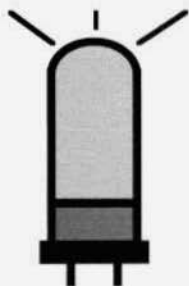


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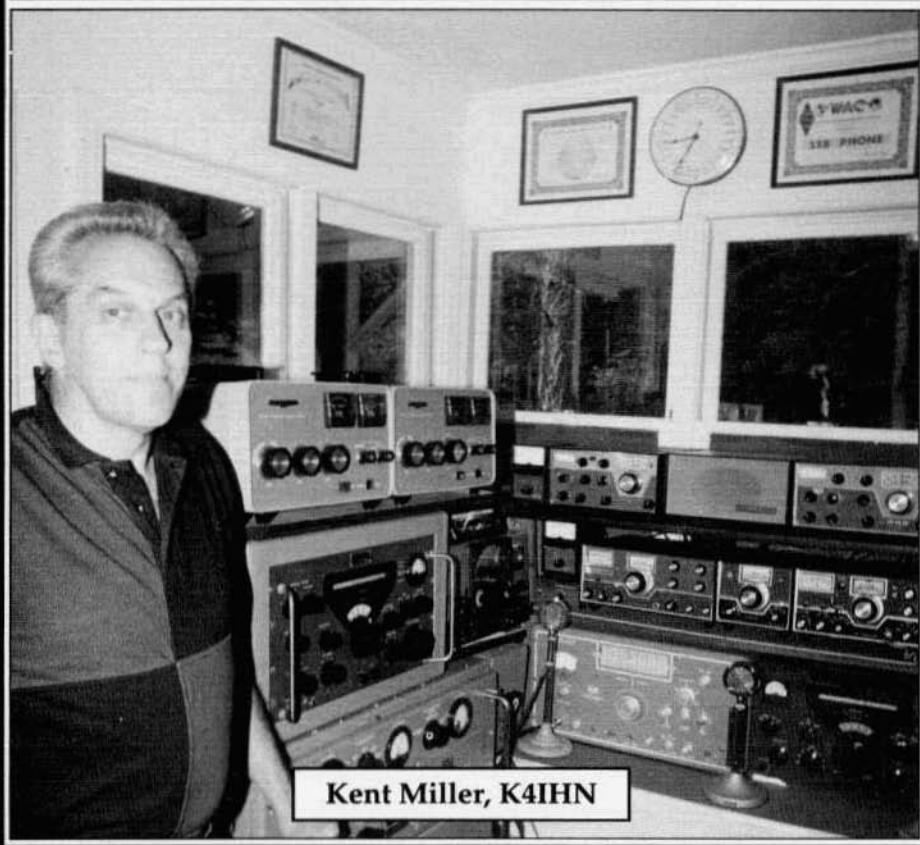


ELECTRIC RADIO

celebrating a bygone era

Number 65

September 1994



Kent Miller, K4IHN

ELECTRIC RADIO

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

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

Regular contributors include:

Walt Hutchens, KJ4KV; Bill Kleronomos, KDØHG; Ray Osterwald, NØDMS; John Staples, W6BM; Dave Ishmael, WA6VVL; Jim Hanlon, W8KGI; Chuck Penson, WA7ZZE; Jim Musgrove, K5BZH; Dennis Petrich, KØEEO; Bob Dennison, W2HBE; Dale Gagnon, KW1I; Rob Brownstein, NS6V; Dick Houston, WØPK; Andy Howard, WA4KCY; Skip Green, K7YOO; George Maier, KU1R; Albert Roehm, W2OBJ; Mike O'Brien, NØNLQ, Bob Sitterley, K7POF (photos) and others.

This issue contains the first (or second) antenna article we've ever printed. Until now we've left that subject to the other magazines. The Hex-Beam antenna, designed by N1HXA is quite a departure from conventional designs. I think N1HXA has broken new ground and I'm delighted to have this antenna article in *ER*. This antenna appears to have those qualities that we're all interested in. It has good forward gain and front-to-back ratio, it's small and doesn't take up a lot of real estate, it's light, easy to install and it can be homebrewed. There'll be more articles to follow on this antenna; hopefully some from readers who have homebrewed their own.

In the future we're going to be doing more articles on antennas and I invite *ER* readers to submit information on their antenna systems for publication. This can be in the form of a letter or a short article, preferably with good photos and drawings. We'll get as many of them in the magazine as possible.

Every now and then I have to mention the *ER* Parts Unit Directory, one of my favorite projects. The list that now contains around 275 units has become a mainstay for those that restore vintage gear. I don't know of any other source for a list of parts unit sets. And as the supply of vintage gear dries up as it is appearing to do, more and more 'basket case' sets are being restored. The demand for parts from 'parts units' is increasing. As I've said before, "Your parts unit can bring another rig to life". Please consider putting any parts units you may have in the Parts Unit Directory. And I'd like to hear from any of those people who have rigs on the list but who no longer have the rigs. Please call or send me a card. I've heard from several people who have called people with rigs on the list only to learn that the rig has been completely stripped. Wasted phone calls are discouraging.

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Cover: Kent Miller, K4IHN, with his vintage equipment. He's a very active AM'er on all bands, 160 thru 10 meters.

LETTERS

Dear ER,

This past April, I fell victim to the dreaded "old buzzard transmission" which monopolized the frequency and chased away most of the participants in the QSO. Although I have heard many "sidebanders" criticize the AM mode because of such occurrences, until recently I had never experienced one. Now I know just what they mean!

My experience began when I called CQ on 3885 one evening. I received a response, and soon thereafter several stations were in the QSO. One station, however, commenced a monologue that lasted in excess of 20 minutes. During the course of his transmission, several of the other stations left the frequency in disgust. I stayed, not because the other station's monologue was interesting, quite to the contrary, but just to see how long he would monopolize the frequency.

Speculating that his rambling monologue was induced by some medication that he was taking for some temporary medical condition, I thought nothing more of it -- until last night.

This same operator did the exact same thing, on the exact same frequency, and for almost the same amount of time! Once again, several stations left the frequency. I also gave up and moved down to 3880 and started another QSO.

Article One of the Amateur's Code reads: "The Amateur is Considerate. . . He never knowingly uses the air in such a way as to lessen the pleasure of others." Lengthy monologues, or "old buzzard transmissions," clearly violate Article One, in that they most assuredly lessen the pleasure of those who fall victim to them.

AM operation is unpopular enough already; providing our detractors with additional ammunition with which to

criticize us is unwise. More importantly, however, is the fact that subjecting fellow hams to such operating techniques is inconsiderate and just plain rude!

Let's all please try to remember that we are not the only participant in a QSO. Those of us that want to hear a 20 minute monologue would probably be listening to a commercial broadcast of our own choosing, rather than being subjected to one by a fellow ham.

Steve Thomason, WB4IYN

Dear ER,

I have a few comments about Walt Hutchens, KJ4KV's, letter in the Aug-'94 ER #64.

* The starting surge (or inrush) current is NOT negligible. While it is true that the HV secondaries are effectively open during power-on using the 5U4 & 5R4, the real culprit is the worst-case inrush currents during the initial magnetization of the transformer core. This worst-case power-on condition occurs when power-on coincides with the peak AC line voltage. These currents are especially high with relatively low DC resistances in the transformer's primary winding. Fortunately, this happens relatively infrequently. When it does, however, these inrush currents can be pretty high and can lead to the premature failure of the on/off switch's contacts - welding the contacts in the "on" or closed position. Solid-stating the HV secondaries exacerbates the problem by increasing the width of the inrush current pulse. It's not a switch problem, per se, it's a design problem. Collins isn't cheap, but these switches have a reputation for failing. Many major switch manufacturers offer a line of switches whose contacts are suited for high-inrush applications.

* I share Walt's concern in solid-stating the 516F-2 - both LV and HV supplies will be higher. It should be noted, however, that solid-stating the 516F-2 is a Collins recommended mod

"A Quartet of Flute Players Under Water"

by Donald F. Meadows, N6DM
1683 Daphne Ln.
Yuba City, CA 95993

My very first ham rig was actually a transceiver. It was a WW II surplus Number 19 Mark II unit designed for use in army tanks. One can find an excellent detailed description of this radio in ER, #22, page 4 through 10. The one I got was a lend-lease item intended for our Russian allies. Its front panel was inscribed both in Russian and in English. In 1946, a few months before I got my ham license, my uncle undertook the purchase of one of these things, sight unseen, unused in the sealed military carton, a heavy wooden crate requiring two people to move it. He thought it was a tremendous bargain for \$75, considering what it must have cost originally. He thought I could surely use it when my ticket came through. I wish he had discussed the matter with me first.

The #19 Mark II was a transceiver covering 2 through 8 MHz. One could transmit and receive in CW, MCW and AM phone. Also, there was a separate VHF transceiver capability on 235 MHz. The original package contained a 12-volt dynamotor together with heavy copper cables for connection to the tank's storage battery. The package included a metal box containing spare tubes—all octal-based receiving types. A spare 807 output tube was also provided. I remember my amazement at the total content of the complete lend-lease package which was designed to survive any physical insult, short of a comet collision. Things were packaged in boxes inside boxes, then wrapped in gummy envelopes to repel moisture. There were three or four low-impedance dynamic headsets each with a

hand-held microphone. Each combination was in a separate container which required a hunting knife to cut through the layers of wax-impregnated cardboard and paper. There was a variometer for antenna loading, plus sections for assembling a whip antenna. There were all kinds of small items, such as spare fuses and dynamotor brushes in a special metal box. There were nuts and bolts and shock-mounted brackets for installing the unit in the military vehicle. There were interconnecting cables, control boxes, and even an olive-drab canvas bag with shoulder strap whose flap bore in large block letters the inscription "satchel signal." I still have this bag. To this day, its intended purpose remains a mystery.

My uncle's gift to an evolving ham was meant well. Out of respect to him, I made every effort to get this contraption operating. It used 12-volt storage-battery power driving a dynamotor. This posed a problem. My parents absolutely refused to let their son bring lead-acid car batteries into his bedroom, which now was gradually becoming his ham shack. Fortunately, a New York surplus outlet at that time advertised an AC power-supply kit designed specifically for this #19 tank set. This kit brought the set to life. I spent hours listening on the receiver. I had finally passed the license exam, on the second try, and was awaiting from the FCC my new call and operator's license. Some hams in like status have been known to test their new transmitter's performance, not necessarily into a dummy load. The evidence, as I recall, suggested that the #19 transmitter was radiating a signal.

"Going Back to the Mountain"

Collins Collectors Association Meets in Cedar Rapids

by Bill Wheeler, KØDEW
272 Donna Lee
Lebanon, MO 65536

When I was somewhat younger, and with a budget that could only support a very modest ham radio station, Cedar Rapids was that wonderful place where the Collins Radio Company was located. This was the place where rigs called KWS-1, 75A-4, S/Line, and KWM-2 were given birth; these were the radios that I could only dream about back then.

Time has a way of passing and changing our lives and I have made several trips to Cedar Rapids but none that can compare to the one on the weekend of August 13th and 14th. This is when the

Collins Collectors Association met in Cedar Rapids. Not only did we have a tour of the museum, Com-central, and the "antenna farm", but we also had a very enjoyable evening meal with such noteworthy people as Chuck Carney, Joe Vanous, Dick Kittrell, Dennis Day, Gene Smith, Joe Jekerle, and Arlo Meyer.

These men were the movers and shakers of amateur radio equipment at Collins during 'the golden age'. These men represent nearly 300 years of service with Collins and were the key players in the development of the 75A-1 to the S/Line. And to make the evening complete, one of our speakers was Dave Berner. Dave was the Project Engineer on the KWM-380.

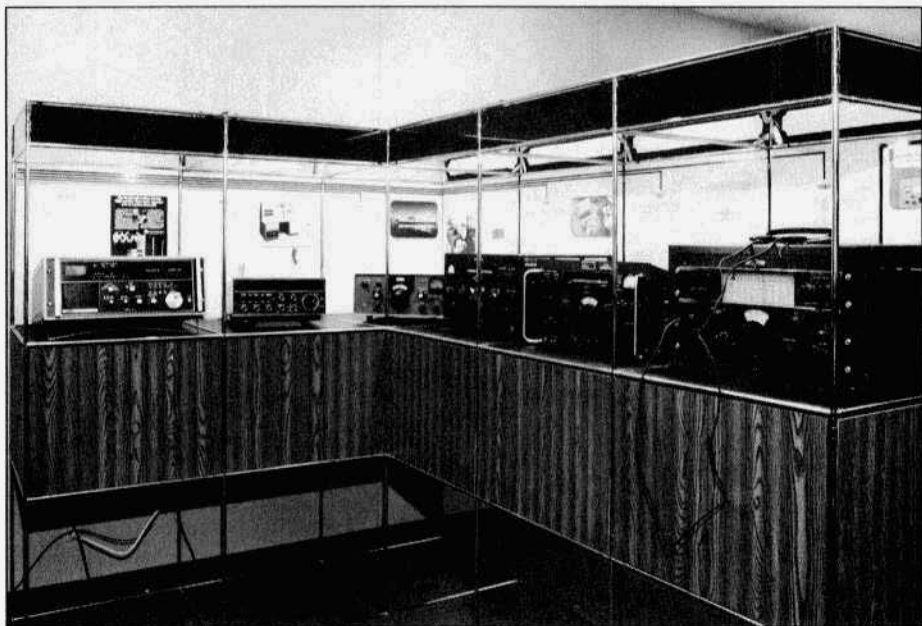
To reminisce with these men and hear the personal stories about Collins Radio was an experience the Collins Collectors will not soon forget. The retired guests appeared to enjoy the dinner as much as we did and appeared to like our attempt at keeping the Collins name alive in amateur radio today. Our host, Rod Blockson, KØDAS, said it was like a reunion for them. These men devoted their time and energy for many years so we might have radios to collect and enjoy. From all the collectors a big thank you.

Next year in August we are planning another meeting. If you want to truly feel like you have 'been to the mountain', make plans to attend. **ER**



Main entrance to the Collins Museum.

Photos courtesy of Rockwell Collins



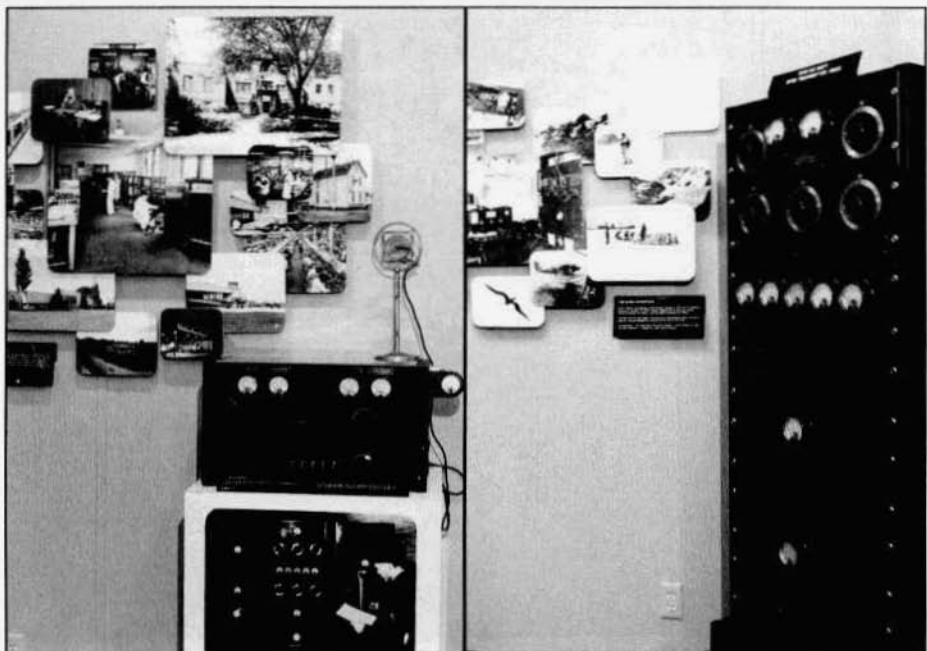
A display showing the progression of receiver development at Collins.



On the right a display of amateur gear; on the left avionics.

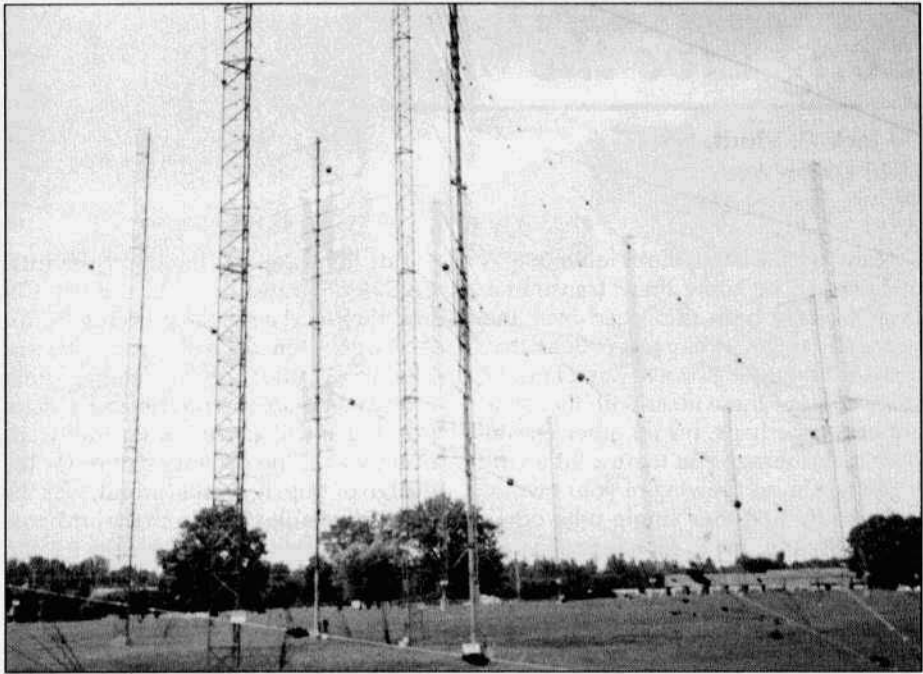


Another display of early equipment.



Police radio.

The Byrd Expedition.



The 'antenna farm' at Collins.



The famous 'Butler Building' where most of the Collins SSB gear was developed.

Long Live the 6L6!

by Jack C. Shutt, N9GT
1820 Dawn Ave.
Ft. Wayne, IN 46815

Many articles about the ubiquitous 6L6 and its use in home brew transmitter projects have been published over the years. My experiences may not be all that unique. I thought, however, that I might share some of these ideas with the readers of *ER*; perhaps, for no other reason than to encourage you to do a little vintage-style home brewing of your own.

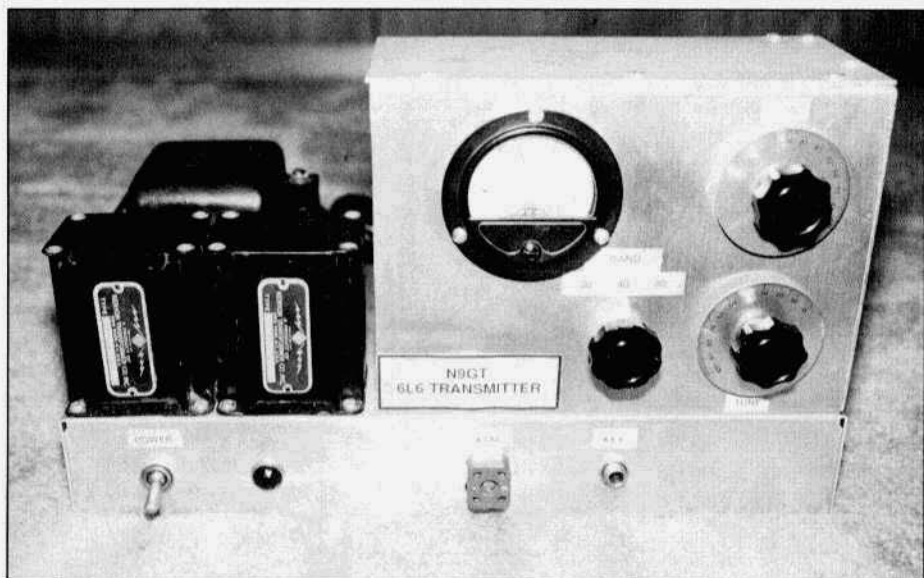
Probably no other single tube other than, possibly, the 6146, has been used more to generate (or amplify) RF than the good old 6L6. I have constructed many rigs over the years using 6L6s and various other hollow state devices. I enjoyed reading WA6VVL's articles in *ER* about his home brew projects. I also was inspired a couple of years ago after going through a few old Radio Amateur's Handbooks and reading articles in some old *QST*s (Ref. 1,2), to heat up the soldering iron (gun) and crank out a new version of some of my earlier 6L6 experiments.

After spending quite a bit of time on 40 meter AM using several different rigs, I decided that it might be fun to build up a little home brew AM transmitter of my own. The good ol' 6AG7-6L6 combination seemed like a great foundation to use for the RF. But what should I do about the audio? What would be an easy way to modulate the little peanut whistle? I have always marveled at how well Heising modulation worked. An example of its use in a commercial rig is the famous Globe Scout. This basic form of plate modulation utilizes a choke rather than a hard-to-find modulation transformer and is capable of providing nearly 100% modulation with super quality.

I decided to first build up the little 6AG7-6L6 transmitter to use on CW and then add a Heising modulator for AM operation on a separate chassis. The transmitter went together quite easily using ideas from several articles (Ref. 1,2 and 4) as well as several twists of my own. The primary driver for the design of this rig, I must admit, was the use of available parts from the junk box. The resulting schematic for the RF and power supply sections of the transmitter is shown as Fig. 1.

I constructed the transmitter on an aluminum chassis that I happened to have on hand that I salvaged from some previously uncompleted project. Dimensions of the chassis are 7" x 13" x 2". It certainly is not necessary to duplicate this size. It worked out well for me and resulted in a fairly open layout for the transmitter. If you wish, you can build this rig in a much more compact package.

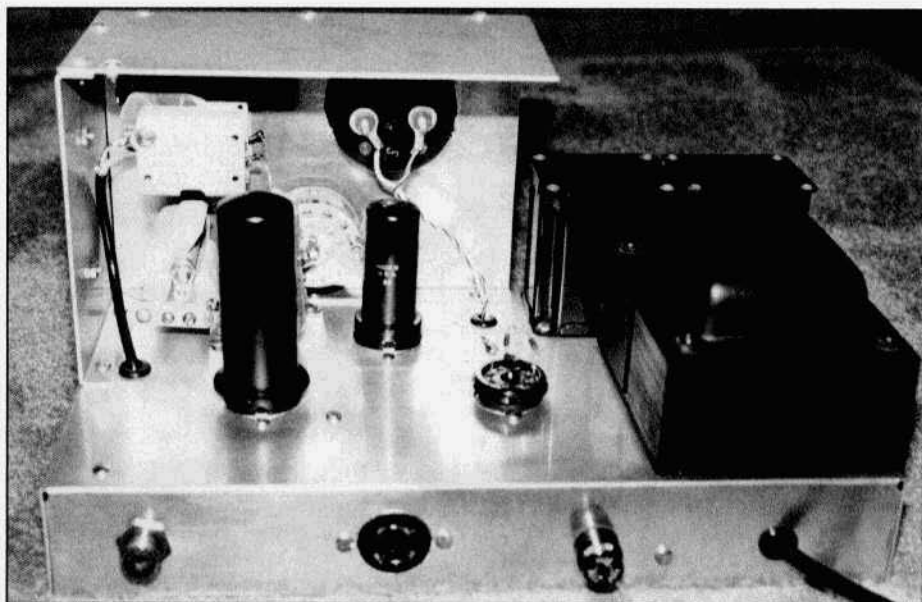
I used some scrap pieces of aluminum to construct a front panel in the form of a channel or "U" shaped panel assembly. I added small plates on the top and the right side. I then cut a hole for the meter, drilled holes for the variable capacitors and band switch, and mounted the panel assembly on the top front of the chassis. The front panel provides mounting space for the plate meter and the band switch as well as plate tuning and loading controls while providing a safety shield for the final plate tank components. This panel could easily be made into a completely enclosed box to provide complete shielding of the final.



Front view of the 6L6 transmitter.



The companion Heising modulator.



Rear view of the transmitter.

The front of the chassis provides mounting space for the other controls that include the power switch, key jack, crystal socket, and a pilot lamp.

I built the power supply on the transmitter chassis utilizing an old TV power transformer and a couple of ancient filter chokes. I provided an octal socket wired for a 5Y3 or 5U4 rectifier tube. If you are not completely hung-up on using all hollow-state, you can make up a plug-in solid state rectifier replacement or just hard-wire in some diodes. The obvious advantage to using the solid state diodes is lower voltage drop and, hopefully greater reliability than provided by the tube rectifier. It's a good idea, however, to use some resistors in series with the diodes if you end up with much over 400 volts.

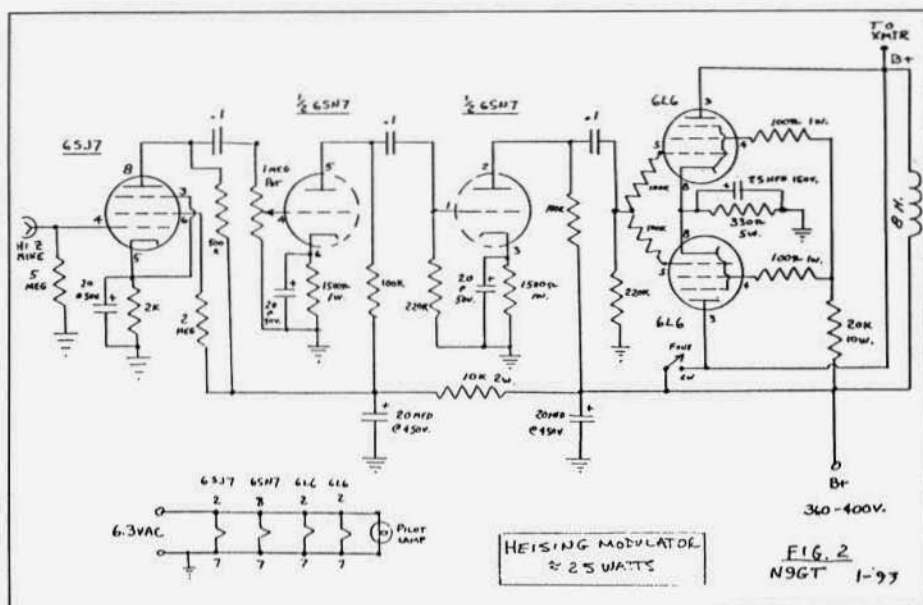
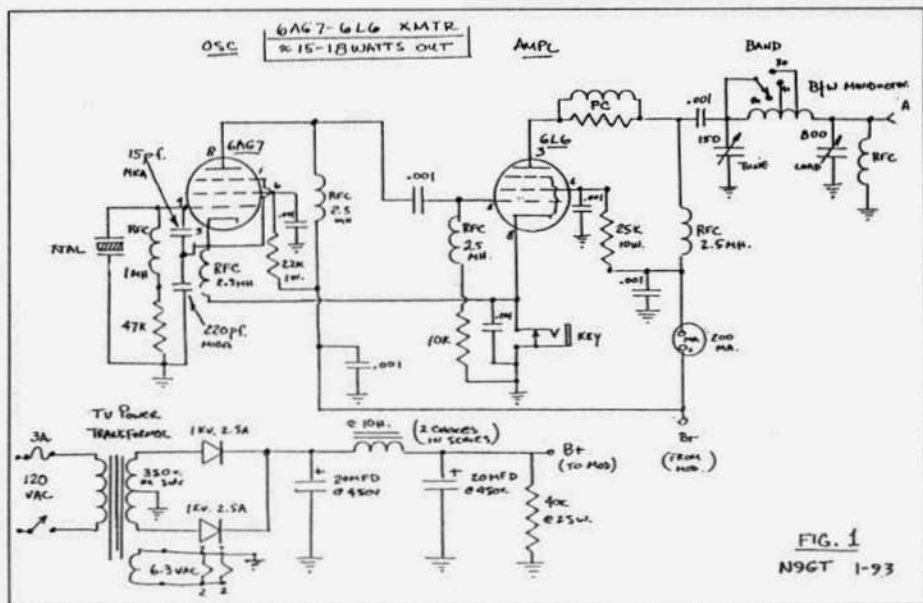
The power supply delivers about 400 VDC which is perfect for the 6L6. My power supply is easily capable of over 200 mA. Who knows, I could probably even add a second 6L6 in the final someday for a real powerhouse!

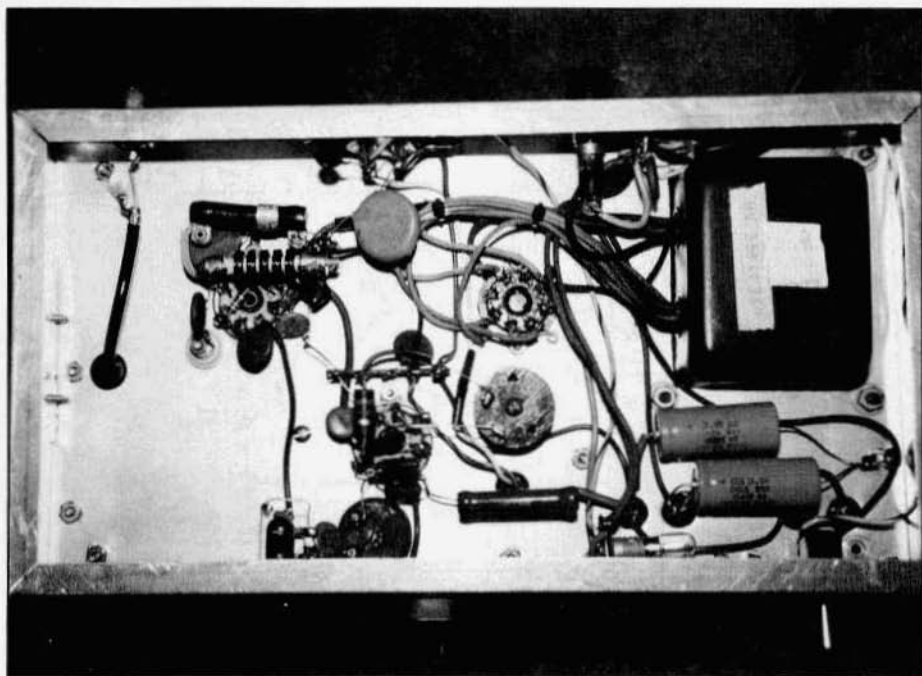
I experimented with several oscilla-

tor circuits and finally settled on the simple untuned Colpitts circuit shown in the diagram. This circuit works very well with crystals or a VFO. Since everyone generally hangs out on or around one or two frequencies on 40 meter AM, I usually just stick with crystal control.

There is nothing special about the 6L6 final except for the Pi-Net output circuit. Many of the circuits in the old handbooks use plug-in coils and link coupling. Link coupling is a no-no as far as I am concerned unless you also use an outboard antenna tuner. I decided to include a Pi-Net output tank and initially tapped the coil for three bands: 80, 40 and 30 meters. I used a piece of miniductor coil stock for the tank coil and experimented with the coil taps for best output. I used a 150 mmF variable for the plate tuning and a small BC radio variable capacitor serves as the loading cap.

I also tried several 6L6's and hand-picked one that gave the best output. I found quite a wide variation among tubes and observed a maximum of about





Underchassis view of the transmitter.

18 watts output. I ended up using a metal 6L6, however, you may use a 6L6G or 6L6GT glass-type or one of the many newer variations that include 6L6GA, 6L6GB, 6L6GC, 5881, etc. You may find that you will get a little more output with one of the newer types, although I didn't really notice that they were much better.

I constructed the modulator on a separate chassis. This one is a little smaller than the transmitter with dimensions of 5" x 9-1/2" x 2". If you prefer, however, you could also include the modulator on the transmitter chassis. The idea for the basic circuit was derived from an article in an old 1947 edition of *The Radio Amateur Newcomer* (Ref. 3). My schematic for the modulator is shown as fig. 2. The original circuit was designed for use with a carbon mike. I modified this circuit considerably and used tube line-up (6SJ7 - 6SN7 - pr. 6L6) that provides more than enough gain when driven with the good old D-104

crystal mike. Actually, I've found that the gain control is normally set at only 2 or so on a scale of 10. I used another ancient filter choke which is approximately 8 Henries at 150 mA for the modulation reactor. I used larger coupling capacitors to provide a little better frequency response. The parallel 6L6s provide more than adequate modulation and probably would be capable of modulating a pair of 6L6s or even an 807 or a 6146. The *Globe Scout* uses only one 6L6 in a Heising modulator to modulate a single 6146 with excellent results.

An audio gain control and a CW-AM switch are mounted on the front of the modulator chassis. Connections to the transmitter are made via an octal socket that is located on the rear of the modulator chassis.

The modulator is connected to the transmitter via a connecting cable equipped with octal plugs that mate with an octal socket on the rear of the

transmitter chassis and the modulator octal socket. A jumper plug can be inserted in the transmitter socket for CW operation without the modulator connected.

The modulator obtains its power from the transmitter power supply. Here is where the extra capability of the power supply pays off. The husky power transformer in my rig runs cool even after hours of operation. The transmitter final B+ actually runs through the modulator and 6.3 VAC filament power is provided by an additional winding on the power transformer.

I use an external antenna relay box for T/R switching which keys the rig and switches the antenna while also muting the receiver. This unit has its own power supply but it could very easily be built into the transmitter. You can also use a Dow Key coaxial antenna relay if desired. The type that has additional auxiliary relay contacts works well for other switching functions such as receiver muting. Of course, the most simple approach is the use of separate transmit and receive antennas and turning down the receiver gain when transmitting!

I have used this little rig on 40 meter AM for about two years now with excellent results. I have particularly enjoyed checking into the DX-60 Net with my mighty little powerhouse. The output power is about 15 to 18 watts with about 90 mA of plate current that kicks upward slightly when modulated. I consistently receive comments about the "excellent audio" and "big sound for such low power." This seems to confirm the theory that it doesn't take a lot of carrier power if you have plenty of good audio.

I chose to build this little rig using the classic open chassis style of construction. If you are a little imaginative, I'm sure you can really dress up this project with a nice cabinet enclosure. Also, if you are not a purist when it comes to

vintage homebrewing, you may want to use some PC board construction for portions of this rig. Sections such as the power supply, oscillator, or low level audio stages might lend themselves to this configuration.

It probably isn't necessary to remind you of safety requirements when working with tube-type circuitry, however, one jolt with 400 VDC may be one too many! Always use the one hand in your pocket rule when testing or working on energized equipment. It really is not dangerous to work with this stuff if you respect it and do not take chances or get careless with high voltage.

This transmitter has provided many enjoyable QSOs and has really been a joy to operate. That is a pretty reasonable return for a couple of weekend's tinkering and a handful of junk box parts, I would say. Why don't you try your own version of this little rig and join the fun on AM! Vintage-style homebrewing is a blast!

Now, . . . for my next project. Where are those 829Bs and sockets that I got so cheap and put in the junk box? Wouldn't an 829B or two modulated by a pair of 829Bs be an interesting and unusual idea? Two should be good for well over 100 watts out. Hey, I wonder what I could do with all of those 1625s? Hmmm! Where's that soldering gun?

ER

(Ref. 1,2) The Radio Amateur's Handbook, 26th Edition - 1949, 27th Edition - 1950 and 31st Edition - 1954, Published by ARRL. *QST Magazine*, Published by ARRL.

(Ref. 3) The Radio Amateur Newcomer (1947), Published by Editors and Engineers, Ltd.

(Ref. 4) The Radio Handbook Twelfth Edition 1949, Published by Editors and Engineers, Ltd.

Improved Audio From A Product Detector

by Al Roehm, W2OBJ
22 Brookdale Rd.
Cranford, NJ 07016

There have been many circuits published showing how to add a product detector to an older receiver. Most often, the popular 6BE6 pentagrid mixer is used to replace the BFO tube. Then the audio output from the plate is filtered to remove IF energy before going to the audio amplifier.

It seems that authors blindly copy previous circuit values without regard for the intermediate frequency. This is particularly true for the pi-type audio filter and amount of IF signal injected into the mixer. Surely, the same design cannot work satisfactorily for 50-kHz, 100-kHz, 455-kHz and higher IF's. A recent *ER* article specified 220 pF capacitors for C_1 and C_2 shown in Figure 1. Other articles use values of 100 pF, 470 pF, 680 pF or 820 pF. So, what is the correct value? I suppose there is some sophisticated design procedure available to the engineers but this article will show you an easier way to select the capacitor sizes.

I have installed hollow-state product detectors in many different receivers by following the published material. Some examples are the HQ-129, SP-400, 75A-1, 75A-3, R-390, R-390A and the HRO-60. For some reason, I was never completely satisfied with the results. The audio always seemed to lack total clarity. Oh sure, there was plenty of recovered audio and all the signals could be copied with the RF gain control wide open. Even the addition of fast attack/slow release AVC time constants didn't solve the problem. Although the modifications to the HRO-60 gave (in my opinion) the best results there was still a subtle trace of operator fatigue after a few hours of listening to the new detector. Then it hit me, and out came the scope. Sure enough, there was enough IF voltage on the trace (point "X" of Figure 1) to cause the audio distortion. With no received signal the scope pattern should be a thin horizontal base line as shown in Figure 2A.

continued on page 37

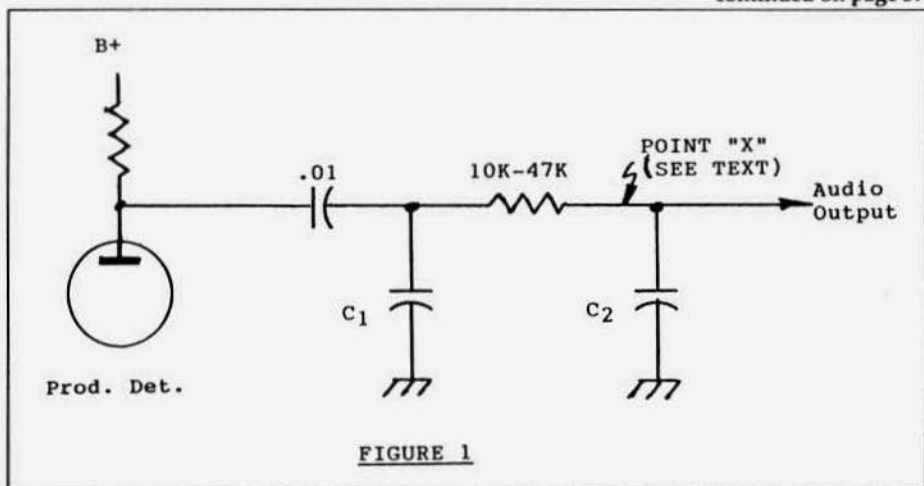


FIGURE 1

"It's in Mint Condition"

by Walt Hutchens, KJ4KV
3123 N. Military Rd.
Arlington, VA 22207

(The following is transcribed from a tape sent to us by an anonymous reader who asked that we run it as an example of the kind of harassing calls you get if you advertise a fine classic rig for sale. Our reader caught his side of the conversation because he had his recorder running when the phone rang; unfortunately it was connected to a mic rather than the telephone so he didn't get the other side -- but he thinks you can imagine it. He doesn't know what happened at the end of the call -- he says there was "kind of a thud, like something heavy falling". He adds that in his opinion it really isn't polite to call in response to an ad for a classic set unless you might actually be interested in buying the set; he says he's had "a lot of tire-kicker calls" about this radio).

(Ringing of telephone) "Hello? Yep, this is him.

"Yep, it's in mint original condition, just like it was when daddy got it back in '46. Been stored in the box since the 50's.

"I really don't know. . . daddy said it worked the last time he tried it. 'Course he did have to replace some of the tubes. . . wasn't that easy either, after he improved it by replacing the finals with AQ-4356's -- you ever see the sockets for those things? But he didn't have no trouble get'n 'em in, after he filed down the bandswitch and got rid of the coils for the bands he didn't need like 80 and 20.

"Well of course he made a few little improvements -- but he only did the standard things. You know -- replaced the mod transformer with one that didn't weigh so darn much and put in

meters for filament current and VFO screen voltage.

"Yeh, he used them square ones with the plastic fronts. He swapped that cheap-looking plate meter at the same time with one just about like the others.

"I kinder hate to say this, since we ain't talked about the price yet, but daddy told me a few years back that it was appraised by the Smithsonian Institute for twenty six hundred dollars. . . now can you believe that? But we'll work out something real reasonable. . . I want dad's set to go to a good home. . .

"It really looks perfect. I remember the day he painted it. We had some extra 'namel left over after we painted sis' room and he took off most of the knobs and just brushed it on. . . a real pretty light pink. . . And it covered up the water stains too.

"Hunh? Oh -- No, don't remember when that happened. . . might have been while the shack was in the basement, cause we used to get water on the floor down there. Only real problem was dad couldn't operate at high tide for a few weeks every Spring.

"Yeh, that was when we lived by the seashore. Mom really liked that salt air. . . "Of course it's all there. Once dad got rid of all that tacky junk (that's what he called it -- 'tacky junk'!) like the nameplate and them funny screws on the front panel and the tin covers over the ajusmunts and the finals, he didn't change a thing. Dad just never could understand why people would take a perfectly good rig and then modify it all to hell. Say, you wouldn't be going to do any mods would you? I'd have a lot of trouble letting dad's mint original rig



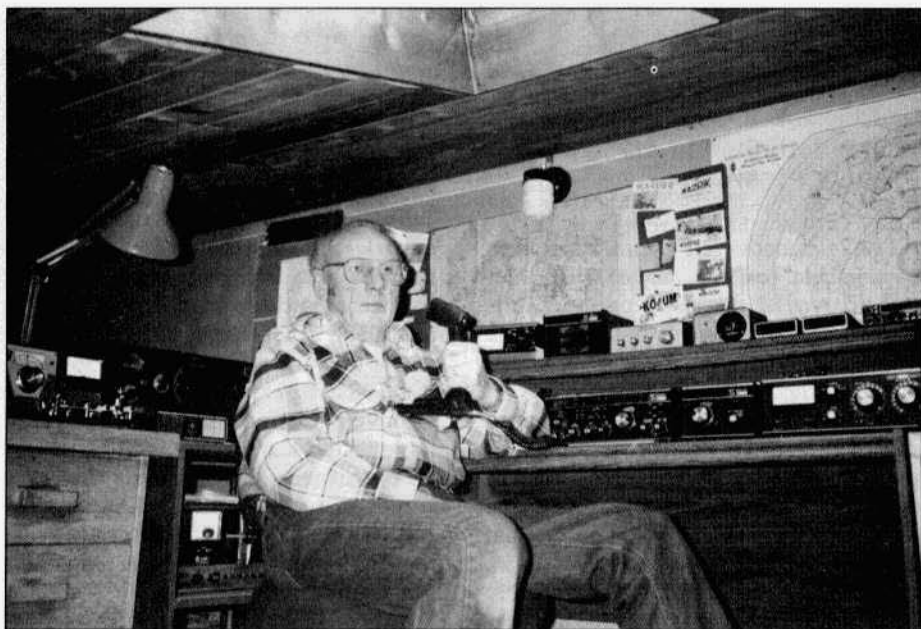
Tom Smith, WA4RBW, in his hamshack with his vintage gear.



Scott Beaver, N9VLH. His grandfather, Wayne Beaver, WØNHK, sent in the photo with the following information:

"Scott went from Noice to Advanced, plus 20 WPM in ten months at age 12. He is now 13 and will try for Extra in a few weeks.

"His station consists of a Heath DX-60B, HG-10 VFO and HD-20 crystal calibrator. The receiver is a Hallicrafters SX-111. He operates mostly 80 and 40 meters."



Jim Leatham, K7BTB, in his ham shack. He has worked 252 countries from his QTH at 7500 feet, using only 1 watt output!



Joe Schroeder, W9JUV, recently acquired this very unusual Japanese WW II receiver complete with its shipping crate that also contains earphones, spare tubes, full set of plug-in crystals (300 kcs - 6 Mcs), charts, etc. He would like to hear from anyone who has information on this set. His address is Box 406, Glenview, IL 60025-0406.

DeoxIT, a Contact Cleaner/Preservative

by Corydon L. Hine, N2AQS
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Plano, TX 75074-6249

I have "discovered" what appears to be the best contact cleaner/preservative. In over 24 years of experience, this is the best that I have found. Tried S-22 a couple of years ago. It works, but does not provide the cleaning properties required on older equipment. The chemical I have found to be the best is DeoxIT, made by Caig Laboratories of San Diego. This company supplies a full line of cleaners for metal to metal contact connectors. It comes in spray cans, wipes, pens, and liquids. It is extremely penetrating, and also provides lubrication in switches. I find that you can lubricate everything from bearings to telescoping antennas with it, and it is long lasting.

A friend of mine in Maryland had a piece of Collins gear that he thought he would have to change the band switch on. After a couple of sprays of DeoxIT, the problem was resolved. This is the kind of thing that happens all the time.

I have used it on automotive electronics and connectors, and radios, and have never found a problem that could not be resolved, short of something physically broken! It can be used on any electrical device, including relays. It is amazing to watch it work on a corroded connector and see the corrosion fly off, and clean down to the bare metal.

Another of their products is Pro-Gold. It gets a little expensive, but is claimed to have better preservative qualities. I have tested this product, and it seems to perform as advertised. This also comes in a variety of applicators. It is claimed that it will seal and penetrate the gold plating and protect the base metal underneath.

This product is an improvement over the old Cramolin, supplied by the same company. Outfits like General Dynamics have been using this product successfully for years. In my business, we use it for Cellular Mobile Telephones, and it has solved some of the internal connector problems inherent in this type of product. I also use it on my own equipment, and in the reconditioning business.

If you write or phone them, they seem quite willing to provide samples and brochures. Although these products are far from cheap, you don't seem to need to use too much to accomplish the desired result. They can be contacted at Caig Laboratories, 16744 W. Bernardo Dr., San Diego, CA 92127-2799. Their phone is 619-451-1799. ER



VINTAGE NETS

Westcoast AM Net: Meets informally, nightly on 3870 at 9:30 PT. Wednesday at 9:00 PM PT they have their formal AM net which includes a swap session. Net control rotates.

California Early Bird Net: Wednesday nights at 8 PM PT on 3835.

Southeast Swap Net: Tuesday nights at 7:30 ET on 3885. Net control is Andy, WA4KCY. This same group also has a Sunday afternoon net on 3885 at 2 PM ET.

Eastern AM Swap Net: Thursday evenings on 3885 at 7:30 ET. This net is for the exchange of AM related equipment only.

Northwest AM Net: Recently started by Pat, K7YIR, this net is on 3875, Mondays and Fridays at 9:30 PT. This same group meets on 6 meters (50.4) Sundays and Wednesdays at 8:00 PT and on 2 meters (144.4) Tuesdays and Thursdays at 8:00 PT.

Twenty Meter AM Net: This net on 14.286 has been in continuous operation for at least the last 20 years. It starts at 5:00 PM PT, 7 days a week and usually goes for about 2 hours. Net control is Les, K6HQL.

Arizona AM Net: Meets Sundays at 3 PM MT on 3860. On 6 meters (50.4) this group meets at 8 PM MT Saturdays.

Colorado Morning Net: An informal group of AM'ers get together on 3875 Monday, Wednesday and Friday mornings at 7AM MT.

DX-60 Net: This net meets on 7290 at 2 PM ET, Sundays. Net control is Jim, N8LUV. This net is all about entry-level AM rigs like the Heath DX-60.

Military Net: It isn't necessary to check in with military gear but that is what this net is all about. Net control is usually Walt, KJ4KV, but sometimes it rotates to other ops. It starts at 5 AM ET Saturday mornings on 3885.

Westcoast Military Radio Collectors Net: Meets Sat. at 2300 local on 3885 and Sun. at 1600 local on 3885. Night net control is Andy, KD6TKX, and daytime net control is Tom, WA6OPE. AM is the mode used at present. It is not necessary to check in with military gear.

Grey Hair Net: The oldest (or one of the oldest) 160-meter AM nets. It meets on Tuesday nights on 1945 at 8 PM in the winter and 9 PM ET in the summer.

Vintage CW Net: For CW ops who enjoy using vintage equipment. This is not a traffic net; speed is not important. The net meets on 14.062, Saturdays at 3 PM PT. Net control is Tracy, WB6TMY.

Vintage SSB Net: Net control is Chuck, N5SWO. The group meets on 14.293 at 1 PM CT, Sunday afternoons.

Collins Users Net: The oldest of the 'users nets'. It meets on 14.263 Sunday afternoons at 2 PM CT. The net control revolves. This group also gets together for an informal ragchew on 3805 Tuesday evenings at 7 PM CT.

Drake Users Net: Another relatively new net. This group gets together on 3865 Saturday nights at 8 PM ET. Net controls are Criss, KB8IZX; Don, WZ8O; Rob, KE3EE and Huey, KD3UJ.

Heath Users Net: A new net started by Marty, WB2FOU/5. Net control is shared by Fred, AA5LW. It meets on 14.275 at 4 PM CT Sundays. Check in on either AM or SSB.

Swan Users Net: This group meets on 14.250 Sunday afternoons at 4 PM CT. The net control is usually Dean, WA9AZK.

Nostalgia/Hi-Fi Net: Meets on Fridays at 7 PM PT on 1930. This net has been meeting since 1978.

K1JCL 6-Meter AM Repeater: Located in Connecticut it operates on 50.4 in and 50.5 out.

JA AM Net: 14.190 at 0100 UTC, Saturdays and Sundays. Stan Tajima, JA1DNQ is net control.

Fort Wayne Area 6-Meter AM Net: Meets nightly at 7 PM ET on 50.58 MHz. This net has been meeting since the late '50's. Most members are using vintage or homebrew gear.

Westcoast Broadcast Equipment Net: Tuesdays on 1959 at 9 PM PT. Anybody is invited to join the group, but the emphasis will be on broadcast equipment. Moderator is Mike, W6THW.

The HEX-BEAM

A Hexagonal Beam

by Mike Traffie, N1HXA
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Ashby, MA 01431

Introduction

Most of us that use the 40M AM window have wondered how we could get out better. We know that it's possible to get out with even a modest antenna when conditions are good - or by adding power when they're not, but "if you can't hear 'em, you can't work 'em". A beam with gain and F/B makes it possible to work stations that aren't even heard otherwise. The benefits are there for both sending and receiving.

For years, many experimenters have made beams of wire. These have often been simple and efficient, but many needed to be used as fixed or switched arrays. For a while, quads were very popular for the higher bands and many excellent high performance versions were built. Unfortunately some were 'cobbled' together and didn't hold up. As a result, wire (or quad-type) beams got a bad name and they slipped in popularity. We hear descriptions such as "too fragile", "too complicated", "too big", etc.

Since these early efforts, new ideas, new techniques, and new products have come along. Some simple, durable, and very efficient wire beams have been developed. Size, weight, and wind loading become the limiting factors. This is especially true at lower frequencies. If we think of a good antenna for 40M, multiple rhombics at different headings would give superb performance, but most of us aren't able to put up such an 'antenna farm'. We might wish for a rotary 3 element 40M beam, but a sturdy one can easily weigh about 200 lbs and require nearly a 100 ft circle for rotation - also we are told "it should be up as high as possible". So much for beams we conclude.

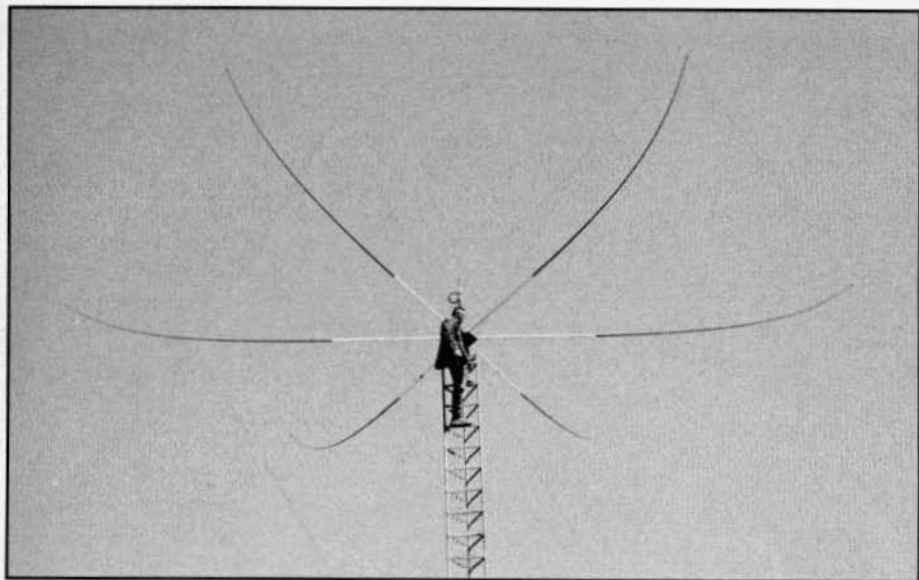
This article is being written to describe a different type of wire beam. It's similar to existing beams in that it's a rotatable directional antenna which demonstrates substantial gain and F/B. It's different in that it's small and light, and performs well at modest heights; it has no boom, no traps, and works well with no matching device. Also, it has held up to New England weather very well. These hexagonal antennas have been built and used on the 2M through 40M ham bands - with some pretty exciting results. I hope this article answers some of the numerous questions that have been asked during the many hours of testing and tweaking.

Performance-wise, the "hex-beam" acts very much like a 2 element Yagi-Uda with "in close" contacts and during range testing, except that better F/B ratios are possible. Further out, the antenna performs more like a 3 element Yagi-Uda. "On-the-air" reports and our range measurements with a calibrated step attenuator indicate a real gain of 4-6 dB when compared to our reference dipoles and other beam antennas. F/B ratios of 20-25 dB or more are possible.

This antenna is about 1/2 the size of a conventional 3 element beam and much lighter. A 10M version has been built which has a 54 inch turning radius and weighs 20 ounces. A 40M version is now in use. It has a turning radius of 18-1/2 feet and weighs approximately 30 pounds.

The 10M version has been used very successfully at about 15' above an outside deck. The 40M antenna works very well on our low (40') tower. It has also been a real benefit in cutting down on foreign broadcast interference here in the northeast.

Gain is quite broadbanded. F/B is more frequency sensitive.



The author making adjustments to his Hex-Beam.

Description

This antenna consists of a full-size electrical 1/2 wave element with one parasitic which is tuned and coupled to it. Tuning the parasitic as a reflector gives the smallest size to the array (with good gain and F/B). This article will describe an antenna built of wire elements which are supported by 6 fiberglass arms. These arms are attached to a center hub which in turn can be mounted into a rotator.

For gain with a good F/B ratio, the following formulas serve as a good starting point w/#14 bare stranded copper wire:

$$D.E. = \frac{6190}{f} \text{ (for length in inches)}$$

$$Ref. = \frac{6262}{f} \text{ (for length in inches)}$$

$$\text{Tip space} = \frac{145}{f} \text{ (for length in inches)}$$

f = frequency in MHz.

(See sketch for rest of details.)

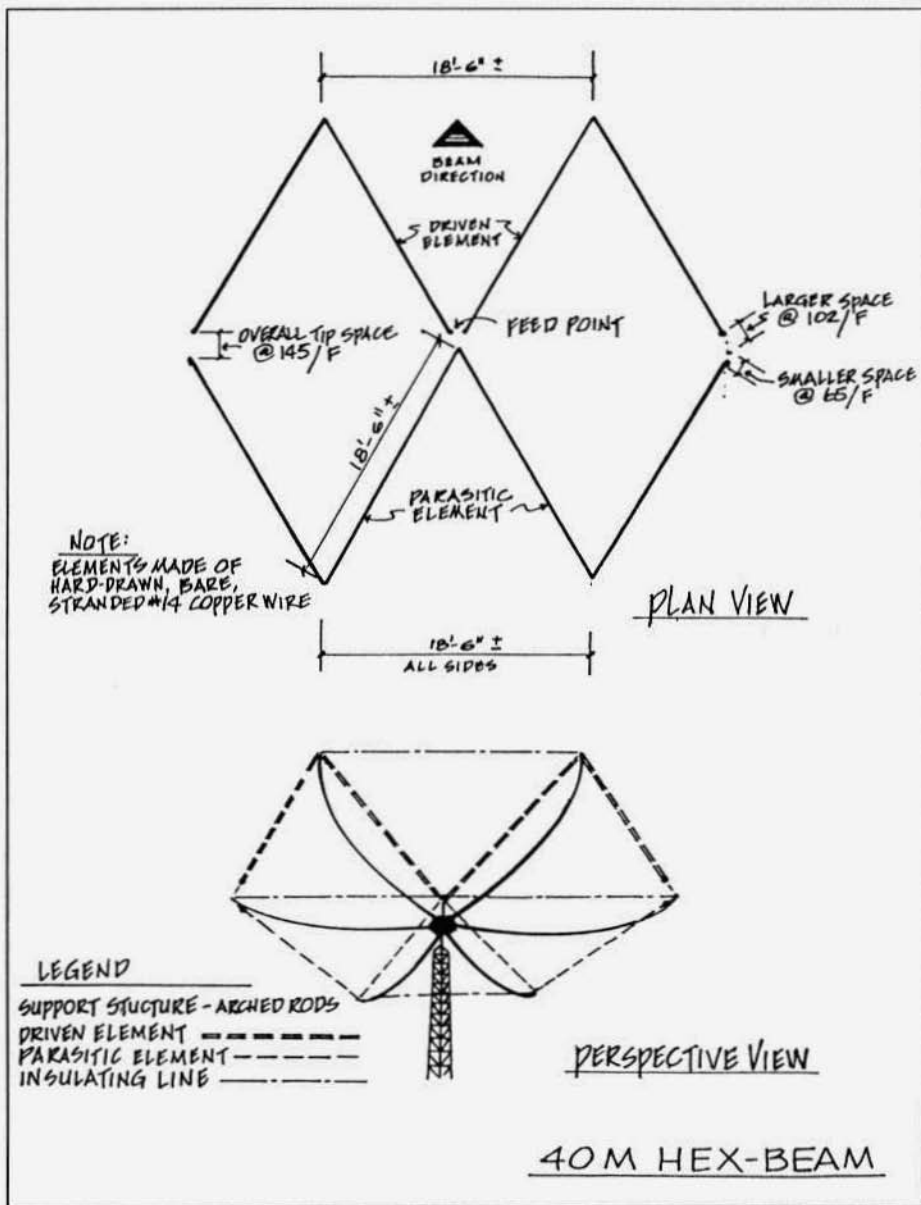
For 40M:

1. There will be useable gain from a little below f to 125 kHz or more above it.
2. F/B will be best near f with useable F/B above.

3. V.S.W.R. will be quite flat for about 125 kHz or so above f. This ratio is about 2:1 without matching and rises sharply below f. We have used a coiled coax choke with direct feed and haven't worried about a 2:1 mismatch. Our V.S.W.R. at the shack is about 1.6:1 with the feed-line attached, so losses are minimal when all factors are considered. A series-section transformer works well if a closer match is desired.

The antenna in the photo was designed for best F/B at the very upper portion of the band. It has useable gain and F/B well above the 40M band, but it doesn't perform well much below f (7.250).

For this antenna (f=7.250) we have D.E.=854", Ref=864", and tip space=20". The hex sides and radii need to be about 18-1/2" to end up with a tip space of 20". This tip spacing isn't super-critical - 18" to 24" works fine. A slight difference in current balance won't greatly affect array performance unless maximum F/B is desired for a narrow band segment.



Construction

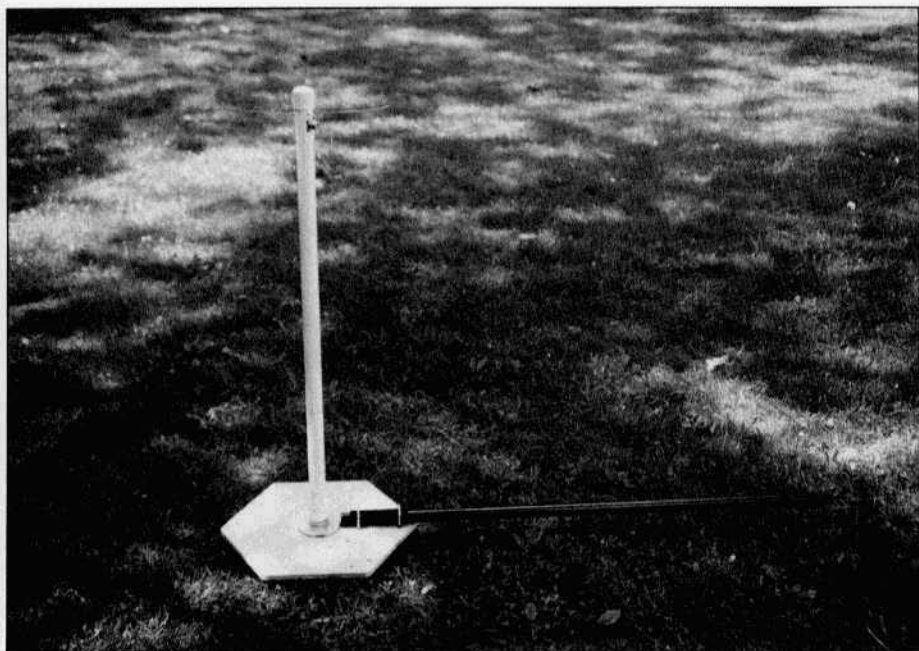
An inexpensive 40M beam can be built from the following list of materials:

Arms: 6/19'-20' non-metallic material. (see notes)

Hub: 1/16"x16" to 18"x18" plate (see photo)

Center Support:

1/1" rail flange
1/1" PVC MPS adapter
1/1"x3-1/2' PVC pipe
1/1" PVC cap



Capped center support with one arm section attached.

Hub Mtg:

1/1" rail flange
1/1"x12" nipple
1/lock pin (see article)
4/ bolts w/nuts & lockwashers

Arm Mtg:

12/ U-bolts to fit arm (w/angle installed)
6/6"+ angle stock to fit arm

Wire: 175'+ #14 stranded bare copper

Support Line: 100' heavy nylon leader line (or 1/8" Kevlar w/insulators)

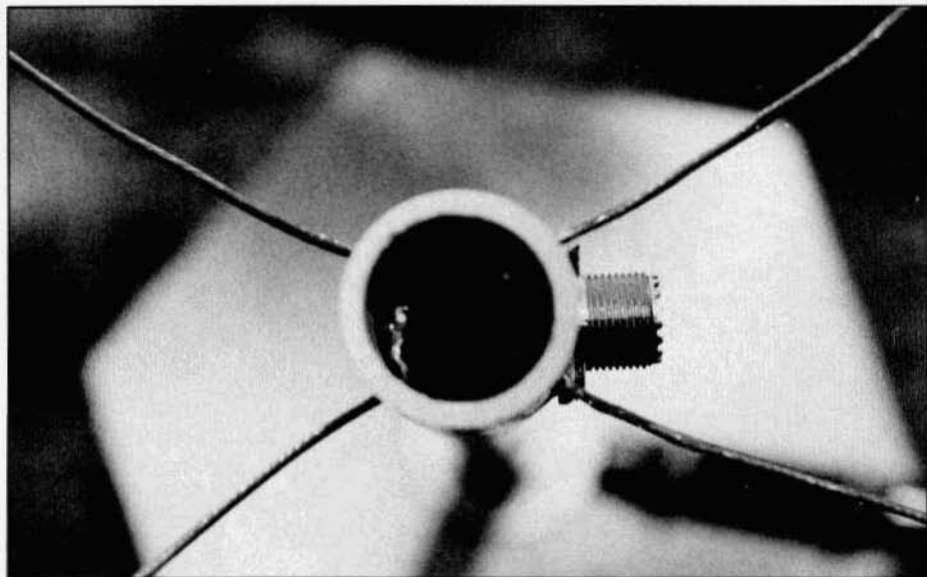
Insulators: 1/1/4" Lexan strip (as required)

Misc:

PVC glue & paint (as required)
Coax fitting if desired

Notes:

1. It is very important to use the right arms. Many, if not most, problems and failures with wire-type beams are due to "economizing" or "over-building" in this critical area. Using the right arms and fastening techniques will pay dividends now and later. The problems that result from using too light an arm are obvious, but the problems that result from too heavy an arm are not so obvious. Heavy arms need heavy wires, which need heavy fittings, which makes a heavy antenna. This heavy antenna needs a heavy rotator which needs a heavy tower, which----- . The 40M beam shown in the photo is rotated with a light duty ham rotator. The arms need to be long enough and strong enough to tension the element wires. They should be flexible enough to prevent wire or fitting breakage and also dampen the start/stop of rotation. The asymmetric loadings of a quad aren't present but allowance should be made for ice and wind loading.



Coax fitting and connections. The solder "beads" are for tension relief. The reflector bead keeps the reflector from sliding back and forth. These beads should be built up in steps so that the solder doesn't 'wick-up' excessively. An inflexible wire will fray quickly.

2. Heavy nylon line ("leader line") can be used for temporary non-element spans. (1/8" Kevlar w/insulators is recommended)
3. A plywood plate works fine for a temporary hub. (A 1/4" aluminum plate & galvanized or stainless steel hardware are recommended.)
4. The driven element is center fed. This feed point is at the top of the center support.
5. The center of the reflector is also brought to this center support. The centers (and tips) of the "W" elements face each other.
6. The element centers, though close ($1'' \pm$), must not touch each other.
7. The element tips are separated by $145/f$ ($20'' \pm$ for top of 40M). A larger space is needed from the D.E. element end to the arm attach point than from the reflector end. This is to keep side sizes equal (the D.E. is shorter than reflector.) These ends are high voltage points so a good insulator is needed. See sketch.

8. If a threaded pipe and flange is used to fasten the beam to your rotor, a pin or positive set screw (s) is recommended. A runaway beam could make for an exciting day!

Conclusion

Thanks to the many hams around the world who took the time to give us reports. Thank you also for your enthusiastic and encouraging comments. Thanks especially to my sons Jon, Tim, and Carl (N1IFU), and to Gary (KA1DW), Dave (GØDAB) and Roger (G4RUW) whose timely comments and support kept me motivated.

Good luck with yours! **ER**

Editor's Note: For those who might be interested in a complete raw materials kit, Mike has put a kit together and it can be purchased for \$400 plus shipping. He can be contacted at (508) 386-7966.

ANTENNA · 40 M Hex·BEAM · DESIGN F/7250 KC

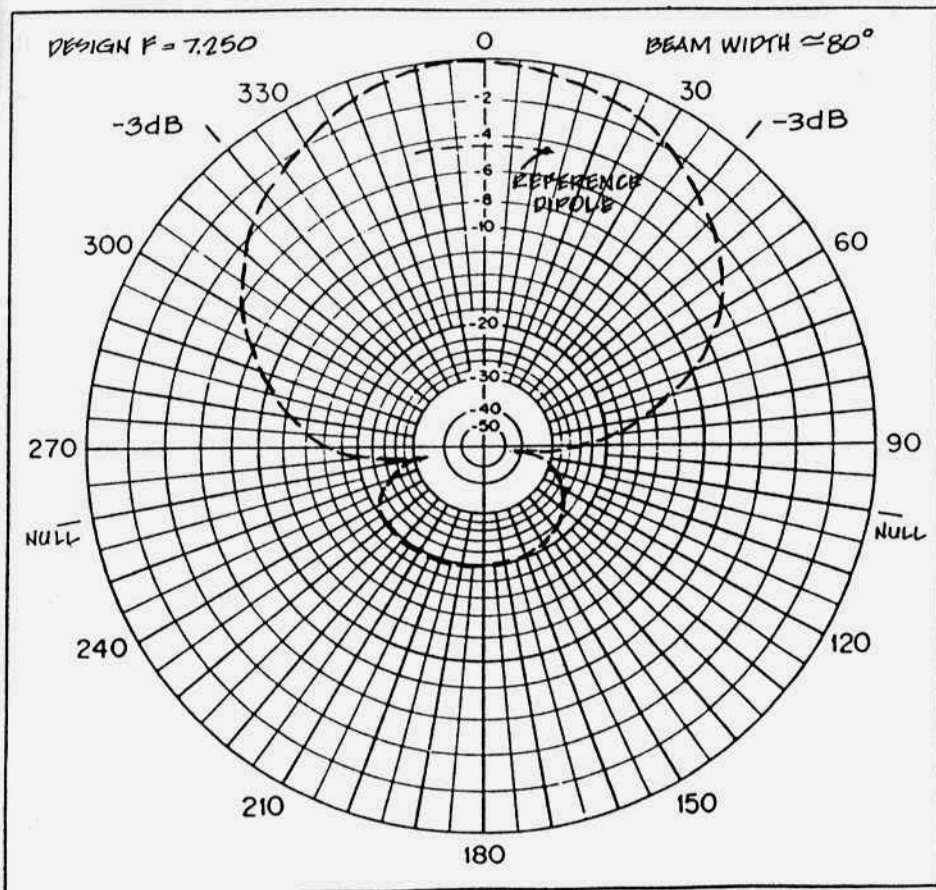
TEST NO. · 40-1

WORKING COND.

1. TEST ANTENNA ON 40' TOWER
2. SOURCE ANTENNA @ APPROX. SAME ELEVATION
3. SX-100 RCVR. WITH REFERENCE @ S9
4. MEASUREMENTS TAKEN WITH HEWLETT-PACKARD 355C & 355D STEP ATTENUATORS

DATE:
30·MAY 94

OTHER·



NOTES:

GAIN CALCULATION

F · 7.250 dB
 PADDING @ BEAM FRONT FOR S9 = 32.5 dB
 " @ DIPOLE FOR S9 = 28.0 dB
 GAIN = 4.5 dB

FB CALCULATION F·7200-7250-730

PADDING @ FRONT FOR S9 · 32 dB · 32.5 · 31.5
 " @ BACK " " 21 dB · 20.0 · 18.5
 F/B 11 dB · 20.5 · 13.0
 (dB) (dB)

The ECO-DYNE, A VFO for the T-807

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

The T-807, a 50 watt CW transmitter which appeared in ER #60, was designed for use with either crystals or an external VFO. This article discusses the design and construction of the companion VFO. The design goals were as follows:

1. Should cover the lower 125 kc of 80, 40 and 20M.
2. One dial calibration should hold for all three bands.
3. Should exhibit good stability, low drift and clean keying.

The T-807 was built primarily for use in the Antique Wireless Association's Old Timer's contest so it was desirable that the VFO should incorporate pre-WW II circuits and components. I did cheat a little and so a few discaps, several miniature switches and a zener diode found their way in. But 80% is basically vintage stuff. Most pre-war VFOs employed the electron-coupled oscillator (ECO) and that's what I chose to use. Properly constructed this circuit can provide exceptional stability. I started with a 6SS7 tube, then switched to a 6SK7 and finally settled on the 6SJ7.

It is usually necessary to provide one or more stages of isolation between the variable oscillator and the input stage of the transmitter. These buffer stages isolate the oscillator from the detuning effects that usually occur when the following transmitter stages are tuned or keyed. Most buffer stages employ either a pentode or a cathode-follower. I chose the latter because it led to a simpler circuit and takes less power. I know someone will say that hams weren't using cathode-followers in pre-war rigs. It's true that they hadn't shown up in

QST or the Handbook, but the TV engineers at RCA were using them in 1939 so they were known and could have been used. The buffer action with just one stage is usually not perfect. Tuning the 6AG7 plate circuit in the T-807 causes a frequency change of about 10 Hz on both 80 and 40 M. For a CW only rig (no SSB) this should be quite acceptable.

Magic Numbers - The Right L & C

The unique feature of the ECO-DYNE is its simple dial where just one calibrated scale serves for all three bands. Most commercial transmitters achieve this feature by heterodyning a precision tunable oscillator (PTO) to the desired band. Here, we use a much simpler and cheaper technique. The secret is the three-gang tuning condenser. Two sections, A&B, have equal capacitances and are connected in parallel on the 40 M band. The proper size coil then gives a 40 M bandspread of 125 kc. On 20 M, only section A is used so the tuning range on 40 M (7 MC) is now only 62.5 kc but when doubled in the transmitter to 14 MC, the range is again 125 kc. When section B is switched out of the circuit, C10 is switched in to compensate for the loss of section B's minimum capacitance and various switch and wiring capacitances.

Section C of the tuning condenser is slightly larger than sections A & B and all three are connected in parallel on 80 M. By choosing the proper size coil, the range on 80 M is again 125 kc. The tuning condenser originally had three identical sections, each having three rotor plates and two stator plates. The rotor plates are semicircular giving a linear capacitance variation. Tuning ca-



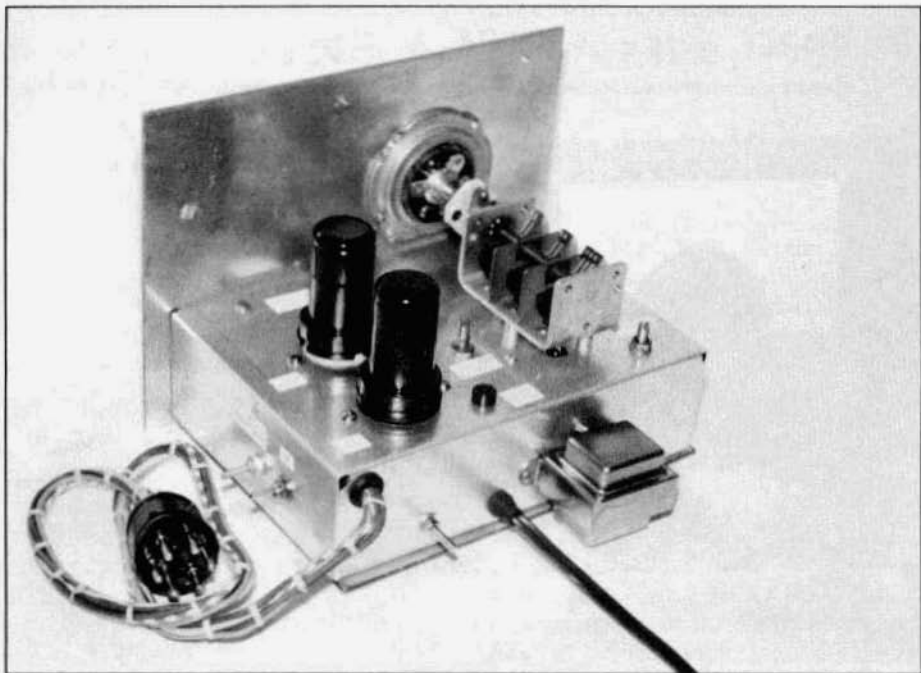
Front view of the Eco-Dyne.

capacitors of this type were made by several companies and often can be found at hamfests. I removed one rotor plate from section A, the front section, and one rotor plate from section B, the center section. The capacitance range of sections A & B after modification measured 4.5 to 15.5 pF while section C has a range of 4.5 to 19 pF. These values are tabulated in Figure 1 along with the formulas used to calculate the required inductance and capacitance. Notice that the capacitance change from full to minimum mesh is reduced by 10% (column 4) in order to provide a little space at each end of the desired 125 kc dial calibration. As a check on the calculations, the difference between C_{max} and C_{min} should equal the change in capacitance shown in column 4. By using a slug-tuned coil and variable trimmer condensers, it is possible to quickly adjust the oscillator for the desired bandspread and make all the bands start and end at the same dial settings. The coils are

wound on Cambridge Thermionic Corp ceramic forms type PLS5-2C4L and tuned by ferrite slugs type 20063-B designed for the 1-20 MHz range. The coil winding data is given in Figure 2.

Bugs, Birdies and the Blues

I would like to be able to say that everything worked A-OK right from the start but that would not be the truth. I experienced all the usual trials and tribulations that are common to radio experimenters. Initially, there were many annoying problems such as low output on 40 M, excessive oscillator plate current, chirp, hum modulation, drift and adjusting the T-807 drive control would cause the VFO frequency to shift or suddenly jump. One-by-one, each of these problems was solved. Along the way, it was necessary to make several changes in the T-807. A list of required T-807 changes and revision 1 of the T-807 schematic have been sent to those who previously sent for the T-807 plans. This T-807 modification infor-



Rear view.

mation will also be sent to anyone who supplies a No. 9 or 10 SASE.

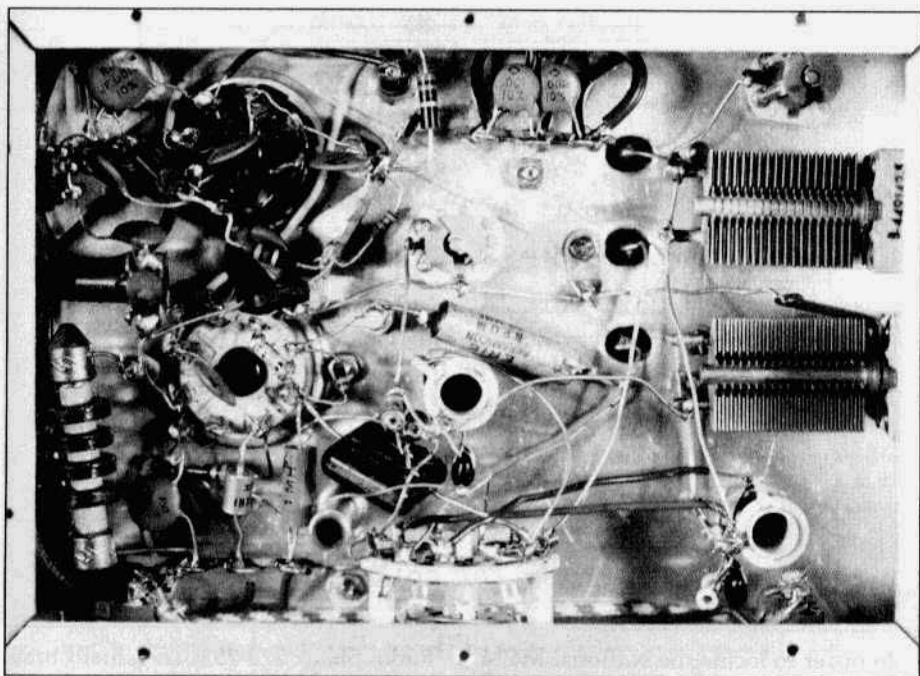
Temperature Compensation

When the components of an oscillator are heated, they expand. This results in increased L and C and the frequency drifts downward. The usual solution is to employ a special capacitor with a negative temperature coefficient (NTC); i.e., one whose capacitance decreases as its temperature increases. In most amateur applications, the VFO sits on a desk in a room where the temperature is fairly constant. Thus it didn't seem expedient to build a heat chamber and subject the VFO to various temperatures. Instead, I assumed that when the VFO is keyed on, two items would tend to heat up the most; (a) the oscillator tank circuit due to the circulating current in the high-C, high-Q circuit and (b) the oscillator tube. So it appears that one should install a NTC capacitor directly on the coil terminals and another at the tube socket. I tried various

NTC capacitors and with each combination made a drift test. I was able to reduce the drift on 80 M to 28 Hz during a 15 minute run. Without compensation, the drift was ten times greater. On 40 M, the compensated drift was 85 Hz in 15 minutes, again a great improvement. My supply of NTC capacitors is limited so I didn't go any further. Since my VFO will be used mainly for short CW contacts, the drift per QSO should be negligible.

Construction

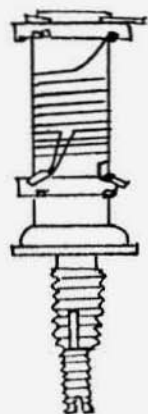
The front panel is .090 aluminum and measures 5.75 by 8 inches. It is held to the 5 x 7 x 2 inch aluminum chassis by four 6-32 screws and the bushings of three switches. An aluminum plate covers the bottom of the chassis, imparting extra rigidity to the VFO. The BUD chassis has welded corners and this also contributes sturdiness. Four rubber feet attached to the bottom plate help to isolate the VFO from shock and vibration



Underchassis view.

BAND	TUNING CONDENSER SECTION USED	ΔC pF	$\Delta C' =$.9 ΔC pF	LuH	Cmax pF	Cmin pF	NOTES
20	A (4.5-15.5) pF	11	9.9	.908	569	559	$L = \frac{50660 \Delta f}{f^3 \Delta C'}$ $C_{max} = \frac{25330}{f_L^2 L}$
40	A+B (9 - 31) pF	22	19.8	.908	569	549	$C_{min} = \frac{25330}{f_H^2 L}$
80	A+B+C (13.5-50) pF	36.5	32.85	4.26	485	452	$\Delta f = .125 \text{ Mc}$ $f_L = \text{LOW END } f$ $f_H = \text{HIGH END } f$ $f = \frac{1}{2}(f_L + f_H)$

Fig. 1.. Inductances and capacitances required to give desired tuning ranges with determining data and formulas.



80 M COIL
L1
24 Turns
No. 24 E
tap at 8 T

$L = 3.5 - 5.1 \text{ uH}$

Coil forms Cambridge Thermionic Corp
PLS5 - 204L with 20063-B tuning slug,
(1-20 Mc type)

NOTE: Both coils are close-wound.

40 M COIL
L2
9 Turns
No. 20 E
tap at 3 T

$L = .7 - 1.1 \text{ uH}$

Fig. 2. Winding data for coils L1 & L2.

In order to locate the National MCN dial at an eye-pleasing height on the panel, it was necessary to raise the tuning condenser slightly so it was mounted on 3/8 inch pillars. The shaft was shortened to 1/2 inch length. A Millen 39006 flexible coupling and a 5/8 inch long piece of 1/4 inch shafting are used to couple the tuning condenser to the dial.

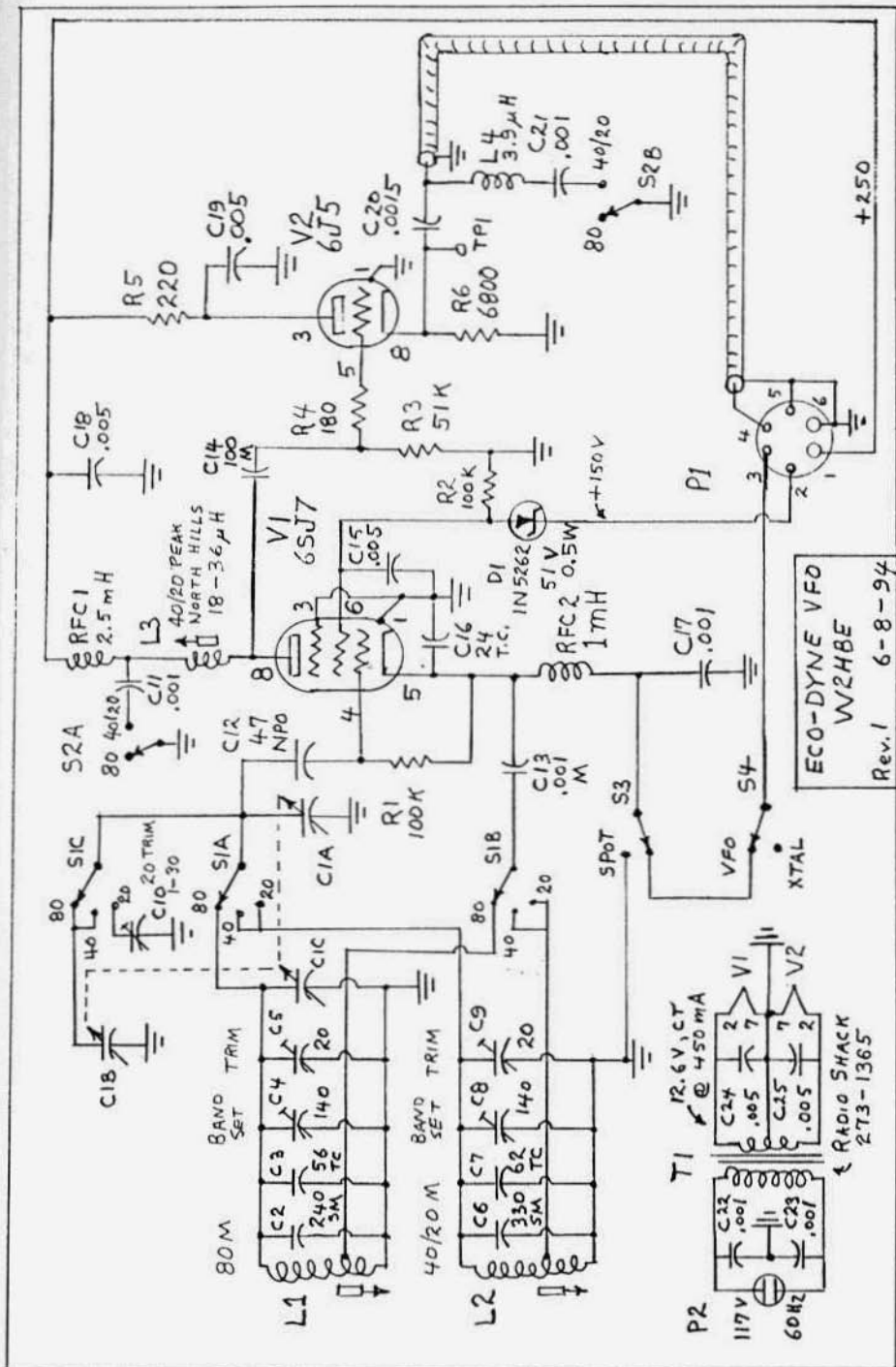
The placement of most parts can be seen by referring to the photographs. Switch S2 is .75 inch from L3. Keep these leads short. Coil L4 consists of 42 turns of No. 34E wire close-wound on a 3/16 inch form - winding length is approximately 5/16 inch. Its inductance is 3.9 uH. The ground wire from S3 (SPOT) should not be connected to the ground side of nearby L1, but instead, run it back to the ground lug which is part of the ceramic octal socket for the 6SJ7 tube. Temperature compensating capacitor C16 is connected by short leads to pins 3 and 5 of this same socket. The power cable is 22-1/2 inches long from chassis to the tip of plug P1. The shielded wire for the output signal is

Radio Shack 278-752. The shield braid of this cable is grounded at each end. The braid is not relied on for the B-return; instead, a separate wire is used (pin 6).

Preliminary Tests

Plug the VFO into J5 of the T-807 and plug P2 into an AC outlet. Turn on the T-807 FIL switch, S6. Check VFO voltages as follows: Pin 8 of V1 and pin 3 of V2 should be approximately 250 volts; pin 6 of V1, 90 to 100 volts; pin 8 of V2 about 12 volts.

Adjust C4 and C8 to full mesh and set slugs in L1 and L2 to about 5/8 inch from top edge of coil form. Set both S1 and S2 to the 80 M position. Turn S3 to SPOT and S4 to VFO. Turn S1 (XTAL-VFO) on the T-807 to VFO. Set the VFO tuning dial at mid-scale and adjust either C5 or L1 to give a frequency of 3560 kc. Measure the RF output at TP1. You can use either a VTVM equipped with an RF probe or an oscilloscope. The level should be about .8 volt rms or 2 volts peak-to-peak. Turn S1 and S2 to 40 M positions. Adjust either C9 or L2 to give a frequency of 7060 kc. Adjust L3



N.S.F. Type HL/7 Merchant Marine Receiver

by Phillip Kor, VE4KOR

P.O. Box 264

East Selkirk, Manitoba, R0E 0M0
Canada

Reading Jim Hanlon's interesting and excellent article on the National SW3, so aptly named the Quintessential Regenerative Receiver (*ER*, Aug. '93), my thoughts went back to 1945 and the end of WW II.

After four years of chomping on the bit in German-occupied Holland, at last I could go to sea as a "Sparks" in the Dutch merchant navy. After a few trips as 3rd and 2nd operator, under the guidance of some old experienced hands, to get back on the right track, I was at last assigned as chief - (and only!) operator of a rather sophisticated tramp-ship. MV Pericles plied the waters around South America and the Carribean. She was just over 3000 BRT and slid out of the ways in Holland in 1937. She had never been home since and her radio equipment was still the original equipment. This equipment was installed in the radio cabin, directly aft of the bridge and adjacent to my living quarters, separated only by a curtain. As was the custom in those days, both cabins and

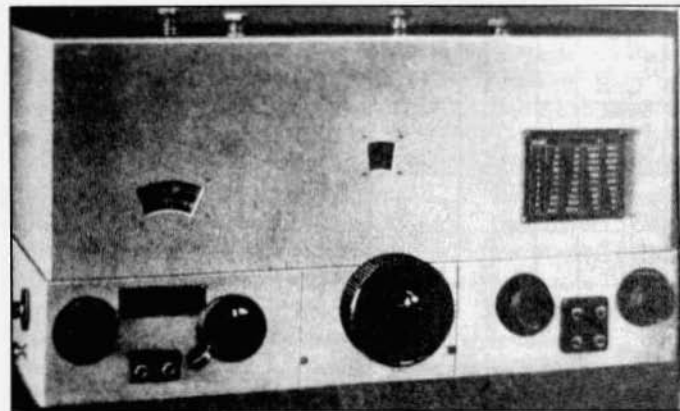
their furniture were done in beautiful red mahogany with brass fixtures. All equipment was designed and manufactured by N.S.F. (Nederlandse Seintoestellen Fabriek i.e. Netherlands Signalapparatus Factory), still in existence today, but absorbed by the Philips concern many years ago.

It consisted of a 200W MW CW transmitter (200-510 kHz) and matching 200W SW transmitter (1.6-22 MHz), suitable for CW or AM phone.

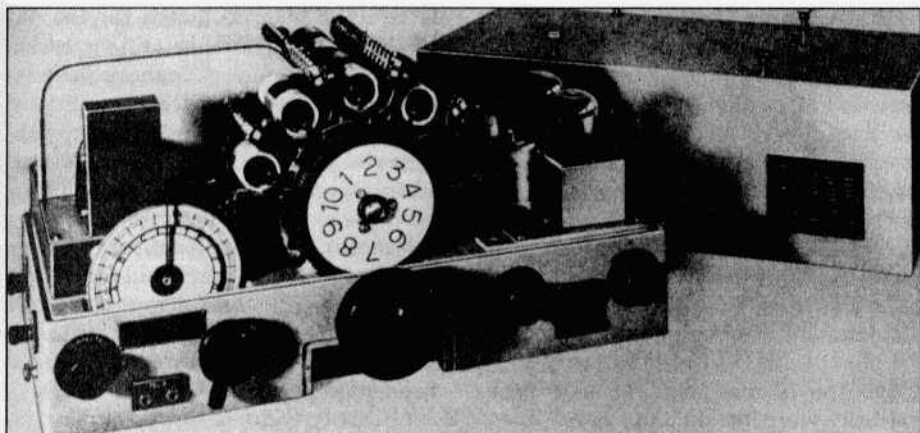
Both units and their PSP were built like the proverbial brick outhouse! A hefty motor generator changed the ship's 220 VDC supply to a transformable 500 Hz AC. After rectification in the PSP the 1000 Hz ripple could be used to modulate the CW signal (A2 mode) by simply switching out the output smoothing capacitor.

The matching receiver was the HL/7. Although extremely simple schematically, the secret of its excellent performance lay in the quality of its components and the manner they were put together.

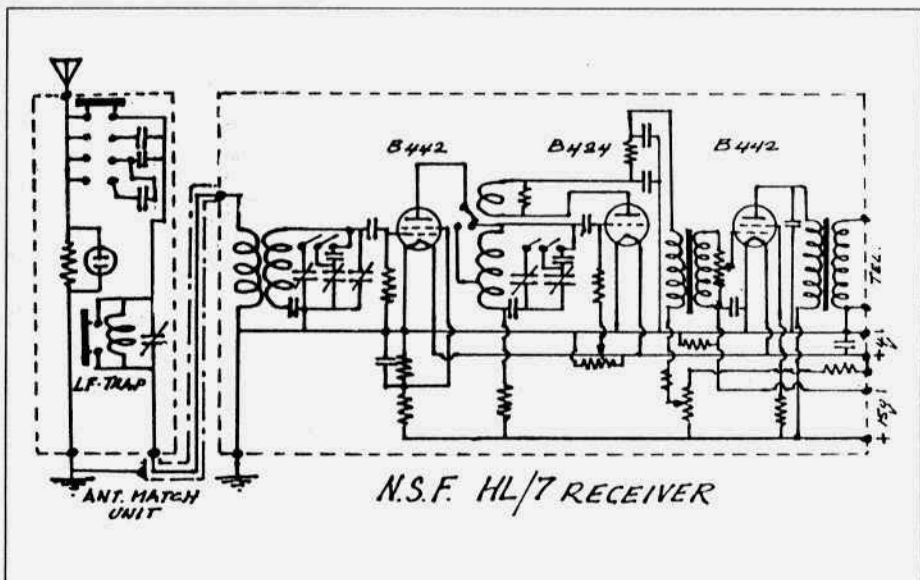
It was a straight regenerative receiver with one RF and one LF stage. The tubes used were similar to US type 30 (B424) and type 15 (B442), except that their filaments were 4 VDC. The frequency range covered everything between 15 kHz and 21 MHz in ten slightly over-



N.S.F. Type HL/7 Merchant Marine Receiver



Receiver removed from cabinet.



lapping bands. All HF coils were wound with silverplated solid copper wire on ceramic (steatite) low-loss forms. The MF/LF coils were wound on the same type of forms with multiwire Litz in a fine honeycomb pattern. All coils were mounted on a large switching drum (10 positions) and terminated with very short connections to silverplated silicon-bronze flat springs, which made contact with ditto pins mounted (insulated) on the chassis. The 4-section tuning capacitor was completely shielded,

2 sections were used on the HF bands, while all 4 were automatically switched in for the MF/LF bands. This capacitor was driven by a no-play spring-loaded 2-speed gear system, attached to a calibrated scale. Pushing in the tuning control resulted in coarse (fast) tuning; when released fine tuning was achieved.

All parts were mounted on a solid cast aluminum chassis and shielded with a brass enclosure, which could easily be removed for access to the interior of the unit.

The performance of this receiver was truly remarkable in the hands of a skilled operator. Its regeneration was very smooth and could be set on the edge of oscillation very precisely on all bands, resulting in very good sensitivity and quite acceptable selectivity.

The power supply for this receiver consisted of two banks (Main and Standby) of 64 separate lead-acid wet cells in series, providing an absolute stable and hum-free anode voltage. Two 4V hi-capacity lead-acid batteries provided the filament voltage. All these batteries were installed in a metal lined box on top of the radiocabin; all feed-cables were thoroughly shielded against any outside interference. A simple system kept the batteries fully charged at all times. (After all, 220V DC was available from the ships electrical supply!). As the receiver was virtually never switched off and the tubes never got beyond handwarm, the stability was excellent.

In 1947, in Panama City, I bought a 220V DC version of a Hallicrafters SX-40 superhet (for \$89-!). Except for se-

lectivity it was no match for the old HL/7! Its absence of hiss and incredible silent background made reception possible of the often very weak signals from home, while internal and external pick-up noise in the SX-40 made this impossible. Of course, the HL/7 was quite a bit more expensive than the SX-40!

Keeping the construction methods and design of this simple old receiver in mind as a guideline, I found it quite possible to build a very stable and quite useable straight receiver for at least the three hambands (3.5-7.0-14.0 MHz).

I heartily endorse Jim Hanlon's conclusion at the end of his article, where he advises: Go for the ultimate! Get (or build a copy of) the Quintessential National SW3! I can only add: or the N.S.F. HL/7! !

Note:

The HL/7 was designed around 1930 and, albeit with more modern tubes and the addition of one more LF stage, did stay in service until the late '50's as a standby receiver. It was replaced after the war by the Philips BX-904, a 17 tube superhet made by the same company. ER

Repair/Restoration Tips

String for Wiring Harness

Here's a tip for those that wish to replace the waxed string that is found on the wiring harness of a great many of the old rigs. Muzzle loading supply houses carry a brand of artificial waxed sinew, for sewing together leather gear, that exactly matches the old string.

I have used this string on a great many Heathkits and it works great and best of all it will not deteriorate with age like the old cord.

The 8oz spool I have I obtained from Dixie Gun Works, P.O. Box 130, Union City, TN 38261. It sells for \$6.95 + \$4 shipping.

Ralph DiMuccio, KC4ALF

Adhesive Remover

If you're having problems removing old adhesives - and who doesn't from time to time - try a product called "OOPS!" manufactured by DIY Products, a division of Rhodes American of Chicago. It's a mix of ethyl alcohol, naphtha, xylene and toluene, and I found it in the local grocery store along with the spot removers. The one-pint can says the product removes old latex paint, gum, adhesives, Magic Marker, ink, etc. From my experience, it's very good stuff.

The acid test was when I had to remove glue residue from brittle, old masking tape on the side of a Johnson Desk KW I was restoring. It took some modest rubbing, but OOPS! removed it completely. The paint was unaffected.

Richard Peterson, WB5NEN

It's in Mint Condition from page 15

go to someone who was gonna do a bunch of (expletive) mods on it.

"Whul matter o'fact, he did. Ceegars mostly, or sumtimes a pipe. I c'n still remember watchin that blue cloud hit the front o'the rig an spread out and slide up to the ceiling. How'd you know that?"

"Hello? Well are y'interested? I've had other offers, y'know. . . Fine piece like this really belongs in a museum, don't you think? But I might consider a swap. . . you got a KW-1? Hello? Hello? (unintelligible) (expletive) tire kickers (unintelligible)". ER

The Eco-Dyne from page 30

to give about 8 volts rms or 22 volts p-p. Listen to the signal on a receiver. It should be steady and T9X.

Calibration

Note: The bottom plate should be in place during calibration.

Set S3 to SPOT and S4 to VFO. On the T-807, set S1 to the VFO position. Turn the VFO dial until the tuning condenser, C1, is at 95% full-mesh. Turn S1 and S2 to the 80 M positions. If a frequency counter is available, connect it to TP1; otherwise, check frequency with a calibrated receiver. Adjust C5 and/or L1 to bring the frequency to 3500 kc. Turn the dial to 95% full scale. We want the frequency to be 3625 kc. If the frequency is lower than 3625, increase L1 and reduce C5 and repeat the low and high end checks until the bandspread is 125 kc.

In a similar manner adjust the 40 M bandspread. Here S1 and S2 are in the 40 M positions and L2 and C9 are adjusted to give the low and high frequencies of 7000 kc and 7125 kc. If everything is in order, the dial settings for 80 and 40 should match or coincide fairly closely across the whole range of the dial.

Set the dial to give an output of 7000 kc. Turn S1 to the 20 M position and

adjust C10 to again give 7000 kc. Turn the dial to the position that gave 7125 kc when S1 was in the 40 M position. The frequency should be 7062.5 kc. Remember that when doubled in the transmitter (20 M operation) this will give an output of 14,125 kc.

Now you can ink in the dial calibration. They should run from 0 to 125 with major marks at 0, 10, 20, etc and smaller marks at 5, 15, 25, etc. The marks indicate the number of kc above the bottom edge of the band whether that is 3500, 7000 or 14,000 kc.

Final Test

Using an 80 M crystal, tune the T-807 into a dummy load. Adjust drive for 3 mA (807 grid current). Set the VFO to approximately the same frequency as the crystal. On the VFO, set S1 and S2 to 80 M and S4 to VFO. On the T-807, set S1 to VFO. Turn S8 to SEND and depress the key. Readjust the drive control for 3 mA. The signal should sound just as good as it did with crystal control. Now check 40 and 20 M the same way. Again the signals should be crystal clear and free of chirp. Do not use excessive drive as it causes high 807 screen current. I have found 3 mA to be optimum.

I am looking forward to using my VFO in next year's AWA contest. It should be a big help in avoiding QRM and boosting my score. ER



NOW I REMEMBER --- HE SAID "IF IT DOESN'T FIT THROUGH THE HALL, TAKE IT IN THROUGH THE WINDOW!"

A Quartet of Flute Players from page 3

In early April, 1947 the ticket finally arrived. My new call, W6ZGM, added a new dimension to the teenager's world. I remember practicing sending it many times on my code buzzer: dah dah dit dit, dah dah dit, dah dah—two dits, one dit, no dit. A great rhythm for CW, but a lousy call for phone. Voice phonetics that came to mind were either ponderous, inane, or obscene.

Anyway, my class-B ticket forbade use of the 75 meter phone band. At that time, there were no American phone band on 40 meters. Now the #19 transmitter was ready to rip. On April 4, 1947 I put it on the air for the first time with my new call. The original log entry shows a CQ on 80 CW at 2:30 PM local time with no response. Twenty-five minutes later I contacted W6DIJ on 80 CW for my very first two-way QSO. We were both located in Long Beach, California, about seven miles apart. I gave Dan an RST 589 signal report; he gave me an RST 454 and suggested that I check my power supply.

What now? Was I doing something wrong? After all, the ARRL definition of a T4 report was a "rather rough a.c. note, moderately musical." I assumed that any CW emission, as opposed to spark, was then legal. I assumed that any report on the ARRL T-scale between 1 and 9 was acceptable—why else would the League have provided this scale in the first place? Nothing was said about state of the art. I continued to operate on 80 CW. Most of my tone reports ranged between T2 and T7. Not too bad, I thought, fairly close to the median. This went on for about a month. Then, wham, I got a ticket from the FCC. The log shows the #19's last QSO on May 2, 1947.

For a beginning ham, this was an educational experience, almost like letting fingers accidentally stroke the high-voltage terminal. I took a breather to study how I would deal with the FCC's then-required written response describ-

ing how one intended to correct a cited deficiency. I carefully studied the chapter on power supplies in my ARRL Handbook, a study I should have undertaken earlier. The #19 rig itself was not at fault, just the fast-buck power supply kit sold by the surplus outlet in New York. This power supply used half-wave rectification. On receiving, the #19's relatively low current drain caused no problems. On transmit, the 807 output stage sucked too much current from this AC supply whose ripple modulated the CW carrier. During its month of operation, this transmitter's many raunchy tone reports were logged and forgotten. But one ham's comment, unfortunately not logged, sticks forever in memory. He said the rig's CW signal sounded like a quartet of flute players under water.

I don't have much of anything left over from this #19 Mk. II episode except memories. I extracted all the tubes from the unit. They have seen service elsewhere over the years. Most fixed capacitors and resistors were mounted compactly with very short leads and were covered with a hard varnish. I extracted many and used them later in other homebrew projects. The panel meter became the S-meter years later in a homebrew CW receiver (ER, #59). What couldn't readily be cut free with hand tools was left in place. The residual hulk gathered dust for several years. Finally, my father and I carted it off to the local Salvation Army depot.

This #19 Mk. II episode was certainly not the ideal way to enter ham radio. But it was at least educational. It taught the young ham that the FCC meant business, that first-hand acquaintance with current technical standards was mandatory, and that converting war-surplus equipment for ham use was better left to the experts. On July 15, 1947 W6ZGM was back on the air. This time it was with a homebrew crystal-controlled 6V6 breadboard oscillator, fed

with pure DC, on 40 meters. My one crystal on 7154 kHz with about 15 watts input to the tube, so shows the log, collected about one contact for every three calls transmitted. But these contacts had a special meaning for the young ham, who had built the transmitter with his own hands. One of these early QSOs had transcended decades. On July 17, 1947 I worked Louis, W6ZRY, for the first time. He also lived in Long Beach, California. He also was using a breadboard crystal oscillator. His one crystal frequency was close to mine. We soon became personal friends, a friendship which endures to this day. Under our new calls--he is now KF6J--we still communicate via ham radio several times a week. **ER**

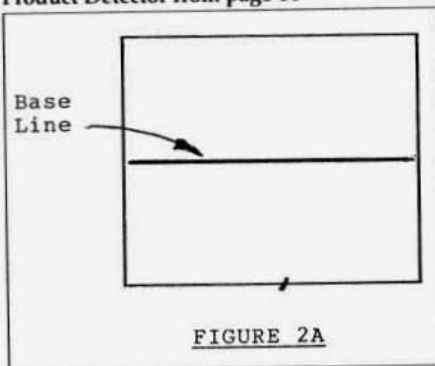


FIGURE 2A

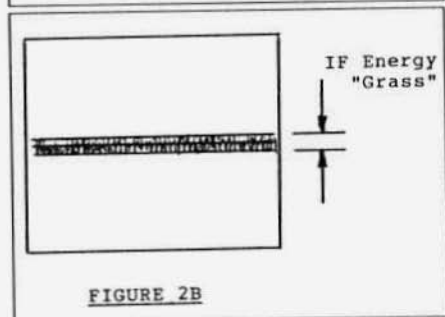


FIGURE 2B

Letters from page 2

(Service Information Letter 1-76) to cure the arc over problem (and associated fuse blowing) with 5U4 & 5R4 rectifiers. The first time I experienced this problem, I had my face buried in the rear of my 516F-2 - the arc-over scared the @#%#^ out of me. The Collins mod indicates a 12% increase in output voltages, to +308V and +896V. The mod was "intended only for those power supplies that have a fuse blowing problem." Not wanting to solid-state my 516F-2, I selected 5U4's and 5R4's that didn't arc-over. On the plus side, solid-stating the 516F-2 removes 25W of filament power from the transformer's secondary - not too shabby.

* The LV supply in my modified (less L3) 516F-2 is +288V @ 115 VAC line in my KWM-2 during receive.
Dave Ishmael, WA6VVL

What I saw was a band of "grass" along the base line as shown in Figure 2B.

It's pretty easy to see how this can happen. As an example, a 220 pF capacitor at 455-kHz has an X_C approaching 1600 ohms. That puts enough reactance between the audio output line and ground to support plenty of IF energy. The solution is also quite simple. Just add enough capacitance at C_1 and/or C_2 to get rid of the "grass". I ended up with about 1500 pF in the HRO-60 circuit and the resulting audio was crisp and clean (you also need a low-distortion audio chain). The larger values of capacitance in the audio filter will not affect high-frequency audio response because the X_C will be very large. For example, X_C exceeds 35K-ohms using a 1500 pF capacitor at 3-kHz (top of typical audio range).

Perhaps ER readers that have already added a product detector to a vintage receiver will want to consider dusting off the scope and retrofitting the audio filter with large capacitors. **ER**

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FOR SALE: RME 69 w/matching spkr, 90% restored, works good, looks good - \$200; Hallicrafters R-50 spkr and cabinet - \$25. Plus shpg. Bob Truhlar, W9LNQ, 1701 W. 101st St., Chicago, IL 60643. (312) 238-0544

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: Manual copies for Eico 720, 730, HQ-110, Elmac AF-68; schematic copies for Knight 50-W xmttr, Ocean Hopper rcvr. Paul Vaughn, 2317 Williamson Rd., Williamson, GA 30292.

FOR SALE: Modified BC-610E, speech amp and cables in real good condx - \$375 PU only. Victor Gregowski, WD8DWR, 8350 Smiths Creek Rd., Wales, MI 48027.

WANTED: Collins 75A-2, F455B08, F455C08, F455J08 mech. filters, spkr; McElroy or narrow based Vibroplex bug. Brian Roberts, K9VKY, 3068 Evergreen Rd., Pittsburgh, PA 15237. (412) 931-4646

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: Omega noise bridge - \$20; Galaxy III - \$100. **WANTED:** Manuals for ESI 250 and Fluke 710 impedance bridges. Hal, KK6HY, (415) 366-5060

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FOR SALE: McMurdo Silver model 5C comm. rcvr, unusual, works; R-390, working, cal. off a bit - \$125; Heath IT28 cap checker; Zenith Transoceanic 6A40, good wrkg; 2 BC-221's; Gertsch FM3 freq. meter, VHF; spark gap key on marble base. **WANTED:** 100 kc xtal cal Hallicrafters SX-122, not 'A' model. (415) 892-2643

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WANTED: Manual for the Millen 90881 amplifier, plug-in inductors and 812A or 812H tubes for this unit. Also want Millen 90281 high voltage sply, 90711 VFO and 90905-B oscilloscope. Thanks. Mike Ruggiero, W2NVR, Rd 3, Box 3358, Saylorsburg, PA 18353. (610) 381-3211

WANTED: Manuals or copies for the Ameco TX-86 xmtr and the Lampkin type 205A FM deviation meter. Jeff Duntemann, KG7JF, 6840 E. Lowden Dr., Cave Creek, AZ 85331. (602) 483-0192

FOR SALE or TRADE: Collins RE 75S3B (500 Hz), 32S3, 312B4, 516F2, excellent - \$1800 OBO; 62S1 - \$900 OBO. **WANTED:** High-end tube audio. Michael Behar, WM1O, (914) 834-7678

WANTED: Ham band coils & tuning units for BC-610. Tom Tate, W7SUM, 306 View Crest Rd., Glendale, CA 91202. (800) 869-8196

WANTED: Hammarlund "Noise Silencer" accessory for the HQ-180A rcvr; also Heath SB-620 panoramic display. Rick, N6NVC, (510) 687-2719.

FOR SALE: 75A-4 w/spkr & 3 filters, exc. condx - \$500 OBO. Paul, (202) 363-8593 (h).

FOR SALE: Receiving tubes, new and used; multi-section twistlock electrolytic caps to 500-VDC; SAMS photofacts. Send stamp for lists. Turner Electronics, 16701 Main St., Ste. 121, Hesperia, CA 92345.

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FOR SALE: NV2C Telegraph Key Illustration Index (TVC8). Tells where to find a picture of that key. \$2 ppd. TVC, Box 88-E, Maynard, MA 01754.

FOR SALE: SX-25 w/matching spkr in exc. condx mech. and cosmetically - \$200 plus shpg/packing. Bud Santoro, 3715 Bower Rd., Roanoke, VA 24018. (703) 774-9153

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WANTED: DX-100, 32V, Viking II, TX-1 Apache, HQ-170, HQ-180 or Collins R-390. Chris Horne, AC4RM, 3017 Fieldcrest Rd., Rocky Mount, NC 27803. (919) 985-2863

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WANTED: SX-25 main tuning dial lens and dial, correct spkr, or parts radio; HQ-100C clock, tube shields; HRO-60 calibrator, spkr, E&F coils. Greg Gore, 11528 Watermoss Ln., Charlotte, NC 28262. (704) 549-4719

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TRADE: Collins 312B-5 W/E, exc. condx, w/orig. manual for any S-Line or KWM2A; also Ameco AC-1 TX. Joe, K2QPR, (407) 220-7362

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Audio Amplifier with tubes, Gov't-Reconditioned - \$32

IF Amp with good filters, but less RT510, used - \$100

Line Level Meter (not original), white face, new - \$20

3TF7/RT510 Ballast tube, unused - \$17.50

Shipping charges additional! Ask for our 1994 catalog!

WANTED: Very early Hallicrafters and Hallicrafters/Silver Marshall equipment including Skyriders with entire front panel dull aluminum color, S-30 radio compass, S-33 Skytrainer, S-35 panadaptor, wood console speakers - R-8 & R-12, HT-2, HT-3, BC-939 antenna tuner, parts, advertising signs, paper memorabilia of Hallicrafters. Also want RCA model AVR-11 airport tower receiver. Chuck Dachis, WD5EOG, "The Hallicrafters Collector", 4500 Russell Dr., Austin, TX 78745. (512) 443-5027

FOR SALE: TMC GPR-90, exc. - \$285; R-392, exc. - \$150; TCS-15, w/pwr sply (Lambda), both mint - \$75. Jerry Andrews, WB3BDM, 1813 Rocky Glen Dr., Frederick, MD 21702. (301) 696-1934

WANTED: Old homebrew rcvrs as outlined in QST articles July 1957 thru April 1964 on HBR-14, HBR-16, HBR-8, HBR-11. Also DCS-500 from ARRL 1962 Handbook. Chuck, W0IUH, 9917 Irving Ave., So., Bloomington, MN 55431.

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

FOR SALE: Galena crystals - \$3 ppd. Pat Person, Box 1063, Bothell, WA 98041.

FOR SALE: S-40B rcvr, w/Heath QF-1 Q-Multiplier - \$95; Morrow Twins, MBR5/MB560, w/pwr sply, spkr, mike, cables, manuals - \$295 OBO or trade. Gene, (208) 522-5854

WANTED: Hallicrafter model S-29 Sky Traveler, model S-39 Sky Ranger. Must be in good cosmetic condx, but OK if not in working condx. Lee T. Bird, N7YXW, 625 Concord Circle, Fernley, NV 89408. (702) 575-6705

WANTED: Eldico TR-75 xmtr. Need not even be in working condx, but must be restorable. Don Temple, AF0C, 5405 S. Florence Ct., Englewood, CO 80111. (303) 779-0923

FOR SALE/TRADE: Signal generators - Eico 324, Knight KG-686, Conar 280, RCA WR-508, Knight KG-650. Exc. w/manuals. Al Bernard, POB 690098, Orlando, FL 32869-0098. (407) 351-5536

WANTED: Multi-Elmac PS-2V pwr sply; tube CB's. Charles Zafonte, N1FRX, RFD 1, Box 75, Fort Kent, ME 04743. (207) 834-6273 eves/weekends.

WANTED: Hallicrafters SX-100 and SX-122A rcvrs, mint to exc. No dealers. James B. Geer, WB5LXZ, 1013 Overhill, Bedford, TX 76022-7206. (817) 540-4331



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

FOR SALE: Complete Eldico SSB station. Manufacture 1960 Radio Engineering Laboratories. Pwr sply, spkr-RF mon/phone patch, xmtr, rcvr, good condx, new 6146 finals - \$300. Fred, KC4MOP, Oxon Hill, MD (301) 567-2012

WANTED: All items in WW II B-26 radio compartment, BC-461 antenna control box, clock lamps, oxygen, chair, etc. Greg Greenwood, WB6FZH, Box 1325, Weaverville, CA 96093. Msg. (707) 523-9122

FOR SALE: ARRL and Editors and Engineers Handbooks, 1930's to '70's. Also a few old Flying Horse Callbooks. SASE. Dick George, 15245 Lynn Terrace, Minnetonka, MN 55345

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

FOR SALE: Repair! Radio repair, tube or solid state, reasonable rates. Jim Rupe, AB7DR, Western Amateur Radio Repair Co., (WARRC), 9330 State Ave., Bldg. B 313, Marysville, WA 98270. (206) 387-6312

FOR SALE: Heath SB-300 rcvr, SB-400 xmtr, SB-630 console, SB-640 remote VFO, Palomar P-405 rcvr pre-amp (as-new) + a spkr. Units very clean and work well. There is a homebrew speech amp in the console. I have rcvr/xmtr manuals, sell as a package - \$325 plus UPS. Vern, WØVV, Box 187, Lehr, ND 58460.

FOR SALE: HyGain/Galaxy GT-550A w/ matching SC550A/AC400A spkr/sply (550 watts), exc. condx - \$400; Swan 350C, w/117X AC sply (no spkr), 520 watts, exc. condx - \$275. Craig Pitcher, WA9HRN, 1308 Kristin Dr., Libertyville, IL 60048. (708) 367-1599

WANTED: QST's. All issues before 1930. Feb., July 1951; July 1952; Sept. 1956; Feb. 1958; Jan. thru May 1960; Aug., Dec., 1961. Howard Weinstein, 15 Lakeside Dr., Malton, NJ 08053. (609) 596-3304

FOR SALE: 38" Philco, RCA radios. Lots of parts + schematics for hobbyists. SASE to IOBST, POB 312, Whitehall, PA 18052-0312

FOR SALE: Vintage parts. Send stamp and request "Vintage Flyer". USA only. 40 years of mail order electronics. Bigelow Electronics, P.O. Box 125, Bluffton, OH 45817.

FOR SALE: Four piece Central Electronics SSB set - 20A exciter, 458 VFO, MM2 scope, GC1 audio compressor - \$395; Hallcrafters HT-37 - \$150; HA5 VFO - \$95. All plus UPS. Ed Clink, WA9PFB, RRI, Box 106, New Berlin, IL 62670. (217) 787-8595

FOR SALE or TRADE: Rare WW II VHF rcvr, BC-1068-A, very good condx - \$150 plus shpg. Fred Clinger, WA8KJJ, 417 Beechwood Dr., Galion, OH 44833. (419) 468-6117 after 6 PM Eastern

FOR SALE: New in box T-30-V throat mics by Shure for US Army and Army Air Corps, WW II - \$15 each ppd. John Snow, 4539 N. Bartlett Ave., Shorewood, WI 53211. (414) 964-0194

WANTED: Manual-operational and maintenance technical manual for rcvr R100/URR. Karl E. Kegley, Sr., 211 Boyd St., Johnson City, TN 37604. (615) 926-0456

FOR SALE: National Select-O-Jet model SOJ - \$50; RCA audio gen., model WA-504B/44D - \$30; Heath tunnel dipper HM-10A - \$50. U-ship. Richard Lucchesi, WA2RQY, 941 N. Park Ave., N. Massapequa, NY 11758. (516) 798-1230

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Presley Travis, KA4NNN, Electronic Workshop, Rt 4, Box 36-B, Louisa, VA 23093. (703) 894-0406

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: Bench pwr splies - Fluke model 407, 2 each, outputs of 6.3 VAC, 5 amps, 1 each 0-550 VDC @ 300 mA, 1 each 0-25 or 0-250 bias output - \$125 each. Mike Murphy, (619) 444-7717

FOR SALE: Subscribe to "The Amateur Market Place". A Canadian newsletter, listing new/wanted Amateur/Computer equipment. 10 issues per year \$16.50 US. Benefit from \$ exchange. P.O. Box 8180, Ottawa, Canada K1G 3H7

FOR SALE: Conset G-76, w/AC sply - \$100; Heath DX-60 - \$75; Hammarlund HQ-140X - \$125; Hallicrafters S-76 - \$75; R-27/SX-73 - \$550. PU only. Steven Wenger, KA9QLF, 803 S. Church, Jacksonville, IL 66250. (217) 243-3920 after 5 PM

Photofacts and Parts for Collectors

Electrolytics, high voltage capacitors, power resistors, plugs, switches and more. Free catalog. A.G. Tannenbaum, WA2BTB, P.O. Box 110, East Rockaway, NY 11518. (516) 887-0057, FAX 599-6523

FOR SALE: Military mic model T-32, desk model with press-to-talk switch, very good to exc. condx - \$20 I ship. John Snow, W9MHS, 4539 N. Bartlett Ave., Shorewood, WI 53211. (414) 964-0194

FOR SALE: Tubes, capacitors, sockets, NOS and reproduction parts for antique radios and TV's. Large SASE for tube list or \$2 for 20 page catalog refundable with 1st order. Vintage TV-Radio, 3498 West 105 St., Cleveland, OH 44111.

WANTED: McIntosh and Thordarson amplifiers any condx. Marcus Frisch, WA9IXP, Box 28803, Greenfield, WI 53228-0803. (414) 545-5237

FOR SALE: Repair & restoration of all classic & vintage radio equipment, reasonable rates, prompt turn around, 25 yrs experience. Mike McKean, N3HJQ, 726 McClellan St., Philadelphia, PA 19148. (215) 336-6111

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

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

FOR SALE: Collins 75A-4 filters: 6 pole ceramic for high quality AM, 6 Khz - \$83.50 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. (909) 985-6250

FOR SALE: 4D32 tubes, NIB (1973 manufacturer) - \$35 U-ship; five volume set Coyne "Applied Practical Radio-Television", exc. shape - \$50. Rich, KD6VK, (702) 222-0442

WANTED: Collins KW-1. Joel Thurtell, 11803 Priscilla, Plymouth, MI 48170. (313) 453-8303

WANTED: RME 4300 manual, will buy or swap; looking for Heath, Eico, Knight, etc. manuals, buy or swap. Pete Markavage, WA2CWA, 27 Walling St., Sayreville, NJ 08872. (908) 238-8964

FOR SALE: Collins 20V-2, 250/1000 watt AM broadcast xmtr, orig., clean - \$2500. K7BDY, (602) 537-2450, 742-2875

WANTED: High serial 75A-4 (5000+) and KWM2A. Ward Remkopf, K8FD, 116 Fairway Dr., Belmond, IA 50421. (515) 444-4396

WANTED: Professional quality VFO for CE 20-A; also need QT-1 anti-trip module. Gary Davidson, KJ6Q, POB 6314, Vacaville, CA 95696. (707) 448-5221

WANTED: Gosnet emblem from front panel of G-66B rcvr. **FOR SALE:** Collins R-390/R-390A manuals; vintage CB's. Charles Zafonte, RFD 1, Box 75, Fort Kent, ME 04743. (207) 834-6273 eves

FOR SALE: Elgin A-11 8 day clock, new in box, used in all large WW II military aircraft, B-17, B-24, etc., needs cleaning, runs intermittently - \$100 I ship. John Snow, 4539 N. Bartlett Ave., Shorewood, WI 53211. (414) 964-0194

WANTED: Hallicrafters SX-11 and SX-15. Robert Braza, N1PRS, 23 Harvard St., Pawtucket, RI 02860. (401) 723-1603

WANTED: Specific issues of QST - July, August 1942; October 1943 and May, June, August 1944. I have some traders. Eddy Swynar, VE3CUI, 3773 Concession Road 3, R.R. 8, Newcastle, Ont. L1B 1L9, Canada

FOR SALE: General Radio 1021A standard sig. gen., 40-920 MHz - \$100, exc. condx., PU only. Al Kaiser, W2ZVR, 713 Marlowe Rd., Cherry Hill, NJ 08003-1551. (609) 424-5387

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.

WANTED: Speaker for Collins 75A-2. David A. Clark, K5PHF, 9225 Lait Dr., El Paso, TX 79925. (915) 591-4184

FOR SALE: Collins meatball lapel pin - \$5.95 + \$.75 S & H. George Pugsley, W6ZZ, 1362 Via Rancho Prky, Escondido, CA 92029.

FOR TRADE: Hammarlund HQ-140X; Hammarlund HQ-170A; National NC-183D, w/matching spkr. All mint in beautiful condx. Unrestored National SW-3 model I/II, ten coils, doghouse sply. Trade for tube equipment. **WANTED:** HT-32A/B, Valiant, etc. Hal, K4GFI/7, (702) 362-8136

FOR SALE: Service manuals. Most photocopies \$5, shpg \$5.00 each. Hallicrafters, Heath, Johnson, others. SASE for list. DSM Diversified (formerly Miller Radio), 909 Walnut St., Erie, PA 16502.

FOR SALE: High voltage RF xfmr - \$65; Gemtronics base CB - \$20; older military mics, headset, throat set. **WANTED:** Keys and other older electricals. J.H. Jacobs, 11768 Seaview Terrace, Northport, NY 11768. Phone/FAX (516) 261-1576

FOR SALE: Collins 51J4 rcvr serial #2822, exc. + condx, works FB, 3.1 mech. filter, dust cover - \$400. Terry AA6TN, 1127 Salvador St., Costa Mesa, CA 92626. (714) 546-9602

WANTED: Collins, still looking for a KWM-2 into KWM-2A conversion kit. Please call, write or FAX to: DJ7HS, Ernst Schroeder, Pinkenburger Str. 25D, 30655 Hannover, Germany. Tel. no. 011-49-511-547-0486, FAX 011-49-511-418-2483

ELECTRIC RADIO PARTS UNIT DIRECTORY

If you need a part for a vintage restoration send \$2 and an SASE (.52 postage) for a 7 page list of parts units. If you have a parts unit, consider putting it on the list. Your dead unit can help bring others to life!

Repair & refurbishment of older tube-type amateur equipment. Fully FCC licensed; 35 years experience. Chuck Banta, N6FX, Claremont, Calif. (LA area) (909) 593-1861

WANTED: Condenser, carbon and other early broadcast microphones; cash or trade. James Steele, Box 620, Kingsland, GA 31548. (912) 729-2242

FOR SALE: National HRO-500; Johnson Valiant; BC-348-Q, w/AC; Heath cap checker, sig. gen., GDO; Eico scope; military TS-175 C/U VHF-UHF freq. meter (looks like BC-221); CRV-46161 military aircraft rcvr; GE dynamotor, 14VDC in, 515/1030/2/8V out, 48 amp, 7500 rpm; Collins antenna tuner control C-2698/SRA-22. Joe Thurtell, 11803 Priscilla, Plymouth, MI 48170. (313) 453-8303

WANTED: Beginning collector needs anything Vibroplex. Send me your bug and key list. Mitch, WA4OSR, 11 Midtown Park, E., Mobile, AL 36606. (205) 476-4100, 342-7259

FOR SALE: Viking I front panel refinishing this summer. Call or write for details. Ron Eisenbrey, KC5DFX, 115 First St., Sugar Land, TX 77478. (713) 491-7823

FOR SALE: Sencore Mighty Mite II portable tube tester w/manuals, VG - \$35; Eico 232 VTVM, VG - \$30; Heath 2255 LCR meter, exc. - \$65. Doug Carter, N5NWC, 1414 Maryland, Corpus Christi, TX 78415. (512) 855-6773

WANTED: WW II ex-service equipment. Suitcase sets. **FOR TRADE:** Warsaw-pact sets, German WW II duplicates. Rag Otterstad, OZ8RO, Hosterkobvej 10. DK-3460 Birkerød. FAX 011-45-4468 1514

WANTED: WW II Japanese military radio equipment of any kind; early wireless related like spark xmtrs, loose-coupler rcvrs; tube type pocket/portable radios; factory made crystal sets; anything S.S. Titanic, German airship related. Takashi Doi: 1-21-4, Minamidai, Seyaku, Yokohama, Japan

FOR SALE: NOS vintage radio drive belts, 100 piece packaged assortment in cabinet - \$35. **TRADE:** Drake NB7A (new) for NB7. Bill Kipping, 6712 Lake Dr., Grand Forks, ND 58201. (701) 772-6531

WANTED: Two BC-645 or ABA IFF sets w/dynamotors, coding disc sets, connectors, control boxes and all antennas. Dave Ross, KA6EPI, (206) 465-2117

WANTED: Military radios. U.S. RT-136/GRC-13, Soviet R (P)-112, R (P)-113. Leroy E. Sparks, W6SYC, 924 W. McFadden Ave., Santa Ana, CA 92707-1114. (714) 540-8123

FOR SALE: Military manuals - MIL HDBK-161A (Army TM 11-487A-1) dated 12 Mar 1964, 235 page illustrated listing of military communications equipment, also AFM 100-14, dated 1 Mar 1971, a lengthy listing (168 pages) of communications and electronics equipment used by the Air Force. Bound reproductions of originals \$25 each plus \$2.90 postage in USA. James Owens, N700, 1363 Tipperary St., Boulder, CO 80303. (303) 673-9019

WANTED: National HRO-507S spkr in mint condx and National NCL-2000. Sam Macy, N9WAF, 486 Glenwood Trail, Elgin, IL 60120. (708) 695-0218

FOR SALE: (4) Eimac 4-1000's - (2) at \$65 each, (1) at \$135, (1) at \$185, SK-500 - \$45, chimney - \$60; Drake L4B, new 3-500Z's installed 2/94, includes spare set Eimac 3-500Z's - \$825; Jennings 2500 pF, 5KV vacuum variable - \$100; Jennings 300 pF, 15KV vacuum variable - \$100; B&W FC 30 - \$15; Johnson 275 ceramic sockets - 4/\$30; (2) Heath HM-102 wattmeters - \$50 for both; Heath 0-30VDC, 1 amp sply - \$20; B&W 5 pos. coax switch - \$20; tons of panel meters - call; Dahl SB-220 plate xfmr, provides 3800 VDC Ep - \$125; junker SB-220, no tubes, fan or plate xfmr - \$175; Heath I KW dry dummy load - \$25. Lane, KM0G, (619) 462-3857

WANTED: BC-348 dynamotor and filter assembly or filter assembly only. John Snow, W9MHS, 4539 N. Bartlett Ave., Shorewood, WI 53211. (414) 964-0194

FOR SALE: AR-8711 Radiomarine Direction Finder, tuning eye - \$65; S-40 - \$65; S-120 - \$45; Heath TC-1 tube checker, roll chart, wood cabinet - \$45; ME-9C/U - \$15; new BC-616 - \$15; 284-314 Mc filter bandpass F-201/U - \$2; MU271 for parts - \$1; Free photo list. **WANTED:** SX-28; National HRO; BC-384; BC-1151; BC-1148; BC-1150; BC-929; SCR-718; manuals also; Fisher M-scope metal detector using tubes; boiler and fire alarm control panels; anything old, even useless items. Chris Cross, Box 94, McConnell, IL 61050.

FOR SALE: RME-45 - \$50; BC-348P - \$80; GR 583-A output meter - \$150; 1206-A amp - \$50; PTT handsets, TS-13E, H22A, H-111/U, TS-9K - \$30/all. Bob Bakinowski, 1524 Saint Tropic, Tucson, AZ 85713. (602) 624-8029

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WANTED: Check those basements for WW II radar equipment, units or complete systems. Thanks. Allan H. Weiner, 507 Violet Ave., Hyde Park, NY 12538. (914) 471-9500

FOR SALE: 455 kHz Collins mech. filters available in 6 kHz, 1.5 kHz and 400 Hz bandwidths. Fits S-Line (not 75A-series). Supplied with data sheet and plot of measured performance - \$75 each plus \$4 per order postage in USA. James Owen, NWØØ, 1363 Tipperary St., Boulder, CO 80303. (303) 673-9019

FOR SALE: Realistic DX-160 w/spkr - \$60; Knight Star Roamer - \$30; Mercury Electronics 101 tube tester - \$25. Ken Johnson, N5US, POB 10063, Austin, TX 78766.

WANTED: CQ Magazine Aug. 1977; Radio Handbook (Orr) 21st Edition; Hints & Kinks (ARRL) Volumes 10 and 11. Lynn Stolz, N8AJ, 2461 Bean Oller Rd., Delaware, OH 43015.

FOR SALE: Lettine 242 6M xmtr - \$50; Lettine 240 parts unit - \$25; RME VHF-152A converter - \$50. All plus shpg. Kim, KE8NE, (616) 677-3706

WANTED: Teletypes, Teletypes, Teletypes and any other teleprinter machines, parts, literature or information from the 1940's to the 70's. Gary Ashbaugh, POB 2008, Corvallis, OR 97339. (503) 758-8006

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: New PL-061 power plugs for BC-375-E transmitter - \$8, I ship. John Snow, 4539 N. Bartlett Ave., Shorewood, WI 53211. (414) 964-0194

FOR SALE: (All working, clean, orig. knobs.) Knight Spanmaster - \$40; Heath GR-81 - \$30; Hallicrafters S-38E - \$40; Heath Two'er - \$25. U-ship. **WANTED:** Heath AR-1, AK-7, GR-54, HW-18 (160), PM1, SB-313; Gonset 220 MHz Communicator; Swan 140, MB80, 350A/B; Harvey-Wells R9A, T90, Z-Match; Elmac PMR-6/A, PMR12/A. All should be good, appearance wise. Herman Cone, WB4DBB, 305 Foxwood Dr., Goode, VA 24556. (703) 586-5643

WANTED: Bird slugs ending in A1, B1, C1, D1, E1. For example 1000A1. Greg Pace, WA4SQR, POB 102, Norcross, GA 30091. (404) 921-9173

WANTED: Hallicrafters xcvsr like the SR-150, SR-160, SR-400, SR-500 and SR-2000. Units need not work. Call Ray collect (407) 676-4952 between the hours of 6 PM - 9PM Eastern.

WANTED: McKay DA5 or DA7 active antenna. McDonald, W6SDM, 24 Glenbrook, Camarillo, CA 93010. (805) 484-1307

FOR SALE or TRADE: Morrow. SASE for list. Michael, Box 226841, Dallas, TX 75222.

ELECTRON TUBES: All types - transmitting, receiving, obsolete, military--Large inventory. **Daily Electronics Corp.**, 10914 NE 39th St., B-6, Vancouver, WA 98682. (800) 346-6667, (206) 896-8856, FAX (206) 896-5476

FOR SALE: Restoration of vintage radios; 25 years experience. Phil Goodman, K4FXB, 217 Millbrook Farm Rd., Marietta, GA 30068. (404) 509-9493

WANTED: Schematic for HP 400 E ACVM; Little Giant hand crank coil winder. **FOR SALE:** Swan 1200X amp. K6UU, Ashland, OR (503) 488-1506

WANTED: Collins 310B-3, 70E8A. Interest in KW-1 group? Jerry, W8EGD, (303) 979-2323

WANTED: WW II surplus Collins R-105A/ARR-15(51H3) rcvr in unmodified condx. John Snow, W9MHS, 4539 N. Bartlett Ave., Shorewood, WI 53211. (414) 964-0194

FOR SALE: Globe King 500B, restored, extra set of xfms - \$600. J. Kelly, 2351 NE Colburn Rd., Lee's Summit, MO 64086. (816) 524-1541

WANTED: SX-28 parts - S-meter (S-meter from an SX-24 or '25 will work), and band indicator assemblies. R.F. Bricker, K4CSV, 821 S. 14th St., Fernandina Beach, FL 32034. (904) 277-7061

WANTED: Original manuals for military AN/APX-2A, AN/DRW-29, DP-12, DAQ, NT-50064, RAK-7, RAO-7, SCR-535, TBX-8, TDE-2. William Donzelli, 304 South Chester, Park Ridge, IL 60068. (708) 825-2630

FOR SALE: Hallicrafters SX-100, exc. condx - \$125; Hallicrafters HT-37 xmt, exc. condx - \$100. Joseph Falcone, AA8HV, 3000 Town Center, Suite 2370, Southfield, MI 48075. Toll free (800) 436-7026 and leave message.

WANTED: Any 16 VDC relay VCR-300/700 ohms, DPTT like type used by Hallicrafters SR-150. Bruce Russell, 370 N. Hythe Ave., Burnaby, B.C. V5B 1G5 Canada. (604) 299-1116

WANTED: Schematic and service information for the R595/ARR-7AX rcvr. This is a later version of the R-45/ARR-7; copy of manual for SX-23; WW II German, Japanese, Australian HRO's. John Orahhood, N5SPQ, 5819 Miller Valley Dr., Houston, TX 77066. (713) 440-5598

WANTED: Telegraphic apparatus and keys by collector, not a dealer. Will pay top dollar. Pete, WB2BYQ, (201) 818-4311

FOR SALE: DX-20 as-is - \$35; HRO-50/60 calib., as-is - \$20; AN/PMR-10 GDO - \$15; HD-19 patch - \$10; Eico #322 - \$15; Morrow 5BR - \$17; GPR-90 - \$295; Sylvania 6550's NIB - \$18 each; parting AF-67 and Viking I. Joe Sloss, K7MKS, (206) 747-5349

WANTED: PP-308/URRDC pwr sply 'working' for radio rcvg set AN/GRR-5. Will consider entire set. Karl E. Kegley, Sr., 211 Boyd St., Johnson City, TN 37604. (615) 926-0456

FOR SALE: Gonset GSB-201 amp - \$175; GPT-750D - \$1095, OBO; Swan 500 w/117XC - \$130; Swan 450X xtal oscillator - \$35; Heath SB-630 station control - \$45; BC-348R, butchered panel - \$50; R-388 parts unit - \$55. Trade for pre-1898 rifles or ?? U-ship. SASE for tube list. **WANTED:** Good clean TCS dynamotor sply. WA7HDL, Rt. 1, Box 178-A6, Salmon, ID 83467. (208) 756-4147 after 1730 MDT.

WANTED: WRL-70 xmt; HB xmt's for display, must be museum quality; thousands of QSL cards to paper walls of Amateur display. Call Leo, (402) 392-1708, Western Heritage Museum, Omaha.

WANTED: Hammarlund HQ-180AC. Top \$ for top condx radio. Gene Ferroni, KA6NNR, POB 58803, Philadelphia, PA 19102. (215) 665-6182 (d)

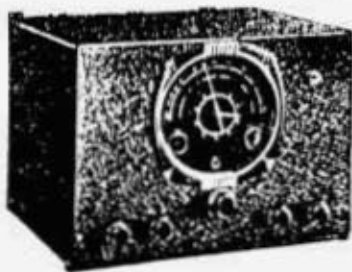
FOR SALE: British Army Wireless Transmitter #1 (1918); DeForest commercial rcvr model RS-500. Francis, (604) 885-1960

WANTED: Collins dial lock assembly for 515-1, (modification kit 757-8616-001). Toyohiro Haruyama, 1641-6 Dainogou, Ota-City, Gunma-Pref., 373, Japan.

FOR SALE: Hallicrafters 553-A - \$80; Drake R4-B - \$150; four sets of Eimac SK300 sockets w/SK806 airflow guides - \$50 each set; HP608E - \$275 (PU only); 40-50 ft. rigid tubular tower w/climbing steps, in Concord, Calif., buyer takes it down - FREE; 2 meter, 4 element beam w/20 ft. mast and cables in Concord, buyer takes it down - \$25. **WANTED:** 51J4, Johnson Desk KW amp. Ben Deovlet, W6FDU, 933 Robin Ln., Campbell, CA 95008. (408) 374-0372

FOR SALE: Collins, Drake collection and related components. This equipment is not cheap. Operational, high quality and collectible pieces. Some will be pickup only and the rest I will package FOB Piqua, Ohio. For complete list phone after 6 PM, Paul, VE3UP/W8, (513) 773-9550

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FOR SALE: Antique radio parts 1920's, early '30's, like Erla, Acme, General Radio, etc. Most new in box, SASE for list. John Snow, 4539 N. Bartlett Ave., Shorewood, WI 53211. (414) 964-0194

WANTED: Top & bottom covers and SN plate for R-390A or junker with such. Jim Schnecker, N3JUH, 719 Sixth Ave., Bethlehem, PA 18018. (610) 868-4159

WANTED: Need several Eimac/Varian 3CX1000A7/8283 power grid tubes. Must have full output. WS4I, 10616 Savoy Rd., Richmond, VA 23235. (804) 320-1130

FOR SALE: Army sig. gen. #1-198-A, no info - \$30; tuning units, TU-5B - \$25, TU-6-B - \$25. **WANTED:** 220 MHz gear. Clem, W8VO, (810) 795-4610

FOR SALE: Collins 32S-3, 312B-4, PM-2, 351E-2, 440E-1; HP 410B VTVM - \$40; equipment, parts, manuals, books, magazines, list - \$1 (bill). Joe Orgrnero, VE6RST, Box 32, Site 7, SS 1, Calgary, AB T2M 4N3, Canada. (403) 239-0489

WANTED: Gorsest II (2M) VFO; KLM Echo 2. Chris Schiotz, K2PGB, 15 Runyon Mill Rd., Ringoes, NJ 08551. (908) 782-7414 eves

WANTED: XF-30C CW filter and DC pwr cord for Yaesu FT-101F. Richard Gentry, POB 9274, Phoenix, AZ 85068.

FOR SALE: Hallicrafters CB 3A (Littlefone), w/mic & manual, no mods, clean - \$88 + shpg; SBE-34 w/manual & cords, clean, no mods - \$122 + shpg; Johnson Viking 430 CB, clean, no mods - \$88 + shpg. Jim Rupe, (206) 387-6312

WANTED: Collins PTO 70K-2 for 75S-3/75S-3A, Collins part #522-1093-00. Merle Crowley, WIGZS, POB 476, Sumterville, FL 33585. (904) 568-1676

FOR SALE: Weston 785 multimeter, VG condx - \$25+shpg. **WANTED:** Schematic, service data for Conelrad monitor CM3; vertical mounting kit 160D2 for USN TCS-12; antenna load coil 47205 and good orig. carbon mic '20N406 for TCS-12. Carl Gottsmann, KN6AL, POB 5670, Chico, CA 95927-5670. (916) 899-8675

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FOR SALE: Tubes, tested, clean, boxed, lowest prices, good selection. Business size SASE for list. Bill McCombs, WBOWNQ, 10532 Bartlett Ct., Wichita, KS 67212-1212

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FOR SALE: FL2100B, VF - \$425; SB-200, VF - \$375; many ARRL Handbooks, plus other books - LSASE for list. WA7IHN, POB 442, Aumsville, OR 97325. (503) 749-1149, 6 PM EST

FOR SALE: Precision E200 sig. gen., E400 swp.gen, ES500 scope - \$29 ea. + shpg. Henry Mohr, W3NCX, 1005 Wyoming St., Allentown, PA 18103.

WANTED: SP-600 cabinet; Collins 516F1. **FOR SALE:** SX-28, good+, needs work electrically, but great cosmetics - \$125. San, K5YY, (501) 756-5010

FOR SALE: E.F. Johnson Viking Invader, w/ manual (will ship) - \$300. **WANTED:** National pwr splies and manuals for NCX-3 and model 200. Craig Pitcher, WA9HRN, 1308 Kristin Dr., Libertyville, IL 60048. (708) 367-1599

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FOR SALE: 2 GE ceramic xmting 4-pin tube sockets, 1-7/8" collar ID, 2 same E.F. Johnson, 1-7/8" collar ID, 2 E.F. Johnson same but 1-3/8" collar ID, all are used - \$5 ppd; Turner mic, as-is - \$6 + \$2 shpg; Turner Dynamic 253 mic, as-is - \$10 + \$2 shpg; transistor radio, looks like a French telephone, plays well, has cigarette lighter in handpiece - \$25 + \$4 shpg, has CD marks; 829B-832A tube sockets - \$5 each ppd. James Fred, R1, Box 41, Cutler, IN 46920. (317) 268-2214

WANTED: Collins KWM-2A, in good to mint condx. State price and condx. Cory Hine, N2AQ5, 1000 E. 14th St., Plano, TX 75074-6249

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FOR SALE: Heath Apache TX-1 xmtr, complete, fair, w/manual (cabinet fits R-390 rcvr) - \$75 plus shpg. S.E. Watkins, K4OWN, 13003 Fennimore Ter., Midlothian, VA 23113.

FOR SALE: NOS tubes. SASE for list. **WANTED:** Ranger II, PRC-77 modules; NC-300 spkr & manuals for RT-1113A/PRC-68A. Joseph Pinner, 201 Ruthwood Dr., Lafayette, LA 70503. (318) 981-7766

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FOR SALE: Hallicrafters HT-41 - \$325, S-108 - \$135; E.H. Scott RDO Marine w/4 plug-in tuners - \$230; National HPS - \$170; E.H. Scott 16A in Chippendale console - \$400. George Schwartz, 18504 Arrowhead, Cleveland, OH 44119. (216) 486-6489

FOR SALE: New receiving tubes, special sale - all \$2.75. Sales expires 10-1-94. Stock up now! SASE for list. TBE, POB 806, Lake City, MI 49651.

FOR SALE: Drake 2NT, mint, w/manual - \$115; Sonar NBFM exciter (late '40's), fair condx - \$35; manuals - see my ads page 49 June, page 50 July, page 48 August ER. Richard Prester, 13 Ridge Rd., West Milford, NJ 07480. (201) 728-2454

WANTED: Manuals/good copies/schematics - Hallicrafters SX-25, Motorola T-1034-C FM sig. gen., Heath IM-524B, Tektronix 127, HP 200CDR. Robert Baumann, 1985 So. Cape Way, Lakewood, CO 80227. (303) 988-2089, eves.

FOR TRADE ONLY: National SW-3, mint, 5 sets of coils in orig. boxes, orig. documentation, HB pwr sply. Trade for Nikon rangefinder cameras, lenses, accessories. Jim, K7BTB, (602) 635-2117

WANTED: Navy RBB rcvr (black wrinkle finish), pwr sply, cables, manual. Prefer working condx. Also looking for WW II Navy xmtrs - TCK, TCM, etc. Andy, KD6TKX, Calif. (408) 484-2389

FOR SALE: Collins 515F1, no case, wired for S-line; Heath HP20, HP13; National 697 doghouse; Drake DC-4; Swan DC module. Joel Levine, 67 Derby Ave., Greenlawn, NY 11746. (516) 757-7641

WANTED: Vintage tube CB's; pwr sply/modulator for Johnson 500. Send card or call with model you may have. Steve White, WB5UGT, Box 1086, Clute, TX 77531. 800-374-6477 - 9008 (leave message)

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FOR SALE: Eldico SSB-100F, SSB-100MIL, REL (Eldico S-Line) type S-119 SSB system T-102, R-104, M-135, P-109, man, cables; Hallicrafters TW-1000 portable, R-46B; rare NC-108; Galaxy V Mark 3, w/ps. Don, W6TVW, (702) 475-0211(d/n).

FOR SALE: FT-101EE, near mint; Tecraft VHF TX w/3 converters - \$75. **TRADE:** National SW-3 coils for similar coils; HRO-50 J coil for F coil; 6V ps for 2.5V ps. Carter Elliott, WDMAYS, 1460 Pinedale Rd., Charlottesville, VA 22901. (804) 979-7383

WANTED: Hallicrafters high profile cabinet to fit HT-20, HT-31 or HT-33. Would also consider entire units. Ron Eveland, W6HFZ, 13169 Briarwood St., Cerritos, CA 90703-7367. (310) 860-3623, FAX 809-2203



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WANTED: Drake R4C rcvr; (Hickok, etc.) mutual conductance tube tester; Kenwood T-599 xmtr; Radio Shack DX-400; Uniden CR 2021; RCA model CRM R6A; Heath SB-610 monitor scope. Rick, K8MLV/Ø, 1802 W. 17th St., Pueblo, CO 81003. (719) 543-2459

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WANTED: Hallicrafters SX-62. T. Geweche, PSC 801, Box 27, FPO AE 09498. Int'l 4471-723-4142

FOR SALE: Ameco TX-62 VHF xmtr - \$40. Dan Greeson, KH6P, 98-1145 Kahapili St., Aiea, HI 96701. (808) 486-8879

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WANTED: Hallicrafters HA-5 VFO in good condx; orig. tuning knobs for S-38C. John Zitzelberger, WB6JJE, 5257 Lewis Rd., Agoura, CA 91301. (818) 991-8358

FOR SALE: Gonset Communicator IV 6-meter xcvr, very good; National NCX DC-DC converter for NCX-3, NCX-5 xcvr. Roger Zaun, W9UVV, 4902 W. Parkview Dr., Mequon, WI 53092. (414) 242-4931

WANTED: FT-243 xtals for AM, Heath xmtrs, 80 & 40 meters. WB2AUE, 378 Albany St., Saddle Brook, NJ 07663. (201) 845-6386

FOR SALE: Hallicrafters HT-37. Cosmetically deficient, but it seems to work. Best offer. Pick-up only. Northern Virginia. Tony Stalls, K4KY0, (703) 522-1568

FOR SALE: National SW-3 model 2, w/ matching doghouse pwr sply and 10, 20, 40, 80 B/S coils and 2 G/C coils. No mods or repairs, in exc. condx, w/manual; National FB-7, w/ matching 5897AB pwr sply, 160, 80, 40, 20, A,B,C,D,E coils. No mods or repairs, in exc. condx, w/manual. Offers to Mike, KSØF, (314) 282-0787

WANTED: BC-211; BC-348 (J, N, Q); ART-13; tuning units for GP-7; BC-191; BC-375. Alan Mark, POB 372, Pembroke, MA 02359.

FOR SALE: BC-348, brand new in wooden crate, w/dynamotor and FT-154 aircraft mount - \$475; brand new BC-348, w/AC pwr sply, operates, w/FT-154 mount - \$350; WW II T-85/AFT-5 aircraft radar xmtr in sealed box dated March 1945 - \$195; very rare FT-295A WW II glider walkie-talkie mount, used - \$150. Sam Hevener, "The Signal Corps", W8KBF, 3583 Everett Rd., Richfield, OH 44286-9723. (216) 659-3244

WANTED: 1st IF for National NC-109 'X-1' or source of parts. Jack Iverson, N9KYT, 1110 Old Mill Dr., Palatine, IL 60067.

FOR SALE: Excellent B&W 5100 xmtr - \$150; B&W 515B SSB adapter - \$125; 2 B&W model 370 rcvr SSB adapters - \$75 each. W5SGT, (915) 677-3675

FOR SALE: Heath TC-2, SB-644A remote VFO, HD-15 phone patch; Heath manuals - GD-19, AR-3, HP-23; Collins trim ring; Bogan AM-FM stereo rcvr, mint. Marty Drift, (908) 359-4425, 6-7 EST only.

FOR SALE: NC-57 - \$75; BC-614-I speech amp - \$75; TG34 keyer - \$20. Plus shpg. Jim, (614) 927-2592

FOR SALE: Command xmtrs - (2) BC-696A's, unmodified - \$40 each; (1) BC-458, restorable - \$15; R16 rcvr - \$20; Heath HD-1410 keyer - \$40; Hi-Mound HK-707 hand key - \$65; National ACN vernier dial, NIB - \$20. All plus shpg. Kathleen Smith, VE3WKW, 951 Wonderland Rd., S., London, Ont., N6K 3X7, Canada. (519) 472-2738

WANTED: Modulation reactor, approx. 40 Hy, 500 mA. Dewey Angerhofer, W0ZUS, POB 540, Edgemont, SD 57735. (605) 662-7692

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FOR SALE: FRR-59A, FRR-59B - \$350 each; BC-669-D, w/pwr sply, cables, extra top section & C-770 case w/100 each DC-34 xmt xtals and 100 each DC-35 rcve xtals, very good condx - BO. **FOR TRADE:** Hickok 539C tube tester, very good condx. **WANTED:** TV-2. John Richardson, 1163 Highland Pl., Dubuque, IA 52001. (319) 556-5504

WANTED: Hallcrafters SX-88 complete, restorable condx. Bob, N4HUR, 8436 Reflection Ln., Vienna, VA 22182. (703) 560-6228

FOR SALE: RCA BTA-10U2 broadcast xmtr; Gates BC-10P 10KW broadcast xmtr; 5762 and 3CX3000F1 xmtr tubes - \$20 each plus shpg. Harry MacLean, VE3GRO, 500 Riverside Dr., London, Ont., N6H 2R7, Canada. (519) 473-1668

FOR SALE: J-38 key, new sealed package - \$50; Galaxy GT-550A, w/ps, like new - \$250; Heath SP-600 spkr. Ron Follmar, K5GIT, 332 Camino Real, Kerrville, TX 72028. (210) 896-8830

FOR SALE: Kenwood R599/T599, good working order, orig. boxes - \$295; Heath SP-600 spkr, like new - \$40. Plus shpg. Phil, W9DVM, (904) 735-2519

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WANTED: Hallicrafters SX-17 only in very good condx. Jose Cangas, EA4JL. Contact in the States Kurt Keller, (203) 431-6850

WANTED: E.F. Johnson Viking II in fair to exc. shape. Will pay fair price according to condx. Joe, WA5HSL, (504) 889-2450

FOR SALE: Collins wattmeter/transmatch for URC-32 - \$150; Yaesu FLDX-400 - \$250; R-390A carrier meters, NIB - \$30. Clark, W08BT, 2546 S.E. Peck Rd., Topeka, KS 66605. (913) 235-2721

WANTED: HT-33B amp, mint or near; SR-400A Cyclone III. Top price for top equipment. Tom, WA4FJQ, (910) 887-0705

FOR SALE: National NC-300 w/factory calibrator, matching spkr & orig. manual in mint condx - \$300; Gonset Communicator III 2 meter xcvr w/orig. manual, 6&2 meter VFO & cables, like new - \$150; Johnson 275W Matchbox w/meter & coupler, orig. manual - \$100; Johnson low pass filter - \$25; Heath MP-10 DC to AC inverter - \$30. All plus UPS. Ron, KC6WTG, POB 783, Santa Rosa, CA 95402. (707) 539-8319

FOR SALE: Thousands of tested tubes w/ warranty! Both xmit and Rec tubes. 15% off current prices for all orders over \$25 during June and July '94 if you ask. Buy those spare tubes for your tube radio, audio, ham and electronics at about 25% of new. I have bunches of octal, older, 7 and 9-pin tubes. All tested and boxed. I give a 30 day warranty. Send wants or SASE with two stamps for list. Daniel Nelson, 1025 E. Desert Lane, Phoenix, AZ 85040. (602) 243-7421

FOR SALE: RF coil (new), 9-3/4" long, adjustable coils edge on ceramic (40T - 3" edge) (20T - 5" edge) w/mounting hardware - \$25. Joe, W6CAS, (916) 731-8261

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FOR SALE: Orig. manuals - Collins 180S1 - \$20, 30L-1 - \$25; RME VHF 152, rusty - \$15; Heath HW30 (Two'er), w/manual - \$35; 32S1 cabinet - \$60; ARRL Handbook, 11th Edition, 1934 - \$38. **WANTED:** Collins S3 main tuning knob or trade S1 tuning knob. G. Stevens, W0ATA, Box 704, Longmont, CO 80502. (303) 776-9036

FOR SALE: T-368E - \$550, PU only. **WANTED:** Manual (or copy) for GF-11/12. Ken Lakin, KD6B, 701 S.E. Salmon, Redmond, OR 97756. (503) 923-1013

WANTED: Paying up to \$50 for KT88 and 300B tubes. Pay top for old Fender and VOX guitar amps. Frank, A19T, 8968 W. Forest Home, #4, Greenfield, WI 53228. (414) 529-9395

WANTED: Tech manual for Collins RT-298/ARC-2A or will reimburse for photocopy/mail expenses. Al Roehm, W2OBJ, 22 Brookdale Rd., Cranford, NJ 07016. (908) 276-2997

FOR SALE: Collins type improved rubber feet, will not mushroom, cannot over torque, mates with front leg elevators. For all S-line, KWM2, 30L1, 51S1 cabinets - \$1.50 each; Mallory's production ended on triple 40 mFd filters for all 755 rcvrs, factory fresh - \$20; Collins S-line cabinet front leg elevators, aluminum, new - \$7 each. Ed, W3WDF, 8245 Garden Oaks Dr., San Antonio, TX 78266-1710. (210) 651-9348

FOR SALE: SB-220, Peter Dahl plate xfmr - \$550; Swan Mk 2 HF amp, runs pair 3-500Z's, includes spare set of tubes - \$675; Hallicrafters S-38B - \$135; pair 4-400's - \$125; pair 813's - \$40; junker SB-220 - \$175. Lane, KM3G, (619) 462-3857

FOR SALE: Fisher 500B stereo FM multiplex rcvr w/manual & spare tubes, exc. condx - \$100, PU only; Altec Lansing 604B bass reflex spkr in Altec mahogany cabinet, very good condx - \$250, PU only. Gerald Luccione, 118 Hiawatha Trail, Liverpool, NY 13088. (315) 457-7928

WANTED: Hallicrafters SX-115 rcvr. Clifford Coleman, K9JTS, 1155 Cedar Ct., Carbondale, IL 62901. (618) 549-7430 (h), 549-3380 (w)

FOR SALE: Vacuum tubes, new - 250TH, 250TL, 833A, 4-125A, 811 and 4CX250B. Make offer. Frank, W8SET, (304) 343-0415

FOR SALE: Dials for Collins KWM-2/S-line, unused in orig. boxes - \$95 each; used Collins PM-2 12V mobile pwr splies - \$75 each; used 5V/14.5A (\$25 each) and 5V/29A (\$35 each) fil. xfms for 3-500Z's etc; used (pulls) 4D32 tubes (for Collins xmtrs) - \$40 each. All items limited quantity and plus shpg. **WANTED:** ARRL manual "How to Become a Radio Amateur" or copy, circa 1951-1955. Derek, KI6O, callbook address, (916) 965-4904

WANTED: Please help. Need the following for restoration projects - DX-100 knobs; front panels for AT-1; Viking II and Globe Chief 90; Eico 722 VFO cabinet; SX-28 pwr xfmr; metal feet for NC-240D spkr; Heath VF-1 and Johnson 122 VFO's; schematic/manual for "Trans-Meter" model 905 field strength/modulation meter manufactured by Electronic Specialty Co., Los Angeles; xfmr for Elmac PSA-500. Jack C. Shutt, N9GT, 1820 Dawn Ave., Ft. Wayne, IN 46815. (219) 493-3901

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WANTED: Hallicrafters Sky Buddy sets S-19 & S-119; also S-31 tuner. Robert Enemark, W1EC, Box 1607, Duxbury, MA 02331. (617) 934-5043

FOR SALE: Tube blowout sale. NOS 5Y3, 6AG5, 6AK5, 6AL5, 6AQ5, 6AU6, 6AV6, 6BA6, 6BE6, 6BJ6, 6C4, 6CB6, 6EA8/6U8, 6J5, 6L7, 6R7, 6SA7, 6SJ7, 6SK7, 6SL7, 6SN7, 6SQ7, 6T8, 6U8/6EA8, 6X4, 6X8 - \$2.75 each + shpg. Many, many more at same price. Stock up now. Prices may never be this low, low, low again. Lucas Transformer, (616) 229-4318 'till 4:30 PM EST.

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