

Issue Number Sixty Six

Second Quarter 2012

OFFICIAL JOURNAL OF THE COLLINS COLLECTORS ASSOCIATION

Join Us on the Air!



- Sunday 14.263 MHz at 2000Z
- Tuesday 3805 kHz at 8pm CST
- Thursday 3805 kHz at 8pm CST
- Friday (West Coast) 3895 kHz at 10pm CST
- Sunday 10m AM 29.050 MHz at Noon CST
- 1st Wednesday AM 3880 kHz at 8pm CST

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

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See our new features.

You can also renew your membership on line via our website and the PayPal link.

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- Collins Radio in its Finest Hour - Work Some History - Talk to the Past



To Work Some Historical AM
(That would be Aeronautical Mobile)
Go to our Website and Click on FIFI
& Check Out her Operations Schedule
and Availability of In-Flight Contact
Times:
Collinsradio.org

Read the upcoming articles in Electric
Radio and this Signal Magazine and
Visit FIFI at:

<http://www.cafb29b24.org/>

Work her on CW for a special treat.

From the Editors' Desk

by Bill Carns, N7OTQ

My eternal thanks cannot be large enough for your patience during the difficult rebuild period on my home. Everyone has been very understanding about the variable delivery schedule of the magazine and that is much appreciated. I am making a huge attempt to get the Q3 and Q4 issues back in their respective quarters so we will see how that goes.

The last month has been educational. After finally moving back into the house, it took about two weeks to get all of the drawers and closets and cupboards reorganized and get the home looking "finished". At that point, yours truly collapsed in a chair and announced success - and that I could then have some fun and relax.....Well, that was kind of short lived.

It is amazing how the brain works. For the three and a half months that the rebuild had been going on, that was obviously my 24/7 focus and my highest priority.... All of the other things on my plate, in fact, disappeared off the radar completely to preserve my sanity. When I finally relaxed, the old brain kicked back into gear and all of those hidden and delayed tasks came flooding back.... So now I realize that there is one more phase to this entire process. The last phase is getting caught up with all of the things that slid into the cracks while I was caught up in "defending my fort".

One of the things that slid off my plate was nurturing future articles and encouraging writing about various projects and

potential articles that I hear about. So - I am going to have to play catch up on that too, and you all can help with that. If you are doing a restoration, if you have found a treasure and would like to share or if you just have something that you think would interest a lot of our members (related to our Collins passion), then please give me a call or an email and let's talk about writing something for the *Signal*.

I am completely dependent upon you all to provide some interesting material for our readers. I can occasionally write for the magazine about my own restoration and maintenance efforts but, and this is the irony of the entire situation, when I am the busiest, is when I have no time to play and write myself and that is also when I do not have as much time to follow up and help you write. Please understand this, and contribute if you can - and wish to.

In short, I need help.

The supply of "In the Shack" pictures is also getting low. If you have a collection to display, or if you are just proud of that nice vintage Collins Radio operating position, get 'er cleaned up and shoot me about 3 or 4 good pictures and send them off to the Editor. I will then send you a short questionnaire about your amateur and collecting history, and you can fill that in and I will then have what I need to feature your collection or shack in a future issue. I am particularly anxious to get more shack photos that show some of the older gear like WW2 or pre-war 30s equipment - but all are welcome.

Now, some very good news!

Many of you know Don Jackson, W5QN, from his writing here. He is a very good writer and an excellent editor and layout person. Don has agreed to help with the production of the *Signal* and you will see reference to him as the Assistant Editor here starting in this issue. I want to thank him for accepting this challenge. We are lucky to have someone of his talent, technical capability and level of interest in Collins and their equipment. Welcome Don and my personal thanks again.

Finally, I hope that you all enjoy the 80th Anniversary Membership Certificate that is included with this mailing. This year represents 80 years of Collins Radio Company excellence in design, engineering, and manufacturing. The CCA sends its congratulations to all of our friends that are current and past Collins employees.

de Bill Carns (N7OTQ), Editor
wcarns@austin.rr.com

Don Jackson (W5QN),
Assistant Editor
w5qn@verizon.net

----- CCA -----

CCA Featured at AWA

Collins & the CCA are the featured theme at the Antique Wireless Association's convention in Rochester, NY on August 21-25. There will be several forums by CCA Board Members Karl Bowman and Jim Stizinger and the dinner speaker is Bill Carns, current CCA President.

For Info: <http://awamuseum.org/>

**FIFI Alert—First Contact made with FIFI on June 25, 2012
You Could Be Next**

**QSL KOCXX confirms QSO w/
at 1555 through 1604 UTC
RST 589 Reported from Wimberley, Texas**



**KCOTEG/AM on 7204 kHz
June 25, 2012
RST 59 Rcvd Reported from Addison, Texas**

B-29 Radio Project



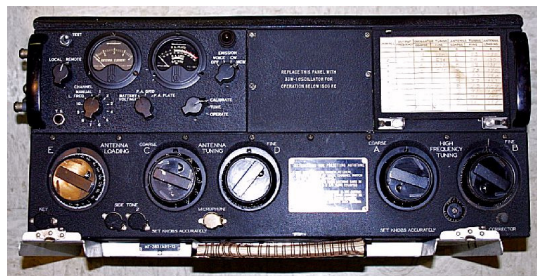
Commemorating the Successful Addition of a Restored B29 Radio Room to the Fully Restored B29 FIFI, On Monday, the 25th of June, 2012 at 1555 UTC, the First Two Way Radio Contact was Made Using the On-Board Collins ART-13 Transmitter and BC-348R Receiver. The Contact was Between KCOTEG and KOCXX with Loney Duncan at the B29 Microphone. Appropriately, a Collins 30K-5 Air Traffic Transmitter and R390 Receiver Were Used at the Other End. The Frequency was 7204 kHz and this was the First In-Flight HF Radio Contact Made from the Restored Radio Operating Position.



Awarded to the *FIFI* team of the Addison Texas Wing, CAF

CCA 94-0009
MRCCC 95-0001

Photo by Randy Rothhaar courtesy CAF



Just the sight of a World War Two B-29 bomber on the ground is awe inspiring for most of us. To see one in the air is a rare treat and very few of us will ever see it - since there is only one remaining flying B-29 in the world. FIFI is based at either Midland, Texas or at the Addison Airport near Dallas. She is beauty personified and if you get a chance you should see this piece of beautifully restored flying history.

A number of years ago, the Rockwell Collins crowd in Cedar Rapids put together a static display of a B-29 radio room with working equipment and some of you may have seen this at several demonstrations. Last year a decision was made by a joint team of Rockwell Collins employees/retirees and the CAF FIFI team to integrate this static display into FIFI and make her just that much more authentic. That work was completed several weeks ago, and during a scheduled pilot certification flight, some testing of the completed radio room was done in the air. During that flight, KOCXX made the first HF contact with a B-29 ART-13/BC-348R radio room that had been made since the 50s. That, and the restoration, is a separate story that will have to wait.

What is important to you all is that FIFI is now flying regularly with an operational radio room and has a radio operator on board on most flights. There are some rare and beautiful QSL cards associated with working this piece of history. Please see our website at collinsradio.org for up to the minute updates on your next contact opportunity. She hangs out around 7200 kHz on the 40 m band. AM of course (Maybe a little CW)..... Good luck!

Dayton and Dallas 2012—A Report

Dayton 2012 Banquet



What did they have in common? Member Camaraderie and lots of Factory History. See Ya' Next Year

Dallas 2012 Dinner Event



Dayton and Dallas 2012—A Report (Cont'd)



It is hard to believe that both Dayton and Dallas have come and gone. Because of my workload on the home here in Wimberley, I could not attend Dayton this year and I missed it. Specifically, I missed you all and the camaraderie which is really why I go.

My spies tell me that **Dayton Hamvention 2012** was again a huge CCA success with almost a record attendance at the banquet in spite of the attendance at Dayton being off somewhat.

The booth was well attended even with a slightly new location and we signed up some welcome new members. There was a good dose of Collins out in the swap area including a couple of big estates, and the weather behaved itself. All in all, a good time was reported.

I want to thank Jim Stitzinger, WA3CEX, who did a great job as usual putting everything together. The effort paid off and all went smoothly I am told. I am also informed that our chosen hotel for coming together has seen the light (read that they were losing business) and the owner has promised to have their club/bar back in operation by next year.



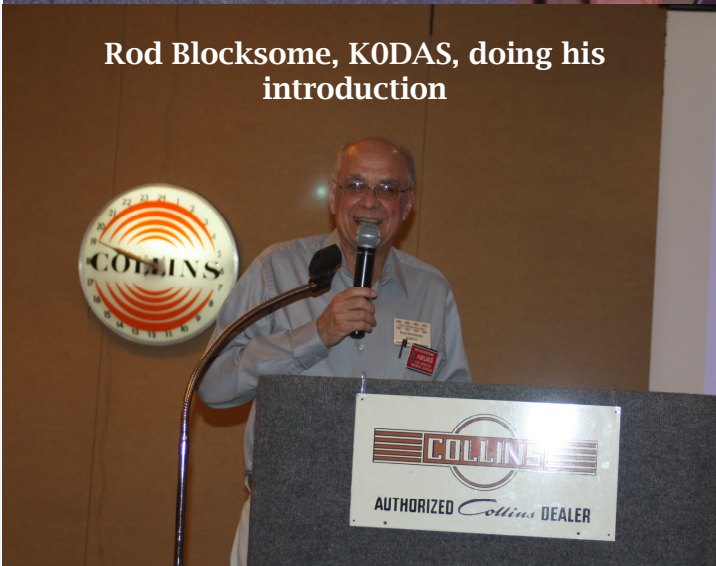
Lawrence Robinson, KC0ODK - current Rockwell Collins employee and curator of their history museum - gave the featured talk at the banquet and gave us a good rundown on the restoration project on the radio room for FIFI, the last flying B-29 bomber from WW2. He was introduced by Rod Blocksome, K0DAS, the past curator of the museum - now retired. It sure was good to have both of them there. If you have not seen the information on our website about FIFI and this project, you should check it out. There have already been some fun airborne contacts with the radio operators on FIFI using their ART-13 and BC-348R equipment. Jim Stitzinger also arranged to have Jim Maccanni (last years featured banquet speaker) bring the smallest transmitter that Collins ever made and it was a *small* hit at the dinner. Also, again, there were some wonderful door prizes, and the drawings were a big hit. I want to thank

Dayton and Dallas 2012—A Report (Cont'd)

Lawrence Robinson Talks about the FIFI Project



Rod Blocksome, KODAS, doing his introduction



all of the donor/sponsors and ask that you all check out the list on the website under Dayton 2012.

I was so disappointed that I could not be at the dinner and booth to enjoy finally succeeding in getting our website updated and getting the CCA clothing store announced to the group. We have been working those two issues for a couple of years, and I sure wish I could have been there to see your faces when we succeeded finally. Many thanks go to Scott Kerr, KE1RR, for representing me there for the announcements and also for his incredible work on the website and the store links.

Dallas Ham Com 2012

While not as large as the Dayton affair, it sure was a great time. I was in attendance at this one, and

Dayton and Dallas 2012—A Report (Cont'd)



Jim Stitzinger and Bill Carns have a wonderful discussion with Warren Bruene, W5OLY, before the Friday evening dinner at the Dallas Ham Com event.

both the Ham Com event and the dinner were great fun. In a way, I enjoy Dallas just as much as Dayton. There are not as many members there, but the environment at, particularly, the dinner is more intimate - and for the second year now, it was a blast. There were again a number of retired and current Collins folks there including Warren Bruene and his daughter and there was some great history discussed. The dinner talk was on the pre-WW2 days at Collins during the formative years - and it seemed to be well received. After presentation of a similar talk at this year's Antique Wireless Association's convention in Rochester, the slides from that presentation will be put up on the CCA website. It contains some great insight into the early days with Arthur and his new company and equipment. So, enjoy the pictures. I hope you are in some of them, and if you are not there, try and make it next year, and I will see you there.



Please Meet Scott Kerr, KE1RR, Your New Board Member



Scott Kerr, KE1RR, recently stands in front of a F4U-1 Corsair

needed services - where there was no visibility at all. Recently he was point man at Dayton in my absence and he is also the guy behind all of those wonderful changes to our website. In spite of having an active career, he literally takes time every day to help us in one way or the other. This appointment is well deserved.

Scott has also amassed a wonderful collection of Collins gear and this is beautifully displayed in a growing collection at his home. If you get a chance, you should take a look. The presentation in this issue of "In the Shack of KE1RR" will give you some indication of what you might see there.

Please welcome Scott to your management staff - and I personally want to thank him for all that he has done for the CCA.

For some of you who are curious about the background of the above picture, that is an F4U-1 Corsair that Scott is standing in front of. Now you might ask how this is related to Collins. This aircraft was also present at Addison when we were there for the B-29 radio room dedication. Later in the war, the F4U was also equipped with an ART-13 which was made by Collins Radio - so we thought this was appropriate.....Besides, who doesn't love a Corsair? ----- CCA -----

For some time now the CCA has been operating with the 5 board members that you have come to know. These men (Karl Bowman, Jim Stitzinger, Bill Wheeler and Ron Freeman) have all done a great job of moving us forward and making good progress on many fronts. Thanks surely go out to all of them from all of us.

As an organization grows and matures, so must the staff, and we are no exception. In a unanimous vote of the Board of Directors, we have authorized a new Board of Director at Large position and this has been filled by appointment by Scott Kerr, KE1RR.

Scott is a relatively new member of the CCA holding member number AC10-12478, but in that two years he has served us loyally and provided many services - badly

75S-3A Gain Reduction in Transceiver Configuration
Two Solutions by Don Jackson W5QN



The Problem - Have you ever carefully aligned your S-Line receiver (with the 100 Ohm termination on the XTAL OSC OUTPUT port), and upon connecting your rig in transceiver mode, found that your S-Meter didn't read the same as it did when aligned in "separate" mode? This is a common problem that comes up from time to time. Let's look at the hookup for transceiver operation, shown in Figure 1.

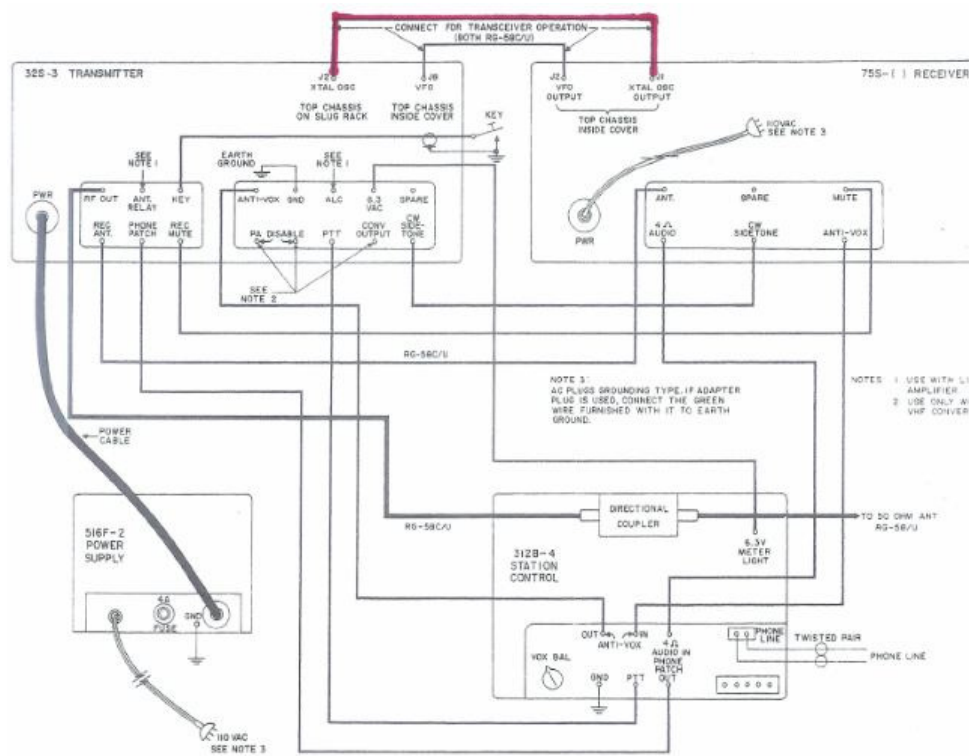


Figure 1 - S-Line Transmitter & Receiver cabled for Transceiver Operation

(black) interconnecting cable, compared to the receiver gain with the 100 Ohm dummy load installed (green). The "green" trace is identical to the result of my "ideal solution" to the problem, which uses an isolation amplifier installed in the 32S-3. Before describing the amplifier solution, let's back up and look at what causes the problem in the first place.

What is happening is that the impedance looking into the cable at the XTAL OSC OUTPUT is not 100 Ohms at all frequencies. In order to produce this ideal "flat" behavior, the cable would need to have a characteristic impedance of 100 Ohms, and its termination at the 32S-3 end of the cable would have to be 100 Ohms as well. Anything other than this will load the 75S-3(X) Xtal Oscillator differently than the 100 Ohm termination, causing the receiver gain to change. It should be noted that I found no significant gain difference due to sharing the VFO. All gain variations were due to sharing of the Xtal Oscillator.

The coax cable (highlighted in red) connecting the XTAL OSC OUT port to the 32S-3 is part of the problem. The second part of the problem is the impedance at the 32S-3 end of the cable. Why this gain change occurs, and what can be done about it, is the subject of this article.

Solutions

I tried changing the connecting cable from RG58 (50 Ohm) to RG62 (93 Ohm) and that helped, but didn't fully correct the problem. Figure 2 shows the relative receiver gain of my 75S-3B using RG58 (red), RG62

Two Solutions to Gain Reduction in Transceive (Cont'd)

by Don Jackson W5QN

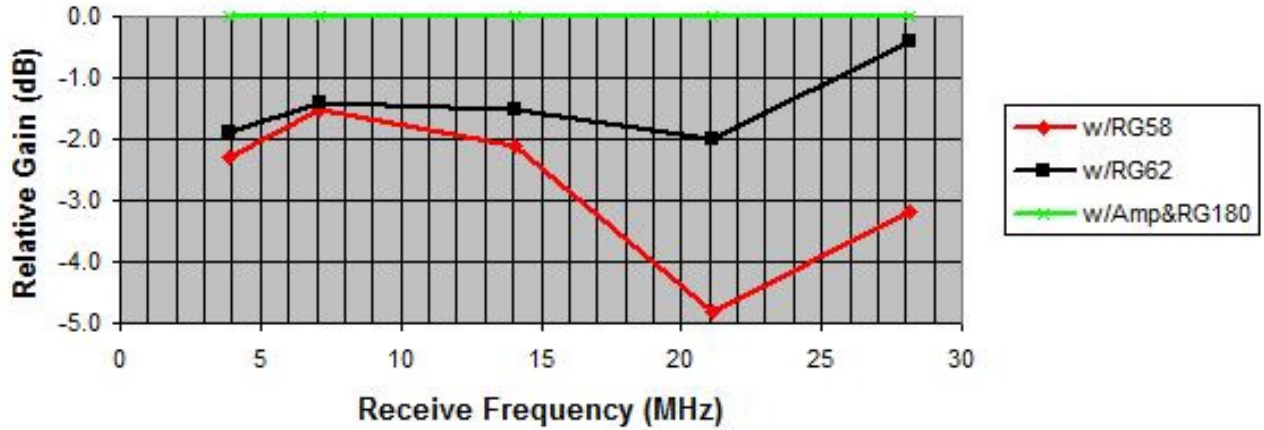


Figure 2 - 75S-3B Gain Change Relative to 100 Ohm Load

Let's look closer at the circuit. Fig. 3 shows the impedance at P1 of the 32S-3, the RCA termination of the short cable that connects to J6 on the slug rack when in transceiver. The Xtal Osc frequency range of interest is from 6.555mHz (3.4 mHz receive) to 32.955 (30 mHz receive). Note that the electrical length of 4ft of RG58 is about .2 wavelengths at 33mHz, meaning that proper analysis of the circuit requires this cable to be treated as a true transmission line. The red trace is the "real" part of the impedance, the olive is the "imaginary" part, and the green is the "magnitude" of the impedance. Using Spice, it was determined that these measurements closely match a 6" piece of RG58 (perhaps not what the "special" cable is, but close enough electrically) loaded with 820 Ohms in parallel with 18 pF.

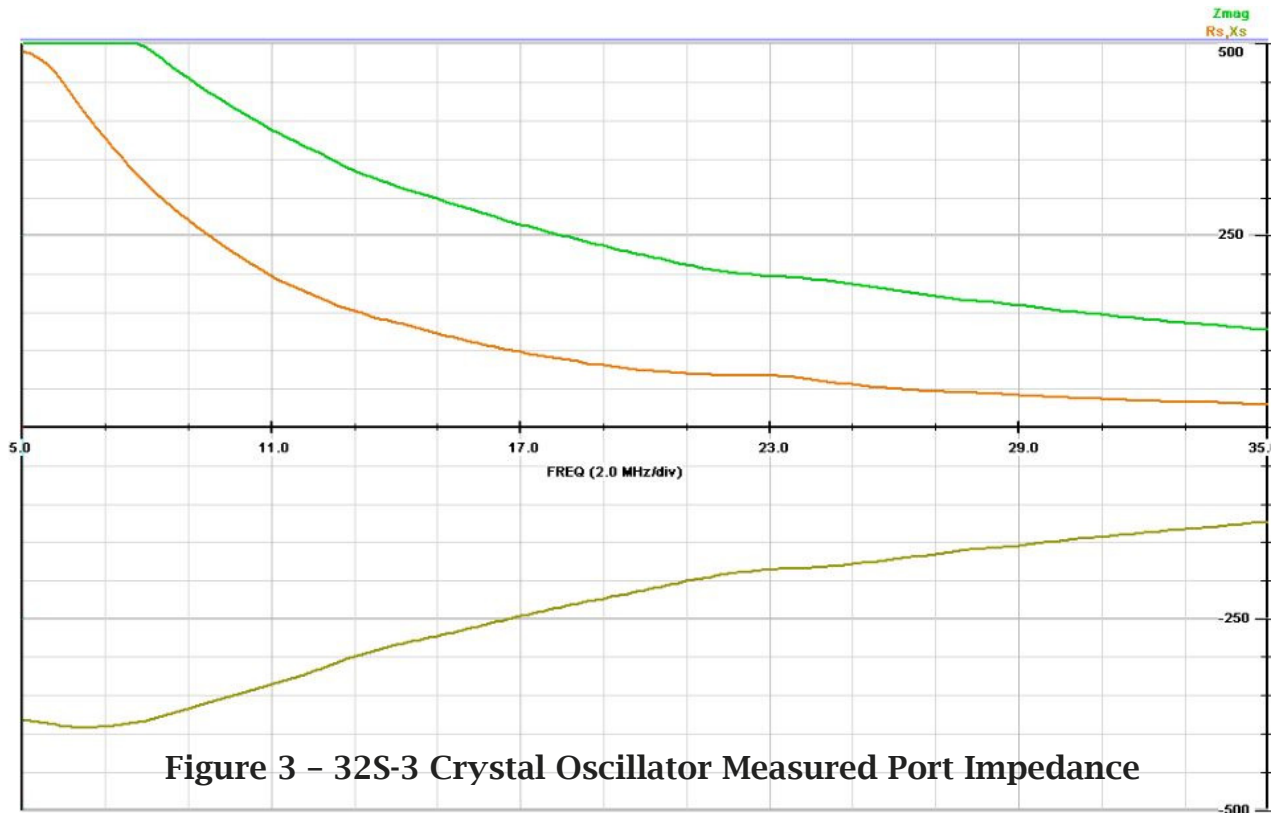


Figure 3 - 32S-3 Crystal Oscillator Measured Port Impedance

Two Solutions to Gain Reduction in Transceive (Cont'd)

by Don Jackson W5QN

Obviously, this is far from 100 Ohms, and simply adding a 4ft piece of RG58 in front of this impedance would create a really terrible impedance mismatch with serious consequences to the 75S-3B gain.

In order to improve the match to the RG58, the Collins engineers installed R141, a 68 Ohm resistor in shunt with the miniature coax in the 32S-3 slug rack. This helps a lot, but the match is still poor. I tried all manner of impedance matching using passive components to make the impedance look close to the resistive 100 Ohm dummy load, but to no avail.

Note: A problem I experienced during this project was accuracy of the characteristic impedance of my RG62 coaxial cable. Although RG62 with 93 Ohm impedance is close enough to produce good results, I was dismayed to find that my chunk of RG62 measured to be 82 Ohms. To solve this problem, I procured some military grade RG180 for the project. RG180 is specified at 95 ± 5 Ohms, and my piece measured to be 93 Ohms. Since I now had a piece of cable with known characteristic impedance, I designed my amplifier to have an input impedance of 93 Ohms, creating a nearly ideal match to the cable.

Figure 4 shows three cases of the impedance looking into a 4ft coax that connects to the 75S-3B XTAL OSCILLATOR OUTPUT port. Two cases show the impedance with RG58 and RG62 connected in the standard configuration. For these two, the RG62 is better, but in both cases the mismatch compared to 100 Ohms is still considerable. Note that the impedance for these cases is always well below 100 Ohms, loading down the 75S-3B Xtal Oscillator port, reducing the oscillator voltage available to the 1st mixer, and thereby lowering the 75S-3B overall gain. The precise amount of gain reduction due to Xtal Osc port loading is dependent on the output "source" impedance of the 75S-3B oscillator/doubler circuit. Rough measurements indicate this impedance varies widely from about 30 Ohms to 150 Ohms, depending on the frequency band. The third case shows the impedance using my isolation amplifier and RG180 cable. With the isolation amplifier, the impedance is a nearly flat 93 Ohms resistive.

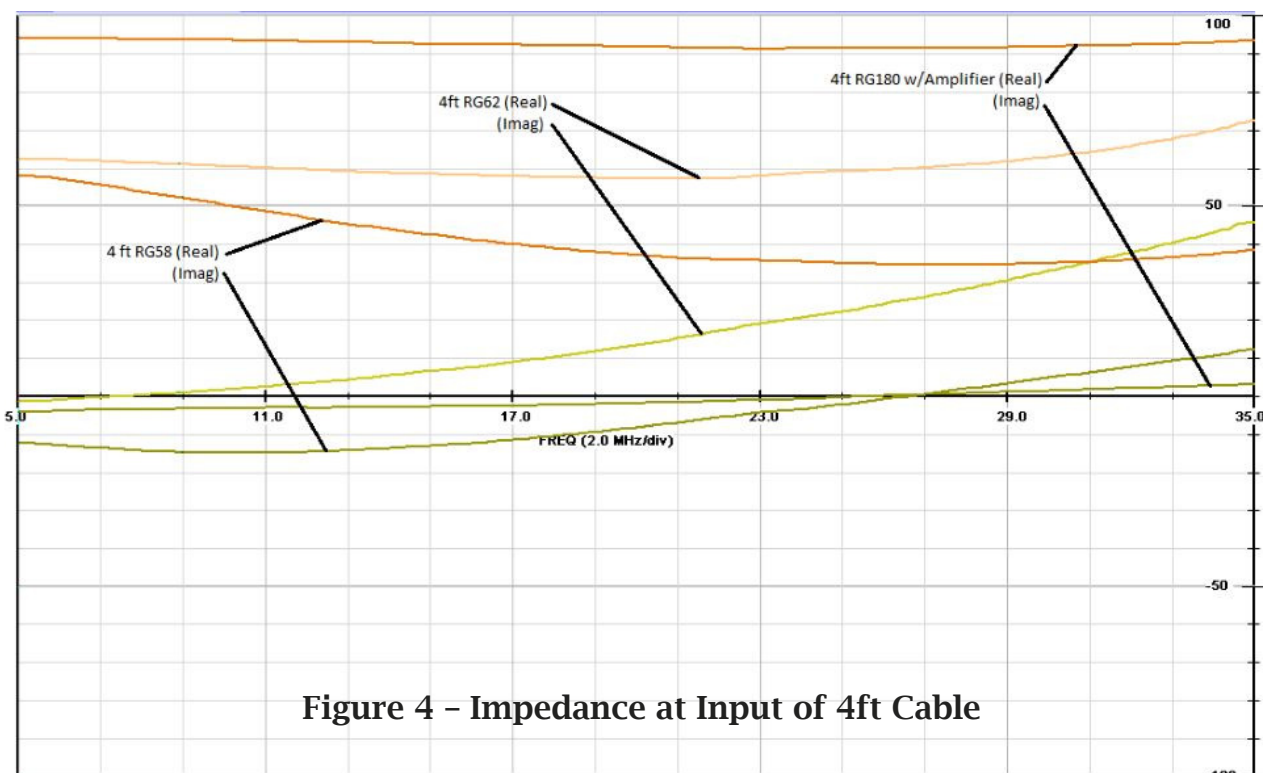


Figure 4 - Impedance at Input of 4ft Cable

Two Solutions to Gain Reduction in Transceive (Cont'd)

by Don Jackson W5QN

Isolation Amplifier Description

The optimum solution is an active isolation amplifier installed at the 32S-3 end of the 4 foot cable. The amplifier needs the following characteristics:

It needs to be small and powered by the S-Line receiver that is its host.

It needs to be well shielded and decoupled.

The electrical characteristics must provide:

Input impedance of 100 Ohms, resistive (or, equal to the cable Z0 for optimum flatness)

Low output source impedance

Low distortion at output levels up to 3 VRMS

High reverse isolation

Low power consumption

With such an amplifier, and a 4 foot cable of 100 Ohm characteristic impedance, the impedance looking into the cable would be the same as the 100 Ohm dummy load. I chose the Texas Instruments TLV4221 operational amplifier for the job, as it meets the requirements quite well. An operational amplifier is particularly well suited to designing for any input impedance. It also meets the high reverse isolation requirement. For this application, high reverse isolation means that the input impedance of the amplifier is not significantly affected by the load impedance placed on its output. This is an innate characteristic of operational amplifiers that is difficult to come by in simple RF amplifiers, particularly amplifiers with low gain. Total current drain of the amplifier is about 15ma with a DC input voltage of +12Volts.

The bottom line result of adding the isolation amplifier (green trace in Figure 2) is that the gain of the 75S-3B remains the same regardless of whether the receiver is operated in transceive mode or separate mode with the 100 Ohm load installed. It also means alignment of the 75S-3B is no longer somewhat dependent on the transceive/separate connection mode.

Another advantage of the isolation amplifier is that it does a better job of driving the 32S-3. Due to the low impedance presented to the 75S-3B Xtal Osc port in a standard transceive hookup, I found my

32S-3 to be somewhat "starved" for Xtal Oscillator power on some bands when in transceive mode. There is no such problem when using the isolation amplifier. The amplifier voltage gain may be adjusted from a value of 1 to 2, using its internal potentiometer.

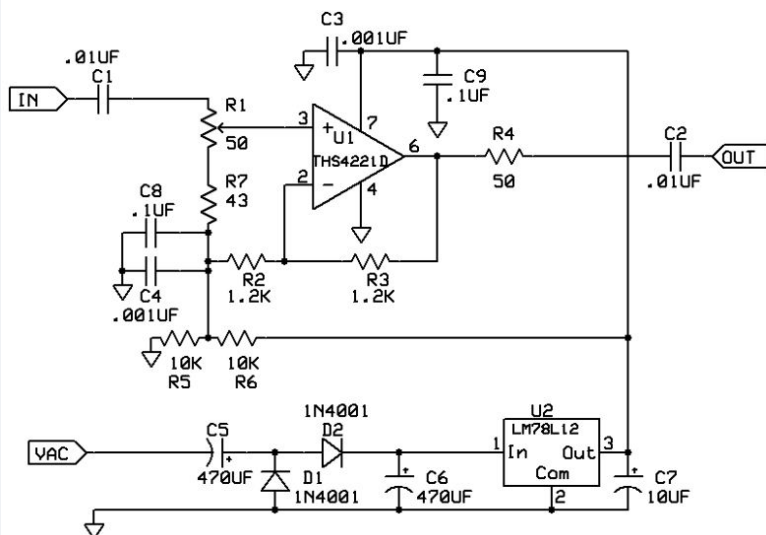


Figure 5

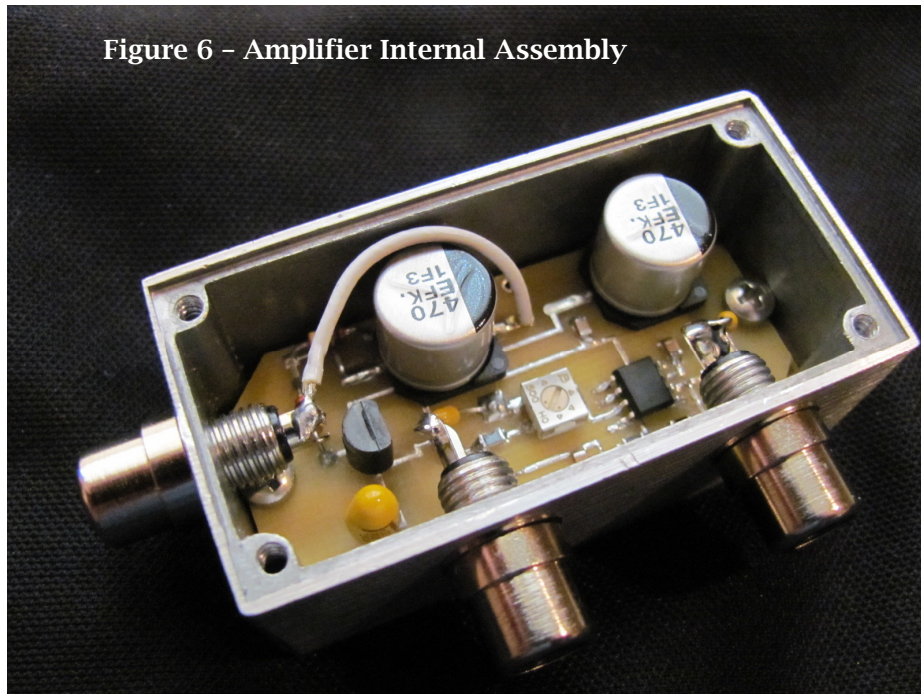
Figure 5 is a schematic of the amplifier, and Figure 6 shows the inside of the amplifier. This is a "non-inverting" op-amp configuration with a voltage gain equal to $(1+R3/R2)$. The value of R4 should be low to drive the 32S-3, and is somewhat arbitrarily set to 50 Ohms.

The amplifier mounts on top of the 32S-3 slug rack (See Figures 6 & 7) with cable ties that slide through holes in specially

Two Solutions to Gain Reduction in Transceive (Cont'd)

by Don Jackson W5QN

Figure 6 - Amplifier Internal Assembly



designed brackets that mount on the ends of the amplifier. Note that the cabling inside the 32S-3 slug rack is entirely bypassed when using the amplifier. Power for the amplifier may be obtained from the 6.3VAC output on the rear panel, or it can be wired to the front panel meter lamp. No modification is necessary to the 32S-3, and the amplifier is easily removed. Some of you clever mechanical guys out there may come up with a more elegant mounting solution, but this is the best I could think of given the self-imposed “no modification” requirement and my limited tool box.

Conclusions

The gain change can be reduced to a couple of dB by replacing the RG58 cable with RG62. For most operators, the addition of the isolation amplifier would appear to be overkill to solve a relatively minor problem. However, if you have time on your hands and are a stickler for ideal performance of your S-Line, have a go at it! At the least, this article should provide the explanation for the gain variations users have noticed when operating their S-Line pair in transceive mode.

Drop me an email if you would like more details on duplicating this amplifier. Although I have a few raw PCBs available, I would warn that the mechanical aspects (custom brackets, box mods, etc.) were, for me, the most challenging aspect of the project.

A big “thank you” is due to Bob Kellow, W5LT, for the use of his AIM-4170 Antenna Analyzer, which made the swept impedance measurements possible.

Cheers, Don W5QN

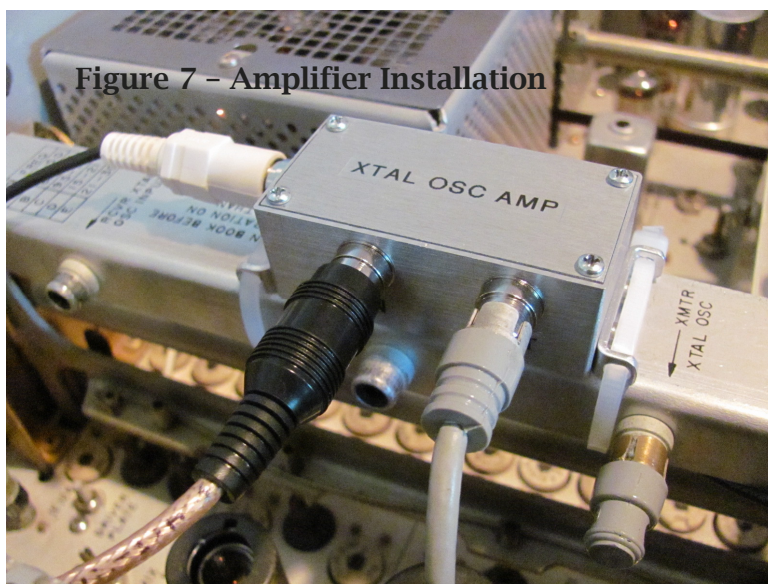


Figure 7 - Amplifier Installation

In the Shack of Scott Kerr, KE1RR

Some “Shacks” are kind of usual, and some are unusual. You can tell that Scott is a bachelor - because one of his main Collins collection displays and operating positions (his Saint James Grey A-Line) is in his huge living room. It amazes me sometimes that what, at first, may seem to be out of place looks so good together. One would not think that a large display of A-Line would fit right in with Elizabethan furniture, a vaulted ceiling and drapes, but it sure does - for me anyway.



Scott Kerr, KE1RR, and his shack, are a great feature for this quarters issue because Scott has just been elected one of our CCA board members.

Scott first became an amateur many years ago when he was younger (KF5EPE). But, like many of us, family and career soon ended that and he became inactive. Fast forward to 4 years ago and he again became active and got his Extra Class and the vanity call KE1RR. Poorly informed at first, he started collecting Drake, but he soon gravitated to the “Good Stuff” and he has now been collecting Collins for 3 years. It is quite a collection I must say.

His first piece of Collins was a 30L-1 and that got him hooked. Now he can be found often operating his S-3A Line, his KWM-2A/30S-1 Line-up, the 30K-5 A-Line combo and his KWS-1/75A-4 that he is just finishing a wonderful restoration on. He had a hard time deciding, but finally confessed to liking the KWS-1/75A-4 the best.

Scott is good with the test gear and a great restoration resource. We will expect progress articles for sure.

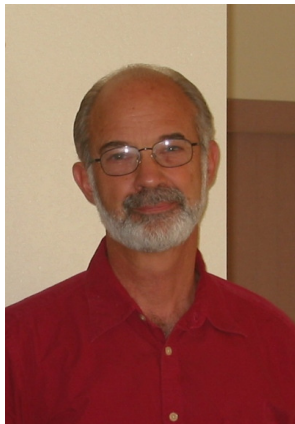
In the Shack of Scott Kerr, KE1RR



He also does a lot of woodworking and has a great woodshop. Very active in the CCA, Scott also is the current President of the Rockwall (That is a town - not Rockwell - Very confusing Scott) Amateur Radio Club. While he snuck in the back door of electronics and amateur radio by being (by avocation and sometimes vocation) a sound producer in large church settings, he started his first significant career being a very successful commercial real estate investment guy, but then got out of that and started his current company, Trackersoft, a network support IT company. If you get a chance, go see his collection. I am sure that you will enjoy it.



From the President - Election News



It is always fun to write when the news is so good. For those of you following *Fifi* and her just completed radio room restoration, you will understand the excitement. It is not every day that you get to communicate with a World War II bomber – a B-29 no less – and do it through almost 70 year old radios. The CCA would like to compliment the Rockwell Collins Cedar Rapids and Dallas teams that worked with the CAF and did this wonderful piece of flying history. Thank you, not only for the historical work, but also for giving us a chance to put a B-29 contact in our logbook. It has been a pleasure for us to provide the restoration team with a little support and visibility as they have gone through the first flight operations and the two dedication ceremonies in Dallas, and then Cedar rapids.

This past quarter has seen the completion of two long term objectives of the current Board of Directors. We have worked hard to get you all a more dynamic and fun CCA website. This website is not only more fun and more current, but it also contains more information and is easier to update. Believe me! We were not happy at all with the time it took to get new material put up on the old site. Now it can be done in a matter of minutes. This behind the scene change is very welcome for, not only you, but for us as your support team. The results have been spectacular in terms of the website activity statistics. We can tell that you are happy to see this too. The fact that it is now available in many foreign languages also is giving us new visibility and serving new members around the world.

Imbedded in that website accomplishment is the re-installation of a great pile of historical archive material that was left behind when the website was overhauled the last time. This work by many past contributors is now there again for everyone to use. Please see the **Website Credits** link under **Information** on the site.

Then, finally, we set up a relationship with a quality on-line clothing supplier who will provide you with a nice discount on custom monogrammed and logoed shirts, jackets and hats, etc. Take a look. We are still working on the links between the two organizations for the website, but what we have there now will take you to the store and allow you to order merchandise. The link will just be prettier and easier to use when we get finished.

Note: We are coming up on elections for the two board positions that are at term limits. Ballots will be mailed coincident with the Q4 2012 issue and results announced in the Q1 2013 issue and on our website. My term is up at the end of this year and I will be running again for a second term. Ron Freeman’s position is also up for election and we are not sure that Ron will be running again because of

his personal workload. At any rate, there are two board slots open for nominations. I would encourage anyone interested in serving on the board to contact us and to give us your information and provide nomination and seconding emails if appropriate. New blood is good and we solicit your participation. I will say that there are no “honorary” positions in this organization, and you will be expected to work and attend functions. I need this information by August 15th at the very latest so bios can go in the next issue.

That’s it for this quarter. Enjoy your Collins and stay safe.

Regards,
Bill Carns, N7OTQ
President
wcarns@austin.rr.com

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Editor Bill Carns, N7OTQ
Ass’t Editor, Don Jackson, W5QN

Board of Directors

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The Collins Collectors Association
P.O. Box 1269
Wimberley, TX 78676-1269

www.collinsradio.org

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