The Signal

OFFICIAL MAGAZINE OF THE
COLLINS COLLECTORS ASSOCIATION
Q1 2018 Issue #89

Collins Radios in Cold War Jeeps

The MRC-83 (The M38-A1 Jeep and TRC-75 Radio)

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Collins Collectors Association

From the President's Desk…

This winter has been very difficult for me as your President. I travelled to Florida in early January to move a large rotating Log Periodic Antenna. The unit was 20 years old and still new in crates. I stepped on a rusty nail which led to a heart attack. It turns out I had 95% blockage and received two stints. As a diabetic, I am just now beginning to walk again. I asked our former president Scott Kerr to take over as acting President and I am so thankful for his leadership and organizational efforts as we approach Dayton!

I have been able to contribute as Gary and his team put together this wonderful edition of this Signal.* My M38A-1 Jeep with the TRC-75 (that I acquired from Dave Ross (SK) appears on the front cover and for all of these Radio Jeeps that were used in Vietnam and later, they are very rare and hard to find! This unit "lives" next my Collins Van!

As we look toward Dayton I am not able to bring the Collins Van as planned. Scott has put together a great booth space and CCA banquet. Retired Collins engineer Lonnie Duncan will be our banquet speaker and Scott will conduct a CCA members meeting after the banquet which you are all welcome to attend. I trust you will review the update to our By Laws prepared by our board. Special thanks to Ron Mosher and Scott Kerr for their hard work. Please take a minute to vote and help us with this needed update.

After Dayton I will resume the CCA Presidency and will be planning the CCA banquet in Cedar Rapids on Aug 4-5, 2018 along with Jim Jones. Board Member Francesco Ledda will be presenting a forum on Military Collins Radio and we plan to hold the CCA banquet at the Longbranch Hotel on the theme of the KWM-380 as it was "rolled out" in this same facility years ago. More to come!!

Jim Stitzinger, WA3CEX
President, CCA.

* I would like to commend our graphics designer, Josephine Toynette for once again producing an outstanding Signal issue in spite of some very challenging circumstances. Josephine also serves as a short-term missionary and despite internet access issues in various countries, she has done a wonderful job. Thank you!

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From the Editor

In this issue, we feature "Collins Jeeps," cold war era military jeeps outfitted with Collins Radios. Scott Johnson's excellent article "A Capsulized History of the Collins URG-0 Program" connects all the evolution dots starting with the Gold Dust Twins to ARC-58, 618-T, etc. to the TRC-75. The next article, which originally appeared in the August 2015 issue of Military Vehicle Magazine, was a collaboration between Jim Stitzinger, WA3CEX, and the late Dave Ross, N7EPI, offering insights into their Jeep-mounted radio collections and those of fellow collectors. John Adams-Graf, editor of Military Vehicle Magazine has graciously allowed us to reprint the article.

In 1975 a booklet was published by W3OEL (SK) that contained a collection of problems occurring in the KWM-1, KWM-2, and S-Line products along with the fixes. This was a (pre-Internet) collective effort with two dozen hams around the world offering their first-hand experiences of problems and fixes to their gear. The idea was to cast a net out and take a second pass with a more comprehensive collection of problems and solutions. Unfortunately the second pass never happened. However, Jim Stitzinger managed to find a published copy which we scanned, cleaned up, and present for your review. Lot's of good tips from the tube era organized by product model.

CCA Treasurer, Ron Mosher, K0PGE, has submitted the 2017 financial report, and it's all good. One of the items that caught my eye was the expansion of the liability insurance policy that deals with the electronic media aspect. Ron explains this expanded coverage and why its necessary.

Dave Jennings, WJ6W, from Tarzana CA, takes us on a tour of his gorgeous shack which features some beautiful Collins broadcast equipment which undoubtedly is why his signal always sounds so good. Dave says he's replicated the AM radio station that he worked at his first job in radio — how many of us can say that? Dave is a regular on the Wednesday night AMI-West net on 3870.

And finally, on behalf of the entire CCA membership, thanks to those who have shared their stories with us. Your contributions are what sustains this magazine. And on that note, the "In The Shack" featured personality bookings for 2018 are going fast. Wayne Heil, KB6OQJ, is booked for Q2. So if you'd like to show off your collection this year, please send an email to signaleditor@collinsradio.org to reserve your slot. Multiple applications will be queued by order received.

73, Gary Halverson, K6GLH
Acting Signal Editor

A Capsulized History of the Collins URG-0 Program*

By Scott Johnson, W7SVJ/AFA6SJ

As a result of the USAF's well documented testing of Single Sideband communications in the middle fifties, Collins was uniquely poised to evolve the technology of the KWS-1/ 75A-4, into a revolutionary array of ground, sea and airborne communications equipment that would usher in the new era of reliable, globe-spanning voice and data communications for the military using single sideband techniques.

Figure 1. Arthur Collins and Major General "Butch" Griswold, Vice-Commander of the Strategic Air Command putting the KWS-1/75A-4 through the paces aboard the Generals' VC-97 over the North Pole on a flight test of Single Sideband on July 4, 1956. National Geographic Associate Editor M.B. Grosvenor is on the far left. Photo courtesy of Collins Family and Jay Miller, KK5IM.

The USAF, particularly the Strategic Air Command, was the driving force behind the conversion to SSB. Gen. Curtis LeMay believed that in order to have a fail-safe method of positive control over nuclear assets, a much more reliable method of communications, as well as much more reliable and dependable equipment set, was required. To that end, Collins started work on a system that would have common architecture, and even common modules that would serve the needs of all the military services, and later, the needs of the airlines and maritime operations.

The first system that would exemplify the systems approach to SSB equipment design was the AN/ARC-58, intended for SAC's new B-52G Stratofortress and KC-135A Stratotanker. This system consisted of five basic line replaceable units (LRUs):

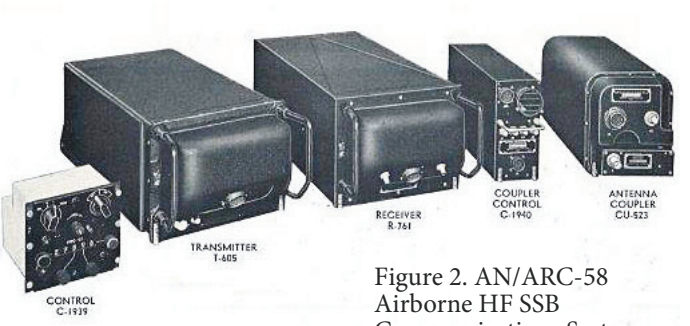


Figure 2. AN/ARC-58 Airborne HF SSB Communications System.

receiver-exciter, power amplifier, antenna coupler, antenna coupler control, and control head(s). This system provided 28,000 upper and lower SSB channels over the 2-30 MHz range, with a power output of 1kW PEP. It operated from the aircraft's 115VAC, 3 phase, 400 Hz bus. The system was very easy to operate; the crew member simply selected a frequency, and the servo-tuned radio came up on frequency, and after a brief tune cycle, was ready for operation. In addition, the ARC-58 could support independent sideband operation, so RTTY could be supported as well.

The ARC-58 would end up equipping a majority of SAC's B-52 assets, serving well until replaced by the Collins AN/ARC-190 in the eighties. As a footnote, the RCA built AM/CW AN/ARC-21, which had equipped postwar bombers and tankers, was modified for SSB in the latter fifties/early sixties, resulting in a new designation AN/ARC-65. It equipped a few older B-52s, and KC-97/ KC-135s. Suffice it to say it was not as advanced (being designed at the close of WWII), and had a considerably lower MTBF. Not to deride it excessively, it was a magnificent piece of technology for its time. It left service in the seventies, replaced in some cases by either the AN/ARC-58 or Collins 618-T, until aircraft were retired or modified with the installation of the AN/ARC-190.

In order to talk to all the airborne assets, a ground station was needed. The KWT-6 filled this need, and was deployed to communication stations around the world, including SAC headquarters at Offutt AFB, NE. The KWT-6 shares the basic frequency generation scheme and receiver as the ARC-58, but rather than being servo tuned, was manually tuned using a frequency selection knob and band switch. The packaging was in a relay rack, with rack units holding several chassis containing the familiar modules that became synonymous with the Collins name.

Figure 3. KWT-6
500 W All Mode Transceiver
covering 2-30MHz.

An AC power supply was fitted, along with a forced air cooling plenum that metered cooling air as required to each panel unit. The KWT-6 could contain an internal 500W PA, and even an internal antenna coupler, or it could be used as a 100mW nominal exciter to drive any of a number of external PAs from 2 KW to 50 KW. A specific model of the KWT-6 system was built for the Navy, designated as the AN/URC-32, it contained the internal 500W PA, with a remotely tuned antenna coupler. It tuned in 1 kHz increments but was later produced (or modified) with a 100 Hz interpolation oscillator to provide 100 Hz tuning increments. It was widely deployed in submarines as well as surface vessels, serving well into the eighties and even nineties.

In what was probably a natural progression, the ARC-58 LRUs were installed, along with a RTTY modem, in an aluminum casket-like enclosure and given the nomenclature AN/TRC-75.

Figure 4. AN/TRC-75
HF SSB Communications System based on
the ARC-58 units adapted for mobile service.

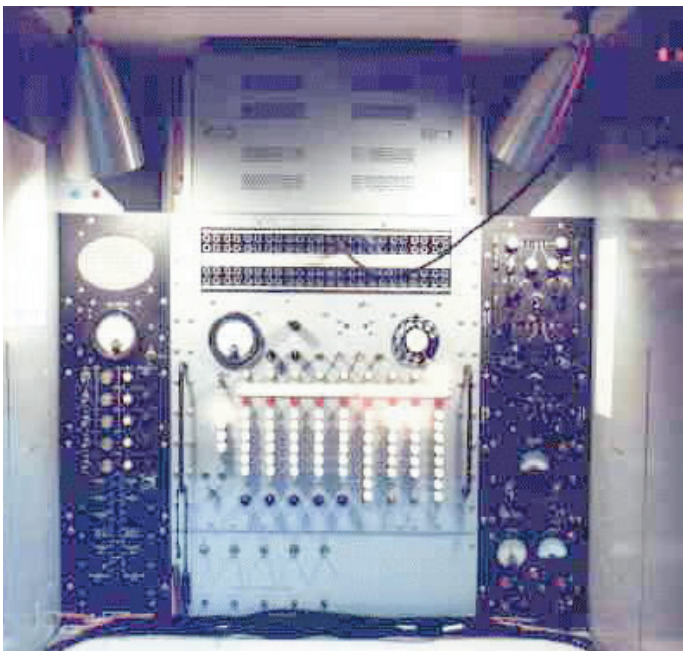


Figure 5. TCS-15
Full Duplex Teletype/Multiplex Voice HF
Communications System.

The TRC-75 was mounted across the back of an M38A1 Jeep, and a Mite teletype unit was mounted in the passenger seat position as well. A large 400Hz inverter powered from the 100A 28VDC charging system provided the three-phase power for the radio. This gave The USMC (and later the Army and Air Force) the ability to forward position a HF teletype link wherever they chose. The entire jeep was known as an MRC-83. Using a long wheelbase M-170 Jeep and adding a Collins ARC-55 UHF radio resulted in an MRC-87, widely used as a forward air control Jeep in the early years of the Vietnam conflict. The TRC-75 was later fitted to the M-151 MUTT and was used by the USMC through the first Gulf War period. Not bad for a thirty-year-old radio!

Several additional variations were built from the URG-0 components and modules: The TSC-15 (figure 5), was a full-duplex teletype and multiplex voice system installed in a small shelter that could be transported by a 3⁄4 ton truck, such as the M-37.

Figure 6. 204F and 204H
2.5KW PEP or CW linear amplifiers using a pair of 4CX1000As. The 204H adds the autotune function.

There were also myriad variants using KWT-6 subsystem components that were assembled into custom equipment, such as multiple diversity receiver systems, multiple exciters, etc. There was also a high stability time base unit to allow precise netting, and as mentioned before, several power amplifiers, such as the 204F and 204H. In addition, the ARC-58 was released for commercial service as the 18Z-3 and 18Z-4 (unpressurized and pressurized PAs, respectively). The 18Z-3 was installed in many early 747s. (A giant airplane needed a giant voice!)

It is hoped that this article will tie together this fascinating and historically significant family of Collins equipment, and perhaps even generate renewed interest in the restoration and operation of said equipment. Individual items have been covered at length previously, so no attempt was made to make this an exhaustive treatment on the individual history of everything discussed herein. Additionally, many details were skipped in the interest of brevity, but the author, as always, is happy to learn more and discuss anything to do with Collins specifically, and Strategic and Tactical HF communications in general.

**URG-0 is an informal term used by enthusiasts to describe Collins first "family" of HF SSB gear. I credit the term to the Late Dave Ross, N7EPI.*

Scott Johnson, W7SVJ/AFA6SJ

Scott is an R&D and Controls Engineering Manager for an alternative energy start-up dealing with natural gas fuels and flare gas reforming.

Scott spent 24 years at Motorola, in the Government Electronics, semiconductor, and corporate research laboratories. Concurrently, he operated an FAA avionics repair station for ten years, specializing in vintage, warbird, and fire tanker support. He has a keen interest in cold war era communications equipment and techniques, and collects equipment from around the world. He owns several military vehicles, used primarily to display and operate the radio equipment, including Collins GRC-19, TRC-75, and MRC-108 equipment.

Collins broadcast equipment is also an interest. He is married, with a teenage son who may well carry on with at least a few of his hobbies.

Collins Cold War Jeep Radios

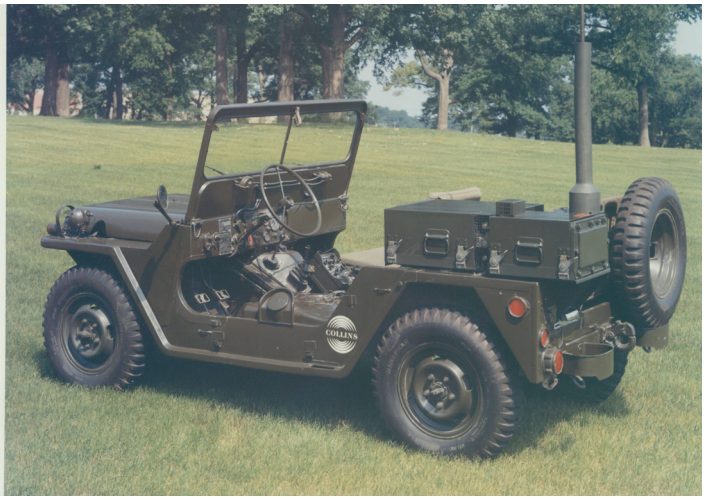
By Dave Ross, N7EPI (SK)

Reprinted with permission from the August 2015 issue of Military Vehicle Magazine. Note from Dave Ross: "The images presented here are from Jim Stitzinger's "Collins Reference Library" in Valencia, California. Many thanks to Jim for letting me have copies of them."

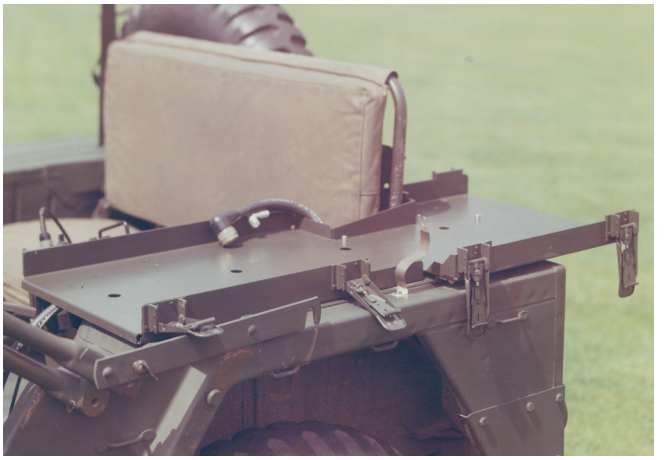
As far as radios were concerned, the WWII-era had been the time of CW and AM modulation. These modes of modulation quickly became inadequate to serve the needs of the post-WWII military. Collins engineering capability and penchant for studying effective communication prevailed and the Single Sideband era (SSB) was born.

Here is a 718U-2 (AN/VRC-80) in a different M151 jeep. The 718U-2 is also a 400W HF radio, again built using URG-2 slices. The -2 version uses a separate 671U-1 receiver/exciter, which is shown next to the radio case and in front of the jeep's rear seat. Note that, with the separate 671U-1 receiver/exciter rather than an internal 671U-4A receiver/exciter, the 718U-2 main radio case is narrower than case on the 718U-2A pictured above. All the 718U-2 variants use the same power amplifier module & power supply module & antenna coupler case.

Another photo of the 718U-2 with a better view of the 671U-1 receiver/exciter. The 671U-1 receiver/exciter is also part of the 718U-1, where it is paired with the 100W 548S-1 PA/coupler. The 718U-1 was sold to the U.S. military as the TRC-169. The TRC 169 came with a rucksack frame for use as a manpack, where it was powered by a BB-451 silver-zinc battery. The TRC-169 also had facilities to mount in and be powered by a vehicle.



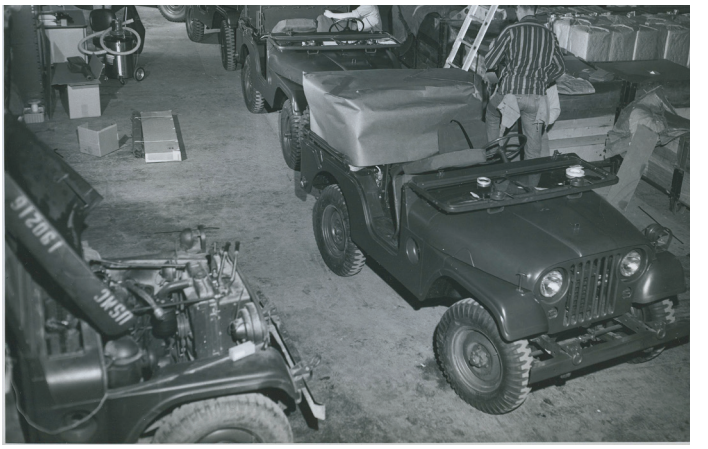
Here is a 718U-2A (AN/VRC-81) in an M151 jeep. The 718U-2A is a 400W HF radio, built using URG-2 slices. This -2A version uses a 671U-4A receiver/exciter, which is inside the larger of the two watertight cases. The control head is shown mounted on the transmission hump, and the driver's seat has been removed so it would be visible from this camera angle. There is also a 718U-2B version of this radio and as far as I can tell the only difference between the -2A and the 2B is the type of frequency selector - either knobs or levers. The M151 jeep itself is apparently owned by Collins and probably makes the rounds to all the trade shows carrying various radios. All photos are courtesy of the Collins Reference Library and were captioned by the late Dave Ross. Thanks go to Brian Bjerkelund, K7AIS, for allowing us to present this information.



The mounting plate is a simple affair and attaches both the radio case and also the antenna coupler case to the jeep. It looks as if the antenna coupler case was specifically designed with a corner missing so that it the radio install would not require removal of the rear seat. It's a bad idea to have the antenna coupler sticking out further than the jeep's bumper, especially considering that the radio costs about 10X what the jeep costs.

USMC 329413 is the hood number on this jeep, possibly it was loaned to Collins as "GFE" - Government Furnished Equipment. All the 718U-2 variants use a 548T-1 RF power amplifier and a 636X-2 power supply - the supply operates from +28VDC generated by the jeep's alternator. In a 718U-2, the PA & PS are inside a 718F-7 case, and in a 718U-2A the PS & PA are in a 718F-8 case along with the 671U-4A receiver/exciter.

The antenna coupler used in these 718U-2 radios is a 490B-4. What's inside the waterproof case is just a 490T-2, which is nothing more than a 490T-1 with a fan. The whip antenna is an AT-1011/U - a 32' fibreglas whip - looks like only the bottom 16' was in use for these photos.



Here's a photo of the MRC-83 production floor at Alpha near Dallas, Texas. In the foreground is an M38A1 with a TRC-75 1kW HF radio installed, the radio is under a protective wrap. Behind the first jeep is another, the radio is visible but has it's front watertight cover installed. Third jeep ditto, fourth jeep ditto. Lower left is a jeep that looks to be in the middle of an alternator install. Middle left on the floor appears to be accessories for the MRC-83 in a cardboard box banded together with an AT-1011/U in its canvas case. Visible at the top of the photo are four TSC-15 "Communications Central" radio shelters, shown with their vent covers open.

Still at the Alpha facility, here's a teamster type driving the finished product up onto a car transporter. Note that the TRC-75 install really flattens out the rear springs in the M38A1.

(LEFT) Here are three unique manpacks - a 719D-2, a 719D-15, and a PRC-105 in a vehicular mount. The 719D-2 is sometimes called a PRC-515 or an RU-20 - it is a 20W HF transceiver which is powered by a NiCd battery pack. The 719D-15 is the big brother of the 719D-2 and is about the only instance where the suffix of the Collins model number means anything in the real world - the 719D-2 is a 20W radio and the 719D-15 is a 150W radio. Both use the same receiver/exciter & control head, but the -15 version has a much larger PA/coupler unit and is powered by a BB-451 silver-zinc battery. The PRC-105 is a strange beast - it uses a Collins-built power amplifier & antenna coupler unit, but has a Hughes-built RT-1209/URC receiver/exciter. Must have really frosted Art to have to build the PA/coupler and not sell his own receiver/exciter with it. The PRC-105 was intended as a 100W manpack - it too is powered by a silver-zinc battery. The PRC-105 shows up in PRC-104 marketing literature from Hughes but Hughes doesn't mention the origin of the PA/coupler unit.

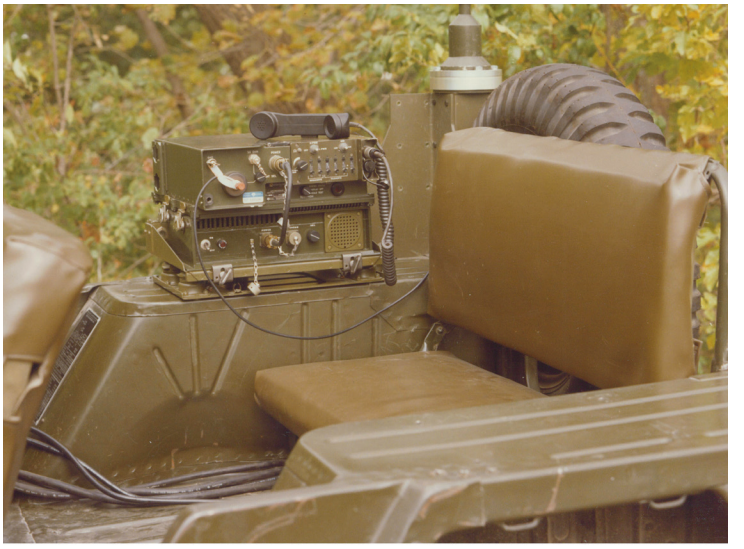
Publicity photo of a complete MRC-83 radio set, a TRC-75 installed in an M38A1 jeep. Visible underneath the radio is the power supply box carrying the PP-2352 inverter - the inverter runs off 28VDC and makes 115 VAC 400~ 3 phase power for the radio. On the front of the power supply box are controls for the inverter and also a rudimentary selftest setup for the inverter with lamps to give a go-no-go indication as to the health of each chopper transistor in the inverter. The MRC-83 first saw the light of day around 1960 - in those days it was quite a feat to put a 1kW automatically-tuned HF radio in a vehicle. I saw over 2000 TRC-75 radio sets come up for disposal at DRMO Barstow in the early 1990s, and I guess that most of those radios were installed in M38A1 jeeps just like this one - the 1960s was an excellent time to own stock in the Collins Radio Corporation.

This appears to be some sort of MRC-108 prototype built in an M38A1rather than an M151. Visible is the 618T-3 box & control head, with a PRC-41 with rucksack frame on top for UHF AM coverage. To the right of the 618T box is a PRC-47 with cover attached, and on top of that is the rear of a PRC-25. There is plenty of room on the M38A1 floor, underneath the 618T box and the PRC-47 and it looks like there are other radios under there. The PRC-25 & PRC-41 & PRC-47 are probably meant to be dropped off and operated 'on the ground'.

(RIGHT) This is a VC-120 installed in an M151 jeep. The antenna is an AT-1011/U and the base looks like something created by the engineering department for this photo shoot. The VC-120 aka GRC-220, this one has an early power conditioner, since the more common power conditioner units have the speaker on the left side of the front panel. The antenna post on the radio will accept a 15' whip antenna (like that used on the PRC-47), and the radio can be powered by a BB-451/U silver-zinc battery (like that used with the PRC-47) - the manpack version of this VC-120 radio is called the MP-150 or the 719D-15. Looks like the antenna post is jumpered to ground but the ANT SEL switch is still in the WHIP position, doubtless a radio silence precaution taken by the Collins Marketing 'droids.

Another photo of the same M38A1 with MRC-108 electronics, this one with the canvas top attached and the vehicular UHF AM antenna erected.

This looks to be an early MRC-108 in an M151, there is a 400W HF SSB radio using a 618T-3 with an 850 CPS teletype modem and 115 VAC 400~ inverter in the box on the right sponson. Usually a Kleinschmidt TT-4 sits atop the 618T-3 case - it is not present here. A 180R-6 antenna coupler is in the case on the left sponson. Since there is a UHF antenna on the jeep, I assume there is more radio gear in the jeep even though it is not visible in this photo.



Problems & Solutions In KWM-1, KWM-2/2A, & S/Line

By Frank Andrei, W3OEL (SK)

(Frank Andrei, W3OEL (7/15/1914 - 8/23/2003)
Lived in Saltsburg PA and worked for FMC/Syntron in Homer City PA. Booklet was printed in 1975 with the intention of collecting more information for a second printing which never happened.

This document is essentially a verbatim copy of the original. Minimal editorial corrections have been made.

NOTE: The CCA does not necessarily endorse all technical content contained in this document. Readers wishing to try the solutions described are cautioned do so at their own risk.

KWM-2A: S-meter not working on receiver. Replaced V17 and V15 tube (6BN8) took care of this problem.

KWM-2: To check final tubes, set (plate grid ALC)switch to grid, key mike, if meter goes below zero, finals going soft, should remain on zero or plus.

KWM-2: Transmitter not working, worked fine the night before. Disc ceramic capacitor which is located in the 6146 cage, mounted over the variable condenser. It was found that the heat from the final tubes melted the wax on the capacitor and dripped down on the variable condenser, shorted out the plates. Cleaned out the wax and the transmitter worked fine.

KWM-2A: If transceiver will not track on receive and transmit. Check diode CR5 (HC7001) in RF amplifier V7 (6CD6).

KWM-2A: Erratic grid drive, would drop down very low during transmission. Replaced V13 tube (6U8/6DK8) worked fine.

KWM-2A: When transmitter was switched on from a cold start it would go into oscillation, this was very bad when the headphones were plugged into the jack, and very noisy, at times it could be stopped if the set was bumped. An intermittent short in V16 tube (6EB8) was found, replaced this tube with a new one took care of this problem.

KWM-2A: When switch in grid position, Emission on Tune, when grid peaked with exciter tuning, grid drive was very erratic. Changed 6CL6 driver tube V8 with a new tube, set worked fine.

KWM-2A: Transmitter VOX Problem. VOX went out. Found three resistors R89 (68K), R112 (68K) on cathode of V11A and R87 (470K), burned out. Replaced tube with a new one, resistors are all 1/2 watt replaced with 1 watt, the transmitter worked fine since repaired. (By Bob W5CRK)

KWM-2/2A: Audio section of KWM-2/2A bad capacitor, audio comes thru when cut off, capacitor C102 100 uf, in cathode of V16 (6EB8) tube, very common cause in these transceivers. (By Bob W4WCG)

KWM-2/2A: ALC Zero Adjust. Check ALC jack (bias) with VTVM. If this bias exceeds 1.8 volts plus or minus 20%, replace tube V17 to bring this voltage into correct limits. Adjust ALC zero potentiometer R30 (top of chassis near R45) until meter indicates zero.

KWM-2/2A: On CW you often forget to move back to a fellows' frequency when he turns it back, when the two frequencies are not the same. The Heath GD-125 Q multiplier can act as a clarifier, turn the GD-125 on and adjust the peak for his signal and in this manner you can work a station a few kc. away from your own with out adjusting the KWM-2 dial. (By W7IRL)

KWM-2/2A: If you operate a particular band for some time and then move to a new band, often the Mic/Gain Control will not be able to raise the ALC, reading on transmit, and it appears that the early tubes of the set may be at fault. However, I found in two of my units, that it is only the band switch and several complete rotations will clear the contacts so the rig will operate normally. (By W7IRL)

KWM-2/2A: On transmit the KWM-2 made a buzzing noise, at times it would stop and work normal, until the transmitter quit all together. Found plug-in relay K2 open, plugged in a new relay and it's been working fine since: this is a common cause in these sets. I did not use a Collins plug-in relay (too expensive to order) I used the same type of a relay which is an exact replacement plug-in type made by Gould Allied Control, 100 Relay Road, Plantsville, Conn, 06479.

For K2 use Cat,# TP16J -4C-115VDC.
Coil Res.15000 Lists $ 6.80

For K4 use Cat,# TP16J-6C-115VDC.
Coil Res, 9000 Lists $ 6.85.

These relays can be bought from any large Radio Store that sell relays or any Nation-Wide Gould Allied Control Distributor.

KWM-2/2A: Jock - ZL2GX found K2 relay had an open coil, no replacement in his country so he fused the coil together by putting some 500 volts across it for a moment, this lasted until he bought a new relay.

KWM-2/2A: Had problem with mike gain control to 4 O'clock and still not enough grid drive. Replaced defective C1 (.02uf) C3 (5000) and C4 (5000). Set 6CL6 plate trimmer to 2/3 capacitance for 14 Mcs and resonate L14 to it, reset 28 Mcs and 21 Mcs for peak grid, V4 V3, V5 found weak. (By WA4CWV)

KWM-2/2A: Using the Heath SB-650 with the KWM-2/2A Connections are as following:

HFO: From KWM-2/2A cathode V6 (12AT7) pin-3,via a 50 mmf capacitor to rear panel J28, NB Ant. disconnected.

LMO: From KWM2/2A rear panel J18 EXT,VFO, BFO, thru .01 mfd, capacitor from junction C8, L22, R56 and C256, to spare rear panel jack.

To calibrate the SB-650 against WWV signal input, unscrew coax Ant. lead PL-259 to KWM-2/2A so as to disconnect the coax shield and just leave the center conductor to give WWV signal input. Then wrap a piece of wire (insulated) around the coax center conductor and then make a coil of the other end of this wire to wrap around the SB-650 crystal. Thus hear both the SB-650 crystal oscillator plus WWV.

In order to eliminate the difficulty in finding WWV "deadspace" on the KWM-2/2A tune the dial off frequency about 1 kc and then synchronize very easily the SB-650 and WWV signal during the WWV no-tone period. It works very well and so easy to do. (By R. H. Ryland TU2 EF VE2)

KWM-2/2A: I noticed that my grid drive excitation was dropping off and erratic operation. Moving the emission switch back and forth would occasionally bring back the drive, so I assumed that the problem was just a dirty wafer switch, so I promptly cleaned the emission switch and while I was at it I also cleaned the wafers in the band switch section, sprayed the Mic. Gain pot and also very carefully cleaned the relay contacts.

This seemed to cure the problem, but after a few days of operation the same loss of drive. So, out of the case again.

This time with the unit connected to a dummy load and lock position I started poking around the emission switch with a long type writer eraser and as I touched one of the terminals of the balanced Mod. pot (carrier Bal. pot R15) the drive shot up and pinned the meter.

Spraying the pot with relay cleaner brought the drive up and stabilized. No trouble since. (By S. J. Prewitt W0TUT/MM)

KWM-2/2A: Transmitter hang up, when I made a long transmission, the transmitter would hang-up and the only way I could get it to go back to receive was to momentarily switch off the power. The problem was a leakage of C47 connected from the 275 volt line (transmit) to pin 3 of the VOX rectifier. A slight amount of leakage is enough to drive the grid of the relay driver positive. (By J . E. Becker K9WEH)

(Editor's handwritten note: "Should replace with .068 Polycarbonate dielectric to cure 'hangup' problem caused by leakage."

KWM-2/2A: Repairing PTO. At certain frequencies there was a mechanical backlash in the PTO so that I could move the dial up 1 kc. without any frequency change. Close inspection proved that the problem was in the PTO itself, and not in the dial mechanism. Here's how I fixed it:
• Remove PTO mounting screws, and loosen dial set screw so that PTO can be pulled free. This problem was in a 312B-5, and I did not have to disconnect any wires. This will be necessary in the KWM-2.
• Remove the collar from the PTO shaft, this limits the number of turns of the shaft normally.
• Remove the nut holding the PTO rear cover, and remove cover.
• Remove two Phillips head screws located on the front of the PTO on either side of the shaft. These screws will go all the way through the coil form and are threaded into the rear cover. They are sealed with Glyptal, but can be removed with care.
• Remove the rear cover from the coil, there is a small metal bead that fits between the coil shaft and rear cover. It fits into dimples in both parts, DON'T LOSE IT.
• The coil slug moves back and forth on the threaded shaft when it is turned. The slug is not supposed to rotate - it has a spring to prevent this. There is a graphite lubricant on the PTO shaft, which builds up in places in my unit causing the slug to rotate instead of moving fore and aft for a slight distance, hence backlash. By turning the shaft, the slug can be removed completely and the excess lubricant removed from inside with a Q-Tip.
• Re-assemble by reversing the above procedure. It is possible to do this with out disturbing any of the internal wiring of the PTO, hence the calibration is not affected.

By J. E. Becker, K9WEH

KWM-2 & 32S-3: There has been some difficulty in using the 6146B tubes. Apparently the interelectrode capacity of these tubes is some what different, and in a circuit in which RF-inverse feedback is used, the differences which otherwise would be of no consequence become important.

KWM-1: Spurious signal 1 kc below regular frequency, they reported main signal 14050 kc S9 but spurious was S1. I suspected that the shaft coming off the VFO might be poorly grounded inside VFO itself, so first tried a short test clip from the shaft on the VFO to case of VFO, this seemed to solve the problem. So I put a strap around the shaft with a bolt and nut to tighten it and make good contact and ground to the case for a more permanent job. According to the stations I worked the spurious has gone. Apparently over the years dust had gotten into the 70K-1 VFO causing my trouble. (By W1HZG)

KWM-1: Emission switch burned out resulting in loss of voltage and a dead Transceiver. Solution: There is an unused identical section on the switch. Wire this (using short jumper) in parallel with burned out section with out removing any existing wires. Can be accomplished at no expense and in a short time. (By W. L. Clarke, W6NIU)

KWM-1: (May not rate being called a problem to some): Original equipment crystal positions will not cover the upper part of the 20 meter phone band. Solution: Installing a 9125 kc crystal in one of the seldom used positions allows coverage from 14250 to 14350. (By W6NIU)

KWM-1: Earlier models of KWM-1 were not equipped to key a linear amplifier. Solution: Pick up keyed 265 VDC and run to one of the unused feed-thru capacitors to J5 (which receives the power, etc., plug). Wire matching plug pin through appropriate resistor to a high resistance, low current relay (total resistance minimum of about 25K). Mount conveniently to rear dust cover, use this relay to control relay in linear. (By W6NIU)

KWM-1: Relay contacts intermittent on "receive". These are very hard to get at on some of the relays. Solution: Cut narrow strips of 3X5 file card. Wet tip with contact cleaner and draw thru contacts several times, (manually open relay to insert strip and let close on strip while drawing thru). Follow with dry clean strips until strips come out clean. This procedure produces a temporary fix and must be repeated whenever trouble re-occurs. (By W6NIU)

KWM-1: 12 Volt DC Mobile Supply. Early model 12 Volt mobile supply having only 4 transistors would not allow full loading. (Can feel over heating of one pair when loading). Solution: Add one of same type in parallel (total of two added) with each of pair which supplies low voltage section. (By W6NIU)

KWM-1: Poor Drive at either end of band. Tune KWM-1 to 14250 kc and put it in the tune position with enough grid drive to get S3 reading on the meter. You then peak the band-pass IF transformer for maximum grid drive, reducing the Mike Gain control to keep the grid drive around S3. This should correct this problem, assuming that the crystals are of normal activity and when you move from one edge of the band to the other, retune the exciter, tune and re-dip the plate for correct operation. (By W6NIU)

32S-1: VOX Circuit. Cathode resistor R89 and R112 (68K each) started to smoke, this is located in the cathode of V11(6U8A) Vox Relay Actuator. These resistors changed to 50 ohms. Evidently resistors were of low wattage, heated and changed resistance, these come off the B+ 275 VDC. Resistors were replaced with 2 watt each (same resistance 68) and worked fine. (By Don W6ZSL)

32S-1: VOX Problem. VOX went out, found three resistors R89 (68K) R112 (68K) on cathode of V11A and R87 470K burned out. Replaced tube with a new one, resistors are 1/2 watt, replaced with 1 watt, the transmitter worked fine since. (By Bob W5CRK)

32S-1: Slow Action Relay. Replaced VOX Relay Actuator/ tone Osc. tube V11 (6U8A). Took care of slow action relay. (By W5SU)

32S-1: Antenna Relay acting up. (32S-1 to 30L-1) phone cord connector between units had intermittent at plug. Replaced cord trouble cleared up. (Very hard to find). (By W5SU)

32S-1: Zero Drive. Had taken 32S-1 to Collins service station for alignment. Service man put output into dummy load at top and bottom of all bands, output was 90 to 100 watts on the dummy load. Brought set home and found that drive (grid) went down to zero on top 50 Kc, of each 200 Kc. crystal. Decrease in grid drive was gradual until no indication at all on tune up. This bothered me most on 15 meters 21350 and zero drive on 21400. Again no drive at top frequencies, changed crystal to 21400 to 21600 Kc. and 21400 was hot as a pistol, not convenient to make a trip to have this rechecked so I put up with this trouble for about a year. Knowledgeable friend visited me and fixed it in less than 5 minutes. He retuned T1 on top of chassis, watching grid drive on the meter. (By W5SU)

32S-1: Cycling On Transmit. Transmitter cycling on to transmit when on standby. Cured by replacing C118 and C119 with premium grade Mylar capacitor. (By R. J. Walker H4 V1 P2)

32S-1: Erratic Grid Drive. Erratic grid drive by replacing R8 Mic. Gain control which had become worn and dirty.

32S-1: Replaced R89 and R112 (68K) 2 watt resistors which showed evidence of being fairly hot by a single 35K 10 watt, which ran cool.

32S-1: Replaced R29 and R30 (4700 ohm 2 watt), resistor had been hot running, by single 2500 ohm 10 watt resistor.

32S-1: Replaced both 6146 finals by 6146B for more plate dissipation and lower filament current. Re-neutralize final afterward.

32S-1: Replaced both 6AL5 by silicon rectifier thus reducing heat and filament current load on power transformer. (By R. J. Walker H4 V1 P2)

32S-1: ALC. To improve ALC attack time by regulating the screen voltage of V6 the RF Amplifier. The reason for this is that as ALC, voltage is biasing off this stage, the screen voltage soars, tending to counteract the ALC effect. A 100K 1/2 watt resistor in parallel with RJ8 and a 100K 1 watt resistor placed from pin 6 of V6 to ground.

32S-1: Tube Shield. The 6CL6 tube in the P. A. shield box and the 6U8's which have a high failure rate due to high bulb temperature, can be improved through the use of IERC TR series tube shields in place of the existing ones. These shields reduce the envelope temperature and give a longer life to these tubes.

32S-3: No Grid Drive. Problem: Unable to obtain any grid current indication on PA grid meter setting when adjusting "Excitation Tuning" in the tune position. Solution: Voltage check of RF amplifier circuit V6 (6AH6) and driver circuit V7 (6CL6) showed that V6 checked out OK, the plate voltage of V7 was zero instead of 300 volts. Inspection of components comparing driver circuit revealed a mechanical failure of R95 100 ohm 1/2 watt resistor in the plate of V7, the resistor was cracked apart. Replaced R95 100 ohm resistor with a 1 watt resistor, worked fine. (By J.W.Pearson W4FAA)

32S-3: Erratic Plate Current. Idling plate current erratic, on CW had a strong noise which showed up on my monitor scope. Output was measured on meter was erratic. The problem was traced to a faulty contact on the CW switch, cleaning helped but eventually the switch had to be replaced, which was not too difficult. (By Bob W9KNI)

32S-3: Blows Fuses. Bought a new 32S-3 and after warming up, the fuse would blow, when turned to transmit. Checked 6146's one had a shorted grid. Replaced, transmitter worked fine. (By Guy K7TPD)

32S-3: VOX would drop out, would not hold in. Changed VOX Relay Actuator tube V11B (6U8A) worked fine. (By Guy K7TPD)

32S-3 & 75S-3B
(1) If equipment fails to operate as a transceiver (switch on receiver in standby position) open up 32S-3 transmitter and clean the contacts on K1 relay.
(2) If the signal begins to drop several dB just as you turn the QSO back to the other fellow, clean the antenna relay contacts on K2 in transmitter. (By Jim W7BCT)

32S-3: Transceiver Issue. Problem: S/Line will not work CW very successfully in transceive mode because any station who zero beats the transmitter frequency is not in the bandpass of the receiver's mechanical filter. Solution: Set the switch to receive VFO, just as you do for transceive mode on SSB, except hook up the crystal oscillator (under the lid of the 32S-3) so that the transmitter' s crystals, not the receivers crystals are being mixed with the receiver VFO. This gives just the right amount of off set for successful CW transceive, handy in contests particularly. Don't forget and operate SSB that way, because you can not transmit on the same frequency to which your receiver is tuned. (By J. S. Dick, W50NL)

32S-3: Using a Non-Collins Linear. 32S-3 relay for linear control or exterior antenna relay control. Jack J17 on rear, labeled Ant Relay - when the 32S-3 is in the transmit mode this jack is shorted to ground, and open when in receive mode. To use with external AC relay:
(1) Take standard AC plug and attach a single wire, properly insulated, to either pin, ignore the other pin.
(2) Connect the opposite end of the above wire to one side of the relay coil.
(3) Run a single wire, properly insulated from the other terminal of the relay, to a phono plug, solder to the center pin only.
(4) Plug the phono jack into the 32S-3 antenna relay jack. Then plug the AC plug into an AC line. To avoid risk of shock, it is important that this sequence be used.
(5) Put 32S-3 into transmit mode, and see if relay closes. If not, turn AC plug to relay around.

I am being very specific on above because it took me a while to figure it out. What happens is that on the 110 VAC line, one side is hot, one side is grounded. What you are doing is grounding the AC line during transmit to close the relay circuit. The reason you might have to turn the plug around is that you may be on the ground side. Actually, I used a DC relay for antenna switching, so instead of running the line to the relay coil, I run it through the DC power supply, which also works fine. (By Bob W9NKI)

30L-1: Smoke boiling out of 30L-1. Physical evidence indicated filter condenser shorted, replaced. (By Bob W5SU)

30L-1: Acting up, not operating properly. Visual inspection indicates soft 811. Replaced tube worked fine. (By W5SU)

30L-1: Relay chatter. Diode CR20 shorted placing AC on the DC relay coil K1. Replacing this diode cleared this problem.

30L-1: ALC meter deflects to the left when 30L-1 is on and the PTT is used. Diode 1N458 in metering circuit leaking, which allows some positive delay bias to appear in the exciter ALC circuit, causing the meter to deflect to the left. Replaced diode. Linear worked fine.

75S-1: Hum when AF gain control was advanced past the half scale. Solution: Replaced each of the three 6U8A tubes in the receiver with 6EA8 tubes, which is a direct replacement. I have heard this from several Collins owners. The 6EA8 tube will give better service, as the 6U8A's begin to cause this hum after about 6 to 8 months of use in the receiver. Upon making this change, the hum in the receiver was minimized. (By D. H. McLean, WA4JTI)

75S-3: Problem with AGC: would not hold after warm up. Replaced V7 (6BA6) second IF Amplifier, trouble cured. (By W5SU)

75S-3C: Abrupt drop in signal strength from S9 to very faint with corresponding drop in back ground noise to near zero. Voltage check of circuits emanating from unregulated 140 VDC output (at the positive side of C59A) revealed a direct short between primary secondary sections of T9 (455 kc.) IF transformer coupling first IF amp, and Q-Multiplier. Verified that this was the only reason by temporary substituting a broadcast receiver type 456 Kc IF transformer. Solution: Ordered a replacement from Collins Radio T9 (PN # 278-2080-010), and upon receipt some six weeks later, placed in the circuit and 75S-3C working normally since. (By W4FAA)

75S-3B: R.F. Section of 75S-3B receiver to provide a little more gain, replace present R.F. tube with a 6CB6.

75S-3B: On 160 Meters. I bought from Ameco a converter which covers 1800 to 2000 kc and fed it into the 75S-3B unit at 3500 kc and out comes 160 CW signal. The converter cost me about $ 35.00 at the time. They are not a stock item and have to be made up. (By H. 0. Severeid, W9DPL)

312B-4: I do not use VOX. Instead use On/Off switch on the 312B-4 console. Would throw switch to receive and transmitter would still block receiver of VOX control position. Replaced 0119 (.002) with .01 - trouble eliminated. (Cathode bypass V10). (By W5SU)

516F-2: F1, the 4 amp, Slo-Blo fuse in primary of power transformer, commenced to blow regularly each time the unit was activated. Reason - Inspection of the bases of V1 (5R4GYA) and V2 (5U4GB) and the tube sockets (phenolic) revealed that flashover was occurring between pin-8 of V2 to edge of chassis hole which holds the tube socket and between pin-6 of V1 socket. Burnt carbonized paths were visible on the base of the tube and socket. Fuse holder F1, the inside contacts could be at fault as the fuse, even when is inserted and locked in place, seemed to be loose. Solution: Replaced tube sockets with steatite type and mounted one eight inch higher than the edge of the chassis holes which accommodate the sockets. And replaced fuse holder F1 with a new and shorter type. (By J. W. Pearson W4FAA)

516F-2: New power supply 516F-2 worked fine until it was moved around in the shack, then the KWM-2 would not

work, the filaments would not come on, the wire on the socket pins (wire inside of pin) was not making contact, poor soldering joint, re-soldered and power supply worked fine. (By Henry KH6DE)

516F-2: Replace 5U4 and 5R4 rectifier tubes in 516F-2 power supply with silicon diodes. Made up in old tube bases and plugged in. Adjusted final idling plate current after, as due to change, the plate current and voltage will be much higher. (By R. J. Walker, VE2YG/GJYKW)

Heath Power Supplies

The Heath HP23 and 23A power supplies work the KWM-2 well. Also older Heath Mobile supplies with variable bias control will operate the KWM-2 mobile. In fact, I have an adaptor made of a short piece of multi-cable with an octal male plug at one end and an octal female at the other end and use the same cable as for the Heath HW units. (By W7IRL)

ADDENDA TO THE KWM-1

KWM-1: Intermittent noise, erratic ALC reading, loud "WHOOP" on turnover from transmit to receive. A lower than normal resistance check on ALC line showed mechanical filter to be grounded internally. To repair, have someone grasp can with a pair of pliers at the same time grasp pins with pliers and apply heat from heavy iron or gun to soldered base. Carefully remove can without disturbing assembly. Locate grounded coil and remove by applying heat to outside of tube. In this case, the wire lead was grounded by being pinched between coil form and body of filter. (By W3QON)

KWM-1: Intermittent noise in the KWM-1 can be caused by shielded wire shorting out components. These braided shields are covered with a very thin coating of clear plastic material. In close contact with B+ it breaks down. Watch especially where it threads thru transformers. (By W3QON.)

Collins Trivia

Note: All of the following items where taken from the Collins Column, the company employee magazine.

Special Delivery

In 1937, Firestone Tire & Rubber Company purchased an early Collins 600A communications transmitter for use in Liberia, West Africa. Because there was no port at the designated place of deliver, Collins sealed the packed transmitter in a huge horse-watering tank and instructed the shippers to float it ashore. At high tide, a freighter carried the tank as close to shore as possible, then tossed it overboard. At low tide, natives towed it ashore with oxen. The radio system replaced a former telegraph system because natives cut down the copper wire line which they made into jewelry.

(From the August 1950 Collins Employee magazine "We", which was previously and subsequently known as the Collins Column)

Braniff was the first airline to be completely Collins equipped.

Tibet Communique

In 1937 an Indian Maharajah purchased a Collins 45A, a 100-watt transmitter, mounted on improvised shock absorbers for use on a bullock cart while hunting tigers in Tibet. To report his luck, he also purchased four small receivers – one for each of his wives – from an associated company.

(From the September 1950 Collins Employee magazine the Collins Column)

Collins was first to commercially produce a Cyclotron.

The first Collins logo, which appeared in 1933, was designed by the stationary store supplying the company's letterhead. The "improved" version (the famous Collins Winged symbol), was designed by Jack Van Dyke in the middle 30's and first appeared on Collins products in 1936.

Dr. Alexander Lippisch, chief of the Collins Aeronautical Research Lab during the 1950's was considered to be "the father of the Deltawing aircraft." He was also the designer of "Flying Triangle" and the first high-speed rocket-propelled aircraft, the ME 163, which flew at 625 mph in 1941.

"Doc" Collins?

Arthur Collins received an honorary doctor of science degree in June of 1954 from Coe College. He was one of six persons honored by the Cedar Rapids college for their contributions to science, music, religion, business and philosophy.

The Collins 75A-4 receiver was produced at the Anamosa Iowa plant at a rate of 240 units per month in 1957.

Milk and Cupcakes

The first Collins company Christmas party in 1933 was an informal event where Art Collins brought 8 bottles of milk and Arlo Goodyear's wife, Monica, baked a dozen cupcakes for the event. That tradition continued until 1940, when Monica stayed up all night baking 16 dozen cupcakes.

By-Laws Update

The CCA board met in person last November and spent hours pouring over our By Laws looking for ways to make the CCA more efficient and also looking at the current practices that we are using. Many of our board members have or currently serve on corporate or non-profit boards. The old By Laws did not consider the digital age that we live in and the tremendous cost savings that can be obtained by transmitting information to the membership electronically and receiving feedback from the members. The current By Laws also do not give the board the flexibility to adapt to coming changes and to deal with potential problems.

Subsequently, we had a conference call with the CCA board and voted on a set of By Law changes that we are recommending to the membership. We feel that these changes are in the best interest of the CCA going forward. An email with the changes, explanations and discussion has been sent out to the CCA membership. If you did not get the email or do not have an email address, please call or text me at 214-991-2850 and give me your mailing address and I will get a copy of this in the mail to you.

Included in this issue of the Signal is a postcard ballot to approve the changes. Please indicate your vote or Yea or Nay in the space provided on the postcard and get it in the mail. We are counting all ballots received by mail on or before May 7th, 2018. Our board secretary will inform the membership of the results via email, the Dayton membership meeting, and a post in the next issue of the Signal. Again, the CCA Board is recommending these changes to the membership.

- Scott, KE1RR

Acting President
Collins Collectors Association

Treasurer's Report

I am pleased to report that the financial condition of the CCA is very good.

The year 2017 began with a cash balance of $20,443 and ended with cash balance of $20,999.

During 2017, we had income of $25,794, compared to $26,134 in 2016. The 2017 income included dues of $21,954 and other income of $3,840 was mostly from the Dayton banquet and booth.

On the expense side of the ledger, we spent $25,238 in 2017, compared to $26,139 in 2016. The largest expense, $11,980, was for production, printing and mailing the quarterly Signal. This was a cost reduction of $3,923 from the amount spent in 2016.

Other expenses include Dayton banquet and booth expenses of $5,993, a liability insurance policy that covers directors, officers and volunteers and also provides network and information security coverage for the Reflector, website and other electronic media with a three-year premium of $2,943 ($981 per year), internet expenses of $1,110 and travel expense of $1,446. Travel expense was primarily for the one face-to-face Board of Directors meeting held in 2017.

Remaining miscellaneous expenses of $1,766 were for PayPal fees, postage, P.O. box and CCA promotion.

Your Board makes every effort to be as effective and efficient as possible with your money.

73,
Ron Mosher, K0PGE
Treasurer

In The Shack with Dave Jennings - WJ6W

I was born in Northeastern Iowa and raised on a farm not far from Cedar Rapids. Collins Radio was always very well known to all Iowans and a source of pride in representing the rural state of Iowa as also having a high-technology capability. As a youngster I first heard Ham Radio on the big old floor model console radio in the living room. I spent countless hours listening to these guys most likely using AM since I doubt the radio had a BFO. I also learned about the Collins-made line of amateur equipment, the S-Line. If I became a Ham I could only dream about owning this Collins gear. My sights were more directed to Heathkit, Allied, and Lafayette catalogs which were still out of my price range at the time, but I saved my pennies and eventually got a Heathkit $50.00 shortwave radio kit.

I also loved listening to broadcast radio on that old console radio. Broadcasting seemed exciting. I understood that having an FCC license was required to work as an engineer in the industry, so I decided to take a correspondence course for the FCC 1st class license. This re-focused my interest towards broadcasting for many years. After receiving my license, my first radio job was at the local AM station, KOEL in Oelwein, Iowa which as it turns out was a showcase for Collins broadcast equipment. They had practically everything Collins made from audio mixers to both a 21E (5KW daytime) and a 20V-2 (500 watt nighttime) Collins transmitter. They even had a custom control desk for the mixer and turntables that I later saw offered in an old Collins equipment catalog. They also had a Collins remote mixer for sports broadcasts. Finally they had a Collins remote DJ console that they took to all the County Fairs and Sock Hops to play records. They sent the program back to the studio over regular phone lines to broadcast on the air! All this was so much fun that I decided to pursue a career in broadcasting from then on.

I went to Iowa State University and earned a BSEE degree. Then I got a job as Assistant Chief Engineer at KTIV-TV in Sioux City, Iowa. A job that I certainly was not qualified for at the time. Eventually, though, I became Chief Engineer. From there I went to ABC-TV in Los Angeles and worked in the engineering department on the 1984 Summer Olympics. In 1987 I became an independent engineering consultant and have worked on countless television projects including four more Olympics for CBS, and NBC since then. So, I can credit the spark that started my career path to listening to shortwave, falling in love with broadcasting, and the Collins gear at that little station in Iowa back in the 1960's.

Now let's return to Ham Radio. Fast forward 30 years from that first radio job to about 1998 when I became interested in shortwave and ham radio again. I discovered the West Coast Collins Net on 3895 kHz. It was very exciting to find such interest in my favorite vintage equipment. I had to get my Ham license and become a part of it. I also discovered the AM nets out here on the west coast which was an additional incentive. I immediately set a goal to get an S-line for sideband and a Collins 20V-2 for AM operation. I was first licensed as KF6YKZ and later changed to WJ6W which is more like a broadcast station call sign.

As you can see from the pictures, I was able to acquire several beautiful S-Lines and build a vintage broadcast station from Collins equipment. I even have the remote mixer and DJ console. So, except for the 21E, 5KW transmitter, my equipment is the same as the Iowa station. I didn't realize it while I was acquiring this equipment, but I was re-building that radio station at my QTH.

My shack has a mostly sideband area with the S-Line and other vintage and modern equipment. Next to it is the main AM operating position which has the "big" Collins 212E-1 audio mixer and other broadcast equipment including Collins record turntables. The mixing console controls the 20V-2 transmitter which is in the garage. The transmitter has been converted to 75 meters. On the opposite side of the shack is the low powered AM position with a 32V-2 and either a Collins R-388 or 51S-1 receiver. This area also has a small workbench with a rack of test equipment. All the audio, control, and RF for the shack is switched by a custom system I designed in 2001 when I built the shack.

Above: The picture with Joe Walsh was at a BBQ at our house with several other hams. We transmitted via the 20V-2 from the Collins DJ console outside on the AMI net that evening.

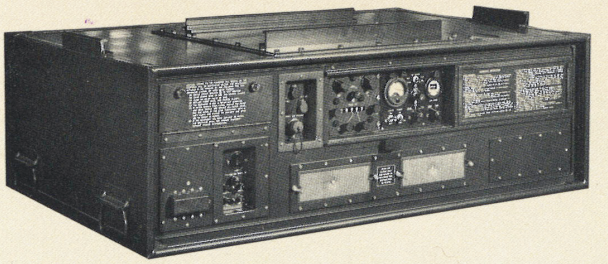
One of the most enjoyable experiences in my ham career was helping to rescue the 250 KW Collins shortwave transmitter from the VOA site in Delano, California in 2014. It was great to work with several of the CCA guys on this project led by Jim Stitzinger and Bill Carns. It was hard work but very rewarding to save such an impressive example of Collins engineering for history.

To sum it up in one sentence, Collins has played an important role in both my career and ham radio hobby.

- Dave WJ6W

COLLINS AN/TRC-75 TRANSPORTABLE HF SSB COMMUNICATION SYSTEM

FRONT VIEW



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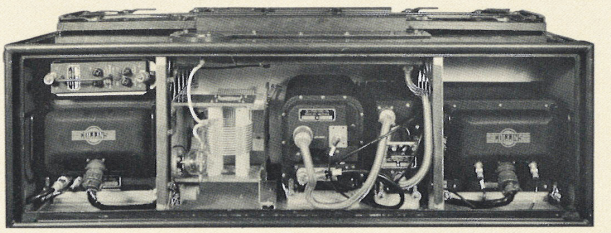

SPECIFICATIONS

GENERAL

FREQUENCY RANGE: 2.0 through 29.999 mc.

NUMBER OF FREQUENCY CHANNELS: 28,000 1 kc increments.

FREQUENCY SELECTION: Four knobs with direct reading indicators.

FREQUENCY STABILITY: Maintains ±0.0001% per 30 days.

ANTENNA: 15 ft. (whip) to long wire.

AUDIO CHARACTERISTICS: Input — Low Z dynamic or carbon microphone. Output — Low Z headset or 8 ohm speaker.

CHANNEL SELECTION TIME: 25 seconds maximum.

EXTERNAL POWER REQUIRED: 115 v, 380-400 cps, 1 phase, sine wave; 115 v, 380-400 cps, 3 phase, sine wave or square wave.

INPUT POWER: Standby — 575 watts. Tuning — 1200 watts. Transmit — 1320 watts (Voice, SSB), 1800 watts (AM) or 2100 watts (CW, FSK).

SIZE (including mounting): 49¾" W, 20¼" H, 30⅝" D (126.4 cm W, 51.4 cm H, 77.8 cm D).

WEIGHT (including mounting): 325 lbs. maximum (147.4 kg).

TRANSMITTING CHARACTERISTICS

NOISE OUTPUT: —50 db.

DISTORTION: Third order intermodulation equals —30 db 2-15 mc, —25 db 15-30 mc.

POWER OUPUT (minimum):	High Power	Low Power
SSB	900 watts PEP, 2-15 mc 750 watts PEP, 15-30 mc	100 watts PEP
AM	180 watts	40 watts
CW/FSK	700 watts	100 watts

SPURIOUS OUTPUT: Undesired sideband —40 db; harmonic spurious —40 db; all others —50 db.

DUTY CYCLE: Continuous voice in sideband operation, 50% in AM, continuous duty cycle in FSK.

RECEIVING CHARACTERISTICS

SENSITIVITY: SSB — 1.0 uv maximum for 10 db signal-plus-noise-to-noise ratio at standard conditions. AM — 3.0 uv maximum modulated 30% at 1000 cps for 10 db signal-plus-noise-to-noise ratio at standard conditions.

SELECTIVITY: SSB — —6 db at 400 and 3000 cps from selected frequency; —55 db at 1500 and 6500 cps from selected frequency. AM — —6 db at 3000 cps from selected frequency; —55 db at 6600 cps from selected frequency.

OVER-ALL AUDIO RESPONSES: 400-3000 cps within +5 or —5.5 db throughout the range.

AVC CHARACTERISTICS: Not more than 9 db increase in audio output for RF increase from 5 uv to 100,000 uv.

AUDIO DISTORTION: 15% maximum distortion at standard conditions.

COLLINS RADIO COMPANY • CEDAR RAPIDS • DALLAS • LOS ANGELES • NEW YORK • WASHINGTON, D. C. • INTERNATIONAL DIVISION, DALLAS, TEXAS

COLLINS

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