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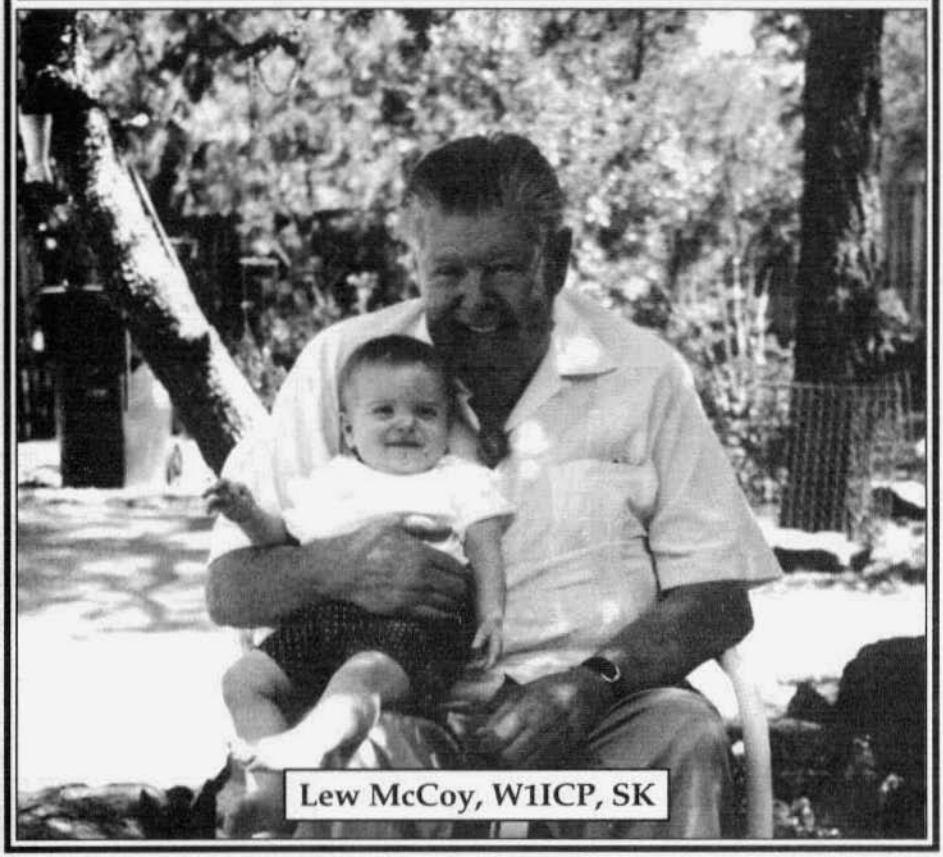
ELECTRIC RADIO

celebrating a bygone era

Number 135 July/August 2000



Lew McCoy, W1ICP, SK

ELECTRIC RADIO

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Editor - Barry R. Wiseman, N6CSW
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Electric Radio is published primarily for those who appreciate vintage gear and those who are interested in the history of radio. It is hoped that the magazine will provide inspiration and encouragement to collectors, restorers and builders.

We depend on our readers to supply material for ER. Our primary interest is in articles that pertain to vintage equipment/operating with an emphasis on AM, but articles on CW and SSB are also needed. Photos of hams in their hamshacks are always appreciated. We invite those interested in writing for ER to write or call.

Regular contributors include:

Walt Hutchens, KJ4KV; Bill Kleronomos, KDØHG; Ray Osterwald, NØDMS; Dave Ishmael, WA6VVL; Jim Hanlon, W8KGI; Chuck Penson, WA7ZZE; Dennis Petrich, KØEOO; Bob Dennison, W2HBE; Dale Gagnon, KW1I; Rob Brownstein, K6RB; Don Meadows, N6DM; Lew McCoy, W1ICP; Kurt Miska, N8WGW; Warren Bruene, W5OLY; Brian Harris, WA5UEK; Thomas Bonomo, K6AD and others.

Editor's Comments

Silent Keys

This month we report on the passing of Lew McCoy, W1ICP; Rick Miczak, K8MLV/Ø; Harry Snyder, W7HC and Park Cunningham, W8HSC. All of these men were important to amateur radio but particularly to those of us interested in vintage radio.

Lew McCoy was someone we all admired. Most of us started out reading his articles when we first got involved in amateur radio. Just the mention of his name causes us to recall pleasant memories of the past. His column here in ER, "Looking Back", was one of the most popular features of the magazine.

For AM'ers Rick Miczak, K8MLV/Ø was our FCC Watchdog. He was constantly vigilant for FCC regulations that would affect AM operations. He was the first to comment to the FCC and the one who constantly urged us all to do the same. Rick was also one of the most active AM'ers and was an encouragement for us all to get on the air.

Harry Snyder was an expert (Gary Higgins, W7ES, his best friend says he was a genius) in the repair and maintenance of Collins gear; particular the KWM-380. He shared his vast knowledge freely with everyone, particularly those in the CCA of which he was a member.

Park Cunningham, K8HSC, was an oldtimer I knew only from 10 meters. If memory serves me correctly he ran an Apache transmitter and had an antenna in his attic. I also remember that he was a crony of W5PYT's. I'd like to invite someone who knew Park to send in some information and a photo for next issue.

All four of these Silent Keys were contributing to the well-being of vintage radio. Now that they're gone vintage radio is somewhat diminished. I think we'll all have to work harder and be better to make up for their absence. N6CSW

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Cover: A recent photo of Lew McCoy, W1ICP, Silent Key, with his great granddaughter Lauren Denissen-Case. *Photo by Leigh Debragga-Case.*

Lew McCoy, W1ICP, Silent Key

This photo was taken on May 31 of this year by Lew's son -in- law, Neil Armann.

A good friend to all of us, Lew "Mac" McCoy, W1ICP died on July 31 after a short illness. He was 84. Three weeks before he died he was diagnosed with a brain tumor that was terminal. This is the same thing that took his first wife Martha in 1998. At his request there wasn't a funeral but a memorial service is being planned in Mesa, Arizona by his daughters for early December when many of his friends will have returned there for the winter. When the date is finalized we'll post it here in ER.

Lew is survived by his wife Clara Gibbs McCoy, whom he married about a year ago, two daughters, Marsha Ashurst, W1HAQ, and Sharon Armann, ex-WN1GQR.There are also many grandchildren and great grandchildren.

Most ER readers are familiar with W1ICP's history through his Looking Back column but for the benefit of new subscribers here's a brief rundown. In the late 40's he went to the ARRL headquarters to work in the Communications Department. After a brief stint there he moved to the Technical Department where he worked under George Grammer, W1DF, who might be described as his mentor. Most of the articles he produced there were very basic construction and technical articles directed toward Novices. These articles and his TVI work in the '50's and his Ultimate Transmatch will be what he will be remembered for. He stayed at the League until the late '70's when he went to work at CQ.

Although he always described himself as a 'phone man' he also worked CW and was a notable DX'er. Ham radio was his whole life. To my knowledge he wasn't interested in very much else.

I really came to know Lew (I never called him Mac like most of his other

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Rick Miczak, K8MLV/Ø, Silent Key

I Remember "Ricardo"

by longtime friend David Olsen, W6PSS/W7AMI

It is most difficult to put into words the feelings we experience on hearing the news of a mate crossing over the bar. Such is the case in the untimely passing of Rick Micvak, (K8MLV/Ø) who was truly a prime mover in preserving our Amateur Radio privileges. Few, if any, know the time and expense Rick expended in writing and rewriting reply comments to the FCC on those petitions which threatened the very AM mode that scores of us utilize and cherish. Many of us remember the pleadings we received from Rick during these times urging us to reply as well. Remember?

The time of our first QSO is uncertain. Perhaps the dial stopped on a late-nite marathon between Rick and Bob (W5PYT) or "Henry L R Radio" Timtron (WA1HLR) on 75M or was it a RICARDO monologue chiding modern technology for a new Ralph Nader appliance that was sure to diminish traditional amateur values. Whatever it was, it became necessary to call this fellow and find out what he was up to. Rick's reference to Ralph Nader was a Ricardo euphemism intended to discredit any innovation not intended for AM. Yes, a bit extreme but it was pure Ricardo entertainment that only he could dole out.

There were rare occasions when QRN made his preferred mode of communications impossible. Painful as it was, Rick suggested a shift to SSB and demanded this event remain confidential. Hopefully, we're off the hook now that the statute of limitations has been modified.

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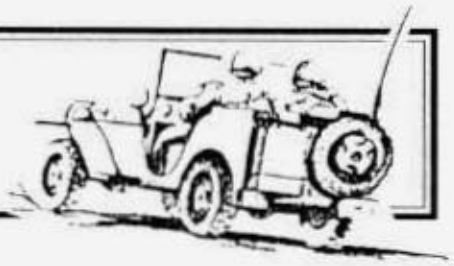
ELECTRIC RADIO IN UNIFORM



by Dennis DuVall, W7QHO
1524 Princes Dr.
Glendale, CA 91207
w7qho@aol.com

Radio Transmitter and Receiver BC-659

My military radio interests and collection activities up to now have been mainly focused on amplitude-modulated HF equipment. However, I have recently come into possession of a very nice pair of BC-659 FM sets which have proved interesting to work on and great fun to operate. This article will address these radios.

Overview

The BC-659 is a low-power FM transmitting and receiving set built on a single chassis. The frequency range is 27 to 38.9 MHz. Within this range the set can operate on either of two pretuned crystal controlled channels. Crystals were provided to cover the operating frequency range in 100 KHz increments (27.0, 27.1, 27.2. . . . . 38.9 MHz). Power output is listed in the manual as 1.3 watts and the range is given as "Approx. 5 mi." (TM-11-615, April 1945).

In the pack (ground transportable) configuration, the system was designated as "Radio Set SCR-609" and ran off batteries BA-40 and BA-39 which were mounted in case CS-79. The vehicular "SCR-610" version used one of two vibrator power supplies, PE-117-C and (later) PE-120-A. The battery pack and the vibrator supplies were normally mounted underneath the transmitter/receiver cabinet (see Figure 1).

An assembled unit (transmitter/receiver and vibrator or battery pack) stands 14" high, 12" wide and 17" deep. Total weight is 55 lbs with the vibrator supply and about 10 lbs less with the battery pack. The set came with a number of accessories including: telescoping antenna AN-29-C; handset TS-13; lip-mic T-45, headset HS-30 and related cords and plugs; mast sections MS-51, 52 and 53; mast base MP-48-A (later AB-15/GR); alignment tool TL-207; vehicle mount MP-250; and various ropes, insulators, covers, straps, etc.

Telescoping antenna AN-29-C was used with the ground based (SCR-609) configuration. Vehicular installations used various combinations of mounts (see above) and mast sections (MS-51/51/53 and MS-116/117/118).

Front panel controls are minimal, consisting only of a meter switch, two-position channel switch, and a combined master switch/receiver volume control. Microphone and headphone jacks with water seal covers are also mounted on the front panel along with a small speaker and a test meter. The latter is used to measure filament voltage, plate voltage, PA grid and PA plate current as selected by the meter switch.

Technical

As mentioned before, the BC-659 transmitter and receiver sections are mounted on a single chassis. Looking back from the front panel the receiver

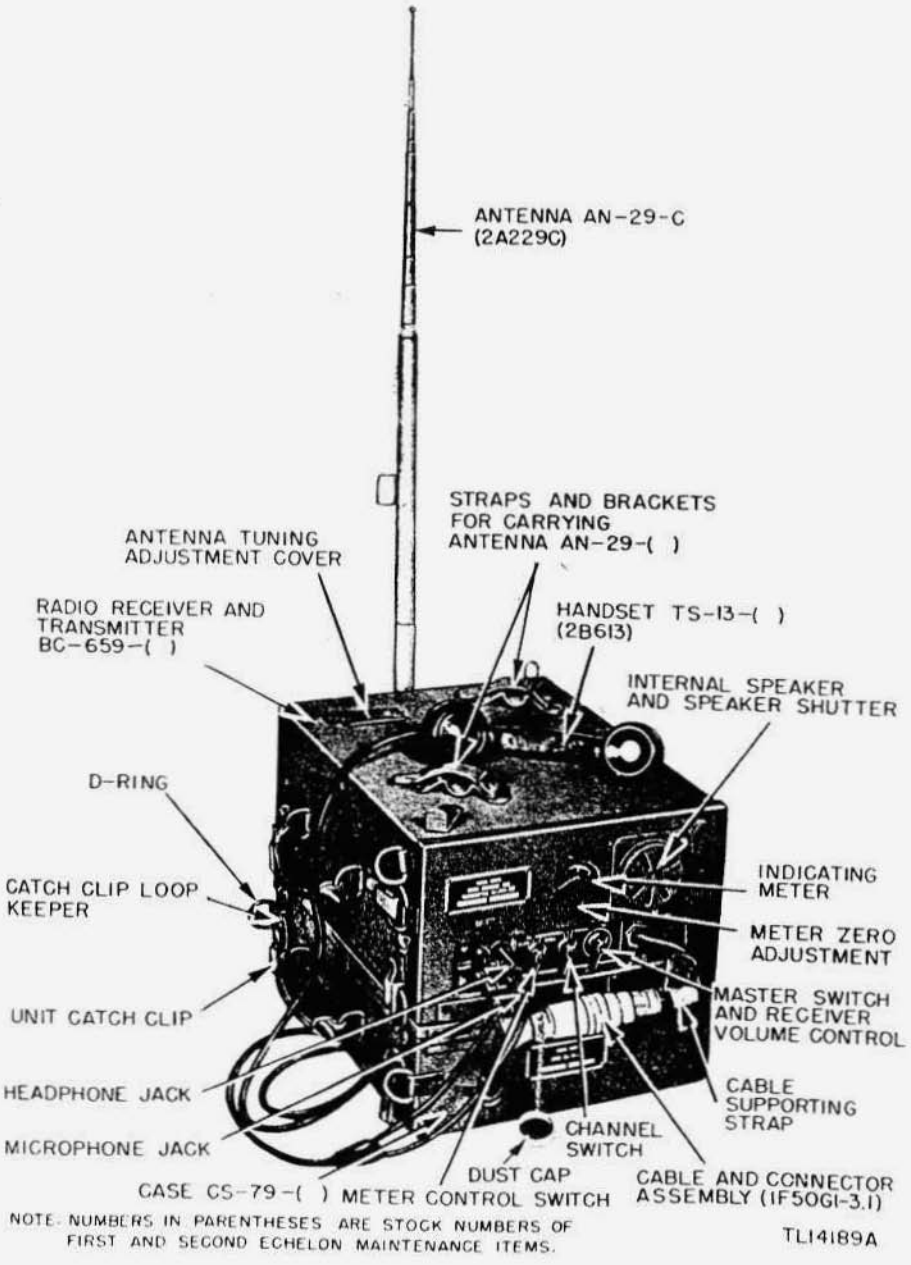


Figure 1. Radio set SCR-609-(), assembled for operation. (TM 11-615)

section is on the right side and the transmitter is on the left. All tubes are 3 and 1.5 volt "loctal" types.

Receiver Section

The receiver is a 10-tube single conversion superheterodyne with a crystal-controlled local oscillator (LO) and a 4.3 MHz IF. The circuit begins with two 1LN5 (VT-179) RF stages followed by a 1LN6 (VT-178) mixer. The LO is a 3D6/1299 (VT-185). We again see 1LN5s in the two IF stages and these are followed by a third 1LN5 amplifier/limiter stage. The discriminator circuit uses a 1R4/1299 (VT-183) and a 1LH4 (VT-177, more on this later), and the string ends with a 3D6/1299 A-F power amplifier which drives the speaker on the front of the set as well as the earpiece in the handset. A squelch circuit is NOT included.

Crystals in the 5-8 MHz range are used in the LO, which quadruples in the plate circuit. This gives an injection frequency to the mixer which is 4.3 MHz below the selected receive frequency. To receive on 29.6 MHz, for example, requires a crystal frequency of (29.6 - 4.3)/4 = 6.325 MHz.

Receiver circuitry is entirely conventional except for an AFC loop coming out of the discriminator section which will be discussed later. The IF bandpass is approximately 100 KHz. Overall sensitivity of the system is somewhat low by modern standards, with 10-15 microvolts at the antenna input terminal being required for full quieting. This is not unexpected given that the transconductance of the 1LN5 RF and IF amplifier tubes is only 500 (as compared to 5000 for a 6AK5, for example).

Transmitter Section

The transmitter consists of a reactance modulator, oscillator, buffer-doubler and a final RF amplifier stage. The reactance tube is a 3D6/1299. Audio from the carbon microphone in the handset is fed to the grid of this tube through a transformer and an RC pre-emphasis circuit. The oscillator is an electron coupled Hartley using another 3D6/1299 which drives a 3B7/1291 (VT-182) push-push multiplier. (The TM calls this a buffer-doubler but the output is actually 4 times the frequency of the oscillator tank circuit.) This stage, in turn, drives the 3B7/1291 final which operates as a straight through (neutralized) push-pull amplifier.

The output power is approximately 1.3 watt as mentioned before, and the deviation under modulation is 32-40 KHz each side of the output center frequency. The filaments of the transmitter tubes are energized only on push-to-talk and there is a slight delay before full output is achieved.

The interesting thing here is the way the transmitter output is locked to the receiver's crystal-controlled operating frequency. The circuit is shown in Fig.2. Two tubes are used in the receiver's discriminator circuit, a 1R4/1294 diode and a 1LH4 diode-triode (V13). The triode section of V13 is configured as a DC amplifier with the grid connected to the discriminator output through an RC filter to eliminate the audio component. The 60 volt battery in the plate circuit of V13 provides the required DC level shift down to the -5 vdc (+/-) operating bias range of the 3D6 reactance tube (V4).

In operation the receiver is not muted on transmit, so the output signal passes through to the discriminator. If the transmitted signal is exactly on the receiver frequency, the discriminator output rests at zero. If the transmitter frequency drifts higher than the receive frequency, a negative voltage appears at the output of the discriminator. This voltage is passed to the grid of V13, inverted and fed to the grid of the reactance tube as a DECREASE in bias level. This, in turn, pulls the transmitter frequency back down to where it belongs. If the transmitter frequency drifts downward, on the other hand, a positive voltage appears at the output of the dis-

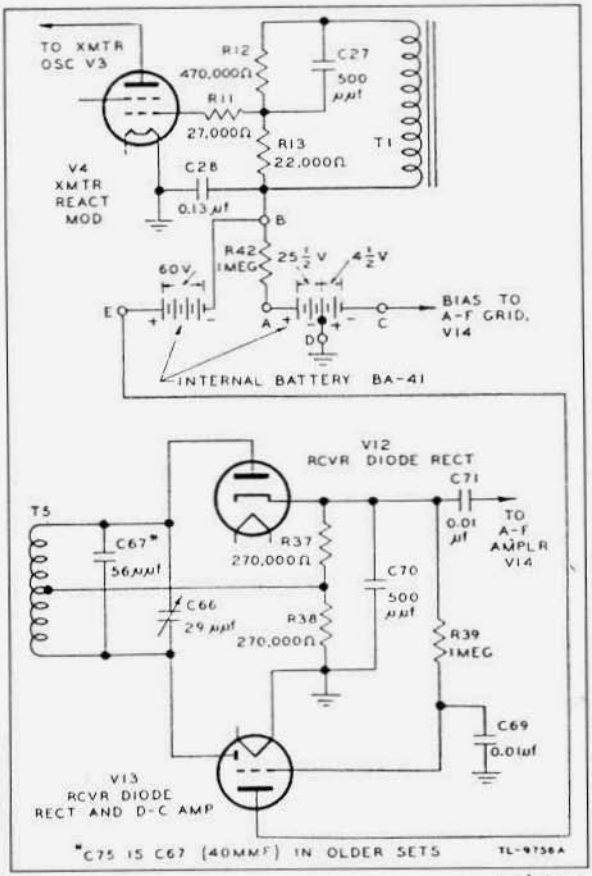


Figure 2. Automatic Frequency Control (AFC) System. (TM 11-615)

criminator, the bias on the reactance tube is caused to INCREASE, and the transmitter frequency is pulled back up.

Presetting

The BC-659 operates on either of two crystal-controlled channels selected by a switch on the front panel of the set. Tuning of the receiver RF and mixer circuits, receiver LO output tank, and the transmitter oscillator, buffer and PA sections is accomplished by pairs of trimmer capacitors in each stage switched in and out by this same control. Presetting a pair of channels is a somewhat involved procedure requiring removal of the transmitter/receiver chassis from its cabinet. This area will be discussed in more detail later.

Power Supply

The set was designed to operate from a battery pack or a vibrator supply as mentioned before. Battery BA-40 supplied 1.5v @ 0.94 amp and 90v @ 48 ma. to the receiver. BA-39 provided the transmitter with 7.5v @ 0.3 amp and 150v @ 50 ma. Both batteries were mounted in case CS-79 which also provided storage space for the handset and other accessories. Case CS-79 measures 4.5 x 14 x 17" (HWD) and weighs 15 lbs with batteries installed.

Two vibrator supplies were available for vehicular use. Plate supply PE-117-C operated from either 6 or 12 vdc; and the later PE-120-A could accommodate 6, 12 and 24 vdc input. The later unit also used a ballast tube to regulate the filament voltages in place of the fixed resistors found in PE-117. The vibrator supplies came in a case the same size as CS-79 and fit the same mountings under the transmitter-receiver cabinet. Room was also provided inside for the handset and other accessories. The vibrator supplies weigh approximately 25 lbs.

History

The BC-659 falls into a class of "pack/vehicular" radios which could either be operated on the ground using battery power (or hand-cranked generators and other portable power sources), or mounted in a jeep, truck, half-track, etc., drawing power from the vehicle's electrical system. Other systems in this family include the later SCR-619 (BC-1335) and the SCR-509/510 which operated in the 20-27 MHz range but was

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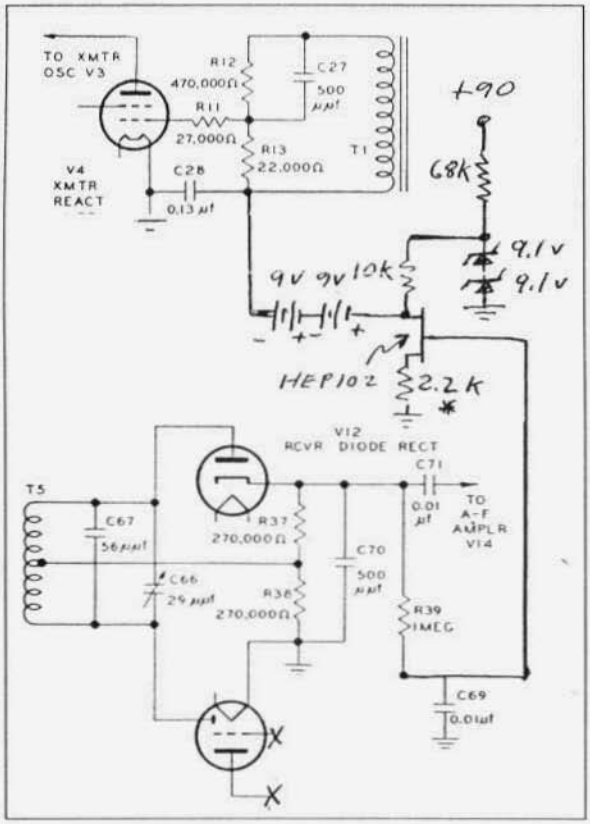

Figure 3. AFC modifications. * Adjust value, if necessary, to give between -5 and -6 volts bias on the reactance tube with the discriminator output at 0 volts.

otherwise identical to the 609/610. The AM/CW sets in the SCR-284 (BC-654), SCR-694 (BC-1306) and GRC-9 series can also be included in this general category.

The SCR-609/610 equipments are listed on the Fort Gordon Signal Corps Museum web site* as "Artillery versions of the SCR-506/510." A 1943 date (operational?) is also given. "SCR-610s were mounted in the right front sponson on M10 and M36 Tank Destroyers, 155mm Gun Motor Carriage M40, and 8 inch Howitzer Motor Carriage M43." Note that the 609/610 covers the same frequency range as the more powerful SCR-608/628, which is also listed as an "Artillery" system.

Unfortunately, I have no information on who designed and/or manufactured these sets or how many were produced. They were still in use during the Korean War and I recently saw a shot of one operating out of a snowy foxhole in a recent TV program on that conflict.

Operating the BC-659

The first challenge encountered in operating one of these sets today is what to do about BA-41, which provided the 60- and 25-volt sources required by the AFC circuit, and -4.5 volts bias for the receiver audio amplifier. This special battery fit inside its own box on the transmitter/receiver chassis. The -4.5v for the receiver is not a problem, but the other two voltages would require a considerable stack of currently available cells to replicate.

It might be possible to operate this set successfully without AFC. The receiver IF is very broad, and considerable drift could be tolerated, at least if one were communicating with another 659. I didn't try this, though, and came up with the fix shown in Fig.3 instead.

What this circuit does is replicate the function of the original DC amplifier (Fig.2) with a modern FET. With the lower operating voltages of the MFP102, an offset of only 18 volts has to be accommodated vice the 60 volts required by the original vacuum tube circuit. This is easily done with a couple of common 9-volt batteries. The -4.5 bias for the receiver is provided by three AAA cells in a Radio Shack holder. The whole thing tucks neatly inside the original B-41 battery box. Note that there

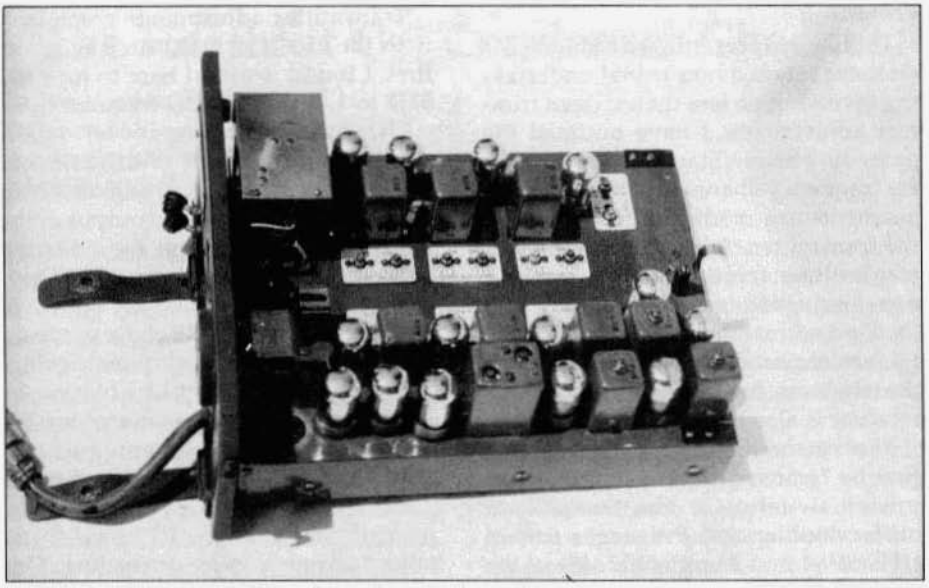

Figure 4. Transmitter/receiver chassis, top view.

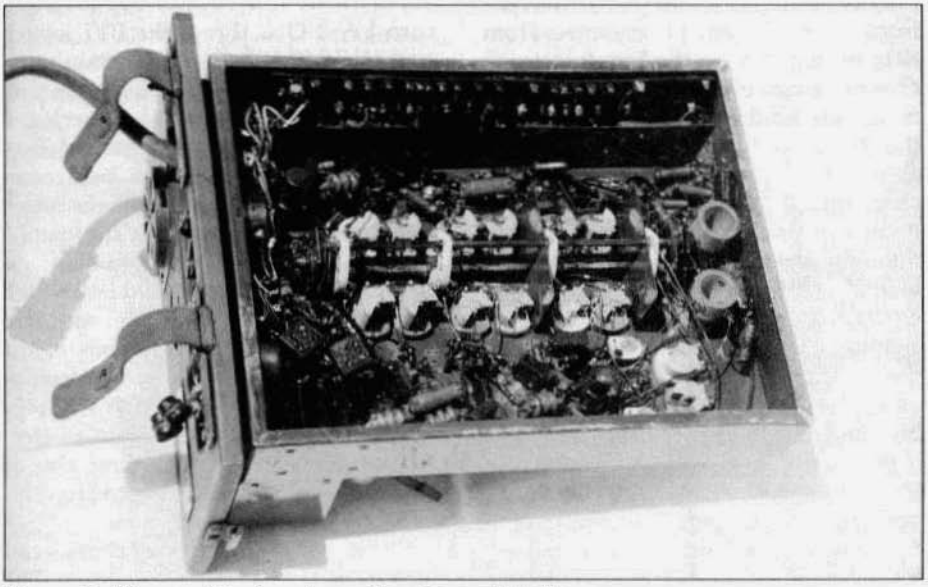

Figure 5. Transmitter/receiver chassis, underside.

is no current drain on the batteries here, unlike the original circuit.

I suspect my design may not provide control over as wide as range of temperature changes and component drift as the original circuit. However, after adjustment and tune-up in my relatively cool shop, placing a set in the sun until the case was uncomfortably hot to touch resulted in no significant frequency shift. A couple of months of mixed use later, both of my sets are still dead-on their original channel frequencies of 29.2 and 29.4 MHz.

continued next page

Presetting

Tuning-up (presetting) a channel pair on these sets is a non-trivial undertaking involving no less than sixteen trimmer adjustments. I have outlined the procedure below. Starting with the lowest frequency channel the receiver adjustments are made first followed by the transmitter. A high impedance (11 meg) voltmeter is required along with a non-conducting screwdriver. I found the kind with a small metal insert at the tip was required due to the stiffness of the trimmers. A good, general coverage receiver is also helpful.

The transmitter/receiver chassis must first be removed from its cabinet, the power switches to the transmitter buffer-doubler and PA stages turned OFF (SW-1 and 2 on the LH side of the chassis), and the appropriate crystals plugged into the holder just behind the front panel. It will be assumed from here on that "A" is the low frequency channel. Next, pre-position the 16 trimmers arrayed down the central area of the chassis and across the back to their approximate settings as identified by a chart in TM 11-615. This is important because it is very easy to get tuned-in to the wrong harmonic, image frequency, or spur with this set.

Starting with the lowest frequency channel (A) first, check for crystal activity. This is done by reading the grid voltage of the LO, available at pin 1 of the metering socket on the front RH corner of the chassis. Look for a reading of -15 volts or more. Next, adjust the LO tank trimmer A1 for a maximum negative reading on pin 2 of the metering socket (grid leak bias on G1 of the receiver mixer). Next, adjust trimmers A2, A3 and A7 for maximum noise in the headset. These tune the mixer, second RF and first RF stages respectively. These settings can be fine-tuned by adjusting for a small peak reading at the midpoint of the discriminator load resistor (pin 8 of the metering socket).

Transmitter adjustments come next with the oscillator frequency being set first. I found it useful here to tune my 51J4 to 1/4 the channel frequency (oscillator fundamental, see above) to make the initial adjustment of this trimmer (A4). I then made a final adjustment to get a zero reading on the output of the discriminator (pin 7 on the metering socket). (This deviates from the TM procedure, BTW).

Moving down the RF chain we peak-up the grid of the push-push doubler with trimmer A5. Grid-leak bias can be read from pin 5 on the metering socket.

All remaining adjustments are made using the front panel meter. Set the meter switch to CHECK, turn SW-1 ON, press the microphone PTT switch and adjust A6 for a maximum reading. This tunes the buffer-doubler stage. Finally, set the meter switch to OPERATE and turn SW-2 ON. Press the PTT switch and QUICKLY tune A7 for minimum current (dip). This completes the presetting of Channel 1. Now, go back and do this all over again for channel 2.

Actually, presetting can be accomplished rather quickly once one becomes familiar with the procedure. The manual recommends study and practice and says that 10 minutes should be enough time to preset two new frequencies (TM 11-615, page 91). Later versions of the BC-659 included a provision for temporarily converting the receiver AF stage and the front panel meter into an electronic voltmeter for presetting. One of my sets has this feature, which I haven't tried yet.

The transmitter/receiver chassis can now be put back inside its cabinet. The PA will have to be re-dipped when an antenna is attached. Trimmers A7 and B7 can be reached through an opening in the cabinet provided for this purpose. There are no antenna tuning provisions on this set, which was apparently designed to work into a high impedance load. The manual makes the

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The Heathkit C-3 Condenser Checker

by Jim Hanlon, W8KGI
P.O. Box 581
Sandia Park, NM 87047
w8kgi@arrl.net

I've been a licensed ham since 1952, and near as I can remember I started repairing Boatanchors about the same time. I've kept my 1950 HRO-50 and 1953 AF-67 running up to now, first out of necessity and later for the fun of it. I started adding other Boatanchors here and there, an HRO around 1966, an Eldico SSB-100 in 1968, a Howard 438 acquired at my first Dayton Hamvention around 1975, and many, many more since then. Today I have about 40 receivers and 35 transmitters with 23 1/2 pairs of them on the air in two ham shacks. All this time I've repaired, realigned and maintained a flotilla of Boatanchors. I've replaced tubes, transformers, chokes, coils, resistors and capacitors; and I've done all of this for the better part of 50 years without benefit of a "Condenser Tester." My approach has always been to measure either the voltage across a cap or its leakage resistance with a Simpson 260 VOM or later a Fluke DVM and to look for evidence of leakage like warm capacitor bodies, blisters or puddles of wax.

But recently the accumulated weight of the "replace the capacitors" guys on the BA reflector made me wonder if perhaps I might not be missing something. Then when none other than Bill Fizette, president of the AWA and National Receiver expert extradinaire, wrote in his column, "A Structured Approach to Fixing Up Those Nice Old Radios,"1 that the three instruments he considers essential and fundamental for

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Figure 1. Not a Benton Harbor Lunchbox, but the Heathkit C-3 Condenser Checker.

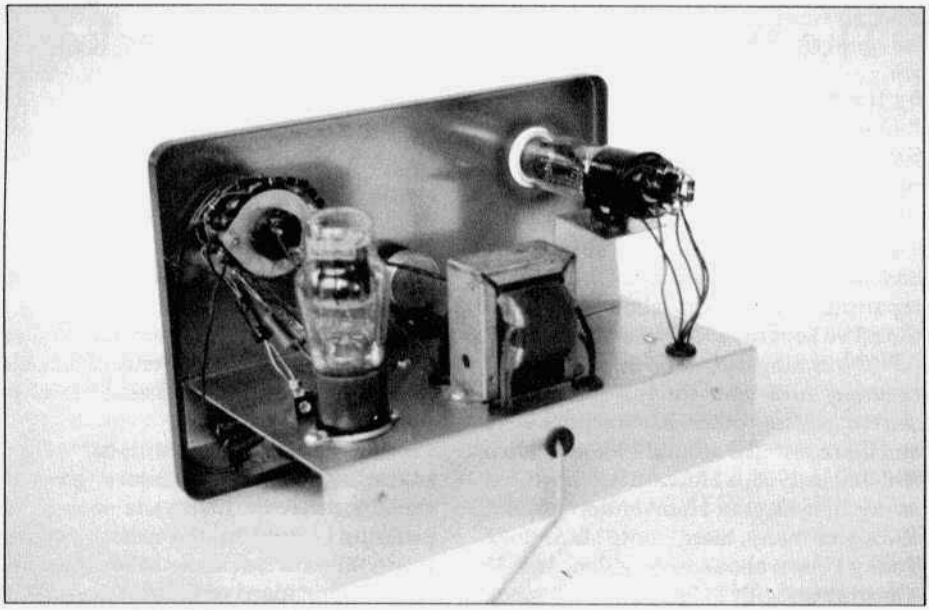

Figure 2. Behind the panel in the C-3 there is a 1626 serving as a rectifier and a 1629 as a magic eye indicator. Where are the 1625's?

a BA restorer's bench are a VTVM, a calibrated frequency meter (like a BC221 or LM) and a Capacitor Tester I broke down and went looking for one.

It didn't take long to find one. A Heathkit C-3 Condenser Tester, vintage somewhere in the 1950's, was waiting for me on the shelf of my local Electronics Surplus store in Albuquerque. It cost only slightly more than the oil change and slightly less than the tank of gas I had already purchased that morning. The fact that it tested "condensers" was no problem since most of my BA's are full of condensers rather than capacitors anyway. It also had two ranges for resistors, a bonus I had not anticipated. When I got it home I was delighted to find it in good, working order.

The C-3 circuit is simple but effective, a Wheatstone Bridge with two legs formed by the variable potentiometer attached to the knob and pointer that cover the calibrated scales in the center of the panel, another leg made up of capacitors or resistors inside the box, with the forth leg being the condenser or resistor under test. The test signal applied to the bridge is 30 volts, 60 cycles supplied by a winding on the power transformer. The bridge detector is a 1629 magic eye tube. DC for the 1629 and for other tests is supplied by another transformer winding and a 1626 connected as a half-wave rectifier. Gee, all it needs is a pair of 1625's and I can put it on 40 meters! The capacitance that can be measured ranges from 10 micro microfarads (picofarads I suppose can also be measured) to 1000 microfarads on four ranges. Resistors can be measured from 50 ohms to 5 megohms in two ranges. There is a "power factor" pot that can be switched in series with the capacitor bridge arm for measuring electrolytics that are naturally somewhat leaky. There are positions on the function switch that allow me to observe the leakage on a condenser at 25, 150, 250, 350 and 450 dc volts with the eye on the 1629 again serving as an indicator. The guys on the

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2000 Fall Classic (& Homebrew) Radio Exchange

The Classic Radio Exchange ("CX") is a contest celebrating the older commercial and homebrew equipment that was the pride of our ham shacks and our bands just a few short decades ago. Our object is to encourage restoration, operation and enjoyment of this older equipment. A "Classic" radio is at least ten years old (age figured from first year of manufacture), but is NOT REQUIRED to participate in the Classic Exchange.

YOU MAY USE ANYTHING in the contest, although new gear is a distinct scoring liability. You can still work the "great ones" with your new equipment!

The Classic Exchange will run from 1900 UTC September 24 to 0400 UTC September 25, 2000 (3 PM EDT Sunday to midnight EDT -in case we figured the time wrong again). Exchange your name, RST QTH (state US, province for Canada; country for DX), receiver and transmitter type (homebrew send final amp tube or transistor), and other interesting conversation.

The same station may be worked with different equipment combinations on each band and on each mode.

CW call "CQ CX;" phone call "CQ Classic Exchange." Non-participants may be worked for credit.

Suggested frequencies:

CW: 3.545, 7.045, 14.045, 21.135, 28.180

Novice/Tech Plus: 3.695, 7.120, 21.135, 28.180

Phone: 3.880, 7.290, 14.280, 21.380, 28.320

7.045 and 3.545 will probably be the most popular CX frequencies.

Scoring: Multiply total QSO's (all bands) by total number of different receivers plus transmitters (transceivers count as both xmtr and rcvr) plus states/provinces/countries worked on each band and mode.

Multiply that total by your CX Multiplier, the total years old of all receivers and transmitters used, three QSO's minimum per unit. For transceiver, multiply age by two. If equipment is homebrew, count it as a minimum of 25 years old unless actual construction date or date of its construction article (in the case of a "reproduction") is older:

Total QSO's all bands times RCVRs + XMTRs + states/provinces/countries (total each band and mode separately; add totals together) times CX Multiplier: SCORE = QSO's x (Rx + Tx + QTH's) x CX Mult

Certificates and appropriate memorabilia are awarded every now and then for the highest score, the longest DX, exotic equipment, best excuses and other unusual achievements. Send logs, comments, anecdotes, pictures to Allan Stephens, 106 Bobolink Dr., Richmond, KY 40475.

Include TWO-stamp SASE for next CX Newsletter and announcement of next CX.

E-mail reports may be sent to modsteph@acs.eku.edu (Al, N5AIT).

Correction to June Article

In my article [Collins Collector Association Annual Dayton Banquet] which appeared in the June issue of ER, I made an error. Bill Kennard was identified as FCC Commissioner. He's actually the Chairman of the FCC. Sorry for the error.

George Maier, K1GXT

The AN/GRR-5 Gas Receiver

Chuck Teeters, W4MEW
841 Wimbledon Drive
Augusta, GA 30909

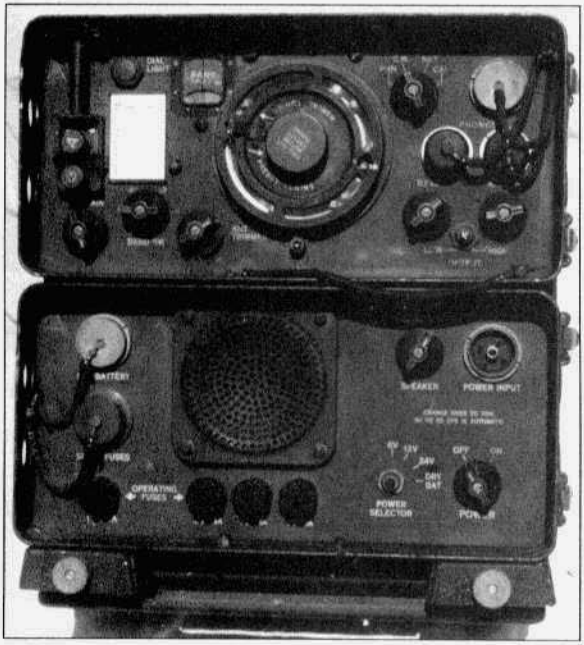
The AN/GRR-5 will certainly be in the military history books. It was the last of the one way or receive only Army tactical AM radios, used without an accompanying transmitter in most installations, and it was the last of the "gas receivers".

Prior to WW 2 Army electronics was developed at the Fort Monmouth, New Jersey, Signal Corps Labs, specifically Squire Lab if it was a radio. The BC-191 and 375 transmitters and the BC-312 and 342 receivers are examples of radios developed at Fort Monmouth, and built by civilian contractors. Starting in 1941, a few months before Pearl Harbor, many off the shelf civilian receivers and transmitters were bought by the Signal Corps. These radios were adapted to Army use as an expedient for the war. Hammarlund Super Pros became BC-779s and 1004s, and the Hallicrafters SX-28 became the AN/GRR-2. When nothing could be found that would meet the requirements to do the job, and Army development facilities were overloaded, contracts were let out to civilian companies to develop the necessary radio equipment.

One of the World War 2 projects contracted out was the SCR-593 "gas receiver". The nickname was the result of the receiver replacing the gas attack bells used in 1917 in France. A warning bell indicated there was a suspected German poison gas attack. In 1941 as the prospect of American involvement in the war in Europe looked imminent Army doctrine established a requirement for a broadcast radio net to disseminate gas warnings. Due to the size, dispersion, and mobility of the "modern" 1941 Army, the gas attack bell system was considered obsolete. As the project went forward, the net was named the Air Alert and Warning Net when Air Defense got involved. As it turned out the air attack alert was more important than the gas warning, however the nickname "gas receiver" stuck.

A military broadcast net works just like commercial broadcast, one transmitter and lots of receivers, all tuned to one transmitter. However the military net transmits only when it is necessary to deliver a message to the listeners. The air alert and warning net used a BC-610 transmitter at Division or Corps, with gas receivers located down the chain of command at Brigade, Battalion, Battery/Company level, and later at each antiaircraft gun emplacement. To get the gas receiver built and into service as quickly as possible, a contract was signed with Belmont Radio Corporation of Chicago. They modified their model 546 battery portable receiver by adding a 2 to 6 MHz tuner from their model 12A52, providing a self contained receiver with 4 mechanically preset frequencies. The receiver operated from self-contained A and B batteries. Later models would also work on vehicular 6/12-volt power. A whip antenna was mounted on the radio. The BC-728 receiver, the basic component of the SCR-593 was the result and Belmont, Detrola, Wholesale Radio and others built thousands.

With the end of the war in 1945, all contract development of signal radios was terminated. Funds for new development of Signal Corps radios disappeared. The Army was caught up in the



Front view of the GRR-5 set which consists of the R-174 receiver and the PP-308 power supply.

American optimism that the war to end all wars had just been won. Most of the non-military in the government were rushing to scrap the U.S. war machine. As a result, signal research and development at Fort Monmouth was mostly a paper exercise, combined with limited lab tests using existing WW2 equipment. To test stabilized linear timing for HF receivers in 1946 the labs used a Collins PTO from the AN/ARC-2 with a Hallicrafters R-19/TRC-1 double conversion radio relay receiver. The crystal controlled first conversion and tunable second conversion receiver testing program run by Hal Myers and Art Pengalli led to specifications for the R-390 and R-392. I wonder how the Collins R-390A buffs would feel if they knew its grand dad was a Hallicrafters.

The air alert and warning net and "gas receiver" was not one of the success stories of the war. Four frequencies were assigned for net use, one day, one night, and alternates. The mechanical cam operated preset tuning did not allow for accurate presets and the receiver calibration was not overly accurate to start with. With at least 2 frequency changes every day, the chances of the receiver being on frequency were not good. In post war reviews, the gas receiver came up several times as a candidate for replacement. More accurate presets with a calibration oscillator were required. Operation from the new 24-volt vehicular systems was also necessary. However no money was available for development or purchase of new gas receivers, so the project never progressed beyond the paper-planning phase.

In 1948, money became available for development work. It was targeted money; it had to be spent in certain areas. One of the targets was radio receiver development in the New York City area, and suggested Emerson Radio and Phonograph Company. Contracts under 100K could be awarded sole source with no competitive bidding if there was justification. LTC Myers, the radio division boss selected the gas receiver as an appropriate project for Emerson. They had a rather unusual preset dial tuning arrangement on their console radios, and had experience building battery portables, so a justification was written up. It flew through the budget channels in Washington. So thanks to a presidential election year payback the development of the new gas receiver was under way.

You would think Short Range Radio had won the lottery when news of the contract money got around. Every one in SCEL, the Signal Corps Engineering

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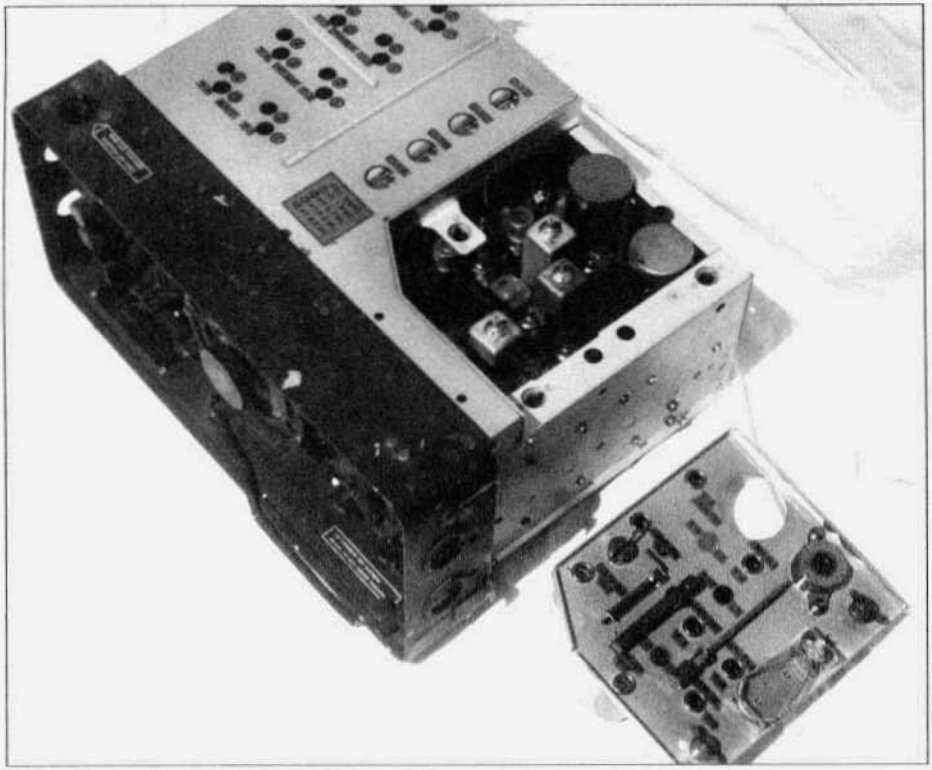


R-174 receiver with top panel removed.

Lab, wanted input into the specifications so as to be part of the windfall. The result was the AN/GRR-5 specifications looked like specifications for a horse designed by a committee, the camel. Emerson was to design a portable receiver that would work from everything from dry batteries through all conceivable vehicular and aircraft electrical systems, and commercial AC power. The frequency range was extended to 18 MHz to make it useable as a replacement for most of the WW 2 HF AM/CW receivers. Environmental specs had the receiver working everyplace from underwater to the top of Mount Everest with vibration and G specs making it survive a direct 88mm hit. Emerson was overwhelmed with the design prospects however they plowed ahead with the design and construction of a test model.

Emerson delivered the developmental test model to Fort Monmouth in the spring of 1950. It was a four band 1.5 to 18 MHz receiver with 2 RF, 2 IF, and dual audio channels. The dual audio channels were the result of a requirement for different power outputs when using battery power versus vehicular power. It had a crystal calibrator and BFO and operated off 1.5 and 90 volts DC. It used eight 7-pin miniature tubes, 1L4s, 1R5s and 3V4s and could hear stuff down close to 1 uV. It had a nice slow tuning rate and was stable. Warm up drift was under 1 kHz at 18 MHz with image rejection greater than 50 dB. It had ten presets that could be locked on the main tuning knob. The operator supplied the muscle and the lock would stop you at the correct frequency. Overall the R-174 turned out to be a very nice working battery operated portable com-

munications receiver. Any ham would have been happy with it, especially for portable operation.

The PP-308 power supply on the other hand turned out to be a maintenance nightmare. To meet all the power input requirements the 26-lb supply used one 6 pole double throw relay, two vibrators, one synchronous and one non-synchronous, three multi-winding transformers, four dry rectifiers, five regulator tubes, and a six section four position rotary switch. The power required by the receiver was only 1.5 volts at 350 mA and 90 volts at 27 mA. Very minimal for a vacuum tube receiver. When operating on battery the power supply did nothing, and was no trouble other than being a 26-lb anchor. With all other input options there was always something to go wrong. Added in was the lack of protection if the power supply was set for a low voltage input when connected to a higher voltage.

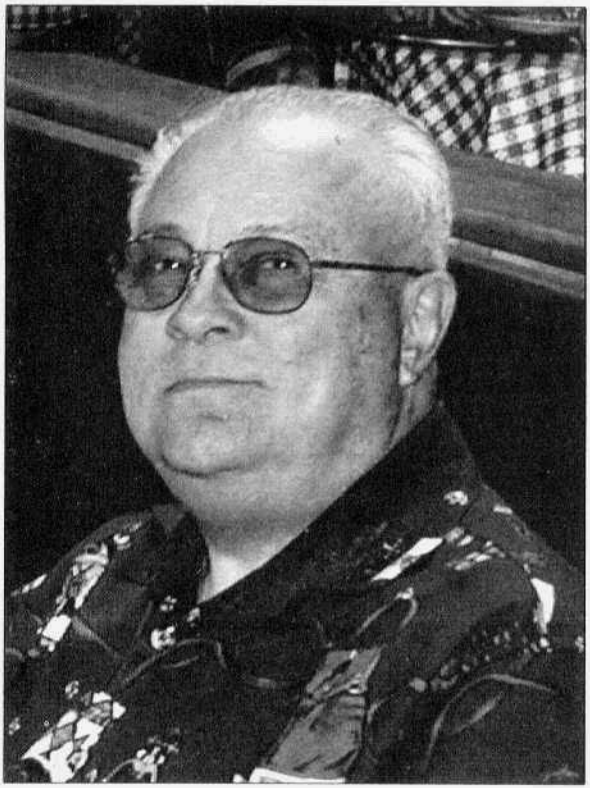
In the midst of testing, Korea busted loose. Everything became full speed ahead to update communications. The AN/GRR-5 got some fast upgrades to improve power supply survivability and within 5 months of delivery of the developmental test model, it went through pre-production tests and into full production. The AN/GRR-5 went to war with the new tactical FM radios, the AN/GRC-3 through 8 series that replaced the SCR-508 and 608. Signal doctrine said it was an air alert and warning receiver but it never got used as such. The war in Korea needed close air support for the ground troops, not air warning. The Division air request net replaced the Air alert and warning net. The new net was two-way radioteletype with voice break in. It employed the AN/GRC-26, which was an updated SCR-399, so the BC-610 was still there. The old broadcast net had gone the way of the gas warning bells. The AN/GRR-5 was reduced to being used as an entertainment radio, standby for the BC-342 in the AN/GRC-26s, or a monitor receiver in headquarters. The gas receiver remained in the military supply system for 8 more years, then was retired. The Army made one last try at a one-way net in the 70s, with the FM helmet radios, the AN/PRT-4 and AN/PRR-9.

These were squad level radios that were never acceptable to the Infantry. They went the way of the gas receivers. One-way radios systems just don't seem to be wanted any more.

Many AN/GRR-5s were picked up by the Military Amateur Radio System and most of the good ones around today followed that route. Military collectors can usually find complete units in very good condition that came through MARS. Units can be found that are like new and never used. They still have that new smell from the moisture and fungus proofing when they are opened up. A good CY-615 case will have kept the insides in perfect condition, as it was just about airtight. If you are not a military collector and just want a good battery powered HF tube receiver, there are lots around, not in pristine condition, but easily put back into operation. TM 11-295 covers the receiver and power supply in detail, and is available from Fair Radio. Four parallel D cells for the filaments and a ten pack of 9-volt batteries in series for the plate supply will provide over four hours of continuous operation and you don't need the power supply. There is enough metal around the receiver to make it almost indestructible even if you use it out of the CY-615 case. The receiver and battery pack weigh under 20 lbs and should make a great receiver for vintage field day. Even if you just use it at home for an occasional QSO, it is a good CW and AM receiver, and is useable on SSB. However the most fun you can have with one is telling hams you are receiving with a military 1950 "gas receiver". ER

Harry Snyder, W7HC, Silent Key

by Gerry Higgins, W7ES



Harry Snyder, W7HC (ex WØNVE, WØRN) of Carefree, Arizona became a Silent Key Friday, July 21, 2000. Harry was first licensed in 1946 at the age of 19 as WØNVE. He served in the Merchant Marine as a radio operator during WW II. After the war he had a TV repair business along with a Motorola 2-way radio service station. Before moving to Arizona from Fremont, Nebraska Harry owned and operated three broadcast radio stations; KHUB in Fremont, Nebraska, KLGA in Algona, Iowa and WZOE in Princeton, Illinois. He was chief engineer of KORN (later KHUB) at age 16.

Harry was active in QCWA as Vice President of the Barry M. Goldwater, Arizona Chapter 16 as well as being a member of the ARRL for over 50 years. He was also a member of the OOTC and the Society of Wireless Pioneers. Harry was an avid collector of Collins equipment and belonged to the Collins Collectors Association and was well known to other collectors as an expert in the repair of Collins KWM 380s as well as HF 380s. Many hams benefited from his extensive knowledge of electronics and he was always ready and willing to help.

Aside from a remarkable career in radio, Harry took time to serve the community as Chairman of the Carefree Planning and Zoning Commission and was very active in the local Kiwanis Club. He also had a great love of organ music, pipe organs as well as electronic and was very knowledgeable in the installation and maintenance of them. The Valley of the Sun American Theater Organ Society (VOTSATOS) benefited from his knowledge of electronics and love of theater organs and music as he spent many hours on the restoration of the Phoenix Orpheum Theater organ. One of Harry's favorite restaurants was Pipes and Pizza in Mesa, AZ. ER

VINTAGE NETS

Arizona 40M AM Group: Meets on 7293 kHz at 10:00 AM MST (1700 UTC) on Sat. and Sun.
West Coast AM Net **meets Wednesdays 9PM Pacific on or about 3870kc. Summer conditions have moved the net control to California with John, W6MIT and Tom, K6AD as net controls. In the winter months Randy, KK7TV usually runs the net.**
California Early Bird Net: Saturday mornings at 8 AM PST on 3870.
California Vintage SSB Net: Sunday mornings at 8 AM PST on 3835
Southeast Swap Net: Tuesday nights at 7:30 ET on 3885. Net controls are Andy, WA4KCY and Sam, KF4TXQ. This same group also has a Sunday afternoon net on 3885 at 2 PM ET.
Eastern AM Swap Net: Thursday evenings on 3885 at 7:30 ET. This net is for the exchange of AM related equipment only.
Northwest AM Net: AM activity daily 3 PM - 5 PM on 3875. This same group meets on 6 meters (50.4) Sundays and Wednesdays at 8:00 PT and on 2 meters (144.4) Tuesdays and Thursdays at 8:00 PT. The formal AM net and swap session is on 3875, Sundays at 3 PM.
K6HQI Memorial Twenty Meter AM Net: This net on 14.286 has been in continuous operation for at least the last 20 years. It starts at 5:00 PM PT, 7 days a week and usually goes for about 2 hours.
Arizona AM Net: Sundays at 3 PM MT on 3855. On 6 meters (50.4) at 8 PM MT Saturdays.
Colorado Morning Net: An informal group of AM'ers get together on 3876 Monday, Wednesday Friday, Saturday and Sunday mornings at 7AM MT.
DX-60 Net: This net meets on 3880 at 0800 AM, ET, Sundays. Net control is Jim, N8LUV, with alternates. This net is all about entry-level AM rigs like the Heath DX-60.
Eastcoast Military Net: It isn't necessary to check in with military gear but that is what this net is all about. Net control is Ted, W3PWW. Saturday mornings at 0500 ET on 3885 + or - QRM.
Westcoast Military Radio Collectors Net: Meets Saturday evenings at 2130 (PT) on 3980 + or - QRM. Net control is Dennis, W7QHO.
Gray Hair Net: The oldest (or one of the oldest - 44+ years) 160-meter AM nets. It meets on Tuesday nights on 1945 at 8:00 PM EST & 8:30 EDT. http://www.crompton.com/grayhair
Vintage SSB Net: Net control is Andy, WBØSNF. The Net meets on 14.293 at 1900Z Sunday and is followed by the New Heathkit Net at about 2030Z on the same freq. Net control is Don, WB6LRG.
Collins Collectors Association Nets: Technical and swap session each Sunday, 14.263 MHz, 2000Z, is a long-established net run by call areas. Informal ragchew nets meet on Tuesday nights on 3805 at 2100 Eastern and on Thursday nights on 3875. West Coast 75M net that takes place on 3895 at 2000 Pacific Time.
Collins Swap and Shop Net: Meets every Tuesday at 8PM EST on 3955. Net control is Ed, WA3AMJ.
Drake Users Net: This group gets together on 3865 Tuesday nights at 8 PM ET. Net controls are Criss, KB8IZX; Don, W8NS; Rob, KE3EE and Huey, KD3UI.
Swan Users Net: This group meets on 14.250 Sunday afternoons at 4 PM CT. The net control is usually Dean, WA9AZK.
Nostalgia/Hi-Fi Net: Meets on Fridays at 7 PM PT on 1930. This net was started in 1978.
K1JCL 6-Meter AM Repeater: Located in Connecticut it operates on 50.4 in and 50.5 out.
JA AM Net: 14.190 at 0100 UTC, Saturdays and Sundays. Stan Tajima, JA1DNQ is net control.
Fort Wayne Area 6-Meter AM Net: Meets nightly at 7 PM ET on 50.58 MHz. This net has been meeting since the late '50's. Most members are using vintage or homebrew gear.
Southern Calif. Sunday Morning 6 Meter AM Net: 10 AM Sundays on 50.4. NC is Will, AA6DD.
Old Buzzards Net: Meets daily at 10 AM Local time on 3945. This is an informal net in the New England area . Net hosts are George, W1GAC and Paul, W1ECO.
Canadian Boatanchor Net: Meets Saturday afternoons, 3:00 PM EST on 3745.
Midwest Classic Radio Net: Sat. mornings on 3885 at 8AM Central time. Only AM checkins allowed. Swap/sale, hamfest info and technical help are frequent topics. NC is Rob, WA9ZTY.
Boatanchors CW Group: Meets nightly at 0200Z on 3579.5 Mhz (7050 alternate). Listen for stations calling "CQ BA" or signing "BA" after their callsigns.
Wireless Set No. 19 Net: Meets the first Sunday of every month on 7.175 +/- 5 kHz at 2000Z (3760 +/- 5 kHz alternate). Net control is Dave, VA3ORP.
Hallicrafters Collectors Assoc. Net: Sundays, 1730-1845 UTC on 14.293. Net control varies. Midwest net on Sat. on 7280 at 1700 UTC. Net control Jim, WB8DML. Pacific Northwest net on Sundays at 22.00 UTC on 7220. Net control is Dennis, VE7DH.

Nets that are underlined are new or have changed times or frequency since the last issue.

De-bugging Homebrew Rigs

by Bruce Vaughan, NR5Q
504 Maple Drive
Springdale, AR 72764
nr5q@aol.com

Part Two

A compulsion to experiment with the new and unknown is part of the human psyche. However, thoroughly exploring familiar territory before venturing forth into the unknown is often worthwhile. For example: If those who breed animals, whether they be racehorses or lapdogs, switched to a new breed every animal generation, improving the breed would be extremely difficult. It is not random luck that produces the very best it is perseverance. It is no accident that the best wine is produced by vintners tending vineyards going back several generations.

Yes, much can be said for making sure you have produced the very best example you are capable of-whether it be wine, racehorses, or a simple crystal radio receiver before starting a new project. This line of reasoning is what keeps me constantly seeking to build a better regenerative receiver.

After completing the receiver discussed in part one of my de-bugging articles I felt my cache of improvement ideas was pretty well depleted. Perhaps it was time to switch to a more sophisticated circuit. After all, the receiver discussed previously was the last of a very long line of receivers-all of which used the same basic circuit. Over the years and after many completed receivers I believe the last one was the best. Yet, there was this urge-indeed a compulsion to build yet another receiver.

I reviewed my list of receiver priorities. The search was underway—out came magazines and books from 1930 onward. I feel that a receiver suitable for the average home constructor should meet the following criteria.

1. Easy to construct and get working properly.
2. The circuit should use a minimum number of variable capacitors-they are becoming difficult to find.
3. The receiver should work well enough to use for Ham Contacts.
4. I hate winding coils. A single coil please-and keep it simple.
5. No interstage transformers-they are hard to find-and expensive when found.
6. The circuit should be flexible allowing use of readily available tubes.
7. No extensive metal work.
8. The receiver should allow you to listen to DX at good loudspeaker volume.
9. It should be stable enough to deliver acceptable SSB reception.
10. Finally, the receiver should be relatively inexpensive to construct.

I think these criteria are reasonable-yet it is surprising how few receivers meet more than half. What to do? I really like the circuits I have been building for years-yet little is to be gained by mere duplication. Is there a way I could make changes-hopefully positive changes-in the old reliable detector-three step? If so, what would I change?

My answer came in the mail-a new catalog from Antique Electronic Supply. On page 49 of their 2000 catalog is a part I have often longed for but never found-AES calls it a 'Point to Point Terminal Board.' From their catalog:

"These boards will aid the hobbyist or OEM in project building. They are built on copper clad epoxy board; the

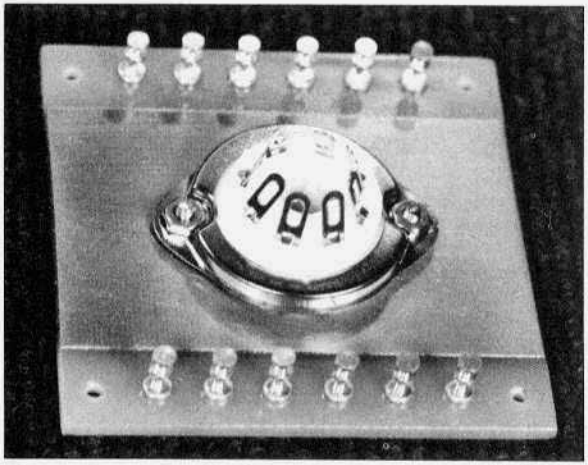


Figure One: Terminal board and tube socket allows builder to construct his project in modules--a very convenient way to build. The modules are available at reasonable prices, and come with single and double, octal or nine pin sockets

copper is used as a ground plane. Wire your project on the board, off chassis, then install the board to chassis for a neat looking finish."

The boards are available with one or two octal or nine-pin sockets. Single socket boards are $8.50, and the two socket boards are $14.95.

So how would my favorite circuits respond to this new construction idea? I would soon find out.

I had one other improvement in mind. I have my bandspread tuning operating the way I like. Any more capacity and tuning would be more critical and any less the tuning would be too broad. Yet, SSB is difficult to tune in. When I started using a swinging link, or adjustable coupling of the antenna coil I quickly found it was easier to fine tune SSB by adjusting the antenna coupling. In a regenerative detector without isolation stages the antenna is part of the tuned circuit. I needed to devise a vernier adjustment of the antenna coil. Of course you can always buy a good vernier dial on e-bay, but remember I am trying to use easy to find and inexpensive parts. I intended to build an adjustable loop that would be cheap, easy to build, and not take more than one evening to construct. This was a little more difficult than I first imagined.

I started typing out my order to AES on my word processor. I have had disappointing results with online order software and prefer to simply e-mail orders. As I searched their catalog another new item caught my attention; Mohawk Ultra Classic Toner. I was curious-could I really get that beautiful toned effect popular in the 20's-a finish that gradually darkened toward the edges. I decided to give it a try. This would give me another excuse for using an oak plywood panel for the radio.

Say, if I kept on coming up with new ideas I just might have a real winner.

For the present I will not go into the problems encountered with the vernier adjustment of the antenna coupling. I will say that I had to go ahead and complete this receiver with a conventional swinging link. I knew I was on my way to a workable unit but had not yet made a satisfactory prototype. Thinking back to my forty years in radio and TV service I knew the answer was in some sort of a 'dial cord, pulley and string' but all my models were too large, too heavy, too complicated, or did not work smoothly.

Today all that is past history. The final prototype is so simple I do not know why I tried to make it difficult. The ideas finally fell into place and resulted in a very smooth working unit. Three of the string-driven models are now in use in different receivers. One will be installed in this receiver soon. In the near future I will cover construc-

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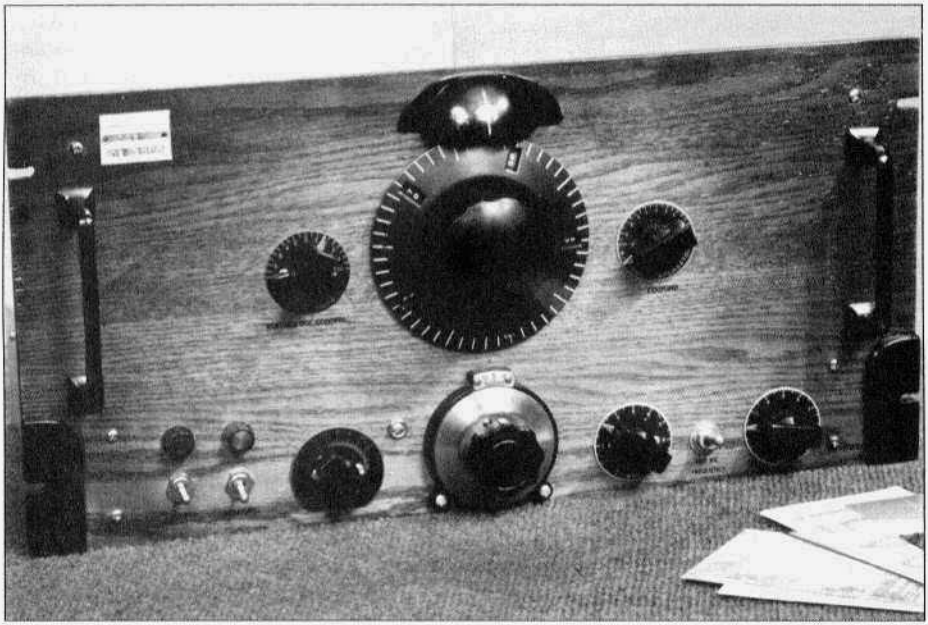

Figure Two: Front view of set in article. Controls are-Upper row, L to R, detector plate voltage control, main tuning, and antenna coil link adjustment. Bottom row, L to R, AC power, marker oscillator, tone control, band set vernier, regeneration, and volume control. Dial light shade for the National PW dial is a drawer pull.

tion of the swinging link in an article with pictures and drawings.

I learned a lot building this receiver. First, I would strongly suggest that you make a rough scale drawing of the epoxy, copper clad, tube socket board. Then I would do my 'wiring' with a lead pencil with a good eraser. I found out very quickly that because it looks so very easy, the temptation to grab a soldering iron and start connecting parts is almost uncontrollable. Control it! Careful layout of parts is a must. I could do much better on a second receiver using this construction technique-so much better that one is already in the planning stages.

Sometimes an item goes up for sale on e-bay that builders either overlook or do not understand. That may have happened with the HRO type dial and gearbox used in this set. The photograph on e-bay was not especially good but the dial looked fair, and it had the gearbox I wanted to use—a 180° drive. Bidding was around the $15.00 mark when I jumped in. I don't have time to sit and watch items for a week so I picked what I thought would be a 'steal' price, $45.00, and made my bid. From the photograph, the unit looked well worn. There seemed to be a variable capacitor of some sort connected to the gearbox. I hoped I would be able to clean it up and get it in good usable condition if I were the high bidder.

These dials normally sell well-usually above $75.00, so I had little hope of being the 'winner' of the auction. I was surprised a few days later to receive notification that I had bought the PW dial and gear box for $34.00. When it arrived I was delighted-the entire unit was in excellent condition. The variable capacitor, a wide spaced-three plate unit measured about 20pf on my ancient

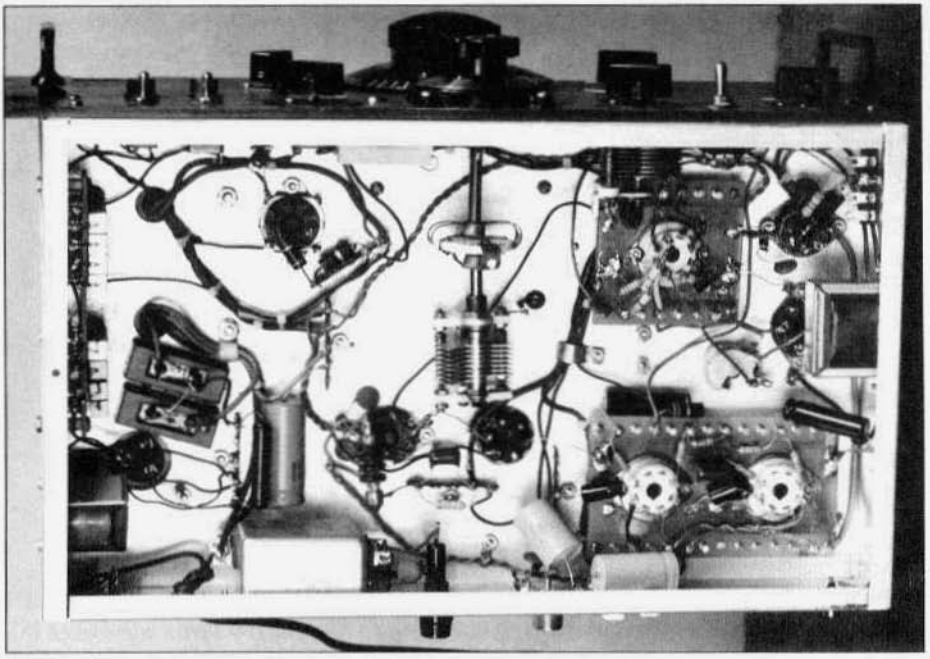

Figure Three: Underside of chassis shows the tube socket-terminal post modules after installation. Note that they drop below the chassis about1/4 inch. Spacers and drilling template come with each socket.

and highly doubtful capacitor checker. The capacitor was beautifully constructed and mounted on a piece of * inch aluminum. From appearances I feel it to be National Radio in origin. I decided to use it as my 'band spread' or main tuning capacitor.

Uh Oh, band spread and main tuning capacitors-here we go again. I don't know which is more irritating, technical writers who assume readers have extensive knowledge of radio construction, or those who assume the exact opposite. I hope you old timers will forgive me if I take a few lines to explain the somewhat confusing terms 'band spread' and 'main tuning.'

In this day and age of 'phased locked loops,' 'digital readout,' and dual VFO transceivers it is more than likely that a number of readers are confused about terminology carried over from the 'Golden Age' of radio.

Let us take a detour here and go back some 75 years ago to get a handle on this thing. Receivers with 'ham band' only tuning did not surface until the end of the roaring twenties-and even then they were a rarity. The majority of receivers, whether home built or commercially constructed, were designed for general coverage. That is, they usually covered all frequencies from the low end of the BC band up to whatever frequency the builder could get the receiver to operate. Notice I did not say operate well-just operate. A number of receivers made in the 30's claimed continuous coverage from 550 KC up through 60 MC of so. Most would do well to go as high as the ten-meter (28 MC) band.

You can immediately see the problem here. If a particular coil, or 'band' covered from 6 to 15 MC, a fairly typical example, then the 40 meter band, 7 to

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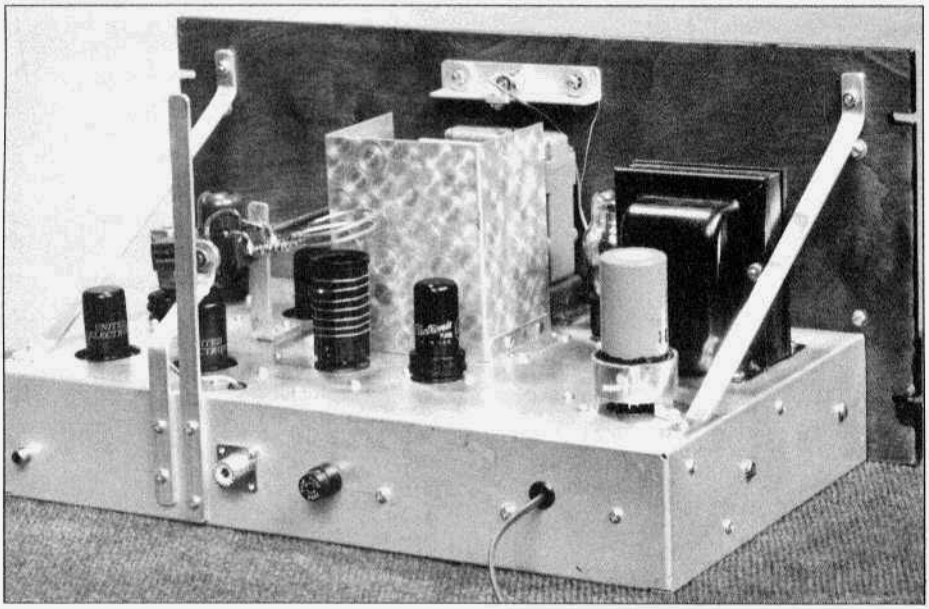

Figure Four: Back view of receiver: note that where modular boards were used the tubes require a larger hole to allow entire base of octal socket to be inserted. Shield was added to reduce tunable hum. A small amount of hum is almost always present in AC operated regenerative receivers-especially on 20 meters.

7.3 would be squeezed into a portion of your tuning scale perhaps 1/2 inch wide-often even less. Obviously, we needed to s-p-r-e-a-d out the band. There were two common answers to this problem; electrical, and/or mechanical band spread. Most receivers by the mid thirties employed variations of both.

Perhaps the best known mechanical band spread concept is the National type PW dial-better know as the HRO dial. Actually PW is the proper designation because this wonderful tuning dial and gearbox was used on several National receivers other than the HRO. In effect this tuning device could spread a ham band out over several feet of dial scale. It was accurate, dependable, and unbelievably simple.

Electrical band spread was commonly accomplished by connecting a variable capacitor of very small value, 15pf to 20 pf, in parallel with the main tuning capacitor, usually a 140pf or larger capacitor.

I am not trying to give a lecture on the development of communications receivers so I will not get involved with coil tapping, L/C ratios, and diverse methods of band spreading.

From this brief description it is easy to see how the main tuning dial was a main tuning dial for the SWL who wanted to listen to everything from DX broadcast stations to aircraft and police transmissions. Hams were concerned with a much smaller segment of the short wave spectrum-normally a section of a ham-band perhaps 100 KC wide. To achieve this goal hams usually set the larger capacitor to one end of the band and actually used the smaller capacitor as the main tuning capacitor. So in reality a much better way to refer to two dial receivers is to call the main tuning capacitor the band set capacitor. The band spread capacitor should be

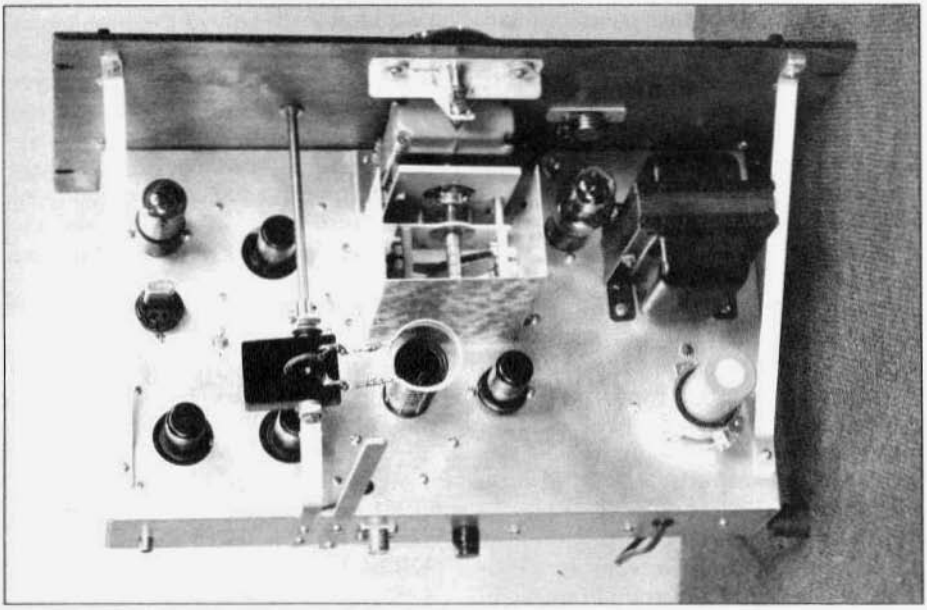

Figure Five: A look at the topside of chassis. Please note bracing from chassis to panel, a very worthwhile addition to regenerative receivers.

referred to as the tuning capacitor.

There. Now that everyone is equally confused we will return to the receiver under discussion.

The National dial, gearbox, and tuning capacitor were cleaned, lubricated, and adjusted according to the instructions copied off the web page mentioned in my previous article. I remembered the problems I had encountered with slippage or 'play' in a flexible coupler; I determined it would not happen ever again. I mounted my smaller capacitor, (if it is OK I will call it my Main Tuning capacitor) directly to the dial. No coupler here-just the beautiful National 180° gearbox. That should take care of any 'play' in the main tuning.

I laid out the receiver so that the Band Set capacitor would lie directly below the Main Tuning capacitor. Short leads and all that stuff you know. I had a nice vernier dial, probably offshore construction that seemed to be moderately well built. I coupled it to the capacitor with the very best, heaviest, most beautifully machined, coupler you can imagine. I found it at a hamfest and have been saving it for an ultimate receiver. I measured slippage as best I could with my haywire mechanical means and was pleased to note there was none.

I also remembered the problems with hamfest diodes so from the start, I installed a heavy pair of diodes from Silicone Alley. The transformer checked perfect and the power supply sported a brand new ten-buck filter capacitor, a new filter choke, great diodes, and as expected it worked perfectly-the power supply that is. The receiver was something else.

This is my first regenerative receiver to greet me with uncontrollable feedback howl. By backing off the volume I could tune in a station-if I was very careful not to touch the panel, jar the table, or take a deep breath. Otherwise, all hell would turn loose.

Sounds easy don't it? I had a microphonic detector tube I was sure. After I had tried three more 6J5's I gave up on

continued next page

that approach. Cold soldered connections are pretty uncommon in my shack but I figured I should check that out. No luck. I know, it must be in the audio. I checked my audio by disconnecting all audio stages and listening with my ancient signal tracer. The howling was still there. I knew my problem was definitely in the detector.

Hey, there are less than a dozen parts in the detector. Let's see, you have a tube and socket, coil and socket, RF choke, two tuning capacitors, a grid leak, and perhaps two fixed caps. Sometimes I by-pass the filament leads at the detector-though in all honesty it is usually a waste of capacitors. What do you check when there is nothing to check? Then it really hit me-two sets in a row with the same problem. One in a million but by golly I had another problem with my shaft coupler.

Here is what was happening. The bandset tuning dial is firmly bolted to the wood panel. A short piece of 1/4 inch brass rod coupled the dial to the great coupler I had been saving. This coupler was of course attached to the bandset capacitor shaft. I could see the problem now. The coupling had absolutely no give anywhere in it. For all practical purposes I was coupling directly from the vernier dial attached to the panel, to the variable tuning capacitor. Any thing that caused the panel to vibrate was transmitted directly back to the tuning capacitor. I was very close to having created a condenser mike. I knew if I kept working with this old stuff long enough I would re-invent radio.

The coupler was replaced with the nice large 'springy' one shown in the pictures. All my problems disappeared.

I next checked my built-in marker against WWV. It adjusted out with no problem at all but the signal was only half as strong as usual. A voltage check showed some rather weird readings on my 6SK7 Oscillator tube. As of this writing I have not solved the problem but am sure that I will need to re-wire the circuit. I am not pleased with the layout of parts. Some critical leads are long and I know I can do better.

The only reason I mention the marker at this time is to share a bit of good news with you. I put in my 20-meter coil, turned on the marker, adjusted the band set dial to zero beat, and started tuning up the band. At a reading of 98.5 on the PW dial I encountered the marker signal again—(14,100). Through absolutely nothing but dumb luck I have a receiver that gives me very close to perfect direct read-out on 20 meters. I can tune in a signal and check the receiver against my Kenwood 930 and the regen will normally be within 1 KC of the digital readout on the Kenwood.

Now if I could figure out how to calibrate 40 and 15 I would have a real winner.

What about the Mohawk Ultra Classic Toner? I really am sold on this product. Take a look at the receiver panel in the illustration. This 1920's look may not appeal to everyone but most people I have shown the receiver to are very impressed. It is extremely easy to use. Finish your cabinet or panel as you normally do and when dry spray the corners until you get the degree of darkening you like. The spray dries in about three minutes and is additive. Make a fast swipe across the corner or edges and let it dry. Chances are if you do it properly-moving the spray can very quickly across the corner, you will not see any difference on the first three or four passes. It takes about a dozen passes to get the degree of darkening you see in the photograph. Frankly, I think I stopped a little soon. I may give it a few more blasts from the spray can and darken it still more.

The toner also works wonders on any stained surface. You can get almost any shade of staining you want. I liked it so well I promptly ordered two more cans

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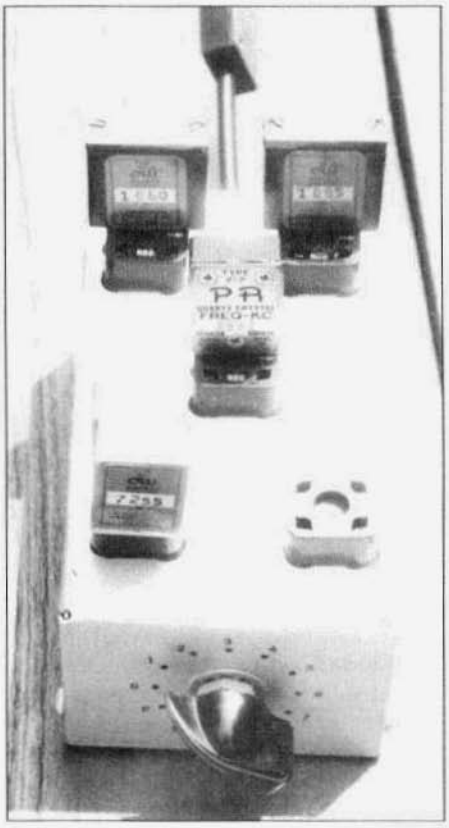
Homebrew Crystal Switching Box

by Gary A. Cook, W9JSN
737 Milwaukee Rd
Beloit, WI 53511
cookga@beloit.edu

Here's a handy gadget that may be of interest to some Electric Radio readers. I built it several years ago to circumvent problems I was having with the VFO in my Johnson Viking Ranger I, but it would be of use to anyone operating a vintage crystal-controlled transmitter or a VFO that tends to drift significantly in frequency as it warms up. It stores up to ten different crystals in a ready-to-use mode (rather than rattling around in a desk drawer!) and it allows the operator to use any of them to control a transmitting frequency just by turning a rotary switch.

I built my crystal-switching assembly into a 5 1/4 X 3 X 2 -1 /8" aluminum box, using an 11-position military surplus single-pole rotary switch. As can be seen from the accompanying photograph, my assembly uses five bakelite dual sockets to accommodate an assortment of FT-243 crystals, but any other kind of crystal sockets of the appropriate size would work just as well. It would also be possible to use standard octal tube sockets, each of which will hold two FT-243 crystals mounted between pins 1-3 and 5-7. (An octal tube socket is used in exactly this manner to create the two crystal sockets accessible through the front panel of the Viking Ranger.) I attached small rubber feet to the bottom of the box, and I used numerical decals to label each of the crystal sockets on the top of the box and the corresponding switch positions on the front.

I learned from experience that it is important to keep the connecting line between the crystals and the transmitter as short as possible. (When I first built the unit using a longer connecting line, the crystals refused to oscillate!) I now use a seven inch piece of RG-58 coax, one end soldered to the rotary switch and the other end terminating in an empty FT-243 crystal case modified to form a plug that fits into one of the two crystal sockets in my Viking Ranger. It would also be possible to use 300-ohm twin lead terminating in a 300-ohm line plug to link the assembly to the crystal socket of the transmitter. One final note: If either side of the crystal socket in your transmitter is grounded to the chassis, you may want to similarly ground the side of the crystal-switching circuit that connects to the grounded pin in your transmitter's crystal socket. ER



Those Colorful Crystal Sets

by Bob Dennison, W2HBE
82 Virginia Ave.
Westmont, NJ 08108

After WWII, some of the smaller Japanese electronics companies solved the problem of converting to peacetime by manufacturing toy crystal radios. They made use of many war time developments - such as- the glass encapsulated crystal diodes, ferrite cores in coils, ceramic capacitors, plastics and piezoelectric earphones.

These little radios were often found in novelty stores and were designed to appeal to young boys. All the sets in my collection came from stores along the boardwalk in Atlantic City, NJ. Fig. 1 shows two crystal sets, one in the shape of a rocket and one having a dial marked with broadcast-band frequencies. The rocket ship is white with a red tail, the plunger in the nose cone moves a ferrite core inside the tuning coil. The other set is a lovely pink color and sports a fake loudspeaker grill bearing the word QUEEN. The dial actually turns and is marked to indicate the frequency the set is tuned to.

Another pair of crystal sets is shown in Fig. 2. On the left is a little black set called the Planatair. Again the set is tuned by moving the antenna rod up or down which moves a ferrite core inside the coil. The decorative ball at the top of the antenna is missing on this set. On the right is a set named "tiny tim RADIO". It is red and the trim is yellow. It features a dial in which a yellow cursor moves up or down in a slot at the left of the simulated speaker grill.

Circuit diagrams of these sets are all pretty much the same. Fig. 3 shows the wiring diagram of the Planatair set. Tuning is done by moving the ferrite core in or out of the coil. A few sets add a small

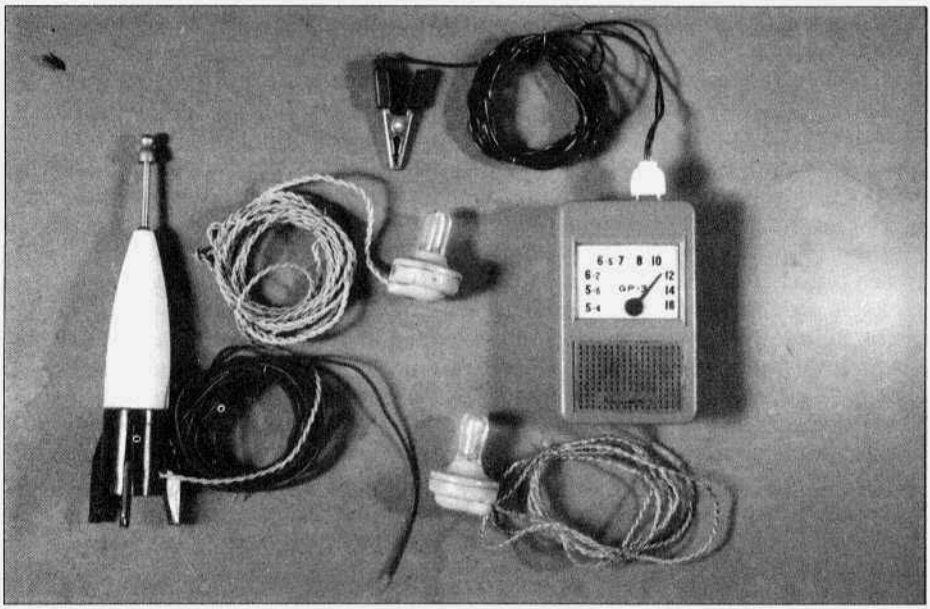


Figure 1. Crystal sets in the 1950's were designed to appeal to young boys.

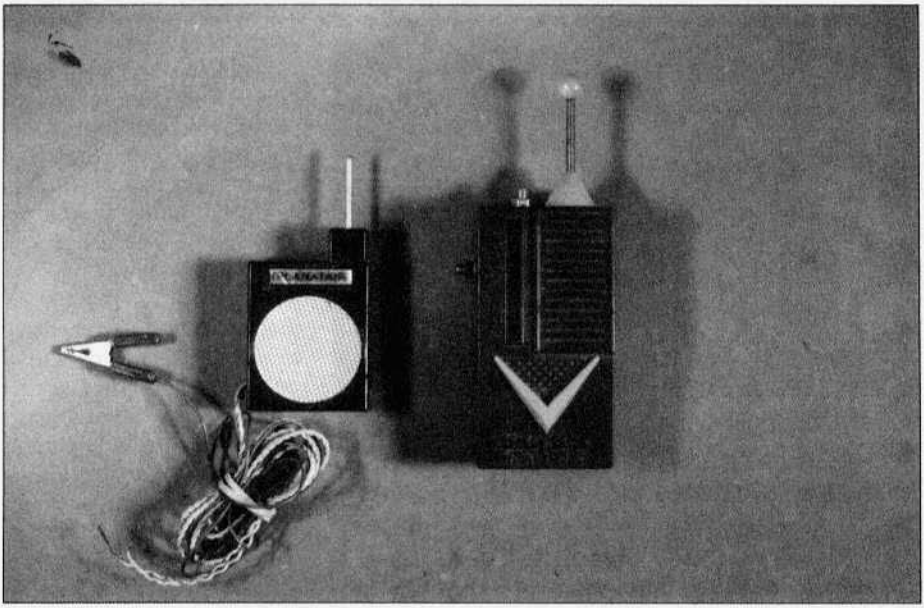


Figure 2. The Planatair set is shown at the left. The other set is the "tiny tim RADIO".

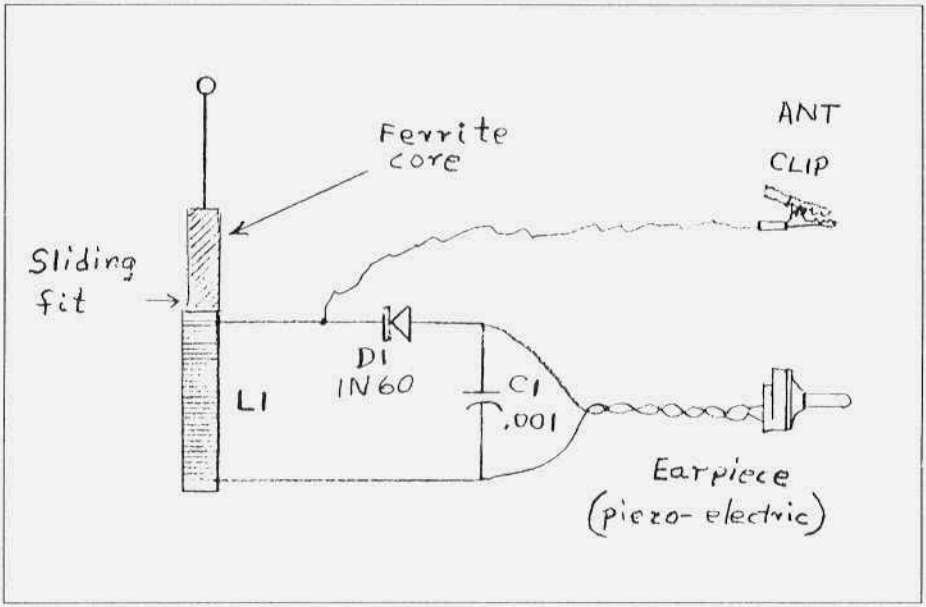


Figure 3. Wiring diagram of the Planatair crystal set. The set is tuned by moving the ferrite core in or out of the coil, L1.

continued next page

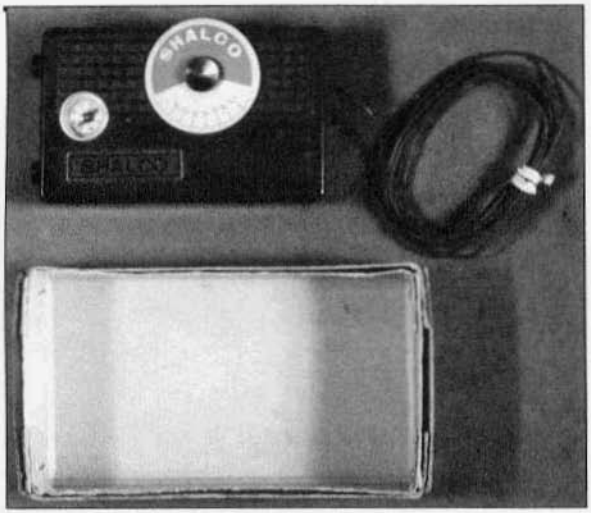


Figure 4. The SHALCO crystal set is well made and quite handsome. Just the thing to take to summer camp!

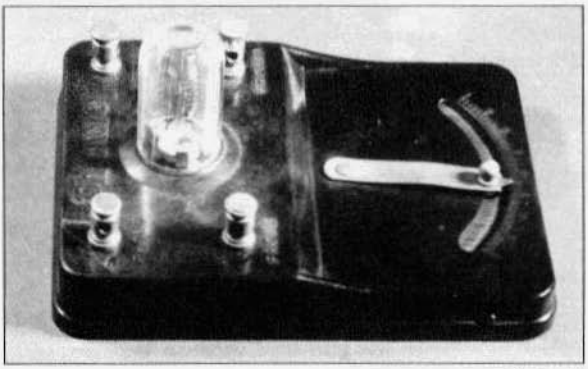


Figure 5. The Philmore "Supertone" sold for 69¢. Of course you needed another 95¢ for some headphones.

fixed ceramic capacitor across the coil. Some sets use diodes that look like the American diodes (e.g. 1N60) while others are in opaque cases and are somewhat larger than an old-style 1N34A.

Since the piezo-electric earphones have a high d-c resistance, you might wonder how any current could flow through the detector diode. But, remember, these diodes are not perfect but exhibit a leakage resistance which provides a return path for the current.

Fig. 4 shows a well-made, good-looking set bearing the name SHALCO. It has a nice dial showing the broadcast band. There is also a built-in compass which should appeal to the boy scout who takes this set along when he goes camping. Behind the dial is a slotted cam arranged to move a ferrite core in or out of the coil. Tip jacks are provided for the earphones and a length of wire permits connection to an outside antenna.

Before WW II, a popular source for crystal sets was Allied Radio Corp in Chicago. They offered sets made by Allied, Philmore, ICA and Carron. One very popular set was the Philmore "Supertone" shown in Fig. 5. Housed in a red bakelite case, this set sold for 69¢. The crystal was enclosed under a dust-proof glass cover and it required the user to experimentally determine a good position of the cats-whisker on the crystal. In actual practice, this was not difficult and even a novice was able to get satisfactory results.

During the depression years of the early 1930's, many boys built their own crystal sets. The tuning coil was usually wound on a Mother's Oats cereal box. You needed some wire—most articles suggested No. 24 DCC wire. A trip to the local radio repair shop might turn up an old honey-comb coil that would supply your needs for years of set building. While at the radio store, try to get a 350pF variable tuning condenser and a 3" or 4" bakelite dial. You'll need a good antenna unless you live close to a radio station. When I was a kid, I lived

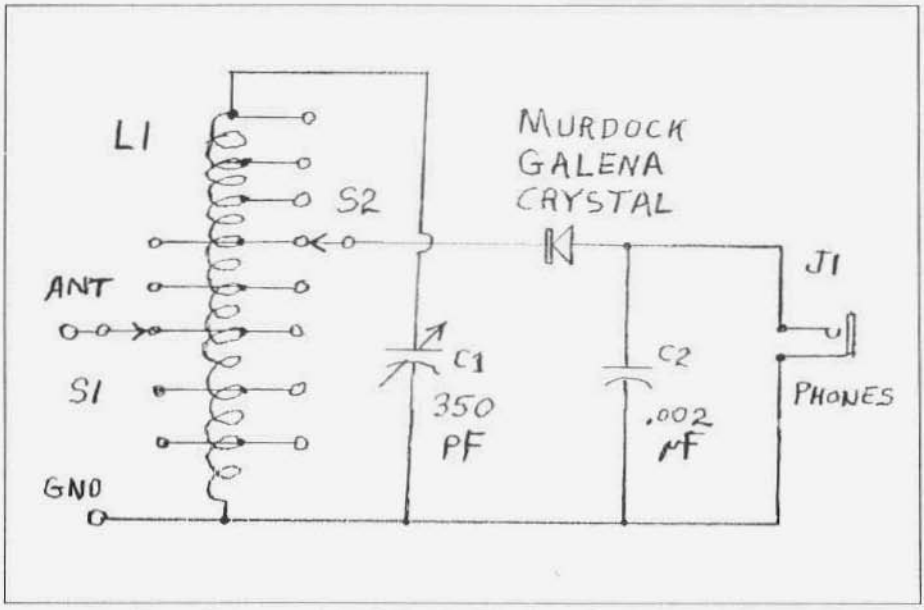


Figure 6. Wiring diagram of the "Murdockophone" crystal set.

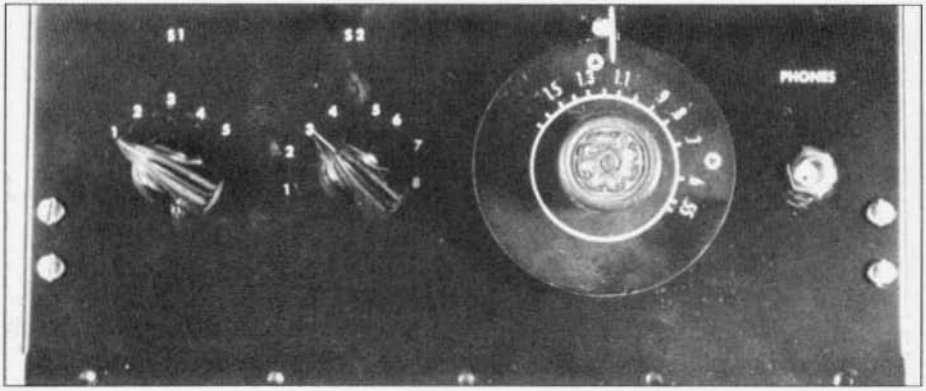


Figure 7. Panel view of my crystal set.

in Salina, KS and could get Dr. Brinkley's station in Mexico—sometimes loud enough to hear it on an old horn speaker! Crystal sets provide lots of fun and are a good way to get your youngsters into radio. Radio Shack sells a crystal set in kit form for just under $10.

A few months ago I ran across an old Murdock crystal detector which dates back to the 1920's. It inspired me to build a crystal set which I have dubbed the "Murdockophone". The circuit is shown in Fig. 6. A front panel view of this set is shown in Fig. 7, and a rear view in Fig. 8. The tuning coil, L1, is wound on a plastic bottle two inches in diameter and has 95 turns of No. 26E wire. This coil is tapped every ten turns starting at the 15th turn. The tuning condenser, taken from an old radio, includes a six to one planetary reduction and a calibrated dial. A pointer was made from a piece of stiff wire and painted white.

In the 1941 Allied Radio catalog, many

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Vintage Field Day Report

by N6CSW

This year's Vintage Field Day proved to me that there isn't sufficient interest in the event to justify supporting it in the future. I think there are some basic problems that are difficult to overcome. First of all, there is a real reluctance on the part of the vintage ops to lug their boatanchors into the field; some are just too old to do it and others are concerned about damaging their gear. And then there's just the general disinterest in Field Day. I've learned that most clubs have difficulty in getting anyone to participate in Field Day. What I suggest is that in future years we join in the regular Field Day operations. In this way we will have more stations to work and we'll also be giving our support to an event that seems to need all the support it can get. Maybe by doing this we'll also be able to gain some converts to vintage operation.

Shirley and I returned to our site at Muley Point overlooking Monument Valley in Southeast Utah. It's really a spectacular location and we've come to look forward to this annual pilgrimage. This year however propagation seemed poor and the level of interest even lower than in previous years. We were disappointed and returned home early Sunday.

Shirley 'twiddling' knobs on my DX-100. The receiver is an R-390. To the right of the receiver is a Dentron antenna tuner. The antenna we used was an inverted V fed with 450 ohm ladderline. ***Photo by Wally Linstruth, K7AMI.***

Report from Chuck Teeters, W4MEW

My Vintage Field Day operation this year was limited to Saturday due to Fathers Day Sunday. The location I used was Davisboro, GA 35 miles south of Augusta. It is a 280 acre wooded tract my son leases for deer hunting. He has a 2 KW generator and old travel trailer there. The only disadvantage was that I had to walk the last quarter mile. Operating alone I selected equipment that I could carry in with one trip. My 11 lb 1942 Echophone EC-3 did the receiving and an 8 lb World War 2 OSS transmitter, the SST-1, did the transmitting. This limited me to xtal controlled CW

with 8 or 9 watts from the single 6L6. I stuck to 40 meters with 3 crystals, 7009, 7046 and 7100 kHz. Separate receiving and transmitting antennas were end fed long wires about 20 feet up in the pine trees. The very flexible antenna tuning on the SST-1 loaded up fine.

I got on about 2 PM local and made 5 contacts, none of which were VFD stations. The bugs got to me about 6 PM so I shut down and carried the radios out. Each contact I made was longer than expected. I went almost 2 hours with Vic, K3FSB. All wanted to know about VFD, Echophone, and especially the SST-1 OSS transmitter. Since the temperature was close to 100 degrees they must have thought I was a nut. I think it was the longest CW session I have had in 10 years, and all with a straight key. The CW monitor in the Echophone helped me keep my sending remotely readable.

I think I will use the same site next year, but will remember to bring two bugs, one electronic and the other a spray for real bugs. While it wasn't part of VFD I took a 2-meter HT along and checked into the Augusta repeater several times. Kind of a back up link and thought that maybe I could stir up some interest for next year.

W4MEW's VFD station consisted of a SST-1 OSS transmitter and a Echophone receiver.

From Tom Anderson, K5HPF

The Renegade Group once again did Vintage Field Day in Corpus Christi, Texas. We are the guys who provide emergency communications for the city in case of a hurricane. We didn't have any luck contacting the West Coast AM nets on 80 meters during the day. So all contacts this year were on CW. But as you can see, a great time was had by everyone. And we were able to do some experimenting with our power systems. The boat anchor ham community in Corpus Christi is continuing to grow. See you next year. [Photo on next page]

The Renegade Group from Corpus Christi, TX. L to R: Reid Hill, KC5YKX; unknown; Jab Murray, K5CNZ and Darryl Dippel, WA5AAO.

From JeRB (James Buchanan), K8WPI

For your gallery, our conception of the "Ideal Vintage Field Day 2000 Station". David Watt, WA8TT is shown at the J-36. The HRO-M is JeRB's (Jim Buchanan), K8WPI while the two-tube (rectifier + oscillator) transmitter was on loan from Jim Keesler, K8EXF. The antenna DuJour was a true Zepp, to match the very high impedance output tank of the transmitter. Since we only had one crystal for the rig, and it was in what is now the phone band, we couldn't take things too seriously, and are not submitting a log, but I thought the ER readers might like to see the station.

Hospital Bed Mobile

by Bob Napoli, K2LGO
177 Herricks Ln
Riverhead, NY 11901

August, 1962 was a busy time in my life, as I had just gotten out of the Navy, got a new job, and was planning to make up for a lot of ham radio activity I had missed while in the service. I was fresh out of U.S. Naval Comm Tech. School, and my CW was as sharp as it was ever going to be, and my Johnson Navigator was pumping a mighty forty watts into my single element rotatable dipole, with very effective results, but I had AM on my mind.

Well my father was a frustrated ham of sorts, but just never took the time to actually become one, but his interest was evident in his watching my QSOs. He must have finally grown tired of hearing me talk of the EICO 730 modulator that I was going to buy, as soon as my salary caught up with my talents, because one evening he came into the house with a package. I had no idea what the package was, and paid it little attention, until my Mom and Dad came out of a back room holding the contents of the package, an EICO 730 Mod. Kit.

Well needless to say I thanked them properly, and promptly took the kit down to our rather modest sized basement, to my more modest size shack, and opened the kit, and marveled at the beginnings of my big time AM career. Well to cut to the chase, I started the construction in earnest, but alas worldly things such as the opposite sex, made the construction a painfully slow process, that culminated in the completion of a -730 that saw very little service, while this phase of my 24 year old life was going in many different directions.

My rebirth into AM was a somewhat painful experience, and its inception was on a cold, cold day about 18 months later in December of 1965. At the time I owned a service station, and because of poor communications, I found myself on the receiving end of the front bumper of a very large 1964 Oldsmobile that was in the shop for BRAKE work...To make a long and painful story very short, I sustained two broken legs, below the knees, and my prognosis was bed for almost three months, as the casts were above my knees.

I thought that I would probably go nuts in bed for three months, as I could hardly stay in bed for eight hours. But after sitting in bed for a week or so, it came to me..HAM radio would save me, but how, as I was much to heavy with the casts to get out of bed? Then I realized that the crude table I had built for my temporary shack in this rental house had enough width to fit across the bed, it just needed to be raised about three feet. So I commissioned my Dad and father-in-law to raise the table so it could fit over my bed, somewhat like a hospital feeding table, but with legs on either side of the bed. They incorporated some wheels, and viola, a table that could be rolled over my rented hospital bed, with all my gear.

The antenna which had been hung previous to my accident was brought into the bedroom I was using for my recuperation, and with a few connections I was on the air. And so the Navigator was once again pumping RF to the outside world, and the Hammarlund HQ-100 never sounded better, and for the first time in weeks, I thought I might retain my sanity.

Well needless to say after about a week of brass pounding, my thoughts turned to those mellow sounds that I was tuning in on my HQ-100, and AM was on my mind once again, but how??? Although the EICO was completed, I had never incorporated it to work with the Navigator. Fortunately during the previous week or two I had sent away for every radio supply catalog avail-

able at the time, and I started thumbing thru them, and the B/A catalog had just what I needed— a chassis, some switches, a relay, some Jones plugs, and in my mind's eye, I could see the control I needed to hook the Navigator & the 730 together for AM. Well the parts arrived and one day when my father and father in law were once again available, I gave them a list of my tools which I needed for this project, including an electric drill, which I managed to use in bed. Construction of the control unit didn't take long, and within two days the control box I had conceived in my mind was complete, and the Navigator and 730 Modulator we're ready to go on AM.

So with my hospital bed in the full sit up position, I loaded the Navigator, adjusted the audio drive on the 730, and called CQ-CQ-CQ de K2LGO and lo and behold after more than a few tries, I made my first hospital bed mobile AM QSO, and I was thrilled, even though it was only with a local ham about five miles away. The lash-up worked very well and I put it to good use for the next six weeks of my recuperation.

The rest of the story is history, thankfully my legs healed up well, but when it came time to get the casts off, I almost had mixed feelings, as twenty four hour access to your ham radio can really spoil a guy.. The Navigator is long gone, as is the HQ-100 but the memory of operating in bed will forever be with me. And even today as I operate with my fancy high power station, and directional antennas, I miss the simplicity, and full time access of my 40 watts hospital bed mobile. ER

DX-60 Operating Tip

Louie Poirrier, K5DAH
2731 Hearne Dr.
Pasadena, TX 77502

Just a hint that might help some of ER's readers. In the fine and enjoyable article "Fun With a DX-60" WC3K says the cabinet must be removed to adjust the screwdriver slot mic gain pot. Well, good news! This isn't necessarily true.

My fix: I took a coathanger, the older metal type, used a hammer and anvil (my vise has an anvil surface on the back end), flattened one end and used a file to dress it into a narrow screwdriver tip. The other end was formed into a handle. The homemade screwdriver is slipped down through one of the cooling holes in the top of the case into the slot in the control shaft. I am sure you can take it from there. When you find the proper cooling hole mark it with ink, whiteout or what ever strikes your fancy. Make sure the shaft of your home made screwdriver is long enough before you form the handle.

I am sure some sharp hams will find other ways to make this "special tool" and that is what ham radio is all about. ER

Park Cunningham, W8HSC, SK

I am sorry to report the passing of Park Cunningham, W8HSC, of Romney, West Virginia. Parker passed away July 15. He was a well known AMer in this region and will be missed by all who knew him.

Don Landes, WX4C

I Remember Ricardo from page 3

Have you heard of the Ricardo Chronicles? These were another entertainment device. By now you've guessed it, Rick was a real character! The Chronicles, it appears, were real happenings or sometimes contrivances, that all bordered on the absurd and intended to entertain you and stimulate conversation. If one succumbed to this device, one could be engaged well into the night wondering what had happened to him. And, it seemed, the later the more Rick enjoyed your company. Was he a fanatic? Perhaps ... What's your excuse?

Mention was made of Activist Ricardo in responding to FCC petitions. This in no way diminishes the noteworthy contributions of Don, K4KYV (ED. AM Press Ex.), Dale, KW1I (Pres. AMI) and Barry, N6CSW (Ed./Pub. ER) in spreading the word via their publications. Don and Dale have both visited the powers to be at FCC and ARRL and have presented at Dayton. But it remains undisputed that Ricardo's vigilance and marathon on-air persona coupled with his untiring FCC reply comment contributions and personal mailings helped immensely to carry the day for Ham Radio during critical periods. AM Radio was his life and he lived AM Radio everyday. Thanks dear buddy.

When asked how he got started in Amateur Radio, Rick would childishly admit to being a teenage radio pirate on the high end of the BC Band in the Cleveland area. But like many of us who similarly strayed, there was a mentor who turned Rick's head. In December of 1988, we drove to the Midwest. Somewhere near Cleveland, we said good- bye to that terminally ill mentor. Rick remained solemn for the remainder of that day.

There were other amateurs whom Rick respected and admired. Ashtabula Bill (W8VYZ) ranks at the top of the list and, of course, was our first stop on that 1988 junket. Rick viewed visits here as those fervent annual visitors who pay homage at Mecca. During each visit, Ricardo took the liberty of signing his name, call letters and date on a certain structural member in W8VYZ's basement shack as well as on the electrical mains box. This was a true example of his primeval AM animal instinct to protect what he loved best. Yes, are you thinking Ricardo was an enigma? Me too. In any event, you are urged to seek that sign-in privilege when you next visit Ashtabula, Ohio. It would be a tribute to these two AM giants.

Rick worked at various broadcast venues as Disk Jockey and Announcer. Being on the air was his reality. Off the air, the mention of music or radio would give you the sense he was back on the air.

There was never a dull moment on our traverse back East. When we weren't talking on the Harvey Wells, Rick was playing cassettes from his huge collection of older Pop, Mo-town, Progressive Jazz and the Blues. The Blues was his favorite idiom. Rick, Joe (W7ISJ) and W6PSS (David) all shared an appreciation for the Blues. We considered ourselves the Blues Brothers of AM. Rick and Bill (WA8LXJ) also had a running AM dialogue regarding Jazz.

Another interesting facet of Ricardo: He maintained a daily radio propagation log where he diligently recorded both Bureau of Standards WWV and ARRL's W1AW broadcasts. He would often mention discrepancies between the two.

Like K7VZP (Phoenix Bill) and WA1HLR (Skowhegan's Tim Smith), Rick was an avid SWL and contributor. He would often suggest, "If you want to know about what's going on inside this country with little bias, tune in on the BBC."

Our complex friend also admired the French Astrologer Nostradamus and his prophetic claims. Ricardo totally rejected modern notions that astrology is generally regarded as devoid of intel-

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Letter From New Zealand

Roger Sewing, ZL/N6TNF
P.O. Box 620
Gisborne 3801
New Zealand
rsewing@actrix.co.nz

I am currently living in New Zealand and would like to pass on some of the comments of the local hams regarding 'operating standards' of U.S. hams. I have also heard the same comments from hams in Australia and Canada when I visited those places. One ham here probably put it the best way: "Nothing against you, Mate, but why do American hams waffle on with each other using profanity, argumentative and insulting statements; especially on 20 and 80 metres? They all seem to pump five kilowatts and disrupt one another and every other bloke on the air. Do you Yanks have any standards over there?!?" I have heard similar statements from many, not just one or two. They admit there are some US hams that are expert operators, but from my experience, they are far and few in between. I think what I am experiencing here in NZ is what ham radio was like 30 years ago. I'm not saying that they do not have their problems—they do, but nothing that compares to US ham operating. I have monitored a lot of local communications here, including their national linked UHF system (something that will never work in the US). Not once, in all the time I have spent here, did I ever hear any swearing or arguing over the air. They are very considerate and polite to one another. Truly professional operators in every sense of the word. Even after all this time here, I am still left in awe listening to them, and I am privileged to be part of all this. Why can't US hams operate this way? Drop the "me first" attitudes and set a good example and change the already bad reputation that exists. 80 metres can and does propagate over here. At times, I am embarrassed to say, "yes, I am an American ham".

AM Operations in NZ

There does not seem to be much AM activity here (not compared to the US). I am a proud member of SPAM New Zealand (member #178, out of 178 members) and would like to help encourage and promote AM activity here. I collect military radio equipment and AM is a natural. They do have regular nets but apparently there is a declining level of interest. I have offered to lend my copies of ER to the group for evaluation and get some ideas that may "spark up" new interest. A few run military sets (mostly Wireless Set #19's, ARC-5 sets, and ZC-1's - a NZ WW2 made set- this is what I have here) and in January have a 'mini military field day'. Unfortunately, I found out about that after the fact! The majority of AM rigs are of the classic type (Collins, Hammarlund, Heathkit, Drake, etc). I have been to two local hamfests, and most 'valve' equipment is quite cheap! The group does have an extensive database for technical information for member use. They have articles once a month in Break In, a magazine published by the NZART (New Zealand Association of Radio Transmitters, Inc). This is the NZ version of QST and ARRL. Listed below is the net operating times and frequencies, as of last month. Note: NZ hams cannot operate above 3900Kc, which is broadcasting here. Also, a lot of phone operation is in the US CW portion of the bands. This does not mean you cannot listen. They are encouraging members, as well all NZ hams, to call "CQ AM" on or about 3850Kc (AM) to increase activity using this mode. Please help NZ hams out and try to work them! They are really a bunch of good people! 80 meters does propagate here at times. Any and all encouragement is welcome to keep AM alive in NZ!! Net times:

On 3850Kc (AM)

Monday to Saturday (NZ is one day ahead of the US) at 2100Z (0900 hrs local)

Monday to Friday (Petone based) at 0700Z (1900 hrs local)

Wednesdays (New Plymouth based) at 0830Z (2030 hrs local)

Fridays (Northern area based) at 0800Z (2000 hrs local)

SSB NET- A regular monthly net held on SSB (LSB) on 3.593 Mc at 0800Z (2000 hrs local) on the first evening of each month. All members are encouraged to participate and all hams welcome. The purpose of the SSB net is to cater to those who have not (as yet, hopefully!) got their AM gear up and running. ER

Notice

Lynn Burlingame, N7CFO, is writing the history of the Dow-Key Company for the N7CFO Keyletter. The Keyletter is a publication dedicated to the preservation of telegraph history and the collecting of telegraph instruments. The Dow-Key company was started in Winnipeg in the early 1940's and later moved to Warren, Minnesota. Dow-Key originally manufactured a line of speed keys, and later made high quality relays.

Lynn requests that any readers that knew Paul or Gordon Dow contact him. He is also doing a census of Dow-Key bugs and needs the following information: Type, finish, label information, serial number, damper type, color and shape of paddles. You can submit this information via an automated questionnaire at his web site at http://www.qsl.net/n7cfo/index.htm or contact him at the address below.

He especially needs to locate original owners of Dow-Key bugs to help date Dow-Keys by serial number range. You can write Lynn at: 15621 SE 26th St., Bellevue, WA 98008. His phone number is (425)641-5488. His email address is n7cfo@ix.netcom.com

W1ICP, Silent Key from page 2

friends did) when he was serving as President of the QCWA a few years back and had hired me to be Editor of the QCWA Journal. What impressed me most about Lew was his honesty. He said what he thought. He always spoke his mind and let the chips fall where they may.

He was also a kind and gentle person who always had time for any ham who wrote or called or approached him at a hamfest. Although he was an 'icon' in ham radio he didn't act like one—he always thought of himself as just another ham.

The last time I saw Lew was two summers ago when his daughter Sharon and son-in-law Neil brought him to Mesa Verde National Park (about 20 miles from our home). He invited Shirley and me up for dinner. Although the high altitude wasn't good for him (he had had a quadruple bypass a few years earlier) he was in good spirits. It was a very memorable evening, one that I'll always remember. I felt very privileged to be in his company.

I always felt honored to have him writing for ER and the readership certainly enjoyed reading him. He'll be missed. N6CSW

Condolences to the family can be sent in care of Marsha Ashurst, PO Box 2260, Lakeside, AZ 85929.

In lieu of flowers the family would appreciate memorial donations be sent to Hospice of the Valley, 1510 E Flower St, Phoenix, AZ 85014

Notice

AMI Discovery Weekend has been moved from its earlier September spot to Sept. 29 - Oct.1. Details will be in the September ER.

To Join AMI send $2 to:
Box 1500
Merrimack, NH 03054

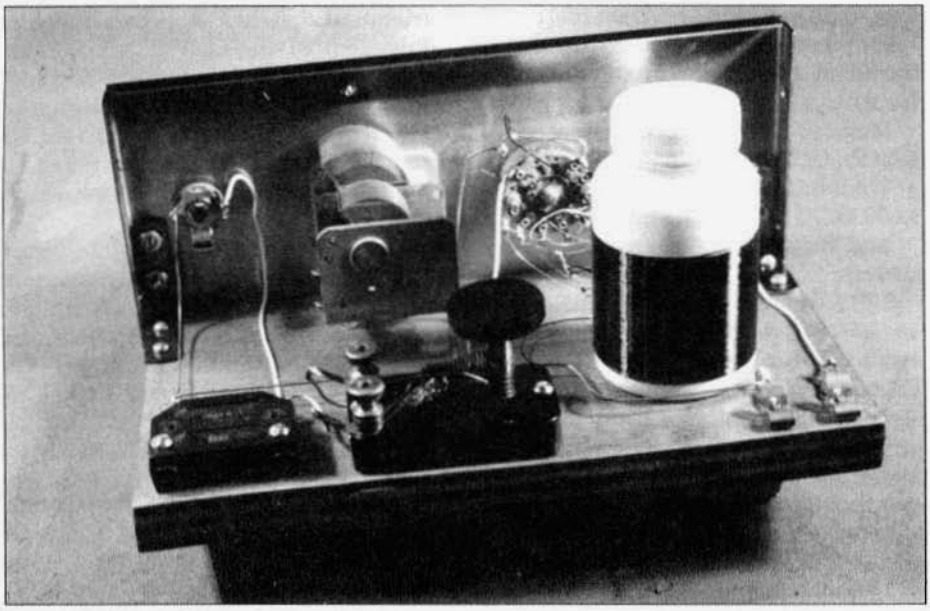

Figure 8. Rear view of crystal set showing the Murdock detector.

Those Colorful Crystal Sets from page 31

different brands of earphones were listed. These included American Bell, Acme, Trimm, Brush, Brandes, Frost and Cannon. If you knew someone in the National Guard or Army, you might be lucky enough to secure a pair of Western Electric phones. Today all these phones are scarce and hard to find. Occasionally they show up at a hamfest or flea market. Try to find a pair with a good cord as replacement cords are even harder to find.

I hope you enjoy listening to your radio. Tell your father to relax—you can let this set run all night and it won't run up his light bill! ER

C-3 Condenser Checker from page 12

BA reflector tell me that I can also use this leakage test function to re-form electrolytics if I have enough patience to hold the spring-return Leakage Switch over for a long enough time.

Well, I've certainly had fun testing some of the older paper and electrolytic capacitors - oops condensers - in my junk box that I've been afraid to use because of their age and uncertain status. I can at least tell whether the electrolytics are close to their original values and whether they need to be reformed before I put them to work. My next BA project is an RME-70 with a lot of its original paper capacitors still aboard. If I get it working it will up my total to 24 transmitter/receiver pairs on the air. I'll probably not use my new gadget to test all of the condensers, because I'd have to disconnect at least one side of most of them to check them. But if my voltage or resistance measurements give me any doubts or if I see any blisters or puddles of wax it sure will come in handy to offer a second opinion. I think I've found a friend. ER

1 - Bill Fizette, W2DGB, "A Structured Approach to Fixing Up Those Nice Old Radios," The Old Timer's Bulletin, May 2000, pp. 32 - 34.

ER in Uniform from page 10

statement that the AN-29-C telescopic antenna is a half wavelength resonator near the center of the frequency range (33 MHz) when fully extended and connected to the set.

One final technical item of note. The system is DC-isolated from all external metalwork. The front panel is insulated from the electronic chassis and fiber mounting rails are used in the cabinet. A negative buss isolated from the chassis is used in the vibrator supplies. This was apparently done to allow the set to be used in vehicles with either positive or negative ground systems.

On the Air With the BC-659

I had very little trouble bringing these sets up on the air. My sets both came with PE-117-C vibrator power supplies. I reformed the filter electrolytics off-line, replaced the buffer caps and both supplies took right off. Even the vibrators worked first time!

Only one of the original tubes was bad, a 3D6/1299 but I was able to get replacements from Antique Electronic Supply. AES was also able to supply 1LN5, 1LC6 and 1LH4 spares, but I have yet to find a source for the 1R4 diode and the 3B7/1291 dual triodes used in the transmitter section.

The voice quality of this set is definitely "military" and the lack of squelch makes it a noisy critter to be around. In a test at Fort MacArthur (ER #123) reliable communications out to a distance of three miles were achieved with these sets until a hill got in the way. I believe the 5-mile range claimed in the manual would definitely be possible over flat terrain. **ER**

*http://www.gordon.army.mil/museum/

A complete index of the entire 11 years of ER is available for viewing or downloading at the following website: http://www.qsl.net/n9oo

De-bugging Rigs from pag e 26

to have on hand. This product will make plain pine dimension stock look like fine furniture. I really can't say enough good about it.

Did this set have any other 'bugs?' Quite honestly it did not. I noticed a small amount of hum on 20 meters-quite normal with a detector of this type. I shielded the tuning capacitor and it did seem to help. I must say that the hum was so low I had to put my ear up to the speaker to hear it. In retrospect I feel the addition of shielding was not really necessary. It just made me feel a little better. Picky, picky, picky.

I forgot to include my e-mail address in my last article. Sorry about that. I received a number of snail-mail letters, several of which mentioned that the writer wished I had e-mail—so here it is. I'll be pleased to receive and answer all e-mail. nr5q@aol.com

*KC and MC—same as Khz and Mhz. Some OT's like me have a little trouble thinking of in terms of Hertz.

I Remember Ricardo from page 37

lectual value. To Rick, the Art Bell show tended to fortify his concept of possibilities. And, who are we to question Art Bell? It was prudent not to go there - hi.

You may not have agreed with some of Rick's ideas but you had to admire his ability to support them.

This represents one persons sincere recollections of a dear friend. Are there embellishments? None were intended. Was Ricardo real or was he an enigma? That's for you to decide. And as you reflect, please remember Rick's (Ricardo's) unselfish contributions to fortify and sustain the privileges we enjoy in Amateur Radio today - much attributable to his activism. He will be missed!

73 Old Friend - I miss ya,
R.I.P RICK & AM FOREVER

CLASSIFIEDS

Advertising Information

Subscribers receive 1 free - 20 word- ad per month. **Extra words are .20.** Here's how to count the words in your ad: the heading - For Sale, Wanted, etc count as **1 word**. Your name, call, address and telephone number count as **6 words**. Hyphenated words count as **2 words**. **Please count the words in your ad and if you're over 20 words send payment for the extra words.**

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Deadline for the September Issue: September 1

FOR SALE: Repair and restoration on all vintage equipment; 45 years experience. Barney Wooters,W5KSO, 8303 E. Mansfield Ave., Denver, CO 80237. (303) 770-5314

FOR SALE: Radio books, magazines, catalogs, manuals (copies), radios, hifi, parts. Send 2 stamp LSASE. David Crowell, KA1EDP, 40 Briarwood Rd., North Scituate, RI 02857-2805. aq253@osfn.org

FOR SALE: KWM-2 fan bracket - $12 ppd. Dave Ishmael, WA6VVL,2222 Sycamore Ave., Tustin CA 92780. (714) 573-0901.

FOR SALE: Small parts, transformers for projects and repairs of tube gear.Let me know your needs. Van Field, W2OQI, 17 Inwood Rd. Center, Moriches, NY 11934. (516) 878-1591 or wreck_and_rescue@juno.com

FOR SALE: NOS,UTC # F-7101 matching (600-8 ohms) xfmrs (2 W) - $13 ppd/dom/USA. ABEN, POB 4118, Jersey City, NJ 07304-0118,Avidov@aol.com

FOR SALE: HT-40, poor - $25; S-38C, fair - $30; CE 10B, vg - $50; HW-16, good - $50. NZ5M, Chuck, (806) 698-8767

FOR SALE: Heath HW-101/ ps/ manuals, very nice - $125; Hallicrafters S-40, new tubes, works fine - $125 OBO; S-120 - $35. Bernie, WA6HDY, 300 James Way, Arroyo Grande, CA 93420. (805) 481-6558

FOR SALE: Collins S-Line aluminum knob inlays: small (exciter/PA tuning) - $1; 30L-1 - $2; spinner/plain (main tuning) - $3. Charlie, K3ICH, 13192 Pinnacle Lane, Leesburg, VA 20176. (540) 822-5643

FOR SALE: Hallicrafters, RME, Gonset, others. Also some military, test equipment, VHF/RF amps, more. LASE, Don Jeffrey, POB 1164, Monrovia, CA 91017.

FOR SALE: Meters for WW II military radios, have some connectors. Henry Engstrom, KD6KWH, CA, (707) 544-5179. pacifica@sonic.net

FOR SALE: NOS TCS baseplates, still in orig. factory shpg wrap - 2/$15.00 plus shpg. Carl, KN6AL. POB 3531 Laramie, WY 82071. (307) 742-0711, kn6al@uwyo.edu

FOR SALE: Drake 2C , exc - $100; Heath HW-100 w/book - $100; HN-31 Dummy load - $20; Hallicrafter HT-32 - $150; National NCX5 - $150; Eico HF 81 audio amp - $20. Lys, KØPGM, (303) 986-5420, lyscarey@juno.com

FOR SALE/TRADE: Over 800 Magazines QST, CQ, 73, Ham radio. list: sase or email. OK in Call Book. K4JRB, thompson@mindspring.com

FOR SALE: ITT Mackay 3010C + extras, exc shape, also have parts radio - $950+ shpg from 83713. John Miller, (208) 938-3103 9AM-9PM MST for questions

FOR SALE: Military and commercial communications items: www.maxpages.com/murphyjunk. For up to date lists: murphy@cts.com. Mike Murphy's Surplus, 401 N. Johnson Ave., El Cajon, CA 92020. (619) 444-7717

FOR SALE: Over 600 electronics magazines, mostly 1960's & '90's - 99¢ ea + shpg; also available: electronics books, parts, etc. List for stamp. Bob Eckert, 133 E. 7th St., Clifton, NJ 07011.

FOR SALE: Tube list, new & used, wide variety audio, ham. Recently expanded. SASE 52¢. Bill McCombs, WBØWNQ, 10532 Bartlett Ct., Wichita, KS 67212-1212.

NOTICE: T-368 Registry. For info w2zr@aol.com or W2ZR callbook address. Subscribe to T-368 reflector: www.onelist.com/t-368_bc-610

FOR SALE: Hallicrafters S-38 in black wrinkle finish, very nice, works just fine. Fred Clinger, WA8KJJ, OH, (419) 468-6117, after 6 PM EST.

NOTICE: A website dedicated to traditional ham radio & classical radio resources. Visit Ham Radio USA, http://www.hamradiousa.com

FOR SALE: BC-224A. I will answer all mail. William Brady, W4SAO, 717 Jacobs Rd, Morristown, TN 37813.

FOR SALE: Astatic D-104 mic/G stand - $40; Johnson KW low pass, B&W 1 kw low pass - $20 ea; (2) new Bencher YA-1, 5 kw - $40 ea. Jack, AZ, (520) 634-2028.

FOR SALE: Books, all electronics related; 300 titles; SASE. Paul Washa, 4916 Three Points Blvd, Mound, MN 55364. wetok@email.msn.com

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 e-mail<bugs@mnic.net>

FOR SALE/TRADE: Collins: ART-13 - $200; 18S-4 - $100; 51 N-2 - $350; BC-348 - $200; TMC exciter, matches GPR-90, SBE-1 - $450; AFC-2 - $125. Sam Timberlake, KF4TXQ, POB 161, Dadeville, AL 36853. (256) 825-7305, stimber@lakemartin.net

FOR SALE: RBM pair, hi-low band, new condx, matching serial numbers - $750. Carl Bloom, (714) 639-1679, 3778111@MCIMAIL.COM

FOR SALE: SA-46/ART-13 switch NIB - $10; Simpson 650 transistor tester plug-in for 260 VOM - $15. Joe Orgnero, VE7LBI, 1349 Leask Rd., Nanaimo, BC V9X 1P8 Canada josephi@pacificcoast.net

FOR SALE: Parts, tubes, books, ect. Send two stamp SASE or email for list. Wayne LeTourneau, POB 62, Wannaska, MN 56761. wb0cte@arrl.net

FOR SALE: Cetron 572B tubes - $35; Yaesu FT-101EE - $220; FT-101ZD - $270; Heath Q mult - $15. Carter, (804) 979 7383, CElliott14@aol.com

FOR SALE: Complete set Sam's photofact series from the '40's to 80's - BO. Jimmy Weaver, 1007 E Bridges, Wynne, AR 72396. (870) 238-8328

FOR SALE: OEM Heath belts - $2.50 each shpd; or 10+ for $2 each shpd. Send check or money order. Roberta Hummel, 202 Midvale Dr., Marshall, WI 53559

FOR SALE: Naval rcvrs, RAK, RAL, RAO, RBA, RBB, RBC, RBL, pwr splys available, prices from $75 to $350 depending on type, condx. Carl Bloom, (714) 639-1679, 377811168@MCIMAIL.COM

FOR SALE: Radio, TV tubes NOS, send want list & SASE. Dan Hill, POB 49, Dixmont, ME 04932. (207) 234-2315

FOR SALE: Manuals for old ham gear of the '30s to the '70s. Check WEB Catalog www.hi-manuals.com

FOR SALE: 75 yr xmt'g tube collection. Over 150 types, many duplicates; sockets for most types. RCA, WE, GE, West., EIMAC, Taylor, RK, HY, CE, H&K. Sell as complete collection only, where-is, as-is in NC - $2500. Complete list available to serious inquiries. Harry Mills, K4HU, (828) 693-7519, millsjr@bigfoot.com

FOR SALE: Collins 30S-1, 30L-1, 30L-1, 30L-1, 30L-1, 312B4, 312B5, 516F2, 516F2, 516F2, KWM2A, 75A-4, 75A-4, 75A-2, R-388, 75S-1, package deal only. George Rancourt, K1ANX, 82 White Loaf Rd., Southampton, MA 01073. (413) 527-4304

FOR SALE: Early radio & collector tubes. Write or e-mail tubes@tuswest.net for catalog. For current listing of available collector tubes see http://www.fathauer.com. A list of xmtg tubes is also available by mail or web site. George H. Fathauer & Assoc., 688 W. First St. Ste. 4, Tempe, AZ 85281. (480) 968-7686

FOR SALE: 24V dynamotor w/base DM-36-D; military vehicle whip antenna w/ceramic base, all NOS, unused - $50 ea ppd. Bruce Beckeney, 5472 Timberway Dr., Presque Isle, MI 49777. (517) 595-6483

FOR SALE: 1930 7th ed ARRL Handbook: covers intact, good condx - $27 shpd USA. Tom Berry, K9ZVE, 1617 W. Highland, Chicago, IL 60660. (773) 262-5360 or 262-0016

FOR SALE: Vintage Germanium transistors CK722, 2N107, 2N35, CK760; many others including point contact transistors & other vintage radio parts. Visit site at: www.electronic-projects.com or send $1 for catalog. Helio Sakaya, 10726 Wiles Rd, Coral Springs, FL 33076

FOR SALE: Microphones: Astic 30; D104 parts; EV606, 638; Turner 9, 22, 66, 98, 602, 715; Shure 580 SB; cables, connectors. Bill Coolahan, 1450 Miami Dr. NE, Cedar Rapids, IA 52402. (319) 393-8075

FOR SALE/TRADE: Instruction manuals National HRO5A1; HRO7; HRO50; HRO60; NC173; NC183D; NC200; SW54; NC100; NC125. NI4Q, POB 690098, Orlando, FL 32869

FOR SALE: Transformers for Collins 32V3, Hallicrafters HT9, BC610 & RF xfmrs for Hammarlund SP600. Roland V. Matson, POB 956, Lake Panasoffkee, FL 33538

FOR SALE: Older type electronic parts & hardware; free vintage flyer. Mail order since 1954. Bigelow Electronics, POB 125, Bluffton, OH 45817

FOR SALE: Meters, mostly new, all sizes & shapes. SASE for list. Bill Riley, 863 W 38th Ave., Eugene, OR 97405. (541) 345-2169

FOR SALE: Spkr for NC303 & NC-109 - $75; BC-645A, looks unused - $50; National S-101 impedance coupler in box - $40; Waters 337, KWM2 Q-mult - $80; Collins X 455KF300 CWF - $100. All + shpg. Wm Ernst, 16300 Campbell Rd., Comins, MI 48619. (517) 848-5002

FOR SALE: GRC-9 & DY88 - $350; BC-348 - $75. **WANTED:** Coils HRO 60 E/F/AD; CXU50-2 xtal cab. W7RBF, AZ, (602) 864-9987.

FOR SALE: HQ-129X Hammarlund rcvr, works great, nice - $175; Drake R-4B, mint condx, realigned to orig factory specifications - $250; Gonset Communicator II, 2 meters, mint, realigned to facotry specifications - $150. All + shpg. Steve Gross, N4PZ/W9OJI, IL, (815) 734-4255.

FOR SALE: Hickok mod OS-10 AF-RF oscillator w/inst A/O - $25; Vis Isotap III WP27A/0/0 @ 9 - $40; EICO mod 435 Sweep Range vernier - $65; antenna, bumper, AN-75D (MFD 10-51) Snyder MFG, 7 foot tall - $35; Johnson Messenger III w/mic @9 - $35; cathode Ray tubes, NOS 5fp7, 3api, 5axp4 - $40 ea. Bernie Samek, 113 Old Palmer Rd., Brimfield, MA 01010. (413) 245-7174, fax -0441

FOR SALE: Johnson Viking II - $175; Johnson matchbox w/meter, good orig condx - $100. Robert Braza, W1RMB, MA, (508) 222-5553.

FOR SALE: RCA BTA-1M AM broadcast xmtr, tuned to 1380 kHz, plug & play condx - $1500. John P. Tiedeck, WA2SDE, 212 Grandview Rd., Media, PA 19063. (610) 566-8049

FOR SALE: Western Electric 443A-1 1000 watt AM broadcast xmtr, complete & in exc condx but hasn't been turned on in years - $1,000. John P. Tiedeck, WA2SDE, 212 Grandview Rd., Media, PA 19063. (610) 566-8049

FOR SALE: National NC183D w/spkr, working - $450; Hallicrafters SX71, working - $125. Both + shpg. Ed Van Fleet, CA, (530) 529-4875.

FOR SALE: VM parts, new boxed electron tubes, new Heathkit parts, new panel meters. Norm, 1440 Milton St., Benton Harbor, MI 49022

FOR SALE: 811, 811A tubes. 3 new GE or RCA 811A; 1 used EE 811A; 1 new GE 811; 2 used GE or Sylvania 811-7/ $35 + UPS. R.J. Eastwick, W2RJE, 400 N. Haddon Ave. Unit 109, Haddonfield, NJ 08033. (856) 429-2477

WANTED: Collins - Amateur catalogs, sales literature, manuals, promotional items & Signals. Richard Coyne, POB 2000-200, Mission Viejo, CA 92690.

WANTED: Howard radios of any type. Andy Howard, WA4KCY, 105 Sweet Bay Ln, Carrollton, GA 30116. wa4kcy@usa.net

WANTED: E. F. Johnson Co. HAMALOGs, unusual photos and information 1923-70. Bruce Hering, 41120 State Highway 13, Waseca, MN 56093. (507) 835-5619. bhering@efjohnson.com

WANTED: For purchase: Equipment & technical information related to AN/ARN-6 Radio Compass. Jim Cavan, 6 Timberline, Norfolk, MA 02056. (508) 528-0908,jcavan56@aol.com

WANTED: SW3 #33A and #35 coils. I will trade my extra coils SW3 coils. Hank Bredehorst, 2440 Adrian St., Newbury Park, CA 91320. (805) 498-8907

WANTED: Parts for a TMC GPT-750 xmtr. I need the AM modulator deck and other parts to restore this unit. John, KF2JQ (716) 873-0524 jprusso@acsu.buffalo.edu

WANTED: Long wire ants AT101, AT102, GRC-9; DY88/105; PP327/GRC9; counterpoise CP12 & 13 GRC9; BC348 pwr conn PLQ102/103. KA1ZQR, 348 N. Main St., Stonington, CT 06378.

WANTED: Globe King 500 B/C; Viking Valiant I/II; Viking 500; Heathkit Mohawk. Frank, (916) 635-4994, frankdellechaie@sprintmail.com

WANTED: Globe King 500 B or C for California PU. Bob, CA, (562) 928-8820. rrjlife@earthlink.net

WANTED: Military radios: British A-13, A-14, & Soviet R(P)-129. Leroy Sparks, W6SYC, 924 W. Mc Fadden Ave., Santa Ana, CA 92707. (714) 540-8123. leroysparks@earthlink.net

WANTED: National Company emblems, escutcheons, WW II era equipment. Will trade HRO coils or purchase. Don Barsema, 1458 Byron SE, Grand Rapids, MI 49506. DBARSEMA@prodigy.net

WANTED: Hammarlund noise silencer for HQ-170/180. Ed, Fort Worth, Texas, (817) 222-5355 (days)

WANTED: BC-610 75 meter coil and T-17 mic. George, N1TNQ, (401) 331-1279

WANTED: Hammarlund SP-400 for parts. Howard Hartzell, 12005 Pleasant Valley Rd., Glen Rock, PA 17327. (717) 227-0459 hhartzell@cyberia.com

WANTED: HRO 5TA1 or earlier HRO rcvr. Ivan, WA6SWA, POB 248, Reno, NV 89504. (775) 329-7738, idh@cs.unr.edu

WANTED: Collins 51J4 rcvr. Robert, K5LYT, TX, (361) 992-9348.

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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: Heath Gear, unassembled kits, catalogs and manuals. Bill Robbins, 5339 Chickadee Dr., Kalamazoo, MI 49009. (616) 375-7978, billrobb@net-link.net

WANTED: I wish to correspond with owners of National FB7/FBXA/AGS coil sets. Jim, KE4DSP, 108 Bayfield Dr., Brandon, FL 33511. j.c.clifford@juno.com

WANTED: British, Commonwealth W.S. 62, W.S. 22, W.S. 18, W.S. 48, W.S. 46. George Rancourt, K1ANX, MA, (413) 527-4304

WANTED: Contact w/Bendix fans, especially those working on the TA-12 xmtr & the RA-10 or similar rcvrs. Sam Kelly, W6JTT, CA, (714) 893-2092 or skellycp@aol.com

WANTED: PreWW-II Iowa QSL cards; materials of 1920s Iowa Radio Relay League. Will trade or purchase. Bill Smith, W5USM, w5usm@aol.com

WANTED: HF-300 tubes. Don Chester, K4KYV, 2116 Oldover Rd., Woodlawn, TN 37191. (931) 647-2179, k4kyv@hotmail.com

WANTED: Hallicrafters SX88 or SX115. Larry Redmond, 413 Bedfort Dr., Duluth, GA 30096. (770) 495-7196

WANTED: Signal Corps BC-307 xmtr, circa 1937 General Electric. Any out there? William Donzelli, 15 General MacArthur Dr., Carmel, NY 10512. (914)225257, aw288@osfn.org

WANTED: HT-32 (A,B) bezel for homebrew project. Condx not critical. Tom Hoitenga, K8NGV, 3170 Kennesaw View, Marietta, GA 30064-2444. (770) 426-8682, hoitenga@atl.bellsouth.net

WANTED: Walter Ashe: WAR-25, WAP-25, WAT-25. Bob Mattson, W2AMI, 16 Carly Dr., Highland NY 12528. (914) 691-6247, bobmattson@juno.com

WANTED: Pwr sply for Westinghouse MW-2 xmtr will pick up; also, BC-603 and Heath DX-60. Gary, WA4ODY, 1626 Evergreen Ln., Seabrook, TX 77586. pyccuuu@gateway.net

WANTED: Restoring Heath VFO model VF-1. Need missing tuning reduction drive & dial scale. Will buy junker for these components. Wes Chatellier, W5DPM, 1950 Chevelle Dr., Baton Rouge, LA 70806. wesw5dpm@eatel.net

FOR SALE: Hallicrafter's manuals, copies starting at $5, some Johnson, WRL, others. SASE for list. DSM Diversified, 909 Walnut St., Erie, PA 16502.

FOR SALE: Military radio TM's, origs & reprints. New list. Send $1 & address label to Robert Downs, WA5CAB, 2027 Mapleton Dr., Houston, TX 77043-2410. (713) 467-5614

FOR SALE: I repair all tube type amplifiers. Licensed in 1955. Steve Gross, N4PZ-W9OJI, IL, (815) 734-4255.

FOR SALE: 51J-4 filter replacements, direct plugin—6.0 kc Collins mech. filter, 500 cycle xtal latice - $215 each. Chuck Felton, KDØZS, WY, (307) 322-5858, feltoned@coffey.com

FOR SALE: Collins 51J series drum overlay - $10 ea, specify which. Ron Hankins, KK4PK, 555 Seminole Woods Blvd., Geneva, FL 32732. (407) 349-9150

NOTICE: The first annual meeting of the Military Radio Collectors Assoc (MRCA) will be held at the site of the Military Vehicle Rally at the Tobyhanna Army Depot, Tobyhanna, PA on Sept 8th & 9th. For registration form & info packet send SASE to: Ted Young, W3PWW, Rd 3 Box 54, Hanover, PA 17331

FOR SALE: Homemade galena xtal radios, SW or BC. Pix available, also parts. Len Gardner, 458 Two Mile Creek Rd., Tonawanda, NY 14150.

FOR SALE/TRADE: Transmitting/rcvr'g tubes, new & used - 55¢. LSASE for list. I collect old & unique tubes of any type. **WANTED:** Taylor & Heintz-Kaufman types & large tubes from the old Eimac line; 152T thru 2000T for display. John H. Walker Jr., 13406 W. 128th Terr., Overland Park, KS 66213. (913) 782-6455, johnh.walker@honeywell.com

FOR TRADE: Two good RCA 833A's for one Taylor 833A; also looking for Taylor 204A, 813, 866B. John H. Walker Jr., 13406 W. 128th Terr., Overland Park, KS 66213. (913) 782-6455, johnh.walker@honeywell.com

FOR SALE: Heavy duty antenna Boston gear rotating system, will rotate full size christmas tree in 120 mph wind, 1725 in & .9 RPM out, includes 2" mast coupler, limit switches, selsyns, Telrex control head, rain proof weather box, all mounted on 1/4" triangular sheet steel for inside lower section of tower - $345, PU. Ed Schaad, W3WDF, 8245 Garden Oaks Dr., San Antonio, TX 78266. (210) 651-9348

FOR SALE: New Release. For details send 2-stamp LSASE to: Olde Tyme Radio Co, 2445 Lyttonsville Rd. Ste 317, Silver Spring, MD 20910

FOR SALE: Gonset G50 6 meter 25W xcvr - $145; Clegg 22er - $85; 2 meter MFJ921 tuner - $45; EICO grid dip meter - $15; new Micronta 12V 1.75A ps - $14. K2MAC, NY, (716) 876-3259.

FOR SALE: WACO-5NWX telephone filters. Just plug in. 1/$13.95, 2/$25, 3/$34. Money back. Cecil Palmer, 4500 Timbercrest Ln., Waco, TX 76705. (254) 799-5931, w5nwx@juno.com

FOR SALE: Heath Nostalgia, 124 pg book contains history, pictures, many stories by longtime Heath employees. (See BOOKS inside back cover.) Terry Perdue, 18617 65th Ct., NE, Kenmore, WA 98028.

FOR SALE: "Complete Guide To WWII Military Communications Equipment", 117 pg info on almost all WWII equip. - $15 + $2 domestic mail. Sam Hevener, W8KBF, 3583 Everett Rd., Richfield, OH 44286-9723. (330) 659-3244

FOR SALE: Convert any wattmeter to read PEP! Perfect for AM/SSB - $19.99 ppd for complete kit! HI-RES, 8232 Woodview, Clarkston, MI 48348. (248) 391-6660, hires@rust.net

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

FOR SALE: Tube type kits for CW/AM. Vintage Radio Kit Co, 427 North Main St., Sharon, MA 02067. email us at CPCW-5@aol.com or visit our web site at: http://www.mnsinc.com/bry/vintage.htm

FOR SALE: Repair, upgrade, performance modification of tube communications & test equip. Accepting most military, all Collins & Drake designs, & the better efforts from others. Laboratory performance documentation on request. Work guaranteed. Chuck Felton, KDØZS, Felton Electronic Design, Box 187, Wheatland, WY 82201. (307) 322-5858, feltoned@coffey.com

FOR SALE: RF Communications RF-403 VHF FM Radiotelephone - $50; MFJ G5RV antenna, used - $15. Al Jenkins, WA1RWB, MA (508) 325-7122.

FOR SALE: (2) Valiants - $400, $200; Viking II + parts unit - $200; (2) Rangers - $200, $100; Viking Challanger - $75; National NC300 - $200; BC 312N - $100; BC 348R - $100; PU only. Jim, MT, (406) 826-5093.

FOR SALE: 4, 5, & 6-pin plug-in coil forms for any homebrew project - $6 ea + shpg; SW3 & pilot plug-in coil forms - $7.50 ea + shpg. James Fred, 5355S 275 W, Cutler, IN 46920. (765) 268-2214

FOR SALE: Collins Radio 1st & 2nd catalog; 1st Signal Newsletter, etc; (8) mechanical filters 51S1, etc; (4) radio xmtr harness; HF2050 Receiver Revision History. Bill Coolahan, 1450 Miami Dr. NE, Cedar Rapids, IA 52402. (319) 393-8075

FOR SALE: WWII Merchant Marine rcvrs, Mackay 128AY, Radiomarine/RCA AR8506B, AR8510, EH Scot SLRH, SLRM, any rcvr - $250. Carl Bloom, (714) 639-1679, 3778111@MCIMAIL.COM

FOR SALE: F 455 Q 7 quartz filter. Jim, (918) 293-9443 Kd5gho@swbell.net

CDs From ER

By Radio Era Archives

R390-R390A/URR Technical CD-ROM - $ 57.
RCA HB-3 Tube Handbook - $ 75.
RCA Radiotron Handbook, 4th Edition - $ 62.
Radio Boys on CD-ROM - $ 39.
80 years of QST - $ 39.95 per set (generally 5 or 10 year set).
All 11 volumes - special package price - $ 373.
Collins Radios Technical CD-ROM series. Vol. 1 - Collins Receivers; Vol. 2 - Collins Transmitters & Amplifiers; Vol. 3 - Collins Transceivers; Vol. 4 - Accessories, Power Supplies, VFO's, etc. Each CD - $ 79, Complete Set - $ 279

By Hamanuals

Drake equipment operator and service manuals on a two CD set by Bill Turini, KA4GAV - $79.95

By August Johnson, KG7BZ (NEW)

Military Boatanchor Manuals, Volume 1 - $45. This CD is one of the best manual CDs on the market. It contains the following manuals: ART-13, -A, B; BC-221-A, B, C, D, E, F, J, K, L, M, N, O, P, Q, R, AA, AC, AE, AF, AG, AH, AJ, AK ,AL; BC-312, -A, C, D, E, F, G, J, L, M, N, HX, NX; BC-314, -C, D, E, F, G; BC-342, -A, C, D, F, J, L, M, N; BC-344, -D; BC-348-J, N, Q; BC 375-E, BC-610-E, F, G, H, I; BC-614-E, F, H, I; BC-779-B Hammarlund Super-Pro; BC-794-B Hammarlund Super-Pro; BC-1004-C Hammarlund Super-Pro; GRC-19; PRC-6; PRC-8, 9, 10; R-388; R-389; R-390; R-390A; R-391; R-192; T-195; SCR-274, includes: BC-453-A, B; BC-454-A, B; BC-455-A, B; BC-456-A ,B; BC-457-A; BC-458-A; BC-459-A; BC-696-A; BC-946-B.

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WANTED: Knight-Kit manuals. I would like to build a collection of Knight-Kit/Allied manuals covering their Amateur, CB, Short-wave and/or Accessory products from the 50's through the 70's. Walt, (818) 883-8282 , Los Angeles walterryan@earthlink.ne

WANTED: WW-2 Japanese military radio of any kind. Yokohama Radio communication Museum, Takashi Doi, 1-21-4, Minamidai, Seyaku, Yokohama 246 Japan. Fax 011-8145-301-8069, takadoi@carrot.ocn.ne.jp

WANTED: Original, if possible, TM with circuit & trouble-shooting for AN/URM-25 & 26. David Boardman, VA2DVD, (418) 877-1316, dbman@angelfire.com

WANTED: Sine/cosine potentiometer, 360 deg. winding and rotation, two wipers 90 degs. apart. Len, WA6ELK, (916) 641-2626, Lenc0135@aol.com

WANTED: CQ issue ? article for first mixer NC-300 6BA7 changed to cathode coupled 12AT7. K1MBI, 21 Freestone Ave, Portland, CT 06480

WANTED: National NTE exciter. I love National. Sylvia Thompson, N1VJ, 33 Lawton Foster Rd. S, Hopkinton, RI 02833. (401) 377-4912

WANTED: Info on R-105/ARR-15 rcvr made for USnavy by Collins, 1944-1950. Louis L. D'Antuono, 8802 Ridge Blvd, Brooklyn, NY 11209. (718) 748-9612 after 6 pm

WANTED: Bug with a 3 inch wide black or grey base. MacElroy bug. Brian Roberts, K9VKY, 130 Tara Dr., Fombell,PA 16123. (724)758-2688 K9vky@stargate.net

WANTED: QSTs before 1936 and various years ARRL Handbook for personal collection. Gary Yantis, WØTM, 800-844-9860, gary@wØtm.com

WANTED: Drake 1A rcvr; 399C1 Collins VFO; JRC 505 twins. K5YY, AR, (501) 756-5010. k5yy@arrl.net

WANTED: GF-11 & GF-12 aircraft xmtr equip. Mike, WØBVA, 305 N. Keith St., Scammon, KS 66773. (316) 479-2756

WANTED: Top $ for Philmore CR5A RX, international xtal 80/40 xmtr, WRL, CW7, xmtr. Gary Wagner, K3OMI, TN, work # (865) 690-4217

WANTED: Rcvr multi band Meissners National 44 & 45; Guthman U17 & U50. H. Mohr, W3NCX, 1005 Wyoming, Allentown, PA 18103.

WANTED: Complete clean R-390/URR w/all technical manuals. C6ANI, POB N4106, Nassau NP, Bahamas

WANTED: RBB/RBC rcvrs, pwr splys, cables & RAK/RAL equip. Andy Miller, KD6TKX, CA, (831) 484-2389, amillertkx@aol.com

WANTED: Collins 310B, basket case OK, welcomed; Chicago 500W CMS-2; high-level modulation xfmr; Taylor T21. Jerry, W8EGD, CO, (303) 979-2323.

WANTED: Squires-Sanders rcvr type AN/URR-58(V). Harry A. Weber, 4845 W 107th. St., Oak Lawn, IL 60453-5252

WANTED: Hallicrafters classic style spkr, 1940-1950 era. Dennis Olmstead, 431 Ridgewood, Glen Ellyn, IL 60137. (630) 469-0531, wb9emd@aol.com

WANTED: Hallicrafters Village/Hamlet radios TR-5/TR-20 & Gonset Civil Defense 6m radios/accessories, manuals also. Daniel Cahn, 3444 Greenwood Ave., Los Angeles, CA 90066. Fx/msg (310) 398-7159 or danielc411@aol.com

WANTED: Cash for Collins: SM-1, 2, 3; 312A-1, 2; 55G-1; 399C-1; 62S-1; KWM-1; 302C-3; 51S-1; 75S-3C; 32S-3A. I buy any Collins equip. Leo, KJ6HI, CA, Ph/Fx (310) 670-6969. radioleo@earthlink.net

WANTED: QSL cards from old/pre WW II Ham DX countries; old regen kits. Hajime Suzuki, Nishikuniyoshi 1644-24, Ichihara-Shi, Chiba-Ken, 290-0231 Japan

WANTED: Western Electric horns, spkrs, amps, mics, theater equipment. Barry Nadel, POB 29033, San Francisco, CA 94129. bnadel@ccnet.com

WANTED: Mics: Astatic JT 30/40; UT-48; Shure CR80/81/41; 707A; Turner VT-73; CD/BD; parts for same. Tom Ellis, Box 140093, Dallas, TX 75214. (214) 328-3225. tomsmics@flexcomp.com

WANTED: Stancor/Chicago PCC200, PCO/PS0150, RC8150; Triad A-9-J, A-10-J, A-11-J, A-12-J. **FOR SALE:** Books, send SASE. Richard Robinson, POB 1425, Wallingford, CT 06492. (203) 949-0871, richmix@erols.com

WANTED: Transmitters: GO-9; TBW; GF11; BC-AR-430; rcvrs: R-1004 part of GRC-109; RR-2B, goes w/xmtr RT-3. Bob Lackey, W4QBE, 1252 Worley Creek Rd., Lakemont, GA 30552

WANTED: Early 4 pin globe shape tubes. We particularly need type 201 (1 amp style) & Arcturus & other blue or gold glass tubes, new or used. Send list of tubes you have to: George H. Fathauer & Assoc., 688 W. First St., Tempe, AZ 85281. (480) 968-7686 or tubes@uswest.net

WANTED: National FRR-59; Hallicrafters SX73; Scott Special Communications rcvr. EA4JL, please call, Kurt Keller, CT, (203) 431-6850

WANTED: Kleinschmidt teleprinter models: 311, 321, (AN/FGC-40, AN/GGC-16, AN/UGC-39...) Tom Kleinschmidt, 506 N. Maple St., Prospect Hts., IL 60070-1321. (847) 255-8128

WANTED: Military survival communications equip: radios, beacons, manuals, books, historical info/photos. Daniel Cahn, 3444 Greenwood Ave., Los Angeles, CA 90066. (310) 398-7159. danielc411@aol.com

WANTED: Visitors and tubes by museum. Old and odd amateur or commercial tubes, foreign and domestic purchased, traded or donations welcome. All correspondence answered. K6DIA, Ye Olde Transmitting Tube Museum, POB 97, Crescent City, CA 95531. (707) 464-6470

WANTED: RCA 140, 141, AVR5A. GE K80, K80X, K85. Any condx. James Treherne, 11909 Chapel Rd., Clifton, VA 20124. treherne@erols.com

WANTED: Tube-type Hi-Fi & guitar amplifiers by ACRO, EICO, Fender, Marantz, McIntosh, Pilot, Triad, UTC. Rob, CA, (510) 845-2625.

WANTED: Seeking unbuilt Heathkits, Knightkits. Gene Peroni, POB 7164, St. Davids, PA 19087. (610) 293-2421

WANTED: Small 1" panel meters, especially DC ammeters. Send price info. Chris Cross, POB 94, McConnell, IL 61050

WANTED: R648 military rcvr in reasonable condx & price. Prefer orig. Norman Roscoe, W1CIX, POB 402, W Bridgewater, MA 02379

WANTED: Any info on RCA/RadioMarine TRP 141 rcvr built for USCG 1947. Robert Martin, 111 Bancroft, Rochester, NY 14616. (716) 663-4182

WANTED: B&W 852 pi inductor; info on ANGRR37 rcvr & TS 3849 test set. Joe, NM1V, MA. (978) 658-6186.

WANTED: Parts for BC 652 military rcvr; 32V2 or 32V3 Collins. Joe, W5JDY, 317 White St., Norman, OK 73069. (405) 321-4717

WANTED: Manual, schematic or other info for a Navy DF set, model DAQ or DAU. Frank, WA6RBQ, OR, (541) 479-7935, wa6rbq@aol.com

WANTED: Ampex tube type decks, mixers, amps. George, OH, (216) 486-6489, blksub480@yahoo.com

WANTED: Schematic or manual, radio freq meter model LP-3 MFG General Radio. Bob Lackey, W4QBE, 1252 Worley Creek Rd., Lakemont, GA 30552. (706) 782-3670

WANTED: BC-375/BC-191 xmtr; BC-611. Pete Hamersma, WB2JWU, POB 467, Holderness, NH 03245

WANTED: Watkins-Johnson or Communications Electronics Inc. info, catalogs, manuals or equipment. Terry O'Laughlin, WB9GVB, P.O. Box 3461, Madison, WI, 53704-0461, 608-244-3135

FOR SALE: Copies: Hard to find schematics for radios, also kit radios 1922-1950; manuals: test equip. ham gear. Contact me for prices, availability. Duane Ballew, KB7QZK, 6813 152nd St. Ct., NW, Gig Harbor, WA 98332. (206) 851-4505

FOR SALE: Various parts for homebrewing. List at: http://home.earthlink.net/~af4k/trade.htm FREE: Buy/Sell crystals at: http://pluto.beseen.com/boardroom/b/21532/ Brian Carling, AF4K, af4k@earthlink.net

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FOR SALE: Send SASE for large list of excess parts, publications, ham & test gear. K4AFW, 104 Glenwood Dr., Williamsburg, VA 23185.

FOR SALE: National NCX-500 xcvr w/pwr sply - $225 shpd; Johnson Mess CB/10M 5 chs, good condx - $20; (2) Nicholet Dig storage scope - $20 ea; Link radio test meter unit, type 1617 - $15; Link FQ meter type 2051A - $20; Triplet test meter mo 1200G - $10; Heath GDO GD-1B w/coils - $20; Philco sig corps rcvr BC-1066-B - $10; EICO 377 sine-sq wave audio gen - $15; Measurements sig gen mo 800 - $35; new Sylvania 6U8 tubes - $3 ea; Sencor Mighty Mite IV tube tester - $25; Philco tube tester mo 9200 - $40; Bogen mixers MX6A-T - $10 ea; Heath sig gen mo RF-2 - $15; Heath TC-1 tube chker, not working, meter & xfrmr OK w/ orig manual - $10; Paco RF gen mo G-30, exc condx - $20; Heath SWR bridge HM-15, bad meter - $5; all + shpg. Randy, K4RHH, VA, (804) 239-6127 or kevinc@nesbeonline.com

FOR SALE: Repair! Radio repair, tube or solid state. Reasonable charges. J. Dan Rupe, W7DDF, 998 Whipple, POB 697, Grayland, WA 98547. (360) 267-4011, w7ddf@yahoo.com

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FOR SALE: RCA tube manuals, RC-15, RC-20, RC-25; ARRL Handbooks, 1965, 1968, 1972 & 1978. LSASE for list. Charles Brett, 5980 Old Ranch Rd., Colorado Springs, CO 80908. (719) 495-8660, brett3729@aol.com

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FOR SALE: Collins drum overlays. 75A-2, 3, 51J#. For 75A-4 & KWS-1, specify new/old - $8.50 ea. 2/ $15 ppd. Correct colors. Charlie Talbott, K3ICH, 13192 Pinnacle Ln., Leesburg, VA 20176-6146. (540) 822-5643.

FOR SALE: Used technical books - radio, electronics, math, military, magazines, etc. List: $1 (stamps OK). Softwave, 2 Dept. ER, 1515 Sashabaw, Ortonville, MI 48462

FOR SALE: Strong steatite antenna insulators. Lengths from two to fifteen inches. SASE for list. John Etter, W2ER, 16 Fairline Dr., East Quogue, NY 11942. (516) 653-5350

FOR SALE: Dial/clock covers. Send bezel, old or drawing, make/model, guaranteed satisfaction - $10 ppd. William P. Turner, WAØABI, 1117 Pike St., St. Charles, MO 63301. (314) 949-2210

FOR SALE: SX-25 w/matching spkr, very good - $225; S-20, like new - $195/ Ron, MI, (517) 374-1107.

WANTED: National HRO black wrinkle spkrs, oak coil boxes, coils; Western Electric horns, spkrs, amps, mics. Barry Nadel, POB 29303, San Francisco, CA 94129. bnadel@ccnet.com

WANTED: Collins 70K-2 PTOs working or not; IN82A diodes; Bretting 14/14AX manual. Clark, WØBT, KS, (785) 286-2132

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: Mohican; SB-200; SB-220; SB-100; SB-101; SB-102; Knightkit Band Spanner II; Heath GW-12A; GW22A; GW42. Debbie, AR, (870) 857-3366.

WANTED: Test equipment & tube audio amplifiers. Mike Nowlen, WB4UKB, 2212 Burgee Ct., Reston, VA 20191. mike@3dnet.com

WANTED: Eimac 75-TLs & 250-TLs for a project. Bob, WB6DPU, (562) 928-8820, rrjlife@earthlink.net.

WANTED: Navy xmtrs: MQ, TCA, TCE, TCN, TCX, TDE; rcvrs: RAW, RAX, RBD, RBJ. Steve Finelli, 37 Stonecroft Dr., Easton, PA 18045. (610) 252-8211. navradi@enter.net

WANTED: Tektronix memorabilia & promotional literature or catalogs from 1946-1980. James True, N5ARW, POB 820, Hot Springs, AR 71902. (501) 318-1844, Fx 623-8783, james.true@ibm.net

WANTED: Cash for Collins: SM-1, 2, 3; 55G-1; 625-1; 399C-1, 51S-1; 75S-3A, C; 32S-3A; any Collins equip. Leo, KJ6HI, CA, ph/fx (310) 670-6969, radioleo@earthlink.net

WANTED: TMC GPT-750, TAC Tuner, GPR-90/92 & GSB-1. Alan Gray, W3BV, PA, (215) 795-0943.

WANTED: Hallicrafters S-39 rcvr Skyranger. Bob, K1YJK, CO, (303) 768-9200, k1yjk@arrl.net

WANTED: Knight Star Roamer in working condx. Dave, WA4YRK, dgarner@usit.net

WANTED: WKG vibrators: CD6VL10; CD6326 & Mallory G-859 for Gonset Twins. Richard, 1122 Via La Cuesta, Escondido, CA 92029. (760) 739-1835

WANTED: Hallicrafters HT-1, HT-9, HT-31, S-T, SX-11, SX-17, SX-25; Howard rcvrs; Harvey xmtrs. Ken Seymour, KA7OSM, 9115 SW 176th Ave., Beaverton, OR 97007. (503) 306-7439 24 hrs. ken.seymour@attws.com

WANTED: 80 & 40 meter xtals in FT243 holders. Howard Weinstein, K3HW, 4041 Ridge Ave. Apt 4-405, Philadelphia, PA 19129. (215) 843-1180. k3hw@arrl.net

WANTED: Merchant ship radio memorabilia, radios, keys, parts, clocks, documentation. Tom Mackie, W2ILA, 14 Washington St., Jamestown, RI 02835. (401) 846-1200

WANTED: Collins promotional literature, catalogs and manuals for the period 1933-1993. Jim Stitzinger, WA3CEX, 23800 Via Irana, Valencia, CA 91355. (805) 259-2011. FAX (805) 259-3830

The Collins Video Library

The Collins KWM-2 Video 4 hours - $89.95. Highly detailed video on operation, rebuilding, alignment, troubleshooting and neutralizing of this classic! A must for anyone who owns and operates a KWM-2/2A. Printed documentation included.

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The Collins 30L-1 Video 1 hour - $39.95. A complete guide to the 30L-1 amplifier. Operation and safety, updates and a discussin of the 811A triode. Learn the secrets to greater performance.

The Collins 30S-1 Video 1 hour - $39.95. Finally, the one everybody has wanted! This extraordinary video describes operation and user safety, maintenance and modifications of this classic Collins amplifier. Very informative—truly a must for all 30S-1 owners. Printed documentation included.

The Collins Amateur Radio Equipment Video Spotter's Guide 1 hour, 40 minutes - $24.95. Close to 90 individual pieces of Collins Radio equipment are shown in the video. Examples of some of the gear covered are: KW-1, KWS-1, 30K-1, 20V-3, 75A-4, KWM-2, S-Line, KWM-1, 30S-1, 30L-1, KWM-380 and much more!

The Collins KWS-1 Video 2 hours - $39.95. This video is the perfect companion to the 75A-4 video for owners of the "Gold Dust Twins"! Butch Schartau, KØBS, shows you how to operate, maintain and repair your KWS-1. Watch as Butch goes through the entire alignment and neutralization process, as well as showing you how to properly operate this famous transmitter.

The Collins 75A-4 Video 4 hours - $89.95. This video is four hours of information on how to repair, maintain and restore this classic receiver. Butch Schartau, KØBS, guides you through all aspects of keeping your own 75A-4 running like a top.

R-390A Video 7 hours - $109.95. Here it is! Long awaited by serious "boatanchor" enthusiasts! The ultimate receiver now has the ultimate video to go along with it. R-390A expert Chuck Rippel, WA4HHG, covers an absolutely incredible array of information in this "heavy duty" video. This video looks at operation, its modules, circuit description, front and rear panel details, complete mechanical and electrical alignment, PTOs, performance evaluation, modifications, troubleshooting and restoration. There is nothing like this video available today, at any price!

R-390A Addendum Video - $49.95. Another 3 hours and 40 minutes of R-390A information from Chuck Rippel, WA4HHG.

SP-600-JX Video 4 hours - $89.95. Chuck Rippel,WA4HHG, takes us through all aspects of the SP-600-JX—repairs, restoration and modifications. This video is a must for any newcomer attempting to work on the SP-600.

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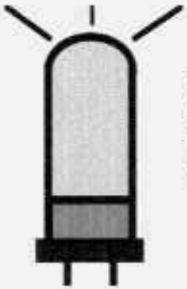

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