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ELECTRIC RADIO

celebrating a bygone era

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Dave Ishmael, WA6VVL

ELECTRIC RADIO

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WALT HUTCHENS,KJ4KV.....ELECTRIC RADIO IN UNIFORM
FRED HUNTLEY,W6RNC.....REFLECTIONS DOWN THE FEED-LINE
BILL KLERONOMOS, KDØHG.....VINTAGE PRODUCT REVIEWS
DALE GAGNON, KW1I..... AM REGULATION UPDATES

Electric Radio is published for amateur radio operators and others who appreciate the older tube type equipment. It is hoped that the magazine will stimulate the collecting of, and interest in, this type of equipment.The magazine will provide information regarding the modification,repair and building of equipment. We will also work to-wards a greater understanding of amplitude modulation and the problems this mode faces.

Electric Radio Solicits Material

We are constantly searching for good material for the magazine. We want articles on almost anything that pertains to the older amateur equipment or AM operation. From time to time we will also have articles and stories relevant to the CW operator and the SWL. Good photo's of ham shacks, home-brew equipment and AM operators (preferably in front of their equipment) are always needed. We also welcome suggestions for stories or information on unusual equipment. For additional information please write us or give us a call.

EDITOR'S COMMENTS Barry Wiseman, N6CSW/Ø

In this issue we have an article by Dave Ishmael, WA6VVL, on regenerative receivers; the Knight Ocean Hopper he restored and the '30-30' he homebrewed. This is the start of something that will be ongoing in ER; articles on relatively simple, easy to construct sets. We all have to admit that however sophisticated our present gear might be, the thrills we got from simple one and two-tube sets, when we were just starting out, are really hard to beat. The biggest or the best does not always equate to the most fun in ham radio.

I'm hoping that everyone enjoys this new series of articles and I also hope that it will inspire a lot of building. Maybe the kitchen table can once again become a radio workshop. Not all of us have the facilities to build big, elaborate rigs. Many of us don't have the time or dedication. But most of us can rustle up the handful of parts and the few tools to put together a simple set. We can all become builders. And by building small sets we have more of an opportunity to become really creative. Like Dave Ishmael doing his sets with plexiglass, we can explore other materials and methods as well. We can get very elaborate - etched front panels, lots of bakelite, etc. - or opt for wood,cardboard or maybe coffee cans. We can use authentic parts - and that's getting to be a real challenge- or utilize whatever we might have on hand or can acquire easily.

Please send in photos or your one and two-tubers (and larger) so that all of us can enjoy what you've done. Next issue, along with the regular fare, we'll have another article on Dave's two-tube transmitter. Following that, Bob Dennison, W2HBE, will describe his two-tube, 1933 "Campers Companion". This regenerative set brought Bob a second place ribbon at the recent AWA Conference in Rochester.

I'm looking forward to what we might start with this series. Hopefully we can recreate some of the excitement and fun we all had years ago with our first sets.

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New Products

Catalogs

There are three new catalogs that should be of interest to the readers of ER. The first one is from an entirely new company Antique Audio. See their ad on page 37. Their nicely organized catalog shows all the stuff we're interested in at very reasonable prices. The company is owned by Durell Roth, K5KZQ, and is located in Austin, Texas.

Antique Electronic Supply in Tempe, Arizona continues to expand their line of vintage radio products. Their new catalog - just out- is bigger and better than ever. If you're not on their mailing list, call or write for a catalog. See their ad inside the back cover. Some of the stuff they have is available nowhere else. I have heard only good things about this company and all my dealings with them have been very satisfactory.

I just received the new Tucker Electronics catalog #992B. Although they sell a lot of stuff - like computers- that some of us are not interested in, they do have the largest stock of test equipment in the country. Everything from early HP and Tektronix gear to the latest 'hi-tech' stuff is in their catalog. Other catalogs of theirs that I've seen have had other interesting gear like tube type transmitters and receivers. To order a catalog see their ad on page 48.

New Publications:

Two new publications that I really like are "The Ocean Hopper" published by Bill Albrant, K7JYE, and "The Vail Correspondent" by Tom French, W1IMQ.

"The Ocean Hopper" is a newsletter for those 'old boys' (and I mean that literally) who still have that "regeneration fever" (to quote Dave Ishmael). It's very narrowly focused on the Knight Ocean Hopper regenerative receiver kits that were sold back in the good old days by Allied radio. The newsletter (14 pages Xerox produced last issue) features short articles and letters mostly on the history and restoration of the 'Hopper'.

Bill Albrandt, K7JYE, says that the newsletter originated about 4 or 5 months ago when he started sending Ocean Hopper information around to his friends. He's done a good job and the newsletter is a good read if you're into Ocean Hoppers.

I asked Bill about subscription rates and he said that at this time the newsletter will be published "just whenever" and he would rather not get involved with subscriptions. If you'd like to get the next copy send Bill a dollar and an SASE. His address is 101 Acorn Circle, Brea, CA 92621.

Another nice little production is Tom French's "The Vail Correspondent". This is a quarterly for key collectors and features articles on keys and a classified section. The premier edition which came out last month is very impressive. Although it is produced on a copier and consists of only 12 pages including cover, Tom has done a very nice job. All copies are sent via First Class. The cost is $10 per year or $2 for a sample. The address is TVC, Box 88-E, Maynard, MA 01754

Heath Nostalgia is a book about the Heath Company of Benton Harbor, Michigan written by Terry Perdue, K8TP. I think it may be the only book on Heath in print. I enjoyed reading it.

The book consists of three sections. The first is on Heath history, the second is called "Picture Potpourri" (pictures of Heath employees, products, etc.) and the third and largest is "Memory Miscellany" that is put together from contributions of past Heath employees.

I recommend this book not only to Heath collectors but to all vintage radio enthusiasts. I think it's well worth the $9.95 asking price. It can be ordered from Heath Nostalgia, 4320 - 196th, S.W., Suite B-111, Lynnwood, WA 98036.

N6CSW/Ø

A Letter From Gaithersburg

Sunrise 6:47 AM, gates open 6:00 AM. At Gaithersburg the truly faithful start with flashlights. One of the largest hamfests in the East, G'burg (properly called 'F.A.R.FEST', the annual hamfest of the Baltimore/Washington area Foundation For Amateur Radio) is also among the best by almost any measure.

Take size for example. Gaithersburg '92 was vast, taking 15 minutes to walk from end to end even if you ignored the many 'sidestreets' and had the superhuman willpower to avoid stopping at any the tables.

Or take variety. There was truly something for everyone, from the only marginally ham-related (computers, VCR's and satellite gear) to the hard core -- Heathkit, Johnson, Collins by the ton, Hallicrafters, lots of Drake, and more than a sprinkling of interesting military radio gear.

Among noteworthy items: a rusty Viking II for $50 and a fairly good one for $125 with VFO; a nice looking Apache for $100; a repainted and dirty Heath HW-101 for $125; a good NC-183 offered at $110; a tobacco stained FT-101 (no letter) for $325; an SX-101 for $100, and an HT-32B for $125, both good; and a fair HT-32 at $80. A complete Eldico R-104 and T-102 station (clones of the Collins 75S1/32S1 system) in fair condition went to a new home for $200. An unused (slightly shopworn) GRC-9 was 'stolen' for $30. There was more than the usual amount of restorable 'command' gear and a number of 'never saw one of those before' items -- a manual for the ATA/ARA sets, one for the ARC-5 in the original Navy binder, and a dummy load for the GF aircraft transmitter.

Now is not the time to buy a KWM-2A. Prices -- firm at $600+ only a couple of years ago -- dropped to $400 last spring as the military began unloading the RT-761, the KWM-2A's military name. G'burg of-

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Only the Goodyear blimp could show the entire G'burg hamfest in one photo. This aisle stretches almost to the trees in the distance and there were several more like it.

ELECTRIC RADIO IN UNIFORM

by Walt Hutchens, KJ4KV
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"The RAX-1 Receivers"

Of the early WW II multiband communications receivers the most popular with hams was probably the US Army's BC-348 liaison receiver, used throughout the war in large aircraft such as the C-47, B-17 and B-24. The U.S. Navy also had large aircraft but because it had only a fraction as many as the Army, the 'Navy BC-348' is both rare and almost unknown today.

The RAX-1 deserves better than that, for it is not only a better receiver in some ways than the BC-348, but it is the father of another military receiver and probably at least an uncle of the most famous one of them all – the WW II command receiver.

Overview

The RAX-1 equipment is a group of three liaison receivers. ('Liaison' means used for long range communications, generally in patrol aircraft, bombers, and transports needing to communicate with a base at ranges of hundreds of miles.) The set covers the range 200 kcs to 27 Mcs, as follows:

CG-46115 (unit no. 1) 200 to 1500 kcs in 4 bands,
CG-46116 (unit no. 2) 1.5 to 9.0 Mcs in 4 bands, and,
CG-46117 (unit no. 3) 7.0 to 27 Mcs in 5 bands.

The 'CG-46xxx' is called a Navy Type Number. The 'CG' means 'Contractor General Electric Co., the '46' tells you that it is a receiver, and 115 through 117 are consecutive numbers running from the beginning of this system around 1920. Navy Type Numbers were used until the modern 'AN' system was adopted in July 1943.

The receivers are 7-1/2" x 7-1/2" x 17" (H x W x D) and weigh about 22 pounds not counting the mounts or junction box. They are six (unit 1) or eight (units 2 and 3) tube superhetrodynes. It appears that all of the sets were built on two contracts, dated 1940 and 1942.

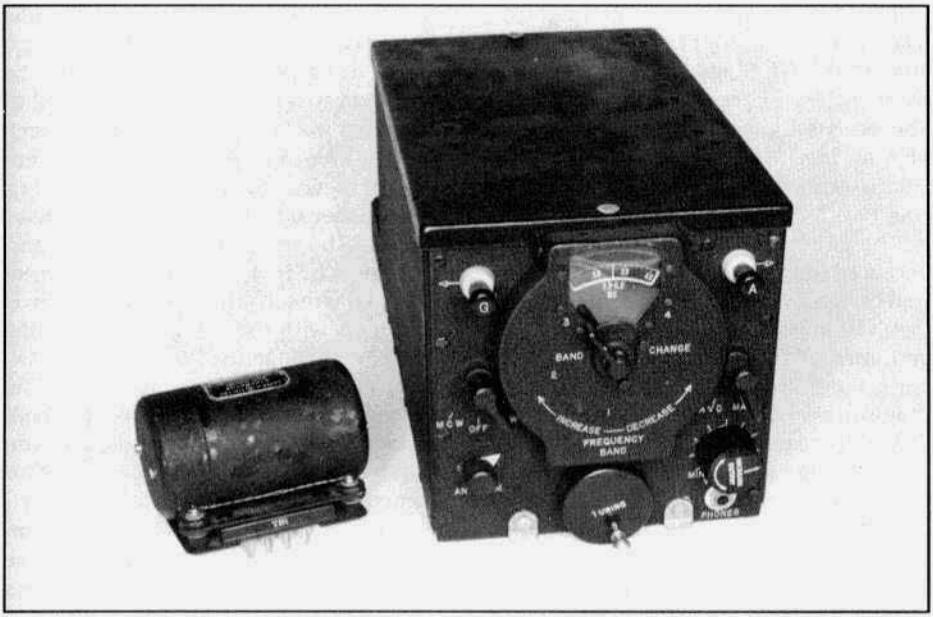
The receivers are directly calibrated in frequency. They are designed for local control only and for output to 600-ohm headphones or an aircraft intercom system. There is a fixed frequency BFO but no crystal filter, calibrator, or noise limiter. There are no external accessories. The RAX-1 is designed for 24-volt DC operation using a dynamotor mounted on the rear of the set.

History

I have almost no historical information on these sets. The original set, the RAX, was probably developed around 1936. I have never seen one and it is likely that very few were made. From the types of tubes it uses the RAX-1 is a 1939 design.

The set was probably used in large patrol craft such as the PBY with such transmitters as the GP, GO and ART-13.

From the serial numbers of the units I have, it appears that about 7000 sets (21,000 receivers) were made; that's about one for each 75 command sets, so it isn't surprising that there aren't many to be found. Conversion articles appeared in CQ and 73 Magazine in 1963, so that's probably when most RAX sets reached the surplus market.



Is the RAX-1 really the ugliest U.S. military receiver? Shown here is unit 1; the others are similar except for the location of the antenna terminals. The dynamotor for this set is unlike any other I've seen in connecting by four male banana pins on the bottom.

Design

This is about the least exciting design you can imagine, both mechanically and electrically. The sides are spot welded to the flat chassis and rear plate; the front panel is held on with machine screws. Like the command receivers, the chassis extends behind the tube compartment and the dynamotor plugs into a socket on this shelf. Other power components such as the fuse, noise filter parts, and power connector are under and beside the dynamotor. Early production RAX receivers have cotton braid over rubber insulation on the wiring; later sets got waxed cotton braid.

The bandswitch and RF/oscillator coils run back from the panel above the chassis. As on the BC-348 the switch section, trimmer capacitors and coils for each stage form a unit inside a shield can. On the BC-348, the switch shaft is fixed: repairing a coil assembly means unsoldering a few wires from the antenna coil unit, taking out the mounting screws and sliding it off the shaft, then doing the same for the first RF coil assembly -- and so on, until you get to the unit with the problem. The oscillator coils, of course, are the most complicated (and thus the most likely to fail) and you can guess which assembly is last. On the RAX, loosening a setscrew lets you slide the switch shaft out through a hole in the back of the case; any coil unit can then be removed without taking out the others. There are more screws to take out than on the BC-348 but the electrical connections are simpler.

The tuning capacitor is below the chassis right under the switch/coil units. The tubes and IF coils form a 'U', open toward the panel, around the RF parts. The arrangement is sturdy and allows the simplest possible bandswitch and tuning dial drives. The tuning rate of unit 2 is 40 kcs/revolution at 3885 kcs; unit 3 tunes 110 kcs/revolution at 14,286 kcs. These rates are about twice those of the BC-348.

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The electronics are equally straightforward. In the two higher-frequency units two 12SK7 RF stages feed a 12K8 converter tube with the triode section used as the local oscillator. There are three 12SK7 IFs, a 12SR7 detector/BFO, and a 12A6 audio output tube. Unit 1 has only one RF and two IF stages.

The gain control is the usual military receiver combination RF/IF cathode rheostat on the same shaft with an audio gain pot. On units 1 and 3 a second rheostat mounted on the rear of the tuning capacitor is connected in the cathode of an RF stage on the higher bands to compensate for the increase in Q of the coils by reducing the stage gain as the set is tuned to higher frequencies.

A parallel tuned circuit in the cathode of the audio output stage tuned to about 6000 cps helps to cut off the response sharply above voice frequencies.

Plate voltage is only 166 volts, contributing to long life for both the tubes and other parts. This is the lowest voltage used in any military receiver I've seen with these types of tubes.

The three receivers are intended to be used together. When installed as a group the antenna connections are wired in series; unit 1 is supposed to be last so it has one end of the antenna coil grounded internally, unit 2 is next and has binding posts for connections to both units 1 and 3, and unit 3 is closest to the antenna and also has two binding posts. When any unit is used alone, the 'G' (next receiver) post is to be grounded.

With three side-by-side receivers running from the same 24 VDC line and wired in series on a single antenna lead, interference is to be expected and precautions have been taken to reduce it to a minimum. There's a pi filter in the 24V power lead and separate filters in the plate voltage supply and oscillator filament leads. A trap adjusted to the IF frequency is provided in the plate circuit of the first RF stage of the unit 2 receiver. Even so, according to the manual spurious signals of up to 50-200 microvolts (roughly S9) can be expected.

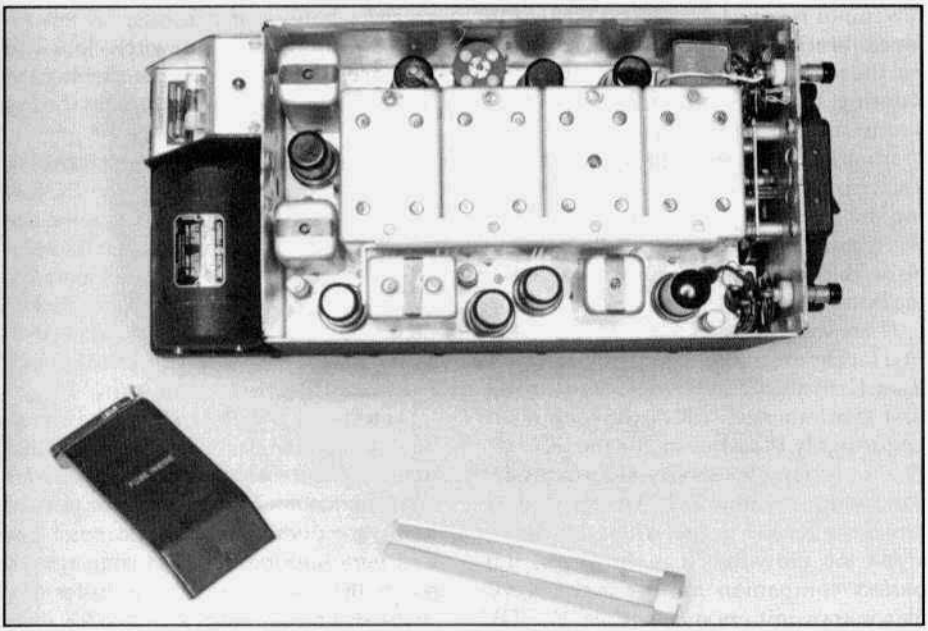
The design may be unexciting, but the attention to detail is outstanding. All of the many machine screws go into either a tapped hole or a spun-in elastic stop nut -- you never have to juggle a nut, a lockwasher and a screw. All the setscrews (knobs, bandswitch shaft, dial and bandswitch drive gears) use a No. 6 Bristol (spline) wrench; the proper wrench is mounted with the spare fuse under the rear cover. The control knobs all have two setscrews and the shafts have a shallow groove where the setscrews land; if both screws come loose the knob will turn on the shaft before it falls off, giving time for someone to notice and fix the problem.

Vacuum tube voltmeters weren't common in 1939; the manual tells you the oscillator grid current in microamperes rather than just saying 'sorry, the grid voltage can't be measured with normal instruments' as many of the early WW II manuals do. And (for those who think such things weren't needed until SSB came along) it is suggested that the IF alignment be done using a sweep generator and oscilloscope because the last IF transformer of unit 2 is overcoupled. If a sweep generator isn't available, then we are told to align in the conventional manner but check for a symmetrical passband.

On The Air With The RAX-1

When you find six sets of one type and all of them have been converted it tells you that the unit was popular with hams. The bad news is that most of them were 'improved' beyond restoration. Of my six radios, only two do not have front panel sheetmetal changes and there is only one power connector, one dynamotor, and three sets of power line filter circuit parts among them.

I picked one of the unit 2 sets as the best candidate and plunged in. The first step was reconnecting the power wiring. It took a couple of hours to get the dynamotor primary circuit back to working condition; next came the filaments. My hopes



Top view of the RAX-1 showing dynamotor and fuse/spare on rear deck. The tongs (stowed inside the top cover) are used to remove and replace tubes; they would be more effective with non-skid tubing on the ends.

had been raised by finding six-volt tubes in the set -- perhaps the former owner had taken the easy route to operation on 12 volts? But, no such luck; the filaments had been rewired for use on six volts, forcing another couple of hours of head scratching and soldering while enjoying the delicate aroma of burning rubber insulation.

My XYL was on hand when at last I hooked up a small bench supply, threw the switches, and heard the dynamotor purr into action. Nothing from the headphones though. Marie's voice had an urgent tone: "Isn't that smoke?!" Sure enough, a blue thread was twisting upward from a 2.2k resistor. It took only a few minutes to find the cause -- the rotor of one of the IF transformer tuning caps had fallen out, causing a high voltage short.

Fortunately, on the RAX you can take the IF cans off to expose the insides without having to disconnect the wiring. The rotor of the Sickles-made 'APC' type air trimmer caps is held by a pressed-on sleeve -- but the fit on this one was just a bit too loose. A tiny drop of 'Krazy Glue' and with the aid of a strategically wedged screwdriver I twisted the sleeve back on to the shaft -- permanently.

Noise from the phones at last. I tune down to 1500 kcs (band1) just in time to hear a spectacular play by Baltimore Orioles center fielder Mike Devereaux. Not bad for a 50 year old receiver with no antenna.

Bands 2 and 3 are likewise okay. Band 4, however, is dead. Looking at the tops of the air trimmers for the RF stages, the reason becomes clear -- another one of those Sickles trimmers has lost its head, that is, its rotor. To apply the Krazy glue fix to this one, the oscillator coil/bandswitch assembly has to be taken out but the job is a whole lot easier than on the BC-348 and BC-312. It gets even easier with practice and while doing the alignment I got more of that: the rotor also fell out of the band 4 antenna coil trimmer.

At last I had everything working. A

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few minor repairs later, the set was ready for calibration. Not only was it easy to do but the results were amazingly good, considering that the only adjustment is a shunt trimmer across each coil. After calibrating as directed about 5 turns of the knob from the top of each band and tweaking the plates of the oscillator section of the tuning cap to minimize the average error, the largest error is about 3 kcs, near the bottom of band 2.

There were no parts failures during the first few hours of use – unusual for a WW II set. Drift at 3885 kcs is about 1 kcs in the first 45 minutes; at 7250 kcs it is about ten kcs; roughly the same as for the BC-348. The 'only fair' selectivity (13.5 kcs 6dB bandwidth for unit 2, 20 kcs for unit 3) limits the RAX-1 to use when the bands aren't too crowded. It is, however, the perfect companion for the early Navy liaison transmitters such as the GP, ATB, ATC, and ATD; it is in the process of becoming the mate for the ATB here.

Conclusions

Ugly and unexciting it may be, but looking at the things one demands of a military receiver the RAX-1 scores well: there are a minimum of controls and they are well marked, easy to operate, and rugged. The simplicity of the design reduces the chance for parts failures and compared to most 'exciting' sets the RAX is a cinch to repair.

The accurate dial calibration is particularly noteworthy: even without the slight capacitor plate bending that I did you could (after warm-up) set this receiver by the dial and hear a calling station. No BC-348 that I've seen comes close to passing this test.

Such precise calibration required that the oscillator coils be made very accurately, suggesting that GE's detail design process (in which a working prototype and schematic are converted into specifications) and quality control (to make sure that parts made for the set meet the specs) were unusually effective.

Turning a knob clockwise should increase whatever it controls; on this receiver turning the bandswitch clockwise increases the frequency but turning the tuning knob clockwise decreases the frequency.

For ham use, the RAX-1 sets have two big disadvantages compared to the BC-348: there is no crystal filter and the tuning rate is much faster. On the other hand the accurate calibration is a pleasure and most any RAX which hasn't been too badly hacked up is likely to be easier to get working than a BC-348 with the usual 15 or so leaky black plastic paper capacitors.

As to 'ugly', is there anything more pug-ugly than an M1 rifle or a jeep? For that matter, is Patton or Nimitz remembered for being handsome? When a man or piece of hardware does the job, appearance just isn't very important, in fact sometimes it seems that 'ugly' adds to the luster of a successful career. Overall, the RAX units are excellent military sets, fully the equal of the BC-348 as WW II liaison receivers.

The most obvious 'relative' of the RAX sets is the BC-652, the receiver of SCR-506, the Army's 90-watt CW and 25-watt AM mobile communications set from WW II. Developed by GE during the early years of the war, the BC-652 covers 2 to 6 Mcs in two bands. Though many details differ it has the same arrangement of coils, bandswitch, and tuning capacitor, the same general stage layout, a similarly low plate voltage of 172 volts and even the exact same tuning knob.

The other probable relative is the WW II command receiver. Here the family ties are less definite but the use of a slide-in rack of similar (but much improved) design, a dynamotor mounted on the top rear of the chassis and even the tube lineup suggest that Aircraft Radio Corp. was looking at the RAX as well as at the previous generation command receiver (the RU) when designing the ARA.

We have been comparing GE's RAX to the RCA-designed BC-348: what can we learn more generally by comparing military sets from the two companies? We have

A typical defaced RAX nameplate; this one has been altered by drilling away the contract date.

studied two GE military sets: the BC-375 liaison transmitter and the RAX-1; both are unexciting but competent and both show an effective design process, attention to detail, and good quality control.

The BC-348 is one of three RCA sets we've covered: the other two are the BC-474 portable transmitter receiver and the SRR-13 communications receiver. Of these the '348 is the best job with only inaccurate calibration showing evidence of quality problems. The other two have multiple problems both in design and quality control.

RCA gave up the ghost a few years ago, becoming a subsidiary of GE. You can't help wondering if this is related to the facts just mentioned.

Those Damaged Nameplates

A curiosity noticed by several collectors is that the contract date on many early Navy aircraft sets has been removed from their nameplates. For example, 3 of the 5 RAX-1 receiver nameplates and 4 of the 11 ATA/ARA sets here have this damage. Many different methods were used. In some cases the corner of the nameplate has been broken off, others were neatly done with a router or end mill, on still others a twist drill has been used to remove the information, and yet others were done with a cold chisel or scraper.

All of the sets with altered plates have 1940 to 1942 contract dates. The variety, and in many cases, crudeness of the methods argues against the alteration being done at the Naval Airplane Factory or an Overhaul and Repair Facility.

In addition, I have some 1942 ATA/ARA sets with the raised contract date replaced by a raised blank area, as if the contract date was removed from the nameplates by the manufacturer during the production run.

The reason for this is probably interesting: does any reader know the story? Does anyone have equipment other than the ATA/ARA sets and the RAX receivers with an altered nameplate? **ER**

The Collins 75A-Series Receivers: A Legacy of High Quality

Part 2, the 75A-1

by Ray Osterwald, NØDMS
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Lakewood, CO 80227

1948 was the first full year of production for the revolutionary new Collins 75A-1 receiver, advertised as the "first really new design since the introduction the superheterodyne. As only a few of us were active in 1948, perhaps a quick review of that year would be in order before going on with the 75A story.

The state of the radio art in those times had been fast changing, and was witnessed by many operators. It was hard to believe that it had been just 25 years since the first trans-Atlantic amateur QSO. The three operators involved with that pioneering 100-meter contact, Leon Deloy (F8AB), John Reinartz (W3RB), and Fred Schnell (W9UZ), were still alive and working, but Deloy was no longer licensed.

The 1947-1948 period was at the peak of solar cycle 18, and it was an excellent time to be on the air with a hot new receiver. VHF'ers were hoping for the MUF to hit 50 Mc., but use of the new 15-meter band had not yet been authorized. Various amateurs were conducting propagation studies up there. Television interference was starting to become a major problem for the amateur community. Designs were published where an entire transmitter was built up enclosed in copper shielding screens. As a public relations gesture, Hallicrafters donated one of their model T-54 television receivers to the ARRL lab. The ARRL was investigating various TV sets, so that the effects that an amateur 15-meter transmitter would have on a TV 21 Mc. sound IF channel could be predicted.

There were lots of published plans for rotary beam antennas, but most of the 80,000 licensed hams didn't have one. High-power amplifiers were not as common, either. A fixed flattop wire beam was much more common. Steel towers were rare, but there were some homebrew wooden towers. The Quad antenna was introduced in November '48, having been invented at HCJB in Quito, Ecuador a little earlier. For the DX man, more and more countries were once again allowing radio operations. The surviving overseas operators were forced to go on the air with whatever simple materials they could lash together. A July, 1948 DX'pedition to semi-rare Nassau, Bahamas (then VP7) described using a length of lamp cord hanging out of the hotel window as their main antenna! These styles of operation meant that for a DX'er, receiver sensitivity was one of the most important specifications. Receiver dynamic range numbers were unheard of at this time. Generally, problems with receiver cross-modulation were still confined to areas of the country where there were lots of hams in a small area, or to a field day site.

In one of the most prophetic articles of the post-war era, Byron Goodman introduced the transistor as an "amplifying crystal" in October 1948 QST. His closing remarks mentioned, in part, that "these clever little devices are well worth keeping an eye on."

Nearly every issue of every amateur magazine had at least one monthly article dealing with the merits of single-sideband or narrow-band FM. The storm of controversy surrounding SSB was evident by the volume of letters from the readers. Another hot topic was the value of coax feedline vs tuned feeders.

Collins 75A-1 receiver.

For members of the ARRL, a sad event was the passing of Ken Warner, W1EH, in September, one of the real old-timers.

Production Of The 75A-1

It was under these conditions that engineer Lou Couillard took the initial 75A receiver design, merged it with what was learned from the field samples, and produced what we knew today as the 75A-1. At Collins, Mr. Couillard went on to become the project team leader for the R-390 receiver in 1949.

I have been unable to find an original schematic for the 75A design, so some speculation is necessary. Looking at the 75A-1 front panel (Figure 1), it is obvious that a noise limiter switch has been added. In the original design, the limiter was in-line at all times, which possibly lead to comments of audio distortion on strong signals. From photographs of the 74A bottom view (Figure 2), and the 75A-1 bottom view (Figure 3) several other changes are evident. Exchanged were the positions of four power supply components, L28/C84, and V14/L29. This move placed the hot rectifier tube to the outside of the chassis, near the cabinet vents, and away from the BFO components. This might have been done to cure some degree of BFO instability. It also looks like C84, the filter condenser, was changed from an octal base plug-in unit to a more typical (and less costly) twist-loc type. There may have been a problem with feedback in the power supply, because an aluminum shield was added between the power supply section and the IF strip. In the front end, the crystal oscillator tube was moved physically closer to the first mixer, and one of the sealed, oil-filled bypass condensers along the left edge of the cabinet was removed. In view of these differences, it is unlikely that a 75A would have been converted to a 75A-1 without a major rebuild, as a chassis change-out

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Collins 75A-Series from previous page

would have been necessary. What is more likely is that an unsold 75A may have had a serial number plate installed with a 75A-1 model designator!

Circuitry

On a Collins 75A-1 receiver, tuning around with the VFO knob also tunes the entire front-end. The VFO is slug-tuned, and all the slugs in the system are matched to variable pitch coils. The entire tuning system is thus made linear. With so many stages tracking together, system Q and overall selectivity are maintained at a high level. Ed Andrade, the designer of the Collins S-line receiver, points out that the 75A-series receivers, with their tuneable first IF and a tracking RF preselector, actually have greater immunity to out-of-band energy than the later S-line units.

The grid and plate circuits of the RF amplifier, the first mixer, and the first IF amplifier stage are ganged together and tuned via the gear-driven slug rack. Actually, only the 80-meter coil slug in the RF amplifier grid and plate circuits is driven from the slug rack. When the bandswitch is operated, additional parallel resonant circuits are switched in parallel with the 80-meter network as necessary to change the RF tuned frequency. This maintains the same value of Q over all band ranges. For the time, this was a unique method of bandswitching. The bandswitch also turns on a separate set of lamps for every band to illuminate the slide rule dial, a very attractive feature.

The RF amplifier used is a 6AK5 pentode. This is a very sharp cutoff tube originally designed for wide-band UHF amplifiers during the war. It has very high gain and an equivalent noise resistance (ENR) of 1700 ohms. Delayed AGC is applied to its control grid, which makes the RF stage susceptible to distortion in the modern environment. In 1948, it was a logical choice, as they were after high sensitivity.

The RF preselector feeds a 6SA7 first mixer, using a separate oscillator tube and high-side injection. The 6SA7 is hard to overload, but is very noisy. Most of the wide-band "hiss" in the A-1 comes from it. With an ENR of 247K ohms, the 6AK5 RF amp has trouble overriding this much shot noise above 20 meters. (Owners of 75A-1s should always keep a "strong" 6AK5 in their receivers). The 6SA7 was largely replaced in the industry with the miniature 6BE6, and was listed by the late '50s for replacement purposes only.

The first IF amplifier has a bandpass of 2.5 to 1.5 Mc. when the receiver is tuned on the 80-to-15 meter bands, and 5.5 to 3.5 Mc. on the 11-and 10-meter bands. These frequencies were chosen as a "best compromise" in avoiding harmonic response, yet the use of a high first IF yields an image rejection ratio on 10 meters of 50 dB with only one RF stage. The IF amplifier tube chosen was the very remote cutoff 6SK7 pentode, which is noted for its near total immunity to cross-modulation. It takes -35 volts of bias to cut the plate current off. Unfortunately, as we know now, most of the distortion in receivers occurs long before the IF amplifier. The 6SK7 is fairly quiet, at 11K ohms ENR, but there is already plenty of signal and noise coming into its signal grid and the low-noise characteristic isn't of much advantage here.

The second mixer is the old faithful 6L7. It gets its oscillator injection voltage from the 70E-7 PTO. It's a good thing that the 6L7 is not used in earlier stages, as it is an extremely noisy tube at 395K ohms of ENR. When the receiver is tuned in the 80-to 15-meter bands, the PTO fundamental of 2 to 3 Mc. is used for low-side mixer injection. When tuned in the 11- or 10-meter band, the second harmonic of the PTO is used for high-side injection. This is another example of Roy Olsen's unique design work, which minimizes harmonic response and at the same time provides a fixed 500 Kc. IF to develop high selectivity.

A conventional crystal filter follows the 6L7. It is very effective and meets all Collins specifications. Judged by "cali-

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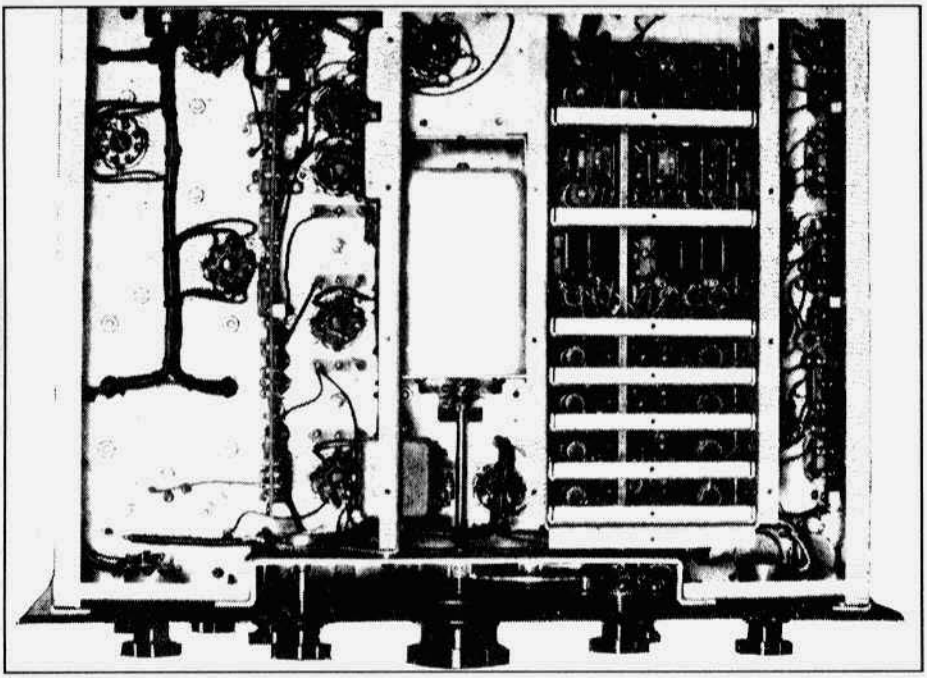

Figure 2. Bottom view of original 75A

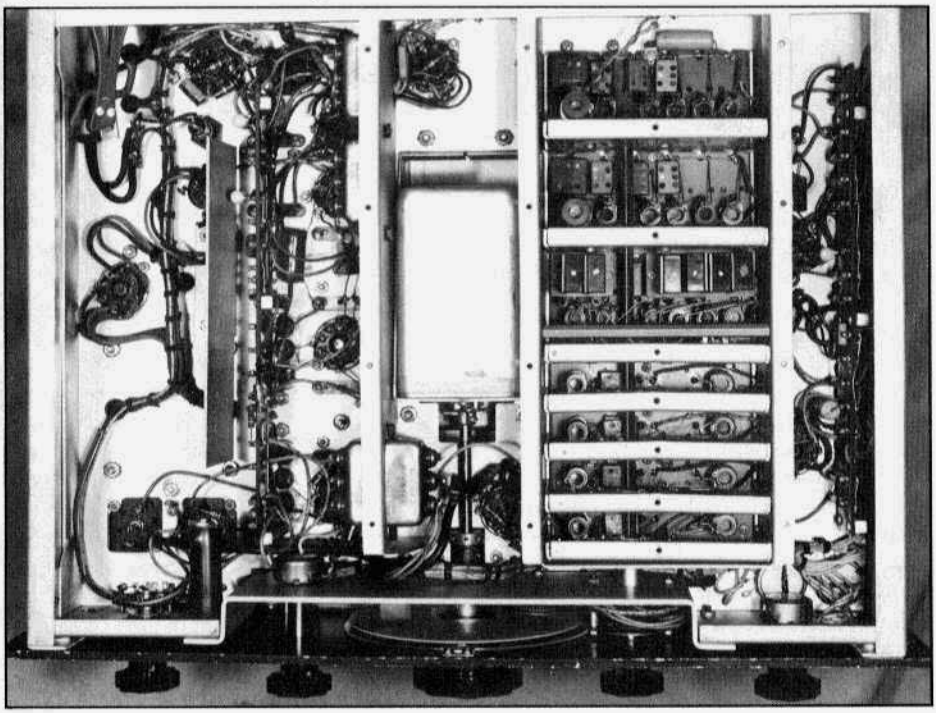

Figure 3. Bottom view of the 75A-1

Collins 75A-Series from previous page
brated ear", changing filter bandwidth does change gain through the filter stage, but not by as much as with other receivers.

Following the crystal filter are two stages of conventional IF amplification. The amplifiers use 6SG7s, which are semi-remote cutoff pentodes having an ENR of about 3.2K ohms with the current ratios used in these stages.

A self-adjusting series type noise limiter is coupled to the detector load resistor, so that the detector always clips positive and negative peaks that exceed 35 percent audio modulation. This circuit was developed during the war, and had not been used before in amateur gear. It was shown in every ARRL handbook thereafter for about 25 years!

A fairly unique system of amplified AVC is used in the 75A-1. A fixed bias voltage is placed on the cathode of the AVC tube (6SJ7 pentode). This voltage corresponds to the amount of delay that was deemed necessary to avoid AVC action on weak signals. The plate is coupled to the IF, and when the IF voltage is higher than the bias on the cathode, the tube turns into a rectifier. AVC bias voltage then appears on the AVC line and is applied to all gain-controlled stages, and to the S-meter. AVC is not available on the CW and SSB modes, as BFO energy would capture the AVC rectifier. A 100 dB change in RF input causes a 5 dB change in audio output, which is impressive performance.

The BFO panel markings are accurate enough to be used to determine a received signal frequency, which also had not been done before.

The remainder of the 75A-1 is conventional and won't be discussed, except to note that the output tube is a 6V6, running at 8 to 10 percent total harmonic distortion at 2.5 watts output.

Construction And Performance Data

The evaluation receiver in the photographs (S/N 1822) was supplied through the courtesy of George Maier (KU1R). George did a magnificent job restoring it to operating condition. He obtained it from Dale (KW1I), who bought it some time ago at the Deerfield swap meet. One of its early owners, possibly the original, was F. Mazza, W2KHG.

Collins' high quality construction standards are obvious when looking at this receiver removed from its cabinet. The chassis is built up from several individual sections, which is labor-intensive but very strong. The 75A-1 has tighter shielding and higher quality components than in the later receivers. The bandswitch extends into separate shielded compartments, and there is shielding fingerstock between the ends of the shield sections and the side walls! Every stage is bypassed with sealed, oil-filled, multi-section condensers. These are mil-spec units which will last several lifetimes. The power supply filter, although grounded through its mounting hardware, has an additional ground lug which is soldered to the shield wall between the power supply and the IF strip. High quality Allen-Bradley type "J" sealed pots are used for AF and RF gain controls, and are even installed on the little used S-meter adjustments. This is truly deluxe construction, as these pots rarely break down or get noisy. Just like the advertisement says, no control on the front panel changes the received frequency except for the tuning knob.

In the minus category, the hum level is too high to suit me. I replaced the filter condenser, but the hum remains. The limiter introduces distortion with strong signals because the clipping level isn't adjustable, and pops and clicks are still strong enough to hurt your ears with the "cans" on. There is too much play in the 75A-1 slug rack, and alignment can be affected by end play. This was eliminated, starting with the 75A-2 receiver.

I did a full alignment in order to do the performance test, and made no improvement over KU1R's alignment. I discovered a few items worth mentioning, how-

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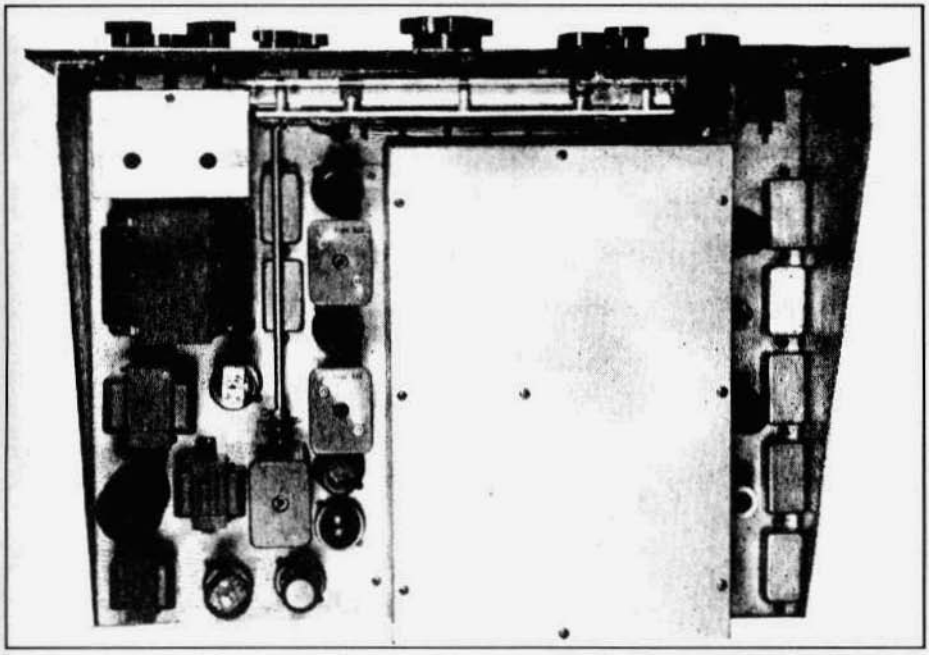


Figure 4. Top view of original 75A

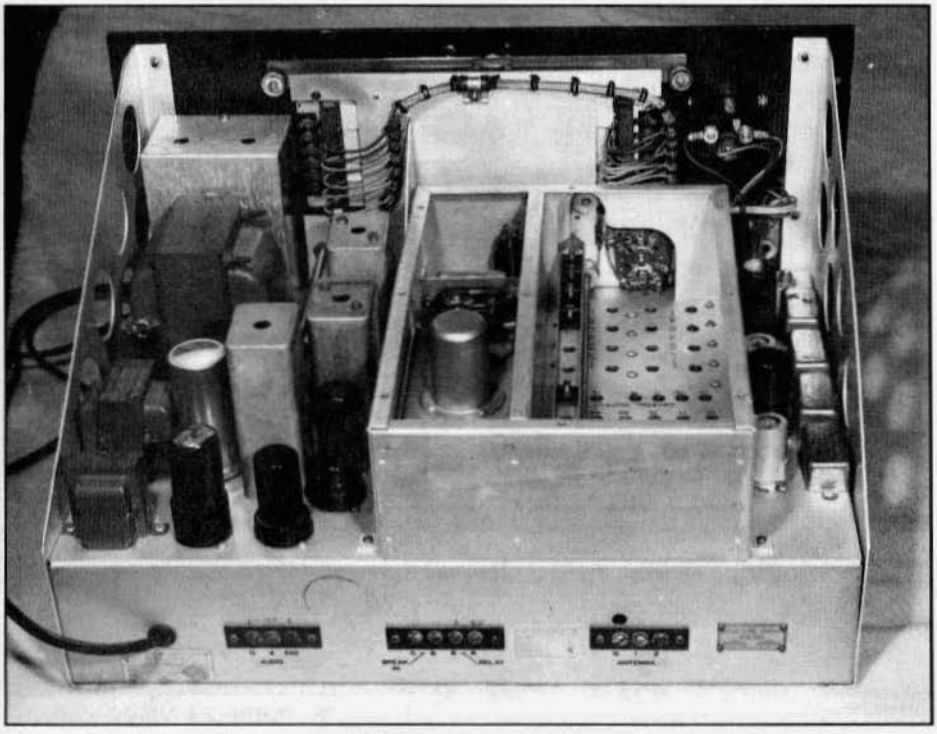
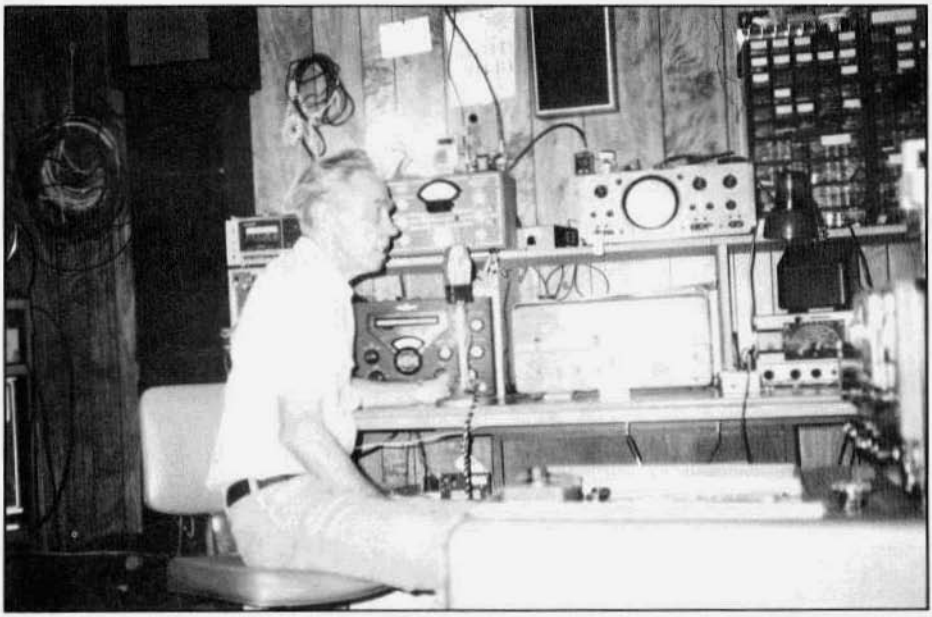
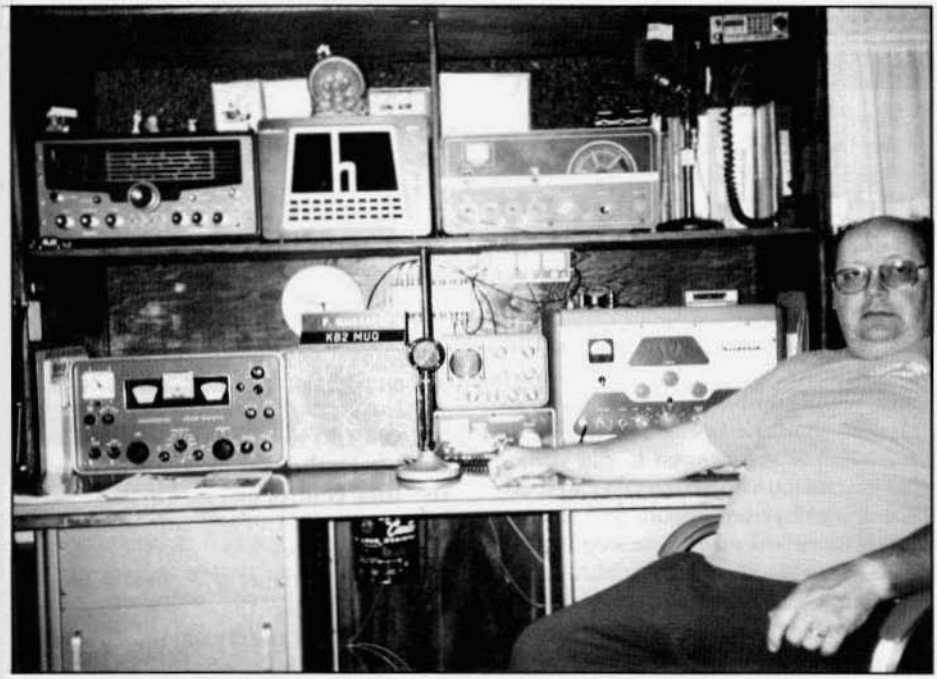


Figure 5. Top, rear view of the 75A-1

Frank Rasmusson, KA9VPH, at the controls of his regenerative set. He operated this set recently as part of a special event station commemorating Armstrong's discovery of the regenerative circuit.



Willis Seaman, W9FGJ, operating his Johnson Desk KW. Willis is a regular with the Westcoast AM'ers on 3870.



Paul Maikranz, KB2MUQ,with his vintage station. SSB gear is located on the upper shelf - SX-101A and HT-37- and AM gear is below.

John Maver, W6MQK, in his vintage shack. Note the well-designed operating desk and shelves.

Collecting/Repair/Restoration ...Tips

Foreign Tubes

Over the past few years I have purchased a number of new manufacture tubes made "offshore" for both my hobby boatanchors as well as commercial transmitters I maintain. It appears that in virtually all cases, these 1990's tubes just don't cut the mustard. In our commercial transmitters, the 250-watt output bottles we were using of Chinese manufacture were lasting six months or less, with a number of failures due to low emission, shorts or opens, where the old Eimacs and RCAs we used would last for what seemed forever. Jeff, KEØMT, a broadcast engineer by trade, reports he refuses to buy any more new manufacture 833As and pays a premium for old stock RCA bottles when he needs them. The latest, and last straw was the recent purchase by both Ray, NØDMS and myself of a number of receiving tubes from a New York distributor who recently began advertising in QST. The "magic eye" tubes Ray purchased were apparently relabeled by the distributor with fictitious tube numbers, and out of the five only two were functional. I purchased five 6BA8As and ran them through my Hickock 752 tester. All five appeared to be of recent Far East manufacture being labeled Japan, and all five had serious flaws such as way out of spec transconductance, being totally dead or utterly failing emission test at 10% low line.

I could go on and on, but my point is that it appears that the bulk of the tubes being made today are garbage - either by accident or design. I personally can't see how anyone could make and sell a 6BA8 for $3.75 today unless they're made in a Chinese prison camp!

Perhaps some ER readers in the know could comment in future issues on their amateur or professional experiences with these new manufacture tubes. Until then, God bless the proprietors of Fair Radio and Antique Electronic Supply, their stock made in Harrison, NJ, Hicksville, NY and Queensboro, KY and the skilled craftspeople who worked the tube lines in the "bygone era" we celebrate!

Bill Kleronomos, KDØHG

UpDate to the NC-300 Update Article

I neglected to mention in the "NC-300 update" article last month that if your distortion on SSB still exists after installing the modifications outlined, then reduce the value of C55 from 5 pF to 2 pF. This will eliminate any tendency for overload into the 6BE6 product detector on strong signals.

Also, for the best SSB reception on your NC-300 I have found these control settings to be the best overall. First, switch the Tone control just to 'on' position, no further. It puts a .01 mfd cap in series with the first audio vs. a .001 and gives deeper, richer audio quality without affecting the highs. Next, place the selectivity switch to position 2 and the crystal filter switch to position 1 with the phasing control centered. I found it necessary to add the crystal filter selectivity to that of the selectivity switch for ease of tuning SSB and to reduce any QRM as well. The RF gain can be at full and the AF gain used to set the audio level. I have used these settings for a couple of weeks with great results. Sorry I didn't include this info in the original article.

NC-303 on SSB

Recently I came across an article in an old June, 1960 CQ in the "Ham Clinic" section page 73, and I quote,"I have an NC-303 that I am very happy with. The other night on the air a friend of mine mentioned that there had been some minor changes made to later models to improve SSB. Is this true? "Yes. Change C55 from 33 to 5 mmf; change R46 from 120 ohms to 270 ohms and interchange R72 and R73, i.e. make R72 100 K and R73 470 K. These little changes allow somewhat less critical tuning on SSB and in general provide better performance. THANKS NATIONAL!"

Dennis Petrich, KØEOO

AM FREQUENCIES

2 Meters - 144.4, calling freq., activity in most cities; **6 meters** - 50.4 calling freq. **10 meters** - 29.0-29.2 operating window; **12 meters** - 24.985 calling freq.; **15 meters** - 21.400 - 21.450; **17 meters** - 18.150 calling freq.; **20 meters** - 14.286 for the nightly SPAM net starting at 5:00 CA time; **40 meters** - 7160, 7195, 7290 are the main freqs. Westcoast SPAM net every Sunday afternoon ,4:00 PM on 7160; **80 meters** - 3870, 3880 and 3885 are the main freqs. Westcoast SPAM net Wednesdays nights, 9:00 PM on 3870. AM Swap net Thursday nights, 7:30 PM on 3885; **160 meters** - Gray Hair net every Tuesday at 8:00 PM EST on 1945. Mostly sporadic summer-time activity but during the winter signals can be heard anywhere on this band.

From the Editor:

Radio Technique

Howard Weinstein,K3HW, has started a very ambitious endeavor on WWCR (Worldwide Christian Radio), a 100-KW shortwave station. The first program - it's called "Radio Technique" - was October 4 and we tuned in.

Basically, Howard has purchased 30 minutes of air time and he's trying to produce a quality program all about amateur radio and shortwave listening - what it's all about, radio basics, antennas, etc. He also says he'll be doing programs centered around building simple sets and will have a weekly propagation report. To cover the cost of the air time he sells 30-second commercials. It's an interesting idea that he has.

It may take a couple of programs for Howard to get everything smoothed out but just on the basis of his first program I can recommend it. It's every Sunday, 1400 UTC, 15.690 Mhz. Good luck, Howard.

15-Meter Week

Andy, N5JBT (is there anyone on 10 or 15 that doesn't know Andy?) told me that on a couple of occasions during the 15-meter week contest/jamboree he couldn't find a spot above 21.400 to call CQ. He said he had to wait until a spot became clear. He also told me that when 10 opened up - about midway through the week - he spent a lot of time up there too.

Hank, W2IQ, made 39 contacts during the week. And of the 39 contacts, 9 were DX. The DX included Germany, Italy, Canada, Mexico, Haiti, Cuba and Honduras. It's interesting to note also, that along with the Johnson Desk KW, Hank also ran a Ten-Tec Paragon Exciter into a Centurion amplifier. He says he ran about 300 watts output. I worked Hank while he was running the Ten-Tec station and have to admit (somewhat reluctantly) that it sounded very good.

Another station I worked was Peter, KH6IRT, out in Hawaii. Peter was running his Collins KW-1 of course and was very loud. In fact, everytime I was on 15 it seemed Peter was there and the loudest signal on the band from this QTH. I'm looking forward to seeing his contest log.

The whole purpose of these contests/jamborees on 15 is to promote activity there. Andy, N5JBT, says we are making some progress as there is more and more activity there as time goes on. Particularly when 10 is dead. When 10 is open everyone heads back up there where there's more space, less interference and a sure chance of running into some friends who only operate that band.

As I've said before, this may be our last year on 10 - and I'm told that even this year it will be somewhat sporadic - so we should be staking out some territory on 15. I'm encouraged; I think we're doing that. **N6CSW/Ø**

Regeneration Fever

by Dave Ishmael, WA6VVL
1118 Paularino Ave.
Costa Mesa, CA 92626

In 1956 when I was in 6th grade and just discovering radio, I spent a lot of time dreaming about the one- and two-tube breadboard radios described in a school library book. I even spent a few unsuccessful Saturdays walking around town trying to find some of the parts. Unlike Bob Dennison/W2HBE (The Schoolboy's 1934 All-Electric Radio, ER#5), I never built that receiver.

It wasn't until two years later that I built my first receiver, an Allied Radio Knight kit Ocean Hopper. I bought the Ocean Hopper in late 1958 and it was not only my first radio but it was my first kit. It didn't work the first time so my folks returned it to Allied for repair. Allied returned it but I don't remember it ever working. I was 14, two years away from my novice ticket, and really had a lot to learn. In retrospect, I suspect that if I had used any kind of decent antenna it would have probably worked OK.....

I wanted to buy the Space Spanner but at $17.95 it was too expensive! The Ocean Hopper at $13.95 was all I could afford. Even then, I only had the original broadcast band coil. I didn't buy the headphones so I used a speaker I removed from an AM radio. I cannot remember what happened to my Ocean Hopper but there are little bits and pieces of my memory that suggest I cannibalized it the following year! I don't believe that I would have torn it apart had it worked.....

I have been looking for another Ocean Hopper for about ten years. My Ocean Hopper want ads in ER attracted the attention of Mike Sewell, KØCRX. After exchanging several very enjoyable letters, he sold me his Ocean Hopper. In addition to the Ocean Hopper was an original manual and a complete set of original coils.

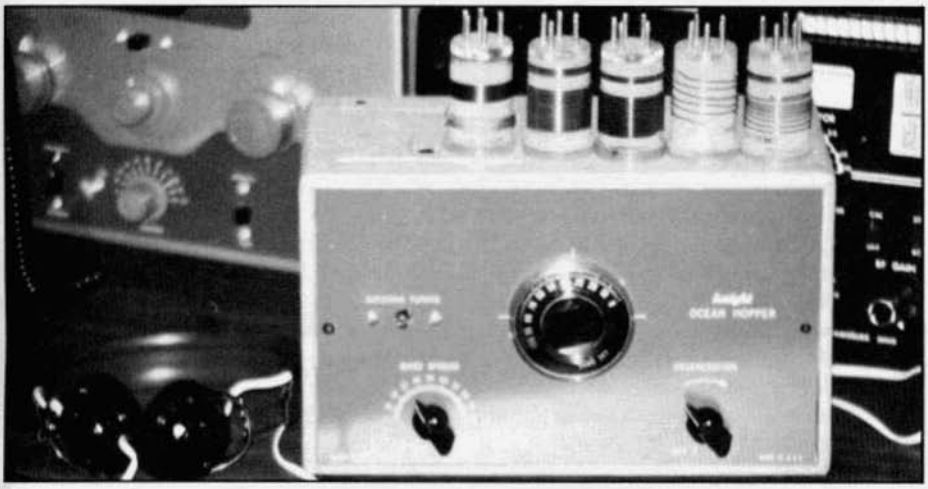
Mike shipped me the Ocean Hopper and I immediately turned it on with the broadcast band coil installed. What a gas!! This was much more of a nostalgic experience than my recent AM QSO with my DX-40. It just brought back all kinds of really good memories.

This Ocean Hopper was in reasonably good condition. Since the manual is marked 83 Y 749, this Ocean Hopper was built after 1958. This Hopper appears to be a very late model, possibly among the last that were sold? The tubes are original Knight and have mid-1960 date codes - 6448 (50C5), 6452 (35W4), and 6513 (12AT6).

The Ocean Hopper worked very well on the broadcast band and OK on the 1.7 - 4.1 Mhz band. It had been "repaired" several times and the top of the chassis was somewhat corroded. The wiring, however, left a whole lot to be desired with several very cold solder joints.

I then decided to completely strip the chassis, and rewire it using as many "period parts" as I could find. I took a very deep breath and proceeded to strip the Hopper down to the bare chassis. I then spent a couple of hours cleaning up the parts that I intended to save. Actually, very little was "tossed" I "tossed" the orange drop caps, all the new style aluminum electrolytics, most of the 6-32 hardware, the 200-ohm 10W resistor, and one tie strip. Everything else OK!

I decided not to paint the chassis gray. I coated the rust spots with naval jelly and then wire brushed the chassis with a fine wire wheel. I then gave the chassis several coats of clear Krylon to protect it from rusting. The chassis looks very much origi-



The restored Ocean Hopper with a complete set of coils and headphones.

nal in this condition as opposed to the gray. I suspect that the wire brushing removed most of the original plating so I am hoping that the heavy Krylon coat will protect the steel from rust. If not, I can always paint it gray.

I then mounted the parts, including the original wafer sockets, with new 6-32 hardware. I cleaned both sides of the front panel with Meguiar's Car Cleaner/Wax before mounting and that really cleaned it up. I had previously sent the front panel out and had a silkscreen master made of it in case I wanted to make a new panel.

I rewired the Hopper using the original wiring guide using the same color codes for the wires. I used 20-gauge insulated/stranded instead of the original 24-(?) gauge. I made a few subtle changes in the wiring just to make it easier to wire. I spent about $7 for the additional parts, which includes the 3-section electrolytic from Antique Electronic Supply.

I used liberal amounts of Fantastik cleaner to remove the stains from the Hopper's cabinet, followed by a coat of the Tannery. The cabinet came out much better than I expected!

Unlike the first Ocean Hopper that I built in 1958, this one worked the first time. It took me 34 years to get it right!!!

My only complaint is that if I reduce the regeneration control just below the point of oscillation with weak signals, the signal disappears! Strong signal reception is OK. Maybe it's just a matter of practice but I seem to be having a problem with weak signal reception...

My rebuilt Ocean Hopper now sits on the shelf beside my 75A-4 and I get it down occasionally to relive some memories.

Even after I rebuilt the Ocean Hopper I still wanted to build that one- or two-tube breadboard radio. It wasn't until I discovered ER last year and Bob's article that I started collecting the parts and articles on one- and two-tube regenerative receivers.

The receiver I chose to build is a classic 2-tube regenerative receiver described by Walter C. Doerle in the "1934 Official Short Wave Radio Manual" (originally published in the December 1931 Short Wave Craft). The Doerle "Globe Circler" is similar to hundreds of designs printed in hundreds of books and magazines.

Dave Ingram/K4TWJ describes a model 30-30 Doerle receiver in his recently published "Keys, Keys, Keys". I used his model 30-30 for my receiver as the type 30 tube is very common for these receivers and is used in mine.

continued next page

Regeneration Fever from previous page

I will be the first to admit that I committed a bit of heresy by using 6" x 9" plexiglass for the base and front panel. I had eliminated an aluminum chassis/front panel right from the start. My wood working skills leave a whole lot to be desired and I had been thinking about using plexiglass for some time. I underestimated how flexible the 1/8" front panel would be and had to stiffen it up using brass stock. I eventually added a U-bracket to the rear of C5, the regeneration control, to get the desired front-panel stiffness.

In spite of the plexiglass, I tried to use as many parts as possible from the original 1934 design(s):

* The two 30 tubes are Silvertone 230s dated 12/7/33.

* The 6 plug-in coil set was manufactured by Alden Mfg. Co. and is thoroughly covered in the "1934 Official Short Wave Radio Manual".

* The 4-pin tube sockets are Benjamin and were obtained from Antique Electronic Supply. These were patented in 1911 and 1925 and were used extensively in 1930s designs.

* The interstage transformer, coil-set, National Velvet Vernier dial, antenna trim cap, knobs, and tubes were resurrected from a Doerle "Globe Circler" that was built as a kit in 1933 that I found at the local TRW swapmeet.

The interstage transformer was cleaned and repainted. New 6-32 hardware was used and the four terminals (P, B+, G, & A-) were made using 6-32 brass hardware.

The seven terminals for the battery and antenna connections located on the base was made using 8-32 brass hardware.

The receiver was relatively easy to build. Finding the "right" parts was, by far, the toughest task. It took me four months to find the Hammarlund 8 mH Isolantite R.F. choke once I started looking for it!!! These parts will NOT be on the swapmeet tables - they will be in the junk boxes under the tables! Had I not blundered into that Doerle at the TRW swapmeet, I would still be looking for many of the parts.

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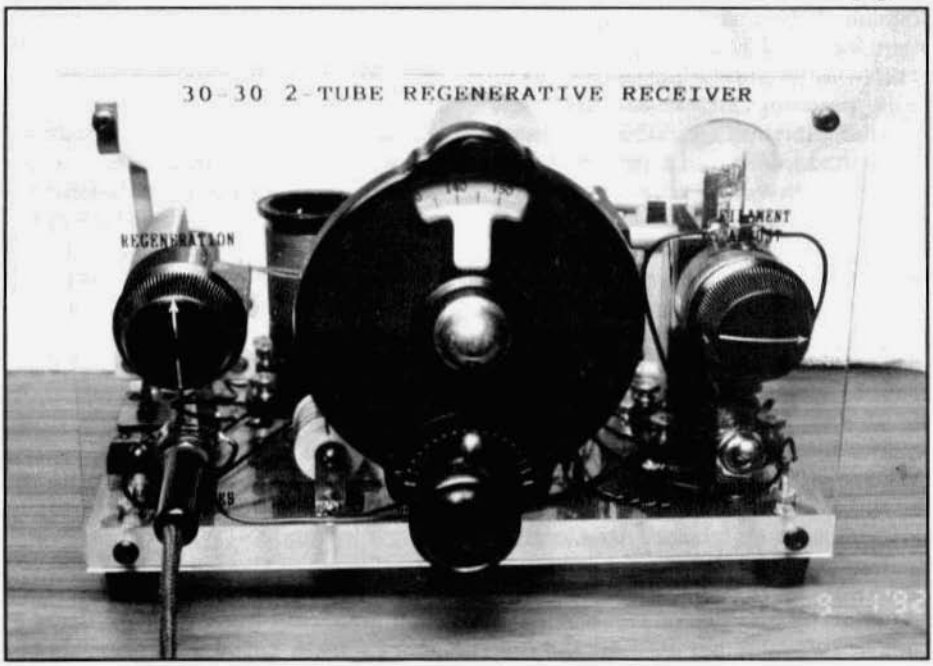
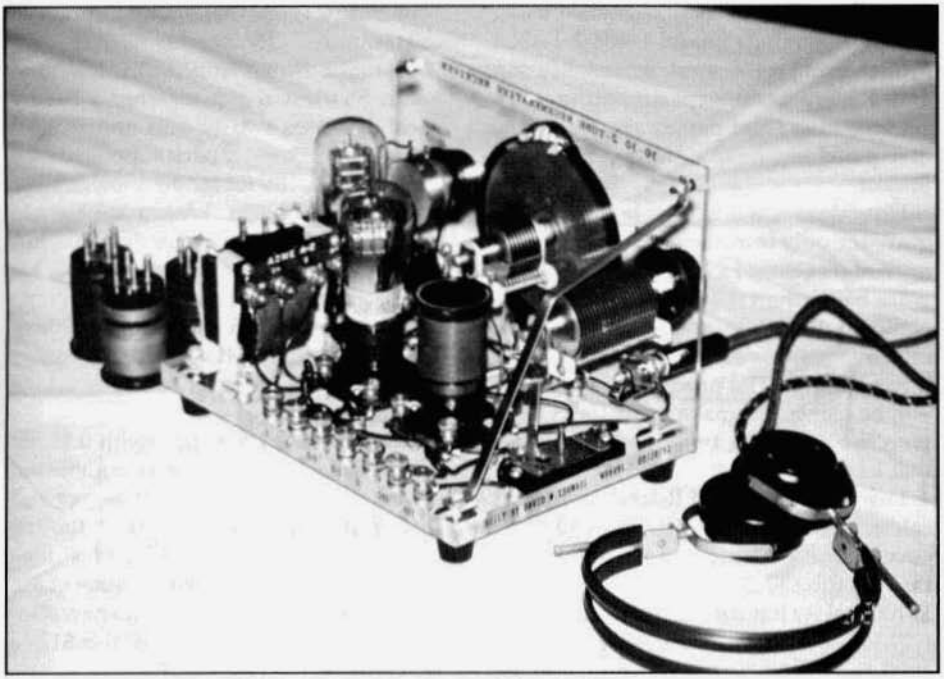
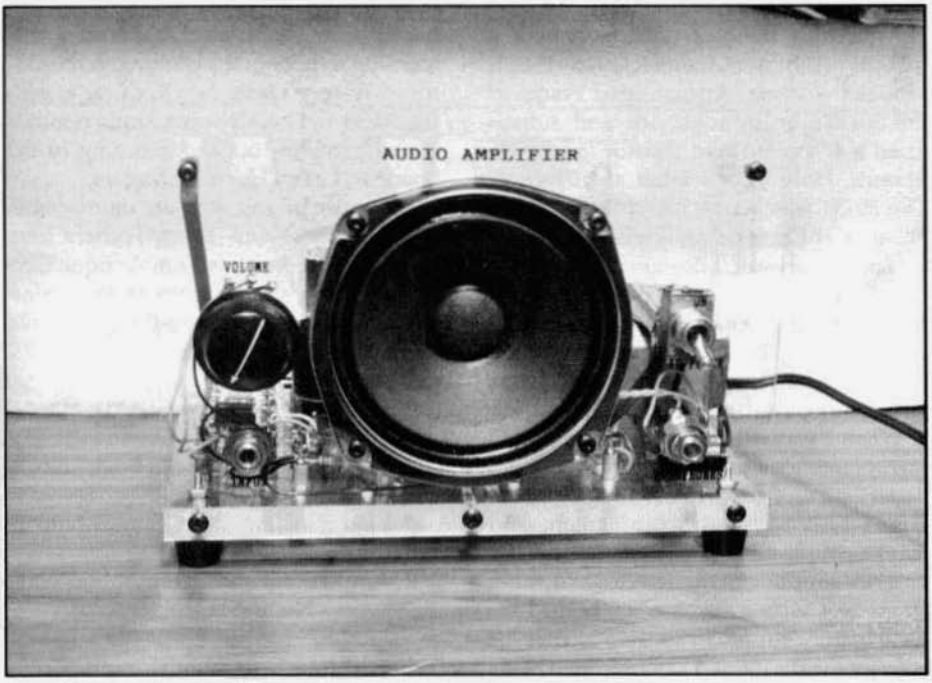


Front view of the 30-30 regenerative receiver.



Rear view of the 30-30, with plug-in coils and headphones.



Matching audio amplifier.

Rgeneration Fever from page 22

The front panel was silkscreened using my son's Jennings model T-404-2 T-shirt printer using a 160-mesh screen. My son and I have been experimenting with silkscreening front panels and this is the first panel we have done for an actual project.

How does it work? Not being a regen guru, the only thing I can compare it to is my Knight Ocean Hopper. The 30-30 does work better than the Ocean Hopper. The National Velvet vernier dial is a huge improvement over the Ocean Hopper's direct tuning!! The proof-of-the pudding will be using it to make some CW QSO's with the matching two-tube transmitter that I am building.

I used my Kenwood R-1000 receiver to calibrate the dial for the two coils that covered the AM band and discovered that the two-tube 30-30 "hears better" than the R-1000! Now it didn't surprise me that an HQ-129-X was more sensitive than the R-1000, but the 30-30! I don't know if this is true on the 80/40M bands but it is certainly true for the AM band...

After usng the hi-Z headphones for a "couple of minutes", I connected my Heath Model T-4 Visual-Aural Signal Tracer to the 30-30's headphone jack and substituted a 47K plate load resistor for the 2K phones. Holy Cow - what a difference! The 30-30 was acting like a "real" radio. What a difference an audio amplifier makes. As a result, I designed and built a matching 6SN7/6V6/6X5 audio amplifier for the 30-30 and it really does make a big difference. The audio amp is also built on plexiglass and the front panel was silkscreened like the 30-30.

When I was designing my 30-30, I had always intended to power it from A and B batteries. I was going to use a couple of the large 1-1/2V batteries for the filaments and (say) a couple of 45V batteries for the 45V and 90V supplies for the detector and audio stage. Boy, what a shock when I called the local battery supplier - for two Neda type 905/Eveready 156 (1-1/2V) and two Neda type 201/Eveready 455 batteries they wanted $64!!!! At that price, I didn't even call around!

To make a long story short, I went to Radio Shack and put together a battery pack that uses two D cells and five 9V batteries. The battery pack supplies 3V for the filaments, 18V for the detector, and 45V for the audio stage. With a strong AM station tuned in, the detector draws 0.4 mA and the audio stage 3.3 mA w/2K-ohm headphones. The filaments draw approximately 120 mA. Battery life should be very acceptable. I don't disconnect the battery pack from the 30-30 - I just turn off the filaments.

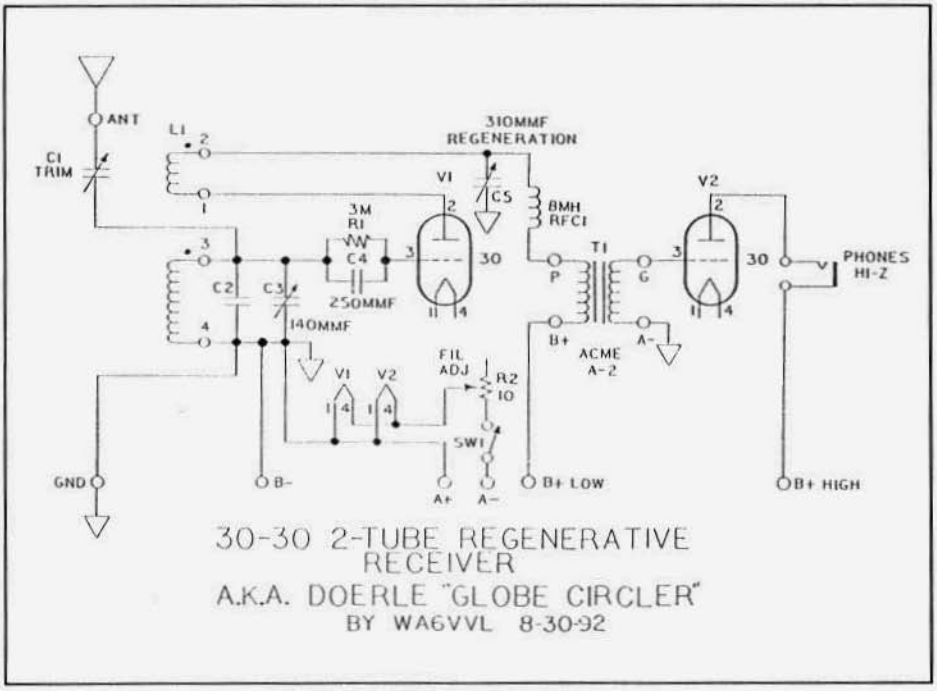
I bypassed the 18V supply with 0.15mfd and 0.0046mfd caps to keep the audio out of the detector as the batteries age and their impedances increase. So far, the battery pack has worked OK and I don't expect any problems. I have a total of $24 invested in the battery pack and new alkaline batteries should run less than $12 - a far cry from the original $64.

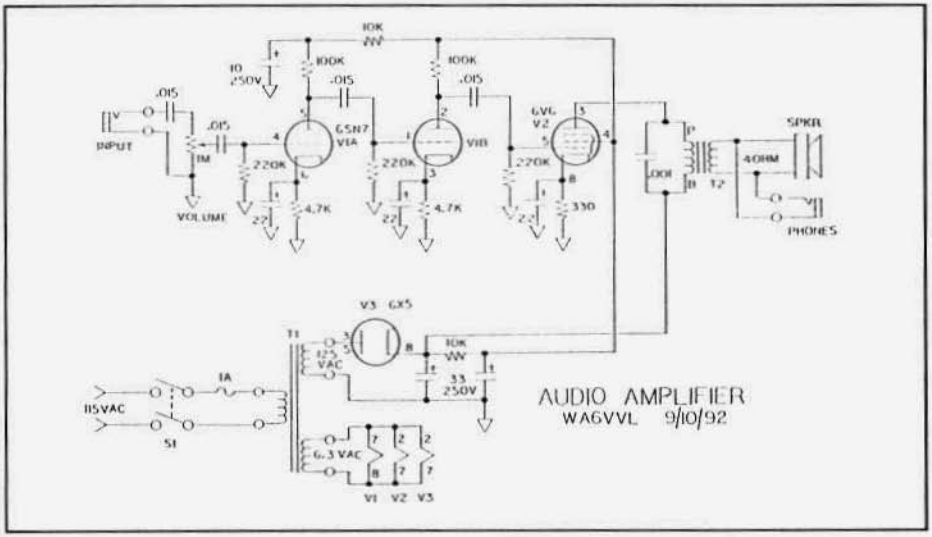
Was the 30-30 worth the wait? You bet! I finally built the radio that got me into this hobby - 36 years later! It's been a real learning experience. Listening to the old-time Mystery Theater on KNX radio with the 30-30 and headphones kinda reminds me of growing up and listening to the Shadow, Green Hornet, Dragnet,.....

For those of you who are interested in building these one- or two-tubers from the 1930s, the reprints from Antique Electronic Supply are a treasure chest of information. I have listed those that I would recommend. The prices are from their 1992 catalog:

* 1934 Official Short Wave Radio Manual - No. B-390 - $12.95
* Short Wave Beginner's Book - No. B-520 - $4.95
* Hammarlund Short Wave Manual - No. B-519 - $4.95
* How to Build and Operate Short Wave Receivers - No. B-403 - $7.95

Editor's Note: Next month Dave describes his two-tube transmitter.


ANT
C1
TRIM
L1
310MMF
REGENERATION
V1
C5
8MH
RFC1
V2
3M
R1
C4
250MMF
C2
C3
140MMF
T1
PHONES
HI-Z
P
G
B+
A-
ACME
A-2
FIL
ADJ
R2
10
SW1
GND
B-
A+
A-
B+ LOW
B+ HIGH
30-30 2-TUBE REGENERATIVE
RECEIVER
A.K.A. DOERLE "GLOBE CIRCLER"
BY WA6VVL 8-30-92


10K
10
250V
100K
.015
INPUT
1M
VOLUME
6SN7
V1A
V1B
220K
4.7K
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6V6
V2
330
SPKR
400M
T2
PHONES
V3 GX5
T1
125
VAC
33
250V
IA
115VAC
S1
6.3 VAC
V1 V2 V3
AUDIO AMPLIFIER
WA6VVL 9/10/92

REAL Audio for the R-390A

by Bill Kleronomos, KDØHG
P.O. Box 1456
Lyons, CO 80540

For some time now, I have been amazed as to how a great receiver such as the R-390A with its mechanical filters, excellent dynamic range and highly accurate digital readout could have a local audio amplifier put to shame by a $2.99 pocket transistor radio! Barely capable of putting out a half watt of audio at some 10% distortion over a highly restricted bandwidth, the audio stages in the R-390A do not befit a receiver built in the good old "cost is no object" days of military procurement. I

I decided to once and for all solve this major annoyance on an R-390A that had recently been given a major civilian overhaul by both Ray, NØDMS and myself. It has been common practice to add an outboard amplifier to this receiver to provide some real audio wattage, however, this does nothing to correct the restricted frequency response and high distortion inherent in the stock audio stages. The receiver still sounds lousy - just louder!

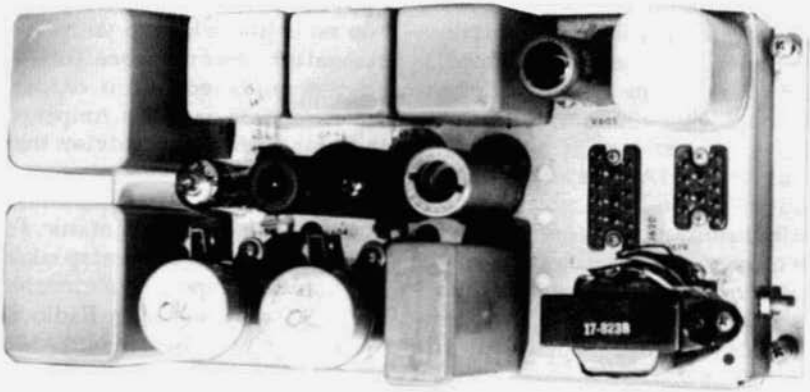
This modification can be accomplished in five to ten hours on the work bench. It involves the replacement of the stock audio amplifier with a push-pull class AB_1 final along with an associated preamplifier and phase inverter. The new final amplifier is a twin tetrode designed for VHF amplifier duty, the Amperex/RCA 6360. Inexpensive and readily available, this tube is an excellent audio amplifier. In general, the circuit is based on the designs that graced the back pages of the RCA receiving tube handbooks of the 1960s. This particular rendition is capable of an audio output in excess of five watts with a measured THD of less than .5%. Although the output transformer is not on par with those used in the best high fidelity designs due to space restrictions, the use of over 25 dB of inverse feedback makes for an essentially flat and clean audio response from about 70 Hz to about 9 kHz.

Note—this modification cannot be done on the R-390 due to the presence of the squelch tube on the audio chassis of the earlier model receiver, but it could be considered for other brands and models of receivers where the components will fit.

To prevent taking up this entire issue of ER with a step-by-step procedure, a la Heathkit, I'll describe what needs to be done in general terms as well as providing revised schematics. It is essential to have the military manual and schematics on hand prior to proceeding, and to spend some time prior to starting with the audio module on the work bench in front of you pondering the best way to proceed. Most of the new components can be placed on the terminal board replacing the old parts and many of the original harness wires can be reused in new roles without adding new wiring. If properly and carefully thought out, it's hard to tell from the bottom of the chassis that major revisions have been made. If you are squeamish about hacking on your prize audio chassis, no problem - spares are cheap, common and available from a number of sources. Buy a spare chassis and fire up the soldering iron!

Mechanical and Chassis Details

Begin by removing the tubes and filter capacitors (note that the filter capacitors are NOT interchangeable!) Remove the flat cover plate next to the connectors; mount the new audio output transformer in this space. Mount a 5- or 6-lug terminal strip underneath the chassis on one of the transformer mounting screws. Later, C7



Modified audio chassis. Note location of new output transformer.

and R9 will be mounted on it. If there is a ground lug with a wire attached which used to be mounted by one of the cover plate screws, attach it instead to the grounded lug of the new terminal strip.

Clip the wires off of the sockets for local AF output V603 and driver V602. Make sure to tag the heater leads as they are removed for future re-use. Unbolt the socket for V603. By the use of a 3/4" chassis punch carefully centered over the hole for this socket, punch a hole for a new 9-pin miniature tube socket. Mark and drill two new holes for mounting hardware and mount a new 9-pin socket in place of the old 7-pin. If the new socket doesn't have built in ground lugs, add one under one of the mounting screws. Orient this new socket so the keyway is in the same direction as those on the other sockets.

Wiring Overview

Step one is to modify the line amplifier circuit to function without the use of driver V602. Examine the schematic of figure 1. Simply put, the old 6AK6 line output is replaced by a 6AH6, and the cathode bias for this circuit is revised. This new V604 is driven directly from the line gain pot via C607. Driver V602B is no longer needed due to the higher transconductance of the 6AH6. This change frees up use of the socket formerly used for V602 for the preamp/phase inverter used in the new local audio stage.

The conversion of the line amplifier is easy and provides good practice for the local audio amplifier conversion. Begin by comparing the schematic of the modified line amplifier with that published in the R-390A manual. Note that R626 and R621 are removed from the terminal board. Then if R625 is replaced with a 390 ohm the cathode resistance will be the sum of the existing R623 (47 ohm) and the new R625 (390 ohm) - sufficiently close to the specified 430 ohm value. The wire that ran from C607 to pin 7 of V602B is identified with an ohmmeter (it was clipped off at the V602 socket - above) and connected to pin 1 of V604. Clip out the now unused C608. Lastly, add the new cathode bypass for V604 either at the tube's socket or at the terminal board.

The local amplifier is modified in generally the same manner. Compare schematics, look for places on the terminal board to reuse with new components, identify the wiring for possible reuse, and lastly, clip out no longer needed components. Example: The plate and screen resistors for the new audio stages can be put on the PC board where R611 and R622 used to be.

For some reason I have found it easier to wire up the new amplifier stages be-

continued on next page

R-390A from previous page

ginning at the output and working my way back toward the volume control pot.

Once the conversion is completed, check and recheck the wiring with an ohmmeter at the tube sockets. Don't forget to clip out and remove C609, the cathode bypass for V601A. This adds a bit of degeneration to the audio preamp and reduces its distortion. If any of the pins of the two connectors on the chassis show traces of corrosion or severe oxidation (gold is NOT green!), burnish the pins with a strip of VERY fine sandpaper such as 1500 grit, followed by a wash of contact cleaner. Don't burnish off the plating on the pins.

If the completed amplifier motorboats or oscillates when put into use, the feedback is incorrectly phased. Reverse either the primary or secondary connections of the new audio output transformer. This amplifier is unconditionally stable and a number of modified units have been tried in a couple of receivers. If it dosen't work, wiring errors or other problems exist!

Due to the change from a nominal 600-ohm to an 8-ohm audio output impedance, the level at the headphone jack will be too low for use with most headphones. Reduce the value of R101, the headphone level dropping resistor, as required. Merely jumper a suitable value resistor from TB102 pins 6 and 8 on the rear of the receiver's chassis. A suitable value is in the 330 ohm to 1 K range. This is the only change that needs to be made to the receiver itself.

I have noticed that for some reason, some R-390As introduce noticable audio distortion when the AGC is switched to the 'Fast' position. I recommend the use of medium AGC for best results. I also suggest a prescription alignment of the entire receiver, especially the IF strip and proper setting of the IF gain pot. The factory stock noise limiter also introduces considerable distortion when switched on.

A good finishing touch to the newly modified chassis should be relabeling the tube sockets for the correct tube types. Copy this article along with any construction notes and add it to your receiver's manual for future reference. Tube shields on the modified audio chassis are unnecessary.In fact, the Amperex data sheet for the 6360 tube advises that they should not be used.

The sound of an R-390A with this audio upgrade is, in a word, fantastic. I'd recommend the use of a decent speaker such as a bookshelf type with reasonable efficiency as available from Radio Shack. When listening to the standard AM or SW broadcast bands you will soon notice things that you couldn't hear in the past, such as how good AM broadcast can sound. Many of the new digital transmitters and associated audio processors have a quality and fidelity of sound that rivals that of FM broadcast. On the other hand, many broadcasters could clearly use the services of any one of the number of 'Real Radiomen' who operate AM on the amateur bands and understand how to make a transmitter work right!

So, heat up that workshop this fall and dig into that audio chassis. You won't be dissapointed with the 'new' R-390A you end up with. **ER**

1. Authors note: In some circles, Collins Radio receivers are as well known for their average to rotten audio quality as they are for their stability and accurate calibration in others. This brings to mind the "wisdom" stated at least once or twice: "If you want to know where they are, buy a Collins, if you want to hear them, buy a National".

Editor's Note:

A couple of weeks ago while we were attending a hamfest at Longmont, Colorodo (near Bill's QTH in Lyons), we had the opportunity to check-out his modifiedR-390A. My assessment is that it sounds better than any communications receiver I've ever listened to. I'm looking forward to hearing what other people have to say about this mod after they've installed it on their R-390As.

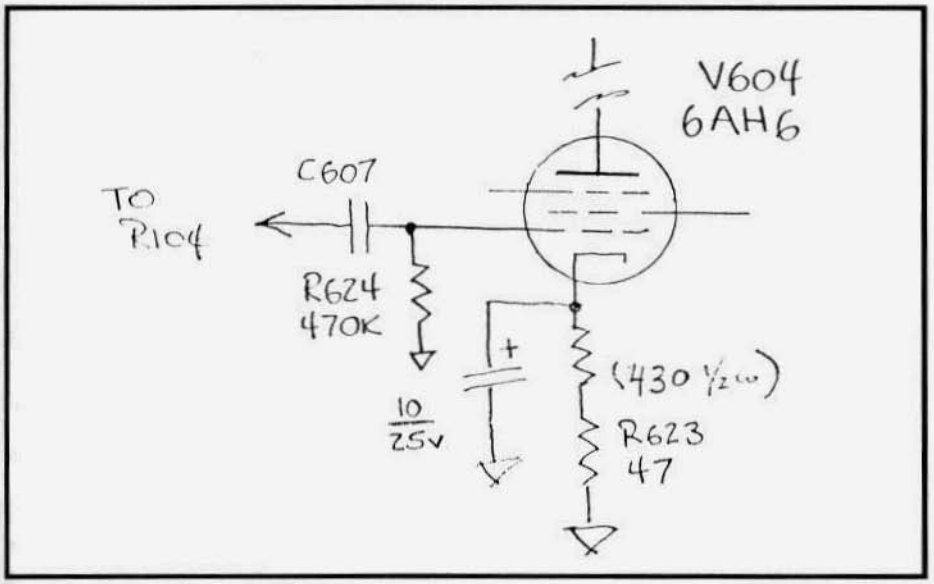


Figure 1. Revised line amplifier.

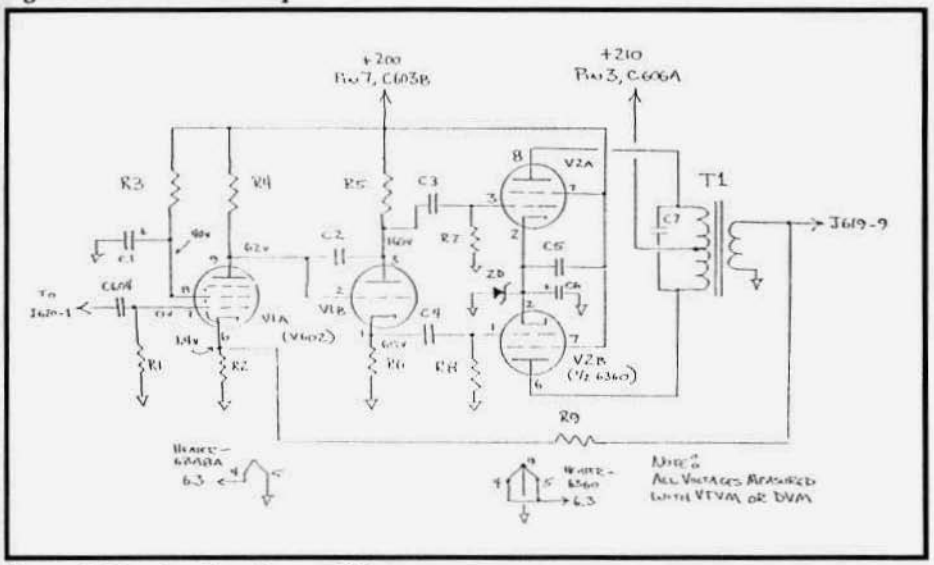


Figure 2. New local audio amplifier.

Parts List For Figure 2

C2, C3, C4, C604 .1 uF 250 volt mylar/paper
C1 1 uF 250 volt electrolytic
C2 47 pF 500 V ceramic
C5 .001 uF 500 volt ceramic
C6 10 uF 25 volt electrolytic or tantalum
C7 .003 uF 1KV ceramic
R1, R7, R8 100K 1/2 watt 5%
R4 100K 1 watt 5%
R3 470K 1/2 watt 5%
R2 820 1/2 watt 5%
R5, R6 15K 1 watt 5%
R9 4.7K 1/2 watt 5%
ZD 24 volt, 5 or 10 watt zener diode
T1 8 watt rated universal output transformer such as UTC S-53X or Antique Electronic Supply P/N PT-291. Set impedance taps for 8000 ohm primary to 8 ohm secondary.
V1 (V602) 6BA8A
V2 (V603) 6360 or 6360A

Lee Faber, W7EH...Radio Pioneer

by Barry Wiseman, N6CSW/Ø
4 Aspen Place
Durango, CO 81301

Part Six

When Lee sold his interest in the James Knights Company he moved to Phoenix, Arizona. His daughter Beverly stayed on with the company until 1962 when she and her husband also sold out and moved to Phoenix.

After Lee left the company it was reorganized and became Chicago Telephone Supply, Knights Company (CTS, Knights Company) and is still in business today under that name. At one time - a few years after Lee left - the company grew to 1500 employees. This was during the period when they were manufacturing quartz crystals for watches.

I thought it might be interesting to find out what their present status might be. I called and spoke with a Mr. Ed Herman, the Director of Human Resources at CTS, Knights Co. He told me that Lee's old company is still the largest employeer in Sandwich, with 450 employees. They still manufacture crystals and other things like precision oscillators.

For more information I called the mayor's office in Sandwich. No one in the mayor's office was available but I did enjoy a long conversation with the City Clerk, a woman named Barbara Olsen. She's 58 years old and has lived in the area all her life. She was familiar with the Faber name but moreso with James Knights and the Knights family. She was unaware that it was Lee who got the company started and that without him there would not have been a James Knights Company. She said that most people in Sandwich today would not be familiar with the name Lee Faber.

Mrs. Olsen told me that the original James Knights Company building is still standing and contains a floral shop, a Sears store and among other things a real estate office. She also suggested I call a city councilman by the name of Louis Miller. She said he was older and might have some recollection of Lee.

Mr. Miller said that he was 72 and that he did remember Lee. When I told him that Lee was still alive he seemed quite surprised, which I suppose is a reasonable response. He was aware of Lee's contribution to the James Knights Company and recalled that a close relative - a brother-in-law- used to help Lee grind crystals in a basement workshop long before the James Knights Company was formed.

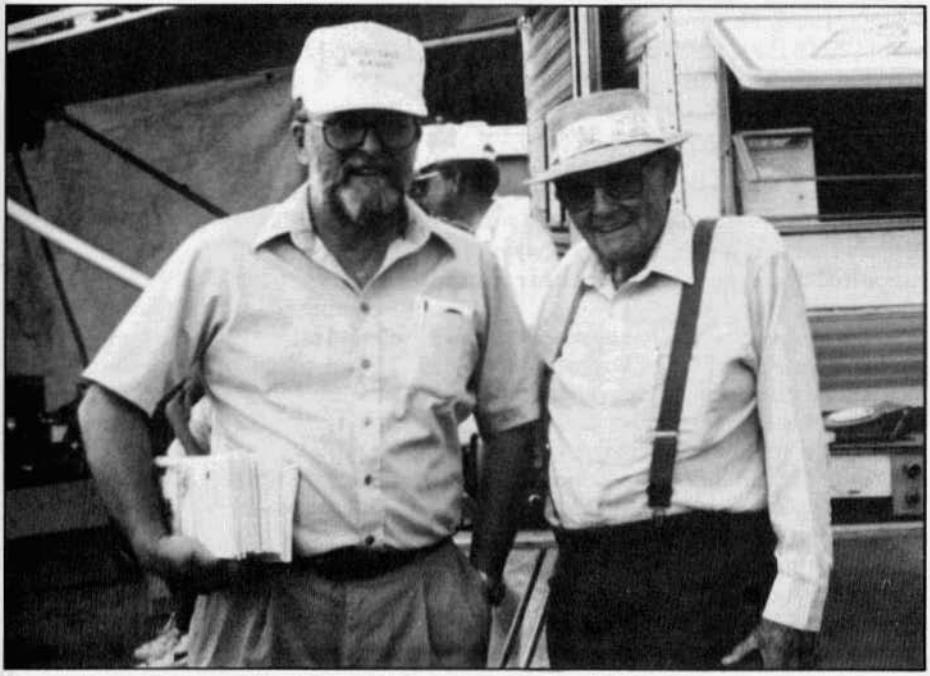
James Knights retired in 1970. He stayed in Sandwich where he was active in the community until his death in January of 1983. "The Beacon-News" a Sandwich newspaper wrote:

"He was just a super nice guy who people really liked," said an employee at CTS Knights Inc. in Sandwich Thursday about James R. Knights, the company's co-founder and a Sandwich community leader who died Wednesday".

"He was very highly respected and liked in the community," said Sandwich Mayor Fred Wehling."

I may have mentioned in a previous installment that Lee had nothing but good things to say about James Knights. I remember in one conversation Lee told me that they shared an office for 20 years and never had a serious disagreement.

One of the first things I asked Lee when I met him three years ago was, what have you been doing the last 30 some odd years since you retired? "Well", he replied, "I



The author with Lee at the Flagstaff hamfest in July of this year.

worked over half my life, and I worked darn hard, so I thought I should just take it easy for the other half." I've found out recently from Lee's daughter Beverly that that isn't the truth entirely. She said that her father has never "taken it easy". When he first got to Arizona he was absolutely "taken" by the desert and that he 4-wheeled and camped most of the state in the first couple of years he was there. He was also involved in real estate investments. At one point he tried raising exotic birds, cockatiels, etc., and then spent literally years landscaping his yard. He has also spent a good deal of time helping his good friend Senator Barry Goldwater, K7UGA, with his antennas. Another interest he's had is in the desert tortoise. He's successfully raised them for many years.

Beverly was the only one of Lee's children that took any interest in the company. She worked at the factory all through highschool and at all the jobs there. When Hank Scharf, W6SKC, a former Collins employee, made his first trip out there in the early '50's, he said Lee turned him over to Beverly for a tour of the plant. He told me that she really knew the crystal business. He also mentioned that he repaired a 75A-4 for Lee at his home on the kitchen table. After Mrs. Faber prepared a nice lunch for him Lee flew Hank back to Chicago. Incidentally, the next time Hank saw Lee was when I got them together at the Flagstaff hamfest last July.

I've visited Lee on 3 occasions; twice in 1989 at his summer place in Show Low Arizona and this last July at the Flagstaff hamfest. We've also had dozens of long telephone conversations - most of which I've saved for posterity on tape.

One thing I noticed at Flagstaff is that Lee is very well known out in Arizona and very well liked. Travelling around the hamfest grounds with him was like being with a visiting dignitary. All the older hams knew him and are very fond of him.

continued next page

Lee Faber from previous page

Lee's wife Ruth passed away in October of 1990 at the age of 83. They had been married for 65 years. According to Beverly, her mother was a real "people person" very extroverted and friendly to everyone. She recalls that whenever hams came to visit, her mother would always entertain the wives and enjoyed doing so. Beverly also said that her mother always supported and encouraged her father in whatever he was doing.

Since his wife died Lee has been spending more time up in Show Low and just recently he purchased a bigger, double-wide mobile home and has had it installed in a location somewhat remote and better for ham radio operations than where he was previously. He has many ham friends up in the Show Low area and enjoys his time up there. I'm not sure he wouldn't prefer living up there year round if it weren't for the friends and family he has in Phoenix.

These days he's very busy. Acting as his own 'general contractor' on the new mobile home project seems to absorb him entirely. He's up at the crack of dawn and puts in a full day running here and there purchasing supplies, arranging for various tradesmen and just making sure everything is done right. Later this fall we're planning another trip to Show Low. I expect to see Lee's new place just as I described his trailer house when I first met him. Everything will be 'shipshape' and well organized.

I've enjoyed meeting Lee, getting to know him, having access to all his archives and writing about him. He is a rare individual and I respect him very much. I value his friendship and I'm very honored to have had this close relationship with him.

Hopefully this is not the last we'll hear about Lee. I'm sure he could homebrew another big transmitter, or put up another monster antenna or even start another company. I'll be in touch with Lee and will keep the readers of ER posted.
ER

Postscript

I've received quite a number of letters from people who knew Lee when he was in the crystal business. Some of them I've included in this final article because I think they are something of a testament to how Lee related to others and how they remember his kindness.

Dear Barry

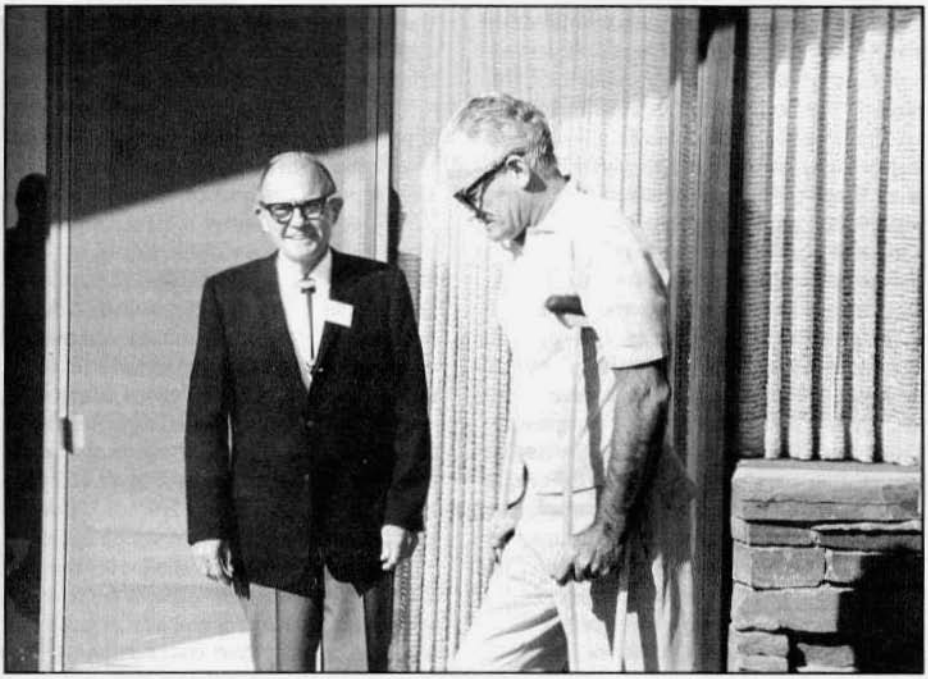
Regarding your article on Lee Faber. He used to call on Collins when operating his crystal company. Then after WW II when I "hit the road" for Art peddling avionic equipment I was in Chicago one Friday at the airport - finished about noon - so called Lee in Sandwich, Ill, just to say hello. He asked where I was on the airport (now Midway in South Chicago) and I told him at Butler Aviation (a FBO, that means Fixed Base Operation). He said stay right there and he would fly his Navion in and pick me up. In a short time there he was. I climbed aboard and off we went to Sandwich.

I spent a memorable couple of days with him and his family. I got to see that TALL beam antenna. The first one I ever saw where the tower rotated. He had taken the drive head off a pretty good size lathe and mounted it in a horizontal position. Can't remember just how many 3-el 10 M beams he had on it but it was a sight to behold.
Bill Steward, K6HV

Dear Barry

A friend of mine (W6EHR) in San Diego just sent me a copy of your May 1992 issue of Electric Radio (#37), because you have an article in it concerning our old friend, Lee Faber (W7EH).

I have been retired for over 22 years, & have moved to the Olympic Peninsula 20 years ago. I have only had one QSO with Lee since that time. He used to join a group of other of my old friends, mostly from the Southwest; &, as I initially retired to Parker, AZ, our last occasion to visit with Lee was when we had a 'hamfest'



Lee with his good friend, Senator Barry Goldwater, K7UGA, sometime in the early '60's.

with the entire group at our retirement location. At that time the group included W7EH, W6GZZ, W6LSN, W6EHR, W6SYA/WA7HOT and several others whose calls I can't recall on short notice. Most of these have become Silent Keys over the last 2 decades. Myself, Reed Evans (W6EHR) and possibly Lee are still active.

I might mention just how I came to meet Lee more than 40 years ago, when I had a requirement for several sets of 300, NT-cut crystals for special developmental equipment. Having canvassed all of the sources for quartz crystals in the country, Lee, at Knights, in Sandwich, Illinois, was the only one which would take the job. He satisfied our need in exceptionally short time. At that time, Lee had the highest ham antenna which I had ever seen; and he used to fly me back to O'Hare to catch my flight back to San Diego.

I have digressed more than I had intended; but, what I really want to know (without having to wait for Part 2 of your story concerning Lee) is he still living? and if so, can you provide me with an address where I might write him and possibly re-establish contact?

Thank you for any further information you can give, and I will look forward to your next issue of 'Electric Radio'.

Editor's Note:

I advised Art that Lee was 'very much alive' and they have been in correspondence. Lee tells me that he as a result of the series of articles we've been doing on him, he has re-established contact with many of his ham friends from the early days.

Regarding the photo in last month's issue of Lee with James Knights and an aircraft. I mistakenly said it was a Navion when it's really an Aircouple. About 25 readers have called or written to point out the error. I apologize for the error and in a future issue we'll have the picture of the Navion for all you aircraft enthusiasts.

Collins 75A-Series from page 15

ever. A good place to attach a VTVM for an alignment "looker" is an unused terminal (#4) on the IF output transformer, T4. I put a little Stabilant 22 (see ER index) on all the core slug threads. This made the adjustment smooth and easy. I discovered that the "S" meter is nowhere near accurate, as a 6 dB change in generator level dropped the meter needle 30 dB.

I found a more accurate crystal filter alignment method than stated in the manual. It turns out that as time passes, the center frequency of the filter crystal changes. To compensate, it is necessary to accurately determine center frequency. To do this, attach the VTVM to the above mentioned point, and with the filter in its most narrow position, slowly rock the signal generator across the passband and note the exact frequency where the crystal filter response peaks sharply. Measure the generator output frequency, and use this new frequency in the book's alignment procedure. When doing the alignment the bottom filter transformer adjustment is easier to get to than the top one. Also, alignment instructions for T1 are not given in the book. Align it for maximum output, using the newly discovered crystal center frequency.

If the dial calibration is out of tolerance, and the end-point adjustment has run out of room, but the mid-range is still fairly linear, there is a procedure which might bring it back into alignment. (You will need an accurate, stable, 14.0000 Mc. signal source or a good 100 Kc. calibrator which has been set to zero with WWV.) First, center the dial fiducial in the kilocycle window. On the 20-meter band, tune up to 15 Mc., and leave the kilocycle dial calibration mark even with the fiducial center line. Loosen the PTO shaft coupler, and without moving the plastic Kc dial, manually turn the PTO shaft to center WWV in the passband. Tighten the coupler, tune down to 14.000 Mc., and use the end point adjustment to center the calibrator signal. This will need to be repeated many times. Each time it is done, the error gets less, and it should eventually bring the PTO back into line. When finished, realign the front end.

The electrical performance of the 75A-1 was measured. Its minimum discernible signal, with the crystal filter in position 1, is -137 dBm, or .031 microvolts. The 75A-1 will show a 10 dB signal-to-noise ratio with an input signal of .1 microvolt. The single-tone blocking dynamic range measured a respectable 82 dB. The 3rd-order, two-tone dynamic range is, as expected, somewhat less at 72 dB. Cold start drift was never more than +430 cycles, and long-term drift settles down to +- 32 cycles. Sharp blows on the bench top don't affect a beat note at all. Varying the line voltage from 105 to 130 volts changed a beat note by only 55 cycles.

Development of the "ultimate receiver" did not stop with the 75A-1. Yet to come were many improvements in circuit design, and the phenomenal mechanical filter. We'll trace these changes starting next month, with the 75A-2's introduction. **ER**

LETTERS

Dear ER

An Open Reception Report
To: All members of the West Coast SPAM net
Date: Sept 23, 1992
Time: 0500 - 0630 UTC (10 PM - 11:30 PDT)
Frequency: 3870 KHz.

Just a note to let you guys know just how much I enjoy listening in on your AM broadcasts. I am always impressed by the professionalism and courtesy shown by everyone, as a lot of operators often forget their air manners these days.

I am a 33 year old SWL, and I work as a bartender in between playing with my radios. You will be happy to know that I try to fit into the spirit of things by using my Hallicrafters SX-99, S-38, S-38D, and S-120. I have also heard you using an Airline 62-177, a Stromberg-Carlson 340-H, and a Drake 2-A. I've also had luck with reception using homebuilt regenerative receivers, and even a crystal set.

When I listen in, I enjoy looking through a copy of Raymond Moore's book on communications receivers so I can see the neat old radios you use so well. I don't have a copy of the ARRL Callsign book, so consider this to be a WSL request. I can promise a response to each and every letter. Thanks for the enjoyment and education, and who knows - perhaps some day I'll go for my license and do more than just listen!

Lyle W. Ahrens
1807 Crescent
Klamath Falls, OR 97601

Dear ER

My most recent acquisition - from the local Melbourne hamfest - was an immaculate, uncorrupted, late production (1962) R-390A. I was told, that it had been released ?? as surplus at Homestead AFB after the recent hurricane in South Florida. It was almost in perfect condition. So, I started doing some of the modifications per Ray Osterwald's excellent series of articles. The receiver turned out better than I ever expected.

My R390A had gone through a complete 1982 overhaul by the Air Force. Apparently most of the paper caps and both power supply electrolytics had been replaced. Several of the modules were dated 1966/67. Best of all the PTO tracks perfectly.

I really don't like modification articles that start out with "Move red wire from terminal #3 of the CK722 to pin #1 of the 203A", without any explanation of what is happening. This kind of modification is dangerous.

Ray, however, goes into elegant detail describing the theory and the options of doing the mod. He really does a excellent, professional job of writing.

Roger Faulstick, KD4AS

Letter From Gaithersburg from page 3

fered your choice of two dozen sets at $250-$300. A year from now your correspondent thinks prices will be around $150.

A hamfest is a public event and there too, G'burg '92 showed the others how it should be done. Ample and clean restrooms for both you and your XYL included those rarest of hamfest 'finds' -- working washbasins, soap and paper towels, as well as the necessities. Admission and parking management were as smooth as one could hope for and a modest variety of food and drink was available to keep up your energy. The 'order here', 'pay here', 'get food over there' system at the food stand was however confusing; with no signs, getting food was a challenge.

The committee that planned this 'fest must have ordered the weather, too. The day was sunny, clear, and pleasantly cool. Gaithersburg '92 may have been the best large hamfest of all time.

Walt Hutchens, KJ4KV

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VINTAGE EQUIPMENT ONLY

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Hesperus, CO 81326 **Phone/FAX 303-247-4935**

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FOR SALE: Repair and restoration on all vintage equipment; 35 years experience. Barney Wooters,W5KSO, 8303 E. Mansfield Ave., Denver, CO 80237. (303) 770-5314

FOR SALE: Collins RT-311/ARC-38 rcvr/xmtr, unmodified AM version, 2-25 MHz coverage, 100 W output max. - $60. Bob Karow, 620 Cortleigh Dr., York PA 17402. (717) 757-4321

FOR SALE: Military tech manual listings, largest stock in the world, over 50k - $5 refundable with first order. SASE for inquiries. Lee Frank, POB 60011, Harrisburg, PA 17106-0011.

FOR SALE: Drake R-4B with xtals for 160, 80, 40, 30, 20, 15, 11 and (4) 10-M , exc. cond. - $225. I ship UPS. Vance, K5CF, (918) 647-9044

WANTED: Clock for Hammarlund HQ-170AC-VHF or HQ-180AC; pwr xfmr for HQ-100; S-meter for Hallicrafters SX-25. John Harris, KC4JVJ, 3435 Stillridge Dr., Alpharetta, GA 30202. (404) 343-9197, lve msge

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WANTED: HRO-60 w/all coils. Will pay top price for top unit. Hank Scharfe, W6SKC, (602) 281-1681

FOR SALE: Collins S-Line aluminum knob inlays: small (exciter/PA tuning) - $1; 30L-1 - $2; spinner/plain (main tuning) - $3. Charlie, K3ICH, 13192 Pinnacle Lane, Leesburg, VA 22075. (703) 822-5643

FOR SALE: Globe King 500C, looks very good, loads 330 watts to dummy load, modulator not working, manual and cables - $450. PU only. Ken Burrough, NE0C, 70260 Morristown-Flushing Rd., Flushing, OH 43977. (614) 968-3067

WANTED: Any bug with sheet-metal base and frame. Also early Mac-Key with brass nameplate. Tom French, W1IMQ, "The McElroy Collector", 120 Great Road, Maynard, MA 01754. (508) 897-2226

FOR SALE: Collins S-Line cabinets; 75A-4 SSB filter; Drake RV-3 remote vfo. **WANTED:** Heath SB-640 remote LMO. Marty, (817) 497-6023 after 6 PM CST.

WANTED: QSL cards - I collect them. Also want General Radio Experimenter, radio books and magazines. Please write: Joe Holstein, N8EA, 1515 Sashabaw, Ortonville, MI 48462.

FOR SALE: Used technical books - radio, electronics, military, test equipment, catalogs, etc. List- $1 (stamps ok). Softwave, Dept. ER, 1515 Sashabaw, Ortonville, MI 48462

FOR SALE: Technical Material Corp. model CFA-1 dual input frequency shift converter with built-in scope, perfect for you antique RTTY ops, exc. cond. - $250 plus shpg. Peter R. Brown, KH6IRT, 5332 Puahia Place, Honolulu, HI 96821. (808) 373-2792

WANTED: HRO-60 coils type G/J/AA/AB and pre-1950 ARRL Handbooks. B. Nadel, Box 29303, San Francisco, CA 94129. (415) 346-3825

FOR SALE: Synchronous detector for 455 khz IF rcvrs. Dramatically improves AM: Reduces fading distortion, selectable sideband cuts interference. Kit: $139, Built/Tested: $199, Info: $3. Steve Johnston, POB 3420, York, PA 17402-0420.

FOR SALE: Rare 1936 Lafayette 3-tube 5-meter xcvr, with print - $100; Hammarlund EU-4 foundation exciter unit, wired, tubes, print - $50. All firm, plus shpg. John Chenoweth, W8CAE, 9130 Yankee St., Miamisburg, OH 45342. (513) 885-2566

WANTED: Buy and sell all types of electron tubes. Harold Bramstedt, C&N Electronics, 6104 Egg Lake Rd., Hugo, MN 55038. (800) 421-9397, (612) 429-9397, FAX (612)-429-0292

FOR TRADE: M-209 cipher machine, OSS/SOE "Spy" radios, and other espionage devises available for trade. Keith Melton, (318) 747-9616

FOR SALE: Lafayette radio operating and service manuals, schematics etc. If I don't have it,they never printed it. Pete Markavage, WA2CWA, 27 Walling St., Sayreville, NJ 08872. (908) 238-8964

WANTED: 75th tubes; 80-meter HDVL coil. Wayne, NØTE, Rt 1, Box 114, Burlington, KS 66839. (316) 364-5353

WANTED: Citizen Radio Callbook magazine for 1920, 1921 and 1922; Amateur Radio Callbook magazine (flying horse cover) for 1925 and 1926. Bob Arrowsmith, POB 166, Annandale, VA 22003. Collect (703) 560-7161

FOR SALE: Hammarlund HQ-110 rcvr; Viking Challenger xmtr; Sonar model SRT120 xmtr. **WANTED:** Viking Valiant I or Viking I or 2. K2OA, (914) 433-7714

FOR SALE: National NC-300 w/6,2,1-1/4 meter matching transverters - $275; rare Henry 4K-Ultra, 3-30 MHz, general coverage amplifier, mint, up to 2800 watts output - $3400 OBO. Gary, KE6MS, (310) 696-0177

FOR SALE: Radiometer Copenhagen MS27G signal generator, AM/FM, 50/75 ohms, 300 kHz - 240 MHz, 0.1 uV - 0/1 V. Excellent cond. w/manual and spare tubes - $350 plus UPS. Terry Perdue, K8TP, 23225 Woods Creek Rd., Snohomish, WA 98290. (206) 568-4403

FOR SALE: U.S. Navy flameproof keys NOS, 1955 sealed packages - $60 shpd. Telegraph items, etc., 7 page illustrated list - $1 plus SASE. J.H. Jacobs, 60 Seaview Terrace, Northport, NY 11768

WANTED: Manual for HP600B; 3TF7 tubes; meters for R390A; TEK 465 or 475 scope, must be in very good cond. Clark Hatch, WØBT, 2546 SE Peck Rd., Topeka, KS 66605. (913) 235-2721

FOR SALE: TBY ground plane - $30; R390A meter set w/orig. hardware - $50 UPS paid; R-100 URR rcvr, needs work - $30; BD-57B switchboard - $30; Collins S.S. MX 1058/U pull-out desk shelf for 19" rack - $30; ME165G SWR/pwr meter/dummy load for T-368 - $100; type 6000 tubes, new, boxed. Ken, K4KQR, 1406 Novella St., Opelika, AL 36801. (205) 745-3761

FOR SALE: R-390A service, module repair to complete remanufacture, cosmetic restoration, 20 years experience, expert service, 1 week turnaround, very reasonable, any cond. accepted. Rick Mish, (419) 726-2249

FOR SALE: Military monitoring antennas: broadband VHF/UHF discones, biconical types, 30 - 1000 Mcs, shipboard construction, 'N' connectors, preamps, antenna multicouplers, cables and accessories. Rick Mish, (419) 726-2249

WANTED: Power xfmr for Johnson Challenger. Will also consider a dead unit for rewinding. Dale Mecomber, N2DM, POB 87, Skaneateles Falls, NY 13153. (315) 685-3730

FOR SALE: Collins mech. filter plug-in adapter type 353E-1 complete with 6 kc filter. Never used, and in exc. cond. - $225 or trade for 8R-1 xtal calibrator and 148C-1 FM adapter in exc. cond. Peter R. Brown, KH6IRT, 5332 Puahia Pl., Honolulu, HI 96821. (808) 373-2792

WANTED: National HRO- 60 coils E,F or G. Willing to pay top dollar, or will trade A,B,C or D coils. Dennis Gibbs, 3863 Beech Down Dr., Chantilly, VA 22021. (703) 631-8539

FOR SALE: Collins mech. filters for 51J-4 - F500B14 and F500B31, used - $75 each, F500B60, unused - $100. Price includes shpg. Dallas Lankford, 903 Sherwood Dr., Ruston, LA 71270. (318) 251-2716

WANTED: B&W 3400 series inductors (page 83, cat. section, 1948 ARRL Handbook; National typ 'O' dials, 3-1/2" skirt. Roland Matson, K1OKO, RFD #1, Box 2943, Kennebunk, ME 04043. (207) 985-3751

FOR SALE: Radio tubes; repair and restoration of all vintage amateur and commercial radios, 25 years experience. Herbert Stark, 321 N. Thompson St., Hemet, CA 92543. (714) 658-3444

FOR SALE: SP-600-JX-21(?) in restored/mint cond. - $300; SX-28, semi-restored, VG cond. - $150; 75A-2, VG/mint - $275; PU only. **WANTED:** Clean to mint orig. ID plate and/or front panel for a BC-348 restoration - any model; S-53A owners manual; NIB BC-454/455. David Ishmael, WA6VVL, 1118 Paularino Ave., Costa Mesa, CA 92626. (714) 979-5858

WANTED: Collins literature, manuals, catalogs, SM2, SM3, MM2 mic's, TD1, 647T dipole ant, 35C low pass filter, 55G1. Rick Coyne, KD6CPE, POB 2000-200, Mission Viejo, CA 92692. (714) 855-4689

FOR SALE: Repair! All makes and models, homebrew, maximum labor per unit - $96. Dan Rupe, W7HBF, Telo Technology, 1302 S. Uplands, Camano, WA 98292. (206) 387-3558

WANTED: I need coil pack and turret ass. for 6010 Radcom/Westrex radio rcvr. Can anyone help? Edward J. White, WA3BZT, 809 Seymour Rd., Bear, DE 19701-1171. (302) 322-1313

WANTED: Cabinet for SP-600-JX-14. L.A. Locklear, 1122 36th St., Gulfport, MS 39501. (601) 864-8384

FOR SALE: Fund raiser for large museum has antique radio for sale. Paul Giganti, W6GVY, 2429 San Carlos Ave., San Carlos, CA 94070. (415) 593-4723

WANTED: Manual for B&K model 500, "Dyna-Quik" tube tester. Barry, N6CSW/Ø, (303) 247-4935

FOR SALE: Globe King modulator - $85; Heath SB-400 xmtr - $160, SB-303 rcvr, w/CW filter - $175; TCS 11 xmtr w/ps and cable - $100. Cliff Fleury, AI7Y, 64174 Tumalo Rim Dr., Bend, OR 97701. (503) 382-9162

WANTED: Globe King series; homebrew 1500 W tube tx; broadcast tx's; broadcast tx's; broadcast mics. Call, write or fax: Donald R. Boland, N1FYX, 28 Faulkner St., Malden, MA 02148. (617) 324-5362, FAX 322-8412

FOR SALE: New, unused BC-375E xmtr w/ shockmount and 4 tuning units, less VT-4 tubes - $300 plus UPS. Homer Henrioud, 2772 Plantation Dr., East Point, GA 30344. (404) 767-0404

WANTED: Lettine model 240 xmtr, any cond. Joe Perratto, K2QPR/4, 1341 SW Evergreen Ln., Palm City, FL 34990. (407) 220-2189

WANTED: Drake SPR-4 rcvr, have other radio equipment to trade. Jim, K7BTB, Box 50355, Parks, AZ 86018. (602) 635-2117

FOR TRADE: Viking 500 and 75A-1 for 75A-4 (late model) and Hammarlund Super-Pro, walnut console model (SP-150 or equiv.) Firm. Steve Hobensack, KJ8L, Rt 8, Box 311A, Marietta, GA 45750. (614) 373-9528

FOR SALE: Russian mech. filters, 600 Hz bandwidth at 500 khz, for rcvrs like 75A-1, 51J, etc. - $62 ppd. Joel Thurtell, 11803 Priscilla, Plymouth, MI 48170. (313) 453-8303

WANTED: EV 419 mike stand; S-38D dial glass or photocopy; S-meter for SX-100 (SX-99 OK). Bob Nickels, 1444 S. Rotzler, Freeport, IL 61032. (815) 232-7142

WANTED: Digital display to read freq. of Drake 4B, such as made by Grand Systems. K6UU, 700 Neil Creek Rd., Ashland, OR 97520. (503) 488-1506

WANTED: Ohmite 75K, 200 ohm resistor as used in BC-610. Thanks. R. Haworth, W2PUA, 112 Tilford Rd., Somerdale, NJ 08083. (609) 783-4175

FOR SALE: New list of over 400 vintage radios and accessories; also list of 500 vintage manuals available. SASE please. Mike Horvat, KA7ASF, 112 E. Burnett St., Stayton, OR 97383.

Western Heritage Museum Omaha, Nebraska
"a magnificent home for your equipment"

Leo Meyerson, WØGFQ, (founder of WRL) in concert with QCWA, needs donations of gear and related materials for the amateur radio exhibit at Western Heritage Museum in Omaha, Nebr.

This permanent display is the only one of its kind in the country and is something that all hams can be proud of. We expect 50,000 visitors annually.

Your tax deductible donation will be permanently noted on a plaque that will be prominently displayed.

For more information contact Leo at (402) 392-1708, May-Nov.; 619) 321-1138, Nov.-May.

WANTED: B&W type 3400 inductors, as pictured on page 83 of catalog section of 1948 ARRL Handbook; REL xmting coils, flat wound on glass rods. Roland Matson, RFD #1, Box 2943 Kennebunk, ME 04043. (207) 985-3751

FOR SALE: Heath Nostalgia - 124 page paperback covers Heath history in pictures and stories. $9.95 postpaid (plus tax in WA). Heath Nostalgia, 4320 - 196th SW., Suite B-111, Lynnwood, WA 98036.

WANTED: National NC-303 and RME 4350, good to excellent. James Geer, WB5LXZ, 604 King Dr., Bedford, TX 76022-7124. (817) 268-1985

FOR SALE: Hickock one inch oscilloscope, 7-tube, circa 1930; HRO-5 coil 'C'; older HRO coils 'G' and 'D' - $35 each plus shpg. Henry Mohr, W3NCX, 1005 Wyoming St., Allentown, PA 18103. (215) 435-3276

WANTED: RCA AR-88, VLF or ELF rcvr; tube CB's; SB-301; SB-401; SB-110; SB-200; SB-101; SB-310; Harvey-Wells; Sonar; Lettine; Gonset; Lampkin; Philco; Arrow; B&W, Bendix, Swan, Hunter, Davco. Donald R. Boland, N1FYX, 28 Faulkner St., Malden, MA 02148. (617) 324-5362, FAX 322-8412

FOR SALE: Collins 204-H. This is an autotune 2.5 KW amplifier. This unit has never been in service and is essentially brand new, w/manual, less finals (4CX-1000's). Best offer over $3,000 plus freight (650 lbs.) Peter R. Brown, KH6IRT, 5332 Puahia Place, Honolulu, HI 96821. (808) 373-2792

WANTED: Espionage equipment. Historian purchases spy radios, code and cipher machines and any equipment, devises or manuals pertaining to the world's intelligence organizations. Keith Melton, Box 5755, Bossier City, LA 71171. (318) 747-9616

FOR SALE: Federal variocoupler, new - $40; Command rcvr BC-1206C, 200-400 kcs - $20; Honeycomb coils 1835-1500 turn and adjustable mounting bracket - $195. (5) Triplett square meters, 3 inch - 10, 50, 250 mA; 4" - 50 and 250 mA, brand new in boxes, bought for large xmtr, never built - $115. Won't seperate either coils or meters in their groups. All plus UPS. Paul C. Crum, 6272 N. Cicero Ave., Chicago, IL 60646. (312) 282-3033

FOR SALE: Conset Communicator II - $25. **WANTED:** Manual for Hammarlund HQ-140X. Clem Duval, W8VO, 33727 Brownlea Dr., Sterling Heights, MI 48312. (313) 268-2467

WANTED: Hammarlund - HX-500, HXL-1, HQ-170A-VHF, spkr for HQ-110; Hallicrafters - SX-101A, HT-33, SX-96; Knight - Space Spanner; National - SW-54, spkr for NC-300; Gonset - G43; Collins - 32V2/3, 75A2/3; WRL - 500B, 300A. Above items needed for museum collection. Don Zielinski, KØPVI, POB 112, Watkins, CO 80137. (303) 344-4630

FOR SALE: AN/PDR-27F radiation detector, w/all accessories - $45; equip,parts, manuals, books, long list - $1. **WANTED:** Any Collins literature. Joe Orgnero, VE6RST, Box 32, Site 7, SS 1, Calgary, AB T2M 4N3, Canada. (403) 239-0489

WANTED: Intelligence museum wants German, Japanese, Italian, Russian and Chinese communication equipment and any British or U.S. spy radios. LTC William Howard, 219 Harborview Lane, Largo, FL 34640. (813) 585-7756

FOR SALE: Military favorites: R-390As, R-388s, SP-600s, R-1051s, WRR3s and other HF and LF rcvrs, modules and parts available. LSASE for new list. APS-E, 107 Fayton Ave., Norfolk, VA 23505.

WANTED: Collins 516F-1 and 516F-2. Mimi, (310) 379-6052 or FAX (310) 379-5543

FOR SALE: SX-28A w/spkr and manual, some scratches on cabinet but front panel exc., wrkg - $250. PU only; S-38C, very good - $45 + shpg. Bill Harris, K5MIL, 1513 Bellechase Dr., Roanoke, TX 76262. (817) 431-2272

WANTED: For 75A-4 - L2, L8, C13 and C28; Hunter Cyclemaster 20A exciter. Ray Osterwald, NØDMS, (303) 571-2644 (w), 987-3836 (h)

FOR SALE: HT-37 - $150; SX-110 - $90; SX-101A - $150; RME converter VHF-126 - $75; Galaxy V MK II, w/pwr sply & VOX unit, extra clean - $275. U-ship. **WANTED:** Books by Bill Orr - especially late '30's, '40's & '50's handbooks. Larry Howe, KBØHIB, 1333 S. Airwood, Springfield, MO 65804. (417) 882-1682

FOR SALE: New Collins parts: 30L-1 blower motors - $35; 51S-1 PTO osc., 70K-7, P/N 522-2918-000 - $200; silver plated 30S-1 tank coils - $7. Dennis Brothers, WAØCBK, HC 84, Box 1, Potter, NE 69156. (308) 879-4552

WANTED: HRO-60 w/all coils, preferably mint; tuning knob for SX-88. Did any other Hallicrafters gear use this same knob? Barrie, KF7VA, 125 Ben Hogan Dr., Missoula, MT 59803. (406) 549-1921 eves and wknds, 728-7637 wkdys.

WANTED: Original or copy of spec sheet for Johnson Signal Sentry. Jerry Burns, K1GUP, P.O. Box 61, Carmel, ME 04419. (207) 848-3400

FOR SALE or TRADE: (2) RT-66 rcvrs w/ps, manuals and base, exc./mint physical cond. - $120. Andrew Yoker, POB 109, Blue Ridge Summit, PA 17214. (717) 263-6109

WANTED: Coil drawers for HRO-50: A,C,D; also manual for PU 286-C generator set. Jim Feasel, W8HPL, 13549 Morse Rd., Pataskala, OH 43062. (614) 927-2592

WANTED: For restoration and use, a 1 kc mechanical filter for 51J4. Howard Hartzell, Rd 2, Box 505, Mifflinburg, PA 17844.

WANTED: KWS-1; 32V-1/2 or 3. MikeSamarco, W1JZ, 111 Glen Ave., Upton, MA 01568. (508) 529-4427

WANTED

Collins promotional literature, catalogs and manuals for the period 1933-1983. Jim Stitzinger, WA3CEX, 23800 Via Irana, Valencia, CA 91355. (805) 259-2011. FAX (805) 259-3830

FOR SALE: Collins 75A-4 filters: 6 pole ceramic for high quality AM. 3 bandwidths available: 4, 6, or 9 Khz - $83.50 ea.; single pole CW crystal filters - $88 ea. 10% discount for two filters. Money back guarantee. Calif. residents please add sales tax. Vector Control Systems, 1655 No. Mountain, Ste. 104-45, Upland, CA 91786. (714) 985-6250

WANTED: "Broadcast News"(RCA), "Pick Ups" (W.E.), other broadcast literature and catalogs of the '30's - '50's. Sam Thompson, W6HDU, 1031 San Antonio Ave., Alameda, CA 94501. (510) 521-1429

WANTED: AN/WRR-3 (R-1134) VLF/LF rcvr in good cond.; Collins R-389/URR in good cond.; would consider other VLF/LF equipment in good cond. Seller must be willing to ship (I pay). I could pick up in upstate western NY. Jim Wilson, 35 Belgard St., Rochester, NY 14609. (716) 288-0427 (n), 726-0952 (d)

FOR SALE: Tektronix plug-ins: types CA dual trace, 'E' AC preamp, D and 53/54D preamp, some need tubes - $10 each. N4GL, Box 1658, Hernando, FL 34442.

FOR SALE: Lafayette HE-45 - $35; mint Hallicrafters HG-1 RF generator - $60; near mint Heath Apache - $175. Plus UPS. Don Winfield, K5DUT, 6080 Anahuac Ave., Fort Worth, TX 76114. (817) 732-3976

WANTED: Schematic or service manual, also operating manual, for Bendix Navigator 555 marine RDF rcvr, copies OK. Herman Plew, W6BYX, POB 754, Atascadero, CA 93423.

FOR SALE: R-390A squelch modication: small external add-on module, super sensitive, works great on AM and SSB, 15 minute installation, instructions included - $25. Rick Mish, (419) 726-2249

WANTED: Rider manuals #1, #20, #21, #22 and #23; articles on 1 & 2-tube radios. Stephen Kalista, 9 Maple Dr., Jim Thorpe, PA 18229. (717) 325-4120

FOR SALE: Transmitting/Receiving tubes, new and used. LSASE for list. I also collect old and unique tubes of any type. Looking for Taylor and Heintz-Kaufman types and large tubes and sockets from the old Eimac line; 250T through 2000T for display. Maybe you have something to trade? John H. Walker Jr., 16112 W. 125th St., Olathe, KS 66062. (913) 782-6455

FOR SALE: R-392 rcvr w/ps and spkr, VGC - $250; large military balloons - $10; tube testers - Heath IT-17, exc. - $35, Knight tester - $30; generators - TS-510A/U (HP 608D) or URM-25F - $89 ea.; counters - HP 5326 w/DMM - $125, HP 5327A - $225, USM-207, 600 MHz - $150, HP 5243L - $50, HP 5245M, hi-stab. T.B. - $150, Systron-Donner 6150, 70 MHz - $50, Beckman 6146 - $75; oscillators - TS-382, HP 233 - $40 ea, HP 330D analyzer - $40, HP 400L, HP 415B, HP 430C - $40 ea.; ME-26, HP 400AB - $25 ea., modular power supplies - 5 V - 5.7 A, 12 V - 3.2 A, 24 V - 1.8 A, 28 V - 1.6 A, 30 V - 2.7 A - $10 each. R-390A parts, crystals, write wants. All plus UPS. Joe Bunyard, 1601 Lexington St., Waco, TX 76711-1701. (817) 753-1605

FOR SALE: Eimac socket for 4CX1000/1500 - $75. Bob, WØZKR, 13790 Beaumont Ave., Saratoga, CA 95070. (408) 867-5548

WANTED: 75A-4 serial no. above 5000 please. Bill Smitherman, KD4AF, Rt 4, Box 79, East Bend, NC 27018.

FOR SALE: Thirty-six page catalog of WW II military radio equip. - $1 or postage stamps. Sam Hevener, W8KBF, "The Signal Corps", 3583 Everett Rd., Richfield, OH 44286.

WANTED: Johnson gear, all models, any condition. Also parts and literature. Please state condition and shipped price. Wen Turner, AD7Z, Box 451ER, Cal-Nev-Ari, NV 89039.

ELECTRIC RADIO PARTS UNIT DIRECTORY

At this point the directory has over 230 units in it. If you need a part for a vintage restoration send $2 and an SASE (.52 postage) for the list. If you have a parts unit, consider putting it on the list. Your dead unit can help bring others to life!

WANTED: Machine shop work. Knobs shafts bushings, etc. made to your sample or drawing. Reasonable. Jim Dill, Box 5044, Greeley, CO 80631. (303) 353-8561 evenings.

FOR SALE: Heathkits - DX-60, exc. - $50, HG-10B vfo - $40, SB-10 SSB adapter - $50; Kenwood 599A - $150; 'Swan stuff'. All manuals, U-ship. Richard Lucchesi, WA2RQY, 941 N. Park Ave., N. Massapequa, NY 11758. (516) 798-1230

FOR SALE: Repair & refurbishment of older tube-type amateur equipment. Fully FCC licensed; 35 years experience. Chuck Banta, N6FX, Claremont, Calif. (LA area) (714) 593-1861

FOR SALE: HRO-60, VGC, w/all 13 coils - offers. KD4AJ, 1968 Huntington Hall Ct., Atlanta, GA 30338.

FOR SALE: HV capacitors, parts, crystal calibrator kit. At prices you'll like. $1 brings catalog and coupon. Thanks. NW2F, Two Fox Electrix, POB 721, Pawling, NY 12564. (914) 855-1829

FOR SALE: Mint working cond. DX Engineering speech processor for Collins S-Line, model LC-1-32S - $100 plus shpg. Gary Elliott, NO5H, 808 Clarice St., Delhi, LA 71232. (318) 878-8032

WANTED: Manual for Simpson 260 series 7P VOM, original or repro; E&E's Radio Handbook 15th, 16th and 17th edition. Makoto Takazawa, JA1XS, 4-15-1401, Wakabadai, Ashi-ku, Yokohama, 241 Japan

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FOR SALE: Barker and Williamson balun coils matching 300 ohms to 50 ohms or vice versa, mounted on steel plate - $15. Bill Riley, W7EXB, 863 W. 38th Ave., Eugene, OR 97405. (503) 345-2169

FOR SALE: First user friendly circuit on early BC-348's. Most component values on 2 sheets, 8x14, reads left to right. Send $2 + (2) $.29 stamps. Ray Larson, 12241-1/2 Gorham Ave., W. Los Angeles, CA 90049-5214

FOR SALE: Working antique Hickok RF-AF generator - $65. **WANTED:** Sylvania 6J86 tubes and working Ranger, preferably Ranger II. Rick, K8MLV/Ø, 1802 W. 17th St., Pueblo, CO 81003. (719) 543-2459

WANTED: All types of military electronics, especially RDF and radar items, manuals too. Also need URD2 antenna. William Van Lennep, POB 211 Pepperell, MA 01463. (508) 433-6031

FOR SALE or TRADE: Hallicrafters SX-99 rcvr, good cond., works fine - $85. Fred Clinger, 417 Beechwood Dr., Galion, OH 44833. (419) 468-6117

WANTED: Collins 51S-1; KWM-1; 32V-3 manual; National HRO-500 or parts unit; HRO-60 rcvr, coils, spkr; Hallicrafters SX-88, SX-112. Charlie Rautsch, K5UPX, 18003 Vintage Wood Ln., Spring, TX 77379. (713) 333-6769 (d), 320-0317 (n)

FOR SALE: Johnson Personal Messenger CB handi-talkie. Will also trade for Ocean Hopper. John, WB9OVV, 6921 Springside, Downers Grove, IL 60516-3114. (708) 964-3020

FOR SALE: Heath VF-1 vfo - $20; Apache - call. **WANTED:** Collins 32S1 xmtr and ps. Dan Radcliffe, KP9BP, (414) 255-9165

WANTED: Manual or schematic for Gonset Communicator II or IIA. Ken Kinderman, WB9OZR, 362 Echo Valley Lane, Kinnelon, NJ 07405. (201) 492-9319

WANTED: HT-9 crystals: Bliley LD2 (80-160), B5 (40 and 20 doubled), HF2 (10 doubled). Your price. Donald Hudson, KA1TZR, 97 Southwood Dr., New Canaan, CT 06840. (203) 966-2859

FOR SALE: Collins PM-2 1- $100, 30L-1 - $550, R-392 - $150, solid state tubes for 75S3B/C - $120, KW-1 - $12,000; Heathkit DX-60B - $50; Eimac socket for 4-1000A - $40. Mike, K5FZ, 16707 Creeksouth, Houston, TX 77068. (713) 893-7004

WANTED: To hear from anyone who served as a radio operator on a military or civilian airplane in the 1930 to 1950 time period. Also, would like to hear from anyone who went to school at Port Arthur College. Ron Thomas, W8QYR, POB 347115, Atlanta, GA 30334

Please remember to count the words in your ad. If you are over 25 words, please send 15 cents for each extra word.

FOR SALE: SAMS for hams. Photofacts of vintage ham gear. We also buy used SAMS. A.G. Tannenbaum, WA2BTB, POB 110, East Rockaway, NY 11518. (516) 887-0057

WANTED: Companion spkr (MS-4) and accessoy crystals for Drake R-4 series receiver. Also, tuning knobs and spkr (R-46A, R-48) for Hallicrafters SX-100. John B. Keil, 4618 Norwalk St., Union City, CA 94587. (510) 471-4838

FOR SALE: National HRO-500 - $450; Collins 62S1 - $750. Plus shpg. Gene Peroni, KA6NNR, POB 58003, Philadelphia, PA 19102. (215) 665-6182

WANTED: Info/parts to put Drake 2B on 160, or 2B w/160. Dan Bookwalter, KC8CH, 10759 Oak Branch Trail, Strongsville, OH 44136. (216) 572-0571

TRADE: My BC-1000 for nice 6 to 9.1 MHz ARC/5 or BC-455 rcvr. Steve, WB7BNZ, POB 589, Roslyn, WA 98941. (509) 649-2913

WANTED: BC-375 shock mount; Navy TCX NT-52228 xmtr; also model 19 Teletype (closeby) and Hal ST-5 or ST-6. Steve Davis, KD2NX, 705 13th Ave., Bellmar, NJ 07719. (908) 280-9760

FOR SALE: Johnson Ranger in good cond.- $100. **WANTED:** Stancor ST-202-A xmtr & Hallicrafters S-40A rcvr. Paul Christensen, 11142 Raley Creek Dr. S., Jacksonville, FL 32225. (904) 721-9111 9AM-5PM.

FOR SALE: Complete electronics suite from decommisioned U.S. Navy aircraft carrier. 1960's vintage equipment. Collins URC32A (500 W HF xcvr); Westinghouse WRT-1s and 2s (1 KW multimode xmtr); Collins R390A rcvrs; Magnavox WRR3A rcvrs; radar sets; ant. couplers; teletypes etc. Call for details. Bob Mantell, W6VQT, 3135 N. Ellington Dr., Los Angeles, CA 90068. (213) 851-2786

MESSAGE: "The Vail Correspondent": New quarterly journal by and for key collectors. Published by W1IMQ. Sample (October issue) $2. TVC, Box 88-E, Maynard, MA 01754

FOR SALE: Millen grid dip meter - $100; Heath GD-1B grid dip meter w/manual - $40; National VFO-62, 6 & 2 meters, exc. cond. - $45; U.S. Navy headset TH-37, new in sealed box - $20; tubes - (2) 100THs, new in sealed boxes - $45 each. **WANTED:** Collins 75A-1 rcvr; Technical Materials Corp. GPR-90, 91 & 92 rcvrs. Ron, KC6WTG, (707) 539-8319, noon - 9 PM Pacific

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WANTED: Heath HG-10B vfo; Globe 755 vfo; info on xmtr radio T-397/SRT-4A, uses 2 813s in final. Bill Bogart, KA9CWK, POB 81, Covington, IN 47932. (317) 793-4660

FOR SALE: Several computer equipment cabinets, perfect for that large homebrew project or to consolidate your loose gear. These are 52 x 27 x 33-1/2 inches (HxWxD) welded steel frames, 22-1/2 inches between front uprights with woodgrain formica tops and have wheels and screw-down feet. Rugged, will easily handle several hundred lbs. Some have power entry boxes with relays, outlets, circuit breaker (s) and heavy duty 3 or 4 wire cables w/plugs. Most have fan boxes to blow or suck air through loovers at top rear and removable tan painted steel covers on 3 or 4 side, no slides. Some have one or two sets of chassis slides. Nice cond. - $45 each, PU only. Walt Hutchens, KJ4KV, 3123 N. Military Rd., Arlington, VA 22207. (703) 524-9794

FOR SALE or TRADE: R-7, spkr, R-4B, PS-4, w/manuals. Levy, 8 Waterloo, Morris Plains, NJ 07950. (201) 285-0233

WANTED: Dot paddle, one weight & hardware for the two terminal lugs on a Mackey. Tom Schlechte, 1021 Hunt Dr., Lakeland, FL 33801. (813) 687-3721

FOR SALE: HRO-60, works but not very well - $225; HRO-50's - $250 and $225; all above HRO's with A thru D coils; Navy HRO-RAS-5, 7 coils, recapped - $145; drum for early 75A-4 - $30; drum for KWS-1 - $30; top half of WRR rcvr. John, N5SPO, (713) 440-5598

WANTED: Top cover for Viking 500 pwr sply/modulator; meter for Navigator (wkg or not); also RCA mics. Andy, WA4KCY, (404) 832-0202 or CB

FOR SALE: (3) Johnson Viking II xmtrs - $75 each, all three - $160; (2) antique Sonar SRT-120 xmtrs, need wrk - $60 for both; WW II J-36 bug, mfg. by Lionel Corp. - $100. John Maver, W6MQK, 1049 N. Holliston Ave., Pasadena, CA 91104. (818) 798-9345

FOR SALE: KWM2, rcvr section wrkg but no grid drive, w/VC to exc. cond. 516F2 pwr sply w/Selco solid state replacements - $350. Plus shpg. Gary Elliott, NO5H, 808 Clarice St., Delhi, LA 71232. (318) 878-8032

FOR SALE: Precision E-200 sig. gen., good wkg cond. - $40 + $7.50 shpg; Eico peak-to-peak VTVM, like new - $30 + $7.50 shpg; AK 60 escutcheon - $12 ppd; AK 665 dial ring - $12 ppd; NRI professional VTVM model 11 - $25 + $5 shpg; vintage hi-voltage, oil-filled caps - write. **WANTED:** Information and radios made by Goldentone, Fordson, Clinton and Aetna. James Fred, R1, Box 41, Cutler, IN 46920. (317) 268-2214

WANTED: National 50TS 10" spkr in good cond. Alan Dale, W9ZPP, 2824 Forest Ave., Evansville, IN 47712. (812) 424-5208

WANTED: BC-669 D xmtr/rcvr and modulator schematics. Also BC-191-C or later with TUs and accessories. Michael D. Runyan, KK7F, 2304 W. 2nd, #4, Spokane, WA 99204.

FOR SALE: RBC-2 - $65; RBB-RBC pwr sply - $40; 27 uH high-pwr roller inductor - $35; turns counter - $10; TEK 53/54 plugin, TEK 'D' plugin, LM-18, LM-21, LP-5 - $15 each; Measurements 560FM - $40; HP-200AB audio osc. - $20; Ballentine 310A VTVM - $15. Shpg xtra. George, WA7HDL, (208) 756-4147

WANTED: HF mobile amp; DC pwr sply 1000-1500V. Howard, W3HM, (703) 318-1074 -X 320 (w), (304) 876-6483 (h) after 1900

← Actual Ad from 1927

FOR SALE or TRADE: Collectors premium, WW II Navy TCS-14 radio system as supplied to the gov't by Air King Corporation of Brooklyn,NY. Released new surplus, never installed in military service. Complete matching serial numbers rcvr and xmtr, mounted on shock mount bases, remote control/spkr unit. Dynamotor pwr sply (12 volt). All orig. interconnect cables, antenna loading coil, carbon mic, manual, condition as near new, fully operational at flip of switch. Looking for good cond., full cabinet meters, Collins R-390A rcvr or will sell for equal dolllars. Wayne, N8MS, Rt 2, Box 1500, Fairmont, WV 26554.

WANTED: Schematic for poly-cmm 6, 6-M xcvr; January 1948 Radio News. Al Bernard, NI4Q, POB 690098, Orlando, FL 32869-0098. (407) 351-5536

FOR SALE: Thousands of vintage radio parts, catalog #0692, 40 pages - $2. Gary B. Schneider, Play Things Of Past, 9511-23 Sunrise Blvd., North Royalton, OH 44133.

FOR SALE: 75A-4; 32V-3; Drake C-Line; TR4CW w/RIT; R-390A. Carter Elliott, WD4AYS, 1460 Pinedale Rd., Charlottesville, VA 22901. (804) 980-7698 (d), 979-7383 (n)

WANTED: Dead Swan 500C, 350C, 500CX and or parts. Don Cossaart, N4KYK, 211947th Pl., W, Bradenton, FL 34209-5739. (813) 795-3731

WANTED: Link and Motorola police radio equip., parts, manuals from the '40's and earlier. Geoff Fors, WB6NVH, POB 342, Monterey, CA 93942. (408) 373-7636

FOR SALE: NC-300, good, w/manual - $85; NC-300, better, w/spkr & manual - $130; SX-117, new cond., w/manual - $110; R-274A/SP-600, recapped, w/manual - $130; National NCL-200 linear, good, w/manual - $350; Hallicrafters HT-44, w/manual - $80; Collins 32S1, 75A-1 & 516F2, good to exc. cond., w/manuals - $650; URM25B sig. gen., complete, new cond., w/all accs. & manual - $85; National NC-190 - $80; Collins RT594/ARC38A, AM/SSB/CW aircraft xcvr w/control boxes - $80; misc ARC-5 rcvrs and parts; Jennings and Eimac variable vacuum capacitors 100 to 500 pF @ 5-15 KV - $15 to $60 each; fixed vacuum caps 20 to 100 pF 5-30 KV - $10 to $15 each; Eimac 4-400As, new in boxes - $60 each; RCA 829B/3E29s,new - $6 each. Roger Faulstick, KD4AS, 210 Mariah Ct., Merritt Island, FL 32953. (407) 453-3312, FAX (407) 453-2258

WANTED: Shortwave rcvr - Patterson, Breting, Howard, Meissner, Pilot, REL, ACS, SW-3, RCA. Cash or trade for AM gear. Bob Mattson, KC2LK, 10 Jane Wood Rd., Highland, NY 12528. (914) 691-6247

WANTED: Still looking for parts and information relative to the Hallicrafters HT-4B, circa 1938. Especially need original speech amplifier, HT-5. Also need tuning unit TU-61, and coil unit C-454 (BC-610 parts will work). Need plug in air-padder for tank circuit. Need several HR-2 or HR-3 heat dissipating connectors (these fit the grid pins on 100TH). Any information that might help me find these parts would be greatly appreciated. Barrie, KF7VA, 125 Ben Hogan Dr., Missoula, MT 59803. (406) 549-1921 eves and wknds, 728-7637 wkdys

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FOR SALE: B&W 5100B w/orig. manual in VGC - $250; SP-600JX-17 in VGC, without cabinet, w/copy of manual - $250. RPS now takes #100 cartons. Please request 3 page list. Clyde Sakir, N7IOK, 4243 E. First St., Tucson, AZ 85711. (602) 323-1120

FOR SALE: Johnson TR switch - $35; National XCU-300 - $27; Meissner EX Shifter - $50; Super 6 Gonset - $7' Commanche and Tener - $25 for both; Racal RA6217 rcvr - BO; Thor 6 - $70; Philco Producta TV - $BO; LM Freq. meter & pwr sply - $30. Joe Sloss, K7MKS, (206) 747-5349

FOR SALE: Heath DX-100 - $50; National NC-200 - $100; NC-188 - $35; Hallicrafters SX-62 - $200. **WANTED:** AM/FRR-59 pwr sply cable for BC-669. John Richardson, 1163 Highland Pl., Dubuque, IA 52001. (319) 556-5504

WANTED: Manual or copy for Navy RBL-3, type CWQ-46161-A rcvr mftd by Wells Gardner; manual or copy for model DFR-10 direction finding rcvr by Apelco (Applied Electronics Company, San Francisco). Jim Wilson, 35 Belgard St., Rochester, NY 14609. (716) 288-0427 (n), 726-0952 (d)

FOR SALE: Drake R4B rcvr and T4XB xmtr, includes ps, manuals and some spare tubes, very good cond. - $375 OBO; Knight T-150A xmtr, 80 thru 6 meters, AM and CW modes, fair cond. - $60 OBO. Must sell these items. David Childers, NL7YU, POB 191213, Kodiak, AK 99619. (907) 487-2496

WANTED: Pwr sply for 'Cosmophone 35', p.s. 35 or schematic and photos so I can try to duplicate. Gary A. Reiss, WAØJRM, Rt 1, Box 141, Wilcox, NE 68982.

FOR SALE: Ranger I - $125; Viking Valiant - $225; Viking 500 - $700; Courier amp - $300; 122 VFO - $30; Heath DX-40 - $40; VF-1 - $25; SB-650 digital readout for SB series - $50; HM-102 - $30; Gonset 6-meter Communicator III - $40; Galaxy III remote vfo - $25; BC-610 stuff - BC-614-H - $25, PA coils - $10, oscillator plugins - $10; Astatic D-104 - $30; tubes - 4-400s - $30, 810s - $25; Eimac socket SK-300 - $75; rotators - Wilson WR-1000 - $500, CDE Tailtwister - $225; I will modify your Johnson Desk KW RF deck to include 160 meters - $call; taking preliminary orders for repainted and re-silkscreened Johnson Ranger I front panels - $45 each. Call after October 19. Gary, W7FG, (918) 333-7893

WANTED: Globe King; homebrew 1500 W tube xmtr; Uniden Tempo 2010; broadcast xmtrs; broadcast mics; ext. vfo for Ameco TX-62; AM broadcast rcvrs. Donald R. Boland, N1FYX, 28 Faulkner St., Malden, MA 02148. (617) 324-5362, FAX (617) 322-8412

FOR SALE: Lafayette HE-30 rcvr. **WANTED:** E.F. Johnson milliammeter; Collins vernier drive, spkr, spline wrenches, 32V. Brian Roberts, K9VKY, 3068 Evergreen Rd., Pittsburgh, PA 15237. (412) 931-4646

WANTED: Original R-390A manual. David Burns, WA3WHR, 5709 Dun Horse Lane, Derwood, MD 20855. (301) 963-0122

WANTED: Heathkit or Kaar Engineering Conelrad Monitor; Turner model 99 dynamic mic. Bill Brossmann, K9IUF, 547 Lake Connie Rd., Carrollton, GA 30117. (404) 834-0460

FOR SALE: Real audio for your R-390A. Send me your audio chassis (no junkers please) and I'll ship you a ready-to-play chassis. If you're not happy (for any reason) return the chassis (within 30 days) for a full refund. Specs will equal or exceed those specified in ER article - $119 shpg prepaid. Allow 30 days for delivery. Bill Kleronomos, KDØHG, DBA Longmont Labs, 224 Main St., POB 1456, Lyons, CO 80540. (303) 823-6438

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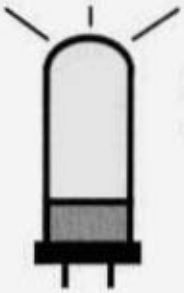

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