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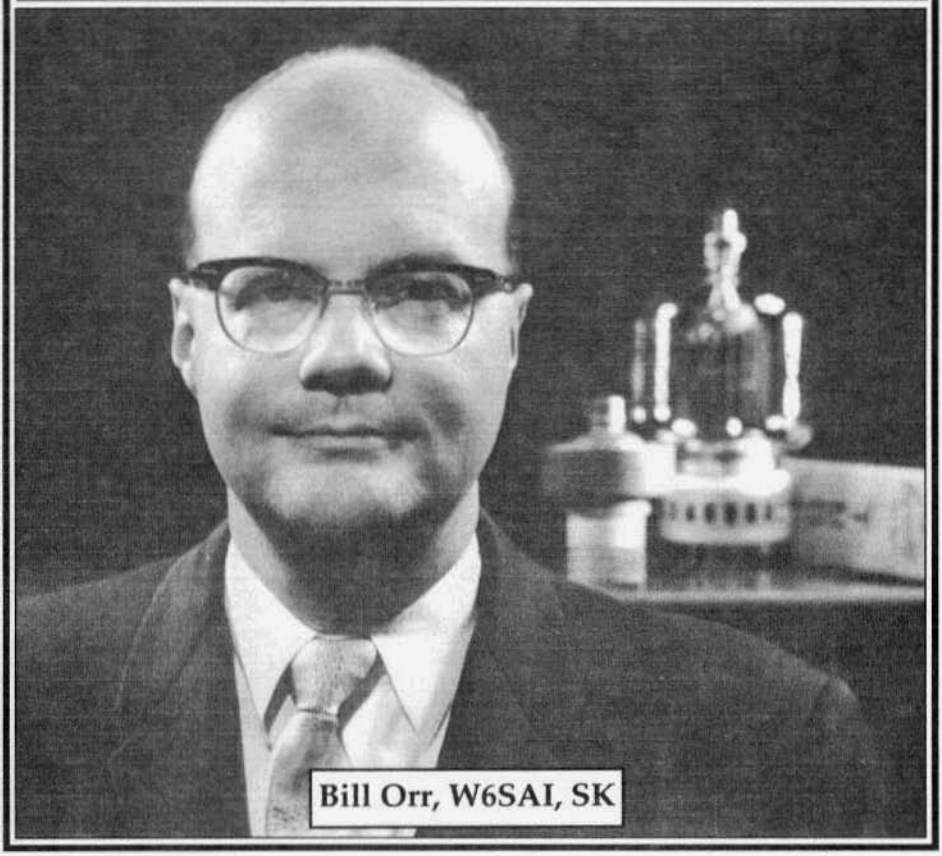
ELECTRIC RADIO

celebrating a bygone era

Number 141 February 2001



Bill Orr, W6SAI, SK

ELECTRIC RADIO

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

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

Regular contributors include:

Bill Breshears, WC3K; Bob Dennison, W2HBE; Dale Gagnon, KW1I; Bob Grinder, K7AK; Jim Hanlon, W8KGI; Brian Harris, WA5UEK; Tom Marcellino, W3BYM; Ray Osterwald, NØDMS; Chuck Teeters, W4MEW; Bruce Vaughan, NR5Q.

Editor's Comments

Subscription Rates Increase

Effective April 1 the subscription rates have been increased $4 per year for US subscribers, $6 for Canadians and also $6 for all other countries. This is the first increase since April of 1994 and it is necessary due to increased costs of postage and in producing the magazine. To soften the blow, especially for those on fixed incomes, we're allowing everyone to renew for one year at the present rates up until April 1. New subscribers will be subject to the new rates immediately.

WN3B 160M QRO Jamboree Winner

Mike McElhinny, WN3B, has been declared the winner of the December 23 160M QRO Jamboree. Bill Kleronomos, KDØHG, the sponsor and organizer of the event, is presently having the award engraved and will be sending it out to Mike shortly. KDØHG says that next year he's planning the event for the day after Thanksgiving. He thinks that band conditions will be better at this time. Another benefit of having the event at this time is that it will not conflict with the Annual ER/N2KSZ Memorial 160M contest (held at the end of December) as it seemed to this year. The ER/N2KSZ event had such a low level of participation that I'm not even going to report on it.

Silent Keys

This has been a sad month. First came the news of the passing of Bill Orr, W6SAI. I had just come to know him over the last year or so and liked and respected him very much. I was particularly happy and proud to have his articles in ER. Bob Grinder, K7AK, has put together a wonderful tribute to W6SAI—see the article on page 2.

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Cover: Bill Orr, W6SAI, Silent Key. This photo was probably taken about 20 years ago. In this issue see Bob Grinder's tribute to Bill and also a reprint of Bill's very first article which appeared in a Gernsback publication, *Radio and Television*, in October of 1938.

A Tribute to William I. Orr, W6SAI

Premier radio amateur of the twentieth century[1]

by Robert E. Grinder, K7AK
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William (Bill) I. Orr, W2HCE, W6SAI, KH6ADR, who was born March 4, 1919, passed away on January 24, 2001. He was 81 years of age. Early in his adulthood he developed a passion for writing books and articles of interest to his fellow amateurs. He chose colloquies as his favorite mode of expression, in order to achieve maximum clarity and an aura of intimacy with his readers. He liked to express himself in the first person as he "conversed" with an imaginary, naive friend, whom he named "Pendergast." By explicitly teaching the topic at hand to Pendergast, he drew his readers implicitly into identifying with the latter and, significantly, into learning along with him. I know that many members of the Electric Radio family are well-acquainted with Bill's writing, and like me, may feel that their lives are diminished greatly by having lost not only a neighbor like Pendergast, but also an erudite mentor. Indeed, an enormously prominent member of our community is gone, however, this essay is in no way a statement of sadness and sorrow; rather it is a tribute to Bill Orr, whose accomplishments are of such magnitude that it is likely few future radio amateurs will ever equal or exceed them.

I regard Bill Orr to have been the premier radio amateur of the twentieth century. My criterion derives from his enduring, surpassing influence upon members of the amateur community. Via his publications, covering every conceivable aspect of amateur radio, Bill Orr inspired countless thousands of amateurs to improve the quality of their equipment, enhance their operating skills, deepen their understanding of electronic theory and its application,

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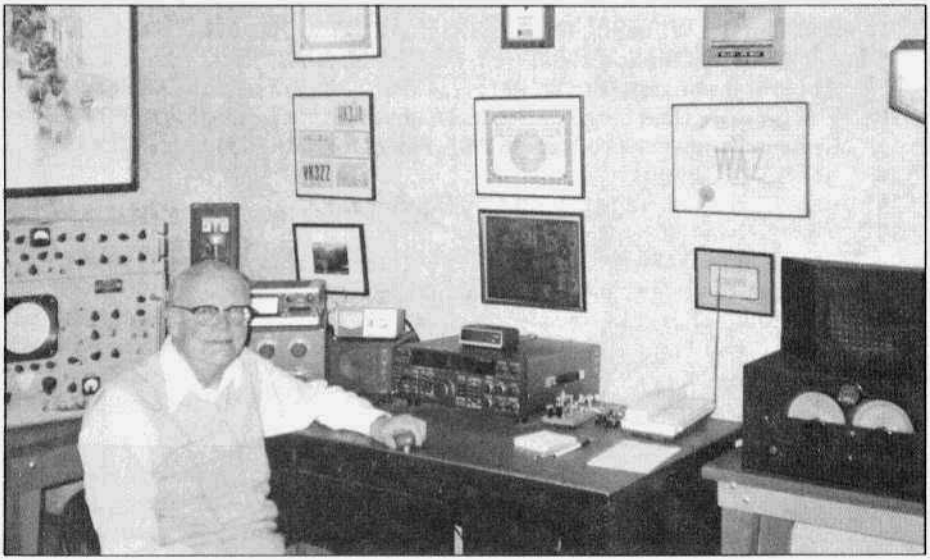

A recent photo of W6SAI taken in his hamshack at Menlo Park, Calif.

From *Radio & Television* October, 1938
Hugo Gernsback, Editor

Fourth Silver Trophy Awarded to William Orr, W2HCE, Bronxville, NY For Best HAM STATION Photo of the Month

The transmitter rig is to the left [below] and is working on 20 meter phone. The rig uses a 41 xtal oscillator on 7,088 kc, a RK39 doubler to 14,176 kc, link coupled to a 805 in the class C amplifier, running at 200 watts input. This RF equipment is contained in the two top panels. In the next panel, the third from the top, is the speech amp. This uses a 57 pentode, 57 triode, push-pull 56's, and push-pull 45's as drivers. The modulators, which consist of 4-46's in push-pull parallel are in the next panel, with the square meter. The bottom panel contains the 500 v 0.5 amp power-supply for the modulators, and the 1250 volt 0.3 amp supply which supplies juice to the 805. The four 866's can be seen in the cut out. On the table to the right is the D-104 crystal microphone, electric clock, and the receiver.

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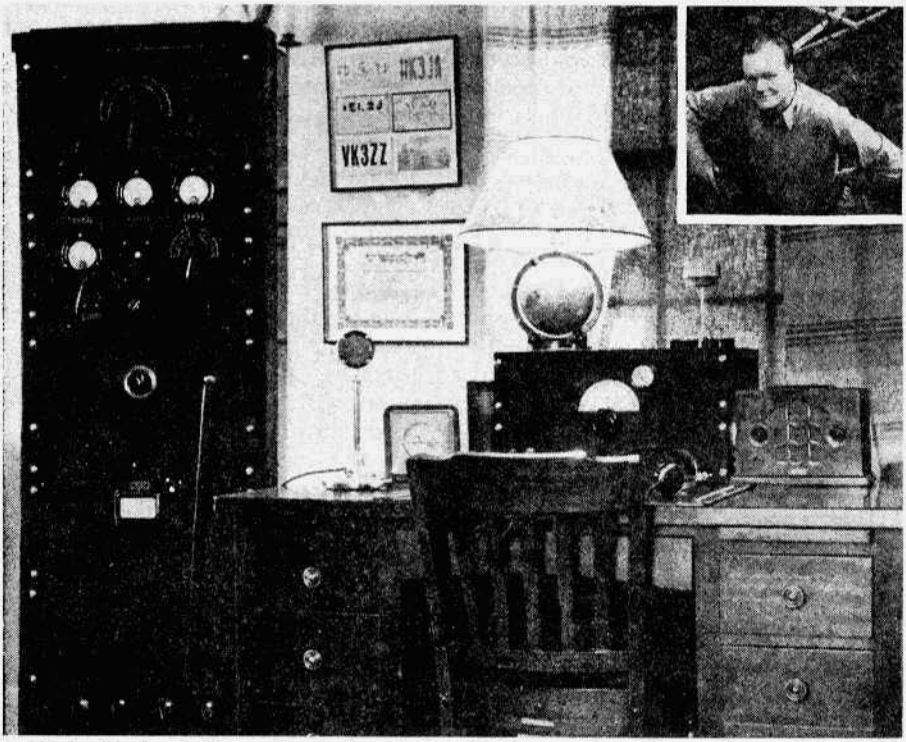

Mr. Orr's first-rate Ham shack, located at 11 Sunny Brae Place, Bronxville, N.Y., has been the scene of much experimenting. Antennas and transmitters of every kind imaginable have been "given the works" at this station. He tells you about some of them in his very interesting description of the station.

AM and Broadcast Transmitters

by Mike Dorrough KO6NM
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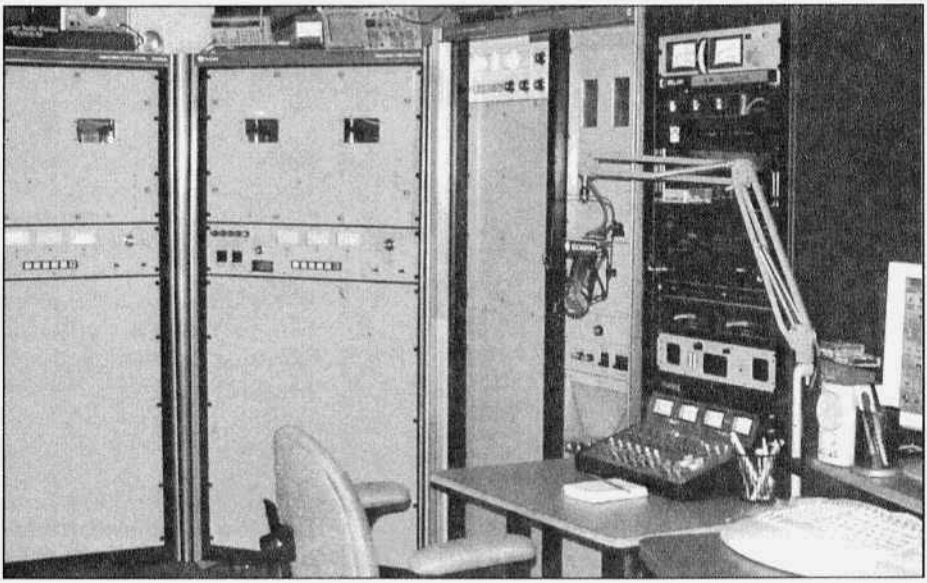
Yes, single sideband is the dominant mode in the voice portion of the HF bands. Yes, single sideband has talk-power, generates smaller electric bills and has even worked its way into the world of shortwave broadcasting. Yes, SSB is tops for passing net traffic and the time of day. If I were running a military operation where communication of intelligible voice data is a life and death proposition I'd issue SSB rigs to the troops. And YES, SSB is tiring, frenetic and ultimately a disappointing way of radio life over the long run. The voice must be used as a percussion instrument in the SSB mode. You can hear the strained pipes of modern Hams being used not so much for conversation as to drive the output meter. Simon & Garfunkel sang about the "Sounds of Silence", possibly because the pauses and quiet are the canvas upon which the art of speech is painted. In Amplitude Modulation mode the carrier acts as the canvas, the blank space upon which radio voices are painted. Single sideband is like paint sprayed into thin air. The paint (voice) must continue to spray else the fleeting illusion of space be lost. Any pause for breath can result in a cacophony of doubling.

That is why an SSB QSO can sound more like a tobacco auction than a conversation. Some SSB operators consciously or unconsciously crank in fan noise as a poor substitute for a carrier so that they might take a breath without having their cohorts start talking over him. Amplitude Modulation is the more satisfying and subtle way to communicate naturally, allowing the occasional pregnant pause or change in amplitude so essential to dimensional human communication. The carrier does most of the heavy lifting and the voice can function as an exquisite musical instrument rather than as a jackhammer.

OK, I confess to being an "AM Chauvinist". This is not to say that AM is perfect, especially in the challenging world of HF sky-wave. Selective fading and the unfortunate and unfair power restrictions on Amateur AM are obstacles to be overcome. Anyone plying the HF band in the AM mode has been frustrated at times to observe fairly strong carriers with feeble audio attached. SSB has an advantage in talk-power, but AM'ers can close much of the talk-power gap without losing their fidelity advantage. My early days in California were totally immersed in sound. As a young audio engineer in the early sixties I was fortunate to work for a studio that allowed experimentation.

It was during those days that I cobbled together the very first multiband audio processor. The recordings produced using these devices had greater overall punch with no loss in fidelity. It seemed that such a device might have even bigger implications for radio broadcast, where greater loudness with fidelity than competitors equaled higher ratings.

By the 1970's the banks of discrete tube limiters and outboard crossovers had evolved into a sophisticated solid-state box known as a DAP or Discriminate Audio Processor. I traveled to radio stations all over North America installing the devices on a "try it and buy it" basis. During those early days of traveling from station to station I got to know a lot of broadcast engineers and



Radio Station KO6NM Left to Right: Collins 820D-2, 820D-2 (both set up for 75 meters), Collins 820D-1 (set up for 160 meters), operating position with audio rack, microphone, boom and computer station.

an equal number of beautiful transmitters. I am to old broadcast gear as a soft-hearted old lady is to stray cats. Imagine the crime of crushing the transmitters that carried the voices and music of some of the greatest talents in our history from ragtime to rock. Rigs that glowed with the warm modulation of Bing Crosby, the wit of Fred Allen and the creative genius of Orson Welles were being treated like garbage. It was a crime to lose these historical transmitters also in the context of their intrinsic value as prime examples of the high art and science of industrial design. As time wore on I would get wind of an RCA, Gates or Collins broadcast rig being turned out for scrap as the stations upped power or went solid-state. The word went out that an eccentric guy from California would gladly haul away the decommissioned gear if at all feasible.

You might ask, "What the heck are you going to do with all that tonnage of broadcast gear in a tightly packed residential suburb of Los Angeles?" The answer came from a different partition of my mental hard-drive. Another long-term passion has been the collection of any and all recorded material from the entirety of the 20th century. Working with a variety of concerned preservationists an impressive archive of records, tapes and even movies and video took shape over a few decades. A large number of those concerned archivists happened to be members of the visually impaired community.

Why not set up the venerable old transmitters on the short wave bands and create a new, unique broadcast service for and by visually impaired people! The archives consisted mainly of transcribed radio programming from the classic era before television. Without pictures all actions and stage direction were described, a perfect fit for sightless audiences. Original material could also be generated by the large reservoir of talent in the visually impaired and blind communities. As a bonus the more fragile and deteriorat-

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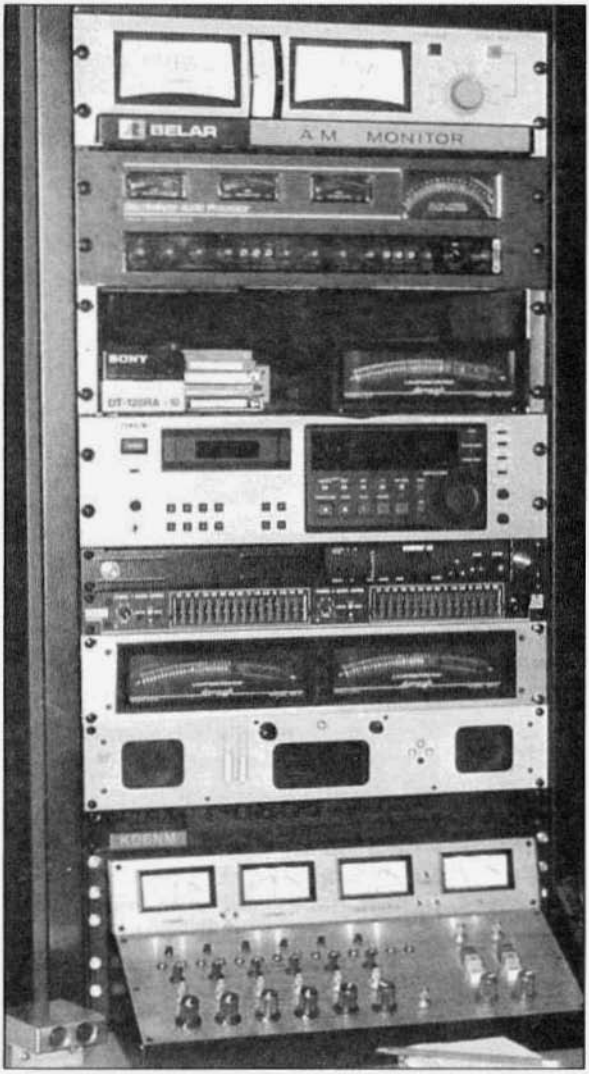


#1 Modulation Monitor: Taps off the transmitter tank circuit to provide visual reading of carrier, percentage of modulation, warning of excessive negative modulation peaks and audio monitoring.

#2 Multiband (Discriminate) Audio Processor: Inserted between audio source and transmitter audio input. Provides peak limiting protection for the transmitter and increases the loudness (power) of the audio to fill the audio envelope to the maximum without distortion.

#3 Loudness Monitor: Audio meter capable of measuring average and peak level simultaneously. The size of the gap between the two readings provides a true representation of the effects of compression (processing).

#4 DAT Recorder: Provides a means of recording incoming signals for playback over the air. This is the best way to let fellow Hams hear their own signals and audio characteristics.

#5 Shure Wireless Mic Receiver: Allows remote operation of transmitter from any room in the facility, including transmitter keying.

#6 Graphic Audio Equalizer: Provides a means of tailoring microphone response to personal preference.

#7 Dual Rack-Mount Loudness Monitors: For monitoring additional audio inputs and sources.

#8 Audio Monitor: Enclosed rack-mounted speakers.

#9 Mixer: Metered, multi-channel device for mixing audio sources (receiver, tape machine, telephone) to be fed to the transmitter. Also provides impedance matching for microphones.

ing recorded material could be transferred to more stable media by willing volunteers working around the station.

Along with the transmitters all necessary period turntables and mixing boards had been rescued and lovingly restored. They only lacked caring and creative hands and ears at the big "blind-friendly" analogue controls.

This soulful little mixer was custom-built for NBC in Los Angeles. Even the knobs were custom crafted! Note two-button transmit switch on far left.

Radio 'Field of Dreams'

The only missing element was a place to build this "Radio Field of Dreams". My wife Kay and I had enjoyed our vacation home in Wisconsin for more than twenty years. After a careful search in 1995 we acquired 16 acres in a distant agricultural satellite of Madison. The house went up and the large archive building/radio plant was completed in 1997. While we knew the character of the wonderful people of Wisconsin we seriously miscalculated regarding the character of government in the State. To learn more about the struggle to bring a radio service to visually impaired and blind audiences in North America, see www.Wisclean.org.

This brings us to a 3rd partition of the mental hard-drive, Ham radio. Just as the construction of the facility in Wisconsin began I started listening again to the short wave bands I loved as a kid. The AM broadcast band had descended into a depressing combination of heavy commercial loads, poor fidelity (because of the restricted NRSC standard) and unfortunate content. The 75-meter AM window was a welcome relief. Nice people, real, unfiltered content and full bandwidth AM signals. It soon became apparent that many of these people were using military gear and broadcast iron. Any tube-type broadcast band transmitter would have plenty of tank coil to be tapped for just about any HF band. Plate chokes and intermediate RF stages were also adaptable in just about all cases, at least to 40-meter operation. It would be hard to imagine any broadcast transmitter that would resist the small hop to the 160-meter band. Most broadcast gear up to the 10KW class can be powered down to well below the Ham radio legal limit. This capability was necessitated by the nighttime power restrictions placed on non-clear channel broadcasters.

I got hooked and decided to study for a Ham ticket. Though already in possession of a 1st-Class Commercial ticket, I was somewhat unprepared for the challenge of the Morse Code but somehow prevailed. Since getting the ticket I have met people who are now lifelong friends and developed a lifeline during the trying times of fighting the old boy network and safeguarding the precious archives

continued next page

"Mechanical Processing?"

For the majority of Hams running the great 100-150 watt workhorses of the AM world, such as the Viking II, Apache and DX-100 a simple method of processing is just a D-104 away!

The classic Astatic D-104 crystal microphone features a form of natural compression thanks to the audio response curve of the mechanical pickup and beefy construction.

This isn't to suggest that such rigs can't benefit from more sophisticated processing techniques. This class of transmitter stands to gain the most from any loudness enhancement. Without a 350-watt carrier to quiet background noise, aggressive modulation is an absolute must, especially during those noisy summer months.

in Wisconsin. While the rows of transmitters restored and modified for use by visually impaired and blind broadcasters could not be used for their intended purpose, at least a few could live at reduced power on the Ham bands!

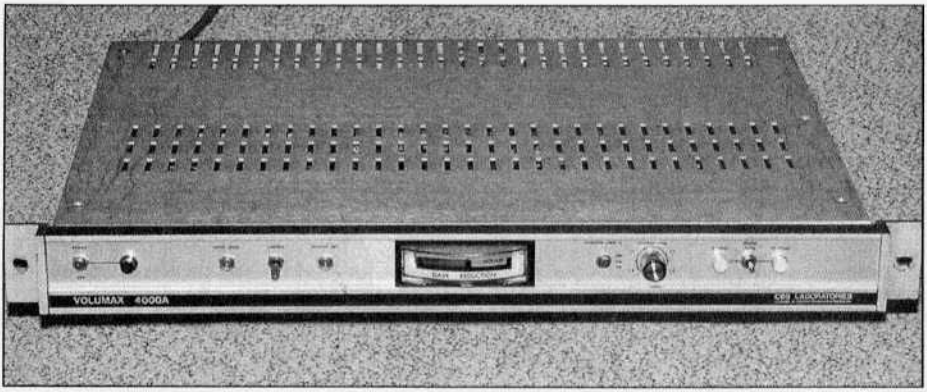
Modifying three Collins broadcast transmitters for 75-meter and 160-meter operation turned out to be fairly straightforward. Re-tapping the tank-circuit coils, adding or subtracting capacitance here and there and injecting a variable frequency in place of the broadcast band crystal was all that was required. I have found a function generator to be an ideal VFO. The Collins 820-Series requires an injection frequency double the desired output frequency.

The next step was to monitor modulation and audio. These broadcast transmitters are set up to make monitoring of wave forms, modulation and output audio a snap. A tap is provided to safely sample RF from the tank circuit. Modulation monitors are equipped to provide both visual and audible feedback to broadcast engineers who are required by law to verify FCC compliance and to prevent interference with adjacent frequencies.

The Effects of Processing

The human voice without processing reveals a tremendous gap between the AVERAGE and PEAK. Bringing up the average for greater overall LOUDNESS would send the PEAK off-scale creating flat-topping (distortion) endangering the transmitter's output tubes and modulation transformer.

With processing the AVERAGE audio power is brought up while the PEAK is limited or held back from the danger zone. This is literally "Having your cake and eating it too!"



This Volumax limiter is a good choice for "voice-only" communications. Such units can be found in fleamarkets or through the Internet from $50-300.

The multiband audio processor pictured in the rack was originally intended for short wave broadcasting. The program material was to include voice and musical material. The multiband design is capable of increasing the perceived loudness of such complex wave forms without adding distortion. This might be considered overkill on the voice-only Amateur bands. For most Hams a simple limiter such as the well-known "Volumax" will do very nicely. The key is to limit the peaks on the voice so that more audio can safely be pushed behind that peak.

In Conclusion:

I have discovered over the years that the key to sounding good **and** loud is to monitor, monitor, and monitor. Inexpensive oscilloscopes can be found in flea markets, closets and junk shops. The Ham varieties such as those made by Heath and Yaesu are most convenient because they are "in-line" types. Coax in, coax out and you are in business. Even standard shop types are easily adaptable. A few turns of wire near the tank circuit of the transmitter will pick up enough RF to produce a usable deflection pattern.

Find some method of listening to your own audio. A receiver with antenna removed or a simple diode rectifier pickup will do the job. I've seen home-built boxes that combine the RF pickup for the scope and diode detector for audio monitoring. A dummy load and line-level input into the rig allows you to play tape recordings of your own voice into the rig as you adjust EQ, and processing. Your own voice in real-time through headphones is problematic, particularly in perceiving lower frequencies. The bones in your head can transfer bass tones from your voice-box directly to the inner-ear. What sounded great in the headphones might just sound tinny to the outside world. It is also necessary to test on the antenna, particularly if you are using outboard audio devices. RF can work its way into mixing boards and other devices. The cure is to unify or eliminate questionable grounds to reduce the potential of ground loops and to get the antenna as far from the studio as possible. If all else fails ferrite chokes on all patch cords might do the trick. Basements are still the best place for Ham stations because they offer the greatest possible separation between radiator and audio stages.

Once the audio is properly tweaked take the headphones off unless you are doing phone patches or playing back another Ham's audio. The image of the DJ with boom microphone and cans is all-pervasive in broadcasting. They have no choice because they need to

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The CV-157/URR Single Sideband Converter

By John Staples, W6BM
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A while back, Jeff, WA6AHL, asked me if I wanted the CV-157 back that I had sold him several years ago. "Sure", I said, and he returned it to me, as agreed, at the same price I sold it to him. Thus began the task of getting this 44-tube monster of electronics overkill finally working.

The CV-157/URR, used with the R-390 series of receivers, is an elaborate frequency-tracking independent sideband receiver converter containing independent IF strips for the upper and lower sidebands, feeding independent product detectors. Two independent signals, be they RTTY data or voice, can be independently demodulated and fed to terminal equipment, replacing voice-frequency landline operation. The unique and most interesting feature is the automatic frequency control in which a motor-driven variable capacitor tunes the local oscillator to follow drift in the transmitter or receiver frequency. A third, narrow-band IF strip isolates the transmitted carrier which is used by the AFC circuit.

The CV-157 can be used as a synchronous AM detector as well. (See my articles on synchronous detectors in ER#30 and ER#34). The outputs of the two product detectors can be summed, or listened to independently through stereo headphones.

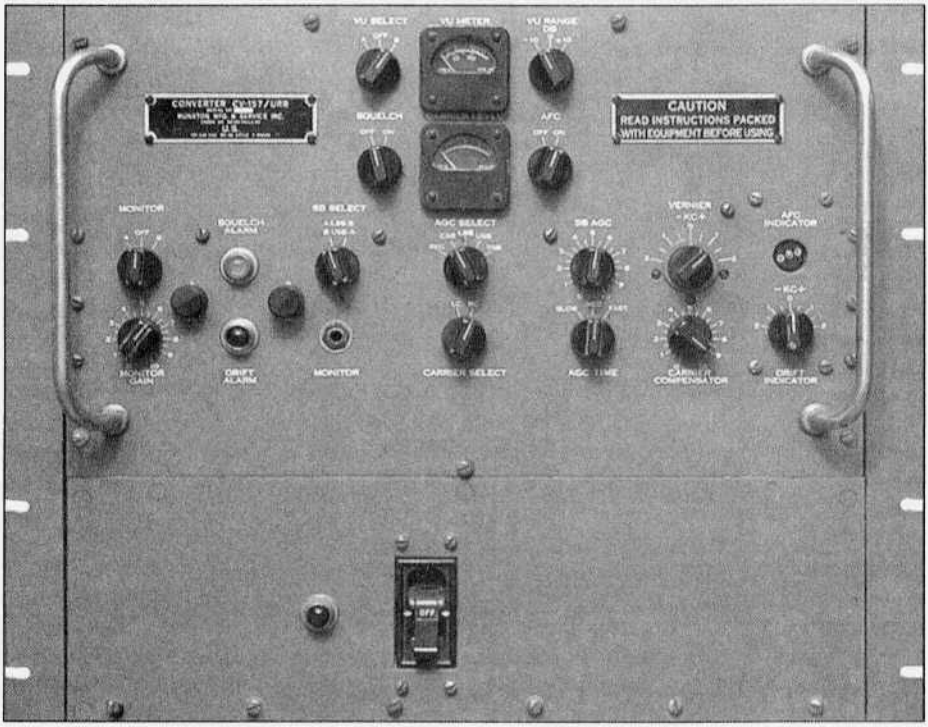
The CV-157 is the big brother to the more common and much smaller CV-591A single-sideband converter, which offers just one channel and no automatic frequency control. Very big brother, as this thing weighs in at 104 pounds, consumes 250 watts, and occupies 15-3/4 inches of rack space, 50% taller than an R-390. An upper slide-out chassis contains the electronics, and the lower chassis houses the major power supply components and the three IF bandpass filters. The nameplate indicates the manufacturer as Munston Mfg. and Service, Inc., order number 38706-Phila-56.

Three Separate IF Strips

In use, the 455 kHz IF output from a suitable receiver, such as the R-390, is applied to the input mixer of the CV-157. The 555 kHz local oscillator mixes with the input and down-converts it to 100 kHz which then feeds three separate IF strips. The upper- and lower-sideband IF amplifiers are followed by product detectors, filters and output amplifiers feeding balanced 600-ohm outputs. A headphone amplifier and a VU meter can be switched to either detector. Each IF filter is 6 kHz wide, with very steep skirts, extending from 180 Hz to 6 kHz from the 100 kHz carrier frequency. Each filter passband drops 74 dB over 180 Hz to the carrier frequency, a very steep falloff indeed.

The third IF strip, centered on 100 kHz with a filter 100 Hz wide at -65 dB, consists of three carrier amplifiers followed by three stages of hard symmetric limiting. The automatic frequency control compares the IF frequency to a local 100 kHz crystal oscillator and adjusts the local oscillator through the motor control to keep the down-converted signal carrier at 100 kHz.

The 100 kHz signal reference for the product detectors may be derived from two sources: the 100 kHz crystal oscillator, or the filtered and limited signal carrier itself, as the sideband informa-



Front panel of the CV-157/URR SSB converter. This unit weighs 104 lbs and is 50% taller than an R-390.

tion has been stripped off by the narrow 100 Hz filter and the carrier strength leveled by the three-stage hard limiter. The carrier-derived signal is approximately phase-coherent with the input signal sidebands (approximately, as the filters have a steep phase shift across their passband) and so can be used as the carrier reference for synchronous AM detection. As the carrier IF strip provides high gain, the transmitted carrier can be significantly reduced, and the CV-157 may be used as a single- or double-sideband receiver with full or nearly suppressed carrier, as well as in synchronous AM detection mode.

Frequency Control Section

The most interesting part of the CV-157 is the automatic frequency control section. The filtered IF signal is compared to the local 100 kHz oscillator, and any difference tunes the local oscillator to bring the down-converted signal carrier to 100 kHz. To increase the sensitivity of the AFC system by a factor of three, each signal is tripled to 300 kHz and compared in quadrature detectors (I and Q detectors in today's parlance). Two phase detectors, each fed from the tripled 100 kHz oscillator, and from the tripled 100 kHz carrier signal, with a 90 degree phase shift in one leg, provide beat frequency outputs of the difference of the two 300 kHz signals, shifted 90 degrees apart from each other.

These two correction signals are amplified and applied to two separate windings of a drag-type motor. The windings are arranged so that the magnetic field applied to the aluminum motor spinner cup rotates either to the left or the right, depending on the phase relation of the I and Q signals. As in

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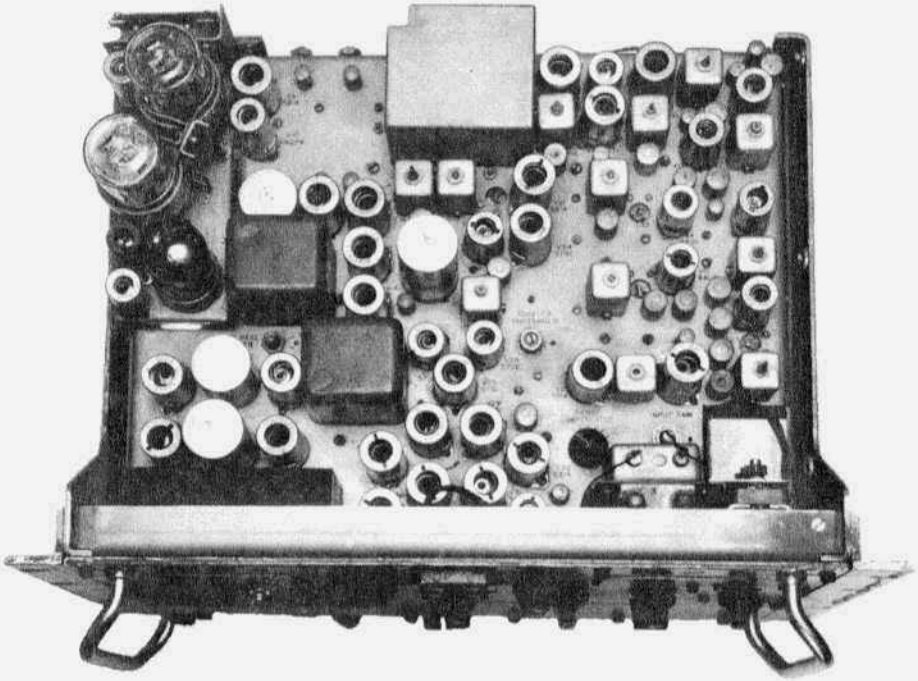

Top view of the chassis. The CV-157 has 44 tubes.

your automobile speedometer, where a spinning magnet drags a disk attached to the pointer proportionally to the speed, the spinning magnetic field drags the aluminum cup either clockwise or counterclockwise, turning the variable capacitor of the local oscillator, bringing the signal carrier back to the local crystal oscillator frequency.

Today, this can all be accomplished with a small IC chip. In the 50's, this took a little more iron. The AVC circuit can be audio-derived from either channel, or can be carrier-derived from either the R-390 or locally. A squelch circuit disables the AFC circuit with weak signals, preventing the AFC circuit from wandering off frequency. A warning signal indicates that the frequency control is at the end of its 3 kHz range.

What Does It Sound Like?

The receiver must be tuned closely to the signal frequency for the AFC to lock in. The AFC circuit takes hold, the motor spins, and the local oscillator synchronizes to the signal carrier frequency. A small spinner on the front panel indicates that the tuning motor is operating.

If you remember the double-sideband suppressed-carrier (DSSC) fad of many years ago, you will recall the fluttering of the audio when the reinserted carrier was slightly off-frequency. This occurs because the recovered audio of each sideband can constructively or destructively interfere with the other sideband, as they may be in phase, or out of phase, depending on the phase of the local reinserted carrier relative to the suppressed transmitted carrier. This does not occur if each sideband is demodulated separately. Listening to AM signals with the CV-157 with stereo headphones brings each sideband to each ear separately, and if the reinserted carrier is not exactly on frequency, some interesting flanging effects are heard. If the filtered and limited carrier is used instead of the local crystal oscillator,

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Review: Longwave Products R-390A Filter Upgrade

by Ray Osterwald, NØDMS
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The latest offering from Dave Curry at Longwave Products is what I would call an R-390A filter upgrade. It is an upgrade because the filter types being offered have bandwidths in line with what a user of today needs, rather than what the military of yesteryear needed. If your rig happens to be one of them that didn't get genuine Collins-produced filters, you are really in for a treat. Purists who are easily offended should stop reading right here because this article does mention the "M" word, namely modifications to vintage equipment.

These filters are based on the modern Rockwell-Collins line of torsional mechanical filters. Torsional-mode mechanical filters are the product of modern materials engineering and computer-aided design. They are produced at lower cost and higher precision than the old style disk-wire filters that were used in hundreds of thousands of Collins products over the years. If the R-390A were still being produced, I have no doubt that they would be equipped with these filters. Readers are referred to ER number 44 from December 1992 (the 75A-series receivers) for a description and history of the older filters. The older style filter has metal disks that resonate like a drumhead, and coupling wires that determine the bandwidth. While the older filters are still manufactured for certain purposes, no new designs are being produced. A cutaway view of the new filters is shown in figure 1. One of the principal differences is that they use coupling rods that vibrate in the torsion mode. The torsional resonators are metal alloys with precisely reproducible characteristics. Likewise, ceramic end transducers are also cheaper to produce and have easily controlled characteristics, unlike the older style filter with electrical inductive transducers. The result is a lower cost filter with nearly ideal passband characteristics, as can be seen in the accompanying filter sweeps. Overall, the packages Rockwell produces them in are

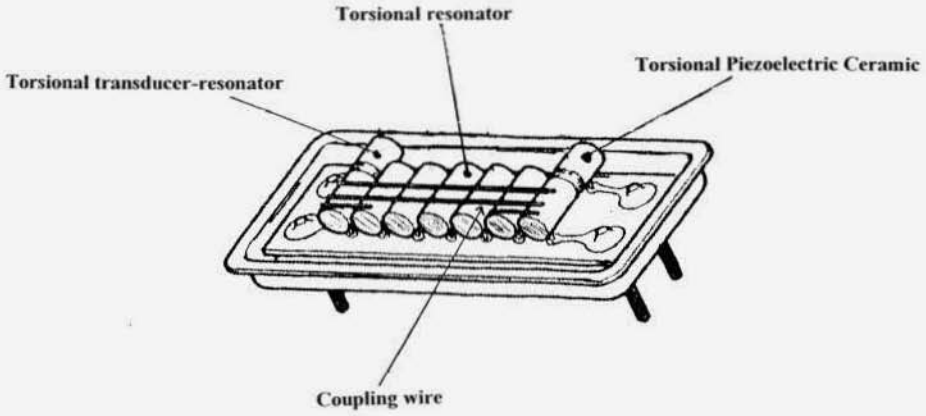

Figure 1. Rockwell-Collins torsional mechanical filter

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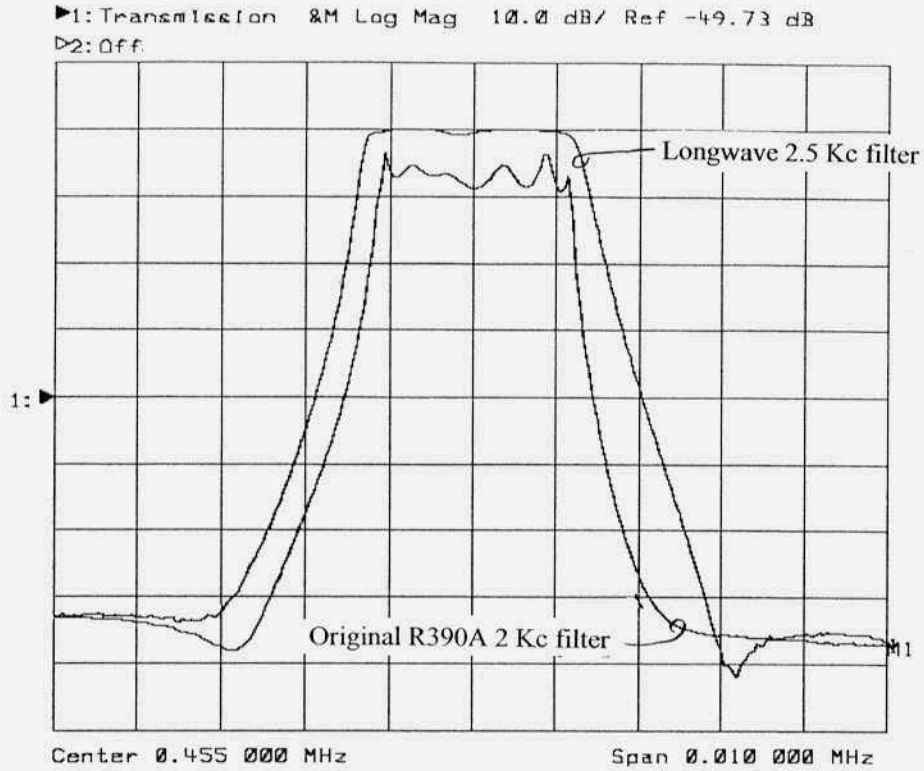
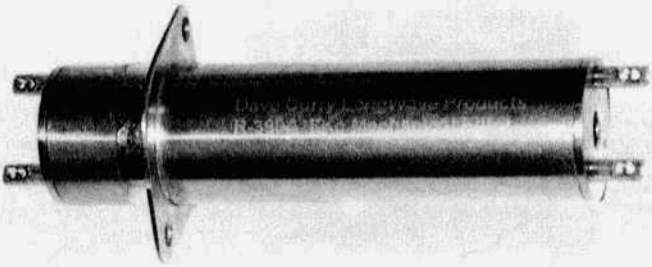


Figure 2. Analyzer comparison of Curry 2.5 kc filters with original R-390A filter.

just over 1 inch in length, their longest dimension.

For the R-390A, Longwave Products has built these filters into brass cylinders, which are identical in size and shape with the existing R-390A filters. I had originally planned to do a "Heathkit" style installation guide for this article, but it turned out that the work is so simple that anyone with enough experience to figure out which end of a soldering iron gets hot can get through it before lunch on Saturday. The ceramic trimmers that you see when the upper R-390A filter shield is removed are no longer required. You can leave them in for looks if so desired, but be sure to electrically disconnect them. (Some R-390As had them top and bottom, some had trimmers on top and selected micas on bottom, and some had nothing except the filters.) Check the receiver schematic before you start the job. The Longwave 2.5 kc filter should be installed in the position of the existing R-390A 2 kc filter, because the 1 kc position on the R-390A bandwidth switch uses the response of a 455 kc crystal in series with the 2 kc mechanical filter to get roughly 1 kc of response at 3 dB down. Once the Longwave-Collins filters are installed and properly soldered to the lugs provided, all that is needed to finish up is to tune in on a 100 kc calibrator harmonic and peak up the trimmer slugs that are visible at each end of the new filters with a plastic diddle-stick. The adjustment is fairly broad. When this is done, you may want to readjust the IF gain and S-meter pots, because the new filters have lower loss than the origi-



nals, which means more gain in the IF stage. I went ahead and did the full alignment that my receiver needed, and which I had been putting off about 3 years.

When the installation is done, fire up the R-390A and get ready for a big surprise. You are going to have R-390A performance that has never been available before.

Longwave is producing these filters with bandwidths of 500 cycles, 2.5 kc, and 6 kc. These are absolutely great to have, and make the R-390A a much more versatile receiver. For example, using the R-390A on CW has always been an irritating compromise. The narrow audio filter works, but it rings so bad that it sure is hard to take for long periods (anything greater than 5 minutes) and it can be tough to tell a weak signal from the ringing noise. Unless the 455 kc filter crystal is exactly on frequency and unless the L-C network is perfectly aligned, you are not going to have a very effective CW filter to back up the audio network. Now, the 500 kc mechanical filter completely eliminates this kludge, and the Longwave filter opens up a whole new world to CW ops. No matter what mode you prefer you better be careful, because an R-390A equipped with Longwave filters just might become your primary station receiver.

For SSB, the 2.5 kc filter offered may be slightly wider than stock, but the lack of passband ripple and the lower loss is a great benefit, unless it just happens to be contest day, in which case the best position on the function switch might be the one labeled "off". With one of the new aftermarket product detectors and Dave's SSB filter, you will have a receiver that will easily outperform many modern receivers selling for 3 times the cost of a hamfest R-390A and 3 Longwave filters.

SWL alert! I have found that the Longwave 6 kc filter for the R-390A is just right. It sure is nice to have after all these years. I'm sure you folks out in radio-land know what it is like to fight band conditions with a speech filter that is either too wide or too narrow. I have no doubt that an R-390A in good condition will quickly become highly sought after if it has a Longwave Products 6 kc filter on-board. I did leave the original 8 kc filter in for AM broadcast—WSM just doesn't sound right with anything less.

I was provided with plots from a network analyzer for the 2.5 kc Longwave filter showing a comparison with the original R-390A 2 kc filter. These are provided in figure 2. Although I swept the Longwave filters with the same setup as in the 75A-4 filter review, I didn't make any pictures because there was no noticeable difference from the analyzer plots. Sweeping the 500 cycle and 6 kc filters confirmed that they are nearly textbook examples of classic bandpass response curves.

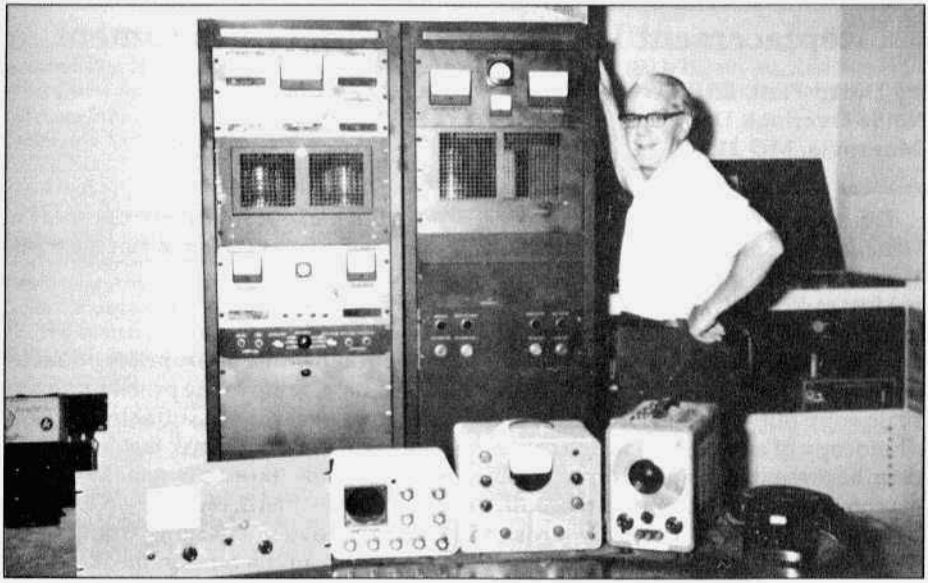
My conclusion is obvious by now, and readers' had better get Longwave filters while they are available. Happy listening! **ER**

K8MLV/Ø Photos:

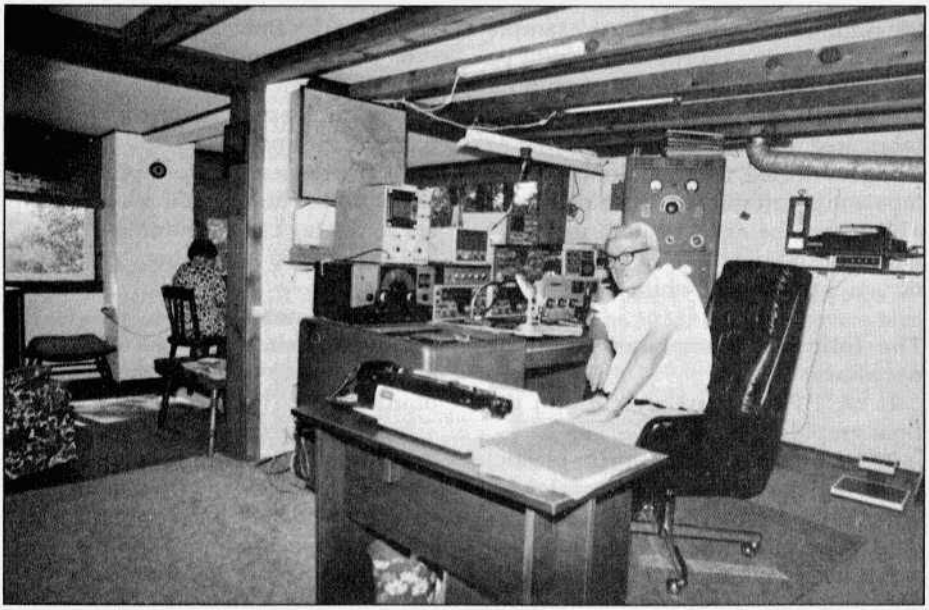
More photos from Ricardo's archives

Ricardo was a character and very willing to express his opinions on any issue. This photo was probably taken in the midst of the AM/SSB wars.

Bill Thissell, K7VZP, back in 1979 when there weren't too many other AM'ers on-the-air. Although Bill did not have his KW-1 back then he does have some nice equipment. Shown in the photo is a HB xmtr, a Johnson 500, a Valiant and a NC-303 receiver.



'Hoisy' Hoisington, W4CJL. On the back of the photo he has written, "Hi there Rick: Appreciate ur interest in Advanced Modulation. This is our "Standby" xmtr, 1 KW output, 4-1000As modulated by pr 4-1000As. Built it up from scratch about 7 years ago. Uses ultra-modulation, only 125% positive peaks." There wasn't a date on the photo but it's probably 20 years old.



Art Clouse, W9CNI, Bean Blossom Hill, Indiana. This photo is not dated, but probably it was take about 15-20 years ago. He was a well-known AM'er and a great friend of Ricardo's. He passed away around 1990.

Replacement ID Tags For Military Equipment

by Doran Platt, K3HVG
12196 Overlook Dr.
Monrovia, MD 21770

This is the K3HVG method of constructing a replacement identification tag for military equipment.

Most military ID tags are constructed of aluminum with marking either photo or chemically etched. The best, albeit most costly method, is to make a large-scale copy (either a newly drafted or a photocopy of an original) which can, in turn, be presented to a good reprographics company for re-scaling and production. A single tag can cost upwards of $100, or more. A quantity buy will bring single-piece price way down, but this may not be an attractive method especially if all you need it one tag!

Another satisfactory method is to construct an ersatz tag that will be, at least, presentable on your equipment. As in the commercial methodology, a sample tag or a graphic reproduction, will be required. Either a standard aluminum tag or a plastic, Navy-type tag may be fabricated. Where a standard tag is being fabricated, use clear double-sided tape and an aluminum "blank" tag. If a Navy tag is being fabricated, use (pref.) white plastic and clear tape. If the plastic is not white, use white tape.

The following components will be necessary:

1. A 1:1 transparency copy of the final graphic.
2. A fabricated aluminum (or plastic) blank tag, the same size as the original, with the mounting drilled to accommodate panel mounting.
3. Clear or white, double-sided tape, depending on the type of tag and blank tag material being used.
4. Clear, photo fixative spray. (3M, etc., but make sure and test the spray to make sure it won't fog or run the transparency!)

To assemble the tag:

1. Using the appropriate, double-sided tape, remove the protective backing from one side of a suitable size piece and affix it to the blank tag.
2. Trim the tape to match the dimensions of the blank tag.
3. Remove the backing from the exposed side of the tape on the blank tag.
4. Very carefully, visually align the photo copied tag and press it onto the blank tag. This is a one-shot deal, so be careful!
5. Using a hand print roller (or similar), press the layers onto the tag to ensure good, final adhesion.
6. Using a good, sharp Exacto knife, do a final trim, as may be required.
6. Lightly spray the tag with photo-fixative. (See note)
7. Using a pin-vice (or just a drill bit) ream out the holes in the mounted layers so the tag can be mounted.
8. Mount your new tag.

Additional notes:

o If you believe that the tag will not be subjected to wear, the spray may be omitted.

o If a Navy-type tag is being fabricated and if aluminum is being used for the blank tag, the white double-sided tape must be thick enough to provide a very white background for the transparency and cover the aluminum color.

Two or more layers of tape may be used, if necessary, to achieve proper result. ER

VINTAGE NETS

Arizona 40M AM Group: Meets on 7293 kHz at 10:00 AM MST (1700 UTC) on Sat. and Sun.
West Coast AM Net meets Wednesdays 9PM Pacific on or about 3870kc. Net control alternates between John, W6MIT and Ken, K6CJA.
California Early Bird Net: Saturday mornings at 8 AM PST on 3870.
California Vintage SSB Net: Sunday mornings at 8 AM PST on 3860 +/-
Southeast Swap Net: Tuesday nights at 7:30 ET on 3885. Net controls are Andy, WA4KCY and Sam, KF4TXQ. This same group also has a Sunday afternoon net on 3885 at 2 PM ET.
Eastern AM Swap Net: Thursday evenings on 3885 at 7:30 ET. This net is for the exchange of AM related equipment only.
Northwest AM Net: AM activity daily 3 PM - 5 PM on 3875. This same group meets on 6 meters (50.4) Sundays and Wednesdays at 8:00 PT and on 2 meters (144.4) Tuesdays and Thursdays at 8:00 PT. The formal AM net and swap session is on 3875, Sundays at 3 PM.
K6HQI Memorial Twenty Meter AM Net: This net on 14.286 has been in continuous operation for at least the last 20 years. It starts at 5:00 PM PT, 7 days a week and usually goes for about 2 hours.
Arizona AM Net: Sundays at 3 PM MT on 3855. On 6 meters (50.4) at 8 PM MT Saturdays.
Colorado Morning Net: An informal group of AM'ers get together on 3876 Monday, Wednesday Friday, Saturday and Sunday mornings at 7AM MT.
DX-60 Net: This net meets on 3880 at 0800 AM, ET, Sundays. Net control is Jim, N8LUV, with alternates. This net is all about entry-level AM rigs like the Heath DX-60.
Eastcoast Military Net: It isn't necessary to check in with military gear but that is what this net is all about. Net control is Ted, W3PWW. Saturday mornings at 0500 ET on 3885 + or - QRM.
Westcoast Military Radio Collectors Net: Meets Saturday evenings at 2130 (PT) on 3980 + or -QRM. Net control is Dennis, W7QHO.
Gray Hair Net: The oldest (or one of the oldest - 44+ years) 160-meter AM nets. It meets on Tuesday nights on 1945 at 8:00 PM EST & 8:30 EDT. http://www.crompton.com/grayhair
Vintage SSB Net: Net control is Andy, WBØSNF. The Net meets on 14.293 at 1900Z Sunday and is followed by the New Heathkit Net at about 2030Z on the same freq. Net control is Don, WB6LRG.
Collins Collectors Association Nets: Technical and swap session each Sunday, 14.263 MHz, 2000Z, is a long-established net run by call areas. Informal ragchew nets meet on Tuesday nights on 3805 at 2100 Eastern and on Thursday nights on 3875. West Coast 75M net that takes place on 3895 at 2000 Pacific Time.
Collins Swap and Shop Net: Meets every Tuesday at 8PM EST on 3955. Net control is Ed, WA3AMJ.
Collins Collector Association Monthly AM Night: The first Wed. of each month on 3885 kHz starting at 2000 CST (0200 UTC).
Drake Users Net: This group gets together on 3865 Tuesday nights at 8 PM ET. Net controls are Criss, KB8IZX; Don, W8NS; Rob, KE3EE and Huey, KD3UI.
Swan Users Net: This group meets on 14.250 Sunday afternoons at 4 PM CT. The net control is usually Dean, WA9AZK.
Nostalgia/Hi-Fi Net: Meets on Fridays at 7 PM PT on 1930. This net was started in 1978.
K1JCL 6-Meter AM Repeater: Located in Connecticut it operates on 50.4 in and 50.5 out.
JA AM Net: 14.190 at 0100 UTC, Saturdays and Sundays. Stan Tajima, JA1DNQ is net control.
Fort Wayne Area 6-Meter AM Net: Meets nightly at 7 PM ET on 50.58 MHz. This net has been meeting since the late '50's. Most members are using vintage or homebrew gear.
Southern Calif. Sunday Morning 6 Meter AM Net: 10 AM Sundays on 50.4. NC is Will, AA6DD.
Old Buzzards Net: Meets daily at 10 AM Local time on 3945. This is an informal net in the New England area . Net hosts are George, W1GAC and Paul, W1ECO.
Canadian Boatanchor Net: Meets Saturday afternoons, 3:00 PM EST on 3745.
Midwest Classic Radio Net: Sat. mornings on 3885 at 8AM Central time. Only AM checkins allowed. Swap/sale, hamfest info and technical help are frequent topics. NC is Rob, WA9ZTY.
Boatanchors CW Group: Meets nightly at 0200Z-0300Z on 3578-80 kHz. During the day at 7050 or 7147. Listen for stations calling "CQ BA" or signing "BA" after their callsigns.
Wireless Set No. 19 Net: Meets the second Sunday of every month on 7.175 +/- 25 kHz at 1900Z (3760 +/- 25 kHz alternate). Net control is Dave, VA3ORP.
Hallicrafters Collectors Assoc. Net: Sundays, 1730-1845 UTC on 14.293. Net control varies. Midwest net on Sat. on 7280 at 1700 UTC. Net control Jim, WB8DML. Pacific Northwest net on Sundays at 22.00 UTC on 7220. Net control is Dennis, VE7DH.
Nets that are underlined are new or have changed times or frequency since the last issue.

The Dreaded Johnson Ranger VFO Disaster (A Recovery Process for the Shorted R3)

by Tom Marcellino, W3BYM
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Many of you have heard about the destruction caused by R3, the 18K ohm resistor, when it shorts in the Johnson VFOs. Well I too had heard about it but never witnessed this destruction. I recently completed a Ranger II through the restoration process and now I can say with no uncertainty what happens when R3 shorts or becomes of such a low value that enormous amounts of heat from the two tubes destroys the board.

After removing the VFO cover and looking down at the two tubes and phenolic board, I was simply amazed at what I saw. The photo doesn't do justice to the destruction that was before me that day. The board had suffered tremendous heat damage due to excessive 0A2 and 6AU6 heat dissipation. The board had been turned into charcoal around the two tube openings with the greatest damage around the 0A2. In addition, the heat had propagated across the board and allowed it to warp.

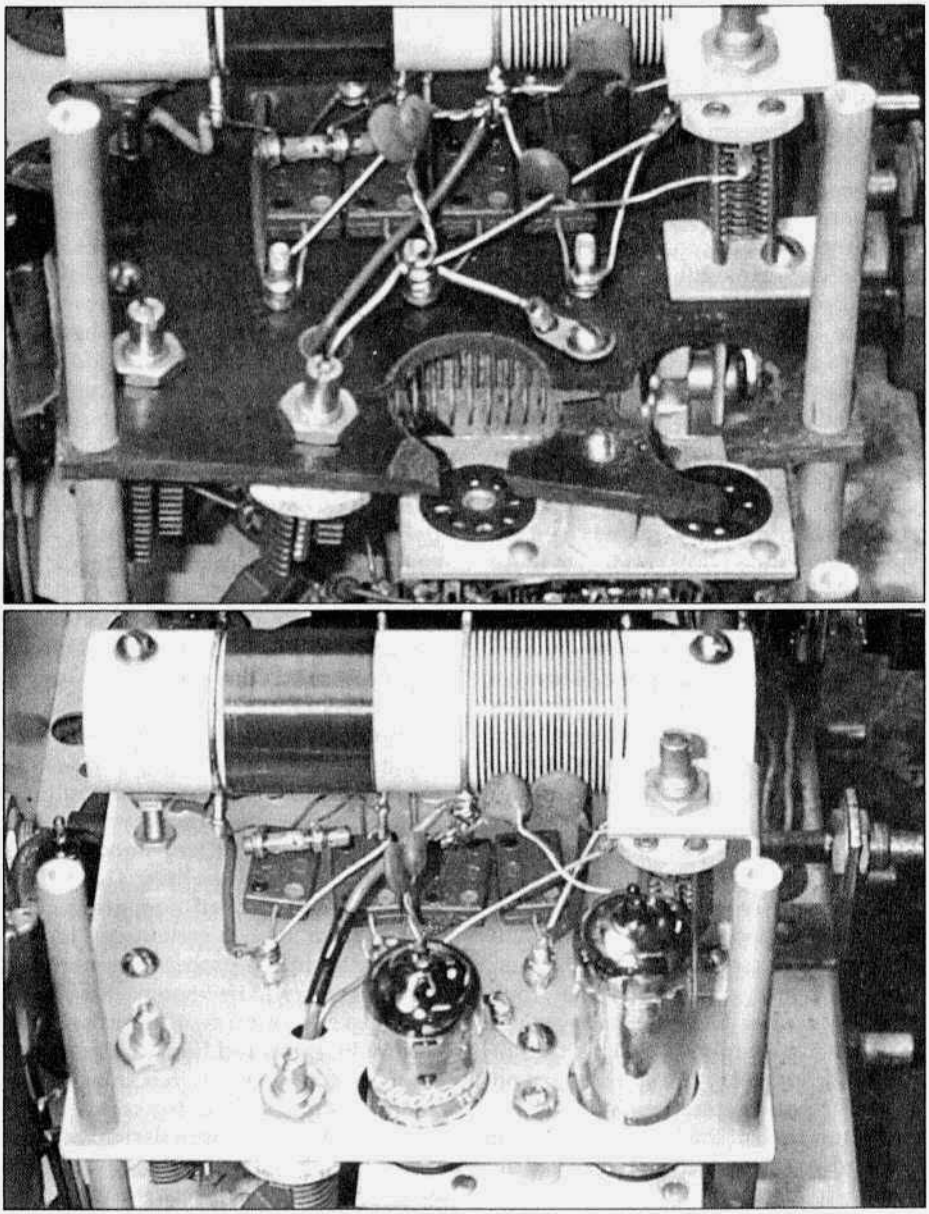
In this unit someone in this rig's history made a poor attempt at bringing the VFO back to life. R3 had been replaced with the same carbon 2 watt style resistor and the board had been physically broken around the tube openings during the process. The side VFO panel mounts had been sheared off at the chassis and all under chassis VFO mounting hardware was either loose or missing. To say the least the VFO was an electrical and mechanical disaster.

The only way to repair this VFO was the right way—rebuild it. I was half way there having removed the front panel for a standard restoration job. I have in past restorations removed the VFO top shield but never had the ***pleasure*** of removing the entire VFO. I would be kidding you if I said this job was an easy one but with a barrel of patience, lots of paper and pencils for making circuit drawings and a digital camera for taking many photos at every angle and step along the way, the job can be done and with total success. Here's how to get it done.

The breakage mentioned earlier was to my benefit. Notice the tube bracket is pushed downward below the board plane. This part of the VFO plus the ceramic wafer switch and terminal strip with mounted components all stay in place and don't have to be removed for the repair. If you have a board that isn't broken like mine, just unscrew the tube bracket mounting screws and you will be at this step of my process.

Remove the side panel and remaining shield. You will need first to remove the bottom shield (SH2) over the driver components to gain access to the top shield retaining nuts. Next remove the four top long standoffs and the board will now be free to move upward off the threaded portion of the four bottom standoffs. The board will not move very far because it is held by the five solid insulated wires connecting the board to the ceramic wafer switch. As with all Johnson wiring this wire is no different. It is very stiff and hard to work with.

To remove the board just cut the five wires somewhere on their center lengths such that you have a pigtail remaining on the switch showing the insulation color and a pigtail coming from the board with the same matching color. There will be two green, one yellow, one red, and one blue. Now is the time to make more drawings of the wiring



The before picture is at the top and the after picture is at the bottom.

on the wafer and those going to the board. Be sure to identify the two green wires. Now you should have in your hand the VFO proper, the coil and fixed caps on the top and the main tuning cap and trimmer caps with other parts on the bottom. Make some more drawings and photos. These will be invaluable when the VFO is reassembled. At this time remove the main tuning brass reduction unit. It is heavy and only supported by the insulated coupling which

continued next page

is very fragile. In fact, my coupling was cracked and repaired using some silicon RTV.

Now there are two wires, a yellow and green, that connect top parts to bottom parts through holes in the board. Cut these two wires about 3/4" above the board. Don't unsolder them, they will be spliced back together and insulated with shrink tubing later. **CAUTION** Be aware that the plates on the trimmer caps are delicate where they attach to their shafts. Use care in handling this unit from here on. Don't lay the board on a hard surface. The plates will break off.

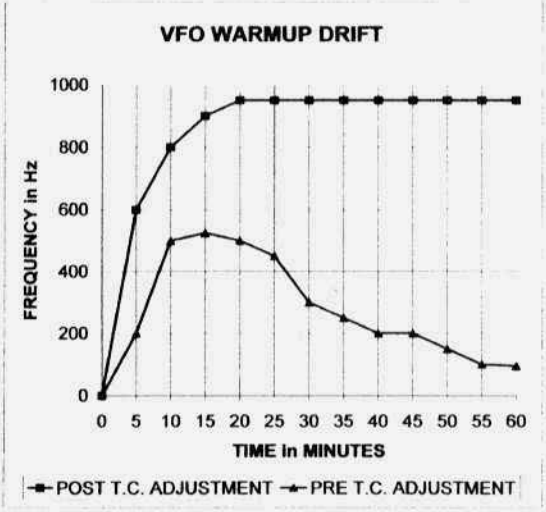
The top of the board has five terminals made from 4-40 screws threaded from the bottom. The various fixed capacitors and buss wires connect to these terminals. Make some more drawings and photos. Wick off all solder from the five terminals and remove the connections. I tacked all connections going to a particular terminal together temporarily to help keep track of things. Now the top components can be removed as an assembly and likewise the bottom components.

Now it's time to manufacture a new board. If you have some 1/8" thick phenolic, like the stock unit, it will work fine. I happened to have some G-10 which is an excellent grade of glass-phenolic board superior to the stock material. I used the original warped board as my template. Using a pair of small C clamps lay the stock board on top of the new material and it is a simply matter to drill the holes to the same size and exact location. A small drill press helps tremendously in this step. The tube openings are 3/4" and were punched with a Greenlee. The board is 4" x 4 -1/8" x 1/8". Obviously the new board must be exact to this stock dimensions.

After the board is made the reassembly process can begin. Tap the five terminal holes for 4-40 threads and screw in brass or solderable screws from the bottom. Mount the top components and the bottom components as two assemblies to the board. Many fingers are used here because the same hardware is common to both assemblies. Next reconnect all the fixed capacitors and buss wires to the five terminals. Reconnect the yellow and green wires going through the board and use heat shrink tubing over the joints. Two new wires must be attached to the screw heads of two terminals on the bottom side. Now solder the three remaining wires to the board components. When replacing these wires use the pig tails left from the earlier dissection step and replace them one by one. These five wires go to the wafer switch on the chassis. It is easier to use #20 stranded insulated wire instead of the solid type.

After restoring several Johnson transmitters, I believe the company had a large supply of solid wire and for that reason very little stranded wire is found in their transmitters. Don't worry about wire flexing and changing circuit capacitance because that won't happen after everything is in place. Using stranded wire makes rework an easier task. Remember to twist two pairs of the five wires. The yellow and blue and the red and green. You should have the two green wires identified earlier in the process therefore the correct green will be known.

Before remounting the entire VFO assembly, clean and lubricate the chassis mounted wafer switch. Also it is a good idea to check all the components mounted to the terminal strip within the VFO. I placed a new R3, 10 watt unit under the chassis on a terminal strip connected by a pair of wires from the old location through the grommet to the new terminal strip. Before cutting the five new stranded insulated wires that will be soldered to the wafer switch, position the board on the standoffs and then cut the wires to their appropriate lengths. Now the wires can be dressed



and connected to the switch. It will be helpful to temporarily remove the right two bottom standoffs allowing the board to tilt into that area while connecting the wires.

Position the board on the left two bottom standoffs and reinstall the right two. Now the four top standoffs can be installed. Reconnect the tube bracket to the board using the long hardware and short metal standoffs. The photo shows the completed "working" VFO ready for the shield installation. Now is the time to install the main tuning brass reduction unit. The set screws are best reached with a long thin screwdriver from the bottom of the chassis through the large hole. Again caution, the insulated coupler is fragile with a very thin phenolic insulator. Reinstall the top shields and cover with trimmer adjusting phenolic tubes. Make sure all screws have an internal locking washer. The whole unit must be rigid to the chassis for good electrical stability.

A very nice feature of this model Ranger is the incorporation of the temperature compensation adjustment C100 in the VFO. The chart shows the pre and post VFO warm-up drift characteristics over a time period of one hour. C100 was adjusted to near mid range during reassembly according to the manual. Obviously from the curves, this wasn't the correct adjustment and only a typical value. The Ranger II was cold started for both runs in the chart. Final adjustment was reached after 3 hours of testing. C100 required about 1/8 turn (more negative temperature coefficient) in the CCW direction to stabilize the frequency as shown in the top curve. The setting procedure for C100 in the manual works quite well. As shown, the VFO reached frequency stability after 20 minutes which is within the stock spec. of 30 minutes. If C100 would have been adjusted past this CCW position, the lower curve would have shown a positive frequency drift. After the warm-up of 20 minutes, the drift is within stock specification of .001% per hour. Now you have to admit for this old tube gear that's a pretty impressive drift spec.

Review of the Ranger I VFO circuit shows it compares very well with this Ranger II circuit. Other than a few value changes and the addition of the C100 variable cap, the Ranger I VFO could be upgraded to a more stable configuration.

There, now you know what I know and how to recover from the evils of the shorted R3. I've included as much detail as necessary for others to perform this task. Like I said at the start this wasn't going to be easy but the effort was well worth it. The rig was powered up and calibration went without a hitch. All told I probably spent an accumulated 25 hours on the VFO rebuild alone but now I have a very reliable and stable VFO that has saved this Ranger II from becoming a junker. ER

Straight Key Night at K6KPH

by Dick Dillman, W6AWO "RD"
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San Francisco, CA 94110

Let no one tell you that radiomen and radiowomen don't know how to celebrate New Year's eve.

The Maritime Radio Historical Society (MRHS) has been working for more than a year at KPH, the famous ex-RCA coast station north of San Francisco. Last July we returned the station to the air on its original commercial frequencies, using the original antennas and transmitters at the transmitting station in Bolinas, CA on the first anniversary of the last commercial Morse message in North America. We have also reactivated some of the commercial transmitters on amateur frequencies. The call K6KPH has been obtained for these operations.

Straight Key Night (SKN) is held every New Year's Eve beginning at midnight GMT. All participating stations use straight keys for communication. As SKN 2001 approached we realized it would be a good opportunity to test our repair and restoration work by operating the transmitters, receivers and auxiliary equipment for an extended period. The MRHS is not an amateur radio club in the usual sense. We use amateur radio mainly as a way to put classic transmitters on the air for the pleasure of seeing them work again and to demonstrate them to the public. While the station does not hold special events in the way many club stations do, we thought that SKN provided the opportunity to contact other "true believers" who love Morse and would enjoy working a famous coast station once heard around the world. Little did we know!

Like all coast stations KPH has a receiving station (at Pt. Reyes, known as "RS") and a transmitting station (at Bolinas, known as "BL"). Our plan was to put two transmitters on the air at BL and have two operating positions active at RS. We had experimentally keyed the transmitters at BL from RS before, but this would be the first extended test of remote multiple transmitter operation.

Tom Horsfall, WA6OPE, was the transmitter technician in charge at BL. Steve Hawes, WB6UZX, "SH" and Denice Stoops "DA" (the first female operator at KPH), Rick Wahl, KK6PR, "FW" (also a former KPH operator) and I were at RS. There was the usual last minute rush to get everything operational. As zero hour approached the antenna feed to all the receivers failed! Steve and I quickly patched around the relays that had failed in the antenna distribution system and the Watkins-Johnson receivers once again came to life.

We called Tom down at BL and told him to put the transmitters on line. Steve pushed the "money button" on the land line link connecting the two stations. We now had control of the transmitters. Steve and I took our seats, I at position 1 (40M) and Steve at position 2 (20M). We selected our respective transmitters on our control panels, just as KPH operators had done for decades. We watched the station clock (with its bold red markings for the silent period) as the second hand swept toward 0000Z.

Right at midnight GMT I rapped out what I hoped was a snappy CQ, worthy of the heritage of the station and all the first class operators that had worked there for so long. I signed K and suddenly it was pandemonium! There was

Dick Dillman "RD" at operating position 1. Note the official KPH flyswatter hanging on the side of the console. These are disrtributed throughout the station and were the primary weapon in the constant battle between the operators and the airborne insects also in residence.

an actual pileup of stations on 40M hoping to work K6KPH. I was entirely unprepared for this. I've never been a contest operator and on past SKNs I've had to troll for extended periods to get a call. Then I realized that the situation would have been normal for the operators at KPH in its glory days. They would send their traffic list and when it was done ships from all over the world would call. Denice reports stacking 'em up 20 and 30 at a time. Sometimes they couldn't all be worked in the two hours between traffic lists and some poor sparks, sweating on a tramp steamer on the Indian Ocean, would have to try again after the next traffic list. I realized there was nothing for it but to work 'em, so I plunged in. I occasionally glanced over at Steve and could see that he was getting a good response on 20M as well.

With the Watkins-Johnson receivers and conical monopole type antenna we had an excellent receiving setup. Every signal at my position seemed to be at least S9. Meanwhile, down at BL, the transmitters were humming away, following our keying precisely. The Henry transmitter on 40M was feeding a double extended Zepp while the 50s vintage RCA "L" set on 20M was using a H over 2. Both transmitters were throttled back to 1.5 KW from their usual multi-kilowatt ratings.

As darkness fell the signal on 40M stretched out, extending to New York and Maryland and Virginia to the east and Hawaii to the west. We had the pleasure of working many former ship and coast station operators who let us know how much it meant to them to work KPH again, even if under a slightly different call sign. Many more stations were calling than we could work. I want to apologize to the stations we were unable to contact, especially to the Europeans I know were calling, and ask

continued on next page

Rick Wahl "FW" in the foreground at operating position 1 on 40M and Steve Hawes "SH" in the background at operating position 2 on 20M. Rick is a former KPH operator.

RCA transmitter 303L in operation on 20m. During its lifetime this 50s vintage transmitter has been used for point-to-point service (in AM mode), Teletype and finally for CW. In the background an RCA H set may be seen undergoing restoration.

Denice Stoops "DA" outside the receiving station building in front of Dick Dillman's Willys Jeep utility wagon. These same vehicles were used for service calls by the Radiomarine Corp. Among the historic photos of the station we found one of a Radiomarine utility wagon parked in this exact spot. Dillman had his vehicle lettered "Radiomarine Corp. of America" and "Service Vehicle No. 50" to match the wagon in the old photograph.

them to please give us try again next year.

After about an hour Rick Wahl took his place at position 1, signing "on watch" in the log in the proper manner. He worked one station after another as his wife, a former operator at KMI, the AT&T station next door, looked on.

Then Denice took over position 1. One of the interesting things about Denice is that she has never been a ham. All of her Morse operating has been on commercial circuits. And commercial and amateur Morse are two vastly different worlds. She'd call a guy and give him a GA (go ahead). After thinking about that for a moment he'd come back with a signal report and his location and his rig - all the normal ham conversation. Denice would look up with an expression that seemed to say, "So does this guy have traffic for me or what?" and then try her best to respond in the amateur format. But for all that I think she enjoyed it. In fact she summed it up for all of us when she said, "Who says you can't go home again?"

And that's what our project is really all about. Every other coast station we know of has been bulldozed before the tubes were cold when it went off the air. The men and women who worked there and considered it home were forgotten. The skills they demonstrated on the air every day can no longer be heard. KPH too was turned off and left for dead. But with the KPH project we hope to not only preserve the artifacts of a long and great period in radio history but to honor the men and women who were part of that history by putting the station back on the air.

In the end we worked about 70 stations and all the equipment worked

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and sharpen their construction practices. Perhaps more importantly, the greatest mark of his legacy will prove to be the extent to which he shared with readers his vast knowledge of historical antecedents in amateur radio. He enabled them consequently, first, to become aware of the significant contributions of their forebears, and second, to appreciate the present state of affairs in amateur radio as both an outgrowth of past events and a precursor of future ones.

Fortunately, I had opportunity recently to tell Bill Orr, somewhat inadvertently, why I hold his contributions to amateur radio in highest esteem. I never met him, however, I talked with him on the telephone in late April 2000, and again, just a few weeks ago. I preceded my first call with a letter that included a few questions about the BC-610, which I have been researching. He had written an informative article about Hallicrafters (Orr, 1979), and I hoped to learn about his sources of data. When I called and introduced myself, instead of acknowledging my letter, he asked warily how I had obtained his telephone number. I explained that it was by way of Barry Wiseman who had suggested that I call him. Once assured of my legitimacy, he revealed that he had an unlisted number, which he did not want passed around, because he got calls at all hours of the night from east-of - California amateurs who neglected time zone differences.

While we were discussing the prominence of Bill Halligan and his company, I commented impulsively that I regarded him to be the most significant radio amateur of the twentieth century. I said also that I was honored to have a chance to talk with him; I indicated that I possessed several of his books, was familiar with many of his articles, and, years earlier, I had practically memorized sections of the 16th edition of his Radio Handbook. He replied that when he was initially an amateur he had memorized most of Frank C. Jones' 1937 edition of the Handbook. He said that he looked upon Jones as his mentor. When he met him eventually, he said that his first impression was of Jones' workshop, where he had more than a hundred jars of parts, all labeled "miscellaneous."

I called him again around the first of the year to inquire whether it would be OK to reprint in Electric Radio his first article, which he published in the October 1938, issue of Radio & Television (see next ER selection). The article was a response to an award the nineteen year-old had received for "best ham station photo of the month." He describes in it how he rebuilt his transmitter nine different times, and he emphasizes that his home-built receiver was modified five times [readers interested in even more details about his station may view a picture of his bidirectional beam in Orr, 1977]. My rationale for publishing the article stems from my hope of generating empathy among younger amateurs who might enjoy participating in the exhilaration experienced by amateurs of that era who created, as he had done, their own equipment. He seemed intrigued by the plan and readily granted his permission[2]. I asked also if I might preface the reprint with a brief biographical sketch and a short list-to be drawn up by him—of his most noteworthy published books and articles. He agreed to provide the information, but indicated to me that I would have to wait awhile for it. His computer was down, he said, and his son was about to repair it. Unfortunately, the computer failed subsequently to work properly, and the material was never forthcoming.

To continue my tribute to Bill Orr, I present below (1) a brief biographical sketch; and (2) an overview of both the publishing outlets he used and the breadth of topics he addressed in his writings.

Biography

Bill Orr was six years old in 1925, when his father brought to their home in Bronxville, New York, a "radio music box," that is, a Radiola IIIA. He learned to operate the set while his parents were away, and became perplexed at hearing voices and music. A haphazard dismantling of the set to find the little men inside prompted his parents, who hoped to divert his experimenting with the family radio, to give him for Christmas a Philmore crystal set and a pair of Brandes earphones. He heard with his new apparatus people talking as if they were on the telephone. His father told him the voices were those of "radio hams." Bill Orr's enthusiasm to join them soared instantly and throughout the rest of his life it never abated.

Bill Orr constructed a two-tube regenerative receiver when he was about twelve years old. He practiced the code diligently, and, in March 1934, at age 15, passed the exam for his amateur license. He was issued the call letters, W2HCE, and he elected to invest his time and limited resources in constructing a transmitter for 160 meters. Teenagers like Bill congregated on 160 meters in 1934 for three reasons: they could avoid QRM caused by high-power stations looking for DX on the higher frequencies; they could contact nearby friends easily; and they could construct effective, low power transmitters relatively inexpensively. In the process of operating the 160-meter band during his formative teenage years, Bill developed an enduring affection for its idiosyncrasies.

Bill attended Bronxville High School. He reports that his grades were "very good," except in Latin. He observed, nonetheless, that studying Latin provided him with a foundation in English grammar for expressing himself. Of course, during the arduous days of High School, he had no idea of how invaluable that training would eventually become to him! He graduated in 1937 from Bronxville High and moved on, as a freshman, to the electrical engineering program at Columbia university. His student days at Columbia surely were tremendously exciting; Major Edwin H. Armstrong, inventor of the regenerative receiver maintained a laboratory at Columbia. Armstrong was developing a FM broadcast station in 1938. Perhaps the young Orr was among the awed members of an audience at one of his demonstrations.

The tranquility of Bill's life was disrupted when his father suffered a heart attack in 1937, which led him to retire. Thereupon, he moved the family in August 1939, to Los Angeles. Bill thus acquired new call letters—W6SAI—which he would hold for the rest of his life. Further, Bill transferred from Columbia to the University of California, Berkeley, from which he graduated in 1940 with a degree in electrical engineering. He then entered graduate school at UCLA, but in the summer of 1941 he abandoned his educational aspirations to take a job as an electrical inspector at the Douglas Aircraft plant in Santa Monica. He was assigned to the second shift of an assembly line, and he hated the job because it disrupted his sleep patterns..

He transferred to the Electrical Test Department at Douglas when he learned that it was looking for junior electrical engineers who held amateur licenses. He reported to his new job on December 8, 1941. Since his work was now regarded as essential to the war effort, his draft number was changed to 4A, which gave him a deferment for the duration. Bill had the good fortune while at Douglas of being assigned to work on several top secret electronic projects and attending radar training school at Wright Field, Dayton.

Bill had become a superbly skilled electronic engineer by 1945, but when the war ended, military contracts were

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cancelled precipitously, and, just as abruptly, Douglas Aircraft jettisoned him. The twists and turns of his activities are not well chronicled for the next few years. However, it is known that for a time he joined the Engineering Division of Hughes Aircraft. At some time during the late 1940s, a predilection to express himself in print seemingly came to the fore. As he put his thoughts down on paper, he must have recognized that he possessed latent journalistic talent. It was a fact that was confirmed promptly and reinforced by editors of radio publications who appear to have acquired—as we look today back upon the scene—insatiable cravings for his prose.

Bill's first book, "The Radio Amateurs' Mobile Handbook," was published in 1953 by the Cowan Publishing Company of New York. Stuart D. Cowan, W2DQT, W2LX, was Bill's friend from boyhood days. When Bill departed Bronxville, Cowan purchased Bill's beam for $12.00. In 1956, Bill and a colleague founded a small publishing outlet, named Radio Publications, Inc., to print the books that Bill would write for radio amateurs. Bill and Cowan coauthored "Better Shortwave Reception" in 1957, and in 1970, Cowan replaced the colleague as partner. Cowan had printed books for Bill since he had started writing them; however, after 1970, he coauthored several books with Bill and continued to market all of Bill's forthcoming books, except his Radio Handbooks (see References for a list of Bill Orr's books). Furthermore, as Bill's knowledgeable and closest friend, Cowan often assisted Bill in putting the finishing editorial touches to his books and articles.

A fortuitous opportunity arose for Bill in 1959 when John Reinartz, the famous radio pioneer at the American Radio Relay League, who participated in the first transatlantic QSO in 1923 and who accompanied Admiral Byrd on his 1925 Antarctic expedition, retired as head of the Eitel-McCullough (EIMAC) Amateur Service Department. Bill Eitel, W6UF, and Jack McCullough, W6CHE, had become familiar with Bills's publications, and they asked him to replace Reinartz. EIMAC had attained world renown as a manufacturer of amateur, military, and broadcast transmitting tubes.

As head of the Department, Bill distinguished himself further in eyes of amateurs by publishing, starting about 1960, a long, undated series of more than 50 "amateur service newsletters." Most of these were aimed at introducing amateurs to the intricacies of high-power linear amplifiers. Eitel and McCullough recognized, too, at the outset, that terrific public relations benefits would accrue to the Company if Bill, as their goodwill ambassador, possessed ample time to expand his writing output. The two owners and Bill thus worked out an arrangement whereby Bill was free halftime to pursue his personal writing objectives. The pact permitted Bill to do nearly all of his writing at EIMAC and virtually none of it at home. He was a familiar sight to office colleagues, pounding with two fingers at lighting speed on an IBM Selectric typewriter. Bill retired in 1985 from Varian, a company which had earlier absorbed EIMAC, and purchased a vacation condominium in Hawaii where he operated KH6ADR. He never retired from either amateur radio or writing.

Publications[3]

Bill Orr's range of major publications fall into four categories: first, the Amateur Service Newsletters, which have been noted above. Second, the hardback Radio Handbooks, which were published mainly by Editors and Engineers, Ltd., in Summerland, California. He succeeded in 1956 Frank C. Jones, whom Bill had greatly respected since boyhood, with the 14th edition. He edited subsequently nine more editions of the Radio Hand-

book: 15th (1959), 16th (1962), 17th (1967), 18th (1970), 19th (1972), 20th (1975), 21st (1978), 22nd (1981), and 23rd (1988). The 23rd edition was in its 7th printing in 1995. Third, Bill published 17 different books, many of which went into more than one edition. Since he coauthored several of the books, each book is listed separately below (see References).

Fourth, Bill Orr published articles in amateur radio publications for 49 years, from 1949 until 1998, a truly extraordinary feat. He distributed his output usually across four leading, exclusively amateur magazines: CQ (1949-1979; 1990-1998); QST 1956-1967), Ham Radio Horizons [HRH] (1977-1979), and Ham Radio [HR] (1980-1990). A review of his productivity over the forty-nine year period reveals an interrelationship between his rate of publishing articles and his choice of topics. The relationships appear to produce four distinct formats: (1) regular rate/random topics; (2) regular rate/homogeneous topics; (3) sporadic rate/homogeneous topics; (4) sporadic rate/random topics.

Bill Orr published six articles in QST over an eleven year period, and they are too few in number to indicate a format. For example, the first article discussed an approach to a "beer-can" antenna (April, 1956), and the second, explained intermodulation distortion in linear amplifiers (September, 1963). A short time later, two articles on Project Oscar appeared (November 1963; November, 1965). Finally, in 1967 he published two more articles on linear amplifiers (June, July, 1967). During the time period in which the QST articles were published, Bill Orr was publishing frequently in CQ. Why did he choose CQ over QST? Presumably, because the cryptic "tell 'em what it is; tell 'em how to build it" policy of the latter was incompatible with both the historical and colloquial emphases that he favored. Clearly, the editors of CQ made him feel more welcome.

The four formats that appear in CQ, HRH, and HR, are distinguishable relative to prominent sequences, albeit with exceptions here and there. Articles from 1973 to 1998 are assigned to sequences, each of which possesses a general title. The titles, in turn, exemplify the underlying themes of the sequences. For example, an editorial (CQ, December, 1973) announced the start of a new monthly feature, entitled "Antennas by W6SAI." This sequence ran until 1979, and its format is #2 above, regular rate/homogenous topics. Next, an editorial (HR, January, 1981) stated: "We are happy to introduce a new department in ham radio by one of the most respected and knowledgeable Amateurs [Bill Orr] in the world." The new department was entitled "Ham Radio Techniques." Actually, the department had been started without fanfare the preceding April in HRH. The HR editors picked it up the first month after they cancelled publishing HRH. This sequence continued until articles began to appear sporadically; its format is #1 above, regular rate/random topics.

When Ham Radio itself was folded into CQ (June, 1990), an editorial in CQ stated that in the future the magazine would feature the best of Ham Radio. The editors kept their word, for the cover of the December 1990 issue of CQ carried this caption: "Bill Orr is back!" His new column for CQ was entitled: "Radio Fundamentals: Things to Learn, Projects to Build, and Gear to Use." It was featured until 1998. Articles did not appear in the sequence consistently; thus its format is best defined as #4 above, sporadic rate/random topics. Finally, Bill Orr inaugurated in the 1970s a brief series, published in both CQ and HRH, entitled alternately "Golden Thirties" or "Golden Years." No editorial introduction accompanied its entree in CQ (July, 1973), and it persisted until 1980. Articles in this sequence appeared sporadically but the topics were homo-

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geneous, so it fits format #3 above, sporadic rate/homogeneous topics.

The subtitle of Bill Orr's last feature in CQ conveys exactly a generic description of the kinds of content that he had always sought to deliver to amateurs-"learn, build, and use." Furthermore, the sequence format, sporadic rate/random topics, guaranteed him the freedom to pick and choose among topics that he believed to be pertinent.

Bill Orr's earliest publications in CQ, from September 1949 until November 1973, are many in number, appear sporadically, and cover a range of topics. They do not have a superordinate title—they suggest, perhaps, a pseudo-sequence. However, these articles offer notable clues to Bill Orr's favorite topics.

For example, his first article (September, 1949) carries the fanciful title of "Winning three fall from Gorgeous George [the famous wrestler of the 1940s]", but it deals with TVI and harmonic radiation problems. The eight other sporadic articles through 1951 disclose that his first love is antenna issues: antenna couplers (December, 1949), building a rotary beam (April, 1950), Completing the 20-meter rotary beam (May, 1950); Collins 32V (July, 1950), expedition to the island of St. Pierre (October, 1950), elimination of parasitics (December, 1950), lattice boom for 14 mc antennas (April, 1951; Collins 75A-1 (September, 1951), and an antenna matchmaker (December, 1951). Five of the eight articles, about 62%, relate to antenna issues, and this emphasis extends to December 1973, when Bill and the editors of CQ agreed that he should have a monthly column devoted solely to antennas. Articles on antennas thus appeared regularly until 1978-79, and then, sporadically until October 1979. About this time, Bill had begun writing almost monthly for HRH in 1978 and HR in 1981.

For nine and one-half years, Bill expressed himself monthly in Ham Radio via his feature "ham radio techniques." His first article (January, 1981) dealt with triband beams and multiband dipoles. Two-thirds or more of the articles in the sequence explored a range of antenna topics so vast that they surely augmented considerably the knowledge bases of amateurs who read the series. Consider: V-beams for 10 MHz (July, 1983), broad band antennas (March, 1984), and the groundplane loop (February, 1984). His longtime preoccupation with 160 meters is not forsaken, for he calls attention to: the beverage antenna (October, 1984), 160-meter end-fed (April, 1986), compact-160 meter Marconi (July, 1985); 160-meter mini-dipole (October, 1985), and an inexpensive 160-meter antenna that works (February, 1986). Moreover, since this is a random topics sequence, he ranged widely with his non-antenna topics. For example: working moonbounce (March, 1981), radio frequency interference (September, 1982), white noise (June, 1983), intermodulation distortion (December, 1983), odd signals on the high frequencies (September, 1984),4 and 160 meter DX (December, 1985).

Bill cemented his reputation as an astute electronic engineer and skilled print journalist with the majority of his published articles. His affection for studying and investigating the inter-workings of such topics as antennas attained boundless proportions. Perhaps, however, his ardor for reporting about vintage equipment and early manufacturers in the "Golden Years" and "Golden Thirties" sequence exceeded even his love for antennas. His favorite phrase in the sequence was "They don't build them like they used to." The issues of the magazines in which these articles were published are highly prized by collectors. Consider, first, the receivers that he reviewed: National FB-7 (July, 1973, CQ), RME story (May, 1974, CQ), National HRO (May, 1975, CQ), National AGS (November, 1975, CQ), National SW-3 (February, 1978, CQ), Hallicrafters' Sky Buddy (May, 1958, HRH), Hammarlund Comet Pro (December, 1978, HRH), Doerle Shortwave re-

W6SAI/FP8AC operating in the Saint Pierre & Miguelon Islands July 7, 1950. The receiver is a BC-348 (one of his favorites) and the exciter is a Collins 310-B5. See October 1950 CQ, page 31.

ceiver (April, 1979, HRH), Hallicrafters' Ultra Skyrider of 1936 (August, 1979, CQ), and Pilot Super Wasp, August, 1980, HRH).

Second, Bill Orr also described within the sequence a variety of transmitters. Most of them were home-built. For example: a 1934 style transmitter (November, 1971, CQ), a 210 transmitter (January, 1973, CQ), the variable frequency oscillator (April, 1977, HRH), the Gross CW-25 (February, 1977, CQ), a 1938 DX transmitter (April, 1978, CQ), a 1935 style DX transmitter, (February, 1979, CQ), a 1933 transmitter (December, 1980, CQ), a 1941 DX transmitter, (August, 1981, HR).

Conclusion

Bill Orr warrants special kudos for his incomparable contributions to our knowledge of the cultural circumstances that have nurtured amateur radio. He complemented his technical state-of-the-art and vintage articles with four that deal with the general history of the hobby. The first of these fine histories appeared in the first issue of Ham Radio Horizons (March, 1977); the second examines the five-meter band (June, 1978, HRH), and the third describes what it was like to get on the air in 1933 (June, 1981, HR). The fourth article, which Bill Orr wrote for the "collector's edition" of CQ (January, 1995), in commemoration of the fiftieth anniversary of the magazine, approximates a monograph in length. This superb historical document reviews the history of amateur radio from 1945 to 1995. It possesses monumentally important ar-

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chival value, and taken in combination with Desoto's (1936) historical account of amateur radio during most of the first half of the century, provides as thorough an account of amateur radio in the twentieth century as we are likely ever to obtain. ER

References

Books

Orr, W. I. (1955). *Radio Amateurs' Mobile Handbook*. New York: Cowan Publishing Company.

Orr, W. I. (1955). *Beam Antenna Handbook*. Wilton, CT: Radio Publications.

Orr, W. I. & Johnson, H. G. (1956). *VHF Handbook*. Wilton, CT: Radio publications.

Orr, W. I. & Stoner, D. (1956). *Novice and Technician Handbook*. Wilton, CT: Radio

Publications.

Orr, W. I. & Cowan, S. D. (1957). *Better Shortwave Reception*. Wilton, CT: Radio Publications. 2nd edition, 1970.

Orr, W. I. (1959). *All About Cubical Quad Antennas*. Wilton, CT: Radio Publications. 2nd edition w/ Cowan, S. D., 1972; 3rd edition w/Cowan, S. D., 1993.

Orr, W. I. (1959). *Antennas For Citizens Radio Service*. Wilton, CT: Radio Publications.

Orr, W. I. (1959), *How to Obtain Your Citizens Radio License*. Wilton, CT: Radio Publications.

Orr, W. I. (1959). Inexpensive *"Build-It-Yourself" Antennas for the Radio Amateur*. Wilton, CT: Radio Publications.

Orr, W. I. & Cowan, S. D. (1971. *The Truth About CB Antennas*. Wilton, CT: Radio Publications. 2nd edition, 1993.

Orr, W. I. & Brier, H. S. (1974). *VHF Handbook For Radio Amateurs*. Wilton, CT: Radio Publications. 2nd edition, 1984.

Orr, W. I. & Cowan, S. D. (1978). *The Radio Amateur Antenna Handbook*. Wilton, Ct., Radio Publications. 2nd edition, 1993

Orr, W. I. & Nelson, W. R. (1981). *Interference Handbook*. Wilton, CT: Radio Publications. 2nd edition, 1993.

Orr, W. I. & Cowan, S. D. (1985). *Beam Antenna Handbook*. Wilton, CT: Radio Publications. 2nd edition, 1990.

Orr, W. I. & Cowan, S. D. (1986). *All About Vertical Antennas*. Wilton: CT: Radio Publications,. 2nd edition, 1993.

Orr, W. I. (1988). *All About VHF Amateur Radio*. Wilton, CT: Radio Publications. 2nd edition, 1993.

Orr, W. I. & Cowan, S. D. (1990). *Simple Low-Cost Wire Antennas For Radio Amateurs*. Lake Bluff, IL: Radio Amateur Callbook.

Articles

DeSoto, C. B. (1936). Two hundred meters and down. Hartford, CT: American Radio Relay League.

Orr, W. I. (1977, June). Antennas. CQ, 33, 44-48. p. 45.

Orr, W.I. (1979, November) The Hallicrafters story. Ham Radio, 12, 20-25.

Footnotes

[1]I wish to express my indebtedness to Barry Wiseman, Editor, Electric Radio, for encouraging me to write this tribute to Bill Orr, to members of the Orr family for providing me with biographical material, and to George Badger, W6TC, currently Vice-president of ECONCO and formerly President of Svetlana Electron Devices and Marketing Director of EIMAC, for sharing with me personal aspects of his friendship and working relationships with Bill Orr.

[2]It is noteworthy that Electric Radio, by printing this article, has the distinction of publishing the first and the last articles of Bill Orr's more than a half-century of productive writing (see ER #139).

[3]In the service of brevity, I have attempted to provide sufficient data in the body of the text for accessing the articles of Bill Orr that I have cited in the context of his publishing sequences.

[4]The material that Bill Orr published recently in ER #138, *"Weird and Wonderful Signals I Have Heard"* is reminiscent of the contents of this article.

The Hallicrafters Skyrider 5-10

by Chuck Teeters, W4MEW
841 Wimbledon Dr.
Augusta, GA 30909

The Hallicrafters Company offered two or three new model communications receivers every year in the late thirties. However in late 1938 they got ahead of themselves. They shipped the new improved Sky Champion, the S-20R before they had depleted their stock of parts and completed S-20s. The new S-20R had separate bandspread tuning, a better RF amplifier, an additional IF stage, and a noise limiter which improved reception on the 10 meter class B voice band. It had a new covered illuminated dial that made it look better also. Since both the old S-20 and the new S-20R had the same list price, the old Sky Champions and the stock of parts were left in limbo. For the same money the S-20R completely outclassed the S-20.

Hallicrafters was a company that always took advantage of developments in broadcast receivers and saw a chance to put the S-20 stock back on the market. The new FM broadcast band at 42 to 50 MHz and experimental TV at 50 to 56 MHz made low cost UHF parts available to receiver manufactures (before WW II everything above 30 MHz was UHF). Hallicrafters took a look at the available UHF parts and found they could rework the S-20 into the S-21, a 5 and 10 meter ham band receiver in a short time at very little cost. Repainting the German silver dial, replacing RF coils, and IF cans would do it. To add icing to the cake they added a noise limiter, and pulled out the 6K7 RF amplifier used in the S-20 and replaced it with an 1852. This gave the advertising department a chance to pitch the S-21 receiver as using the very newest RCA higain TV tube, and cash in on RCA TV tube ads.

At $69.50 the S-21 Skyrider 5-10 could undercut the National Radio Company NC510 UHF receiver by $60 even if you bought the optional S meter. In fact the Hallicrafters superhet was slightly cheaper than the National 1-10 superegen receiver. For the Hallicrafters Company $5 worth of parts would add $20 profit to the receiver. The S-21 5-10 also could use many of the same parts and the same assembly line as the S-22 Skyrider Marine. This allowed the company to up grade the S-22 into the S-22R as the old integrated S-22 cabinet/chassis could be used for the S-21 so nothing would be wasted. The only thing wrong with this stupendous engineering triumph was that, after the initial dealer stocking, nobody was ordering any Skyrider 5-10s.

The 5 and 10-meter bands were going downhill due to the declining sunspot cycle, and most of the ham receivers on the market did a pretty good job receiving on 10 meters anyway. The 5 meter capability of the Skyrider 5-10 was too good in selectivity for the common modulated oscillators in use on five meters (the five meter band, 56 to 60 MHz, was replaced by the six meter band after WW II). The police bands the 5-10 covered were converting to FM so the AM/CW only 5-10 didn't hear them very well. The only broadcast band it covered was FM also. About the only thing you could hear well was the experimental TV sound channel, which was AM back then, and only if you were around New York City. Most hams bought the $20 cheaper S-20R or the same priced SX-24 ($69.50) to cover 10 meters and got the AM BC, 160, 80, 40, and 20 meter bands to boot.

continued next page

the hallicrafters inc.

The SKYRIDER 5-10

This receiver is designed for the amateur who needs and wants the exacting performance required for superior ultra high frequency reception. The Skyrider 5-10 covers the radio spectrum from 68 MC to 27 MC (4.4 to 11.1) in two bands with a degree of sensitivity and selectivity that offers unparalleled reception of the ultra high frequencies.

The recently developed RK 1852 tube, with a gain increase of 6 to 1, is used as an R.F. amplifier through which an ultra high frequency sensitivity of better than 1 microvolt is obtained for this receiver.

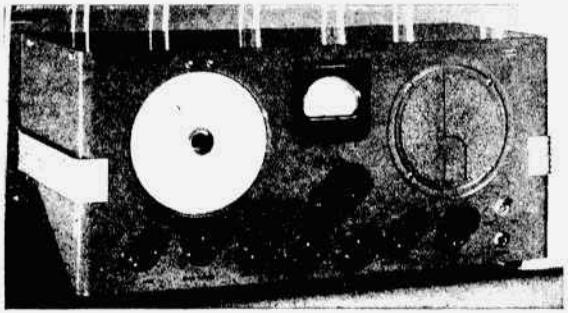
The coverage by bands is as follows: Band 1 — 27 MC to 42 MC, Band 2 — 40 MC to 68 MC. The separate Band Spread Dial provides easier and more accurate logging, and equipped as it is with an inertia tuning control, makes tuning practically effortless.

1 stage of 1600 KC I. F. amplification is used, providing a band width of 30 KC, at 10 times down. With this selectivity, even frequency modulated 5 meter signals are clearly understandable with the Skyrider 5-10. Mounted in sturdy steel cabinet finished in gray. For the specialist in ultra high frequency reception there is no finer receiver than the Skyrider 5-10.

For operation on 110-120 Volts, 50-60 cycle current. Can be operated on 6-volt Battery current with the addition of Model 301 Electronic Converter. Ask your dealer.

Tube Complement

1852 — r. f. amplifier.
6L7 — first detector.
6J5 — high frequency oscillator.
6P7 — I. F. amplifier B. F. O.
6Q7 — second detector, AVC, first audio.
6H6 — noise limiter.
6F6 — power output tube. 80 — rectifier.



FEATURES

- Noise Limiter.
- Improved Band Spread.
- Built-in Speaker.
- Socket for SM21 Carrier Level Meter.
- Send-Receive Switch.
- 8 Tubes.
- RK 1852 stage of pre-selection.
- Continuous coverage 27 MC to 68 MC on 2 bands.
- 1600 KC I. F. amplification.

SKYRIDER 5-10 (Model S-21), complete with tubes and speaker **$69.50**

SM21 Carrier Level Meter $10.00

Overall Dimensions, 18½" wide, 9⅜" deep, 8½" high. Shpg. Wt. 34 lbs.

The Skyrider 5-10 sat on the dealer shelves, looking a bit out of place in the Hallicrafters line as it was a light gray compared to the dark gray of the others. The color was selected as the original S-20 and S-22 cabinets had to be repainted and the lighter color covered the old silk-screening better. When World War II started Hallicrafters production went to the government, and the Skyrider 5-10 became the only receiver in stock at many dealers. Since it could not receive FM, despite occasional Hallicrafters ads saying it could, and with ham AM on 5 and 10 meters gone, they just did not sell. Between 1943 and 1945, courtesy of the government, I traveled around the country a bit, and managed to hit a lot of radio shops. It always seemed like home when I walked in and saw the same radio stuff on the shelves that I had seen at Genesee Radio in Buffalo. At most of these stops, if they were a Hallicrafters dealer you saw a lonely S-21 Skyrider 5-10 sitting on the shelf. It at least kept up the Hallicrafters presence in the store.

Used Skyrider 5-10s show up every so often so somebody must have bought them. A few are picked up at hamfests by buyers thinking they have an S-20 or 22. I saw one 5-10 sold as an S-10. The dial is marked Skyrider 5-10 and if you don't look close it can be mistaken for S-10. There is a big difference between the two, in looks, in technical characteristics and in value. Most of the 5-10s you run into are in bad physical shape as they have spent most of their lives sitting unused in some garage or basement. A 5-10 in good electrical shape however is a decent 10 meter AM receiver, and with a low noise preamp is good on 6 meter AM. Sideband or CW reception on either band is difficult as the stability is not great and the oscilla-

tor pulls with RF gain changes. Selectivity is not a high point either with the 5-10, but with the limited activity in the AM windows it is not a problem so far. The S-21 is about 22 kHz wide 6 dB down and over 40 kHz wide down at the skirts. A broad/sharp selectivity switch cuts in an extra winding on two IF cans to over-couple them for an even broader bandwidth. This is kind of a nothing switch as the bandwidth increase is only about 5 kHz. The same switch is used to turn the noise limiter on and off so it has a useful function.

The 1852 RF amplifier is as good as needed on ten meters, but a little short on 6 these days. The 6L7 mixer and 6J5 oscillator do a creditable job, but the 6J5 suffers from lots of warm up drift, and pulls with RF gain changes, either AVC or manual. Probably due to B+ changes as the plate voltage is not regulated. The original S-21s which were rebuilt S-20s and a few S-22s had one 1600 kHz IF stage with a 6P7 which provided an additional triode section to function as the BFO. The original 6J5 BFO was changed to a 6H6 Dickert noise limiter. Later production, after number 205, brought the tube count up to 9 by adding the old RF amplifier tube, a 6K7, back in as an additional 1600 kHz IF amplifier. Despite the increase in tube count the advertising did not mention the change. Overall gain of the first 5-10s must have been a bit marginal so perhaps it was better left alone. The 2nd detector, AVC, and 1st audio amplifier is a 6Q7. A 6F6 is the audio output and an 80 is the rectifier. Like the Sky Champion, the built in speaker field coil functions as the filter choke in the B supply. The AVC on-off and BFO on-off are combined into a three position switch like its predecessors. The tube layout is a bit unusual, with the AF noise limiter next to the HF oscillator but given its history, seems it was the most logical way out.

Dial calibration is every 200 kHz on the low band which covers 25 to 40.6 MHz and every 500 kHz on the hi band, 38 to 66 MHz. Nineteen turns of the tuning knob covers each range. A separate logging scale of 0 to 100 gives 1800 divisions on each band. Resetability is about 15 kHz on 10 meters and 35 kHz on six. Once you find 29 MHz you can set it reasonably accurately to the AM window but the dial is not good enough to find a specific frequency. On 6 meters the setability is only within about 250 kHz.

The S-21 is not much if it is your primary receiver, but as a monitor to check 6 or 10 meter AM for openings it is fine. The noise limiter is good on pulse type noise, and it has good audio. If you add squelch it makes a much better monitor for band openings, and with a voltage regulator it will sit on frequency for a long time. So if you find one, even if it is a rust bucket, take a closer look. It might be easy to put back in operation. Mine is put together from two with a dial found at three different swap meets. There is no mess of coils and band switch sections to fight your way through under the chassis. Repair is not much more complicated than an old BC receiver. The power transformer tunes a little hotter than most, but this is normal with the extra tube. They seem to hold up OK as I haven't seen a bad one. If you find a 5-10 that can be restored you will have a 6 and 10 meter AM receiver with some limitations, but with a history that shows the results of bottom line engineering without marketing input. If nothing else it makes an excellent subject for "Not So Great Engineering Blunders". ER

Bobby Weaver, K6GZL, Spearfish, South Dakota, in his hamshack. He's very active on 160M with a group that includes, WØZUS, KØAS, VE4BX, KFØOW and Roger, KD7HH, pictured below.

Roger Barnhill, KD7HH, Winchester, Wyoming, in his hamshack. He's a very active, very enthusiastic newcomer to AM operation.

CV-157/URR from page 12

this effect disappears, and the CV-157 works as a true synchronous detector, while the AFC operates to follow a drifting signal.

Jeff returned the unit just as I sold it to him. Neither of us had any time to work on it. After its return, I found the usual sorts of problems, such as broken wires in the IF cans, off-value resistors and misalignment. With each fix, the thing came to life and the motor started spinning, its little heartbeat. **ER**

Straight Key Night from page 27

without a hitch. At about 2100 local Steve flipped the switches on his panel to key both transmitters and sent a sign off message. Then we called down to Tom to tell him we were finished with the transmitters. We locked up at RS and headed down to BL for coffee and a review of the night's proceedings. At midnight we decided to get wild and popped a couple of bottles of sparkling apple cider. We all agreed it was a great night and an excellent way to bring in the New Year.

A special QSL card for K6KPH is being prepared but it may be a while before it is ready for distribution. We ask for the patience of all the stations we worked and promise that we will indeed QSL. We hope you will consider the card to be worth the wait. For now please accept our vy 73 (and, from DA, a sincere 88). **ER**

Broadcast Transmitters from page 9

listen to the control room, incoming listener phone-calls and canned promos, etc. You can almost always tell when a Ham is listening to his own audio. A copious amount of lanolin creeps into the voice as the content becomes self-conscious and stilted. You don't need to eat the microphone, just sit back naturally and converse like you are sitting in a coffee shop across from an old friend. I've noticed that SSB converts or Bi-modal types tend to bring frenetic habits to AM, but as the QSO wears on you can feel the tension draining from their normal hyper radio countenance. As a friend mentioned, radio legend Big Wilson used to say, "Turn on the radio, put your feet up, open a can of beans and watch the trains go by". **ER**

Editor's Comments from page 1

Shortly after I received the notice that W6SAI had passed away, I got an e-mail telling me that John Foster, WØYDX, had become a Silent Key. As many of you will remember, John was the principal designer of the Collins KW-1 and the Johnson 500. I came to know John very early in the history of ER. He was on the cover of #7, November, 1989. We'll have more on him in a future issue of ER.

And then came the news that Gene Tincher, K5NYT had died. He was what I would call an 'oldtimer' and had many outstanding virtues, one of which was that he was very technically astute. He had homebrewed some nice transmitters and other gear. One of Gene's friends is preparing a memorial of him for next issue.

Last week Leo Meyerson, WØGFQ, called to tell me that Andy Andros, WØLET, the founder of Hi-Gain, had passed away while undergoing bypass surgery. I did not know Andy but Leo told me that he was a fine gentleman and that he and Andy were long-time friends. Incidentally, in the course of our conversation Leo told me that he will be 90 years young on March 7. Many happy returns of the day Leo, from me and from all the ER readers who hold you in the highest regard for the kind of person you are and all that you've done over the years for Amateur Radio. N6CSW

Best HAM STATION Photo of the Month from page 3

The receiver is a *home-built* job. The line-up is 6K7 RF amp, 6A8, 1st det., 6C5 HF osc., 2 6K7's IF with three iron core 465 kc IF transformers. A "R" meter is incorporated in the IF amp in a Wheatstone bridge circuit. 6H6 2d det and noise-silencer, 6C5 and 6F6 audios. The receiver uses a Tobe tuning unit which covers 20, 40, 80 and 160 vy fb. In front of the receiver are a pair of Brush xtal phones. To the right of the receiver is a small BCL midget for use when 20 m is flat. On the wall are the Phone "WAC" ticket and the six QSL's that brought it.

I have one of your "globe" lamps on the receiver. The doohickey to the right of the lamp is a tricky match stand. The whole station, from the antenna to the receiver, is home-made.

The antenna is a *rotary beam* supported on a 36 ft telephone pole erected in the back yard. The antenna is 17' x 17' square and is bi-directional. It gives a 4R gain on receiving and a 1-1/2R gain in transmitting over 1/2 wave doublet. The antenna is fed with a quarter wave stub and 45 ft of coaxial cable. It is extremely effective, as we have worked 55 countries on phone in all continents. WAC on phone was made with 120 watts in 1936. We worked VU2CQ several times and got reports ranging up to R8. The antenna is rotated by means of two ropes from the shack.

So much for the present rig. Hr's some other dope you might be interested in.

I'm 19 years old and am in the first year at Columbia, University taking an EE course. Got interested in radio about 10 years ago and progressed through the xtal sets, battery sets and the like. Got my ticket in 1934, and got on 160 phone with a pair of 59's, suppressor modulated. Since I was cursed with an experimental nature, the rig was rapidly rebuilt and torn down 19 times in one year! I tried suppressor, grid, and plate modulation, controlled carrier and tried out several antennas. I had the best luck with a 250 ft. center-fed job. We didn't use over 60 watts on 160. In 1935 I got my class A and stuck the rig on 14 mc phone. As you can guess, the parallel 46's didn't put out much, so the rig was ripped down. *I rebuilt it 9 times before I was satisfied!* I tried 46's, an 825, 203A, 242A, 211, 852, and finally ended up with the 805. After this I got ideas on oscillators and tried all of 'em. After I blew up a couple of xtals with hi-powered oscillators, I decided the 41 pentode oscillator was best. I messed around with buffers, and finally stuck in a RK39 as a doubler with 600 v on it. It works wonderfully, and I can drive the 805 to 50 grid mills. During this time I messed around on 56 mc with W2HXD (he heard the five meter sigs of G5BY a few years ago). I also tried 20, 80, and 160 cw.

The receiver has only been changed about five times, but it seem, to be OK now.

That's about all there is about the station. I've handled a little flood tfc (traffic) and took messages from the "Morrisey" W1OXDA, but I don't regularly do much tfc, handling. My main interest, when the rig is in working order, is to experiment with antennas and work DX on phone.

Just thought I'd let you know about S W & T. I've been reading it since it came out every other month. Remember? w2hce

A complete index of the entire 11+ years of ER is available for viewing or downloading at the following website: http://www.qsl.net/n9oo

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FOR SALE: New Ranger 1, Valiant 1, & Navigator plastic dials, freq numbers in green, with all the holes just like orig. - $17.50 ppd. Bruce Kryder, W9LWW, 336 Sliders Knob Ave., Franklin, TN 37067

FOR SALE: Gates BC-500T 500/1000 Watt AM xmtr in Las Vegas, complete, heavy. Rich Baldwin, (702) 222-9941, richard@wizard.com

FOR SALE: QST binders- small $5 + $1 shpg, large $6+$1 shpg. R.J. Eastwick, W2RJE, 400 N. Haddon Ave. Unit 109, Haddonfield,N.J. 08033. (856)429-2477

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

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FOR SALE: FT-101EE xcvr; NC-100ASD rcvr; RR-6 spy rcvr; B&K 500 tube tester. Carter, (804) 979-7383, CElliott146@aol.com

FOR SALE: Navy rcvr, AN/URR13, B/O, local only; Drake 2NT xmtr, very good condx - $75. Carl, W2YH, (973)827-7441 or chanfield4@juno.com

FOR SALE: Swan 750 CW, PSU-3, manual, new finals, collector condx - $400 + shpg. John, W9MHS, TX, (956) 584-7840.

FOR SALE: NOS pole xfmr 120-7200; mobile spkrs - $4; Motorola scope to 999 MHz - $500. Dave, WØBEI, POB 462, Faribault, MN 55021. (800) 500-8055

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FOR SALE: GE world monitor solid state allwave portable P99C - $35 + shpg. Bill Riley, W7EXB, 863 W. 38th Ave., Eugene, OR 97405. (541) 345-2169

FOR SALE: Oscilliscopes: Heath 0-6, 5" mint - $50; Heath 10-4560, 4" - $45; Rapid City midgetscope, 3" - $40. + UPS. **WANTED:** Manual/schematic Hickok Radio set tester 4900S. Same for Solar capacitor analyzer CB-1-60, copies OK. Onerio Sabetto, W8PIU, 1717 Burgess Rd., Cleveland, OH 44112. (216) 481-1036

FOR SALE: NI-CAD batteries, D cells, 1.2V, Eveready, new unused, not charged - 6 for $10, or $1 ea. L. Gardner, 458 Two Mile Creek Rd., Tonawanda, NY 14150

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FOR SALE: T-Shirts 4 Color 807 Tube - $18.07 ppd. Priorty Mail (CA-$19.43), S, M, L, XL (XXL-+$3). See ER #128 pg 52. http://members.aol.com/tcsopr / mousepads, buttons, hats, etc. Greg Greenwood, WB6FZH, POB 1325, Weaverville, CA 96093. msg# (707) 523-9122. wb6fzh@arrl.net

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FOR SALE: 12 good condx GE Ham News issues from 1947 to 1956 - $3 ea ppd; Sylvania Radio Service Hints, 5 books, 1935-1943, 2 Radio Circuits, 2 Radio Tube Hints, 3 Radio Equipment Hints, 1 Auto Radio Installation & Servicing - $4 ea ppd; RCA book, Aircooled X-Mitting Tubes, TT3, 1938 - $15 ppd; 6 ARRL books from 1965 to 1975 - $5 ea ppd; 6 ARRL books from 1965 to 1975 - $5 ea ppd; many others list SASE. James Fred, 53556 275W, Cutler, IN 46920.

FOR SALE/TRADE: Manuals: HRO-60; 75A-4; TX-1; NC400; 30L-1; TR-5. Bernard, NI4Q, POB 690098, Orlando, FL 32869. (407) 351-5536

FOR SALE: Drake R-4A, - $150; HW100 w/spkr & pwr sply - $175; both w/manuals. **WANTED:** Yaesu FL-200B. Robert Braza, W1RMB, MA (508) 222-5553

FOR SALE: Ranger, good working order, some scratches - $300; Collins 75A-4, SN#5755, 2 filters, minor mod on rear. George, K1ANX, MA, (413) 527-4304.

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FOR SALE: Collins R-389 long wave rcvr. S/N PP-4. Order 14214-PH-51-93. Nice cosmetic front panel but missing parts, many thought to be in common with R-390 - $600 firm. Peter, Hastings NY, (914) 478-3659 or peterhazou@hotmail.com

FOR SALE: Kenwood World Clock Model HC-10 - $125 plus shpg. Lee, (775) 575-6705 ltb@birdhouse.fernley.nv.us

FOR SALE: Johnson Adventurer - $75, Collins 270G1 speaker - BO. Ed Sauer, 787 N.Peterman Rd., Greenwood, IN 46142. (317) 881 1483

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WANTED: For purchase. Equipment & technical information related to AN/ARN-6 Radio Compass. Jim Cavan, 6 Timberline, Norfolk, MA 02056. (508) 528-0908,jcavan56@aol.com

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

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

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

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WANTED: Knight C-555 (walkie-talkie), C-777 (walkie-talkie), Bandspanner II, TR-108, TR-106, V-107. Willis, (541) 923-2784, W0WI@JUNO.COM

WANTED: Collins 51J-4 w/all filters; clean, in good operating condx (covers?). Ron, WA2EIO, (516) 546-9884, NY, wa2eio@mindspring.com

WANTED: National NC-400 rcvr; NTS-2 spkr; also looking for a cabinet for the NC-400. James, W4JO, GA, (770) 429-8189 or w4jo@worldnet.att.net

WANTED: Radio set SCR-614/BC-969A. Harry Weber, 4845 W. 107th St., Oak Lawn, IL 60453.

WANTED: Manual schematic for Comtronic 6 meter FM xcvr, clean copy OK. Jim Eberwine, W4APV, 8118 37th Ave. N, St. Peterson, FL 33710. (727) 347-0942

WANTED: Gonset G-76, TCS xmtr, ARR-15, ARR-41. Gary, K7ADF, MN, 952-496-3794

WANTED: My school days covetous BC-348 late version. Katsu, ex.N8EYH, Japan, mxc04040@nifty.ne.jp

WANTED: National NCX-A pwr sply, cabinets for a CPR-90 , SX-140 and 51S-1. Bill, (701) 772-6531, kc7kk@earthlink.net

WANTED: Mill typewriter (all caps). Vern Weiss, W9STB, PO Box 7105, Grand Chute, WI 54912. telegrapher@hotmail.com

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

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

WANTED: I wish to correspond with owners of National HB7/HBXA/AGS coil sets. Jim, KE4DSP, 108 Bayfield Dr., Brandon, FL 33511. j.c.clifford@juno.com

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

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

WANTED: Any info on the Eldico company and the Eldico SSB Twins for future article. Joel Thurtell, finder@radiofinder.com

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

WANTED: PRC-74B whip antenna mounting base and original/copy TM's. PRC-66B nicad battery and charger cable. K7MBK, (480) 962-0220, milspec22@aol.com

WANTED: Noise silencer (immunizer) for Hammarlund HQ-170/180 receiver. Ed, N5BFW, (817) 222-5355, ecuevas@juno.com

WANTED: 1930s Army Navy control boxes, pwr splies, dynamotors - any wierd types. William Donzelli, 15 MacArthur Dr., Carmel, NY, 10512. (845) 225-2547, aw2888@osfn.org

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WANTED: HRO power supply 697, doghouse or rack mount. Ivan, WA6SWA, POB 248, Reno, NV 89504. (775) 329-7738, idh@cs.unr.edu

WANTED: WW II Military Television

Looking for the following for a restoration project: round & square cameras, #AXT, CRV, ATH; transmitters, #AXT-6, 7, ART-26, 28; dynamotor CRV-21; test set, I-232, 231, 206, TS-93, CRV-60058.

Maurice Schechter, 590 Willis Ave., Willis Park, NY 11596
516-294-4416, mauricsch@cs.com

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

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

FOR SALE: I repair all tube type amplifiers. Licensed in 1955. Steve Gross, N4PZ-W9OJL IL, (815) 734-4255.

FOR SALE: 51J-4 filter replacements, direct plugin—6.0 kc Collins mech. filter, 500 cycle xtal latice - $215 each; R-390A 16 kHz flat phase filter, for Hi-Fi AM - $245. Chuck Felton, KDØZS, WY, (307) 322-5858, feltoned@coffey.com

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

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

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

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

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NOTICE: T-368 Registry. For info w2zr@aol.com or W2ZR callbook address. Subscribe to T-368 reflector: www.onelist.com/t-368_bc-610

NOTICE: A website dedicated to traditional ham radio & classical radio resources. Visit Ham Radio USA, http://www.hamradiousa.com

FOR SALE: RBM pair, hi-low band, new condx, matching serial numbers - $750. Carl Bloom, (714) 639-1679, 3778111@MCIMAIL.COM

FOR SALE: WACO-SNWX telephone filters. Just plug in. 1/$13.95, 2/$25, 3/$34. Money back. Cecil Palmer, 4500 Timbercrest Ln., Waco, TX 76705. (254) 799-5931, w5mwx@juno.com

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

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

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FOR SALE: Clegg Thor 6 - $245; Drake T-4XC & AC-4 - $300; Lionel J-36 - $125; Heath AC-1 - $85; coax relay - $35. Richard Prester, 131 Ridge Rd., W. Milford, NJ 07480. (973) 728-2454

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WANTED: National FRR-59; Hallicrafters SX73; Scott Special Communications rcvr. EA4JL, please call, Kurt Keller, CT, (203) 431-6850

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

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

WANTED: Mics: Astatic JT 30/40; UT-48; Shure CR80/81/41; 707A; Turner VT-73; CD/BD; parts for same. Tom Ellis, Box 140093, Dallas, TX 75214. (214) 328-3225. tomsmics@flexcomp.com

WANTED: Desperate for museum display: lge AC cooled or water cooled xmtg tubes. Certain types including RCA, 898, 862, 893A or R & 5831s; other manufacturers such as Federal Telephone & Radio F 124R. Name your price. Tommy Bolack, 3901 Bloomfield Hwy, Farmington, NM 87401. (505) 325-4275

WANTED: Millen 74001 coil form assembly, shielded-plugin type, need a few. w1jz@hotmail.com

WANTED: Amplifier AM3007 for T-827/FR-1059B AN/WRC-1 set. Don, WA2ELD, KY, (859) 254-1886 or Lbrooke@Lex.infi.net

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

WANTED: Military survival communications equip: radios, beacons, manuals, books, historical info/photos. Daniel Cahn, 3444 Greenwood Ave., Los Angeles, CA 90066. (310) 398-7159. daniel4116@aol.com

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WANTED: Clean Mackay 3010C & Kenwood R599D w/all filters & manual. Ric, C6ANI, POB N4106, Nassau NP, Bahamas.

WANTED: Junker Panadaptor PCA-2 (1950 era) or source for Freed power xfmr for same. Dennis Olmstead, WB9EMD, phone/fax (877) 469-0531, wb9emd@aol.com

WANTED: McElroy, Vibroplex, or Speed-X bug. Pre-war Collins goods. Brian Roberts, K9VKY, 130 Tara Dr., Fombell, PA 16123. (724) 758-2688. K9vky@stargate.net

WANTED: WW-2 US Aircraft Radar for B-29 etc. Yokohama WW-2 Japanese Military Radio Museum, Takashi Doi, 1-21-4, Minamidai, Seyaku, Yokohama 246 Japan. Fax 011-8145-301-8069, takadoi@carrot.ocn.ne.jp

WANTED: National spkr w/4-pong plug for NC-101X or NC-100X. Jim Miller, WA2UMP 32 Garretson Rd., White Plains, NY 10604. (914) 644-2603, jmiller@Basit.com

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FOR SALE: Naval rcvrs, RAK, RAL, RAO, RBA, RBB, RBC, RBL, pwr splys available, prices from $75 to $350 depending on type, condx. Carl Bloom, (714) 639-1679, 37781116@MCIMAIL.COM

FOR SALE: Heath SB-620 & SB-650 - $100 ea; nice HW100 w/spkr & pwr sply - $200. **WANTED:** FTDX560. Robert Braza, W1RMB, MA, (508) 222-5553.

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

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

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

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

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

WANTED: 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: Postcards of old wireless stations; QSL cards showing pre-WWII ham shacks/equip. George, W2KRM, NY, (631) 360-9011, george2@aol.com

WANTED: AN/BRR-3 rcvr. **FOR SALE/TRADE:** Racal RA-117; Meissner Signal Shifter. Tom Brent, POB 1552, Sumas, WA 98295. (604) 826-4051

WANTED: Info on a Johnson 224-6 roller inductor; also info on a B&W BTE1 turret inductor. Joe, NM1V, MA, (978) 658-6186 or eico7206@mediaone.net

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

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

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

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

WANTED: Merchant ship radio memorabilia, radios, keys, parts, clocks, documentation. Tom Mackie, W2ILA, 14 Washington St., Jamestown, RI 02835. (401) 846-1200

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

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

WANTED: WRL Globe Scout 680A in + shape; meter for Heath AT-1. Paul, K8JJC, 8735 76th St. SE, Alto, MI 49302. (616) 891-2190 collect or nvcltd@iserv.net

WANTED: References to articles written about New York City's Radio Row on Cortlandt Street. Louis L. D'Antuono, WA2CBZ, 8802 Ridge Blvd., Brooklyn, NY 11209. (718) 748-9612 after 6 pm

WANTED: WW II military remote control rcvrs #ARW/CRW, xmtrs, dynamotors PE186 PE126, joy sticks, Gyroscopes for the GB, Azon glide bombs. Maurice Schechter, NY, (516) 294-4416 or mauricschi@cs.com

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WANTED: R-390A rcvrs, parts rigs or restorable, will restore yours at reasonable prices. Walter Wilson, KK4DF, (706) 733-8323, wewilson@knology.net, www.knology.net/~wewilson

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

WANTED: Cash for Collins: SM-1, 2, 3; 312A-1, 2; 55G-1; 399C-1; 625-1; KWM-1; 302C-3; 51S-1; 75S-3C; 32S-3A. I buy any Collins equip. Leo, KJ6HI, CA, Ph/Fx (310) 670-6969. radioleo@earthlink.net

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

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WANTED: Schematic &/or manual for Collins 651S-1 rcvr. John Anthony, anth2ga@linkamerica.net

WANTED: Millen 90800 exciter/xmtr. **FOR SALE/TRADE:** TCS interphone amplifier complete w/tubes & dynamotor. Ted Bracco, WØNZW, braccot@hotmail.com

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

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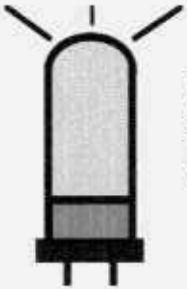

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