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ELECTRIC RADIO

celebrating a bygone era

Number 75 July 1995

George Cummings, K7DU

ELECTRIC RADIO

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

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

Regular contributors include:

Walt Hutchens, KJ4KV; Bill Kleronomos, KDØHG; Ray Osterwald, NØDMS; John Staples, W6BM; Dave Ishmael, WA6VVL; Jim Hanlon, W8KGI; Chuck Penson, WA7ZZE; Jim Musgrove, K5BZH; Dennis Petrich, KØEOO; Bob Dennison, W2HBE; Dale Gagnon, KW1I; Rob Brownstein, NS6V; Dick Houston, WØPK; Andy Howard, WA4KCY; Skip Green, K7YOO; Albert Roehm, W2OBJ; Steve Thomason, WB4IJN; Don Meadows, N6DM; Bob Sitterley, K7POF (photos) and others.

EDITOR'S COMMENTS

Last week I got an angry letter from a subscriber who was upset about what he calls our "promotion of the use of parts rigs in repair and restoration". He says that most of these 'so called' parts rigs could be restored back to operating condition and should not be parted out.

On the one hand the 'angy letter writer' may have a point. Some people might part out a rig that someone else might have undertaken to restore. But it's everyone's choice what they do with a rig. If they decide to part it out; it's a parts rig. And I don't think there's any monetary incentive for someone to part out a rig. Any rig restored and operating is worth more than a parts rig.

The benefits of a parts rig to vintage operators/collectors are immense; analgous to a human organ donator. As I've always said, "your dead rig can bring others to life". The hundreds of parts rigs that have been listed on the parts unit directory over the past few years have brought countless other rigs back to life. And if it weren't for the Parts Unit Directory I'm sure a lot of the 'parts rigs' would have wound up in a dumpster.

I think it might be appropriate to suggest that before we declare a rig a parts unit we evaluate it carefully to determine if it could be restored. If it's a parts unit please consider putting it in the Parts Unit Directory. The directory has become very depleted and more units are needed. **N6CSW**

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Cover: George Cummings, K7DU, with his homebrew transmitter. See the story on page 26.

LETTERS

Dear ER

I just received *Electric Radio* #74 and am absolutely appalled and saddened. I thought we'd finished with all this. ER #74 contains a large article on "modifying" Command Set receivers for double conversion. I propose that this is not only destructive of irreplaceable pieces of history, but that it simply doesn't make good sense.

Suppose that you own a Ford Model-T automobile and you take it for a drive on today's highway. Porsches and Hondas go zipping by you, honking. You're hot, since the old highway vet has no air. So you decide you'll "convert" your model-T to be like a modern sports car!

What you have left after this butchery is neither fish nor foul. It still won't go 0-60 in 5 seconds. The chrome pipes look pretty silly next to those spoke wheels and the jury-rigged fanbelt for the air that keeps flying off. Your model-T has lost its meaning. It no longer has a story. It is a nothing. Better to have enjoyed the old Ford for what it was--unhurried, uncluttered...a masterpiece of simplicity that requires a little skill and an appreciation of the romantic.

Command Set receivers are broad and tune fast-- no question about that. They were designed that way on purpose. Formations of hundreds of B-17s would be lucky to be within ten kcs of each other. I have worked stations all over the west with them in their original configuration and listening to 75 meters at night does take some patience and skill. They are not "Yea-Com-Woods." If I want sharp tuning, sensitivity and punch I turn on my IC-735. If I want history and romance then the filaments glow, the dynamotors whir and I am a boy again, dreaming boys' dreams of flights of B-17s when there were still noble causes to live and die for.

Only a few of these historical rigs remain undamaged by "modification." Let's keep those few so future generations can know the romance of history.

"So these flew in the war so long ago? That's really cool, Grampa. . . "

Dave Stinson, AB5S/7

Dear ER

First off I would like to point out that, as anyone who read the article[On the Air With the Command Set Triplets, ER #74] would have discovered, the receivers which I "converted" had already been owned and modified by previous hams. I did not destroy pristine, museum quality exhibits. Rather, I restored three receivers found in the fleamarket to a condition in which they had been used by tens of thousands of hams for the period of at least twenty years following the war. I appreciate one Internet critic's remark that the radios shown in the article picture are unmodified, but he is mistaken. They are the actual, converted receivers that have become the Command Set Triplets described in the article.

I respect the opinion of those who would preserve or restore old military equipment to its original condition. But after the war, Command Set receivers and transmitters were in seemingly endless supply and were available for next to nothing. Almost every ham had several, using them for receivers, transmitters, monitors, VFOs and mobile rigs, converting them to cover other bands, to crystal controlled novice transmitters, even to single band SSB transmitters! They were an integral part of the fabric of amateur radio for two plus decades. This amateur experience with Command Sets is also a valid part of their history, and it is equally deserving of recognition, honor and preservation in the pages of *Electric Radio*.

Like other Internet commentators, I

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Art Robinson, WØIWV, Silent Key

Art Robinson, WØIWV, passed away June 23 in Pueblo, Colorado after a several-month struggle with bone marrow cancer. He was 73.

Art was one of the most well-known and best-liked AM'er out here in Colorado. He will be sorely missed; particularly on the Colorado Morning Net where he was a mainstay.

From his daughter Lois and his best friend Hank Adams, WØAEE, I gained the following information about Art. He served in the Navy, he worked for Braniff Airlines (in radio and electronics) and he was a broadcast engineer with radio station KFML in Denver. He also owned and operated Artcom, a company involved in microwave repair and installation. Flying was another hobby he enjoyed, almost as much as ham radio.

Hank, WØAEE, sent the QSL card below and told me that the day the QSO took place (6-6-90) Art had called him and said that they should get on the air because it was his 50th anniversary as a ham. Hank and Art had shared a lot of experiences. They had attended Dayton together five years in a row, 1989 - 1993.

A while back I had a conversation with a shortwave listener down in New Mexico. He told me that he often listened to the Colorado Morning Net and WØIWV was his favorite station. I asked him why and he said that Art always had something interesting to say and that he was just a very nice man. I guess that's a legacy we could all shoot for. **N6CSW**

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On the Air With the Command Set Transmitters

by Jim Hanlon, W8KGI
P.O. Box 581
Sandia Park, NM 87047

If you were there in that Golden Age of Surplus in the late 40's and 50's, you certainly must have had at least one Command Set on the air or built into your rig somehow. There seemed to be an inexhaustible supply of them, and we used them for all sorts of things. As is, they made good little 50 to 100 watt transmitters for 80 and 40. My brother and I used a BC-457 as the VFO in our 80 to 10 meter rig. Novices hung a crystal control adaptor on them which they removed "later when they got their General Class tickets." *CQ* and *QST* carried "conversions" which put them on all bands from 160 to 6. They went mobile with an AM modulator. They were the VFO's of choice for the first generation, 9 MHz SSB rigs. One guy literally sawed off the final amplifier section and just used the VFO by itself. There was even a conversion which turned a Command Set into a complete SSB transmitter! They were cheap, rugged, and everywhere.

If you come from that era, this story will hold nothing new for you - you'll know it all and then some. So if that's who you are, I'll invite you to read this critically and then send in your Hints and Kinks for making Command Sets work even better than the simple, "basic conversion" I'll describe.

If you're new to Command Sets, I hope this story will inspire you to go out and resurrect one or two at the next swapfest and put them back on the air.

The Command Set Transmitters are well described in Walt Hutchens' two part article in the March and April, 1990 issues of *Electric Radio*. (I have to apologize to Walt, since my focus is on doing the damage that he tries to undo in returning sets to pure, military condition. Oh well, to each his own.) All of the services used Command Sets. The Navy started with the ATA series and later improved them to the ARC-5 series. The Army and Air Force versions which are more often found are in the SCR-274N family and have the BC numbers I'll use here. But they're all essentially the same, using a 1626 Hartley VFO driving a pair of 1625's (12 volt 807's) in parallel as a final amplifier and with a 1629 magic eye tube and a crystal in a calibrator circuit. The figure shows a generic schematic. One picture shows a BC-459 sitting alongside a pristine BC-457, untouched by human hands since it was boxed in 1942. The other picture shows a BC-459 with a CBY-52209.

So, how do we go about getting one of these beauties on the air? Fortunately its very easy, a major reason why they were so popular. Any Command Set you have will work in a ham band, so don't worry if you have a BC-457, 4 to 5.3 Mc, or a BC-458, 5.3 to 7 Mc, model. I'll start first with a conversion for a BC-696, 3 to 4 Mc, or a BC-459, 7 to 9.1 Mc; and then I'll cover pulling the others into the band in one extra step.

Basic Conversion

The basic conversion is quite simple. You have a few wiring changes to make, and you have to decide how you are going to power and key the rig. Let's cover those options, because they will influence what you do in the wiring changes.

Command Set Transmitters. Left a Western Electric BC-459, 7 to 9.1 Mc. Right a CBY-52209, Navy BC-457, 4 to 5.3 Mc, pulled down to cover 80 meters.

Power

The Command Set, if you are going to use it as a 50 to 100 watt, stand-alone transmitter, likes to be fed as follows.

The 1626 oscillator and 1629 magic eye tube work well with 250 to 300 volts, preferably but not necessarily regulated. My BC-457 draws 33.8 mA at 278 volts in this circuit. The 1625 screens are also happy with 250 to 300 volts, mine pulling 10.1 mA at 278 volts, and they can be fed through a resistor from their plate supply or from the oscillator plate supply as you please. The later method provides a good keying opportunity, so you may want to consider it. Unfortunately, the oscillator and final screens together require more current than a single, series pair of regulator tubes (VR150/VR105 or two VR150's) will supply, so it would be best to go to an electronically regulated supply.

The 1625 plates will run on anything from the same voltage as their screens up to 750 volts. (Some foolhardy souls ran up to 1000 volts in the 50's, but then 1625's were only a quarter apiece.) You will probably also want to consider metering either the final plate or cathode current so you'll know how much power input to the final you are running. The 1625 pair is rated up to 200 mA, but max power output and best keying will probably occur at less plate current, and not necessarily simultaneously.

Filaments as wired were meant to run on 25.2 volts DC. Since we won't be using the relays, you can run the filaments on AC, either 24 volts as wired or 12 volts if you rewire them in parallel. The 1629 calibrator circuit won't work if you use AC, unless you make another change; but that doesn't affect the transmitter operation at all and we usually didn't bother with it in the '50's. If you want to be really vintage, power the filaments from a spare Lionel or American flyer electric train transformer!

If you want to use the Command Set as a low power VFO, as I used to, run the oscillator and final screens at around

continued next page

150 volts and the final plates at 300 volts and all will be well.

You also have to decide how to get the power leads into the transmitter. The FT-234 single transmitter racks advertised by Fair Radio(1) until recently will hold the transmitters and make connection to their rear power sockets. Most of the time, however, we either replaced the original socket with a ring-mounted octal socket - a plug would have been safer - or just (shudder) soldered wires into the holes of the original socket. We weren't particularly worried about defacing Command Sets in those days, and a rack took up more room and cost one or two more grass cutting jobs.

Keying

Here again you have several choices. I must warn you up front that I've never met a BC-696 or BC-457 that chirped, and a BC-458 or BC-459 that didn't! More about that later.

Keying the final cathodes and running the oscillator continuously was probably the most popular way to run CW with a Command Set. It's simple, works well, the frame of the key is at ground potential, and you can power the final screens in either fashion with this keying mode. My contemporaries often mounted a key jack on the front panel opposite the small tuning knob. I usually brought the cathode lead out on the power socket myself. My BC-457 has a borderline click when I key it this way, so I use a filter consisting of a 2 Henry, 100 mA, 100 ohm power supply filter choke, also from Fair Radio(2), paralleled with a 0.1 mFd, 400 volt capacitor in series with the hot side of the key. Don't forget the capacitor! The choke will build up an amazingly high voltage across itself when you break the current through it without the capacitor.

Another option is to key the B+ to the oscillator plate and final screens. This method keeps the oscillator off when the key is up, of course, so you can use it if you like to operate break-in. Because the final screens are also unpowered, the 1625's will idle at near zero plate current with the key up. But don't feed the final screens through a resistor from the final B+ and just key the oscillator. There will be no control grid bias on the finals with the key up, and they will quickly self destruct. Speaking of self destruction, unless you'd like to do it personally you'd better keep the high voltage off the key by using a relay to switch the oscillator and final screen B+ for you.

Internal Changes

Now that you've made your power supply and keying choices, the only thing left to do is to make a few internal changes and you'll be ready to go. I'm going to assume you are starting with an unmodified Command Set. In the more likely event that you have one previously "converted," check to see that it has been done correctly.

The first thing to do is to get rid of the 24 volt DC relays. The one under the chassis by the 1625 sockets switches the final cathode and the oscillator plate. We used to just pull it out and hard wire the connections, but you can either just wire across it or jam it closed with a toothpick if you are faint hearted. It might even be fun to try keying it using a 24 volt DC supply to see how the rig sounds. I never did do that myself. Also under the chassis, you may find what looks like an open wound resistor or choke in series with the 1625 plate feed, R76 in the diagram. You can see it right in front of the 1625 sockets. This little fellow acts like a low current fuse; and I generally blew it when I tried to run more than the government approved 25 watts to the transmitter. If it's still there, save yourself some trouble and replace it or at least parallel it with a piece of wire.

You will also want to go up top, in front, and hard wire the lead coming

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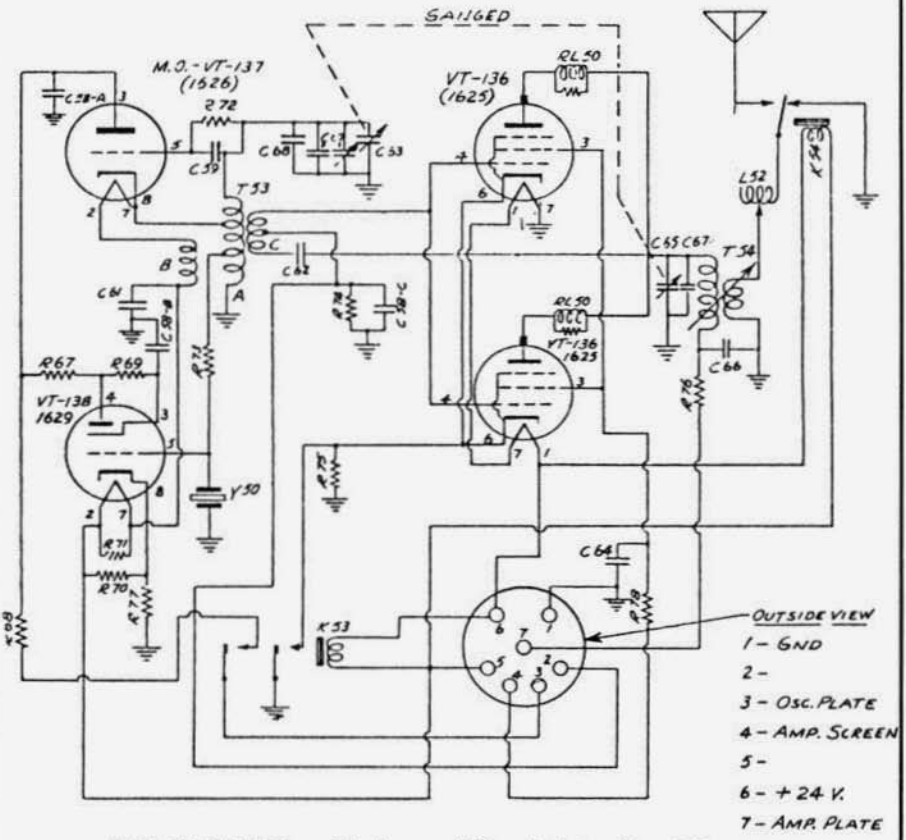
SCHEMATIC OF BC-459 TRANSMITTER (7-9.1 Mcs)



C58A,C58B,C58C - .05 uf
C59 - .00018 uf
C60 - Master Osc. padding
C61 - .006 uf
C62 - Fixed Neutralizing
C63 - Master Osc. tuning
C64 - .002 uf
C65 - P.A. tuning
C66 - .01 uf
C67 - P.A. padding
C68 - 3.0 uuf
C69 - 50 uuf
K53 - Xmttr Selector Relay
K54 - Xmttr Output Relay
L52 - Ant. Loading Coil
R67,R72,R75, - 51,000 ohms
R68,R76, - 20 ohms
R69 - 1 Megohm
R70 - 1000 ohms
R71 - 126 ohms
R73,R74, - 15,000 ohms
R77 - 390 ohms
R78 - 51 ohms
RL-50 - Parasitic Suppressors
T53 - Oscillator Coils
T54 - Amplifier Coils
Y50 - Crystal Unit

fig 8

from the variable link that's inside the 1625 plate coil directly to the antenna connector, bypassing the loading coil and the antenna relay. You can leave the coil and the relay physically in place if you want to, but we won't be using them electrically unless you have an end fed longwire that you'd like to try loading up without using a transmatch. You might also want to (shudder) replace the antenna connector with a coax jack while you're there.

Another thing to do topside is to take a small file and cut back one of the two metal stops on the fiber cog wheel that turns the final link. As it is, there is one stop that limits the link at its vertical, minimum coupling position and a second stop that prevents the link from turning into a full, horizontal, maximum coupling position. If you want to run more than 25 watts or so, and what red blooded ham doesn't, file down this second stop and free up the link to turn all the way to the horizontal. You also may want to add another turn or so in series with the link on the outside of the plate coil, this if you find you still need a little more loading.

Back underneath, there are just a few more things to be done. Rewire the filaments to parallel if you're going to run from 12 volts. If you do that, disconnect and consider removing R71, the big, black wire-wound resistor mounted on the side wall under the 1629 socket. It is also a good idea to put a 0.01 mFd bypass on the filament lead at the 1625 socket before it heads back toward the oscillator tube. If you want the 1629 circuit to operate properly and you're not running the filaments from 24 volts DC, remove resistors R70 and R77 and replace R77 with a 2700 ohm, 1 watt resistor.(3) Then make your power socket changes, if any, and that's about it for the Basic Conversion.

You are now ready to go on the air. Hook up the power, the key, and I'd suggest a dummy load, a 60 watt light bulb will be fine, for your first trial. Listen to the note on your receiver, and adjust the link loading for a level that will give you an acceptable combination of output and keying. Now put it on the air and HAVE FUN!

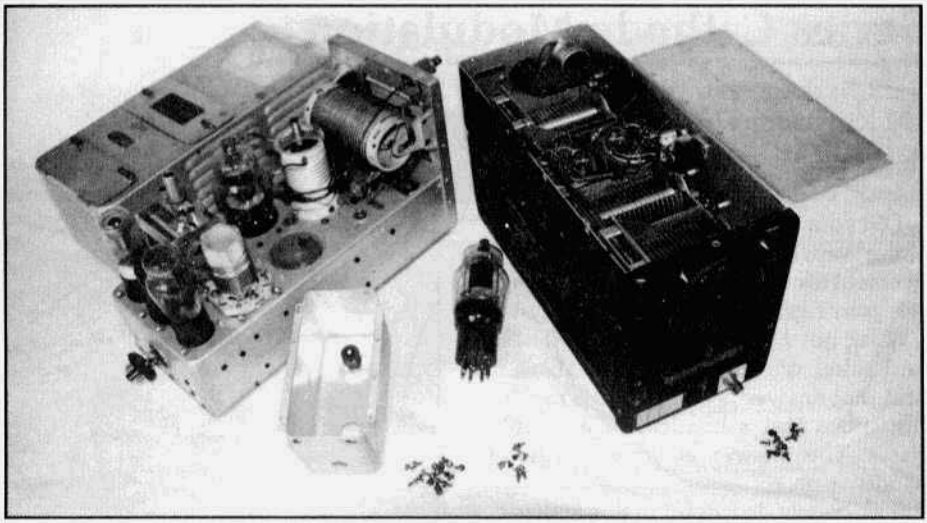
Pulling a BC-457 or BC-458 into the Band

In the good old days, a BC-696 or a BC-459 sold for 10 to 15 bucks or more depending on condition, while a BC-457 or a BC-458 could be had for half that amount. We soon found out how to retune the cheapies to 80 or 40, so neither they nor our hard earned cash went to waste. Let's start by putting a BC-457 into 80 meters.

You are going to adjust the padder capacitors on the oscillator and final to cover the new range. The oscillator padder is underneath the aluminum shield box that sits on top of the chassis behind the 1625's. Remove the shield and you'll see it. The shaft is held in place by some setscrews in a collar around it, which is in turn secured by a screw fastening a lever attached to the collar to the padder frame. You just might be able to get the setscrews loose if you have the right wrench and if that red Glyptol cement is willing. If not, just remove the screw holding the lever to the frame. Replace the shield and pop out the hole plug that gives you access to the padder shaft. By the way, at no time should you mess with the settings of the slugs in either the oscillator or amplifier coils. They adjust the tracking of the two tuned circuits, and they should be left alone.

The final padder is below decks, just behind the final tuning capacitor. It is secured the same way the oscillator padder is. Loosen it and pop out its tuning hole plug, and you're ready to retune the transmitter.

Set the main tuning dial to 4.0 Mc, apply power to the oscillator only (not to the final plate or screen), and increase the capacitance of the oscillator



A peek inside. Left, the BC-459 with top cover, interior oscillator cover and one final amp 1625 removed. The oscillator padder condenser is just in front of the magic eye tube and behind the final amp 1625. At right the CBY-52209 with its bottom plate open. The second tuning capacitor from the front is the final padder.

padder until you hear the oscillator running at 3.5 Mc on your receiver. Continuing to listen, make a first cut at retuning the final by increasing the capacitance of the amplifier padder until the signal is loudest. Finally, power up the amplifier and tune it to resonance with the oscillator, as indicated by a dip in the final plate or cathode current, by adjusting the capacitance of the amplifier padder. If possible, lock the padders in their new positions with the set screws. If you couldn't get them loose, don't worry. The friction in the padders is quite adequate to keep them in place. Put back the hole plugs, replace the covers, and you are ready to run your BC-457 all over the 80 and 75 meter bands. If you wish, you can even put a new paper scale on the dial and calibrate it.

Putting a BC-458 on 40 is the same process, except you set the frequency dial at 7.0 Mc and decrease the capacitance of the padders to hit 7.3 Mc.

Minimizing Chirp

As I mentioned earlier, I've yet to meet a BC-458 or BC-459 that didn't chirp. But there are things that will minimize it. Maybe some other vintage operators of Command Sets can contribute even more wisdom on this issue.

Using a regulated power supply on the oscillator will help to reduce chirp. Two VR150's in series or a VR150, VR105 pair should be OK. Running the VFO continuously and keying just the final might help. I've even tried block grid keying the final screen; you have to run it to about -90 volts to get complete cutoff, which yields some improvement. Adjusting the final loading for less chirp is pretty effective and well worth a few watts less output.

Another fix goes after the amplifier output signal that is fed back by way of the filament wiring into the oscillator. Put a low resistance choke, made from as many turns as you can wind of decent sized wire around a ferrite toroid, in series with the filament lead powering the 1625's. Bypass both ends of the

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Series Cathode Modulation

Berk Berkemeyer, WØREP
402 Kingridge Dr.
Ballwin, MO 63011

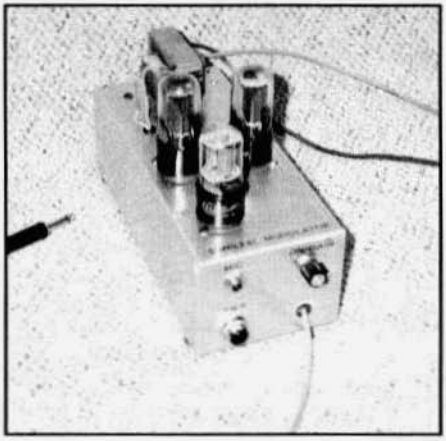
Did your modulation transformer just shoot craps? Do you want to get back on 'Ancient Modulation' without mortgaging your first born? Do you have a nice CW rig but no way to talk on it? These and other questions have an answer, and that answer is two or three receiving tubes and a handful of available parts. The answer is Series Cathode Modulation.

The system described in this article is not new. The first description that I found was in the December 1939 volume of *Radio Magazine*. Ray Dawley, W6DHG used four 6L6s to modulate a pair of 810s at 1 KW CW input. I have tried that circuit with two 6L6 tubes and one 810 but have had problems. I think they may have been caused by the grid bias circuit I used in the RF amplifier.

The next reference is in the 1959 Hints and Kinks (Vol. 6) in a Kink by I.F. Gardner, W6LNN, modified by P.J. Hart, W8MMK. This is the one I built. It takes two 6Y6G (or GT) tubes to handle the current in an 810 amplifier or the 4-250 amplifier I am now using.

W6LNN called the unit "The Simplest Modulator", a real descriptive title. A 2-stage 6SL7 speech amplifier drives one or more 6Y6G (GT) tubes. There is no plate supply needed, only a small transformer to heat the tubes - all other voltages are derived from the modulated tube(s). Even the voltage for the speech amplifier is developed across a small choke in parallel with the modulator tubes.

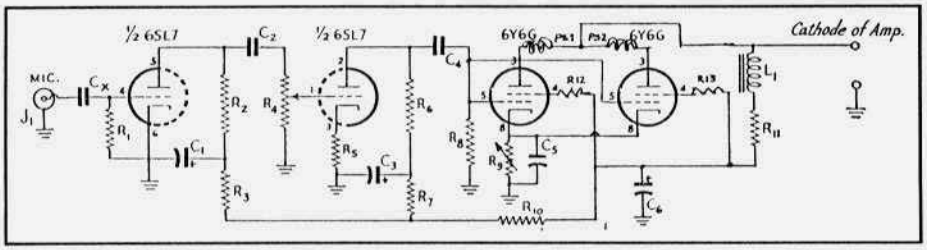
The system places an audio amplifier tube(s) in between the RF amplifier cathode and ground, essentially acting as a cathode resistor except that the effective resistance can be varied at an audio rate, which, in turn, varies the RF amplifier plate and grid currents at the audio rate. This gives mostly grid bias modulation although there is a small amount of plate (and screen) modulation. You can modulate triodes, tetrodes or pentode tubes, either single-ended or push-pull. The efficiency is about the same as any other efficiency modulation system, but good quality reports should be obtained. The main feature of the system is that proper operating conditions for good modulation are almost automatic.



Series Cathode Modulator built by the author. It uses two 6Y6GT tubes.

Examination of the schematic shows a very simple two stage speech amplifier using a 6SL7GT. The coupling caps are large enough that the speech frequencies are not restricted. The only thing unusual is the method of obtaining the B+ for the speech tube and the screens of the 6Y6s.

The 6SL7 drives the grids of the modulator tubes. The same speech amplifier is good for either one or two 6Y6s. The



C1,C3,C6- 8 uf,450 volt electrolytic
C2- 0.005 uf.400 v.
C4,Cx- 0.01 uf. 400 v.
C5- 50 uf., 50 v. electrolytic
R1- 2.2 megohm, 1/2 watt
R2- 220K 1/2 watt
R3,R7,R10- 22K 1/2 watt
R4- 500K pot.
R5- 2200 ohm, 1/2 watt
R6,R8- 100K, 1/2 watt
R9- 100 ohm 2 watt pot.
R11- 2K, 2 watt
R12,R13- 27 ohm, 1 watt
PS1,PS2- 10 t. #26 on 47 ohm, 1 watt res.
L1- Small filter choke

plate voltage comes from the RF amplifier cathode. Don't omit the decoupling and filtering of this voltage. As noted earlier, the speech amplifier and 6Y6 screen voltages are developed across the small filter choke and the 2k resistor in series with it. If the unit is used with a fairly low level RF amplifier, the series resistor may need to be reduced or eliminated. If only one 6Y6 is needed, the suppressors in the plate circuit and the 27 ohm screen resistor is not needed. They were added by W8MMK to eliminate occasional instability.

To use the modulator, the RF amplifier is tuned up for CW and loaded in the normal manner. Use fairly heavy loading. The modulator is then connected into the cathode circuit. The plate current should drop to about one-half the CW level. Then talk! That's all there is to it unless (hah! you knew there was a catch) the plate current is considerably different from the desired level. If so vary the pot in the 6Y6 cathode circuit until the proper RF plate current is obtained. WARNING: be sure the 6Y6s are powered and warmed up before applying B+ to the RF stage, especially if using high power. Failure to do so will cause more failures, probably in the filter choke where the modulator voltages are developed. Incidentally, I bought ten 6Y6GT tubes from Fair Radio Sales. Nine were good and the tenth has an intermittent connection in the base, but indicated good when I could make contact. These are pulls and untested, but ten for $8 seemed like a good gamble.

On the air signal reports have been good. A scope indicates that the unit can be driven into the flat topping region, but it does not appear possible to overmodulate in the downward direction.

The unit can be constructed in various ways. I used the other half of the 3 x 4 x 17 chassis from the VFO (ER#73). Use normal precautions for audio equipment and keep the low level wiring as short as possible. The output can be run to the RF stage through a shielded wire and a phone plug. You may want to bring the output out through the front panel to make it more available for plugging into the RF amp. I did not use or need tube shields.

So there you have it, another voice from the past that can bring a lot of pleasure to the present day hollow state ham. Good luck and I'll be looking for you on 1985 kc. **ER**

Book Review

the best of Beasley by Robert Beasley, K6BJH

112 pages,
$8 plus $2 S&H,
published by Worldradio Books, 2120 28th St., Sacramento, CA 95818

Robert Beasley's cartoons have been a part of *Electric Radio* since our first issue back in 1989. I've always appreciated his brand of humor and the way he depicts us as hams. We're far from perfect and I think Bob's mission in life is to remind us of that. N6CSW

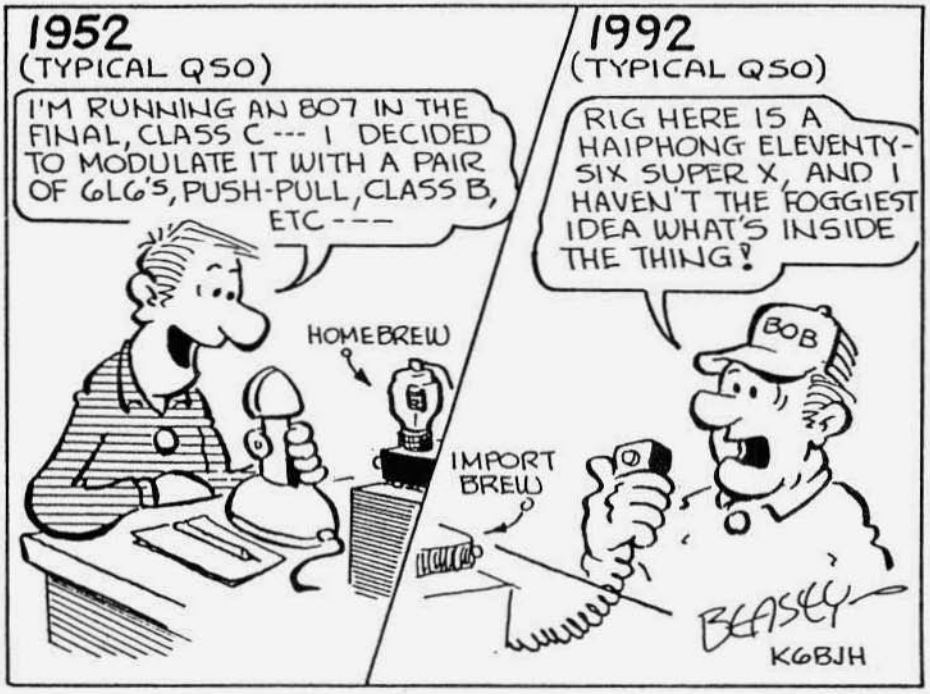
—73 O.M., I REALLY MUST SIGN NOW------

I WONDER IF LOADING THE FLAGPOLE UP AS AN ANTENNA WILL BOTHER SPOT

THIS IS "SLIM" McINTYRE--- HE CLIMBS LADDER LINE

WHAT IS IT, NOW? SEEMS LIKE YOU'RE ALWAYS YELLING ABOUT SOMETHING!

YOUR SHACK IS THE ONLY PLACE WHERE THERE'S ANY ROOM --- MY BROTHER IS GOING TO STAY IN IT FOR A WHILE



Butler (PA) Breezeshooters 41st Annual Hamfest

by Sam Hevener, W8KBF
3583 Everett Rd.
Richfield, OH 44286-9723

Sunday June 4th the Butler Farm Showgrounds came alive with several thousand hams attending the largest hamfest in the tri-state area (PA-OH-WV). Unfortunately Saturday afternoon and evening had seen heavy rain and flood warnings for Eastern Ohio and Western Pennsylvania.

I was up at 2:30 AM for the usual two hour drive to Butler. Fog had moved in overnight and I had fog the entire trip. At times I was down to 35-40 MPH on the Ohio and Pennsylvania Turnpikes, afraid I may hit a deer. Sure enough, a trucker came on the CB saying he had hit one about a half mile in front of me on the other side. The normal two hour drive became about two and a half hours; at least I didn't hit a deer.

That wasn't the end of the bad news, because of the heavy rain the night before, about 1/4 of the flea market area was mud, with many stuck vehicles. What is a Farm Showgrounds without a farm tractor? It really got a workout that Sunday.

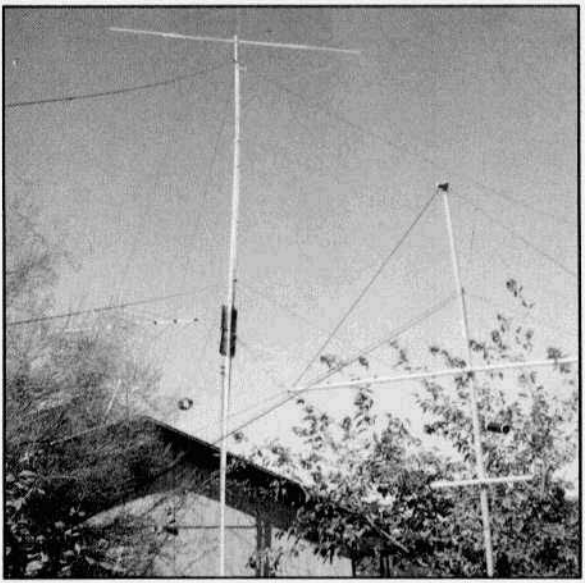
Now the good news, the hamfest was great as usual with only a one dollar fee to get in and one dollar per flea market space. The fog stuck around until about 11 AM but a lot of vintage equipment was seen. Collins 75A2s, A3s and A4s, I didn't ask the prices. A Heathkit DX-100 with manual $100, DX-20 in very good condition $45, R-390A with original meters but one module missing $75, R-390A operating $250, ART-13 with calibration book $100, ART-13 no book $75, brand new 3-6 Mc Command receiver $20 (I missed it), T-195 transmitter operating with solid state dynamotor $100, Sky Buddy receiver $125 (WOW), a BC-342 complete with shock mount, I didn't get the price, and a large Navy rack mount WW II transmitter I think was an RAL $20 a unit or $60 for the entire thing.

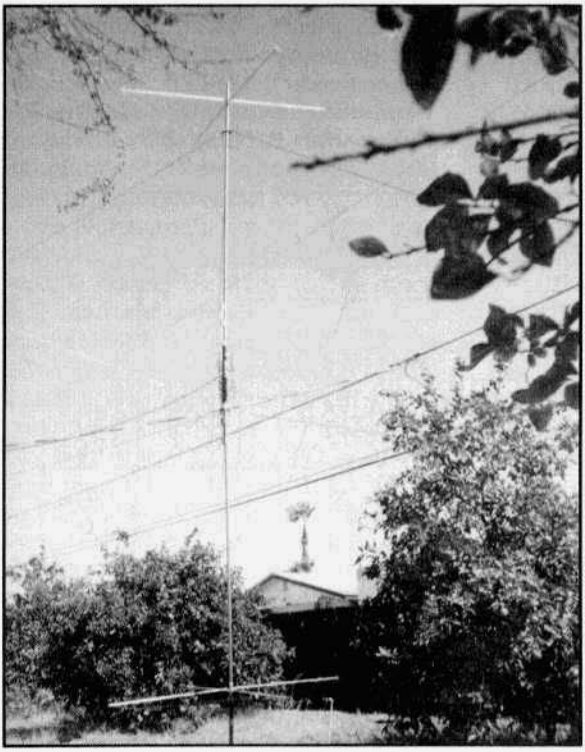
I was ready to leave at about 11 AM but vehicles were still waiting in line to get in including more sellers. An old ham was setting up and he pulled out a WW II Japanese aircraft transmitter. He told me he had removed it from a Japanese Zero he helped capture. He also said he had a second set he recovered from a crashed Zero but it was in bad shape and burned. The set has the aircraft slide-on mount which he also removed and the radio looks like it uses two Japanese 807 type tubes in the final. It took us about 10 minutes to agree on price but now I'm the new owner. The only thing I have done so far is decode the date code which comes out to July 1944.

What started out to be a poor hamfest turned out to be great for me. Next year I'll remember my rubber boots. Also seen were several "Electric Radio" hats and T-shirts, more than at any other hamfest except Dayton. ER

IS THIS ONE OF THOSE CARS THAT HAS A COMPUTER THAT WILL BLOW OUT IF I DECIDE TO GO MOBILE ?

The Antennas at NØBD





On 160 and 75 meters there is one station that is consistently loud at my QTH and that is NØBD. When Dave Bull was living in Iowa he was always loud and he's still loud from his present QTH in Apache Junction, Arizona.

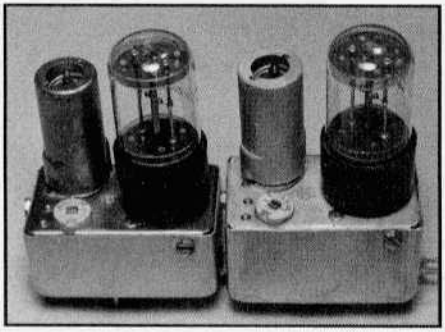
Recently Dave sent in these photos of his antennas, with a few lines of description. N6CSW

The antenna in the top photo: "This is my 160 meter ground plane. It consists of a 16 ft. vertical radiator, 17 ft. off the ground operated against (6) 32.5 ft. loaded ground plane elements. I'm using open wire feedline. The bottom coil on the mast is not being used. This antenna used to be a center-fed vertical but broke in half. I just left the second coil on the support and used the top half for the vertical portion of the ground plane. My 160 meter loop is in the foreground."

The antenna in the photo at left: "This is my 80 meter center-fed vertical. It's 22 ft. long, elevated 2.5 ft. above ground. Because I use the top and bottom hats, no radial system is needed."

The Hallicrafters HA-7 100 KHz Crystal Calibrator

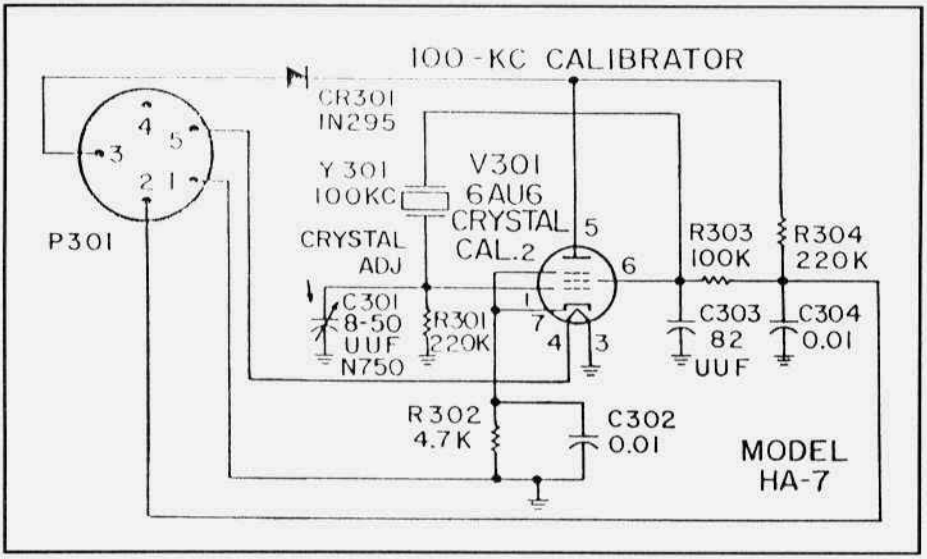
by Dave Ishamel, WA6VVL
1118 Paularino Ave.
Costa Mesa, CA 92626



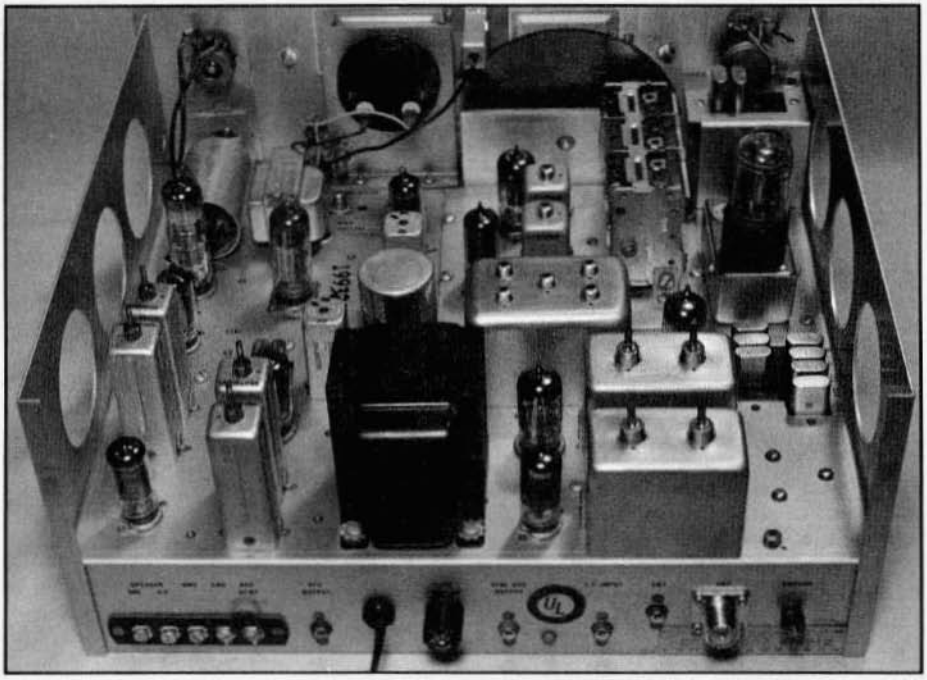
The Hallicrafters HA-7 100 kHz crystal calibrator is at the left. The SX-100's P/N 001-902508 crystal calibrator is to the right of the HA-7. The octal-sized T-9 100 kHz crystal was supplied by Northern Engineering Laboratories, Inc.

The Hallicrafters HA-7 100 kHz crystal oscillator/calibrator is built into an extruded-aluminum bathtub-shaped enclosure that is 2-5/8" L x 1-5/8" W x 1-1/4" H. The calibrator uses a unique Northern Engineering Laboratories 100 kHz T-9 crystal that has the size and looks of a 6V6GT, including the octal base. A 6AU6 is used in an electron-coupled configuration, with feedback between the screen and control gird. The calibrator's frequency is adjusted by C301, an 8-50 pF N750 trimmer cap. A standard 5-pin plug is used to interface the calibrator with the host receiver's power supply and antenna. The first mention of the HA-7 option was with the introduction of the SX-122 receiver in April '64. It was priced at $19.95.

The HA-7's genesis was the 100 kHz oscillator/calibrator used in the SX-100, SX-101/101A, and SX-111. This calibrator dates to the introduction of the SX-100 in September '55, and is almost identical to the HA-7 with two exceptions: the enclosure is 1/4" deeper and has two additional manufactured ears. The Hallicrafters P/N for this calibrator is 001-902508 and can be found in the



HA-7 schematic.



The HA-7 mounted in the Hallicrafters SX-117.

receiver's Owner's Manual in the Service Parts List. The HA-7 was first used in the SX-117 receiver that was introduced in October '62, but it was not an option. The -117's schematic indicates that the calibrator is an HA-7.

The Northern Engineering Laboratories, Inc. T-9 crystal was specified at 100.000 kHz ±5 Hz at 25° C. The specified load capacitance was 20 pF. A source at NEL said that the Hallicrafters T-9 crystal was made in both DT (T-9D) and E (T-9E) cuts. The DT cut's temperature coefficient is approximately half that of the E. The T-9D crystal is used (only) in the SX-101/101A with a Hallicrafters P/N 019-101915. The T-9E with P/N 019-202351 is used in the SX-100, SX-111, SX-117, and SX-122/122A with the HA-7 option. The T-9D is no longer cost-effective to manufacture because of the amount "of the quartz that would have to be committed". The T-9E is still available from NEL, but I was unable to get a quote on price. NEL's minimum order is $125.

Northern Engineering Laboratories, Inc., was founded in '54 as a manufacturer of frequency control products. They supplied Hallicrafters the T-9 crystals from the introduction of the SX-100 in September '55 until the SX-122A was discontinued some time in the early '70s. They also supplied some of the HC-6/U crystals. Although their facilities have expanded, they have been in their existing location in Burlington, Wisconsin, since '61. Additional assembly facilities are located in Korea, Taiwan, the Philippines, and England. The company's name has changed to NEL Frequency Controls, Inc.

I bench-tested the SX-100's calibrator and the HA-7 from my SX-117 and made the following observations:

* Both the HA-7 and SX-100 calibrators can be adjusted to 100 kHz +/- 1 Hz with little difficulty. Better than +/- 1 Hz requires some patience, but +/- 0.1 Hz is possible on the bench.

continued on page 39

A Ham Who Knows Good Tubes—

Bill Guimont, W9JID, W. A. S. on 160 Meters in 20 Hours with TAYLOR TUBES *in his Rig.*

Proud of his record and proud of his rig, Bill Guimont, AMERICAN AIRLINES RADIO OPERATOR, knows the vital part that good tubes play in amateur communications. He knows too, that quality can't be sacrificed when there's a job to do. For dependability and top-notch performance, Bill has relied on Taylor Tubes for nearly 10 years. Again, "On the Air" proof of Taylor superiority has been confirmed.

HISTORY REPEATS—

Once more, Taylor Tubes have played their part in another outstanding achievement. Whether it be a W. A. S. party or just plain every day contact work, discerning amateurs know that the dependability, high efficiency and greater safety factors of Taylor Tubes give their rigs the power and punch needed for good clear signals.

The *plus* features built into every Taylor Tube result in greatly increased *safety factors*, longer life and better all 'round performance. The Taylor margin of extra safety is backed up by Taylor's famous "More Watts Per Dollar" policy.

STILL LEADING IN SALES

And for the new rig, Taylor's T40-TZ40 and 866 Jr. are a hard combination to beat.

"MORE WATTS PER DOLLAR"

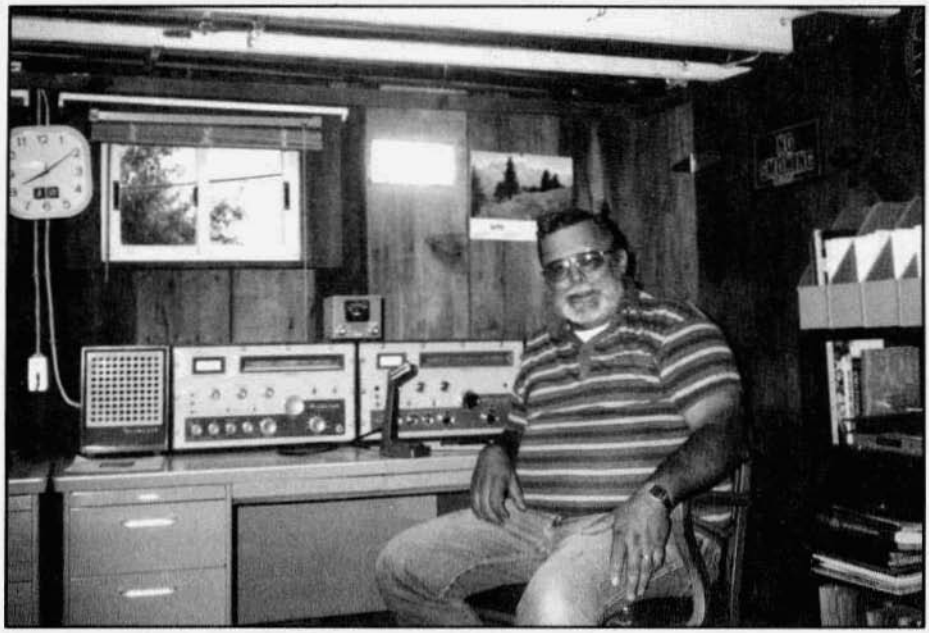
Taylor HEAVY CUSTOM BUILT DUTY Tubes

TAYLOR TUBES, INC., 2341 WABANSIA AVE., CHICAGO, ILL.

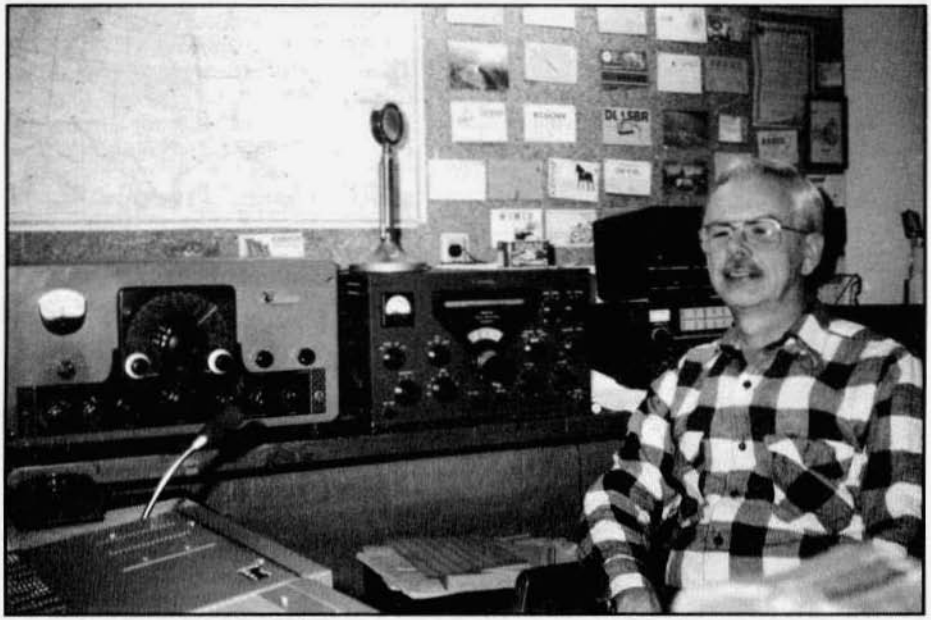
You too can work all states on 160 in 20 hours! Just equip your rig with Taylor tubes. Berk, WØREP, sent this in. It's from the November 1941 issue of *Radio Magazine*.

VINTAGE NETS

Westcoast AM Net: Meets informally, nightly on 3870 at 9:30 PT. Wednesday at 9:00 PM PT they have their formal AM net which includes a swap session. Net control rotates.
California Early Bird Net: Wednesday nights at 8 PM PT on 3835.
Southeast Swap Net: Tuesday nights at 7:30 ET on 3885. Net control is Andy, WA4KCY. This same group also has a Sunday afternoon net on 3885 at 2 PM ET.
Eastern AM Swap Net: Thursday evenings on 3885 at 7:30 ET. This net is for the exchange of AM related equipment only.
Northwest AM Net: AM activity daily 4 PM - 5 PM on 3875. This same group meets on 6 meters (50.4) Sundays and Wednesdays at 8:00 PT and on 2 meters (144.4) Tuesdays and Thursdays at 8:00 PT.
Twenty Meter AM Net: This net on 14.286 has been in continuous operation for at least the last 20 years. It starts at 5:00 PM PT, 7 days a week and usually goes for about 2 hours. Net control is Les, K6HQI.
Arizona AM Net: Meets Sundays at 3 PM MT on 3860. On 6 meters (50.4) this group meets at 8 PM MT Saturdays.
Colorado Morning Net: An informal group of AM'ers get together on 3808 Monday, Wednesday and Friday mornings at 7AM MT.
DX-60 Net: This net meets on 7290 at 2 PM ET, Sundays. Net control is Jim, N8LUV. This net is all about entry-level AM rigs like the Heath DX-60.
Military Net: It isn't necessary to check in with military gear but that is what this net is all about. Net control is usually Walt, KJ4KV, but sometimes it rotates to other ops. It starts at 5 AM ET Saturday mornings on 3885.
Westcoast Military Radio Collectors Net: Meets Sat. at 2300 local on 3885 and Sun. at 1600 local on 3885. Night net control is Andy, KD6TKX, and daytime net control is Tom, WA6OPE. AM is the mode used at present. It is not necessary to check in with military gear.
Grey Hair Net: The oldest (or one of the oldest) 160-meter AM nets. It meets on Tuesday nights on 1945 at 8 PM in the winter and 9 PM ET in the summer.
Vintage CW Net: For CW ops who enjoy using vintage equipment.This is not a traffic net; speed is not important. The net meets on 14.050, Saturdays at 1 PM PT. Net control is Tracy, WB6TMY.
Vintage SSB Net: Net control is Chuck, N5SWO. The group meets on 14.293 at 1 PM CT, Sunday afternoons.
Collins Users Net: The oldest of the 'users nets'. It meets on 14.263 Sunday afternoons at 2 PM CT. The net control revolves. This group also gets together for an informal ragchew on 3805 Tuesday evenings at 7 PM CT.
Drake Users Net: Another relatively new net. This group gets together on 3865 Saturday nights at 8 PM ET. Net controls are Criss, KB8IZX; Don, WZ8O; Rob, KE3EE and Huey, KD3UI.
Heath Users Net: A new net started by Marty, WB2FOU/5. Net control is shared by Fred, AA5LW. It meets on 14.275 at 4 PM CT Sundays. Check in on either AM or SSB.
Swan Users Net: This group meets on 14.250 Sunday afternoons at 4 PM CT. The net control is usually Dean, WA9AZK.
Nostalgia/Hi-Fi Net: Meets on Fridays at 7 PM PT on 1930. This net has been meeting since 1978.
K1JCL 6-Meter AM Repeater: Located in Connecticut it operates on 50.4 in and 50.5 out.
JA AM Net: 14.190 at 0100 UTC, Saturdays and Sundays. Stan Tajima, JA1DNQ is net control.
Fort Wayne Area 6-Meter AM Net: Meets nightly at 7 PM ET on 50.58 MHz. This net has been meeting since the late '50's. Most members are using vintage or homebrew gear.
Southern California Sunday Night 6 Meter AM Net: 8 PM Sundays on 50.4. Net controls are Dan, KV6I and Scott, K6PYP. Informal, supports restoring old gear and using it on the air. Loan gear available for those wanting to join in.



Ken Burrough, NEØC, in his hamshack. Note the pristine Heathkits; the Apache (TX-1) and Mohawk (RX-1).



Steve Harris, KF8KS, in his "wattage cottage", studio 'B'. Gear from the left: a Johnson Viking Valiant; a Collins 75A-4 and a Drake 2B with 2BQ.

Don Meadows, N6DM, frequent ER contributor, in his hamshack.

An advertisement for the Fort Tuthill, Flagstaff, Arizona hamfest coming up July 21 -23. Bill Thissell, K7VZP ('Phoenix Bill') (center) and Art Heikkila, KB7LOQ, (right) enjoying a rest with Dave, KB7AUH, a fleamarket vendor *Photo courtesy of K7POF.*

Running Mobile

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

Around 1950, ten meters was the only HF band where phone operation was legal for hams without a Class-A ticket. At that time, the sunspot cycle still permitted amazing long-skip contacts on 10 with almost no power. These two factors attracted many beginning hams. There was the new thrill of speaking into a microphone and being heard thousands of miles away. Thanks to the availability of bargain-priced surplus equipment and parts, the beginner could afford to put an effective ten-meter signal on the air. Even a few watts of power from a Heising-modulated AM transmitter would get out. When TVI threatened to shut down ten-meter operation at home, one could sometimes escape by running mobile.

The postwar surge of new hams on ten meters collided with the new TV technology, where Channel 2 often shared company with interference from ten meters' second harmonic. It wasn't just new hams, however, who messed up nearby picture tubes. Around 1950, virtually all ham transmitters operated in the Class-C mode, which provided maximum efficiency on CW and in frequency-multiplying stages. Undistorted amplitude modulation required Class-C operation of the output stage. But Class-C is also the maximum-harmonic mode because the tube is driven about as far from linearity as it can get. The TVI remedy was therefore to fight against harmonics on all fronts. One fiddled with circuit design in order to minimize harmonics without stepping outside the tube's Class-C operating parameters. This led to weird parallel-tuned harmonic traps in plate leads--traps so frequency sensitive that one's garlic breath could almost detune them. There appeared tubular bypass capacitors of about 15 pF. These were direct capacitive shunts from the final tube's plate to ground. In their vertical configuration on the transmitter chassis they resembled a miniature version of NASA's modern booster rockets. They proved so successful that the National Company offered them commercially. One learned that it was necessary to contain Class-C harmonics by imprisoning them in a shielded cage while choking off any possible escape routes. All wiring leading in and out of the cage passed through at least one filter checkpoint manned by choke coils and bypass capacitors. The Class-C final stage's message to the outside world ran the gauntlet through low-pass filters and tuned matching circuits designed to scrub away any remnants of harmonics that might reach the antenna.

Around 1950, many new hams on ten meters, when suddenly touched by the TVI demon's finger, were ill prepared to react according to the principles delineated above. Their unshielded transmitters were working just fine. These young guys didn't really understand the problem's magnitude unless their well-to-do parents possessed a new TV receiver where one could see the damage first-hand. The option of shielding and filtering the ten-meter transmitter could intimidate the recent ham, whose rig was often a homebrew 6L6 or 807 plate modulated with a pair of receiver audio power tubes. Shielding and filtering the transmitter could be mechanically and economically demanding, often beyond the young ham's resources.

But once touched by the magic of ten meters, many young hams survived by escaping from their neighborhood TVI problem. Motivated like fertile jackrabbits threatened in their home thicket, they scooted about the countryside, reveling in their new freedom to make ten-

meter radio contacts anywhere they chose by running mobile. Fortunately, physics helped out, as an eight-foot whip antenna mounted on the car was a quarter wave long and quite efficient.

Sometimes unexpected status was conferred upon the young guy who had a legal radio transmitter in his car. People thought he might have some connection with law enforcement, as police were then the only high-profile users of two-way mobile radio. This was long before 11 meters became the Citizens Band. There was, indeed, a link between mobile hams and the civic establishment. In the larger metropolitan areas, ham emergency nets involving ten-meter mobilers were just then being set up with some moral and material support from the Red Cross.

Sometimes this status provided a bonus feature. The young single male ham might find that ten-meter mobile radio offered a splendid way to impress a date. Having one's own automobile in the first place earned points. When the car sported sophisticated boxes, hung under the dashboard, that barely brushed the young lady's knees, the point total could equal a record score. It depended on the driver's skill in playing his cards. Would he voluntarily explain this ten-meter gear to the young lady in scientific detail? No, he might look like a nerd. Instead, he might remain silent, as if those mysterious boxes, from one of which dangled a microphone, didn't exist. He would await her questions. If the young lady showed interest, there could be a new and lasting rapport established between two people--perhaps reinforced by a third party called in via the airwaves to enhance the experience.

A Saturday night high atop Signal Hill, a landmark in Long Beach, California. A place where mobilers went often because of its clear shot to the horizon in all directions. There, one could find many quiet parking areas never visited by neighborhood police cars. It wasn't then a neighborhood, just a site covered with oil companies derricks that quietly pumped crude petroleum from the earth. The city lights below sparkled. The young lady, alert and curious, watched the driver speak a CQ into the microphone followed by some letters and numbers--a mysterious linguistic ritual whose magic called out of one of those strange boxes the voice of another human being. Being nighttime, it was a local contact, no dramatic cross-country DX. Back then, it seemed that legions of young hams monitored ten meters at all hours, eager for any kind of an AM phone contact. They were still thrashing in the one-year experience requirement before the FCC would let them qualify for Class-A phone privileges on the lower bands. The driver secretly thrilled that he had gotten out on the first CQ with eight watts input. Hopefully this mini-drama had impressed the young lady.

In those days, most ten-meter mobile transmitters were homebrewed or converted surplus. A few were modified police or taxicab transmitters, retired from active service. There was a neat little commercial rig for ten-meter mobile offered back then, designed specifically for the amateur market. It was made by Lysco and it contained three 6AG7 tubes. It sold for around 25 dollars. One tube was the oscillator, quadrupling to ten meters from a 40-meter crystal. Another 6AG7 was the modulated final amplifier running eight watts input. A third 6AG7 tube functioned as a Class-A Heising modulator driven directly by a surplus carbon microphone.

For receiving, one could convert a surplus BC-455 Command receiver to ten meters for less than ten dollars, and this little surplus job was hotter and more stable on 10 than many contemporary commercial receivers. For mobile operation, one rewired the BC-455's

continued on page 40

The Fifty Cent Filter - or - How I Met Bob

by Jim Miccolis, N2EY
126 Summit Ave.
Upper Darby, PA 19082-3523

Here at N2EY, the HF equipment is all homebrew. It started with a simple regenerative receiver in my Novice days almost 30 years ago, and has progressed to more modern and complex equipment over the years. Along the way there was manufactured, kit and surplus gear, but I kept finding that I could build better gear than I could afford to buy. I've had some projects that never seemed to work right, and others that worked "like magic".

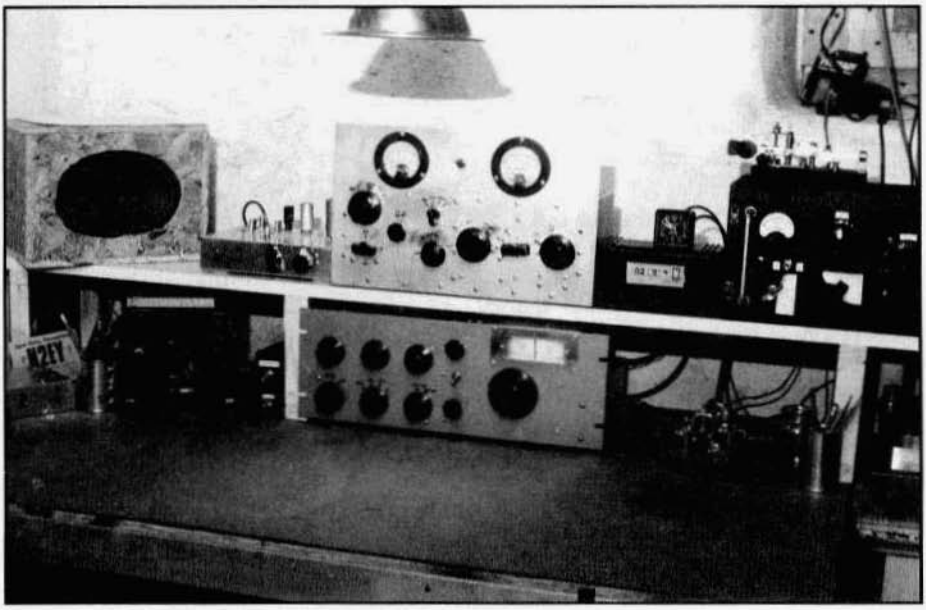
Most of my homebrew efforts are inspired by *QST* articles. Certain authors have provided many good ideas and inspiration: Doug DeMaw, W1FB and Lew McCoy, W1ICP, for inexpensive but effective gear, George Grammer, W1DF, for making complex electronic principles understandable, and Bob McGraw, W2LYH, for radio workmanship of the highest order. I adopted many of W2LYH's receiver design principles, such as no AGC and slow tuning rate, to my gear.

Over the years I've become "spoiled", to a certain extent, by homebrew gear. Manufacturers have to build gear to please the market, but a homebrewed rig only has to please the builder and the FCC. Here at N2EY the main interest is CW on the lower HF bands, so the equipment is built to do the best possible job on CW, and unwanted features are left out. Repairs, alignment, spare parts, and maintenance are only minor concerns - if you can build it and get it to work, you can certainly fix it. Equipment is built around available parts, even if they are not what manufacturers would use. My HF gear uses only tubes - the only semiconductors are two 1N34's in the SWR bridge! Since I use mostly recycled parts, the cost is low. Resale value? This gear isn't for sale.

Projects here follow a definite cycle. First, a new part or parts are acquired, usually at a hamfest. Next, a preliminary design is sketched out. Then a prototype is built to prove out the concept. Finally, if the prototype is satisfactory, a working model is built and put into service. Sometimes "Mark 2" or even "Mark 3" versions of the working model are built, because of things learned over the course of time. Eventually, better parts and ideas come along, and the whole process starts again.

As an example, at the 1978 Rochester hamfest I found a Heath SB-series CW filter at the very bottom of a whole box of sideband filters. Brand new, and only five bucks. Around this filter I built a CW-only receiver/exciter which drove a pair of 807s in a separate final amplifier. There were two working versions built - a plug-in-coil, multiple chassis version and later an improved bandswitching rackmount version. The four-pole Heath filter, and the ability to transceive, were a big step up for me. The rigs had some limitations, but served well for over ten years, including contests and several Field Days.

At the 1989 Gaithersburg hamfest I found a fellow selling crystal filters marked "500 Hz Bandwidth, 1.4 Mhz Center Frequency" with a manufacturer's name and part number, fifty cents each. As with many hamfest finds, one takes one's chances, so I bought four, not knowing any other specs or even if they were any good. Perhaps I could build a simple CW receiver around one.



Operating position at N2EY; mostly homebrew.

My brother Tom, WA3UZI, tracked down the manufacturer and specs. The filters were 8 pole mil-spec units, much better than anything I'd ever used! I should have bought the whole box! But I still didn't know if they were any good.

Over the next several months I designed and haywired together a crude prototype 80 meter receiver to test the filters. Only parts from the very bottom of the junkbox were used in the prototype, and the "chassis" was just bits of aluminum and PC board bolted together. Parts were stuck on any which way, and only the most essential circuits were included. The prototype was not intended for on-the-air use. Its only purpose was to evaluate the fifty cent filters. A power supply and the VFO and audio section from another prototype project were tied in, and on December 14, 1990 I was ready to try it out. With a piece of old wire on the basement floor for an antenna, I tuned across the CW part of 80. The Society of Wireless Pioneers contest was going on, so there were lots of good signals to listen to. In spite the limitations of the crude haywire prototype, it was soon obvious that the filter was not only good but better than I'd ever expected! Here was the next big project at N2EY.

I kept tuning around the band, listening more to the receiver's performance than the content of the QSOs I was hearing. I was listening to a particularly good signal when it signed - W2LYH! Although I'd read all of his articles many times, and used many of his ideas and methods, I'd never heard or worked him before. It seemed only fitting that a new homebrew receiver would find him!

I ran from the workbench to the operating table, fired up the rig, and gave him a call. He came right back and we had a memorable hour-long QSO. Bob was still using the 23-tube receiver described in October, 1961 *QST*, the Franklin VFO described in August 1971 *QST*, and the control system described in January 1960 *QST*. I described my all-homebrew setup, and how I'd come across his signal with the prototype re-

continued on page 39

A Unique Rig of My Own

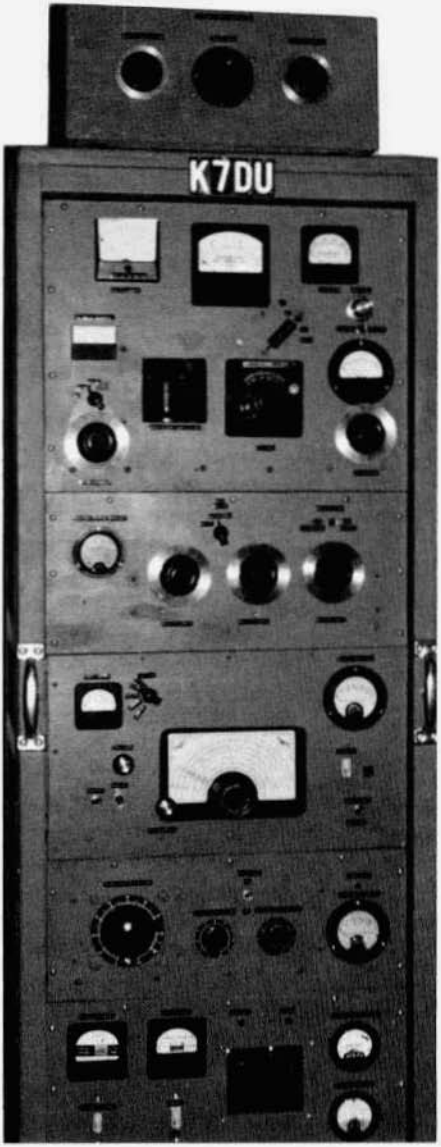
by George Cummings, K7DU
Box 657
Hanna, WY 82327

"When I retire I'm going to build a new rig," that's what I had been saying for years. We perused the swapfests and watched for all the parts that I didn't have in my junk box. Retirement happened in 1991, and after three years the rig was started.

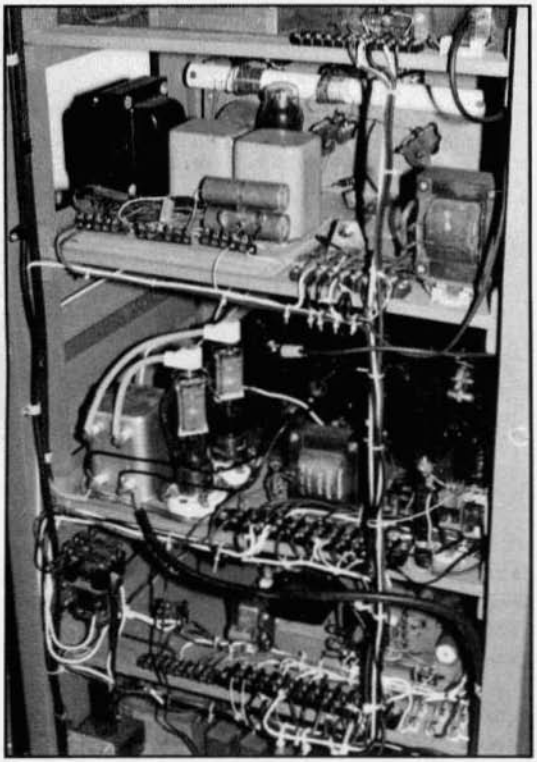
The base was two layers of 3/4" plywood with big, easy-to-roll casters. The corners were 2 x 4's, and a plywood top provided a shell approximately 5 feet high. The prices of metal panels and chassis were out of sight, so the five decks were 1/2" plywood built in a breadboard style. By mounting two narrow strips of hardwood on the inside of the 2 x 4's on each deck, the individual decks can be slid in and out easily. Anyone who has struggled to get a deck out of a conventional rack can appreciate the ease of having the full deck supported while it slides out of the cabinet.

Front panels are made of 1/8" masonite, with copper screen and sheet aluminum providing any needed ground or shielding. Every bit of wood was painted grey inside and out (except for the inside of the side panels, which are white to help visibility when working on it). With black meters and knobs, and a few shiny dials, I like the way it looks.

The RF portion is a VFO (80 meters), frequency multipliers and final amp. VFO is a series-tuned Clapp oscillator, multipliers are 6V6's and the final is a 4E27. This tube is very easy to drive and, on 80, the VFO is all it needs. The transmitter is band switching and covers 80, 40, 30, 20 and 17 meters. Modulators are Class B 811's. On CW mode a screen keyer, break-in and power control system provides smooth operation.



K7DU HB transmitter.



Rear view of transmitter.

The final has a TR switch with relay bypassing for best signal-to-noise on receive mode. A built-in SWR bridge is included, plus an RF ammeter with external thermocouple; it was so good looking I couldn't resist adding it. There are thirteen meters all together, including two which are time-recording for filament hours and plate hours.

The decks, from just above the wheels up, are:

(a) High voltage power supply.
(b) VFO power, HV variac, PA filament variac, multiplier power variac and keyer.
(c) VFO, 811 modulator and speech amplifier.
(d) Frequency multipliers and bias supply.
(e) Final amplifier.

Several of the relays (including time-delay) are mounted on the rear 2 x 4's, inside the corners of the cabinet. Fastened under the top "plate" is a low-pass filter, TR switch and by-passing relays.

Frequency multipliers are doublers or triplers: tuning the VFO down to 3 MHz allows tripling to 9 MHz and doubling to 18 MHz; frequency of 3375 provides tripling to 10.1 MHz for 30 meters, with 40 and 20 reached by doubling. A "T" network transmatch was put together in an aluminum-lined wood box and sits on top of the rig. This provides a 50 ohm load on all frequencies, and was painted to match the rig.

All of my vintage and homebrew rigs have low-pass filters and a good short ground wires. All the gear also uses three-wire grounded power cords so I never have anything hot around the shack. TVI hasn't been a big problem for me in this rather remote Wyoming town where TV signals are either cable or satellite.

If you feel you can't possibly build a rig because of lack of panels or chassis, try wood with metal lining. It's worked well for me. Copper screen is hard to find. I found some on the windows of an abandoned military radar site in Washington state. The aluminum sheets came from a newspaper in a small Washington town. It was used in printing at that time, and cost 35 cents a sheet. It was a great buy, after I wiped off the ink with an alcohol-soaked rag.

This project took longer than I figured it would, but it is a real kick to say "The rig here is home brew." I doubt it will ever be in "final" form, because I like trying different ideas. But in its current form it is on the air and working out very well. **ER**

A Most Unusual AM Transmitter

by George Carroll, N2GBY
301 New Jersey Ave.
National Park, NJ 08063

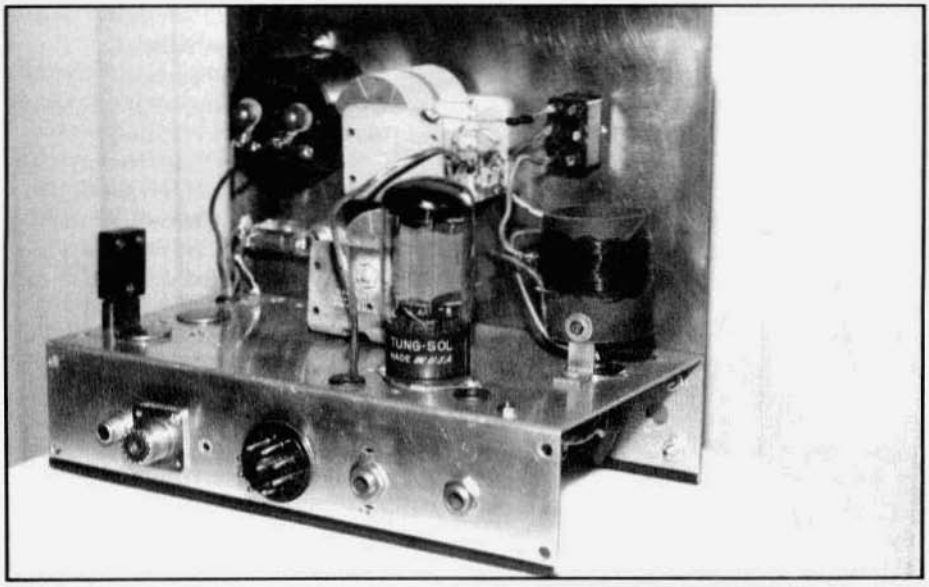
Back in December, during an early morning AM round table, Bob, WA4OID, mentioned that he was building a single tube CW transmitter from an article he read in the May 1983 issue of "*73 Magazine*" (written by Penn Clower, W1BG). Since I had been looking for a simple home brew project, I asked Bob to send me a copy of the article.

The transmitter is basically a 6L6 crystal oscillator with the output of the tube going into a Pi network. The Pi network consists of two AM broadcast receiver tuning capacitors, which act as the tune and load controls; a coil with 23 turns of #20 copper wire wound on a toilet paper tube; and a 470 pF cap.

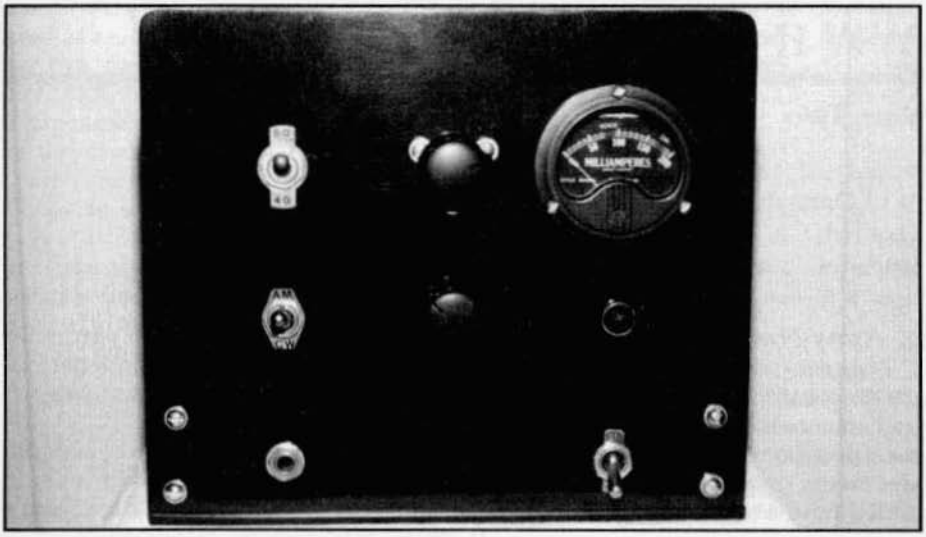
The classic approach would be to build this rig breadboard style, however, I opted to strip and use the chassis of a junk Heathkit Lunch Box. The front panel was made from a door of an old automotive parts cabinet. To retain a vintage look, I used cloth covered wire removed from a junk NC-300 receiver. 3/4 inch steel plugs were used to fill the holes in the chassis left from the original Lunch Box tube sockets. The remaining needed parts were found in my junk boxes.

Having built the transmitter but not the power supply, I once again turned to my collection of trusty Lunch Boxes. Sure enough, 260 VDC @ 60 mA and 6 VAC @ 1.8 amp are provided at the octal power plug on the rear apron of a Sixer. . .how convenient.

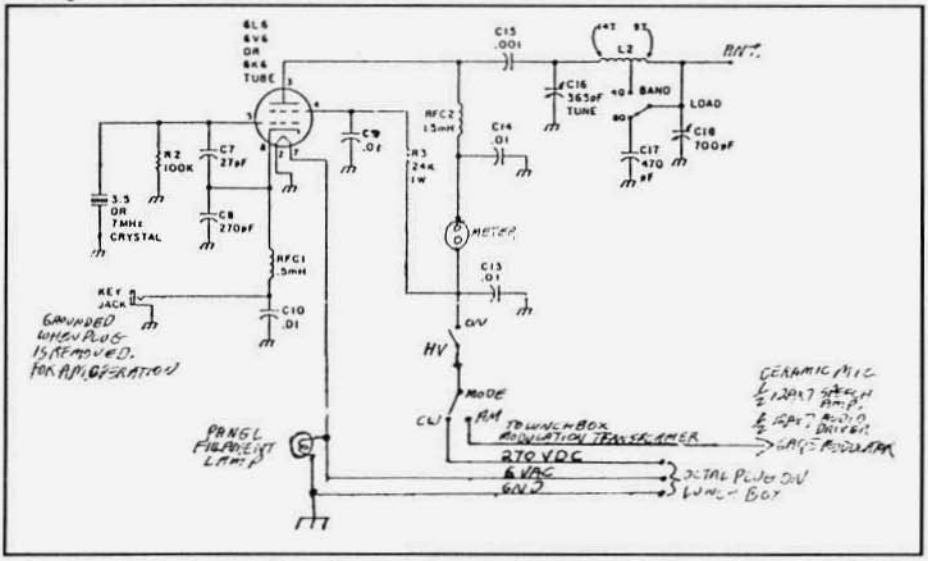
I wired the little rig to the Lunch Box power supply and loaded it into a dummy load. The wattmeter read 4 watts with a 3.885 MHz crystal. I then plugged in my keyer and sent some code while listening on a communications receiver. It sounded decent, a little chirpy on 40 meters, but certainly worthy of "on air" operation.



Rear view.



Front panel of 'most unusual transmitter'.



During the next week I made several solid CW contacts on 40 and 80 meters. I wondered if I could take it a step further and modulate the rig to use it on AM. I went inside the Sixer and disconnected the high voltage lead that runs from the modulation transformer to the final amplifier tube and ran it to the high voltage switch of the home brew rig. Listening to it on my NC-303 receiver, it sounded surprisingly good.

Since then I have had many AM QSO's on 75 meters with the rig. I usually run it on AM with the help of a Heath SB-200 amplifier, which gives me about 20 watts to the antenna.

In conclusion, the audio is far from broadcast quality but I would wager that it's the best sounding modulated crystal oscillator you're likely to hear on the air. **ER**

WW II Nomenclature Systems

Part Two

by Ray Mote, W6RIC
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5. Army-Navy Nomenclature:

I've never seen a document that gives the exact date on which this system was implemented. We can infer the approximate date from initial nomenclature assignments, beginning with the AN/ARR-1 (and AN/FRT-1) in late December of 1942. This was followed in January 1943 with assignments for the AN/ARR-2, 2X, and 3, as well as AN/ARN-1 and AN/CRT-1 components. Publications of the period made it abundantly clear that the presence of equipment with AN/-type nomenclature did not automatically mean that it was in fact used by both the Army and Navy! It only indicated that the type number was assigned in that system.

System designators were formed from the prefix "AN/", three letters specifying the installation type, equipment type, and purpose, a hyphen, a numeric designator, and possibly a suffix to indicate a modification of the basic system. For example, an "AN/ARC-5X" would be a system under the Army-Navy Nomenclature System ("AN/"), it would be an airborne ("A") installation, radio equipment ("R"), used for communications ("C"). It would be the fifth such system assigned this nomenclature ("-5"), and it would have been modified for a different input voltage, phase, or frequency ("X"). In actuality, the AN/ARC-5X was intended for 14-volt DC systems rather than the normal 28-volt equipment, and it does exist. The table of system designators gives a full description of the possible combinations of three letters for the first part of the nomenclature. Modification letters for different input voltage, phase, or frequency were restricted to "X", "Y", "Z", "XX", "YY", etc., and were to be assigned in that order. Any other modification to the basic system was to be assigned a modification letter ranging from "A" to "W", "AA" to "WW", etc.

Component nomenclature featured a one- or two-letter prefix indicating the type of component, a hyphen, a number to indicate which component model was meant, and a possible modification suffix letter. For example, the R-2A was a modification of the original R-2 receiver design in the AN/ARR-3 airborne radio receiving system. One- and two-letter prefixes are provided in the table of component designators. Note: NAVSHIPS 900,109 (Navy Type Number Book) uses "CO" for RF Cables and Transmission Lines, while CO-NAVAER 08-5Q-227 (Nomenclature List for Bureau of Aeronautics Aircraft Electronic Equipment) uses "CG" for this purpose. The Army version in War Department Pamphlet 11-3 (Signal Corps Equipment Security Classification List) also uses "CG". All three documents were published at about the same time, indicating the existence of at least some confusion about this system which was approaching its third birthday.

It was possible to specify both the component and the major system for complete identification. For example, the R-2A full specification would have

been "R-2A/ARR-3". This would be read as modification of receiver number two, part of (or used with) system AN/ARR-3. (The slant bar between the component portion and system portion of the description was read to mean "part of, or used with".) Some descriptions stop short of this point by giving only the three-letter generic designator after the slant bar. This was done to indicate that the component might be used with more than one system of that generic type (R-295/ARR, etc.).

Experimental sets carried an experimental designator enclosed in parentheses, composed of a two-letter originating agency designator, a hyphen, and the experimental model number. For example, AN/ARC-3(XA-1) would designate airborne radio communications set number three, experimental model number one, built by the Aircraft Radio Laboratory. These two-letter agency designators are also shown in a table below.

System Designators:

Installation

A- Airborne
C- Air Transportable
F- Ground, fixed
G- Ground, general use
M-Ground, mobile
P- Ground, pack or portable
S- Shipboard
T- Ground, Transportable
U- General Utility
V- Ground, Vehicular

Purpose

A - Auxiliary Assemblies
C- Communications
D- Direction Finder
G- Gun Directing
L- Searchlight Control
M- Maintenance and test assemblies
N- Navigational Aids
Q- Special, or combination of types
R- Receiving
S- Search and/or detecting
T- Transmitting
W- Remote Control
X- Identification and Recognition

Type of Equipment

B- Pigeon
C- Carrier (wire)
F- Photographic
G- Telegraph or teletype (wire)
I- Interphone & public address
M-Meteorological
N -Sound
P- Radar
R- Radio
S- Special Types or combination
T- Telephone (wire)
V- Visual and light
X- Facsimile or Television

continued next page

Experimental Sets: Originating Agency:

XA - Aircraft Radio Laboratory
XC - Camp Coles Signal Laboratory
XE - Camp Evans Signal Laboratory
XM - Fort Monmouth Signal Laboratory
XN - Navy
XO - Eatontown Signal Laboratory
XP - Army Pictorial Service
XR - NDRC - Division 14
XT - Toms River Signal Laboratory

Component Designators:

AB - Antenna Supports (Bases)
AM - Amplifiers
AS - Antenna Assemblies or Systems
AT - Antennas (Simple)
BA - Battery, Primary Type (Dry)
BB - Battery, Secondary Type
BZ - Audible Signal Device
C - Control Articles
CG - RF Cables and Transmission Lines
CK - Crystal Kits
CM - Comparators
CN - Compensators
CO - RF Cables & Transmission Lines
CP - Computers
CR - Crystal Units
CU - Coupling Units
CV - Converters (electronic)
CW - Covers
CX - Cords
CY - Cases
DT - Detecting Heads
DY - Dynamotors
F - Filters
FN - Furniture
G - Generators (see PU)
GO - Goniometers
GP - Ground Rods
H - Head, Hand, & Chest Sets
HD - Air Conditioning Apparatus
ID - Indicators
IL - Insulators
J - Junction Units
KY - Keying Devices
LC - Line Construction Tools
LM - Lamps
LS - Loudspeakers
M - Microphones
MD - Modulators
MK - Maintenance Kits or Equipments
ML - Meteorological Apparatus
MT - Mountings
MX - Miscellaneous
O - Oscillators
OA - Operating Assemblies
PF - Pole Fittings
PG - Pigeon Articles
PH - Photographic Articles
PP - Power Supplies
PT - Plotting Equipments
PU - Power Equipments
R - Radio & Radar Receivers
RD - Recorders & Reproducers
RE - Relay Assemblies
RF - Radio Frequency Units
RG - Bulk RF Cables & Transmission Line
RL - Reel Assemblies
RP - Rope & Twine
RR - Reflectors
RT - Receiver and Transmitter
S - Shelters
SA - Switching Assemblies
SB - Switchboards
SM - Simulators
SN - Synchronizers
ST - Straps
T - Radio & Radar Transmitters
TA - Telephone Apparatus
TD - Timing Device
TF - Transformers
TH - Telegraph Apparatus
TK - Tool Kits or Equipments
TL - Tools
TN - Tuning Units
TS - Test Equipments
TT - Teletypewriter & Facsimile Apparatus
U - Audio & Power Connectors
UG - RF Connectors
V - Vehicles
VS - Visual Signaling Equipments
WD - Two-Conductor Cable
WF - Four-Conductor Cable
WM - Multiple-Conductor Cable
WS - Single-Conductor Cable
WT - Three-Conductor Cable

6. Confusion Factors:

There are a number of aspects of the three nomenclature systems, the way they were implemented, and the effects of wartime events, that can be very confusing. First, you will find a mixture of two or more nomenclatures in the same system! There was at least one Army radar, SCR-296-A, that included a Navy LF. strip, CAOS-50AEY (see Modification Work Order 11-1505-1). Additionally, various AN nomenclatured systems contained either Army nomenclature or Navy nomenclature components.

Model or component numbers can provide confusion in a variety of ways. For example, if someone offers you an "ARC-1", is he describing the AN/ARC-1 VHF transceiver or the Navy Model ARC-1 countermeasures receiver? Additionally, commercial manufacturers were fond of assigning "R-xx" or "T-xx" model numbers to their transmitters and receivers. Then we have the famous Aircraft Radio Corporation, with their ARC Type 12 and ARC Type 15, etc. systems. The Navy type numbers were sufficiently weird to preclude most confusion problems, but did you know that there are 21 identical component prefixes in the Army and AN systems? Fortunately, eleven of these (BA, BZ, GP, LC, LM, LS, ML, PH, RL, ST, and TL) are essentially the same in both systems. The rest (C, CO, CP, F, J, M, R, T, TD, and TS) have radically different meanings in the two systems, and you'd better watch out.

Even in a single service model, multiple manufacturers can confuse the issue. Your BC-348-J, N, or Q was made by Wells Gardner. Others, such as the E, M, P, or S would have been made by a different manufacturer, and will have different schematics and tube lineups. The same warning applies to a number of Navy receiver models. In this case, it pays to get the manufacturer's code prefix, as well as the rest of the Navy type number. In some listings of type numbers, even the Navy left blanks in front of the type number due to the large number of contractors involved.

Worse yet, the horse-trading between services over priorities at various plants led to Army and Air Corps use of Navy radio models and vice versa. As if that weren't bad enough, one look at an equipment listing for either service shows a fairly large number of commercial models in use, in addition to all the military gear. This is particularly evident in aircraft installations and in test equipment, where names like Bendix, RCA, Dumont, and General Radio keep cropping up. Even the venerable Hallicrafters S-27 did its bit as a countermeasures receiver, first for the British, and later in American "ferret" aircraft making electronic intelligence flights over enemy territory.

7. Conclusions:

Although all three nomenclature systems individually met the basic objectives stated in the beginning of this article, they were not without weaknesses. All nomenclature systems are weakened by both intentional misuse and unintentional errors in assignments. The former must be prevented, but we will have to live with the latter. The Army system was relatively robust, but had several category pairs (such as I and IS) where reasonable confusion could exist as to the correct category to use. The old two-letter Navy model system was incapable of coping with wartime expansion, in terms of a great many additional models.

The three-letter Navy system was no better in a few areas, notably those involving airborne systems. (A single letter limited the system to no more than 26 models.) The AN system appears to be the most robust, in terms of expansion and flexibility, and this is proved by its survival.

There is one more aspect that has not been thoroughly explored. It involves

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A Review of "RCA Lies & Fiction"

by ER Editor, N6CSW

Back in 1956 (almost 40 years ago) the broadcast transmitter sales department at RCA put together a 50 page document they called "Competitive AM Transmitters", comparing all the broadcast transmitters being manufactured at that time. The document was intended as a sales tool for the sales staff. As you can imagine it was hardly an 'objective' assessment; it put RCA transmitters in the best possible light relative to the competition.

This document somehow fell into the hands of the broadcast engineering department of the Collins Radio Co. where it was labelled "RCA Lies & Fiction". RCA never intended that this document would ever get 'out of house' and must have been quite embarrassed when the Collins Company got hold of it.

Last year I acquired this document from a retired Collins broadcast engineer, who will remain nameless (or headless if found out). This copy is labeled "Confidential Copy No.2". A note written on the cover page says, "Lifted from RCA through 'special' channels" .

The book (?) compares all the transmitters that were in production at that time by RCA, Collins, Continental, Gates, Westinghouse, General Electric and Raytheon. It compares the various models of the same power level in charts comparing the features and goes into brief discussions of shortcomings of various models. There is also a section that lists the trade-in values of all the broadcast transmitters.

I know this information is interesting to a lot of AM'ers who are using broadcast transmitters on 160 so we are going to reproduce "Lies & Fiction" and make it available for $12 plus $3 shpg. Some excerpts from the book follow.

"Bluebook Price List, Standard Trade-In Values 2-1-56, AM Transmitters"

1000 Watts

RCA

1-D	$500
1-DB	$600
1-K	$2,000
BTA-1L	$3,000
BTA-1M	$4,000
BTA-1MX	$4,000

Collins

20-K	$1,750
20-T	$2,100
20-V	$2,800

Raytheon

RA-1000	$2,000

Gates

BC-1E	$1,750
BC-1F	$2,500
BC-1J	$3,200

G.E.

XT-1A	$2,000

Continental

314	$2,000
314-2	$2,600

W.E.

443	$600
503	$1,550

This 'Bluebook Price List' covers all of the broadcast transmitters at all power levels.

One Kilowatt AM Transmitters
RCA BTA-1MX vs. Collins 20V-2

The Collins 20V-2 is a cost-reduced unit, with every feature of the design being aimed at minimum, "satisfactory performance" at lowest price. It sells variously from $4300 to $4600, and has less current acceptance than any competitive model except possibly Continental's old 1KW Doherty, since replaced.

There are ten control positions, including hum balance, one in modulator and one in RF amplifier. Hum can be adjusted down to -60 dB with these controls, plus the audio balance control. (RCA guarantees -60 dB without such hum-bucking gimmicks, which have been obsolete in RCA designs since 1938.) Collins also needs a modulator bias adjustment on the front panel to maintain 3% distortion to 7500 cycles. (RCA guarantees 2% distortion to 10,000 cycles without this knob-riding).

Collins uses eight tube types, RCA only four.

Collins offers 10 cycle "cold crystal" stability vs. 5 cycles in RCA "oven" holder.

Collins guarantees performance only to 6000 feet. RCA is designed for 10,000 ft. operation. This means better insulation, less arcing at any altitude, and better cooling.

Collins is still making all components as difficult for accessibility as ever. By use of horizontal chassis construction, cumbersome shielding and component-cramming, they have succeeded in reaching a new low-water mark in the 20V-2. No resistor or capacitor is visible from front or back of the 20V-2. All RCA components are visible from the rear in RCA's vertical chassis construction.

There is a law against soldering "up" from below, as necessary in the Collins design - the Law of Gravity.

Collins uses shielded air capacitors for RF tuning. This effects about $300 cost reduction over variable inductance technique, at considerable cost in dependability.

Collins uses parallel tetrodes in the final RF amp, with no provision for neutralizing. Our experience indicates beam tetrodes can occasionally cause trouble with parasitic VHF or LF oscillation, from tube to tube.

RCA uses broadband transformer "one-shot" neutralizing, and has a really tame final. No tube ever built has the life or performance record of the 833A. Some are still going strong at 40,000 hours.

The 20V-2 although larger than the BRA-1M, weighs only 1150 lbs., vs. 1400 lbs. for the RCA product. Only heavy duty transformers can guarantee heavy-duty performance. RCA has them.

Collins doesn't mention distortion above 7500 cycles. There, at 95% modulation, it's 3%. It increases considerably as frequency increases. At 10,000 cycles, 95% modulation RCA is under 2% distortion.

RCA components are conservatively rated, dependable, long-life items. They cost a little more, but last a lot longer.

RCA, for this reason, has highest resale or trade-in value. Collins' is quite low, once it's "used."

Dr. Vernon Baker, President and Chief Engineer of WBCR, Christianburg, VA. bought a Collins kilowatt in 1955. He has been through three plate transformers, now running on his fourth. He complains about component access. He has wrung off the panel screws in attempting to remove housings to reach components. His tube life has been less than 5000 hours on the Eimac tubes.

continued next page

250 Watt AM Transmitters
RCA vs. Gates BC-250GY

1. Gates has higher distortion.
(2.9%. 50-7500 cps at 90% modulation vs. RCA. 2%, 50-10000 cps at 95% modulation.
2. Gates consumes more power. (1.6 kW vs. 1150 W).
3. Gates has higher drift (± 10 cps vs. ± 5 cps)
4. Gates uses more tubes - (11)
5. Gates uses more tube types (6 vs. 3)
6. Gates has six tuning controls (RCA 1).
7. Gates does not modulate driver screen for improved linearity. RCA does.
8. Gates used RF feedback - RCA doesn't need to "gimmick" its RF chain.
9. Gates requires high-level audio input of + 14 VU (+ 24 dBm). RCA needs + 10 dBm.
10. Gates used considerable horizontal chassis and enclosed-assembly construction. Access to low-power RF and audio components is difficult.
11. Gates requires 220 volt supply. RCA gets along with standard 110 volts.

Gates BC-5P - Ebb-Tide of the Hi-Watter

We are pleased to announce the arrival of the newest flower in the AM garden - the Gates BC-5P, 5 KW AM transmitter, at a price of $11,700.

Contrary to popular supposition, the BC-5P is not an AC/DC rig. It operates on new subminiaturized transformers, which can be found after careful search inside the equipment. The power transformer, modulation transformer and reactor are smaller than the equivalent items in our new BTA-1MX!

The transmitter features nine "clip-on" front panels which protect the innocent from electrocution while attached. However, such controls as driver tuning are located behind the panels. Convenient interlock positioning makes it possible to tune with the right hand while shorting with the left.

The plate transformer in the BC-5P requires a full volume of .6 cubic foot, one-fifth the size of the small BTA-5H equivalent. Solidly-bolted chassis trays neatly prevent access to components underneath the decks, on such items as low-power RF tray, low power audio tray, power supply tray and audio driver tray.

Gates has abandoned twin-drive audio in the "P", in favor of "ultra-linear audio-drivers", which are rated only ± 2 dB from 5-10,000 cps.

They have also abandoned such expensive rectifiers as 5R4GY tubes in favor of the less costly 5U4G for all power except bias and H.V. where 8008's are used. 5U4G tubes frequently give up to 2000 hours reliable service in TV receivers. They use, however, less filament current than the 5R4GY.

Rotary inductors are used to enhance carbonization of power tuning rollers.

Gates' latest design throws the same kind of bombshell into the transmitter business as the Crosley car hurled into the automotive business some years ago....

Don't let your shoeless customer become a "P" picker - sell him a 5-DX!

Five Kilowatt AM Transmitters
RCA BTA-5H vs. Gates BC-5E

Gates has announced a later version of their 5 KW AM offering, type BC-5E, which supersedes the older BC-5B transmitter. It sells at $15,750. The transmitter is a cut-down version of its predecessor, similar in electrical and mechanical design, tube lineup and cubicle arrangement. It features "self-contained" miniature power transformers, and has no external components. (Last year they advertised "heavy-weights in the backfield," referring to the BC-5B transformers).

1. Gates has come up with a new type of construction - not "walk-in", but "walk-on" construction. The floor of the transmitter is cluttered with assorted transformers, reactors, capacitors and various other components, which provide the convenient "walk-on" access.

2. Nine tuning controls, including front panel neutralization of the driver (they know best) are handy adjustments on the BC-5E. (RCA has two controls).

3. Twenty-six tubes, eight types are utilized (we use 22 and 7 on the BTA-5H).

4. The Electro power transformer is dry-type, and a mammoth seven inches by twelve by fourteen approximately in size. No other transmitter today features "portable" power transformers. (RCA once tried Electro transformers on one run of 5 KW transmitters, abandoned them when we closely examined the workmanship and mortality rate). Gates' transformers are less then one-third the size of our current BTA-5H model transformers.

5. The RCA transmitter weighs 5400 lbs., about 800 pounds more than the Gates. (RCA weighs more, it must be better!)

6. Gates uses horizontal-type chassis construction on its audio driver equipment. Not one resistor or capacitor is accessible or even visible in the modulator. Vertical construction is used elsewhere, with only fair accessibility.

7. Variable air capacitors are used in the driver stages for tuning and neutralization.

8. Gates' Electro transformers could blow away in a strong gale, if proper precaution was not taken.

9. For air cooling, Gates has gone to a canvas wind-bag instead of a metal duct. This saves nothing but money. Maintenance and dust-prevention, especially in a transmitter using air capacitors, are not simplified by this economy.

10. No access for crystal oscillator adjustment is possible without shutting down and disassembling the transmitter.

11. No forced air cooling is applied to the transformers or reactors. (No stove is needed at the transmitter house for that early-morning snack). Only Gates provides this air-cooking feature.

12. Gates will not rate their transmitter's distortion above 90% modulation. We understand it to be 4% or more at 95% modulation between 50-7500 cps. RCA guarantees better than 2-1/2% distortion between 50-10,000 cps at 95% modulation, and actual experience indicates far less than spec. guarantees.

13. Gates "doesn't really need" a modern power supply, either. The RCA 4-phase grid-controlled Thyratron supply makes mechanical protection, sticking relays, etc., as obsolescent as last year's hat.

14. Gates supplies one crystal, one oscillator. RCA supplies two separate crystal oscillators. Gates guarantees ± 10 cps stability. RCA guarantees ± 5%! ! ! !

choke to ground with 0.01 mFd capacitors.

If you've done all this and you still have chirp, as I do, relax and enjoy it. You'll have one of the few, remaining "distinctive" signals on the air. And when some guy gives you a 579c, he will then be amazed when you tell him that you are running a fifty year old, World War II surplus Command Set and he'll forgive you - most of the time.

Or...watch these pages for more suggestions from readers who are wiser than I.

When Shopping for Your Command Set

Command Set transmitters are extremely rugged beasties. I bought my original BC-457 from "Columbia, The Gem of the Surplus" for $2.95 in "used, as is, removed from aircraft" condition. What they didn't tell me was that the plane had crashed into the ocean!

Undaunted, I removed the cover and shook out the broken chards of the 1626, the 1629, one of the 1625's and the loading coil. I bent the front panel back into shape, pounded the biggest dents out of the top cover, washed out the salt with the garden hose, and baked it dry in my mom's oven - all on one afternoon when she was out at the hairdresser's. I then completed the Basic Conversion, plugged in the remaining, unbroken 1625 and three replacement tubes; and it worked perfectly for years thereafter. Now that's rugged!

The moral of this story is that even a thoroughly beat up Command Set can be made to work again. Just make sure it has all of its vital parts and you should be OK.

There is one semi-subtle thing to look for, pointed out by Walt Hutchens in his article. The tuning and padder capacitors have their stator sections supported by small, round plastic beads. A heavy shock can knock these beads loose. So try to inspect at least the capacitors under the chassis before you buy to make sure that they haven't "lost their marbles." If they have, look around carefully because they might just be rolling around inside.

Hints and Kinks

The crystal in the 1629 calibrator circuit connects to pins 1 and 3 of the center socket in the back. You can use any FT-243 crystal, for example one on the band edge, in this marker circuit. You can also, I understand, wire the socket to take two crystals in parallel if you want to keep an eye on both band edges. A Novice or Tech Plus might appreciate this feature, even today.

The single-plate trimmer on top of the oscillator padder, accessed through the slide-open port on the top cover, is used to correct the dial calibration. It's conveniently used either with the internal calibrator or with your receiver.

CQ published a great compendium of Command Set Transmitter and Receiver articles back in the 50's. It is aptly titled "Command Sets." Walt reports that it has a yellow, black and white cover, and it carries a picture of a black crackle finished transmitter. If you find one at a flea market, grab it. It's great reading and it will give you more ideas. If you find two, send one to me!

73 and happy transmitting with your Command Set. ER

Footnotes:

1. Fair Radio Sales, POB 1105, Lima, Ohio 45802. (419) 223-2196. Catalog WS-19, page 24, under ARC-5 Accessories the FT-234 Single Transmitter Rack is listed for $9. Fair Radio is an ER advertiser.

2. Fair Radio Sales, Catalog WS-92, page 14, center column, top line, #T56379, $3.50.

3. This change comes from the Surplus Radio Conversion Manual, Volume 1, Second Edition, By R.C. Evenson and O.R. Beach, 1948, page 64. I haven't tried it myself, yet.

HA-7 Crystal Calibrator from page 17

* The adjustment range of the HA-7's 8-50 pF N750 trimmer was 99.979-100.086 kHz, a -21/+86 Hz adjustment range. Compare this to the SX-100's calibrator's range of 99.987 - 100.074 kHz, a -13/+74 Hz adjustment range. Neither one had a symmetrical adjustment range, but with their relatively low temperature coefficients, it's not a big deal as long as they can be adjusted to 100.0000 kHz.

* The HA-7's temperature coefficient using the T-9E crystal is approximately +0.05 Hz/°C or +0.5 ppm/°C. The temperature rise in the SX-117 during the first two hours of operation is approximately 17° C which corresponds to a ±0.85 Hz increase at the fundamental 100 kHz or 85 Hz at the 10 MHz WWV calibration point. It's probably best to calibrate the HA-7 in the host receiver after two hours or more warm-up if maximum accuracy on the higher bands is required. The HA-7 in the SX-117 and SX-122 can be easily calibrated through the perforated top cover using an Xcelite 4" pocketclip style slotted screwdriver. The perforations in the SX-100's top cover are too small for this screwdriver, so you have to raise the lid.

* The voltage coefficient from 125 - 175 VDC is +0.025 Hz/V or +0.25 ppm/V. The HA-7 should be powered from a regulated source for best results (e.g., +150 VDC from an 0A2). **ER**

Selected References:

1. "The Hallicrafters Story, 1933-1975", Max De Henseler, HB9RS, Antique Radio Club of America, Inc., 1991, pg. 219.

2. Catalog 380, Frequency Control Devices, NEL Frequency Control Devices, Inc., pgs. 10 & 12.

3. Catalog 9001, NEL Frequency Controls, Inc., 1990, pgs. 2, 12, 13 and 36.

The Fifty-Cent Filter from page 25

ceiver. He seemed pleased to hear that there were still some young squirts keeping the soldering irons hot. We later swapped QSL cards and letters.

Since then, I've worked Bob several times, always on CW. A 12-tube single conversion/premixer type receiver using the fifty cent filter is now the main inhaler at N2EY, next to the matching transmitter and transceive adapter. All CW, all hollow state and all homebrew, of course. It's a joy to use, and the "Mark 2" version is in the planning stages. It will use better components and TWO of the fifty cent filters. No homebrew project is ever completely finished.

How well does it all work? Using an 80/40 inverted V at 35 feet and a quarter wave 20 meter vertical, this setup was good for over 600 QSOs and 71 sections in the '94 CW Sweepstakes. **ER**

Letters from page 2

too require all of the equipment in my shack to operate consistent with its original design and the state of the art of its era. My Command Set Triplets, and their companion, "converted" 80 and 40 meter Command Set Transmitters, occupy a prominent position there. Anyone who would like to work them on the air is invited to look for W8KGI on 7060 or 3560 in the next Classic Exchange on Sunday, September 24.

Jim Hanlon, W8KGI

Dear ER

I looked at the cover of the May issue of ER and I said "that's my old headset mic that I threw away 15 years ago". I quickly recognized it as it was a handmade prototype that was given to me many years ago by Jim Taylor. I looked closer and sure enough, it was Jim in the picture. Jim called on me in Minneapolis where we were Collins dealers. What a surprise. I often wondered what happened to him and I find he lives 150 miles from me.

Don Gies, K4GIT

Running Mobile from page 23
filaments in parallel and replaced the 12-volt tubes with their 6-volt equivalents to match the then-standard car battery voltage. Some users replaced the 6SK7 with a 6AC7 tube in the RF stage. This high-transconductance pentode made a dramatic improvement in ten-meter sensitivity. One could also use a converter ahead of the car's broadcast-band receiver. But such converters cost as much or more than the BC-455 job. And quite often the automobile of beginning hams did not sport the luxury of a BC car radio.

Back then, one had to convert 6 volts DC from the car battery into hundreds of volts for the tube's plates. This could be done with a vibrator power supply, whose current output was quite limited. Or one could use a dynamotor, a generic term for a DC high-voltage generator that was motor driven from the car battery. The surplus PE-103 was the most popular unit at the time. It was cheap, and it provided both 150 and 500 volts, ideal for powering both a mobile receiver and transmitter. Experience quickly taught users that an extra 6-volt car battery tied in parallel with the car's own battery would insure against a silent starter motor. This was especially true if much time was spent listening without the car's engine running. On transmit, the PE-103's whine would lug down under the extra load. Even with the extra battery, one didn't make long transmissions before again starting the car's engine to produce a recharge.

That Saturday night on Signal Hill, everything remained charged. In the quiet night, contacts were made. When it was time to go, the car started with no problems. It's fun to think back on that time, when many of today's ham senior citizens were first active on the bands. That early ten-meter experience will always live in memory for those who were there, especially for those who did it mobile. ER

WW II Nomenclature Systems from page 33
dual assignments of both Army nomenclature and British Air Ministry "reference numbers" to quite a few systems. Airborne radio, radar, and IFF systems in particular carry both the Signal Corps tag and a cute little red tag with a crown and Air Ministry reference numbers. As far as I know, no one has ever come up with a cross-reference list of these numbers. If you have this type of information, I'd sure like to know about it!

Now that you know the nomenclature systems, where do you find listings of the equipment? (I'll give you a hint -- they're far too lengthy to publish here.) I'd recommend the Antique Wireless Association's annual "AWA Review": Volume 6 has Fred Chesson's list of Army-nomenclature equipment, Volume 7 has Fred's list of the Navy manufacturer's codes (which the Army also used), and Volume 8 contains a pretty good list of the Navy models. The Navy type number list runs about 1600 pages, and is not for sale anywhere I've looked. Additional information on Army equipment can be found in Army TM 11-227 (a directory of radio gear), TM 11-486 (Communication Systems Engineering), and TM 11-487 (Communication Systems Equipment). SHIPS 275 (Navy Catalogue of Radio Equipment) is available from New Wireless Pioneers at (716) 681-3186.

Good luck, and good hunting. If this has helped you, my work will have been worthwhile. I hope to publish an article on the technical manual numbering systems of the Army, Air Corps, Bureau of Ships, and Bureau of Aeronautics in the near future. Unfortunately, lists of BuShips publications are hard to find and I'll need help from "out there". ER

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FOR SALE: HS-30 headsets, GI dated 1944, brand new, in sealed, waxed, protective cartons. Extra earpieces, dessicant, instructions, cord, included. Used with virtually all WW II and many later combat and clandestine radios - $20. Gene, KD4YIZ, (800) 619-0900.

FOR SALE: BC-453 Command Set in exc. unmodified condx. - $100 + UPS. Jeary Vogt, 3 Brampton Rd., Malvern, PA 19355. (610) 296-2162

FOR SALE: Millen 90881 RF deck w/80M coils, 3 NOS RCA 812A's. **WANTED:** Good SX-100 rcvr. Sandy, W5TVW, 417 Ridgewood Dr., Metairie, LA 70001. (504) 836-2134

FOR SALE: TV-7D/U tube testers. These units have been stripped to bare metal, repainted, restenciled and calibrated. Looks and operates like new - $150 U-ship. Bob Bakinowski, 1524 St. Tropaz, Tucson, AZ 85713. (520) 624-8029

FOR SALE: Pick up items: 40 foot commercial tower, five 8-foot sections, tilt base - $315; Meissner 150B xmtr, 813 final /811 modulators, manual, cables - $69 (250 pounds). Can ship: RCA 8021 shipboard radiotelephone, restorable - $69. Don, N3RHT, PA (412) 234-8819

FOR SALE: HT-32 parts. **WANTED:** pwr xfr for HT32. W7RBF, AZ (602) 864-9987

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

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

FOR SALE/TRADE: Hallicrafters S-38D, S-40A, S-53, S-85, SX-111, HT-37, HT-41, National NC-270. **WANTED:** Collins 75S1 unmodified;Central Electronics 100V, 600L. Herb Ellmers, W1QPD, 775 Howard St., Fort Pierce, FL 34982. (407) 466-0926

FOR SALE: ARC-5 & 274N original, rebuilt xmtrs and rcvrs. Ken Kolthoff, K8AXH, 5753 David Pl., Fairfield, OH 45014. (513) 858-2161

FOR SALE: "Introduction to Key Collecting", 64 page softcover illustrated guide - $11.95 ppd USA. Start now in this fascinating hobby. Artifax Books, Box 88-E, Maynard, MA 01754.

FOR SALE: Heath SB-313 rcvr, manual - $225; HX-11 xmtr - $150; DF-3 Mariner - $125, all exc. condx. Stuart T. Carter II, W4NHC, POB 033177, Indialantic, FL 32903-0177. (407) 727-3015

FOR SALE: TMC CV-591A/URR converter SSB w/manual - $75 + UPS. Alan Dale, W9ZPP, 2824 Forest Ave., Evansville, IN 47712. (812) 424-5208

WANTED: RME DM36 converter. Matches RME69 rcvr. Trade nice RME VHF152A converter or money. Bill, WC7O, 12405 Ranchette Dr., Tucson, AZ 85743. (602) 682-7285

WANTED: Old meters & any aircraft stuff. Chris Cross, Box 94, McConnell, Il 61050.

WANTED: I am gathering information on A.C. Gilbert radios, circa 1919-1922, need photos, advertising sheets, assembly manuals, catalogs, etc. (copies OK). Will pay for copies and radios. James Fred, RI, Cutler, IN 46920. (317) 268-2214

WANTED: Regency TR-1; Sony TR-63 & Japanese made pocket type transister radios; WW II Japanese military radios. Takashi Doi, 1-21-4, Minadmidai, Seyaku, Yokohama, Japan. FAX:011-8145-301-8069

WANTED: HRO plug-in xtal for HRO variation two (only xtal). Tajima, JA1DNQ, c/o The Nakagawa's, 22942 Cedarspring, Lake Forest, CA 92630.

WANTED: Military electronics, RDF, radar, communications, test, manuals, literature, etc. What have you got? William Van Lennep, POB 211 Pepperell, MA 01463. (508) 433-6031

WANTED: SC-101; SC-301; KW-1; 30K-1 thru 5; 302C1; 75A thru 75A-4 rcvrs and spkrs, any condx. Purchase entire estates, pick up 48 states and top $ paid. Rick, (800) 462-2972

WANTED: Johnson gear, all models, any condition. Please state asking price. Wen Turner, AD7Z, Box 451, Cal-Nev-Ari, NV 89039-0402.

WANTED: Collins Radio goods, coil cover, calibrator, mechanical filters and kilocycle dial for 75A3. Brian Roberts, K9VKY, 3068 Evergreen Rd., Pittsburgh, PA 15237.

WANTED: B, C & D coils for HRO-60. Marc Kulbacki, VE3GDX, 2434 Alexandra Ave., Windsor, ONT. N9E 2J3 Canada. (519) 969-5620, wknds.

MESSAGE: John Bess call Joe Bunyard, TX (817) 753-1605

WANTED: Handle & carrier meter for R-389 that was damaged in shipment. I believe the R-390A & R-391 carrier meters are the same. Bob Bakinowski, 1524 St. Tropaz, Tucson, AZ 85713. (520) 624-8029

WANTED: Top shape NC-400 or SX-115 or HQ-170A. Jack Busk, W9FQK, 926 Rio Verde E., Cottonwood, AZ 86326. (520) 634-2028

WANTED: P&H Electronics VFO-Matic model #8010 (transeives 75A-4/KWS-1). Butch, KØBS, MN, (507) 288-0044

WANTED: Manuals for HP 410B vac tube volt meter; Eico model 250 VTVM. Don, N6IDY, CA, (818) 368-7374

WANTED: Copy Feb. 1948 Radio News Magazine. I need it badly. Al Gross, W8PAL, AZ, (602) 814-6387

Vintage Manuals Available
for amateur, audio, and radio-related equipment. Quality is always our number one customer priority. Catalog, two $.32 stamps. Pete Markavage, **Manual Man**, 27 Walling St., Sayreville, NJ 08872. (908) 238-8964

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

WANTED: KWS-1; HF-380; 62S1; R-389 and SP-600JX. Need exc. condx. Mitsugu Shigaki, JA6IBX, 2825 -2. Jozan Kamidai Machi. Kumamoto. 860 Japan. FAX Japan-96-329-4601

WANTED: Tektronix memorabilia & promotional literature or catalogs from 1946-1980. James True, N5ARW, POB 13280, Maumelle, AR 72113. (501) 851-8783, FAX 851-8784.

WANTED: HI-FI spkr's & enclosure by Altec, Electrovoice, Jensen, JBL; tube components. Tim Phelan, 845 Lilybud, Ballwin, MO 63011. (314) 227-9264.

WANTED: To borrow service manual/schematics for Singer/Gertsch FM10CS station monitor. Marvin Moss, Box 28601, Atlanta, GA 30358.

WANTED: KWS-1 pwr sply. Rolynn, K7DFW, 23471 Cedar Grove Rd., Clatskanie, OR 97016-2505. (503) 728-4157

WANTED: T-368, prefer intact, all considered. Greg, N6PUO, 1607 Grandview Ave., Martinez, CA 94553-1863. (510) 228-9440, collect OK eves & wknds

WANTED: Cardwell receivers (e.g. 54), manuals, advertising literature & technical bulletins. Newell, VE7AEC, in callbook. (604) 943-6033

WANTED: Heathkit, Eico, Fisher, Dynaco or similar tube audio amplifier in any condition or manuals for same. Mike Nowlen, WB4UKB, POB 1941, Herndon, VA 22070. (703) 716-1363

WANTED: Hallicrafter BC-610 xmtr, 100% complete unit or just empty cabinet or anything in between. Joe, AB5LL, AR, (501) 257-2567

WANTED: Commercial HF preselector for receiving, any make OK. Joe, AB5LL, AR, (501) 257-2567

WANTED: Schematic & operating instuctions for Harris RF communications, model RF-675 antenna coupler. Bill Mills, KC5PF, 16523 Tony's Ct., Amissville, VA 22002.

WANTED: Johnson Navigator; matching spkrs for National NC-300 & NC-183. Clean equipment only. Clint Hagemeier, KB5ZHT, 107 Forest Oaks Ln., Lake Jackson, TX 77566. (409) 297-3338

FOR SALE: New book on Tube Type Transmitters, Transceivers, Linears and more. 1922 through 1970. 500 pictures, 105 manufacturers, 550 models of xmtrs/xcvrs & more - $15.95, including postage. Add $1 for Canada, Calif. residents add appropriate sales tax. Allow 3 weeks for delivery. Sound Values, POB 9, Auburn, CA 95604.

FOR SALE: Collins 75A1 w/manual, everything works, condx 8-plus. Pete Patton, WØEWQ, 6908 Clearview St., Philadelphia, PA 19119. (215) 849-5830

FOR SALE: Viking II CD w/122 VFO, xmtr rough, VFO nice, works fine, w/manuals - $150; Central Electronics 20A w/458 VFO w/manuals -$125; Collins ART-13 w/0-16 low freq. osc. - $150; SB-300 rcvr, needs TLC - $40. Mike Heltborg, WA7NPA, 191 Tote Rd., Washougal, WA 98671. (360) 837-3560, eves

FOR SALE: 73 issues of ER including #1, all in like new condition - $50. Cliff, W3LVC, MD (410) 796-1070

FOR SALE: FAA red lense tower clearance fixtures -$25; Collins 516E-2, very clean - $150; Collins 75S Mallory direct replacement filter capacitors (new) -$25; Collins cabinet rubber feet (can't over torque or mushroom) - $1.50 each; Collins front leg elevators - $7; never used, original boxed 813 tubes - $25 each. Ed, W3WDF, 8245 Garden Oaks Dr., San Antonio, TX 78266-1710. (210) 651-9348

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FOR SALE: Fan bracket for KWM-2/32S-? lowers the internal temp 20 deg.C using two 60MM micro-boxer fans (ER #71). Drop-in, no mods - $15; replica Ocean Hopper front panels - $20. All $ ppd. DWI Engineering, POB 3611, Costa Mesa, CA 92628-3611.

FOR SALE: New Collins PJ-068 mic plugs for S-line/KWM-2 - $8 each. Clint Hancock, KM6UJ, 6567 Ashfield Ct., San Jose, CA 95120-4502.

FOR SALE: Millen 90881 HF amp w/filament xfmr, 90801 xmtr NIB, sale or TRADE toward Millen Variarm VFO. **WANTED:** B&W BVL coils especially BVL-15; 812 tubes; Stancor xmtrs. Thanks! Tom Smith, N5AWA, 13034 Elmington Dr., Cypress, TX 77429-2062. (713) 376-3436 (h) 957-6420 (w)

FOR SALE: Johnson panel refinishing: Ranger I, Ranger II, 500, Desk KW, Viking I, Viking II. Production runs this summer. Call or SASE for info. Ron, AB5WG, 115 First St., Sugar Land, TX 77478. (713) 491-7823 after 6PM CST

FOR SALE: Aux Vox unit for KW Atlanta, new - $20; Nacometer automatic code xmtr - $60. Larry Asp, VE3RF, Canada, (519) 632-7921

FOR SALE/TRADE: Vintage Aermotor 97 foot tower, good condx w/prints, specs & 22 foot 3 inch dia mast. Can ship but prefer pickup. Lloyd, AA6T, CA, (408) 722-4349 eves.

FOR SALE: Collins 30L1, mint, WE, call or write for price; SB200 mint - $350 non owner - 2nd owner. Jack Busk, W9FQK, 926 Rio Verde E, Cottonwood, AZ 86326. (520) 634-2028

FOR SALE: TV-7D/U SN 991 in exc. condx. complete with repair invoice & calibration sheet from Dan Nelson - $125; Hallicrafters S-38 & S-38A w/orig. manuals - $30 ea; McMurdo Silver Micromatch, fair - $20; Collins 180S-1, very good - $100; Bud cabinets, NOS, in orig. boxes, 1 ea 8.75" & 1 ea 10.5" - $65 ea. Clyde Sakir, N7IOK, AZ, (520) 323-1120

FOR SALE: Hallicrafters S-19R, orig. book, very good condx.; S-22R Hallicrafters rcvr, fair to good condx. Fred Clinger, WA8KJJ, OH, (419) 468-6117 after 6PM EST

BUY/SALE/TRADE: Misc. issues US Amateur Callbooks, 1914 thru 1980, SASE for list. Bob Arrowsmith, W4JNN, POB 166, Annandale, VA 22003. (703) 560-7161

FOR SALE: BC-398R, no mods with dynamotor - $250, U-ship. Ken Kolthoff, K8AXH, 5753 David Pl., Fairfield, OH 45014. (513) 858-2161

FOR SALE: Repair! Radio repair, tube or solid state, reasonable rates. Jim Rupe, AB7DR, Western Amateur Radio Repair Co., (WARRC), POB 697, North Cove, WA 98547. (360) 267-4011

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FOR SALE: Pearce-Simpson Inc. model CBD-5, nice condx except cover & mic missing - $20 + $5 shpg; tuning condensers, (var. caps) some pre-1930, some NIB, many broadcast radio types - $5 to $10 + shpg; National Velvet vernier dials - $10-$15 + $2ea shpg; Remler tuning capacitors $10ea + $2ea shpg; 1920s filament rheostats & tube sockets - $5-$10 ea. + shpg. James Fred, R1, Cutler, IN 46920. (317) 268-2214

FOR SALE: WRL UM-1 modulator, scratched - $85; Hallicrafters R42 spkr, top paint bad - $80; Hallicrafters SX-16 matching spkr, Jensen, scraped at edges - $80; Hallicrafters SP-44 panadapter, scratched, knobs wrong - $95; Heath DX-100, some knobs wrong - $95; Lysco Dipmaster GDO, like NIB w/manual - $65. Don, N3RHT, PA (412) 234-8819

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

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

WANTED: Photographer is looking for collections of American ham gear made between 1930 & 1980 to illustrate book. I will travel to your location. Joe Veras, N4QB, POB 1041, Birmingham, AL 35201. (205) 328-2661 (d), 967-0639 eves/wkends.

WANTED: AX-9909/6083 finals for Globe Champion or modification info to 4-65s. Tom Koch, W4UOC, 8170 Habersham Waters Rd., Dunwoody, GA 30350. (404) 391-0914

WANTED: 6 kHz Collins mechanical filter, circular types F-455-FA-60 or -K-60 or N-60 or -Y-60. Reinhard Wieschhoff, 7, rue du Debuche, F-78120 Rambouillet, France

WANTED: Hallicrafters HT-9 osc/ant coils & xtals. Robert Braza, N1PRS, 23 Harvard St., Pawtucket, RI 02860. (401) 723-1603

WANTED: SRR-11-12-13 or FRR 21-22-23 rcvrs, manuals or schematics. Ray Blackford, WA1ZYE, Box 6591, Edison, NJ 08818. (908) 892-6537, 9-10 PM

WANTED: Hallicrafters HT-6 xmtr; Sky Chief rcvr; SX-24 rcvr; Gonset G-77 xmtr; Johnson mobile xmtr; other 50's mobile equipment. Pete, WB2BYQ, NJ, (201) 934-0321

WANTED: Globe King 500B parts xfmrs, meters, etc; 75A-4 4-1 reduction gear drive. Norm Hegyi, KG9D, 9200 Henry St., Dyer, IN 46311. (219) 365-4089

WANTED: Shock mount rack for BC-348 rcvr, rack # is FT-154. R. Collins, KE2HE, NY, (718) 454-5361

WANTED: Squires-Sanders SS1BS, SS1RS, SS1V, SS1S. Weber, 4845 W. 107th St., Oak Lawn, IL 60453-5252

WANTED: Relay RL1/RL2 for Heathkit SB-101 & Hallicrafters R-274 (SX-73) parts rcvr. Frank, W8SET, 1 Wildacre Rd., Charleston, WV 25314.

WANTED: Split Stator tuning capacitor 30 to 130 pF or similar, see 73 magazine, May '95, pg 48. Doug McArtin, N2QPX, NY (914) 968-3560

WANTED: Drake DSR-2 rcvr. Frank Scutch, 11780 NW 24th St., Plantation, FL 33323. (305) 472-9474

WANTED: Cabinet suitable for Lettine 240, opening for panel 8" x 12", 8" deep. Jim Hanlon, W8KGI, POB 581, Sandia Park, NM 87047. (505) 281-0814

WANTED: Heath HR-20 in exc to mint condx.; HP 23 PS. Bob, WD4ROG, FL, (813) 349-6272

WANTED: Collecting early Heath gear 1940's - 1950's; early Heath catalogs and literature; Heath mics, spkrs, supplies, access., any parts units. Byron, WA5THJ, 1215 Fresa Rd., Pasadena, TX 77502-5017. (713) 941-3631

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: New list -hundreds of manuals, schematics and service information. Send 2-stamp LSASE. David Crowell, KA1EDP, 40 Briarwood Rd., North Scituate, RI 02857-2805. (401) 934-1845

FOR SALE: TMC VOX-5 - $145; TMC FFR rcvr, 4 plug-ins, book - $165; Forest Service 1940's SPF HF field radio w/pack box - $110; R-388 w/manual copy - $235; TCS-13 rcvr, xmtr, cables, control box, vertical mount w/base, navy AC sply, manual copy - $365; Motorola 13.5 volt, 15 amp regulated - $40; LS-166 - $10; 872A used - $6; 500 watt modulation xfmr, 1.33/37:1 ratio w/37H 275 mA choke - $85; HS-30 - $10; T-32 carbon desk mic - $25; TM-11-5820-358, R-390A - $10; ME-352 multimeter - $15; Canabalizing: T-195, TS-382, TCS rec/xmtr. Trades? Offers? U-ship. WA7HDL, ID, (208) 756-4147 after 1730 MDT

FOR SALE: Hammarlund HQ-180, Hallicrafters FPM-300. **WANTED:** Johnson Viking II, SX-42. Carter Elliott, WD4AYS, 1460 Pinedale Rd., Charlottesville, VA 22901. (804) 979-7383

TRADE: Two bound volumes of Trains Magazines, 1981, 1982 for surplus conversion manuals 1, 2, 3. Louie, NY, (718) 748-9612 after 6 PM

FOR SALE: Heath Ham Radio Collectors Guide pictures, specs of all Heath ham gear - $20 includes shpg. Marty Drift, POB 21, Blawenburg, NJ 08504

FOR SALE: Globe phone patch - $60; Globe SWR meter, new - $40; Collins 4:1 reduction knob - $150; 75A2/3 spkr - $150. Bob Kemp, MN, (612) 345-5345 (d)

FOR SALE: Heath HO-10 scope - $70; D-104 mic new - $50; Heath 2-meter converter for SB series rigs - $15; Granada AM, FM, SW rcvr, works, good condx. - $75; VHF-1 parts rig - $30; top & bottom cover for Drake Trans - $10. Marty Drift, POB 21, Blawenburg, NJ 08504

FOR SALE: Very low freq. aficionados, HP 310A wave analyzer/rcvr/manual, exc. - $125; HF Signal Generators: HP 606A, exc. - $195; URM-25 ( ) exc. to Gov't reconditioned - $100-$150; Oscilloscope, USM-281A/HP 180A dual trace, delayed sweep, exc. - $195; Meters: new Simpson #1622 edgewise direction 0/90/270/360° meters, heavy duty military, great for Ele./Az. projects. boxed/sealed - $10; freq. counter USM-207 600 MHz histab oven, exc. - $200; tubes: new US mfg, Eimac 4-400A/JAN 8438 - $120; 805 - $30; 810 - $100, also 100TH, 250TH, 809, 813, 814 and others. U-ship. Joe Bunyard, 1601 Lexington St., Waco, TX 76711-1701. (817) 753-1605

FOR SALE: Airline #62-1057 AM AC-DC portable WW II - $70. Vern, GA, (404) 307-1459

FOR SALE: Hallicrafters HT-32B, SX-115, HT-33B w/spare new final - $1250; HT-37, SX-111 - $250; HQ-180A w/matching spkr - $350; CE-200V w/spare finals - $400; NC-303 w/spkr - $300; Valiant w/audio mods - $150; Drake R4B, T4XB, MS4, MN2000 - $550; Drake 2C, 2CQ, 2NT, MN4 - $400; Drake 2C, 2CQ, 2NT, MN4, as new - $450; NC-183D w/spkr - $300; NC-173 - $250; LK500-ZA linear - $450; B&W 5100B TX - $350; DX-20 - $60; DX-35 - $60; DX-40 - $60; HX-11 - $60; Viking Adventurer - $50; Viking Challenger - $50; Globe Scout 40-A - $60; Globe Scout Deluxe - $65; Globe Chief Deluxe - $60; VF-1 VFO - $25; Knwd R599D, T599D, S599 - $375; Heath SB303 w/filters, SB600, SB401 TX - $375; SB630 console - $35; SB620 scope - $50; MFJ 986 - $220; Drake 2B, 2BQ - $75; NC-190 w/matcing spkr - $200; HT-18, S53 - $150; HT-18 - $65; Millen 9220 Transmatch - $150; SX-110 rcvr - $75; HA-1 T/O keyer - $50; Eico 717 keyer - $25; R46 spkr - $30; R468 spkr - $40; R47 spkr - $40; (2) R48 spkrs - $40ea; SB614 station console - $40; R42 reflex spkr - $50; SB301 w/SB600 - $80; SB301 - $75; SB401 - $65; SX24 rcvr - $100; Swan 600T, 600R custom, 330 VFO, FP-1 - $1000; 275 Matchbox w/meters & sensor - $150; SX-100 rcvr - $100; HW-8 w/supply - $100; HW-9 w/matching tuner, wattmeter & pwr sply - $250; (2) D-104 mics - $60 ea; (2) 10 DA mics - $60 ea; DX-60, HR-10 - $140; HG-10B VFO - $45; Globe LA-1 linear - $60. Have manuals for most gear. Monte, KB6NHG, CA, (619) 242-9158

FOR SALE: Military RBM-3 200 kHz-2 MHz, good - $79; TBX-5 xtmr/rcvr, exc - $175; Collins TCS spares kit, NIB - $55; BC-1068A, no case, mods but no holes - $39; BC-654/SCR-284 legs - $20 set of four; GN-4X hand crank generator legs - $18/set, w/seat; GN-4X handles - $8 pair; ABA control box - $15; 1959 & 1961 Lafayette catalogs - $15 ea; PRC-6 RDF loop antenna, NIB - $30. Don, N3RHT, PA (412) 234-8819

FOR SALE/TRADE: Johnson Viking II, works, good - $115; Hammarlund HQ-129X, needs filter, audio repair, fair - $75; RME VHF-126 converter w/manual, exc. - $65; S-38E, missing two knobs, works, good - $25; Jerrod 704 VHF field meter - $15; All Star Jr w/BC coils, rusty, restorable - $85; relays, new Potter & Brumfield 120V, sealed DPDT, 10A octal base - $10 ppd. **WANTED:** Johnson Ranger; Valiant 500; National NC-183, 183D; Select-o-Ject; NC-183 main dial, BS knob, parts radio, spkr emblem, spkrs; Gonset 2M Comm. IV; Gonset mics; pwr plug for II & IV Comm; VHF VFO; 2 & 6M xtals; Globe VFO. **TRADE:** Plastic & wood table radios, Tomestones, etc. Sam Champie, KD7XX, 105 W. McKenzie, Hermiston, OR 97838. (503) 567-2879 wknds only.

FOR SALE: Collectible Edgecom 3000A, 2M xcvr, works great - $200. Michael Crestohl, KH6KD, (617) 581-5479

WANTED

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

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

WANTED: Radar equipment, the bigger the better! Also early TV cameras. Allan H. Weiner, 507 Violet Ave., Hyde Park, NY 12538. (914) 471-9500

WANTED: Help Vibroplex build its Company collection of Vibroplex bugs, keys and memorabilia. Call Mitch, WA4OSR, at The Vibroplex Co., (800) 478-8873

WANTED: Collins - Amateur catalogs, sales literature, manuals, promotional items & Signals. Richard, KD6CPE, POB 992, El Toro, CA 92630-0992. (714) 855-4689

WANTED: Collecting: Pre-1950 commercially built amateur gear; xmtrs, rcvrs & accessories. Dean Showalter, WA6PJR, 72 Buckboard Rd., Tijeras, NM 87059. (505) 286-1370

WANTED: Old tube amps & xfmrs by Western Electric, UTC, Acro, Peerless, Thordarson; Jensen, JBL, EV, ALTEC, WE spkrs. Mike Somers, 2432 W. Fargo, Chicago, IL 60645. (312) 338-0153

WANTED: Kleinschmidt "Teletype" equipment, literature, 7/8" paper tape, Hallicrafters elevating base for SX-42. Tom Kleinschmidt, 506 N. Maple St., Prospect Heights, IL 60070. (708) 255-8128

WANTED: TMC GPR-92 HF Rcvr. Hank, W6SKC. (602) 281-1681 FAX: 281-1684

WANTED: Knight T-60. Bob Braeger, WA6KER, 6634 Navel Ct., Riverside, CA 92506. (909) 682-5084

WANTED: Military radios RT-136/GRC-13, Soviet xcvr R-112, rcvr R-323. Leroy Sparks, W6SYC, 924 W. McFadden Ave., Santa Ana, CA 92707-1114. (714) 540-8123

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

WANTED: Military radios. Any manpack, walkie-talkie, survival. Prefer working/cosmetically clean, premium for NIB. Particulary PRC-17, 21, 28, 63, 64A, 93, 103, 126; CRC/7; URC-64 pwr sply AM-65; RT-66-67-68/GRC; crank generators including G8/GRC & G-76G; test sets URM-30, AN/PRM-32, TS 2530/UR, URM-172; TRC-77 battery box, 12V pwr cable & TM. Harness for PRC-75. Daniel Cahn, 3444 Greenwood Ave., Los Angeles, CA 90066. Msg (310) 398-3840, FAX 398-7159

WANTED: Coils for National 1-10/A & FB-7. LSASE for eight page radio/book list. Wayne Childress, KC7KUE, 1903 Jerome Pl. #3, Helena, MT 59601. (406) 443-7255

WANTED: AP-1 adaptor for Central Electronics sideband slicer. Dave, NY, (315) 446-1258

WANTED: Drake SPR-4 rcvr. Al Faragher, KC9IV, 318 W. 3rd Ave. N, Aurora, MN 55705

WANTED: Need paper work for Gonset Communicator III, Gross Radio CB-55 xmtr. Randy Hull, WB3ECC, 1101 Hagy Ln., Dauphin, PA 17018. (717) 921-2966

WANTED: Digital freq. display for Hammarlund SP-600JX26 or info on source or plans. Victor, KE6VHI, CA, (805) 581-5317

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

WANTED: Military radios, any URC/PRC, manpack, walkie-talkie, survival, particularly URC-4, 64, 68; PRC-63, 93, 68, 47; RT-10, 20, 60. Pref. working/repairable. Additional contacts appreciated. Daniel Cahn, 3444 Greenwood Ave., Los Angeles, CA 90066. Msg/FAX (310) 398-7159

WANTED: Hammarlund manuals, parts, parts units, from the series Comet, HQ, SP. Also accessories, catalogs, spec sheets, memorabilia. Robert, Amateur Radio Surplus, (517) 789-6721

WANTED: Collins 30J, 30FXB/C, other pre-1940 Collins amateur gear for my collection. John Firey, WB5HRI, 14818 Delbarton, Houston, TX 77083. (713) 5615-KWI

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

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

WANTED: Plug in xtal for National HRO variation two. Stan Tajima, JA1DNQ, c/o Nakagawas, 22942 Cedarspring, Lake Forest, CA 92630. (714) 707-4675

WANTED: Paying immediate cash for old Fender and VOX guitar amplifiers. Frank Czaja, AI9T, 8968 W. Forest Home #4, Greenfield, WI 53228

WANTED: Manuals, manuals, manuals for radio-related equipment to buy or swap. Catalog available. Pete Markavage, WA2CWA, 27 Walling St., Sayreville, NJ 08872. (908) 238-8964

WANTED: Early exciter such as National NTX30, Hallicrafters HT-6, RCA ACT 20; need ICPI CRT. John Zitzelberger, WB6JJE, 1673 Devonshire Ct., Thousand Oaks, CA 91361. (818) 991-8358

WANTED: Cabinet for GPR-90; SX-42. Only in very good condx. Jose Cangas, EA4JL. Contact in the States Kurt Keller, (203) 431-6850

WANTED: Cosmophone, or related info; Viking 500 ps/mod; B&W coils 2175-2179; Drake 1A vernier knob. Brian, TX, (214) 596-2914

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

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

WANTED: RBB SRR-12, SRR-22 or similar rcvr in repairable or better condx, cash or trade. Ray, WA2ZYE, Box 6591, Edison, NJ 08818. (908) 225-0909, bus. hrs EST

FOR SALE: Replacement 5x7" spkrs for Collins S-line, drop-in, 4 ohm, dual cone, 2.8 oz. magnet. Sounds better than orig. - $17.50 + $2 shpg ea, any quantity. Cory, N2AQS/AFA4TZ, 1000 E. 14th St., Bldg 178, Plano, TX 75074-6249. (214) 751-7535. hinec@ccgate.dl.nec.com

FOR SALE: Spinner knobs 348 main tuning, new - $8; **TRADE:** 522 19" rack w/pwr sply. Joe, W6CAS, CA (916) 731-8261

FOR SALE: KWS-1 #1,271, exc; KWS-1 #1,527, as is; Johnson Invader 2000, as is; Viking II CDC; Viking II; Harvey Wells T-90 w/ps; TBS-50A w/ps; HRO-60 w/ABCDEF & AC coils, calibrator, spkr. Joel Thurtell, 11803 Priscilla, Plymounth, MI 48170. (313) 453-8303

FOR SALE: Hal. SX122A w/manual - $139, + shpg. **WANTED:** Guthman U17, U50. Henry Mohr, 1005 W. Wyoming St., Allentown, PA 18103.

TRADE: 75S3C RE for KWM2A RE. **WANTED:** Collins KWM1/516F1, 516F1, KWM2A RE, 32S3A. K2OA, NY, (914) 691-7957.

FOR SALE: Over 200 back issues of Electric Radio, Popular Communications, Monitoring Times, World Radio TV Handbook & others - $1.50 ea or all for $100, or trade for antique radios, parts, etc. Jon, OH, (419) 893-1737.

FOR SALE: Drake 2B, nice - $125 + shpg. Larry, W5VHP, OK, (918) 333-2891.

FOR SALE: Collins KWM-2, nice unit - $450 + shpg. **WANTED:** Copy of manual or any info on Waters Channelator model 349. Thanks. Merle Crowley, W1GZS, POB 476, Sumterville, FL 33585. (904) 568-1676 (d)

FOR SALE: Morrow - FTR & S-BR-E - fair condx.; Knight Kit T-60 w/manual; Heath SB-610 monitor scope w/manual. W0RN, AZ. (602) 488-4287.

FOR SALE: 75A-4 W/1 filter - $495. Ed Sauer, KC9SP, IN, (317) 881-1483.

FOR SALE: National NCX-5 & sply in orig. boxes - $250; National NC-270 - $90; Swan xcvr - call. Richard Lucchesi, WA2RQY, 941 N. Park Ave., N. Massapequa, NY 11758.

FOR SALE: T-Shirts w/Johnson Viking logo - $15, state size. Viking Amateur Radio Society, POB 3, Waseca, MN 56093.

FOR SALE: Unopened Heathkit HG 10-B VFO kit - $100, OBO; very good condx TS- 820 front panel w/knobs - $50. Dick Ridinger, W6ZPE, CA (909) 597-3865.

FOR SALE/TRADE: Shure 588SA Unisphere B mic - $38; signal generators BK- E-200D, E-310B. Al Bernard, POB 690098, Orlando, FL 32869-0098. (407) 351-5536

FOR SALE: Drake 2C, 2CQ, 2AC, manual, exc - $250; Heath SB300, manual, exc. - $125; SB630, manual, exc. - $75; HW-16, manual, exc. - $125; HM 15 SWR, manual, new - $35; National NC109, matching spkr, manual, VGC - $150. LSASE for other equipment/manuals. Richard Prester, 131 Ridge Rd., W. Milford, NJ 07480. (201) 728-2454

TRADE: Ameco VHF AM xmtr w/accessories. **WANTED:** HF antenna tuner rated 250 watts. David Childers, Loran Station, Port Clarence, POB KPC, Nome, AK 99762. (907) 642-3844

FOR SALE: Tubes NIB PT 8 model G triode directly heated socket, 4 pins, made by Philips for telephone service, years 1950/60, tubes are exc. for preamplifiers in HI-FI. Andrea Moretti, POB 8, 50040 Usella FI, Italy. tel/FAX 574 982123 anytime.

FOR SALE: Valiant II - $375; 75A4 w/matching spkr & 3 filters - $1000; 2-T368's - $575 & $625; T368 parts & decks - call; 3-Heath twoers w/vibrator ps - $10 ea; 2M Gonset communicator - $20; B&W 380B T-R switch - $10; 4-400's - $25 ea; 4-125's - $10 ea; 4-250's - $15 ea; many other tubes, parts & manuals, call or SASE. PU or U-ship all items. Tony Wheeler, K9BBA, RR1 Box 215, Carlock, IL 61725. (309) 376-7721

FOR SALE: HP3550B test set, great for audio testing, AM radio/IF alignment, etc. consists of HP204C 5 Hz-1.2 MHz low distortion osc, 403B 10 Hz-2 MHz AC/dB meter (.001-300V FS in 12 ranges), & 353A 110 dB attenuator (in 1 dB steps), tested units w/manual, good condx. - $125, untested - $75, modules also available individually; telephone ringing generators, NIB, 120 VAC input, 110V 30 Hz output - $10; much more, list-LSASE. Kirk Ellis, KK4YP, 203 Edgebrook Dr., Pikeville, NC 27863. (919) 242-6000, eves

FOR SALE: Vintage 1940 Aircraft Radio xmtr model GP7, exc condx w/tubes & manual - $200; BC-442-A antenna relays (black wrinkle) - $20, all + UPS. James Owens, NW0O, 1363 Tipperary St. RR3, Boulder, CO 80303-1621. (303) 673-9019

FOR SALE: Good used 810's - $55 ea. Don Gies, K4GIT, Box 2790, Rt2, Melrose, FL 32666. (904) 475-3306

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

FOR SALE: Radio tubes; repair and restoration of all vintage amateur and commercial radios, 25 years experience. Herbert Stark, 321 N. Thompson St., Hemet, CA 92543. (909) 658-3444

FOR SALE/TRADE: Galaxy Comm 2 SSB xcvr/case; Harvey Wells Bandmaster deluxe, matching p/s; Heathkit 20M Singlebander, DC p/s. **WANTED:** NC173, NC183. Berk, MO, (314) 394-0441

FOR SALE: R-390A/URR orig. maintance manual, TM 11-5820-358-35, 12/61 issue, 189 pgs. - $28 incl. Priority mail. Aben, POB 4118, Jersey City, NJ 07304.

FOR SALE/TRADE: Collins 32S-3 DX engineering speech processor & Turner (SM-1) (no base) mic for KWM-2 DX engineering speech processor. **WANTED:** Mint Astatic mic stand model T-UP9; switch for KWM-2 NB 136B-2, case or complete 302C-3 watt meter; 399B-4/5 novice adapters; 399C-1 or 312B-5 ext. VFO. Dale, WA7GMY, WA, (206) 391-2328 or 1995 CB

FOR SALE: Synchronous detector for 455 kHz IF rcvrs, dramatically improves AM, reduces fading distortion, selectable sideband cuts interference. kit - $139, built/tested - $199; info - $3. Steve Johnston, POB 3420, York, PA 17402-0420.

TRADE: SW3 coils: 64A RF&Det, 10A RF&Det, 11A Det, 14; FB7 coils: E Det&Osc, Hro Sr B. **WANTED:** SW3 coils: 60A RF&Det, 14A Det, HRO Sr: D, C; FB7: E RF. Niel Wiegand, WA5VLZ, 12105 Mustang Chase, Austin, TX 78727. (512) 219-8548

FOR SALE: R-390A sales & service. Info - SASE. Miltronix, POB 80041, Toledo, OH 43608.

WANTED: Any condition, Hallicrafters S-35 panoramic adaptor and S-33 Sky Trainer as shown. Chuck Dachis, 'The Hallicrafter Collector', 4500 Russell Dr., Austin, Texas 78745. (512) 443-5027

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

FOR SALE: R1051 rcvrs, exc. cond's, cleaned, completely checked, various models to choose from. Shawn Daniels, (314) 343-5263.

FOR SALE: SASE for list of vintage ham-related equipment, parts, tubes & publications. Chase Hearn, KC4SJ, 104 Glenwood Dr., Williamsburg, VA 23185. (804) 229-7263

FOR SALE: Rockwell Collins (rectangular emblem) KWM-2A w/PM2, manual & crystal pack, exc BO (confidential). **WANTED:** Early National Co. TRF set (SW-2, SW-4, SW-5, etc) or ACS or NC-5 converter. Greg Gore, 11528 Watermoss Ln., Charlotte, NC 28262. (704) 549-4719

FOR SALE: Repair of TV-7 tube testers and calibration: I will fix and then verify calibration of your TV-7 tube tester for $40 plus shpg or return it no charge. I now have meters to repair those units with. Daniel Nelson, 1025 E. Desert Lane, Phoenix, AZ 85040. (602) 243-7421 eves

FOR SALE: RIT for KWM-2 and S-Line. No modifications for KWM-2. $59.95 tested/42.95 for kit. SASE for details and order info. John Webb, W1ETC, Box 747, Amherst, NH 03031.

FOR SALE: PRC47 LSB/USB kit - $40; new machined coax antenna panel - $9. All restorable. Jay Craswell, WBØVNE, 321 West 4th St., Jordan, MN 55352-1313. (612) 492-3913

Please remember to count the words in your ad. If you are over 20 words, please send 20 cents for each extra word.

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

FOR SALE: Homemade galena crystal radios and parts. L. Gardner, 458 Two Mile Creek Rd., Tonawanda, NY 14150. (716) 873-0447

FOR SALE: Swan 120/ps/manual - $150; R390A IF deck, complete - $100; Heath QF1 - $20; GP II vibrator ps - $25; SA2060 tuner - $250; B&W model 200 audio osc. - $25; 1130 signal generator - $25; TS497 signal generator, 2-400 Mc - $50. Mel, K2AOQ, NY, (716) 671-0776

FOR SALE: Used tube list, good selection and quality, SASE. Bill McCombs, WBØWNQ, 10532 Bartlett Ct., Wichita, KS 67212-1212.

FOR SALE: Level meters for Collins R-392/URR rcvrs, new - $35, UPS prepaid. Dennis, WAØWAB, (316) 225-3737 (d), 225-2961 (n)

FOR SALE: 1923 Westinghouse RA/DA rcvr w/ manual/spare 01A, VGC - offers; Heath DX60B, VFO & manuals, looks new - $65; HRO5 spkr - $45; HRO7 coils 160-10M - $100; Viking II w/VFO/ manuals - $160; ARC 5 TX new in orig. box - $65; ARC 5 single TX rack, new - $20; ARC 5 CBY 29125 ant. relay box - $20; ARC 5 RX CBY46104 1.5-3 MHz w/tuning knob, dynamotor - $65; misc ARC 5 junk what do you need?; Hallicrafters S36 - $35; Dowkey ant. relay 110 VAC - $30; Dowkey, new, mil w/gold contacts, 28 VDC - $20; Transco remote antenna sw SP3T w/pb control 120 VAC - $40; E&E Radio Handbooks, 1945, 1979, 1981 - $30 ea; ARRL Handbooks, 1969, 79 & 81 - $20 ea; Kruse "antennas" - $50; Radiotron Designers Handbook - $40; ITT ref data for radio eng - $40; 1937 USSR printed, Russian/English/German/French Radio Dictionary - $60; TX tubes, United UXCVII, German WW 2 Lorenz RD12TF (Mil Marking); new Taylor TZ40's - $20 ea; 829B/3E29's, NIB - $10 ea; 866A's, NIB - $6 ea; new 813's - $25 ea; new 4E27's (5-125B's) (8001) - $30 ea; new RCA 7094 - $40; RCA 6L6's metal, NIB - $12 ea; RCA 6L6G's, NIB - $10 ea; 6550's, 816, 866JR, 7768, 7077, 7644, 2689, NUVISTORS, photo cells, Amperite time delay & other oddball tubes. Roger Faulstick, KD4AS, 210 Mariah Ct., Merritt Is., FL 32943. (407) 453-3312. FAX: 453-2258, E-mail - roger@truemedia.com

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FOR SALE: NOS 3B28 - $15; 5894B - $27.50; 4CX250B - $45. **WANTED:** AN/PRC-68B. Joseph Pinner, KC5IJD, 201 Ruthwood Dr., Lafayette, LA 70503. (318) 981-7766. E-mail -josephwp@aol.com

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FOR SALE: Hallicrafters SX96 & R46B, mint condx - $200; SX43 & R42B, fair condx - $100; Heathkit DX100 (early model), exc condx - $115; Heathkit Q-multiplier; National NC188, good cosmetics but not working - $40; Clegg 99'er, exc condx - $50. John, AE4EN, 2859 Scotts Hill Loop Rd., Wilmington, NC 28405. (910) 686-4236 (d)

FOR SALE: Drake 2A; Drake 2AQ; King DB-68 VFO (sold by WRL & similar to WRL model 755); Hammarlund HQ-140X; SBE codax for using SBE-34 on CW; parting out: Drake 2-B, Hammarlund HQ-140X. Al Culbert, KØAL, IA, (319) 377-4367

FOR SALE: Hallicrafters HT32B exciter, 2M transverter, collector quality - $250; HT40 - $50; Heathkit supplies, HP23A - $40, HP13A - $50. Dave, W1DWZ, MA, (508) 378-3619.

FOR SALE: Western Union tape tickers (Teletype 5B) - $125 & $85, details, SASE. No ship, can deliver Rochester. **WANTED:** Mac Keys. Tom French, 151 Barton Rd., Stow, MA 01775. (508) 562-5573

FOR SALE: Manuals (copies): DX20, DX40, HR10B, HW29 - $10 ea; Ocean Hopper - $7.50; LSASE (2 stamps) for list of 500 more. David Crowell, KA1EDP, 40 Briarwood Rd., North Scituate, RI 02857-2805. (401) 934-1845

FOR SALE: Manuals: Hickok 505 scope - $7; HT-46 xmtr - $6; Drake TR-33C xcvr - $7. Ken Hodge, KB4CM, 42846 Cinema Ave., Lancaster, CA 93534. (805) 945-4702

FOR SALE: 2 Eimac 35T's, porcelain base, both - $25; 1929 GRC 224L wavemeter, complete kit, beautiful walnut - $125; 2 RCA DeForest 800's - $15 ea; 1933 ARRL Handbook - $49; SW-54, works but needs help - $45. Mack Lester, POB 149, Lewisville, AR 71845. (501) 921-5874

FOR SALE: Parting out SRR-11 & 13. What do you need? Bob Graham, 2105 NW 30th, Oklahoma City, OK 73112. (405) 525-3376

FREE: Need antique radios, parts, tubes, schematics, repairs? For catalog send 2-stamp LSASE to Olde Tyme Radio Co., 2445 Lyttonsville Rd., Site 317, Silver Springs, MD 20910.

FOR SALE: Hallicrafters SX-110 AM/CW ham band only rcvr in real nice shape - $200, OBO, trade. KK6AN, CA, (415) 467-9669, FAX 468-9669

FOR SALE: R-390 power input cables - $25 shpd. Rick, OH, (419) 255-6220.

FOR SALE: Johnson front panels refinished and silk screened. Viking I - $75, 122 VFO - $40. Exchange prices. Turner Enterprises, POB 451, Cal-Nev-Ari, NV 89039-0402

FOR SALE: DX-100, good working condx - $150. Joe, NY5Z, UT, (801) 393-6840

FOR SALE: Heathkit lives on in historical anecdotes by employees. Quality 124-page illustrated book. $9.95 postpaid. Heath Nostalgia, 4320 196th S.W., Suite B-111, Lynnwood, WA 98036-6754

FOR SALE: Collins 75S1, Waters Rejection, CW filter, bad case, great panel; Heathkit Comanche, Cheyenne HB ps, needs TLC; Hallicrafters S76, fair case, works A1; Echophone Commercial EC1, works. BO. Gary, WN9U, WI, (414) 332-5872.

FOR SALE: Racal MA79 xmtr drive unit, 1.5 to 30 MHz, SSB/DSB/CW/FSK ex-British government, matches the RA17 rcvr, 19 inch rack mounting, all tube, diecast chassis, VGC - $450; Racal TA83, 500 watt SSB/CW tube xmtr, 3 to 15 MHz, unused & mint, stored since the '70's - $3500; Racal TA127 1 KW tube xmtr, 1.5 to 25 MHz continious, VGC - $3750. **WANTED:** RTTY terminal units made by Frederick Electronics/Plantronics; Seimens T100 teleprinter spares & tools. Nigel, AD4AG, GA, (404) 920-6790 ext 252 (w), 949-1097 (h).

FOR SALE: SX-43 completely restored, no spkr - $175; many pwr xfmrs, chokes, all sizes from salvaged equip. Call for info. Ted Stewart, W6NPB, 2157 Braemar Rd., Oakland, CA 94602. (510) 531-7042, FAX 531-7072

FOR SALE/TRADE: Transmitting/Receiving tubes, new and used. LSASE for list. I collect old and unique tubes of any type **WANTED:** Taylor and Heintz-Kaufman types and large tubes from the old Eimac line; 152T through 2000T for display. John H. Walker Jr., 16112 W. 125th St., Olathe, KS 66062. (913) 782-6455

FOR SALE: Thousands of Tested Tubes w/Warranty! Send for new list with improved discounts and monthly specials. Both xmit and rec. tubes.I have acquired many common tubes recently. Buy those spare tubes for your tube radio, audio, ham and electronics. Most tubes are used at about 33% of new, many are about $1. I have bunches of octal, older, 7 and 9 pin tubes. All tubes are tested on TV/7D/U tester and then boxed. I give a 30 day warranty. Send wants or SASE with two stamps for list. Daniel Nelson, 1025 E. Desert Ln., Phoenix, AZ 85040. (602) 243-7421 eves.

TRADE: My Collins 353C-31 75A-1 mech filter/adapter for 75A-4 4:1 tuning dial. Dave Mills, 1503-G Adelaide, Tucson, AZ 85719.

FOR SALE: R390 collectors: 11 rare, full size shop drawings detailing all aspects of R390 design - $95 ppd. N1FRX, ME, (207) 834-6273 eves./wknds.

WANTED: Mic buyer, Astatic JT-30, T-3, 200S; EV 605, 619, 630, 641; Shure 440, 707A, 520, 705; Turner BX, CX, BD, CD, VT-73; Hi-Z, working or not. T. Ellis, Box 140093, Dallas, TX 75214. (214) 328-3225, FAX 328-4217

WANTED: Military sets, US Rt-136/GRC-13; ABK, APX-1 & other I.F.F. sets; British W.S. No 21. Leroy E. Sparks, W6SYC, 924 W. McFadden Ave., Santa Ana, CA 92707-1114. (714) 540-8123

WANTED: MFJ-8100 regenative SW rcvr; service manual for BC-1206-B beacon rcvr, not a BC-1206-C. Al Kaiser, W2ZVR, 713 Marlowe Rd., Cherry Hill, NJ 08003-1551. (609) 424-5387

WANTED: Heathkit, Eico, Fisher, Dynaco or similar tube audio amplifier in any condx. Mike Nowlen, WB4UKB, POB 1941, Herndon, VA 22070. (703) 716-1363

WANTED: Manual for early version of Collins 310B-1 with meter on left side. Jim Wilson, 3540 Carnation Cir., Seal Beach, CA 90740. (310) 430-5164

WANTED: NC200 tuning knob bottom plate; SX28 Smeter tuning cover, will buy parts sets. Fred Watson, KB8NRF, POB 58, 581 W. Summit St., McClure, OH 43534.

WANTED: Globe Scout; Globe Chief; Johnson Adventurer; HT-18 Hallicrafters TX; HRO4 or 5 "S" meter & spkr; RAS spkr & coil 7-14 MHz; 75A1/A2/A3 spkr; Heath SB-640 VFO; junker 2B/2A/2BQ/2AQ; ARC-4; GRC-9; MD-7 modulator; FT-221 (3RX shockmount); FT-154 (BC-348 shockmount). Greg Greenwood, WB6FZH, Box 1325, Weaverville, CA 96093. MSG phone, (707) 523-9122

WANTED: Orig. manuals for: Viking II, Hammarlund HC-10, HQ-120X, SX-28 (parts also). Lee Shumway, WB8ZEY, 2820 Yankee Springs Rd., Middleville, MI 49333. (616) 795-3255

WANTED: Schematic/alignment data for Hallicrafters R-649A, made for US Coast Guard. Leonard Meek, 2265 Komo Mai Dr., Pearl City, HI 96782.

WANTED: Collins 75S2, KWM1, 32V3 (no cabinet needed); Transco 141000 series, 4 position N connectors; 28 VDC, ant. relays. Ron Steinberg, K9IKZ, IL, (708) 773-3583 (h), FAX (708) 773-0822, (800) 279-8324 (w), rhsteinit@interaccess.com

WANTED: Need to locate a PTO for an R389, to be used for restoration and ER historical article. Will purchase entire parts unit. Ray, NØDMS, Box 582, Pine, CO 80470. (303) 838-3665. Please call collect.

WANTED: 50 kc BFO assy. used in Hallicrafter models S76, S96, S100 & S122; ITT Mackay 3010C rcvr. John McDonald, W6SDM, 24 Glenbrook, Camarillo, CA 93010. (805) 484-1307

WANTED: Midland 4 transistor tape recorders, working or not. John Hegeman, WBØBIZ, 1460 Grapler Ct., Bettendorf, IA 52722. (319) 355-5598

WANTED: Front panel CRT bezel (glare shield) from Heath SB610 or SB620 scope. Rick, N6NVG, CA, (510) 687-2719.

WANTED: B-26 radio operators or crew, your stories & experiences with the SCR-274N radio system. I am building a B-26 radio operators display. Any assistance appreciated. Greg Greenwood, WB6FZH, Box 1325, Weaverville, CA 96093. MSG phone, (707) 523-9122

WANTED: Service manual for Radiophone Co. bandspanner panoramic adapter, copy OK. K6LLQ, CA, (510) 682-2838 or callbook address.

WANTED: Navy xmtr's TBW, TCE & RAS rcvr & accessories. Steve Finelli, N3NNG, 37 Stonecroft Dr., Easton, PA 18045. (610) 252-8211

WANTED: SX42, SP400, only in very good condx. Jose Cangas, EA4JL. Contact in the States, Kurt Keller, CT (203) 431-6850

WANTED: AN/WRR-2 or AN/FRR-59. Will pick up in Washington state. Tom Brent, Box 1552, Sumas, WA 98295. (604) 826-4051

WANTED: Need manual for Racal RA6217E or will take copy, also need parts. Bob Graham, 2105 NW 30th, Oklahoma City, OK 73112. (405) 525-3376

THE
COLLINS COLLECTORS ASSOCIATION

Bill Wheeler, KØDEW, Chairman
Proudly extends this invitation to attend
The Second Annual CCA Convention and Social Dinner Event
at
Cedar Rapids, Iowa
August 12 And 13, 1995
Where:
The Long Branch Motor Inn
90 Twixt Town Road, N.E.
Cedar Rapids, Iowa 52402
Phone 319-337-6386

Room reservations must be made by July 11th as this is a very busy time for Cedar Rapids and reservations cannot be guaranteed at any later date.

To register for the convention please contact
Tom Vinson, NYØV at 319-393-8087
or
Rod Blocksome, KØDAS at 319-393-8022

Contact Motor Inn directly for rooms at 319-337-6386
if you wish to stay at The Long Branch.

ACTIVITIES

Tour of Collins Radio Museum, Comm. Central and the antenna farm. Displays of equipment from Collins (one of a kind items) such as a solid state amplifier for the KWM 380, and an HF 380A in olive drab color (one of only two) and many more items. This is a once in a lifetime opportunity to see Collins equipment that was never marketed. You will not want to miss this event as it may never happen again in our lifetime!

Also, a very interesting program at the dinner is being planned.

The convention starts at 10:00 AM on Saturday, August 12th, 1995. Dinner cost will be approximately $16 per person.

The Cedar Valley Amateur Radio Club annual hamfest will be held on Sunday August 13. Please plan to attend this fine hamfest!!

ELECTRIC RADIO STORE

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All back issues are available at $34 per year or $3.25 for individual copies. Buy the entire first 6 years (#1 - 72) for $175 and save. This price includes delivery in the U.S. Foreign orders please inquire.

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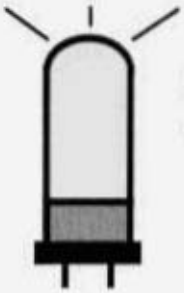

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