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ELECTRIC RADIO

celebrating a bygone era

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ELECTRIC RADIO

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Electric Radio was founded May 1989 by Barry Wiseman, N6CSW. The magazine continues publication 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 and operating with a primary 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:
Bob Dennison (W2HBE); Dale Gagnon (KWll); Chuck Teeters (W4MEW); Bruce Vaughan (NR5Q); Bob Grinder (K7AK); Jim Hanlon (W8KGI); Brian Harris (WA5UEK); Tom Marcellino (W3BYM); John Hruza (KBØOKU)

Editor's Comments

After a summer of the worst drought in Colorado in 350 years and a severe wildfire season, winter seems to have gotten started in a very robust style. We've had a lot of snow here, and very cold temperatures. Up here we expect cool weather in the fall, but the last few weeks have been unusual. I had been hoping to finish my 160-meter antenna, but at 9300 feet, my antenna season may be over for now. If the weather breaks, maybe I will still finish the work. I'm looking forward to running my recently restored Valiant in the AMI Thanksgiving AM Jamboree starting November 29. KW1I has the details in his update on page 2. It should be a lot of fun, and from what I'm hearing, AM is the fastest growing segment of ham radio at the present time.

The 3rd Annual Heavy Metal AM Rally is coming up in December, and the event always attracts a lot of attention. Bill (KDØHG) will make an announcement in December ER about it. My ART-13 won't meet the qualifications, but I'd like to stop by to say hello anyway!

I had major problems with the October mailing. We went to a new mailing label system that uses a bar code to presort ER so that we can take advantage of some new postal regulations. I contracted the mailing label task to a fellow who does that work and some errors were made. By the time this issue is received the problems will have been corrected, but anyone who didn't receive October ER that should have needs to contact me for a free replacement. I apologize for any confusion this may have caused.

I am making some additional changes to the subscription rates. Beginning with November ER, #162, we are going to provide two subscription rates, $32.00 for Second Class and $42.00 for First Class. All First Class subscribers will receive their copies in an envelope. To be fair to the current subscribers who are using the $46.00 1st Class in-envelope rate, I will be extending all of those subscriptions out 2 months past their current expiration date. This change is also made to take

[Continued on page 27....]

TABLE OF CONTENTS

Cover: W7EEN and friends demonstrate real radio in the 1930s

East Coast AMI Update-November 2002

by Dale Gagnon, KW1I
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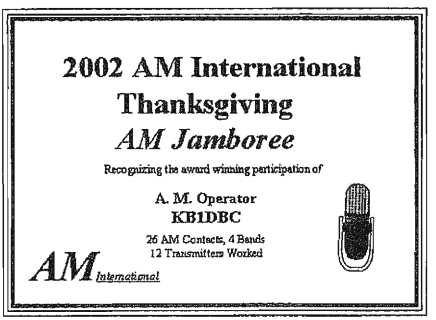
AMI Discovery Weekend – The following are a few highlights from the logs received from the end of September Discovery Weekend. Dave, W6PSS topped the returns with 82 contacts. He was using a Globe King 500B. His contacts were spread across the HF spectrum, but he reported 20 meters had the best propagation. Bill, KE7KK turned in 33 contacts. He reported, "The RF gods smiled on 10 meters this weekend." One of his 10 meter contacts was VK2BA. Dave, W9AD made 20 contacts in the event. His nine contacts on 10 meters were made using his mobile rig. Among his 10 meter contacts were several Europeans. Mike, W1JZ made 24 contacts. Mike may have the record for receiving the most sequential AMI operating award certificates. His submission had the note, "I did it again-JZ!".

Thanksgiving AM Jamboree scheduled for November 29 – December 1, 2002. This year's operating event rules are a little more involved, hopefully for your operating enjoyment. The event begins Friday evening and ends late Sunday evening. Participating stations should leisurely exchange Thanksgiving greetings, signal reports, transmitter in use and AMI certificate numbers (if they have one). AM contacts on any amateur band count. You can work the same station on more than one band, but not more than once on the same band. We're going to try scoring this time with each contact being one point. Multiply your total contacts by the number of bands used for AM contacts. Multiply again by the number of different AM transmitters worked. Major transmitter variants count, e.g. Ranger I and Ranger II, but not both T368 and T368A. Record the final and modulator tube types for homebrew transmitters. If you work more than one homebrew transmitter with the same RF/Mod tube configuration, only count it as one transmitter multiplier. Certificates will be awarded to any station submitting a 1000 point log, e.g. 4 bands, 25 contacts, 10 transmitter types. Use this weekend to fire up your rare old boatanchors to provide multipliers, as well as points! Please calculate your point total at the end of your log for faster processing at AMI Headquarters. Send logs to AMI, Box 1500, Merrimack, NH 03304. Send requests for lost AMI numbers to aminternational@earthlink.net.



West Coast AMI Update and Interesting AM Nets November 2002

by Bill Feldmann N6PY
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On November first I received an email from my friend Dave (W6PSS) who has been writing this AMI update for the west coast. Dave informed me that his XYL Miyoko was recovering from surgery and that he would be not be able write the November update. Dave asked if I would fill in for him. All of us wish Miyoko a speedy recovery and hope to hear Dave's station on the air soon. Being a little unprepared, and needing to get this article to Ray ASAP, I decided to give a summary of AM nets and activities here on the west coast in this update.

The West Coast Wednesday AMI net is now back at its normal meeting time of 8:00 pm PST at 3870 kc. During the last summer we met at 9:00 pm PDT. This net is an excellent opportunity for all AM operators to meet fellow AM'ers and get signal reports, exchange ideas, and have the opportunity to buy, sell, and swap parts for their AM rigs. The net control duties rotate every week during each month. Last month Don Grantham (W6BCN), when it was his turn to run the net, asked each station to tell us the first rig he operated on the air. This added lots of fun to the net. Even though the net is sponsored by the AMI you don't have to be a member to join in the fun and fellowship. You only have to operate in the AM mode and share an interest in the operation, restoration, and repair of gear that can operate in the AM mode.

Another interesting net, which is not sponsored by the AMI but most those participating are AMI members, is the West Coast Military Collectors net. Dennis DuVall (W7QHO) calls this net to order every Saturday night at 9:00 pm PST on 3983 kc. This net is an excellent opportunity for those interested in restoring and operating military radios to meet, get signal reports and find sources for parts. Most stations check using vintage AM military gear such as ARC5's, ART13's, and the TCS. The net usually operates in the AM mode but Dennis will also take check in stations on military SSB and CW radios. The net is run as a round table, which is a great opportunity to exchange information. You don't have to be on a military radio, but just interested in this type of gear to check in.

The Collins Collectors Association, CCA, sponsors two AM nets that are open to all AM operators. The first is on ten meters every Sunday at 1800Z on 29.050 mc. This net has three net control operators. The idea is to completely cover North America, band conditions permitting. Net control stations are Russ Hunt (WQ3X) on the east coast, Pete Zillox (K5PZ) in Texas, and myself, N6PY, on the West Coast. If you check in ten times in a year you can apply for a very nice certificate from the CCA. The second CCA net meets the first Wednesday of each month in the 75-meter band at 3880 kc. The net is run in three consecutive segments by time zone starting at 8:00 pm EST PM on the east coast. Each hour the net changes to a new control operator for the next time zone to the west. The last segment starts at 8:00 pm PST, or 10:00 pm EST, with the west coast net control operator.

There are many other AM nets and

[Continued on page 27....]

A Beginner's Battery Operated Regen

by Bob Dennison, W2HBE
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Westmont, VA 08108

If you are just getting started in the wonderful hobby of building radio receivers, I suggest that you start with a simple battery set. In the old days we used the 201A or the UX99. Then the amazing type 30 came out and radio set building became a very popular hobby. Several magazines devoted themselves to publishing diagrams and photos of these intriguing sets. Magazines such as Short Wave Craft and Radio Craft popularized these sets by showing beautifully colored pictures of these sets on their front covers. It's been sixty years since the radio bug bit me and I'll never recover. I will build these sets till I die.

In my latest set, I had decided to use the 1G4-GT tube. This tube costs more than some of the other tubes but it has several advantages that appealed to me. First, the tube is octal based and octal sockets are much easier to find and cheaper. And the 1G4-GT has a 1.4-volt, 50 mA filament so no rheostat is required and the filament battery should give long life. Furthermore, the construction of the tube is more robust so it is less likely to be microphonic.

However, this set was a disappointment. The headphone volume was too low to suit my tastes. So back to the tube manual and a few more cups of coffee. I decided to change the triode detector to a pentode. This would increase the overall gain significantly. There was a nice pentode (the 1N5—GT) that had an octal base and a 1.4-volt, 50 mA filament. This change also eliminates the hard-to-find audio transformer and replaces it with plate choke L3 that is readily available and cheaper than the AFT. These changes made a vast improvement in the performance of the receiver. And, best of all, the 1N5-GT is much cheaper than the 1G4-GT.

The wiring diagram is shown in Fig. 1. Also see Figs. 2, 3, and 4 for the arrangement of parts and controls. If this is your first radio set, let me give you a few ideas on how to proceed. Draw a full size schematic and start collecting the parts you need. Check these off on your list as you find them. Some parts will require cleaning and it's a good idea to do it now rather than at the last minute. Some parts may need work; e.g., a variable capacitor may need to have some plates removed. Now's the time to make any brackets you need for supporting a tuning capacitor or for bracing the panel. Make a set of drawings showing the placement of all parts and the location of all holes in the chassis and front panel. Make sure there are no mechanical interferences.

It's up to you whether you paint the panel or leave it unpainted. If

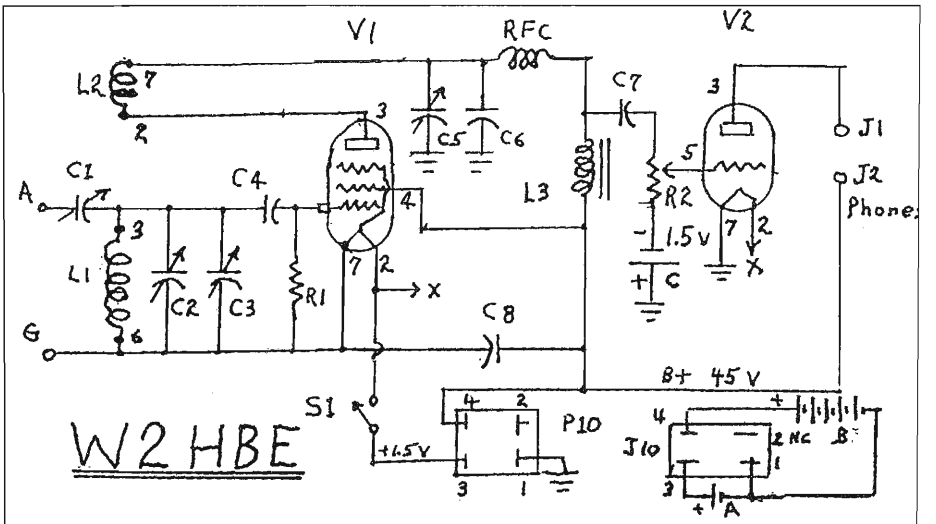

Figure 1: Wiring diagram of the beginner's regen

you decide to paint, first make sure that all holes are the proper size. Then thoroughly clean the panel. I used soap and water followed by acetone.

CAUTION: Flammable! I covered the back of the panel with paper to keep it free of paint. The front side was then given two applications of Krylon sandable gray primer No. 1318. For the final coat, I used Krylon No. 1608 smoky gray spray paint. I labeled the controls with dry-transfer letters. Then I applied a thin coating of Sally Hansen supershine topcoat nail polish.

In all the sets I've seen in various articles, the antenna coupling capacitor was always a Hammarlund type EC equalizing condenser that required a screwdriver for adjustment. Here I've used a small two plate variable capacitor controlled by a knob on the front panel. A plastic bracket made from a box that had contained a phono cartridge supports this capacitor. A Bakelite shaft extender connects this capacitor to the dial on the panel. The dial with markings 0-100 makes it possible to record the best settings of this control for each band.

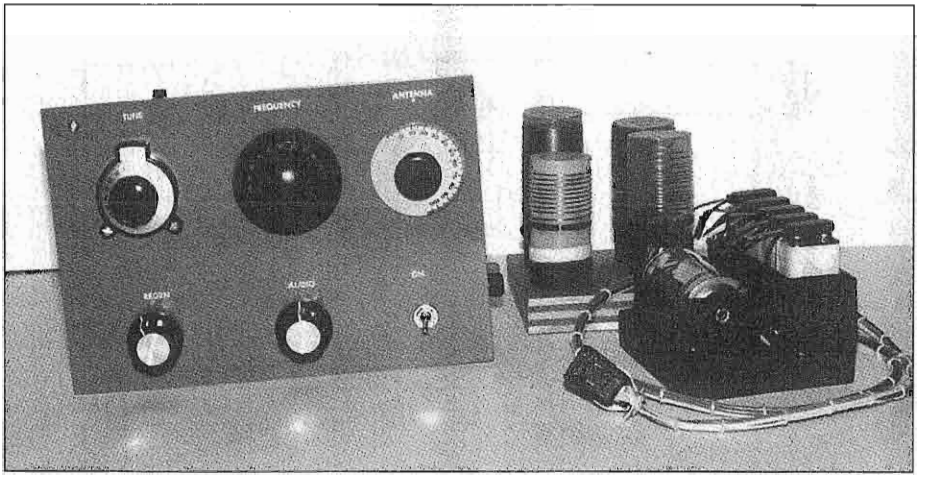

Figure 2: The Beginner's receiver, its set of coils, and the A&B batteries

The main tuning capacitor, C2, is a Hammarlund MC—100—M with rotor plates shaped to give nearly even spacing of stations over the entire range of wavelengths. The bandspread capacitor, C3, is also a Hammarlund. Here I used what I had and removed plates to make it effectively an MC—35-S. It has two rotor plates and three stator plates. An aluminum bracket supports this capacitor so that its shaft is 1.75 inches above the chassis. The dial is a Japanese import available from Mouser Electronics. It offers an 8 to 1 ratio and is graduated 0—100. The dial is coupled to the tuning capacitor by means of a short piece of ¼" shaft and a National TX—1O flexible coupling. If this is your first project, go slow and try to get these parts to line up exactly right or as the old timers say "dead on".

Regeneration is controlled by C5, a 50-pF variable capacitor. It would be cheaper to use a pot to vary the detector screen voltage but the capacitor wastes no battery power and is quieter.

In the 1930's our radios used either batteries or a B—eliminator. In this radio, I've kept the current requirements very low so we can get by using low—cost, readily available batteries. A single D size flashlight cell is used for the filaments that together require only 100 mA. The B+ requirements also are low so here I used five 9-volt transistor radio batteries connected in series to give 45 volts. To keep things neat and orderly, a few scraps of wood were glued together to make a compact receptacle for the A and B batteries. See Fig. 2. A home made three foot cable and Jones connector, J10, permit the battery unit to be located remote from your desk, table or bed. A single AAA size cell provides bias for the amplifier stage and is mounted on a piece of perf board, which in turn is mounted on the left chassis apron near C5. Since there is no load on this cell, it is expected to last many years.

The Coils. A set of plug-in coils

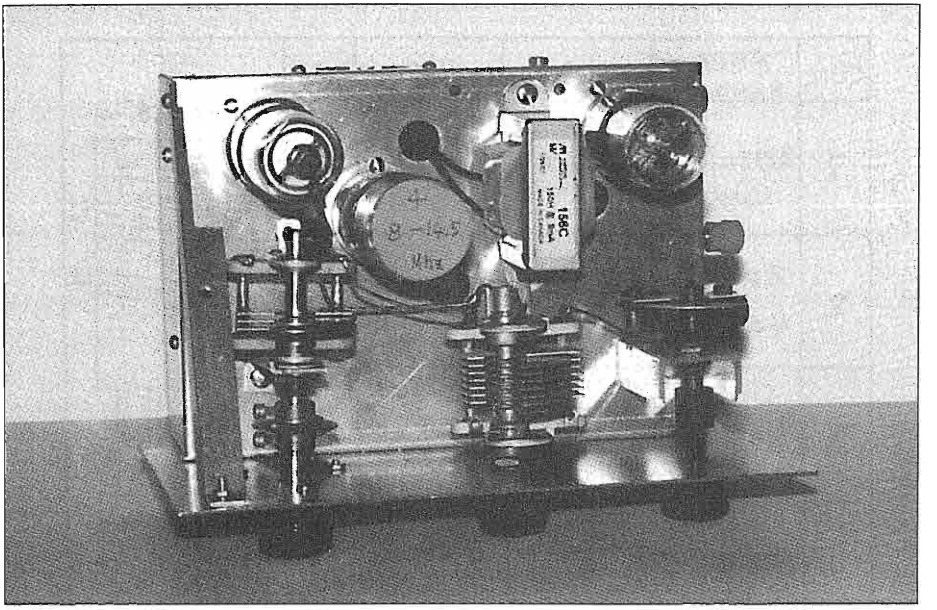

Figure 3: Top view of the receiver showing component locations

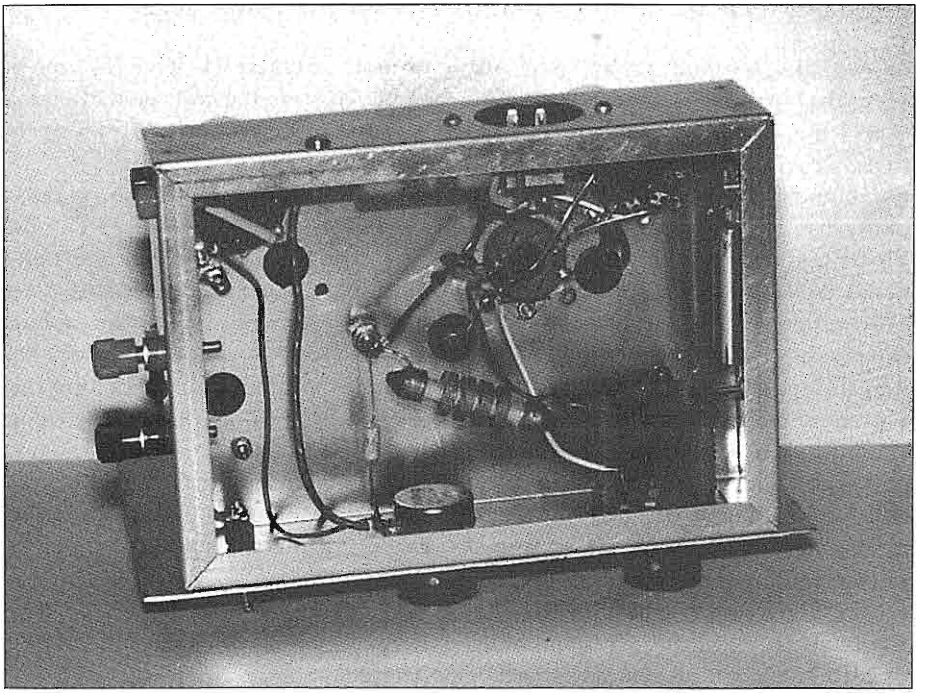

Figure 4: Bottom view of the beginner's set

COIL	FREQ RANGE	L1	L2	a
1	700 kc – 1200 kc	152 turns No 32 E	25 turns No. 32 E	1.4"
2	2.8 Mhz – 4.5 Mhz	32 turns No. 22 E	10 turns No. 24 E	1.5"
3	4.75 Mhz 8.75 Mhz	16 turns No. 22 E	7 turns No. 26 E	1.5
4	8–14.5 Mhz	10 turns No. 22 E	6 turns No. 26 E	1"

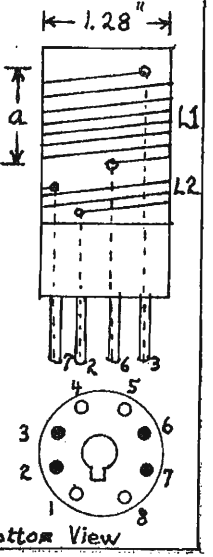

Figure 5: Coil winding data for the 2-tube regen

allows this receiver to be used on several short wave bands. Data for four coils is given in Fig 5. All of these coils are wound on low-cost home made plug-in coil forms. Refer to my article [1] in the July 2002 issue of Electric Radio which tells how to make these coil forms out of plastic pill bottles. Coil No 4 is made from the plastic container in which Fuji 35 mm film is supplied. I sawed off the bottom of the container and sanded it smooth. This was then glued to the octal tube base taken from a defunct 6SN7 tube. Here I used Testor's cement No.3501 sold for assembling polystyrene plastic models. All coils were given a coat of coil dope to hold the turns in place. A 1.25-inch circle of card stock can be cemented to the top of each coil and labeled to show its frequency range. Incidentally, the unused contacts (1, 4, 5, 8) can be removed from the coil socket to make it easier to insert and/or remove the coil.

Conclusion I hope your radio works right from the minute you finish putting it together. But don't give up hope if you have problems. Very often a radio needs a little de-bugging or trouble-shooting. Check the wiring, the tubes and make sure that the various parts are the correct value. If necessary, have a friend check your assembly and wiring. I hope your radio gives you many pleasant hours exploring the short wave bands.

1. "Home-Made Plug—in Coil Forms", Bob Dennison, ER, No.159, Aug.2002.

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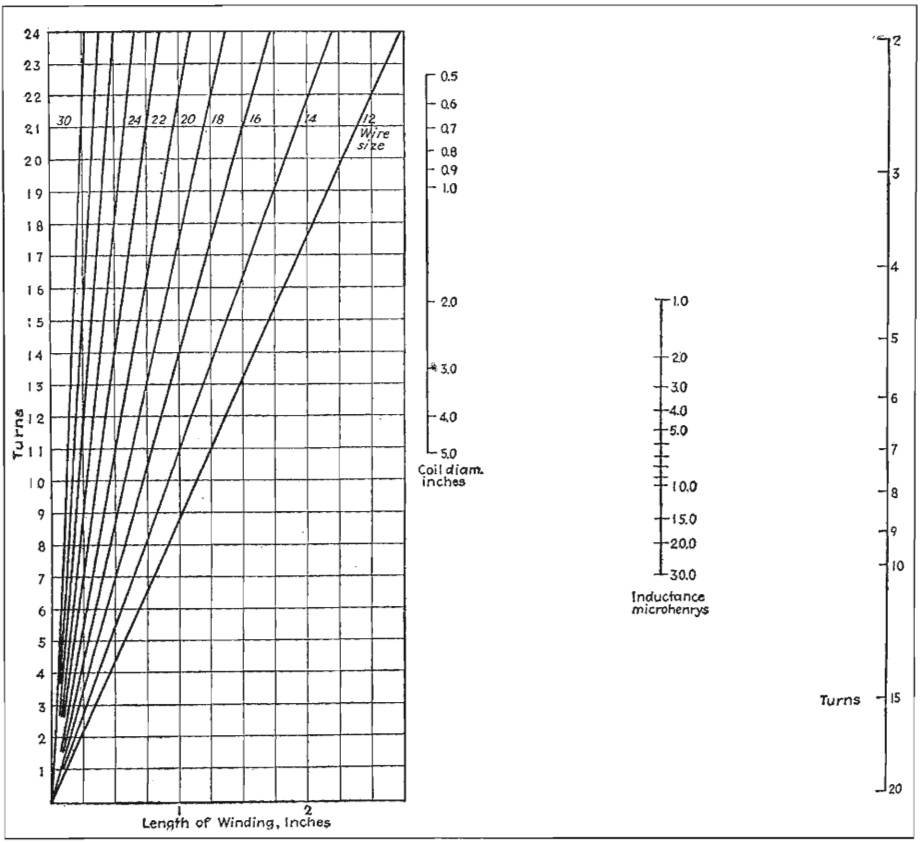
Optimum Shortwave Coil Winding Chart



This chart was originally published in the September, 1937 issue of Electronics Engineering magazine. For builders, it is very useful because it allows one to get the highest possible "Q" in tuned circuits for any desired value of inductance without a lot of tedious cut-and-try. This is very useful for building PA tank circuits, for example, where you need the highest possible attenuation of harmonics in the space you've got to work with. To use the chart, you need to know what value of inductance is needed. This is usually found from similar published designs. Starting with the charts on the right side, lay a ruler horizontally from the "inductance" column to the right-hand "turns" column. For any given coil, the highest Q is obtained when the length of the winding is equal to half the diameter. What you never know is what size of wire is optimum to meet all the requirements. It's easy to figure out with this chart. Take the number of turns found from the right-hand chart. We'll say you came up with 8 turns. Lay a ruler along the left-hand chart from 8 turns to whatever coil diameter you are using. Let's assume it's a 2-inch coil. Then, read up from 1-inch on the "length of winding" axis on the bottom to where it intersects with the closest wire size. In our example, it's #14 wire. Wind the coil so that 8 turns occupies the entire given length. Easy!

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TAHA, A Really Big HF Antenna

by Chuck Teeters, W4MEW
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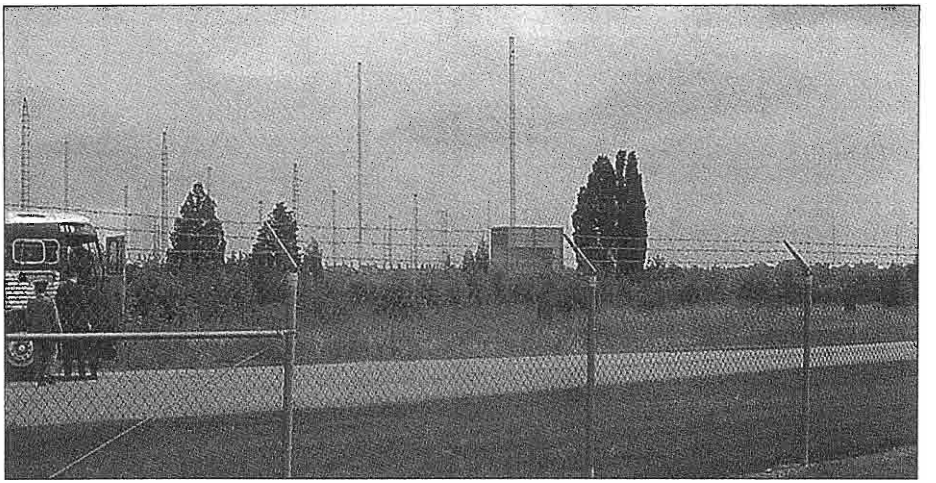
Photography by Lt. Larry H. Will
Instructor, US Army Signal School
Ft. Monmouth NJ
Photos taken August/Sept. 1967
(Now W3LW)

Some of the fallout from the first Soviet Union Atom Bomb test August 29, 1949 was not radioactivity, but was money for the United States Army Signal Corps. After WW2, money was tight for research, development and procurement at Fort Monmouth, New Jersey, home of the Signal Corps Engineering Laboratories, or SCEL. When the Russians popped off their atom bomb everybody in Washington D.C. said, "...how come we weren't told it was coming?" The intelligence agencies, looking for a way out, pointed a finger at ACAN, the Army Command and Administrative Network. In the forties and early fifties ACAN was the principle overseas communication link for the War/Defense Department and supported Presidential communications through the White House Signal Agency as well as State Department Embassy communications.

In 1949 there was no Internet, no cell phones, no satellites, no fax, and no overseas communications except by very slow undersea telegraph cables or high frequency radio. The Army had one undersea telegraph cable to Alaska, but none under the Atlantic or Pacific. All military and federal government communications to Europe, Central America, Hawaii, and the rest of the Far East was by HF radio. The equipment was WW2 vintage 4 to 26 MHz, 1 to 40 KW, RTTY and SSB voice and multi-channel TTY. Antennas were rhombics and system reliability was about 85-90% on a monthly basis. Because of the bomb, and Washington finger pointing, money was poured into SCEL in 1949 to update the system. The result was new equipment such as the R-390 receiver (Collins), CV-116 TTY converter (Northern), AN/FGC-29 Teletype terminal (Western Union), CV-157 SSB converter (Cosby), T-409 autotune SSB transmitter (WEco) and the AN/FRT-22 40 kW SSB amplifier (Collins).

System reliability had improved a few percent but still left much to be desired when the Korean conflict busted loose in July 1950. The Russians set off their first H-bomb in August 1953, and the cold war was really started heating up. Washington said, "...Signal Corps, do something to make our overseas communications work better!" The result in September 1953 was funding for a Signal Corps project called "Tropicom". The project included higher-power transmitters, better HF antennas, and an integrated modulation/crypto system. The transmitter project ended up in the AN/FRT-33, a 900 KW PEP HF SSB built by Continental with RCA assistance. The integrated modulation/crypto system ended up with the F9c Lincoln labs (MIT) spread spectrum noise transmission equipment. The antenna project started out

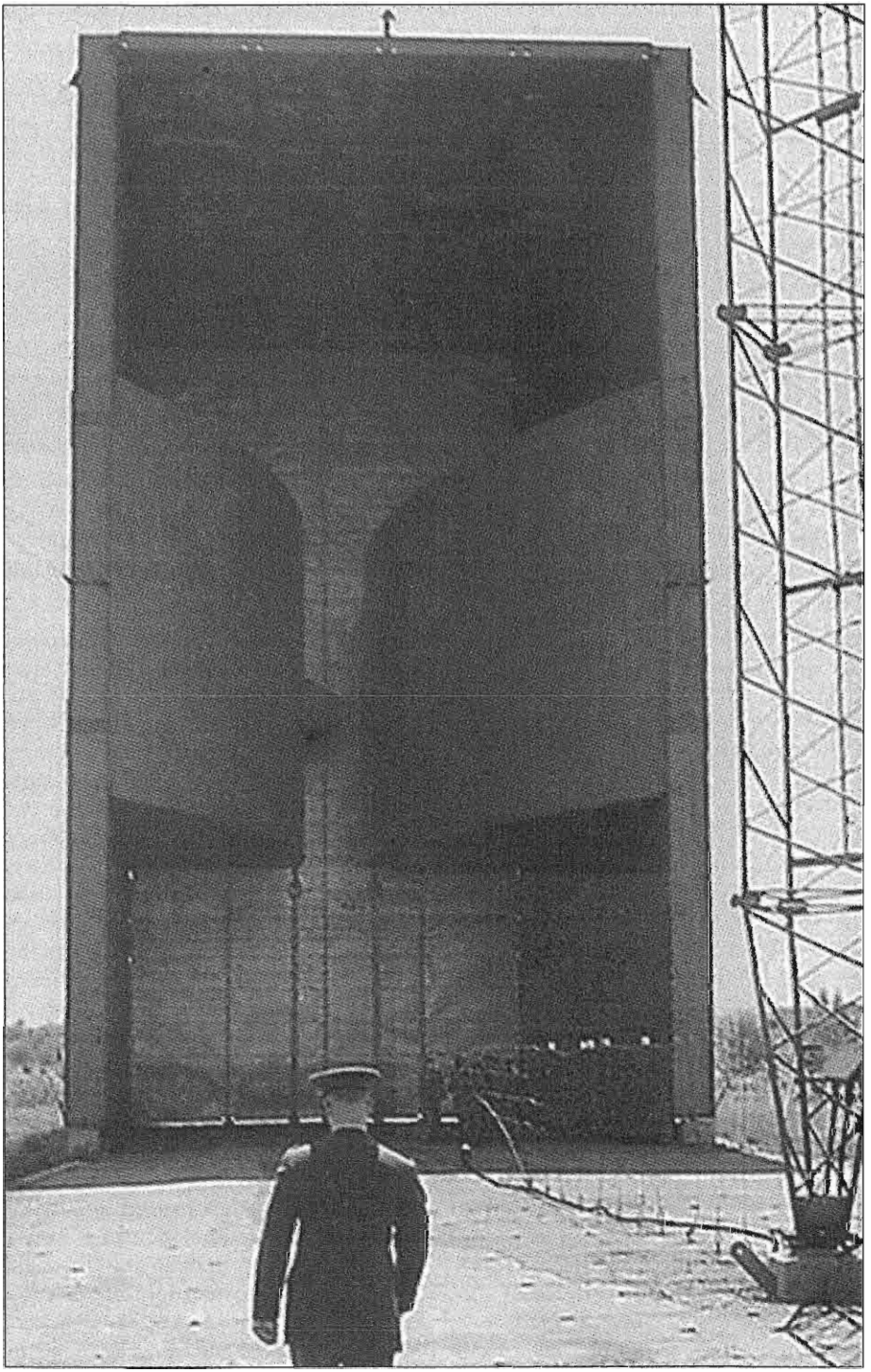


This photograph shows the large waveguide feed structure, called the "grain elevator" in the center of the photo. Except for the two taller towers which were not part of the TAHA antenna, the other towers supported the horn, which was constructed as a wire grid on roughly 12 inch centers.

with an improved rhombic, and ended up with a horn, and a HF horn is a really big antenna.

The first improved antenna was the LaPort rhombic. The design by Dr. Ed LaPort, RCA International Division, increased the directivity and gain of the standard Army RD series rhombic while reducing minor lobes. Minor lobes are a problem with a rhombic. This was a good-sized antenna, hanging on seven 130' towers spaced over an area 900' by 500'. What Dr. LaPort came up with was two rhombics using a common feed point at one tail tower, but offset by 3.5 degrees in azimuth. This provided cancellation of minor lobes in the horizontal pattern. The non-symmetrical sides allowed cancellation of some minor lobes in the vertical pattern. Both sides used three curtains, or wires, that were spread vertically 11' at the four side towers to flatten out the impedance variations with frequency changes. The antenna used 2 dissipation lines at the two head towers, which made using the high-powered transmitters easier. Performance was good with better side lobe attenuation, and a forward gain of 8 to 13 db over the 4 to 26 MHz frequency range. The main lobe vertical radiation angle varied up to 12 degrees over the frequency range and that did not always put the main lobe on the ionospheric control point. Even with this limitation it was better than the standard Army RD rhombic. It was tested with the AN/FRT-33 transmitter at the United States Army Communications Service Agency (USACSA) transmitter site at Woodbridge VA on the Washington, DC to Asmara, Ethiopia radio link.

The Signal Labs looked at a design used by AT&T overseas communications, the Multiple Unit Steerable Antenna. The MUSA consisted of 7 rhombic antennas in line, pointing in the direction of the distant station. Each had its own transmission line and the phase of each could be adjusted where the signals were combined to steer for



a favored vertical angle. The antenna was adjusted manually. Looking over the AT&T data showed why they only built one MUSA; it did not provide a significant improvement over a single rhombic.

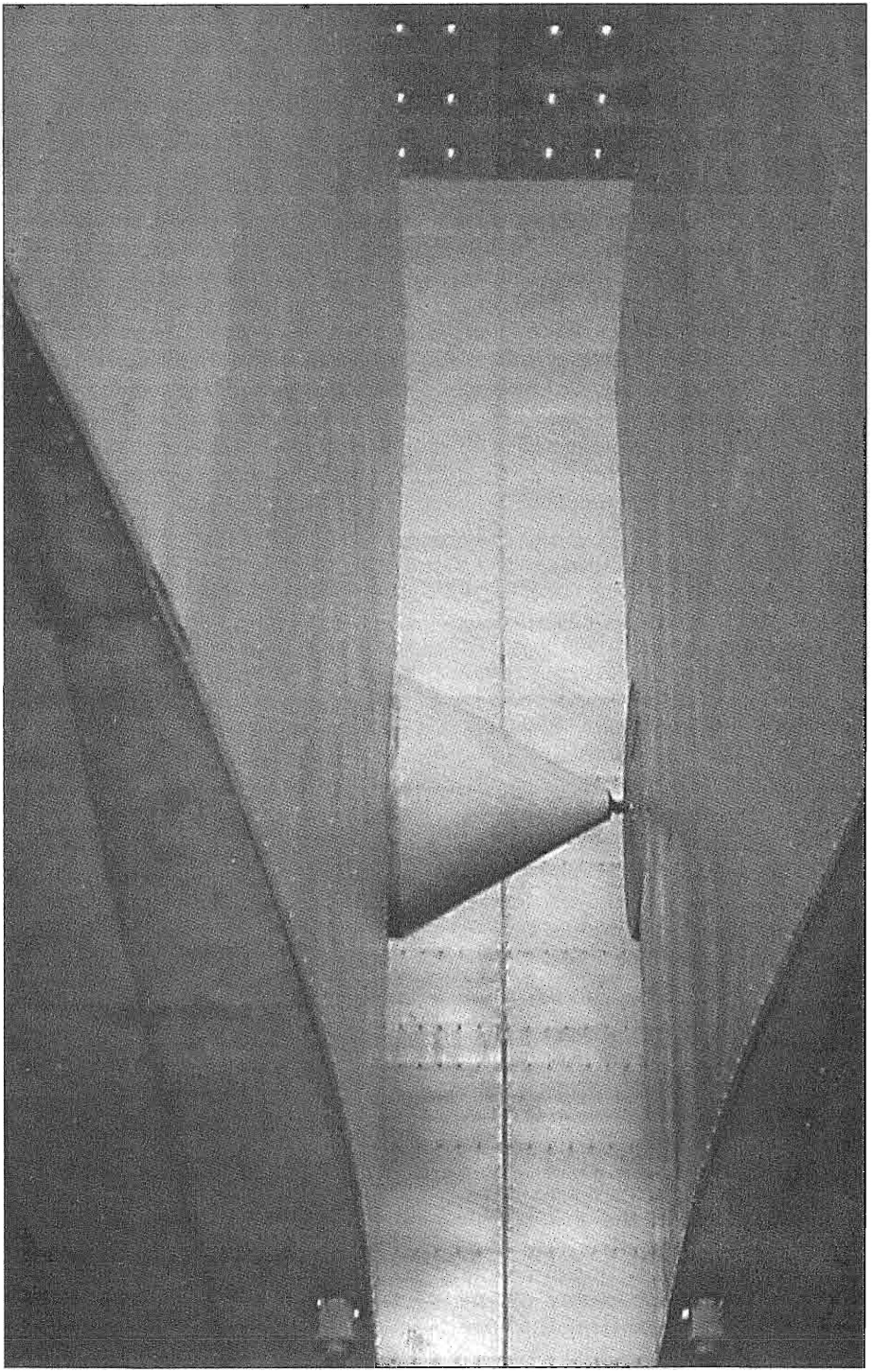
Dr. Helmont Bruckman designed a 16 element collinear receiving antenna at Fort Monmouth. He came to this country after WW2 as part of the Wernher von Braun rocket team. Bruckman was a UHF telemetry and radio control expert. He was on temporary duty at Monmouth for antenna research. The objective of his collinear design was high gain, elimination of minor lobes, and a uniform pattern in the vertical and horizontal planes. The antenna consisted of two sets of four half wave horizontal collinear elements stacked vertically one wave length and backed up by 8 reflectors spaced 1/4 wavelength behind the driven elements. The gain measured 10 db. at the design frequency of 13.37 MHz. This was a relatively compact antenna measuring 150' wide, 90' high and 20' deep.

Two antennas separated by 900' for diversity reception were constructed at the USACSA receiver site at LaPlata, MD. The antennas were orientated on the ACAN station in Hawaii. Performance was good except the collinears were single frequency only. Ionospheric changes required the use of three or four different frequencies over a 24-hour period, and monthly and seasonal changes required one or two additional frequencies. The use of the collinear was therefore limited, however they did prove the value of increased directivity compared to the standard rhombic antenna.

At the time, Dr. Bruckman was also working on an antenna for a 1300 MHz radio relay system development contract. The optimum antenna for this project appeared to be a UHF horn. Horns exhibit broad bandwidth and high gain, with a uniform vertical and horizontal pattern that could be operated with either vertical or horizontal polarization. Because of project mobility requirements he experimented with ridge loading to reduce the size, weight and wind load of the horn, which was to be mounted on top of a 60' mast. Out of curiosity he scaled up the horn to work at 6 MHz. Everything indicated the horn should work well at HF. The horn data showed a significant improvement over the LaPort rhombic. When he showed the figures to Col. Robert Myers, the Tropicom project manager, he was told, "...you got to be kidding, a horn antenna 600' by 800' and 1600' long to eliminate minor lobes and get more gain? Forget it!"

Just two months later Myers was called to a conference in Washington. The Russians were selectively spot-jamming ACAN radio circuits. The Army Security Agency (ASA) was sure they had not broken any crypto systems as they were attempting to do a traffic flow analysis. ASA said the Russians were using the same technique we sometimes use to check the difference in traffic volume when the interference makes alternate routing necessary. USACSA considered the Russian jamming serious, so anti-jam was added to the Tropicom antenna objectives. They wanted to know what Fort Monmouth

The photograph to the left shows the gigantic TAHA feed assembly and the ridge loading to broadband the feed. The picture was taken standing inside the horn. Not very clear in the photo, but the grid of wires also was constructed along the bottom. The tower on the right is one of the central towers supporting the wire horn.



To the left is a closeup of the broadband feed assembly. It used horizontal polarization. The two ridges accomplished the broadbanding of the waveguide feed. This design is very similar to that used in other U.S. Army horn antennas for 900 to 1350 Mc as part of the AN/GRC-50(V) radio sets, but "blown up" in size.

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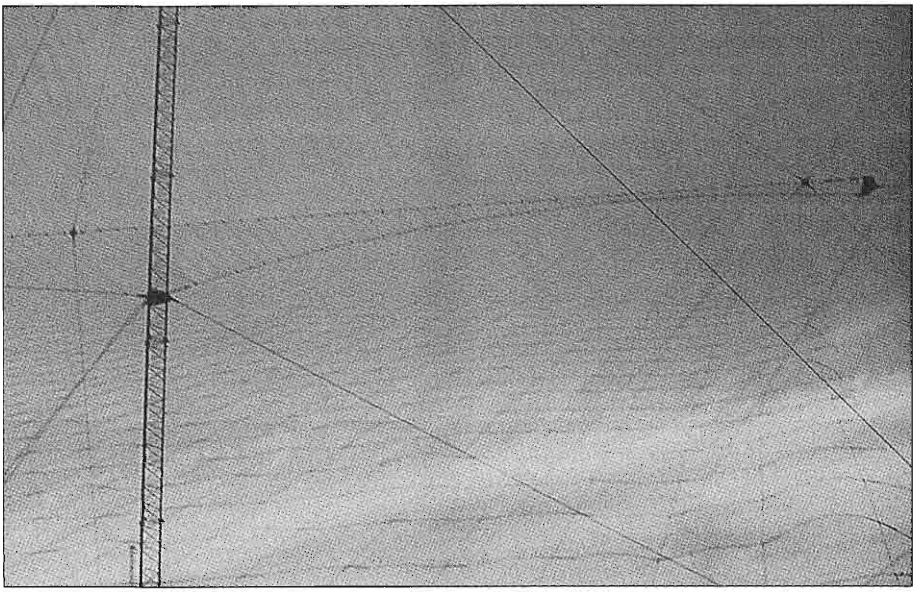
could do to overcome the Russian threat. Myers said SCEL had just started a paper investigation of an anti-jamming antenna that might provide an answer, and to give Fort Monmouth a month and he would be back with a project proposal. So, thanks again to the Russians, SCEL was going to get more money and Dr. Bruckman was going to get to try his big horn.

Thirty days later the TAHA project was funded and underway. The acronym TAHA stood for Tapered Aperture Horn Antenna. SCEL and the Signal Corps could have run a school on acronyms, although in this case it was a very descriptive one. Since this antenna was primarily an anti-jam device, a narrow beam-width with no minor lobes was the objective. To achieve this goal, horns need a long throat-to-mouth length to maintain a uniform field in magnitude and phase across the mouth. When a horn is designed for 6 to 20 MHz, "long" means thousands of feet. Dr. Bruckman used his 1300 MHz horn experience with ridge loading and applied it to the HF antenna design. The tapered aperture allowed a 35% shorter horn while the phase difference across the mouth was kept to less than 15 degrees. His antenna design was a 3-to-4 ratio H-to-E plane pyramidal horn, which flared more in the horizontal than the vertical plane. This kept the vertical and horizontal patterns similar, but the vertical radiation was spread more than the horizontal pattern. The design allowed the larger side of the horn to lay flat on the ground, which would simplify construction. The 1600' horn was 10 wavelengths long at 6 Mhz and 33 wavelengths at 20 MHz.

A construction contract was awarded to the Trylon Tower Company in January 1955. The major part of the horn was to be constructed of 8-gauge wire with a 5-foot mesh. The exciter feed at the horn throat was made with copper-clad steel plates. The first phase of the construction was to clear a strip of land 1600' by 800' on the southwest side of the LaPlata antenna field. A strip of asphalt was poured to lay the bottom wire mesh on. Fourteen guyed towers ranging in height from 170 to 600 feet were erected to hold the wire mesh. Dr. Bruckman was constantly checking the construction. Since he always had a lit cigar in his mouth, all you had to do was look for the smoke to find him. The feed line was RG-85 coax, the Army standard fixed station receiver line. The exciter in the horn throat was a horizontal discone, which was 85' off the ground.

The antenna was completed and ready for testing by September. The first test stopped when loose connections in the mesh caused noise whenever the wind was blowing. It took almost a month to get all the connections tightened up to eliminate the noise. The mesh had to be lowered in sections for this work. Half kidding, the station manager Benny Zohl blamed it on the nicotine from the Bruckman cigars. There were almost 150,000 joints in the mesh and only a few were corroded or loose, but it only took one to make noise. Horizontal beam width, as measured at the 20db down points,



This photograph shows a closeup of a small portion of the wire mesh used to make the roughly 600 foot long horn along with one of the support towers.

was 18 degrees on 6 MHz, and 9 degrees on 20 MHz. Vertical beam width at 20db down was 34 degrees at 6 MHz and 16 degrees at 20MHz. Measurements for minor lobes, front to back and front to side ratios exceeded the measurement capability of 90 db. Forward gain measurements were approximate as the target transmitter on the helicopter acted up. At 6 MHz they measured 19 db, and at 20 MHz 35 db. Dr. Bruckman said to move on as, we could calculate the gain from the pattern measurements.

During the testing program, it was found the asphalt strip looked like a runway because several small aircraft made approaches. Large white Xs' were painted on the asphalt strip to indicate a closed runway, and to warn pilots away. This did not work with birds however. While they could fly through the mesh, most of them continued on into the throat and flew into the horn, and beat themselves to death there. It became a weekly task for station personnel to clean out the dead birds. One of the USACSA civilian employees at the LaPlata receiver station, Bill Schuchman (W4JUY) had an Elmac AF-67/Gonset converter in his car. With the approval of Benny Zohl it was connected to TAHA. Bill, a member of the Potomac Valley Radio Club, preceded to work 20 meter mobile and probably got the best reports any D.C. area mobile ever got from Hawaii. Bill said he got down on the low end of 20 phone, called CQ, and the Hawaiian stations were lined up calling him. He said the only thing that limited his enjoyment, as top man on 20 that day, was the smoke in his car from Dr. Bruckmans' cigar. Bruckman was sitting in the back seat to see how his antenna was working on 20 meters. He had been a ham in

Germany, but not being an American citizen he was not eligible for an American license in those days. In talking to Bill recently, he said he wonders how many stations still talk about the mobile with the tremendous signal that was using a car horn for an antenna.

After initial testing and the sojourn on 20 meters, the antenna was put into service on the Hawaii circuit with WECO LD-T2 receivers. A standard RD-7 Army rhombic was used on the other receiver in the diversity pair. The result of the different antennas was that 94% of the time TAHA carried the circuit. On of the unexpected results of using TAHA was the improvement in signal to noise ratio. Off path noise sources were attenuated over 90db, and many times there was no noise in the receiver. It sounded like the receiver was switched to stand by, except the signal from Hawaii was there. Overall TAHA met its objectives for anti-jamming. If the jamming source was not on-path and at the proper skip distance it was not heard. The jamming tests also proved that a diversity switching system based on signal strength was not effective under jamming conditions. Also circuit reliability did not improve more than 2% with TAHA. When an ionospheric black out or S.I.D. occurred even TAHA could not pull the signal out.

While the evaluation of TAHA was under way, the testing of the F9c Lincoln encryption system was also underway. The F9C was a spread spectrum system that transmitted pseudo-random noise over a 16 KHz bandwidth. Encoded in the noise was a 240 wpm frequency shift signal. The equipment took up 9 bays and used over 1250 vacuum tubes. It was installed on the Washington, DC to Asmara, Eritrea circuit. It generated a low-detectible encrypted signal and it performed flawlessly. It offered between 40 and 60-db improvement in circuit performance and required a jamming signal to be 45 to 50 db stronger to cause any errors in the copy. It could hold synch for 15 minutes with no signal when there was fading or jamming. Lincoln Labs said it could be built using transistors in place of some tubes and would fit into 5 rack cabinets.

When comparing the F9c encryption to TAHA and the AN/FRT-33 transmitter in terms of cost and performance, there was no contest. Three AN/FRT-33s had been contracted for, and one had been delivered for the Washington tests and would be kept in service, while the second would be held at the Texas factory. The third was shipped to Mike Villard, W6QYT, at Stanford University for propagation tests. TAHA would remain in service but no more would be built. Tropicom moved forward with a contract to Raytheon for 22 of the F9cs. It provided our communications until the first undersea coax cables arrived in 1959. The satellite systems of the sixties put HF radio out to pasture. The F9c was removed from HF service and served on some of the first satellite links. TAHA remained in service until 1972, and despite rumors that the Potomac Valley Radio Club bought it, it was taken down the following year. Bill said the club would have bought TAHA if they could have figured out how to rotate it. The Government gave up the site in 1982, and today the spot where TAHA stood is part of a Charles County MD park. The only reminder of the Army receiver site and TAHA is the road to the park, Radio Station Road.


ER

Radio Service in the Golden Age 1930's through the 1950's Episode 18

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The man who writes about himself and his own time, is the only man who writes about all people and all time.

George Bernard Shaw (1856-1950)

Everyday experiences, often closely related, create a common bond between those of us who enjoy radio as a hobby. As I think back to that point in my childhood when I first experienced a curiosity—indeed, a burning interest—to learn more about this new and wondrous means of communication, the transmission of 'wireless' telegraph and telephone signals, the thought occurs to me that it is not our diversity of experience, but our equivalence that binds us together.

Reader response to my stories about my radio repair shop has been both gratifying and surprising. I receive a lot of mail each month, all of which I try to answer promptly. One 'thread' I find throughout my mail is an interest about radio and my experiences during the 1930's. Through my correspondence with ER readers I've discovered that my beginning experiences in radio are amazingly similar to those of others.

How and why does a young man become interested in radio? What motivates a young person to spend most of their allowance, and far too much time building and operating radio gear when they could be associating with others their age in the pursuit of more common, and less demanding pleasures? Perhaps it is akin to a sickness or disease—we pick up a germ here, a germ there, then something comes along to lower our resistance, and before we know it we have fallen victim to the 'radio virus.' Where and when did you pick up your first 'radio germs?' What activity, or experience, lowered your resistance to a point to where the 'radio germ' infected your body—head to toe?

Small towns and villages throughout this country had one family more prominent than others. Invariably the family owned one or more business firms as well as a number of real estate holdings. The family normally lived in a large house with a well-kept lawn overlooking the village. Most of their houses were painted white.

In our little town, Spring Valley, Arkansas, Henry Sanders was the village Patriarch.

I was once privileged to visit in his home—I remember the occasion well. My mother took me up to the big house on the hill to see, and maybe even hear, the new radio set Henry had purchased in the city. She warned me before going that I must be exceptionally well behaved, and to touch absolutely nothing. I was told that all items in the house were very costly, and that we could not afford to pay for anything if I accidentally broke it. The year was 1924. I was almost three years old at the

time.

Mrs. Sanders answered the door, and invited us to have a seat in the parlor. On a table near a huge grandfather clock, sat the new radio. It was a long, black box with a lot of knobs and dials on the front. On top of the box was a gracefully curved horn—also black in color. Nan, Henry's wife, explained to us that the radio was 'terribly expensive' and 'extremely delicate.' We were asked to be absolutely still and quiet while she operated the new and strange instrument. As she turned the dials on the box we suddenly heard a voice—a man talking. The sound was coming from the big black horn. His voice was not too distinct, and faded in and out. When the voice faded away, there was a rushing sound like wind blowing.

Nan explained to us that we were listening to a voice from "across the water' and that the rushing sound was the sound of waves on the ocean as the signals traveled across the miles of stormy ocean. I suppose the explanation was reasonable at the time. However, I thought it seemed like so much bull. I had no idea how radio worked, but I doubted the signals stopped along the way to pick up the sound of ocean waves. We stayed a respectful fifteen minutes, thanked her profusely, and took leave of the Sanders mansion. I had been exposed to a 'radio germ.'

A few months later, my dad bought a country store at Habberton, Arkansas. Some months after we moved into the little house next to the store he brought home an Atwater Kent radio, complete with horn speaker, wet cell 'A' battery, and numerous other batteries. I remember Dad nailing a tall pole to the end of our house, and running a shiny copper wire from that pole to the top of our barn. I asked him what he was doing, and he explained that, "The radio waves are in the air. We try to catch those waves on this copper wire. This is called the 'aerial' wire."

Then he drove a big rod into the ground by the window. He drilled holes through the wall and put some long white glass-like tubes in the holes. Then, he ran a wire from the aerial and ground rod through the tubes and into our house. The wires entered the living room directly behind the table where he placed the radio. Outside, on the window framing, he attached a brown glass-like gadget that he told me was a lightning arrestor. It was supposed to protect us from lightning—should it strike the aerial. All this seemed like some sort of magic to me—and it was, because when he connected all the wires to the radio he turned it on and we heard some singing. Later a man came on a talked a lot. I was not interested in what he was saying until he said, "This is station KUOA, the University of Arkansas, Fayetteville." Even though I was not yet five years old I recognized the name University of Arkansas. After all, we lived less than 8 miles from the U of A campus, a favorite route with my Dad for our Sunday afternoon drives in our new 1926 Plymouth. They pointed out 'Old Main,' the landmark building of the U of A to me on one of our Sunday afternoon drives. When we returned home my Dad showed me the pictures of Old Main that appeared on every box of 'University Oats' that he carried for sale in his country store.

I asked if they knew where the U of A 'broadcasting station' was located. My mother assured me that she would drive me by the station the next time she went to the Bank in Fayetteville. I thought it must really be something to see. I could visualize the station as being big, with dozens of wires running all over. I knew there would be a lot of other radio things, but I had no idea what they would be like.

True to her word, the very next week my Mother drove me out to a small white house near Fayetteville. The house seemed awfully small—smaller than our five-room house. Behind the

house was a tall metal thing that resembled a big metal ladder. Several wires ran from the metal 'ladder' down to the ground. My Mother told me that the metal thing was the radio tower. That was where the radio waves left the station.

Can you imagine, my own Mother was exposing me to another 'radio germ.'

In the crash of 1929 my Dad lost everything—the store, his job as postmaster, his gristmill, and his farm. I did not understand what was happening, but I heard my Dad and Mother whispering about 'losing' our home and discussing where we find a home or get money for food. Everything we owned disappeared practically overnight.

We moved to a house in Spring Valley, where Dad took over the operation of the little general store there. I'm sure it was a deal in which no money traded hands because we had no money. I remember my parents discussing where they would get the $4.00 a month for rent on the old house.

Every Sunday I was scrubbed, dressed in clean clothes, and forced to attend both Sunday school and church. The church had one thing I really appreciated—big, plain glass, windows. I was seldom interested in what the preacher said, but I could look past him and see the wooded area behind the little church. Amid the trees was an old two-story house, long unoccupied, that must have dated back to the Civil war era. One Sunday I noticed something different—there was a small windmill on top of the old house. I could not wait for church to end to go see what was going on at the house.

I found out that a young couple, Harold Sullivan and wife, moved into the old house three weeks ago. The windmill was actually a wind-powered generator to power electric lights. In Spring Valley electric lights were rare, indeed. My Grandfather had a 'Delco,' and Mr. Welch on a farm south of the village had a 'Delco.' The primary source of light was the kerosene lamp. President Roosevelt and the TVA were a topic of discussion, but little more. I never thought of getting electricity from the wind.

Harold, about 19 years old at the time, moved into the vicinity with his Dad and Mother a few months before. The family moved from southern California to a small farm in Arkansas when the depression took everything they had. Mr. Sullivan, Harold's father, figured he might be able to eek out a meager living doing carpenter work in Arkansas.

I don't think the elder Sullivan gained much from the move, but Harold found a young lady friend, and was soon married. Dead broke, and without a job or prospects of one, they moved into the old abandoned shack. Harold using nothing but scrap lumber from a local stave mill, and auto parts from junked cars soon had a wind-powered generator on the roof. The generator charged two old batteries connected in parallel, which in turn furnished power to light two 'tail light' bulbs—one in each room. He explained all this to me, and I thought I understood some of it.

Then he let me see his radio—a 'Crosley Pup' that he had brought with him from California. I thought it was beautiful with the single tube perched on top of the small square metal cabinet. He put the 'phones on my head, and I could hear KVOO in Tulsa, Oklahoma!

The germs were stirring, and my resistance was growing weaker every month.

My mother's Aunt, Uncle, and four daughters lived in Muskogee, Oklahoma. My Mother was very fond of her cousins, and we paid a yearly visit to see them. On one such visit, sometime in the early thirties, cousin Mabel drove us around town pointing out all the 'big city' sights. One thing she showed

us was the Bixby mansion. Today, it would be an average home in an older neighborhood—but then it was a mansion. Mabel explained that the Bixby's were wealthy, and owned the daily newspaper, the Bixby Hotel, and now a radio station, KBIX.

I, quite naturally, asked where the radio station was located. "Why, It's on the very top floor of the Bixby Hotel. Where else would you expect the Bixby family to locate it?" she asked.

"I sure would like to see it, I've never been inside a real radio station," I replied.

"Oh, that is no problem at all. We'll go see a live broadcast tomorrow morning." Said Mabel.

I remember being very quiet as we entered the lavish (to a young country boy) lobby. I admired Mabel for her self-assurance and confidence as she asked the desk clerk if it was OK for us to go up to the station. He assured us it was fine to do so, but asked that we refrain from any loud talk or noise while in the studio area.

As we stepped from the elevator on the top floor we entered a room probably 16 feet square. There was nothing in the room but several rows of neatly aligned folding metal chairs. One wall of the room was practically all glass. There was a door to one side that said "Employees Only."

Through the glass wall we could see a small studio about 12 X 12 feet with a grand piano in one corner of the little room. The only other furnishings were three folding chairs, and two microphones. One mike was on a floor stand near the center of the room, and the other was placed near the piano. More interesting by far was the radio transmitting room. There a young man, neatly dressed in white shirt and tie was sitting in front of two large racks of equipment. Both racks were about six feet high, and I found out later were a standard 19-inch width. The young man was sitting at a desk talking into a microphone. He was reading the local news and weather report. There was a speaker in the listening room, and we could hear every word he said. A young man told us that 'live' broadcasts of music was a rarity—most all music they transmitted was from standard phonograph records.

As I sat watching the young man read the news I thought of the words traveling out from the radio stations in all directions—for maybe 50-miles of more. I wondered how many people were sitting at home listening to the very same words I was hearing?.

As he talked I noticed he kept glancing at the meters on one rack and I could see them move in cadence with his voice. Red and green pilot bulbs glowed from several different sources. This was strictly 'big time' radio. I believe KBIX was a 100-watt station—certainly less than 500 watts.

After sitting quietly for a short time I whispered to Mabel, "Do you think it would be OK for me to go stand closer to the window, and get a better look at the 'broadcasting set'? She replied in the affirmative.

I must have admired the gear for at least five minutes—I don't think I ever saw anything so beautiful.

See how the disease works? Those darn germs are everywhere. Lucky that they only attack a small majority of the population—those with a weak resistance to the 'radio virus.' Little did I realize that the most deadly virus of all was waiting to infect me later in the day.

That evening we were invited over to Opal's house. Opal was my mother's oldest cousin, and married to a man on the Muskogee Fire Department. As one would expect, he was something of a hero to me. When I got a chance I told Earl about the trip to see KBIX that morning. Earl listened to my story and then said, "After we finish eating I'll take you across the street and introduce you to a Ham Radio Operator that

works for the Muskogee Police Department. He takes care of their new two-way radio system. He even builds radios and sells them to other Hams."

I was so nervous I could only eat one grilled hamburger. It was just getting dark when Earl said, "Well, I suppose my neighbor has finished his supper by now, come on with me and we'll go see what Ed is doing tonight."

Earl knocked on the door of the small bungalow. We could look through the screen door, and see inside the house—the front door was open. A young man was sitting at table talking into a microphone. On the desk, and in racks beside his table, was radio gear even bigger and more beautiful than KBIX. He said something into the mike and came to the door. "Come on in he said, I'm talking to a fellow up in Ohio. I'll sign with him and be with you fellows in a few minutes."

"Oh, go ahead with your radio friend," said Earl. "I just wanted to show Bruce your station. He likes radios. If you don't mind I'll leave him with you a few minutes, and then come back over. I'm winding up my hamburger grilling."

"No problem," said Ed. "Bruce and I will finish up this QSO—then talk radio." With that, Ed returned to his mike. I followed along behind him. I had a feeling like I get when I go into a sick room in a hospital.

Ed grabbed the Mike, and I heard something clatter in the tall radio. As he talked, I could see a flashing blue light. I looked to see where it was coming from. Near the bottom of the big tall cabinet I could see a window covered with wire mesh. Behind the mesh two big radio tubes flashed blue every time Ed said something. Suddenly I heard him say, "I have a young visitor here in the shack. He is interested in radios. I'm going to hand him the mike and let him say a few words."

Few times in this world have I been caught speechless—but this was one of them. I was so busy looking that I had not listened to what the hams were talking about. I did not even know the name of the person I was supposed to talk to. I took the mike in a sweaty hand and managed to say something—I did not know then, and do not know now what I said. All I knew was that I must get rid of that mike or I was going to pass out. I was really scared—but I was by now hopelessly infected radio.

About the sixth grade I made friends with a young man who shared my interest in radio. His dad owned a small grocery store in Huntsville. We decided it would be nice to communicate across the schoolroom using 'Morse Code.' Our method was very simple—we used the tools we had—lead pencils and our desks. Taking pencil in hand we held it in a vertical position. We touched the desk with the pencil eraser to indicate a dash. If we inverted the pencil, and touched the desk with the point, that indicated a dot.

Mostly we transmitted obscene words, but we did, very quickly, learn the code characters. We found it easy to appear deep in study with an open book in front of us while casually 'toying' with a pencil in our hand. The teachers never caught on. It was a small step to learn what those dots and dashes sounded like. We found learning code so easy that we never understood what all the 'fuss' was about when prospective hams thought learning code was difficult. With little help from anyone, two young boys were well on their way to becoming Amateur Radio Operators. It had to be something that was going around—and our weakened resistance to the radio virus was putting us in the high-risk category.

Oh, the many times I was exposed! In retrospect I believe the 'bug' that got me was radio station HSVS. We were living in an old house near the town square in Huntsville at the time. A road from the square passed in front of our house, and continued westward, up-

hill, to the High School. Our house was about ¾ of a mile from the school.

In the early 30's the State of Arkansas appropriated money to build two State Vocational Schools—one at Huntsville, and one in Clinton. In reality, the schools were little more than high schools that stressed learning something about woodworking, electrical wiring, printing, and Agriculture. When the school was built there were no high schools in those rural areas. The first few years of operation the schools often had a freshman class with students over 20 years old.

You can imagine the excitement when word got around town that the High School had a radio station, and that they were 'broadcasting' every day during the noon hour on a frequency of around 1500 Kc. I use the word 'around' because that best describes their operating frequency. Sometimes it came in about 1450 on the dial. Other times it was almost off the dial scale—up above 1600 Kc—a common problem with self-excited oscillators I would learn a few years later.

How did radio station HSVS (Huntsville State Vocational School) come in? It was very weak, and the fidelity was terrible. As a matter of fact the thing was so bad that it was discontinued after a few weeks. It's just as well—the entire operation was as illegal as the moonshine made in the area at the time.

I was still two years or so away from high school, but I had to see that radio station. I rode my bike up the hill to the school almost every day to watch the 'broadcast.' The 'broadcasting set' was built on a breadboard with a plywood panel. The parts came from old radios donated to the school by citizens of the community. I was told that it used three tubes, a self-excited oscillator, an amplifier, and another tube served as a modulator. The mike was a home-built affair that used an old telephone transmitter. The mike stand was fashioned from an old metal floor lamp stand. Overall, I thought it was a thing of beauty.

Two years later when I entered high school I found that the General Science class had built the radio set. To be perfectly honest, the class stood by watching while Floyd and Boyd Roberts built the radio.

If you wish to avoid this 'radio virus' her are a few tips to remember. The filaments of large vacuum tubes seem to emit radio germs that are especially dangerous. Any metal box covered with black or gray crackle paint should be avoided. The same is true of large silver dials, big black dials, red, green, or amber colored pilot bulbs, and be especially careful to not stare at big round voltmeters and ammeters that appear on electrical equipment. When near tall metal towers—especially those with antennas that turn—cast your eyes downward toward the ground. Listen only to music on radios—never listen to the beautiful sound of a 'bug' sending CW. Those that do sometimes fall victim to a secondary infection; 'The Lake Erie Swing.' Lastly, and by far the most important, is avoid crowds—especially those at affairs called 'Hamfests."

I was exposed to radio very often when young, and in my weakened condition I had no resistance at all to any sort of radio virus. It was inevitable that I would succumb, and spend the rest of my life consumed by radio.

-30-

Addendum: A few years ago there appeared in Electric Radio magazine a classified ad offering a BC transmitter free to anyone who would carry it off. It was thought to be the original KBIX transmitter. Of course I grabbed the telephone and called the owner. Alas, I was a little too late. I would like to hear from the present owner telling of his restoration experience with the rig.


ER

Gonset Converters and Tuners

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Photography by Cora E. Cobb, KBØLPZ

America in 1946, with her allies, had won a war on not just two but five fronts! This left us with a great sense of optimism. We could do anything, and now we wanted the fruits of that victory. We had been promised not just a chicken in every pot but also a car in every garage.

The American economy boomed after the Second World War. Not only could we afford the car but also now it had to have a radio. Amateur radio boomed too, with many new hams coming from the ranks of those trained by the military. Amateurs wanted that car radio to cover the shortwave, or at least the ham, bands as well as standard broadcast.

Faust Gonsett had the solution: the converter. Although the Gonset name is best known for the company's vhf transceivers, their first, and for several years their only, products were converters.

A converter is a receiver front end that uses the superhetrodyne principle to convert signals from a higher (or lower) frequency band to a band that can be tuned by the receiver. It usually consists of an RF amplifier followed by a converter (oscillator + mixer) stage. It can be tuned or untuned. In the latter case, tuning is done in the receiver. For example, the Heathkit HD-1410, still being manufactured into the 1990s, converts 10-500 kc VLF signals to 3.51-4.00 mc for reception on an ordinary shortwave or communications receiver. The signal you are receiving has a frequency exactly 3500 kc less than that indicated on the receiver dial.

Tuned converters have their output at a single frequency. An example is the RME DB-20 preselector, first offered in the mid-1930s, which tunes .55-32 mc and generates its output signal at 7 mc. This unit is also an example of a self-powered converter, one with its own power supply. Others, including most Gonsets, depend on the associated receiver for their power.

CONVERTERS

The first of what became an extensive line of converters was the Gon-Set 10-11, announced in September 1946 by the Waterproof Electric Company of Burbank CA. 20-meter and 6-meter versions were announced the following month. The 10-11 was a tunable converter covering 27.5-30.5 mc (the 10- and 11-meter bands) with an output frequency that could be adjusted to any point between 1500 and 2000 kc. It could be used with any AM radio because it took its power from the radio and thus didn't care what the primary power source was. It used only 15 ma at 180 vdc and 1/2 amp at 6.3 v. The tube line up was a 6AK5 RF amplifier, 6C4 local oscillator and another 6AK5 as its mixer. It also had a 0B2 regulator to minimize drift and allow it to work over a wide range of power supply voltages. Its only panel controls were

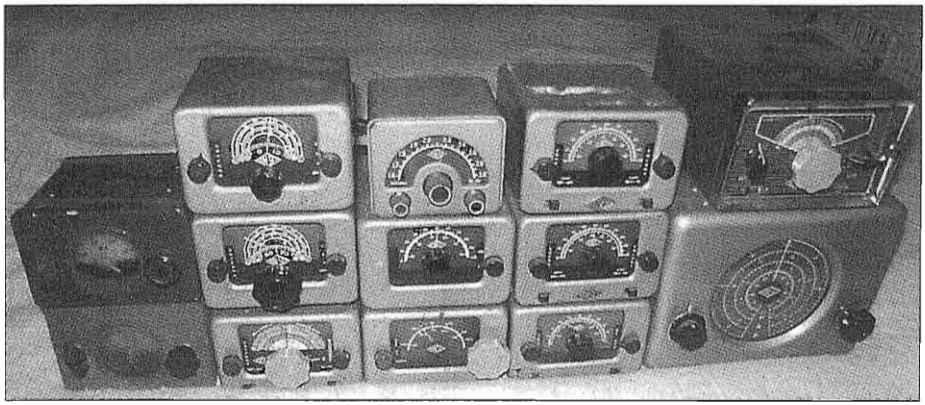


Figure 1: Here are the classic Gonset converters as described in the text. The group on the left is the black and gray-wrinkle 10-11 meter converters. Second from left and top to bottom is older 3-30 models, newer 3-30 models and Super 6 models. The center column holds 160, 6 and 2 meter converters. The next column from the right shows the VHF tuners: 30-40 mc, 40-50 mc, and 152-162 mc. The last column on the right displays top to bottom the Super 12 and 15-10-6 meter converters.

a power switch and a tuning control.

In March of 1949, the company offered a second product that would become a staple of its line for almost two decades. This was the Gon-Set 3-30, a 3-band converter that covered 3-30 mc with an output at 1500 kc. It later became the Gonset model 3002. It used a 6BH6 RF amp, 6C4 oscillator, 6AV6 mixer and another 6BH6 as an isolation IF amplifier. Even with four tubes, it used only 12.5 ma at 130 vdc and 1 amp at 6.3v. In addition to a band/power switch and a tuning control, it had an antenna trimmer on the panel. It was originally offered in a black wrinkle case like that of the 10-11, although it was later built in a standard 5-1/4" by 3-1/2" by 5-1/4" deep gray hammertone case like most other Gonset converters.

The models listed below are among the many converters that followed the pioneers. An asterisk (*) indicates units that can be identified in the photographs with this article.

3003 1.6-6.0 mc, 2 bands, 1mc out, police, marine, CAP and amateur freqs.

3008* 2-Meter - 144-148.2 mc, 1mc out, amateur and CAP freqs.

3014 VHF Adaptor - 108-128 mc with noise clipper

3015 VHF Adaptor - 108-128 mc with noise clipper and squelch

3030* Super 6 - 10, 11, 15, 20, 40 & 75 meters plus 19- & 49-meter short wave, 1430 kc out

?* 160 Meter - 1.6-3.0 mc, slightly smaller replacement for the 3003

3261* Super 12 - 10, 15, 20, 40 & 75 meters plus 19- & 49-meter shortwave, replacement for the Super 6, larger case matches GPP-1 phone patch

3275* 6 Meter - 49-54 mc, 1500 kc out

?* 15-10-6, 20.8-21.6, 26.9-30.2 and 48.8-54.2 mc, much larger case with ac power supply

A tuner was basically a converter with an IF strip and detector added. Most Gonset tuners looked very much like the converters as they were built into the same style and size case.

3009* 30-40 mc am or fm, squelch optional

3010* 40-50 mc am or fm, squelch optional

Figure 2: Left to right is shown the Gonset Super-ceiver with a 262 kc IF and an attached Super 6 converter. Center stage is the Gonset Commander, 1.7 to 54 mc, 35 to 50 watt AM transmitter with its original set of 4 plug-in coils. The Commander measures 8.5" X 5 3/8" X 7 1/8" deep. On the right side is the classic Gonset Signal Slicer that used a 455 kc IF.

3011 88-108 mc fm, squelch optional
3012* 152-162 mc fm, squelch optional
3013 162-174 mc fm, squelch optional
3029 VHF Crystal Controlled Tuners - any single frequency 30-170 mc
3037 2-Meter Tuner - receiver portion of Communicator with cascode RF amp & noise clipper
3038 Deluxe 2-Meter Tuner - same as 3037 but with squelch
3239 Auto FM Tuner - 88-108 mc fm, replacement for 3011

FIGURE 2 EQUIPMENT

The 3041* Super-ceiver was a unique accessory consisting of a 262 kc IF strip with BFO and detector plus the 3034* audio unit listed below. It could be used with any converter but was normally shipped with a crystal to work with the Super 6's 1430 kc output. The control head for the IF strip/detector is shown in figure 2 mounted on the bottom of the converter, grouping all the receiver controls together. The Super-ceiver was often used as a companion receiver to the 3016* Commander transmitter, built between 1952 and 1956. The 3020 VFO Adapter for this transmitter is really just a box of tuned circuits that cover the amateur bands. Again, it came in the standard converter case.

All tuners can be used with ordinary radios, audio amplifier/speaker systems or the following:

3034 Audio Amplifier/Power Supply with speaker and 6vdc vibrator power supply
3036 same as 3034 except 115vac power supply

Other accessories included the following items:

3000 Deluxe Noise Clipper with Squelcher, smaller case
3001 Noise Clipper, to reduce ignition interference, smaller case
3006 Steering Post Mounting Adaptor, bracket for any standard size con

verter or tuner

3027 Cascode Pre-Amplifier - untuned 144-148 mc, 10db gain, smaller case

3028* Signal Slicer – 455 kc IF amp with noise clipper, 3.5 kc selectivity, larger case

With the exception of the 3003 1.6-6.0 mc and 3030 Super 6 tuners, which were replaced by new models, most of the equipment listed above was manufactured almost to the end of the independent Gonset Company. A few continued after Faust Gonsett sold the company to Young Spring and Wire early in 1957. The Super 12 was the last Gonset converter, surviving until the sale of Gonset to Altec Lansing in 1963. After that, Gonset manufactured only the 6- and 2-meter Sidewinder transceivers and a line of linear amplifiers. The company's last advertisement in QST was as a division of Aerotron in the November 1968 issue. ER

[Editors comments from page 1:]

advantage of current postal regulations, and to streamline the pre-sorting process.

As a lot of readers may already know, Electric Radio is going to have a web site that will be operational in January 2003. I've put a lot of thought into this, and I have decided that web sites are a near-necessity for doing business these days.

ER will never be a web publication, and I don't intend for the web site to compete with the magazine. One of the big advantages for subscribers is that I will be able to communicate to everyone the date when the magazine goes into the mail, or if there are other problems with the mailings such as what happened in October. It will also be more convenient for some who wish to renew their subscriptions on the site via a secure server. Information about the site is inside the back cover of this issue.

Please get your photos and biographies into Barry for his photo book. There have been a few more submissions, but not enough to make the project work. I've been guilty of this as well. Here is his address:

Barry Wiseman, 14643 County Road G, Cortez Colorado 81321-9575.

I need to ask everyone who sends in their classified ad copy to include a note saying how long that you would like the ad to run in the magazine. A lot of the ads have been running for some time, and I'm sure the equipment has been sold or found. I need to provide room for everyone to run their ads.

See you on the bands!

ER

[West Coast AM Update from page 2:]

groups, all too numerous to mention, meeting in the AM windows. One interesting group meets every Saturday and Sunday morning on 7293 kc at 9:00 am PST and is usually called to order by Willis Seaman (W9FGJ). A second is on 160 meters at 1925 kc and meets around 9:00 pm PST every Saturday evening. John Svoboda (W6MIT) usually calls this net to order. There is always someone monitoring or having an informal rag chew here in the west on 3870 kc, our west coast calling frequency, 1885 kc for the Southern California guys, and 14.286 kc just after 0000Z for cross country QSOs. Another interesting informal group is on or around 7290 kc every Friday and Saturday night after 10:00 pm PST or 1:00 am EST working AM contacts over North America.

I hope this information will help encourage you all to heat up the filaments and join in the fun along with great fellowship of operating your AM rigs. I'll look forward to hearing you on the air. ER

A Sure-Fire 10 Meter Exciter or Transmitter

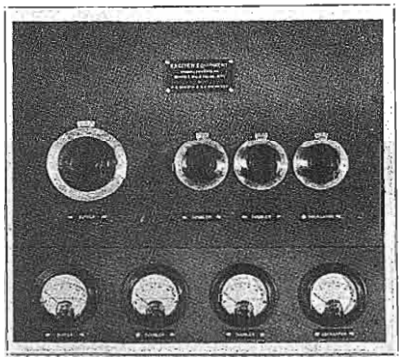
by Faust Gonset
W6VR

A Sure Fire 10 Meter Exciter or Transmitter

By Faust Gonsett, W6VR

No neutralizing, no trick circuits, 30 watts output on either the 10 meter amateur band or the 8½ meter police band, this unit may be used either as an exciter for a high power stage or as a transmitter. If used as a transmitter, it may either be used as is for c.w., or plate-and-screen modulated for telephony.

Although there are dozens of trick methods of getting down to 10 meters from a 40 meter crystal "in a hurry", and in spite of the fact that most of these circuits can be made to work satisfactorily after much juggling of constants and shifting of components, it is highly



The 30 Watt 8.5-10 Meter Unit

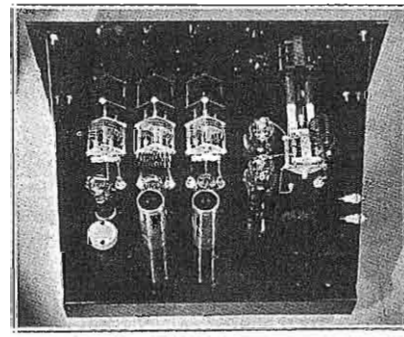
doubtful if the saving in equipment is justified, unless space is a prime factor. There is no denying the fact that a string of straight doublers is easier to get going than a regenerative quadrupler, and where reliability is of importance, the cost of an extra receiving tube and inexpensive midget condenser is a minor item.

The unit shown in the photographs was designed as an exciter unit for a pair of type 800's on 8½ meters, running 24 hours a day in a police transmitter. Naturally, for such work dependability is of greatest importance. For that reason, straightforward design was followed in preference to innovations.

Cathode bias on all stages makes operation practically foolproof. If the crystal fails to start, or for any other reason should any of the stages lack excitation, no apprehension need be felt for any of the tubes, as the plate current falls to a safe value.

In case you wonder why 41's were used in place of 42's, the 41 was found to be a better doubler than the 42 at 10 meters, probably due to less interelectrode capacitance. In fact, when using a 42 in the 10 meter doubler in place of the 41, it was necessary to prune a turn off the coil to hit resonance (the doubler coils are cut to resonate at a very low value of tank capacitance). 41's were used in the oscillator and first doubler stages merely for the sake of uniformity. Then too, as 41's are used in the police car receivers, it is unnecessary to add another tube type to the stock kept for spares.

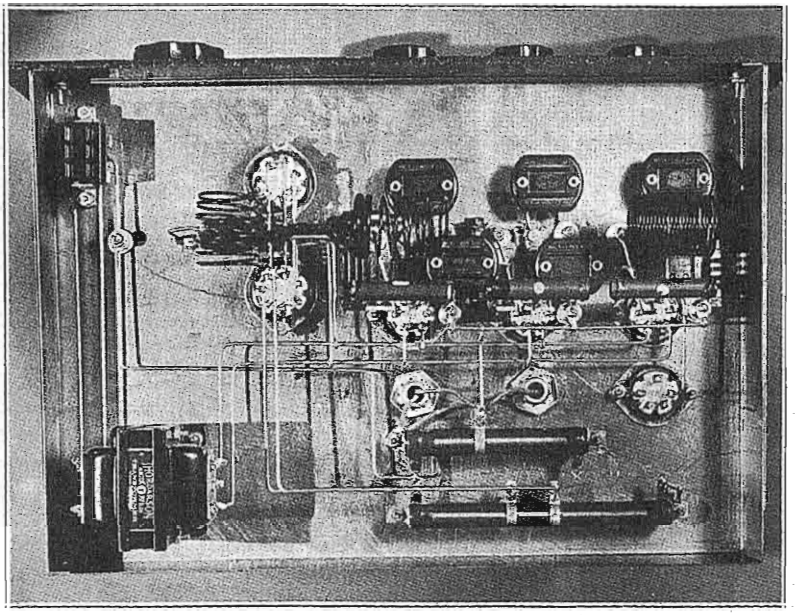
Filament supply is obtained from a 6.3 volt transformer mounted on the underside of the chassis. Plate voltage is obtained from an external power supply that delivers 600 volts under load, the 500 volts for the oscillator and buffers being obtained from the 600 volt supply through an adjustable dropping resistor of 1000 ohms, set to give a 100 volt drop under load. This resistor, not shown in the diagram, is of 50 watts rating and may be seen in the photo showing the bottom view of the chassis.



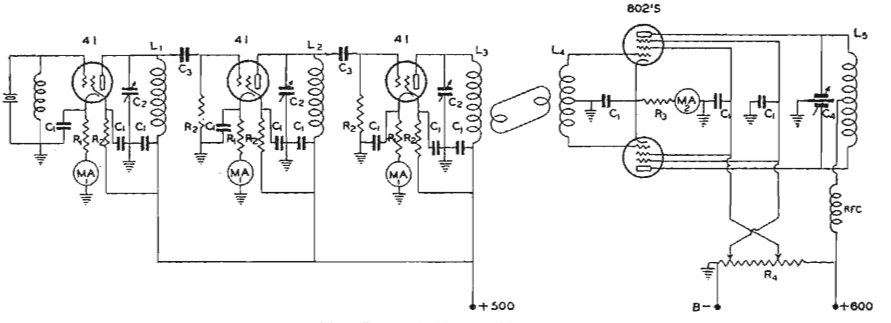
Looking Down on the Unit, Showing Construction

If desired, the plate voltage for the three 41 stages may be obtained from a separate power supply.

Although the plate voltage on the crystal oscillator may seem rather high (500 minus the cathode bias) the crystal current is not suffi-



Under Chassis View. Layout of Parts Should Be Followed Exactly



The General Wiring Diagram

C_1—.004 µfd. mica
C_2—35 µµfd., 2000 volt spacing
C_3—50 µµfd., mica
C_4—25 µµfd. per section, 2000 volt spacing
C_5—Two 4 µfd. 700 volt paper condensers in parallel to provide additional filtering on 500 volt supply (not in diagram)
R_1—750 ohms, 10 watts
R_2—50,000 ohms, 3 watt carbon
R_3—300 ohms, 20 watts
R_4—25,000 ohms, 75 watts, adjustable taps
MA_1—0-100 ma. d.c.
MA_2—0-150 or 0-200 ma. d.c.
RFC—2.5 mh. pie wound
Coils—See coil table

cient to endanger the crystal, and if an "AT" cut crystal is used there will be no noticeable drift, even if left on for long periods of time. The low crystal current is due to avoidance of grid leak bias and to the fact that low screen voltage is used.

The three coils L_1, L_2, and L_3 should be squeezed together or pulled apart until each tank resonates with the condenser plates nearly all the way out. The coil L_4 should be adjusted the same way, being adjusted for maximum

grid drive to the 802's. A ½ watt neon bulb touched to an 802 grid, or a small flashlamp and loop coupled to the coil itself, will facilitate this adjustment.

The final coil, L_5, should be adjusted in the same manner, until the condenser resonates with the plates from a quarter to a third of the way in. Low "C" is also desirable in this tank, but it should be not too low. In the oscillator and doubler stages, the lower "C" the better.

The method of placing the coils automatically provides all the necessary shielding. As may be seen in the photograph, the 10 meter final grid coil and last doubler coil are below deck, shielding the 10 meter input circuits from the 10 meter final plate circuit. Only the final amplifier plate coil and the 20 meter doubler coil are above deck, all others being below.

The coupling link between the last doubler and the 802 grid coil consists of 3 turns on each end. Some juggling may be necessary here to load the doubler fully. When properly loaded and operating correctly the cathode current (plate current, grid current, and screen current) should read between 45 and 50 ma. on each of the 41's. If the last 41 does not pull that much current, it needs tighter coupling to the 802 grids. It may be necessary to use 4 turns on one end of the link in some cases, as the transfer of energy with link coupling seems to fall down at frequencies above 25 mc. But even so, it is much more efficient than capacitive coupling at those frequencies.

The final tank coil should be mounted in the clear, as far from any mass of metal as possible, and not closer than an inch to the condenser or panel in any case. The ends of the coil should not be closer than 2 inches from any metal in the direction of the axis of the coil, as the field is much stronger in that direction than off the sides of the coil.

The most important thing to observe in wiring the unit, besides short grid and plate leads, is to run separate ground returns on all bypasses and return circuits to a *common point for each stage.* Ground each cathode through a condenser with as short a lead as possible, and then run all other ground leads for that stage to the point at which the cathode bypass

COIL TABLE

	8.5 Meter Police Band	10 Meter Amateur Band
L_1	20 turns slightly spaced	22 turns slightly spaced
L_2	9 turns space wound	10 turns space wound
L_3	5 turns space wound	6 turns space wound
L_4	7 turns space wound	8 turns space wound
L_5	8 turns space wound	9 or 10 turns same

All Coils Are Wound with no. 12 Enamelled, 1⅜" Diameter.

RECEIVER CONTEST

For the best receiver article submitted to "RADIO" before November 30, we are offering the winner his choice of the following transmitting tubes: One HK-354, one Taylor T-200, one Amperex HF-300, two Eimac 50-T's, two Raytheon RK-35's, or one RCA-805.

RULES:

1) *The story must be original and must not have appeared elsewhere.*
2) *All articles accepted for publication will be paid for at our regular rates without regard to the contest. The winner, in addition to the usual cash payment for his manuscript, will receive his choice of the above prizes.*
3) *No rejected manuscripts will be returned unless accompanied by a stamped, self-addressed envelope.*
4) *The members of the* RADIO *technical staff will act as judges.*
5) *Manuscripts must be postmarked by November 30, 1936.*

The receiver does not have to be elaborate to win, may have as few as three tubes. Originality, performance, unique features, and mechanical construction will determine the winner, not the number of tubes. Diagrams may be rough pencil sketches, and the article does not have to be written in flowery language, as the diagrams are redrawn anyhow and the manuscript can be rewritten by us if necessary. However, *good clear photographs* will be a deciding factor in choosing the winning manuscript. Also, be sure to list the components *both* by value (ohms, etc.) and manufacturer's type number. Before announcing the winning receiver, it will be duplicated in our laboratory to confirm the author's performance claims.

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is grounded. After the wiring is finished, take a piece of number 8 copper wire and bond together all of these ground points.

Do not rely on the chassis for the ground return for the variable condensers, even though they all have their rotors grounded. Run a wire from each condenser frame as directly as possible to the common ground point for that stage.

If the unit is used as a driver for a high power stage, the two should be placed close enough together that the coupling link is not over 2 or 3 feet long. There will be considerable loss in the line if it is much longer than this. Using manufactured 72 ohm cable (the type designed for twisted pair fed doublets) will help to minimize this loss. Do not use the cheaper grade antenna feeder cable sold for b.c.l. all-wave antennas. Most of this b.c.l. cable has stranded wire conductors, which are unsatisfactory at high frequencies.

The screen and suppressor voltages for the 802's are obtained from the voltage divider, R_4. After the 802 stage is working, the sliders should be given a final touch-up with the 802's delivering power under normal load, as the voltages will change somewhat when the final tank circuit is loaded and the screen and suppressor currents change. Adjust the taps so that the suppressor reads 50 or 60 volts as read on a high resistance voltmeter from suppressor to *cathode*, not from suppressor to ground. Adjust the screen tap to 150 or 175 volts as measured from screen to *cathode*. Then take another look at the suppressor voltage to make sure that it is still in the neighborhood of 50 volts positive with respect to cathode, as the adjustments will interlock somewhat.

It is important that in the 10 meter stages the sockets be of good grade ceramic material. Fiber sockets will introduce considerable loss at that frequency.

When working properly and at the voltages specified, the 802's will draw about 150 ma. cathode current when detuned from resonance. (*Warning*: Do not let them run that way for more than a few seconds.) When properly loaded and tuned to resonance, the stage will draw from 125 to 130 ma. cathode current. At this input the measured output should be between 25 and 30 watts, and if this output is secured, the efficiency will be high enough that the tubes may be run all day at the input specified without danger of their getting too hot.

For c.w. use, the plate voltage on the 802's may be run up to 650 or 700 volts, and the stage loaded up to 145 or 150 ma. cathode current. However, at this input the key should not be held down for any length of time, as the input is considerably in excess of the rated maximum for the tubes. A keying jack may be inserted between MA_2 and ground for c.w., thus keying the cathode circuit of the 802's.

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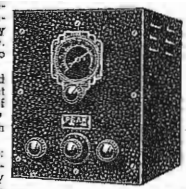

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This article was reprinted from the October, 1936 issue of Radio Magazine, the so-called West Coast radio magazine that was established in 1917. It was published in Los Angeles, California and the boss was W.W. Smith (W6BCX). On the staff in 1936 under the title of "Laboratorians" was Faust Gonset.

One wonders what became of rigs such as this. It is a beautiful piece of work that may be resting yet today in some forgotten attic.

ER

A WW2 Navy CW Rig Speaks

by Robert B. Login, AA8A
jlog@mindspring.com

I couldn't pass it up! The Navy TBD had a pair of 813's in the final and the price was right. My friend Brian (KN4R) didn't want to restore it, and he knew as soon as I saw the 813s I would take it off his hands. The rig was not big by navy standards at 135 lbs. Its dimensions are about 14" wide, 21" deep and 45" high. It came with a separate ac power supply, the ET-8019, and both the navy and coast guard versions of the manual. Well, a pair of 813's should be good for a kw input, say 600-800 watts out, but the manual and the tag on the rig says 200 watts, CW only. There is no AM modulator, but they included MCW instead! Hey, did our Navy ask only partial output from the sailors? I would think Uncle Sam would at least expect 500 watts! Some of the other navy rigs you see from time to time are extreme boatanchors of gigantic size and weight. By ham standards, they have low output. Well if you are like me, big means power beyond 100 watts. We won WW2, so our navy must have known what they were doing.... possibly listening to the ARRLs call for the use of only "necessary power"?

The circuit consists of an 807 master oscillator covering four bands from 2000 kHz to 5600 kHz. The 807 stage is used as a VFO or as a crystal oscillator. It is followed by an 807 buffer/multiplier for frequencies up to 22MHz. The 813s function as straight through amplifiers. The VFO is unique in that it uses a special heat compensating capacitor that works like a thermostat. It changes mechanically as it heats up to compensate for drift. I have had no problems with drift and it works as advertised. Next to the 813s is a MCW modulation transformer that can be fed with 500 cycles in the primary from the shipboard power supply. It produces 70% modulation, according to the manual. The rig is keyed with a relay that activates all stages by grounding the cathodes. The output circuits are designed to current or voltage feed a variety of short and long antennas. One of the coils with switchable taps also had a giant ferrite slug that can be mechanically moved in and out of the coil from the front panel. It looked to me like it would be pretty easy to tune the rig up on the wrong frequency with all the controls and multiplication necessary to get up to higher bands. The builder solved this issue by providing detailed charts of the control settings for desired frequencies. I suppose that an astute radioman would use his adsorption wave meter just to be sure.

Radiomarine Corporation of America (RCA) built the rig in 1943, and it looked very neglected. It gave the impression of being consigned to some damp, dusty storage for years. It did have signs of some ham use, like a coax connector and an extraneous switch. The first order of business was to strip her down and redo the front panel. I diligently removed the entire front panel trying my best not to damage anything in the process. Every item was carefully labeled and placed in plastic bags. When the panel was finally free, it was stripped of all paint then sanded and primed. I then used Plasticote black crackle paint to finish it. After putting on several thick wet coats, I would hold my breath waiting for the crackle

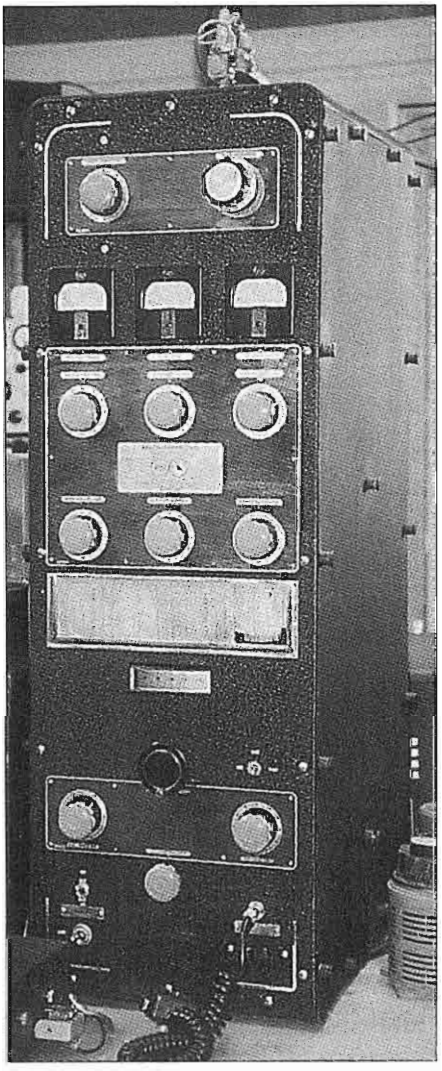


Figure 1: The great-looking Navy TBD is all fired up and QRV in the authors' shack.

to appear. I try to do this on a hot, clear, low-humidity day. If the weather turned foul before the job was finished, I would have a radiator-type room heater available. I didn't need it, as the crackle appeared as expected and looked pretty good.

Now that everything was exposed, it made sense to check all the components, I found several resistors that had gone high in value and were replaced. I removed the 807 VFO assembly and found additional out-of-spec resistors that were also replaced. The 813 screens are fed through a battery of series dropping resistors. The total resistance was significantly higher than the schematic indicated, so I simply tapped them at a convenient point that gave the correct resistance.

Rather than use the rather strange output circuits designed for either short whips or shipboard long wires, I decided to convert the whole shebang to a pi-network. This required installing an output loading capacitor in one of the holes vacated by the unused tank components (C127 and L101) and lifting the ground off of L102 and routing it to the new loading capacitor. I then reinstalled the panel components including the cleaned and polished meters.

I was very pleased with the appearance of the rig especially after cleaning and repainting the engraved plates. The old Lady looked nice!

I now tackled the power supply, which was a dirty, corroded, heavy weight backbreaker. I was able to remove the front plate exposing the chassis for a good cleaning and wire brushing. Painting was straightforward and I used black crackle on the front panel to match the rest of the rig. I substituted solid-state 866A replacements for simplicity and to boost the 1250-volt output. The power supply was brought up on a Variac. It worked OK, and afforded voltage in the range expected.

It was now time to try her out. My first problem was to set the pi-network taps to the correct position on the tank coil. I used the suggested settings in the manual to initially set the VFO and the

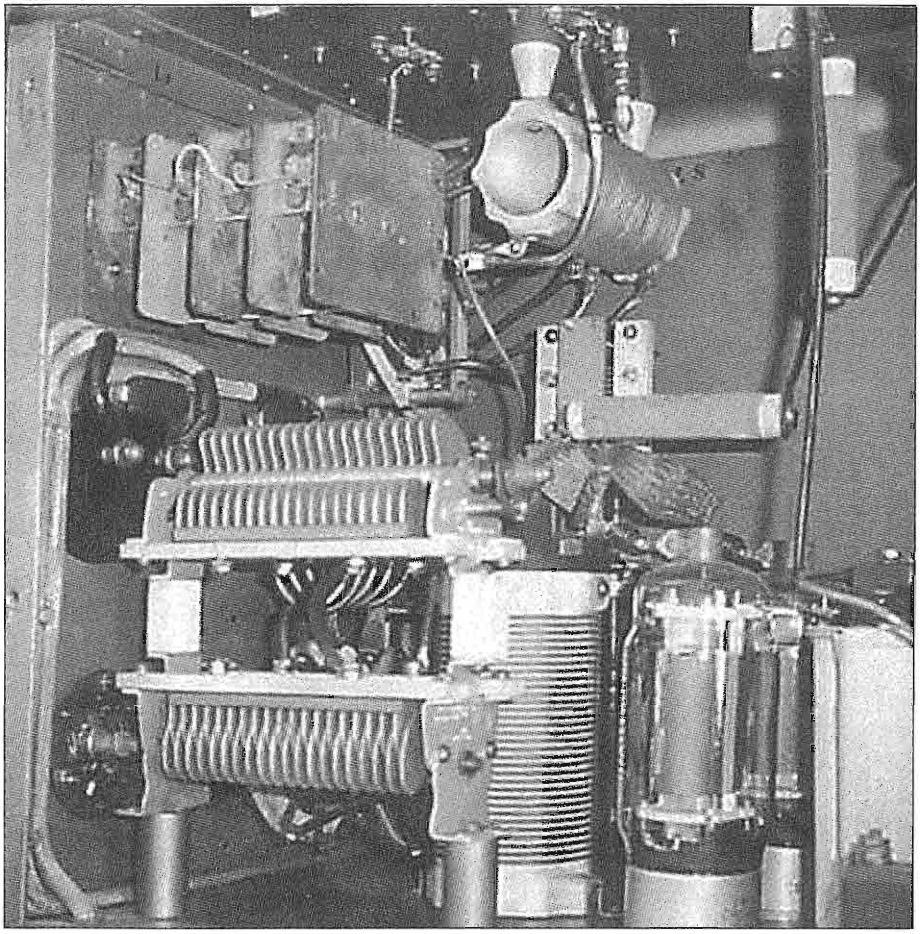


Figure 2: The unmodified TDB and it's associated power supply. Notice the 813s and the MCW modulation transformer behind them. The bank of resistors is employed to drop the screen voltage from the B+ line.

buffer/multiplier stages. I applied power to the VFO and buffer/multiplier with only filament voltage on the finals. I listened in a nearby receiver and heard the sweet note, loud and clear. The buffer/multiplier indicated a peak on its associated grid drive meter, so I keyed the final by actuating the CW relay that grounds the 807 cathodes and the center tap on the 813 filament transformer. I employed a Variac on the plate supply and used about 1000 volts for tune-up. I tried to tune-up on 3885 kHz and had very little output. I started moving the switch on the several coils that I placed in series to act as a tank circuit in the new pi-net. I started from the end with the greatest number of turns and went towards the other end. I watched an output power meter, and output frequency with a HP frequency counter. As I approached resonance, the power out came up on the correct frequency. Go-

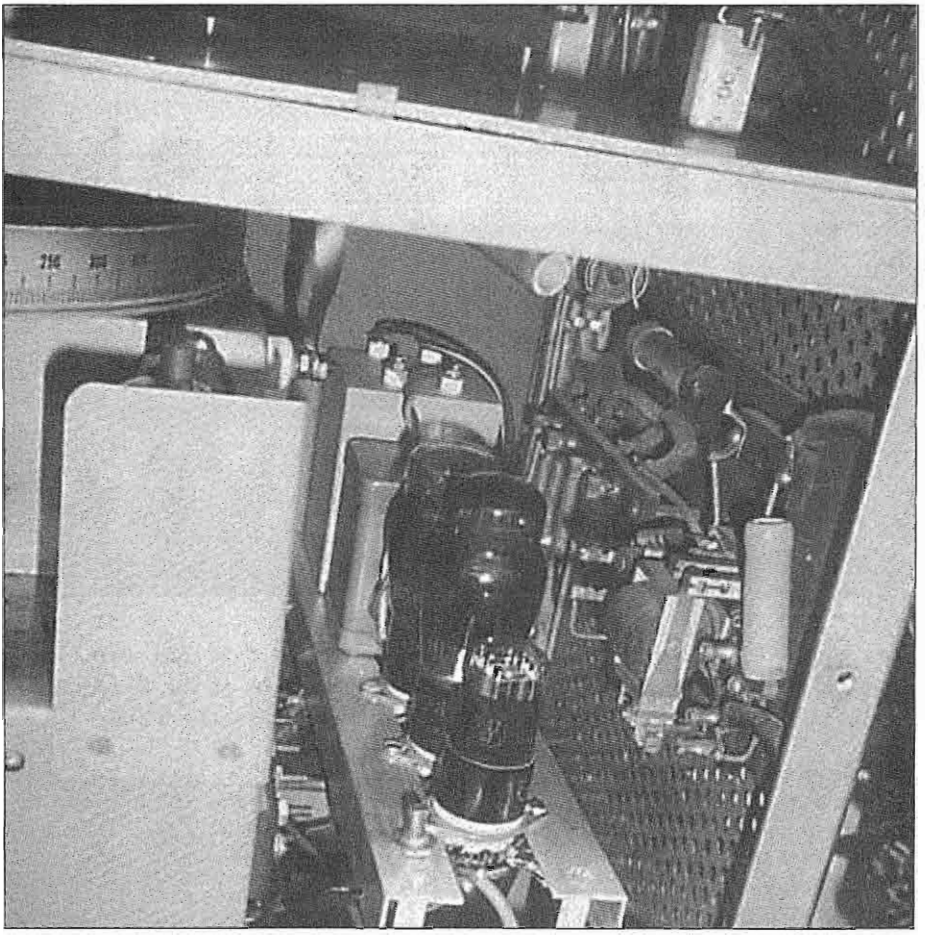


Figure 3: The cathode modulator mounted behind the vfo. It has a pair of 6Y6's, driven by a 6SL7. The 813's filament transformer is conveniently mounted under the modulator for easy access.

ing past the sweet spot resulted in lower power and even the wrong frequency! At the best spot I was able to get about 200 watts. Now, increasing the variac to maximum resulted in 400 watts with about 370 ma total (screen & plate) on the final. So far, I have obtained this level of output on 1935 kHz. This is the lowest frequency the VFO will tune without modification. It will tune up on 7290 and 7295 kHz, but I have not tried 14286 or 15 meters.

CONVERSION TO AM

Well, now I had a big and probably chirpy CW rig. How was I going to get it on AM? I could not find a suitable modulation transformer. The closest I came to getting one was watching Andy (W4KCY) walk off with one at the Lawrenceville hamfest. Andy does such beautiful work that I took solace in knowing the prized object found a good home.

Frustrated, I decided to build the

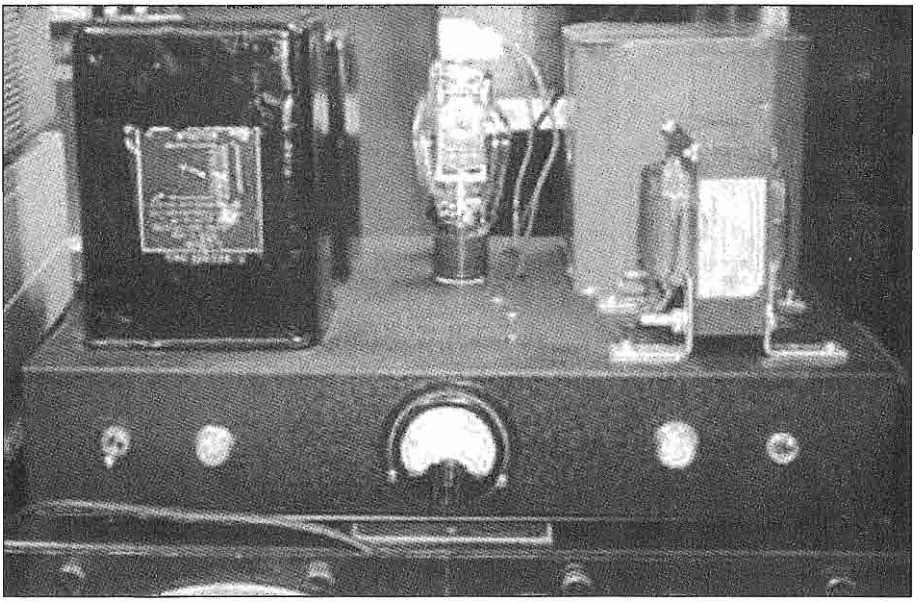


Figure 4: The class B 811A modulator. The prized S-22 250 watt modulation transformer is the grey one to the right of the 811As. The chasis is painted black crackle to match the finish on the TDB.

cathode modulator described in ER #75 by Berkemeyer. I built this device on an aluminum angle so that I could mount it behind the VFO. Then, I placed a CW/AM switch and a mike connector with extra contacts on the panel. These are used for a ptt system that consists of a 120-vdc coaxial relay whose extra contacts are used to activate the 120 vdc keying relay in the rig. This guarantees that the antenna is in the circuit before the RF power comes on.

Firing up on cw gave 400 watts out, but when turned to AM, the output power dropped to 200 watts. My Heath SB610 scope showed quite a bit of modulation, but not 100%. It looked like maybe 40-60%, so I crossed my fingers and checked into the Old Friends Net. The "Voice With Distinction", K4VWD, came back and signed me in saying "We know it's you Bob, but you sure don't sound as potent as usual. You have a good strong carrier but turn up the gain on the modulator". I explained this was the best it would do. They said in reply "...well it sounds OK but with a lower level of modulation."

I went on to have several QSOs on 75 & 40 meters with similar results such as...."I've heard worse...sounds good but doesn't match the carrier".

Well, it was still fun after all; I had the old lady on the air and speaking! I used the rig with my "Battleship" receivers, the RBB & RBC described in ER#114 (Login), also manufactured by RCA. They use relays in the power supply center taps controlled by the extra set of auxiliary contacts on the ptt coax relay.

Jim (K4DEE) worked me on 160 and I knew from my friend's comments that cathode modulation with this rig was not the best situation. I had to find a modulation transformer.

It's really freaky how when you need

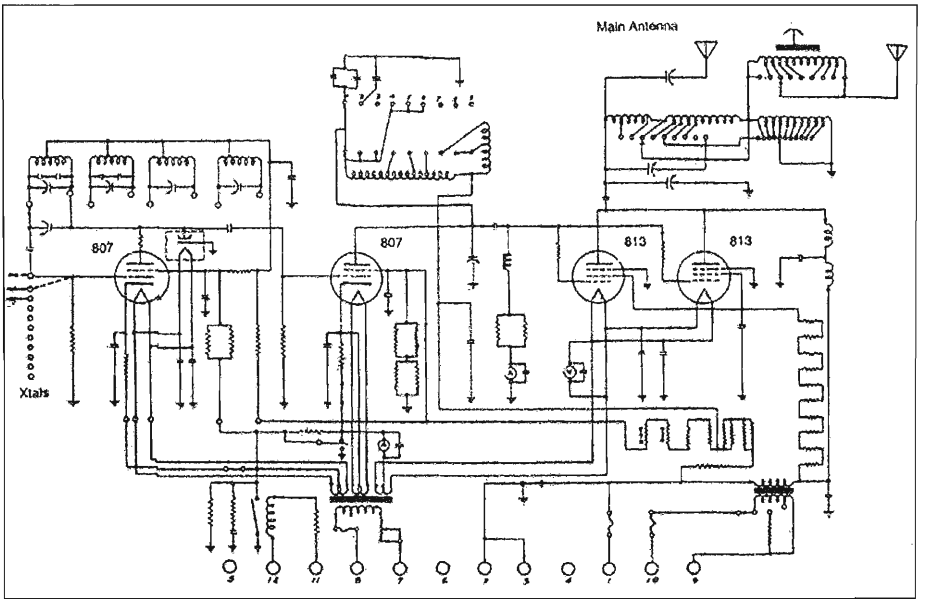


Figure 5: A partial TBD schematic showing major components of the original design.

something it will appear as if by magic. One day I decided to try 10 meter AM and I worked a W6. After a long and pleasurable QSO, I told this fellow about my search for a transformer. He said that I could come over and pick one up! Well, he is in the San Francisco area and I'm in SC. Even though it was not the easiest situation for him, he agreed to box one up and send it along! I asked if could I pay him something for it. He refused my suggestion, but I sent him a check anyhow. A week or two later a NOS S-22 250 watt multitap modulation transformer showed up at my door!

I set to work immediately on a Class-B 811A plate modulator. It was a straightforward handbook design, and I built the power supply on the same chassis so that the unit would be self-contained. I divided the B+ line in the rig so that I could modulate the final while maintaining the correct voltage on the other stages fed by dropping resistor networks from the plate supply. I used a small 10-watt PA to drive the modulator by using a receiver output-matching transformer backwards to match the 811A grids. It sure looked good on the scope, showing big positive peaks and a nice string of pearls. Jim (K4DEE) and many others really liked the sound and raved about it; I was very pleased!

Well, that's it; look for me mostly on 40 because that is my favorite band. I should really get back into the TDB and improve a few minor issues, like replacing the rheostat in the filament circuit, but I'm too busy enjoying using it to jockey it back onto my workbench.

ER

VINTAGE NETS

Nets that are underlined are either new, or have changed times or frequencies since the last issue.

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

Boatanchors CW Group: 3546.5, 7050, 7147, 10120, 14050 Kc. Check 80 on winter nights, 40 on summer nights, 20 and 30 meters daytime. Nightly informal net usually meets around 0200-0400 UTC. Listen for stations calling "CQ BA" or "CQ GB".

California Early Bird Net: Saturday mornings at 8 AM PST on 3870.

California Vintage SSB Net: Sunday mornings at 8AM PST on 3860 +/-

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

Canadian Boatanchor Net: Meets Saturday afternoon on 3745 Kc at 3:00 PM EST.

Collins Collectors Association Nets: Technical/swap sessions meet every Sunday on 14.263 Mc at 2000Z. A long-established net run by call areas. Informal ragchew nets meet Tuesday evening on 3805 Kc at 2100 Eastern time, and Thursday on 3875 Kc. West Coast 75 M net is on 3895 at 2000 Pacific time.

Collins Collector Association Monthly AM Night: Meets the first Wednesday of each month on 3880 Kc starting at 2000 CST, or 0200 UTC. All AM stations are welcome.

Drake Technical Net: Meets Sundays on 7238 Kc, 4 PM Eastern time. Hosted by John (KB9AT), Gary (KG4D), Jeff (WA8SAJ) and Evan (K8SQG).

Drake Users Net: This group gets together on 3865 Kc, Tuesday nights at 8 PM Eastern Time. Net controls are Criss (KB8IZX), Don (W8NS), Rob (KE3EE) and Huey (KD3UI).

DX-60 Net: This net meets on 3880 Kc at 0800 AM, Eastern Time on Sundays. Net control is Jim (N8LUV), with alternates. The net is all about entry-level AM rigs like the Heath DX-60.

Eastern AM Swap Net: Thursday evenings on 3885 Kc at 7:30 PM Eastern Time. Net is for exchange of AM related equipment only.

Eastcoast Military Net: Check Saturday mornings on 3885 Kc +/- QRM. Net control station is W3PWW, Ted. It isn't necessary to check in with military gear, but that is what this net is all about.

Fort Wayne Area 6-Meter AM net: Meets nightly at 7 PM Eastern Time on 50.58 Mc. This is another long-time net, meeting since the late '50s. Most members use vintage or homebrew gear.

Gray Hair Net: The oldest (or at least one of the oldest at 44+ years) 160 meter AM nets. Net time is Tuesday evening on 1945 Kc at 8:00 PM EST and 8:30 EDT. Also check www.hamelectronics.com/ghn

Hallicrafters Collectors Association Net: Sunday on 14.293 Mc, 1730-1845 UTC. Control op varies. Midwest net Sat. 7280 Kc 1700Z. Control op Jim (WB8DML). Pacific Northwest net Sunday 7220 Kc at 2200Z. Control op Dennis (VE7DH).

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

K6HQI Memorial Twenty Meter Net: This flagship 20 meter net on 14.286 Mc has been in continuous operation for at least 20 years. It starts at 5:00 PM Pacific Time and goes for about 2 hours.

Midwest Classic Radio Net: Meeting Saturday morning on 3885 Kc at 7:30 AM, Central Time. Only AM checkins are allowed. Swap and sale, hamfest info, and technical help are frequent topics. Control op is Rob (WA9ZTY).

Northwest AM Net: AM activity is daily 3 PM to 5 PM on 3875 Kc. The same group meets on 6 meters at 50.4 Mc. Times are Sundays and Wednesdays at 8:00 PM. 2 Meters Tues. and Thurs. at 8:00 PM on 144.4 Mc. The formal AM net and swap session is on 3875 Kc, Sundays at 3 PM.

Nostalgia/Hi-Fi Net: Started in 1978, this net meets Friday at 7 PM Pacific Time on 1930 Kc.

Old Buzzards Net: Daily at 10 AM local time on 3945 Kc in the New England area. Listen for net hosts George (W1GAC) and Paul (W1ECO).

Southeast Swap Net: Tuesday at 7:30 PM Eastern Time on 3885 Kc. Net controls are Andy (WA4KCY) and Sam (KF4TXQ). Group also meets Sunday on 3885 Kc at 2 PM Eastern Time.

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

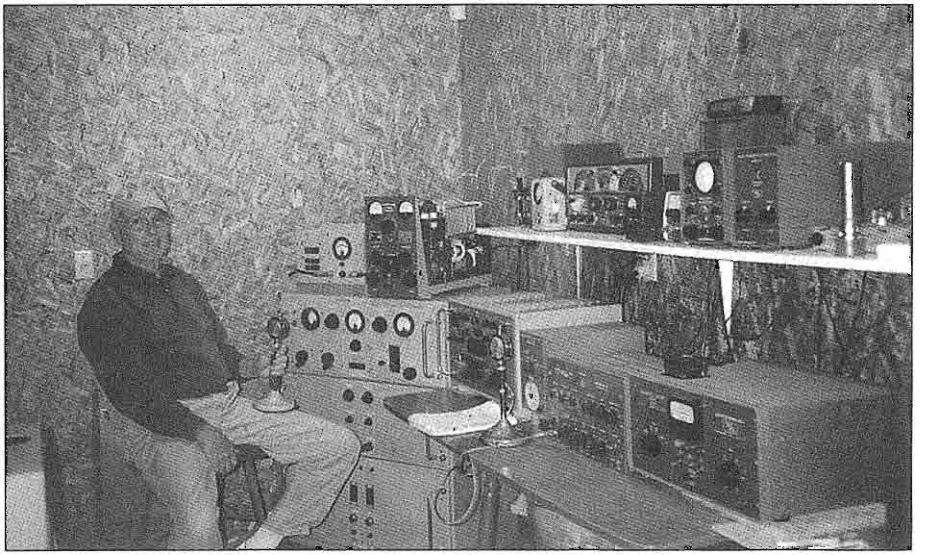
Swan Users Net: Group meets Sunday at 4 PM Central Time on 14.250 Mc. Net control op is usually Dean (WA9AZK).

Westcoast AM Net: Meets Wednesdays at 8 PM Pacific Time (winter sked) on or about 3870 kc. Net control rotates between Skip (K6YRZ), DJ (K6CRL), Don (W6BCN), Bill (N6PY), and Vic (KF6RIP).

Westcoast Military Radio Collectors Net: Meets Saturday at 2130 Pacific Time on 3980 Kc +/- QRM. Net control op is Dennis (W7QHO).

Wireless Set No. 19 Net: Meets the second Sunday of every month on 7270 Kc (+/- 25 Kc) at 1800Z. Alternate frequency is 3760 Kc, +/- 25 Kc. Net control op is Dave (VA3ORP).

A group of AMers gather at one of their favorite boatanchor hangouts, the Consignment Center in St. Paul Minnesota. Pictured from the left to right are Ken (WØSX), Larry (NØXB), Larry (WØFLY), Mike (KØMAZ), Tom (WØZR) and Dennis (KØEOO), and Mike (KØCOM).



Here's Butch (KØBS) with his vintage SSB station as he used in the late 1950s, when he was KØEUK. In the picture is an SX-100 rcvr., a CE 20A SSB exciter, a BC-458 VFO, a CE 600L broadband HF amp, a CE MM-2 scope and GC-1 gate compression audio amp. To the left is a B&W T-368E, a ME-165, and TMC TAC-1 tuner, and the faithful R390a.

Taking Digital Pictures for ER Articles

By Cora E. Cobb, KBØLPZ
2521 S. Holly St.
Denver, Colorado 80222
Cecobb@earthlink.net

To paraphrase a well-known saying, when you take a picture for ER, the important thing is detail, detail, detail! You should be able to read the markings on the dial, at least in your original photograph and its grayscale version. If you have people in your photo, you should be able to recognize them.

The most important element here is not your ability as a photographer but your camera. If your digital camera will not give you the necessary detail, then use a film camera and scan the photo to create a digital image. (Choose the scanning option of grayscale rather than color, since ER doesn't print color pictures.)

Remember that you need as much light as possible. Taking an indoor picture always requires a flash. You might also have to supply more light with a portable lamp or photoflood. Light your subject(s) from the front to get the most detail.

You also want to get as close to your subject(s), electronic and/or human as you can without cutting anything important out of the picture. An adjustable zoom lens is a real help here. Be sure to focus on the main subject when setting up and preferably keep everything of importance close to it.

Once you have decided how far away from the subject(s) your camera has to be, then you have to set your aperture ("f" number) and shutter speed. This depends on your individual camera and lens. Let whatever automatic abilities your camera has figure out the correct values for you. Otherwise use the "f" number and shutter speed combination that allows for greatest clarity of detail.

Once your picture has been taken and loaded into your computer, you can get it ready for submission to ER. For this you need the right photo software. I use Microsoft Photo Editor for ER pictures. (Software like Microsoft Photo Draw and Micrographix Picture Publisher can be used for more elaborate effects than you need for ER.)

Whatever format the picture had originally, you will want it to come out as a grayscale jpeg (jpg) image with a resolution of 300 dpi. Its width should be about 5 inches. You may crop and resize the photo to fit this width, but don't do anything else. Sharpening, color changing; fancy borders, etc. all interfere with ER's typesetting program.

Email the picture to ER@OfficeOnWeb.net (preferred) or snail mail it to:

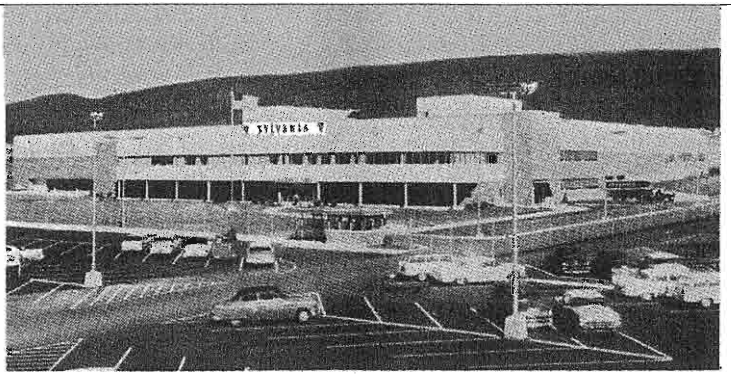
Electric Radio
PO Box 582
Pine, Colorado
80470-0582.

Note: I have taken all my ER pictures with a Kodak DC 4800 Zoom digital camera. It has a resolution of 3.1 megapixels and a 28-84 mm zoom lens. It will automatically give you the correct exposure under most distance and lighting conditions.

[Editors note: In addition to these photo tips, ER prefers articles in Microsoft Word format. Please don't embed photographs, drawings, or diagrams within the Word document because it is difficult typeset them, and preserve the resolution the author intended. Authors may email Word documents if it is convenient to do so, but

photos and drawings should be sent as email attachments, or sent through the mails separately. Also, mailed manuscripts are and non-digital photographs are fine. With the exceptions mentioned above, I can work in nearly any format that is submitted. If you scan photographs or drawings to send by email, please use Greyscale, 256 scales, and 300 dpi minimum. Digital photo resolution needs to be at least 150 dpi to reproduce well in the magazine, with 250 dpi preferred. With many digital cameras, the user doesn't always know what the resolution is. If the camera has menu settings for picture quality, select "best". The email system at ER can handle large files.]

ER



Sylvania Opens Tube Plant

FORMAL opening of Sylvania Electric Products Inc.'s new 190,000-sq ft receiving tube plant took place recently in Altoona, Pa. New facility is part of Sylvania Electronic Tubes, a division of the company, which produces a wide variety of receiving tubes, subminiature tubes, television picture tubes and c-r tubes for commercial, industrial and military applications.

Designed by the company's Facilities Planning Office at Williamsport, Pa., the new structure is fully air-conditioned, thus ensuring constant temperature and humidity control, factors vital to the production of high-quality electron tubes. The plant contains approximately 110,000 sq ft of production space and features one of the most modern systems for d-c voltage generation and distribution.

The new plant replaces two smaller tube plants in Altoona. William B. Bowes remains as manager of the operation, a post he has held for the past eight years.

Speaking at the opening, Don G. Mitchell, chairman and president of Sylvania, said that sales volume of the receiving tube industry will rise to the level of about 450 million tubes a year due, in part, to the development of new types of electron equipment and new applications for already existing equipment.

I wish this were true instead of being from a press release, December 12, 1958! ER

CLASSIFIEDS

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FREE: Various 19 inch rack panels, aluminum and steel types. PU only in Central IN. Dave, K9HDQ, 765-354-2884

FOR SALE: Collins 75A4 Pilot Line Receiver One, Collins 310C2 exciter, Hallicrafters VFO exciter, British Power Supply AC DC in or out, 1939 Ford car radio 937 chrome front, AR20 delux, NOS tubes: 3B24, 572B, 811A, 866jr, 807, 1625, 803, VT136, CNU3FP7. Bill Coolahan, 1450 Miami Drive NE, Cedar Rapids IA 52402-2933, 1-319-393-8075

FOR SALE: 2-805 & 2-845 tubes NOS in boxes $20.00 each, 2 WW2 field telephones EE-8B exc condx $100 pair + shipping. Lawrence Gross 11040 70th St So. Cottage Grove MN 55016, 651-459-3233

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

FOR SALE: 312A-1 lamp hoods, plastic finger holes and lid supports for S-Line cabinets. NOTICE: KW-1 Registry. For info K0BS@ATT.NET

FOR SALE/TRADE: C-E 100V, KW Bird Thruline #4113, Hallicrafters: S-108, S-119, SX-101A. **FOR SALE** Clegg Thor VI w/AC supply, $235; Gonset VFO, $75; Heath Sixer, $35. Richard Prester, 131 Ridge Road, West Milford, NJ 07480. 973/728-2454. rprester@warwick.net

FOR SALE: SBE 34 transciever $200.00. Back issues Electric Radio, $2.00 each. QST $2.00 to 5 each. John V. Smith WA4CG 1924 Dolphin Blvd, St. Petersburg FL 33707, 727-345-0464

FOR SALE: 516F-2 mint Collins, late winged, s/n 17508, manual, test report, $280; New 30L-1 fan motor $28.00. Ed Schaad, W3WDF, 8245 Garden Oaks Drive, San Antonio TX 78266. 210-651-9348

FOR SALE: Collins R390a, Extra nice, Original meters and tag. Works great. P/U only. David Thomas, Findlay OH. 419-423-9178

FOR SALE: Hallicrafters S-38-E, clean and original, $65 plus shipping. Ken, Waco TX. 254-772-7307

FOR SALE: Collins S-Line, 75S-3, 32S-1, 312B-4, and 516F-2. Very good to excellent condx. $1450. Cliff, AI7Y, 509-493-8203

FOR SALE: Hallicrafters SX-111 nice, $190; Megger, 500 volt, $70; Philco 70 cathedral, exc. $395. Ron, MI., 517-374-1107

FOR SALE: Fil. Xfmrs 5V/20A $29, 6V/8A $20, 6V/4.5Ax3 $29, 6V/6A $12, 7.5V/51A $95, 10V/5A $15, more. Small Fahnstock Clips 50c ea. Brian Carling 407-323-4178 _http://come.to/AF4K, or E-mail: af4k@arrl.net

FOR SALE: Heath SB300 $150, SB400 $150, HW101 w/ HP23 $200. Drake TR4C $250, TR3 $150. Ken Sands, K8TFD, 734-453-7658, ken.sands@juno.com

FOR SALE: Heath "Sixer", $35; Johnson 6N2 VFO, $85; Gonset VFO, $75; Ameco VFO, $55. Richard Prester, 131 Ridge Road, West Milford, NJ 07480. 973/728-2454. rprester@warwick.net

FOR SALE: TS-183 battery 40.00, I-208 sig-gen 50.00, BC-439 NIB freq meter 50.00, BC-1000 NATO 125.00, BC-221 freq meter 50.00

FOR TRADE: BC-611for FL-10-GN-44, RBL-5 Navy rcvr for PPN-1 ant. Or PPN-1 bag, BC-611 handy talky good condx trade FL-10-GN-44 PRC-25 nice shape trade for above & trade for PE-120 p.s.

Steve Bartkowski, 4923 w. 28th st, Cicero IL 60804, 1-708-863-3090

FOR SALE: RCA BTA-1R 1000-watt broadcast transmitter. Excellent condition with tubes. No mod transformer. John P. Tiedeck, 212 Grandview Rd., Media, PA 19063. 610-566-8049

FOR SALE: Reacto tester Mod. T-402 (cathode test) w/adaptors & original case $30.00; BK Dyna Q Mod 550 tube tester, big case, $35.00; Hallicrafters S40 A-A/O $100; Turner mic dynamic mod. 90 $150; Johnson CB Messenger 3 w/mic $45; Browning Laboratories (Business Radio Telephone) mod. 30 A/O w/jacks & plugs A/O $30; Scope tubes: 5AXP4, 3API (Navy) NOS; 5FP7 ea $20; Books: First Principles of Radio by Oxford Press PB, 1944, 250 pgs clean, @9 $5; International hand book for radio operators by Winston Red 1925 HB, @9 $5. Bernie Samek, 113 Old Palmer Rd, Brimfield MA 01010, 413-245-7174 ex 0441

FOR SALE: Hallicrafters SX-28, nice, works, complete, slight mods, w/manual copy and another SX-28 parts chassis $225. Jim, W8JHPL, 740-927-2592

FOR SALE: DZ-1 direction finder radio w/ shock mount $35. P/U only. Mike, 510-732-0932

FOR SALE: Hallicrafters S-38D, NR $45; Military whip antennas. Bruce Beckeney, 5472 Timberway DR, Presque Isle MI 49777. 989-595-6438

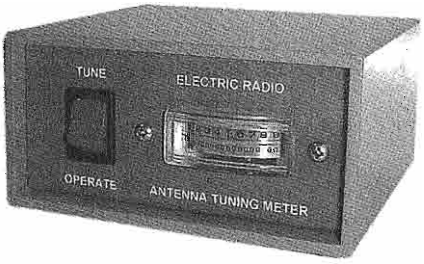
FOR SALE: CV-431 Transverter, Looks new, all tubes, 4 xtals, no bottom cover, $50 shipped. Don Moth W2MPK, 315-687-6453 W2MPK@dreamscape.com

FOR SALE: Gonset AR1 VHF Transceiver $25; Navguide AT-103 XTR VHF $15. Robert Martin, 111 Bancroft, Rochester NY 14616, 585-663-4182

FOR SALE: Hallicrafters R-48 spkr $45; Yeasu FT-101E w/ manual. Both exc condx $175. Bob Braza, W1RMB, (MA) 508-222-5553

FOR SALE: Power xfmr "SM330" for Silver-Marshal Radio $20. Free shipping in contiguous USA. J.F. Micsak, 1549 Shoecraft Road, Penfield NY 14526

Electric Radio Tuning Meter



This unit (built by Ron Hankins, KK4PK) allows you to tune up right on top of a QSO with only milliwatts of RF going to the antenna. Once the antenna is brought into resonance shown by a meter null, flip the switch to operate and you're ready to go. Saves friends and saves tube finals.

SO-239 connectors connect unit to transmitter, dummy load and antenna. For more information on how this device works see ER#60.

www.kk4pk.com

$49.95 plus $4.50 S&H
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ER Store, PO Box 582, Pine Colorado 80470-0582
720-924-0171 ER@OfficeOnWeb.Net

FOR SALE: Johnson Ranger w/manual $100 PU only. Doug, 303-791-3559, 6 Sutherland CT, Highlands Ranch CO, 80130

FOR SALE: Hallicrafters spkr R-46B $150 OBO; Brush BK-401 Soundmirror tape recorder $150 OBO; 1959 Bogen stereo amp $75 OBO; Saba-Freiburg Vollautomatic-15M stereo radio $50 OBO; ElectroVoice Aristocrat spkr $200 OBO; Heathkit A-7 amp $75 OBO; Scott 209 amp $200; Scott 300 tuner $200 OBO. Packing and shipping extra.

FOR TRADE: Hickok 650C video generator for Hickok 6000 tube tester, but will consider ANY Hickok 6000 unit. Henry Schwartzman, 32 E. First St., Corning NY, 14830, 607-962-0442 breakacd@hotmail.com

FOR SALE: Rare teletype Model 14 Non-typing reperforator, near mint condx $300.00 Bob, KL7HDX, 907-346-1044

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

FOR SALE: Interesting regenerative tube rcvr construction projects. Reprints from 1930s Gernsback magazines. Free list. Winners of first 20 Gernsback trophys in 1934 and 1935 "Short Wave Scout" DX contests. 50 full-size photocopy pages. Colorful front cover. Plastic comb binding. $15.00 ppd USA. ($18 to Canada). Bob Ryan, 1000 S. Gilbert St., Apt. 132, Hemet CA 92543-7065

FOR SALE: Collins Radio stock certificates, 33 avail, 10 share (green) or 100 share (blue), issued to various companies. $20.00 each limit one per customer. Check or MO. No choice on color. William O. Dean, KC7ICH, PO Box 3105, Tonopah, NV, 89049

FOR SALE: 1 KW professional broadcast AM transmitter. Raytheon RA-1000 in good condx, disassembled. Enclosure 4X5X7 ft, with all tubes, transformers. Perfect for 160 or higher. $400.00. Charles Graham K2GVE, 4 Fieldwood Drive, Bedford Hills, NY 10507. 914-666-4523

FOR SALE: New Ranger 1, Valiant 1, & Navigator plastic dials, freq numbers in green, with all the holes just like orig. - $17.50 ppd. Bruce Kryder, W9LWW, 277 Mallory Station Dr., Ste. 109, Franklin, TN 37067.

FOR SALE: Military Radio manuals, origs & reprints. List for address label & $1. For specific requests, feel free to write or (best) email. Robert Downs, 2027 Mapleton Dr., Houston, TX 77043, rwdowns_wa5cab@compuserve.com

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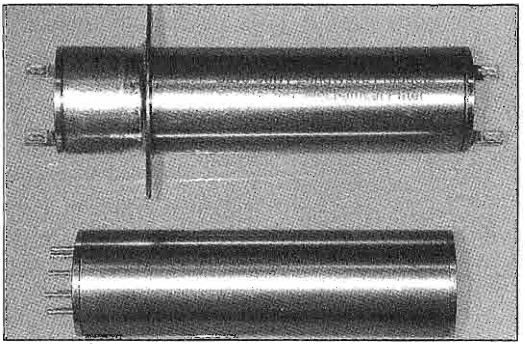
FOR SALE: New Collins winged lapel pin, still have meatball version, either type - $5.95 + .75 s/h. W6ZZ, 1362 Via Rancho Prky, Escondido, CA 92029. (760) 747-8710

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

FOR SALE: Mohawk/Apache drum dial reproductions, email for details. Ron, AB5WG, ab5wg@mylinuxisp.com; (281) 491-7823

FOR SALE: Vintage Radio Service. We repair radios, record changers, radios home, auto, tube & transistors. 1930-1980. Ken Hubbard, KA9WRN, POB 792, Beloit, WI 53512. (608) 362-1896

Dave Curry Longwave Products



R-390A filter Top, 75A-4 filter bottom

These are exact duplicates of the originals using the latest Collins-designed mechanical filters. The electrical specifications meet or exceed the original Collins design.

Back by popular demand! The R390a filters are back in production in all previous bandwidths.

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Has twelve aluminum alloy on steel sections form sturdy, yet lightweight 30 foot 1.7" dia mast. Kit in-cludes five each lower and upper sections, one ea lower and upper adapter sections, gin pole swivel base, four ea 36 and 42 ft guy ropes, four guy stakes, two guy rings plus 2.5 pound sledge hammer. Part of OE-254/ GRC antenna set; 30 lbs sh. NEW, $139.50

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IF Amp with good filters, but less RT510, used, $125

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

FOR SALE: Repro Nameplates, R-390A generic $9, S1J-3 and S1J-4 exact replicas, $12. Tom Marcotte, N5OFF, 210 Clem Dr., Lafayette, LA.70503. courir@yahoo.com

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

FOR SALE: R.L. Drake repair and reconditioning, most models including TR-7's, 35 years experience. Jeff Covelli, WA8SAJ, (440) 951-6406 after 4 PM, ws8saj@ncweb.com

NOTICE: Visit HamRadioUSA.com a website dedicated to traditional ham radio & vintage radio resources. http://www.radioing.com. Let's radio. W5AM

FOR SALE: Vacuum tubes NOS, used, some xmtg, SASE for list. E.F. Hayes, WØJFN, 3109 N. Douglas Ave., Loveland, CO 80538

FOR SALE: DX-35, DX-40 reproduction crystal doors. $11.50 shipped. Texans add 8.25% sales tax. Glen Zook, 410 Lawndale Dr., Richardson, TX 75080

FOR SALE: Galena xtals, detectors, radios, parts, etc. L. Gardner, 458 Two Mile Creek Rd., Tonawanda, NY 14150 radiolen@aol.com

FOR SALE: Tubes, xfmrs, meters, gear reducers. SASE for list. **WANTED:** Philco output xfmr 32-8107. E.F. Hayes, WØJFN, 3109 N. Douglas Ave. Loveland, CO 80538

FOR SALE/TRADE: Transmitting/rcvr'g tubes, new & used. $0.55 & LSASE for list. I collect old & unique tubes of any type. WANTED: Taylor & Heintz-Kaufman types & large tubes from the old Eimac line; 152T through 2000T for display. **FOR TRADE:** Two good RCA 833As' for one Taylor 833A. Also looking for Taylor 204A, 813, TR40M. John H. Walker Jr., 13406 W 128thTerr., Overland Park, KS 66213. 913-782-6455 jhwalker@prodigy.net

FOR SALE: Commercial power supply, 3000 volts at 1 amp. $175. Joel, W4SLH, 337 Compass Point Dr., Oriental NC 28571, 252-249-2344

FOR SALE: TUBES, good, used: 6JE6/6LQ6 $20; 4-125A $20; 6L6G $12; 211/VT-4C $30; 5763 $5; 811A $12; 5894 $17; 829B $18. Mel, WOMLT, 67750 Ridge View DR, Montrose CO, 81401. 970-249-1544

FOR SALE: Heath QF-1; HD16-HD1416 CPOS; AM-2 bridge; IM-10 VTVM; TO-1 Osc; $17.50 ea + shpg. Henry Mohr, W3NCX, 1005 Wyoming, Allentown PA 18103-3131

FOR SALE: HCX-100; GRP-109. Jim Barton, W0KNJ, PO Box 417, Burke SD 57523-0417

FOR SALE: Radio tubes, tested OK, used, free list. Len Gardner, 458 Two Mile Creek Rd., Tonawanda, NY 14150. radiolen@aol.com

FOR SALE: Books, send SASE. Richard Robinson POB 1425, Wallingford CT 06492 203-949-0871 richmix@erols.com

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

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

FOR SALE/TRADE: Misc. parts, tubes, for tube gear. Sandy Blaize W5TVW, 40460 Edgar Traylor Rd., Hammond LA 70403. ebjr@i-55.com

FOR SALE: Vintage equipment at the K8CX Ham Gallery Classified Ads section. Visit the largest Antique QSL Card Gallery http://hamgallery.com

NOTICE: T-368 Registry. For info w2zr@ao1.com Subscribe to the T-368 & BC-610 reflector at http://groups.yahoo.com/group/T-368_BC-610

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

FOR SALE: Strong steatite antenna insulators. Lengths from two to fifteen inches. SASE for list. John Etter, W2ER, 16 Fairline Dr., East Quogue, NY 11942. 516-653-535

FOR SALE: We have ham gear, tubes, parts and so much more! Carl A. Blomstran, POB 890473, Houston, TX 77289Please visit www.nadioworldonline.com.

FOR SALE: Aluminum knob inlays, Collins, Drake,National, Hallicrafters, Heath; Collins Dial Drum Overlays. Charlie Talbott, 13192 Pinnacle Ln,Leesburg VA 20176 540-822-5643, k3ich@arrl.net

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

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

FOR SALE: Build your own "Midget" bug replication by K0YQX, ca 1918, featured by K4TWJ in CQ Magazine, May '98. 10 detailed blueprints. FAX: 507- 345-8626 or e-mail bugs@mnic.net

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

FOR SALE: Tubes. We specialize in early receiving collector tubes & tube related books. Send for free catalog or see www. fathauer.com. George H. Fathauer & Assoc., 688 W. First St. Ste 4, Tempe, AZ 85281, 480-968-7686 tubes@qwest.net

FOR SALE: Collins restoration. Everything inside & out to make it as Art Collins built it. 50 yrs experience. W9OJI / N4FZ, IL, 815-734-4255 or N4PZ@aol.com

FOR SALE: Collins S-line and A-line repair. FCC licensed, many years of experience. lal@metrocast.net 207-457-9257

FOR SALE: Convert any wattmeter to read PEP! Perfect for AM/SSB-$19.95 ppd for complete kit! HI_RES, 8232 Woodview, Clarkston MI 48348, 248-391-6666, hires@rust.net

FOR SALE: Complete hardware set to connect Collins FM2 to KWM2 -$19.95 ppd. Warren Hall, KØZQD, FOB 282, and Ash Grove, MO 65604.

FOR SALE: Repair, upgrade, performance modification of tube communications & test equip. Accepting most military, all Collins & Drake designs, & the better efforts from others. Laboratory performance documentation on request. Work guaranteed. Chuck Felton, KD0ZS, Felton Electronic Design, Box 187, Wheatland, WY 82201. 307-322-5858 feltoned@coffey.com www.feltondesign.com

FOR SALE: Ur old QSL card? Search by call free, buy find at $3.50 ppd. Chuck, NZ5M, CRBCSl@prodigy.net

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

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FOR SALE: Military and commercial communications items. Murphy's Surplus, 401 N. Johnson Ave., El Cajon, CA 92020. 619-444-7717 http://www.maxpages.com/murphyjunk

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

FOR SALE: Panel refinishing: Johnson Ranger sets - $250; Valiant sets - $300; Johnson 500 sets -$300; Collins R390 (A), front side -$125, both sides -$225; Hammarlund HQ-180 series panel & bezel-$200, cab add $100. Dee Almquist, 534W. Main St., Waynesboro, VA 22980. 540-249-3161 Cell: 540-480-7179 http://w4pnt.8k.com.

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

FOR SALE: Aluminum heat dissipating plate and grid connectors for all 3, 4 and T series Eimac including 3-500Z, 4-1000, 304T's and 1000T's, W1ETC, Box 747, Amherst, NH 03031 etc. Alan Price fixr7526@cs.com

FOR SALE: GR 11, EK2, Swan 250, Hallicrafters S-38A. **WANTED:** Heath SB 110/ps.Bob WB0DMC 507-331-5103

WANTED: Needed for restoration project: Hallicrafters FPM-300 toothed band selector belt or information on its design to duplicate same. Kevin Gaul, N9HHI, 1424 South 2nd St., Springfield IL 62704.

WANTED: RCA/USCG T-408/URT-12 xmtr. Sam Timberlake KF4TXQ PO Box 161 Dadeville, AL 36853-0161 stimber@lakemartin.net (256)825-7305

WANTED: Heathkit DX-100B w/manual, no mods and in excellent condx. AND Johnson KW Matchbox exc. W/manual. Raymond Fisher, 937-692-8550

WANTED Information on a Sylvan Electronics transmitter. Uses an AX9903/5894 in final. Wayne LeTourneau PO Box 62 Wannaska, MN 56761 **letourneau@wiktel.com**

WANTED: Last part to complete restoration, Junction Box JB-70-A for xmtr BC-610-E. Robert L. Richmond, 3360 W. Water St., Port Huron, MI 48060. 810-984-439, w8mnq@tir.com

WANTED: Driver Transformer UTC S-9. Duane Scott 189 Laura Dr. Clinton PA.15026. 724-899-2441 zebsco@westernpa.us

WANTED: Coil sets for HRO-50. Casey, W8FDE MI 231-755-1579 FAX 231-737-3101

WANTED: Info on Signa-ICA-Tone CPO. Leather or canvas bags for EE-8 field phones. Louis. D'Antuono, 8802 Ridge Blvd, Bkooklyn NY 11209, 718-748-9612 6PM

WANTED: Misc. parts for ART-13 restoration. Got a parts unit? Tnx. Brian McQueen 2005 W. Iowa Hiawatha, KS 66434 785-742-4581 wj0p@hotmail.com

WANTED: Ranger II and HT-32B in near-new condition. John Curtis, W0CAR, 3146 S. Franklin Street, Englewood, CO 80110. (303) 781-8027. W0CAR@arrl.net.

WANTED: SB-104 main tuning knob, Ed Cuevas, 817-222-5355 (Fort Worth), ecuevas@juno.com

WANTED: Hallicrafters SX100 gen coverage rcvr (MK 2 preferred) exc operating condx (others considered). J.I. Lillie, PO Box 128, Onondaga MI 49264 517-628-3531

WANTED: Interstage audio xfmr (T3 or T4) for Johnson Viking xmtr. Cliff Fleury, AI7Y, PO Box 1233, Goldendale WA 98620. 509-493-8203

WANTED: Two Sylvania 8950 sweep tubes; Main tuning knob for SX-100 MK1a. K9GTB 618-362-6539

WANTED: Bandspread and main tuning dial for RME-70. Richard Petersen, 319-377-9126. dottielee526@juno.com

WANTED: Schematic for Ham Keyer Model HK-5 (small unit). Or, will buy working unit. Wes Chatellier, W5DPM, 1950 Chevelle DR, Baton Rouge LA 70806. wesW5dpm@eatel.net

WANTED: 70 foot or taller steel crank-up tower, prefer UT, TN, KY, W8, W9, W0, W5 or AZ locations. Others considered. Tom Berry, W5LTR, 1617 W. Highland, Chicago IL 60660, 773-262-5360, 773-301-7640

WANTED: Matching rcvr for my TCS transmitter; Hallicrafters SX-23 spkr. Bob Forte, K2RGM, 518-696-2400. forte@capital.net

WANTED: Needed to complete my BC-375: Very top panel and the top front louvered panel. Wallace D Simpson Jr, 2607 Norwood Ave, Savannah GA 31406

WANTED: Any TMC Equipment or Manuals, what have you? Will buy or trade. Brent Bailey, 109 Belcourt Dr., Greenwood, SC 29649 864-227-6292 brent@emeraldis.com

WANTED: Main tuning knob or slow motion drive for 75A4. KWS-1 parts including internal wiring loom, transformers T502 and T504, capacitor C501, and other smaller parts. John Munro, G3GBB tel. 01379-783657, Email jmunro2@ukonline.co.uk.

WANTED: AN/WRR3-R1134 VLF receiver. Jack Holzer 913-791 5141, days

WANTED: KNOBS and front panel meters for the GRC-19 set, T-195 and R-392. Please contact Gary W5UUO, 450 Cunningham Road, Celina, TN 38551 931-243-5323 w5uuo@info-ed.com

WANTED: James Millen plug-in coils p/n 42080, 42040, 42015, 43015. Bretting 14 manual. Gary Carter, WA4IAM, 1405 Sherwood Drive, Reidsville, NC 27320. Phone: 336-349-1991. Email: gcarter01@triad.rr.com.

WANTED: Westinghouse MW-2 and MW-3 transmitters and parts. Also HP Model 1727A Oscilloscope manual. Gary, WA4ODY, Seabrook TX 77586, 281-244-7695, myctpab@earthlink.net

WANTED: Manual for General Radio Co. Unit Oscillator Type 1211-C (.5-50 Mc.) Jim Eberwine, W4APV, 8118-37th Ave. North, St. Petersburg FL. 727-347-0942

WANTED: Empire PA210 Panadaptor, URM-25 Sig Gen, URM-26 Sig Gen, URM-7 Rec SBT. Dean, 6725 Portland Ave South, Richfield, MN 55423

WANTED: Manual and schematic diagram for LAPP Power Supply Model 73. 0-18v, 0-36v, 30 Amps (?). Alan Lurie, W9KCB, 605 East Armstrong Ave., Peoria, IL, 61603. 309-682-1674

WANTED: Schematic diagram for Freq Meter CRR 74028 (part of LM-13). Frank Hill WA6SYI 1313 Milton Ave., Walnut Creek CA, 94596 fdhill@attglobal.net

WANTED: Hallicrafters HA-20 VFO Line Sampler, or schematic and parts to homebrew. H.I. Stark, K9UBL, 3215 S. Meridian Street, Indianapolis IN 45217-3231

WANTED: Radios Master catalogs, pre vol #12th ed, all before 1947. R.V. Matson, W1CSO, FOB 956, Lake Panasoffkee, FL 33538. (352) 568-1629

WANTED: SCR-522, other WWII radio for flying aircraft restorations. NIB or exc condx. Ian Abbott, KC6UPT, 209-747-3639 ian@wildblueaviation.com

WANTED: TBX radio and/or accessories required by military radio collector. Ray, VK2ILV, ROBINSON@SHLRC.MQ.EDU.AU

WANTED: Older rigs & accessories. **FOR SALE:** Fil. Xfmrs 5V/20A $29, 6V/8A $20, 6V/4.5Ax3 $29, 6V/6A $12, 7.5V/51A $95, 10V/5A $15, more. Small Fahnstock Clips 50c ea. Brian Carling 407-323- 4178 http://come.to/AF4K or E-mail: af4k@arrl.net Brian Carling, AF4K, 117 Sterling Pine St., Sanford, FL 32773

WANTED: National radio pwr sply's for HRO, HRO-5 or SW-3. Bill Cabeen, KM6P, CA (310) 829-7678, cabeen@ucla.edu

WANTED: Fully functional w/manuals: Johnson AN/FRT 5O5 xmtr, Swan F51 and FC76. Contact Ric at C6ANI@ARRL.NET

WANTED: National NTE CW xmtr in working Condx. I love National. Sylvia Thompson, 33 Lawton Foster Rd., Hopkinton, RI 02833. (401) 377-4912. n1vj@arrl.net

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Military Boatanchor Manuals, Volume 2 -$45- contains the following manuals: ARR-41; BC-611-A, B, C, D, E, F; BC-939B; CV-157; CV-591A; CRC26-A,B,C; GRR-2; R-274;R-274-A,C; R-320A; R-483,-A; R-520; SCR-578-A,B; T-368, -A, B, C; TV-3B; TV-7, -A, B, D; TV-8; TV-10; URM-25-C, D, F, G, H; SX-28-A; SX-73; Hammarlund SP-600; Zenith Transoceanic; Gibson Girl.

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WANTED: Still looking for manual, schematics, trouble-shooting, RCAF Rx by TMC R-5007A/FRR5O2. David Boardman, VA2DVD, 418-877-1316 radioman@dbtubes.com

WANTED: Heath SB series parts source; B&W 160,80,40 JEL coils; McElroy bug. Brian Roberts, K9VKY, 130 Tara Dr., Fombell, PA 16123.724-758-2688, k9vky@arrl.net

WANTED: BC-348 () rcvr w/following suffix: B,C, H, J, K, M, N, P, S, for collection. Ken Kolthoff, K8AXH, POB 215, Craig, MO 64437. 660-683-5353

WANTED: Tube rcvrs in any condx from the Eddystone Radio Company. In particular the Following: 680, 680X, 888 (any model), and EA-12. Cal Eustaquio, N6KYR, 1747 Pescadero Dr., Salinas, CA 93906. catman351@yahoo.com

WANTED: B&W plug-in coils 80MEL, 800ES, 80BVL, 80JVL, 80TVL. Jim Jorgensen, K9RJ, 1709 Oxnard Dr., Downers Grove, IL 60516. 630-852-4704 k9rj@attbi.com

WANTED: Heath SB-220 project amp. Jim, AD5KD, Tulsa OK, (918) 747-3136, kd5gho@swbell.net

WANTED: Racal rcvrs; manuals for RA6790/GM/ ELF/VLF; Plessey IMR5000 manual; Plessey radios. Allan, Norco CA, (310) 812-0188, alan.royce@trw.com

WANTED: BC-610 pieces and parts of all kinds. John Schneider, K4HLM, 320 Woodchuck Ct., Roswell, GA 30076. 770-992-9668, tphase@mindspring.com

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WANTED: ARC-5 rcvrs, racks, dynamotors. Jim Hebert, 1572 Newman Ave. Lakewood, 0H 44107.

WANTED: Antique tubes. Paying $40 ea for good used type 201 tubes (not A). Buy list & new 2000-2001 catalog of collector tubes available. See www.fathauer.com. George H. Fathauer & Assoc., 688W. First St. Ste 4, Tempe, AZ 85281. 480-968-7686, tubes@qwest.net

WANTED: Old military radar displays, scopes, antennae, receivers, manuals, etc. Even half ton items! William Donzelli, 15 MacArthur Dr., Carmel, NY 10512. 847-225-2547, aw288@osfn.org

WANTED: Bendix radio rcvr RA-1B; Belgium set RST-101. George Rancourt, K1ANX, MA, 413-527-4304 or klanx@mindspring.com

WANTED: Collins 70K-2 PTOs working or not; 1N82A diodes; Bretting 14/14AX manual. Clark, WØBT, KS, (785) 286-2132

WANTED: Seeking unbuilt Heathkits, Knight kits. Gene Peroni, POB 7164, St. Davids, PA 19087. 610-293-2421

WANTED: Electric Radio, Antique Radio Classifieds, and Old Timers Bulletin. Alan Mark, POB 372, Pembroke, MA 02359

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

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

WANTED: Collecting military electronics including radio, radar, RDF and test, manuals & literature. William Van Lennep, POB 211, Pepperell, MA 01463. 978-433-6031

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

WANTED: Stancor/Chicago PCC200, PCO/PSO15O, RC8150; Triad A-9-J, A-l0-J, A-1l-J, A-12-j. **FOR SALE:** Books, send SASE, Richard Robinson, POB 1425, Wallingford, CT 06492. 203-949-0871 richmix@erols.com

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WANTED: Info on xmtrs made by Clough-Brengle Co. Used by the CCC, in the mid to late 30's. Any help would be greatly appreciated. Ron Lawrence, KC4YOY, POB 3015, Matthews, NC 28106. (704) 289-1166 hm, kc4yoy@trellis.net

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

WANTED: WW II Japanese xmtrs & rcvrs (parts, plug-in coils) for restoration & ER articles. Ken Lakin, KD6B, 63140 Britta St., Ste. C106, Bend, OR 97701. 541-923-1013. klakin@aol.com

WANTED: Collins 310B3, basket case OK - welcomed; & Chicago 500W CMS-2, high-level modulation xfmr; Taylor T21. Jerry, W8EGD, CO, 303-979-2323

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

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

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

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

WANTED: Orig Heath manuals for ham & test equip. Please state condx & price. Warren, K1BOX, NC, (828) 688-1922, k1box@arrl.net

WANTED: RCA 140,141, AVR5A. GE K80, K8OX, K85. Any condx. James Treherne, 11909 Chapel Rd., Clifton, VA 20124. treheme@erols.com

WANTED: ARC-2, ARR-7 and ARR-15 racks; BC1387for BC-611; whip antenna forPRC-124. Joseph Pinner, KC5IJD, 818 Hill St., Kingston, TN 37763. kc5ijd@bellsouth.net

WANTED: WW II German, Japanese, Italian, French equipment, tubes, manuals and parts. Bob Graham, 2105 NW30th, Oklahoma City, OK 73112. 405-525-3376, bglcc@aol.com

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

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

WANTED: Collins 30K1 xmtr; also need orig manuals & literature for 75A1, 32V1, 30K1. Paul Kluwe, W8ZO, POB 84, Manchester, MI 48158. 734-428-2000

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

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Produced by Floyd Soo, W8RO (ex-KF8AT)

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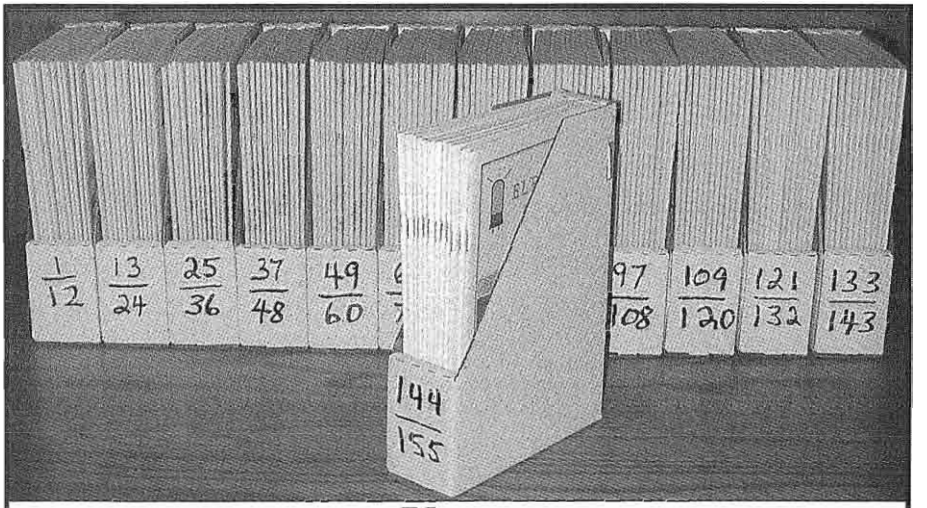

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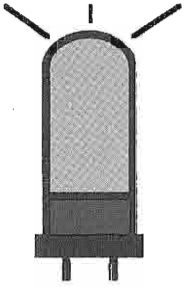

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