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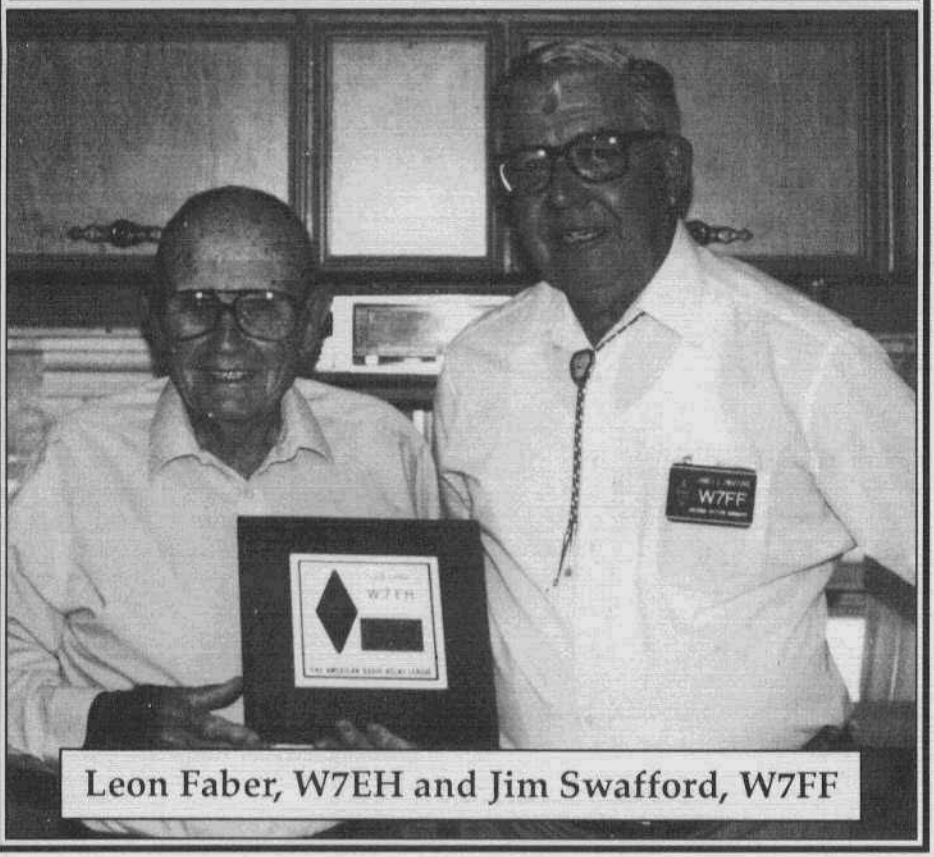
ELECTRIC RADIO

celebrating a bygone era

Number 17 September 1990



Leon Faber, W7EH and Jim Swafford, W7FF

ELECTRIC RADIO

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Editor - Barry R. Wiseman, N6CSW
Office Manager - Shirley A. Wiseman

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; George Maier, KU1R; Albert Roehm, W2OBJ; Mike O'Brien, NØNLQ, Steve Thomason, WB4IJN; Don Meadows, N6DM; Bob Sitterley, K7POF (photos) and others.

EDITOR'S COMMENTS

Barry Wiseman N6CSW/Ø

Leon Faber (Lee), W7EH, the gentleman on this month's cover, is someone who you will be reading about in future issues of ER. Let me tell you a little about him. First of all, he built his first transmitter (spark) in 1913. He got his first license (9EH) in 1917. He attended the first ARRL convention in 1921. He was one of the first people to grind crystals in the world. He supplied crystals to the Macmillan Antarctic expedition. Later he started the James Knights Crystal Co. In 1950 he erected, what was then, the largest amateur antenna in the world. It was a 125 foot tower (a tree trunk) with 36 elements on 10 meters. A photo of the tower appears on the cover of October, 1950, QST. A couple of weeks ago I drove to Show Low, Arizona, and spent the afternoon with Lee. I found him to be one of the most interesting radio pioneers that I have met. A real bonus is the fact that he had several albums of photographs going back to 1913 and a large accumulation of newspaper clippings and other documentation. Lee was kind enough to loan me his archives and they will be the basis of the articles I plan to do. I think the readers of ER are in store for some very interesting reading. The first article will be an overview of Lee's life and career, the second on his homebrew transmitters - he built at least 8 - the third on the James Knights Crystal Co. and the fourth on his monster antenna.

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Cover: Lee Faber, W7EH, receiving a plaque from ARRL, Southwest Division, Section Manager, Jim Swafford, W7FF for 70 years of membership in the ARRL. See Editor's Comments for more information. Photo by Maria Swafford, KB7INH.

Reflections Down the Feedline

by Fred Huntley, W6RNC
POB 478
Nevada City, CA 95959

About six years ago, a sidebander on 160 meters created a lot of interest with his claim to be using an underground transmitting antenna. This WA6 station, located north of Los Angeles, was putting out a good signal that he swore came from an antenna made of RG8/U coax cable buried in the ground in a two foot deep trench; with the outer shield of the coax being the radiator.

This station became a topic of conversation and speculation on the band. After hearing him several times, I wrote a letter asking whether his antenna was "on the up and up". He sent me a nice reply assuring me that it was genuine, but he didn't go into any factual details. Through further listening on 160 meters, I heard that a delegation of hams had gone over to this WA6's QTH to inspect his underground antenna system. From what I have heard, their evidence gathering was inconclusive, and after four months of operation, the WA6 station disappeared from the band. So, the underground antenna episode remains one of those unsolved mysteries. Was this guy for real -- or was he just a good con man? Does any ER reader have info on this kind of antenna?

The only reference that I have on underground antennas, is for a receiving type which is described in a 1928 vintage book, "Radio Trouble Shooting". Called the "Subantenna", it supposedly eliminated interference and static by operating on only ground waves. This old book, written by E.R. Haan, an associate editor of Popular Mechanics, is chockful of all kinds of interesting old information about radio.

On vacuum tubes, over the years there were reportedly about 150 different tube manufacturers. This book mentions some of the real oldies. Most 'senior' hams have heard of Cunningham, Arcturus, Tungsol, W.E. Hytron, National Union, Kenrad, etc. But, how about Ceco, Gem, Jaeger, Magnavox, Perryman, De Forest, Duval, Excell, Daven, Sonatron, Schickerling, Sovereign and Van Horn?

In the old days, according to this book, "quickie" trouble shooting on a radio set was done by moistening two fingers of your hand. Then place one finger on the grid terminal and the other finger on the adjacent filament terminal of the detector tube socket. If you heard a click in the headphones, the stage was ok. Audio stages were checked the same way. For RF stages, grasp the RF coil with your hand. If the set comes to life, then you know that the stage is defective.

Getting back to the present, I noted the anti-AM RM-7401 comment reprinted in August, '90, ER. Let me assure the author, WA1DVU, that on the West Coast, including Idaho, Nevada and Arizona, there is no "disproportionate share of kooks" on AM. In fact, out here AM is 'kook free'. All our AM QSOs are conducted in a friendly, dignified manner. Invariably the topic of conversation is about AM equipment. Out here, AM operations are completely harmonious -- there are no feuds, no bickering and no sound-effect performers, etc. There is a lot of cooperation in finding radio parts and information -- helping to keep the 'good stuff' equipment on the air.

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AM Petitions Update

by Dale Gagnon, KW1I
9 Dean Ave.
Bow, NH 03304

The four AM petitions before the FCC received over eight hundred comments. All but three were favorable to AM. The commission was very impressed by the quantity and quality of the comments. William Cross of the private radio bureau had reviewed RM-7401 comments by the third week in August. He commented that the arguments were good once he got through the "Why is the FCC doing this?" AM enthusiasts deserve a tremendous amount of credit for this outpouring of comments. This is especially true considering the comment period was only 30 days following the assignment of RM numbers.

William Cross stated that he would be drafting the recommendations for action on these petitions. He hoped to have these recommendations complete and submitted for review by Labor Day. There are several levels of management that must review these recommendations. Ralph Haller, chief of the private radio bureau, is the most important decision maker in this review process. Petitions may be denied, a notice of proposed rulemaking , NPRM, may be developed out of one or more of the petitions or the commission could come out with a notice of inquiry which would request public comments on specific issues. It may take until November until the FCC makes an announcement on this. Cross sited the no-code license NPRM, the handicap examination issue and the forecast federal budget problems with the possibility of a reduced work week as other business that would delay the decision on the AM petitions.

My general impression after talking with Mr. Cross was that RM-7401 had no chance from the overwhelming comment response and the lack of any substantive issues being raised in the petition. It is likely to be denied. Cross had not reviewed the power petition comments when I spoke to him. I believe the Commission is still inclined to deny these petitions. The next major step for the AM community is to wait for the Commission to disclose it's decision. In the meantime, for those who still have a little letter-writing in them, a short note to Ralph Haller, FCC, Room 5322, 2525 M Street, Washington, DC, 20554, urging a decision for a NPRM might be helpful. Cross assured me that Haller is aware of the AM petitions and the comment volume.

My personal thanks to the many who wrote in with supporting comments to my petition 7404. The copies I received were a pleasure to read. There were many excellent points. If carefully read by the Commission I am confident that they will make a positive impact on their decision.

Editor's Note: Here are the final numbers on the petitions as of August 23.
Total received.....819
7401.....439 against, 2 in favor
7402.....149 for, 0 against
7403.....42 for, 0 against
7404.....189 for, 0 against

ELECTRIC RADIO IN UNIFORM

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

'The RT-505/PRC-25'

"This looks like an explosion in a radio factory!" said my wife, Marie. My PRC-25 had arrived as a kit of parts -- some used, some new -- in one large box and one much larger box. When everything was unpacked, the mess filled the front hall and the entire radio room. "Just like one of your Heathkits (she builds them) -- but no parts list and no assembly instructions!",I answered.

Because the PRC-25 is still in use, it's expensive by 'war surplus' standards, but I was lucky enough to find a fellow collector willing to make a swap for a more-than-complete set of parts left from a refurbishing business. And so -- having 'pulled duty' on radios developed as early as 1932 in past columns -- we are going to study a recent set this month. As you'd expect there's been a lot of progress, but we will find one real foul-up and quite a number of smaller problems, even so.

Overview

The PRC-25 was the standard U.S. portable field radio from its introduction in 1963 until 1967 when an improved (but identical looking) set, the RT-841/PRC-77 was delivered. Although other sets were used, the PRC-25 and PRC-77 worked so well that they expanded into jobs not ordinarily given to this type of radio, being used nearly everywhere in the Vietnam War. You can see them in action in any of the Vietnam movies of the past few years, as well as in the TV series 'Tour of Duty'.

The PRC-25 covers 30.00 to 75.95 Mcs in 920 crystal synthesized channels. A bandswitch selects either 30 to 52.95 Mcs or 53 to 75.95 Mcs. One frequency knob sets the megacycle; the other sets the 50 kilocycle increment within the megacycle; the selected frequency is shown under a plastic window between the knobs. The set is 4"x12"x12" (H x W x D) and weighs about 20 pounds with battery and typical accessories. It is designed to be carried on a man's back but vehicular (VRC-53), ground (GRC-125) and other configurations also exist. Both short and long whip antennas are supplied, and long wire, DF loop, and other types can also be used.

Power output is 1.1 to 1.5 watts, giving a range of roughly five miles with the short whip. The set is completely transistorized except for the PA which is a unique (type 2DF5) nine-pin miniature tube.

The set has tone-operated squelch (described below). Like earlier back pack FM sets, two PRC-25's can be connected together to operate as a repeater, with each set transmitting the audio output of the other -- this is called 'RETRANSMIT' operation.

Power requirements are 60 ma at 12 - 15 volts on receive and 1.4 amps at 12 - 15 volts plus 0.4 amps at 2.5 - 3 volts (for the PA filament) when transmitting.

RT-505/PRC-25. The BNC jack cover and AUDIO jack dust cover would normally be anchored by lanyards. Latches near the rear hold the battery case, which (because the set is transistorized) is a fraction the size of those for earlier portable radios.

The standard BA-386 zinc-carbon battery gives about 20 hours of service; a long life magnesium battery and an arctic battery were also used.

Nearly all the electronics of the PRC-25 is in plug-in modules; except at the depot, service is based on replacing bad modules. The GRM-55 test unit gives you GO/NO-GO information (a green or red light) for signals at test points scattered throughout the set. A step-by-step procedure (on aluminum plates in the tester) guides you through the test points, in most cases ending by telling you which module to change.

History

The book "Military Communications: A Test For Technology", part of the "United States Army in Vietnam" series, contains some information on the history of the PRC-25.

Development of the set began about 1955 with the decision of the Signal Corps that all short range vehicular and portable radios were to be FM and that the recent development of the transistor should be exploited. The hardware design was obviously done by RCA, as there are many details in common with other RCA sets of the time and RCA built many of the early sets. Deliveries began in 1963, going first to our forces in Europe.

The PRC-25 was first sent to Vietnam in 1965 when the limits of the PRC-6 and the PRC-8, 9, and 10 series (short range and restricted frequency coverage) caused problems. By 1967, Military Assistance Command Vietnam deputy, Commander General Creighton Abrams Jr., was calling the PRC-25 "the most important tactical item in Viet Nam today."

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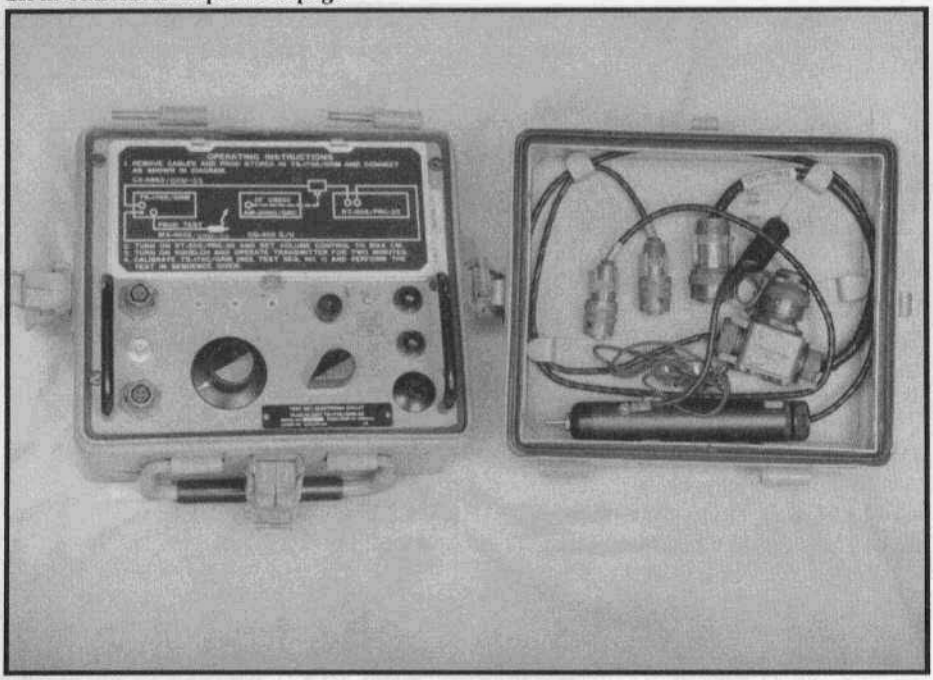

GRM-55 test set. The cover (right) holds a cable used to take power from the set under test and the test probe.

About 24,000 sets were in service there before the PRC-77 -- with a transistorized PA and other improvements -- began to be delivered in 1967. Altogether about 130,000 sets were built.

Design

The first impression the PRC-25 gives is of ruggedness. A nearly indestructable die cast panel serves as a foundation for the rest of the set. Steel handles on each side protect panel fittings if the radio is dropped on its face. The radio and battery cases are heavy gage stamped aluminum.

Considerable attention has been given to watertightness. Rubber gaskets in grooves seal the panel to the radio case and the radio to the battery case. Parts mounted though the panel are sealed with O-rings; each control shaft is sealed with two O-rings. All exterior screws go into blind holes. There is a pressure test tap in the bottom of the case.

Inside, almost all circuitry is in plug-in modules -- 25 of them. The three relays are also plug-in units; there's no part which would take over 30 minutes to change.

Each module is a logical section -- for example: the receiver IF, receiver audio, and each RF stage are in separate modules. Most modules consist of one or two transistors and their associated parts mounted on a single-sided printed circuit board.

The radio is built in three layers. On the bottom (accessible from below), are all the 'tall' modules; these plug in to a printed circuit board located near the middle of the set. The center layer consists of the vacuum tube power amplifier, two tuning capacitors, two relays, and associated parts. The top section is a shallow tray containing another printed circuit board; several modules plug into this board from above. The tray is hinged

at the side and can be swung away to gain access to the center section.

Electronically the PRC-25 is like other modern transceivers in doing most signal processing at an intermediate frequency (11.5 Mcs on receive; 50 kcs higher or lower on transmit) and heterodyning this from (or to) the channel frequency. The heterodyning signal covers 41.50 Mcs to 64.45 Mcs (50 kcs lower on transmit); on the low band the IF is subtracted to give 30.00 to 52.95 Mcs, while on the high band the IF is added, giving 53.00 to 75.95 Mcs. This technique (called 'band imaging') is sometimes used by hams to build sets for two bands using only a single range VFO and no multiplier stage.

The 50 kc offset of the transmitter IF is probably to eliminate direct pickup of the transmit IF signal by a nearby set which is in receive mode as would occur in 'RETRANSMIT' operation. In the PRC-77, probably due to better filtering, both receiver and transmitter IF's are 11.5 Mcs.

The 41.50 to 64.50 Mcs hetrodyne frequency is produced by a variable frequency oscillator which is phase locked to a function of the frequencies of three crystal oscillators, one giving 1 Mc steps over the tuning range, one giving 100 kcs steps over a 1 Mc range, and one providing the 50 kcs steps and 50 kcs offset on transmit.

The PRC-25 is probably the first Army radio (and is certainly the first small ground radio) to use a phase locked loop. One might wonder at the need for such methods in an FM radio with its relatively broad bandwidth, but as we will see when we visit earlier small FM radios, stability really is a problem with simpler designs.

On transmit, a crystal oscillator on the proper IF frequency (11.45 Mcs for low band, 11.55 Mcs on the high band) is frequency modulated by both the voice signal and a 150 cps tone.

On receive, the output of the 11.5 Mcs IF module is applied to a discriminator which recovers the audio signal and 150 cps tone. With the function switch set to 'SQUELCH', audio output is disabled unless the 150 cps tone is present. Use of a tone sent by FM eliminates tripping of the squelch by AM noise as often occurs with the carrier-operated squelch used in earlier FM radios; this means you don't need a squelch sensitivity control. The 150 cps tone is removed in the receiver audio circuits so you don't hear it.

With the generation of radios which includes the PRC-25, the Army at last dumped the carbon microphone, replacing the H-33 handset (and its carbon relatives) with the H-183, H-250, and other dynamic units. Old-timers know the advantages – better intelligibility, much less sensitivity to heat and moisture, and less variation from unit to unit.

At the same time, the U-77 12 pin audio connector of the earlier generation was replaced by a greatly superior five pin connector. Much smaller, the U-229 has an O-ring seal which makes it watertight when something is connected and it's gold plated and spring loaded pins give a good connection even in poor conditions.

On The Air With The PRC-25

Although it came as a collection of loose parts, this wasn't a hard radio to get working. Starting with a bare panel, I had to mount the dial and antenna loading mechanisms, connect the controls and wiring from the chassis, and secure the chassis to the panel. The two tuning capacitors had to be synchronized with the dials and the bandswitch rail with the switch knob. None of these operations was tricky, though there were several broken wires to be reconnected. I then installed the plug-in modules, checked for shorts on the power circuits, and turned it on. The set didn't work, but the GRM-55 tester quickly pointed out a defective receiver IF module.

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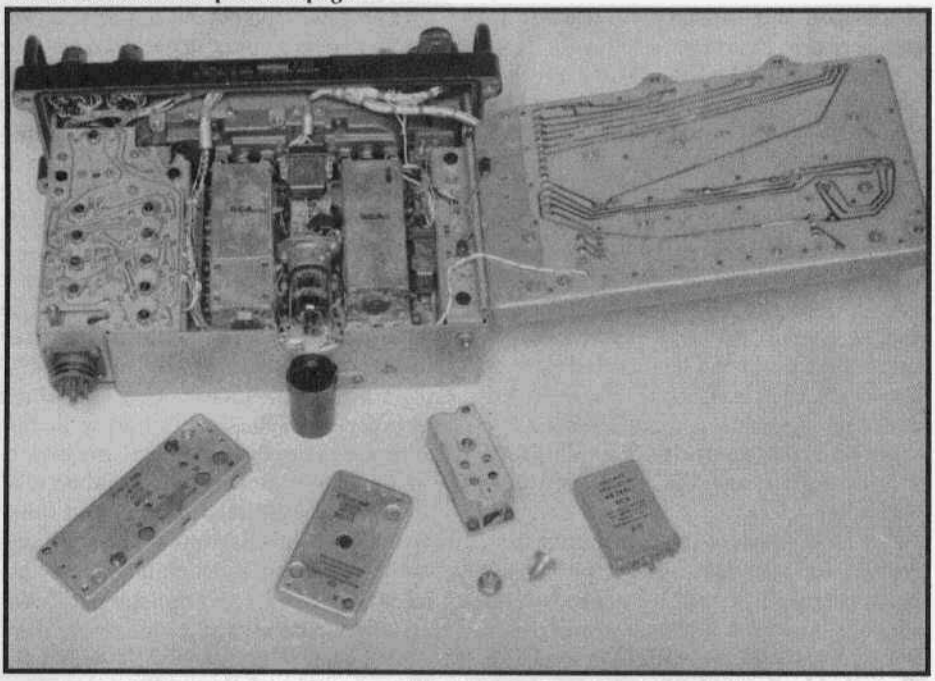

Inside the RT-505/PRC-25. Modules shown illustrate several of the different designs used: left to right --receiver IF, speech amplifier - limiter, transmitter driver, and voltage regulator. The two small knobs are extractors which can be screwed in to the top of most modules to help you pull them out. The top chassis tray has been swung aside to give access to the tuning capacitors, PA tube (above shield) and relays.

A 'once over' alignment put the synthesizer on frequency and gave full transmitter output and receiver sensitivity. One crystal (of 14) in the interval oscillator module was considerably off frequency causing the two channels in one 100 kc interval to be wrong; when the crystal was replaced, the set passed its (+/- 3.5 kc of channel) frequency tolerance test.

Gobble, Gobble, Gobble

In some or all of mud, noise, fatigue, fear and darkness you can easily make a mistake turning knobs or reading a dial to set up a new frequency. Tactical radios covering many channels often allow setting up a few frequencies so you can find them easily. The PRC-25 lets you PRESET two frequencies, however the designers of this hardware seem to have forgotten why the capability is needed, providing 'quick and easy' frequency setting which requires more cool attention to detail than 'the hard way'!

The PRESET mechanism is simple enough. Both frequency knobs have two projections on their circumference, one arranged to act as a stop when turning the knob clockwise and the other when turning counterclockwise. These projections can be positioned relative to the shafts by loosening wingnuts in the center of the knobs. To return to a PRESET frequency you flip up two lugs on the panel and turn each knob in the right direction as far as it will go.

That sounds easy, but what is 'the right direction'? Well, for the lower frequency

to be set on a knob, turn it counterclockwise, for the higher one, turn it clockwise. Thus if you are now on 37.55 Mcs, you get to a PRESET 40.30 by going clockwise on the megacycles knob and counterclockwise on the kilocycles knob. If, however, you are now on 37.10, you must go clockwise on the kilocycles knob.

What if you are now on 58.10 Mcs? That's on the other band, so you change bands and turn the megacycles knob clockwise – 58 on the high band is 'lower' than 40 on the low band. And these are not the only tricks...

An unskilled operator would not be able to use PRESET reliably even in good circumstances. In combat, almost anyone would be better off without this bizarre 'helper'. The PRC-25's PRESET capability is hereby awarded the In Uniform Turkey With Trimmings' award.

Conclusions

When the TBY transceiver (E.R., February, 1990) was developed in the late 1930's, no one knew we would be involved in a jungle war, nor what effects tropical use would have on radio equipment. Twenty years later, these things were well known and accordingly the PRC-25 should be held to a higher standard.

The set gets an A+ for ruggedness and general mechanical design. It would easily support the largest man in your squad; if you covered the panel with a board, it would probably hold up one wheel of your jeep. Except for the BNC connector used for auxiliary antennas, panel fittings are strong enough to withstand a whack from a canteen or helmet. Military collector, Robert Downs, tells of a PRC-25 he saw in Vietnam which stopped a Russian-made rifle bullet; he reports that the radio operator (who was carrying the set on his back at the time) was not too concerned that his radio could not be repaired.

To check its tightness, I left a PRC-25 outside all day, first in the summer sun, then in the thundershower which followed. After spending the next day in the sun, it was submerged in a nearby stream for several periods of ten minutes. Finally, I hosed it down with about the care you'd give a driveway. There was no trace of moisture inside – an impressive performance.

The radios of WW-II contained rubber, cotton, and other natural materials; absorbed moisture and fungus growth was a severe problem which was only partly solved by spraying with special (toxic) lacquer. The materials in the PRC-25 are all synthetic, so such troubles should not occur.

In general the set is reliable and its design appears to have solved many problems of earlier sets. The fact that a random assortment of modules and other parts could be so easily assembled into a working radio tells you that there are no tricky adjustments.

Despite the outstanding mechanical design and solid electronics, the PRC-25 has a distressing number of small operational and maintainability problems.

The frequency knobs are so shaped (and tall enough) that vines and grass can easily catch on them. The other knobs have double or triple the necessary clearance to the panel so they have the same problem. There is neither a panel cover nor a way to lock the volume and function controls to prevent turning if they hook a branch or vine. In Vietnam there were many problems with breakage of the short antenna due to catching on vegetation.

The 'AUDIO' receptacles are only sealed if something is connected – the rubber protective caps are just dust covers.

Battery operated radios should turn themselves off if there is no handset, speaker, (etc.) connected; the PRC-25 lacks this feature. There is no built-in way to test the battery.

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Power for the PA filament should have been developed within the set (easily done in the high voltage supply); this would make possible operation from a vehicle battery without accessories.The digits on the frequency dial are rather small for a combat radio.

My set and another I examined were wired with teflon wire. The ability to resist very high temperatures isn't needed here and the use of this relatively stiff insulation makes breakage, where the jacket ends at connections, a real problem – especially for a radio which is used in vehicles. Good quality vinyl would have been cheaper and more reliable.

Many modules can be inserted in more than one place. Though all are plainly marked (and the right pattern of module numbers is easily learned) this is still a way for a tired or inexperienced repairman to install a new problem.

The technical manual has many small errors and was not written by someone working on the sets. Its focus is almost entirely on the modules, with no practical advice about solving problems at the set level -- for example, which modules cause certain patterns of errors in frequency. The theory sections are barely adequate --while we are told that the transmitter IF is 11.45 or 11.55 Mcs, we are not told why. There are no 'wiring' diagrams to show you where to reconnect the white wire with the violet tracer if it breaks off -- for this information you must refer to the detailed assembly drawings provided for the set builder or rebuilder. While the maintenance concept for the PRC-25 is that anything complicated will be fixed at a depot, this manual helps make that a necessity.

The operator's manual warns against changing frequency when the transmitter is keyed because this may cause off frequency operation or damage to modules. In a troop radio, it should not be possible to damage the set by use of normal operating controls.

The PRC-25 shows some attempt at low cost design. For example there are many stamped sheetmetal and plastic parts. More could have been done, however, to design out costly parts (today this is called 'value engineering') and to minimize the number of types of parts and thus reduce the cost of stocking spares. There are (for example) about ten types of captive screws; probably six would have been enough with slight redesign of the assemblies they hold. It is hard to believe that the 2DF5 – used only in this set, so far as I know -- is significantly better than an already existing tube or pair of them.

The PRC-25 (and 77) became the communications workhorse of Vietnam and (as we will see below) has had a long service life since then. One can only wish that a set with such outstanding basics had fewer small problems.

After The PRC-25

When the PRC-77 replaced the '25 in the late 60's, it was almost a non-change, so slight are the differences. The pace has continued to be slow since then. Military collector Ken Kinderman writes as follows (with editing):

"The replacement for the PRC-77 was supposed to be part of a total system called SINCGARS (Single Channel Ground and Air Radio System): countermeasures resistant, unified inter-service capability (remember Grenada when all of a sudden we discovered that ... the Army was on 30-75 MHz FM and the Navy was on 225-400 AM?)"

"The problem is that after more than 9 years, the ITT designed SINCGARS still doesn't have the bugs worked out and it has not been produced in any large numbers. ... Not only is the Army still ordering PRC-77's by the thousands, they're still procuring spares for the 25. The latest (and the Army said, the last) PRC-77 order was about 2 years ago. The irony is that the low bidder ... was located in ... Israel."

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The Classic and Homebrew Radio Exchange

by Jim Hanlon, W8KGI
POB 581
Sandia Park, NM 87047

THE CLASSIC AND HOMEBREW RADIO EXCHANGE is a very low key contest (actually a QSO party with a score thrown in to make it attractive to folks who enjoy competition) for people who enjoy old "Classic" equipment, restoring it, using it on the air, or just hearing it again. There are no strict limits to the equipment that may be used. Most of the gear comes out of the post war, American made, vacuum tube era; but older gear, war surplus gear, and even Japanese transceivers are welcome. Your signals will be copied on receivers made by such companies as Collins, Drake, Hallicrafters, Hammarlund, Howard, National, RME and others. You'll hear CW signals once again from transmitters by Johnson, Heath, Stancor, World Radio Labs, Harvey Wells, Millen, Meissner, Elmac, Central Electronics, Collins and more, as well as homebrew and military surplus gear (Yes, Command Sets!). Some notes will be T9X and some will be more individualistic, chirpy, weepy (comes from keying a crystal oscillator with marginal 'starting' feedback), drifty, a few clickers, some hummers and some with all of the above.

The CX was started back around 1976 as the "Nostalgia Exchange" by Stu Stephens, then W8KAJ and now K8SJ, and a few like-minded friends and brothers. "Big Al" Stephens, another "Founding Father" is N5AIT and he shows up often on the CX, with occasional participation also by brother Ben Stephens, K9KOM. Stu Stephens told the story of our genesis in an article December '76 QST. Stu still works the CX, though several years ago he passed along the honor of putting out the CX Newsletter and tabulating the results to myself and Marty Reynolds, AA4RM.

Most of the activity starts out on or around 7060 CW and migrates down to 3560 later in the evening when 40 becomes a pain because of the foreign broadcast. You will find a few guys on other bands and modes. We would welcome a surge of AM activity on the traditional AM frequencies as well. But most of the traditional activity has been on 40 and 80 CW.

A minimum contest QSO consists of an exchange of name, signal report, state, transmitter and receiver (or transceiver); but many of them turn into longer chats, especially when things are a little slow or when you've just found an old friend or made a new one. Some guys have been know to tie up one person for the better part of an hour working many different combinations of gear, since to 'qualify' a given piece of equipment for the score's age multiplier requires you to have made at least three QSOs with it.

Most of the activity comes out of the east coast, midwest or southern USA and eastern Canada. But there are a few far westeners who are regular CXers as well and we even had a log from Japan in September '87! You haven't worked Idaho until you've done it from Ohio with a barefoot, 5 watt Meissner EX Signal Shifter!

Our September 1990 CX will run on Sunday, 9/30, starting at 4 PM EDST and running to 11 PM as announced in ER and all the better ham magazines ('better magazines' are by definition the ones which publish our announcement). Send an SASE to myself or to Marty Reynolds, AA4RM for a copy of the CX Newsletter.

73, cu on cx, es SK de W8KGI

Negative Cycle (Un)-Loading

Increase Your Modulation Percentage WITHOUT Splatter

by Bill Kleronomos, KDØHG
POB 1456
Lyons, CO 80540

The practice of negative cycle loading has been in common use for a number of years. For those of you not familiar with the idea, it is quite simple. Basically, it is a circuit consisting of a series connected high voltage diode and resistor connected across the secondary of a plate modulation transformer (the RF final side). The polarity of the diode is such that at the moment the transformer secondary attempts to swing negative during that half of the audio cycle, the diode starts conducting and allows the resistor to load the secondary of the circuit. This scheme allows the use of higher positive audio peaks without an accompanying increase in the negative point where the final cuts off. It is this cutoff that causes splatter, and the infinite load presented to the modulation transformer when the RF final is cut off can blow the insulation in the modulation transformer. Negative cycle loading helps both of these problems.

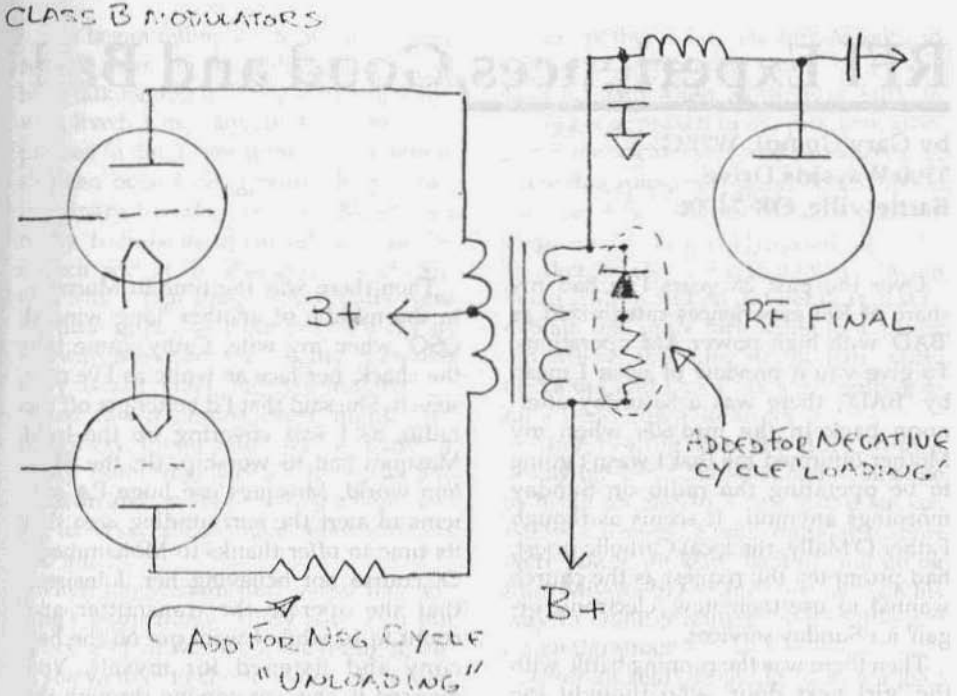
As we know, in a class B push-pull modulator there are two tubes. One generates the positive peak, and one produces the negative 'peak'. In fact, when a negative cycle loading or ultra-modulation circuit is properly adjusted, one can clearly see one modulator tube running hotter than the other since the 'negative' tube has an additional load on it, it has to work harder.

Having recently restored a Collins ART-13, I was naturally spending some mental energy in trying to improve the modulation percentage, as would any other AM aficionado.

I did not want to make any modifications that involved major circuitry changes as I wanted to keep this classic rig as stock as possible. I did notice, however, that there was plenty of modulator power available for the 813 final - in fact too much. I could modulate this rig to about 110% positive (good!) but at the same time, over 100% negative (bad!). What to do?

Well, I started thinking about the negative cycle loading circuit again. The reason it works is that it loads down the negative half cycle tube in the modulator more so than the positive half cycle tube. The negative tube is actually working harder to produce less effective power than the positive tube. So, the idea is to make this tube produce less power, one way or another. Was there another way to do this? Yes there was. In fact, this idea is so simple that someone, somewhere, must have already thought of it years ago, but I've never seen it in print.

I started experimenting with putting wirewound power resistors of different values in series with the plate lead of one of the 811 modulators. Presto! It worked. A 3K 40 W resistor provided a nice balance of reducing the negative swing while the positive peaks were unaffected. A higher value reduced the negative swing so much that overall modulation percentage was reduced. You want to get down to at least the center line on the scope!



This scheme appeared to provide results similar to the traditional negative cycle loading circuit. Advantages of this technique is that the negative tube is not working harder on the negative half cycle as can happen with the loading method and that one does not need a high voltage diode. Also, you generally won't need to find room for the resistor or even have to remove your rig from the cabinet. All you need do is make up a lead to the plate cap lead that can accommodate a resistor in line to the modulation transformer.

Other suggestions

You will need to determine the best resistor value experimentally. It will dissipate some 1/4 of the rated power from your modulator, so those of you with the 'honkers' might need to find room for a 100 watt or so resistor.

There are other possible ways to achieve the same results of reducing the audio power delivered by the modulator during the negative half cycle.

One might try reducing the screen voltage to one tube if the modulator uses tetrodes. I have also heard of putting a high output or new tube in one socket of a modulator and a weak one in the other socket.

One really needs to use a scope when making modifications like this - if you put the resistor in the plate of the wrong tube, you'll notice at once! And as with any other modification to the audio waveform transmitted, you've created audio distortion, so tread lightly if you are obsessed with audio quality more than quantity.

Those of us who enjoy AM need to be conscious of the bandwidth we use, and splatter is definitely a useless waste of spectrum, adding nothing to audio punch or fidelity. This technique, along with negative cycle loading, ultra modulation, and asymmetrical audio clipping are good ways to both improve the efficiency of our rigs as well as being good neighbors to others on the bands.

RFI Experiences, Good and Bad

by Gary Gompf, W7FG
3300 Wayside Drive
Bartlesville, OK 74006

Over the past 28 years I've had my share of RFI experiences categorized as 'BAD' with high power AM operations. To give you a preview of what I mean by "BAD", there was a Saturday afternoon back in the mid'60s when my Mother informed me that I wasn't going to be operating the radio on Sunday mornings anymore. It seems as though Father O'Mally, the local Catholic priest, had prompted the request as the church wanted to use their new 'electronic organ' for Sunday services.

Then there was the running battle with the 'girl next door' who thought the Beatles should be coming out of her hi-fi system, not the boy next door. One evening after a long winded QSO I received a telephone call from who I thought was the girl next door. If I had given the Girl (woman) on the phone a chance to say more than 2 words, I would have realized that this wasn't the female I'd been rehearsing my finest 'anti feminist' speech for. After the phone rang a second time, Mom informed me that I was DEAD and that I owed Mrs. Johnson, my English teacher, an apology. Shucks, how was I to know that she had moved into the house across the street last week? I had DX to chase, not worry about new neighbors! After great begging and pleading my Mom consented to letting me keep my pair of 810s modulated by 811s. I'm sure you understand; low-pass filters cost money and besides they used coax and my Windom antenna didn't.

Then there was the time in Morocco, in the middle of another 'long winded QSO' when my wife, Cathy, came into the shack, her face as white as I've ever seen it. She said that I'd better get off the radio, as I was covering up the local Mosques call to worship. (In the Moslem world, Mosques use huge PA systems to alert the surrounding area that its time to offer thanks to Mohammed.) Of course not believing her, I insisted that she operate the transmitter and count to 10 while I went out on the balcony and listened for myself. You guessed it, she was coming through the PA system loud and clear. We immediately turned the radio off, rolled down the shutters, grabbed our 1 year old son and went to friends for the evening.

Enough for the 'BAD' experiences; now I have a 'GOOD' one to pass on. Several months ago, after getting my Johnson Desk KW going and just after finishing a QSO with 'Ozona Bob', W5PYT, the door bell rang. At the door I found a neighbor lady who said she'd like to come in and talk about my radio interfering with her daughter's stereo. I almost turned and ran, but then she said, "I know the interference is not the fault of your ham radio equipment, but the fault of my 4 year old daughter's cheap stereo." Wow, what a turn of events this is, I thought, as I opened the door wider for her to come in for coffee, tea or whatever else she might like to consume while telling me about her daughter's 'cheap stereo'.

She began telling me how for the past several days her daughter, 'Missy', had been talking about her new friend, Gary, who lived in her stereo.The mother explained in detail about the conversations she had been having with Missy about imaginary friends, and how Missy had many friends in the neighborhood, at church and at the day care center. She told Missy that imaginery friends were for little girls that were not as lucky as she way. Missy kept telling her mom that Gary is not make believe and that he talked to her almost every night. This imaginery friend stuff was apparently really bothering Missy's mom, as she went on and on about how she kept talking to Missy about make believe friends and all.

Then the woman told me of the evening's happenings. Missy had been put to bed and all was well, she thought, until she went in to check on her. She found Missy sitting in front of the stereo. She said she was "talking to her friend Gary".

The mother sat down with Missy and started in explaining about imaginery friends again. Then, as she was working on a new approach to the problem, all of a sudden, clear, crisp and not very loud came this voice,"very good Bob, W5PYT, this Gary, W7FG, in Oklahoma."Missy responded very quickly, pointing at the speaker,"See Mommy, that's Gary". Mom being a Mom and all did her darndest to explain one more fact of life to a 4 year old Missy, this time about ham radio operators and that Gary was really Jennifer's dad down the street.

After hearing this sad story from a young mother, I did what had to be done to bring an end to 'Gary in the stereo'. Before the evening was complete toroids were placed on leads coming and going from Missy's stereo and Gary was on his way to being forgotten by the little girl down the street.

After 28 years of living from one bad RFI experience to another it was nice to finally have one with a happy ending.

continued on page 30

MEMO from Don "Hoisy"Hoisington

W4CJL - Founder- Chairman
Society for Promotion of AM
202 Baker Drive
Florence, AL 35630

Hello Barry:

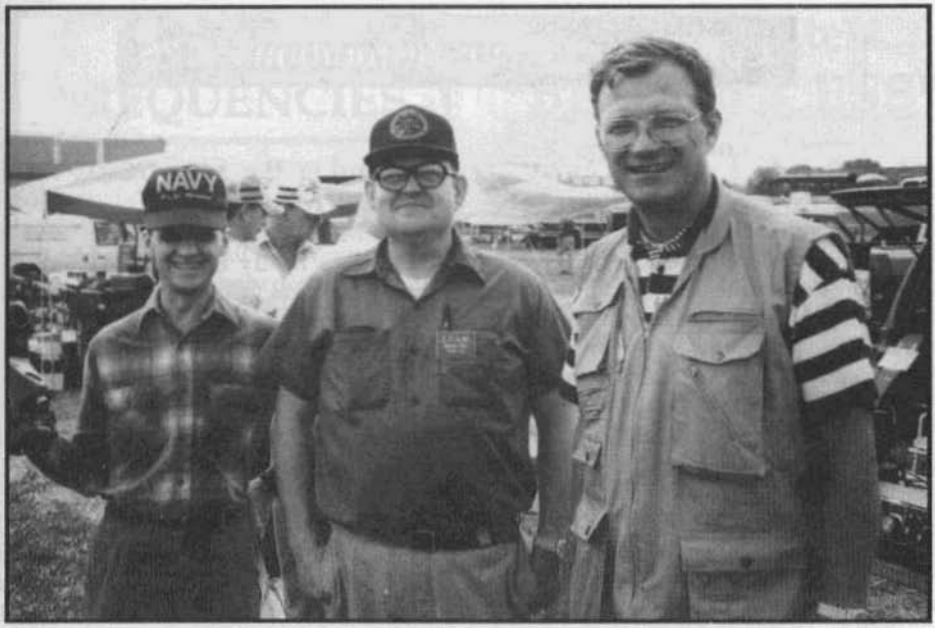
I thought you might like to look at my '50s AM transmitter. The transmitter is typical but the installation is a little different. You see the antenna system consisted of a 180 ft. vertical tower and (120) 180 ft. radials.

I was indeed fortunate back in 1954 to obtain a position as Manager-Chief Engineer of a daytime BC station, KCRB, at a small town, Chanute, Kansas. The owner kindly consented to allow me to build my 75 meter AM station in the transmitter building workshop.

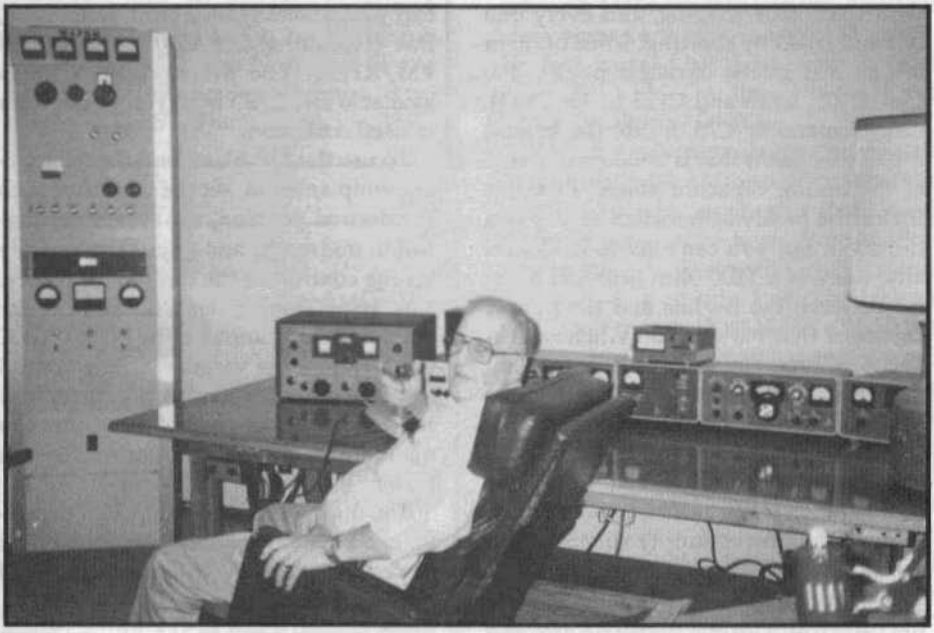
As you might know, the daytime BC station must sign off at local sunset which in December is 4:45 PM CST. Since the 180 ft. length is just three-quarters wavelength on 75 meters, a simple 'L' network at the base of the tower gave me a perfect match. The pair of 4-400As at 3 KV gave me a full KW input and with a pair of 304TLs as modulators and using 'Ultr-Modulation' I had a beautiful signal coast to coast.

I just finished reading another excellent issue of ER. I 'specially' enjoyed the article by Jim, W4PNM, about his Dad [Nostalgia 1928, August ER]. I was also operating back in 1928 with a 'bootleg' AM transmitter of low power, using the call ' Double Nine - Question Mark !!! on 160 meters. I can see that Chick, W8FDV, was way ahead of us 'Jayhawkers' in that he was using MOPA while we were still using self-excited oscillators with Heising modulation.

Gud luck and best 73, Hoisy



Walt Hutchens, KY4KV, with walkie-talkie, Eric Evans, WB4VVI, in the center and Howard Mills, W3HM, at the Manassas, Virginia hamfest.



Jim Taylor, W4PNM, at his operating position. The homebrew transmitter consists of a pair of 4-400s modulated by 4-400s. The receiver next to the transmitter looks like a Hammarlund HQ-129X. The rest of the gear is Collins S-Line.

Collecting/Repair/Restoration...TIPS

Meter Repair

If you have an old meter that is beyond repair, look for another meter of about the same size whose movement you can transplant into the defunct meter's case. Most manufacturers used the same hole locations for terminals and faceplates on their popular size meters. I have transplanted movements into an SX-73 signal strength meter and an HT-20 multimeter thus saving their original appearance.

Jim Hanlon, W8KGI

Ailing Hammarlund SP-600s

If your Hammarlund SP-600 is ailing, suspect one or more shorted bypass capacitors. My SP-600 was built with black, molded epoxy 0.01 and 0.022 mfd units with color code striping, and every one of them failed by shorting. Some of them are located in the darndest places, like C98, C108, C118 and C123 inside the IF transformers, or C70, inside the second mixer subchassis that is bolted to the side of the tuning capacitor shield, or C109, under the bandwidth switch where you can see it but you can't get to it. Generally, there is a 2200 ohm isolation resistor between the B+ line and the bypass capacitor that blows open when the capacitor shorts. You can diagnose this failure by measuring the voltage at the tube plate pins - it will be zero when the associated capacitor has shorted and the isolation resistor has opened. Getting at some of these capacitors is a 'bear'! I had to drop the power supply subchassis to get inside the second mixer box to fix C70. And I had to unwire and remove the bandwidth switch to reach C109. But a functioning SP-600 is well worth the trouble, so persevere.

Jim Hanlon, W8KGI

Upgrading the ME-61/GRC Field Strength Meter

The ME-61/GRC Field Strength Meter (FSM) is a handy item to have around the ham shack. It covers 1.4 Mhz to 24 Mhz in three bands and features variable tuning, a sensitivity control, a phone jack for monitoring AM transmissions and a telescoping whip antenna. All of this is packaged in a neat little box measuring 5"x5"x4.5" and weighing only 5 pounds.

The performance of the ME-61/GRC FSM can be improved by substituting a 0-500 (or better) microammeter for the original 0-1 milliameter. The original meter is 1.75" square so be sure to substitute a new meter of equal size. A suggested replacement is listed in the 1989 Fair Radio Sales catalog (Fair Radio Sales, Box 1105, Lima, OH 45802) for $6 (P/N #M/R1230. The ME-61/GRC FSM is available for $22.95 from Fair Radio Sales in used condition.

To use the ME-61, extend the telescoping whip antenna, set the band switch to the desired position, the sensitivity control to midrange, and adjust the variable tuning control for the desired frequency. Key your transmitter and tune it for maximum indication on the ME-61/GRC FSM. Adjust the variable tuning control for a peak indication on the meter and set the sensitivity control as required to maintain a midscale indication on the meter.

The audio quality of an AM transmitter can be monitored by plugging a high impedance headset (at least 2000 ohms) into the phone jack.

Mark Starin, KB1KJ

Editor's note: If you have a tip that you think might be of interest please send it in.

AM FREQUENCIES

2 Meters - - - 144.4 - calling frequency Activity in most cities.
6 Meters - - -50.4 - calling frequency
10 Meters - - - 29.0 - 29.2 operating window. Most activity occurs here, although there is some activity around 28.325
12 Meters - - - 24. 985 - calling frequency
15 Meters - - - 21. 385 calling frequency
17 Meters - - - 18.150 calling frequency
20 Meters - - - 14.286 nightly SPAM net starts around 5:00 PM CA time.
40 Meters - - - 7160, 7195, 7290 - main operating frequencies. Westcoast SPAM every Sunday afternoon on 7160. Starts at 4:00 PM CA time.
80 Meters - - - 3825 - 3850, 3870 - 3890 main areas of operation. Westcoast SPAM net , Wednesday evenings, starting at 9:00 PM CA time. The frequency is 3870. The Northeast SPAM group meets Thursday evenings , starting at 7:30 EST. The frequency is 3885.

I'M PICKING UP THE SPIRIT OF A SHIP'S RADIO TELEGRAPHER -- ANYONE HERE COPY 'BS WPM OU?

15 Meter Contest.... "BIG SUCCESS"

by Barry Wiseman,N6CSW/Ø

The first annual "15 Meter Weekender" contest sponsored by Electric Radio over the Labor Day weekend was a tremendous success. The level of participation was very much beyond my expectations; not only were there more AM/Vintage operators than I expected but the number of participants using solid state transceivers - many in the AM mode for the first time - was absolutely outstanding.

Friday night when the contest started I didn't hear much action from this QTH and I thought that maybe there wasn't going to be much of a contest. But late Friday night, Sam, W6HDU, called me to tell me that he had already worked 31 stations. He told me that most of them were on Japanese transceivers and that most were very new to the 'AM game'. He had worked all these stations from about 5:00 PM CA time till the band folded up about 9:00 PM.

Saturday morning I got out to the shack early (9:00 AM) and discovered the band to be wide open and there were AM signals everywhere. Propagation was mostly east west with the skip somewhat on the long side. I worked Hawaii with good reports (KH6U and KH6B) but those were the only contacts to the west. I did hear a couple of California stations very faintly but they could not hear me when I called them. Most of my contacts were in the northeast and southeast. I think that the best locations for the contest were either on the east or west coasts.

No DX was heard from this QTH but I did hear Tim, WA1HLR, working Scotland and John, WA6ZJC, working South American stations. I think John also worked a couple of JA's.

continued on page 31

LETTERS

Dear ER:

Enclosed is the photo of the unusual Collins 51J4 I talked to you about on the telephone. I have contacted the people you thought might be able to provide me with some info, but to no avail.

Some of the most obvious differences of this rig are:

1) The only power connection (110 v) is on the face (upper left connector) next to (2) 1.5 amp. fuses. The power connector is marked J-103 and is of the 6 pin military type.

2) The antenna connection is in the lower left (BNC) and next to it is a 3 pin (military type) audio output marked Audio, J-102.

3) Next to the 'ON' position is a green pilot light.

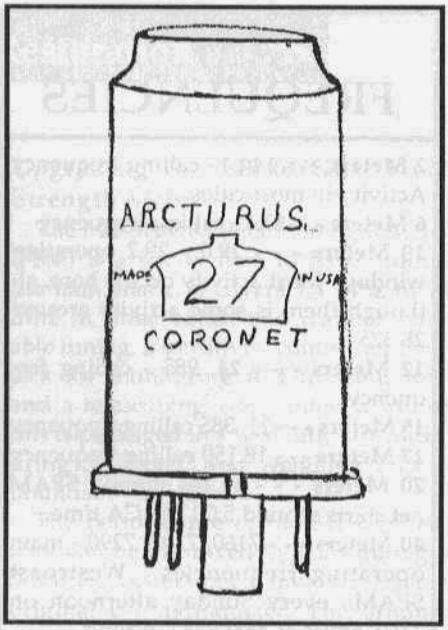
4) The name plate is attached w/4 phillip screws and stamped 51J4 and serial # 2349.

5) The bottom corners of cabinet face carry clamp connectors - (shock mount?)

6) The rear of the chassis is normal 51J4 except for lack of power cord.

Larry D. Cohen. AJ5N

Ed: If anyone has any information on this unusual rig please send it in to ER and I will forward it on to Larry



Dear ER:

The purpose of this letter is to ask for help from your readers in identifying a rather unusual tube that has come my way through my efforts at collecting old radios. This is a CORONADO tube in an octal format and marked "27". When I first got it, it was in an adapter socket from octal to old style 5 pin base. I put it in the tube tester and it tests as a good type 27 tube. I have never seen a tube like this before. I know of many tubes in the octal series that have the same electrical characteristics as some of the 5, 6 or 7 pin bases, but never before have I seen an octal tube bearing the same number as the old style tube. I was in the radio repair business after WW-II and did work on many of the sets with the old tubes in them but no tube of this nature came my way.

Any and all information would be appreciated.

Ed English, W6WYQ

Ed: Again send any information to ER and I will forward it on to Ed.

Dear ER:

This letter is in regard to the article on an OT rebuilding his 1920's rig.[Nostalgia, 1928, August, 1990] I thought it was great with the exception of stressing so heavily the requirement of 1920's parts. I understand that was the object of the particular project in the article, however, the younger part of the AM community should know that breadboarding reached the full flowering of that transmitter style around 1934-1935 and continued on until WW-II among the younger hams, the poorer ones and the rural fellows even though rack and panel began to be the 'in' thing around 1935. A properly made and operated breadboard rig can be used through the 7 Mhz band at power levels up to 300 or so watts in urban areas where TV signals are high. I've been doing it here for years with no shielding, no RFI filters in output or power supply. I feed my 160 meter wire direct from the output link with no tuner at all on 7 Mhz. It likely would not survive fringe areas.

If you really get taken with the idea of a breadboard rig there is no reason not to make a copy of something in a handbook or magazine with whatever is available and suitable for the project. For a first rig a copy is a good idea to get the feel of building such gear. After that you can carry on the tradition and not be stuck to what they did 50 years ago. A properly made breadboard rig is a piece of art, a thing of real beauty and an answer to the gleaming appliance.

Harry Wells, AA6PP

Ed:

Jim Taylor's (W4PNM) article , Nostalgia , 1928, in which he describes the re-building of his father's (Chick, W8DFV) 1928 transmitter has been received with a great deal of interest by the readers of ER. I would like to see some more material on breadboard construction projects.

Dear ER:

My name is Dennis and my wife is Marla. Right now I am a SWL and am studying for my novice as well as my general license.

We have a National 183D and a Hallicrafters S-38B just like the one on the cover of your December , 1989, issue. Our transmitters so far are a Hallicrafters HT-32B and a mint condition HT-37.

Ever since I was about 12 years old I have been very interested in ham radio; when I first saw my uncles home-built 300 watt station. His wooden framed and shelved transmitter was taller than me. My uncle was Harry Miller, W6IBX. He is now a silent key.

Right now I am 49 and now have my chance to really get into the hobby I love.

I get so very excited when I tune in an AM group talking with each other. I call my wife and we sit there listening to their special relaxed style and I say," Soon honey, we'll be talking on AM to these fellows too.

73 for now, sincerely,
Dennis Cody and Marla Banuelos
Long Beach, CA

Ed: We'll be listening for you, good luck on getting your license.

Dear ER:

Electric Radio proves that good things do come in small packages. I first go through the classifieds and then read the whole issue cover to cover.

I'm using a Johnson Navigator and a DX-20 with an HQ-145X on CW but it's hard finding other vintage folks on CW . How about suggesting some frequencies for the CW guys. Maybe 3690-3700,7060-7070 and so on. Also how about something on 160 for 'close in work' and for the guys who want to 'eyeball' once a month?

Al James, K8CFC

Ed: Vintage CW operators take note of Al's suggested frequencies on 40 and 80. Let me know if you get together.

Western Heritage Museum in Omaha Adds Radio Section

by Barry Wiseman, N6CSW/Ø

A few days ago I received a call from Leo Meyerson, WØGFQ, from his summer home out in Omaha. Most of you will recognize the name and call, but for those of you who don't, Leo was the founder of World Radio Labs in Council Bluffs, Iowa, that produced the Globe equipment; Scouts, Champions, Kings, etc. and the Galazy gear.[See Leo Meyerson, WØGFQ, An Interview, ER#1, May, 1989]

The reason for Leo's call was to inform me of his latest endeavor; the establishment of a radio section in the Western Heritage Museum in Omaha. Recently Leo moved all his collection of radio gear and archival material to the museum from storage in Council Bluffs and would like to solicit the help of his ham friends to add to the collection. The museum has given Leo 3000 sq. ft. of space and at this point he's far from having it filled.

Leo's vision for the radio section of the museum is that it will chronicle the complete history of amateur radio. It could be the first display of it's kind in the country. It will also have an operating vintage station set up. He stressed to me the quality of the museum and the secure and permanent environment that the radio section would have. As yet, Leo hasn't come up with a name for the display. He invites input from his ham friends on this.

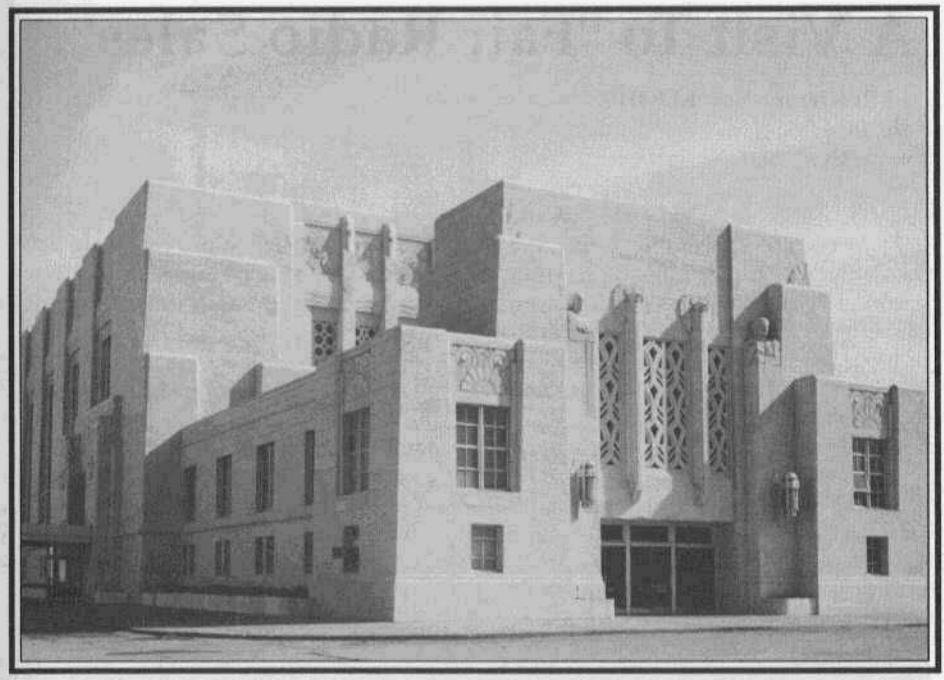
The Western Heritage Museum is housed in a restored art deco railway station. The railway station - The Omaha Union Station - was built in 1931, shut down in 1971 and donated to the city of Omaha in 1973. The museum was formed shortly thereafter. Some of the displays - large railway display, telephone, telegraph etc.- will attract visitors who will also enjoy the radio exhibit. Another advantage of the museum is that it is located in the center of the country.

Leo says that hams may decide to donate or will their old gear to the museum. It's non-profit so deductions can be made for tax purposes. Another idea that's acceptable to Leo is that hams could loan gear to the museum for a period of time. He will also purchase needed pieces for reasonable amounts. He says that anyone who loans or donates gear to the display will be recognized with a plaque by the gear. He also says that they will be proud of the way their gear is displayed in the beautiful environment. Another point that Leo made is that hams should consider the importance of having their collections somewhere where everyone can see them.

I think we should all get behind Leo in this project. A museum for vintage ham gear, is something that's long overdue. And we couldn't ask for a more credible curator than Leo.When I pass away I would like my notes, photos, tapes, papers and gear to go there. I've already put a letter in my files to that effect.

Leo says that it will be several months to a year before the radio display will be open to the public. From time to time Leo will give us a progress report on how things are moving ahead. Maybe we'll have some photos in the near future.

For more information contact Leo: May - November: 1210 N. 97th Court, Omaha, NE 68114. (402) 392-1708.....November - May: 69911 Via Del Sur, Cathedral City, CA 92234. (619) 321-1138 . The best time to contact Leo by phone is the late afternoon - after 4:PM local.



The Western Heritage Museum, Omaha, Nebraska

The Museum , which was once the Omaha Union station ,is described by Leo as ,"One of a Kind" and one of the most beautiful buildings he has ever been in.

Leo in an ad that appeared in 1946

A Visit To "Fair Radio Sales"

by Bill Kleronomos, KDØHG
POB 1456
Lyons, CO 80540

I was becoming positively excited this past July while planning our summer vacation to rural Southeast Ohio, ostensibly for a family reunion - not because of a pending visit with the 'in-laws', but because I had a secret agenda unknown to my wife before we left Colorado - a trip to the radio 'Mecca' of boat anchor enthusiasts - Fair Radio Sales.

As we rolled into the state of Ohio on US 30 on a hot July morning, I began the pitch, "Hey, I have a great idea - let's take a detour over to Lima and drop in on a store I've done a lot of business with - I'd like to see the place".

"What kind of store is it Bill?", as if my wife didn't know.

"It's a radio parts store", I answered.

"Oh, and what about the crib, books and family heirlooms and other things we were planning to pick up at Dad's place?". "We need all the room in this pickup for that stuff".

"Don't worry", I said, "I won't buy a thing".

Not believing me a bit, she reluctantly agreed to go on the half hour detour. Anyway I was driving.

Lima City Limits, the sign said. Oh Boy! Almost there. As we rolled into town, the stories we've all seen in the news about the tough times in the industrial heartland became evident. Block after block, we passed the boarded up remains of what were at one time the symbols of our industrial strength, the huge brick and steel factories that thousands once worked in. Everything from car parts to tanks were made in Lima at one time or another. I thought that in some way it was appropriate that a store that sold the very things that were once made in these now quiet factories was located in the same area - almost as a museum might be.

Finding the street, we pulled into the lot, parked, and in ten seconds I was in the door. Before my eyes could focus on anything, my nose caught the aroma. Yes, you surplus jocks all know what I mean - there is a distinct aroma to old surplus electronics. I guess that smell is a combination of old musty tech manuals, fungus proof varnish and fabric wire insulation. It smelled wonderful to me, just like 'Channel 807'. Walking in, I was so mesmerized I almost tripped over a T-368 parked in front of the door.

The showroom, in itself, is a most fascinating place to see; a wall of meters in boxes, two or three giant two foot transmitting tubes, a box of tubes labeled 'as is' for two or three bucks apiece, a bread slicer variable cap tucked in here and there, boxes of tube sockets, inductors, capacitors, chokes, subassemblies and on and on. Rod Sterling was standing in the corner saying, "Cortland Street,New York, 1947,observe the ham operator about to be engaged in divorce proceedings...."

I told the man at the counter that I was from Electric Radio magazine in Colorado and I'd like to meet one of the owners. A minute or two later I was shaking hands with Phil Sellati. I told him about our pilgrimage across the 'heartland' just to see this 'Disneyland' of electronics and he offered me a tour of the place. As we strolled around I had more than a few questions for Phil and I learned a lot about the electronics surplus business.

Phil told me that Fair Radio Sales was started by his father, Joseph, in 1946, right there in Lima and that he had passed the business on to his brother George and himself. Fair Radio is a large (30,000 sq. ft) retail business and employs about 12 people. As we walked through the mail room into the first of a series of never ending rooms packed wall to wall and 20 ft. high with pallets and boxes of radio parts, I enjoyed identifying the bits and pieces - there's a bandswitch from a BC-375, there's part of an ART-13 Autotune mechanism. etc.etc. We stopped in front of some wooden boxes containing a number of Command sets. Phil pointed them out, " That's the last of what we've got, the government isn't surplusing them out anymore". I asked if the government was still surplusing out any 'good' old time WW-II through '50s radios. He replied that, "Yes, to some degree they are". Apparently, the government doesn't realize what kind of stuff they have in storage to this day. He mentioned one storage area at Wright-Patterson AFB, there in Ohio, that you could literally drop a dozen Fair Radio Stores into. I then asked,"Do you guys know exactly what you have and where you've got it stashed away"? I had seen literally thousands and thousands of bins and boxes. He said that yes, they pretty much could find anything that they had.

We walked through room after dimly lit room. I saw many items that were not listed in the catalog. I asked Phil about this and he responded that they didn't put stuff in the book unless they had sufficient quantity of an item. Three of something won't make it into the book. But, believe me, if you need a part to restore an old boat anchor, they just might have one lying around.

I followed Phil into another warehouse area, on the way passing a pallet of cases for Collins 516 type S-Line power supplies.

continued on next page

Lord, they were beat up. It was not pleasant to see anything out of Cedar Rapids ending up in such a manner. He stopped in front of a huge pile of R-390s and mentioned that there's no shortage of these venerable receivers. I asked why they were all missing the meters and was told that since they were 'glow in the dark' and contained a small amount of radioactivity, the government removed them. My thoughts are that somewhere, in some hazardous waste dump, there are barrels of R-390 meters someone could get wealthy off of if one could get them. Then again, I don't know about traipsing through a government 'Hazmat' area in search of R-390 meters. We looped back through the store at the end of the tour. Reluctantly, I collected my wife, who was having a most exciting time reading two year old CQ magazines, and departed.

Phil Sellati in front of what used to be a pile of over 900 R-390s

A few weeks later I called Phil with some follow-up questions that I neglected to ask due to my sensory overload at the store. The first question I asked was who the typical Fair Radio customer was - is he a ham, experimenter, industrial customer or a mad scientist working in a basement somewhere? Phil replied that he is all of the above. He mentioned 'budding Einsteins' of our day who are buying high power RF parts in order to construct devices to cure Aids and Cancer with radio waves. He hopes that some of their buyers of high voltage antiquities know what the heck they're doing! (I feel I'm missing out on a real story here!)

My next question was a philosphical one: if your business is doing so well, where are all the other old time surplus dealers? Why did they all disappear? Phil said that the oldtimers had no one to carry on for them. No on was interested in owning or buying that type of business, and one has to learn it inside and out from someone experienced. There's no school that could train someone to run a surplus electronics store, these stores, for the most part, were family operations. In the case of Fair Radio, the founder had two sons who learned the business and were interested in carrying on.

Finally, I asked Phil about the Japanese; was their interest in old radios as great as I had heard? He answered that they are very interested in collecting and restoring vintage military gear - particularly Collins - and that the Japanese market has grown tremendously in the last few years. The Japanese, he said, will take a 'beat up radio' and put literally thousands of hours into it restoring it to original; they are very meticulous.

That wrapped up my interview with Phil. I'm very grateful for the time he gave me at the store in Lima, it was a most enjoyable experience. I'd be safe in saying that all of us interested in the preservation and restoration of older electronic equipment wish them well. My own hope, in parting, is that a third generation of Sellati's takes over and keeps Fair Radio a going concern for future generations of hams with an interest in 'Real Radio'.

Steve's Hamfest Report

Lafayette, Indianna

by Steve Sauer, WA9ASZ
1274 Londonerry Lane
Greenwood, IN 46142

Sometimes a person would do well to listen to his own advise. I have been suggesting that everybody get out there and visit a hamfest or two (dozen), only to find myself not having the time recently. At any rate, on August 19th I knew that there was one occurring in Lafayette, IN, which is about an hour and a half from the home QTH. Unfortunately, I needed to be at a location the same distance in the opposite direction and decided to pass it up. However, my brother, Ed, KC9SP, was seriously feeling the withdrawal pains from not having attended a hamfest in a month. So, somewhat reluctantly, I agreed to go.

Waking up at 4:OO in the morning, we were ready to leave by 5:00. Always taking time to stop along the way for breakfast (tradition), we arrived sometime around 7:30. While riding in the car, I went through my usual denial routine. You know the scenario: "I really don't intend to buy anything; I've got everything I need, etc." At least this time I said that if I should come across, say, a complete rack mounted HRO-5 or 7 system, I might be interested. (But when was the last time you saw one of those at a midwest hamfest? It was a safe statement.)

The Lafayette hamfest is held at the county fairgrounds. Part of the flea market is located outdoors in a tree grove while the rest is held in one enclosed building and one roofed shelter area. At this particular hamfest free coffee and donuts are available until they run out. I generally fail to obtain either being too wrapped up in not missing the bargains.

We started with the tables under the trees, but by the time we had come to the end of the first row, I was out of money. That wasn't very hard to do since I really hadn't planned on coming and didn't bring much, but we were amazed at the quality of the equipment along the first row. Christmas had truly come in August! At the end of the first row was a truck that had a HRO-60 with speaker, 7 coils and original manual in excellent condition ($140). There was also an excellent Ranger ($50) and the best looking Johnson KW matchbox I have yet to see ($150). After loading and returning my truck to its original parking spot, I had to walk down that row again. This time there was an almost mint Ranger at the front along with two excellent HQ-170s. In this instance no prices were set; you were asked to make an offer. This makes some people uncomfortable; however, I was less uncomfortable than another individual who was interested in the rig. But, before I could say anything, my brother offered $50 for it and picked up his second Ranger of the day which he promptly gave to me. (No, I'm not bigger, he was just afraid that through my silence I was going to lose out on it.)

At this point I was out of money and had been down one row! Turning the corner I started down the second row and could not believe my eyes. There it was, resting on a blanket on top of the ground, a HRO-7 rack mount with the power supply, speaker, coil compartment and four original coils. And, for only $80 – all of which was borrowed – it found a new home.

continued on page 31

"Rig Here is Homebrew"

by Jim Musgrove, K5BZH
4217 Buckeye
Fort Worth, TX 76137

All of us have various interests in ham radio. As far back as I can remember, I have appreciated homebrew gear. You see, I built my first homebrew transmitter back in the late forties when I was about 4 or 5 years of age. It was a mobile. The front panel was made of a piece of cardboard with matching cardboard knobs. The shafts must have been fabricated from bent pins. Doggone impressive on a bicycle or tricycle! Several other kids in the neighborhood had cardboard mobile too.

At the time, my father, Sanford W. Musgrove, was an engineer employed by the Shell Pipeline near Eldorado, Texas. Apparently we had been introduced to ham radio by one of Dad's co-workers. I didn't really comprehend what amateur radio was all about. In a few years that would change though.

A year or so later Dad retired. We moved to a small farm near Goldthwaite, Texas. In about four years I was introduced to ham radio again. The local high school math teacher, Lee Tesson, and Church of Christ minister, George Devoll, were amateur radio operators with the calls WN5ZTB and WN5EFJ respectively. Ham radio was a disease that was definitely contagious. My older brother and two of his school friends soon passed novice exams. I followed suit within a year and the summer of 1955 received the call KN5BZH at the age of eleven.

I'm not sure why, but I was always more interested in the older gear and homebrew rigs. For example I recall an occasion when several of us from Goldthwaite visited W5DZ in Waco. I was more impressed with his old Hallicrafters receiver that had an external tuning dial than his newer Collins rig.

W5DZ had a brochure of the yet to be announced Collins SSB gear, yet the pictures of his old BC-610 got more of my attention.

Max Donnell, Jr., W5HSE, one of the fellows at Brownwood, had a homebrew transmitter that I was never to forget. I first saw this rig around 1955. It was in a three foot cabinet and had casters so that it could be moved easily. The top panel had a row of meters that monitored virtually everything. There was a RF deck, a modulator deck which contained a plate meter of it's own, and a power supply deck. The final amplifier had a single Raytheon 4D32. The modulator was a pair of Eimac 35Ts. Blue light emitted from the power supply due to the mercury vapor rectifiers. The VFO was in another small cabinet. The unit looked like a small commercial broadcast transmitter. Perhaps this was because Max was a broadcast engineer.

A few months ago while visiting my mother, who still lives in Goldthwaite, I was talking to some of the guys on the Brownwood repeater. During the QSO we discussed the older days around Brownwood and Goldthwaite. During the course of the conversation we quickly got around to Max Donnell. I was informed that Max had suffered a stroke and was a patient in a local care home. I described the old transmitter. One of the guys asked another,"Do you reckon we have just found a home for that transmitter"? The response was, "Yes." I was asked to come to Brownwood and pick up the unit. Max was looking for someone that would know how to operate it and would put it back on the air.

Jim Muscrove, K5BZH, with the homebrew transmitter built by Max Donnell,Jr., W5HSE , sometime in the late forties.

Unfortunately I had driven down to Goldthwaite from my Fort Worth QTH in my car instead of the pickup. I quickly 'conned' Web Mays, AA5NZ, one of the Goldthwaite hams, into taking his pickup and going with me to Brownwood, about 35 miles away, to get the rig. It took three of us to load it on the back of Web's pickup truck. Spare tubes, crystals and all of the coil sets came with it. Thats probably good as 35Ts would be hard to locate today. We carried the rig back to my mother's place and placed it in one of the rooms that Mom has designated as my Goldthwaite hamshack.

The next trip down to Goldthwaite, my mother and I drove to Brownwood and visited Max at the care home. We found him in good spirits and quite alert. He seemed glad to have found a home for his pride and joy. Max designed and built the rig sometime in the late forties. We discussed ham radio for a good while. Max glowed when he learned that a lot of guys are dusting off their old gear and putting it back on the air. I asked if he would be interested in receiving a subscription to a new magazine, "Electric Radio", which covered vintage equipment. Definitely!

In my recent discussions with Max it has become obvious that he has been involved in amateur radio for over a half century. Max passed his class "A" test around 1934. The FCC did not use multiple choice exams in those days. All questions were essay and drawing schematic diagrams. These were the days that homebrew reigned.

Max encountered some real learning experiences while building his own transmitters. He built at least two transmitters before building the beauty I have. Max told me that his first unit had only one stage and would easily fracture a crystal. The next rig was a little more advanced.The 4D32 transmitter was much more complex.

continued next page

Homesbrew Rig from previous page

The professionalism is really apparent. It should be noted that Max implemented a lot of nice little touches when he built this particular transmitter. Metal nameplates are used on the controls, jacks, meters and switches. The meter panel is a separate shielded unit that uses a large Cinch Jones connector to mate with the RF deck. AC line voltage, buffer plate, PA screen, PA grid and PA plate are metered.

Unfortunately the schematics and engineering notes for the old transmitter had been lost. I have been carefully documenting the rig again so that if anything happens once I apply power, I will be in a better position to rebuild it.

Many things caught my attention when I pulled out the RF deck to document it. I have never seen a transmitter with as many decoupling chokes and bypass capacitors. In several places Max used flat metal strips instead of wire to reduce inductance. The oscillator (6AG7) and buffer (6AG7) utilized bandswitching; however, the amplifier (4D32) had plug-in coils. The top of the RF deck has a lid that contains RF gasketing. The chassis was fabricated from galvanized steel. The oscillator was later changed to a cathode driven buffer when the VFO was added.

On another visit I asked Max about the decoupling and shielding. He was apprehensive of TVI. Max designed the rig to be free of any unwanted RF. Later, when they became available, he even added a Johnson TVI filter. Max claimed he never experienced TVI problems. He did have one neighbor file a BCI complaint and the FCC investigated. Their position was that the transmitter was of sound design.

Max was using a Hallicrafters SX-71 with the rig in the mid-fifties. He, in a typical fashion for some of the hams of that day, modified the receiver to improve some of the characteristics. Max doesn't know what happened to the SX-71 or the homemade VFO.

My brother Sanford, W5FIT, and I attended a hamfest near Austin this spring and I purchased a National HRO50-T1 to mate with Max's transmitter. I have a Hallicrafters HT-18 VFO and a Meissner Signal Shifter. One of these will be utilized.

I should have the transmitter checked out by this winter. I feel certain that I will enjoy it as much as some of the fellows enjoy their Collins KW1s. After all, how many hams today can say, "The rig here is homebrew, designed and built by W5HSE?"

Calling All Military Radio Operators!

Attention - those of you who own military and modified 'boat anchor' radio equipment! Take advantage of your built-in WARC band coverage and let's get together for an evening bash on the 17 meter band. Conditions are great - same propagation as 20 and NO QRM! I suggest 18.160 Mhz for starters - that would give enough buffer for AM up to the band edge. And let's not limit it to AM, by any means. I'd like to hear those SSB military and other classics on there too. What say? I'm going to start seriously working up there with my ART-13 this September. How about some company, guys?

Bill, KDØHG

Military Aircraft Command (MAC) Frequencies

The following frequencies for the Military Aircraft Command ,flying supplies into Saudi Arabia from Ascension Island, Turkey, England and Spain ,were given on the program "Sweden Calling DX'ers"which is broadcast by" Radio Sweden International".

The frequencies are 11.176, 13.214, 13.244, 15.015, 18.848, 19.219, 19.272, and 19.744. All transmissions are on SSB. For those of you with satellite capabilities, the Military Fleet Satcom can be picked on 252 - 276 Mhz FM.

Rick, K8MLV/Ø

Steve's Hamfest Report from page 27

I do not remember much of the hamfest after this point. There was a smaller Johnson Matchbox in excellent condition ($75) as well as a Globe 400C which I have never seen before at a hamfest. Perhaps some more of the classic gear is coming out of the attics. Also seen was a GPR-90 ($175), Drake 2C with everything ($150), a couple of very nice HQ-170s (one a VHF), and a R47 speaker ($10).

I guess that each hamfest will always be different from another, but when I think about almost missing out on it all, I'm glad I followed my own advise.

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15 meter contest from page 19

Three stations who were very active (I did not hear them but I heard stations working them all weekend) were John, WA6ZJC, in San Diego, Martin, K7BDY, in Sho Low, Arizona and Don, KV7S, in Tucson. I called these three to get their impressions of the contest.

John, WA6ZJC, worked 113 stations and he commented that he also worked a surprising number of stations running solid state transceivers. He also had some comments on the rules that I think I'll consider for other contests. First of all he said that the 10 points for DX was too much. "If I wanted to 'really' win the contest I would have pointed the beam to Japan and worked JA's all weekend or I could have pointed it south and worked South Americans". At one point he said he pointed his beam south and called CQ AM in Spanish. That one call yielded him two stations; one in Peru and one in Venezuela. So, I guess, we'll have to reduce the points for DX to 2 in future contests.

Martin, K7BDY, made worked 88 stations running his DX-100B for the weekend. Again, he had the same experience as the others; a large percentage (more than half) of the stations he worked were using Japanese transceivers.

Don, KV7S, really went at it in a serious way. So serious that he went through 3 transmitters over the weekend. He worked a total of 148 stations and from reports I've heard from other stations this high score was partly due to his ability to get SSB operators to switch to AM for the contact.

I'm very pleased the way everyone avoided the emergency net on 21.390. So far I have received no reports of anyone interfering with this operation. Also I'm extremely pleased to report that I heard no grumbling from SSB stations regarding our contest. In fact I think there are a great many new-comers who heard their first AM signal during our contest. A couple of the AM'ers have told me that they received reports from SSB stations that they had a 'strong carrier' on their signals.

I hope that the contest will stimulate more activity on 15 meters. It's a good band for us in that there is plenty of room for us to operate without interfering with the SSB stations and the band appears to be open to somewhere 24 hours a day. I'm going to be operating more on 15 in the future. I hope many other AM'ers will consider doing this as well.

Next month we'll have more information on the contest and we'll have determined the winners by then. If anyone has any ideas on how the contests may be improved or ideas for future events of this nature please let me know.

A while back I announced that ER would provide certificates for WAC, WAS, etc. but so far there have been no takers. Is anyone working toward one of these awards?

The next contest is going to be on 10 meters; I'll announce the details in the next issue. In the meantime consider joining in on the Classic Exchange contest. The details are in an article on page 11.
73 for now, Barry, N6CSW/Ø

Reflections from page 2

Also, there is a silent listening audience on the West Coast and this has resulted in a steady trickle of "new-old comers" who heard, enjoyed and became inspired to get back on the AM airwaves, because of the high level of "program material" that they heard out here on 40/75/160 in the AM mode.

DSB-AM has made its way into print, with two publications devoted almost exclusively to it. It also has made it into video, with various ham productions. The next step should be 'going into song'! Music is a powerful medium for spreading a message.

After reading the classic article in last month's ER about the 1928 transmitter, I can visualize this further step. Here is a cap for the whole W8DFV-W4PNM project. The title: "The Ballad of the Old 211"(or whatever the name of the transmitter is). The music: "Tie Me Kangaroo Down, Boy", with the chorus words revised to: "Screw them Sangamos down, boy, screw them Sangamos down". W4PNM can take it from there.

ER in Uniform from page 10

Tadiran (is) the only ones that have usable tooling for the castings on the 77... The only US maker of PRC-77's, Keystone General in Cincinnati, went bankrupt last year. ... The radios have been around so long that many companies ... have been awarded spares contracts ... the Germans, Koreans (as US supplied kits) the Pakistanis, the Israelis, the Italians... the bid prices went lower and lower to the point at which Keystone was making about $50 on every $2000 radio they shipped. And the Army thought it was getting abargain by driving the pricing down when instead they were simply making it unprofitable for reliable companies to produce the unit."

"(Anyway) the RT-505 is still alive in many National Guard units and in over 55 countries ... and the RT-841 is still the most widely used tactical radio by the US and by US supplied forces around the world ...".

The story of the PRC-25 and its successors show several problems of the way we buy radios (and other military hardware) -- for example if we need more PRC-77's because of a mideast war, will Tadiran be able to supply them? -- but we will leave that discussion to another time. SINCGARS is a 'frequency hopping' system, capable of changing frequency 150 times per second to avoid jamming or interference and provide security, so it is a considerable step in complexity.

Orphans

At a Maryland hamfest in July, I saw a couple of good military sets get passed by. Contact the sellers directly; be sure to get full information before buying as I did not look at the sets closely. (1) TCS transmitter, no case but seller thinks he may be able to find it; antenna ammeter replaced with a later model white face unit, but otherwise original, $15. Seller John Sherrick, W3HUQ (in callbook). (2) Five or six ART-13's; the one I saw was in 'good' restorable condition -- not as 'tired' as many you see. One sold for $50. Seller Jim Schmidt, (301) 686-3138.

Next month, we've got TDY (temporary duty) on a U.S. Navy radio which needs some 400 cps AC power; you can thank E.R.'s publisher for this one, as his threats of a 15 meter AM contest are the reason I decided to try to fire it up.

Editor's Comments from page 1

I'm hoping to have the first article finished for the next issue. And the other articles will appear over the course of the next year or so.

Meeting and talking with Lee has been a rare treat. As others of you might treasure a piece of equipment in your collections, I treasure my experiences of meeting and knowing the 'real radio' pioneers.like Lee Faber. On to #18

CLASSIFIEDS

Advertising Information

Subscribers receive 1 free - 30 word- ad per month. **Extra words are .10.** Here's how to count the words in your ad: the heading - For Sale, Wanted, etc count as **1 word**. Your name, call, address and telephone number count as **6 words**. Hyphenated words count as **2 words**. **Please count the words in your ad and if you're over 30 words send payment for the extra words.**

Non-subscribers: $3 minimium for each ad (up to 30 words). Each additional word is .20. **Please call or write for display rates.**

VINTAGE EQUIPMENT ONLY

E.R.
145 CR 123
Hesperus, CO 81326 303-247-4935

DEADLINE FOR THE Oct. ISSUE: Oct. 7

FOR SALE: Hammarlund HX-50 transmitter in good condition - $150; Drake 2B receiver w/Q multiplier - $130. Charlie Vaughn, KD4AJ, (404) 396-0276

WANTED: Accessories for R4-C; AM filters and SW xtals. Levy, 8 Waterloo Drive, Morris Plains, NJ 07950. (201) 285-0233

WANTED: Navy RAX CG-46115 LF receiver; R-392 receiver and Conset Communicator IV for 2 meters. Steve Davis, KD2NX, 2372 84th St., Brooklyn, NY 11214. (718) 265-2390

WANTED: APS-50 power supply for the Harvey Wells TBS-50D in working condition. James Schliestett, W4IMQ, POB 93, Cedartown, GA 30125. (404) 748-5968

FOR SALE: 70 years accumulation. 1920's radios, tube testers, servicing generators, meters, transmitter/receiver parts, Radio Master catalogs, flyers, books, manuals, linear amplifiers, 48 pages - $1. F.H. Yonker, W2IBH, 7 Old Farms Rd., Saddle River, NJ 07458. (201) 825-1895

FOR SALE: Collins 51J2 with manual - $225; Collins 51J4 - $375; Hickok #600 and #6000 tube testers - $75 each; Riders 1-5 abridged - $35. **WANTED:** Pilot and German radios. Bill Moore, 1005 Fieldstone Ct., Huntsville, AL 35803.

WANTED: Heath Chipiwa linear, RF deck or whole amp. working or not or for parts. Ron Penska, WA3WBC, 664 Homestead St., Simpson, PA 18407. (717) 282-2731

FOR SALE: HT-32, needs xfmr, nice - $40, pu only; Thunderbold amp. - $350 pu only; (2) 803 tubes - $20 plus shipping; Clegg 22'R, nice - $40 plus shipping. Rich Lucchesi, WA2RQY, 941 N. Park Ave., N. Massapequa, L.I., NY 11758. (516) 798-1230

WANTED: Crystal calibrator for NC-303. Ron Henderson, K3NFS, 120 Fairfield Dr., New Stanton, PA 15672. (412) 925-7040

FOR SALE: Military, Ham, test equipment, books, tubes, etc. Send LSASE for list. Gary Cain, 1775 Grand, #302, St. Paul, MN 55105.

CLASSIFIEDS

FOR SALE: National NC-33/USN BM-282 AC/DC receiver, poor/restorable - $10 plus UPS. **WANTED:** Circuit diagram for Globe King 500A. Fred Huntley, W6RNC, POB 478, Nevada City, CA 95959.

WANTED: Johnson Viking Navigator; Speed-X bug; expertise on Ranger mods; copy of Johnson 122 vfo manual (xerox ok). Brian Roberts, 3068 Evergreen Rd., Pittsburgh, PA 15237. (412) 931-4646

WANTED: Plug-in coil, B&W 20 HDVL or equiv., possibly Johnson 1000LCS20; also appreciate photocopy of any spec sheets for swinging link series. Paul Courson, WA3VJB, Box 73, W. Friendship, MD 21794-0073.

FOR SALE: National NC-270, vg condition - $95; Hallicrafters SX-25, vg condition - $85. Both plus UPS. **WANTED:** Model 28 teletype parts. Bob Zimmer, NVIX, 205 Brigham Hill Rd., Milton, VT 05468. (802) 879-7235

WANTED: Transistor radios from the 1950's and early 1960's. Cash or trade. James Weil, 15915 Armada Ctr. Rd., Romeo, MI 48065. (313) 784-9860

WANTED: 500 Hz mechanical filter (p/n 526915400) F-455J-05 for Collins 75A-4. Bob, NØATW, 5917 Decatur Ave. N., New Hope, MN 55428. (612) 535-2745

FOR SALE: 32 extra ARRL Radio Amateurs Handbooks, 1941-1978, SASE for list. **WANTED:** 1931 ARRL Handbook, Harvey Wells Bandmaster Deluxe TBS-50D; AM filter for Collins 75A-3; Riders Radio Manuals 1, 2, 3, 4. Bob Schafer, WA7IHN, POB 442, Aumsville, OR 97325. (503) 749-1149

WANTED: Book for Hickok 6000A -L.S.-3 speaker - RBB,RBC and or manuals - speech amp CRV-50055 part of TBL-12. Tom Horsfall, WA6OPE, 1862 Tulare Ave., Richmond, CA 94805. (415) 237-9535

FOR SALE: Bigelow Electronics has been in the electronic mail order business since 1954. Vintage parts and equipment available. Request free "Vintage Flyer". Bigelow Electronics, Box 125, Bluffton, OH 45817.

FOR SALE: TV-7 tube tester - $50; URM25D Signal Generator - $60. **WANTED:** WW-II radar equipment. Steve Bartkowski, 4923 W. 28 St., Cicero, IL 60650. (708) 863-3090

FOR SALE: Central Electronics Multiphase Exciter model 20-A with matching C.E. 458 vfo, all very good condition, with manuals - $75; Hammarlund SP-600JX-17, very good condition, in cabinet - $250. Larry D. Cohen, 1011 Hummingbird, Waco, TX 76712. (817) 776-7357

FOR SALE: BC-348R receiver - $40; Heathkit color bar dot generator IG-28, with manual - $55; Hewlett-Packard 200 AB audio oscillator w/manuals, as new- $40. Ward Becht, W6IRK, 625 Tufts Ave., Burbank, CA 91504. (818) 842-3444

WANTED: Harrington GP-50 grid assembly; UTC CG-53AX or LS-47 audio driver transformer. Rex Johnson, K4JBJ, 3391 Oak Drive, Lawrenceville, GA 30244. (404) 923-7919 after 6:00 EDT.

FOR SALE: Johnson 500 - $600 pu only; Valiant - $200 pu only; 6N2 - $45; 6N2 vfo - $25; Invader 2000 - $600 pu only; Hallicrafters HT-37- $125 pu only; Heath Marauder - $100 pu only; Pacemaker - $150 pu only; 51J/R-388 - $150; Atlas 210X - $350; Atlas 215X - $350; CE MM-2 RF analyzer - $35; HP 200B, 200C audio generators - $25 each. All equipment has been checked out, retubed and is ready to go. Howard Mills, W3HM, Rt #3, Box 712, Harpers Ferry, WV 25425. (304) 876-6483 after 2000 EDST

FOR SALE: Do you need tubes, parts, schematics? Send SASE. Nick Marshal, 2207 Peachland Ave., Sebastopol, CA 95472.

CLASSIFIEDS

WANTED: Hammarlund SP-600JX; TMC GPR-90 (R-825/URR); GPR-90 RX (R-840/URR); SBT-350; Racal RA-17; RA-217; RA-6217; RA-6772. Al Roehm, W2OBJ, 22 Brookdale Rd., Cranford, NJ 07016. (201) 276-2997

FOR SALE: SSB converter model CV 157 URR; Johnson Viking I. Cliff Fleury, AI7Y, 64174 Tumalo Rim Dr., Bend, OR 97701. (503) 382-9162

FOR SALE: Lots of AM 'goodies'. Globe Scout; RME 45; HT-9 etc. R. Matson, K1OKO, RFD #1, Box 2943, Kennebunk, ME 04043. (207) 985-3751

WANTED: National receivers; NC45, NC80, NC81, TV7; HRO-5 coils; E, F; HRO-7 coils; E,F; HRO-50 coils G, H, J, AA, AB; HRO-50 FM adapter, NFM-50; NC-183D xtal cal, XCU-83; HRO-7R main tuning knob (black); feet for the NC-2-40D and it's speaker. Also National brochures, advertising items, displays, knobs, speakers, etc; Johnson 500 instruction manual (copy ok); Johnson Signal Sentry model 250-25; Johnson T/R switch 250-39; Ameco AC-1 40 meter coil; any tube kits complete but unbuilt: receivers, transmitters, audio equipment. Steve Sauer, WA9ASZ, 1274 Londonerry Ln., Greenwood, IN 46142. (317) 882-4598 eves. after 7:00 EST

FOR SALE: Hallicrafters Sky Rider, SX-28 receiver - $75; Johnson Ranger I - $89; GR variacs, 15 and 20 amp at 115 volts - $45 each; Heath Cantenna - $15; 813 and 805 tubes - $20 each. Levy, 7600 Blanco Rd., #608, San Antonio, TX 78216. (512) 341-9549

WANTED: Lafayette Voyager and Starflite xmtrs; Viking Navigator; Globe Chief 90; WRL CW-7; HA 14 amp and will pay top $ for a Davco DR30 RX. Gary, K3OMI, 11124 Oak Hollow Rd., Knoxville, TN 37932. (615) 690-4217 days

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WANTED: Geloso receiver, model G-250. D.H. Moore, POB 521, Palo Alto, CA 94302. (415) 322-2728

FOR SALE: BC-610, with BC-614 speech amp and manual, no mod. tubes, needs work - $200; FT-101E - $250. Chuck Graves, KØRFQ, 1120 N. Cedar Brook, Springfield, MO 65802. (417) 869-6884

FOR SALE: SCR-522s, APR-4, APR-5, PE-103, BC-344, PE-112, SCR-515A, Mod 65, 80 sig. Gens.; GR bridge; T-39/APQ-5. Ted Heithecker, W5EJ, 1409 Cooper Dr., Irving, TX 75061. (214) 438-8038

FOR SALE: 45 year cleanout. CX-7s; Atlas; Swan; Galaxy; Henry 4K; Clipperton linear; Drake L4B linear. SASE for list. Harry Gartsman, W6ATC, 1915 Armacost, Los Angeles, CA 90025. (213) 820-3997 FAX (213) 826-4058

FOR SALE: Connectors, banana pin female types; ARC-5/274N, ARN-30; BC-223 and others. Also send your want list w/ SASE. I still have a lot of collectable WW-II stuff. Henry Engstrom, POB 5846, Santa Rosa, CA 95402. (707) 579-2070

WANTED: National HRO-60T accessories. HRO-60TS speaker; SOJ-3 Select-O-Ject; Coils F, AA, AB, AC; manual for National NC-300, copy ok. I will pay top $ for any or all of the above. Frank DeCoito, Star Rt. #2, Box 242, La Honda, CA 94020. (415) 948-2045

FOR SALE: Lampkin signal generator model 105-B - $60; nice old home made crystal set with very early glass enclosed detector - $40. Both good condition, plus shipping. **WANTED:** 2 new 8122 tubes for my NCL-2000 amp. John Chenoweth, W8CAE, 9130 Yankee St., Miamisburg, OH 45342. (513) 885-2566

FOR SALE: Connectors for ART-13, ATD, TA-12, ARB, TCS, GP-7, SCR-543, others using K, MS, large banana type; M-38/A1 radio power connector. Robert Downs, WA5CAB, 2027 Mapleton,Houston, TX 77043. (713) 467-5614

CLASSIFIEDS

FOR SALE: General Radio 1931-A modulation monitor with manual - BO by Oct. 8; Viking 122 vfo with photocopied manual - $29. Berj N. Ensanian, KI3U, Box 3342 Williamsport, PA 17701. (717) 326-2148

WANTED: ATB transmitter tuning coils; mount; control box; dynamotor. If it has ATB (or ATD) on it please contact me. Henry Engstrom,POB 5846, Santa Rosa, CA 95402. (707) 579-2070

FOR SALE: HQ-180A w/matching speaker, mint - $225; Drake 2-B receiver w/Q multiplier - $130. Charlie Vaughn, KD4AJ, 1968 Huntington Hall Court, Atlanta, GA 30338. (404) 396-0276

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

FOR SALE: Hallicrafters FPM-300 - write for details. **WANTED:** Brown case "Oceanic" type radios. Also want Hallicrafters SR-500 and FPM-200; Vocaline PT-27 manual or complete unit with manual and Kenwood R-2000 or R-1000 receivers. Ed Deptula, POB 751, Havertown, PA 19083.

WANTED: 3/8" paper tape rolls to fit BC-1016 inked tape telegraph recorder; (2) 809s and Hallicrafters S-35 Pan 3RP7 CRT. Nicholas Oland, W3DSE, 821 Kenhorst Blvd., Reading, PA 19611. (215) 378-1411

FOR SALE: Antique radios, parts, tubes, books, 150 panel meters, knobs, amateur, test equipment, transmitter crystals, etc. 13 lists. SASE + $2 cash (no checks). Richard & Rose's Radio Mart, POB 691443, Tulsa, OK 74169.

WANTED: B&W 5100 (not B) xmtr in good condition. Bob Ivone, 622 Avenue U, Brooklyn, NY 11223. (718) 339-3394

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Bumper sticker - $1 each with a #10 SASE. We service American made amateur radio products circa 1940's, 50's and 60's. Manuals and/or schematics available for most rigs and radio sets back to mid 1920's. Call or write for a quote on your service or tech data requirements. **Classic Radio,** PO Box 3486 Eureka, CA 95502. 24 hour phone (707) 444-3911. K6VHP

FOR SALE: Hallicrafters SR-42 (2 meter xcvr) with HR-26 vfo, w/manual - $60; DX-20 w/manual - $40; DX-40 w/manual - $40; Viking 6N2 - $35; AF-67 w/AC supply and manual, not working - $50. Barry Wiseman, N6CSW/Ø, 145 CR 123, Hesperus, CO 81326. (303) 247-4935

FOR SALE: Don C. Wallace, W6AM. This book describes the history of amateur radio, as experienced by Don Wallace. By Jan D. Perkins, N6AW. Hardbound, 350 pages. Prepublication price $19.95. Available from Wallace & Wallace, 11823 Slauson Avenue, Suite 28, Sante Fe Springs, CA 90670.

FOR SALE or Trade: (2) SX-43s w/R-44 speakers. **WANTED:** SX-28, SX-42, SX-88. Will pay premium for mint or near mint condx. Always SP-44s, SM-40s. Roy, N5QQM. (504) 272-2563 FAX (504) 272-4913

FOR SALE: RBB receiver/ps - $75 p/u only; R-648/ARR41 receiver - $175. Thousands of tubes, advise your needs. **WANTED:** Original manual and bottom plate for RAX receivers; BC-946B receiver; ANB-HI headphone element (CQF); schematics and manuals for BC-1031C, BC-12065-CMZ and WRL 755 vfo. Mel Stoller, K2AOQ, 100 Stockton Lane, Rochester, NY 14625. (716) 671-0776

FOR SALE: National NC-57 - $60. **WANTED:** Main tuning knob and locking mechanism for Hallicrafters SX-28. Henry Rogers, WA7YBS, POB 501, Minden, NV 89423. (702) 267-2725

WANTED: Manual for Drake 2-NT. Dan Mason, 1325 N. Lima St., Burbank, CA 91505. (818) 848-9474

WANTED: U.S. Army technical manual TM-11-809-20 Organizational Maintenance Manual for radio transmitter T-368. Bill Mills, KC5PF, 1740 Tonys Court, Amissvile, VA 22002. Office: (703) 818-3955, Home: (703) 937-4090

WANTED: Copy of manual for Johnson Viking Courier. Also any info on RCA model AVR-20-A aircraft receiver (2.3 - 6.5 Mhz) mfg. by Continental Radio and Tel. Corp., Chicago. Al Bernard, NI4Q, POB 690098, Orlando, FL 32869-0098. (407) 351-5536

WANTED: LF coils for BC-229: C-439, C-440, C-441 or C-442. Patrick Marineau, 2819 Innsbruck Dr., Apt. #1, St. Louis, MO 63129.

FOR SALE: 6 Kc filters for Collins 75A-4 - $125 each. **WANTED:** Hickock 539B/C tube tester. Gene Peroni, KA6NNR, Box 58003, Philadelphia, PA 19102 (215) 665-6182

WANTED: Gonset 220 Mhz Comm. IV, 2 meter Comm. III. Also want G-28 and 650 for parts. J.M. Roseman, W9UD, 2716 West 3rd St., Coal Valley, IL 61240.

WANTED: WW-II military electronics; test equipment, radios, radar, odd-ball items, counter measures, APS-13; also manuals, books, articles pertaining to same. William Van Lennop, POB 211, Pepperll, MA 01463. (508) 433-6031

WANTED: FT-260/C-24 local control box or plug-in for Command receiver front receptacle. Manuals for Command receivers. J. Orgnero, Box 32, Site 7, SS 1, Calgary, AB T2M 4N3, Canada

CLASSIFIEDS

FOR SALE: Tubes, new in box. Please send $1 for list of 300+ tubes. Refundable. Wilson Hauck. BTB. Inc. E.R., 6820 Stout Rd., Memphis, TN 38119

FOR SALE: Transmitting/receiving tubes, new and used. Exa: OD3, 3B28, 4X150, 4X500, 4-65A, 4-125A, 4D32, 6A3, 12A6, 45, 250TH, 807, 809, 810, 811, 812, 815, 829, 832, 836, 872, 1619, 1625, 5894, 6130, 6146, 9003 plus others. LSASE for list. I also collect old and unique tubes of any type. Maybe you have something to trade? John H. Walker Jr., 16112 W. 125th St., Olathe, KS 66062. (913) 782-6455

WANTED: Brown case "Oceanic" type radios. Also want SR-500 and Electro-Voice 419 mike stand, mike or both. Edward Deptula, KA3OTT, POB 751, Havertown, PA 19083.

WANTED: Colored plastic radios from the 30's and 40's. I have a nice Hallicrafters SX-62A to trade or will pay cash. Kevin Eftink, 16 Edgewood Dr., Quincy, IL 62301. (217) 228-2221

FOR SALE: Military, Ham, test equipment, books, tubes, etc. Send LSASE for list. Gary Cain, 1775 Grand, #302, St. Paul, MN 55105.
WANTED: National AGS or AGS-X, any condition. Have several quality trades or will purchase. Henry Rogers, WA7YBS, POB 501, Minden, NV 89423. (702) 267-2725

WANTED: Military radios - any vintage - any country - any related items. Will trade. Also need 801 and 843 tubes. Charles DiCecca, 501 Mystic Valley Pkwy, Medford, MA 02155. (617) 396-9354

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

WANTED: Pre 1950 ARRL handbooks. WA7NNH, 1024 Main St., Boise, ID 83702.

FOR SALE: Miscellaneous odds and ends, antique radios and parts. LSASE for list. Hidyne Research, POB 3342, Williamsport, PA 17701. (717) 326-2148

WANTED: Tech manuals or schematics for AN/URM-50 and AN/URM-89 (IM-109A/URM-89), reproductions ok. Bob Beebe, W6SHF, 4943 Whitfield Ave., Fremont, CA 94536. (415) 792-0202

WANTED: Two 75TH vacuum tubes, badly needed. Paul Bauer, N3DAN, 11708 Bacon Race Rd., Woodbridge, VA 22192. (703) 590-0843

WANTED: 5514 mod. tubes and V-70-D final tubes for Globe King 400. Mike Nichols, KE9FK, 105 N. 4th St., Fort Atkinson, WI 53538. (414) 563-2825

WANTED: Schematic or manual copy for a Globe Chief model 90 and for a Conar 500 receiver. I'll pay for copying and mailing. Thanks. Jim Hanlon, W8KGI, POB 581, Sandia Park, NM 87047.

WANTED: Manual for Heath HG-10 vfo. Also any modifications for DX-60 transmitter and National NCX-3 transceiver for AM operation. Chris Campbell, POB 108, Cohoes, NY 12047-0108. (518) 237-8746

FOR SALE: Collins 312B4/RE - $135; National 100ASD (WW-II general coverage receiver) - $90; NC-200 silver anniversary w/matching speaker (see 1940 QST) - $120; (7) coil sets for HRO with 175 Kc IF - $65; (2) Central Electronics 20A transmitters - $35 each; CE 100V - $90; QST magazine collection - the history of amateur radio! Complete from mid 1920 to Dec. 1975 except for Dec. 1926. Have six issues prior to 1920. (QST was not printed for 22 months during WW-I). Recently bought complete set. Sell my incomplete set for $950. Mike Palmer, K5FZ, 16707 Creeksouth, Houston, TX 77068. (713) 444-7737

WANTED: Melehan "Valiant" dual pendulum bug. Jay, KI1W, (617) 227-5228.

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FOR SALE: Hammarlund SPC-10 single sideband adapter with manual - $150. B.G. Martin, N4YYP, 127 South Oliver St., Elberton, GA 30635.

WANTED: Pierson-Holt KE-93 receiver with or without AC supply. Howard Hood, WA7QQI, 5670 SW 44th St., Port Orchard, WA 98366. (206) 674-2179

FOR SALE: Hard to find power supply for the Heath MR-1, MT-1; Heath HP-20. Marty Drift, WB2FOU/5, (817) 497-6023

FOR SALE: DY-17A/ART-13A, gov't reconditioned - $45; 75TH tubes, good used, $40 or BO. Robert Downs, WA5CAB, 2027 Mapleton, Houston, TX 77043. (713) 467-5614

Electric Radio - the first year - all twelve issues delivered First Class in a padded envelope - $25. Individual copies $2.50 delivered. #1 and #11 are reproductions.

WANTED: 813 tubes, carbon plate only, with good emission and no gas, subject to my testing. Also need 811 and 811A types. Will pay cash or trade. Mike Carroll, NI4N, 108 Wessington Ct., Hendersonville, TN, 37075. (615) 822-0082

WANTED: Schematic diagram and technical info for West German FM-AM-SW table radio, model Olympic Opta, Delta, type 5400W. Stephen Kalista, HC 1, Box 137, Jim Thorpe, PA 18229. (717) 325-4120

FOR SALE: Collins equipment: KWM2A, 512F-2 and 312B-5 console, round emblem, excellent, package only, prefer pick-up. Send bid to Charlie, KD4AJ, 1968 Huntington Hall Ct., Atlanta, GA 30338. All inquiries answered.

FOR SALE: Hallicrafters S-94 with manual - $20. WANTED: Crystal phasing knob for SP-600, manual for Lambda MM-2 modulation scope. Geoff Fors, WB6NVH, 769 Pacific St., Monterey, CA 93940.

FOR SALE: Hombrew modulator with pr of 6146s, beatiful construction, with clipper and speech amp. -$40; audio level meter for R-390 - $10; Thordarson 60 watt mod. transformer model T-21M61, never used - $20. Bill Kleronomos, KDØHG, POB 1456, Lyons, CO 80540. (303) 823-6438

ER Parts Unit Directory

At this point the directory has about 50 units in it and it's growing daily. If you need a part for a vintage restoration send $1 and an SASE for the list. If you have a parts unit consider putting it on the list. Your dead unit can help bring others to life.

FOR SALE: Newly published instruction books, authorized by Rockwell International, are now available for the Rockwell/Collins S-Line. These instruction books are brand new and have been printed from the latest editions - complete in every detail, including the front and rear color covers. A money-back guarantee of the purchase price ensures your complete satisfaction. Instruction books for the following models are currently available. KWM-2/2A ($35); 75S-3B/C ($30); 32S-3A ($30); 75S-3/3A ($25); 32S-3 ($25); 312B-4/5 ($20); 516F-2 ($15). For U.S. orders, include 7% of the purchase price for shipping and handling. (Canada and Mexico add 12%; all other international countries add 25%) Ohio residents add 6% sales tax. VISTA Technology Incorporated, 3041 Rising Springs, Bellbrook, OH 45305. (513) 426-6700

FOR SALE: Collect keys? You'll enjoy W1IMQ's illustrated references. "Introduction to key collecting", 64 pages - $9.95, "Vibroplex Collectors Guide", 87 pages - $14.95. Add $2 s/h to total. See your dealer or order direct from: Artifax Books, Box 88-E, Maynard, MA 01754.

FOR SALE: Used technical books: radio, electronics, math, military, magazines, etc. $1 for large list. Stamps OK. Softwave Communications, Dept. ER, 1515 Sashabaw, Ortonville, MI 48462.

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

WANTED: Military radios and related equipment; tubes, 801 and 843; GP-7 tuning units. Charles DiCecca, KA1GON, Mystic Valley Parkway, Medford, MA 02155. (617) 396-935

FOR SALE: Hallicrafters SX-101A, retubed, nice - $175; Hallicrafters SX-62A, very nice - $150; Drake TR-4 transceiver, 80-10, Drake serviced, AC-4, MS-4, nice - $250. All with manuals. U-ship. Frank Vardeman, 4612 Eddy Dr., Tampa, FL 33603. (813) 871-2134

FOR SALE: UTC transformers, brand new in factory cartons, 100 different types: transmitting, filament, chokes and modulation transformers. Also audio interstage and outputs etc. Commercial, military and amateur grades. Send #10 SASE for catalog and inventory to: Len Crispino, POB 702, Hudson Falls, NY 12839. (518) 638-8199

FOR SALE: SX-101, no spkr, w/manual - $125; Globe Champion 300 - $125. **WANTED:** 4-250s with sockets; mod. transformer for 810s to 4-250s; 872s; SX-101 glass dial face plate. Jeff Garrett, KEØMT, 2822 W. 55th Ave., Denver, CO 80221. (303) 455-5658

WANTED: RCA AVT-15 transmitter; AVA-120 trailing wire antenna reel and related hardware; SCR-319 items. Ken Gillis, 27217 Garden Way, Franklin, MI 48025. (313) 390-6873 days.

WANTED: Very old or unusual Hallicrafters equipment, entire 1934 "H" and "Z" line of Silver Marshal, parts, memorabilia and manuals. Chuck Dachis, "The Hallicrafter Collector", WD5EOG, 4500 Russell Drive, Austin, TX 78745.

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

WANTED: Wierd tubes (duds ok) for display. Marcus Frisch, WA9IXP, Box 28803 Greenfield, WI 53220-0803.

WANTED: Brown Brothers keyer paddle; crystal set parts. John Strang, K9HBM, (714) 454-2701

WANTED: Old National sets: esp. SW-4 and NHV for cash or nice trades. Also need a SP-400. Robert B. Enemark, W1EC, Box 1607, Duxbury, MA 02331. (617) 934-5043

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