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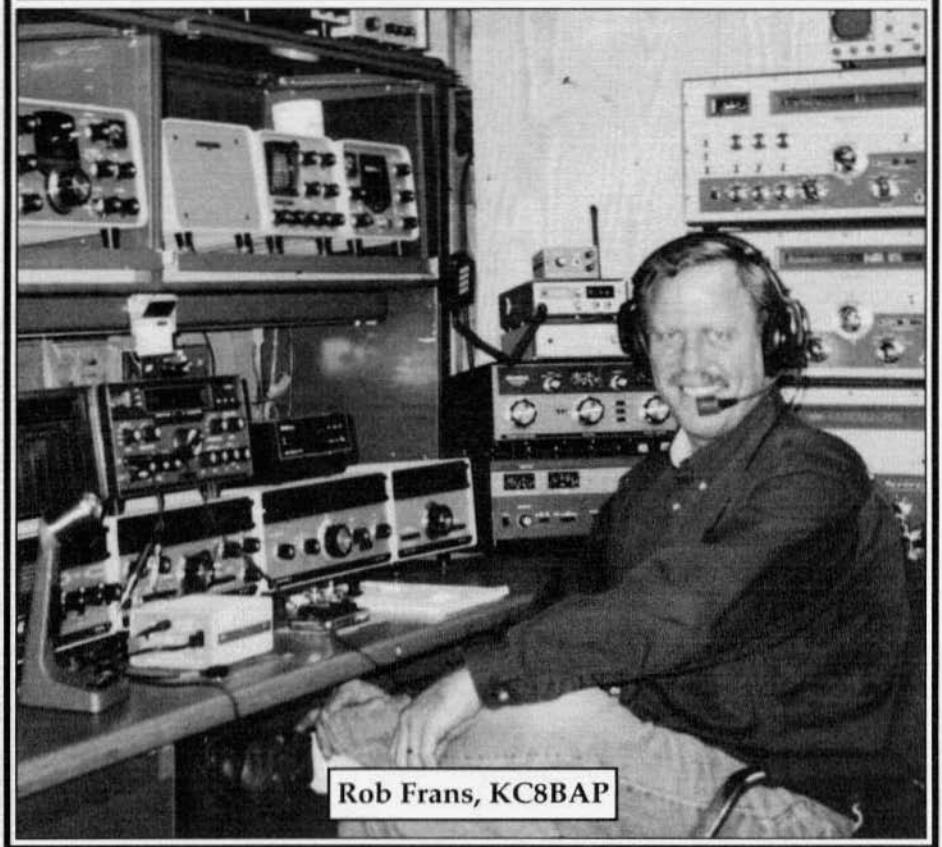
ELECTRIC RADIO

celebrating a bygone era

Number 133 May 2000



Rob Frans, KC8BAP

ELECTRIC RADIO

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

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

Regular contributors include:

Walt Hutchens, KJ4KV; Bill Kleronomos, KDØHG; Ray Osterwald, NØDMS; Dave Ishmael, WA6VVL; Jim Hanlon, W8KGI; Chuck Penson, WA7ZZE; Dennis Petrich, KØEOO; Bob Dennison, W2HBE; Dale Gagnon, KW1I; Rob Brownstein, K6RB; Don Meadows, N6DM; Lew McCoy, W1ICP; Kurt Miska, N8WGW; Warren Bruene, W5OLY; Brian Harris, WA5UEK; Thomas Bonomo, K6AD and others.

Editor's Comments

ER Now Takes Credit Card Payment

Up until recently we got along just fine without taking credit card payment—checks, money orders and cash seemed to work OK. But now that we're selling more products and doing more business via the internet we've had to acquire the capability to take credit card payment. We hope it makes doing business with us more convenient.

Vintage Field Day

Another reminder that we're a month closer to VFD #4, this year being held on the weekend of June 17/18. I hope that this year we'll see an increased level of participation. As an inducement I'll be providing awards and other prizes.

15M AM Jamboree

I have no idea how the 15M Jamboree worked out last weekend (April 29/30) as I was totally incapable of getting down to my basement hamshack. For the last while I've been suffering from the complications of a Baker's cyst that has rendered my left leg almost useless. I think I could have got down to the basement but I don't know how I would have operated with my foot elevated the way the Doctor's would like me to keep it. Anyway, those who did participate should get their logs and reports in to me in time to be included in the June issue.

Dayton and Bliss Tuner

As a reward for my financial support of the AMI Special Event Station at Dayton the organizers are allowing John Bliss to display his new tuner there. It will also be in use as part of the station equipment. This is the tuner that was described in last month's ER and is a new product we'll be selling in the ER Store.

Plans for July

I still haven't decided what to do with my month off in July but maybe I'll have something to announce in next month's issue. N6CSW

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Looking Back

by Lew McCoy, W1ICP
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I have written much about George Grammer, W1DF, who was the Technical Director of ARRL. He was with the League for most of his career. He was, without a doubt, one of the most intelligent men, when it came to electronics or simply 'radio' that probably ever lived. That is not just my opinion, the IRE (later the IEEE) made him a "fellow". Such an honor was unusual for someone who devoted his work primarily to amateur radio.

The Technical Department had extremely qualified people. People like Don Mix and By Goodman were experts in their fields. By Goodman was exceptional in receiver design while Don excelled in transmitter work. But as much as they were qualified, they could not approach Grammer.

Like many great minds, George did have certain "hang-ups" but they did not effect his work. He really didn't believe that beam antennas were necessary—he always claimed a dipole was good enough. I don't think he ever owned a beam. Another point was power; he just did not believe in high power. I don't think in his entire career he ever ran much more than 60 or 70 watts. But he didn't campaign against the use of beams and high power and he probably knew more about those subjects than anyone else at the League or anywhere.

By Goodman on the other hand was both a power and high gain antenna man. Byron was a genius when it came to BIG antennas. He favored rhombics and other wire arrays. I remember one incident where an advertiser—or rather a would be advertiser—wanted to advertise a tiny 80 meter antenna. This was a small wire contraption that would fit on the end of your coax line. The guy specified (now get this) a 60-foot length of coax which was terminated with this small wire contraption.

Grammer called By into his office and told him to test this contraption. As I recall, neither of the two men was in a happy mood that morning but Byron looked at the system and looked at George and said something like, "George, you have to be kidding? You know this is nothing but a 60 foot vertical, the antenna is coupled to the shield so the whole damn thing radiates." George just looked at By and told him to test it. Now for any of you who don't know what the antenna was—some clown had designed this small (about 2 feet square) iron mesh which was attached to both the inside conductor and outside of the coax. The guy insisted that it be used on a nonconducting 60-foot high support. George knew it was a ridiculous antenna and so did Byron but George insisted that By test it. By came out of George's office really steamed. He came and got me and said "Let's put this stupid thing up." Of course it worked like a 60-foot vertical—a very poor 60-foot vertical. I recall By bringing it back into George's office. What bothered me about the whole thing was that George knew it was a piece of junk but he insisted that we put it up and test it. It took me a while to realize that what George was doing was making damn sure that when he sent the antenna back to the manufacturer (and the guy's advertising refused) that we had actually tested it. The League's policy in those days was that ALL products were tested.

I have to write that I was just about the luckiest ham in the world in those days. I got to work with what I think were the greatest minds in radio and it was wonderful. The League in those days was truly a magic place. **W1ICP**

AMI Update - April

by Dale Gagnon, KW1I, President

Dayton Hamvention 2000 - AM Festival Station, KG2IC Operating Schedule

Friday May 19
Saturday May 20
Sunday May 21 (station closes down at 1100 EST)

0700 - 1000 EST	3885 +/-
1000 - 1830	7290 +/-
1300 - 1800	Listening for calls on 14.286 +/- on the hour
1315 - 1815	Listening for calls on 18.150 +/- quarter past each hour
1330 - 1830	Listening for calls on 21.410 +/- half past each hour
1245 - 1745	Listening for calls on 29.020 +/- quarter of each hour

AM Operation on 17 Meters

Tim, WA1HLR reports that the common military surplus crystal 6050 kHz will work in most classic AM rigs to produce AM on 18.150 MHz utilizing either the 20 meter or 15 meter bandswitch setting. Transmitters like the Ranger, Viking I and II, Valiant, DX-100 and Apache have been used to good advantage. Tim suggests AM ops think about populating 17 meters this summer as 10 meter propagation cools off.

East Coast Old Military Radio Net CW Session

The CW Net Session is an outgrowth of our Saturday morning phone net. We meet on Sunday evenings at 2100 Eastern Time on 3570 kc. Net control is usually myself, AJ1G, or Ted, W3PWW. An informal round-robin rotation established by the NCS is the format used. Use of military equipment by net participants is encouraged, but not a prerequisite for participation. Typical equipment used by net participants ranges from GRC-9s and GRC-109s to more powerful sets, such as GRC-19s, T-368s, and BC-610s. Ted, W3PWW, and Bob, W4QBE frequently check in with their BC-375s, which add lots of "character" to the net. Unlike the AM net, where the low power sets are not always good copy to all net participants, everyone, regardless of power level, is usually QSA 5 QRK 5 at all outstations on CW. Other notable sets that frequently show up are KW1I's McKay ex-Merchant Marine set, lots of TCS-12s and 13s, WS No. 19s, PRC- 47s, Command Sets, and WA1OMI's modified Gibson Girl lifeboat transmitter (he uses an AC supply, but also can handcrank it!). During the summer months, we get a lot of check-ins from people with low power field radios from summer cottages or camp sites. I frequently run the net during the summer from the yard at our summer cottage in Charlestown, RI, using my GRC-9, powered from its PE-162 gasoline generator set, and a "field expedient" inverted-vee antenna. The exhaust from the PE-162 2-cycle engine makes for a great mosquito fogger!

Chris Bowne, AJ1G

John Leary, W9WHM, SK September 20, 1999

by Joel Thurtell, K8PSV
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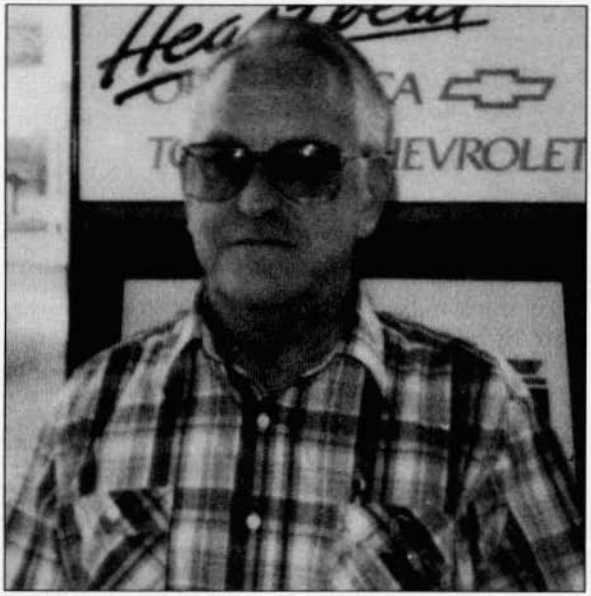

A 1988 photo of John Leary, W9WHM.

When time comes to part with a radio, some hams have a hard time letting go. Not long ago, I unpacked a Collins transceiver and found a note under the lid. The seller already had waxed on in several e-mails about how attached he was to the rig, so I wasn't surprised to find a small sheet of paper with a handwritten farewell message addressed to his beloved KWM-2A. "Sorry we have to part, old friend. Maybe we'll meet again in the next life."

Man, I thought, and he didn't even BUILD the radio!

I put the note down and thought of a much more touching radio parting which I watched several years ago in the bedroom-turned-hamshack of a small house in Fortville, Indiana. I'd driven there, nearly to Indianapolis, from my place near Detroit. I was planning to buy a very special radio. It was the last of John Leary's souped-up Super Pros.

Now maybe it's an exaggeration to say John Leary, W9WHM, "built" the radio. But it would be fair to say that he redesigned, re-engineered and reconstructed the receiver.

Not once. Not twice. John Leary did it 36 times – each time with a little different twist.

His last effort — # 36 – sat on a table in that bedroom, and John gave it one last tune, cranking the volume full blast. The music swelled so loud the cat left the room and I was ready to follow.

Then John began to sob. He bowed his head, rubbed his eyes. I couldn't think of anything to say. After awhile, he had turned the radio off and was helping me load Leary # 36 into my car.

Three years later, on September 20, 1999, John Leary died of colon cancer. He was also suffering from Alzheimer's disease, according to his wife, Margery Leary

She recalled that day in 1996 when I bought his radio. "He was crying when we took that stuff out to your van," said Mrs. Leary. "It wasn't because of the radio. He knew something was wrong with him. He said that this was the last one – it was the 36th that he built."

John Leary SP-600 #36. ***Photo by the author.***

"I think he knew he was going to die," she said. "I didn't realize he was as sick as he was – I didn't know he had Alzheimer's."

John told me in a phone call that his memory was failing. Yet he seemed sharp enough discussing details of his SP-600 projects. But he knew he'd never rebuild another SP-600. Inside the radio, on the chassis, he'd written words that said emphatically that this was the end of the Leary receivers.

John Leary's receivers, I had learned, were sought after by broadcast DXers for their sensitivity and sound quality. Their calibration about 10 megahertz was iffy, because John didn't care about that range. He made great medium frequency DX receivers.

I'd met John Leary through an ad in the Ham Trader Yellow Sheets. I'd bought a Hammarlund SP-600 Super Pro receiver from somebody who swore it was the best-working radio on earth. That was way off. After nearly a complete overhaul, the receiver, which had been very sick on arrival, was ready to go, except that it was missing a couple of RF coils for the front end. I ran a want ad in the Yellow Sheets listing the two Hammarlund parts numbers. I got one response. It was a scrawled letter from this guy in Fortville, who said he had the parts and they were $4 each. By the way, he wrote, he would sell me the last of a series of SP-600s which he had rebuilt. $389. And he would throw in a slew of Hammarlund parts.

Now it happens that my brother-in-law lives near Fortville, so on a visit with his family, we drove over to the Leary house. What I saw convinced me not to buy it. It was an SP-600, and yet it was not. The power supply had been removed and in place of the transformer, chokes, capacitors and rectifier he had installed a product detector and crystal calibrator. He'd built a power supply on a separate chassis with a potentiometer for varying the bias and thereby the receiver's IF gain. He'd made a new panel, minus the square hole where the auxiliary crystals were mounted on the original set.

The most striking thing about the receiver was the color scheme. He'd painted the handles and panel screws bright red. He'd also painted white cross-hairs on the knobs. Inside, IF transformer cans were hot pink.

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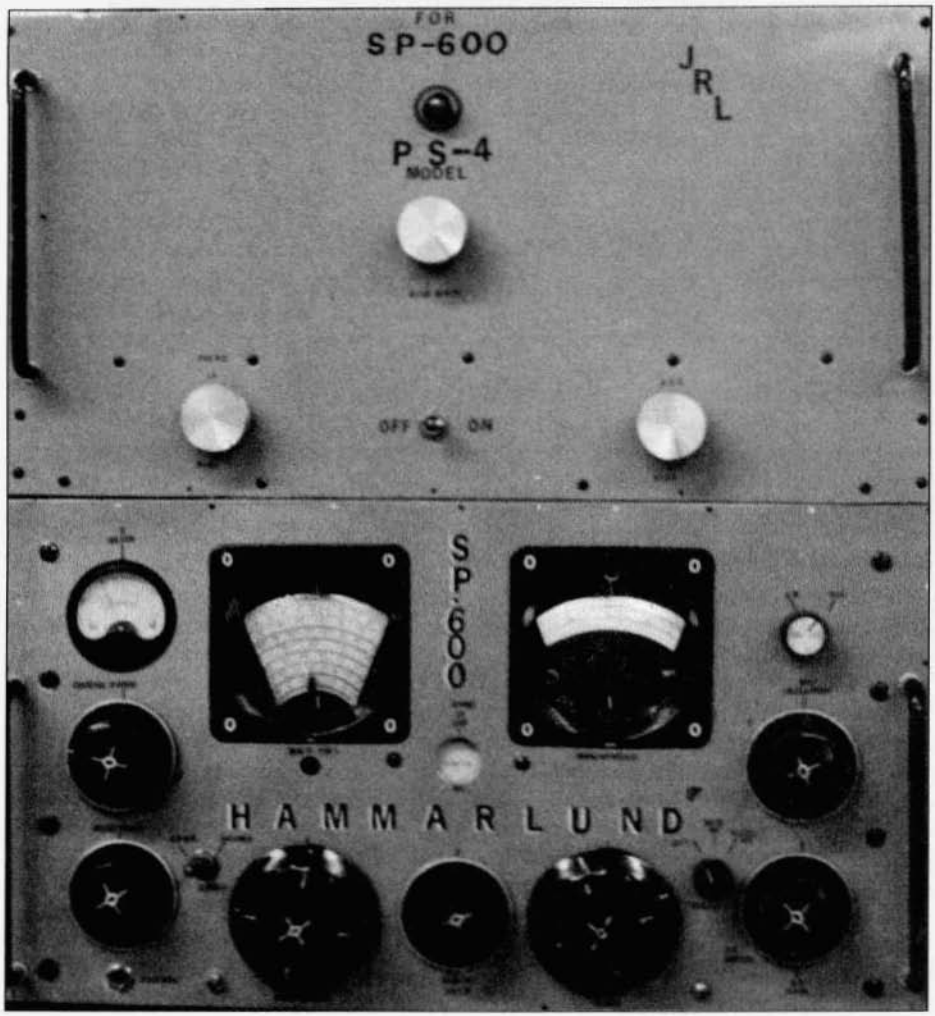

Another photo of the John Leary SP-600 #36. This one shows the outboard power supply.

John Leary was not an electrical engineer. He did not go to college.

At 15, said his wife, "he pumped gas and changed oil and was a mechanic."

He was a GI in Gen. George Patton's Third Army in World War II. He fought in the Battle of the Bulge and suffered terribly from the cold that winter of 1944-45.

"John was in on the liberation of the concentration camps at the end of the war," said vintage radio collector Les Locklear, who owned two of Leary's receivers. "He stated that it affected him for the rest of his life. The haunting thoughts were with him daily."

Back home in Fortville, he was a car salesman for 51 years. His real love was ham radio. He loved rebuilding SP-600s.

"This was a labor of love for him," said vintage radio collector Les Locklear. "He sure as hell wasn't making any money off of these receivers."

"What struck me," said Locklear,

"Was the pains he went through to rebuild the SP-600 receivers. Taking them down to a bare chassis, replacing many of the tube sockets, new capacitors, resistors and replacing much of the wiring."

John had discovered the SP-600 and realized its good side—the Super Pro can traverse long sections of radio spectrum without changing bands. But it was not great on single-sideband and even more frustrating, there was no built-in calibrator to help you know precisely where in the spectrum you were.

John Leary fixed that. He installed a product detector and a calibrator. Some have questioned his replacement of the original audio output stage with the circuit Collins used in the 75A-4. I can attest, though, that the audio from his radio was superb, even at the very highest volume levels, which John preferred.

He painted his radios the most garish pinks and purples and reds—so much so that radio collector Les Locklear remarked that he sold Leary # 32 after he got tired of looking at the colors.

But it was Les who persuaded me against my better judgment to buy the Leary receiver, after all. I had returned home with pretty negative thoughts about it. I was trying to think like a radio dealer. Neat as it seemed, I doubted it had any resale value. It had been too seriously modified. Most collectors shun modified radios. They don't want radios that are unique. They want radios that are "stock" or "factory mint" and which appear to be identical to all others in their model class. The Leary definitely failed that test.

But Les pointed out that technically the Leary radios were superb performers, despite their ugly colors.

"I have owned two of John's SP-600s, No. 31 and No. 32," said Locklear. "They were both hot receivers, and stability was far better than a stock SP-600. John did many innovative modifications to the JRL SP-600s he built. Dual voltage regulator tubes, and solid stating the power supply. B+ was never above what it should have been due to the attention he paid to details. He also built some with separate power supplies."

John was quite proud of the manual he supplied with the receiver. For him, it probably worked fine. For me, it was a hodgepodge of pages from the original Hammarlund book interspersed with clippings from *QST* articles, on which he'd scrawled comments which undoubtedly made perfect sense to him.

It was not electronics that eventually prompted Locklear to sell his Leary receivers. He got tired of looking at the colors. "IF cans painted magenta, pink, blue or whatever suited his fancy," said Locklear. "Kind of circus-like."

Unique, in other words. I have a weakness for nonconformity. Why else would I keep as my own a handmade, ersatz Collins 75A-4 or another 75A-4 with seven (not the factory-equipped three) selectivity positions? Eventually, I would find a collector with a mind of his own in John Sanders, who now owns Leary # 36.

Sanders explained why he bought the radio: "The uniqueness of it first of all. I'm an old sports car racer, and when you have a car you tend to want to modify it to get performance instead of what comes from the factory, where there are a lot of compromises when it's manufactured. I figured this would be a receiver with the right kind of modifications, and it is a pretty neat receiver."

So I made that second trip to Fortville. By the time we loaded the radio into the car, I thought John had gotten over his anguish at saying good-bye to his receiver.

I started my car, then thought of a question about the radio. I went back and knocked at the door. There was no answer. **ER**

The Howard 435A and Friends

by Jim Hanlon, W8KGI
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This is a story about two hams, Jim and Mac, and a radio named Howard.

Jim's Story

In the fall of 1953 I was a sophomore at Saint Xavier High in downtown Cincinnati and the "Old Man" of the Radio Club. I'd had my general class license for a year, and I was blessed with a good home station, an HRO-50 and a sprawling, home brew 150 watt transmitter that ended in a pair of 809s modulated by a pair of 807s that my brother Bob, W4RXK, and I had built and shared together. Bob had graduated from X the spring before and now he was away at Ohio State studying engineering. He had left me pretty much in charge of the club station at St. X, a BC-696 VFO,

Howard, Mac, and Jim. Howard is the handsome fellow sitting between the AT-1 and the bug. Mac is on the other side of the AT-1. If you look very carefully, you will also see Jim in the picture on the wall just behind Howard—also published in ER, page 5, October 1994.

Millen 90800, push-pull 812 RF lineup, a Masco hi-fi audio amplifier driving a pair of 211s for modulation, two power supplies full of heavy iron, 866s and 816s, an HQ-129X receiver, a National MB-150 antenna tuner matching to a 134 foot center fed Zepp, and a Dumont 5-inch scope borrowed from the Physics Lab next door for a modulation monitor. The transmitter was all in open wooden shelving and the 816s and 866s were real crowd pleasers.

The freshman class that year brought several promising neophytes to the club, among them John Duncan MacAulay III. Mac was a bright, freckle-faced, near sighted kid with not much extra spending money but with limitless imagination and ambition to make up for it. He quickly learned the code with the aid of our trusty TG-34, and he picked up the Novice Class theory thanks to my excellent tutelage of course. He soon passed the FCC exam to become WN8SBW. The next thing we had to do was to get Mac some gear of his own.

A year or so earlier I had helped a fellow Boy Scout in my neighborhood rejuvenate a Howard 435A. As he brought it to me it was completely deaf —due as I found to all of its antenna-input link coils having been vaporized. Maybe it had taken a lightning surge or perhaps someone had plugged the antenna into the 110-volt line. At any rate, after I rewound the coils it played just fine. (I think this may have been my very first, fatal instance of boatanchor repair.) My scout friend had lost interest, so I managed to convince him to part with the Howard—perhaps five bucks of grass cutting money changed hands—and Mac had a receiver.

Mac's story

Along with the revitalized Howard 435A, Jim and his brother lashed up a homebrew 15 watt 80 meter rig to help me get started. A wire strung between our apartment building and a neighboring one at the first floor level put WN8SBW on the air. Like many a novice's first QSO, mine was with my Elmer, Jim. The QSL cards show the 15 watts got across the 10 miles between my Cincinnati shack and Jim's in Kentucky on that fateful day. The Howard let me hear lots of hams but the low power and marginal antenna did not result in any unscheduled QSOs. I did get lots of practice sending "CQ" and calling other stations.

My mom always encouraged me to try things. Remember that song "How Much Is That Doggie In the Window?" I used the $5 mom gave me to buy groceries to instead buy a female puppy and a basket to go with her from a storefront window. Mom kept me and the puppy. She was very tolerant of my new-found ham radio obsession including letting me put the station in the living room where I had best access to the meager antenna. With Jim's input, she dug down deep for the $29.95 to buy me a Heathkit AT-1 for my birthday. About the same time, September 1954, she also moved us to northern Kentucky where I could put up a real antenna—67 ft. center-fed Zepp with home brew ladder line. I suspect there were other reasons for the move than my need for a better QTH for antennas. The Howard and the AT-1, working through the Zepp, really put WN8SBW/4 on the air. That first "real" QSO was with WN8PWP, Tony - another 14 year old. He is still a ham but not active; he still has a Viking II he built as a kit and an NC-300 waiting for him to return to them.

The FCC changed WN8SBW/4 into KN4AWW in November 1954—those were the good old days when you could tell where a station was located by its call—and in March 1955 I got my general class and dropped the "N". Throughout that time and for several years thereafter, the Howard 435A was the cornerstone of K4AWW. BC-342s, a BC-348, and command set receivers

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The WN8SBW and W4VIV QSL's from Mac's first QSO, showing that Howard was on the job from the very first day.

came into the shack but the Howard was the old reliable. It wasn't until a National NC-173 showed up that the Howard got moved out of the main operating position.

Howard's Story

The third party in this story is a radio named Howard. The original Howard that started all of this was made in 1941 and was only two or three years younger than Mac and Jim. In the Howard fam-

ily, he was a "435A," a seven-tube superhet with a circuit similar to the Hallicrafters S-20 (not the "R" model). He had a 6SD7 RF stage, 6SA7 converter, 6SK7 IF, 6SQ7 detector and first audio, 6K6 audio output, 6J5 BFO, and 5Y3G rectifier, and of course a power transformer. His cabinet was a gray-painted steel shell that covered front, top, back and sides, perhaps the most rugged thing about him. To get his copper chassis out for any service, even to check a tube, one had to remove all of his knobs, twist his BFO pitch shaft which was directly coupled to a slug in his BFO coil all the way in to make it as short as possible, and then pull and jiggle and twist until his insides finally came out through the bottom. His parts were distinctly broadcast band, entertainment radio quality, slide switches rather than toggles, and mostly phenolic wafer tube sockets. His tuning capacitor was like the ones in the inexpensive Hallicrafters receivers of his day, a three gang BC band type unit with an additional bandspread rotor that drove a single plate into the stator stackup. He had a four band, slide rule, general coverage dial with a red pointer on the left that indicated the band in use and a bandspread disc off to the right that ran in its own little circle, calibrated from 0 to 100. He had an electromagnetic speaker mounted in the top of his cabinet whose magnetic field coil also served as the choke in his power supply.

Mac's original Howard receiver and Heath AT-1 transmitter are long gone. They, along with the other gear collected during high school and college, went to a high school radio club to begin life again. What prompted this story was Mac's recent acquisition of a Howard 435A from the world's greatest ham fleamarket—the Dayton Hamvention—and Jim's being given a Howard 436A by friend James Taylor from Los Alamos, NM. Both of them are part of Howard's "Progressive Series" of receivers, a unique family that could be returned to the factory for an upgrade. The original Progressive Series came out in 1940 and started with the 435, much like Mac's receiver except it didn't have an RF stage, that sold new for $29.95. For an additional $12.75 and a trip back to the factory, Howard would add a 6H6 noise limiter and "the famous HOWARD Inertia 'Fly-wheel' action tuning controls", making it into a 436, or you could buy a new 436 for $39.95. For yet another $17.05, you could get a second 6SK7 IF stage and a 6SD7 RF stage and you would have a 437, or you could buy a new 437 for $54.50. A crystal filter for the 437's new IF stage could be added for another $7.50. An S-meter could also be added to any receiver in the line for $15.75.

In February of 1941, Howard upgraded the Progressive Series by adding a 6SD7 RF stage to the 435 and 436 and designating them as A-models. Initially they held the same prices across the line. In November they announced price increases, $36.75 for the 435A, $42.75 for the 436A, and $61.95 for the 437A without crystal, $69.75 with crystal, and $85.50 with crystal and S-meter. Compared to the Hallicrafters SX-24 which had all of the features of the fully loaded 437A plus calibrated ham bandspread and sold for $69.50, to the S20R with a noise limiter and 2 IF's but no crystal that sold for $49.50, or to the AC-DC Echophone EC-3 which had similar features to the SX-24 and sold for $49.95, the 437A in any form was not a best buy even before the price increase. The AC-DC Echophone EC-2 at $29.95 had a 6H6 noise limiter and calibrated bandspread, and it probably gave the 435A and 436A some tough competition as well. Unfortunately World War Two came along only ten months after the A-line Howards were released and put a halt to almost all amateur receiver manufacturing. Howard never again

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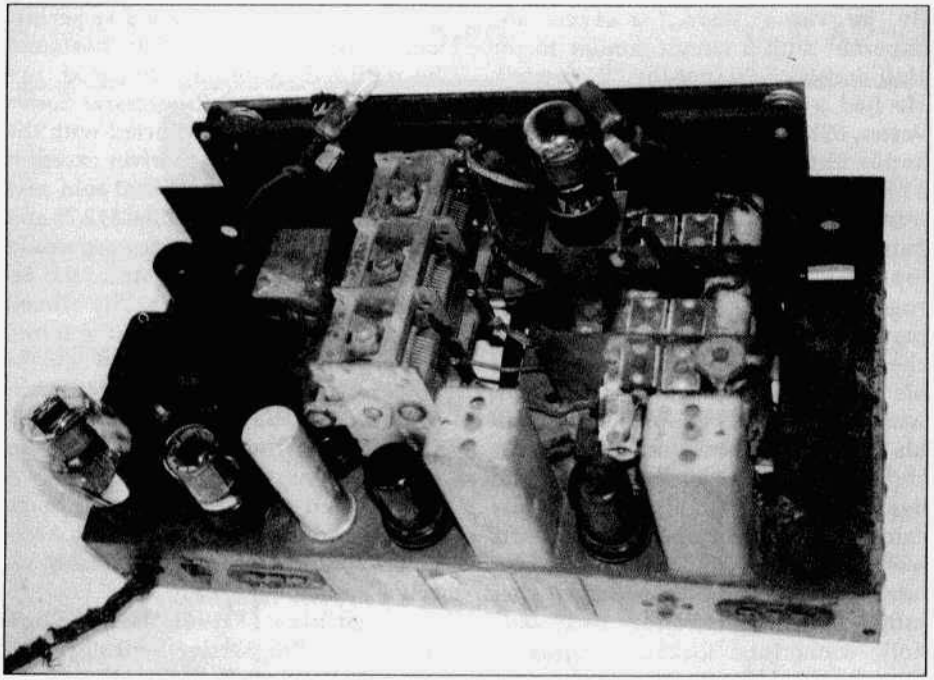
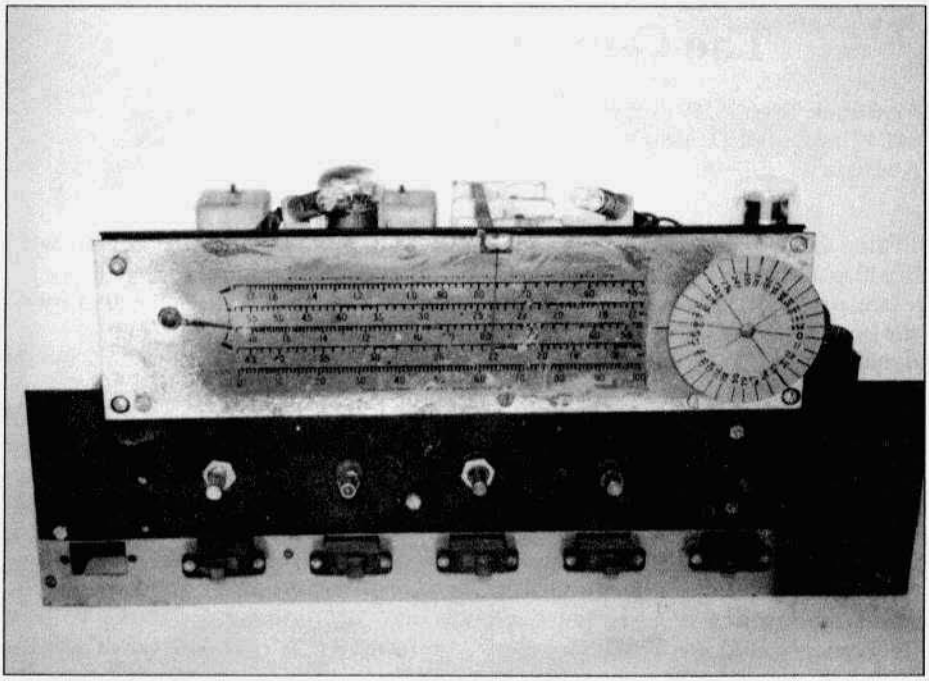


Looking down on the Howard 436A chassis. The open holes on the right end of the chassis are for the second 6SK7 and IF transformer of the 437A.

built any amateur receivers after the war.

Getting the 435A and 436A working was not difficult. Both receivers have their schematics glued to their bottom covers, so locating a manual was not necessary. You get real funny looks from the folks at Kinko's when you take a steel bottom plate in for an enlarged copy of the schematic. All of the tubes and parts in Jim's 436A were still functional. The receiver required only removal of one extraneous wasp's nest and some mouse debris, a new line cord and an alignment to make it go. Jim did increase the BFO coupling to the 6SQ7 diode detector, and he also added an IF gain control (one of the upgrades of the 437A), both to help the little radio deal with the loud 2000 era 40 meter CW signals at his QTH. Paul Wood, WØOD, has a 437A that he uses regularly on 75 AM, and he reports that the high signal problem is solved in that model. The calibration on Jim's radio is good enough to get you into the ballpark, but you have to fish around the dial a bit if you are looking for a station on an exact frequency. Howard provided only one, parallel padding capacitor on each short wave band for local oscillator alignment, so your best bet is to set it for best calibration at the frequency where you really care about it. Once in place, however, the Howard is amazingly stable for something of its vintage and breeding. Jim turned his 436A on and tuned in WWV on 10 megacycles, and half an hour later it was still sitting on the same frequency.

Mac's 435A was also in generally good shape. After the struggle to get the copper-coated chassis out of the cabinet, it appeared to be in virgin condition. It is S/N A4352033 so one wonders if it was the thirty-third built or the 2033rd. Pride in workmanship was evident from the personal mark, a combined "P' and "L",



There are extra holes in the front of the 436A chassis and sub-panel for the RF gain control, crystal phasing control and crystal filter switch of the 437A.

put on the underside of the chassis in grease pencil. The dial string was slipping because the rubber sleeve on the knob shaft had deteriorated; a few wraps with masking tape restored the grip. The old AC line cord had also deteriorated so a new line cord was installed. A few squirts of DeoxIT took a lot of noise out of the radio and an alignment brought it to usable condition. It exhibits the same good and bad sides as Jim's. The WWV experiment demonstrated good frequency stability. The same calibration and high signal level problems seen in Jim's were also in Mac's suggesting that these are family traits. Mac's 435A had a microphonic problem that was solved by reinstalling and tightening the speaker mounts and replacing the 6K6 audio amplifier.

From the photo you can see if you look carefully on the end of the chassis opposite the power transformer that the 435A and 436A have holes already punched for the additional tubes and IF transformer of the 437A. The chassis front view shows the extra holes for the additional controls and switch of the 437A. The RF stage is perched up front and above the main chassis, hanging behind the tuning dial on an L-bracket. It is electrically functional, but it sure looks like a pasted-in afterthought.

On the air, the receivers are about as good as an S20R or S40, although they are not quite as selective. A Heath QF-1 would probably make a very worthwhile improvement. Mac's 435A/AT1 pair recreate his original KN4AWW novice station, though Jim still bugs him about reinstalling his old, efficient doublet instead of the B&W dummy load he's using now (hi). Look for WQ8U and W8KGI on the next CX. You may get lucky and have your sigs copied by a genuine Howard receiver. **ER**

The Gonset Communicator

by Chuck Teeters, W4MEW
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Augusta, GA 30909

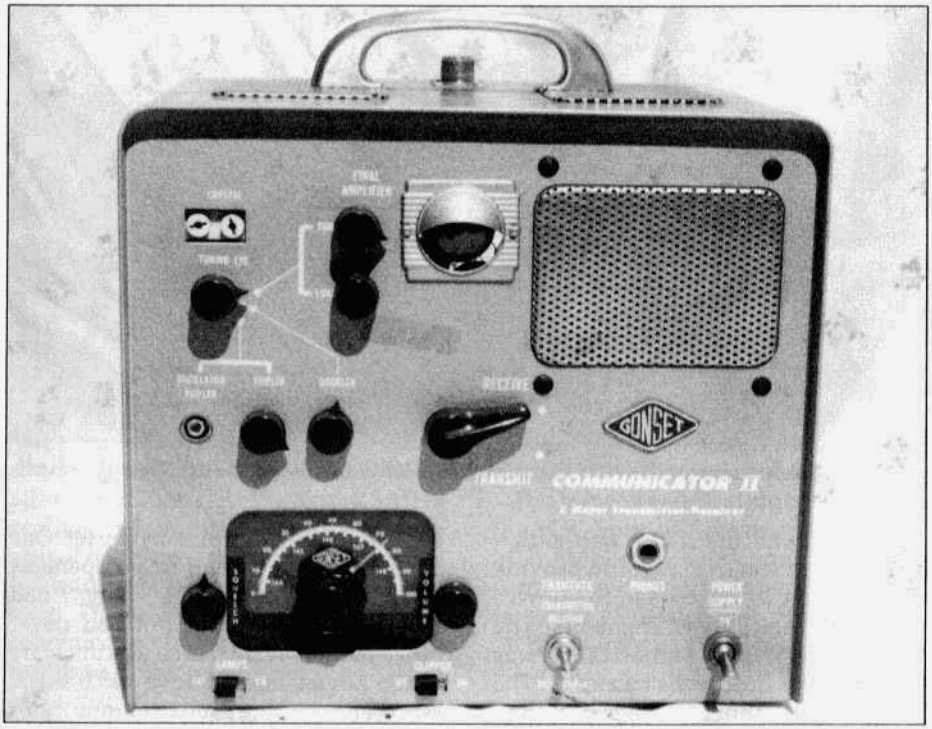
Faust Gonsett's ability to move rapidly into new markets led to many successful products, however his most prolific product was due to a combination of market prediction, and FCC actions. The introduction of the 2-meter Gonset Communicator in 1952 was almost coincidental with the FCC announcement of the new novice and technician class licenses. The only voice band open to the new novice operator was 2 meters. Following on the heels of the novice and technician licenses was the FCC action creating the Radio Amateur Civil Emergency System, RACES. It provided a semi-amateur type Civil Defense operation in case the hams bands were shut down due to the Korean war, similar to the 1941 WW II shut down and the War Emergency Radio Service, WERS. All the RACES local frequencies were in the 2-meter band. The timing of these events was perfect for the Gonset Communicator.

The FCC established the amateur 144-148 MHz 2-meter band in March 1946 to replace the pre-war 112-116 MHz band that was now aircraft navigation. By 1950 amateur operation on the band fell into two types, local and DX. The local operation was AM phone and mostly used WW II army surplus aircraft radios such as the SCR-522, ARC-3, 4 and 5. Output from the 832 final amps was around 5 watts and the 6AK5, 717 or 9003 receiver front ends with a 12-15 dB noise figure could hear the locals just fine. The 2-meter DXer used both AM and CW and went for more power with 100 watt 829B finals up to push pull VT-127s running a KW. Receiving equipment at the better DX stations was a crystal controlled converter with grounded grid 416s, 417s or 446s. At the least, a Wallman cascode with a triode 6AK5 and 6J6 was used.

The ham that wanted to go 2 meters with commercial equipment didn't have much choice in 1950. The Abbott TR-4 super regenerative receiver-modulated oscillator was still around, but was useless to work stabilized stations. National made a super regen receiver, the HFS, and so did McMurdo Silver, but they were past their time. Transmitting-wise only Millen offered a 2-meter 75 watt transmitter. In 1951 both Sonar and the Robert Dollar Co. came on the market with 2-meter receivers and 6 watt AM transmitters, but both were less power supplies and cables. They were primarily designed for mobile installation and required some work to put into operation.

In most cities and even some rural areas you could find lots of 2-meter local operation and some DX hopefuls. This was what Faust Gonsett saw as a potential market. If he could recreate the popular one unit ready to go 2-1/2 meter transceiver of 1940, with a performance equal to or better than the war surplus sets being used, he was certain there would be a market.

Gonsett has concentrated on the ham radio mobile market since his start in 1937 with 10-meter transmitters and converters. After the war he resumed building mobile equipment, first 10-11 meters and then expanded his line to include 75 and 20 meters. In 1947 he changed the name of his company from Waterproof Electric to Gonset. By 1950 he was producing a 2-meter mobile converter. It was unusual in that it elimi-



Front view of the Gonset Communicator II.

nated images by using them to cover the 2-meter band. With an IF output of 1000 kHz it tuned 144 to 146 MHz and 146 to 148 MHz at the same time. Not an ideal situation if there was much activity on the band. In 1951 he corrected his mistake by building a 2-meter tuner; with 1 RF amp, a converter, a three stage 6 MHz IF and a detector, everything but the audio and power supply. This was a good working unit and despite the almost $100 price tag, it sold well. He made it more attractive with a matching audio amplifier/power supply for $45. The brisk sales of these units confirmed his decision to go ahead with a complete one-package station.

Gonsett had 2/3s of his 2-meter Communicator and only needed a transmitter to complete the package. With his mobile transmitter experience he whipped up a 7-watt output xtal controlled 2-meter transmitter with a 6CL6 oscillator, 12AV7 multiplier, and 2E26 final. The receiver power supply-audio amplifier was modified to provide voltages and amplitude modulation for the transmitter. Also the power supply was redone to operate from either 110 volts AC or 6 volts DC using a vibrator. A clever Jones plug switching arrangement provided the power source change without any internal switching. The low noise 6BQ6 cascode TV receiver RF amplifier tube had just come out so he added it to the receiver. A 6E5 eye tube provided a cheap tune up meter for the transmitter and doubled as an S meter on receive. The whole package, transmitter, receiver and power supply was wrapped up in a cabinet a little over 8 by 10 by 10 inches, weighing 17 lbs. He had it on the market in the summer of 1952 for $209.50 complete with mic and 19 " whip in time for the novice license surge.

continued next page

Gonset Communicator II with the matching VFO on the left and 50-watt amplifier on the right.

The FCC and the ARRL had anticipated the novice license would provide an influx of CW trainees in the novice 40 and 80 meter band segments. The novice 2-meter voice authorization was looked at as a little extra incentive. The Gonset Communicator changed that. Lots of novices went on 2-meters with the Communicator and neglected their code speed. Since the novice license was 1 year nonrenewable and the technician licensee was not permitted on 2-meters, a secondary used market opened up for Gonset Communicators and many got into the hands of older hams. I was introduced to the Gonset Communicator in the summer of 1953 by a local ex-novice who wanted to recoup some of his investment. The price was too good to pass up so I became the third owner of the almost new Communicator. The little Gonset was opening up 2-meters to the old line hams as well as the new novice operators.

My friend Al Burson, W8WXV, had induced me into 2-meter operation in 1950. Al held the 2-meter DX record of 1100 miles at the time. By 1956 Al was leading the country with 28 states worked on 2-meters. Really a super good VHF man. He talked me into putting up a 64-element collinear, building a 200-watt xmtr and low noise converter. One aurora and a couple of tropo openings and I had the 2-meter DX bug. I had gotten up to 14 states but had never tuned above 144.5 MHz so was unaware of the novice boom above 145.0 MHz. When I bought the used Communicator in '53, I was exposed to the other 90% of the 2-meter band. I made a lot more local ham friends, got involved in RACES and Civil Defense, and had a ball with the little go-anywhere Communicator. Car, boat, airplane, hilltop, you name it, it would work, and was fun. (Two years ago I used my Communicator II for vintage field day. Carrying the 17 pound radio and 6-volt automobile battery I'm not sure why I called it fun.)

Gonsett followed up the Communicator with the Communicator II in February 1953. The II had squelch, dial lamp switch, improved ventilation, headphone/external speaker jack, and cost $19 more. The silent stand by squelch optimized the Communicator II for Civil Defense nets. This led to the yellow Communicator II that was Federal Civil Defense Agency approved for matching federal funds when purchased by local governments. The government was apparently looking out for our ears

as they required squelch to get CD approval. Gonsett added a matching VFO in 1954 and a linear amplifier in 1955. The 50-watt output linear was the first AM linear that I know of for the ham bands. It was interesting as he used 826s. This VHF radar tube was on the surplus market in large quantities for pennies and no one else ever used it in a commercial rig. He followed up with a 6-meter Communicator and linear, offered various aircraft and commercial frequency versions and made 12 VDC models to match the new cars in '56.

As many hams found out, the Communicator I and II were not clean transmitters and receivers. They used 8 MHz crystals and multiplied 18 times. Quite a bit of the 19th harmonic got out, and it fell into the commercial 152-156 MHz band. The receiver IF of 6 MHz and low side injection put the image frequency response of the receiver in the 132-136 MHz aircraft band. The interference problem was giving the Communicator a hard time. Gonsett responded with the Communicator III that cleaned up the problem. The III had several cosmetic changes on the front panel, the receiver dial, transmitter tuning knobs, meter in place of the eye tube, and crystal switching; but the real changes were inside. Broadband circuits were replaced by hi-Q tuned circuits and filters in the transmitter and a tuned receiver front end added some image rejection. Two more IF transformers tightened up the receiver selectivity. The I and II with three 6 MHz IFs was broad as a barn, over 200 kHz wide. The modulation was pepped up with a 6L6 replacing the 6V6. The Communicator IV and V followed along in a few years, and then the Gooney Bird. This was a nickname the Communicators had picked up over the years and the factory cashed in on it.

When other manufactures saw the sales of the Communicator, they followed suit. Sonar had corrected their mistake and packaged their 2-meter rig in a single cabinet with a power supply and speaker. Hallicrafters and Heath jumped in with both high end and economy models. The low-end Heath, nicknamed the 'Lunch Box' because of its appearance, was a step backwards with a super regen receiver. If you had one in the neighborhood you were out of the weak signal reception business on 2-meters. They transmitted almost as far with the oscillating receiver as with the transmitter. Even the stoic National Radio Company built a 6 and 2-meter VFO that would work with the Communicator and other rigs.

But the end was in sight in 1961 when the FCC split the commercial 150-170 MHz FM channels and required replacement of old 2-way FM radios. Large numbers of used 2-way FM sets came on the market at very low prices. They were easy to convert to 2-meters and with the repeaters that were also available the swing to FM was started. The 2-meter DXer never went for the Communicator, they stayed on the low end of 2 and gradually switched to SSB. So most all of the Communicator users deserted the low power AM market. Several FM conversion articles were published for the Communicators but not much ever came of them. With the large number of very cheap FM sets on the surplus market it wasn't worth the time to convert the Communicator. The Gonset linear amplifiers continued to be used for many years however. The push pull 826 amplifier could run over 100 watts output on FM so was a useful item in a 2-meter station. Used Communicators these days are available at cut-rate prices, and make fine AM rigs for local use on 6 or 2-meters. The amplifiers are scarce and expensive these days.

An interesting comparison can be made between the communicator and the Radio Shack HTX-202. The price of the two was almost the same, the power

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PRODUCT REVIEW

KG7BZ's Military Boatanchors Manuals CD Volume 1

Reviewed by Michael Crestohl, W1RC
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Many of us who are interested in older equipment know that often the documentation is harder to find than the radio itself. Fortunately modern technology has helped solve this problem - in the 1960s with photocopiers and now in the 1990s with computer imaging and scanning devices. It is now possible to run a page of text through a page scanner program using a program called Optical Character Recognition (OCR) which can then be easily saved to a computer file for future retrieval. Adobe Systems has produced ACROBAT - an interesting format for archiving manuals called .pdf which is short for portable document format. Pdf has become the de facto format because it looks exactly the same on any computer platform, be it IBM/Windows, Mac, Unix, Linux and so on. The Acrobat file reader program is free of cost and may be downloaded from www.adobe.com. Scansoft, which is a division of Xerox, in turn has created the .xif format as competition to Adobe ACROBAT.

In addition, the past couple of years have seen CD writers and the blanks dropping in price to a point where anyone who can afford a reasonably new computer can easily access this technology. Ink-jet and LED page printers have also become very affordable so now it is a snap to produce high quality copies of anything scanned into .pdf or .xif at a reasonable cost.

Another nice benefit of technology is fast modems and Internet connections that allow these .pdf files to be downloaded from Web and FTP sites so the distribution is greatly facilitated.

Now having read all this we can proceed to the focal point of this article. The ELECTRIC RADIO Bookstore has been offering several CDs containing compilations of .pdf files of manuals and documentation for quite a while now, including an excellent compilation of DRAKE manuals by Bill Turini and another containing R-390/390A documentation from RADIO ERA ARCHIVES.

The latest addition is the Military Boatanchors Manuals, Volume 1 done by KG7BZ August Johnson, (kg7bz@whitemtns.com). August first got the idea to make the Military Boatanchors CD because he had a few manuals around and was looking for something to do with his scanner. He started by disassembling the manual so he could lay the pages flat on the scanner and scanned the pages at 600 dpi black and white line art, saving them as .tif files. The images are then imported into Adobe Acrobat for conversion to .pdf. As mentioned earlier the Acrobat program necessary to read these .pdf files is free for the taking but you won't have to do this because they are included on this disc. In fact several versions for different computing platforms are included.

Some of the documentation contained in this new CD includes the ART-13, BC-610, T-195, BC-375 transmitters, BC-779 Hammarlund "Super Pro", BC-312, 342 and 348 receivers, the famous SCR-274 "Command Sets" as well as the PRC-6, 8, 9 and 10 FM portables. Of course, no military radio manual archives of this period would be complete without the beloved R-37? family - the R-388, 389, 390, 391 and 392 which are well represented on August's CD.

The quality of the scans is superb! August has certainly done an outstanding job scanning in all these manuals to .pdf! However I am wondering why he did not include the TM11-5820-357-10

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VINTAGE NETS

Arizona 40M AM Group: Meets on 7293 kHz at 10:00 AM MST (1700 UTC) on Sat. and Sun.
West Coast AM Net **meets Wednesdays 9PM Pacific on or about 3870kc. Summer conditions have moved the net control to California with John, W6MIT and Tom, K6AD as net controls. In the winter months Randy, KK7TV usually runs the net.**
California Early Bird Net: Saturday mornings at 8 AM PST on 3870.
California Vintage SSB Net: Sunday mornings at 8 AM PST on 3835
Southeast Swap Net: Tuesday nights at 7:30 ET on 3885. Net controls are Andy, WA4KCY and Sam, KF4TXQ. This same group also has a Sunday afternoon net on 3885 at 2 PM ET.
Eastern AM Swap Net: Thursday evenings on 3885 at 7:30 ET. This net is for the exchange of AM related equipment only.
Northwest AM Net: AM activity daily 3 PM - 5 PM on 3875. This same group meets on 6 meters (50.4) Sundays and Wednesdays at 8:00 PT and on 2 meters (144.4) Tuesdays and Thursdays at 8:00 PT. The formal AM net and swap session is on 3875, Sundays at 3 PM.
K6HQI Memorial Twenty Meter AM Net: This net on 14.286 has been in continuous operation for at least the last 20 years. It starts at 5:00 PM PT, 7 days a week and usually goes for about 2 hours.
Arizona AM Net: Sundays at 3 PM MT on 3855. On 6 meters (50.4) at 8 PM MT Saturdays.
Colorado Morning Net: An informal group of AM'ers get together on 3876 Monday, Wednesday Friday, Saturday and Sunday mornings at 7AM MT.
DX-60 Net: This net meets on 3880 at 0800 AM, ET, Sundays. Net control is Jim, N8LUV, with alternates. This net is all about entry-level AM rigs like the Heath DX-60.
Eastcoast Military Net: It isn't necessary to check in with military gear but that is what this net is all about. Net control is Ted, W3PWW. Saturday mornings at 0500 ET on 3885 + or - QRM.
Westcoast Military Radio Collectors Net: Meets Saturday evenings at 2130 (PT) on 3980 + or - QRM. Net control is Dennis, W7QHO.
Gray Hair Net: The oldest (or one of the oldest - 44+ years) 160-meter AM nets. It meets on Tuesday nights on 1945 at 8:00 PM EST & 8:30 EDT. http://www.crompton.com/grayhair
Vintage SSB Net: Net control is Andy, WB0SNF. The Net meets on 14.293 at 1900Z Sunday and is followed by the New Heathkit Net at about 2030Z on the same freq. Net control is Don, WB6LRG.
Collins Collectors Association Nets: Technical and swap session each Sunday, 14.263 MHz, 2000Z, is a long-established net run by call areas. Informal ragchew nets meet on Tuesday nights on 3805 at 2100 Eastern and on Thursday nights on 3875. West Coast 75M net that takes place on 3895 at 2000 Pacific Time.
Collins Swap and Shop Net: Meets every Tuesday at 8PM EST on 3955. Net control is Ed, WA3AMJ.
Drake Users Net: This group gets together on 3865 Tuesday nights at 8 PM ET. Net controls are Criss, KB8IZX; Don, W8NS; Rob, KE3EE and Huey, KD3UI.
Swan Users Net: This group meets on 14.250 Sunday afternoons at 4 PM CT. The net control is usually Dean, WA9AZK.
Nostalgia/Hi-Fi Net: Meets on Fridays at 7 PM PT on 1930. This net was started in 1978.
K1JCL 6-Meter AM Repeater: Located in Connecticut it operates on 50.4 in and 50.5 out.
JA AM Net: 14.190 at 0100 UTC, Saturdays and Sundays. Stan Tajima, JA1DNQ is net control.
Fort Wayne Area 6-Meter AM Net: Meets nightly at 7 PM ET on 50.58 MHz. This net has been meeting since the late '50's. Most members are using vintage or homebrew gear.
Southern Calif. Sunday Morning 6 Meter AM Net: 10 AM Sundays on 50.4. NC is Will, AA6DD.
Old Buzzards Net: Meets daily at 10 AM Local time on 3945. This is an informal net in the New England area . Net hosts are George, W1GAC and Paul, W1ECO.
Canadian Boatanchor Net: Meets Saturday afternoons, 3:00 PM EST on 3745.
Midwest Classic Radio Net: Sat. mornings on 3885 at 8AM Central time. Only AM checkins allowed. Swap/sale, hamfest info and technical help are frequent topics. NC is Rob, WA9ZTY.
Boatanchors CW Group: Meets nightly at 0200Z on 3579.5 Mhz (7050 alternate). Listen for stations calling "CQ BA" or signing "BA" after their callsigns.
Wireless Set No. 19 Net: Meets the first Sunday of every month on 7.175 +/- 5 kHz at 2000Z (3760 +/- 5 kHz alternate). Net control is Dave, VA3ORP.
Hallicrafters Collectors Assoc. Net: Sundays, 1730-1845 UTC on 14.293. Net control varies. Midwest net on Sat. on 7280 at 1700 UTC. Net control Jim, WB8DML. Pacific Northwest net on Sundays at 22.00 UTC on 7220. Net control is Dennis, VE7DH.

Nets that are underlined are new or have changed times or frequency since the last issue.

Fun With a DX-60

Bill Breshears WC3K
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Bowie, MD 20720

AM Operation Fun With A DX-60

"WOW, Strong signal and great modulation!" I never expected to hear that when I started to reclaim a dusty old Heathkit Cheyenne MT-1 from the junk box to use as an exciter for a homebrew AM rig. I discovered or perhaps rediscovered what an inexpensive but effective approach controlled carrier screen modulation can be.

I like many others had been biased by what I had read and heard; "Controlled carrier is just an afterthought to add phone to a novice CW transmitter." "It will only modulate to 60%." "Screen modulation has lots of inherent distortion." "It's only good for communications." As a result, my pursuit of the AM hobby has always been directed towards high level plate modulation. Furthermore, my listening experience included hearing plenty of really awful modulation on Heathkit DX-60 signals.

The Heathkit series of controlled carrier AM transmitters includes: DX-35 ('56-'57), DX-40 ('58-'60), Cheyenne MT-1 ('59-'62), DX-60 ('62-'64), DX-60A ('65-'67), DX-60B ('68-'76). All have almost the same tube lineup but there are progressive circuit improvements. Of the two decades of production, the DX-60 series are the most plentiful and many are still available including the matching VFO, Heathkit HG-10 for less than $100. The remainder of this article will specifically address the DX-60 but is applicable to all models above. Mike McElhinny (WN3B) obtained an older DX-60 and I a DX-60B to try out the following modifications and operation techniques.

Power Supply Updates/Improvements

All the electrolytic capacitors had to be replaced in our units including the twist lock, which will leave a hole. Update the circuit and use the new values as shown by Figure 1. An attempt to use just 100uF in each of the HV caps left a residual 60 Hz, the additional 22uF is needed. A terminal strip was added at the twist lock capacitor location to support the 270 ohm resistor and other connections. See the photo for the new capacitor layout.

Designed To Overmodulate

Figure 2 shows the speech amplifier and modulator circuit with our component values. Note that the modulator is a cathode follower circuit that establishes a DC screen voltage with a superimposed audio signal that provides the modulation. (A good reference for variable efficiency modulation and cathode follower screen modulators is in the 15th edition of Editors and Engineers, Radio Handbook.) The DC voltage is less than the needed CW value and establishes the resting power output (power output with absence of audio) of the final (6146) at about 7 to 10 watts. The superimposed audio amplitude must vary screen voltage from the full output CW value down to about 15 volts negative to get 100% AM modulation. The early designs had only the resistor in series with the final screen or the parallel resistor to ground, not both. Such a configuration can never go negative, thus the source of the 60% modulation maximum story. Some bright engineer put both resistors in so that the series screen resistor would drop the resting DC screen voltage then bypassed the resistor with a capacitor such that the full audio signal would not be proportionately attenuated by the series

Two 'Cheyennes' and a DX-60

resistor and the resulting negative swing of the audio signal would fully modulate the final. An excessive amount of audio is available and unless carefully monitored will cause severe over modulation 'flat lining' on the negative peaks and severe clipping of the positive peaks as the final runs out of positive headroom capability. This produces the over modulation splatter and distortion that is associated with operation of the rig and erroneously associated with screen modulation. The situation is not helped by the design locating the screwdriver audio gain control inside, such that the cabinet must be removed to adjust it. The DX-60 book says "The MIKE gain need not be readjusted once it is set unless the microphone is replaced." The DX-40 book says "... an ideal position between the microphone and the operator should be chosen and maintained for proper modulation." A disarmingly cavalier approach to such an important point. Maintaining the right level for full modulation is very difficult unless monitored to prevent overmodulation. With a scope on the output of the transmitter, I could easily keep the voice within bounds and prevent over modulation. Modulation was full and effective.

Modulation Limiter And Monitor

A visit to Radio Shack with $3 resulted in the neat diode string shown attached between the lead to the final screen and ground. (Carefully observe polarities shown, and don't think too much, it is a brain twister). First the circuit will clamp the negative going modulating audio to a value that will prevent the final from completely turning off, thus no overmodulation. Secondly, and more important, the red LED will flash at that point to allow you to set that audio pot and later to monitor 100% of the time for excessive speech levels. Cheaper and easier than a scope. With the components shown, the indicator also defines a level of speech that will not flat-top on the positive peaks, thus no distortion. Of all the things to do to sound good this is the most important. Each flash of the LED says you have distortion. Don't flash, a good rule for this AM monitor and for us old men!

I installed my LED in a small 1/8 inch hole in the front panel, located half way between the "Function" and "Drive Level"controls. It is almost level with the "AM" switch position. WN3B removed the neon bulb from the "Pwr" lens and installed a wide angle LED in its place. The diodes are on a terminal strip added under the chassis just behind the drive pot and close to the connecting points.

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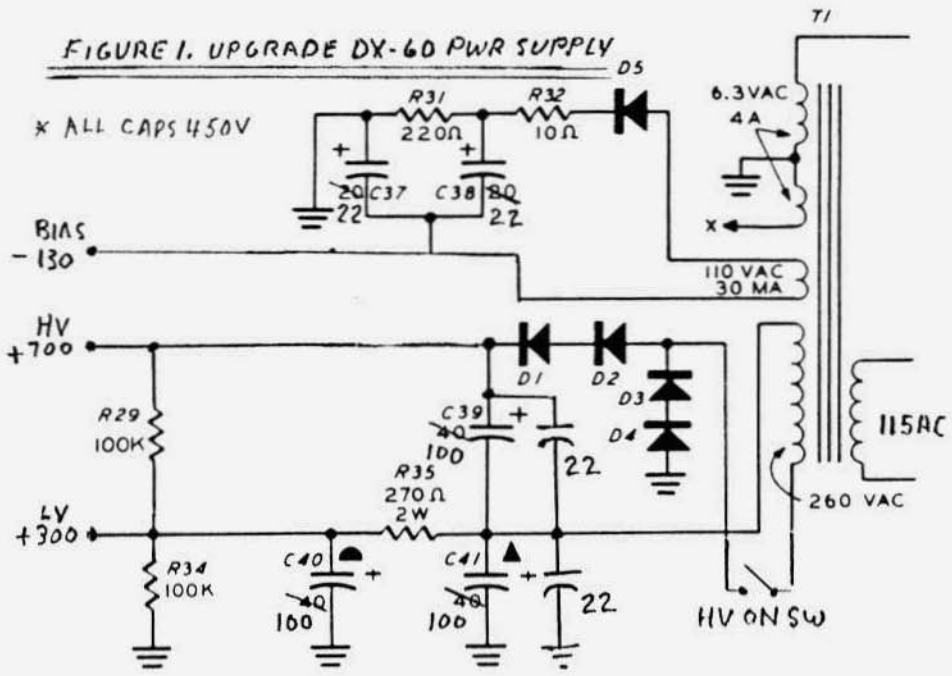
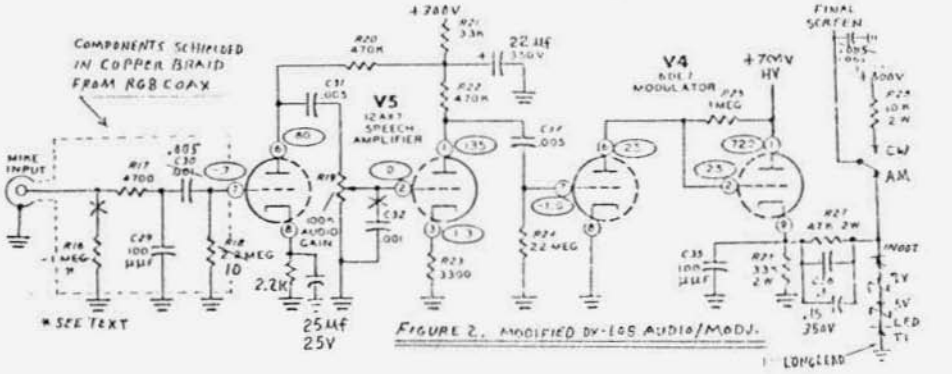


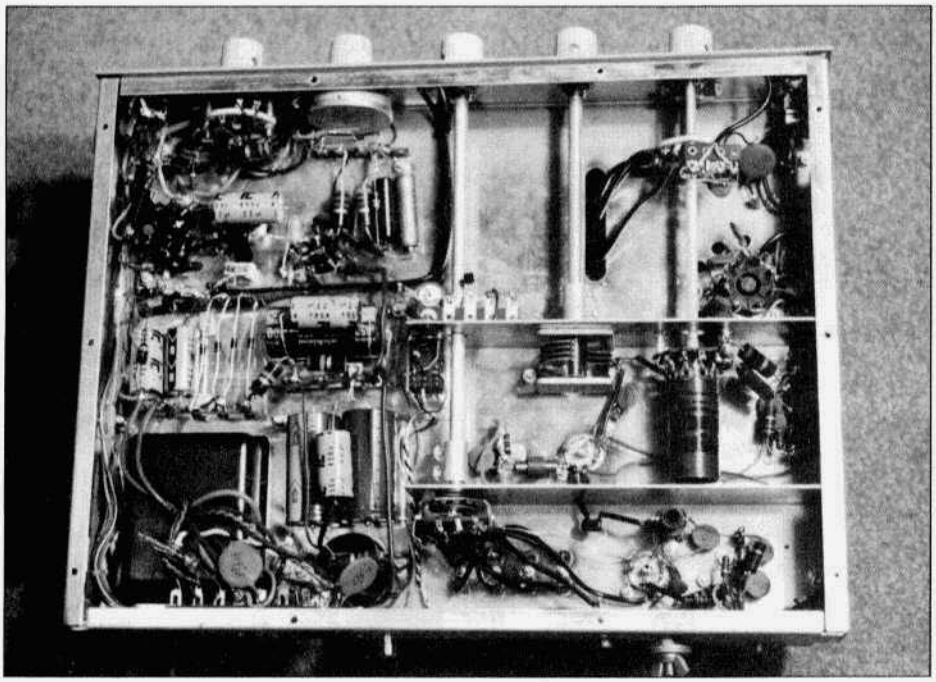


Selection Of Zeners

The negative clamp voltage is made up of the of the sum of the zener voltages and forward diode drops. The voltage needed is primarily a function of the final plate voltage and the condition of the tube. If you just want to get on with it, a 12 volt, 1 watt zener, (RS 276-563,) will work well in every case. If you want to just squeeze it off before the 100% modulation baseline, use a scope to monitor transmitter output and select zener voltages. My DX-60 with 605 volts plate required a 9.1V (RS 276-562), in series with a 5.1V (RS 276-565), about 14.2V total. My Cheyenne with 770 volts plate required 18.2V.

Wider Audio Response

Today's AM activity includes the joys of easy listening with wider audio response than the communications oriented circuits of the 60's. The goal with



DX-60B wiring and capacitor locations.

this project was to have good sounding audio with a D-104 microphone. Nothing new here that hasn't already been done to de-scratchy that Apache or fill out that Valiant. But note that the unmodified audio of the DX-60 is not all that bad. In fact our quest for lower audio response gave us a hum headache, more later. The modulator is without any transformer with their associated limitations. The approach was to put in all the usual audio changes , hook it up and solve any problems. The values I am currently using are shown in the schematic.

The initial sound of the D-104 microphone working into the 10 megohm input resistor was full bodied yet crisp. Wonderful. But now there was 60 Hz HUM modulating at a full 50% of carrier. I'll spare you the painful quest, and report that the single most effective countermeasure was to consolidate the first audio grid components into a shielding cocoon with a short connection to that grid. Other measures taken include: Filament and filament return rewire. DC filament supply. Single point audio ground. Bigger first audio cathode bypass capacitor. Still there was detectable hum. Most of these measures could have been avoided by lowering the first grid impedance. The easiest way is to put a 220K ohm resistor across the mike input jack, this gave acceptable hum but had some microphone response reduction. The best way is to put a small MPF-102 impedance conversion amplifier in the base of the D-104. (subject for another article.)

Negative Feedback

I experimented using negative feedback to improve the fidelity of the system since there is audio gain to spare. First using audio level from the modulator output, and finally with audio obtained from rectified RF output. The latter is superior. In both cases the feedback was injected at the cathode of the second audio amp. I could see improve-

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Product Review

Longwave Products 75A-4 Filters

by Ray Osterwald, NØDMS
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Dave Curry of Longwave Products has introduced aftermarket filters designed as plug-in accessories for the Collins 75A-4 receiver. These filters are a very welcome addition, as 75A-4 filters have been out of production over 35 years now, and original units are hard to find and very expensive.

I've had the opportunity to review three of the Longwave filters, and I'm going to give my conclusion at the start: These filters are better performers than the original Collins filters I have in my receiver. This shouldn't come as a surprise. Inside are new-production Collins Mechanical Filters in a high-quality, custom built case having the same dimensions as the original 75A-4 filters. They are built into brass tubes, and they fit perfectly into the 75A-4 filter spaces. The original filter clamps may be used just as originally designed.

Actually, these filters could be used for lots of homebrew projects. The impedance matching has already been done, and they are ready to use in high-impedance tube circuitry. Lack of good available filters is probably the second toughest problem in vintage homebrew work, the first being a good dial mechanism. Any manufacturer who takes the time to bring out a product as good as these filters deserves our support.

I sweep-tested the Longwave-Collins filters in my 75A-4 with a Tektronix 71.5 spectrum analyzer, which is equipped with the tracking generator option. The analyzer has been recently calibrated for deflection and sweep timing. In the A-4, pulling the oscillator tube disabled the VFO. The analyzer sweep output was injected at the grid of the 2nd mixer, V5. The filter response was taken from the plate circuit of V6, the 1st IF amplifier. This method isolates the analyzer from the filter impedance, and gives the actual filter response to be expected in a receiver. My AGC was off, and RF gain was fully on.

The results I tested for were bandwidth at the -6 dB and -60 dB points, passband ripple, and insertion loss. By convention, IF filters are tested at -6 and -60 dB. At -6 dB the voltage response of the filter has dropped by half of its peak value. Sometimes a filter is advertised as having a certain bandwidth, but no mention is made of at what level the bandwidth measurement is made. This can be quite convenient if you are trying to sell a filter with a rather wide bandwidth for a narrow application!

"Shape factor" is a specification given in filter data sheets. It is good for is comparing filter response without having the actual response curves. It's just a ratio that's found by dividing the -60 dB bandwidth by the -6 dB bandwidth. Without actually having a filter curve, one is able to say that a filter with a 1:2.15 shape factor should be sharper than one with a 1:3.00 factor.

"Ripple" is not a bottle of wine. The ripple specification gives us an idea of how flat the passband region is in terms of dB of voltage variation. If you have ever tried to use a receiver calibrator and noticed more than one place where the signal peaks up, that effect is due to passband ripple. I've had operators tell me that their mechanical filters have drifted. Actually, what has probably drifted is the value of the filter termination capacitors. For the center frequency of a vintage mechanical filter to change, the number of resonators or their mass would have to change. Similarly, for the bandwidth to change the number of coupling wires would need to change.

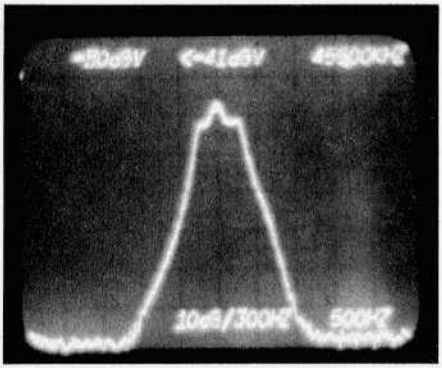

Figure 1

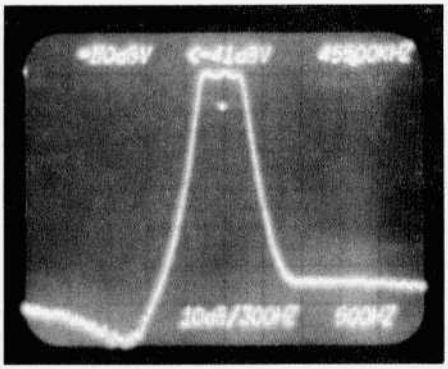

Figure 2

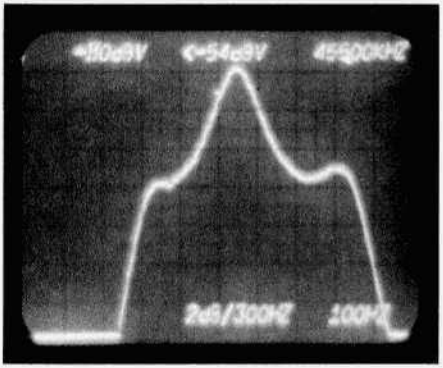

Figure 3

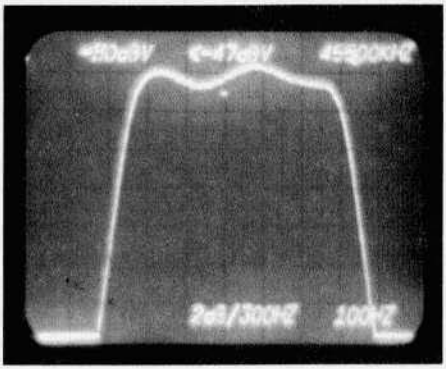

Figure 4

The nickel alloys that were used to build these old filters are extremely stable. So, the filter terminations affect mainly passband ripple, or in some cases spurious response. Peaking up the receiver calibrator against the filter passband might make it seem as though the center frequency had changed, when actually only the ripple in the passband has changed. A voice filter with excessive ripple will not evenly pass the entire speech bandwidth. This can sound like distortion, and is tiring to listen to.

The insertion loss term is pretty obvious. It tells the amount of attenuation, if any, that the filter presents to the signal.

Response Testing

The 500 cycle CW filter curves are shown in figures 2 through 4. It is the only one I was able to directly compare with an original filter. My SSB filter is 2.1 kc, and I don't have a 6-kc AM filter. For AM I use an 8-kc filter that was salvaged from a junked R-390a IF deck found at a hamfest. I built an adapter into a 9-pin "Socket Saver" purchased from Antique Electronic Supply. This got me a wide filter for almost no cost, but it is too wide for AM when the band is crowded.

500 Cycle CW Filters

Figures 1 and 2 were made with the analyzer set at 10 dB per vertical division to show the entire filter response. Figure 1 is the original 500 cycle A-4 filter, and figure 2 is the Longwave (LW) filter. Notice the peaked response of the Collins filter, and the nice flat response of the LW filter. The LW filter curve is slightly asymmetrical, but the aberration is so far down on the response

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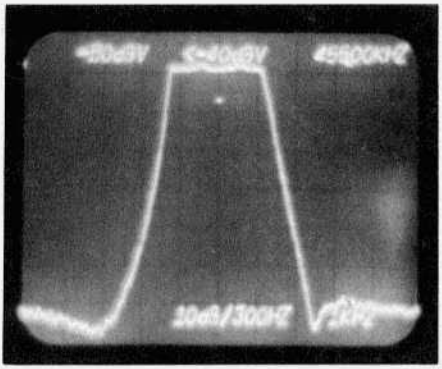

Figure 5

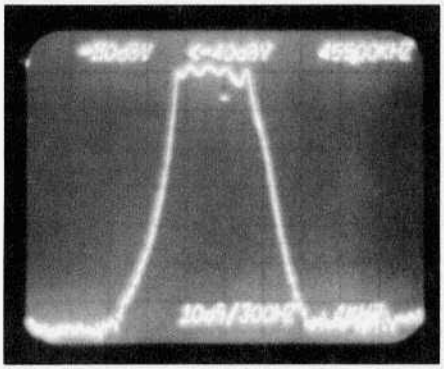

Figure 7

curve that you'll never notice it. Figures 4 and 5 were taken at 2 dB per vertical division so that only the passband detail shows. Figure 4 is the LW filter, and Figure 5 is the A-4 filter.

If the screen graticule divisions reproduce well in the magazine, the exact bandwidth (BW) and overall response of these filters is obvious-just count off divisions. The original A-4 filter has a real "peaky" response overall. I've always wondered if this really is a 300-cycle filter that got mislabeled, because the part of the curve that is 300 cycles wide is almost 6 dB down.

The comparison between the two filters is shown in Figure 8.

The Longwave CW filter is obviously superior to my original filter in every category, especially in shape factor.

The first IF amplifier in the 75A-4 is

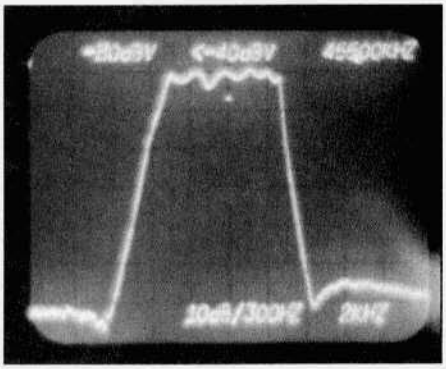

Figure 6

designed to compensate for loss in the mechanical filters. The LW Products filters have negligible loss, so overall IF gain will be higher. This will not mess up the gain distribution in your receiver because the AGC has enough reserve dynamic range to compensate. The S-meter might read a little higher, but that's all you're going to notice. The S-meter can be readjusted if needed per the alignment procedure.

The passband ripple is less than 1 dB. When I calibrated my dial, the calibrator peaked up nicely, no ambiguity due to excessive ripple.

2.5 kc SSB Filter

Figure 5 is the Longwave SSB filter. I don't have a 2500 cycle filter for direct comparison, but the LW filter at 2500 cps is considerably sharper than my original filter at 2100 cps! The numbers for the LW filter are shown in Figure 9.

Again, as with the CW filter the shape factor is much lower, resulting in a filter with steeper skirts and improved interference rejection.

6 Kc AM Filter

As previously mentioned, I don't have the original AM filter for direct comparison. Figure 6 is a response curve of the Longwave 6 Kc filter, and figure 7 is a sweep of the R-390a 8 Kc filter which I've included for comparison. See Figure 10.

The passband ripple is slightly higher in this filter, but I couldn't notice it by

listening. It would take 6 dB ripple to change the voltage response by a factor of 2. In wider multipole filters, whether crystal or mechanical, some passband ripple is the trade-off for narrow skirts.

I would advise readers to take advantage of these new filters while they are available. See page 47 for ordering information. **ER**

	-6 dB BW	-60 dB BW	shape factor	passband ripple	insertion loss
75A-4	600 cps	2400 cps	5.33	6 dB	12 dB
LW	500 cps	1800 cps	3.00	.6 dB	0

Figure 8

	-6 dB BW	-60 dB BW	shape factor	passband ripple	insertion loss
75A-4	2100	2000 cps	4300 cps 2.15	2.5 dB	12 dB
LW	2500	2600 cps	4600 cps 1.77	1 dB	0

Figure 9

	-6 dB BW	-60 dB BW	shape factor	passband ripple	insertion loss
LW 6000	6000 cps	10000 cps	1.66	4.4 dB	0

Figure 10

W3HM's Assessment of the Longwave 75A-4 Filters

Over the past few years many people have asked me if I knew of a source for mechanical filters for the 75A-4 receiver. Other than getting an original filter, the usual recourse was to adapt an R-390A filter. This worked but the bandwidth choices were limited and the adaptation was unsightly. For a time period Vectronics offered a ceramic filter that worked quite well. But alas, they soon stopped production and went out of business. Lately, original filters have been appearing on the e-bay auction site. The prices received are high and many people reported filter failure. After all, these filters are almost 50 years old!

In an effort to solve the 'filter problem', Davis Curry of Longwave Products fame (www.longwave.net) has begun production of a new line of mechanical filters for the 75A-4 receiver. David has done extensive homework on this project. Two months ago he sent me a prototype filter for evaluation. I put it through its paces. The filter (6 kHz AM) performed as well as and in most cases better than my collection of six 50-year old originals. The innards of the Curry filter consist of a brand new Collins-Rockwell mechanical filter and a small impedance matching network. The filter is housed in a machined brass tube with a nine pin plug on the bottom and a brass cap on the top. The dimensions of the filter are the same as the original. In an effort to keep costs down, the brass tube has not been silver plated; it remains the color of brushed brass. I recently received three production models from David, a 6 kHz AM filter, a 2.5 kHz SSB filter, and a 500 Hz CW filter. I tested each filter in several A-4s; I compared them with my original filters. In every case, the Curry filters outperformed the original ones (for SSB I have original 3.1 kHz and 2.7 kHz filters). After comparing the Curry filters with the originals, I installed all three in the receivers. When I switched from one filter to the other, there was no

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Compiled by Don Buska, N9OO

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Miscellaneous - Technical

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District #7: K7AK-128/5;K7AMI-123/39;N7APL-122/6; N7WEK-123/17;W7JKY-125/17;W7QHO-127/13;W7QHO/6-123/6; W7VQH-122/8.

District #8: K8DBN-124/16;K8DBN-132/17;K8GJW-122/17; K8JVK-132/16;K8OWT-132/16;KG8SX-132/16;KI8BQ-132/16; KW8G-132/16;N8CT-122/17;N8CT-132/17;N8ECR-132/16; N8JRJ-123/11;W8DFV-127/3;W8KYD-132/17;W8MPC-128/16; W8MWQ-123/11;W8QYT-124/16;W8QYX-124/16;W8TOW-132/16.

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District #0: K0BS-131/33;K0BS-131/34;K0DAS-131/34; KØXI-131/16;KAØTOF-132/27;KFØOW-123/39;NØWZH-123/34; NØWZH-123/35;WØBQV-129/26;WØLTL-131/34;WØLTL-131/35; WØNKL-122/15;WØNYQ-129/26;WØRT-123/16;WAØDFW-132/27.

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More on the Military NC-183D From ER #131

In the March issue of ER (#131) we printed a photo of a military-looking rackmount National NC-183D. I asked that any additional information that anyone might have be sent to the owner of the receiver, Hal Potter, KF6FHL. He forwarded to me some of the letters he received.

From Clare Owens, N2RJB: It was nice to see in the latest ER that there was another generation of the National diversity receiver. Ralph Parker, VE7XF, and I have NC-183NR receivers and they are NC-183s with the same set of special diversity functions that your NC-183D has. Beside the obvious single vs double conversion difference some of the knobs are in different positions on ours compared to yours. It's also interesting that ours are engraved with the NC-183NR model ID in the upper right corner but yours just has the NC-183D there and probably had further ID on the tag on the left corner.

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An NC-183MR/R651/URR-39 owned by George Rancourt, K1ANX.

The MM-1, a 1-Tube Receiver

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

With the advent of the millennium, I decided to celebrate by building a 1-tube receiver. The design was influenced by my fond memories of the simple regenerative sets I had read about in the old Short Wave Craft magazines of the mid 1930's. So here it is, 65 years later, my reentry into the world of the 1-tube set.

Why the 6F7?

I had to choose whether to build an AC operated set or one employing A and B batteries. But this would depend on the tube I chose to use. I searched the tube manuals and catalogs. There were many possibilities. To name just a few, I considered the 6U8, the first 9-pin miniature offering triode and a pentode in one small package. I also considered the 6F8, an octal-based twin-triode, since I had one. I noticed that the Handbook listed a few triple triodes. This was tempting but they were 12-pin tubes and that just didn't sit well with me—too modern! The Raytheon RK-43 seemed very promising. It has two triodes similar to the type 30 but requiring only 1.5 volts on the filaments. However, this tube is scarce and might be hard to find. I also looked at the 6SN7 but it lacked sex-appeal—there are just too many of them available. After a long search, I decided that the only tube for my set was the 6F7. This tube combines a pentode and a triode in one 7-pin glass envelope. The 6F7 dates back to 1933, an era when one and two-tube regenerative receivers were found in almost every ham shack. Oh yes, if you're wondering what MM-1 stands for, here's the answer. The letters MM represent the Roman numeral two-thousand, thus MM-1 identifies my first receiver for the new millennium.

A Fun Project

Now I could start drawing a schematic. But many new questions began to pop up. Should this set cover just the broadcast band or employ plug-in coils for various shortwave bands? And if it tunes the shortwave bands, it will need bandspread tuning. Should I use the tapped coil method of bandspread? And how should regeneration be obtained? By means of a tickler coil or the well-known cathode tap? Then, how should regeneration be controlled? By varying the screen voltage or with a variable condenser in the plate circuit? Finally, since the triode and the pentode in the 6F7 have a common cathode connection, how best should I bias the triode?

Many other questions popped up so it took time to arrive at the final design. This was a fun project—looking for parts, sending off orders, making sketches, designing and winding coils. The end result is a set that works really well. I believe it is better than the two-tube set I built in 1935 (57 Det, 56 AF) because it has better shielding, less hum and is more rugged mechanically.

Basic Circuit

The circuit diagram of the MM-1 is shown in Fig. 1. The pentode section of the tube is used as a grid-leak detector and regeneration is provided by a tickler coil, L2, in the plate circuit. Bandspread is provided by tapping C2 down on the coil. Screen voltage is fixed at the optimum value of 30 volts by means of R2 and R3. For best results, a pentode detector should work into a high impedance load. Here, L3-R4 pro-

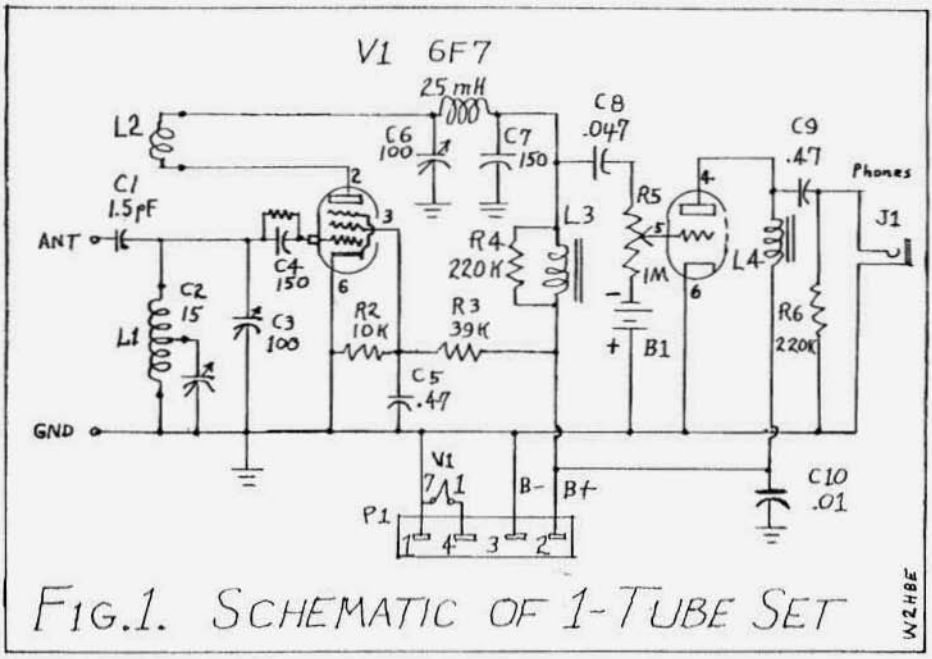

FIG. 1. SCHEMATIC OF 1-TUBE SET

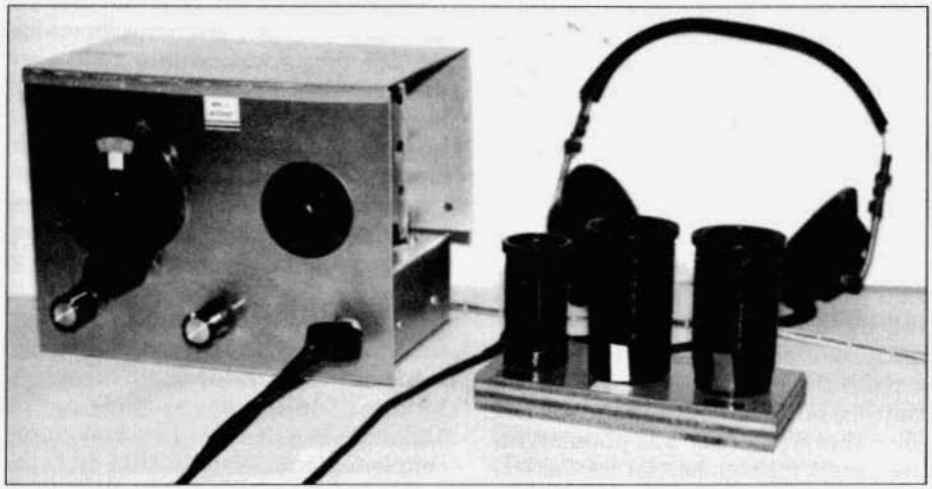

Figure 2. The 1-tube radio. Coils are at the right.

vide the required high impedance while avoiding excessive DC voltage drop that would occur if only a resistor was used.

Audio amplification is provided by the triode section of V1. Bias is provided by two AAA penlight cells. Volume is controlled by a 1 Meg pot. I don't like getting an electric shock when I touch my headphones so I avoid putting B+ on them. Here, I use shunt feed where L4 carries the DC plate current. Choke L4 is simply the primary winding of a small Radio Shack filament transformer. Resistor R6 insures that C9 is charged through R6 rather than through my fingers.

continued next page

Figure 3. Rear view of the MM-1. The 6F7 is also shown.

Panel Layout

A front view of the set is shown in Fig. 2. Bandspread tuning is controlled by the National BM dial at the left side. A two inch dial plate with markings from 0 to 100 is held to the panel by the mounting nut of the bandset condenser C3. A small pointer knob on the shaft of this condenser makes it possible to log settings for various frequencies or bands. Along the bottom of the panel from left to right are the volume control, the regeneration control and the headphone jack. At first, I was tempted to paint the panel black and label the controls; however, back in the thirties when this type of set was popular, no one, except the commercial set makers, labeled controls. You built your own set and you knew perfectly well what each knob controlled. Back then, each ham in town had his own homemade receiver and transmitter with unmarked controls and it lent a certain wonderful and mysterious excitement when visiting his station.

Parts Layout

Looking at the back of the set (see Fig. 3) the detector plate coupling choke, L3, is seen in its bright silver colored metal housing. In the left foreground is the 6F7 tube enclosed in a ventilated tube shield. Near the center is the plug-in coil, L1-L2. This coil plugs into a 5-prong National isolantite socket which is supported one-half inch above the chassis by means of two metal spacers threaded for 6-32 screws. A one-inch hole is centered under the coil socket to permit passage of wiring.

The bandspread tuning condenser, C2, is mounted on an L shaped bracket made of heavy .094 inch aluminum. A Millen 39016 flexible coupling and a 1.25 inch length of 1/4 inch shafting couple C2 to the National BM dial.

Fig. 4 shows the bottom view of the receiver. Most of the components are readily identified. Resistors R2 and R3 and capacitor C5 are on the terminal board at the upper right. The AAA bias cells are in a Radio Shack holder just behind the volume control. Condensers CB and C10 and resistor R4 are on the terminal board at the upper center. The ANT and GND binding posts are on the

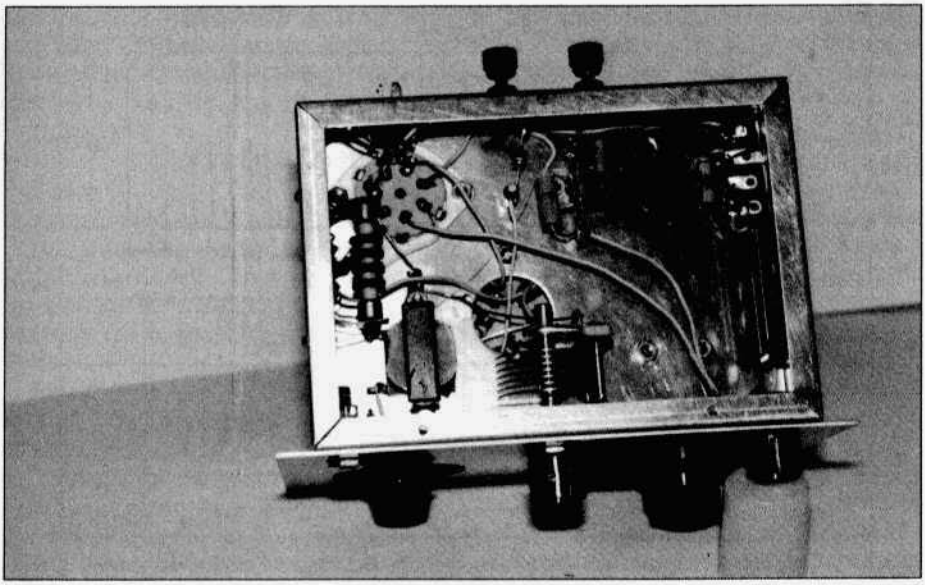

Figure 4. Bottom view of the MM-1. Bias cells are at the far right.

back apron of the chassis and C1 is just behind the ANT post. The 4-prong power plug, P1, is on the back apron at the far left. Condenser C9 is not visible, being in the lower left corner and is hidden by the flange on the chassis.

Shielding

Most regenerative receivers are plagued by AC hum due to fields set up by house wiring and various appliances. Usually, this can be corrected by proper shielding. Another bothersome problem manifests itself as follows: Tune in a CW signal. If the beat-note changes as you move your hand away from the dial or when you touch the chassis or panel, that defect is known as the hand-capacity effect. The solution, generally, is to employ better shielding. In the present receiver, I provided two shields, one under the bottom and one over the top of the set. The bottom shield is a 5X7 inch aluminum plate held in place by three self-tapping screws. Four "stick-on" rubber mounting feet were attached to the underside of this shield.

The top shield is made of .062 inch aluminum. A 1/4" lip fits over the top edge of the front panel. The back of this shield presses snugly against choke L3. With both shields in place, AC hum and hand-capacity effects are eliminated. The effort expended on these refinements is worthwhile.

Coil data (for three bands 80, 40 and 20 meters) is shown in Fig.5.

The bandspread tap can be moved if you want more or less bandspread. After each coil is wound and you are satisfied with it, it should be given a coating of coil dope. This will hold the turns in place and lend a professional appearance. For your own convenience, you may want to make a chart showing the frequency tuned at various settings of the band-set dial. To do this, you can use either a signal generator or a calibrated grid-dipper as a signal source.

The Power Supply (see Fig.6)

The power supply is built on a 5x7x2 inch steel chassis. Both T1 and L1 were donated by an acquaintance. A diode bridge rectifier is used. Each diode is shunted by a condenser to preclude the generation of parasitic oscillations which often cause "tunable hum". A

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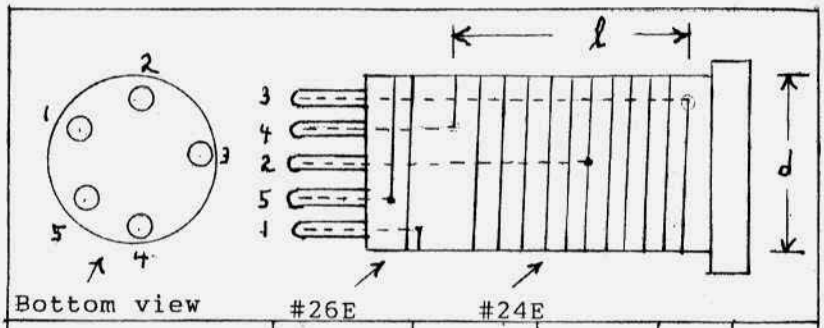


Freq Range-Mc	L1	L2	Tap	d	l
2.72 - 5.84	30.25	3.87	18.5	1½	1½
4.25 - 9.05	19.25	2.87	11.5	1½	1½
8.0 - 17.75	10.25	1.87	4.5	1¼	3/4

Fig. 5. Coil Data.

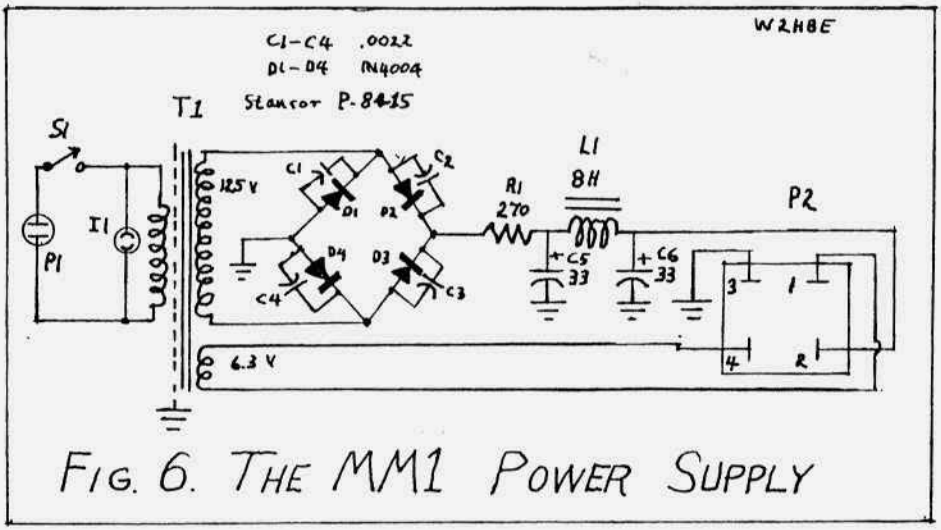


FIG. 6. THE MM1 POWER SUPPLY

four-wire cable runs from the power supply to a socket, P2, and is laced with twine. No trace of tunable hum has been observed and only a faint bit of AC hum is evident.

Conclusion

I am pleased with how well this set performs. If some beginner decides to copy it, I would suggest using two dials that can be hand-calibrated. I recommend either the National MCN or the Millen 10039 dials. I have friends who scoff at the idea of using such a set but I derive more pleasure having a QSO using a simple , home made receiver than working a DX station using a $1000 set made in Japan. ER

ment using a scope and sine wave input, however the difference it made in speech was hard to detect and no where close to the 'bang for the buck' of avoiding overmodulation/distortion. It is fertile ground for further 'serious audio' pursuit.

Tuning For Screen Modulation

The final should be very heavily loaded and the grid drive current sparse for best performance. The following beefs up the manual's meager instructions.

First dip the final in the Phone position, switch to CW position and load to 100 Ma, redip, then reduce grid drive till it affects the plate current. Note that grid current and raise it about 0.5 Ma. The final value will be between 1.5 and 2.5 Ma. Just setting it at 2.0 is not all that bad. Don't linger with the following step. Increase loading and dip the final until the dip is just detectable, Heathkit says, set it at 150 Ma plate current. If your tube will do it go higher. That's it. Switch to Phone.

Raise The Power Output

The enjoyment of AM depends on sufficient resting carrier power to quiet the listener's receiver. This is very much is a function of conditions. My operating experience has been: Barefoot transceivers, single 807s, and Viking Rangers, with 15 to 40 watt output will be pleasant to listen to only with very good conditions. DX-100s, Viking 2s, Apaches, and Valiants with 80 to 125 watts output will work most of the time. BC-610s, Viking 500s, T-368s, and homebrews with 200 to 400 (375?) watts always have a big sound. The average barefoot DX-60s produce a resting carrier of 6 to 10 watts, and an AM sideband peak of 50 to 70 watts. The nominal 8 watt resting carrier doesn't even make the first category. But note that the corresponding nominal side band PEP is 60 watts, almost twice that which would be available from an 8 watt plate modulated AM rig. This effect contributes to a 'Big Audio' sound.

The characteristic of low resting carrier but high audio side band PEP is well suited for amplification by the trusty SSB linear amplifier already on the operating desk. SSB linears are not built for much continuous carrier amplification but can easily handle the audio side band peaks. The trick is to just ask it to amplify enough to get the carrier into the 80 to 200 watt range, and to not exceed the maximum PEP headroom capability. As a simplified example the popular AL-80 (one 3-500) has an amplification factor of about 12 (1000W output /85W input), and a max. PEP spec of 1000W. The amplified DX-60 resting carrier would be 96W (8W x 12). The maximum PEP would be 720W (60W x 12). The signal is now into the desired level for good AM. Most amplifiers will handle this load except those with really wimpy power supplies and/or tubes such as the Collins 30L-1. My Cheyenne and AL-1200 amplifier produce a 200W resting carrier and 1400W PEP with no ill effect

If the nostalgia aspect of big iron is ignored, I believe the above approach is very effective and may be the quickest, least expensive, and most convenient route to quality AM operations. Yes, A transceiver will work, however it is less fun if 'It ain't got no toobs'.

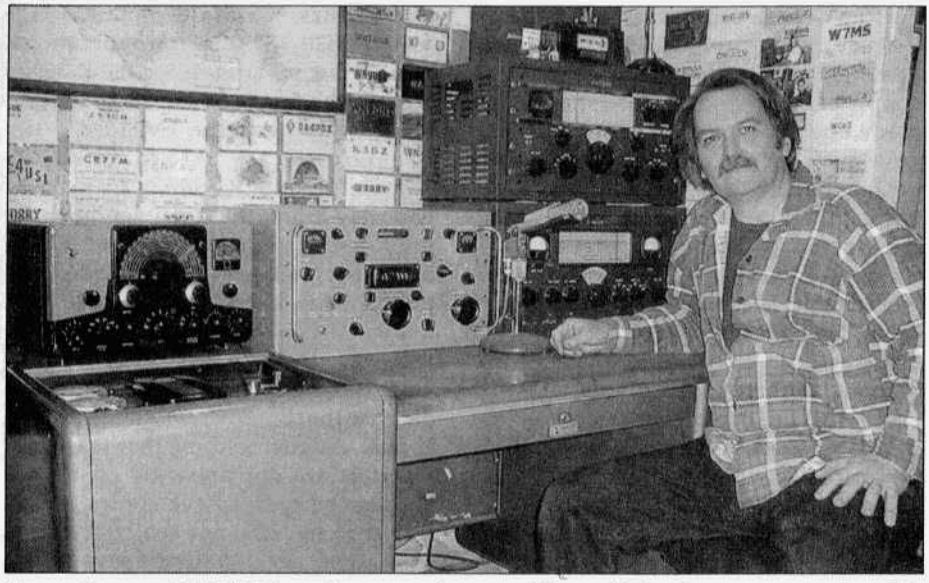
Recommendations

Purchase a DX-60 & VFO before the secret gets out. Install the $3 negative cycle Clamper/Monitor to assure good modulation. Raise the resting carrier power output to about 100 watts with your trusty SSB linear amp. This will give you a very acceptable AM signal up there in the 90 percentile. Enjoy operating clean AM with a rig you can carry under one arm and fits on the operating desk.

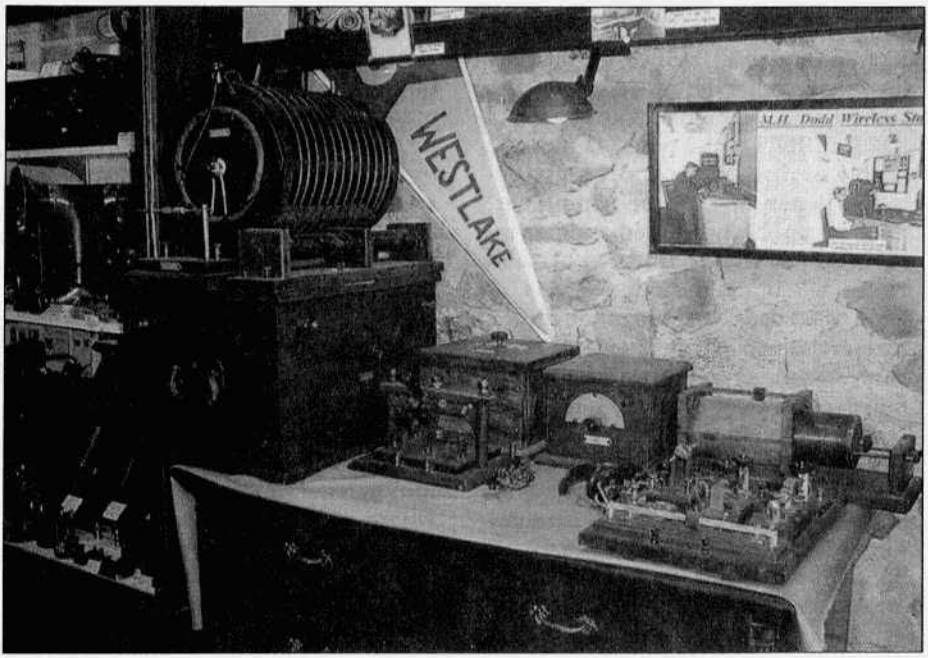
Be careful about taking on the extension of the low frequency audio response unless you enjoy wrestling with the Hum Monster, but if you do it does sound great. ER

Tom Anderson, K5HPF, his Viking Valiant, Hammarlund HQ-170A and Heathkit SB-10 sideband adaptor. Note Heathkit SWR meters and phone patch.

Jeff May, WØXV, at one of his vintage operating positions. Most of the gear shown is Collins. The big transmitter in the rear of the photo is a 30K.



Henry Rogers, WA7YBS at the operating position of his vintage amateur radio station which is located at the Virginia City Radio Museum.Henry and his wife Sharon (KK7EI) own and run the museum. *Photo by Bob Rosenhahn, KE6LNI.*



M.H. Dodd wireless, 1910/1912 spark station that is on display at the Virginia City Radio Museum. This complete station was found in a steamer trunk in a shed in Reno, Nevada. The museum's website address is www.radioblvd.com. *Photo by Bob Rosenhahn, KE6LNI.*

Military NC-183D from page

From George Cummings, K7DU: Saw the picture of your NC-183 in ER. Many years ago a friend showed up with a couple of them in not to good shape. We made one good one out of two and he gave me what was left. I did manage to get the remaining on working with a lot of imagination. These units came from the Bureau of Standards at Boulder, Colo. The 183s that we worked over were not the 'D' models. This was in the early '70's. Perhaps several government agencies used National receivers.

From Lambros Lambrinides, K1MBI: I saw the picture of your receiver in ER's March issue. I have to tell you that there are a few of these around. I don't know if the term "rare" applies. I've had two of them myself. The first one was missing the tag in the upper left (I sold it because I needed the money) but, I did learn a lot from it because I made it work. The second receiver I bought a few years later (when I was employed again) and this one had the ID tag in the upper left and of all the luck, the manual.

So, if no other letter or phone has reached you yet, what you have is a NORTHERN RADIO type 141 model 2 capable of dual or triple diversity operation depending on the "Combiner" panel set up. They wanted a super receiving system for telegraph, teleprinter, telephone communications for commercial use. This was made for the commercial market, for point to point communications so you will find them on the east & west coasts.

I saw the picture of the NC-183D in ER #131 and wondered if it was the same unit I traded to Jim Shoemaker, NØCKL a few years ago. I dug up some photos I took of the set while I was making repairs, and the screw-slot orientations on the front panel were the same (except for one screw on the far right) as in your picture!! If it's the same unit I bet it isa rare one! I bought the set in inoperative condition from a hamfest in Washington, MO. **ER**

REVIEW from page 18

(Operators Manual) and the TM1105820-357-20 (Organizational Maintenance Manual) for the R-390 as well as the TM11-5820-358-10 (Operators Manual) and the TM1105820-358-20 (Organizational Maintenance Manual) for the R-390A? As many of you may know the documentation for the R-390 was originally titled TM11-856 (TM11-856A for the R-390A) and published in one volume. However in the early 1960s some military power-that-was decided that these manuals were too big and so they were broken down to the three manuals that are listed above. August told me that these four manuals are not presently on the CD because he didn't have copies to scan and that he was not really trying to specialize. Eventually he says he will probably add these manuals to the CD, but for the moment he's going to put his efforts towards scanning other manuals that aren't available on CD elsewhere.

August tells me that he is currently (slowly!) working on scanning the manuals for another volume and that he probably has enough manuals for 4 or 5 more CDs. August hopes to have another one out by the Fort Tuthill Hamfest in AZ in July. Some of the manuals he says will be on it include the T-368, BC-611, CV-157, CV-591, RT-70, TV-2, TV-7, TV-8, TV-10, R-274, GRC-26 and more and also August will eventually be adding the manual for the BC-610A-E to volume 1.

Notwithstanding the above, which is a minor criticism in the light that these four manuals are readily available elsewhere, KC7BZ has done an outstanding job of creating his first archival-quality disc and it is well worth the $45.00 price tag. I look forward to seeing more of his work in the near future. It is definitely a worthwhile endeavour! **ER**

	1953 Gonset Communicator II	1993 Radio Shack HTX-202
Size	10-7/16"W 10-3/8"H 8-3/16"D	2-9/16"W 4-5/8"H 1-7/8"D
Weight	16 lbs.	1 lbs. 3 oz
Power Input	115VAC 1.3 A or 6VDC 18A	7 to 13VDC .8 to 1.1A
Power Out TX	7 watts	2.5 to 6 watts
Power Out Spkr	4 watts 5"	.3 to 1 watt 2"
Receiver Sens	1 uv	.2 uv
Receiver BW	200 kHz at 6dB down	50 kHz at 70 dB down
Trans Spurs	10 dB down	70 dB down
Receiver Spurs	6 dB down	80 dB down

output is very close, and they both cover 144 to 148 but that's about as close as they come. The chart above shows some of the differences.

The Gonset figures are based on measurements of my unit, the HTX-202s are from the owners manual. Obviously 40 years had made some improvement other than the switch from AM to FM. The size and power requirement reduction, along with the channelized frequency control and memory are probably the most significant. Also the Radio Shack HT is probably the cleanest 2-meter set around. The old Communicator has several things going for it however, the audio from the speaker will wake up the neighbors and if you are mobile it will give the "rappers" in the next car something they can hear. The vacuum tube transmitter will load up anything without a care for standing waves, impedance, or stray RF floating around. I find the receiver images kind of fun, as the aircraft give me some AM signals to listen to. With 16 tubes in the Communicator II it is amazingly reliable. It sure generates a lot of heat however, but it keeps on ticking. The vibrator used when operating on DC is probably the weakest item in the Communicator. I have a 1961 solidstate replacement that solves my problem, and I may replace the two 6X4 rectifiers with solid diodes before the next VFD. Now if I can find some young and strong ham that likes boatanchors to help carry the stuff I will be all set for June. How about a 2-meter AM calling frequency (and a nice temp inversion) for Vintage Field Day Barry? ER

75A-4 Filters from page 27

signal loss, not so with the originals. Most spectacular for me was the 500 Hz CW filter. Peaking the passband tuning control enable me to really separate the CW signals. They just seemed to jump out at me.

David includes printouts from his spectral analyzer of each filter's characteristics. As one who has had extensive experience with the 75A-4, I highly recommend these outstanding filters which are only available from the ER Store. See the ad on page 47 for ordering info. **Howard M. Mills, W3HM**

To Join AMI send $2 to:
AMI
Box 1500
Merrimack, NH 03054

TUBE COLLECTORS GROUP FORMED: The new tube collectors association is now in operation. This is a non-profit, non-commercial organization of collectors & history enthusiasts focusing on all phases & vintages of tube design. The founding president of the group is Al Jones, W1ITX, who is known for his award winning tube collection. For more details & complimentary copy of the association's bulletin contact Al Jones, CA, (707) 464-6470, Ludwell Sibley, OR, (541) 855-5207, or mail request to POB 1181, Medford, OR 97501.

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VINTAGE EQUIPMENT ONLY

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e-mail: er@frontier.net

Deadline for the June Issue: June 1

FOR SALE: Repair and restoration on all vintage equipment; 45 years experience. Barney Wooters,W5KSO, 8303 E. Mansfield Ave., Denver, CO 80237. (303) 770-5314

FOR SALE: "AM FOREVER" quality Hanes T-shirts, grey, blue, green & red. Sizes M, L, XL - $15 shpd. Rick, K8MLV/Ø, 1802 W. 17th St., Pueblo, CO 81003. (719) 543-2459

FOR SALE: Radio books, magazines, catalogs, manuals (copies), radios, hifi, parts. Send 2 stamp LSASE. David Crowell, KA1EDP, 40 Briarwood Rd., North Scituate, RI 02857-2805. aq253@osfn.org

FOR SALE: KWM-2 fan bracket - $12 ppd. Dave Ishmael, WA6VVI, 2222 Sycamore Ave., Tustin CA 92780. (714) 573-0901.

FOR SALE: Small parts, transformers for projects and repairs of tube gear. Let me know your needs. Van Field, W2OQI, 17 Inwood Rd. Center, Moriches, NY 11934. (516) 878-1591 or wreck_and_rescue@juno.com

FOR SALE: NOS,UTC # F-7101 matching (600-8 ohms) xfmrs (2 W) - $13 ppd/dom/USA. ABEN, POB 4118, Jersey City, NJ 07304-0118,Avidov@aol.com

FOR SALE: w/manuals: HP606A sig gen - $125; HP200CD audio generator - $48. Much more, list-SASE. KI4RK, 203 Edgebrook Dr., Pikeville, NC 27863. (919) 242-6000, kirke@goldsboro.net

FOR SALE: Collins S-Line aluminum knob inlays: small (exciter/PA tuning) - $1; 30L-1 - $2; spinner/plain (main tuning) - $3. Charlie, K3ICH, 13192 Pinnacle Lane, Leesburg, VA 20176. (540) 822-5643

FOR SALE: Hallicrafters, RME, Gonset, others. Also some military, test equipment, VHF/RF amps, more. LASE, Don Jeffrey, POB 1164, Monrovia, CA 91017.

FOR SALE: Meters for WW II military radios, have some connectors. Henry Engstrom, KD6KWH, CA, (707) 544-5179. pacifica@sonic.net

FOR SALE: NOS TCS baseplates, still in orig. factory shpg wrap - 2/$15.00 plus shpg. Carl, KN6AL. POB 3531 Laramie, WY 82071. (307) 742-0711, kn6al@uwyo.edu

FOR SALE: National HB-7A rcvr, restored, works, includes photocopy docs - $225 plus shpg. Jim Clifford, KE4DSP, 108 Bayfield Dr., Brandon, FL 33511. (813) 654-7531, j.c.clifford@juno.com

FOR SALE: Tube,Eimac 35TG N.I.B. - $40 ppd. R.J.Eastwick, W2RJE, 400 N. Haddon Ave., Unit 109,Haddonfield, NJ 08033. (856)429-2477

FOR SALE: Western Electric 2N-110, CK-722 Ratheon in orig package - $15 ea; Westinghouse 3-tube RADA, like new - $325. W. Harder, 911 W. Northrup St., Lansing, MI 48911-3640. (517) 882-2303, harderw@pilot.msu.edu

NOTICE: At long last Chuck Dachis has opened his web site. Come visit him at http://www.hallicraftercollector.com

FOR SALE: Military and commercial communications items: www.maxpages.com/murphyjunk. For up to date lists: murphy@cts.com. Mike Murphy's Surplus, 401 N. Johnson Ave., El Cajon, CA 92020. (619) 444-7717

FOR SALE: Over 600 electronics magazines, mostly 1960's & '90's - 99¢ ea + shpg; also available: electronics books, parts, etc. List for stamp. Bob Eckert, 133 E. 7th St., Clifton, NJ 07011.

FOR SALE: Radar, APS-88, ex Grumman S2A Tracker, complete, antenna and mount, rcvr/xmtr, synchronizer, control amp, display, antenna control box, system control box, 65KW, X-band - $1500, no cables, manual available, extra. Carl Bloom, (714) 639-1679, 377811148@MCIMAIL.COM

FOR SALE: Naval rcvrs, RAK, RAL, RAO, RBA, RBB, RBC, RBL, pwr splys available, prices from $75 to $350 depending on type, condx. Carl Bloom, (714) 639-1679, 377811148@MCIMAIL.COM

FOR SALE: Tube list, new & used, wide variety audio, ham. Recently expanded. SASE 52¢. Bill McCombs, WB0WNQ, 10532 Bartlett Ct., Wichita, KS 67212-1212.

FOR SALE: Drake R4-B rcvr, near mint - $275 plus shpg; Johnson 250 Matchbox, near mint - $100 plus shpg. Marty, NJ, (609) 466-4519

FOR SALE: Books, all electronics related; 300 titles; SASE. Paul Washa, 4916 Three Points Blvd, Mound, MN 55364. wetok@email.msn.com

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

FOR SALE: parts, tubes, books. SASE or email for list. Wayne LeTourneau, POB 62, Wannaska, MN 56761. wb0cte@arrl.net

FOR SALE: WWII Merchant Marine rcvrs, Mackay 128AY, Radiomarine/RCA AR8506B, AR8510, EH Scot SLRH, SLRM, any rcvr - $250. Carl Bloom, (714) 639-1679, 377811148@MCIMAIL.COM

FOR SALE: RBM pair, hi-low band, new condx, matching serial numbers - $750. Carl Bloom, (714) 639-1679, 377811148@MCIMAIL.COM

FOR SALE: Clipperton L - $ 325; FT-101ZD - $300; FT-101EE - $250; NC-240D w/speaker - $250. (Foregoing with orig. manuals.) BC-348 - $ 75; SX-42 - $175; Viking II orig manual - $ 25; 122 VFO manual - $15; Viking II mod xtmr - $ 30. Carter Elliott, (804) 979 7383, CElliott148@aol.com

FOR SALE: NC-46 - $175; NC-183D - $275; Lettine 242 - $95; Scott R8O - $200; Gonset III - $75; Subraco 10M - $95; Lafayette HA-410 - $145; TenTec PM-2A QRP station - $225. Free List. Richard Prester, 131 Ridge Rd., W. Milford, NJ 07480. (973) 728-2454, rprester@warwick.net

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

FOR SALE: 30 yr collection, moving to a no basement house, send LSASE for list. Gregory S. Pace, WA4SQR, 5636 Mountainbrooke Ct., Stone Mountain, GA 30087.

FOR SALE: Radio, TV tubes NOS, send want list & SASE. Dan Hill, POB 49, Dixmont, ME 04932. (207) 234-2315

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

FOR SALE: Babcock mod MT-5A D-Xmtr, rad eng Yan Nuys 489 - $55; Hewitt Packard radio freq counter, electronic counter 524C, freq converter 525C, all one unit 489 - $45; Takitso (KK)?? A-901A amp - $45; RCA xtal calibrated marker generator WR-89A - $50; Paco mod C-25 in circuit capactor checker - $30; Midland mod 13-160(CB) xcvr w/ mic - $60; Heath Star Roamer 489 - $55. Bernie Samek, 113 Old Palmer Rd., Brimfield, MA 01010. (413) 245-7174, fx 245-0441

FOR SALE: Collins KW-1, serial #105, exc condx - $22,000. Will deliver to Dayton Hamfest. K5JV, TX, (281) 358-4207.

FOR SALE: FT-101 xcvr w/spkr phone patch & DC cable - $500. Chuck, KØRFQ, MO, (417) 863-7415.

TRADE: CE 100V for very exc R-388 URR rcvr or 51J4. Dick Dixon, W7QZO, 16032 Lost Coyote Ln., Mitchell, OR 97750. (541) 462-3078, richdix@bandnet.com

FOR SALE: (5) ea 6D5 tubes; (2) ea 6Z6 tubes. Made by Triad, NIB, ans by snail-mail only. W7SC, 3932 S. Mesa View Ln., Boise, ID 83706-6052.

FOR SALE: R-23A/ARC-5 190 to 550 kc, like new running spares for radio set AN/VRC-19; 14 tubes, 2 vibrators, 4 brushes; 2 Lafayette 12" spkrs. **WANTED:** 600V center tapped xfrmr for plate sply for 2E26s. Herb, W4VHY, 8671 SW Loop 410 Lot 66, San Antonio, TX 78242.

FOR SALE: Johnson TR switch, works, w/manual copy - $50; SB34 xcvr, needs work, w/manual copy & orig mic - $55. John Nauman, 420 Patrick Ave., Merritt Island, FL 32953. (407) 452-7904

TRADE: My HRO50 AC coil for your HRO60 AC coil. Dave, W7SWB, OR, (541) 276-6335, dsenter@oregontrail.net

FOR SALE: Sencore CB42 automatic CB analyzer, NIB w/manuals, untested - make offer + shpg. WH6CZD, 80 Lehua St., Kahului, HI 96732

FOR SALE: TenTec SP325 rcvr w/manual - $350 (OBO). Harry Blesy, N9CQX, 95740 Clarendon Hills Rd., Hinsdale, IL 60521. (630) 789-1793

FOR SALE: Transformers for Collins 32V3, Hallicrafters HT9, BC610 & RF xfmrs for Hammarlund SP600. Roland V. Matson, POB 956, Lake Panasoffkee, FL 33538

Message: Vintage Radio Yard Sale - communication rcvrs & gear. Many restored units, May 20 and 21. Rain Date: May 27 and 28. Call for details. Jim Koehler, 242 Guy Lombardo Ave., Freeport, NY 11520. (516) 623-0035

FOR SALE: Presto table top recording lathe, nice condx, complete, w/spare cutters. Heavy. PU only! Fred Clinger, WA8KJJ, OH, (419) 468-6117 after 6 PM EST.

FOR SALE: Millen, set (4), abpsorption freq meters in metal box, 1.5-40 Mc, ex - $40. Harry Blesy, N9CQX, 95740 Clarendon Hills Rd., Hinsdale, IL 60521. (630) 789-1793

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

FOR SALE: Johnson Invader 2000, looks like it just left the factory, beautiful, for sale at Dayton, space 2952/53. George, W6ZZ, CA, (760) 747-8710. w6zz@home.com

FOR SALE: VC50 vacuum cap. 55mmf 20KV; Precise VTVM Model 907; Harmon Kardon AM/FM tuner Model ST360; Lafayette SWR field strength meter, new; Hallicrafter HT-37 xmtr, works; Heath transistor tester Model IM-30; EICO capacitance decade box Model 1180; Micronta 1 kv pwr SWR meter; tube list 400 +; parts list pwr xfmrs, meters, Stanwyck, Miller, Zenith coils, pwrstat, 4p4t ceramic sw 10kv +. Offers on any & all items + shpg. SASE for lists. E.F. Hayes, WØJFN, 3109 N. Douglas Ave., Loveland, CO 80538-2548.

FOR SALE: Heath color bar dot generator IG 62 mint - $25; Antique Radio Classified 1990-1999 - $100; RCA tabeltop RUC28W - $15; Panasonic RE6451 - $15. All + UPS. Onerio Sabetto, 1717 Burgess Rd., Cleveland, OH 44112. (216) 481-1036

FOR SALE: BC610-I pwr sply, U pick up - $275; Heath Seneca - $175; PE94-C dynamotor - $40. W7RBF, AZ, (602) 864-9987.

FOR SALE: Antique tube collection, 100 various types, used, untested - BO, SASE, first PU. Louis D'Antuono, 8802 Ridge Blvd., Brooklyn, NY 11209. (718) 748-9612

FOR SALE: Tube test socket adapters, 9 different for - $18 ppd. Robert Martin, 111 Bancroft, Rochester, NY 14616. (716) 663-4182

FOR SALE: Jane's Military Communications for 1989 & 1993 - $50 ea. Harry Weber, 4845 W. 107th St., Oak Lawn, IL 60453-5252.

FOR SALE: Hallicrafters SX-28 - $225; SX-28A - $275. Jack Brower, K8HFX, 9101 S 47 Rd., Cadillac, MI 49601. (231) 775-6469

WANTED: Collins - Amateur catalogs, sales literature, manuals, promotional items & Signals. Richard Coyne, POB 2000-200, Mission Viejo, CA 92690.

WANTED: Howard radios of any type. Andy Howard, WA4KCY, 105 Sweet Bay Ln, Carrollton, GA 30116. wa4kcy@usa.net

WANTED: E. F. Johnson Co. HAMALOGs, unusual photos and information 1923-70. Bruce Hering, 41120 State Highway 13, Waseca, MN 56093. (507) 835-5619. bhering@efjohnson.com

WANTED: Globe King 500B/C; Johnson Ranger; Heathkit; Mohawk; National 183D; Hallicrafters SX100. KBØW, CA, (916) 635-4994. frankdellechaie@sprintmail.com

WANTED: For purchase. Equipment & technical information related to AN/ARN-6 Radio Compass. Jim Cavan, 6 Timberline, Norfolk, MA 02056. (508) 528-0908,jcavan566@aol.com

WANTED: Gearshift for Teletype Model 28, or complete machine with one. Ivan, WA6SWA, POB 248, Reno, NV 89504. (775) 329-7738, idh@cs.unr.edu

WANTED: SW3 #33A and #35 coils. I will trade my extra coils SW3 coils. Hank Bredehorst, 2440 Adrian St., Newbury Park, CA 91320. (805) 498-8907

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

WANTED: Long wire ants AT101, AT102, GRC-9; DY88/105; PP327GRC9; counterpoise CP12 & 13 GRC9; BC348 pwr conn PLQ102/103. KA1ZQR, 348 N. Main St., Stonington, CT 06378.

WANTED: Globe King 500 B/C; Viking; Valiant I/II; Viking 500; Heathkit Mohawk. Frank, (916) 635-4994, frankdellechaie@sprintmail.com

WANTED: Globe King 500 B or C for California PU. Bob, CA, (562) 928-8820. rrjlife@earthlink.net

WANTED: National Company emblems, escutcheons; National S-101 impedance coupler; NC-2-40D knobs. Don Barsema, 1458 Byron SE, Grand Rapids, MI 49506. (616) 451-9874, DBARSEMA@prodigy.net

WANTED: Military radios: British A-13, A-14, & Soviet R(P)-129. Leroy Sparks, W6SYC, 924 W. Mc Fadden Ave., Santa Ana, CA 92707. (714) 540-8123. leroysparks@earthlink.net

WANTED: German Enigma encryption machine. W7KPB, POB 1773, Pinehurst, NC 28370. yatama@yahoo.com

WANTED: Working ART-13 w/power supply (dyno OK); working GRC-9. Lee, N2UDF, N2UDF@metzero.com

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

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

WANTED: I wish to correspond with owners of National FB7/FBXA/ACS coil sets. Jim, KE4DSP, 108 Bayfield Dr., Brandon, FL 33511. j.c.clifford@juno.com

WANTED: British, Commonwealth W.S. 62, W.S. 22, W.S. 18, W.S. 48, W.S. 46. George Rancourt, K1ANX, MA, (413) 527-4304

WANTED: Contact w/Bendix fans, especially those working on the TA-12 xmtr & the RA-10 or similar rcvrs. Sam Kelly, W6JTT, CA, (714) 893-2092 or skellycp@aol.com

WANTED: PreWW-II Iowa QSL cards; materials of 1920s Iowa Radio Relay League. Will trade or purchase. Bill Smith, W5USM, w5usm@aol.com

WANTED: HF-300 tubes. Don Chester, K4KYV, 2116 Oldover Rd., Woodlawn, TN 37191. (931) 647-2179, k4kyv@hotmail.com

WANTED: Hallicrafters SX88 or SX115. Larry Redmond, 413 Bedfort Dr., Duluth, GA 30096. (770) 495-7196

WANTED: 80 and 40 meter tank coils and xtals for BC610; BC614/HT-5 speech amp. Gary Willey, W4ZXS, 8125 Lunenburg Rd.Keysville,VA 23947. (804) 736-9029

WANTED: Signal Corps BC-307 xmtr, circa 1937 General Electric. Any out there? William Donzelli, 15 General MacArthur Dr., Carmel, NY 10512, (914)225257, aw288@osfn.org

WANTED: Manual or schematics for Fisher Research Laboratory RS-25 and TS-25 xmtr and rcvr. Geoff Fors, WB6NVH, POB 342, Monterey CA 93942. (831) 373-7636

WANTED: Transistors for HRO-500: 2N3294, 2N2654, 2N2672, 2N2429, 2N706, 2N2646, 2N1168, 2N2375, 2N2188; Lamps 6ESB Jo, g4xxw@compuserve.com

WANTED: Disc recording lathe (over-head only) for 16" turntable; or 12" w/turntable, w/w-out recording head. Charles Graham, 4 Fieldwood Dr., Bedford Hills, NY 10507. (914) 666-4523

FOR SALE: Hallicrafter's manuals, copies starting at $5, some Johnson, WRL, others. SASE for list. DSM Diversified, 909 Walnut St., Erie, PA 16502.

FOR SALE: Military radio TM's, origs & reprints. New list. Send $1 & address label to Robert Downs, WA5CAB, 2027 Mapleton Dr., Houston, TX 77043-2410. (713) 467-5614

FOR SALE: I repair all tube type amplifiers. Licensed in 1955. Steve Gross, N4PZ-W9OJI, IL, (815) 734-4255.

FOR SALE: US military generators MEP-026A 24-28 VDC gasoline engine, great running condx - $350. PU only St Louis, MO. Shawn, MO, (636) 343-5263.

FOR SALE: 51J-4 filter replacements, direct plugin—6.0 kc Collins mech. filter, 500 cycle xtal lattice - $215 each. Chuck Felton, KDØZS, WY, (307) 322-5858, feltoned@coffey.com

FOR SALE: Kenwood TS 520S, gd condx - $300; MC 50 mic - $35. **WANTED:** Info on Taylor Super mod TX TSM-75K. Randy, K4RHH, VA, (804) 239-6127.

FOR SALE: Collection of SK electric engineer ham friend; xcvr, handy talkies, older computer, much miscellaneous including Heathkit, test equip, many tools. Must take all, can't ship. Chicago area - $675. Paul C. Crum, W9LC, 6272 N. Cicero Ave, Chicago, IL 60646. (773) 282-3033.

FOR SALE: Drake R4C/T4XC/spkr/pwr sply/manuals + extra fliters & parts - $475; Heath linear SB220 w/all Harbach mods - $575. Orig owner Jim, WILLU, MA, (978) 363-1619.

FOR SALE: Radio Magazine, 62 issues, (10 per year) February 1936 to March '42 - $200. Bob Thomas, W3NE, 216 Sunrise Ln, Philadelphia, PA 19118. (215) 247-2427.

FOR SALE: Johnson Viking II - $175; Matchbox - $125. **WANTED:** Drake 2-A or 2-B. Robert Braza, W1RMB, MA, (508) 222-5553.

FOR SALE: Interference Measuring Set NM-20B by Stoddart Electro Systems, w/90780-2 pwr sply & pwr cables, no antennas or manual, exc condx - $130 + shpg; similar set by Singer as made for Air Force, w/manual, pwr cord & extra tuning unit but w/out antennas - $150 + shpg. BC-733 Army Signal Corps airborne VHF rcvr, about the size of ARC-5 rcvr, but has remote-selection of six xtal-controlled channels, exc condx w/"Serviceable" tag dated 1955, no accessories or dynamotor, made by Crosley Radio Co - $50 + shpg. Bob Simpson, NØNTC, 9570 Haney Dr., Houston, MO 65483. n0ntc@train.missouri.org

FOR SALE: Collins 51J series drum overlay - $10 ea, specify which. Ron Hankins, KK4PK, 555 Seminole Woods Blvd., Geneva, FL 32732. (407) 349-9150

FOR SALE: WACO-5NWX telephone filters. Just plug in. 1/$13.95, 2/$25, 3/$34. Money back. Cecil Palmer, 4500 Timbercrest Ln., Waco, TX 76705. (254) 799-5931, w5nwx@juno.com

FOR SALE: Heath Nostalgia, 124 pg book contains history, pictures, many stories by longtime Heath employees. (See BOOKS inside back cover.) Terry Perdue, 18617 65th Ct., NE, Kenmore, WA 98028.

FOR SALE: "Complete Guide To WWII Military Communications Equipment", 117 pg info on almost all WWII equip. - $15 + $2 domestic mail. Sam Hevener, W8KBF, 3583 Everett Rd., Richfield, OH 44286-9723. (330) 659-3244

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FOR SALE: Tube type kits for CW/AM. Vintage Radio Kit Co, 427 North Main St., Sharon, MA 02067. email us at CPCW-5@aol.com or visit our web site at: http://www.mnsinc.com/bry/vintage.htm

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

FOR SALE: SASE for list of reconditioned gear. Ed Clink, WA9PFB, 1285 New Salem Church Rd., New Berlin, IL 62670

FOR SALE: S-40B - $50; SR160 w/sply - $150; HA-350 rcvr - $70; Citi-Fone tube CB - $50. Ken Sands, K8TFD, 15614 Edgewood Circle, Plymouth, MI 48170. (734) 420-3448

FOR SALE/TRADE: Manuals: Knight R100, T50; Multi-Elmac AF54, AF-67, AF-68; Drake 1A; Regency ATC1, NI4Q, POB 690098, Orlando, FL 32869-0098. (407) 351-5536, ni4q@juno.com

FOR SALE: SX-25 w/orig spkr, very good - $290 shpd; S-20 & NC-98 exc - $265 ea shpd; BC-696A, BC-459A - $65 ea shpd; military xcvr, 47 to 58 Mc - $75. Ron, MI, (517) 374-1107.

FOR SALE: Ampex recorders 351, 601 AG-440 & 960 stereo; ART-13 w/all plugs, dynamotor, mounting base, remote box, key box; QST 1923-1993. Rudy, W2ZIA, NY, (716) 937-9279

FOR SALE: Three foot by five foot reprint of factory schematic for Collins KW-1 - $28 ppd. Tom Berry, K9ZVE, 1617 W. Highland, Chicago, IL 60660. (773) 262-5360

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

FOR SALE: Military Radios, etc. E-mail N1UDI1980IDT.NET for a List or SASE. Ronnie Parker, 1357 Bridgeport, CT 06601-1357.

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WANTED: QSTs before 1936 and various years ARRL Handbook for personal collection. Gary Yantis, WØTM, 800-844-9860, gary@w0tm.com

WANTED: Drake 1A rcvr; 399C1 Collins VFO; JRC 505 twins. K5YY, AR, (501) 756-5010. k5yy@arrl.net

WANTED: GF-11 & GF-12 aircraft xmtr equip. Mike, WØBVA, 305 N. Keith St., Scammon, KS 66773. (316) 479-2756

WANTED: Top $ for Philmore CR5A RX, international xtal 80/40 xmtr, WRL, CW7, xmtr. Gary Wagner, K3OMI, TN, work # (865) 690-4217

WANTED: Collins xtal calibrator (100 kHz) model #8R1 for 75A2 rcvr. John, CO (719) 481-4564 or thomas@bwn.net

WANTED: Original meter for Hammarlund HXL-1 linear. Paul, KU6T, CA, (310) 825-1564 or pkcwang@ee.ucla.edu

WANTED: Ampex tape decks or parts, mixers, etc. George, OH, (216) 486-6489.

WANTED: Rcvr multi band Meissners National 44 & 45; Guthman U17 & U50. H. Mohr, W3NCX, 1005 Wyoming, Allentown, PA 18103.

WANTED: Complete clean R-390/URR w/all technical manuals. C6ANI, POB N4106, Nassau NP, Bahamas

WANTED: C band satellite dish without electronics for pickup within 50 miles Austin, Texas. (ex-W7QGX) (509) 838-2161, e.o.johnsonww2@home.com

WANTED: Hallicrafters Village/Hamlet radios TR-5/TR-20 & Gonset Civil Defense 6m radios/accessories, manuals also. Daniel Cahn, 3444 Greenwood Ave., Los Angeles, CA 90066. Fx/msg (310) 398-7159 or danielc411@aol.com

WANTED: Cash for Collins: SM-1, 2, 3; 312A-1, 2; 55G-1; 399C-1; 62S-1; KWM-1; 302C-3; 515-1; 75S-3C; 32S-3A. I buy any Collins equip. Leo, KJ6HI, CA, Ph/Fx (310) 670-6969. radioleo@earthlink.net

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

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WANTED: Collins 310B3, 70E8A oscillator assembly w/main scale & Chicago 500W CMS-2 high-level modulation xfmr, Taylor T21. Jerry, W8EGD, CO, (303) 979-2323

WANTED: Stancor/Chicago PCC200, PCO/PS0150, RC8150; Triad A-9-J, A-10-J, A-11-J, A-12-J. **FOR SALE:** Books, send SASE. Richard Robinson, POB 1425, Wallingford, CT 06492. (203) 949-0871, richmix@erols.com

WANTED: BC375/BC-191 xmtr; DM-24 dynamotor. Pete Hamersma, WB2JWU, POB 467, Holderness, NH 03245.

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

WANTED: 2 NOS dial light knobs for BC348. FL10 filter for BC474A. Thanks! Carl, KN6AL, POB 3531 Laramie, WY 82071. (307) 742-0711 kn6al@uwyo.edu

WANTED: Military survival communications equip: radios, beacons, manuals, books, historical info/photos. Daniel Cahn, 3444 Greenwood Ave., Los Angeles, CA 90066. (310) 398-7159. danielc411@aol.com

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

WANTED: RCA 140, 141, AVR5A. GE K80, K80X, K85. Any condx. James Treherne, 11909 Chapel Rd., Clifton, VA 20124. treherne@erols.com

WANTED: Tube-type Hi-Fi & guitar amplifiers by ACRO, EICO, Fender, Marantz, McIntosh, Pilot, Triad, UTC. Rob, CA, (510) 845-2625.

WANTED: Seeking unbuilt Heathkits, Knightkits. Gene Peroni, POB 7164, St. Davids, PA 19087. (610) 293-2421

WANTED: Help! Need manual (copy OK) for Hallicrafters SX-11 Super Skyrider. K9QPM, 12855 Hadley Rd., Lockport, Il 60441.

WANTED: Small 1" panel meters, especially DC ammeters. Send price info. Chris Cross, POB 94, McConnell, IL 61050

WANTED: R390A rcvr, can PU within 300 miles or meet at Dayton; also orig top & bottom covers. Bill, KD4AF, NC, (336) 699-8699

WANTED: Mclaughlin signal splitter; any radios of the OSS; also BC-652/653. Gary, MN, (612) 496-3794

WANTED: BC-610 Parts: coils, tuning units, tubes, cable for speech amp, meters, (anything). George, N1TNQ, (401) 331-1279

WANTED: Transmitters: GO-9; TBW; GF11; BC-AR-430; rcvrs: R-1004 part of GRC-109; RR-2B, goes w/xmtr RT-3. Bob Lackey, W4QBE, 1252 Worley Creek Rd., Lakemont, GA 30552-1612.

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FOR SALE: Repro Nameplates, R-390A generic - $9; 51J-3 and 51J-4 exact replicas - $12. Tom Marcotte, N5OFF, 242 Chestnut Oak Dr., Mandeville, LA 70448. marcotte@iamerica.net

FOR SALE: Copies: Hard to find schematics for radios, also kit radios 1922-1950; manuals: test equip. ham gear. Contact me for prices, availability. Duane Ballew, KB7QZK, 6813 152nd St. Ct., NW, Gig Harbor, WA 98332. (206) 851-4505

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FOR SALE/TRADE: Transmitting/rcv'g. tubes, new & used - 55¢. LSASE for list. I collect old & unique tubes of any type. **WANTED:** Taylor & Heintz-Kaufman types & large tubes from the old Eimac line, 152T thru 2000T for display. John H. Walker Jr., 11015 W. 126th Terr., Overland Park, KS 66213. (913) 782-6455, johnh.walker@alliedsignal.com

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FOR SALE: Collins drum overlays. 75A-2, 3, 51J#. For 75A-4 & KWS-1, specify new/old - $8.50 ea. 2/$15 ppd. Correct colors. Charlie Talbott, K3ICH, 13192 Pinnacle Ln., Leesburg, VA 20176-6146. (540) 822-5643.

FOR TRADE: Two good RCA 833A's for one Taylor 833A; also looking for Taylor 204A, 813, 875A. John H. Walker Jr., 11015 W. 126th Terr., Overland Park, KS 66213. (913) 782-6455, johnh.walker@alliedsignal.com

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FOR SALE: Strong steatite antenna insulators. Lengths from two to fifteen inches. SASE for list. John Etter, W2ER, 16 Fairline Dr., East Quogue, NY 11942. (516) 653-5350

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

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

WANTED: Collins 70K-2 PTOs working or not; IN82A diodes; Bretting 14/14AX manual. Clark, WØBT, KS, (785) 286-2132.

WANTED: Looking for quality rcvr for my AM station, ie; 75A3, 75A4, 51J4, R390A. Tom, W3BYM, (301) 871-7463, W3BYM@arrl.net

WANTED: Searching for RMECT-100 or 389 xmtrs and info about them. David Edsall, W1TDD, 156 Sunset Ave., Amherst, MA 01002. (413) 549-0349, dedsall@crocker.com

WANTED: Mohican; SB-200; SB-220; SB-100; SB-101; SB-102; Knightkit Band Spanner II; Heath GW-12A; GW22A; GW42. Debbie, AR, (870) 857-3366.

WANTED: Test equipment & tube audio amplifiers. Mike Nowlen, WB4UKB, 2212 Burgee Ct., Reston, VA 20191. mike@3dnet.com

WANTED: Navy xmtrs: MQ, TCA, TCE, TCN, TCX, TDE; rcvrs: RAW, RAX, RBD, RBJ. Steve Finelli, 37 Stonecroft Dr., Easton, PA 18045. (610) 252-8211. navrad@enter.net

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

WANTED: Cash for Collins: SM-1, 2, 3; 55G-1; 62S-1; 399C-1, 51S-1; 75S-3A, C 32S-3A; any Collins equip. Leo, KJ6HI, CA, ph/fx (310) 670-6969, radioleo@earthlink.net

WANTED: Tube type shortwave converters, preferably pre-war. David L. Muse, 510 Minturn Ave., Hamlet, NC 28345.

WANTED: TMC GPT-750, TAC Tuner, GPR-90/92 & GSB-1. Alan Gray, W3BV, PA, (215) 795-0943.

WANTED: Hallicrafters S-39 rcvr Skyranger. Bob, K1YJK, CO, (303) 768-9200, k1yjk@arrl.net

WANTED: Knight Star Roamer in working condx. Dave, WA4YRK, dgarner@usit.net

WANTED: 73 mag Sept. '64 issue, xerox of ARC-5 rcvr article done in miniature tubes. K1MBI, 21 Freestone Ave., Portland, CT 06480

WANTED: Eimac 75-TLs & 250-TLs for a project. Bob, WB6DPU, (562) 928-8820, rrjlife@earthlink.net.

WANTED: Walter Ashe xmtr kit & pwr sply. Breck Smith, K4CHE, smithAB1@bellatlantic.net

WANTED: 10 pin female front panel pwr connector for RU-18/19 or CW 4604D aircraft rcvr w/ complete maintenance manual w/parts list, copy OK. Have extra coil sets for sale or trade. Ray Chase, 1350 Marlborough Ave., Plainfield, NJ 07060. (908) 757-9741, enrpnr@erols.com

WANTED: (2) junk T-39 chest unit, broken, any condx; cables. Steve Bartkowski, 4923 W. 28 ST, Cicero, IL 60804.

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FOR SALE: Johnson panel, cabs, refinishing. Done in same finish as new cars. Valiant-1 - $285. Ranger-1 - $250. + shpg. Visa/MC/Am-Xp Dee, W4PNT, Virginia, (540)249-3161 or cel pho.(540)471-7023,http://home.rica.net/soundnmind/forpics

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

HAMFEST: Six Meter Club of Chicago 43rd Annual Hamfest, featuring vintage & antique radios. Sunday, June 11, DuPage County Fairgrounds, 2015 Manchester Rd., Wheaton, IL. (W of Chicago, N of Rte 38, E of County Farm Rd) ARRL & commercial exhibits, buildings open 8 AM. Outdoor flea market open 7 AM. Overnight RV parking available. Info: http://cyberconnect.com/orion/hamfest.htm or (708) 442-4961.

FOR SALE/TRADE: GPR-90, ARC-5 flex tuning cables & dual xmtr racks. **WANTED:** SP-600 JX. Tom Brent, POB 1552, Sumas, WA 98295-1552. (604) 826-4051

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The Collins 75A-4 Video 4 hours - $89.95. This video is four hours of information on how to repair, maintain and restore this classic receiver. Butch Schartau, KØBS, guides you through all aspects of keeping your own 75A-4 running like a top.

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R-390A Addendum Video - $49.95. Another 3 hours and 40 minutes of R-390A information from Chuck Rippel, WA4HHG.

SP-600-JX Video 4 hours - $89.95. Chuck Rippel,WA4HHG, takes us through all aspects of the SP-600-JX—repairs, restoration and modifications. This video is a must for any newcomer attempting to work on the SP-600.

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

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WANTED: Watkins-Johnson or Communications Electronics Inc. info, catalogs, manuals or equipment. Terry O'Laughlin, WB9GVB, P.O. Box 3461, Madison, WI, 53704-0461, 608-244-3135.

WANTED: Hallicrafters HT-1, HT-9, HT-31, 5-T, SX-11, SX-17, SX-25; Howard rcvrs; Harvey xmtrs. Ken Seymour, KA7OSM, 9115 SW 176th Ave., Beaverton, OR 97007. (503) 306-7439 24 hrs. ken.seymour@attws.com

WANTED: 80 & 40 meter xtals in FT243 holders. Howard Weinstein, K3HW, 4041 Ridge Ave. Apt 4-405, Philadelphia, PA 19129. (215) 843-1180. k3hw@arrl.net

WANTED: Merchant ship radio memorabilia, radios, keys, parts, clocks, documentation. Tom Mackie, W2IH.A, 14 Washington St., Jamestown, RI 02835. (401) 846-1200.

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

WANTED: WRL UM-1; 755A; Globe Chief Deluxe. Bob Mattson, W2AMI, 16 Carly Dr., Highland NY 12528. rjmattson@hvi.net

WANTED: Power supply for Westinghouse MW-2 transmitter (Will Pick up). Also, BC-348, Heath DX-60. Gary, WA4ODY, 1626 Evergreen Ln., Seabrook, TX 77586, pyccknn@gateway.net

WANTED: Manual or info on RCA / Radiomarine T-408/URT-12 HF xmtr built for USCG in 1955. Sam Timberlake KF4TXQ, P.O. Box 161, Dadeville, AL 36853. (256)825-7305, stimber@lakemartin.net

ELECTRON TUBES: All types - transmitting, receiving, obsolete, military-- Large inventory. **Daily Electronics Corp.**, 10914 NE 39th St., B-6, Vancouver, WA 98682. (800) 346-6667, (360) 896-8856, FAX (360) 896-5476

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

WANTED: National SW-3, model I version 3 (uses 32-32-30 tubes). Dean Showalter, W5PJR, 72 Buckboard Rd., Tijeras, NM 87059. (505) 286-1370.

WANTED: Keyer paddles of all kinds. Cap, WØXC, CO, (970) 247-0088. capallen@frontier.net

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

NEW RELEASE: Flyer 200. For details send 2-stamp LSASE. Olde Tyme Radio Co., 2445 Lyttonsville Rd. Ste 317, Silver Spring, MD 20910. Ph/FX (301) 587-5280, oldetymeradio@juno.com

WANTED: National SW-3, coils, doghouse ps, National HB-7. Scott Freeberg, WA9WFA, (651)653-2054, scott.freeberg@guidant.co

WANTED: Johnson Viking Valiant II w/TR switch & orig manual. C6ANI, POB N4106, Nassau NP, Bahamas.

WANTED: Any info/schematic for Harvey-Wells SM-1 station monitor, all cards answered. Kelley, W8GFC, 9010 Marquette St., St. John, IN 46373. (219) 365-4730.

WANTED: Postcards of old wireless stations; QSL cards showing pre-WWII ham shacks/equip. George, W2KRM, NY, (631) 360-9011, george2f@aol.com

WANTED: Stancor/Chicago PCC200, PCO/PSO150; RC8150; Triad A-9-J, A-10-J, A-11-J, A-12-J. **FOR SALE:** Books, send SASE. Richard Robinson, POB 1425 Wallingford, CT 06492. (203) 949-0871 richmix@erols.com

WANTED: Complete ARC-5, SCR-274N command set, UK No.19 or 22 set with acc. for museum display. Takashi Doi 1-21-4, Minamidai, Seyaku, Yokohama, 246 Japan. Fax 011-8145-301-8069, takadoi@carrot.ocn.ne.jp

WANTED: Vibroplex bug with a 3 inch wide black or grey base. Brian Roberts, K9VKY, 130 Tara Dr., Fombell, PA 16123. (724)758-2688. k9vky@stargate.net

WANTED: Change-over relay from BC191 or 375; also HV fuse & cannibalized units. Bill Hill, W4ZXW, 510 E. 25th Ave., Cordele, GA 31015. (912) 273-7264.

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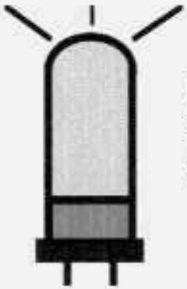

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