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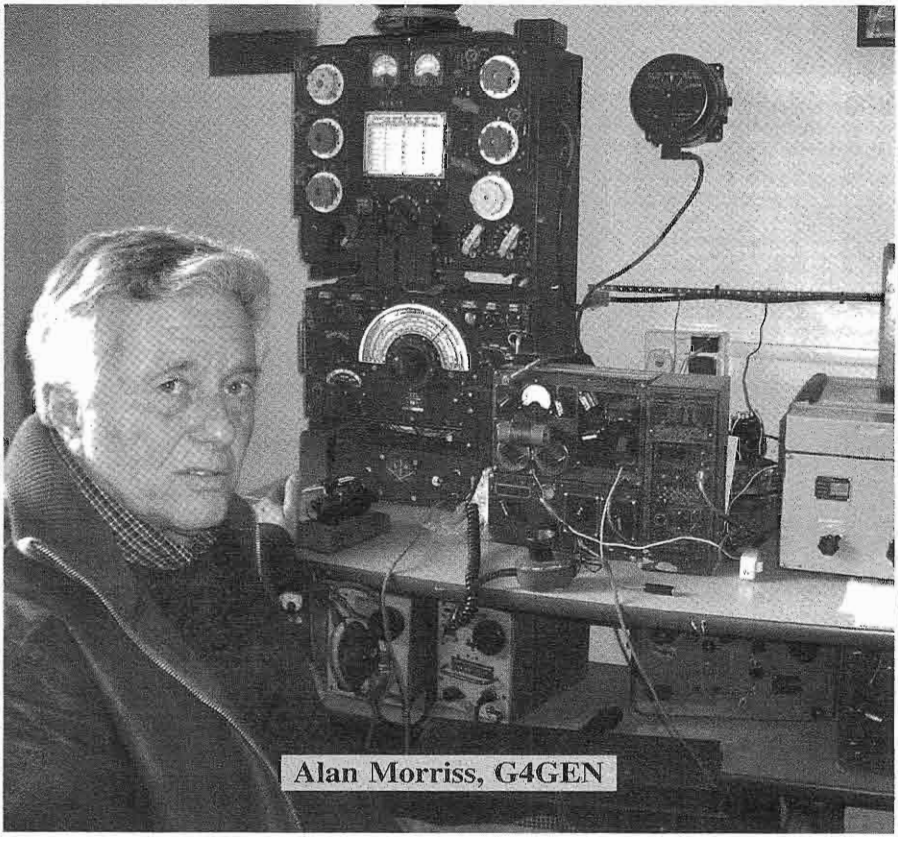
ELECTRIC RADIO

celebrating a bygone era

Number 182 July 2004



Alan Morriss, G4GEN

ELECTRIC RADIO

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Electric Radio is dedicated to the generations of radio amateurs, experimenters, and engineers who have preceeded us, without whom many features of life, now taken for granted, would not be possible. Founded in May of 1989 by Barry Wiseman (N6CSW), the magazine continues publication for those who appreciate the intrinsic value of operating vintage equipment and the rich history of radio. It is hoped that the magazine will provide inspiration and encouragement to collectors, restorers and builders.

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

Regular contributors include:
Bob Dennison (W2HBE), Dale Gagnon (KW1I), Chuck Teeters (W4MEW), Bruce Vaughan (NR5Q), Bob Grinder (K7AK), Jim Hanlon (W8KGI), Brian Harris (WA5UEK), Tom Marcellino (W3BYM), John Hruza (KBØOKU), Bill Feldman (N6PY), Hal Guretzky (K6DPZ)

Editor's Comments

June, 2004 saw an important event occurring at the ARRL's venerable Maxim Memorial Station, W1AW. A dedicated group of AM'ers returned W1AW to the AM frequencies by installing and operating American made AM radio equipment in Newington. Please see Dale Gagnon's article on page 2, and the Photo Section on page 33 for further details. This operation, and others to come, will help AM gain much wider exposure. Let's all be sure to extend a warm welcome and a big helping hand to the new AM'ers which will be surely trying out the mode.

Alexanderson Arc Transmitter on the Air

Although word of this event reached me too late for the June, 2004 issue, I feel there should be some mention made of the historic arc transmitter operating at Grimeton, Sweeden. I think this is the last operational arc transmitter. Quoting a message I received a few weeks ago:

"...Special commemorative transmissions from the 17.2 kHz alternator at SAQ are scheduled for 0830, 1030, and 1230 UTC on 4 July, 2004. The message is expected to include the result of UNESCO deliberations on whether the Grimeton station will be included on the World Heritage list.

In addition, amateur station SA6Q will be operating on 14.035 MHz CW and 14.215 MHz SSB for the annual Alexanderson Day events, which drew 800 visitors last year."

Hopefully, the arc transmitter will be on the air in the future during winter in North America so that quiet radio conditions will permit it being heard by many.

Quoting further from the Nordic HF Conference web site:

"SAQ, officially opened in July 1925 by King Gustaf V, was in commercial service slightly beyond WWII. The Royal Swedish Navy then needed SAQ for VLF traffic to submarines and remunerated the maintenance costs. However, the naval interest decreased and in 1995 the Swedish Telecom decided to close the station, still in perfect working order.

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Alan, G4GEN, with his Marconi T1154 (with its distinctive and colorful knobs), R1155 below, a B2 spy set, and Telefunken E-52A U-Boat receiver. A British Army R109 receiver can be seen under the bench, right. The round unit mounted on the back wall is a type 'J' antenna switch.

W1AW AM Gear Installation, June 18 2004!

By Dale Gagnon, KW1I
9 Dean Avenue
Bow, NH 03304

Late in May the AM community in New England heard from Bob Heil (K9EID) that the Joe Walsh (WB6ACU) donated AM equipment for W1AW was to arrive in Newington for installation on June 18. Bob encouraged us to make an event out it.

On the morning of June 18, I was in contact with several AM stations that were keeping track of us as we mobiled closer to the ARRL Headquarters. I pulled into the parking lot near the brick W1AW building and recognized the structure that I had seen in pictures and in graphics on League materials for decades. In the parking lot a group of at least a dozen other AM ops had gathered and were already taking pictures of the three fellows that had driven all night from the Midwest to make the final segment of the journey that had started months ago in Studio City, CA. Larry (W9AMR), Jeff (KA9TOC) and Jeff (AA9JC) had driven through the night and arrived a few minutes after 10:00 am.

As more AM ops arrived, the equipment was carefully carried in the back of the building and then out the front for a photo op on the doorstep under the W1AW call letters chiseled in stone above. Then the Valiant, NC-303, and associated cabling and audio equipment was carefully installed on a table in the middle of the building. Joe Garcia (NJ1Q), the W1AW Station Manager, had everything in readiness and supervised the installation. Several ARRL members including QST staff were there taking notes and taking pictures. I presented a framed AMI Certificate #1500 for W1AW to Joe and he will keep it there near the equipment location. Every one was cordial and friendly. I think most of the AM people that visited that day had a sense of the history of the W1AW station as they looked around at the museum pieces, pictures, and old photos. I think they also had a sense that this reinstallation of AM gear was appropriate and overdue.

The first contacts on the newly installed station occurred around 11:00 am. Although the equipment transport team were the only ones officially scheduled to operate the AM station on Friday and Saturday, they were very gracious and gave anybody an opportunity to sit down behind the attractive "W1AW" labeled Heil microphone.

As lunchtime arrived, Ed Hare (W1RFI), Lab Manager at ARRL, led all the AM visitors across the lawn and down a block or so to a very nice Italian Restaurant. Ed picked up the tab for the 18 of us that had lunch. It was a very nice gesture and added to the warmth of the welcome we received.

The station was closed to visitors at 3:00 pm for W1AW scheduled transmissions. We toured the ARRL office building before heading out.

Now it's up to the AM ops that live in the Northeast and those who visit from other parts of the country to stop in and operate the station. There won't be AM on the air from W1AW unless AM'ers go there and operate the station. Bob (K9EID) and Joe (WB6ACU) deserve our thanks for making this possible. For more information, go to www.arrl.net and click on "June 21 Vintage Station QRV at W1AW" under "Current Feature Articles".

ER

The AM Scene in the UK
Historical Background and Current Activity

By Dave Gordon-Smith, G3UUR
Whitehall Lodge
Salhouse Road
Rackheath
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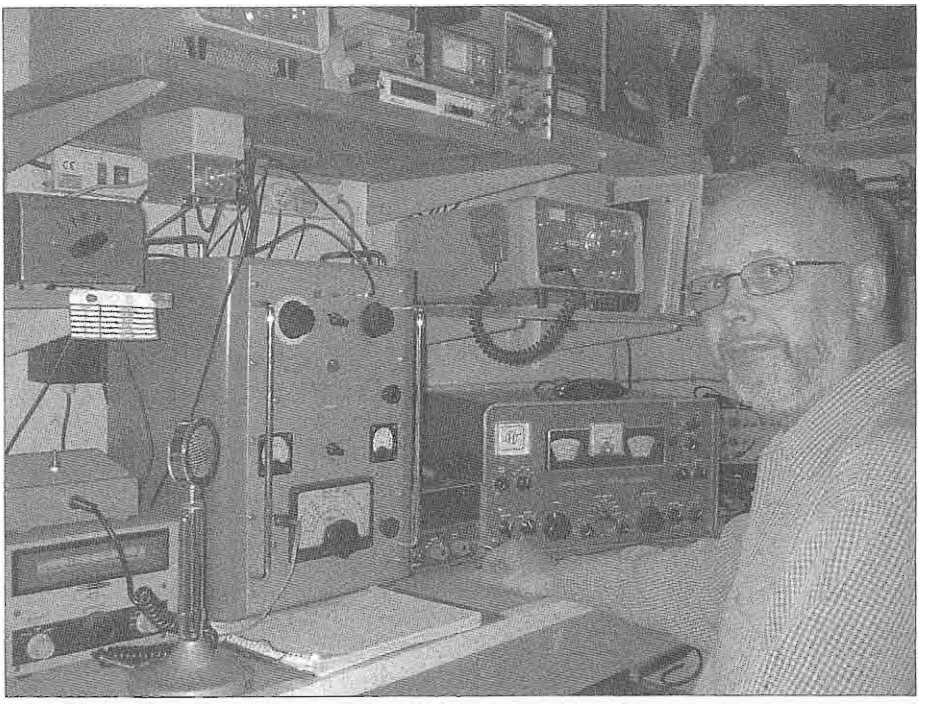
Norfolk, UK.

Although AM activity on the HF bands had pretty much died out in Britain by the late '70s, there was still a strong core of AM devotees on the 160m band, and a small bunch of diehards on 80m and 10m too. The reason for this strong AM following on 160m can be traced back to pre-war days. Prior to World War II, 160m had been popular as a local chat band on AM, and was affectionately known as "Top Band." In fact, for many amateurs it was the main phone band for inter-G working because of the additional restrictions imposed on amateurs operating 80m, and the exclusive use of CW on 40m. ER readers may be amused to know the extent of the 'regulation' that British amateurs had to endure back then. There were very restricting limits placed on the maximum operating time per day and the length of the antenna plus feeder, which were 2 hours and 100ft, respectively, prior to 1934. After 1934, the maximum operating time was increased to all of 4 hours per day, and the length restriction on antennas no longer included the feeder. On top of these rather punitive restrictions, operation on 80m was prohibited for periods of months per year because of military use, and even when it was allowed there were conditions restricting weekday operation. So, phone use prior to World War II was pretty much restricted to local chatting on 160m AM. Top Band (1715 – 2000 kHz) was also one of the first bands to be returned to British amateurs after World War II, and there were no time or antenna length restrictions as there had been prior to the war. However, the power limit was just the same as before the war – 10 watts DC input. "Breakfast Clubs" and "Shaving Clubs" and all forms of AM nets sprang up on 160m as amateurs returned to the air after the cessation of hostilities.

The return of 160m to British amateurs after the war was surprising, especially as there had been much commercial pressure in Europe to deny this band to amateurs ever since the Madrid Radio Conference of 1932. However, very few European countries, apart from Britain, got Top Band back after the war, so the Swedish and Danish Governments who had been pushing to remove all European amateurs from Top Band had nearly succeeded. After the war, there was also a sharp increase in the number of radio amateurs in Britain, and many were eager to join in the fun on Top Band, but new licensees had to wait a year before they got phone privileges. AM on 160m became very popular again for both casual local chatting and club nets. The band was reduced to 1800 – 2000 kHz in 1953, possibly because of complaints from the Danish authorities about interference from British amateurs to their marine services, but at least Britain still had Top Band. Many British amateurs built separate, small, dedicated AM transmitters for this band because of the very low power limit compared with the HF bands, where it was 150 watts DC input. Several commercial manufacturers also produced small 10 watt AM/CW transmitters specifically for the UK 160m band. Really, it was the use of AM for local chatting and club nets, and the uniquely low power limit that



Part of the shack at G3VKM: The tall unit in front of Roger is the RF deck of the Labgear LG300, which runs 150W to an 813 PA driven by a 5-stage 5763 wideband multiplier for operation on 80 - 10m. The VFO dial on the LG300 is the Eddystone 598, baby brother of the famous 898 dial. The modulator (PP 6146s) and PSU are housed in a separate matching cabinet hidden under the operating bench. The Hammarlund receiver to the right of the LG300 is an HQ-170A-VHF. To the left of the photo is an HG-10B, and sandwiched between the LG300 and the HQ-170A you can just see a Hallicrafters keyer. The unit on the shelf above the Hammarlund is a KW Electronics KW204 transmitter.

secured the future survival of AM on the 160m band in Britain.

Post-war, up until 1964, there was really only one level of amateur radio license available in the United Kingdom. This was the full transmitting license (Class A), and you had to be 14 years, or older, to hold one. Then, in 1964, the Class B license was introduced by the authorities. Initially, this allowed operation on 420 MHz and above, though in later years this was changed to 50 MHz and above. It still required a pass in the same technical examination as the full license, but it did not require 12 wpm Morse. However, you still had to be 14 years old, or over, to hold one. Some ER readers, with an interest in the history of Amateur Radio, may have come across references to two different classes of license in Britain prior to 1964. However, this distinction was somewhat arbitrary at that time because newly licensed amateurs were forced to spend their first year of operation on CW only. This period on CW was classified as a separate category of license by the authorities despite the fact that it did not require any additional Morse or technical examinations to upgrade to the other class of license, just operational experience on the air. If amateurs were deemed not to have had enough operational experience during that year on CW,

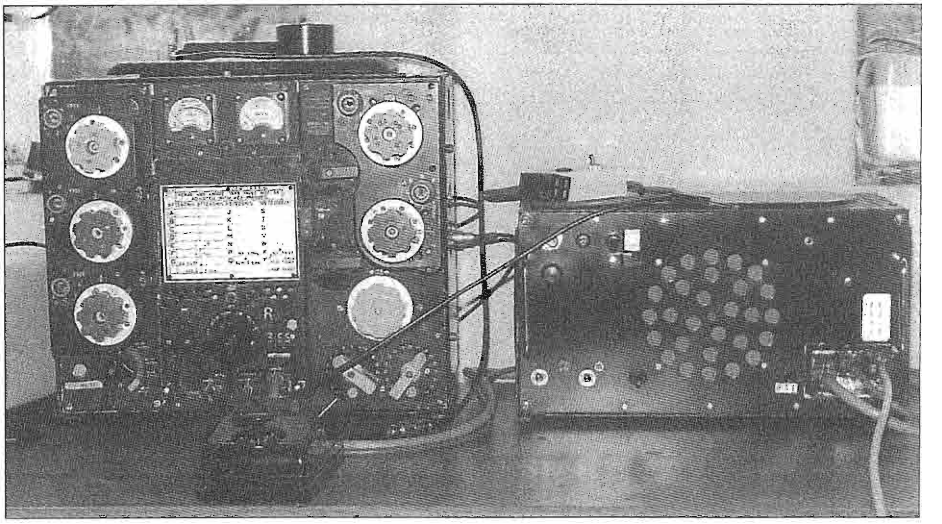
One of several vintage operating positions at G3RXH, Skipton, N. Yorkshire. The transmitter just to the right of Howard is a Labgear LG300. The stack of 3 Eddystone receivers consists of EA12 (top), 888 (centre) and 830 (bottom). A small Codar AT5 160m AM transmitter can be seen sitting on its 250/S power supply to the right of, and level with, the Eddystone 830 receiver.

the authorities could refuse phone privileges until enough experience had been gained. This enforced first year on CW was abandoned in 1957, and newly licensed stations could use phone immediately, if they wished. After that, very many newly licensed amateurs made their first contacts on 160m AM. Even after 1964, I think most youngsters interested in wireless went for the full HF license and started on 160m. So you can see that, while American amateurs have fond memories of their novice days, those of us who were licensed as teenagers in the British Isles have very fond memories of our first days on 160m AM. Certainly, this is one of the reasons I have remained operational on 160m AM for nearly 4 decades now, and I'm sure many others share the same sentiments about the band and the mode.

During the '60s, some of the club and local nets did transfer to 2m AM, but many also stayed on 160m. Nowadays, most of the local nets on 2m have gone over to FM, but I know of one up in Scotland, on 145.8 MHz, that still remains devoted to AM. The level of AM activity on the 160m band in Britain has declined slowly since the '70s as some of the old timers, who were the mainstays of their local nets, have passed away. This has happened to such an extent in some areas of the country that entire nets have folded. The Bristol net in the late '80s, and the Bath net in the mid '90s, both ceased to exist for this reason. The South Wiltshire net also folded when one of its senior members, G5YN, moved to sheltered housing in the late '90s. Some old timers in the United States may remember G5YN, who as the original AC4YN activated Tibet in the 1930s. His call and equipment were taken over by Reg Fox, who

became quite a DX legend until the Chinese takeover of Tibet in the early '50s. South Wiltshire is still represented on AM by G3CMJ, who can be heard on the Southampton Sunday morning AM net, from 0900 Hrs onwards, on 1964 kHz. I can very often hear stations in this net beating with members of the "Frankly Speaking Net" which is 2 kHz higher in frequency. The members of the Southampton net are between 200 and 250 miles from me, so I only hear the stronger stations at low signal strength. The members of the "Frankly Speaking Net" are between 70 and about 130 miles from me. They are generally stronger, but you have to bear in mind that the power levels we use here on 160m AM are quite low, and the strongest signals are still only S5, or so. Although we have had a generous increase in the power level that we can use between 1810 and 1850 kHz, the power level we're permitted to use on the part of the band traditionally used for phone operation has only gone up to 32 watts PEP. This permits us to run 8 watts of carrier out, with a fully modulated AM signal, compared with about 6.5 watts output from the 10 watts DC input we were allowed to run before the increase! So, in reality, the changes to our licensing regulations over the last decade, or so, have not made much difference to AM operation here on 160m. The "Frankly Speaking Net" starts at 0930 Hrs on 1966 kHz, though there are stations warming up the frequency before the official start time. This net derives its name from the two Franks, G5WL and G3BLI, who were two of the original members of the net when it was first formed many, many years ago. It is run every day of the week, not just on Sundays, at the same starting time of 0930 Hrs. G3WWI (Maidstone, Kent) seems to be the 'Master of Ceremonies' these days, and the net consists mainly of stations from the counties of Essex and Kent. These two counties have very strong AM communities, and hold a number of AM nets each week on both 1966 and 1986 kHz. Kent and Essex are also the home of AMPS, the AM Preservation Society. AMPS were formed back in the '70s to keep AM going at a time when it seemed doomed to extinction. The founders are believed to have been G3BLI and G4GVO. AMPS have a net, which is run by G4FCX (Benfleet, Essex) on 1986 kHz every Sunday afternoon at 1600 Hrs.

Sunday mornings are traditionally a popular time for local 160m AM nets. There are nets that have been going since just before, or just after, World War II. Other local nets are not quite as old. My local net here in Norwich, which operates on Sunday mornings at 1130 Hrs on 1952 kHz, was started back in 1980 by G3BNV, G3PZQ and G3TOZ. There are 10, more or less, regular participants in our net, but somehow we only seem to get about 6 or 7 stations on at any one time. Often we have a smaller local net just after lunch on Saturday afternoons, when 2 or 3 of us gather for a chat on 1952 kHz just before we start our afternoon chores. The Echelford Club, down in Middlesex, have an AM net that meets on 1979 kHz at 1000 Hrs every Sunday morning, and I regularly check to see how well the AM net in South Lincolnshire on 1981 kHz, which starts at 1100 Hrs, is coming through before I join my local net. The South Lincolnshire AM Net is probably not the oldest AM net in Britain, but it must rank as one of the older ones. I used to check into this net on a semi-regular basis way back in the '60s, when the late G4OO was 'Master of Ceremonies' for the net. It had been running for many years at that time, and I got the impression that it had been started just after World War II. Some of the AM nets in Kent and Essex probably have the same sort of vintage. Anyway, the South Lincolnshire net is still going strong despite the passing of many of its original members. The current members consist of a few 'old hands' such as Gordon, G3MMS, David, G3RED, Cliff, G3THX, and Colin, G4DDI, and at least half a dozen new recruits who have joined the net in recent years. Howard, G3RXH, has advised me



The Marconi T1154 transmitter used by Gerald, G3LEO, from Belgium (ON8BG) in 1984. This transmitter probably started the revival of AM on 80m in Europe. The transmitter consists of an ML6 oscillator driving a PT15 pentode PA. The pentode suppressor grid is modulated on AM, and the T1154 gives about 18 watts carrier output with an HT of 1000 to 1200 volts in this mode. The unit to the right of the T1154 is a homemade combined receiver and transmitter power supply, with an additional receiver output stage and speaker, all built into an R1155 cabinet. Note the RAF type 'D' key in front of the transmitter.

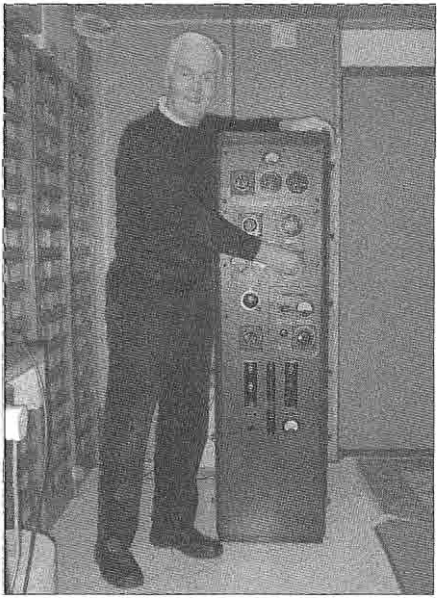
that there is a local Sunday AM net in Lancashire, starting at noon on 1940 kHz, which he regularly joins despite the fact he is in Yorkshire. You may have heard of the rivalry between Yorkshire and Lancashire through reading Shakespeare, or studying the 'Wars of the Roses' in history. Well, you probably learnt about it at school, and then promptly forgot all about it. Most of us did! But up in the North of England, where it all happened, there are still many who haven't! AM enthusiasts are above such feuds, though, and Howard is an honorary Lancashireman for a couple of hours, or so, every Sunday! Sometimes I can hear G4FBG and company, also from Lancashire, using 1963 kHz or 1990 kHz on Sunday mornings. They appear to have an AM gathering at the weekend, as well as on several evenings during the week.

Other AM nets take place around the country on 160m in the evenings during the week. These are held on various frequencies between 1.9 and 2.0 MHz. Examples are the "G2WK Net" in Coventry, which uses 1981 kHz at 2100 Hrs on Wednesday nights and was originally started back in the '60s, and the Shefford Radio Club, which uses 1985 kHz at 1900 Hrs on Monday, Tuesday, Wednesday and Friday nights. The Shefford Radio Club net may be another contender for the oldest AM net in Britain. The slow decline in AM activity on 160m as the number of older operators gradually diminishes with time, which I mentioned earlier in this article, has been reversed to some extent in recent years by returning amateurs and the formation of several new AM nets. Some people are re-discovering amateur radio, and AM, after many years of inactivity due to family commitments and work responsibilities. A relatively new organisation called "VMARS" (see later explanation) has been running an AM net on 1963 kHz at 2200 Hrs on Friday nights for the last 3

The BC375 and BC348 set-up used by Tom, G3TBQ, on 80m from the Wirral. Tom was unable to get any 211s for his BC375 because they're much sought after by tube audiophiles in this country, so he substituted 805s. This is one of the many operating positions which are spread all over Tom's house. There are other operating positions using gear from Collins, Marconi, Bendix, RCA, Panda, Labgear, Heath, ARC and Redifon.

or 4 years, and a net in the Southport/ Manchester area of Lancashire (G4FBG and co.) has also been using the same frequency several nights a week for more than 5 years now. They tend to convene from 2000 Hrs onwards, and on Friday nights make a point of finishing before 2200 Hrs for the VMARS net to use the same frequency. This focus of AM activity on 1963 kHz has encouraged a number of newer amateurs, who used to listen to AM as SWLs in the good ol' days, to give it a try. It has also stimulated more long distance working on 160m using AM over the last few years, and many more casual contacts are taking place between 1950 and 1970 kHz than before. So, you see, the use of AM on 160m in Britain has continued ever since the days before WW II, and currently the AM activity on Top Band is in quite a healthy state.

The good mode survived here on 80m, too, but only just. Many new licensees in Britain in the '70s acquired cheap second-hand AM equipment to get on the HF bands, and this kept AM activity going on 80m throughout the decade. Although AM activity on the band was rather low by the early '80s, it never completely died out. Even in the lean years between 1980 and 1984, there were a few dedicated supporters of the mode, including two old timers, G2XQ and G2BTO, who never gave up AM on 80m and kept the mode going on this band until AM activity was revived by



Jim, G4XWD, one of those responsible for reviving AM activity on 80m in Britain, with the RCA ET4336 which he has lovingly restored. Many of these transmitters found their way to Britain during WW II, but many were also exported to Third World countries after the war, particularly countries in Africa.

Gerald, G3LEO, and other AM enthusiasts such as Jim, G4XWD, from 1984 onwards. Around this time, Jim and a group of friends in the Midlands, including Vernon, G4LVO, and John, G4OAZ, were starting to use their old military AM equipment on 80m. Jim had just passed his Morse test and upgraded from a Class B license to Class A in 1984. This gave him HF privileges for the first time, and he was very active on 80m AM. By 1988, he had acquired an Ex-War Department Austin "Champ" and really was living up to his callsign – XWD. He installed a C11 transmitter and R210 receiver in this small, former British Army "jeep" and operated mobile around his home area, and also from military vehicle events. Both his mobile and fixed station AM operation attracted the attention of other amateurs, and he worked a number of casual AM operators as well as G4LVO and G4OAZ on a more regular basis. In the main, Jim and his friends operated AM between 3674 and 3700 kHz. Gerald's AM revival activity on 80m was prompted by remarks made by Lee R. Chasse (formerly KA3FJM, now N1YDX) and a German amateur (Detlef, ON8BD at the time) who were working at Supreme Headquarters Allied Powers in Europe (SHAPE) in Belgium in the early '80s. They encouraged Gerald to get some of his collection of old military gear going on AM on the amateur bands. This he did by the middle of 1984, signing ON8BG from Mons in Belgium. His first AM contact from there was with Frank, G3DVL, in Brighton during June of 1984. Gerald's preferred equipment at this time was the Marconi T1154/R1155 combination, which had been used by the RAF in Lancaster bombers in World War II. Later, in the summer of 1985, when he had returned to Britain, he started calling "CQ Vintage" on 3603 kHz using AM from Porchester in Hampshire. Over the next 8 or 9 years, he worked a number of AM enthusiasts on 80m who were using a variety of vintage and military receivers and transmitters. As far as I can ascertain, Gerald and Jim were unaware of each other's AM activity until they worked in the early '90s. Other stations who were regularly active at various times during this period included G3LPS, G3MJW, G3NOD, GW3NWS, G3TBQ, G4CCV, G4FHI, G4UJJ, GØDDU, GØEAE and GWØHCB. However, it took the formation of a regular AM net to really get things going on 80m.

Gerald, G3LEO, joined the Military Wireless Amateur Radio Society (MWARS) when it was formed in 1992, and put a note in the MWARS Newsletter suggesting that they should have a net on 80m to discuss technical matters and old equipment. The MWARS committee wanted the net to be on SSB, but Gerald convinced them that it should be AM, so that they could continue to give their old gear an airing every week. The first three nets in April of 1993 (starting on the 9th) consisted of only Gerald and Jim, G4XWD, using the T1154/R1155 combination and WS19 Mk II, respectively. However, after a few weeks they were joined by GØHKH and GØRTU, and then it blossomed as more and more enthusiasts got to hear about it. Paul, GØRTU, later joined John, G3TFC, and Tom, GW3LJS, in taking turns to act as net controller, and did much to foster interest in 80m AM. The MWARS AM Net was run every Saturday morning at 0930 Hrs, and moved around a bit in frequency for the first few years to try and establish a channel that was relatively clear of commercial and loud amateur SSB stations. It gathered an enthusiastic following, but in 1998 a rift occurred between the operational amateurs and the committee of MWARS, and a break-away society was formed by the operational amateurs. This society now encompasses those who are interested in old vintage amateur radio equipment as well as military equipment, and is known as the Vintage and Military Amateur Radio Society (VMARS). Their nets are held on Saturday mornings at 0830 Hrs on 3615 kHz. The task of net controller is shared by G4BQF, G4GEN and GØTBI. You'll hear stations using Collins ART-13s and 18S-4s, many TCS

Alan, G4GEN, sitting next to his 53 set transmitter - the large unit filling most of the right side of the photgraph. This transmitter runs a pair of 813s in the PA and another pair in the modulator. This is the transmitter that Alan is currently using on 20m AM. The small transmitter in the black wrinkle-finish cabinet, with National knobs, that can just be seen above Alan's head is a Diplomatic Wireless Service Mk 33, which nicely matches the HRO receiver sitting on the shelf beside it.

variants, 19 sets, 52 and 53 sets, RCA ET4336s, Bendix TA12s, and many other British and American military and commercial sets on this net. Occasionally, amateurs from the Dutch Surplus Radio Society (SRS) also call into the VMARS net. A few British amateurs also join in the SRS AM Net on 3705 kHz, from time to time. I know that some German, Belgian and French amateurs, with an interest in AM, also monitor 3615, 3625 and 3705 kHz, and I have worked a few of them when the opportunity has arisen. Welsh vintage radio enthusiasts in the Swansea / Neath area, including GW2ABJ, GW4EVJ, GW4KYT and GW8TBG, have an AM net of their own on Sunday mornings at 0830 Hrs on 3615 kHz. Even the Eddystone Users Group (EUG) has a once monthly AM net on 80m now. This is run by Chris, G3XFE, around 3695 kHz on the first Sunday of every month between 0930 and 1000 Hrs.

The regular, non-net, AM activity on 80m tends to be around 3625 kHz, but other frequencies down to 3605 kHz are used to avoid SSB interference, or when 3625 kHz is occupied by other AM operators. The most popular times are between 1200 and 1400 Hrs weekdays, and 1500 to 1900 Hrs any day of the week. The "Boat Anchors Group" holds an AM gathering on 3625 kHz every Saturday morning, which starts at 0930 Hrs and goes on until about 1100 Hrs. The main participants of this group are G3RXH, G3TBQ, G3GXQ and G3LEO. They tend to rotate the gear

they use, and the transmitters can be anything from the old British Olympic T150X to the Labgear LG300, or even a Johnson Viking Valiant. Tom, G3TBQ, seems to prefer his ART-13, 18S-4 or BC375 most of the time, but also comes up on his Bendix TA12, Panda PR-120V, DX-100U, Marconi Globespan or T1154 every so often. Howard, G3RXH, rotates his Labgear LG300 and Bendix TA12 with sundry other transmitters. Wally, G3GXQ, has Johnson and KW Valiants, as well as an LG300. Their receivers vary from week to week as well, and can be anything from RCA AR88s (LF or D models), BC348s, BC342s, or Collins 51S-1s to Eddystones of any variety from the wartime 358X to the more modern EA12. Others join this net on a less frequent basis, including John, G3TFC, who has his own personal museum of airborne military radio equipment at Baginton, near Coventry, and Alan, G4GEN, who often uses his big 53 set in conjunction with an AR88, HRO or Telefunken E-52A receiver. Alan is one of the more active and prominent AM operators in the UK, and has a fine collection of working equipment. He provides military equipment to film makers, and supplied the BC611s and BC1000s used in "Band of Brothers." One of Alan's pet niggles concerns film makers not using equipment authentically, and despite his warning not to have BC611s talking to BC1000s as they did in "Kelly's Heroes," they still went and did it, anyway! So, if you happen to work Alan on 20m AM, don't blame him for this mistake; he did warn them not to do it. The "Boat Anchors Group" also has an afternoon gathering on 3625 kHz at 1600 Hrs on Mondays, Tuesdays and Thursdays, and is often joined by other AM enthusiasts, including Ross, GW3NWS, and one of the real veterans of 80m AM, Frank, G2XQ, from Weymouth in Dorset.

AM activity in the UK on the 10m band was down to a handful of stations by solar cycle 22, but staggered on until interest was aroused again during the peak years of this cycle. Some readers may remember the late GI3NUM, who was one of the small number of UK stations who kept AM going on 10m. Ian was a real enthusiast, and had a marvellous collection of vintage equipment, much of it American. He's greatly missed by the AM community in the UK, and his many friends abroad. Northern Ireland continues to be represented by Ian's old friend and collecting rival, Dick, GI3OQR. Dick can be heard occasionally on 80m and 10m AM, usually with some tasty bit of AM equipment – most recently a Collins 30K-1. During the peak years of the present cycle, articles in the popular amateur magazines in Britain encouraged many 'ricebox' operators to try 10m AM. This caused some aggravation for the vintage enthusiasts, like myself, who had been using modest power and modest antenna systems on the 10m band for many years. Unfortunately, some of these new AM operators didn't appear to know that 100 watts of carrier fully modulated gives our power limit of 400 watts PEP, and regularly flouted our regulations. I run a Ranger II on 10m AM, and it's hard to compete with stations running up to10dB more power as well as better antennas! I can't grumble too much about 'ricebox' operators on 10m AM, though, because after several years of trying to work Alaska for my last State on 10m AM this cycle, I only got it because of a 'ricebox' operator. I'm very grateful to Radio Shack, as well as the amateur concerned! Hopefully, some of these guys might continue to use AM on the other bands now that 10m is no longer viable for regular transatlantic contacts, and even develop an interest in old tube gear. Who knows? Anyway, one major benefit of the influx of British 'ricebox' operators onto 10m AM was that some of the vintage enthusiasts, like myself, were forced to improve their antenna systems just to continue making AM contacts. Consequently, when conditions were really good we were able to work some of the low power vintage AM operators in the States, particularly in the Mid-West and on the West Coast that we wouldn't otherwise

have been able to contact with our old antenna systems. It also opened up the possibility of working further a field, and caused some excitement when DX stations like Jack, KH6CC, Doug, KH6U and David, VK2BA, were coming thru from the Pacific area. Not that I'm a DXer, of course. I'm really more interested in the technical side, but have been known to get carried away by the excitement of working great distances on occasions! It just seems so much more of an achievement on AM, especially with modest power.

Generally, the long-standing AM enthusiasts in Britain are not interested in DX, and consequently don't bother too much about good HF antennas. They tend to use multiband doublets, Windoms or just random bits of wire, and usually aren't very competitive signals on 10, 15 or 20m with SSB, let alone AM. The result of this is that many of them have given up on HF AM, and they just stick to 80 and 160m now. This explains why not too many British vintage AM stations have been heard on HF, apart from the few enthusiasts mingling with the 'ricebox' brigade on10m, and occasionally 15m. The 'ricebox' brigade is not very committed to AM, and tends to come and go as the fancy takes them. I don't hear any of the 'ricebox' operators, who were regularly on 10m AM two or three years ago, on 80m now. Recent changes in licensing here removed the requirement for Morse on HF, and many of the former Class B licensees have now come on the HF bands. A number of these guys have had an interest in old military equipment and AM for a very long time and as a result we have seen a step increase in the AM activity, particularly on 80m. The Welsh contingent, which formerly only included GW3LJS, GW3NWS, and GW4RYK, has now trebled in strength, and a similar sort of increase has also taken place in England. The same cannot be said for Scotland and Northern Ireland, though. Dick, GI3OQR, is still the only consistent Northern Ireland AM operator that I have heard in recent years. As for Scotland, occasionally I hear GM stations on 80 or 160m trying out AM on their 'riceboxes,' but usually I don't hear them on AM again. I only know of two vintage radio enthusiasts in Scotland who are amateurs, and one (GM3WKB) has not been active on the air for years. The other, Cecil (GM0EKM) has been active on 80m AM from the Shetlands in the past few years, but has not been heard recently.

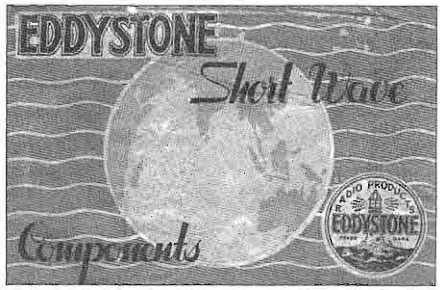
I have not mentioned much about 40m, 20m, and 15m or 2m AM activity here because, in relative terms, it is a very small part of the total AM activity in Britain. There is a small amount of AM activity on these bands in Britain, but operation is generally very sporadic, apart from the 2m AM net in Scotland, which I mentioned earlier. The 40m band in Europe is only 7000 to 7100 kHz, and it is highly congested. Up until a few years ago, the RSGB news service, GB2RS, used to put out weekly news broadcasts on 7047 kHz AM from Northern Ireland. They put down a great sounding signal over most of the UK. A few AM enthusiasts would call the newsreader after the broadcast and have a chat. Since the cessation of GB2RS news broadcasts on 40m AM, the occupancy of this small band has increased substantially because of licensing changes in the UK, and the AM activity has dropped to practically nil. Nowadays, because of the congestion, there are frequent disputes and unpleasant incidents between SSB, SSTV, Data and CW operators about mode sector boundaries, and it would be downright inconsiderate and thoughtless for any of us to use AM on the current narrow band. Almost certainly, it would lead to intermode disputes, and any operators who do try to use AM on the European 40m band these days run the risk of bringing down the wroth of other amateurs, and the authorities, on the heads of us all! We are going to get 7100 to 7200 kHz in a few years, and hopefully we'll eventually get up to 7300 kHz when the broadcasters move out completely. Then, we should be able to join you guys on 7295 kHz. It'll be

great when that happens, and I dare say that you'll rejoice when all the broadcast heterodynes disappear on that band. Until then, we will have to make do with 20m for transatlantic contacts. A few English AM stations are proposing to go on 14.286 MHz on a more regular basis in the future, but our power restrictions, our mediocre antennas, SSB interference and time differences may be against us. I did try 20m AM with a DX-100U some fifteen years back, and it didn't work out too well. The main problems were the lack of activity before 2400 UTC and the world-wide Greek SSB net on 14.285 MHz. Recently, Alan, G4GEN, has been having some success on 20m AM with stations on the East Coast of North America between 2000 and 2300 UTC, so things may have improved. Let's hope so. But if 20m AM doesn't work out for us, then I shall be looking forward to the peak years of the next solar cycle, and hoping to renew acquaintances with the many friendly and enthusiastic AM operators 'over the pond' that I've met on 10m in past years.

Obviously, this review of AM activity in Great Britain is coloured by my own personal experience of operating AM on 160m, 80m and 10m. I have observed the AM scene here from several locations around the country over the last 4 decades, with the exception of a few years in the States and Caribbean. Where I knew my own knowledge was lacking, I enlisted the help of those with particular knowledge to fill in the gaps. So, I think the scene I have painted is a reasonably comprehensive picture of what has happened in the last few decades and what's going on now, but it is not necessarily complete. However, I hope you can see, from what has been said in the preceding paragraphs, that the 10m AM activity you have heard from the UK in the last 3 or 4 years is not at all representative of the real AM scene here. We have a thriving and long established AM community, particularly on 80 and 160m, which might be small by American standards, but is committed and enthusiastic. Many are vintage enthusiasts, but not all. There are some who just like AM, and prefer to build their own equipment with tubes or solid state devices. We're a minority interest group in amateur radio, and welcome anyone with an interest in AM into the fold! We've never given up the use of AM here in Britain and, hopefully, we never will!

I gratefully acknowledge the information and help given to me by Gerald (G3LEO), Jim (G4XWD), Howard (G3RXH), Gary (G3TOZ), Geoff (G3YVF), Peter (G4EVY) and Dennis (G3HCM) in the preparation of this article. The times mentioned in this article are local clock times, unless otherwise specified. We use British Summer Time (BST) for about half the year, starting in late March, and Greenwich Mean Time (GMT) for the rest. BST is GMT plus one hour.

ER



The Original Meissner Signal Shifter

By Jim Hanlon, W8KGI
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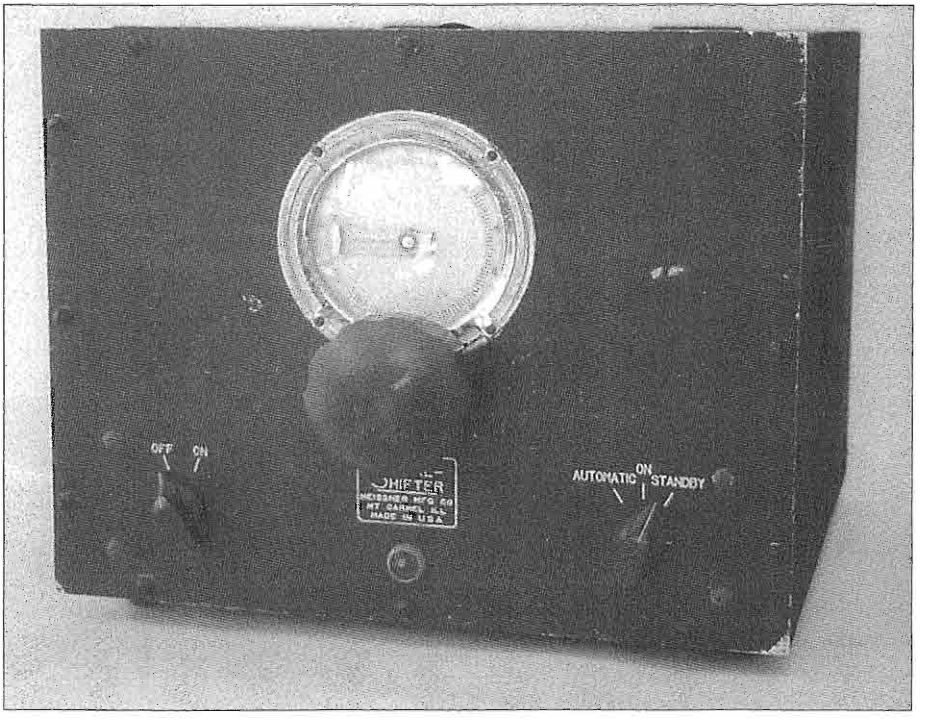
I was fortunate recently to be able to refurbish a first-generation Meissner Signal Shifter for a fellow who had acquired it but who needed some assistance in getting it back on the air. In telling you about this little transmitter/VFO, I will be repeating some of the information first published in my original article on the Meissner Signal Shifter family in ER #72 for April, 1995. I apologize for this to longer-term ER subscribers, but I just can't resist laying out the context of what amateur radio was like in 1938 when the Signal Shifter was introduced so that readers will better understand its significance.

1938 was a year in which the Great Depression had begun to lift and things were getting better economically for everyone including radio amateurs in the United States. At the same time, it was just a year before the Nazi war machine would start World War II in Europe, so things were hardly stable in the world.



The original 1938 Meissner Signal Shifter.

Despite the depression years, Amateur Radio had made great improvements in the last decade. In 1929, the Federal Radio Commission, predecessor to the FCC, responded to the international allocations conference of 1927 and made drastic reductions to the width of the ham bands. That in turn required hams to make considerable improvements in the purity and stability of their transmitters. Readers may be familiar with the single-tube Hartley, TNT and TGTP transmitters that AWA members use in their Bruce Kelly Memorial 1929 Transmitter Contest each December. Those transmitters were the initial response to this rule change, and even though they seem primitive to us these days and their signals are at best a bit watery, they were reasonably stable and mostly free from hum and chirp if they were run from a well filtered and regulated power supply and properly tuned up. They weren't limited to just the small rigs we see today with a UX210 running 10 or 20 watts, either. The ARRL station, W1MK, ran a pair of UV-204A's in a push-pull TGTP oscillator capable of as much as a kilowatt input on 80 and 40 CW! One of the bigger problems with rigs like this was just to get them inside of the ham bands back in those days when no one had dependable frequency standards.

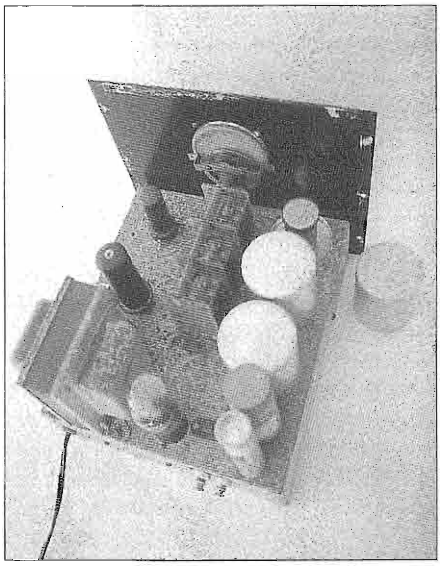
In about 1934 hams made another great improvement by adopting crystal-controlled transmitters. Crystals were just becoming available and they were expensive, as much as five dollars apiece, so most hams had only one or a few of them at best. When you consider that a new Ford V8 cost about $630 that year, you can appreciate how dear that five dollar crystal really was. With crystal control, hams had a pretty good idea, within a few kc at most, of just what their transmitter frequency actually was so they could operate much closer to the band edges without worry. The process of making a QSO generally involved calling CQ on your crystal frequency and then tuning the entire band for a reply. In 1934 you were most likely to be using a regenerative receiver, but by 1938 you had probably traded that for a much better superhetrodyne that was reasonably stable and had good, if not calibrated, bandspread. If you were well enough off it may even have had a crystal filter affording good CW selectivity.

The next improvement to come on the ham transmitter scene was a step backwards to self-controlled oscillators again, only this time they were low power devices designed primarily for stability and intended to be used to drive the higher-powered stages in a transmitter. One of the earliest commercial VFO's to be offered was the 1938 Meissner Signal Shifter. The March, 1938, QST has a full-page add for the new Signal Shifter that describes it in part as follows:

"Unbelievable frequency stability – superior to that of many crystals – obtained by use of special Hi C electron coupled oscillator circuit and dual buffer arrangement to isolate load. Rigid, foolproof construction insures against changes due to ordinary handling and usage. Maximum variation of calibration observed during 21-day actual operation at W8WWI under varying conditions of temperature and humidity was .008% or 300 cycles at the operating frequency of 4,000,000 cycles (75 meters). Frequency shift with load variation, tested during this period, was less than 500 cycles from full-load to no-load.

Entirely revolutionary stand-by system, never before used in apparatus of this type – permits tubes to remain at essentially constant operating temperature whether an exciter is in use or standing-by thus eliminating all possibility of thermal frequency drift.

Selective-Automatic operation – internal relay system permits exciter (1) to be 'killed' with transmitter by present 'stand-by' switch; (2) to remain in operation independent of transmitter for



A peek inside. The three plug-in coils are under the large shield cans. The 6F6 and 6L6 are on the other side of the tuning capacitor. The freckles on the chassis come with age.

frequency-check, etc.; or (3) to remain 'dead' independent of transmitter as when crystal exciter is being used although kept in operating condition and ready for instant use when desired. Any of the three operating conditions instantaneously available by a 3-position selector switch on front panel of unit. Only other control besides tuning adjustment is a simple 'On-Off' switch.

Fully assembled including cabinet; wired and completely adjusted in the laboratory – not a factory-built product – yet priced within the means of the average amateur.

Every unit laboratory-tested for operation and frequency-stability on all bands.

Available with or without built-in power supply.

Coils furnished separately in sets of three for each band. Purchase only those you need for bands in which you operate."

The price for this wonder, complete with power supply and one set of coils, but less tubes, was $39.95. Without the power supply it was $31.95. Considering that the cheapest type BC3 Bliley crystal at the time cost $3.35 and their best type B5 for 20 meters was $7.50, a Signal Shifter was a worthwhile investment for any ham who was considering buying more than just a few crystals.

The Meissner ad in the November, 1938, QST reproduced a number of comment cards that purchasers of the Signal Shifter had returned. They said things like, "A few hours operations with this instrument on any QRM crowded band will convince the most skeptical Ham." "I would not exchange my Signal Shifter for a box full of mounted xtals." "... leaves nothing to be desired in the way of operation." "... giving me results far beyond my expectations especially in the 20 meter band." "I have one of your Signal Shifters, and it is performing beautifully." "There are lots of empty spots on all the bands with your Signal Shifter." "I see no reason for putting money into crystals when such an instrument can be had." "... and for the first time I can get away from QRM instantly." "I haven't missed a single QSO since I put in my Meissner Signal Shifter." "I have been using a Meissner Signal Shifter in lieu of a crystal with my transmitter and have found it to be the exact answer to dodging around QRM that every ham should have."

As you can see from its picture, the 1938 Meissner Signal Shifter is a basic "black box," with what was described as an "airplane dial" on the front and three knobs, one to adjust its frequency, one for AC power on-off, and one to select either standby, "automatic" mode (remote control), or to turn it "on." Inside it has a 6F6 Hartley oscillator with its plate tuned to the oscillator's second harmonic – one of the two "buffer arrangements" that the advertisement above was talking about - in turn driving a 6L6 ampli-

fier also doubling to the oscillator's fourth harmonic except when operating on 160 meters where the 6L6 runs as a "straight through" amplifier. Plug-in coils in the oscillator grid with 4 pins, the oscillator plate with 5 pins, and the final plate with 6 pins, allow band changing. All tuned circuits are tracked and gang-tuned by a three-section variable condenser. This is exactly the same physical and electrical RF layout used in the subsequent Meissner Signal Shifters up until the EX model came out in 1946. The power supply in the 1938 model is a simple 80 full wave rectifier driving a condenser input pi-filter. The later versions of the Signal Shifter added VR105 and VR150 voltage regulator tubes. Voltage Regulator tubes were apparently not available when the Signal Shifter first came out in 1938, at least they are not mentioned in my tattered copy of the 1938 ARRL Handbook.

This first Signal Shifter comes with only one keying option. When the front panel or the remote switch is turned "on," the oscillator stage comes on and runs all the time. The user can, if he wishes, key the cathode of the 6L6, or he can just let the 6L6 run as well and key a later stage in his transmitter. The Meissner was designed primarily to drive a former crystal oscillator stage or another low-powered stage in a higher-powered transmitter. Its output is via a low impedance link, nominally matching to a couple of hundred ohms impedance. Since the 6L6 puts out at about 8 watts, there is usually enough voltage across the output link to allow it to be connected directly to the grid of the following stage through a DC blocking capacitor. If that is not enough drive, the user can link couple the output of the signal shifter to the tuned input of the next stage and easily get enough signal to drive even a pair of 807's to full output. Hams soon found out that the Signal Shifter was quite competent as a stand-alone rig by itself. 8 watts is about 6 db above the output level of a typical UX-210 Hartley running 10 watts input; and especially in the next few years when European hams were put off the air because of the coming of the war, American hams found they could easily work coast-to-coast in the US with their barefoot Signal Shifters.

This particular little rig came back to life without very much trouble. One of its paper bypass capacitors was shorted, and because its owner wanted to use it on the air we decided to replace all of its paper bypasses with new orange drops. It also needed a new set of electrolytic filter capacitors, installed under the chassis with the old can-types left in place so as not to spoil its looks. Its original 6F6 was still perking along, but it needed a new 6L6 and an 80 to round out its tube complement. Strangely, its power transformer had higher peak voltage on one side of its HV secondary to center tap versus the other, but the transformer did not get warm when run for a good while, and the power supply otherwise operated normally. It had fortunately come with a set of 40 meter coils, and all I needed to do was to set the oscillator padder to cover the entire band and then to resonate the oscillator plate and 6L6 padders accordingly. After that it delivered a good 8 watts to my 50 ohm Heath Cantenna dummy load all across the band, it keyed well with no noticeable chirp or click, and it was stable within a few minutes of turn-on. What more could one ask for in a pre-World War Two boatanchor?

The Meissner Signal Shifter family went on through several additional "improved" models beyond this one. By 1940 VR tubes had been added and one could key the oscillator as well for break-in operation. That model also had a panel that was lacquered, polished brass with black painted features and labels, and the frequency control was an external, pinch-drive vernier dial. The 1942 version, now the VFO/exciter for the Meissner 150B transmitter being sold to the military,

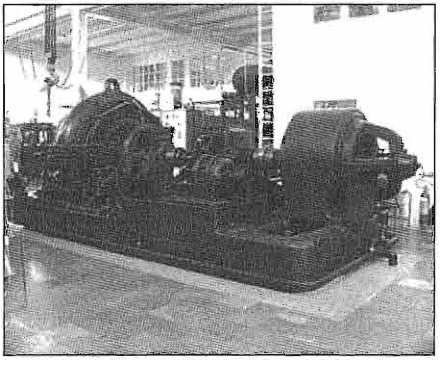
had general coverage output from 1.36 to 12.7 megacycles and had an inside, calibrated dial with a National Velvet Vernier drive. It also included a drawer beneath the regular chassis that held its complete set of 18 plug-in coils. There was at least one model after this one with the internal, calibrated dial, ham-band coverage, brass and black-painted panel, and no coil drawer. All of these still used the same basic 6F6-6L6 lineup of the original model and the same plug-in coils. After the war there were several versions that used a 6V6 oscillator driving an 807 doubler and that had coils, usually for 80, 40, 20, 15 and 11/10 meters, inside of an internal, rotating turret. These models also had a two-window, counter dial instead of direct calibration and a green, magic-eye tube on the panel that monitored 807 grid current. By this time a fully assembled EX model was selling for $99.50, or you could buy a kit and build it yourself for only $64.75. That was a lot to pay for a VFO, even one that covered all of those bands, considering that at this same time you could buy a Command Set VFO that covered 80 or 40 meters for under $10 or a little later a Heathkit VF-1 for $20. So the big, clunky Meissner Signal Shifters faded from the scene in the early 1950's, no longer able to fit into a modern ham shack.

Any version of the Meissner Signal Shifter makes a nice, usable boatanchor transmitter as well as a VFO for a higher powered rig. I have a "1941 Deluxe" model that I use "barefoot" on the AWA and Classic Exchange events on 80, 40 and 20 meters. I use an EX model to drive my 1947 vintage Globe King 275. And I have the 1942, general coverage model as a back-up. It was a particular pleasure to have the original, 1938 model on my bench and to work on it for a while. I wish it and its new owner many happy hours on the air together.

ER

[...Comments, from page 1]

As people prepared themselves to listen to its last transmission, other people started a resistance movement. Interest to preserve the station increased and Grimeton Radio was soon listed as a national industrial monument. The station buildings, the Alexanderson alternator and the multiple tuned antenna system will be kept in working order. The next mission is to get the unique SAQ listed as a Unesco World Heritage."



The Alexanderson Arc Transmitter at SAQ, Grimeton, Sweden. This machine is the last of its kind that is complete and able to be placed on the air. The transmitter building has survived, as has the huge network of LF antennas.

ER

Modifying the Johnson Ranger I and II for PTT

By Hal Guretzky, K6DPZ
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Many Johnson Rangers were produced over the years and they did not have push-to-talk (PTT) capability. Current AM operators would rather have PTT available because it is easier than reaching over and throwing the standby/phone switch. It is easier to just leave the switch in one position, key the mic, and be able to switch the antenna relays, mute the receiver, and also place the Ranger into transmit. PTT modifications have been published in the past, but I've come up with an easy method that I would like to share.

Most of the early modifications involved using a high-impedance relay, and a lot of extra parts to get the keying circuit to work[1]. My approach is to use a 6 or 12 volt DC relay, which is easy to find, and put it in the center tap of the Ranger's power transformer. By doing this, the relay is energized and held down whenever the Ranger is turned on. When the microphone PTT switch is closed, it releases the relay automatically as the schematics show, and the Ranger goes into transmit. The external antenna change-over relay is activated to switch from transmit to receive. I have found that this method works very well, and is

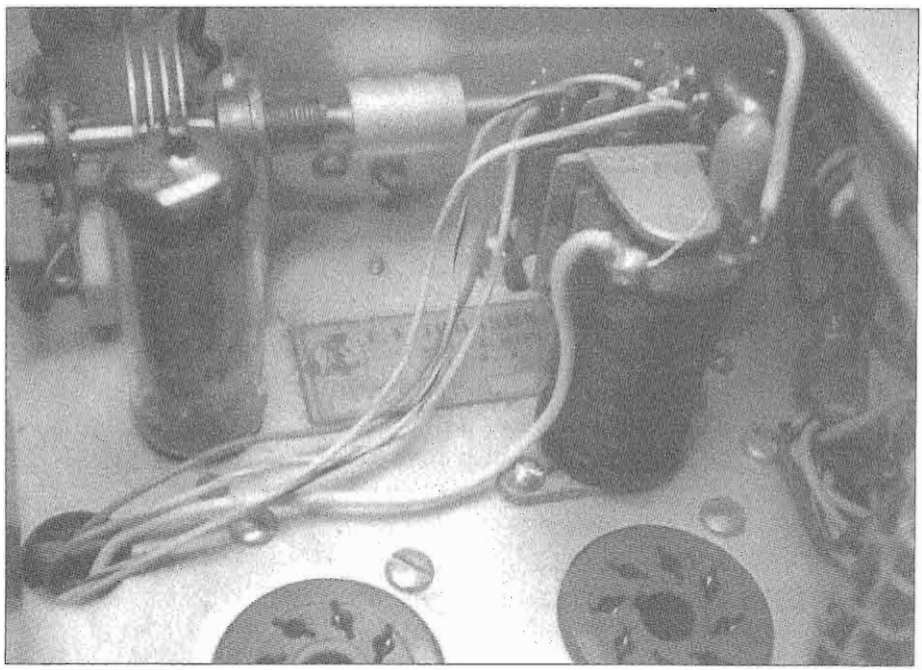


Figure 1: Mounting location and wire routing for the Radio Shack relay I used with the Ranger PTT modification.

good for both versions of the Ranger transmitters. I have done this on many Rangers and have had no problem with the circuit.

The relay can be purchased at Radio Shack. It is a 2-pole, 12 volt relay. A 6 volt relay will also work as long as it is a 2-pole style.

The picture in **Figure 1** shows the relay I used and where I mounted it on the Ranger. The same mounting location can be used for the Ranger I and II because it is open on both models. There is an existing hole for bringing the wires from the switch SW-4A to the relay.

Looking at the schematic in **Figure 2**, across the relay is a little 47 µF electrolytic capacitor. Be sure to follow the polarity in the schematics by connecting the positive terminal to ground. This part takes any hum produced in the power supply off of the relay and keeps the relay points from vibrating and chattering.

From the top of the relay there is a lead which goes to pin 2 of plug J-1, which is the mic plug on the Johnson Ranger.

Referring to **Figure 3**, for the Ranger II, on switch wafer SW-4A I've shown two "X" points on the schematic. What needs to be done is to lift R9 and R12. The ends which are lifted are tied together, and that point goes to one of the relay contacts, #C. The "B" contact goes back to the switch SW-4A. R9 and R12 are shown in the highlight of **Figure 5**.

For the Ranger I, the only part lifted is the end of R12 which goes to SW-4A. R9 is not present because there is no 6-meter doubler tube.

Figure 6 is a photo showing how the relay is connected to the external relay control plug on the back of the Ranger.

[1]Ranger PTT modifications have appeared in ER #46 (2-93) and #131 (3-00)

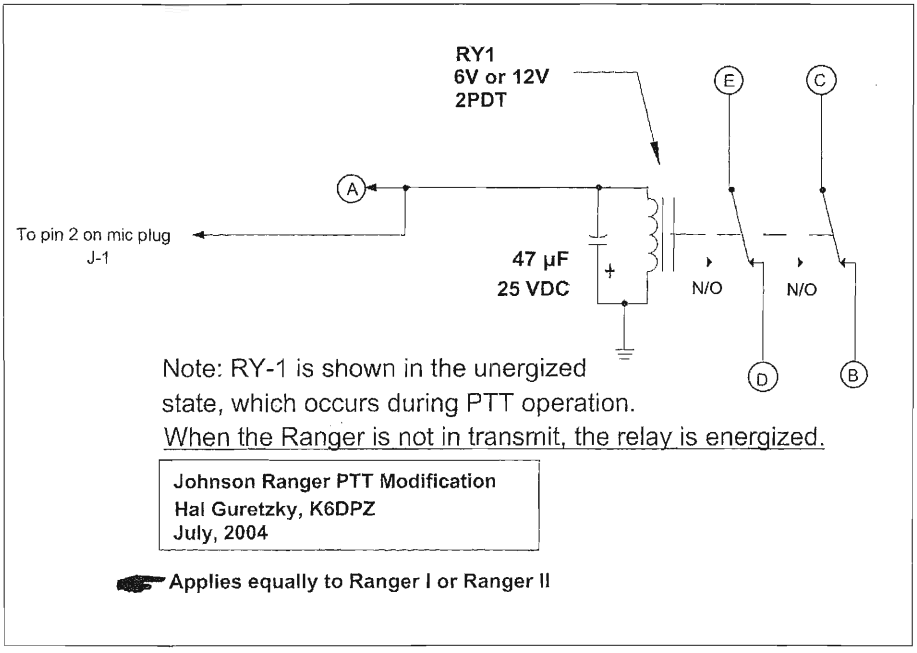
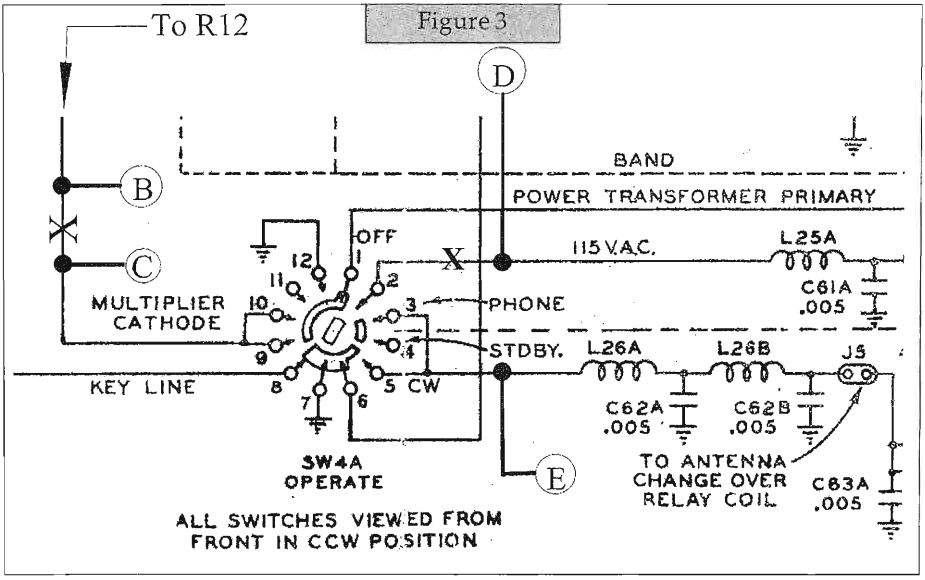
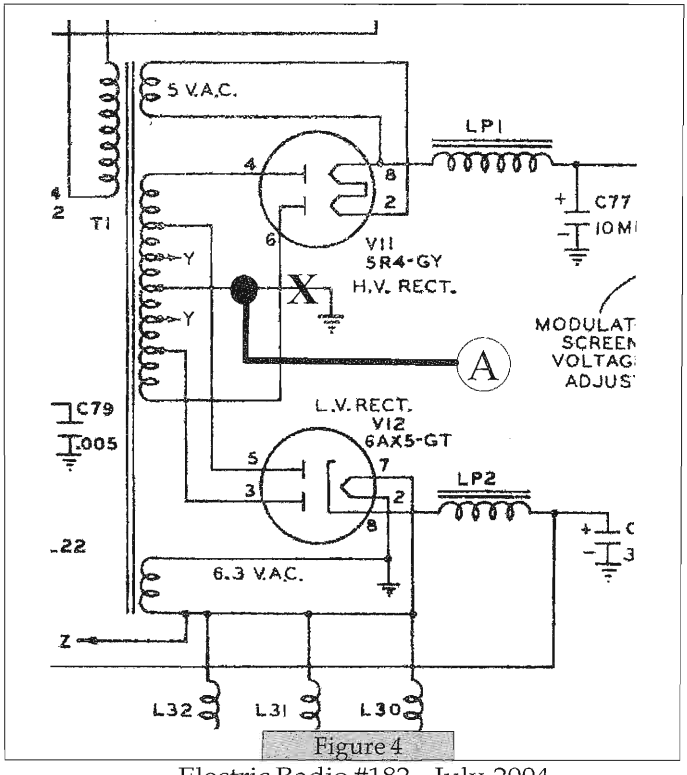


Figure 2: Wiring diagram for the new Ranger PTT relay. The circled letters correspond to lettered points in the schematics of Figures 3 and 4.



Figures 3 (above) and 4 (below): These are partial Ranger I schematics which show the locations of the changes to the transmitter for PTT operation. The "X" indicates a lifted connection, and the circled letters go to the schematic of Figure 2.



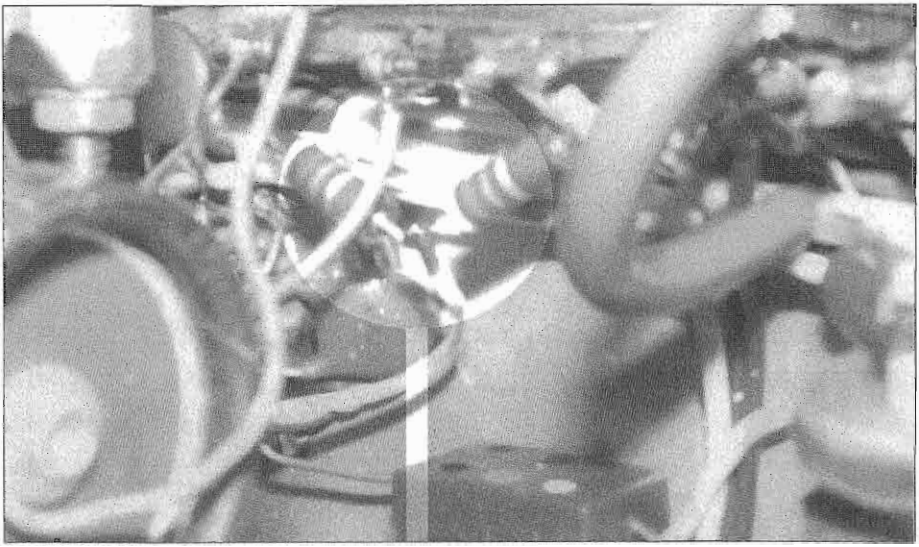


Figure 5: The highlighted area in this photo shows how R9 and R12 (470 ohms each) have been lifted from their original position in the Ranger II and the wire which runs up to the new PTT relay. This area is in the center of the Ranger II chassis, near a terminal strip. Note that the Ranger I does not have a R9 because the 6-meter doubler, V15, is not present.

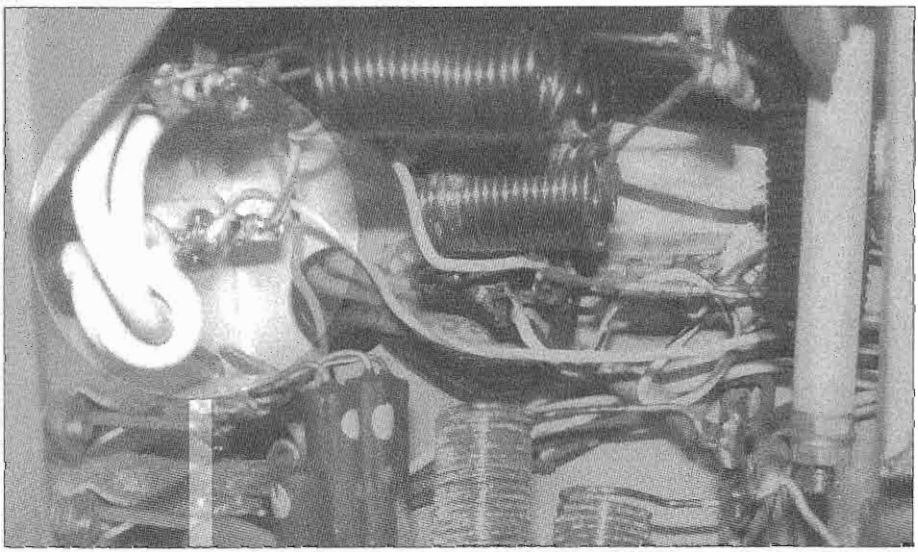
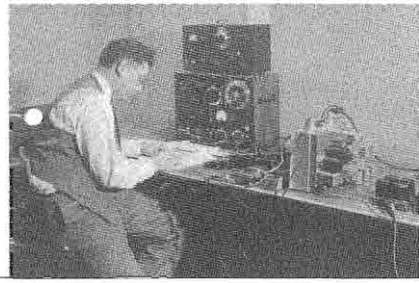


Figure 6: The highlighted area in this photo is a closeup of the white, rear-mounted ceramic crystal socket that Johnson used for the external transmit/receive relay connections. The wires which run to the new relay are to the right of the highlight.

ER

The Restoration Corner



The Restoration Corner can run only if restoration topics are sent in to Electric Radio!

Cheap and Easy Power Supply Protection

By Joe Sloss, K7MKS
4732 119th Ave. SE
Bellevue, WA 98006

Fuses have traditionally been installed in the primary circuit of a receiver power transformer as protection against damage in the event that components "downstream" become shorted or draw excessive current. Whatever the reasons were, many vintage AC operated receivers did not have fuse protection, including some that were considered top of the line.

The addition of fuse protection is relatively simple and can be done by the installation of a fuse in the AC input hot lead. A preferred method installs a new 3-wire line cord with the fuse again in the hot lead. These fuses are usually rated at 1 to 2 amperes which offer component protection in the event current drain exceeds the fuse rating. The Hammarlund HQ-120 which I am restoring has factory provisions for a 1 ½ amp fuse which is acceptable if total current through the power transformer does not exceed this amount. Little protection is offered in the event that a partial high voltage (HV) short or capacitor leakage increases current drain to a value less than the fuse. In this instance the power supply components may be subjected to overheating and possible failure.

Fortunately, there is an easy and inexpensive method to offer HV current protection to the power supply. The installation of a #47, 6.3V, 150ma pilot lamp, wired in series between the power transformer HV center tap and ground, offers 150ma of protection to transformers and filter chokes. Other pilot lamps, with different current ratings, can also be used. An additional advantage to a fuse lamp is the slight voltage drop which makes life a bit easier for the radio when used on higher line voltages. In the case of the HQ-120, which draws about 90 ma of HV, the lamp causes a voltage drop of approximately 2 volts. Voltage drop may vary from this amount depending on the current requirements of your radio.

Each installation will vary so I'll leave that to you. I usually tack solder the tip of the lamp to a convenient ground point and then solder the HV center tap lead to the case of the lamp. This arrangement has worked well as there is usually little physical stress on these connections. The pilot lamp will illuminate when current starts to pass through; mine glows softly with the

HQ-120's HV current draw. Heat generated by the lamp is inconsequential.

Does it work? You bet it does! I installed a fuse lamp in my HQ-120 followed by replacement of three 450V electrolytic capacitors in the 2-filter choke power supply section. For whatever reason, I carelessly installed one of the filters in a reversed polarity configuration and applied power to the receiver. I still recall the smell and mess of an exploding filter cap the first time it happened in a homebrew Novice transmitter. It could have been costly to the Hammarlund's power supply components, but the quick action of the 150ma "fuse" spared 2 chokes, 2 correctly wired capacitors, and a transformer from damage.

Restoration of the HQ-120 is complete and it performs as well as it did when it left the factory decades ago. I cannot take credit for this "fuse" idea as it has been around for years but perhaps is not well known by some who treasure vintage equipment. Try it; you may be glad you did.

My thanks go to Colin Lamb, K7FM, for his comments and proof reading.

A Unique Method of Neutralizing HF or VHF Amplifiers

By Bob Ahmann, W7SC
3932 S. Mesa View Ln.
Boise, ID 83706

When constructing or tuning up an amplifier for HF or VHF, there is a way of adjusting the neutralization which I have used with good results and haven't seen in any literature.

It involves driving the plate circuit of the stage to be neutralized with another transmitter, or the driver, if it can be properly coupled.

In my case where I use a triode with link coupling in and out, the proceedure would be thus:

a) Remove the plate voltage and any fixed bias.

b) Connect the auxillary exciter to the plate circuit output connection and tune the plate and grid circuits for a mixiumum reading on the grid current meter.

c) Adjust any neutralization capacitors for a null, which will be deep and sharp.

If you are using an old BC rig, take another transmitter and check the neutralization by this method. The old way where you watch the grid and plate meters for a simultaneous maximum and miniumum is OK, but this way is better; after all, the purpose of neutralization is to keep RF in the plate circuit from showing up in the grid circuit, and this proceedure does just that.

I have used this on VHF gear with 4CX250B's with good results. It goes without saying that if you cannot get a null on the grid meter, you had best look to your construction and shielding for a solution.

ER

From Radio Magazine, February 1938.

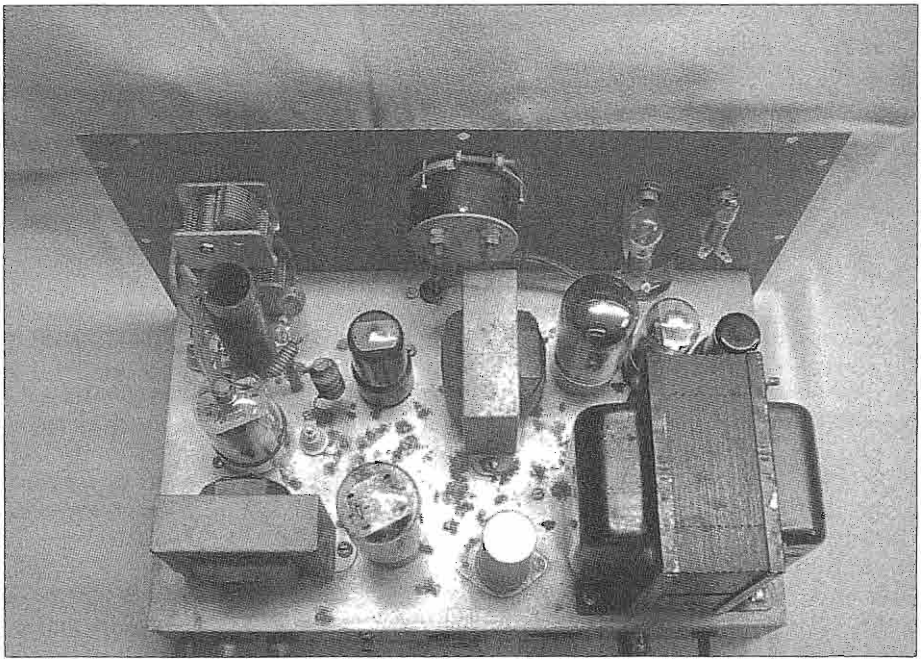
The Globe Scout 65A

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

We have been told many times that confession is good for the soul; well, I am about to make a confession. I am a collector; I have been a collector for several years and will probably be a collector for the rest of my life. There, I have admitted my one weakness in life. Collins equipment has dominated my collecting habit for the past twenty-five or so years but now I find myself thinking and looking at the radios that were used in my shack during my younger and impressionable years. The fifties were the best of times to grow up and be involved in amateur radio. Everything was made in America, from the TV in the living room to the car in the garage and all the amateur equipment was full of tubes. You had to warm up the equipment if you wanted to make a contact. Some times it might take thirty to sixty minutes to get the receiver stable to the point you did not need to keep one hand on the band spread knob.

Yes, I must truthfully admit I like to collect equipment from the fifties and make no excuses for doing so. Ham radio to me almost fifty years ago was a Hallicrafters S-38C and a Heathkit AT-1 and I thought when I had that combination in my possession the collecting habit would be satisfied but sadly that was not going to be the case. Something more was needed, maybe the second rig in my shack would quench the desire. In 1955, after filling several pages of the ARRL log book with nothing but CQs and no responses, I knew something must be very wrong. As a teenager with limited resources and certainly limited knowledge, the problem, so I thought, was the amount of power the AT-1 was putting out. If I only had more power, all of my

The Globe Scout 65A, made by World Radio Laboratories

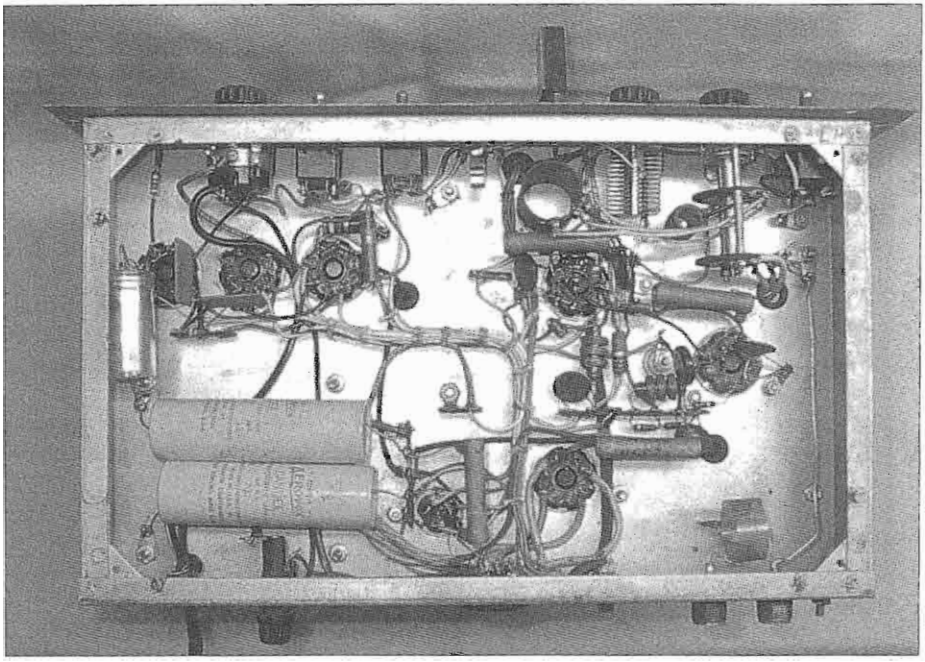


A top view inside the cabinet shows the compact 6-tube layout that WRL used in the Globe Scout 65A.

problems would be solved. As I think back now, how sorry I feel for the little 6L6 in the AT-1, running it totally off resonance and having no idea what a dip in the plate current was all about.

Into the pages of the World Radio Labs catalog I went to find a rig that was on the cutting edge of amateur radio and might increase my QSO rate. There were many transmitters to choose from. The Harvey-Wells TBS 50, Johnson Adventurer, Lysco 650 and even the Eldico TR75-TV were possibilities, but the Globe Scout 65A kept drawing me back for a second look. Here was a transmitter that was advertised to have 65 watts on CW and 55 on phone. This was a major increase from the 25 watts that I thought I was getting out of the AT-1 and the 55 on phone was great because I was about to advance to Conditional Class. It had the new 6146 tube in the final and included band switching from 160 meters through 10. It also had something called a pi-network that would match any antenna impedance from 52 ohms to 2000 ohms, whatever that was, surly my wire fell some place within these figures. It came in kit form, but after my experience with the Heathkit AT-1, I was somewhat timid about trying another soldering job on the dinning room table. The WRL catalog also said that I could have one of these beauties in my possession for only nine dollars down and eight dollars per month for twelve months. I might even get a few dollars for my AT-1 on trade-in even though I could not under oath say that it had ever made a real contact, but maybe they would not ask for that testimonial.

My parents were not much inclined to purchase anything on time payments so after I pleaded my case before them, a new wired and tested Globe Scout 65A was ordered. While I was doing so well on the financial front, it was stressed that a used, Hallicrafters S-40B would be an



Neat wiring and a well thought-out layout are evident below the chassis of the 65A.

essential requirement in case my new transmitter was heard some place other that on the family TV and someone might really return of my many unheeded CQs. With only three months remaining on my Novice ticket, and discovering that if the plate current is tuned to its lowest point, things really began to happen. The log book took on a new look, calls of other amateur stations were recorded and I really knew I had joined the ranks when the first QSL cards began to arrive.

That old 65A served me faithfully for many years and took me into my Conditional license privileges with AM phone and the many discoveries this great hobby has to offer. I do not even remember what I traded it in on, but it remained in the back of my mind these many years. It is becoming harder and harder to remember the many different receivers, transmitters and transceivers that have been used at KØDEW, but the fond memories of the Scout resurfaced after these many years. After much searching an S-40B was found that looked very much like the one used years ago, but the 65A was much more difficult to find. Many hours, and miles of walking at hamfest flea markets, yielded little more that junkers that did not do justice to my original transmitter. Then, much to my surprise, a very nice looking Globe Scout 65A appeared on ebay. As fate would have it, I turned out to be the high bidder, and within a few days my second transmitter was in my radio room.

The 65A can not be described as an engineering marvel, but its circuitry served very well for the Novice in the mid-fifties. The oscillator circuit was designed primarily for crystal operation; however a VFO could be added with only the addition of a .005 mf condenser. Later models, after serial number 4800, had a switch that allowed the addition of a VFO such as either the Johnson or Heathkit VF-1. This stage utilizes the

ever faithful 6V6, unlike many of the two stage transmitters designed during this time. The more popular choice for an oscillator tube might have been the 6AG7, which had it origins as an oscillator going back into the 1940's. The 6V6 tended to overdrive the final stage on the lower bands and it was even suggested, almost commanded, that this stage be detuned to keep the final grid current at 3 milliamps. Above 3 milliamps of drive current, the class C final tended to become very harmonic rich and cause TVI problems.

The final RF stage in the 65A is a 6146. It is self biased with a 450-ohm resistor in the cathode to protect it from drawing too much plate current in case of failure in the oscillator stage. CW was accomplished by keying both the cathode in this stage and the oscillator. This, as it has been pointed out before, places high voltage on at least part of the telegraph key and made for some very fast hand removal when conditions were right. This sudden, electrifying experience some times made it difficult for the operator to return to the QSO in progress. I, however, had the mind set that it was like getting thrown from a horse, that it is best to get back on as soon as possible.

The 6146 operates straight thru on all bands except for 10 meters where it becomes a doubler. The operator may use crystals cut for 160, 80 or 40 meters. 40-meter crystals may be used for 20 meters and above, but problems could be encountered by doing this. For 20 and 15 meter operations, there are two resonance points in the oscillator tuning range, and also when operating on 10 meters. The WRL engineers caution the operator to use the tuning point that doubles in the final. If this instruction is not followed the transmitter will have more RF just above the 40 meter band than on 10 meters. The relationship between a fundamental frequency and its harmonics was a common problem to many Novice operators which resulted in the Official Observer's, and even in some cases the FCC Monitoring Stations, sending mail that was less than welcome. The one QSL a young Novice operator did not want to collect was the one from Grand Island, Nebraska. Matching the final stage to the antenna is accomplished with a pi-network that was well designed and will truly match antennas that are not a pure 50 ohm resistive load.

The power supply design is very common for its time and the only thing of interest is the auxiliary socket on the rear in case the operator wishes to run the rig in a mobile installation. This is very unlikely because of the size and weight of the 65A, but when I remember some of the mobile setups of the time, some Scouts may have been put in the family car. The 5U4 is very adequate for the 500 volt supply. If this transmitter had used true plate modulation with two 6L6's with a big center tapped modulation transformer, a total redesign of the power supply would have been required.

The modulator circuit is somewhat unique and I find it very interesting. The 65A uses plate modulation but accomplished this with a modified Heising type modulator. Other articles have been written expounding on Heising modulation and I will not go into details now, other than to say it was a very ingenious way of modulating the 6146 without the need of a second 6L6, a big, heavy modulation transformer, and doubling the size of its power supply. By checking the schematic of the 65A we see that the screen as well as the plate of the 6146 are modulated. This makes for a good sounding AM signal without the added hardware. This make for a much better sounding AM signal than was found in the Heathkit DX-35 or DX-40 with their controlled carrier type modulation.

There was no push-to-talk on the 65A and the operator had to throw a toggle switch into the upright position to accomplish the task of going to the transmit mode. To a young person with less

than a year's experience in amateur radio, this gave the operator a feeling of power to not only hear the switch engage, but to witness the less than silent Dow-Key relay that changed the antenna from the receiver to the transmitter. There was not a KW transmitter on the planet that made any more noise. For the CW operator, and because I operated mostly CW, I later added a Transition T-R switch. That made my radio operation less noisy but took away the psychological advantage I had with the Dow Key.

This 65A arrived in very good condition. The only major problem I encountered was that someone had painted the entire chassis with an aluminum paint to cover several spots of rust. The rust did not bother me as much as the paint, so it was removed with paint thinner. The wiring was carefully gone over because some mods had been done that I had no knowledge about. Investigation found that an attempt had been made to add an outboard modulator which was not in keeping with my reasons for the purchase and the mods were removed. With an addition of a Dow-Key relay, the S-40B, and a crystal in the 80 meter novice band, I was on the air.

My original 65A was eventually traded off to World Radio Labs or Allied Radio in Chicago, or maybe to Walter Ashe in St. Louis and was replaced with, I am sure, the rig to end all rigs and was soon forgotten until I entered my second childhood or whatever we call the state of mind where we want the radios of our youth. My third transmitter surely made an impression if only I could remember what it was. Now let me see, was it the Hallicrafters HT-37 or the Johnson Ranger? I bet if I had either one this in my possession this collecting thing would stop nagging and I could get on with old age.

ER

The RF-LO Tracking Problem in Superhet Receivers Part I

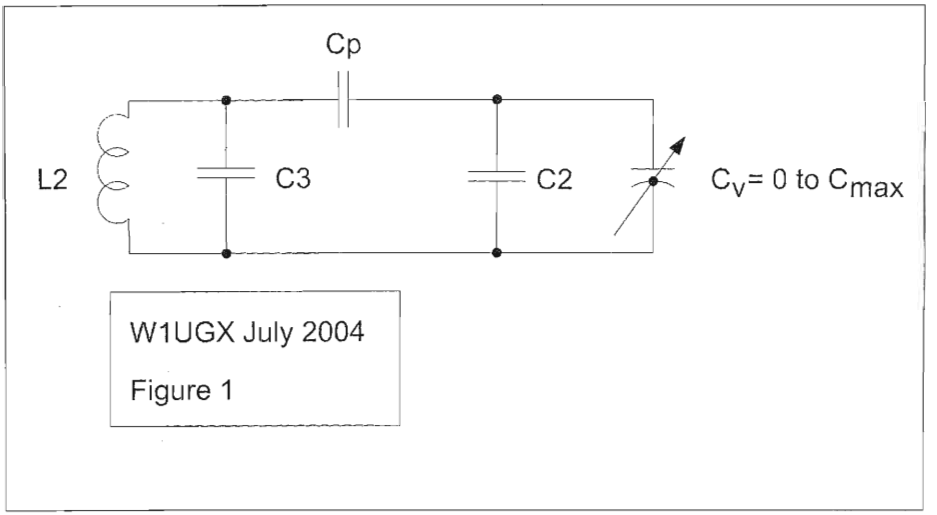
By Joel Eckstrom, W1UGX
PO Box 391
Cabin John, MD 20818

Near the beginning was the TRF, and it was made real and played among us and we were pleased. The multiple knobs that had to be properly set to tune in a station were a small price to pay for the novelty of being able to listen to local and DX broadcasting stations.

Eventually the novelty of multiple knob twiddling wore off, and gang tuning was born - only one control for tuning purposes. The ganging posed no real design challenges—each circuit was tuned to the same frequency, so it was simple to make the coils identical, and likewise the tuning capacitors and padders (if used). If perfect tracking did not result, no matter, since the loaded coil Q's were not very high and a little variation in the LC resonant frequencies (resulting in small gain loss and distortion) would hardly be noticed by the listener. However, if the tracking error was large, serious consequences could ensue. For example, let's consider an RF single tuned circuit with a Q of 100, operating at 1 MHz, so that the bandwidth would be 10 kHz. Now suppose for some reason that there is a 5 kHz tracking error, and the received signal is DSB AM with a bandwidth of a few kHz. Now the carrier will be at one of the -3 dB points on the selectivity curve, meaning less signal gain in the receiver. Worse yet, one sideband will be enhanced relative to the carrier, while the other will be attenuated, leading to distortion (possibly severe) in the demodulated signal. So this simple example shows that tuned circuit tracking errors can be an important consideration in receiver design.

Now along comes the superhetrodyne (thank you, Major Armstrong) which had the obvious advantages of providing much better control of selectivity, among other features. But now, the ganging problem was complicated by the fact that the RF circuits are tuning over one range of frequencies, while the local oscillator (LO) is tuning over a slightly different range. For example, if the LO is always higher than the signal frequency by the value of the intermediate frequency, then if the RF tuned circuits cover the range F_1 to F_2, the LO must tune from $(F_1 + F_{IF})$ to $(F_2 + F_{IF})$ and at any LO frequency, F_{LO}, in this range the RF signal frequency will be $(F_{LO} - F_{IF})$. Now, if this RF signal frequency differs from the center frequency of the RF tuned circuits preceding the mixer, a tracking error (T.E.) is said to occur. It will be defined here as T.E. = actual RF signal frequency being converted to the IF frequency minus the center frequency of the RF tuned circuit or circuits through which the signal has passed before arriving at the mixer.

When the difference $(F_2 - F_1)$ is small compared to F, and the IF frequency is not too high, the tracking problem can be essentially solved using suitably chosen coils and trimmer capacitors shunted across the (assumed equal) RF and LO tuning capacitor sections. This approach is fine for single Ham or SW band coverage, but may produce excessive tracking error when multiple band or general coverage receivers are desired. For example, suppose one wants to cover the 80 and 40 meter Ham bands continuously, with a 500 kHz IF. Calculations made by the



author show that tracking errors of 50-75 kHz will occur at some frequencies, depending on where the two points of zero tracking error are chosen. This is too much error, when modern hi-Q RF circuits are used to reject images and adjacent channel interference.

An old method of dealing with this problem involves putting a suitably chosen fixed capacitor in series with the LO tuning capacitor (assuming that the LO frequency is higher than the signal frequency), thereby getting zero tracking error at 3 RF frequencies, instead of two. The inventor of this technique is unknown, but a recent article in the January 2004 issue of the RSGB RadCom magazine dates the idea to 1931, while also pointing out that the pre-war National HRO did not take advantage of this idea!

With the series capacitor in place, the LO tuned circuit looks like **Figure 1**, where C_v has the same range as in the RF circuits and now we have 3 capacitor values; C_2, C_3, & C_p, together with L_2 to compute. The advantage of this approach is that much lower tracking errors can be achieved, and if the design is "done well" the tracking error curve will something like that shown in **Figure 2**.

Note that there are now 3 points of zero tracking error —one in the middle

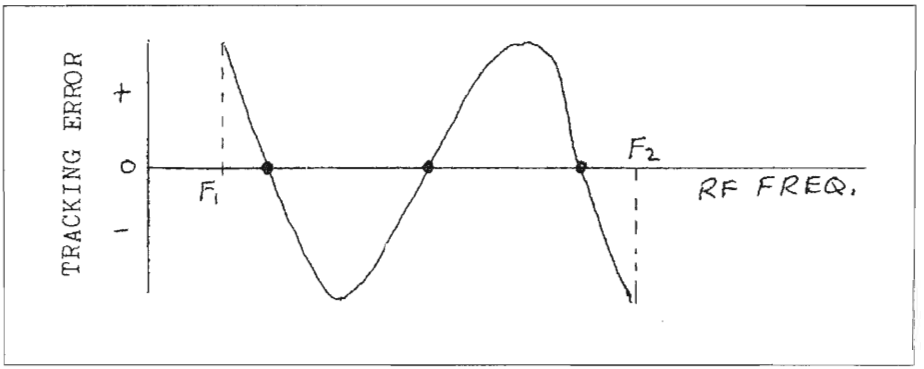


Figure 2: Typical good 3-point tracking error curve.

of the RF range, one above the lowest RF frequency, and one below the highest RF frequency. The idea is to choose the 3 frequencies of zero error so that the departures from zero error all have roughly equal magnitudes.

Vast amounts of effort seem to have been expended on analyzing this circuit, mostly in the UK and the USA in the 1930's. These references are unavailable to me and so I tried to make use of summaries published in the books by Terman, the Radio Receiver Design book by Sturley, and the 4th edition of the Radiotron Designer's Handbook. These I found somewhat unsatisfactory, since they generally do not account unambiguously for the value of C_3, which cannot be ignored since all coils have some distributed capacity, and in addition the LO tube or transistor is frequently connected directly across the coil. In addition, I found the math unwieldy and the quoted equations difficult if not impossible to substantiate. The general impression I got was that the problem was very difficult to analyze, and that the published information may well have been based on some approximations of unknown source and accuracy. Therefore I decided to attack the problem from near the beginning. After much effort I arrived at a solution which appeared to be logical and correct, but which depended in part upon the solution of a quadratic equation with complicated coefficients. There the matter rested while I debated whether or not all this algebra would be of interest to ER readers - even if the Editor accepted the manuscript.

Then, I got sick with an upper respiratory infection, and started spending most of each day in bed. While there I contemplated **Figure 1**, and realized that at each of the 3 zero tracking error RF frequencies the resonant frequency of the LO circuit would be known and would be equal to the RF frequency plus the IF frequency. In addition, the value of C_V would be known, since it would be equal to the value used in the RF stage or stages. Then if C_2 were specified in advance there would be 3 variables to solve for – L_2, C_3, and C_p. But there are 3 independent frequencies of LO resonance, so we have that old intermediate algebra problem- 3 equations and 3 unknowns! It didn't take long to find the solutions, and they are exact. No approximations, no guesswork, no graphs, no quadratic equations, no arm-waving, nothing of that sort. However, it is required that the RF circuits be designed first, and an initial value of C_2 has to be selected, as well as the IF frequency, the RF tuning range, and the 3 frequencies of zero tracking error. If the computed value of C_3 is not large enough to reflect the realities of devices and stray capacities placed across L_2, then a smaller value of C_2 must be tried in an effort to increase C_3. However, C_2 cannot be smaller than the minimum value of the LO tuning capacitor.

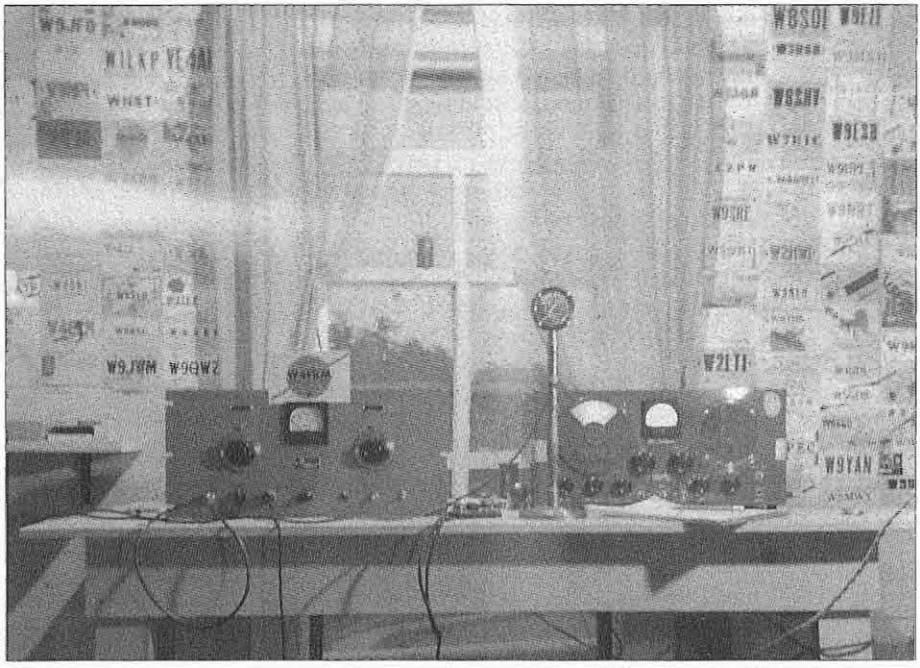
In Part II of this article I will present the formulas for the 3 LO component values, and will give a practical example. There will also be some introductory material so that interested readers can, if they wish, derive the formulas on their own. Two methods of choosing the 3 frequencies of zero tracking error will be given.

Please stay tuned!

ER

PHOTOS

The Photo Section needs your photos because everyone likes to see the face behind the voice!



Station of W4FRM, Grady B. (Bascom) Fox, as it appeared December 7, 1941, Pearl Harbor day. TX is a Stancor 60N, built from a kit, bought from Allied Radio. Kit supplied a Gammatron HK-24 for the final RF output. However, the HK-24 was damaged (probably by too much grid current during neutralization.) The HK-24 was replaced by a Taylor T-40, since it was almost a couple of dollars cheaper than the HK-24. Fortunately the filament transformer in the 60N had taps at both 6.3 and 7.5 volts, making it rather simple to change from the HK-24 to the T-40. The T-40 was modulated by a pair of 6L6's for AM operation. The station was powered by a 300 watt generator since it was located on the family farm, which did not have commercial 60 cycle power. The receiver is a nearly-new Hallicrafters S-20R, which I still own and use. (Photo and text courtesy of Grady Fox, W4FRM)

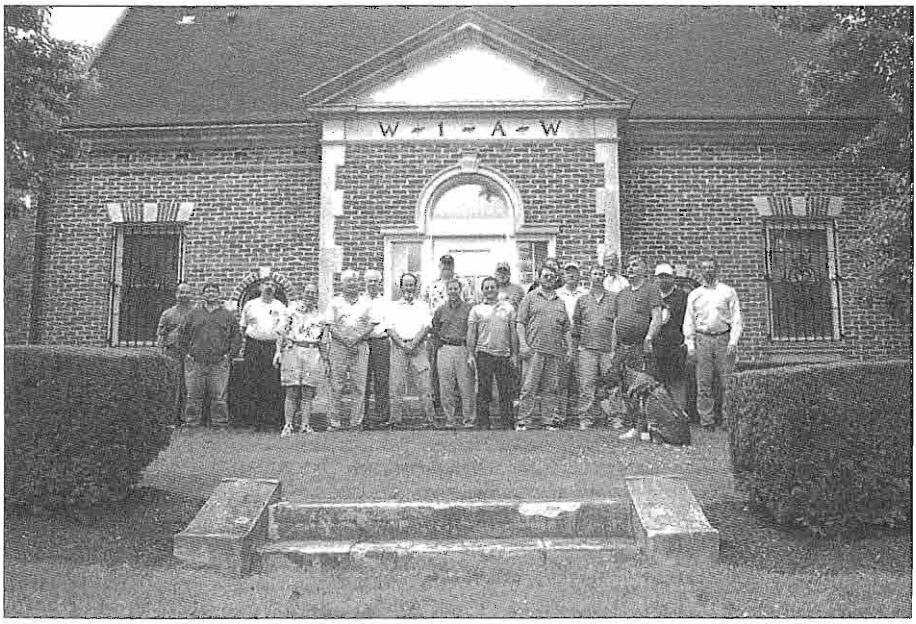
From a press release by Bob Heil, K9EID: AM RETURNS AT W1AW

June 18, 2004 has become a memorable day at W1AW when AM enthusiasts delivered a vintage AM station – the first one in decades to illuminate the ARRL's flagship station. The equipment, a Johnson Valiant transmitter and a National NC-303 receiver, was a gift from the West Coast AM community that was picked up in the LA area on April 26 by WD9HHN and hand carried across America to it's final installation at the League's historic station, on June 18.

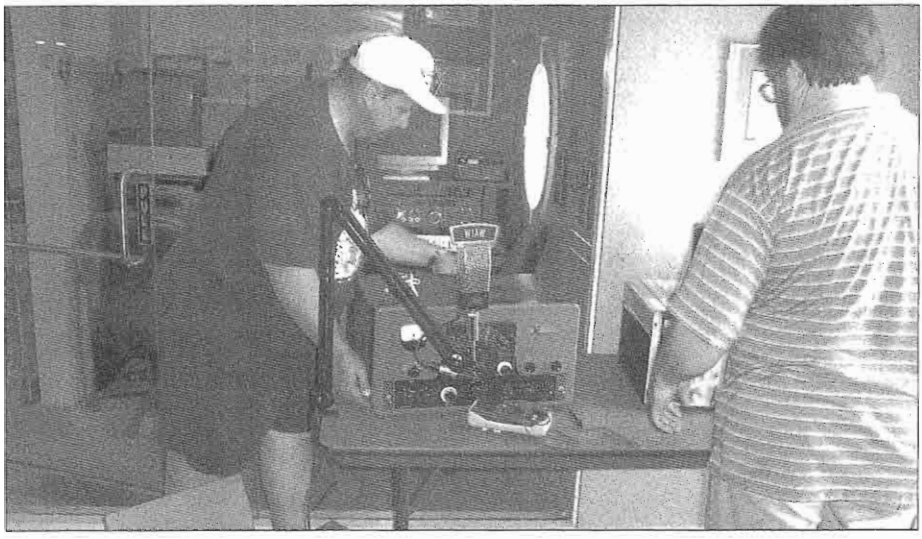
The idea came about on a recent visit to Newington by Joe (WB6ACU) and Bob (K9EID). In a discussion with the League's CEO, Dave Sumner, (K1ZZ) about expanding the AM frequency window, Joe thought that our case would be better served if there was an actual AM station in operation at W1AW. The vintage, plate-modulated AM transmitter now joins just about every technology represented from an original spark gap transmitter to an ICOM 7800.

The Johnson Valiant and NC 303 were brought from Studio City, CA, to the Heil Sound plant in the metro St Louis area by Larry (WD9HHN) who makes that trip weekly delivering food products. The gear was then taken to April's Dayton Hamvention and handed off to Jeff (KA9TOC) and Larry (W9AMR), of South Bend, Indiana, for some work at Larry's professional workbench . He, along with Jeff, spent several weeks cleaning, making minor repairs, adding a transmit/receive changeover relay, and otherwise preparing the classic AM "station" for delivery to Newington..

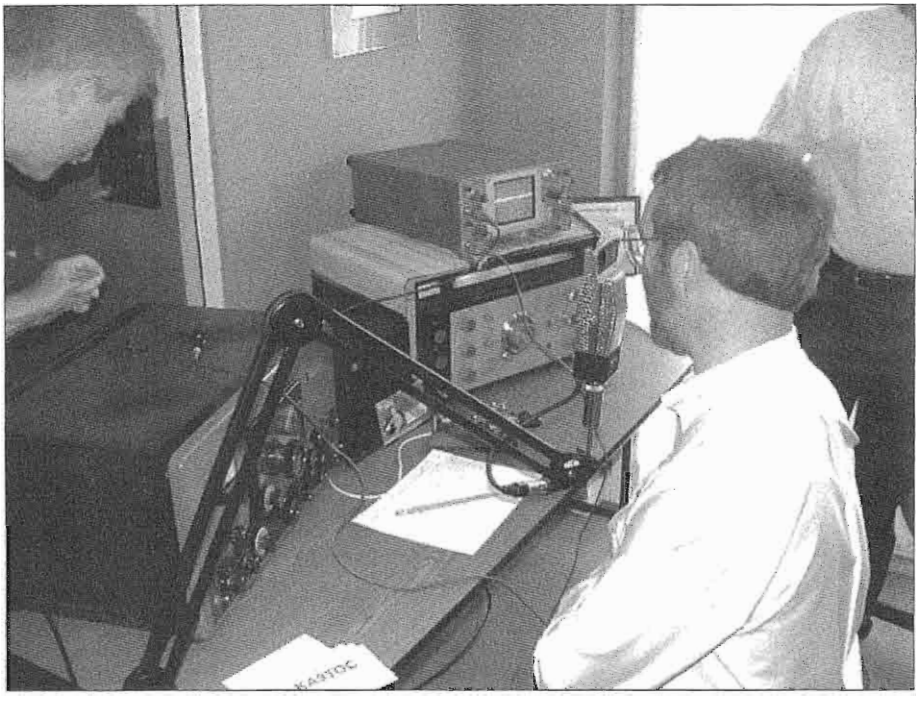
The gear was operated for several weeks and passed all tests. On June 17, Jeff and Larry loaded the gear, picked up Jeff (AA9JC) and the group drove straight through from Indiana to Connecticut. Arriving on the doorstep of W1AW on Friday morning, they were greeted by more than 30 of the East Coast AM community and within 90 minutes, W1AW-AM hit the airwaves!



The East Coast AM greeting committee in front of the old entrance to W1AW. (Photo courtesy Bob Callahan, W1QWT)



The Viking Valiant transmitter is being installed by volunteers at W1AW. Jeff (KA9TOC) is setting the Johnson rig in place as Larry (W9AMR) looks on. (Photo courtesy Bob Callahan, W1QWT)

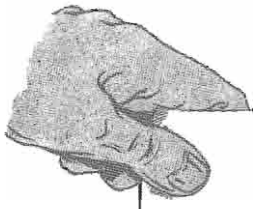


Steve (WA1QIX) at the Heil mike and Tom (K1JJ) trying to jury rig an RF pickup loop so the scope will monitor the modulation of the Valiant. (Photo courtesy of Ken Barber, W2DTC)

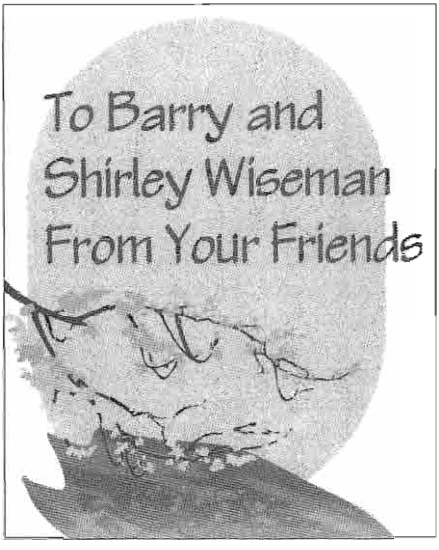
Dale (KW1I) makes one of the "first day" QSO's from W1AW on Amplitude Modulation. (Photo courtesy of Ken Barber, W2DTC)

Standing, left to right: Joe (WA2PJP), Wayne (WA1SSJ), Tom (K1JJ), Norm (W1GGY), Steve (WA1QIX). Seated is Larry (NE1S). (Photo courtesy of Ken Barber, W2DTC)

Mailbag



To:
Electric Radio
PO Box 242
Bailey, CO
80421



Barry & Shirley,

You two are the greatest!!! I wish you well on your new home in Canada. Take care of each other.
73 & 88's Leo Meyerson, WØGFQ

Barry,

I wish the very best for you and Shirley. You, and your many contributions to the history of radio, will not be forgotten. I hope you find the boat you are looking for and have favorable winds on all your journeys.
Bruce, NR5Q

Thank you Barry & Shirley for all you have done over the years for Amateur Radio and especially AM. ER has brought a great deal of pleasure to many of us over the years. We are indebted to you both for your vision and time invested as the former publishers of ER. Please except my best wishes for your move to Vancouver. I look forward to working you on AM as a DX station in the future. I pray the Lord's blessings on you both.
Best Regards,
George - WB6YEC
Lemon Grove, CA

Dear Barry and Shirley,

From Japan, I would like to say that I am appreciated of your contribution to satisfy our scientific WANT for enjoying the originality of electricity. I am very happy that you can enjoy your conclusion through your new life with your wife Shirley from now.
Best regards,
Katsuhiko Hirai (JO1GEG/exN8EYH)

Barry and Shirley,

Wow, you two are going to be sailing off into the sunset! Are you going to call your boat the "Yasme III?"

Barry, thanks a lot for starting Electric Radio and giving us Boatanchor types a place in the sun. I've had a lot of fun reading and writing articles, and it's been interesting getting recognized by other

crazies who enjoy radios that glow in the dark too.

Shirley, thanks to you for all the support you have given Barry and the rest of us. I know that without you Electric Radio would never have started or carried on.

Be sure to let us know when you will be on the air.

73,
Jim Hanlon, W8KGI

Thanks Lady (Shirley) & Gentleman (Barry) for your dedication to our HOBBY! Through you, ER has "touched" all of us in our continued & renewed enjoyment of Radios from 'yester year & the things that "Glow In The Dark"....and reminding us how we used to do it ! Bon Voyage & hope to work you marine or maritime mobile soon!

73 es 88...
Don Grantham
W6BCN

Barry,

I still remember the QSO's back in the late 80's that preceded the launch of the first issue. My how time fly's by. If you are heading for Vancouver Island, it will be great to have you in the Pacific Northwest QSO's. As a continuous subscriber from the first issue, thanks for all of yours and Shirley's persistent and dedicated efforts. I look forward to many more QSO's.

73,
Pat Person, K7YIR, Bothell, WA

Dear Barry

I hope your move to Canada will be a pleasant one and I hope it will make you as happy as I AM each month to receive a copy of ER. I have taken many publications through my ham career but now the only magazine I need is ER. Thank you, I wish you all well from the old out house of David Adams,

wd5bzo@yahoo.com.

Dear Barry and Shirley,

It was years ago that someone first mentioned Electric Radio Magazine to me. (I thought they must have the name wrong - what other kind of radio could there be?!) I checked the library to see if they could locate an address; they couldn't. But I found it somewhere, was sent a free copy to evaluate, and have subscribed ever since. It's electronic nostalgia at its best, and more. Thanks for starting such a great publication, seeing it through for so long, and for finding someone else as passionate as yourself to continue it. Wishing you the best as you move back home.
Terry Perdue K8TP

Dear Barry

I look back at when Barry and I first talked—way back before ER #2 came out. I always appreciated his candor and kind passion about "glow in the dark" radio. More than that I understood that we are kindred spirits in appreciating more than hardware—Indeed it is the "software"—late nite QSO's where the conditions are just right to carry on for hours, getting to know the person at the other end of the propagation path. The designers of the radios we all appreciate had no other purpose in mind for their hardware than communications—quality communications. I look forward to a little more of the same with Barry on Puget Sound (I'll be the one without the sails—only a stinky 'ol diesel.. hi)

See you there!!
Skip Green, K7YOO

Barry and Shirley,

Thanks so much for all the work you have done with ER. I have found the magazine an excellent resource. I have always looked forward to every issue. I grew up in Washington State near the Canadian border and loved going to Vancouver Island BC. It is truly a beautiful place. My best wishes for the both of

you.
Mike, N6WIG

Barry & Shirley,
My first subscription issue of Electric Radio was Number 2. I credit you and the magazine with rekindling and sustaining an interest in the older radios and communications modes. The once derisive "boatanchor" has become a badge of honor to many. I hope that you find your dream sailboat and wish you Fair Winds and Following Seas.
Robert Downs, WA5CAB.

Barry,
You did a good thing!
Gary, WA9MZU

Ray:
I just heard that Barry and Shirley were planning to head north and retire, so to speak. Please pass along my warmest regards and thanks for the ten wonderful and fun years working with them.
Bill, KDØHG

Dear Barry es Shirley,
How can we ever say thank you enough. Your years at the helm have helped me enormously. I wish you well as you begin a new episode in VE land. I'm now in my 55th year of AM radio. So, God bless you both.
73 Es gud dx de Ron K, W1ARS

Dear Barry
Congratulations on your sale and the move back north. It was wonderful getting to meet you both last summer while taking over custody of Barry's 300G. Shirley, thank you for the wonderful iced tea - it was most refreshing and appreciated. Barry - thank you for the tips and the crystal radio gift. I'll get pictures to you soon; restoration of #110 is coming along nicely. Most of all, thank you both for creating the wonderful world of Electric Radio and for passing on such a healthy publication to a most competent new editor, who obviously shares your vision. Those of us who enjoy vacuum tube radio gear appreciate it very much.
Todd 'Boomer' Bigelow, KA1KAQ

Dear Barry,
Thanks and good luck!
de N7WB, John

Dear Barry,
I have always enjoyed ER Mag. I appreciate your great effort to make the mag a success. My best wishes to you & Shirley on your move to Canada (home). Will be watching for you on one of the AM windows.
Best of 73
Dee, W4PNT

Dear Barry
Barry Wiseman and Electric Radio have had a great deal to do with my enjoyment of amateur radio for many years. First, the whole Electric Radio magazine idea was perfect. I have always appreciated vintage equipment and military radios, I enjoyed maintaining and converting them, I enjoyed buying and selling, and I enjoyed reading stories by and about the pioneers from the early days of amateur radio operation and manufacture. What a thrill when the magazine arrived. Everything else took a back seat to a review of the current issue. I know I am not alone in appreciation of the magazine in this way. I have distributed back issues at hamfests for Barry and have seen amateurs pick up an ER for the first time and have seen them struck the same way I was when I saw the first issue.

Second, Barry was one of planners, encouragers and enablers for AM International. He was not a businessman publisher who had found a magazine market. He was really interested in classic radio equipment and the classic operating modes, especially AM. He wanted to use ER to preserve, not only the memo-

ries of the classic radio years, but the amateur's ability to operate classic radios. When a national organization was needed to promote and protect AM in the early 1990s Barry, with a few others, tried to resurrect SPAM. When that was not possible, he encouraged the efforts to launch a new organization that could get visibility for AM and counter efforts threatening the mode. He offered space in the magazine as often as necessary to notify readers about issues facing AM. The ability to use ER for AMI news made an informed organization possible. Barry also directly subsidized AMI projects on occasion. Barry and ER made a significant contribution to the current broad acceptance AM is enjoying.

Lastly, Barry and his wife Shirley are wonderful people. Barry and I spent many hours on the phone discussing ER articles, AMI issues, and radios we both owned. I met Barry at the Dayton Hamvention one year and in the summer of 1995 on a family vacation I was fortunate to visit Barry and Shirley on their mountain perch in Durango, Colorado. They made us feel at home even though they had barely set up housekeeping there themselves.

My frustrations with Barry were that he never came to the East Coast to visit and we never had as many QSO's as I would have liked. We talked about making schedules and aiming antennas, but when you factored in his busy schedule with the vagaries of propagation I guess we were fortunate the times we did make contact.

I thank Barry for all his work starting and running ER all those years, and I thank him for finding Ray Osterwald to continue the tradition. I wish Barry and Shirley the very best with their new plans. I am still holding out hope for some transcontinental communication in the future.

73, Dale Gagnon, KW1I

Hey you guys,

I want to wish you a wonderful retirement in Canada, and to say heartfelt THANKS for starting up ELECTRIC RADIO, and for maintaining it for so many years. It has wonderfully filled a great gap in Ham Radio. Thanks so much, and happy fishing!

73,

Herb Ulrich K2VH

Dear ER,

I would like to take a moment to say thanks to Barry for giving me and so many others the opportunity to develop our writing skills through Electric Radio. Many of us conducted research to help preserve history and I suspect provided pleasure for others at the same time. I wish the best to Barry & Shirley as they move into their future.

Regards,

Jim Musgrove, K5BZH

To Barry and Shirley,

Many thanks for your vision in creating ER. I view it as my favorite magazine and I get quite a few! Arriving home after a hectic work day and finding the latest addition in the mail box always refreshes my day. Best of wishes to both of you in your re-location venture. Hopefully, one of these day's Barry, we will have an on the air QSO!

Regards,

Joe W3GMS

Installment 13

W. J. Halligan
Newspaper Reporter and the State of Radio 1923-1924, Part 5
Amateur Radio State Of The Art, 1923-1925

By Robert E. Grinder, K7AK
49 Great Hill Road
Kennebunk, ME 04043
atreg@asu.edu

Full Outline of Part 5*

A. General Happenings
   Calling CQ
B. The American Radio Relay League (ARRL) at work
   ARRL conventions
   Transatlantic receiving tests and con- test
   1-MO–French 8AB two-way contact
C. The silent period and the crises of interference at every turn
   Prevalence of interference
   Silent period: practices and regulations
   In defense of amateurs
   Legislation–the White bill
D. WNP ("Wireless North Pole")
   MacMillan's expedition to arctic regions
E. Irving Vermilya, 1ZE
F. Epilogue
   1. Traffic handling and calling CQ
   2. Intermediate/interval sign "u" supplants "de"
3. Amateur license regulations and frequency allocations
4. Silent periods and the White bill
5. The Hoover Cup awards
6. Transatlantic receiving tests
7. The second ARRL National Convention
8. The 1MO–French 8AB two-way transatlantic contact, November 27, 1923
9. WNP ("Wireless North Pole")
10. Irving Vermilya, 1ZE

*Topics formatted in bold are covered in this installment.

ARRL Conventions

How many of the gang are going to the second national convention of the American Radio Relay league, to be held in Chicago, Sept 12-15? Here, as Publicity Manager J. K. Bolles says, is an opportunity to shake out of that sun-kissed blistering old shack and hop a freight. With the increased interest in radio and the added numbers to the A.R.R.L., Massachusetts should be able to send a fair sized delegation to the convention. Let's hear from some of you fellows who are planning to make the trip. [8-1-23]

It's almost time for those Boston radio enthusiasts who plan to attend the American Radio Relay league convention in Chicago, opening the 12th of this month, to wind up their preparations. Most of the local hams feel that it's too bad the National convention has to be held at such a distant point. But Chicago is probably the best suited of the centrally-located cities, and the hams of the United States and Canada have got to convene, and there you have it. [9/5/23]

The American Radio Relay League opens its second national convention in Chicago tomorrow. This statement in itself means little or nothing to the newer radio fans, but to the "old timers," the men who have seen radio progress from the first experiments of Hertz to its present stage know that in that gathering of amateur radio experimenters will be found many who are directly responsible for the great strides that have been taken within the past few years. It is not to be forgotten that Armstrong, the inventor of the regenerative circuit, was an amateur. Marconi even now is president

of an amateur wireless association, and countless other men first became acquainted with this most fascinating branch of science through experience as amateurs.

All is not yet known about radio. That certain pieces of apparatus connected in a certain way produce results is known, but why the connected act in that way is not as yet thoroughly understood.

There is but one way to increase the world's knowledge of radio, and that is by experiment. Hundreds of amateurs here in New England are conducting such experiments, bearing the entire expense themselves. Whereas in a few instances, they are condemned for their pain, they should be supported, and they would be if it were remembered that from their ranks were produced Reinartz, Bishop and Dallin, men whose experiments made it possible for the newer acquaintances of radio to enjoy their concerts. [9/11/23]

John Reinartz, who needs no introduction to local fans, has been signed to attend the Fourth District East Gulf radio convention in Atlanta, Dec. 27, 28, and 29. A.A. Heber, treasurer, and probably F.H. Schnell, traffic manager, will represent the American Radio Relay league headquarters. Another radio celebrity, Prof. A.J. Jansky, of the University of Minnesota, will also attend the banquet, which is expected to be one of the biggest radio-social events since the National Amateur convention held recently in Chicago. [12/22/23]

The first district radio convention of members of the American Radio Relay league will be held in Springfield, March 28 and 29. Accordingly it should behoove every radio man hereabouts to save his pennies from now on and make this the biggest and best radio convention the radio men of New England have ever known. [2/6/24]

Here is what Archibald S. McLean, of 288 Main st., Springfield, who is charge of the coming First District A.R.R.L. convention has to say about that most important event.

"The convention will be held in Springfield, March 28-29 and will be a real ham affair. We are planning Wouff Hong initiations, stunts, contests, entertainments, surprises, technical meetings, a whale of a banquet, and dancing. (So don't forget the OWs and YLs.)"

"We hope to see hams present from everywhere, including Canada. Let us see that Eastern Massachusetts does her part in 'telling the world' of this great occasion." [2/6/24]

Several local amateurs are planning to take in the annual Second district radio convention, which is to be held at the Hotel Pennsylvania, New York, March 3 to 7. This is to be an exhibition of fine spirit. Local fans hope these same fellows will not overlook the First district convention, which is to be held in Springfield March 28-29. [2/26/24]

Tomorrow is absolutely the last day for reservations to the First district convention at Springfield. Boston should have a record-breaking crowd at the convention, which promises to be one of the best radio get-togethers New England has ever seen. [3/24/24]

We hope everyone who can possibly attend has made reservations for the First District American Radio Relay league convention which is to be held in Springfield, Friday and Saturday of this week. Some of the radio men hereabouts are planning on going to the convention in automobiles, while other are going to make the trip by train. It appears that most of the local radio men, members of the Commonwealth Radio association, will leave for the convention either Friday night after the regular association meeting, or Saturday morning. The convention promises to be the best radio affair New England has ever known. [3/25/24]

Transatlantic Receiving Tests and Contest

With the American Radio Relay League

convention over and everybody happy and full of ideas, the next step is preparation for the Trans-Atlantic tests. The tests will begin about Dec. 20 and will last for five days. The first part of the test period, according to present plans, will be taken up entirely by European transmissions, with American and Canadian amateurs listening in. Amateurs in England, France, Holland and Switzerland will take part in the tests. [9/17/23]

Just one week from today members of the American Radio Relay league, the transmitting amateurs of the United States will begin a 20-day period of voluntary silence, during which they will listen for amateurs in England and France who will at that time endeavor to push their signals across the Atlantic. Last year a score or more of American amateurs succeeded in having their signals heard in Europe. The European amateurs were not so successful. So many transmitting stations are working in this country, it was thought that the European signals may have been "jammed." Accordingly officials of the ARRL arranged the 20-day silent period which will begin at midnight, Dec. 21, and will end Jan 10. The silent period for American amateurs will be between 8 p. m. and 1 a.m. eastern standard time, extending over 20 days. [12/14/23]

So far the Trans-Atlantic tests have been very successful. Probably 90 percent of the amateurs in this vicinity are doing their utmost to hear signals from amateur stations in Britain and France. The other ten percent are either unaware that the tests are in progress or are intentionally making no effort to co-operate.

Among the local fellows who have been transmitting are 1-AGG, whom we have to believe knows the tests are going on, 1-QB and 1-CEV. In addition to these there are operators at several stations in other districts who seem to be ignorant of or unwilling to regard the tests. [12/26/23]

In case there are still some operators who do not know the rules of the test we herewith repeat them. ALL AMATEUR STATIONS IN NORTH AMERICA ARE URGED TO OBSERVE A PERIOD OF QUIET BETWEEN 8 P.M. AND 1 A.M. UNTIL THE CLOSE OF THE TRANS-ATLANTIC TESTS, JAN 10. During this 20 day period amateurs in Europe will transmit, and it should behoove every single radio man in the United States to leave nothing undone in his effort to hear the foreign station. [12/26/23]

One thing about these T.A. tests, there are plenty of fellows hereabouts who are ready and willing to tell the offenders wherein they are in error. We believe, however, that it would be better to telephone the fellow who transmits, if possible, thus avoiding the bedlam which has marked a least one of the nights to date. [12/26/23]

The Trans-Atlantic amateur code tests are succeeding beyond the fondest hopes of any member of the American Radio Relay league. It appears that some of the amateurs in this vicinity who were transmitting had not been apprised of the opening day of the tests. But now that they know the whole story, we can look for 100 percent co-operation and even greater success than has yet been enjoyed. [12/27/23]

Although official announcements have not yet been made, it has been confidently stated that two Massachusetts amateurs are well up among the contestants for the prizes for Trans-Atlantic reception. The tests recent held under the auspices of the American Radio league offered a first prize of a $1100 transmitter, donated by the Grebe company. Other valuable prizes were included in the long list. Winners of which are soon to be announced. [1/19/24]

1-ANA, Bourne of Chatham, one of the leading amateurs of the country, has been announced as winner of the Grebe transmitter offered as a prize to the amateur who copied the greatest [number] of European "hams" during the recent

American Radio Relay league Trans-Atlantic tests. We extend our heartiest congratulations to 1-ANA, and at the same time modestly remark that we knew the First district always was and by the same token will be in the lead in amateur radio. [2/26/24]

Six Massachusetts amateurs scored in the recent Trans-Atlantic tests held under the auspices of the American Radio Relay league, one of them, R. B. Bourne, 1-ANA, of Chatham, winning the grand prize of the entire contest.

The tests, so far as the American amateurs were concerned, consisted of listening for signals from amateur radio stations in Europe over a 20-day period from Dec 20 to Jan. 10. Mileages to stations heard were then totaled and prizes awarded. [3/5/24]

The grand prize won by Bourne, which consisted of a 100-watt Grebe transmitter, was given for the greatest total of station miles. Other Massachusetts amateurs among the prize winners were Sheldon S. Heap, 1-BDT, of Atlantic, who won first prize for the greatest French mileage for any single night; Levi G. Cushing, 1-BCF, of So. Duxbury, first prize for the greatest total French mileage for any single night: Levi G. Cushing, 1-BCF, of South Duxbury, first prize for the greatest total French mileage: Robert H. Sproul, 1-GG, South Hamilton and Richard S. Briggs, 1-BVL, Dorchester, third and fourth prizes, respectively, for greatest British mileage for any single night; Boardman H. Chace, 1-BDU, Winthrop, a member of the Commonwealth Radio association, third prize for the greatest total British mileage. [3/5/24]

Although amateurs in all parts of the United States and Canada participated in the contest, it remained for Massachusetts members of the American Radio Relay league to carry off the prizes of importance which consisted of valuable pieces of radio apparatus. [3/5/24]

The success of many of these men in the tests has led to a reaction in favor of simple receiving sets. [3/5/24]

1-MO and French 8-AB Two-Way Contact

The latest indoor sport among the code enthusiasts in all parts of the country is to listen in on 100 meters to the exchange of messages which has been going on between 1-MO, operated by officials of the American Radio Relay league at Hartford, and French 8-AB, operated by Leon Deloy, Nice, France. [12/20/23]

The two-way short wave communication between the United States and Europe is doing more than merely holding the interest of men actively engaged in amateur code transmission—it is luring many of the old-timers back to the key, according to reports from the American Radio Relay league headquarters at Hartford. [12/21/23]

Guglielmo Marconi today congratulated the radio amateurs of the United States for having spanned the Atlantic Ocean in the first two-way short wave communication.

The greetings were sent by Marconi shortly after amateurs of France and England established first two-way communications with stations in Connecticut operated by Hiram Percy Maxim, president of the American Radio Relay league, Kenneth B. Warner, secretary of the league, F. H. Schnell, traffic manager, and John W. Reinartz of South Manchester, Conn.

Reliable communication has been maintained regularly across the ocean ever since on 100 meter wave lengths. [12/21/23]

C. THE SILENT PERIOD AND THE CRISES OF INTERFERENCE AT EVERY TURN

Prevalence of Interference

President Harding himself is bothered now and then with interference, it is said. The President is reported to have tried to pick up a concert the other evening, but heard two broadcasting stations going at once, and being unable to

separate them gave up in disgust. [4/5/23]

The broadcast listeners-in from all over the country are making a howl that is heard far and wide in official circles, because nightly their concerts are broken up by radio telegraph stations. [5/7/23]

Immediate relief from naval and commercial ship interference is in sight following a series of conferences with President Coolidge. John Shepard, 3rd, and Radio Supervisor Charles C. Kolster have been leaders in the work for quieter air. [12/14/23]

Station WGI will sign off at 8:30 tonight in order to allow local fans to hear the broadcast from WCAP [Washington D.C.] or WJAR [Providence, RI] at which station Herbert Hoover, radio chief, is to speak. [3/27/24]

Radio listeners are being promised less interference from the spark transmitters of ships operating within the broadcasting wavelength limits. They are getting higher wavelengths outside the broadcast area. [5/3/24]

Another communication from our BCL correspondent: "There is an operator in or near Boston who is sending out very poor phone signals. I believe that this due to the fact that he is shouting into his transmitter. This man would probably like to know how his signals are being received, and when I catch his call letter, I'll inform him through your column." [6/2/23]

Wonder when NAD is going to get CW, or take some other steps to keep from interfering with the radio concerts? [7/28/23]

It is interesting to note in connection with this last "wonder" that WNY, WSE, WSC, WCC [Government stations formerly with spark transmitters] and a great many more stations along the coast have realized from whence comes this code interference and have installed CW. The result has been entirely satisfactory. More than that, however, it proves our original contention that the hams haven't been causing the interference. [7/28/23]

Eureka. The navy yard is about to install a CW set for short wave work. Every ham in the district is willing to bet that all former interference ills will have been cured when this is accomplished. [8/16/23]

Jawn and all the boys wish NAD would hurry up with his CW set. [9/5/23]

We understand that the engineering force at AMRAD recently located a leaky power transformer on one of the poles of the local light company in Medford as the cause of much interference with radio reception in that district. Their efforts in locating this QRM have resulted in clearing the air, and also resulted in probably saving the light company further trouble and expense. Thus, we find radio a possible help to other industries, and not merely a fad as some people still believe. [10/1/23]

And now comes one Navy Yard and deposes that the radio station located there is not going out of business, as was stated in this column, the other day, but will continue to transmit as previously. It is barely possible that the continuous wave method of transmission will be installed in the near future. [10/5/23]

Remember the old CW NAD had before and during the war? It was almost an impossibility to do any DX work when the old arc set was working. Those were the days when regenerative sets were not the order of the day, when some of our best hams did most of their receiving on what was alleged to have been a sensitive piece of galena. The old arc used to reradiate sharply on 200 meters and almost as sharply on waves 100 meters either side of 200. Boy, wouldn't some of the newcomers kick if that were still in vogue. [10/5/23]

Smash—*'&"—Bam! What's that? Oh, only NAD sending a QST, or something of the kind. [11/8/23]

Saw our Radio Supervisor and Honorary President of the Commonwealth Radio Association, Mr. C.C. Kolster, down

in 1-PF's store, surrounded by an interested group of BCLs, explaining just why residents in Greater Boston were unable to get ex-President Wilson's speech. The explanation was quite simple, and it bears out what 1-GRE, Whit, and we have said before. NAD began a weather QST just as soon as Mr. Wilson was introduced. [11/15/23]

Wonder why WIM, Chatham, tells all ships to send their batches of messages on 450 meters, the standard broadcast wave, while WBF, the Boston station asks that the ships work 700 meters, a wavelength well above that used by broadcasting stations. [12/19/23]

Wonder why the powers at NAD took such great care some time ago to deny that they were going to get one form of CW transmitter after we had made mention of it in "waves?" There's probably an explanation, but why kick 'em when they're trying to do the right thing by the BCL's and hams of greater Boston. [12/1/23]

Among the many records made during the recent newspaper man's night from AMRAD, WGI, was one made by a Boston journalist which may mean the solution of all code interference to broadcasts. It happened that NAD, the Navy Yard started up, just as Thomas Phelan of the Advertiser began his five minute dissertation. And the fans, who have heard the Yard in operation prepared to suffer in silence, minus the pleasure of hearing and appreciating the words and thoughts of Mr. Phelan. But the voice of Mr. Phelan rose and rose, and the powerful Navy spark paled until it could no longer be heard. Voice had conquered over spark, and the thousands were enabled to listen with thorough enjoyment to Mr. Phelan's talk. [1/2/24]

The increased power at WEAF has certainly caused a big commotion among the fans of New York. While even the largest stations have been content with 500 watts, WEAF, has jumped its power to 1000 watts. So loud are signals and other noises which emanate from the WEAF antenna that fans in Metropolitan New Your can hear nothing else. Because of this complaints galore have flooded the office of Radio Inspector Arthur Batchelder. However, he declares the directors of WEAF are entirely within their rights. [1/7/24]

[Editor's Note: The June 2004 issue of ER listed the wrong installment number in the Table of Contents. That issue contained Installment 12.

Next month, Bob continues with Part 5, Installment 14.]

ER

AM Calling Frequencies

160 meter band: 1885, 1945 kc
80 meter band: 3870, 3880, 3885 kc
40 meter band: 7200, 7290 kc
20 meter band: 14.286 Mc
15 meter band: 21.400 to 21.450 Mc
10 meter band: 29.0 to 29.1 Mc
6 meter band: 50.4 Mc
2 meter band: 144.450 Mc

[Editor's note: Please send in your updates and corrections to the calling frequency list. I'd like to keep the frequencies as accurate as possible. Many newer AM'ers are not familiar with the traditional gathering spots.]

To Join AM International, send $2.00 to AM International, PO Box 1500, Merrimack, NH 03054. AMI is our AM organization and it deserves your support!

An on-line, searchable index to the entire 15-year history of Electric Radio Magazine may be found under the "links" tab at www.ermag.com or at Don Buska's web site: www.qsl.net/n9oo/ersearch.html

VINTAGE NETS

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

Boatanchors CW Group: QNI "CQ BA or CQ GB" 3546.5, 7050, 7147, 10120, 14050 kc. Check 80M winter nights, 40 summer nights, 20 and 30 meters day. Informal nightly net about 0200-0400Z.

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

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

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

Canadian Boatanchor Net: Meets daily on 3725 kc (+/-) at 8:00 PM ET. Hosts are AL (VE3AJM) and Ken (VE3MAW)

Collins Collectors Association Nets: Technical/swap sessions meet every Sunday on 14.263 mc at 2000Z. Informal ragchew nets meet Tuesday evening on 3805 kc at 2100 Eastern time, and Thursday on 3875 kc. West Coast 75M net is on 3895 kc 2000 Pacific time. **10M AM net starts 1800Z on 29.05 mc Sundays, QSX 1700Z.**

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

Collins Radio Association nets: Mon. & Wed. 0100Z on 3805 kc., also Sat 1700Z on 14.250 mc.

Drake Technical Net: Meets Sundays on 7238 kc, 2000Z. Hosted by John (KB9AT), Jeff (WA8SAJ), and Mark (WBØIQK).

Drake Users Net: This group gets together on 3865 kc, Tuesday nights at 8 PM Eastern Time. Net controls are Gary (KG4D), Don (W8NS), and Dan (WA4SDE)

DX-60 Net: This net meets on 3880 Kc at 0800 AM, Eastern Time on Sundays. Net control is Mike (N8ECR), with alternates. The net is all about classic entry-level AM rigs like the Heath DX-60.

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

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

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

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

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

Heathkit Net: Sunday on 14.293 mc 2030Z right after the Vintage SSB net. Listen for W6LRG, Don.

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

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

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

MOKAM AM'ers: 1500Z Mon. thru Fri. on 3885 kc. A ragchew net open to all interested in old equipment.

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

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

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

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

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

Swan Nets: User's Group meets Sunday at 4 PM Central Time on 14.250 mc. Net control op is usually Dean (WA9AZK). Technical Net is Sat, 7235 kc, 1900Z. Net control is Stu (K4BOV)

Vintage SSB Net: Sunday 1900Z-2030Z 14.293 & 0300Z Wednesday. Net control Lynn (K5LYN) and Andy (WBØSNF)

West Coast AMI Net: 3870 kc, Wed. 8PM Pacific Time (winter). Net control rotates between Brian (NI6Q), Skip (K6LGL), Don (W6BCN), Bill (N6PY) & Vic (KF6RIP)

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

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

CLASSIFIEDS

Advertising Information

Subscribers receive 1 free 20-word ad per month. **Extra words are 20 cents.** Here is how to count the words in your ad: "For Sale" or "Wanted" and your contact information counts as 7 words. Hyphenated words count as 2 words. **Please count the words in your ad as described above, and if you are over 20 words, send payment for the extra words at .20 each.** Note: Not all readers use email, so it is a good idea to include phone numbers. Non-subscribers: $3.00 minimum for each ad up to 20 words. Each additional word is 25 cents. Email ads are fine.

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Deadline for the August 2004 issue: Friday, July 30

SERVICE 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

MANUALS FOR SALE: Military Radio manuals, orig. & reprints. List for address label & $1. For specific requests, feel free to write or (best) email. Robert Downs, 2027 Mapleton Dr., Houston, TX 77043, wa5cab@cs.com

FOR SALE: Collins KWM-2A with power supply, $800 + shipping. George, W8QBG, 480-986-5797

FOR SALE: Kenwood 6 band shortwave receiver. QR666 (like R300), 140 kc – 30 Mc, $79 + shipping. Henry Mohr, W2NCX, 1005 Wyoming St., Allentown, PA 18103 610-435-3276

FOR SALE: National coil boxes; 3-hole, exact mechanical and dimensional reproductions; 1-coat water-based paint; very limited quantity. $55 ea. Plus $5 shipping. Kelly, W8GFG, 9010 Marquette St., St. John, IN 46373, 1-219-365-4730

FOR SALE: GRC-19 radio system. Includes T-195/GRC-19 transmitter, R-392/URR receiver, cables, mic, handset, speaker, manuals, mounting. $750, pick-up only please. Mike Forgensi, Rocklin, CA. 916-630-0932

FOR SALE: Military whip antennas, EH Scott RBO-2 receiver, $295. Bruce Beckeney, 5472 Timberway Dr., Presque Isle, MI 49777 989-595-6483

FOR SALE: James Millen set of 4 wave meters 90605-8 $10. Millen grid dip meter 90651, $20. Model 15 TTY good working condx with manuals $100, no ship. Bud Gross, WØBYG, 651-459-3233

FOR SALE: Hallicrafters S-120, EICO 320 Sig Gen, Heath MR-21 D.F., Precision E-200C RF Sig Gen, R-19C-TRC-1 Rec, Heath PT-1 stereo tuner w/2 amps, McIntosh MX-110 tuner pre-amp. Al Jenkins, WA1RWB, 508-325-7122 (eves.)

FOR SALE: Heath HW100 w/HP23, looks, works good $150. WE 30L-1 $575, PR 3CX800A7 $375. k8woz@earthlink.net 281-361-3847

FOR SALE: SpeedX model 321 vintage chrome straight key, NOS in original box, $35. Jim Riff, K7SC, k7sc@arrl.net

FOR SALE: GR 1617A Capacitance Bridge, manual copy, $211.00. L&N Wheatstone Bridge, $25.00. Ross Wollrab, 229 N. Oakcrest Avenue, Decatur, IL 62522-1810. 217-428-7385. REWollrab@aol.com

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FOR SALE: Atwater Kent Bandbox parts, knobs, tuning condenser-coils, Chelsea tuning condensers-all $57. Paul Recupero, 265 Union St., Portsmouth, RI 02871 1-407-847-8589

FOR SALE: Hammarlund SP-600 JX good working condition. Marv, gunworks@wctc.net 715-424-2305

FOR SALE: HT32B, KWM2, R4B, HT-44. Bob Ryals, KIØGF, 719-265-9950, joebob1@adelphia.net

The Collins Radio Association

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The No. 1 Collins website is still at www.collinsra.com

FOR SALE: Skillman bug, exc, $85; Atlas Power Supply/Base w/RIT for 210X/215X, $115. Richard Prester, 131 Ridge Road, West Milford, NJ 07480. 973-728-2454. rprester@warwick.net

FREE: New front plate Heath SB620 hamscan. Dennis Olmstead, 1124 South 11th st, Montrose CO 81401 970-249-4099. email wb9emd@aol.com

Vintage Key Auction

18-piece lot as shown. Straight keys, bugs and telegraph sounders.
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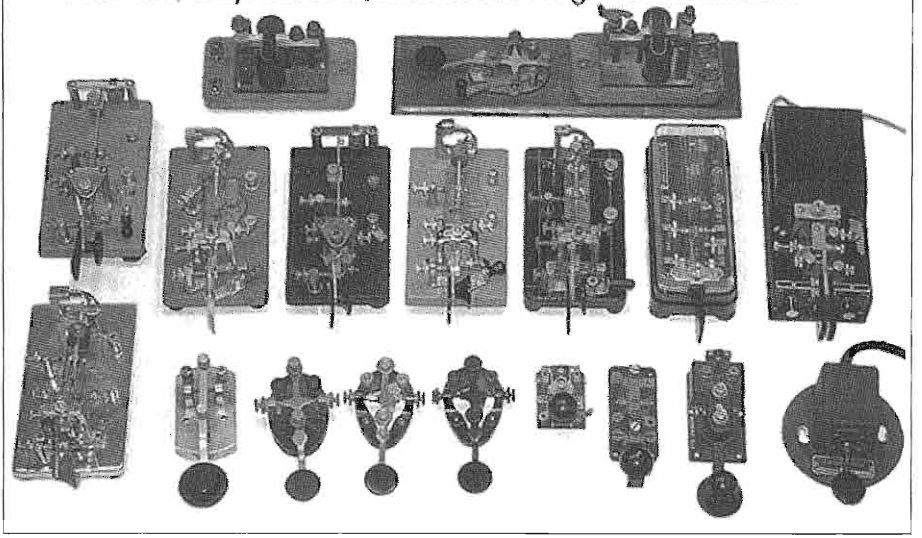
WA9MZU, Gary Halverson, 209.286.0931 or ghal@ix.netcom.com



FOR SALE: Johnson Invader Crystal Filters , p/n 's 22.1772-1670 and 22 1772-1698 , both for $40. k4deejim@aol.com or 864-855-9570

FOR SALE: HT-32B very good condition $325 + shipping. Ed Sauer, KC9SP, 787 N. Peterman Rd., Greenwood,IN 46142, 317-881-1483

FOR SALE: WW2 Japanese rcvr, 94-5, good condx with tubes and frequency charts. Terry, KØLSW, 816-424-3076, medlarkn@cameron.net.

FOR SALE: 2 ea J38 keys, black Bakelite base $75 pair. Realistic Navaho Mod TRC-3A CB, works, 120 and 12 volts, $60. Realistic Rcvr Mod DX150A, clean, works, $80. QST 1945, Jan-Feb missing, flat &clean $10. Coil winding book, 3rd edition by Querfurth, 215 pgs, 1968, $40. Transistor code oscillator, Jackson Mod 63 (?) @9 $20. Bernie Samek, 113 Old Palmer Rd., Brimfield MA, 01010, 413-245-7174, FAX 0441.

FOR SALE: Two UTC S-50 plate xfmrs, 6 kv, 5 kv CT, 115v primary, 52 lbs, $50 each. Delivery possible to S. West or Mid West. Tom Berry, W5LTR, 1617 Highland, Chicago IL, 60660. 1-773-262-5360. Cell: 773-301-7640

FOR SALE/TRADE: Original manuals: National NCX3, NC173, NCL2000; Hammarlund HQ100, HQ110A, HQ145, HX500; Hallicrafters FPM300. Ni4Q@juno.com, 407-351-5536

FOR SALE: 50 years of radio stuff. Email fbridges@citcom.net **WANTED:** Need final coil Mfg. Bud, 80 meters. Frank Bridges, 104 Maple St. Brevard, NC, 28712

SERVICE 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

feltondesign@yahoo.com

FOR SALE: General Radio lab equipment, over 250 pieces, manuals, write wants, SASE. Stuart T. Carter II, W4NHC, 680 Fernwood Dr., Melbourne, FL 32904, 321-727-3015

FOR SALE: FT243 crystals (plenty) 3510, 3520, 3579, 3880, 3885, 7044, 7050, 7143, 7290, 7295, 8400, 10106, 14286 kcs. ONLY. $9.00 each plus $3.00 S/H. Details at: HTTP://AF4K.COM/CRYSTALS.HTM 407-323-4178 Brian Carling, AF4K

FOR SALE: Heathkit HW100, nice, working, $145. Bearcat DX1000, good, $135. Realistic PRO2006, $395. Shure Boom 535, $75. Ron, MI, 517-374-1107

REPAIR!: Radio repair reasonable charges. Manuals for sale. I buy Radios. J. Dan Rupe 998 Whipple Ave, Grayland, WA 98547 360-267-4011 W7ddf@yahoo.com

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

PARTS FOR SALE: Request free vintage flyer. USA only. 50 years of mail order electronics. Bigelow Electronics, POB 125, Bluffton, OH 45817-0125

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FOR SALE: Naval Receivers RAK, RAL, RAO, RBA, RBB, RBC, RBL, RBM. Some checked, pwr splys available. $75-$450 depending on condx. Many other types. Carl Bloom, 714-639-1679. carl.bloom@prodigy.net

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This is an excellent auction from the collection of James Weil from Michigan. It contains a large amount of Vintage Amateur Radio Items, also Audio and Hi-Fi, Tombstone and Cathedral Style Radios, 30s era Table Radios, Battery Sets, Horn Speakers, Test Equipment and lots of Tubes.

Some of the items to be sold are:
Collins 32 S-1, 75 S-1, 30LI, Speaker & Phone Patch, Hallicrafters SX-28, SX-101, SX-100, SX-62, SX-43, SX-101A, Drake T4XC, R4C, 2B, T4XB, R4B, TX4, MS-4, 2B, 2AQ, WV-4, Kenwood TS-830, TS-520, Heath Kit HR-10B, MR1 Comanche, SB-220 Linear AMP, DX60-B, DX-100, HG-10 VFO, Hammarlund, HQ-145, HQ-100, HQ-110, HQ-140XA, HQ-170A, HQ-170AVHF, RME 45, 69, Yasev YR-901, Globe Scout Deluxe, Globe Hi Bander, National NC-183D, FB-7 w/coils, SW-3, Swan 5S-200 w/PS 20, Knight R-195, T-150, Hallicrafters 5R10A, HA-1 Keyer, SX-130, S-76, Sky Buddy, R-48 Speakers, R-46, Speakers for SX-28, Harvey Wells Bandmaster Deluxe, Johnson VFO, Knight Mono Amp, Fisher 500-C, Eicost-40, Carver CT-24, Pioneer SR-202, Denon DAP-2500 Digital Pre Amp, Marantz 249-U Quad Amp, Bang-Olsen, Sony, Kenwood, Marantz, Boston A-200 3 Way Speakers in Original Boxes.

Marantz SR-2000, Fisher 2002, Carver CT-24, Preamp Tuner, Mitsubishi DA P10 Stereo Amp, DA-P10 Pre-Amp, Marantz 2400 (New), Panasonic AG-6300, Sony STR-7055, McIntosh Audio Amplifier A-116B, McIntosh 250 Stereo Amp, Sony CRF-2308, and more.

EARLY ITEMS: Deforest Every Man Crystal Set, Deforest Model D-101 Crystal Detector ca. 1919, Atwater Kent Model 12 Bread Board, Atwater Kent Model 10 Breat Board, Atwater Kent Type 3960 3 Tube Bread Board, King Am-Pli-Tone Head Phone Speaker, Radiola 103 Tapestry Speaker, Magnavox, Radiola, Reichman, Saal, Trimm, Western Electric 10-D, Atwater Kent and Thorola Horn Speakers, Several Thousand Tubes, Many ca. 20s Battery Sets, Many Nice Cathedral and Tombstone Style Radios, a Large Selection of Books and Magazines. *All of the items in this sale are clean and most are in good working condition.*

SPECIAL ITEM: Beautiful E.H. Scott All Wave Deluxe Custom Built 1931 E-250 Console Walnut Cabinet with Inlays and Heavily Carved Figures of Maidens on the Cabinet Legs *you must see this radio to truly appreciate the beauty of this marvelous set!*

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

FOR YOUR MUSEUM. For your rare tube collection. Uranium glass Jennings "Peanut" fixed capacitor. Still in original 1944 box. Unused "mint" condx. Glows bright green under your UV blacklight. $20 postpaid, free info. Bob Ryan, 1000 S. Gilbert St., Apt 132, Hemet CA 92543-7065

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

QSL'S FOR SALE: Your old QSL card? Search by call free, buy find at $3.50 ppd. Chuck, NZ5M, NZ5M@arrl.net

SERVICE FOR SALE: Repair, Restore, Sales of antique, vintage tube radios. John Hartman, NM1H, www.radioattic.com/nm1h

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ACCESSORIES FOR SALE: KWM2/S-line metal logo pins. Meatball or winged. Excellent replica of the original. Put one on your hat, badge, or replace a missing logo on your panel. $6.25 shipped. W6ZZ, 1362 Via Rancho Prky, Escondido, CA 92029. 760-747-8710, w6zz@cox.net

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

DRAKE SERVICE FOR SALE: R.L. Drake repair and reconditioning, most models including TR-7's, 35 years experience. Jeff Covelli, WA8SAJ, 440-951-6406 **AFTER 4 PM**, wa8saj@ncweb.com

NOTICE: Visit Radioing.com, dedicated to traditional ham radio & vintage radio resources. Let's Radio! Charlie, W5AM. http: / /www.radioing.com.

BOOK FOR SALE: Heath Nostalgia, 124 PG book contains history, pictures, many stories by longtime Heath employees. (See ER Bookstore) Terry Perdue, 18617 65th Ct., NE, Kenmore, WA 98028

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Transmitting/Receiving tubes, new & used. $0.55 & LSASE for list. I collect old & unique tubes of any type. **TUBES WANTED:** Taylor and Heintz-Kaufman types and large tubes from the old Eimac line; 152T through 2000T for display. John H. Walker Jr., 13406 W. 128th Terr. Overland Park, KS 66213. PH: 913-782-6455, Email: jhwalker@prodigy.net

TREASURES FROM THE CLOSET! Go to www.cjpworld.com/micromart to find some unique items many hams would lust for! Gus, WA, 360-699-0038 gus@wa-net.com

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

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

PARTS 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. 631-653-5350

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

letourneau@wiktel.com

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

ACCESSORY FOR SALE: Convert any wattmeter to read PEP! Perfect for AM/SSB-$24.95 ppd for complete kit! HI-RES, 8232 Woodview, Clarkston MI 48348, 248-391-6660, info@hi-rescom.com

PARTS FOR SALE: Complete hardware set to connect Collins PM2 to KWM2 - $19.95 ppd. Warren Hall, KØZQD, POB 282, Ash Grove, MO 65604-0282.

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

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

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

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

PARTS FOR SALE: Aluminum heat dissipating plate and grid connectors for all 3, 4 and T series Eimac tubes including 3-500Z, 4-1000, 304T's and others. Alan Price, fixr7526@wmconnect.com

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PARTS FOR SALE: Collins reproduction items available through the CRA on www.collinsra.com. Join the CRA and subscribe to the Collins Journal. Dave, W3ST

FOR TRADE: Two good RCA 833A's for one Taylor 833A. Also looking for Taylor 204A, 813, TR40M. John H. Walker Jr., 13406W. 128th Terr., Overland Park, KS 66213. PH: 913-782-6455, Email: jhwalker@prodigy.net

WANTED: Top dollar paid for WWII radios, PRC-1, PRC-5, AR-11, SSTR-1, SSTR-5, British B2, need pts for PRS-1 mine detector. Steve Bartowski, 708-863-3090

WANTED: Astatic F11 adapter, came with 10DA mic. Also test leads for Simpson 355 Midgetester VOM. Joe, K2MZE, 603-652-4873.

WANTED: B&W bandswitched pi-network inductors model 850 & 850A. Help appreciated. Richard Cohen, 813-962-2460

WANTED: DX-60, hope it works. Don Hunter, WA6NBT, 6229 Monterey Rd, Paso Robles, CA 93446

WANTED: Unmodified Heath AT1, VF1, AC1, Hallicrafters S38D, Tom Root, wb8uuj@arrl.net, 810-659-5404.

WANTED: Air variable cap approx 2-15 uuF, 2 KV or better, Mike VE7MMH at mike46@shaw.ca or 604-988-0112

WANTED: Hallicrafters external s-meter for S-40A Pete Hardiman N7DUC 1040 SE 58th Ave, Hillsboro, OR 97123 503-591-9312 n7duc@juno.com

WANTED: Good Power Transformer for my HT-32A. Pay $75+ shipping. K7NCE 209-634-4330 or hwlight@sbcglobal.net

WANTED: Central Electronics MM1 or MM2 station monitor. WA9SUE, Cliff, 608-625-4527 after 6:00 PM CST.

WANTED: Hallicrafters S-20R "Sky Champion" in good condx. W5AQ, "Hiltz", 4703 Scrimshaw Ln, College Station, TX 77845, 979-690-3316

WANTED: Audio transformer (T1) in Elmac AF67; "U" frame filter choke 5 HY 250mA 600V or greater in PS-2V. K9GTB, Herb, 618-362-6539

WANTED: External plug-in S-Meter in case for National NC-57. Gus Stellwag 117 Edgewood Drive Orangebug, NY 10962 845-359-0769 astellwag@juno.com

WANTED: Heathkit SP-620 "Scanalyzer" w/3396 kc IF, also 1963 ARRL handbook. Shannon Latham, W3FML, 570-524-7797, w3fml@hotmail.com

WANTED: RCA/Radiomarine T-408/URT-12 xmtr/info. Sam, KF4TXQ, PO Box 161 Dadeville, AL 36853-0161 stimber@lakemartin.net 256-825-7305 "Life is another radio."

WANTED: RCA communications receivers, ACR-175, ACR-111, CR-88, AR-8516, CRM-R6A, SRR-13. Dan Gutowski, 9753 Easton Rd, Dexter MI, 48130. 734-718-7450, dg16ms26@msn.com

WANTED: Still need #33A and #35 coils for Universal SW-3 for cash or trade.

Hank Bredehorst 2440 Adrian St Newbury Park CA 91320. 805-498-8907 quailhill@earthlink.net

WANTED: Telegraph key stapler, featured in 73 Magazine, March 1969, page 17. Louis L. D'Antuono, 8802-Ridge Blvd., Bklyn, NY 11209. 718-748-9612 AFTER 6 PM Eastern Time.

WANTED: Fully functional with manuals: Johnson AN/FRT505 transmitter, Swan F51 and FC76. Contact Ric at C6ANI@arrl.net

WANTED: A Collins R-389 LF receiver to complete my SWL shack. Have quality trades/pay cash. Dan Gutowski, 9753 Easton Rd, Dexter MI, 48130. 734-718-7450, dg16ms26@msn.com

WANTED: Scott Special Communications rcvr. EA4JL, please call Kurt Keller, CT, 203-431-9740, k2112@earthlink.net

WANTED: Technical Materials Corp. model DCU combiner, DVM monitor, LPP patch panel, LSP speaker, DCP power panel VOX V.F.O., CFA converter, and PSP-1 power supply. K8CCV, Box 210, Leetonia, OH 44431-0231, 330-427-2303.

WANTED: ANY Harvey-Wells speaker, aircraft unit, or military surplus component. Will answer all. Kelley, W8GFG, 9010 Marquette St., St. John IN, 46373, 219-365-4730

WANTED: SCR-602 components, BC-1083, BC-1084 displays, and APS-4 components. Carl Bloom, 714-639-1679

WANTED: Collins 310B-3, basket case OK, 70E-8A PTO per 1948. Chicago CMS-2, pair of Taylor T-21. Jerry, W8GED, CO, 303-979-2323.

WANTED: James Millen coils 42080, 42040, 42015, 43015. Navy SE2511/SE2512 receiver, SE2513 coil set. Gary Carter, WA4IAM, 1405 Sherwood Drive, Reidsville, NC 27320. Phone: 336-349-1991. Email: gcarter01@triad.rr.com.

WANTED: Correspondence with others (am incarcerated) on Military (especially R-390's & backpacks) and tube rigs. Also looking for copies of old surplus catalogs postwar thru 90's. W.K. Smith, 44684-083, FCI Cumberland Unit A-1, POB 1000, Cumberland, MD 21501.

WANTED: 23 channel tube-type CB radios for 10-meter conversions. Also tube-type 10-meter linear amplifiers. Ed, WA7DAX, 1649 East Stratford Ave., Salt Lake City, UT., 84106. 801-484-5853

WANTED: Looking for the emblem of National "NC". Katsu JO1GEG/ex.N8EYH, khirai@ieee.org

WANTED: National "DOG HOUSE" power supply, as used on National SW-3 and FB-7. Roland V. Matson, POB 956, Lake Panasoffkee FL 352-568-1629

WANTED: Collins R-389 LF receivers, parts, documentation, anecdotes, antidotes. W5OR Don Reaves, PO Box 241455, Little Rock AR, 72223 501-868-1287, w5or@militaryradio.com, www.r-389.com

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

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

WANTED: QSL card from my Grandfather, W9QLY, from before 1957. Also seeking original National Company logos from Ham or military equipment. Don Barsema, KC8WBN, 1458 Byron SE, Grand Rapids, MI 46606. 616-451-9874. dbarsema@prodigy.net

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

WANTED: Top prices paid for globe shape radio tubes, new or used. Send for buy list or send your list for offers. Write or email: tubes@qwest.net See www.fathauer.com or send for catalog of tubes for sale. George H. Fathauer & Assoc., 688 West. First St., Ste 4, Tempe, AZ 85281. 480-968-7686, Call toll free 877-307-1414

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

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

WANTED: Western Electric horns, speakers, amps, and mics. Barry Nadel, POB 29303, San Francisco, CA 94129. museumofsound@earthlink.net

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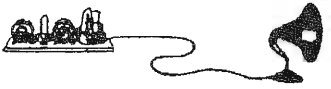

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WANTED: Postcards of old wireless stations; QSL cards showing pre-WWII ham shacks/equip. George, W2KRM, NY, 631-360-9011, w2krm@optonline.net

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

WANTED: 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: Looking for info on radio and radar equipment aboard the Navy PBY-1. Warren, K1BOX, NC, 828-688-1922, k1box@arrl.net

WANTED: WW II German, Japanese, Italian, French equipment, tubes, manuals and parts. Bob Graham, 2105 NW3Oth, 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/AGS coil sets. Jim, KE4DSP, 108 Bayfield Dr., Brandon, FL 33511 j.c.clifford@Juno.com

WANTED: Tektronix memorabilia & promotional literature or catalogs from 1946-1980. James True, N5ARW, POB 820, Hot Springs, AR 71902. 501-318-1844, Fax 623-8783, www.boatanchor.com

WANTED: Collins promotional literature, catalogs and manuals for the period 1933-1993. Jim Stitzinger, WA3CEX, 23800 Via Irana, Valencia, CA 91355. 661-259-2011. FAX: 661-259-3830

WANTED: Any books featuring panel meters, gauges, or flight instruments. Chris Cross, POB 94, McConnell, IL 61050.

WANTED: JOHNSON RANGER CABS & or BEZELS. Or the whole cab set. Dee Almquist, W4PNT w4pnt@w4pnt.8k.com (540)249-3161 (msg). Cell: (540)480-7179 Virginia. Willing to trade.

WANTED: Westinghouse MW-2 Transmitter (RF Unit, Modulator, Power Supply, Coils, Transformers, Parts). Will pickup anywhere. Gary, WA4ODY, Seabrook, TX. 281-291-7701, myctpab@earthlink.net

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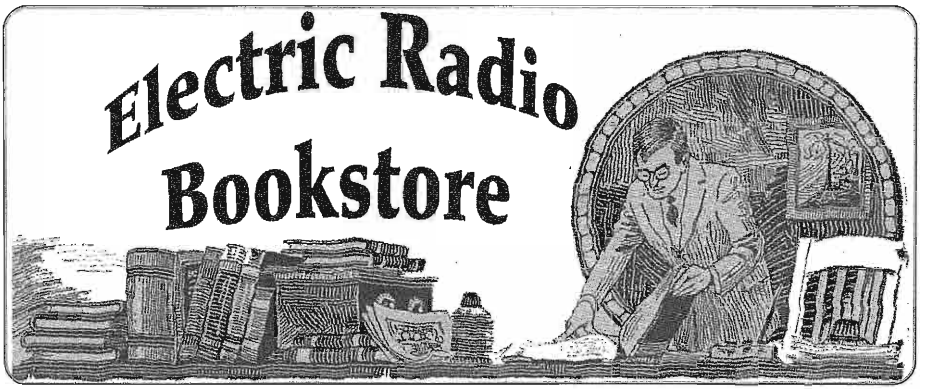

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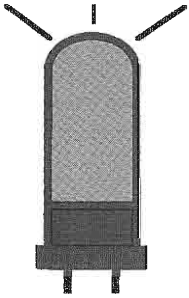

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