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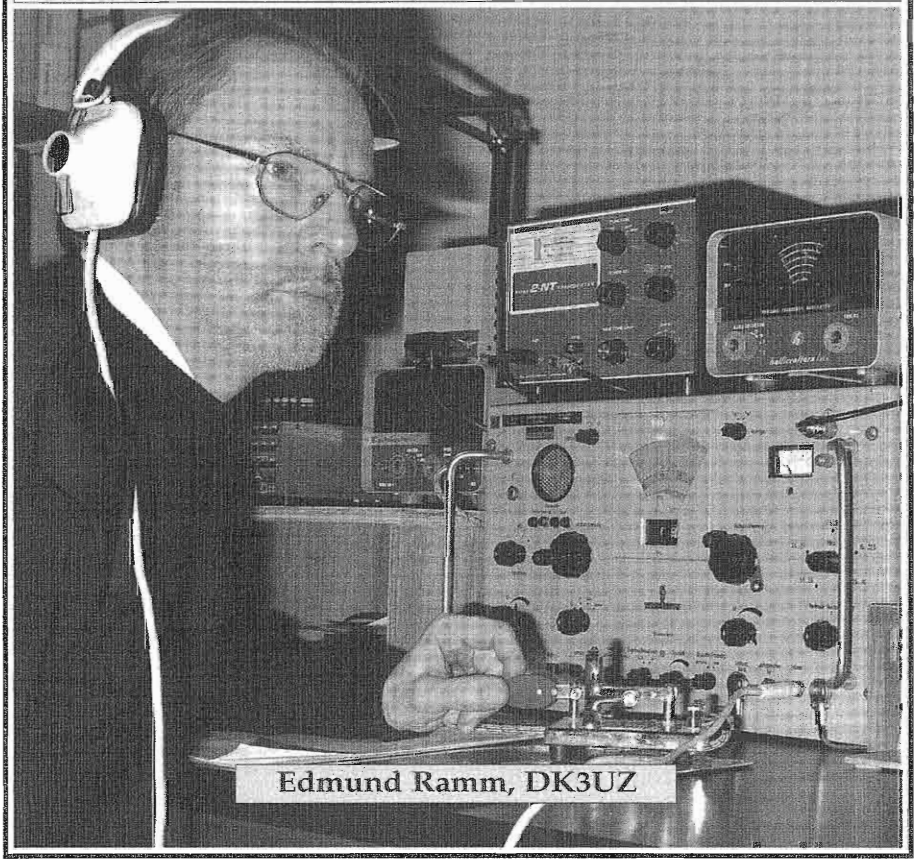
ELECTRIC RADIO

celebrating a bygone era

Number 214 March 2007



Edmund Ramm, DK3UZ

ELECTRIC RADIO

Published monthly by Symbolic Publishing Company
PO Box 242, Bailey, Colorado 80421-0242
Periodicals postage paid at Cortez, CO
Printed by Southwest Printing Inc., Cortez, CO
USPS no. 004-611
ISSN 1048-3020

Postmaster send address changes to:
Electric Radio
PO Box 242
Bailey, CO 80421-0242

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

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

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

Editor's Comments

February 2007

February 2007 has certainly been a month of change for amateur radio. When the FCC did away with the code test elements for a ham ticket, a chain of events started. We may not know the outcome of the changes, or their advantages and disadvantages, for many years to come.

The code tests were given for roughly 93 years. There is a beginning and an end to everything, and someone had to have been given the very first code test, and someone had to take the very last one. As it turns out, Will Campbell, a junior high school student at Dos Pueblos High School in Santa Barbara, California, at one second before 9 PM, Thursday evening, February 23, 2007, probably became the last person in the United States to be tested on the Morse code. Will had become interested in telegraphy, and wanted to be tested. The last test was administered at the Santa Barbara County Health Auditorium by volunteer examiners Michael Jogoleff (WA6MBZ), Tom Saunders (N6YX) and Carl Stengel (W6JEO). This test was given almost 163 years after Morse transmitted his first message on May 24, 1844.

Author Feedback

Many Electric Radio authors have mentioned to me the lack of feedback they get on their articles from readers. If you like something an author writes–or something you don't like–please take a few minutes to send your comments to them. It makes an author feel like the effort was worth the time it takes to produce an article.

SX-117 Article Correction

The SX-117 part 2 article in ER #213 had an error on page 43. The AGC resistor to change is R63, *not* R64.

73, Keep Those Filaments Lit!

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Cover: Eddi Ramm (DK3UZ) is an ER reader who is on the air from Hamburg, Germany. To the left is his Hallicrafters HA-1 TO keyer, whose input is connected to the Vibrokeyer in front. The HA-1 keys the Drake 2-NT transmitter, resting on top of a Siemens E311b receiver of 1960 vintage. The 2-NT gets its RF from the HA-5 VFO on top of the receiver.

The Collins 32RA

By Jim Hanlon, W8KGI
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"Calling all cars! Calling all cars!" That's what I feel like announcing when I squeeze the switch on the T-17 mike attached to my newly-acquired Collins 32RA. This big, heavy, old black box first appeared around 1938 as a four-channel, general-purpose, shortwave transmitter for the range between 1.5 and 15 Mc., and as such it was probably used by many police departments in their allocation just above the AM broadcast band in those days. The 32RA was designed for both CW and AM phone. Collins says that the rig is good for speeds up to 60 WPM on CW—more than enough for me. On phone, the audio response is "uniform plus or minus 2 dB from 400 to 5000 cycles and the audio frequency amplitude distortion is less than 5% RMS total harmonics at any modulation level. The residual noise level is more than 50 dB below 100% modulation." That probably makes the F-1 telephone mike button cobbled onto my T-17 sound at least as good as any telephone connection did in 1938.

The 32RA was not particularly well suited to amateur work, and it was not widely advertised in the ham magazines, appearing in QST only for May 1938, June 1939, October 1940, and September and October of 1945 as far as I can tell. Per the QST ad of October 1940, it came in two versions, the 32RA with an AC power supply installed on the right side of the cabinet, and the 32RB with a battery-powered dynamotor in that same place. The 1939 ad touted its use "as a standby transmitter for airlines, in

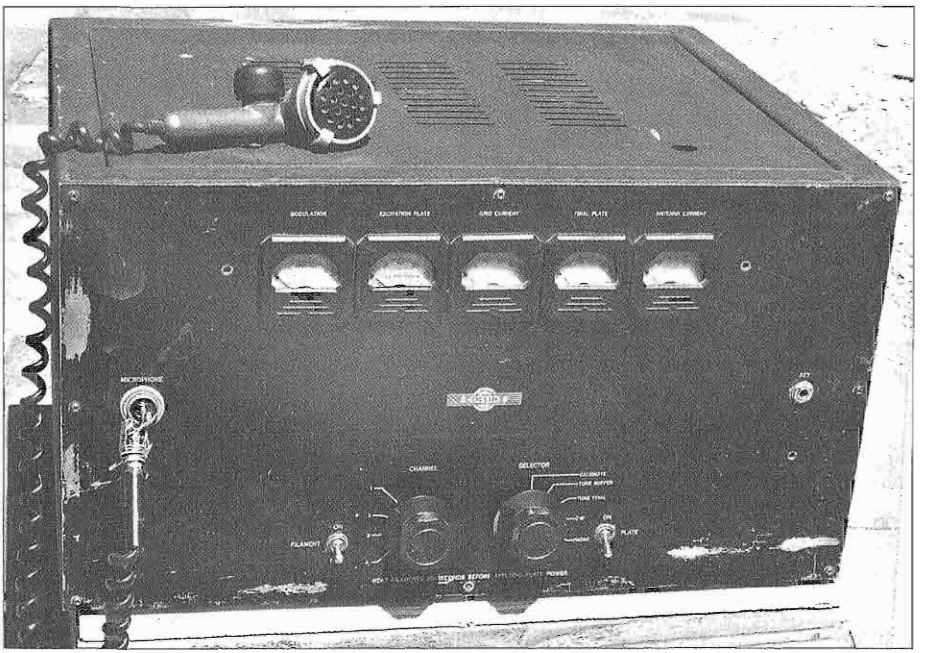
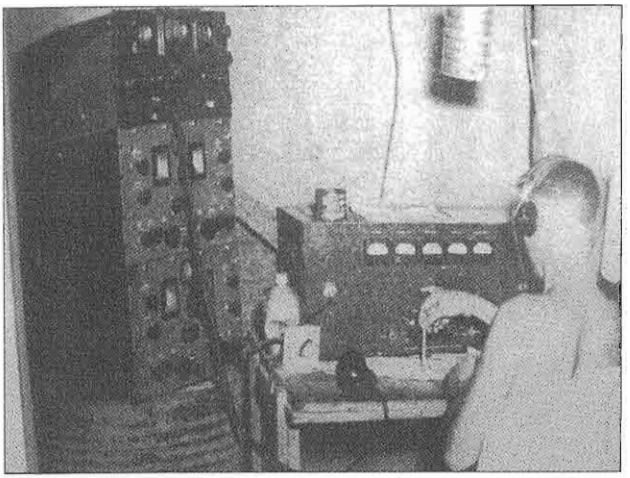


Figure 1: The Collins 32RA and my T-17 mike, Modified with a Telephone F-1 Button



A 32RA in Service During WWII (Photo courtesy Marty Reynolds, AA4RM)

emergency radio systems, interzone police networks and for many other varied uses." The September 1945 ad said about the 32RA, "It was found to be rugged, simple to operate, easy to service, and so thoroughly and universally satisfactory that a rising commercial demand was halted only by the war. During the entire war the Armed Forces have employed thousands of these transmitters. A typical use has been that of control towers on air training fields throughout the country." I was extremely fortunate to find a ham who had actually used a 32RA during the war. My friend Marty (AA4RM), who also has a 32RA on the air, referred me to Ron Dick (W2NEG) who was with the Army Airways Communications System during and after the war. Ron was based in Bangladesh and involved in "over the hump" communications. He told me that the 32RA, which had its own independent gasoline generator and antenna, was used as a backup to the higher powered T4FRCs, a big Collins autotune rig. Baring failure of the big rig, the 32RA sat on the back wall collecting dust. It was exercised about once a month to make sure it was still working. Ron said in a recent email, "I was trying to recall details about the use of Collins 32RA transmitters. Many of the AACS stations had them; late in the war they would have been the improved models. For me, at that time, none compared in technical interest and power with another Collins transmitter AACS used in its point-to-point CW services, the BC-460 autotune multichannel rig found along with T4FRCs in the transmitter building. When WXWZ, Kurmitola, was closed down, all the equipment was put aboard a train to be shipped to Calcutta, except for the humble 32RA.

"Given the uncertainty and delay of Indian rail transport, added to that, security problems, it was decided to install an emergency station using a 32RA and receivers, complete with antennae in one weapons carrier connected by power cables to a gas powered generator in another. The escort party would keep in contact with headquarters until the shipment reached Calcutta. What happened to the 32RA or equipment left on the train, I don't know. The trip was deemed too hazardous and along with the rest of the escort party I was flown out in a C47. We would go on to close down other stations until shipped home on a military transport and discharged in July 1946."

So, one way or another, not many 32RAs made it back home after the war, probably because they were really just four fixed-frequency rigs and because they were a bit on the heavy side to carry around. But, even though it was not widely used or particularly well-known in amateur circles, the 32RA is still a neat boatanchor for my Classic Exchange hamshack.

My particular 32RA, a version 8, spent some time working for Uncle Sam since it has a June 13, 1943, Signal Corps in-

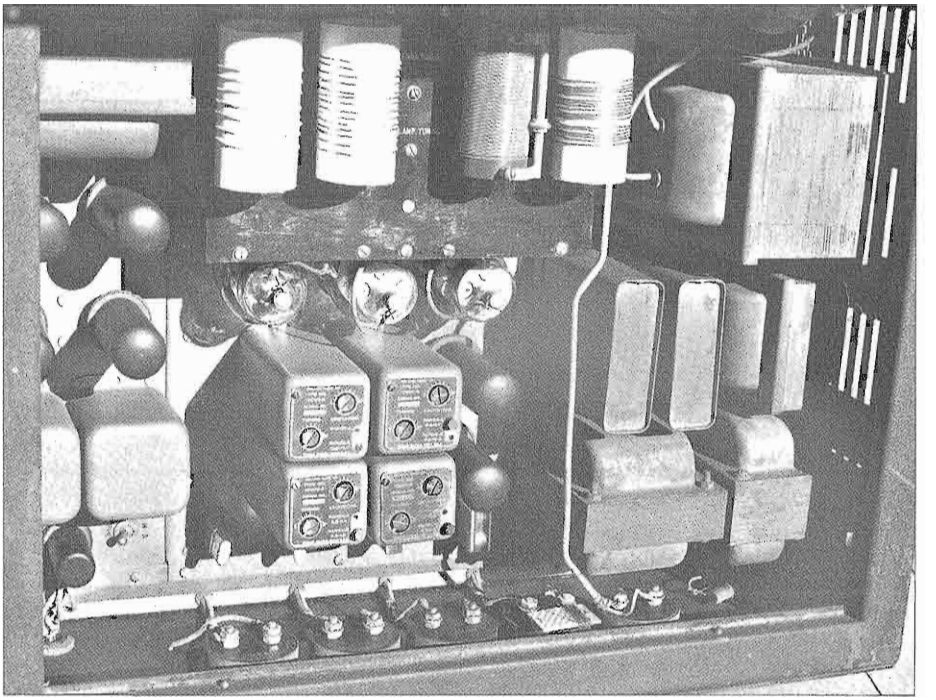


Figure 2: Looking under the 32RA lid, this photo shows the modulator along the left side, the RF deck in the center, and the power supply is against the right side.

spection stamp on the underside of its lid. I can trace it as far back as a warehouse in Cheyenne, Wyoming. It was stored there, along with a number of other high-end radios from the '30s and '40s, the property of an owner who had died. A radio collector from Colorado Springs, Colorado, finally liberated it and then traded it to Barney Wooters (W5KSO), a longtime ER subscriber. Barney described it as "dirty, but apparently complete" at that point. Barney eventually advertised it and passed it along to my friend of several previous transmitter stories, Doc. Doc, already having another 32RA, brought it down to me and deposited all 120 pounds of it on my garage floor. He was kind enough to supply four interstage tuning units for 80, 75, 40 and 20 meters and one of the original type 190F tapped plate coils that span 1.5 through 5 mc.

As you might expect from Collins, the 32RA is a very substantial, both electrically and mechanically. Its RF lineup consists of a 6L6 oscillator-multiplier driving a 6L6 buffer-multiplier, in turn, driving three parallel 807s in the final amplifier. The modulator starts with a rugged, no nonsense, single-button carbon microphone driving a 6C5 speech amplifier, driving four push-pull-parallel 6L6s. Two husky power supplies also reside in the box, a low voltage supply with an 80 rectifier that supplies B+ to the oscillator, buffer and speech amp and also negative bias to the final, and a high voltage supply using a pair of lovely, blue 866As for the final and the modulator. All of this inhabits a black, "table mounting cabinet" as it is called in the manual, 12" high, 22" wide, and 18" deep and that weighs 120 pounds.

Mechanically, the 32RA would put a Sherman tank to shame. It is built in four modules, the Radio Frequency unit, the

Speech Amplifier and Modulator, the Power Supply, and the Panel and Cable Assembly. Cables with plug-in connectors span the modules and all wiring is independent of the cabinet so that individual modules can theoretically be removed for work. Cabinet and chassis construction is of heavy gauge, welded sheet steel with a flat, black enamel finish on the panel, black crackle paint on the cabinet, and a flat gray enamel finish on the chassis inside. As shown in **Figure 1**, there are five, two-inch meters across the top of the front panel. The meters, from left to right, monitor the AC voltage output of the modulator or the DC voltage of the HV power supply, buffer plate current, final grid current, final plate

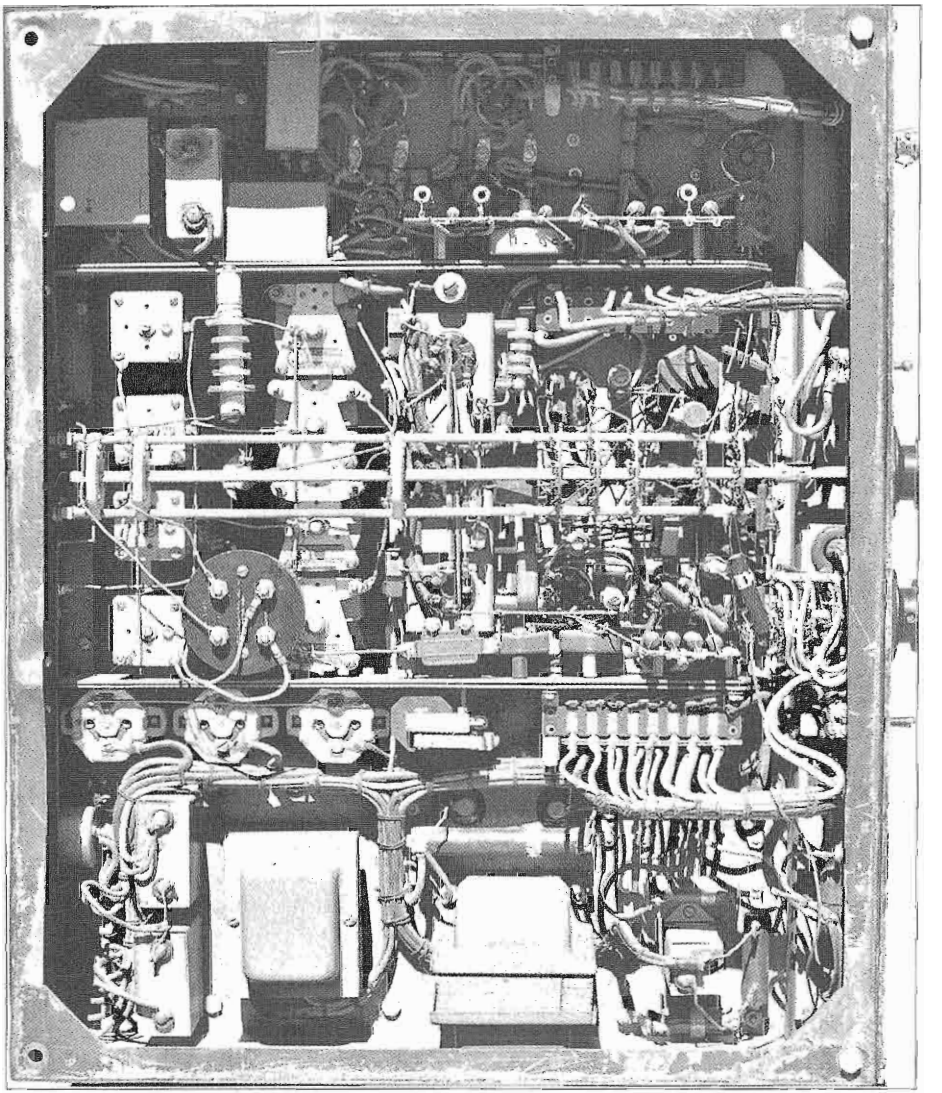


Figure 3: The 32RA power supply is on the bottom, the RF deck is in the center, and the modulator is on top in this bottom view.

current, and antenna current. There are two toggle switches on the panel, filament voltage on the left and B+ on the right. The left rotary switch selects one of four channels. The right rotary switch, labeled "Selector," chooses between Calibrate (oscillator only on), Tune Buffer, Tune Final, CW, and Phone. Also on the panel are the Microphone jack on the left and the Key jack on the right.

The three functional modules can be seen in the top-view picture, **Figure 2**. The RF module, in the center of the cabinet, has four separate "Exciter Coil" plug-ins grouped near the front of the set and four separate final amplifier tank circuits in the rear. You can see the four plate-tank coils beside each other. The one with the sliding tap is a Collins original, the other three are homemade for 75, 40 and 20 meters. Under each coil there are two Johnson transmitting variable capacitors, 250 pF for the plate tuning adjustment and 420 pF for the antenna loading side of the pi-match circuit. Not shown in the photo are the four output terminals and one ground terminal on the back panel. You can connect a different antenna for each of the four channels if you wish. One plate tank, one exciter coil, and one output terminal are selected by the bandswitch for each of the four channels that the 32RA may be tuned for. The oscillator and buffer 6L6s are to the right of the exciter coils, and the three final amplifier 807s sit in a row between the exciter coils and the tank circuits. The modulator module is to the left of the RF module. In **Figure 2**, you can see the microphone and 6C5 plate transformers in the front, the four 6L6 tubes in the center, and the modulation transformer in the rear. The power supply module is on the right, with the 866As in the rear.

Figure 3 shows the 32RA underside. You can see that all of the larger parts are bolted down and that the smaller parts are mounted on terminal boards. Nothing is left to just hang by its leads. Wiring is done with #16 solder-coated copper wire. Cabling is made with #18 wire and is all laced and tied as it is routed around the modules. Along the side of the power supply module, next to the RF module in the rear of the chassis, you will see three white ceramic fuse sockets. This guy uses three of the old fuse-box type, screw-in fuses, a 10 amp for the main power line, a 6 amp for the high voltage plate transformer, and a 3 amp for the low voltage and bias transformers. I sure hope I don't ever blow one, because it should be really interesting to find replacements these days!

The RF section of the 32RA employed several innovative circuits for its day. The 6L6 oscillator uses what we would call today a "grid-plate" or "Colpitts" circuit. The manual says that crystals in the range from 1.5 to 5 Mc may be used in the oscillator. For transmitter output up to 9 Mc there is no tuned circuit in the oscillator plate, only a "special choke," as it appears in the parts listing. That means that the oscillator delivers output on the crystal fundamental frequency and that the 6L6 buffer may be called upon to deliver fundamental, second, third and even fourth harmonic output to drive the final amplifier. In practice, I have used 160 and 80-meter crystals for 80-meter transmitter output, making the buffer run either straight through or act as a doubler. There is more than ample grid drive for the final amplifier in this configuration, and also, when I use an 80-meter crystal for 40-meter output, where again, the buffer runs as a doubler. For output above 9 Mc, the plug-in "exciter tuning unit" includes a tuned circuit for the oscillator plate as well as one for the buffer plate. My best guess is that the rig doubles in the oscillator plate and again in the buffer at this point. When I use an FT-243 80-meter crystal for 20-meter output, I can tune for the rated 7 mA of grid drive to the final. But, when I use a more modern, plated 80-meter rock, the

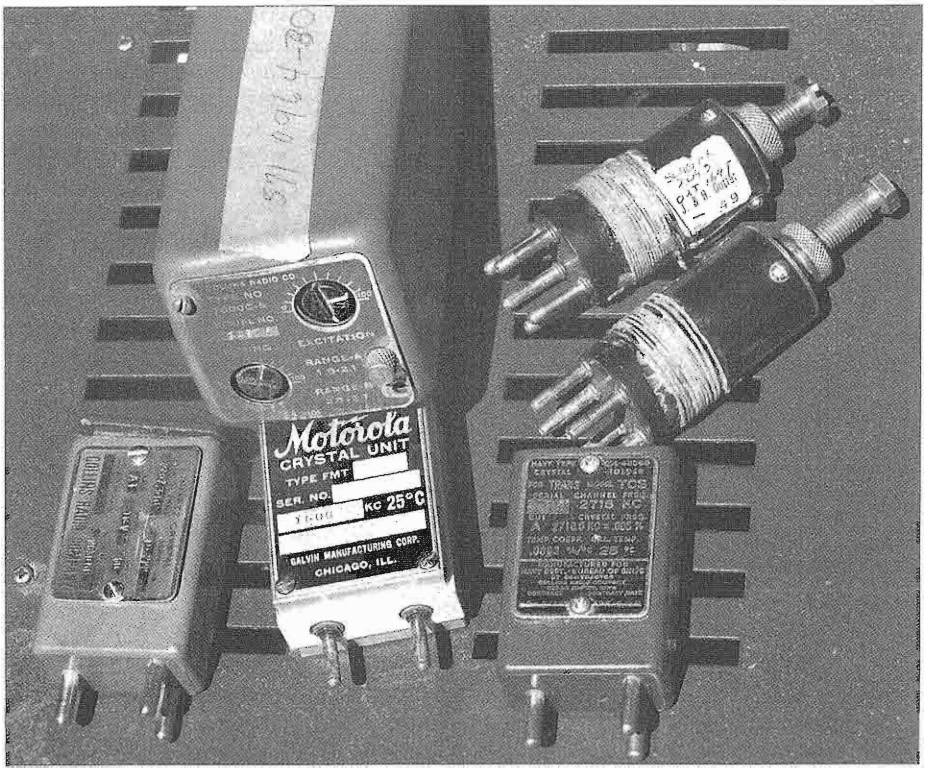
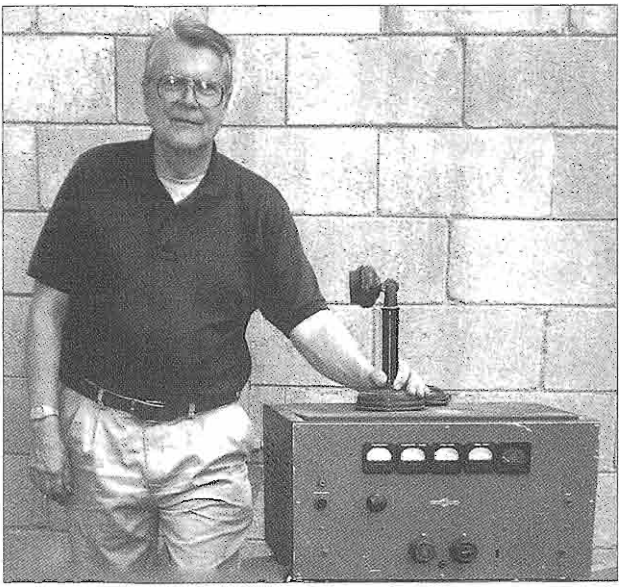


Figure 4: A collection of 32RA crystals, an exciter tuning unit, and master oscillator coils.

best I can do is about 5 mA of drive on 20, still enough to put out a respectable CW signal on 14045 for the Classic Exchange.

The original crystals used in the 32RA were physically much larger than even the WWII-era FT-243 types. **Figure 4** shows three of the crystals that were in the rig when it arrived. The crystal holders have either two or three pins each, suitable for plugging into a five-pin tube socket. The Collins-made units are 2" x 1 3/8" x 7/8", almost six times the volume of an FT-243. One of the Collins units, by the way, is marked "For Trans Model TCS," so you TCS users may recognize these guys. Unfortunately, none of their frequencies or harmonics are particularly useful (the third harmonic of 2407.5 is at 7222.5, but I don't think the SSB boys would appreciate talking to my 32RA), so all I can presently do with them is to admire them. Does anyone make custom crystals that I might acquire to fill these holders and make them useful in the ham bands again?

Collins also built "master oscillator coils" for the 32RA which could be inserted in place of a crystal. The wiring on the MO coil base picks up a fixed capacitor attached to the crystal socket which resonates with the variable MO coil at the desired oscillator frequency. The oscillator frequency can be varied over a range of more than 1.25-to-1 by means of an adjustable core in the coil. The position of the core is adjusted by a screw on top of the coil unit. (Shades of the Collins PTO to come, during and after the war!) I found out, when I was redesigning the two out-of-band coils



Marty Reynolds (AA4RM) and his Collins 32RA

shown in **Figure 4** so that they would oscillate on 160 and 80 meters, that running the slug into the coil decreases its inductance, so these slugs must be "shorted turn" copper or brass types rather than the high permeability powdered iron or ferrite types used later to increase the coil inductance. In any event, my experience with these "master oscillator coils" is that the oscillator is pretty drifty when using them and that it does not key particularly well. I might use the 160-meter coil in the oscillator to hit the frequency of a 75 meter AM QSO if I didn't have the right crystal, but I sure wouldn't use it for a CW QSO on 80 or any higher band, and I wouldn't use the 80 meter coil at all. Fortunately, Collins figured out how to build a much better VFO by the time they brought out the ART-13 in WWII and its many PTO-based successors that came afterwards.

The exciter coil units, one of which is shown in **Figure 4**, have two adjustments on top and a knurled screw that changes between two available ranges. In the unit shown, one of the adjustments is labeled "tuning," and it tunes the buffer plate circuit. The other is labeled "excitation" and it varies the coupling between the buffer plate and the final grid to set the grid drive properly. The oscillator plate circuit is just a choke in these lower frequency units. In higher frequency units, there is a resonant plate tank in the oscillator as well that allows frequency multiplication in the oscillator plate, and there are corresponding tuning controls for the oscillator and buffer in these units.

This particular 32RA was in very good condition when it came to me, a tribute to both its previous owners and to its Collins builders. Almost all of the original parts were still in place and functional, even after six and a half decades. Because it weighs 120 pounds, I did not attempt to hoist the 32RA up onto my workbench. Instead, I built a wooden, wheeled dolly that became its permanent base in my shack, and I worked on the rig at garage floor level.

As mentioned above, there are five meters on the panel of this beastie, providing simultaneous monitoring of the oscillator plate, final grid, final plate and antenna currents, and either the modulator AC voltage output or the DC high-voltage power supply level. All of these meters were functional except for the final plate current meter and the RF ammeter. I substituted a new 1-mA movement from a donor meter of the same size for the plate-current meter, and I wound a shunt for it that you can see mounted on its back. I soon found that the RF ammeter problem was due to its external thermocouple being open. Rather than fuss with a new thermocouple element, I just fed the meter from

the RF output point through a series resistor and diode so that it now serves as an uncalibrated RF output voltmeter.

The 807 output pi-match is poorly designed, a surprise to me since Collins pioneered the use of the pi-match in the '30s. The output or loading capacitor, at 420 pF, is too small for the circuit to tune and have high enough Q to suppress harmonics, especially on the lower frequency ranges. I first noticed this when I loaded the 32RA through an SWR meter into my antenna transmatch. The SWR meter was showing considerable reflected power with the 32RA, whereas it showed no reflected power at all when driven by my tune-up rig, an Elmac AF-67. After a moments thought, I realized that this reflected power must be harmonic output, being reflected because the transmatch was not presenting good match at the harmonic frequencies. I confirmed my hunch by running the 40-meter output of the 32RA through a 40 meter "half-wave filter" of the type that Lew McCoy used to recommend to novices to get rid of their harmonics back in the good old days[1]. With the filter in the line between the rig and the SWR meter, I now saw zero reflected power. I had a couple of options at this point. I could have gone into the 32RA, installed some fixed capacitors in parallel with the loading capacitors, and accordingly, adjusted the tank coil to achieve a proper Q of 12 or so. But, so far I am just using my set of McCoy filters on 80, 40 and 20, and that has allowed me to leave the 323RA in its original state.

I have made a couple of minor "improvements" in my usage of the 32RA. I'm driving the input of the crystal oscillator stage from the low-impedance link output of a Hallicrafters HT-18 VFO. The HT-18 provides enough voltage to drive the crystal oscillator directly on 80 meters without having to use some kind of voltage step-up device, for example a link-coupled tuned circuit that would have to be adjusted periodically when I change frequencies, for example, from 3545 CW to 3880 phone. So, I have the luxury of a stable VFO controlling the 32RA rather than being stuck on just a few crystal frequencies or using the rather dubious Collins master oscillator coils. I have also rearranged the 32RA keying so that I can key its "oscillator" stage along with the HT-18 as well as keying the buffer and final amplifier with my differential keyer, allowing me to operate full break-in CW.

On the air, the 32RA is a decent performer. With my VFO as a driver, I get 85 watts out on 80 and 75, 50 watts out on 40, and 23 watts out on 20, and 25 watts out if I go to crystal control. The audio reports that I got from the guys on 7290 range from "sounds good" and "pretty good" to "sounds great" and "rare and exotic." I suspect the last comment is probably the most honest. I ran it on 40 in the AM version of the Classic Exchange last fall and worked George (W8QBG) in Mesa, Arizona, Bob (NA7RH) in Scottsdale, Arizona, and Bob (W6OOQ) in Escondido, California with it. That's the good news. The bad news is that on 20 it produces significant TVI on my local channels 2 and 5. On 80 and 40 meters it is clean on those channels and is also clean on channels 4, 7, 11 and 13. The 32RA on 20 would not have been a family or neighborhood-friendly rig back in the late '40s and early '50s when folks expected perfect TV reception with a set of rabbit ears located 25 miles or more away from the local stations. While the 32RA is not the best transmitter in my collection, it is a genuine, prewar rig and a solid performer that I can consistently count on for a good sounding CW or AM signal for the Classic Exchange and the AWA contests. It also does a very good job of holding down the garage floor. I think I'll keep it for a while.

References:

1. McCoy, Lew, W1ICP, "Harmonics, Harmonics, Harmonics," QST, May 1960, p. 16. (Also see The Radio Handbook, 15th Edition, page 378 or 22nd Edition, page 16.7)

The Collins 75A Revisited, Part 2

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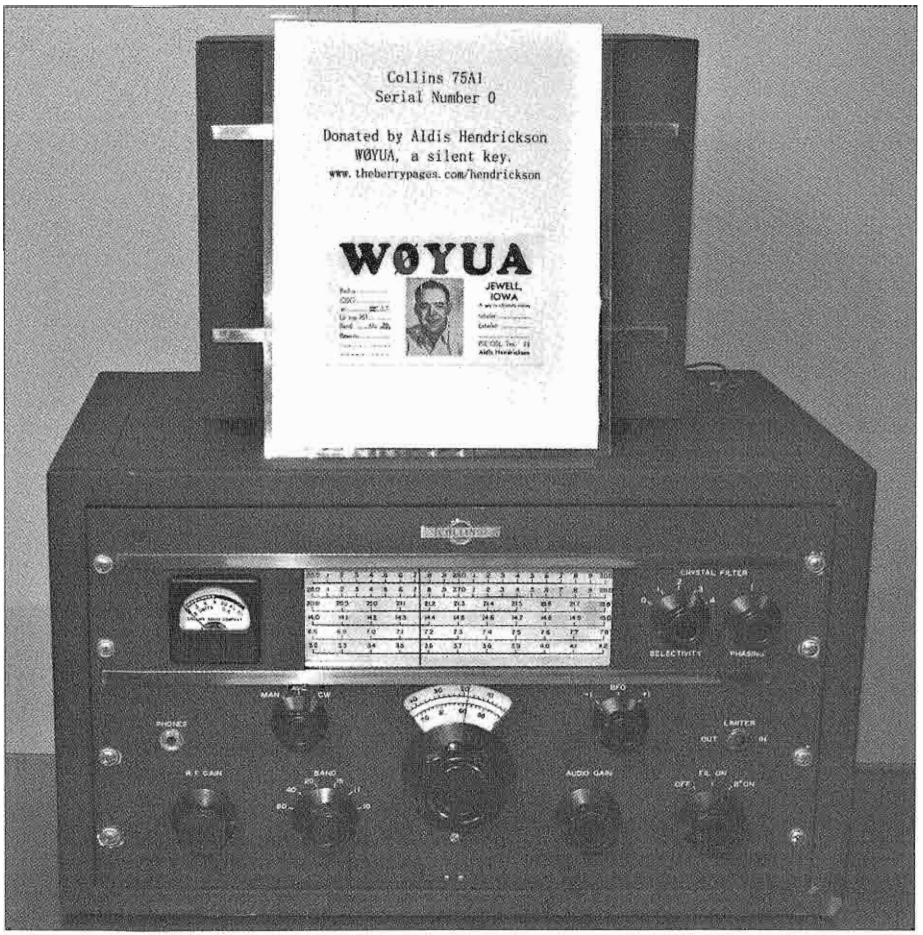
Collins 75A-1, Serial Number "0"

A few years ago, a call was received from a man who had a 75A-1 receiver with serial number 0. His name was Max Hendrickson and he has held the call sign KØDPT since the age of 12. After college, Mr. Hendrickson joined E.F. Johnson, where he was involved with the development of single sideband equipment and the scanning receivers. His father, Aldis Hendrickson, held the call WØYUA and was the owner of a 75A-1 with serial number 3.

Ralph E. Evans (WØBTX), who lived in nearby Webster City, Iowa, was Aldis Hendrickson's friend. Mr. Evans owned a 75A-1 receiver with serial number 0. The receiver had been previously

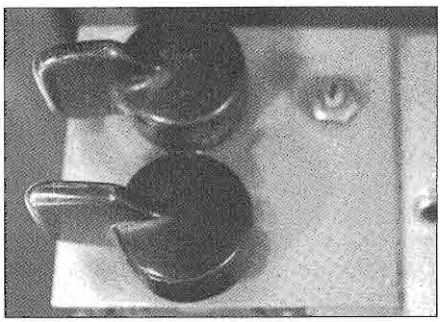


Here is the Collins 75A-1, S/N "0" and documentation from its owner, WØYUA.

ID Plate on 75A-1 S/N "0"

modified to receive the 160-meter band. A crystal calibrator had also been added. There came a time that Mr. Evans wanted to buy a new Hammarlund receiver. His 75A-1 was not a suitable trade-in because of the modifications. Mr. Evans and Aldis Hendrickson swapped receivers.

A few days after Max Hendrickson's call, the 75A-1 receiver arrived with a card which read, "Collins 75A-1 Serial Number 0 Donated by Aldis Hendrickson WØYUA, A Silent key." The receiver is proudly displayed with my A-Line equipment, along with Max and Aldis' QSL cards.



Outboard Coil Assembly on the 75A-1, S/N "0"

The receiver had an outboard tuned circuit and band switch, just as Max Hendrickson had described. A toggle switch was added between the RF stage and first mixer. The switch connects the first mixer to either the external tuned circuit or the RF stage. The external tuned circuit can be tuned to 160 meters or 80 meters. The crystal filter was wired out of the circuit, and a frequency calibrator, using a 200-kilocycle crystal, was wired inside the bandswitch compartment. A micro switch, with a string attached to its lever, was used to activate the calibrator.

The receiver was slowly powered up on a Variac and it was obvious that the electrolytic filter capacitor needed to be changed. With that completed, a signal applied to the grid of the second mixer indicated that the IF amplifiers were functioning fairly well. At that point, the crystal filter was wired back into the receiver.

Next, the generator was loosely coupled to the plate of the first mixer. The variable IF gain seemed to be within reason, but the front end was totally dead. Close inspection revealed that the 6SA7 mixer socket had been removed and placed back into the receiver, only turned 180 degrees. The high frequency oscillator had been wired into the signal grid and the signal from the RF stage into the oscillator injection grid. The toggle switch and the external tuned circuits were removed and receiver rewired to its original configuration.

The receiver now played on all bands with the signal loosely connected to the plate of the 6AK5 in the RF stage. The RF stage was completely dead. The sides of the aluminum switch box were heavily worn where the partition holding the antenna coils and switch was located, indicating that it had been in and out of the receiver many times. The partition was removed and all of the capacitors on this assembly were replaced. This time, the trimmer capacitors were checked and found to be usable.

The assembly was placed back into the receiver and the RF stage was now operational. A complete alignment was made and the receiver functioned just as new.

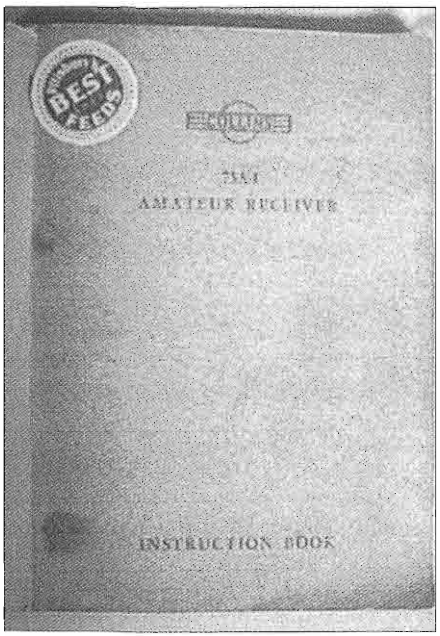
Collins 75A-1, Serial Number 1

The February 1947 edition of the Collins Column announced the delivery of the first 30K Transmitter and 75A Receiver[9]. "Clyde Hendrix, division president of Pillsbury Mills, Inc. has held an amateur operator's license for more than twenty years, and a commercial radio

PRESENTATION OF SERIAL NO. 1

Clyde Hendrix operates his new amateur radio unit. Standing are M. E. Cook, Earl Harris, C. F. Baker and J. W. Zipoy. Harris is a radio service man at Clinton, Iowa and operator of ham station WoQBM. Cook, Baker and Zipoy are members of the Advertising Department at Pillsbury Mills, Inc.

license for the last seven years. He purchased one of the first transmitters built by Arthur Collins. In 1942, he turned his first Collins 30FBX transmitter over to the U.S. Army, after which he called and reserved the first Collins postwar transmitter to be delivered. Hendrix received a 30k and a 75A receiver."



Original 75A-1 Instruction Book

Included above is a picture of Mr. Hendrix receiving his equipment at Collins. A similar picture may be found in QST[10]. Close inspection of the pictures will reveal that the limiter switch and fiducial adjustments are missing. We also note that the ventilation holes on the side panels of the receiver can be seen through the slits in the side of the cabinet, indicating that the rectifier and power supply components had already been moved to their new locations. A better view of the receiver can be found in QST, where it appears Mr. Hendrix's friends have been edited out of the photograph.

In July of 2001, Collins 75A-1, serial number 1, was placed on auction at eBay. The description read as follows: "Yes, that is right! This is a 75A-1 receiver and it is serial number 1. The seller continued,

"The original owner was L.E. Seevers, his call was WØAXD, and he was an operator technician for the Illinois State Police. This comes with the original manual, which is in great shape, even has the warranty card still."

The seller was contacted by phone, and a discussion about the previous owner followed. We spoke about the articles in QST and the Collins Column, and that the owner of another 75A-1 with serial number 1 was Clyde Hendrix, who was president of Pillsbury Mills Feed and Soy Division. "That would explain the Pillsbury Best Feeds label found on the cover of the instruction book," the seller said. Looking inside he could see the faint signature of Clyde Hendricks.

The photos which accompanied the eBay auction were very interesting. At this point, only low resolution photos are available, and the instruction book photo [page 12] is the only one suitable for reproduction. Note the Pillsbury sticker and how the instruction book is identified "75A-1 Amateur Receiver." The receiver name tag reads "75A-1 serial 1." Today, this receiver has both the limiter switch and the fiducial adjustment.

Collins 75A-1, Serial Number "4"

Glen Zook, K9STH, is a well known radio amateur and author who has published many articles in the amateur periodicals. Glen was, at one time, the owner of a 75A-1, with serial number 4. While a student in Georgia Tech, he frequented a local amateur radio store. At some point, the owner was out of the store and an employee had taken the receiver as a trade in. It was a "basket case" and not resalable. Glen, who received the receiver as a gift, described it as follows:[11] "The bathtub capacitors had been removed and tubular capacitors hung in their place. It had a limiter switch added which was unlabeled and the fiducial adjustment was missing. The name tag read '75A-1, serial 4.' Unfortunately," Glen said, "I traded it off in the mid-1970s when you almost couldn't give some of the old boat anchors away."

Collins 75A-1 Serial Number "10"

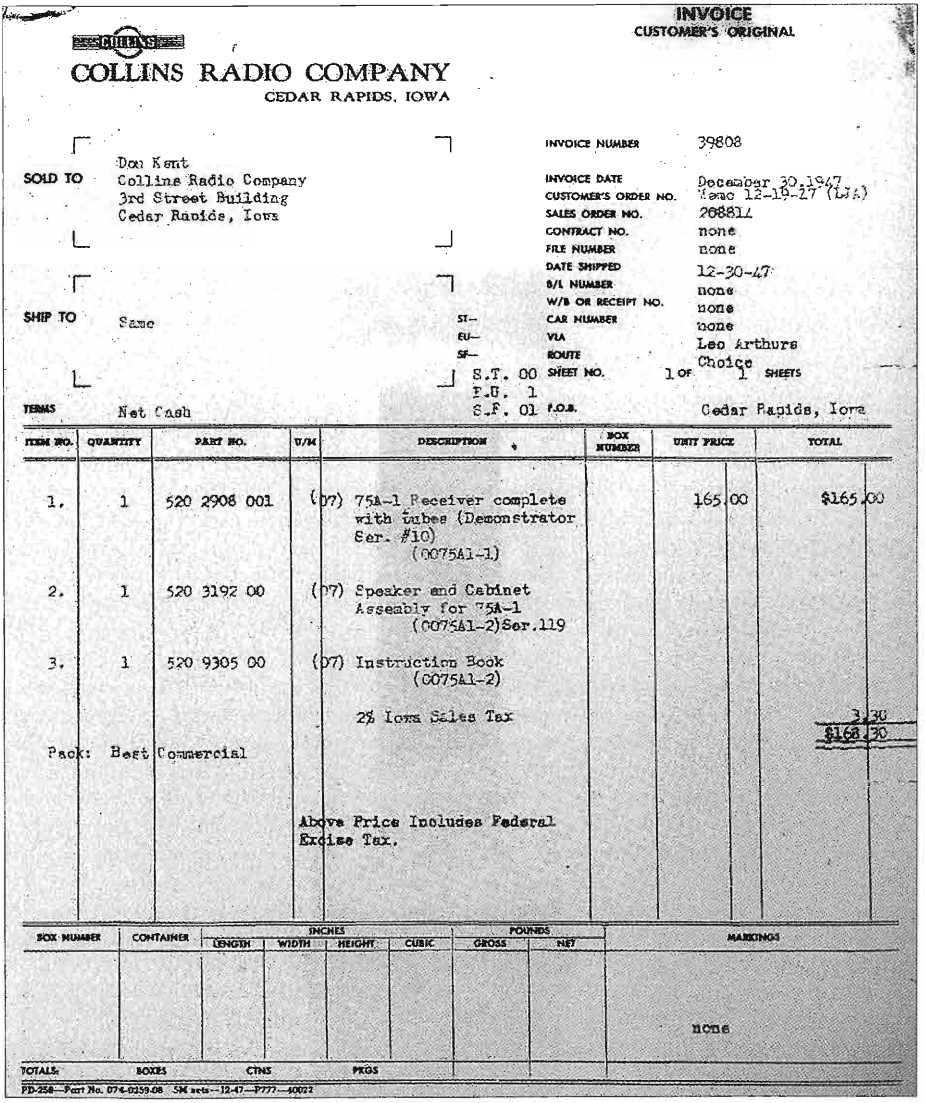
A thread[12] exists on the Internet Collins QTH.net email reflector seeking information about a 75A/75A-1 receiver. The owner at the time was Charlie Summers (WØYG). Mr. Summers was contacted recently[13] and he shared this information about the receiver. The name tag is stamped "75A-1 Ser. 10." An original Collins invoice accompanied the receiver. It is dated December 30, 1947, and is labeled "Demonstrator." The purchaser of this receiver was Don Kent (WØGM). Mr. Kent, an employee of Collins Radio, paid $168.30 for the receiver. Mr. Summers subsequently sold the receiver to Bill Standefer who is the present holder of call sign WØGM. Bill has graciously shared photos and a copy of the Collins invoice for this article.

A noise limiter switch has been added to the receiver. It is not a toggle switch, rather a wafer switch with a knob. The hole for the switch is not in alignment with the other knobs and it is unmarked. Only one of three holes needed to mount the fiducial assembly has been drilled in the front panel. The receiver retains the original fixed kilocycle dial pointer but the red line is missing. Most notable is the wire used in the receiver. It is the same multicolored wire used in the 75A prototype. A copy of the original invoice is shown on page 14.

Notable Changes in the 75A: Relay and Break-in Control

A board with two terminals exists on the prototype and all of the early production 75A-1 receivers. A set of external relay contacts can be used to place the receiver in standby during times of transmission. Problems associated with this circuit were identified early in the design stage. The circuit was changed four times during production of the 75A-1.

I am indebted to Warren Bruene[14] for sharing his personal notes that are dated May 13, 1946; "Notes and comments on 30K-I and 75A-1 performance on the air." Roy Olsen and Arthur Collins



INVOICE
CUSTOMER'S ORIGINAL

COLLINS RADIO COMPANY
CEDAR RAPIDS, IOWA

SOLD TO: Don Kent
Collins Radio Company
3rd Street Building
Cedar Rapids, Iowa

SHIP TO: Same

INVOICE NUMBER 39808
INVOICE DATE December 30,1947
CUSTOMER'S ORDER NO. Memo 12-19-47 (LJA)
SALES ORDER NO. 26881L
CONTRACT NO. none
FILE NUMBER none
DATE SHIPPED 12-30-47
B/L NUMBER none
W/B OR RECEIPT NO. none
ST— CAR NUMBER none
EU— VIA Leo Arthurs
SF— ROUTE Choice
S.T. 00 SHEET NO. 1 OF 1 SHEETS
F.U. 1
S.F. 01 F.O.B. Cedar Rapids, Iowa

TERMS: Net Cash

ITEM NO.	QUANTITY	PART NO.	U/M	DESCRIPTION	BOX NUMBER	UNIT PRICE	TOTAL
1.	1	520 2908 001	(07)	75A-1 Receiver complete with tubes (Demonstrator Ser. #10) (0075A1-1)		165.00	$165.00
2.	1	520 3192 00	(07)	Speaker and Cabinet Asseably for 75A-1 (0075A1-2)Ser.119			
3.	1	520 9305 00	(07)	Instruction Book (0075A1-2)			
				2% Iowa Sales Tax			3.30
							$168.30

Pack: Best Commercial

Above Price Includes Federal Excise Tax.

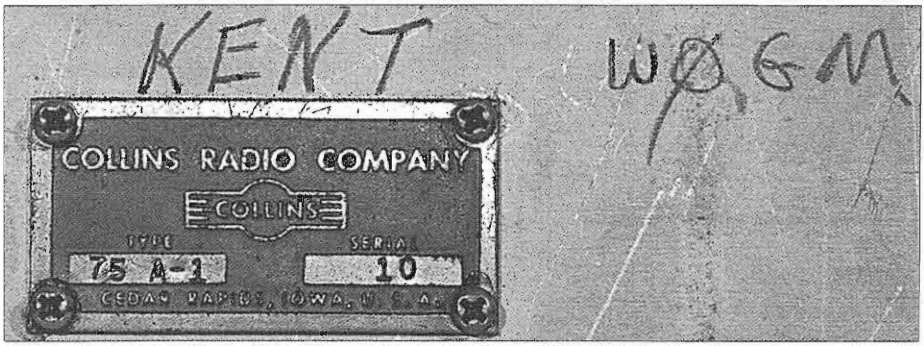
BOX NUMBER	CONTAINER	INCHES LENGTH	INCHES WIDTH	INCHES HEIGHT	INCHES CUBIC	POUNDS GROSS	POUNDS NET	MARKINGS
								none

TOTALS: BOXES CTNS PKGS

PD-258—Part No. 074-0259-08 SM sets—12-47—P777—40022

Collins Radio Company Invoice for 75A-1, Serial Number 10

listened at Olsen's home on the 75A receiver while tests were made with the transmitter at John Foster's place." Warren continues, "The receiver seemed slow in coming back to life when the switch was thrown from send to receive. This could be caused by two conditions. One is that breaking the power transformer CT in the receiver causes a delay by the amount that it takes the filter condensers to charge up. The other is that the transmitter dies down slowly as it keeps running until the filter condensers die down so far that the oscillator stops. If this is the cause, the transmitter would paralyze the AVC for a short time and would have to be eliminated by opening the key when turning the transmitter off." An additional note[15] on May 16, 1946, reads



ID Plate From 75A-1 Serial Number 10

"Last night I worked some CW using the 30K-I and 75A-1 and have following comments. The transmitter worked break-in nicely and when working on same frequency, the receiver made a nice keying monitor by turning gain down a bit."

For the phone man, break-in operation typically means single control, or simply push-to-talk. The receiver must recover fast enough to keep from missing a syllable or word. For the CW operator, break-in is more difficult to achieve. The operator receiver must be able to hear signals during the key-up intervals of a transmission. True break-in operation requires a very fast antenna switch, which is properly sequenced, and a quick recovery of the receiver. Separate antennas for the receiver and transmitter gives some relief for the low-power stations but the amount of power delivered to the antennas terminals on the receiver must be limited in some way. As we have read, the prototype could not recover fast enough when switching the power transformer center tap to ground.

The first 75A-1 production receivers were wired so that the standby switch (wired in parallel with the external relay terminals) interrupted the B+ to all of the receiver stages. This unloaded the receiver power supply during transmit and was not very desirable.

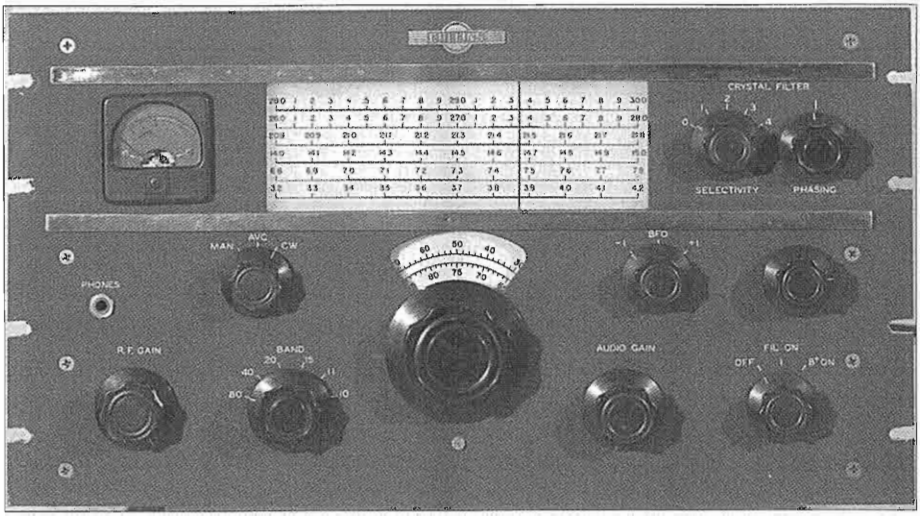
The circuit was revised such that the B+ was interrupted to all stages of the receiver with the exception of the screen voltages to the audio stages. Since the plate voltage on the audio output stage comes from the first section of the power supply filter, the output stage provided some loading of the power supply.

Finally, B+ was continuously supplied to all stages of the receiver. This time, the cathode resistor (R51) of the output stage and the RF gain control were both switched to ground. Also, two additional terminals were added to the board marked "Relay." The added terminals are labeled "Break In Voltage." A positive voltage (20-50 VDC) may be inputted to these terminals to fully mute the receiver. The instruction book warns that external protection must be used to limit excessive power that might be available at the antenna input terminals.

Problems continued with the break-in circuits in the field. Strong signals at the antenna terminals tended to charge up the AVC line, silencing the receiver until the operator cycled the standby switch. The problem was most notable in the 6SA7 mixer stage. For more information about this problem, see the 75A-1 Collins Service Bulletins, numbers 3 and 4.

Noise Limiter Switch

The noise limiter switch was added, following the evaluation of the demonstration receivers, and before the release of the schematic diagram for production in March 1947. It is an enhancement that allows the performance of the limiter to be determined by the operator. Revisions in the parts list indicate that a SPDT



Front Panel of the Collins 75A-1, Serial Number 10

switch was once used, but soon changed to a DPDT switch as seen today. The limiter switch is shown on the schematic and is found in the initial release of the instruction book.

Addition of a Fiducial, or Zero Set Adjustment

As we have seen, the 75A receiver was introduced in 1946 as the most stable and accurate receiver being built. The Collins ad in the June 1947 QST[16] claimed the "dial is accurate to within one kilocycle at all frequencies below 22 megacycles, and within 2 kilocycles on ten and eleven meters. By the March 1948 QST ad, there is no mention of this accuracy. It states," Accuracy and stability is very high.[17]"

A third "Product Description" was released in April 1948, titled "The Collins 75A-1 Amateur Receiver." All references to the 75A were changed to 75A-1. The most notable change was found in the section under "Accuracy and Stability." It reads, "Three factors contribute to very high accuracy and stability (1) the use of precision quartz crystals in the first conversion circuit, (2) the inherent accuracy and stability of the V.F.O. in the second conversion circuit, and (3) linearity and absence of backlash in the tuning mechanism. In order to take advantage of this precision, a secondary frequency standard, continually checked against WWV, is utilized in the factory calibration. You can rely upon the 75A-1 being accurate under all normal variations in operating conditions." The zero set or fiducial adjustment was added without fanfare. Byron Goodman's review of the Collins 75A in QST[18] reports, "Although not present in the models examined at headquarters, we have been advised that a movable index, or 'fiducial,' has been added to the calibration dial. This allows the operator to set up the receiver exactly on frequency, in the event that drift or aging of components shifts the calibration slightly."

The following 75A chronology is presented:

• Year 1946

–January: Roy Olsen was asked to design the receiver.

–February: QST reports the new receiver design shaping up.

–May: Warren Bruene records 75A-1/30K tests in notes.

–August: 75A Product Brochure #1 is released.

–September: Lou Couillard announces the new 75A in the Collins Column.

–October: (1) A Collins ad announced "The Collins 75A...A new standard for amateur receivers" in QST. (2) Pictures of Collins 75A were shown in the general section of the Collins Signal. (3) 75A-1 literature was available upon request.

• Year 1947

–January: Design Engineer, Lou Couillard, described the 75A receiver in the Collins Signal.

–February: The Collins Column announced shipment of 75A-1, serial "1" on January 8th, to Clyde Hendrix, in a special presentation.

–March: (1) The schematic of 75A-1 was originally released. (2) The Collins Column announced a production line for the 75A was in process of setup.

–April: The Collins Column announces that "the 75A production line is really underway now."

–May: (1) 75A Product description #2 was released. (2) QST ad showed Clyde Hendrix and his new 75A-1 and 30K along with a telegram dated January 17th, 1947, describing its operation.

–June: QST ad showing a 75A and 32V on a desk with mike and key was titled "This can be your complete ham shack."

–September: A QST article was titled "Looking Over the Postwar Receivers." The 75A has a limiter switch, but announces a new fiducial adjustment to be added to later models.

–December: Bill of sale delivered for Collins demonstrator, S/N 10.

• Year 1948

–March: A QST ad showing the same picture and title was used in a June 1947 ad. The receiver model numbers have been changed from 75A to 75A-1 in the text.

Conclusions

In the March 1947 edition of the Collins Column, Edith Mason announced, "We proudly present to you the new Lloyd Banks line, 'Ham Radio 75-A.' Operations are now being set up for final production, and we hope to get going soon, luck prevailing."[19] The April 1947 Collins Column continues, "The new line is really underway now."[20]

As we have seen from the chronology, the 75A-1 receiver serial number 1 was delivered to Clyde Hendrix three months before the production line was set up.

Collins Radio has historically used "pilot lines" to build the first models of a new product. The pilot line operators are highly skilled operators who can work from hand-drawn schematics and procedures. Engineering technicians also possess the same skills. It is likely that these first ten (or more) 75A-1 receivers were assembled by pilot line or engineering technicians. The use of colored wire with plastic insulation indicates that they were not assembled by the production line. The wire used on the production 75A-1 receivers has cotton covered insulation and is laced on a cable board.

All receivers (including the pre-production receivers serial 1 through serial 10) were labeled "75A-1." All editions of the instruction books carry the 75A-1 identification on the cover. The lack of a limiter switch on the front panel and the placement of power supply components shown in the initial "Product Descriptions" have traditionally been used to set the 75A receiver apart from the 75A-1 receiver. There are photographs showing the 75A-1 receiver, serial number 1, without a limiter switch or fiducial adjustment.

We conclude that there are no production receivers legitimately labeled 75A. At this time, only two prototype 75A receivers can be identified from the photographs that are currently available. Both have the original holes in the chassis for the power supply components as shown in the two product descriptions. One of these receivers has the socket holes covered or painted in. That receiver can be seen in the first edition of the instruction book. The other receiver is in my collection.

While Clyde Hendricks' 75A-1 receiver appears to have been upgraded at the factory, many of the first ten serial numbered receivers were not upgraded, as we

have seen. These receivers are probably the demonstration models mentioned by Lou Couillard.

A study of several 75A-1 instruction book editions has revealed an interesting fact. Each page of the instruction book, with the exception of schematics, pictures, and drawings, has a 5-digit part number. It may be found at the bottom of the page on the left hand side. The pages containing only text are written on a typewriter, several sheets at a time. When a page is revised, a dash number follows the 5-digit number. Changes can be easily followed by comparing the various editions of the instruction book.

The schematics in the instruction books do not carry a revision history. A recently found schematic drawing gives an original release date of March 1947. The drawing revision history records three changes. Unfortunately, it is not possible to identify the various changes that were made. Only the "0" numbers are shown, not the actual changes. The schematic is identical with that found in the latest edition of the 75A-1 Instruction Book.

The assignment of product type numbers or model designators was very important to Mr. Collins. These numbers were usually set up in families, such as the 30-series and 32-series of transmitters. The Collins Radio Company has been a manufacturer of commercial and military receiver products since the 1930s. However, the 75A was the first receiver designed specifically for the amateur. The receiver needed a new family number. The number "75" was likely chosen because it was unused, available, and easily remembered by the amateur radio operator. Mr. Collins often chose type numbers that were familiar to the amateur. The "A," while first in the alphabet, likely stood for amateur, just as the letter "S" stood for "sideband" in the 75S-series receivers.

Recently, while looking through some papers that Warren Bruene gave me, I discovered additional information. In 1965, a proposal marked "company private" described equipment to be designed that would follow the "A" and "S" lines. The equipment was transistorized and therefore carried the "T" designation. The receiver carried the designation, 75T-1. A preliminary set of specifications were listed but no picture was given. Similarly, a 51T-1 commercial receiver was proposed, as well as a transceiver designated TWT-1. I have seen pictures of the TWT-1, or at least a balsa wood model. The 30S-3 was part of the package. None of these ever made it into production.

Some believe that the "75A" type number was assigned to the hardware and the "75A-1" designator to its documentation. There is some indication that this is true. However, this would require the second generation receiver to be assigned type 75B and its documentation to be 75B-1. We now know this is not the case.

By 1950, suggestions for improving the 75A-1 began to show up in the amateur publications. The 75A-2 addressed many of these suggestions, such as improving the antenna input match, especially on 10 meters, and the upgrade to the newer 7 and 9-pin tubes throughout the receiver. Only the octal-based 5Y3 rectifier was retained. A secondary frequency standard was no longer needed because a frequency calibrator was included in the receiver. The high frequency oscillator was changed to the Butler circuit and the 160-meter band was added. An additional stage of IF gain and a noise limiter for CW was added. Manufacturing costs were improved by eliminating a number of coil partitions and the many screws needed for the covers. Rumors are, Mr. Collins did not favor the slide-ruled dial on the 75A-1 receiver, thinking it was too similar to a Hallicrafters all-band receiver, which was popular at the time. That problem was also corrected with the 75A-2.

The origin of 75A-1 receiver, serial "0," is unknown at this time. The receiver has a production wiring harness, and the BFO and IF transformer covers

are painted gray. It was likely removed from early production for engineering evaluation. To my knowledge, no Collins product ever started with serial number 0. The serial tag was probably added at a much later date by the original owner. The outboard tuning network, mentioned earlier, may have been used to evaluate the addition of the 160-meter band to the receiver. The crystal filter was likely removed during the evaluation of the mechanical filter plug-in assemblies. The reversal of the inner and outer grids on the 6SA7 mixer stage could have been an attempt to solve the break-in problem previously mentioned. For a complete explanation of converter tubes with oscillator voltage on an outer grid, and signal voltage on the inner grid, see The Radiotron Designer's Handbook.[21]

Acknowledgments:

A number of people have shared documents, JPEG photos, and information for this article. A special thanks to Warren Bruene (W5OLY), Rod Blocksome (KØDAS), Jay Miller (KK5IM), Jim Stitzenger (WA3CEX), Max Hendericks (KØDPT), Ray Osterwald (NØDMS), Glen Zook (K9STH), Bill Standefer (WØGM), Charles Summers (WØYG), and Robert Ramirez.

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12. "75A vs. 75A-1," Collins QTH.net Internet Reflector, 8-22-01
13. "Conversation by Telephone," Charles Summer, WØYG, 10-06
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17. "This Can Be Your Complete Ham Station,"Collins ad QST, 3-48, p.160
18. Byron Goodman, "Looking Over the Postwar Receivers, " QST, 9-47, p.130
19. Edith Mason, "Product Assembly #1, Ham Receiver 75A," Collins Column, 3-47
20. Edith Mason, "Product Assembly #1, Ham Receiver 75A," Collins Column, 4-47
21. "Mixer Section of Converter Stage," Radiotron Designer's Handbook, Fourth Edition, pgs 978-985 *ER*

Mailbag

Dear ER,

I was excited to read the article by Cliff Kurtz in the February 2007 issue of Electric Radio. In the early 1990s, my family and I lived in San Jose, California. Every month during the warmer half of the year there was a once-a-month ham flea-market at Foothill Community College in Los Altos. Cliff was always there with his RV and tables of vintage tubes and parts. In 1995, I started collecting the parts to build a dual 4-400 amplifier. One Saturday at the flea market, I was browsing the tubes at Cliff's booth. I knew nothing about Cliff, but I overheard him talking to another ham about homebrew amplifiers. After a minute or two, it was obvious that Cliff had built a lot of amps and knew what he was talking about. I waited my turn and then told Cliff what I was doing and had a bunch of questions. Cliff was happy to answer my questions. For example, I remember asking him about the diodes in the power supply and what I should use. Cliff suggested simply using a string of 1N4007s in each leg of the bridge. I asked about equalizing resistors and caps. He said, "Forget 'em, don't need 'em." Cliff had nice knobs for sale and I bought some for the amplifier I was building.

Months later I finished building the amp and tried it out on my workbench. It didn't work. I tried debugging it but couldn't figure out what was wrong. I

[Continued on page 38]

The Heathkit *Lunch Boxes*

By David Kuraner, K2DK
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Haymarket, VA 20169
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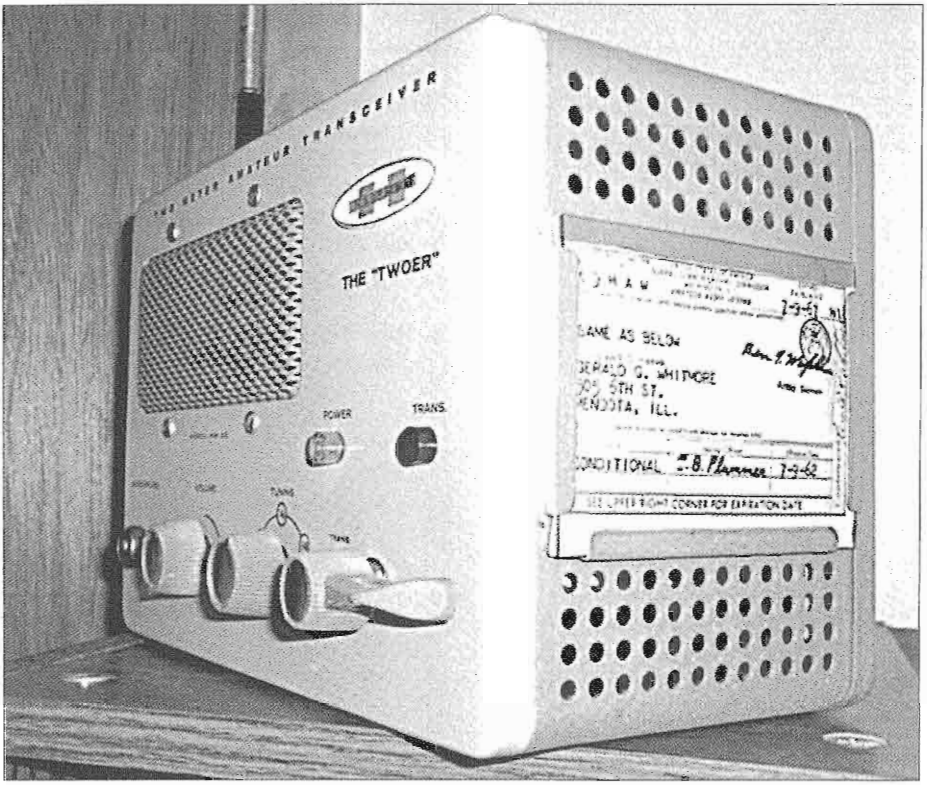
Photos courtesy of Jerry Whitmore, K9HAW

"I challenge anyone to find an unmodified Heathkit lunch box." With those words embedded in a previous ER article, I learned that at least one ER reader, Jerry Whitmore (K9HAW), has one. His two-meter unit was built in 1962 and refurbished several years ago. So what's so special about the Heathkit *Lunch Box*? For those who know, the memories flow. For those who don't, here is the story.

The units are simple transceivers covering 10, 6 and 2 meters with a version for 11 meters (CB). They were nicknamed the *Lunch Box* because of the metal lunch boxes of that period carried by many children and adults to school and work. They are just about the same physical size and shape right down to the handle on the top of the box. Heath used the same cabinet to house other pieces of test equipment such as their RF and audio generators. The cost varied between $39.95 and $44.95, depending on the model and year.

The concept started with the CB version (CB-1), just about the time that the 11-meter band was taken from the ham operators (1958) and given over to the new service called Citizens Band. It was an inexpensive way to get in on this new concept of radio communication. And, it was a "no brainer" to extend it to the 10-meter band and then to 6 and 2 meters. The CB and 10 meter versions (*The Tener*) were not very popular and may have been produced for only a few years. The

Known as the "Benton Harbor Lunch Box," the HW-30 "Twoer" 2-meter crystal-controlled AM Transceiver was produced between 1960 and 1971.



The right side of the "Twoer" provided a metal frame to display a copy of the operator's FCC license.

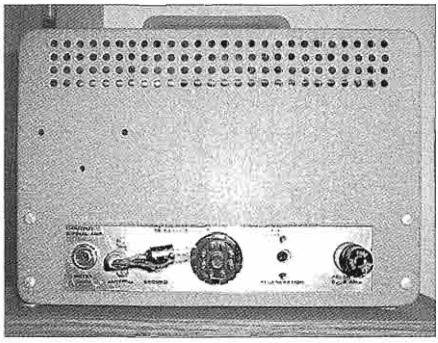
amateur VHF versions sold very well in the early 1960s. They eventually faded as new technology and operating practices developed. These VHF versions were an inexpensive way to get on the bands which, at the time, were not very populated. Many, many thousands for each band were produced.

What is a *Lunch Box*?

The receiver portion is a simple super-regenerative detector with an RF amplifier stage. The RF stage isolates the detector from the antenna so as not to permit the detector to radiate a signal, as is common with the regenerative detector. Selectivity ? These things are as wide as the proverbial barn door. Accuracy in frequency calibration? Who cares? It doesn't matter as perhaps 500 kHz, or more, can be received at any point on the tuning dial. At the beginning, it really wasn't a problem because the bands were very sparsely populated.

It was claimed that 1 microvolt produced a usable signal and 3 microvolts approached full quieting. There is no squelch control so the operator is forced to listen to the "rush" noise of the receiver when no signal is present. The radios were sometimes referred to as Heathkit *Rush Boxes.* The receiver controls are just the tuning knob and volume control.

The transmitter control (at least on the front panel) is a laver switch. In the down position, the transmit function is momentary. The neutral position is the receive function. In the up position, the unit stays locked in the transmit mode until returned to the neutral position.



Rear View of the "Twoer"

The transmitter is crystal controlled with one crystal socket. You have to remove the chassis from the cabinet to change crystals. Here was the justification for the most common modification.

Almost all surviving units have some modification to easily change the crystal without removing it from the cabinet. Some users mounted a crystal socket on the front panel. Others cut a whole in the side or back to gain access to the chassis-mounted crystal socket. The transmitter has a provision to monitor the final stage and output with an external meter. When changing crystals, it would often be necessary to retune the transmitter stages.

The next commonly performed modification was to drill holes in the cabinet to gain access to the transmitter tuning coils and capacitors. Most often, non-metallic tuning tools were used, but some either changed the tuning components or modified them to add some type of tuning shaft and knob. I recall a modification which used a toothpaste tube cap glued to the top of the turn screw of the small variable chassis-mounted inductors.

As the popularity of the VHF bands increased, the need to raidly change transmit frequency became imperative. Almost all of the units used during the mid 1960s, by necessity, were modified to permit frequency changes without removing the cabinet. Any "Twoers" no longer being used, by then, perhaps escaped the rapid QSY modifications. These specimens are rare indeed and prized by collectors. Being stuck on just one frequency was really frustrating even when these devices first appeared.

Operating practices were quite different on VHF in those days. The standard was to call CQ and then tune the entire band for a response. The vast majority of early VHF gear, either commercial or homebrew, was crystal controlled. Crystals were expensive, so operators had just a limited number of them. Attempting to start a three-way or roundtable QSO would have had unlikely results, although a receiver with super-wide selectivity would make it possible. Some standard frequencies were agreed upon. The most used 6-meter frequency was 50.400 MHz, and the FT-243 VHF crystal for this frequency is probably the most common example surviving today (Of course, back in those days it was 50.400 "Megacycles."). And, it was a common RACES (Radio Amateur Civil Emergency Service) net frequency. The 2-meter band also had its common frequencies. But, these tended to be chosen by the regional operators. The greater DX opportunities on 6 meters encouraged the almost universal use of 50.400 MHz.

Completing the external description, the *Lunch Boxes* had their regeneration control on the back panel using a slotted screwdriver adjustment. There is an RCA jack for the antenna, a fuse holder, a grounding post, and the previously mentioned ¼-inch meter jack and an octal socket for an external DC-powered vibrator power supply. This power supply is for mobile use. (There is an internal AC supply.) Also, some models had a holder on the right side to display the station and operator's license. Often, a common modification replaced the RCA antenna jack with the more common SO-239 or BNC jack.

Another reported modification included adding PTT. I do recall seeing this described, but I believe this would have been more trouble than it was worth

to implement. The microphone connector is the Amphenol type, common to this period of equipment. The *Lunch Boxes* were supplied with a hand-held ceramic mike (made by Turner) which did not have PTT provisions. Any PTT modification would thankfully be rare to find. It would surely destroy the radio's basic character and charm.

What's For Lunch?

Inside, the units employ a solid-state rectifier voltage doubler for the AC power supply. When the device is tuned on, a neon bulb mounted on the front panel indicated the presence of HV as a power-on indicator. A second panel-mounted neon bulb illuminates in the transmit mode.

Following the super-regenerative detector is one half of a 12AX7 audio amplifier and then a 6AQ5 for the audio output. During the transmit mode, the other half of the 12AX7 becomes a microphone preamp, and the 6AQ5 is a plate modulator. The special output/modulation transformer drives the speaker and provides Heising plate modulation to the 5-watt RF final (6CL6). The primary of the transformer was tapped and became a Heising choke to insure that the modulation could never exceed 100%. It was a clever scheme and was reasonably effective for such a simple device.

Depending on the band, the RF chain varied. The CB-1 and HW-19 (10-meter version) are reported to use crystals in the 9-MHz range with output on the third harmonic of the operating frequency. Crystals in this frequency range are third-overtone types and were specifically designed to operate in oscillators which produced the majority of energy output on the third harmonic. They were expensive and not very common, which may well have contributed to the lackluster sales.

The next band up, 6 meters, originally also used overtone crystals. The HW-29 (*Sixer*) used 10-MHz, fifth-overtone rocks. Quickly, it was realized that this was a big mistake because stability and reliability became a major issue, in addition to cost. The error was quickly rectified with the redesigned HW-29A. The few hundred (at most) owners of the original design were offered a retrofit kit.

The vast majority of 6-meter versions are the HW-29A, now using the more common 8-MHz FT-243 (not overtone) crystal, or were modified to accept them. The oscillator (pentode section of a 6BA8) is tuned to the third harmonic. The next stage is the triode section acting as a doubler. The 6CL6 final runs "straight through." That is, there is no frequency doubling. Power input is 5 watts and about 3 ½-watts output.

Since 8 times 6 is 48, you may be now convinced that I have lost all my multiplication skills. You are probably correct. However the tripler-doubler chain is correct because to get to 50 MHz you start out at one sixth of the output frequency. The defacto standard frequency of 50.400 MHz would begin with an 8.400 MHz rock.

The 2-meter version, the HW-30 (*Twoer*), needed one more stage to bring an 8-MHz crystal up to 144 MHz. To get the output at 18 times the crystal frequency, the oscillator output triples to 24 MHz. The next stage is also a tripler, to 72 MHz, and then a doubler stage to reach 144 MHz. Output is about 2-½ watts.

Memories

The *Twoer* was often the first phone rig used by the young Novice, as they were permitted to operate voice on a segment of 2 meters. Many hold the same fond memories, just as the first CW novice rig does. The *Sixer* or *Twoer* was often the first rig for the young, newly-licensed Technician. They may not be the best technology the era had to offer, but it presented many youngsters of yesteryear with their first taste of AM phone. The little *Lunch Box* will always conjure up sweet memories.

ER

An AM Automatic Noise Limiter for the Heath SB-3xx Series Receivers

By Joel Ekstrom, W1UGX
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The Heath SB-3xx series receivers (known to some as the Poor Man's Collins) have, at best, only a pair of diodes, across the second IF plate tank circuit for noise limiting purposes. In my Heath SB- 310 receiver, these don't seem to be very effective on AM against the high non-ignition pulsed noise levels experienced at this location, and so some improvements were called for.

First, I looked into using a Lamb silencer placed before the filters at the front end of the IF strip. But, there is a lot of VFO leakage present there, and I was afraid that it, and not the noise level, would control the noise rectifiers in the Lamb circuit. (The same reservations would hold true for noise blankers as well). So, I abandoned that approach (for the time being, at least) and started to look at second detector limiters, spending considerable time reviewing the fundamental articles by E. Toth (Electronics, November and December, 1946) and W. Grenfell (CQ, July and August, 1952). Armed with this refreshment and a review of ANL circuits in the ARRL Handbooks, I devised a shunt limiter using an lN34 diode, but, despite a fair amount of fiddling, the performance was poor.

I then decided to try a full-wave shunt limiter using a 6AL5 double diode with 5 volts on the filament, requiring a 5.1-ohm, half-watt resistor between the tube and a 6.3-volt supply. The circuit I used is similar to that employed in the National HRO-7 receiver (QST, June 1949) and is shown in **Figure 1**.

Some comments on the schematic are in order. First, I had to mount the 6AL5 and other components at some distance from the last IF stage. I used a small coupling capacitor (3-12 pF, adjustable) followed by some shielded cable running to the chosen AM detector and ANL circuit site (the original AM detector circuit was disconnected, at least temporarily). The LC circuit shown was added, allowing the cable capacity to be tuned out, and the lN34 AM detector is connected to the "hot" end of the LC circuit. Second, the on-off switch was mounted concentrically with the AF gain control using parts salvaged from defunct Tektronix scopes and plug-in preamps. Third, I used a 300-milliampere filament transformer (with a dropping resistor) so as not to overload the existing power transformer.

Those concerned with equipment resale value and who don't want extra holes in the chassis or front panel will have to use a threshold pot mounted on a bracket above or below the chassis.

Stashing the 6AL5 also presents a bit of a problem, unless the 5896 subminiature dual diode is used. I have not tried that tube, but it should work OK, provided there is not too much plate-to-plate capacity. In my case, the SB-310 already has so many other modifications that the resale value is now probably negative, so mounting convenience dictated component placement. Many of the parts were mounted on an old Vector socket I found in the junk box. These things are fine for DC and audio circuits, but risky at high impedance video and RF frequencies.

The use of a 250-k pot in series with a 240-k fixed resistor for the AM detector load allows the percent-of-modulation clipping level to be set anywhere from about 25% (wiper to the left) to about 50% (wiper to the right). My pot is currently mounted on the chassis and usu-

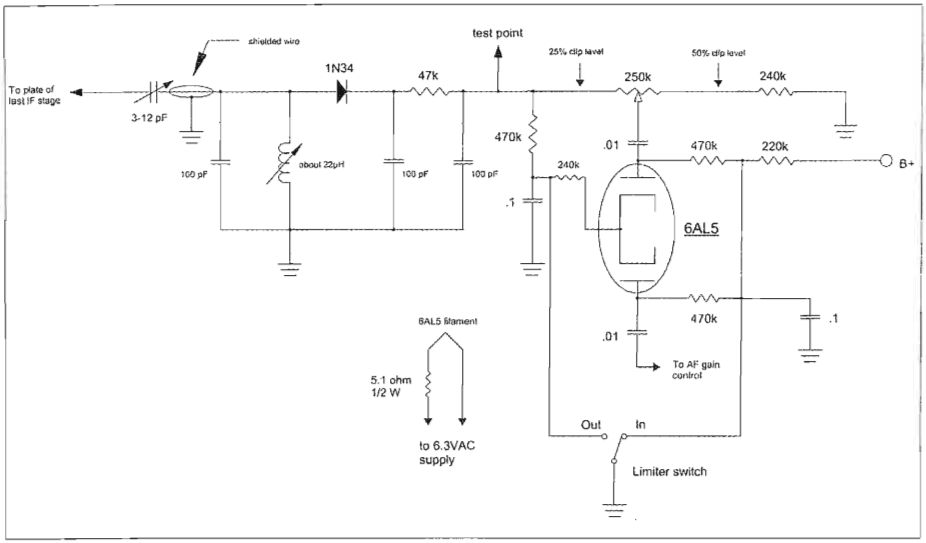

Figure 1: AM Automatic Noise Limiter Circuit for the Heath SB-3xx Series Receivers

ally is set near the 25% limit, adjustment being rarely required. The limiter works well enough so that AM signals inaudible without it are actually readable with the limiter turned on. It is, of course, a little distorted, but totally unusable when the limiter is turned off.

Alignment is simple. Set the coupling capacitor to minimum and tune in one of the 100-kHz calibration signals. Then, peak the parallel LC circuit for maximum DC level at the indicated test point. Next, increase the coupling capacitor until the voltage at the test point starts to drop. At this point, stop–the job is done.

I would like to note in passing that in the 1971 edition of the RSGB VHF-UHF manual, an AM limiter circuit similar to **Figure 1** is described, but it uses silicon diodes such as the 1N658, or similar types, together with an adjustable biasing circuit to compensate for the delayed conduction characteristics of silicon diodes. I have not tried this circuit, but it certainly would save space. According to the NTE catalog, these diodes can be replaced by the NTE type 177 which, in turn, is a replacement for numerous other 1N-series diodes. The main objective would be to maximize the back resistance and minimize the shunt capacity. At 10 volts, I found reverse current for typical 1N658 and 1N3063 diodes, from my small supply, to be less than .1 µA, implying a back resistance of at least 100 Megohms at 10 volts.

ER

The Restoration Corner

Please send in your short restoration topics so this column can run regularly!

Alternate "S" Meter Circuit for Hallicrafters SX-25 and Other Receivers

By Ben Booth, W4CT
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Several years ago I acquired a "parts SX-25." It sat on my shelf for several years until I became inspired to see if it could be made to work. It was rusty, full of cobwebs, and cosmetically a disaster. More to the point of this article, it was missing its S meter.

Why the need for an alternate circuit? Why not use the factory circuit? Good Question! The problem with the factory circuit is that it is designed for a mechanically reverse-loaded meter. The meter on a stock SX-25 lays over to the right side when turned off (Also typical of the NC-300, NC-183, SX-100, others?). When turned on the needle is drawn to the left, towards zero, unless a signal is detected. I did not have such a meter—mine were all normally "left" meter face loaded.

The circuit described is designed for normal left-loaded meters. It is simple, works great, and is non-intrusive. It measures the difference in plate voltage drop (gain) between successive IF stages. It may do as well between successive RF stages. The values of RX are equal, try 4.7-k, 1/2-W values. It may need to be changed to suit your application. This is

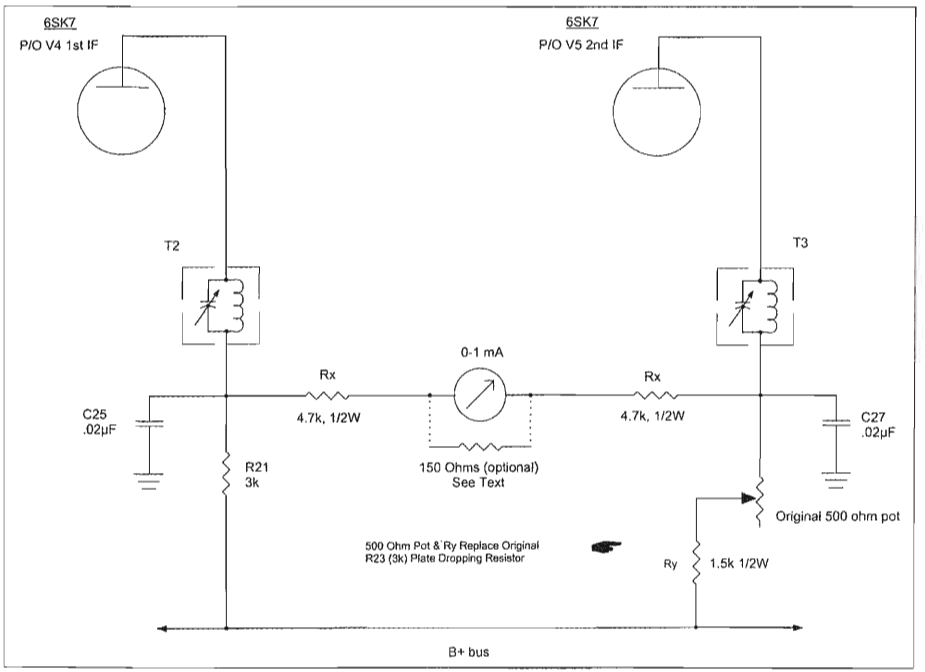

Figure 1: Alternate SX-25 S-Meter Circuit

also true of RY (try 1.5k, 1/2 W). I used the original 500-ohm, S-meter pot in the SX-25. This circuit works even if the IF screens and their associated dropping resistors (if any) are tied to the plates above the plate-dropping resistor.

This circuit should work on any number of other receivers. A meter shunt may be needed. My meter needed 150 ohms to achieve a balance between strong signal meter indications and to keep the meter from being "pinned" with RF gain reduced.

Be very careful—the back of the meter has B+ on it!

ER

A-54th harmonic
B-72nd harmonic

Channel	Har-monic	Channel —Mc.	Fundamental Frequency	Progressive Difference in Kcs.
0	A	20.0	370.370	
1	A	20.1	372.222	1.852
2	A	20.2	374.074	1.852
270	B	27.0	375.000	.926
3	A	20.3	375.925	.925
271	B	27.1	376.888	.463
4	A	20.4	377.777	1.389
272	B	27.2	377.777	0
273	B	27.3	379.166	1.389
5	A	20.5	379.629	.463
274	B	27.4	380.555	.926
6	A	20.6	381.481	.926
275	B	27.5	381.944	.463
7	A	20.7	383.333	1.389
276	B	27.6	383.333	0
277	B	27.7	384.722	1.389
8	A	20.8	385.185	.463
278	B	27.8	386.111	.926
9	A	20.9	387.037	.926
279	B	27.9	387.500	.463
10	A	21.0	388.888	1.388
280	B	28.0	388.888	0
281	B	28.1	390.277	1.389
11	A	21.1	390.740	.463
282	B	28.2	391.666	.926
12	A	21.2	392.592	.926
283	B	28.3	393.055	.463
13	A	21.3	394.444	1.389
284	B	28.4	394.444	0
285	B	28.5	395.833	1.389
14	A	21.4	396.296	.463
286	B	28.6	397.222	.926
15	A	21.5	398.148	.926
287	B	28.7	398.611	.463
288	B	28.8	400.000	1.389
16	A	21.6	400.000	0
289	B	28.9	401.389	1.389
17	A	21.7	401.851	.462
290	B	29.0	402.777	.926
18	A	21.8	403.703	.926
291	B	29.1	404.166	.463
19	A	21.9	405.555	1.389
292	B	29.2	405.555	0
293	B	29.3	406.944	1.389
20	A	22.0	407.407	.463
294	B	29.4	408.333	.926
21	A	22.1	409.259	.926
295	B	29.5	409.722	.463
22	A	22.2	411.111	1.389
296	B	29.6	411.111	0
297	B	29.7	412.500	1.389
23	A	22.3	412.963	.463
298	B	29.8	413.888	.925
24	A	22.4	414.814	.926
299	B	29.9	415.277	.463
25	A	22.5	416.666	1.389
300	B	30.0	416.666	0
301	B	30.1	418.055	1.389
26	A	22.6	418.518	.463
302	B	30.2	419.444	.926
27	A	22.7	420.370	.926
303	B	30.3	420.833	.463
28	A	22.8	422.222	1.389
304	B	30.4	422.222	0
305	B	30.5	423.611	1.389
29	A	22.9	424.074	.463
306	B	30.6	425.000	.926
30	A	23.0	425.926	.926
307	B	30.7	426.888	.462
31	A	23.1	427.777	1.389
308	B	30.8	427.777	0
309	B	30.9	429.166	1.389
32	A	23.2	429.629	.463
310	B	31.0	430.555	.926
33	A	23.3	431.481	.926
311	B	31.1	431.944	.463
34	A	23.4	433.333	1.389
312	B	31.2	433.333	0
313	B	31.3	434.722	1.389
35	A	23.5	435.185	.463
314	B	31.4	436.111	.926
36	A	23.6	437.037	.926
315	B	31.5	437.500	.463
37	A	23.7	438.888	1.388
316	B	31.6	438.888	0
317	B	31.7	440.277	1.389
38	A	23.8	440.740	.463
318	B	31.8	441.666	.926
39	A	23.9	442.592	.926
319	B	31.9	443.055	.463
40	A	24.0	444.444	1.389
320	B	32.0	444.444	0
321	B	32.1	445.833	1.389
41	A	24.1	446.296	.463
322	B	32.2	447.222	.926
42	A	24.2	448.148	.926
323	B	32.3	448.611	.463
43	A	24.3	450.000	1.389
324	B	32.4	450.000	0
325	B	32.5	451.389	1.389
44	A	24.4	451.852	.463
326	B	32.6	452.777	.925
45	A	24.5	453.703	.926
327	B	32.7	454.166	.463
46	A	24.6	456.555	1.389
328	B	32.8	456.555	0
329	B	32.9	456.944	1.389
47	A	24.7	457.407	.463
330	B	33.0	458.333	.926
48	A	24.8	459.259	.926
331	B	33.1	459.722	.463
49	A	24.9	461.111	1.389
332	B	33.2	461.111	0
333	B	33.3	462.500	1.389
50	A	25.0	462.962	.462
334	B	33.4	463.888	.926
51	A	25.1	464.814	.926
335	B	33.5	465.277	.463
52	A	25.2	466.666	1.389
336	B	33.6	466.666	0
337	B	33.7	468.055	1.389
53	A	25.3	468.518	.463
338	B	33.8	469.444	.926
54	A	25.4	470.370	.926
339	B	33.9	470.833	.463
55	A	25.5	472.222	1.389
340	B	34.0	472.222	0
341	B	34.1	473.611	1.389
56	A	25.6	474.074	.463
342	B	34.2	475.000	.926
57	A	25.7	475.926	.925
343	B	34.3	476.888	.463
58	A	25.8	477.777	1.389
344	B	34.4	477.777	0
345	B	34.5	479.166	1.389
59	A	25.9	479.629	.463
346	B	34.6	480.555	.926
60	A	26.0	481.481	.926
347	B	34.7	481.944	.463
61	A	26.1	483.333	1.389
348	B	34.8	483.333	0
349	B	34.9	484.722	1.389
62	A	26.2	485.185	.463
350	B	35.0	486.111	.926
63	A	26.3	487.037	.926
351	B	35.1	487.500	.463
64	A	26.4	488.888	1.388
352	B	35.2	488.888	0
353	B	35.3	490.277	1.390
65	A	26.5	490.740	.463
354	B	35.4	491.666	.926
66	A	26.6	492.592	.926
355	B	35.5	493.055	.463
67	A	26.7	494.444	1.389
356	B	35.6	494.444	0
357	B	35.7	495.833	1.389
68	A	26.8	496.296	.463
358	B	35.8	497.222	.926
69	A	26.9	498.148	.926
359	B	35.9	498.611	.463
70	A	27.0	500.000	1.389
360	B	36.0	500.000	0
361	B	36.1	501.388	1.388
71	A	27.1	501.851	.463
362	B	36.2	502.777	.926
72	A	27.2	503.703	.926
363	B	36.3	504.166	.463
73	A	27.3	505.555	1.389
364	B	36.4	505.555	0
365	B	36.5	506.944	1.389
74	A	27.4	507.407	.463
366	B	36.6	508.333	.926
75	A	27.5	509.259	.926
367	B	36.7	509.722	.463
76	A	27.6	511.111	1.389
368	B	36.8	511.111	0
369	B	36.9	512.500	1.389
77	A	27.7	512.962	.462
370	B	37.0	513.888	.926
78	A	27.8	514.814	.926
371	B	37.1	515.277	.463
79	A	27.9	516.666	1.389
372	B	37.2	516.666	0
373	B	37.3	518.055	1.389
374	B	37.4	518.444	1.389
375	B	37.5	520.833	1.389
376	B	37.6	522.222	1.389
377	B	37.7	523.611	1.389
378	B	37.8	524.999	1.388
379	B	37.9	526.388	1.389
380	B	38.0	527.777	1.389
381	B	38.1	529.166	1.389
382	B	38.2	530.555	1.389
383	B	38.3	531.944	1.389
384	B	38.4	533.333	1.389
385	B	38.5	534.722	1.389
386	B	38.6	536.111	1.389
387	B	38.7	537.499	1.388
388	B	38.8	538.888	1.389
389	B	38.9	540.277	1.389

Above is a supposedly complete list of different types of surplus low-frequency crystals and their relationships. These crystals still turn up at hamfests and swap meets, and can be useful to builders *if* you can find out what the crystal numbers refer to!

ER

RADIOMAN SCOUT KURTZ REPORTING FOR DUTY!

By Cliff Kurtz, N6ZU
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This is Part 2 of a collection of short stories by Cliff Kurtz (N6ZU) about his experiences as a radioman during World WarII.

The Coastwatcher

December 1942

British forces in the Solomon Islands, of which Guadalcanal was of most concern, had organized a net of coastwatcher posts on each of the larger islands. They were linked by shortwave radio and reported sightings of Japanese sea, air, or land activity to headquarters to be analyzed and used for defensive or offensive use.

Late in December 1942, they contacted our unit asking for a radio operator to assist the one they had at their main relay station. It was located on Malaita, the next large island to the north of Guadalcanal, about 90 miles distant.

I was "chosen" to fill the spot and told to report to the quartermasters the following morning to draw three months' rations from the officer's store. (I was later to find out why they were so generous with me!) At the dock was a 20-foot wooden boat (more accurately, a tub). Manned by five Solomon natives, with no radio, no compass, and certainly no charts, we set sail.

The boat was also equipped with a one cylinder diesel engine which we used all the way. I hoped they had checkd the fuel supply, the Pacific is *big*!

The sea was choppy and the short boat bobbed a lot, making this landlubber a bit woozy. About halfway to our destination, the natives excitedly motioned me to get under the small canopy, because a plane was approaching in the distance no more than 20 feet above the water. It was a **Japanese Zero**!

This was one good pilot. He went by us and dipped his wingtip, almost touching the water. What a moment. *But*–he climbed, circled, and headed back at us. I was sure we would be strafed and sunk, but he *never fired a shot!*

The rest of the trip was uneventful and we arrived at the dock at Auki, the capital of the Solomons in peacetime. A group of about 20 natives hoisted all of my supplies on their shoulders and we began a four-mile climb up, up, and up to about 3000 feet in three miles. The trail was very steep and wet and I had a hard time keeping up.

The station was very near a native village and was very rustic, to say the least. It was manned by three officers of New Zealand, Australia and Great Britain. My job was to maintain daily contact with a US Navy station on the island of Tulagi. The radio and transmitter were of British manufacture, not military, but peacetime types. The main station had a US Navy transmitter. The operator was a commercial op from an ocean liner in peacetime and had a terrific fist.

I stayed at this post for two months and ten days and then was suddenly recalled. The US Navy sent a float plane

to pick me up at the dock; we flew to Tulagi where I had to catch a PT boat back to the "Canal." I was lost, but when a Jeep approached me I recognized the officer and waved him down. He informed me we were leaving for Fiji that night. I hopped on, he took me to the landing craft area, and I jumped aboard and then got on the troop ship that left that night. I am sure that must be some sort of record for conveyances in a twelve-hour period!

Later, while recovering from a malaria attack in the hospital on Fiji, I heard a voice in the next bay. I walked over to see who it was but did not recognize anyone by sight. When the speaker piped up again I asked him, "Are you Bill?" and he said, "Yes, are you Cliff?" We had spoken many times over the last two months. He was the operator of the Navy station on Tulagi. Again, a small world.

By the way, Coastwatchers were considered spies by the Japanese and would be executed if caught–yes; being a radio operator could be dangerous work.

"What Fire?"

May 1943

While I was recovering from a hip operation in a hospital on Fiji Island, my outfit, an infantry regiment, was again called up for combat on Bougainville Island, further north. That left me in limbo for a while until I was sent to a replacement center in New Caledonia, where I had previously spent six months. They transferred me to the Signal Corps and assigned me to a radar unit as a maintenance tech.

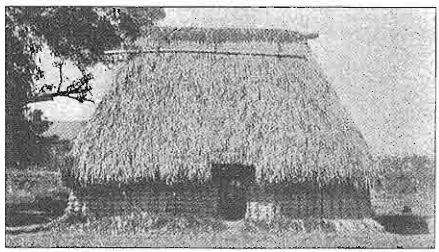
The radar was the 100-kW BC-268. I had to do some boning up! This unit had a terrific "on air" reputation, which is what was important—no down time. We were located on the north-east coast of the island on a high cliff, 660 feet above the ocean directly below us to give a good viewing area with about a 150-mile range.

This radar had a huge rotating antenna consisting of 36 dipoles in a "bedspring" shape. It was rotated by a 5-HP motor which was mounted vertically. This caused a problem because the bearing lubricants would leak out and drip on the surrounding metal surfaces. I might add, the building housing was a 21 x 21 metal structure and had a pyramid-shaped roof with a 40-foot tower out the top. The antenna would sweep back and forth over a 180-degree arc. This reversing would cause the tower to twist ever so little each time, but had long-term effects.

Cleaning the mess was high priority with our chief, and he insisted we do it with the power on! One day I took my usual bucket of gasoline, a brush, and some rags and proceeded to climb the bracing of the tower (it had no ladder). When I got to the soiled area I began cleaning it. I noticed there was a tiny arcing sound every time the antenna reversed direction. All of a sudden, *whoosh*, the tower was on fire! The brush, still wet with gasoline, in my back pocket, caught fire. My pants were on fire, and while swatting at it I dropped the gas can—then we *really* had a fire.

To save my hide, I started to climb higher to escape the flames, but luck was also with me. The wind was blowing inland and away from me. Had it been blowing offshore the fire would have roasted me.

The fire soon burned itself out and no one really saw it except a small French boy. When Staff Sergeant Lamb, my



A Bure (Boori) — Home for the Author During His 10 Months on Fiji

chief, asked about it I said "What Fire?" (I 'fessed up later.)

The small arcing was caused by a broken silver-solder joint in the half-inch copper tubing feedline running from the transmitter to the antenna. This was caused by the slight flexing of the tower after many months of operation.

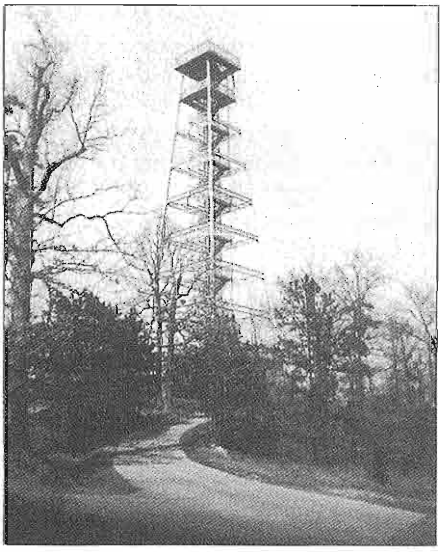
Dad Used To Say "Slow Down!"
February 1944

After two and a half years in the South Pacific as an infantry radio operator and radar maintenance man, stateside duty looked like a snap! Trouble was, nobody wanted a seasoned veteran on base, they just wanted green rookies to process and move out! I was shunted from base to base until I landed at a Signal Corps base in Arkansas. They were in the planning stages of establishing a direct contact with a base in northern Louisiana via a 160-MHz circuit. The route was about 200 miles long over mountainous terrain.

This was going to mean some pretty good antennas since we were using relatively low power. These radios were made by Link and could handle four transmissions simultaneously. The antennas were 3-element Yagis.

We had decided to use the 200-foot tower in Hot Springs, Arkansas, as one of the transmitter sites. Several of us were sent to this site to install and run this equipment.

For transportation, we were given a brand new Dodge weapons-carrier truck. It had huge tires with great big lugs, good for deep mud, but too slick to be used on wet blacktop roads. We did not realize this until one day when it had rained and we started down the very steep hill with many very tight hairpin turns. I was driving. We buzzed down the hill in 4-wheel drive and as we hit a tight curve the Dodge did a 180 and we were sliding down the hill backwards. Putting the brakes on did not help and



The Mountain Tower

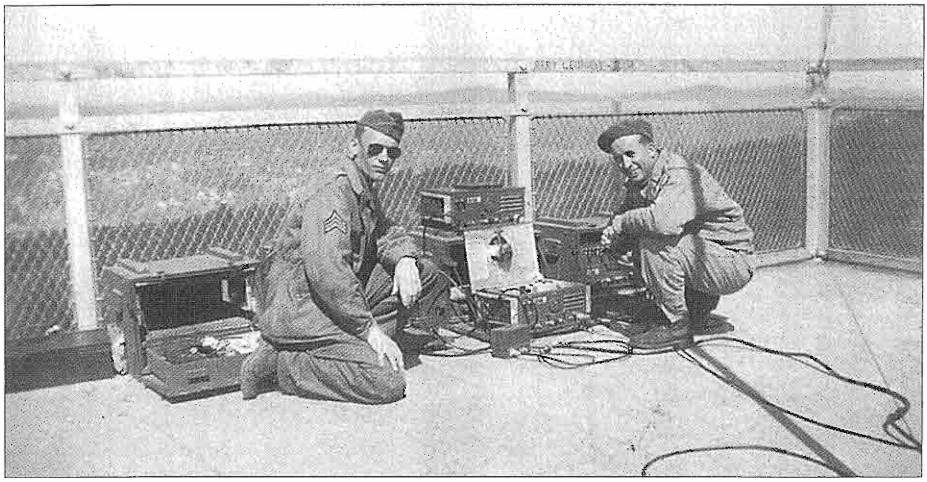
we slid perhaps fifty feet before we hit the edge of the road and the gravel stopped us. My partner, Sgt. Nichols, looked over at me and said "Do you always drive this way?" I replied, "Only when it rains." We both laughed and went on our way. What the heck? Radio men should be able to have some fun!

We had not been satisfied with the results we got with our setup. More trials and other antennas and locations were in our plans.

"It Was a Dark and Stormy Night"
March 1944

Many of Snoopy's (the Peanuts' character) stories start that way. As I write this, those words entered my mind. The fact is that it actually happened and was in important part of this story.

Our Signal Corps group was in the process of trying to work the bugs out of a project we had started earlier (in the previous story). The attempt to make direct contact on a UHF link between Stuttgart AFB and Shreveport, Louisiana, had not been very successful. The tower in Hot Springs, Arkansas, was not in the right location, and in spite of its



The author is on a tower near Hot Springs, Arkansas with the Link Equipment and Sgt. Nichols.

height did not help. What was needed was a site more centrally located to our project.

We decided that a mountain top in one of the National Forest areas might work out better. With proper permission granted (due to our very "official" connections), we scouted out the best location. It proved to be a daunting task.

In order to get our equipment to the site we needed a lot of help. We (the Captain in charge) decided to use a Jeep to haul the stuff to the top. We literally tore up a set of tires on the Jeep (the motor pool had a fit when we returned the Jeep). Using four-wheel drive, we went up the steep slope over rocks and more rocks, until we got to the top.

We had decided to put up two full-size rhombics pointed in the right direction to complete the path. These would be put on 40-foot aluminum poles guyed by new nylon ropes. When the local forest ranger, a seedy old guy, looked at them he said, "They ain't a-gona make it." We asked, "Why?" and he replied, "They's a storm a-comin' up, and its gona blow 'em down."

I thought, well old timer, maybe you ain't heard about these here new *Nylon* ropes we just got.

So what happened?

We finished putting up two beautiful rhombics and headed down the mountain to come back the next day.

We arrived on the site the next morning to see both of our antennas and eight 40-foot masts a tangle of ropes and wires! Yes, there had been a storm that night, no doubt about that, but I always wondered, did the wind really do it or did the old ranger make his prediction come true? (He really didn't like us to be on "his" mountain.)

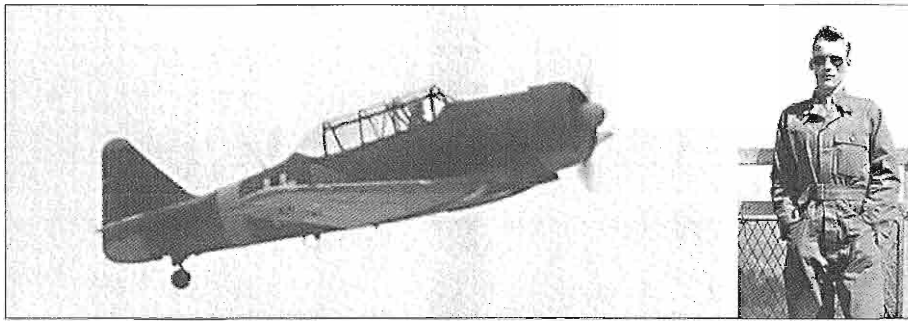
Did the rhombics do the job? Yes. Was the circuit ever used? I doubt it.

"Oh, You Can Do It"

February 1944

Having been recently rotated back to the states after 30 months in the South Pacific gave one sort of a lost feeling. You were in the Army, but given nothing meaningful to do. Being moved from one base to another did not help either, as you had no time to form new friendships.

Such was the case in February of 1944 when I had been transferred to a base in



The North American AT-6 Trainer and the Author

Louisiana. DeRidder AFB was a small field, and they did not need a radio operator, it seemed. I bummed around the base for several days, when one day a staff sergeant came into the barracks and said he needed a "volunteer." (Hey, wait a cotton pickin' minute—I volunteered for one year of military training in 1941, remember?) I don't think he heard me. When no one raised their hand he looked at me and said "You! Come with me!" He had one more stripe than I did so I had to obey, comprendo?

He said he needed a control tower operator at the landing strip. I told him that I had no such training. He said, "Oh, you can do it!" I became an instant air traffic controller. We got in his Jeep and roared down a dusty gravel road for about a mile when he suddenly turned off and went into a wooded area. We soon came into an area that looked like the kind of air strip the drug traffickers use these days. No lights, no markers of any kind, but a very rickety looking control tower. It was built of 4 by 4 posts, some 2 by 4 lumber and a few sheets of plywood! The *mighty US Air Force* had come to this?!

The sergeant said "I'll show you what you gotta do." He unzipped a green canvas carrying case and pulled out a hand-operated lamp. It was "two-faced," it had a green lens on one side and a red lens on the opposite side. He said when a plane came into the landing area and if the strip was clear I should "give him the green light." However, if there as a plane already on the runway I was to give him the red light. Well, I thought, I think I can handle that. He handed me the lamp, and as I was climbing the ricky-ticky ladder up the side of the tower he said "don't drop the lamp!" Well now, he was one heck of an instructor, I thought.

Once in my lofty roost, I realized I was going to have to stand the whole afternoon. There was not a stick of furniture in the place. Of course, it was only four feet square, but a nice padded chair would have been nice. Then the good sergeant left.

I was left alone and already getting lonely when my first "customer" arrived, flying his AT-6 trainer into the approach. I quickly checked the runway and it was clear. I gave him the green light and a great feeling of power came over me—he had to do what I said. A mere radio operator, given this much power, could be a danger to mankind! He touched down, then gunned it and took off again. This was repeated numerous times that afternoon.

The sergeant returned a few hours later. "How'd it go?" he asked. I told him there had been no midair collisions and no crash landings. He said "See, I told you that you could do it!" I got goose bumps all over.

[To be Continued...]

ER

PHOTOS

Editor's Note: "Thank You" to everyone who has recently sent in photos, and please keep them coming so I can run the Photo column on a regular basis!

Lake Erie Boatanchors Group Winter Meet, February 10, 2007

By Jeff Covelli WA8SAJ
5368 Melody Lane
Willoughby, Oh 44094
wa8saj@ncweb.com

On February 10, 2007, the Lake Erie Boatanchors Group had their winter meeting in Westlake, Ohio at Clague Park, near I-90, just west of Cleveland, Ohio. I want to thank Bill (K8DBN) for getting the meeting site this year. The meeting is for hams that operate vintage gear on AM and CW. We try to meet three times a year, and have a total of about 125 folks on the roster. There is no membership, just a bunch of hams having fun. There is going to be another meeting on May 5th near Akron, Ohio, and the fall meeting will be on September 22nd in Willoughby, Ohio. Willoughby is just east of Cleveland.

Well, there were many folks that brought gear to show and exchange. Ed

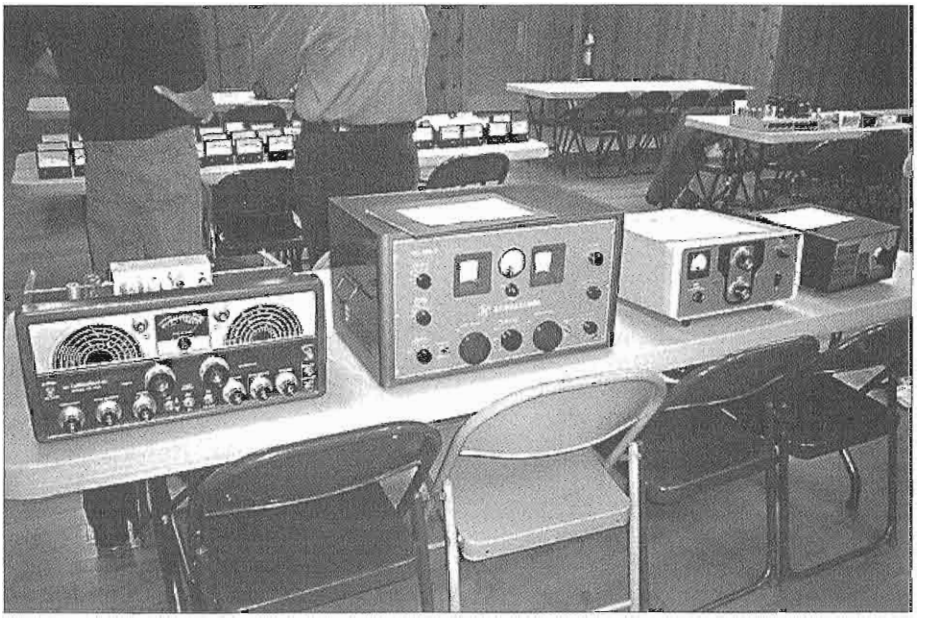
Lake Erie Boatanchors Group, February 10, 2007

Meters For Sale!

DX-60 Net meets on Sunday at 0800 EST on 3880 kHz. Jeff also found a Knight-Kit R-100 receiver for parts. Bill (KA8WTK) brought many Heathkit single-band rigs with various accessories. There were various other rigs that were on display to be looked at by all of the 40 or so folks that attended.

I would say there were about six hams that have never been to this meeting. I'm sure all six had a great time talking about all the gear and the good times on the air. Some were surprised to find out that we also operate other modes and the newer gear, but prefer the older glow-in-the-dark tube gear. Grover (ex-W5VYV) heard some of the guys talking on AM one day and decided to come to the meet. Now, he is going to get his license again and maybe get his old call back.

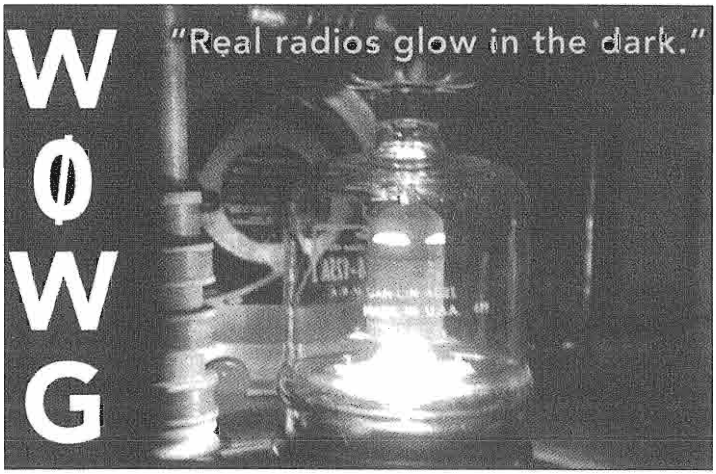
One note on all of this AM stuff, I have (AA8DC) grabbed a National NC-300 receiver and a Johnson Viking II transmitter to get on AM. The beautiful Hallicrafters SX-100 MK II went to Bill (WB8ZEJ) to compliment his SWL part of the shack. AL (KB8MTZ) brought about 40 meters (not the ham band) of various types to sell and they did sell. Jeff (KA9TOC) brought the DX-60 net banner to have the folks sign. By the way, the



More Great Equipment Displayed at the Lake Erie Boatanchors Meet

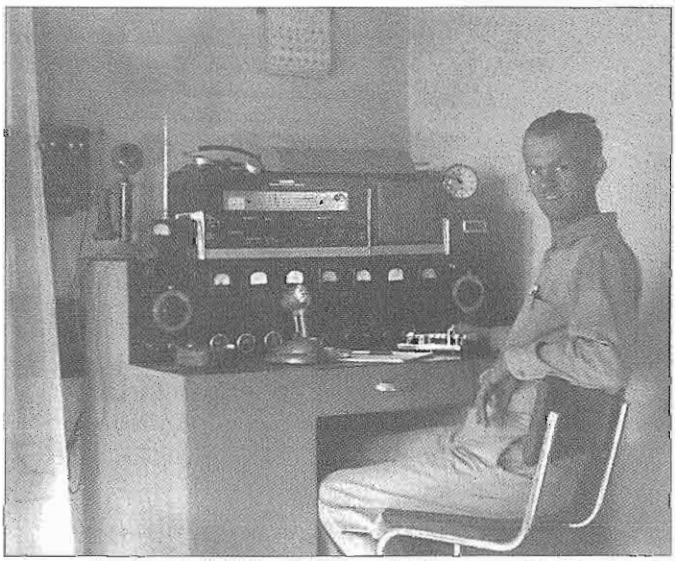
On the left, a Johnson Viking II is on display. To its right is a scarce Allied Knight transmitter, one of the 255 series, made from 1956 into 1961.

found about a dozen SWLs that have called me to find out more about ham radio. They listen to all the QSOs on AM on their SWL receivers and wonder what is going on with all the older gear. Now, with the new FCC requirements changing, this could help in getting new hams in the ranks. Bill (K8DBN) and Jeff (WA8SAJ) brought all the coffee and donuts. Dave (WI8F), who just got back on AM and is having a ball after being off the air for many years, took the pictures. For more information on the Lake Erie Boatanchors Group, contact Bill (K8DBN), Ron (W8KYD) or Jeff (WA8SAJ). *ER*



Mike Warren (WØWG) recently sent me a copy of his colorful QSL card that has a very attractive full-color view of a glowing Eimac 4-125A.

Above: W9FG, 1949



Left: W5IAQ in New Mexico, 1947

(Photos on this page are courtesy of Hubert Miller, KA7LXY)

Page 36, top: This photo was taken July 3, 1949, and it shows W9FG's basement shack, owned by Jack Martin. Jack has what looks like an SX-25 Super Defiant HF receiver on the top shelf at the left. Underneath the SX-25 is an unknown receiver, perhaps a homebrew. To the right of the SX-25 is a ubiquitous war surplus ARC-series aircraft transmitter, and above the Hallicrafters is a "coffee grinder" antenna rotator, also ARC equipment. In Jack's modern shack is an oscilloscope for monitoring purposes. The large rack to the right is his main transmitter, and it looks like a nice prewar homebrew rig that has been updated many times over the years.

Page 36, bottom: W5IAQ was using homemade QSL cards during 1947. Here he is shown with a Howard 460 receiver on the top shelf, next to the "candlestick" telephone and separate ringer. Below the Howard receiver is his homebrew 300-watt rig. It uses two HK-64s modulated by 811s. A note on the back of his card mentions that he was operating on 10 meters, and had a 3-element beam.

Page 37, bottom: This is the K9YHH 75-meter "Benton Harbor" AM station run by Bill Prepejchal. Above the MFJ tuner is an AR-10B, and below is the HR-10. Also in the photo is an HO-10, HG-10 VFO (top right), and Bill's DX-60 transmitter, lower right.

Above is Bruce Howe's (W1UJR) custom QSL card. It's also very attractive, and in full color. Bruce will have an article in next month's ER on the Collins 30K-1 transmitter!

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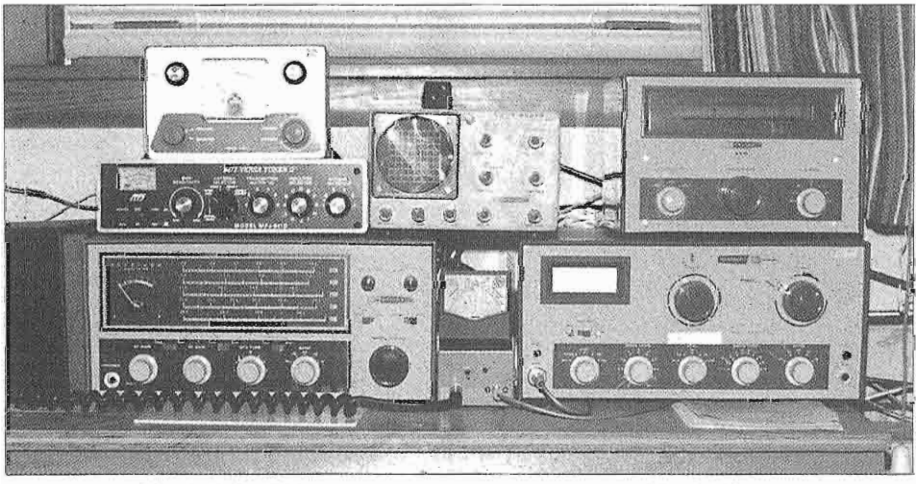
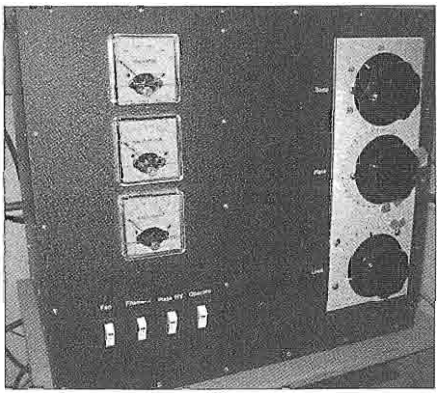


[Mailbag, from page 19]
remembered Cliff and looked up his phone number and gave him a call one evening. I don't think he remembered me, but he was happy to give me advice. He asked me a couple of questions and quickly zoomed in on the bias idling circuit. His advice was correct, and with his tip I was able to easily diagnose and fix the problem with the circuit. The amplifier then worked and is still in use to this day. I've attached a picture (still has the knobs I got from Cliff).

Cliff is one of the most helpful hams



Tom Taylor's Homebrew 4-400 Amp

I've met in my 33 years as a ham. I was thrilled to open the latest issue of ER and see the article he wrote.
73, Tom Taylor
N7TM

Dear ER,

I am writing this letter to other ER readers to warn them about the increasing amount of fraud and low-level criminal activity that is becoming more common with Internet sites such as ebay all the time.

I recently purchased an expensive machine tool on ebay. It was advertised to be "new in the box." When it arrived, sure it had the box, but it obviously was a used item had been damaged somehow. The seller was contacted, and he refused to do anything about the problem, even though he did not say it was being sold "as is" in his listing. He ignored the "dispute process" and sent me email full of profanity. In a few weeks, I found out that the ebay dispute process is deceptive and is entirely automated—humans are not involved. I am out the cost of the item with no recourse and the seller has my money and is *still operating*.

Then, I bought a piece of test equipment that cost nearly $1000. I paid with Paypal. The seller assured me he would double box the item. When it arrived, it was ruined because he didn't bother to double box it. It was wrapped one time with thin bubble wrap and thrown in a used box with a few packing peanuts. (Packing peanuts, used by themselves, provide the bare minimum of protection, only good to about 2 pounds.) He refused to do anything about it, claiming that my purchase was covered by the so-called Paypal "buyer protection plan." I filed the Paypal dispute, escalated it to a claim, the seller denied the claim, and that's where it ended. I am out $1000, simple as that. There is no recourse, and the seller is *still operating*.

The exact same thing happened about two months later with some expensive radio gear.

If you read these ebay listings, there is a section that says "How you are covered...the PayPal buyer protection plan..." HA! What it should say is "How You Are Not Covered." Reading the exact policy at PayPal reveals that it's *NOT INSURANCE*. The fine print says it's only an arbitration between PayPal and the seller. PayPal has the right to change the terms whenever and however they want. All the seller has to do is deny the claim, and *YOU LOOSE*.

Theft rings do operate on Internet sites, and the site operators are apparently not responsible, but buyers can be prosecuted for receiving stolen merchandise—beware! It is important to learn about the pitfalls of Internet sales before you loose a lot of money, like I did.
73, Elmore Sand, Chicago, IL

ER

New Product Reviews: Hammarlund DD101H Digital Dial and REA AMM-HF1 AM Modulation Monitor

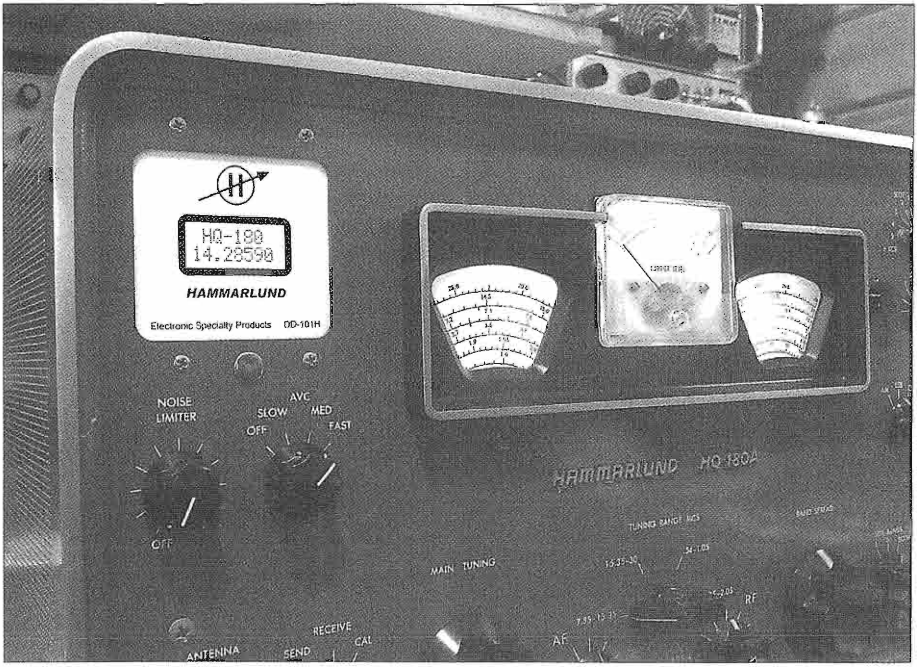
Ron Hankins (KK4PK) at Electronic Specialty Products (ESP) has released a new digital dial that is designed specifically for the Hammarlund SP and HQ-series of receivers. Having recently become available, this dial might be of interest to Hammarlund users.

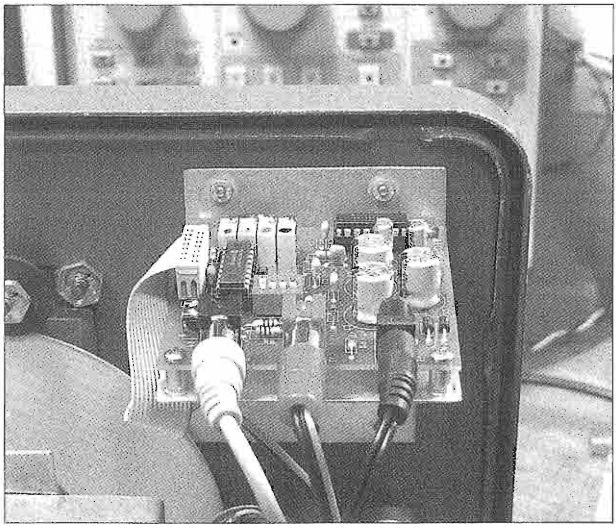
Designated model DD-101H, this dial is designed to install in the clock opening in the HQ-series. By the time this article has been printed, ESP will have another cabinet-mounted model available (model DD-101H/U) if owners would rather not use the clock opening to house a digital gadget. Many Hammarlund receivers never did have a clock because it was an accessory, and many other clocks have a synchronous movement that has quit working.

This is not a kit of parts. It comes fully assembled and ready to use, see page 58. All necessary cables and connectors are supplied; there is nothing extra to buy. It comes with new hardware and a hole plug for the clock switch shaft. You don't have to save any of the old hardware for reuse.

Electrically, the dial is a frequency counter with special programming. It connects to the HF oscillator in a Hammarlund and has programming to allow use with the SP-600, 400, 210, 110; also the HQ-200, 180, 170, 160, 150, 145 and 140. It gets power from the 6-VAC heater line and draws very little current.

There are three installation options. Users may elect to either connect the counter input to the stator of the oscillator tuning condenser, the cathode of the 1st mixer, or they can elect to use a





DD-101H Digital Dial Installed in the HQ-180A

special tube shield that fits around the HF oscillator tube. The counter can be installed in 30 minutes if you decide to use the special tube shield or connect to the tuning condenser, and maybe a couple of hours if you connect to the mixer. A permanent connection to the mixer cathode or the special tube shield is recommended because connecting to the condenser will load the oscillator somewhat and you won't be able to tune the entire range on each band. (Due to overlap in the tuning ranges, this really isn't too much of a problem.)

In the HQ-180A, the area around the 1st mixer is crowded with components. It is not recommended to make a flimsy installation this area. Installation of a ceramic standoff, with a female mounting thread, into the mounting stud for T27 is best. The cable to the counter can be soldered to the standoff, and a new Mylar axial-lead capacitor can be used to connect into the mixer cathode. A convenient spot to pick off the 6.3 VAC for the counter's B+ is at pin 4 of V10.

Once installed, it is only necessary to rotate R7, a 10-turn pot, until the display reads the correct model number for the receiver in use. (R7 is shown in the instruction sheet.) Then, every time the receiver is powered up the microprocessor reads the resistance across the pot and the correct model number is programmed in. You don't have to readjust the counter every time it's powered up.

It takes some time to get used to a digital dial on the HQ-180A, but after using it for a few days it's obviously a very useful accessory.

One chronic problem with the HQ-series is difficulty maintaining a careful oscillator alignment. The chassis metal is too thin for the weight it supports. Twisting and flexing when reinstalling the chassis into a cabinet will undo a careful alignment. Also, on the higher frequencies it is nearly impossible to tell what frequency you are on, even with a crystal calibrator, because the dial is crowded and poorly calibrated. The HQ-180A has long been a favorite among SWLs and broadcast-band listeners. With the new ESP digital dial, it will no longer be a problem for a DXer to log a frequency in the 19-meter shortwave band and easily return to it the same time on another day.

Please note that the HQ-180A's small vernier tuning dial (not the bandspread dial) has no effect on the readout because it's in the 2nd local oscillator circuit. It has to be set at the "0" position for the dial to be accurate.

No digital noise was noticed coming from the counter with the antenna disconnected.

When listening to the standard broadcast band, there is no decimal point if you are tuned below 1 Mc. Either make a mental note, or use the analog dial.

The counter comes with switch-selectable 100 or 10-cycle counter

resolution. Perhaps the 10-cycle position might not be too useful, but it's fun to have the digits available. Also, any backlash in your tuning system immediately becomes apparent on the readout. There is a "tweak" mode to be used to calibrate for differences between receivers.

All considered, this is a well built, excellent accessory for a great receiver! (Review by NØDMS)

Radio Engineering Associates Modulation Monitor Model AMM-HF1

Reviewed by Joe Fell, W3GMS

Every now and then, a new product shows up and just gets you excited! Usually with me, it is something that has to do with audio. This Radio Engineering Associates modulation monitor is definitely something to get excited about. It will simultaneously show both positive and negative modulation percentages and at the same time allow you to listen to your transmitted signal. You will hear exactly the way you sound. This unit is nicely packaged as a stand-alone, tabletop unit or with the supplied rack ears it can easily be rack mounted. When rack mounted, it takes 2 rack units of vertical mounting space, which is 3.5 inches. The unit is powered by a supplied wall-mounted transformer.

I had heard over the air that Steve Cloutier (WA1QIX) was developing a broadcast quality modulation monitor and marketing it though a company he formed named Radio Engineering Associates (REA). It was slated to be affordable, while still maintaining high design quality along with good construction and packaging techniques.

I am an avid homebrewer. I constantly toss around the "build-or-buy" decision. Steve had published a very well designed modulation monitor years ago and placed the schematic on his website. For me, limited time always kept me from building one. Homebrewing is one of my favorite aspects of the hobby, but sometimes, family duties and a busy career keep me from spending time in my "GMS Laboratory."

Remote RF Sampler

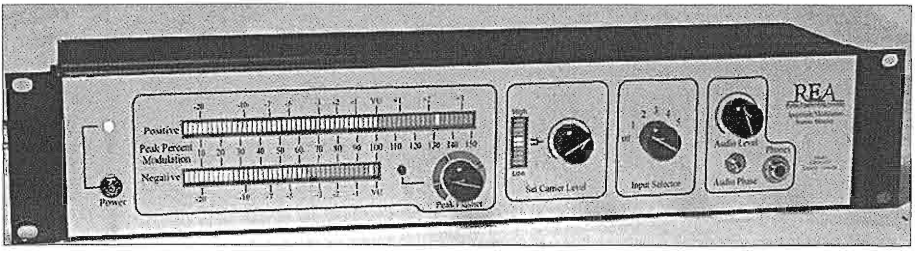
A remote RF sampler is straight forward, and one could be built for almost any power level without purchasing one, if so desired. However, REA does provide a power sampler of your choice without any extra charge when the unit is ordered. Optional power offerings are available if you choose not to build one yourself.

Display Presentations

The simultaneous presentation of both positive and negative modulation levels along with peak hold gives an instantaneous picture of transmitter performance. This includes the carrier "sag" that might be present in the RF modulation process. The display, along with the placement of the front panel controls, is not only pleasing to look at but extremely functional.

On-Air Results

In writing this product review, I felt



The Attractive REA AMM-HF-1 Modulation Monitor

that ER readers would benefit from hearing comments not only from me, but from several others who have purchased this modulation monitor. This product review is a compilation of comments from AB2EZ, KG2IR, W1GHW and myself.

Nick (KG2IR) installed the REA Modulation Monitor in the rack next to his Belar AM AMM-1 commercial modulation monitor. The purpose was to benchmark the REA unit against the Belar to see how the two compared. Belar has been supplying the broadcast market with its modulation monitors for years and its products are well recognized in the business. He compared measurement accuracy on positive peaks, negative peaks along with the negative peak "flasher" threshold markings. In addition, a comparison was made concerning the quality of the off-air audio monitor aand with ease of setup. Nick concluded that the REA unit matched the performance of Belar AMM-1 monitor at a fraction of the cost.

Since Steve (WA1QIX) designed the remote power divider and the envelope detector in the same small enclosure, Nick ran a shielded cable 26 feet from the RF sampler output to the monitor, which he located right at the operating position. Even with the extended cable, no degradation in performance occurred. If anything, the additional capacitance of the cable offered more filtering of the detected RF.

An interesting alternative use for this modulation monitor is to look at receive signals over the air. The five position input selector lets you monitor multiple audio sources. In order to look at received signals, Nick took the detected output of his R390-A receiver, ran it through a small amplifier with a variable-gain control, which then went to one of the spare inputs on the modulation monitor. Of course, it works best with stronger stations and while using either "fast" AGC or no AGC.

Nick highly recommends this unit to anyone operating AM radio, amateur or professional, and he feels that once again Steve (WA1QIX) has provided the amateur radio community with a piece of great technology. Nick believes that anyone who is thinking of getting one should do it now, before Steve realizes he is selling the REA Modulation Monitor at too low a price!

Stu (AB2EZ) did his own testing on the unit. Stu's and Nick's results supported the merit and accuracy of the unit. Stu stated that his unit was very accurate in terms of both linearity (output voltage v.s. RF envelope level) of the envelope detector and the accuracy of the displayed modulation. Using a 2-channel scope, the output of the REA sensor was compared to the modulated RF waveform with an off-air "RF sniffer." The output of the REA sensor faithfully tracked the envelope of the RF signal and the modulation monitor readings were right on target. The available monitored audio output sounds very good. Like Nick, he concurred that the unit was very easy to install and use. Stu liked the well-designed display as well as the overall package.

With the current version of the product, small changes in the carrier level require the user to re-tweak the front panel "set carrier level" control, which is not a big deal. Stu did build a very simple automatic level control, which is posted on his web site and goes between the RF pickup and the modulation monitor. This eliminates the need to make a front-panel, carrier-level change if the power of the transmitter changes.

Stu mentioned that once you have one of these, it would be hard to do without it. Considering what you get, the price is very reasonable compared to alternative available products.

Gary (W1GHW) reported he had two looks at this fine piece of equipment. The first being at the famous "Hosstraders" hamfest this past fall and the second was during a visit to K1KBW's shack. Gary

mentioned that like most AMers, he just uses a scope to monitor his percentage of modulation. He questioned the need to purchase another device to see modulation percentage. The angelic voice of his conscience was balanced by the devilish thought that it would be a handsome addition to his station. The time to buy was soon, as the price would surely rise as its praises were sung.

Gary listened to the devil, bought one, and was not disappointed. Like Stu, he reported the ease of installation. It became apparent early on that the so-called limiting circuitry of his DBX 266 XL compression/gate limiter was not fast enough to act as a true peak limiter. Gary said, "With the assistance of this modulation monitor, I am much better able to adjust my audio level to prevent potential 'splatter' about the band. The horizontal traveling LED peak indicators (positive and negative) along with the sample and hold feature on the display, gives an accurate picture of modulation percentage." The more he used the unit, the more he felt comfortable that it was a wise purchase.

And, lastly some comments from your author! When I evaluated this unit, none of my findings contradicted any of the other reviewer's findings mentioned above. I do feel it prudent to mention that this monitor will display positive peak modulation up to 150%. This modulation monitor is specified to operate over a frequency range from 1 to 30 MHz. The actual cabinet size, without the furnished mounting ears, is 17"w x 3.5"h x 4.5"d. I need to mention that after I put the product through its paces, I opened it up to look at the internal construction. I was very impressed with the overall appearance of the construction. The physical appearance on the outside has a very nice, finished look and the inside internal aspects are very neatly done. The circuitry is on a single printed circuit board directly behind the front panel. All the front panel controls are mounted to the PC board, so no there are no dangling wires between the front-panel controls and the PC board. The only wires I noticed were those coming from the rear-mounted jacks and going to the main PC assembly and these were neatly twisted. It appeared that all the components used in this product were readily available, off-the-shelf devices. I did not see any proprietary or hard-to-find items used in this unit.

Ordering

The current price of the unit is $399.00 factory direct from REA. Shipping time is quick from the time an order is placed to receiving the unit. To contact REA, please visit their Internet web site at www.radioassociates.com or by telephone, 978-597-0010 9:00 AM to 5:00 PM Eastern Standard Time. REA's mailing address is: Radio Engineering Associates, 79 Tyler Road, Townsend, MA 01469.

ER

For a lifetime AM International membership, send $2.00 to AM International, PO Box 1500, Merrimack, NH 03054. AMI is our AM organization and it deserves your support!

An on-line, searchable index to the entire history of Electric Radio Magazine may be found under the "links" tab at www.ermag.com or at Don Buska's web site:

Western Region CW Net Frequencies:
MSN (Mountain States Net) Slow Speed Beginners Net 3.570 0300Z (8pm MST)
TWN - Twelfth Region Net 3.570 0330Z (6:30pm MST)

VINTAGE NETS

AM Carrier Net: Sunday mornings, 8:30AM local Eastern time, 3835 kc. QSX W2DAP. Friendly format.
Arizona AM Nets: Sat & Sun: 160M 1885 kc @ sunrise. 75M 3855 kc @ 6 AM MST. 40M 7293 kc 10 AM MST. 6M 50.4 Mc Sat 8PM MST. Tuesday: 2M 144.45 7:30 PM MST.
Boatanchors CW Group: QNI "CQ BA or CQ GB" 3546.5, 7050, 7147, 10120, 14050 kc. Check 80M winter nights, 40 summer nights, 20 and 30 meters day. Informal nightly net about 0200-0400Z.
California Early Bird Net: Sat. mornings @ 8 AM PST on 3870 kc.
California Vintage SSB Net: Sun. mornings @ 8AM PST on 3860 +/-
Colorado Morning Net: Informal AMers on 3875 kc daily @ 6:00 to 6:15 AM, MT. QSX KØOJ
Canadian Boatanchor Net: Daily 3725 kc (+/-) @ 8:00 PM ET. Hosts are AL (VE3AJM) and Ken (VE3MAW)
Collins Collectors Association (CCA) Nets: Sunday, 14.263 Mc @ 2000Z. Informal ragchew net Tue. evening, 3805 kc @ 2100 ET, Thu. 3875 kc. West Coast 75M net, 3895 kc 2000 PT. 10M AM net 1800Z, 29.05 Mc Sunday, QSX 1700Z. CCA First Wednesday AM Night each month, 3880 kc starting @ 2000 CST, or 0200 UTC.
Drake Technical Net: Meets Sun. on 7238 kc, 2000Z. Hosted by John (KB9AT), Jeff (WA8SAJ), and Mark (WBØIQK).
Drake Users Net: Check 3865 kc, Tue. nights @ 8 PM ET. QSX Gary (KG4D), Don (W8NS), and Dan (WA4SDE)
DX-60 Net: Meets on 3880 Kc @ 0800 AM, ET on Sun. QSX op is Mike (N8ECR), with alternates. The net is all about classic entry-level AM rigs like the Heath DX-60.
Eastern AM Swap Net: Thu. evenings on 3885 kc @ 7:30 PM ET. Net is for exchange of AM related equipment only.
Eastcoast Military Net: Sat. mornings starting 0500, 3885 kc +/- QRM. QSX Ted, W3PWW. It isn't necessary to check in with military gear, but that is what this net is all about. Late checkins are welcome.
Florida AM Group: A large group meeting every Sunday, 7:30AM ET, 3875 kc and pre-net checkin 7:00AM ET, **3675** kc. QSX Maury, N4GUI. Also, Florida vintage SSB net "AFLAC" meets Wed., 3910 kc, 9PM ET. QSX Warren, W1GUD.
Fort Wayne Area 6-Meter AM net: Meets nightly @ 7 PM ET on 50.58 Mc. Another long-time net, meeting since the late '50s. Most members use vintage or homebrew gear.
Gulf Coast Mullet Society: Thu. @ 6PM CT, 3885 kc, QSX control op W4GCN in Pensacola.
Gray Hair Net: One of the oldest nets, @44+ years ,160 meter AM Tue. evening 1945 kc @8:00 PM EST and 8:30 EDT. Also check www.hamelectronics.com/ghn
Heathkit Net: Sun. on 14.293 Mc 2030Z right after the Vintage SSB net. QSX op W6LRG, Don.
K1JCL 6-meter AM repeater: Operates 50.4 Mc in, 50.4 Mc out. Repeater QTH is Connecticut.
K6HQI Memorial 20 Meter Net: Flagship AM net 14.286 Mc daily for 25+ years. Check 5:00 PM Pacific Time.
Lake Erie Boatanchor CW Net: Saturday morning, 1 PM ET, 7094 kc QSX op Steve (WA3JJT) or Ron (W8KYD).
Midwest Classic Radio Net: Sat. morning 3885 kc @ 7:30 AM, CT. Only AM checkins. Swap/sale, hamfest info, tech. help are frequent topics. QSX op is Rob (WA9ZTY).
Mighty Elmac Net: Wed. nights @8PM ET (not the first Wed., reserved for CCA AM Net), 3880 +5 kc. Closes for a few summer months. QSX op N8ECR.
MOKAM AM'ers: 1500Z Mon. thru Fri. on 3885 kc. A ragchew net open to all interested in old equipment.
Northwest AM Net: AM daily 3870 kc 3PM-5PM winter, 5-7 PM summer, local. 6M @50.4 Mc. Sun., Wed. @8:00 PM. 2M Tues. and Thurs. @ 8:00 PM on 144.4 Mc.
Nostalgia/Hi-Fi Net: Started in 1978, this net meets Fri. @7 PM PT, 1930 kc.
Old Buzzards Net: Daily @10 AM ET, 3945 kc in the New England area. QSX op George (W1GAC) and Paul (W1ECO).
Southeast AM Radio Club: Tue. evening swap, 3885 @7:30 ET/6:30 CT. QSX op Andy (WA4KCY), Sam (KF4TXQ), Wayne (WB4WB). SAMRC also for Sun. Morning Coffee Club Net, 3885 @ 7:30 ET, 6:30 CT.
Southern Calif. Sun. Morning 6 Meter AM Net: 10 AM on 50.4 Mc. QSX op is Will (AA6DD).
Swan Nets: User Net Sunday 2200z winter 14.250Mc ±QRM. QSX op rotates Jim (WA5BDR), Jay (WB6MWL), Norm (W7RXG), Bill (W4WHW). Tech Nets: Wednesday 2300z 14.251Mhz / Saturday 1900z 7235 kc QSX op Stu (K4BOV)
Texoma Trader's Net: Sat. morning 8:00AM CT 3890 kc, AM & vintage equip. swap net.
Vintage SSB Net: Sun. 1900Z-2000Z 14.293 & 0300Z Wed. QSX op Lynn (K5LYN) and Andy (WBØSNF)
West Coast AMI Net: 3870 kc, Wed. 8PM Pacific Time (winter). Net control rotates between Brian (NI6Q), Skip (K6LGL), Don (W6BCN), or Vic (KF6RIP)
Westcoast Military Radio Collectors Net: Meets Sat. @ 2130 Pacific Time on 3980 kc +/- QRM. QSX W7QHO.
Wireless Set No. 19 Net: Meets second Sun., monthly, 7270 kc (+/- 25 Kc) @ 1800Z. Alternate 3760 kc, +/- 25 kc. QSX Dave (VA3ORP).

CLASSIFIEDS

Advertising Information

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

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Deadline for the April 2007 issue: ☞ Saturday, March 24!

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

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

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

FOR SALE: ARRL handbooks, QSTs, (p.u. only), Heathkit HW-8 $80, VTVM $30. Les Matthews, WB2DQV, 2405 Thistledown Ct, Sewell, NJ 08080

FOR SALE: Millen KW Transmatch $300. Hallicrafters SX-28 front panel $40. SX77 $40. Richard Cohen, 813-962-2460

FOR SALE: Hammarlund HQ105 in a HQ100 cabinet, band switch problem $39 + shpg. Henry Mohr, W3NCX, 1005 W. Wyoming St., Allentown, PA 18103

FOR SALE/TRADE: Johnson Invader 2000 restoration project, started, you finish: $700/swap. Collins package; 75S-1 with Waters Q-Multiplier; 32S-1; 516F-2: $1200. Secret stuff – contact me. Gary, K6GLH, 209-286-0931 or k6glh@volcano.net

FOR SALE: Collins Radio paper work: 1950 general catalog, 1960 catalog, 1940s Collins Column. PTOs, autotunes, auto-positioners. 50th anniversary memorabilia. $500 or trade. Bill Coolahan, 1450 Miami Dr NE, Cedar Rapids, IA 52402, 1-319-393-8075

FOR SALE: Collins Radio microphone SM-2, no stand. Excellent condition, $200. Contact Mike Grimes, 5306 Creekside Ct., Plano, TX 75094, 972-898-7251 Email k5mlg@verizon.net

FOR SALE: Johnson Ranger, NC300, HQ-170C, Knightkit R-100, T150A. Hallicrafters S20R parts unit. Harvey Wells TBS50D Bandmaster Deluxe with VFO, P.S., orig. manual. Conar 400 CW transmitter. Lafayette Explor Air regen rcvr. Ameco multiband converter CMA. Heathkit HO10 monitor scope. Eimac 304TL tubes new in box. Accepting offers on Viking Valiant, mint condx. R390A very clean and nice. 32V3, works great. Many more items–test equip., CB radios, parts, microphones, etc. Send for price and condition list. Ed, WA7DAX, 1649 E. Stratford Ave., Salt Lake City, UT 84106. 801-484-5853

FOR SALE: Books. Lodge: The Ether of Space, $65. Instruments of Amplification, $20. Ross Wollrab, 229 N. Oakcrest Avenue, Decatur, IL 62522-1810. 217-428-7385.

FOR SALE: Ford spark coil, $30. SX-28 eight small knobs, $50. Globe Chief 90A $60. National NC-100ASD $125, Richard Cohen, 813-962-2460

FOR SALE: Johnson Viking Messenger 5ch CB. $10.00 + postage. 989-354-5978, jeohlrich@hotmail.com

FOR SALE: 12SG7 tubes NOS in the original military packing, $1.25 ea. or 10 for $10. Tom, 303-979-6135

FOR SALE: TR-3 w/MS-4 speaker and Heath HP-23 supply, package only $350 you ship. Ken Sands, K8TFD, 734-453-7658 home, 734-564-0316 cell

FOR SALE: Blank 19" steel panels Motorola tan clean 2" to 11" 50 cents pd 1-21" alum 5.00. Dave, WØBEI, 800-500-8055

FOR SALE: Tube Manuals RCA TT-3, TT-5, RC-20, Sylvania Eleventh Edition, GE Thirteenth Edition $15 Each + Shipping. Dean Gagnon, 802-893-6692, dean.gagnon@juno.com

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

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"ZENITH STRATOSPHERE"

A beautiful model 1000Z 25-tube Zenith Stratosphere will be sold at our Radio Auction April 28, 2007. The radio is complete and in working condition. The Zenith Stratosphere is the "Ultimate" Prize for a Zenith collector, or the devoted collector of quality-made radios. This beautiful piece of radio history will be sold in the same auction with the "WLW" Crosley Super Power Receiver and the "Sparton Nocturne." We are fortunate to be able to bring these rare objects of radio beauty to the radio collectors and provide the opportunity for someone to be an owner and caretaker of these important radios. Make this the year you add a "Stratosphere" to your collection!

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FOR SALE/TRADE: Manuals: Swan, Hickok, Johnson, Clegg, Drake, National, Hammarlund, Hallicrafters, Gonset, WRL, RME, Heathkit. Al, NI4Q, POB 690098, Orlando, FL 32869 407-351-5536 ni4q@juno.com

FOR SALE: Ham, CB, and test equipment, all older tube-type gear. Send for list. Ed, WA7DAX, 1649 E. Stratford Ave., Salt Lake City, UT 84106. 801-484-5853

FOR SALE: Hammarlund clock reproductions, 12 hour (easier to read) or 24 hour, specify, $35 each, shipped. Rob Hummel, WA9ZTY, 202 Midvale Dr, Marshall WI, 53559-9616

FOR SALE: Complete rare bound set of QSTs 1915 to now. Best offer by 3-17-07. K8CCV, 330-427-2303

FOR SALE: 350uF 330V capacitors .50 ea. Johnson 6N2 converter $10 28V prop pitch motor $100. 100A alternator, 12V out $40. All + shpg. Rudy, W2ZIA, 716-937-9279.

FOR SALE: New 12" speaker in original carton made by Sondgrand, $35 plus shipping. John Snow, 1910 Remington Ct. Andover, KS 67002 316-733-1856

FOR SALE: Military manuals LSASE for list and prices. John Snow, 1910 Remington Ct. Andover, KS 67002 316-733-1856

FOR SALE: 70 years accumulation ham gear & books. LSASE for list, many new items. John Snow, 1910 Remington Ct. Andover, KS 67002 316-733-1856

FOR SALE: For Tektronix 550-series scopes: 2 ea 067-521-00 1M1 w/book, $100 for pair. 3 ea 1A1, $50 ea. 1 1A2 $40. 1 Type L, $20. 1L10 1-30 Mc spectrum analyzer $100. Call Charlie 941-747-2082, k4zks@tampabay.rr.com

FOR SALE: Heath semiconductors: Over 200 unique, new, OEM Heath part numbers. Card or email for list, or just tell me what you need. JeRB, K8WPI, 9549 N. 17Th St, Kalamazoo, Mi. 49009, 269-226-8873 Oldbugger@earthlink.net

FOR SALE: Timewave DSP599DX w/ p.s., used once, $200. Original 500 hz filter for 75A4 $125. Earl, 603-434-8326

FOR SALE: Sprague Orange Drop capacitors New/NOS. Many values/ voltages. 50% off retail. Mix or match values. eMail for complete list. gg136@aol.com

FOR SALE: KWM-2 CDs. All original material, not a copy of the manual. High resolution color pictures which will really help locate parts, plus much more. For more information visit my web page at http://www.heavymetalradios.com/ or E-Mail me at boatanchors@comcast.net, DW Holtman, WB7SSN

FOR SALE: Hallicrafters S40B rcvr $75. 5 amp Variac in case w/meter $35. HP335D VHF attenuator $25. Dentron 160-10AT 3kW super super tuner $75. Triplett 2413 emission tube tester $35. Norbert C. Wokasch, WAØKJE, 3312 W. Bijou, Colorado Springs, CO 80904. 719-633-5661.

FOR SALE: Technical Books & CDs. Harold Kinley (WA4GIB), 204 Tanglewylde Dr., Spartanburg, SC 29301 www.radiotechnologies.net

FOR SALE: Chinese Army type 65 hand crank generators for 102E radio sets. Ken, KD6B, kd6b@bendbroadband.com 541-923-1013, POB 310, Redmond, OR 97756

FOR SALE: Sencore SM-158 Speed Aligner as new with all leads and accessories and manual $225 plus shipping. John Snow 1910 Remington Ct. Andover, KS 67002 316-733-1856

FOR SALE: National coil set Type JC 3.5Mc to 7.3 Mc, exc cond $35 plus shipping. John Snow 1910 Reming-ton Ct. Andover, KS 67002 316-733-1856

FOR SALE: Antique headsets 40 pair in various stages of repair. 18 different manufacturers. Make offer plus shipping. John Snow 1910 Remington Ct. Andover, KS 67002 316-733-1856

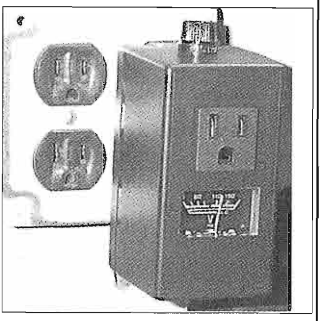
ZIM ELECTRONICS INRUSH CURRENT LIMITERS

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

Model AB-1M, (With Voltmeter) $34.95
Model AB-300M, 300 watts (2.5 amps x 120 VAC) with meter $39.95
Model AB-1 (With Pilot Light) $29.95
Shipping, each limiter $5.45

(4 or more limiters are shipped free for US orders. Overseas customers please ask for shipping quotes.)

The Inrush Limiter provides a gentle, slow startup for your valuable vintage radio equipment. They also reduce the line voltage closer to original design values due to the voltage drop across the limiter element. AB-1 and AB-1M are 150W. All models come with a full money-back guarantee.



Model AB1-M

Electric Radio Store
720-924-0171

FOR SALE: Hammarlund HQ100A in exc cond $300 plus shipping. John Snow 1910 Remington Ct. Andover, KS 67002 316-733-1856

FOR SALE: CRTs 2AP1A; 3AP1; 5AXP4; 5BP1; 5UP1; 7BP1A; 8XP4; 14RP4. All guaranteed or money back each $10 plus shipping. John Snow 1910 Remington Ct. Andover, KS 67002 316-733-1856

FOR SALE: Channel Master Model 7275 solid state Field Strength Meter exc cond $65 plus shipping. John Snow 1910 Remington Ct. Andover, KS 67002 316-733-1856

FOR SALE: Military manuals all original. List for large SASE. John Snow 1910 Remington Ct. Andover, KS 67002 316-733-1856

FOR SALE: Kustom Kreations universal floor- mount new in box for any CB or ham rig. $20 each plus shipping. John Snow 1910 Remington Ct., Andover, KS 67002 316-733-1856

FOR SALE: Hard cover books by John F. Rider $5 each plus shipping. List for LSASE. John Snow 1910 Remington Ct., Andover, KS 67002 316-733-1856

FOR SALE: NIB Miller; Meissner; Delco radio parts, LASE for list. John Snow 1910 Remington Ct., Andover, KS 67002 316-733-1856

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

This is possibly a long shot, but I would like to obtain an unrestorable SX-88 for parts. A chassis with missing unobtainable parts or a complete receiver in very rough condition is preferred to prevent breaking up an otherwise restorable unit. I am willing to pay above-market for the right chassis or parts unit and I will make it available to others whom might also have a project SX-88 on hold due to needing parts.

Greg Gore, WA1KBQ
10291 Kendan Knoll Dr.
Charlotte, NC 28262
704-503-5952
WA1KBQ@AOL.COM

FOR SALE: Galena crystals and/or parts to make your own crystal radio. Also have radio tubes. Len Gardner, 458 Two Mile Creek Rd, Tonawanda, NY 14150, radiolen@att.net

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

FOR SALE: Military whip antennas $40. AN/TRC-77 FM transceiver $295. Bruce Beckeney, 5472 Timberway, Presque Isle, MI 49777, 989-595-6483

DRAKE PARTS FOR SALE: New spun inlays for the B Line or TR4 main knob. $6.

Also sell new pointer knobs. Alan, KC9YS, 630-879-1132 after 7pm.

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

QSLs FOR SALE: Your old QSL card? Search by call free, buy find at $3.50 ppd. Chuck, NZ5M, nz5m@arrl.net

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

FOR SALE: DRAKE TR-7/TR-7A/R-7/R-7A service kit. Includes 13 extender boards and digital jumper card. $63.85 includes postage. See http://pweb.amerion.com/~w7avk, Bob, W7AVK, 807 Westshore J28, Moses Lake, WA 98837, w7avk@arrl.net 509-766-7277.

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

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

DRAKE OWNERS: New Sylvania 6JB6, same date code, tubes for sale. Price: $23 ea. Call Dick at 207-490-5870

FOR SALE: FT243 Crystals: 1000, 1700, 1750, 1822, 1880, 1942.5, 3530, 3535, 3540, 3545, 3550, 3625, 3675, 3735, 3870, 4325, 4335, 4340, 7040, 7050, 7123, 7140, 7143, 8400, 10106, 28238, 28258, 28571 kHz more. 100kHz, 455kHz HC51U wire leads. Some FT171B, HC6U Crystals. Contact af4k@hotmail.com or send SASE to Brian Carling, AF4K, 117 Sterling Pine Street, Sanford, FL 32773 or call 407-323-4178 http://www.af4k.com/crystals.htm

HALLICRAFTERS SERVICE MANUALS: Ham, SWL, CB, Consumer, Military. Need your model number. Write or email. Ardco Electronics, PO Box 24, Palos Park IL, 60464, wa9gob@aol.com 708-361-9012 www.Ardcoelectronics.com

DRAKE INFO FOR SALE: Drake C-Line Service Information. Hi-Res Color photos of boards and chassis with parts identified. CD also includes Hi-Res scans of R-4C and T-4XC manuals, various version schematics and more. Garey Barrell, k4oah@mindspring.com 4126 Howell Ferry Rd, Duluth, GA 30096. 404-641-2717

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

FOR SALE: QRP transmitter kits. Step-by-step instructions. Wood model, up to 5 watts 40/80M $15. "Tunatin" one watt 40M $10. You furnish crystal and power. Robert Larson, 1325 Ridgeway, Medford, OR 97504 w7lng@arrl.net

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

FOR SALE: Radio parts and hardware. Some are 60 years young! Free flyer, USA only. Bigelow Electronics, POB 125, Bluffton, OH 45817-0125

FOR SALE: Tubes tested good globe 200A $8.50, 201A $14, 226 $8, 227 $9. Write or e-mail: tubes@qwest.net for price lists or see www.fathauer.com. Slightly weak tubes guaranteed to work in early radios 1/2 regular price. George H. Fathauer & Assoc., 123 N. Centennial Way, Ste. 105, Mesa, AZ 85201. 480-968-7686 or toll free 877-307-1414

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

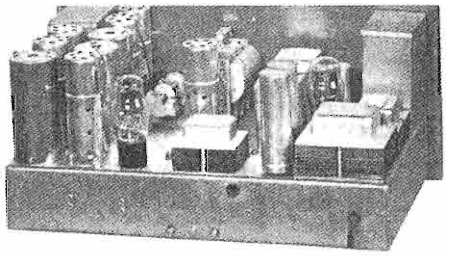
SERVICE FOR SALE: Authorized repairs and sales of all types of amateur radio, communications, and test equipment. Please call Land Air Communications, 718-847-3090, visit our web site: www.landaircom.com. We have over 3,000 items in inventory and carry all types of communications parts.

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

JOHNSON PARTS: New Ranger 1, Valiant 1, & Navigator plastic dials, freq numbers in green, with all the holes just like orig.- $17.50 ppd. Bruce Kryder, W4LWW, 277 Mallory Station Dr., Ste. 109, Franklin, TN 37067. b.kpvt@provisiontools.com

REWARD – WANTED!

THE NEW "RME-9" SUPER



Will pay $2000 for complete RME-9 receiver in any condition. Not tested, working order unknown or needs restoration is OK. The RME-9 has a single airplane style tuning dial and was the forerunner to the later RME-9D and RME-69. Greg Gore, WA1KBQ; 10291 Kendan Knoll Dr.; Charlotte, NC 28262 (704) 503-5952; wa1kbq@aol.com

FOR SALE: FT243 CRYSTALS: 1885, 1915, 1925, 1945, 1985, 3870, 3875, 3880, 3885, 3890, 7143, 7280, 7285, 7290, 7293 kHz, more. Contact af4k@hotmail.com or send SASE to Brian Carling, AF4K, 117 Sterling Pine Street, Sanford, FL 32773 or call 407-323-4178 http://www.af4k.com/crystals.htm

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

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

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

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

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

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

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

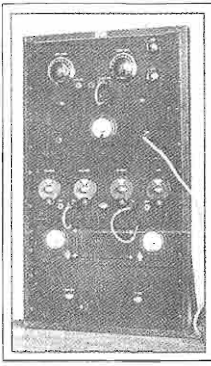
TREASURES FROM THE CLOSET! Go to www.cjpworld.com/micromart to find some unique items many hams would lust for! Gus, WA, 360-699-0038 gus@wa-net.com

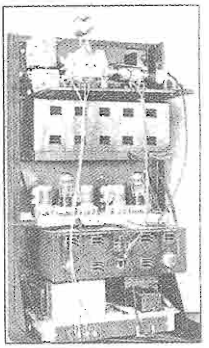
SERVICE FOR SALE: I build hot-rod receivers: R-390A, SP-600, R-388/51J. NC-183D and transmitters: Valiant, DX-100, T-4X-A-B, HT-32, AF-67. 51J-4 filter replacements, R390A Hi-fi AM $245.00 ea. Chuck Felton, KDØZS, Wyoming, 307-634-5858, feltondesign@yahoo.com

WANTED: Roll chart mechanism for TV-2 tube tester. Robert Harding, KC5LHR, 7917 Pickard Ave NE, Albuquerrque, NM 87110, 505-293-1074, rehardingiii@yahoo.com

WANTED: Military manual TM 11-5820-474-14 for AN/GRC-109. FOR SALE/TRADE: AN/GRC-9 manual (TM 11-263) Al, NI4Q, POB 690098, Orlando, FL 32869 407-351-5536 ni4q@juno.com

WANTED: 88mH telephone loading coils, contact Mike, VE7MMH. at: mike46@shaw.ca





REWARD – WANTED!

Will pay $1000 for a 1930s National type LRR 36" relay rack pictured to left. It is identified by its ¾" wide top and bottom crossmembers with a red "National Co.; Malden, Mass" decal on the top crossmember. Greg Gore, WA1KBQ; 10291 Kendan Knoll Dr.; Charlotte, NC 28262

704-503-5952
wa1kbq@aol.com

WANTED: SW3 coil sets for 20 and 40 meters. Only original 63A & 61A considered. Swap for restored, working Type 2 SW3. No tubes or coils. Roger, K1TG, rwkuchera@snet.net

WANTED: HRO-60 G, H and J coils. Please state price and condition. Phil Whitehouse, W1GEE. w1gee@yahoo.com

WANTED: Yellow sheets equip. guides. Also Yaesu FRG7, working condition, U-ship. Charles Bott, 14302 Texas Rd #37, St. Robert, MO 65584 573-336-2371

WANTED: BC-457A, BC-458A parts. Robert Caponi, 30 Revolution Dr. Leominster, Ma. 01453 recaponi@hotmail.com

WANTED: Collins 312B-4 winged emblem station console. Also bandswitch knob for 75S-1 receiver. Shannon, W3SML, 540-867-9294 w3sml@hotmail.com

WANTED: Allied-Knight T-150A transmitter in very good electrical and cosmetic condition. Alan Fremmer, KB2HEI, 550-H Grand Street, New York, NY 10002, 212-777-3630, awfremmer@aol.com

WANTED: PRC-47 RTs, modules, parts, or accessories. Tom, 303-979-6135

WANTED: BW-3008, 3011, 3012, 3018 Miniductors. Hammarlund MCD-140M dual 140pf variable. Pete Hamersma, WB2JWU, PO Box 467, Holderness, NH 03245. pehamers@worldpath.net

WANTED: Manual and schematic for Heathkit SB-230 or just the schematic. Will pay copy and shipping. Tom, w3bym@logonbasic.com

WANTED: Unmodified R44/ARR5, ARR41 receivers, J48 key, BC1003 loop antenna. Jeff, WB6ZBX 559 916 3311 vce.lab@att.net

WANTED: Philco model 47-1230 chassis only, must be useable with all parts. No tubes is fine. John Snow 1910 Remington Ct. Andover, KS 67002 316-733-1856

WANTED: Bud cabinet 15"W x 9"H x 10"D any condition. Also NC-303 National dead or alive. respond ke0mt@aol.com state condition and price

WANTED: James Millen plug in oscillator coils for Millen 90881 linear amplifier, Millen parts #s 43011, 43015, 43021, 43041 and 43081. Gary K2PVC; gschonwald @earthlink.net 917-359-8826

WANTED: Technical Materiel Corp (TMC) power supplies PS4 (low voltage and bias) and PS5 (high voltage) for the TMC PAL 1K kilowatt linear amplifier, also known as the RFD or RFA. Gary K2PVC; gschonwald@earthlink.net 917-359-8826

WANTED: Squires-Sanders SS-1R and SS-1V. Bob, WØYVA. 703 450 7049; robert@isquare.com

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

WANTED: Hallicrafters HT33 with salvageable power supply. The RF section is not required to be useable, need a power supply to contribute to one that is. Gary Schonwald K2PVC. gschonwald@earthlink.net phone: 917-359-8826

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

The Caps Are Back!

By popular request, we are offering another run of the popular Electric Radio baseball caps. These new caps are a nice 5-panel all-cotton style with an adjustable rear headband and a 3-inch front brim. The background color is light tan, and the ER logo is embroidered in 3 colors, not printed. These hats will hold up for a long time.

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Or on-line: www.ermag.com

WANTED: Technical Materiel Corp rack mounted antenna tuner and RF /SWR meters to be used with the 350-watt or 1000-watt TMC linear amplifiers. Will consider other TMC transmitting equipment and accessories for collection and on-air use. Gary Schonwald K2PVC. gschonwald@earthlink.net phone: 917-359-8826

WANTED: Need two Westinghouse RT35 0-1 RF amps, 3-1/2" round Steve Bartkowski, 1-708-430-5080

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

WANTED: Vacuum Tubes: 279A, 212E, 249B, 258B, 271A, 242A, C120, C100A, 804, RK20, CK70, GL805, C201, ZB-120, 802. Components for rebuilding Collins 30J RF output deck, including Cardwell or equivalent dual section variable 440 pF and 240 pF capacitors. Components for Collins 12H /12N speech input console, including preamplifiers and program amplifiers. Rod, W5CZ, 303-324-2725, rodperala@aol.com

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

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

WANTED: Clean National Select-O-Ject, NC-183DTS and Heath VX-1. Contact Ric at c6ani@arrl.net.

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

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

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

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

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

PRESS WIRELESS, NY: Photos, information wanted on Hicksville, Baldwin, Little Neck, Centereach, Northville facilities. George Flanagan, 42 Cygnet Dr., Smithtown, NY 11787 w2krm@optonline.net 631-360-9011

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

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

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

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

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

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

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

WANTED: TCS & TBY Navy radios. Ken Kolthoff, K8AXH, PO Box 215, Craig, MO 64437. 913-634-3863.

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

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

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

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

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

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

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

WANTED: Scott Special Communications rcvr. EA4JL, please call Kurt Keller, CT, 203-431-6850

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

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

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

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

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

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

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

WANTED: Radio correspondence course lessons by National Radio Institute (NRI) of Washington, DC. George Reese, 380 9th St., Tracy, MN 56175, 507-629-4831

WANTED: NOS 11" x 7" aluminum natural finish bottom plate for chassis. Louis L. D'Antuono, WA2CBZ, 8802-Ridge Blvd., Bklyn, NY 11209. 718-748-9612 AFTER 6 PM Eastern Time.

WANTED: R390, R390A and R392 receivers dead or alive or parts/assemblies. Any condition considered. Will pickup if you have enough items. Glenn, WA4AOS, 864-684-2956

WANTED: Mint, complete or parts sets. Hammarlund SP-600 JX-28 version, has nomenclature tag R-620, doesn't have name engraved on panel like others, 1937 RCA ACR-111, RCA CR-88B version, RCA AR-8516, TMC CV-1758 SSB converter, and DEI Defense Electronics TR-711 telemetry receivers and modules. Will send custom shipping carton for easy transaction/shipment. Dan Gutowski AB8VM P.O. Box 142 Dexter, MI 48130 734-718-7450. dg16ms26@msn.com

WANTED: Electric Radio Tuning Meter as shown in many back issues of ER. Joel, W7EPA, 928-231-3774, clarksnaz@msn.com, 1895 327th Ave, Wickenburg, AZ 85390

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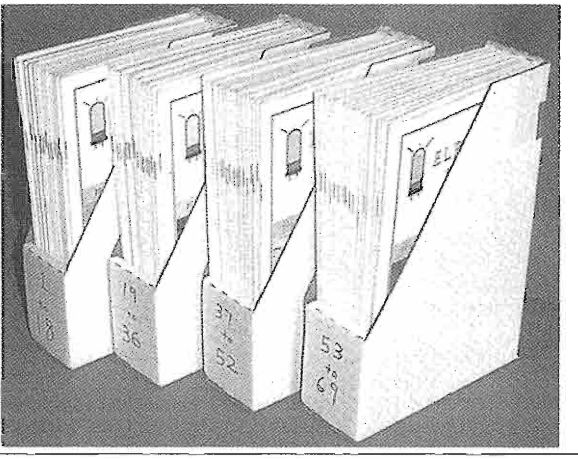

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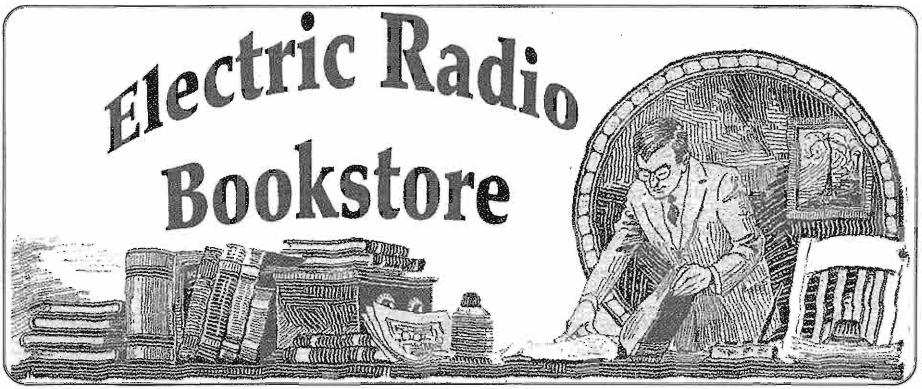

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Heath Nostalgia: Written by Terry Perdue, K8TP, an ex-Heath employee, this 124-page book is a great history of Heath and the Heathkits that we all remember. ------ $14.95-10% = $13.45

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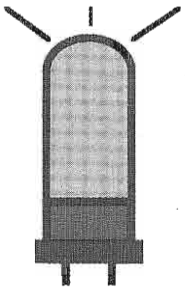

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Postmaster: Return entire magazine for address changes, do not destroy.