706

FOR SALE: Atwater-kent dual speed tuner repair kit. Complete details at www.adamsradio.com. Adams Manufacturing CO., PO Box 1005, Lincoln Park, MI 48146

FOR SALE: *"Unique Radio Parts", LLC.* www.wa9tgt.com (Replacement parts for "Drake" radio equipment)

FOR SALE: Globe Champion 300 electrically and cosmetically restored, new tubes, with audio and power supply mods. Frank KBØW/6, 916-635-4442 fdellechaie@sbcglobal.net

FOR SALE: Make offer: 1 radio tower 97 feet high base 12 feet, ladder all way to top with platform heavy duty. Need sell at once. Frank Bridges, 104 Maple Street, Brevard, NC 828-885-2470

FOR SALE: Tubes, transformers, receivers cabinets, more. LSASE w/2 stamps or email for list. WA7HDL, 167 Highway 93 south, Salmon, Idaho 83467 GBABITS@SALMONINTERNET.COM

FOR SALE: Pair Hallicrafters lunch box HW-30, manuals. Coca Cola clock. Falstaff motorized sign. Bill Coolahan, 1450 Miami Dr. NE, Cedar Rapids IA 52402, 1-319-393-8075

FOR SALE: Telephone Filters, suppress >1MHz interference, plug in, 1/$7, 2/$11, 3/$14, 4/$16.75, shipped U.S. Brian Harris WA5UEK 3521 Teakwood Lane, Plano TX 75075 brian.k.harris@philips.com 214-763-5977

FOR SALE: Military whip antennas, Sears Silvertone batter set $45, Cathedral project radio $40. Bruce Beckeney, 5472 Timberway, Presque Isle, MI 49777, 989-595-6483

FOR SALE: Naval Receivers RAK, RAL, RAO, RBA, RBB, RBC, RBL, RBM. Some checked, pwr splys available. $75-$450 depending on condx. Many other types. Carl Bloom, carl.bloom@prodigy.net 714-639-1679

FOR SALE: Manual for a Heathkit, Apache xmtr.mod.TX-1 1959 clean original. w/5 pull out schematics.$10. Heathkit Cheyenne M-MT-1 no cords or mic $90. Halli S-38C needs dial string, clean $75. Lafayette Comm. RCVR M-HB-75 30-50 meters (scale) $40. Bernie Samek, 113 Old Palmer RD. Brimfield, MA. 01010, 413-245-7174, bernies@samnet.net

QSLs FOR SALE: Your old QSL card? Search by call free, buy find at $3.50 ppd. Chuck, NZ5M, NZ5M@arrl.net

FOR SALE: DRAKE TR-7/TR-7A/R-7/R-7A Service kit. Includes 13 Extender Boards and Digital Jumper Card. $63.85 includes postage. See http://pweb.amerion.com/~w7avk, Bob, W7AVK, 807 Westshore J28, Moses Lake, WA 98837, w7avk@arrl.net, 509-766-7277

BOOKS FOR SALE: Lots of old radio & related books. Please contact Eugene Rippen, WB6SZS, www.muchstuff.com

SERVICE FOR SALE: Let's get that old radio of yours working again! Antique Radio Repair - All Makes- Also Transistor Radio Repair. Tom Senne, N5KCL, 937-865-5213

http://tomsradiorepair.bizland.com

FOR SALE/TRADE: Manuals: HRO60, NC400, Morrow, 32V2, 75A3, DX100, Mohawk, G76, SPR4, Valiant, Ranger, others. NI4Q, FOB 690098, Orlando, F1 32869 407-351-5536 ni4q@juno.com

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FOR SALE/TRADE: Transmitting/ Receiving tubes, new and used. LSASE or email for list. **WANTED:** Taylor 204A, 211, TR40M and Eimac 500T. John H. Walker Jr., 13406 W. 128th Terr., Overland Park, KS. 66213. PH: 913-782-6455, Email: jwalker83@kc.rr.com

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FOR SALE: FT243 CRYSTALS: 3500, 3505, 3515, 3520, 3546, 3548, 3558, 3645, 3686, 3702, 3805, 3825, 3830, 3837, 3855, 3875, 3880, 3885, 3890, 3983, 5355, 5360, 7000, 7025, 7030, 7035, 7037, 7040, 7044, 7045, 7047, 7050, 7060, 7125, 7146, 8025, 8400, 10106, 10116, 10120, 12500, 14060, 14286kHz. See: http://www.af4k.com/crystals.htm or call Brian, AF4K, at 407-323-4178

HALLICRAFTERS SERVICE MANUALS: Ham, SWL, CB, Consumer, Military. Need your model number. Write or email. Ardco Electronics, PO Box 24, Palos Park IL, 60464, WA9GOB@aol.com, 708-361-9012 www.Ardcoelectronics.com

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DRAKE INFO FOR SALE: Drake C-Line Service Information. Hi-Res Color photos of boards and chassis with parts identified. CD also includes Hi-Res scans of R-4C and T-4XC manuals, various version schematics and more. Garey Barrell, K4OAH@mindspring.com, 4126 Howell Ferry Rd, Duluth, GA 30096. 404-641-2717

HALLICRAFTERS PARTS: Hallicrafters SX101/101A reproduction main tuning knob. Includes silver inlay and set screws. $35.00 Mike Langston KL7CD, 1933 Diamond Ridge Drive, Carrollton, Texas 75010, mlangston@hcpriceco.com 972-392-5336

JOHNSON PARTS: EFJ replacement parts: Valiant tie bolts-4 for $18.50. Ranger tie bolts-3 for $17. 80-2CM mic connector (also for Heath/Collins/others) $10 All ppd. Contact Cal Eustaquio, N6KYR/8, 823 W. Shiawasee St, Lansing, MI 48915, catman351@yahoo.com

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DRAKE SERVICE FOR SALE: R.L. Drake repair and reconditioning, most models including TR-7's, 35 years experience. Jeff Covelli, WA8SAJ, 440-951-6406 AFTER 4 PM, wa8saj@ncweb.com

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FOR SALE: QRP transmitter kits. Step-by-step instructions. Wood model, up to 5 watts 40/80M $15. "Tunatin" one watt 40M $10. You furnish crystal and power. Robert Larson, 1325 Ridgeway, Medford, OR 97504 W7LNG@arrl.net

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SERVICE FOR SALE: Repair, upgrade, performance modification of tube comm. & test equip. Accepting most military, all Collins & Drake, & better efforts from others. Laboratory performance documentation on request. Work guaranteed. Chuck Felton, KDØZS, Felton Electronic Design, 1115 S. Greeley Hwy, Cheyenne, WY 82007. 307-634-5858 feltondesign@yahoo.com

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PARTS FOR SALE: Complete hardware set to connect Collins PM2 to KWM2 - $19.95 ppd. Warren Hall, KØZQD, POB 282, Ash Grove, MO 65604-0282.

FOR SALE: Obsolete Triplett parts. Send part number and description for possible quote. USA only. Also several tons of transformers, switches, other material that's Triplett surplus. Bigelow Electronics, POB 125, Bluffton, OH 45817-0125

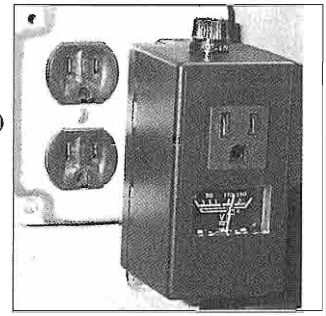
NOTICE: Visit Radioing.com, dedicated to traditional ham radio & vintage radio resources. Let's Radio! Charlie, W5AM. http://www.radioing.com.

ZIM ELECTRONICS INRUSH CURRENT LIMITERS

Inrush Current Limiters are now available from the Electric Radio Store or on-line! These inrush limiters were reviewed in the September 2004 issue of Electric Radio and are available in three versions:

Model AB-1M (With Voltmeter) $34.95
***NEW! Model AB-300M* 300 watts (2.5 amps x 120 VAC) with meter $39.95**
Model AB-1 (With Pilot Light) $29.95
Shipping, each limiter $5.45
(4 or more limiters are shipped free for US orders. Overseas customers please ask for shipping quotes.)

The Inrush Limiter provides a gentle, slow startup for your valuable vintage radio equipment. They also reduce the line voltage closer to original design values due to the voltage drop across the limiter element. Both models come with a full money-back guarantee.



Model AB1-M

Electric Radio Store
720-924-0171

BOOKS FOR SALE: Radio books, magazines, catalogs, manuals (copies) radios, hi-fi, parts. Send 2 stamp, LSASE David Crowell, KA1EDP, 40 Briarwood Rd., North Scituate, RI 02857 ka1edp@juno.com

FOR SALE: Swan 350, working $85. Carter, CElliott14@earthlink.net 434-979-7383

FOR SALE: Tubes tested good globe 224 $6, 226 $8, 227 $9. Write or e-mail: tubes@qwestnet for price lists or see www.fathauer.com. Slightly weak tubes guaranteed to work in early radios 1/2 regular price. George H. Fathauer & Assoc., 123 N. Centennial Way, Ste. 105, Mesa, AZ 85201. 480-968-7686 or toll free 877-307-1414

BOOK FOR SALE: Heath Nostalgia, 124 page book contains history, pictures, many stories by longtime Heath employees. (See ER Bookstore) Terry Perdue, 18617 65th Ct., NE, Kenmore, WA 98028

SERVICE FOR SALE: Repair of tube and solid state 1930 to 1975 radio equipment, auto, shortwave and older amateur gear. Please contact Ken Hubbard, KA9WRN, at 608-362-1896 or write Vintage Radio Service, POB 792, Beloit, WI 53512-0792.

SERVICE FOR SALE: Authorized repairs and sales of all types of amateur radio, communications, and test equipment. Please call Land Air Communications, 718-847-3090, visit our web site: www.landaircom.com. We have over 3,000 items in inventory and carry all types of communications parts.

JOHNSON PARTS: New Ranger 1, Valiant 1, & Navigator plastic dials, freq numbers

in green, with all the holes just like orig.- $17.50 ppd. Bruce Kryder, W4LWW, 277 Mallory Station Dr., Ste. 109, Franklin, TN 37067. b.kpvt@provisiontools.com

FOR SALE: 160m FT243 CRYSTALS: 1885, 1900, 1915, 1925, 1930, 1945, 1970, 1977, 1985 kHz. See: http://www.af4k.com/crystals.htm or call Brian, AF4K, at 407-323-4178

ACCESSORIES FOR SALE: KWM2/S-line metal logo pins. Meatball or winged. Excellent replica of the original. Put one on your hat, badge, or replace a missing logo on your panel, $6.25 shipped. W6ZZ, 1362 Via Rancho Pkwy, Escondido, CA 92029. 760-747-8710, w6zz@cox.net

FOR SALE: Vintage electronics at Almeda Antique Mall, 9837 Almeda Genoa in Houston. Visit www.RadioWorld-OnLine.com Carl Blomstran, PO Box 890473, Houston TX 77289

ACCESSORIES FOR SALE: Spun Aluminum Knob Inlays for most Boatanchors. Collins Dial Drum Overlays. Dakaware Knobs. Charlie Talbott, 13192 Pinnacle Lane, Leesburg VA 20176-6146. 540-822-5643, k3ich@arrl.net

PLANS FOR SALE: Build your own "Midget" bug replication by KØYQX, ca 1918, featured by K4TWJ in CQ Magazine, May '98. 10 detailed blueprints. FAX: 507-345-8626 or mobeng@hickorytech.net

PARTS FOR SALE: Parts, tubes, books, ECT. Send two stamp SASE or email letourneau@wiktel.com for list. Wayne LeTourneau, POB 62, Wannaska, MN 56761

ACCESSORY FOR SALE: RIT for Collins KWM-2/2A; No modifications needed. $79.95 SASE for details. John Webb, W1ETC, Box 747, Amherst NH 03031 w1etc@adelphia.net

PARTS FOR SALE: Aluminum heat dissipating plate and grid connectors for all 3, 4 and T series Eimac tubes including 3-500Z, 4-1000, 304T's and others. Alan Price, fixer7526@wmconnect.com

TREASURES FROM THE CLOSET! Go to www.cjpworld.com/micromart to find some unique items many hams would lust for! Gus, WA, 360-699-0038

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SERVICE FOR SALE: I build hot-rod receivers: R-390A, SP-600, R-388/51J. NC-183D and transmitters: Valiant, DX-100, T-4X-A-B, HT-32, AF-67. 51J-4 filter replacements, R390A Hi-fi AM $245.00 ea. Chuck Felton, KDØZS, Wyoming, 307-634-5858, feltondesign@yahoo.com

WANTED: Early QSL cards from my Grandfather, Hal Smith (SK). His calls were KH6KA, K6YJR, K6OQE. Gladly reimburse postage plus modest finder's fee! Phil Wilson, 1355 Big Otter Dr, Blue Ridge, VA 24064 k6cra@arrl.net

WANTED: QST, Jan 1932 issue. National right-angle drive ACD-1, National dial pointer DP-2. Clean National P dial, 0-100 scale. Clean Hammarlund or equiv vari cap, APC, HF or VU style, screwdriver or extended shaft with plated brass plates only. Two sizes, approx 15mmf and 100mmf. V. Yeich, 357 Mountain View Rd. Newfoundland, P A 18445, 570-676-4266

WANTED: $10 plus shipping paid for a Heathkit S-2 Electronic Switch. Mike Bittner, 27215 Sunnyridge Road, Palos Verdes Peninsula, CA 90274 310-377-4797 mmab@cox.net

WANTED: Heathkit condenser checker Model C-3, basket case preferred. John Snow W9MHS 1910 Remington Ct., Andover, KS 67002 316-733-1856

WANTED: 2 inch radio dials or equivalents. Len Gardner, 458 Two Mile Creek Rd, Tonawanda, NY 14150, radiolen@att.net

WANTED: Hallicrafters SX-73/R-274D junker with good main tuning capacitor. Tom, W4PG, wtw@rti.org 919-382-3409

WANTED: BTI L2000 3-1000 amp. Must be complete, unmodified, less tube. Nonworking OK. Carl, W3BRX W3BRX@AOL.COM 717-852-3223

WANTED: HRO-60 with coils or NC-183D. Byron Jones, 775-738-7979.

WANTED: CV-591A SSB adapter, working condition or repairable. Doug, 559-683-0530 dwheeler@sierratel.com

WANTED: Fan blade for one of the two cooling fans in my Central Electronics 100V. Fan motor OK, just need blade. Jerry, portangeles21@hotmail.com

WANTED: Bias and filament transformer from HT-33A or B, also HT32B transmitter parts unit. John, W8JKS, 740-998-4518

WANTED: Will buy SP-600 and some other Hammarlund equipment, working, not, or incomplete. Al, W8UT, anchor@ec.rr.com 252-636-0837

WANTED: Radio correspondence course lessons by National Radio Institute of Washington DC. Will pay cash and shipping. Also need a capacitor analyzer. George Reese, 380 9th St. Tracy MN 56175-1020. 507-629-4831

WANTED: Good quality Globe Scout Deluxe and Globe Chief manual or information for possible ER article. Dave, K2DK, k2dk@comcast.net or Electric Radio at 720-924-0171

WANTED: Manual for Brown Electro-Measurement Corp. Model 815AF Impedance Bridge. Might be same as ESI 815. Norbert C. Wokasch, 3312 W. Bijou St., Colorado Springs, Colorado 80904, 719-633-5661

WANTED: 2-Crystal ovens and 1-relay #1K303 (110 VAC SPST) for BTR-1R2 Rick Brashear K5IZ 214-742-1800 RICKBRAS@AIRMAIL.NET

WANTED: CQ Magazine April, May, June 1945. Lynn Stolz, N8AJ, 614-885-5428 n8aj@yahoo.com

WANTED: Hallicrafters SX-73/R-274D junker with good main tuning capacitor. Tom, W4PG, wtw@rti.org, 919-382-3409.

WANTED: Pearce-Simpson manual/ schematics for VHF marine radio, model "Catalina", JR Linden, K7PUR, PO Box 4927, Cave Creek, AZ 85327 jrlinden@usa.net

WANTED: The large connector and curved hood from the front of the BC-312 or 342 receiver, or just the hood. Trade or cash ok. Contact: Frank, WA6RBQ at wa6rbq@aol.com or 541-479-7935 in Grants Pass, OR

WANTED: Hallicrafters R45/ARR7 receiver, even non working but complete and good cosmetics. Francesco Sartorello, francesco.sartorello@virgilio.it

WANTED: Entire metal case or back and bottom for BC125 or junker radio. Robert Hawworth, 112 Tilford Rd, Somerdale, NJ 08083, 856-783-4175

WANTED: CR-91A cabinet, audio gain knob, and manual. Would also like to purchase an AR-88. Ward Rehkopf, 1417 E. Bradley, Shawnee, OK 74804, 405-275-5677 or radiohound2@yahoo.com

WANTED: Altec Lansing horns: 811B, 511B. Drivers 808-8A, 806-8A. Ron, 262-673-9211, karenson87@yahoo.com

WANTED: Zenith chassis with speaker, model # 12S-232 or near equivalent for Walton cabinet. Please contact: Mike Grimes, K5MLG; 5306 Creekside Ct.; Plano, Texas, 75094, 972-384-1133. Email: k5mlg@verizon.net

WANTED: National NC-183DTS speaker, NFM-83-50 adaptor and SOJ-3 Selectojet. Contact Ric at C6ANI@arrl.net

WANTED: Tektronix **Type 570** curve tracer, any condition. Ron, AA2QQ, 718-824-6922

WANTED: Service for my Hallicrafters transmitters. Will deliver/pickup within 4 hours drive of Savannah, GA. Bob, W4WTO, 912-663-4311 armco1@bellsouth.net

WANTED: SX115 and HT-32B. Ward Rehkopf, 1417 E. Bradley, Shawnee, OK 74804, 405-275-5677 or radiohound2@yahoo.com

WANTED: Clean Gonset G76 with power supply/speaker and working R390A. Frank, KBØW/6 916-635-4442 fdellechaie@sbcglobal.net

WANTED: Hickok adaptor 1050-144 or it's schematic. Also boom ends or entire Astro-Beam antenna. Ted, 906-884-4723. 26103 M-64 West, Ontonagon, MI 49953

WANTED: ITT-Mackay Marine 3010-C Receiver, late S/N, complete and in good or VG conditions, with original box and manual. The item has to be shipped to a friend in Ohio (not outside U.S.). Send your offer to Paolo Viappiani, Via Valle 7, 19124 La Spezia, Italy, or pviappiani@tin.it

WANTED: National NTE-30 Transmitter. Any condition, any price! I love National. Sylvia Thompson, n1vj@hotmail.com 33 Lawton Foster Rd., Hopkinton, RI 02833. 401-377-4912.

WANTED: Collins 310B-3, basket case OK, 70E-8A PTO per 1948. Chicago CMS-2, pair of Taylor T-21. Jerry, W8GED, CO, 303-979-2323.

WANTED: Meter movement for Western Electric tube tester KS-15750. Walter Hughes, WB4FPD, 6 Academy Ct., Berryville, VA 22611 540-955-2635

WANTED: INTECH COM 6000 Service Manuals: COM3648, COM1000, COM1005 HF SSB Marine radio. Wes, K5APL, 870-773-7424 k5apl@cableone.net

WANTED: Harvey Radio Labs Tri-Tet Exciter or FT-30 Transmitter. $1000 reward! Robert Enemark, W1EC, PO Box 1607, Duxbury, MA 02331, 781-585-6233

WANTED: Any TMC equipment or manuals, what have you? Will buy or trade. Brent Bailey,109 Belcourt Dr., Greenwood, SC.29649, 864-227-6292, brentw2@earthlink.net

WANTED: Seeking unbuilt Heathkits, Knight kits. Gene Peroni, POB 7164, St. Davids, PA 19087. 215-806-2005

WANTED: Top prices paid for globe shape radio tubes, new or used. Send for buy list or send your list for offers. Write or e-mail: tubes@qwest.net. See www.fathauer.com or send for catalog of tubes for sale. George H. Fathauer & Assoc., 123 N. Centennial Way, Ste 105, Mesa AZ 85201 480-968-7686, Call toll free 877-307-1414

WANTED: Manuals, manuals, and manuals for radio-related equipment to buy or swap. Catalog available. Pete Markavage, WA2CWA, 27 Walling St., Sayreville, NJ 08872. 732-238-8964

WANTED: Postcards of old wireless stations; QSL cards showing pre-WWII ham shacks/equip. George, W2KRM, NY, 631-360-9011, w2krm@optonline.net

WANTED: Searching for RME CT-100 or 3R9 xmtrs and info about them. David Edsall, W1TDD, 156 Sunset Ave., Amherst, MA 01002. 413-549-0349 dedsall@crocker.com

WANTED: WW II German, Japanese, Italian, French equipment, tubes, manuals and parts. Bob Graham, 2105 NW 30th, Oklahoma City, OK 73112, 405-525-3376 bglcc@aol.com

WANTED: Looking for a National NTX or NTE transmitter/exciter for use in my vintage hamshack. Any condition, even basket cases or parts, considered. Will pick up in New England, or arrange shipping if outside of area. Paying any reasonable price, and most unreasonable ones! Please email with details or photos, all considered and most likely bought! Thanks! Bruce, W1UJR, 207-882-9969 or w1ujr@arrl.net

WANTED: Hammarlund ED-4 transmitter. Any condition or information. Bob Mattson, W2AMI 16 Carly Drive Highland NY 12528. 895-691-6247

WANTED: QSL card from W9QLY, Frank (Mac) Maruna, from 1956 or before. WILL PAY TOP DOLLAR. Don Barsema, KC8WBM, 1458 Byron SE, Grand Rapids, MI 49506, 616-451-9874

WANTED: PYE, Fairchild, Syncron, Langevin. Richard P. Robinson, PO Box 291666, LA CA 90029 323-839-7293 richmix@erols.com

WANTED: Schematic and related info on Halowatt TR5 broadcast rcvr made mid-1920s in Portland, OR. Fern Rivard, VE7GZ , PO Box 457, Cranbrook, BC V1C4H9 Canada crc@cyberlink.bc.ca

WANTED: Incarcerated ham seeks correspondence. w/others on mil (R-390's &backpacks) & tube radios. Also copies of postwar-90's surplus catalogs, backpack specs & photos. W.K. Smith, 44684-083, FCI Cumberland Unit A-1, POB 1000, Cumberland, MD 21501

WANTED: Commercial or kit-built 1930s and 40s transmitters. Doc, K7SO, 505-920-5528 or doc@cybermesa.com

WANTED: Hallicrafters SX115, SX88, Collins 75A-1, AM broadcast transmitter in New England area, Heath DX100B. Will pay good price for good equipment. w1txjohn@aol.com, 802-775-7632 Eves.

WANTED: Scott Special Communications rcvr. EA4JL, please call Kurt Keller, CT, 203-431-9740

WANTED: Top dollar paid for WWII radios, PRC-1, PRC-5, AR-11, SSTR-1, SSTR-5, British B2, need pts for PRS-1 mine detector. Steve Bartkowski, 708-863-3090

WANTED: Sonar CB transceiver model J23 mobile set. 23-channel, tube-type CB radios, also 23-channel mobile sets. Ed, WA7DAX, 1649 E. Stratford Ave., Salt Lake City, UT 84106. 801-484-5853

WANTED: TCS & TBY Navy radios. Ken Kolthoff, K8AXH, PO Box 215, Craig, MO 64437. Work #913-577-8422.

WANTED: ARC-5 rcvrs, racks, dynamotors. Jim Hebert, 900 N. San Marcos Dr. Lot 77, Apache Junction, AZ 85220

WANTED: Harvey-Wells Odds-'N-Ends: Speakers, phones, mikes, manuals, supplies, prototypes, military, aircraft. Kelley, W8GFG, 219-365-4730, 9010 Marquette St., St. John, IN 46373

WANTED: Collins R-389 LF receivers, parts, documentation, anecdotes, antidotes. W5OR Don Reaves, PO Box 241455, Little Rock AR, 72223 501-868-1287, w5or@militaryradio.com or www.r-389.com

WANTED: Receivers. Telefunken E1800, Rohde Schwarz, EK-56/4, NC-400, Racal 3712, Hallicrafters SX 88, Collins HF8054A, Collins 851S-1. Manual for Racal R2174B(P)URR 310-812-0188(w) alan.royce@ngc.com

I NEED INFO!: Radiomarine T-408/URT-12/USCG/1955. Sam, KF4TXQ, PO Box 161. Dadeville, AL 36853-0161 stimber@lakemartin.net 256-825-7305

WANTED: SCR-602 components, BC-1083, BC-1084 displays, and APS-4 components. Carl Bloom, 714-639-1679

WANTED: Western Electric horns, speakers, amps, and mics. Barry Nadel, POB 29303, San Francisco, CA 94129 museumofsound@earthlink.net

WANTED: KWS-1 RF section in any condition, or a complete KWS-1 for TLC restoration. Also HT33, prefer operating unit; Gary, K2PVC, 917-359-8826 gschonwald@earthlink.net

WANTED: Tektronix memorabilia & promotional literature or catalogs from 1946-1980. James True, N5ARW, POB 820, Hot Springs, AR 71902. 501-318-1844, Fax 623-8783 www.boatanchor.com

WANTED: Collins promotional literature, catalogs and manuals for the period 1933-1993. Jim Stitzinger, WA3CEX, 23800 Via Irana, Valencia, CA 91355. 661-259-2011. FAX: 661-259-3830 jstitz@pacbell.net

WANTED: Westinghouse SSB Transmitters MW-3 (Exciter, Amplifier, Power Supply). Also, MW-2 (AM). Will pickup anywhere. Gary, WA4ODY, Seabrook, TX 77586, 281-291-7701 myctpab@earthlink.net

WANTED: WWII Navy GP-7 transmitter in any condition, with or without tuning units or tubes, etc. Ted Bracco, WØNZW, braccot@hotmail.com A.C. 717-857-6404 X306

WANTED: JB-49 junction box, BC-731 control box, DY-17 dynamotor. Rick Brashear, K5IZ, rickbras@airmail.net or 214-742-1800

WANTED: Power change switch (S103) as used in a Collins 20V2. Dewey Angerhofer, PO Box 540, Edgemont, SD 57735 605-662-7692

DONATIONS WANTED: Southern Appalachian Radio Museum, Asheville, NC, where others can view your radio treasures. For general information or donations call Clinton Gorman, Curator, 828-299-1276

WANTED: WW-2 IFF Equip FM-80 rack BC-126F RA-105A 1-221, BC-1293. Will pay top dollar. Steve Bartkowski, 1-708-430-5080, 7702 Austin Ave, Burkank, IL 60459

WANTED: Electrical Engineer's Handbook, Pender, Del Mar and McIlwain, John Wiley and Sons, NY 1914, 1922, 1936. Louis L. D'Antuono, WA2CBZ, 8802-Ridge Blvd., Bklyn, NY 11209. 718-748-9612 AFTER 6 PM Eastern Time.

WANTED: One of my "KN8GCC" QSLs from the mid-1950s. Tom Root, 1508 Henry Court, Flushing, MI 48433, wb8uuj@arrl.net, 810-659-5404.

WANTED: 8873 tube for Heath SB-230 amp. Bill Smitherman, KD4AF, 9401 Hwy 67, E. Bend NC, 336-699-8699

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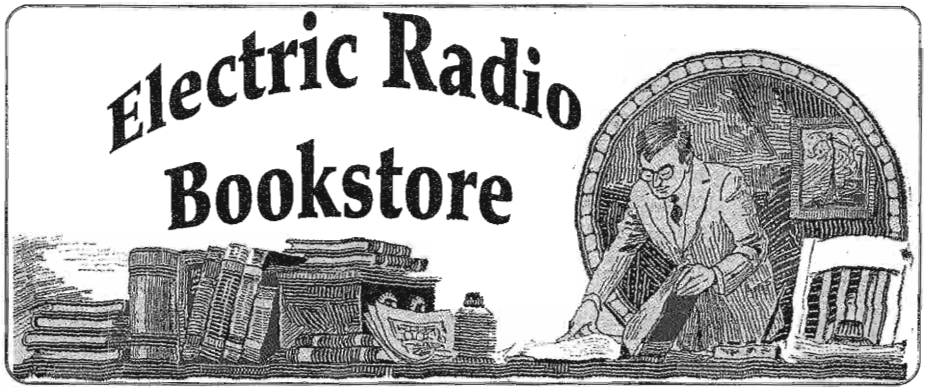

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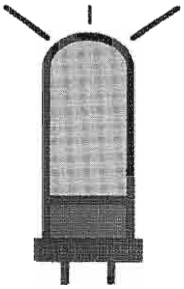

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