

Issue Number Fifty Seven

OFFICIAL JOURNAL OF THE COLLINS COLLECTORS ASSOCIATION

First Quarter 2010  
International Issue

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Sunday for Technical, Buy, Sell & Swap  
Tues., Thurs., Fri., & Sunday for Ragchew

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## In the News

- CCAE Formed
- CCA Elects New President - N7OTQ
- Dayton Coming
- President requests help with the Signal magazine.

## New CCA Chapter Formed in Europe as the C.C.A.E.



February of 2010 saw a milestone in the Collins Collectors Association history with the formation of an official European Chapter. The idea seems to have originated with Gérard Coric, F6FMT, in France but had several other central founding members, among whom were ON6DU in Belgium and HB9ASE.



### ON6DU at the Mic in Belgium

The CCAE now has 7 members in Europe and the US (N7OTQ) and is in discussions with the folks in the UK, Germany, and Switzerland, and the expectation is that they will have 25 members signed up by April.

The group is already very active and has a Saturday morning SSB net which is operating under the, what I assume are, club calls of TM9CCA, initiated in March, and the second TM6CCA a week after the first one. TM9CCA

and TM6CCA are active from March 11th to May 2<sup>nd</sup>, 2010 and for May and June the club will try to activate TM7CCA and TM7CLS or TM7COL. During April, TM9CCA was on the air the 7th and the 30<sup>th</sup>. In addition to the commemorative operations scheduled on the websites, individual members will be operating with their own call signs during normal net operation.



### Beautiful Collins Shack at F6GTC

The CCAE has several websites that are beautifully done and give much more information in English and French. These can be found at [www.ccae.info/](http://www.ccae.info/) and [www.tm6cca.com/](http://www.tm6cca.com/). See these websites for time of operation of the club station calls and the nets. The folks across the pond would love to include those of us in the US that would like to work into their nets, so check the times on their website and listen up.

Several of the CCAE members will be in the US for Dayton, so look for them, including Gérard, at the CCA functions that weekend.

----- CCA -----

## From the Editor's Desk

by Bill Carns, N7OTQ and Co-Editor Joe Nyberg, WILJN

Well, I don't know if Einstein ever realized it, but he missed one of the theories of relativity. This one says that as you get older, time gets compressed and you get less done in more time that is passing more quickly. I guess this is another version of the old adage of "I never knew what busy was until I retired."

Seriously, since I finished my shack building over a year ago now, I have been rushing towards getting everything installed, antennas put up and I am still not done. It didn't help at all that I darn near cut off my right thumb last month. At this point I do have 4 of the 12 operating positions running, and I am seriously close to getting the AM studio with the 20Vs up and going. Buck Owen's 212F-1 mixer board from his first Bakersfield AM station came alive several weeks ago and last week 2 friends of mine cracked a bottle of wine and sat and listened to a early Buck Owens record being played on the restored TT200 turntable into Buck's 212F-1 studio board and out to his processing rack and the monitor speakers....Now, that is what it is all about.

I thought that maybe KOCXX would be in the "Shack of the Quarter" this issue, but the layout is still not ready for prime time.

It also amazes me that we are coming up on Dayton again "so soon". This year I am going to make it and I sure hope to see a lot of you there. We will have a great banquet again, I am sure,

and Bill Wheeler (KODEW) has promised us another good program from our fearless founder. Bill has a great surprise for all of us also. The banquet is on Friday night again and there will be social activities before and after, along with a cash bar get together on Saturday evening where we can all share pictures and stories of our latest finds. Bring your pictures for sure!

The CCA booth will be in its usual location and there will be a "Dance Card" put together with all of the CCA member's booths and swap sites listed for your reference. We can all thank Rich, WB3JLK, for that. You can get the full story on Dayton by going to the CCA website and you can also register and pay for the banquet tickets on line. Registration is required ahead of time so that the chef knows what you prefer to eat. Please do not wait until the last minute. In addition to the program by Bill Wheeler, yours truly will make a few comments and pass out some great door prizes that you automatically get registered for when you register for the banquet. My thanks go to Jim Stizinger who has taken on the job of being the Dayton Event and Banquet Chairman this year following Tony Sokol's departure from this position due to illness. Tony has done a great job in the past and we wish him well.

The *Signal* received some really great fan mail following the last two issues that tried to document some of the history of the development of the S-Line. I am glad that you all enjoyed that so much. Speaking of that series, there is a correction that needs

to be recognized. Following the release of the last issue, I got an email from Dennis Day very politely pointing out that I had made a mistake in crediting him with the project lead on the KWM-5000. He pointed out, again, that it was Ed Andrade, WODAN, that was the project lead on that never to be introduced "Cadillac" transceiver. I don't know what happened, because Dennis caught that error on the proof copy that I sent him of the article, and I somehow failed to include the change in the final issue. Sorry Dennis and thanks again for the help on the article and for taking the time to do the proof reading.

Speaking of the *Signal*, as usual, I am seeking your help to keep the content up and useful for all of us. I need authors. The queue of potential articles is down to shorter than I would like and I need your support. If you have even an idea for an article, please give me a shout via phone or email and we can discuss it. I am particularly looking for articles that are service oriented, document historical perspective, provide information about the people of Collins or the CCA, and stories about a great find or really vintage piece of Collins gear.

Lastly, as this issue is going to press, the Board of Directors has held the required election to backfill the President's slot that was vacated by our leader Paul Kluwe - Greatly Missed. I find myself now following in big footsteps and I will certainly do my best to fill those shoes. More on that in the

## **The Practical Aspects of Using Military HF SSB Equipment On the Ham Bands**

by Scott Johnson - W7SVJ

### **An Overview**

In two earlier installments, the first generation of Collins Military HF SSB equipment was described, and basic functions and circuitry were discussed. This installment will attempt to relate some of my personal experiences with the early military SSB equipment manufactured by Collins in the period from 1955 to roughly 1963. The equipment included will be limited to the URC-32/KWT-6 fixed station/shipboard transceivers, and the ARC-58/18Z-3 airborne 1KW PEP transceiver. I will also touch on its ground transportable derivative, the TRC-75. This particular family of radios shares a host of modules. The three sets differ primarily in packaging and the method used to set an operating frequency (servo system, or manual).

My first attempt at resurrecting a URG-0 radio came about when I purchased an odd lot of ARC-58 receiver-exciter, power amplifiers, antenna couplers, and coupler controls from one of the many aircraft salvage yards that once ringed Davis-Monthan AFB in Tucson, Arizona, home of the DOD's aircraft "boneyard". I purchased said lot by the pound and stole away with my plunder, thinking that I had really gotten away with something. Reality set in when I realized several things:

- The ARC-58 needs about 2.5 KVA of 115/208V three phase at 400 HZ , not to mention a fair amount of 28 VDC (no problem, I told myself since I have several 2500 VA inverters).
- I didn't have any mounting racks (again, no problem - don't need them! The connectors are on the front - sweet!).
- Uh-oh, the racks supply the mach 8 cooling air (what am I worrying about, C&H sales has all kinds of high velocity blowers!).
- There are lots of connections, lots of MS connectors (I keep Wm. Perry and Spacecraft connectors afloat).
- After all the blood, sweat, tears and money, I will have a really noisy, cantankerous, 50 year old 1KW PEP HF station (but it's a Collins station, so it's all worth it! Right? Right!).

So, that is how it all started, and, although it is something to behold, I can hardly recommend all of you run out and do the same, for several good reasons:

- I, the foolish one, have already done it, so it's not really novel!
- If the five reasons enumerated above don't scare you, they should and if not, then you are probably as mentally defective as I am.
- There is a much better way to enjoy essentially the same station, without the screaming fans, 400Hz power issues, etc
- You can have about 90 percent of the same experience as with the ARC-58 with a much more readily available, and easier to operate and maintain, set. (I have mentioned the KWT-6 before so read on!)
- 

### **OK, so you really want to do this !**

The KWT-6 (and it's naval brother the AN/URC-32) are a family of equipments developed in the mid fifties by Collins to fulfill the need (initially by Gen. Curtis LeMay's Strategic Air Command) for a robust, reliable, scalable HF-SSB fixed station transceiver for SAC's Big Talk network. Big Talk's job was to communicate globally with SACs many facilities and airborne mission aircraft. It did indeed fill that

## Practical Aspects of Operating Collins Military HF SSB Gear (Cont'd)

role, for nearly twenty-five years! KWT-6 and URC-32 gear started to show up with regularity on the surplus market in the late eighties although, due to the relatively low numbers of equipments produced, it has never been as prevalent as some of the more common gear such as the R-390, etc.

The basic KWT-6 is a 500W PEP transceiver standing about seven feet tall and weighing in the neighborhood of 300 pounds. It boasts an internal manual antenna coupler (basically, a repackaged 180S-1), and internal SWR bridge (Bruene coupler), a small local speaker, and will run on 115 or 230 VAC on a 15A circuit although 20A is, of course, preferable. The transceiver is organized into functional, physical assemblies which consist of the synthesizer/receiver front end/exciter (the largest unit, about 15" high), sideband generator, IF/audio, PA, low voltage power supply, high voltage power supply, blower assembly, and rack/interconnect, and air plenum assembly. In addition, there are several assemblies for different non-standard configurations, such as a high stability time base, phone patch, external servo tuned antenna coupler (The SRA-22 is standard on the URC-32), a monitor panel, and doubtless many others. In some SAC application (and perhaps airline communications), an external 204F-1 or 204G-1 2.5 KW amplifier was used in lieu of the internal 500 watt PA. Either the KWT-6 or URC-32 makes a fine 2-30MHz SSB amateur station. Later versions (and early versions, if modified) have

a 100 Hz step tuning oscillator installed, which is a very nice addition. I have not recently seriously looked at availability of equipment, but it now seems pretty good and it seems there are always units out there for brave souls willing to tackle them.

### Care and Feeding of Your KWT-6/URC-32 - to borrow a N7OTQ Phrase

There are a couple of things to remember about this equipment:

- 1) The transistor was new in 1955. This equipment is hybrid, with most of the RF/IF duties falling to tubes, and audio, servo, and control functions falling to the new "semi" kid on the block. The early transistors are prone to many passage of time induced maladies, such as corrosion of internal metallization, and a condition known as "purple plague", which was the formation of intermetallic compounds from the gold metallization being applied directly to the silicon without a interface barrier metal. Because of this, some - usually not many - of the transistors may require replacement. There are ECG replacements for all but the 2N158 power transistor, which are very robust.
- 2) Electrolytic and tantalum capacitors are used everywhere in almost all of the modules. My experience is varied and I have one URC-32 in which all the capacitors are still good, and one KWT-6 that needed over thirty tantalums and electrolytics replaced.

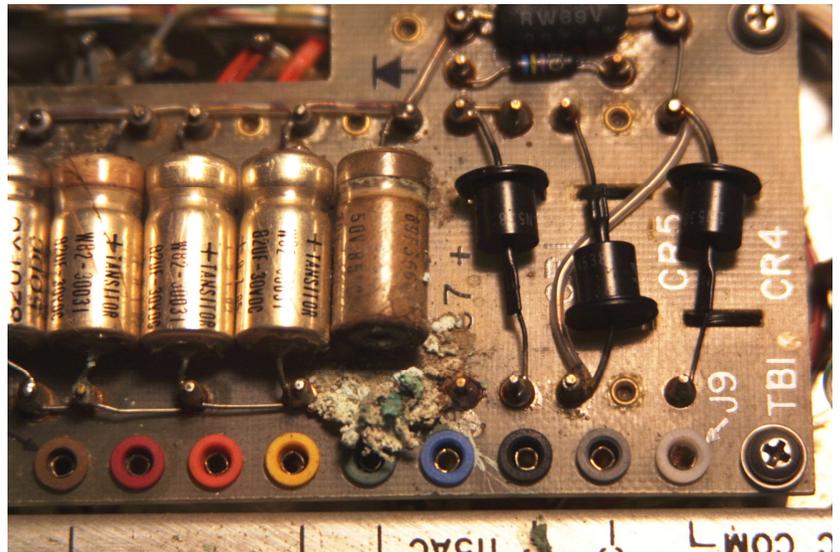


Figure 1. Time related Tantalum leakage

- 3) As always, get the manuals and read them cover to cover twice before starting anything. Keep in mind that the troops that worked on these sets when they were in service spent around six weeks studying just this system.

## Practical Aspects of Operating Collins Military HF SSB Gear (Cont'd)

- 4) If you are starting on a set that has not been in service for a while, a complete disassembly is probably in order. Module interconnects are either PCB edge connectors, or D-sub connectors, and the simple act of removing, cleaning, and re-installing works wonders. Use a good pencil eraser on the edge connectors, followed by DeOxit and then just the DeOxit on the D-sub connections.
- 5) Troubleshooting is relatively easy, due the modular nature of the radio. Most assemblies serve a simple, specific, well-labeled purpose. Because of this, most modules can be operated and aligned by themselves on a reasonably well equipped bench. (You likely wouldn't be contemplating a radio such as this if you didn't have one, right?)



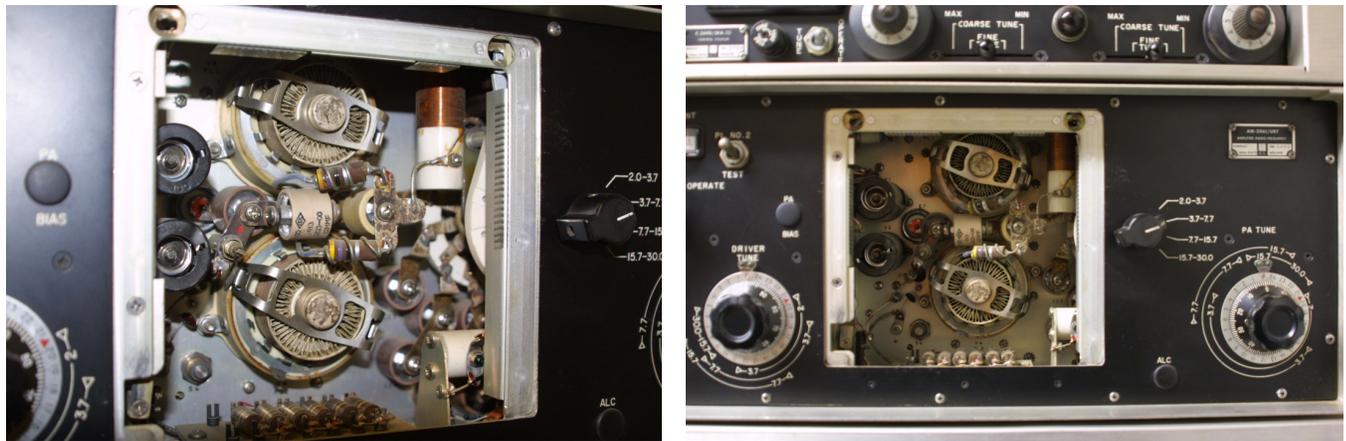
**Figure 2. SSB Generator Chassis with the Balanced Modulator Module Removed**

- 6) There are many wired-in subminiature tubes in the modules, and if the rig has lot's-o-hours (ex-USAF KWT-6's seem to be a bit more tired), many of them may be soft, especially in the IF modules. Most of the tubes are just a high bid away on that well known website.
- 7) The PA deck warrants special mention. If you own a KWS-1, the PA will seem strangely familiar. The big difference is the closely packed components and the bizarre PA capacitor stack. Take extra care to scrupulously clean and inspect for evidence of breakdown, and replace any suspect components. Any effort spent on the PA initially will be repaid tenfold in the future. The PA is likely to consume 25% of the total time required to revamp a KWT-6 or a URC-32.
- 8) Cooling warrants special concern, in that it is absolutely critical to have adequate airflow to all the assemblies, especially the

power amplifier. Cooling air is supplied by a large squirrel cage blower located at the base of the rack. The blower pressurizes a plenum that runs the vertical length of the rack, and air is supplied to the individual assemblies through a series of round couplers that extend from the plenum to the back of the assembly, sealed by a soft rubber gasket. Each assembly has a sliding gate that controls the flow of cooling air into the assembly, and a removable screw facilitates the insertion of a manometer into the assembly to read pressure. This allows an indirect measurement of airflow to the assembly. It is important that airflows be set properly, otherwise it is possible to have inadequate airflow to the PA by virtue of having all the other assembly gates set wide open. Keep the inlet filter clean and be sure the radio has one. It cannot be stressed too much that proper cooling is essential!

- 9) It goes without saying (or does it?) that this equipment is capable of exercising one's life insurance policy. Pay attention! The PA cage and HV PS in particular are potentially very nasty due to the tight spaces and difficulty reaching components. Do not rely on interlock and discharge switches! Don't exercise them, lest you damage the HVPS and PA. In this respect, the KWT-6 should be familiar to those who have experience with the KWS-1.

**Practical Aspects of Operating Collins Military HF SSB Gear (Cont'd)**



**Figure 3. Two views of the RF Power Amplifier Showing the Very High Packing Density**

**Operating Notes**

The KWT-6 has the potential for being quite reliable, if it is brought back to life with care and conviction. As with most electro-mechanical devices, periodic exercising tends to promote long-term reliability. However, after a three year hiatus from the HF bands, I finally put my URC-32B back on the air and I believe it had been dormant since 2004. Nonetheless, it came up without a hitch. I felt rather lucky, but I had completed all the maintenance I have just described above when I acquired the radio back in about 1998.

I operate my URC-32 in a semi-remote fashion. It, along with a KWT-6 and a couple of broadcast rigs, are positioned about eight feet from my operating position. It is a good idea to have a handset connected to the rig for tune-up, unless it (the rig) is positioned at the operating position. I have a rather unique audio system consisting of an AN/AIC-25 aircraft interphone box, which allows me to monitor any or all of ten receive sources, and select any one of six transmitters. The AIC-25 has transformer isolated, amplified microphone and receive circuits, and also has a very nice audio AGC circuit.



**Figure 4. AN/AIC-25 Interphone Control**

I typically use this audio setup with a David Clark low impedance H-76 (USAF) headset. For best speaker audio, I have found that line level audio from the KWT-6 into a 5-10W amplifier driving a good quality, baffled, six to ten inch full range speaker is quite nice. Good microphone choices include the EV 664, or just about any good dynamic or electret microphone. I have found that the M-87 microphone in my David Clark headset gives very good, albeit somewhat restricted, audio

*Service Line - The Care & Feeding of Your 30L-1*

And other Pertinent Trivia

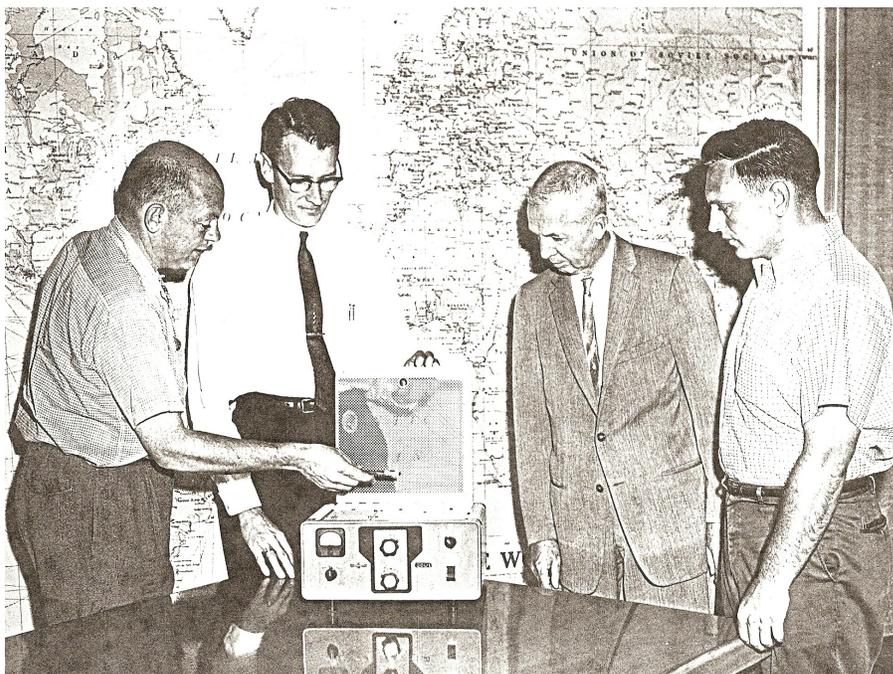
by Bill Carns, N7OTQ



This article is the second one in a series of three articles on the significant contributions of Gene Senti, who retired in 1976 as the Group Head for Amateur Radio Products at Collins Radio. The first article, *The Care and Feeding of Your KWS-1 and Other Pertinent Trivia*, appeared in the *Signal Magazine* in the Spring of 1992. To stay on schedule, the final article on the KWM-1 will run in the Q2 issue in the year of our Lord, 2028.

Needless to say, it takes this author a while to work up to one of these, but I hope you enjoy them as much as I enjoy producing them.

As you may remember, I cut my teeth on the venerable KWS-1 very early in my Collins collecting days which started in about 1986. This, of course, led to the first article in this series and my complete fascination with the folks of Collins Radio, their farm and family ethic, and the resulting quality equipment that we now still enjoy - in some cases, some 70 years later. I have one piece of Collins gear that is now 76 year old and still has its original finals and capacitors.....They just don't make 'em like they used



**Figure 1. Gene Senti (left) Admiring his New Baby with Fred Johnson, Leo Arthurs and Harold Downig**

to. It did not take long, in the grand scheme of things, for me to acquire my first S-Line and very rapidly thereafter, my first 30L-1. I was in love - Again!

A brief history of the 30L-1

The 30L-1 is a marvel of efficiency and cost-effectiveness. As you may know, but worth repeating here, Gene was heavily involved in the development of the S-Line. The S-Line was meant to be a more cost effective, and more prolific, offering following the production of the KWS-1 and the 75A-4 Gold Dust Twins. As the S-Line became reality though, the transmitter and receiver (32S-1 and 75S-1) marginally met their cost targets, but the 30S-1 amplifier which

brought the line-up output up to KWS-1 standards, was way more expensive than the original concept had proposed.

The high cost and selling price of the 30S-1 bothered Gene Senti a lot. It bothered him to the point that, following the introduction of the 30S-1, and during the winter of 1959-60, he began experimenting with a smaller and less expensive linear power amplifier in his basement at night and on the weekends. This G-job approach soon led to an amplifier being built on an old TV chassis. This low cost amplifier used 4 811As in parallel to come close to the then legal limit of 1 kW input power and yielded about 650 watts out. With the help of ME Arlo Meyer and some trips to

## *Service Line - 30L-1* (Cont'd)

the Collins employee surplus store, the infamous basement yielded two rough prototypes which were shown to Ernie Pappenfuse who was the then Director of Development for Amateur and Commercial Products. Art Collins was brought up to speed, a Green Room was immediately set up and the now famous little amp was in production 6 months later.

At a very competitive introduction price of \$520, it more than satisfied the need for a cost effective amp and the rest is history. Manufactured from April of 1961 through 1981, a run of 20 years, it is estimated that over 17,000 30L-1s went out the doors of Collins Radio. This is quite a feat for the little amp.

There is more good news when you look into the performance and history of this amp. It has a wonderful record and reputation as being reliable and a real performer in spite of packing such a lot of "punch" into that small S-Line cabinet. Very few Service Bulletins were issued for the 30L-1 and they dealt with some pretty minor stuff. These will be summarized and commented on in this writing.

To keep your amp in great shape, however, there are some issues that should be dealt with and these will also be summarized as I walk through

bringing up a 30L-1 that has been in storage for quite a while.

Just quickly, I have just finished a 5 year sojourn into selling my homes in Arizona, the resulting packing and moving, getting a new pad in Wimberley, Texas and then building my dream shack. You will be hearing more about this new shack in a couple of issues from now, but the result is that I am in the process of bringing up a number of pieces of Collins gear that have been in storage for from 5 to 10 years. I thought I would take this opportunity to share the process with you all and start with one of my favorite 30L-1s. It is a 30L-1 that you might say, at this point, has some "baggage".

Now, this is another long story that will have to wait for another day, but I almost left Arizona without most of my Collins gear. I was the almost victim of a

540,000 acre forest fire - the Rodeo Chedeki Fire - which, in 2004, was put out less than a quarter of a mile from my mountain retirement home. In the process of being evacuated, I had just enough time to grab some of my favorite and more mobile Collins gear and this included the 30L-1 that will be looked at here. The result was a very unceremonious trip in the unpadded bed of my ¾ ton pick-up truck and then out over a rough dirt road - in a big hurry.....e.g. lots of shock for those poor 811As.....So, this is where we start.

### Uncasing and Disrobing

I know that this is more general, but here are a couple of hints on how to get the case off of that heavy guy without damaging the paint or the unit. This question comes up from time to time and doing it wrong on a 30L-1 can result in much paint scratching, especially on the trim ring.

Put a soft towel down on your work space, and carefully - keeping the lid under control - turn the unit over on its top on the towel. Remove the 4 Phillips screws that hold the feet on the bottom of the case/chassis. Now, roll the unit back over right side up and with the panel to the left. Open the lid and remove the two short flathead Phillips screws that



**Figure 2. Serial # 12770 is waiting in the exam room Doctor, but there seems to be something wrong with his foot and he hasn't bathed in months.**

## Service Line - 30L-1 (Cont'd)

are on the front inner flange of the trim ring under the lid. DO NOT remove the painted flat-head Phillips screws that show from the outside and that hold the trim ring to the case. Have a chair ready in front of your work space and call your significant other in for a moment if you have one. The only thing holding the 30L-1 chassis in the case now is the single bottom center back screw that goes through the case to the chassis so you will be using your finger tips to carry some weight for a moment.

Pick the entire cased unit up by putting your arms down the sides of the case and letting your fingertips wrap around and push the panel tightly back into the case. Now, have your helper, standing behind you, hold the cord straight up in the air. Pushing back with your finger tips, lift the unit straight up and sit back in the chair behind you and as you do, rotate the 30L-1 front panel down until the weight is resting generally on the knobs and panel on your thighs and in your lap. Hold the 30L-1 with your left hand and take out the top center screw on the bottom of the case. Now, using both hands, balance the case and chassis in your lap and lift the case straight up being careful to keep the alignment between case and chassis. Done properly, there will be no scratches on the trim ring. Continue to lift the case up (You are going to go by and maybe bump some side screws - Go slowly) and let the cord come down through the access hole in the rear of the case. This can be done alone with a little bal-

ancing with your right hand. NOW, and this is IMPORTANT, thank your wife. Putting the case back on is just a matter of reversing the process.

covers of the PA tube and HV compartments. Notice that there are spring loaded shorting interlocks that short the HV to ground when the covers are



**Figure 3. Covers off and HV Shorting Switches, Or Interlocks Annotated**

While we're at it, let's get those covers off. First, a couple of points. Before removing covers, turn the PA tuning and loading knobs to exactly 9 o'clock. This assures that the plates are meshed and will prevent "oh craps" while working in the RF compartment. Then, get a few Ziploc bags and start organizing screws as you take off the two top covers and the bottom cover. Leave the RF top cover screws in place - just loosen them to slide out the cover. Those screws are small and they get legs if removed.

Remove the bottom and 2 top

off. There are two on the top and one on the bottom. I say that because 30L-1s are often damaged by inexperienced repair efforts that involve running the RF amp with these covers off. First, try to never do that and if it is absolutely necessary and you are experienced at debugging HV equipment, then these shorting interlocks need to be defeated TEMPORARILY while the trouble shooting proceeds. This can be done by slipping a piece of heavy high voltage rated heat shrink over the screw in the center.

.....HMMMMMMMM, Time Out! ...

## Service Line - 30L-1 (Cont'd)

Mr. Thorough seems to have packed up those 811As for the move. It is tube hunting time. With the current cost of 811As, read that PANIC time!

Now, with the case and covers off, and while I look for those 811As, let's get to work on bringing everything else up to par.

Another surprise: This is not the 30L-1 that I thought it was. I have 3 30L-1s, two of which I have run in the past. I am still not sure if this is one of the ones that I have run, but the cord has not been cut off and replaced - as I know I did with the two operating ones from the Rim home and also both the main fuses are missing along with the tubes. This may be a case of borrowing, or it may be a danger signal. Damn my 70 year old memory! However, I am going to continue with this one since it brings the same issues to the forefront, and I observe that this 30L-1 - rare indeed - is pretty much a complete virgin. I can not find one sign of repair. And, it is pristine inside. So, my purist philosophy is going to come to the head of the line here and we are going to proceed to try and keep this amp completely original in the interest of history. If, over time, everyone makes their 30L-1 better than it was when it left the factory, there won't be any really pristine ones to treasure hunt for. :-)

If your 30L-1 has been used recently and is working fine, you can skip the next couple of paragraphs on testing the 811As and reforming or replac-

ing the 6 100 mfd 450 V electrolytics. If, on the other hand, the rig has been in storage and or abused physically, then a thorough going through of the tubes and the caps is definitely in order. Bad things happen if either the caps or the tubes short.

### Testing Those 811As

Now, thank goodness, I have found those tubes so let's start with testing the 811As. Most good tube testers will test 811As. I use a TV-7, one of the better military tube testers, and when I have finished testing the tubes initially, I then turn the tube tester on its side so that the tube is horizontal with roughly the same side down as when in 30L-1 service and repeat the shorts and opens tests while tapping lightly on the tube envelope. This is good preventative practice since filaments can droop and get a bit brittle after they have been in service for some time. Again, you want to do every thing you can do to not have a shorted tube in the amp. We will talk later about the one mod I like to do on a 30L-1, even though I am a purist. This mod protects the bias and relay supply in the event of a plate to grid short which is not uncommon.

### High Voltage Section

Now that we have tested the tubes and have 4 solid 811As laid aside, it is time to look at the electrolytics in the HV power supply. I know that it is common practice to put a 30L-1 on a variac when you first bring the amp up after a long period of storage. Because of the bleeder

resistor configuration where "it" is distributed across the 6 effectively stacked 100 mfd caps, you can actually get away with this - *to a point!* - with the 30L-1.

In fact, using best practices and the procedure laid out in the mil spec for reforming electrolytics, all caps that are reformed should be reformed to full rated voltage: In this case to 450 Vdc. A quick calculation will show that even in high line situations and with a variac bringing up the voltage, the most you will see on each cap is about 270 Vdc. When an electrolyte has depolarized, it can not be completely repolarized without taking it to full rated voltage. In this case you are short by almost 45 %. If the caps come into the process needing help, a variac job will not completely fix them. If they are marginal, a variac job will not hurt them and will certainly help.

If you want to take the time, unsolder the connections from the HV transformer and rectifier board, get a DC power supply and clip into each cap individually and reform it completely to 450 Volts. This can be done with the cap in the circuit by calculating the current through the 25K ohm resistor at each voltage set point and then assuming that any current above that fixed resistive path is leakage through the capacitor under reforming. (This technique will not overstress the resistor since, as built, it is 26 watt rated and at 450 Vdc applied, you will only be dissipating 8 watts.) If it will not reform

## *Service Line - 30L-1* (Cont'd)

to less than specified leakage current at 450 Vdc, then definitely replace it. And.....yes, I know, we are talking a few days of work and waiting here, but worth it if you suspect the caps.

I have just gone through two cap boards that came out of 30L-1s where the boards were pulled for a preventative maintenance Harbach board replacement and all the caps measured were in spec. These caps are old, but they were very high quality caps.

The mil spec involved is MIL-HDBK-1131 and can be downloaded on the web from the Defense Supply Center website at:

<http://www.dsccl.dla.mil/Programs/MilSpec/listdocs.asp?BasicDoc=MIL-HDBK-1131>

Normally, if there were any indication of leaky diodes on the HV diode board, I would replace all of the diodes. The original 1N1492 diodes are early GE silicon top hat diodes and have a higher reverse leakage specs and lower performance than currently available inexpensive diodes. Because of the lower leakage and the huge increases in breakdown voltage that have been achieved since the advent of the 1N1492, one can replace all 16 1N1492s with just 12 1N4007s and still have more breakdown margin, less reverse leakage, roughly the same forward drop and 33% more current handling capability. This is a win win. Just jumper the unfilled diode slots on the diode board and use just 12 1000 pf caps across the slots filled with 1N4007s.

### HV Diode Specification Comparison:

<u>Diode</u>	<u>Forward Current</u>	<u>PIV Rating</u>	<u>Reverse leakage</u>	<u>Package</u>
1N1492 (Original)	750 mA	600 Vdc	300 microA max	Metal
1N4007	1000 mA	1000 Vdc	5 microA 25 deg C 50 microA 100 deg C	Plastic

In the case of this unit with absolutely no previous mods, I have measured the forward and reverse characteristics of the original 1N1492s and they look good - so I am going to give them a new lease on life at least until the next repair party.

### Service Bulletins

OK, now let's look at the Service Bulletin situation. The 30L-1 actually has a very clean history related to design or manufacturing problems. It is, after all, a pretty simple amp, and it is really built well.

Service Bulletins for the 30L-1 can be downloaded for free from the CCA website at:

[http://www.collinsradio.org/archives/Service\\_Bulletins\\_and\\_Information\\_Letters.aspx](http://www.collinsradio.org/archives/Service_Bulletins_and_Information_Letters.aspx)

Service Bulletins #1 (August 1961) and #4 (November 1977) both deal with operation on 240 Vac. Carefully review the TB-1 wiring of Fig. 1 in SB #1 and make the DC measurement required on the AC cord if the unit is strapped for 240 Vac operation. There was an initial wiring problem on the 30L-1 that was pretty much gone by serial number 2500 and then, during production in the 70s, the AC switch issue crept in and was not discovered in line testing due to the fact that they tested in the 115 Vac configuration. I have observed this sort of 240 Vac wiring error problem in 2 other rigs, the 30K-5 and the KWS-1, due to this propensity to test at just the one voltage. So, the lesson on any Collins rig is, if you are converting from 115 Vac to 240 Vac for the first time, be careful and do a little tracing - or stand back.

Service Bulletin #2 deals with early production only and you should check early units to make sure

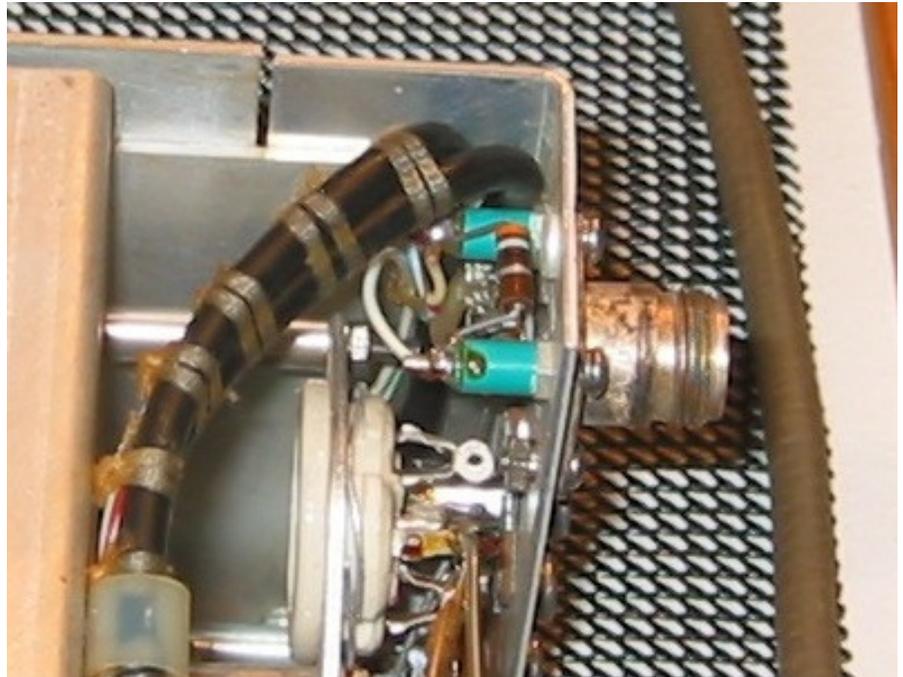
## Service Line - 30L-1 (Cont'd)

that the CR19 is the later 1N458 lower reverse leakage version. If you have used your 30L-1 with a Collins 32S exciter and not experienced the negative going ALC indication, then you are good to go.

Part A of Service Bulletin #3 was issued, again very early, in April 1962, to reduce the resting current of the 4 811As to 110 mA from the original approximately 130 mA (the bias was increased to about -3.0 Vdc) . This change results in R12 being 2000 ohms 7 watts, R28 being 39 ohms @ ½ watt, and R9 changed to 47 ohms. Follow the service bulletin here to check and see if it has been done.

NOTE: There are a lot of folks that will tell you to change R28 to at least a 1 watt resistor and that the original ½ watt specified in the SB3(A) is not big enough. The bias voltage is around -3.0 volts. When the antenna relay is pulled in (R28 grounded) a quick  $V^2/R$  power calculation will tell you that this resistor is only dissipating a quarter watt.

When the antenna relay is not pulled in, there is no current in R28.....So, why are folks upping the wattage when they find it blown? I think Collins engineers knew exactly what they were doing here and used a half watt because it was enough UNLESS the grid came up in voltage because of a tube short. In this case, what do you want to blow here? Without the below mentioned modification, there is some justification for a hefty R28 to “clamp” the relay supply during a failure. In fact,



**Figure 4. R28 Bias setting resistor hiding behind the RF Antenna N Connector**

with the MOV protection mod recommended, R28 will never see more than a half watt of dissipation. I leave this resistor at ½ watt. Now, finish this part by checking to see that R9 is 47 ohms and not 82 ohms. You may have to tweak this 47 ohm value to a bit higher to get the correct 110 mA idle current with today’s higher line voltage.

Part B of SB3 deals with pilot light fluctuation under RF excitation and may or may not have been done, even where applicable as all units did not exhibit the problem. Using SB3, check to see if the listed changes have been made. I would go ahead and make them if they have not been done and you do not know if the amp has the problem. If you have operated the amp on 75 and 40 meters before and not seen the problem, I would leave

well enough alone.

While you have the covers off, measure the individual grid resistors that are in a star pattern below the 811A tube sockets. They should be well within their tolerance of 10% meaning they should be from 42 to 52 ohms. If they are out of tolerance or any one is significantly different than the others, replace all four of these with current production 1 watt resistors. See the replacement parts list for the thick film IRC replacement. In the case of #12770, all the 47 ohm resistors measure 47 to 48 ohms and look really good, so they are staying.

Don’t forget to measure and check R12.

While we are checking things,

## Service Line - 30L-1 (Cont'd)

and to document this, there is an unmentioned fuse link in a 30L-1 (Not shown on the schematic). It is located on the terminal strip underneath the chassis and closest to the diode board. It is difficult to see and runs from the outer-most terminal lug to the next (g'nd) lug in and is made of #30 tinned buss wire. If you do not have high voltage and can not locate the difficulty, first check to see that this link is not blown. If it is blown, replace with like size buss wire to continue to get the protection for the transformer.

### N7OTQ Recommends a Modification - Has the world come to an end?

Now for "The exception that makes the rule!" While we are in the back end of the amp, I am going to make the one and only (non-destructive, completely reversible) mod that I recommend (no, insist on) in a 30L-1. Locate C2, a disc ceramic 0.01 mfd cap that is just to the right of the 47 ohm star connection of grid bias through the RF choke L3. Physically, C2 is on a three lug (center ground) terminal strip that is located just to the right of the tube sockets looking at the back of the amp while it is lying on its bottom. C2 lies flat against the chassis going from the right outside terminal to the center ground.

Install a bidirectional surge suppressor rated at 20 amps and 130 to 180 volts. It will install in the mirror lower position on the terminal strip flat to the chassis and is non-destructively tacked across C2. In the case of a plate to grid short in one of the 811As



Figure 5. C2 shown to the right of the barrier strip before MOV Install

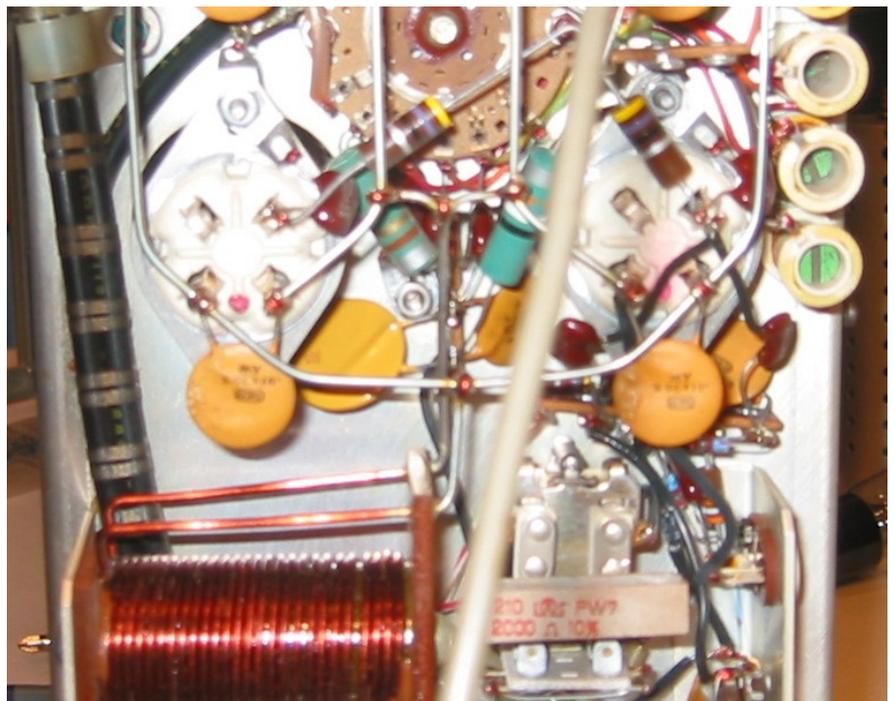


Figure 6. MOV shown to the left of the barrier strip after MOV Install

## *Service Line - 30L-1* (Cont'd)

(not uncommon), the MOV or surge suppressor will shunt the plate voltage to ground and save the bias supply, including the transformer winding and also save the relay. Good Job! It will possibly die in the process and will short to ground which hurts nothing and then can be easily and non-destructively replaced. As they say at Am Ex, Don't leave home without it. Note: This mod is highly recommended by Dennis Brothers who is still an authorized Collins repair station and ran the internal repair facility at Collins, Cedar Rapids.

OK, now you know that I am not a completely fanatical purist....Just sorta.

### Cleaning, Lubing and Check-Out

Now, before getting ready to close up, I am going to clean and lube the fan motor. Too much lube in the past may have resulted in a greasy frame and blades and these should be squeaky clean for good air flow without dirt accumulation. In order to lube the motor correctly, it must be removed from the chassis. This can be done without unwiring the fan by using a nut driver to carefully remove the castellated locknuts that hold it to the grommet mounts. Pull the motor sub-chassis up and off of the mounting studs. Have 3 each 1/4 inch (.060 thick stock clearance) neoprene grommets ready to use since the rubber ones in there are probably toast. Two of mine were, so I replaced them all.

Use very light sewing machine or appliance (razor) non-

gumming oil and use only one drop standing on each end bushing and work the oil in by spinning the fan and then remove the excess with a Q-tip. Unless recently lubed, you will know when it is worked in when the fan gets a lot easier to spin. When correctly lubed the fan will spin about 3-4 turns (hard to count) and come to a smooth stop. The smooth stop is the difference I notice the most. Now, remount the motor being careful not to over-torque and squash the grommets. The mounts should not shift incrementally, but should flex if they are the correct tightness.

Do not clean and lube any of the RF switching (Band Change/Input Network) components. Who needs more carbon for carbon tracks.

Finally, let's do a good visual inspection of all of the compartments. In the case of this amp, I found a ground shield of an RF cable running dangerously close to a filament buss wire and a tie wrap solved that problem. Also found a piece of buss wire rattling around under the HV diode board. The biggie was that I discovered that this amp was the one that I had not run because it had a 120 Vac plug on it and it was wired (Incorrectly) for 240 Vac. Thank goodness for the visual. TB 1 was re-strapped and the black hot lead moved to the switched side for safety.

### Testing

Now that we have gone through the little amp and brought it up to par, it is time for some testing. The first thing I always do with a repaired 30L-1 is put the covers on with the tubes out and turn on the power, make sure nothing blows, check that the HV is at 2 kV and then plug my DVM into the antenna relay jack and make sure that you have roughly the correct (about -160 to -175 Vdc) undropped bias voltage on this control jack. This is a crude way of making sure that you are going to have about -3.0 Vdc on the tubes when this pin is grounded. You do not want to risk the tubes if there is low bias voltage, but enough to still pull in the relay.

Before RF testing, here is some brief history on the 21 foot "required" exciter to 30L-1 RF input cable. I think most of you know that one of Art Collins' big hot buttons was harmonic distortion, or linearity, in the Collins SSB equipment. This philosophy was thoroughly passed down to the troops below him, and I think most of them were pretty conscientious to start with. When the 30S-1 and the 30L-1 were in the development stages, the engineers discovered that there was a small effect on the distortion of the exciter amplifier system related to the minimal reflected voltage that remained after the 30L/30S input networks were tuned properly. This effect in the exciter PA was phase dependent and therefore, by using a "on average - since there was a spectrum of frequencies involved" length of cable, the engineers found that they could get another small amount of improvement (on the amateur bands) in the exciter, and thus the system, distortion products. This somewhat klugey fix made it through into the manual as the "required" driver

## Service Line - 302-1 (Cont'd)

to amp cable length.

This, of course, raised many questions with customers - and still does today - and Art did not like that. He said it reflected poorly on the amplifier designs and that if the amps were any good they should meet specs without doing this kind of thing. After the engineers reviewed the entire problem, the "fix" was to just remove the requirement from the manuals.....Nothing else was changed and the amps still nicely meet specs without the kluge.

So, having passed the "no tube" HV and bias check, the tubes were put back in the RF compartment, a dummy load was connected for stability and the idle current and HV were checked now with tubes in place and with no drive. High voltage looks good but no idle current. Dang!

Some quick checking showed HV continuity to the tubes and the correct bias and high voltage, so some checking of the switching and metering was indicated. Meter is good because it shows HV. Continuity is good out to the minus lug on the meter through the switch....Looks like the ground switching in the Amps position is no good. Cleaned the contacts with DeOxit and exercised them, then blew them dry and waited a half hour and Voila.....110 mA idle current.....We are in business.

By the way, while I was doing the no drive testing and exercising the relay/bias port, I

hooked my MFJ 259B RX analyzer to the input drive port and looked at the input VSWR on all bands (You will need to do this while the amp is keyed).....Pretty good - Less than 1.3:1 on all bands and no tweaking required....This is a cheap and dirty way to do this testing and adjustment.

Now, let's connect up our 32S-3 driver and do some testing, and adjusting if necessary, into a dummy load before casing the amp back up. In this case, the testing was uneventful with > 600 watts output and the amp now resides in the S-Line display and operating area.

On to the next project which is getting the 20V-3 back on the air.

Have fun.

de Bill, N7OTQ

### Parts Supply Information:

Grid Balance Resistors (R1-R4) 47 ohm @ 2 watts Replace  
Carbon Comp w/IRC Thick Film Precision 47 ohm @ 3 watts  
Mouser 66-GS310047R0JLF

HV Capacitors (C3, C5, C7-9 & C12) 100 mfd @ 450 Vdc Mouser  
PN 75-TVA1718  
Sprague/Vishay Atom Price \$18.85 each

811As (V1-V4) RF Parts (Taylor) Note 1) PN, 811A-MQ-TAYSEL  
or f/ Surplus Sales of Nebraska, PN (TUT) 811A-JAN  
Note 1: These do not need to be matched, but RF Parts offers them only this way. Cetron brand tubes

CR1-8, CR9-16 1N4007 1A @ 1kV Common Stock Part  
Only 12 total required and reduce parallel capacitors to a total of 12 and these can be mounted on the original board with jumpers if a replacement board is not used.

HV Diode and Capacitor Replacement Board - Very little experience here. You are on your own, but I am very impressed with the Harbach board. Contact:

Harbach Inc. Jeff Weinberg, W8CQ, w8cqjeff@verizon.net  
K1ROD Rod Murry, Fountain Hills, AZ [k1rod@arrl.net](mailto:k1rod@arrl.net)  
K6HM Young Kim Board, Los Altos Hills, CA  
[youngkim@yksystems.com](mailto:youngkim@yksystems.com)

W0BN & W4NI boards f/ Bill Noonan & Steve Pautard are no longer available. Steve's wife requests you no longer call him. He is very ill and she is tied up caring for him.

## Practical Aspects of Operating Collins Military HF SSB Gear (Cont'd)

that is ideal for SSB.

I do not use any external speech processing on my URC-32, as the audio is almost ideal for communications. It is very punchy but restricted in bandwidth. I have plans that include speech processing that will be able to be switched in. It will be interesting to see how a speech compressor plays with this radio.

### In Closing

I cannot help but wonder how much important traffic was handled by my URC-32, or how many times my KWT-6 broadcast the code words to SAC aircrews and missile crews all over the world during the cold war. I have to wonder if I ever listened as a kid to the very transmitters I now own transmitting all the strange phonetic messages with that authoritative Collins sound! These radios may not be the most practical rig for the modern ham but they sure get the job done in style. If they could only talk.....

If you have decided that you want to try your hand at getting one of these classics on the air, here a couple of practical tips in the acquisition department. I see these sets change hands more often than I see them actually get on the air. When you consider one, and the price and value you get, pay attention to the rack and cooling assembly and the stock interconnect cables that may or may not come with the equipment. There is real value in getting the factory interconnect cables and the rack. You can do without the cooling assembly, rack and cables by home brewing these components, but it sure makes it harder. You get what you pay for here for sure.

The real "turn on" of having one of these historic and unique sets is that there are actually very few of them on the air. If you decide that you want to go for it, there is help available from those that have them running. There are a couple of those that are ex-military maintenance types and just had to have one and all are a great resource. Bottom line, the KWT-6 and the URC-32 are not as intimidating as they look and they just sound so good.

Good luck and I will look forward to working you on the air with your very own HF classic.

de Scott Johnson, W7SVJ  
[Scottjohnson1@cox.net](mailto:Scottjohnson1@cox.net)

**Editors Note:** Scott Johnson, W7SVJ, has written for the *Signal* several times in the past and it is good to have him back. Scott is employed in the electronics industry, works in material sciences in several capacities including being a Captain in the Arizona Air National Guard and is also a licensed pilot and certified C-130 flight engineer. He collects mostly Collins military and avionics equipment, but is sneaking up on the amateur gear real fast. Thanks Scott.



*Did You  
Know?*

**COLLINS RADIO COMPANY**  
Designers and Manufacturers of  
Transmitters, Transformers and Speech Equipment



There have been, depending on how you count them, either 9 or 11 "official" Collins Radio logos during the past 77 years.

It all started with what has come to be known as the "Old Winged Globe" shown here.

This Old Globe went on to become the short winged globe, and that was then followed by the long winged globe.

Shortly after WWII, Collins briefly used what has become known as the "Script Collins" emblem, quickly replaced with the bar Winged Emblem.

In the mid 60s, the Winged Emblem as we now know it was phased out for the new Round Emblem (there was a brief transition Round logo). When Rockwell purchased Collins Radio in the 70s, the Round Emblem was replaced with the "Red" Rockwell-Collins bar logo. This was also later found in Blue and then a Rockwell Collins Terra-cotta and Grey.

Now that Collins Radio is again a stand alone company, they have kept the Rockwell in their logo and have a new highly protected Rockwell Collins logo.

So there you have it - Eleven in all over the years - so far—and depending how you count.

-----CCA-----

## The WODAN Mobile Transceiver

by Rod Blocksome, WODAS

**Editor's Note:** This quarter we have a treat. In the last 2 issues of the *Signal*, there was an extensive history of the S-Line presented. In that history there were several references to the early solid state engineering work done by Ed Andrade as a side project exploring the new semiconductor potential. One of the results was his "Critter" transceiver as it became known. Rod Blocksome reminded me that he had written a short article about this little transceiver that was the predecessor of the TMT finally attempted as a formal engineering project years later.

### Introduction



Last fall Dennis Day, W0ECK, donated to the Rockwell Collins Museum several artifacts related to Collins Amateur Gear history. One item was a small homebrew transistorized receiver-exciter designed and built by Ed Andrade, WODAN. The unit was well built but suffered some deterioration from many years of garage storage. Accompanying the unit was a mailing tube containing the hand-drawn schematic and chassis layout. The drawings were dated Jan. 2, 1961 and had Ed's initials on them.

This caught my eye since transistorized ham transceivers did not hit the market until nearly a decade later. I realized I had another example of

Collins engineers pushing the state of the art and thought perhaps the Collins Collecting community would like a glimpse into the future from the perspective of 1961 Collins ham equipment designers.

### Features

The mobile transceiver covers only 100 kHz in the SSB portions of the 20 and 40 meter bands - 7.200 to 7.300 MHz and 14.250 to 14.350 MHz. This reduces the complexity considerably over the traditional 5-band design.

### Circuit Description

There are two stages of microphone amplification using 2N466 transistors in each. The balanced modulator looks like early S/Line as it is a diode bridge of 1N34As followed by a standard 2.1 kHz Collins mechanical filter (naturally). The 455 kHz IF signal is amplified by three stages using 2N274 transistors. Another 1N34A diode bridge mixes the 455 kHz signal up to the 2nd variable IF operating from 3.155 to 3.055 MHz. The VFO tunes from 2.700 to 2.600 MHz and uses 2N274's for the oscillator and buffer stages.

A second transmit mixer stage (2N274) mixes a local crystal oscillator (10.355 MHz for 40 meters and 8.7025 MHz doubled for 20 meters) with the 3.155 - 3.055 MHz IF to the final operating frequency. Two tuned RF stages of 2N274's follow and provide 0.4 volts of RF across 50-ohms as drive for the PA stages in a separate chassis.

The receiver front end featured a selectable pad feeding a 2N274 RF amplifier stage. Another 2N274 1st receiver mixer with local oscillator from the crystal oscillator produces the 3.155 - 3.055 first IF. A second 2N274 mixer follows and receives its oscillator injection from the VFO. The mechanical filter provides the IF selectivity at 455 kHz. After IF amplification, the signal is fed to a separate 1N34A diode bridge product detector where it is mixed with the crystal BFO (453.65 kHz for LSB and 356.35 kHz for USB). The AF amplifier is a 2N466 driving a 2N1184 driving a transformer coupled push-pull pair of 2N1184's in the audio output stage.

## The WODAN Mobile Transceiver (Cont'd)

The AGC circuit has a 2N466 driving a 2N466 as AGC amplifiers. 1N67A diodes are used for AGC delay and time constant steering.

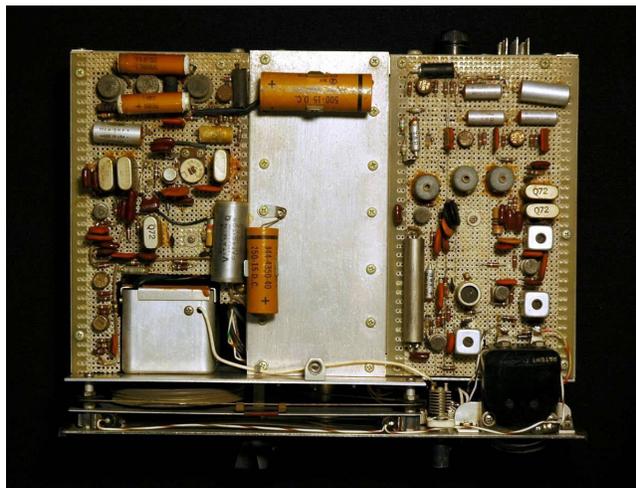
A 0-to-1 ma. meter serves as the S-meter in receive and can be selected to read PA Grid current, plate current, or ALC voltage in transmit.

### Power Amplifier

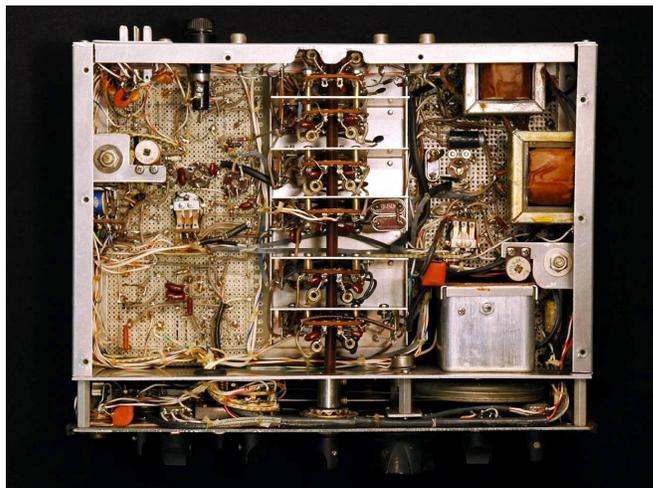
The PA unit was apparently in a separate chassis that would clamp together using the latches mounted on the sides of the receiver chassis. A note on the schematic indicates the PA was not transistorized. The note simply states "Total: 24 transistors & 3 tubes". There must have been a dc-dc converter power supply for grid, screen, and plate voltages either separate or built into the PA chassis.

A similar and probably later version of this prototype appeared in an article published in Electric Radio by Harry Snyder, W7RN. This prototype covered three bands - 80, 40 & 20 meters but otherwise carried similar controls and features.

Oh - one additional tid-bit. Ed always referred to this little radio as his "critter". Are there other prototype versions out there?



**Figure 2. Top of the chassis/breadboard view of the early transistorized mobile rig built by Ed Andrade, WODAN-SK**

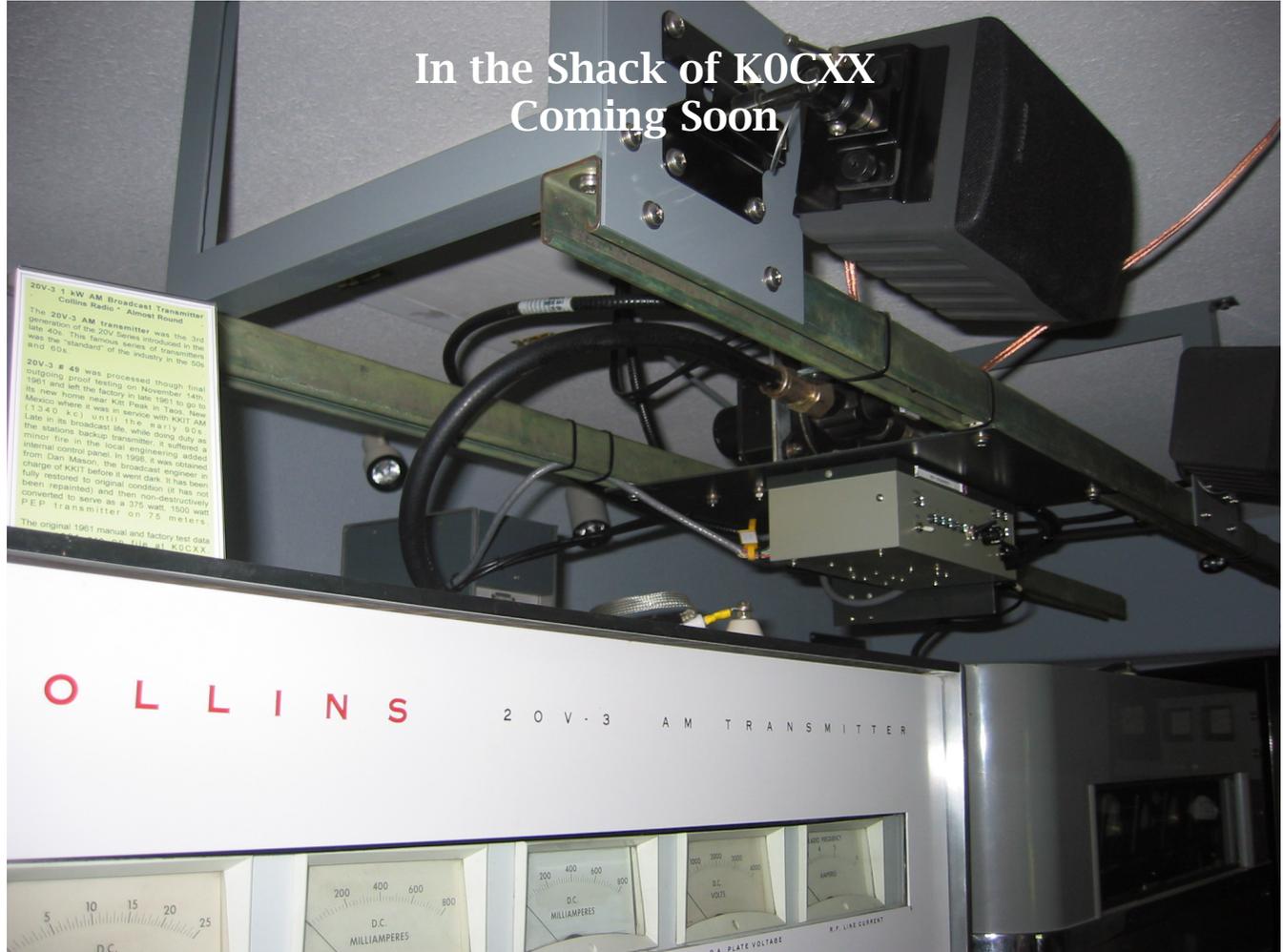


**Figure 3. Under chassis view of Ed's Critter prototype showing the very high level of technical excellence involved in this "home" project**

**Final Editorial Comments:** Although the current transistor state-of-the-art at the time that Ed built this prototype was pretty limited, this transceiver was used for several years by Ed as a mobile rig and was then retired. This Editor also built a solid state all band HF receiver in that same time frame and I can attest to the fact that transistor ft numbers were just passing through 30 mc and getting any kind of performance on 10 meters was just plain impossible. This would explain why the little "Critter" just covers up through 20 meters. I also remember using transistors like the 2N107 and CK722 in the receiver that I constructed. High Tech in it's birthing throws.

Thanks again to Rod for another jewel from the past and it is always nice to have you here in print. By the way, Rod retires from Collins Radio on May 28th and the Signal and CCA board wish him a really long and happy retirement.

## In the Shack of KOCXX Coming Soon



**Overhead cable tray, ceiling wire plenum entry and make-up for all cables coming to the 1 kW Broadcast Transmitters. This kind of approach to the station configuration may be why it took 1 1/2 years to get this all going..... Do you think?**

KOCXX is the commemorative call sign of the Mogollon Rim Collins Collectors Club, a adjunct of the Collins Collectors Association.

KOCXX and the MRCCC were formed and began operation at the QTH of N7OTQ in the Forest Lakes area of Arizona and has since moved to Wimberley, Texas. In 2007 work was commenced on the new station headquarters of KOCXX and the building was completed early in 2009. Work on installing equip-

ment and building out the control, RF and audio wiring for the 12 operating positions in the building has been ongoing since that time. At this point, 4 operating positions are full up, 2 are partially up and the AM studio with its vintage restored Collins equipment from the 50s and 60s is about 2 to 3 weeks from being on the air with the 75 meter Collins 20V-3.

Current operations include the S-Line display, the KWM-380, the R-390/30K-5 AM position and

the HF-80 1 kW solid state system from the 80s.

KOCXX is expected to resume full up operating status in the fall of 2010 and the complete shack tour will be in the Q2 issue of the Signal in the "In the Shack of" column.

Visitors are welcome. Come see over 100 pieces of Collins gear on display along with the history of the company and people that built them. Over 80 pieces are in full operation.

## From the President

Well, it is official as of April. Your *Signal* Editor and VP has traded one of his hats. I must admit that it was not without serious thought



that I accepted the nomination for President of the CCA. Doing the *Signal* magazine and playing some roll in the management of the CCA has proven to take some significant time and I do not ever want the quality of either of those rolls to suffer.

I have decided to accept this new roll as President of the CCA because of my passion for the CCA's charter mission which is to preserve, not only the equipment, but the history of the people that made this happen. I am sure that you all know that Collins contributed significantly to our country during WW2 and the beginning of the space programs. It continues to do so today. Recording the history, and honoring the people that made this happen, is an important function that we all can contribute and what a great hobby.

I can not do this alone. I hope that your past support of the *Signal*, writing and ideas, will continue and that I can count on a lot of you to help occasionally when it comes to supporting our functions.

I will continue to focus on the history (and ethics particularly)

of Collins Radio in all that I do for this organization and I think that you know that we on the board will do our best to exhibit the same type of behavior as we go about managing the CCA.

One of the focuses during the coming year will be the continued improvement of membership benefits. The CCA is announcing a new "company" store for clothing that is embroidered with the CCA and Collins logos. This store will be accessed through the member's only forum area of [collinsradio.org](http://collinsradio.org) and will give a nice discount to CCA members.

I am also trying to get our QSL card availability back on line as there have been many requests for this product recently.

Finally, I want to thank Jim Holabaugh, W6TMU, for stepping up to the plate and becoming net manager for the 20 meter Sunday afternoon SSB main CCA net. We have had an open need here for some time, and it is a real pleasure to hear the net being consistently run professionally. Great job Jim and keep it up! We love it! My thanks also go to the other net managers who have been handling the 75 meter nets.

Speaking of Pete Zilliox, he is continuing to do a great job as membership chairman and that is a job that takes a Herculean effort at times and pretty much goes unnoticed. Thanks Pete!

That's it for this quarter from yours truly and I hope to see you all at Dayton. Best of 73s, Bill, N7OTQ

## From the Editors' Desk (Cont'd)

President's Column on the last page of this issue.

That's it for this quarter. I will see many of you soon at Dayton, and - if history repeats - I will be writing you again soon in the next issue. Time is really flying. Have a great quarter and keep those filaments glowing. Let's really crank up the checks with Collins gear now that propagation is coming back.

Best 73s  
de N7OTQ  
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