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Collins Collectors Association
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Are All Tubes the Same?

by John Bess, WA5VVT

Those of you who have worked with any other brands of radios other than Collins will probably be able to relate to what I am about to say. I think that it might give you some food for thought in your use of your Collins gear as well.

Drake designed the TR-4 series and the T4X- series around the Sylvania 6JB6 final tubes and provided "matched pairs" for those that needed to replace the original "matched pairs" that were supplied with the unit when it left the factory.

Why did they "match pairs" if all of the Sylvania 6JB6 tubes were the same? The answer to this is obvious. They were not all the same even though they were from the same manufacturer. Later, after Sylvania stopped producing the 6JB6 tubes Drake went to suppling GE 6JB6 "matched pairs" as these were the only ones available. However, Drake included a statement in with these replacement "matched pairs" that they might not neutralize properly in your radio and that you might have to change some capacitor values in order to get them to neutralize. They did give you some suggestions as where to start and three or four values to try.

I guess the GE 6JB6 tubes were somewhat different than the Sylvania tubes.

Yeasu produced the FT-101 series radios that were designed around a Japanese 6JS6 tube (it had a green stripe around the base of the tube). Yes, you could order " matched pairs" to replace the original "matched pairs" that the factory installed. When the Japanese tube manufacturer stopped production, the only 6JS6 tubes commonly available to us were those of US mfg. You guessed it. The US tubes would not neutralize in the FT-101 or the Henry Tempo One (Yaesu FT-200). So what did one do? The cure was to change a capacitor value to make the US tubes neutralize properly.

Heathkit HW and SB series used the 6146 tubes. When the 6146B came out many users had problems with getting them neutralized. Here again, capacitors had to be changed to get them to settle down.

Now what does this have to do with Collins gear? Even though RCA stated in its tube data sheet that the 6146B could be "unilaterally interchanged with the 6146, 6146A and 8298", Did this hold true for GE and Sylvania as well? Which brand of 6146 did Collins design the units around? Why did Collins change the neutralization circuit about the time the 6146B was introduced? Your guess is as good as mine. There was only a .02pf difference in the inter-electrode capacitance between the RCA 6146 and the 6146B according to their data sheets. Not much but a slight difference none the less.

If all 6146 series tubes were the same, why the reason for the change?
All 6JB6 tubes were not the same from all of the different manufactures and neither were the 6JS6 tubes. There were differences even between each tube and run within the same plant. Otherwise, the term "Matched Pairs" would never have been necessary.

I have never seen the need for matched pairs in any Collins gear as long as you stayed with the same brand for both tubes. Although, I have used mismatched finals on some occasions in my younger years with mixed results. Some times I got lucky and some times I didn't. What is the point? Food for thought.

In this issue...

CCA Membership Meeting in Dayton

The CCA will hold its annual membership meeting at the Dayton 2000 Hamvention on Satruday night, May 20th at 9pm at the Dayton Downtown Marriott hotel. Please try to attend if possible...we want your feedback!

Collins Corner in Dayton

by Jim Green, WB3DJU

Finding particular items as manufactured by the Collins Company has been my major ham radio activity in recent years. I have learned the true meaning of "The early Bird gets the worm".

At Dayton last year I was blessed with having a pass granting me access to the Flea market on Thursday. Thursday is setup day and there is no general admission. Even at closing time there is only about 60% of spaces filled. Most smaller sellers don't arrive until early on Friday morning.

My target was the much sought after Collins 51S1 general coverage HF receiver. Sales area for Flea market at Dayton is approximately 40 acres. Arriving at 7:30 AM with the standard threat of rain (and it did) I started walking. The grounds are familiar to me as this was my 5th time attending. Walk and walk and walk some more back and forth as new arrivals may reveal that scarce piece of equipment.

Competing with professional buyers is an interesting challenge. They have eyes in the back of their head, hands, and wallet. Overheard were 2 guys discussing the condition of a bulk purchase of 6, yes 6, KWM2 Transceivers for a bit over $1000.00. I choked and kept on walking. A gentleman with a brand new Jeep had a blanket covering some pieces in the back with "Collins For Sale" sign which caught my attention. Asking his neighbor tailgater revealed that the Jeep owner was out buying Collins gear----one of those pro buyers.

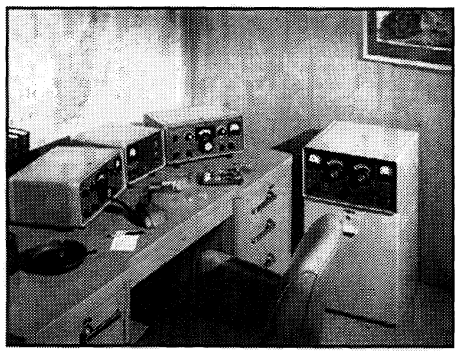
Hours later I was totally impressed by seeing what was under that blanket. A mint 75S3C, 32S3, and a 516F-2. This was the last and best split transmitter and receiver plus power supply that Collins purportedly built. The selling price was set at $3200.00. This was high but at the going fair for the excellent condition. Yes I was interested. This pro was sharp, he knew he had me hooked. He had interpreted my facial expressions just right. Foiled. There was to be no sale as he would not take any checks. "Can't buy from others with someone else's check", he said.

(continued on page 3)

Basic Trouble Shooting

Cabling the "S" Lines

A guest article by Dennis Stinnett KA9AWF



This month we are featuring another article from Dennis KA9AWF. If you would like to contribute to this column, please contact me or Michael, W1RC. 73 John, WA5VVT

My first experience in setting up an S Line station came in July of 1999, and I would like to share with you how I accomplished this task with home built, and off the shelf components from Radio Shack.

The first connector that I was not familiar with was the female "N" type connector on the 312B4 station control console. I started to change them to SO 239 UHF connectors but then decided that this would really alter the equipment, which was against my wishes.

After digging through some catalogs, I decided to go to the local Radio Shack store to see if they had any components available that would help with my cabling efforts. I found an adapter designated UG146 N-type RF adapter (Radio Shack part number 278-156A) which adapts the UHF male (PL 259) to fit the "N" type female. Now that gets us back to the SO 239, but in doing so it has also placed the connectors close to the sides of the 312B4 cabinet.

I then began to search for an "L" type connector that would provide me with a clean right angle to get the SO 239 straight out the back of the 312B4. This connector is designated UHF M-359 Right Angle Adapter (Radio Shack part number 278-199). This adapter when used in conjunction with the 278-156A provides a clean pair of SO 239's right out the back of the 312B4 and you have not permanently altered the equipment. There has been some concerns regarding the integrity of the radio shack connectors, so just to make sure that they were OK, I purchased two of the above mentioned connectors and cut them in half.

What I found was comforting as the center conductor of the "L" was two brass rods that screw together at the 90 degree turn just as amphenol does it. The straight adapter also revealed a solid one-piece brass rod. The connectors are just as they should be with no springs or other mechanical devices that may cause problems while transferring RF. So for the time being the connectors currently being supplied to Radio Shack are OK.

The next hurdle was the RF connection coming out of the back of the 32S1. Hmmmm a phono jack...maybe I could put an SO 239 in place of it? No way, as it would detract from the originality of the gear.maybe they make an adapter for this..so I went back to Radio Shack and purchased Part number 278-208A "Scanner Adapter" that adapts RCA phono to SO 239, which will now permit you to use a PL 259 plug on the RF connections.

Question number three was what to do with all of the patch cords between the 32S1, 75S1, 312B4, and 30L1. One more trip to Radio Shack and I purchased several packs of three foot shielded audio cables part number 42-2309A. These were used for all connections except the VFO and crystal Oscillator hook up which requires routing the cables to the inside of the cabinets and carries your crystal and VFO oscillator R.F. from the receiver to the transmitter. John Bess WA5VVT recommended that I cut two pieces of RG-58/CU 48" tip to tip and install the RCA phono plugs on each end. This keeps the capacity and impedance correct and will prevent any cabling problems induced by stray RF signals.

For the RF connection between the 32S1 and the 30L1, the 4th edition manual dated 15 November 1961 recommends a 52 ohm 20.5' (feet) length of coax. The manual states that this will improve the system linearity by presenting uniform impedance to the exciter, however in some installations it may be necessary or convenient to alter this length. Altering the length may be done at the expense of a slight increase in the level of distortion products. It is also stated in the 11th edition 30L1 manual, that a four feet length of cable should be used. It is also known that various other lengths of cable have been used over the years without any noticeable problems. I chose to follow the early manual on this one and cut a 20.5'(feet) length of RG58U and used PL 259's mated to the 278-208A "Scanner Adapter". (The impedance of the audio cables is unknown to me, but the impedance between the exciter RF out and the amplifier RF in should be 50 ohms). We hope that this article will take some of the mystery out of cabling your station together and that it will save you some time in chasing down all of those darn part numbers.

Please Note: Some of the techniques and technical information discussed in the Signal are controversial and we invite you to share your knowledge and experience with us. Please send your letters and comments to the Editor.

The CCA web site can be viewed at:
www.collinsradio.org

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The Editor's Operating Desk

de Michael Crestohl, W1RC/VE2XZ

Well, gang, it's almost that time of year again - the annual pilgrimage to Hamvention in Dayton Ohio! Many of the faithful will gather once again at the Hara Arena and surrounding area hotels for the festivities. Hamvention 2000 will be held in conjunction with the ARRL National Convention so it's sure to be a good one. Dates for this year are May 19, 20 and 21st.

There are several Collins events that are worthy of mention. The CCA has booked a block of rooms at the Marriott Hotel downtown which will be the venue for several events, including the Thursday evening hospitality suite and the Banquet on Friday evening, May 19th. This year's event is sure to be very memorable. Our guest will be Riley Hollingsworth, K4ZDH, FCC Special Counsel for Amateur Enforcement, who is also a CCA member! Jay Miller KK5IM will give a presentation on his new book, A PICTORIAL HISTORY OF COLLINS AMATEUR EQUIPMENT and I'm sure he will have several great anecdotes and tales for us. I understand that a 75A-4 will be raffled off and that there is some special entertainment planned by Joe Walsh, WB6ACU.

CCA Board Members Floyd Soo, W8RO and John Bess, WA5VVT, will be at their booths inside the Hara Arena and of course, many members will be outside in the flea market. The ever-popular AM Forum hosted by Dale Gagnon, KW1I, will he held in Room 3 on Friday from 3:15 - 5:00. Saturday morning from 8:30 to 9:30 in Room 2 there will be a Collins Forum hosted by Dave Knepper, W3ST, publisher of THE COLLINS JOURNAL. Although not an official CCA event, Dave's forum is sure to be interesting and informative. Although accurate at press time, you might want to check the time and room allocation in the official program or the Hamvention Web site www.hamvention.org.

I am still hoping that I can get away for the annual event and look forward to seeing many old friends and making some new ones too. On another front I just received word from my contact at the DRMS that several more Collins radios have been reclassified as DEMIL CODE 'A' (No DEMIL Required) which is good news indeed. These include the 51S-1, 30L-1, 516F-2, PM-2, 180S-1 and other equipment that had formerly been destined for destruction by the government. There are still several more items under review for reclassification and I will be pleased to report any changes as they occur.

Collins Corner *(continued from page 1)*

Nothing personal. With almost half the day gone and walking some in the rain, I was about to loose hope of finding my 51S1. Then I saw the first of the 2 units that were to found at Dayton. Even the pro dealers admitted that they had not seen any. The first unit was a big disappointment. It had been modified and was very dirty. The $950.00 price was not out of line , but I was hoping for much more radio for the money.

It was not until about 4PM when a small group was hovering around a booth way in the back. This space had been listed on my computer printout of places that might be selling Collins but he had not been here earlier. There it was. Three guys were actively negotiating the price. Time to be silent and not show too much interest. When there was a pause in the action I put my hand on the receiver and said, "SOLD". The others turned away with some degree of disappointment and left. It was a bit more money than I wanted to spend , I told him. With a straight face he asked me what I would pay. Negotiation is fun. I was able to purchase my 51S1 for $250.00 less than three guys before me were offering. Full documentation and a weighted main tuning knob became part of the deal.

I was happy with my perchance and very importantly it works. Collecting is not for everybody but the reward has been worth it for me...

From Dutch, WB7DYW

As a young student, I had to memorize a poem and recite it to the class. "Timothy Twirp was quite astounded when what he thought was, wasn't grounded. As a matter of fact you could say, he was quite transfixed with his thumb on pin 3 of a live 6L6."

CCA Convention in Cedar Rapids, Iowa in August!

The finest Collins event of the year will be held on August 11-13 in Cedar Rapids, Iowa. This is a smaller and more concentrated gathering of Collins collectors and a real chance to focus on our common love for Collins equipment.

The meeting will be sponsored by the CCA members at Rockwell and will include a tour of Rockwell Collins, a banquet on Saturday night, the Cedar Valley Amateur Radio Club Hamfest, CCA membership meeting, and many other CCA activities. Check the CCA web site for the latest information and costs. Be sure to plan now to attend and mark your calendar! Don't miss one of the best CCA events of the year.

In the Shack

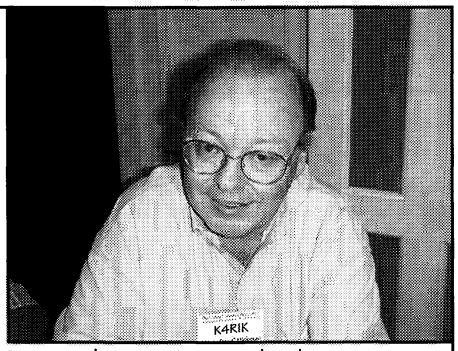
Lee Wimbs, W1MBS

Currently I am running two complete S-Lines, and a 30L1. The antenna tuner is homemade in a KWM2 case with Collins parts and Collins paint.

Send us a picture of your shack, your callsign, and any shack information and we may use it in a future issue of the *Signal*. Just mail it to the CCA address.

At the Mic with KW6KW

Sandy Meltzer
President, CCA



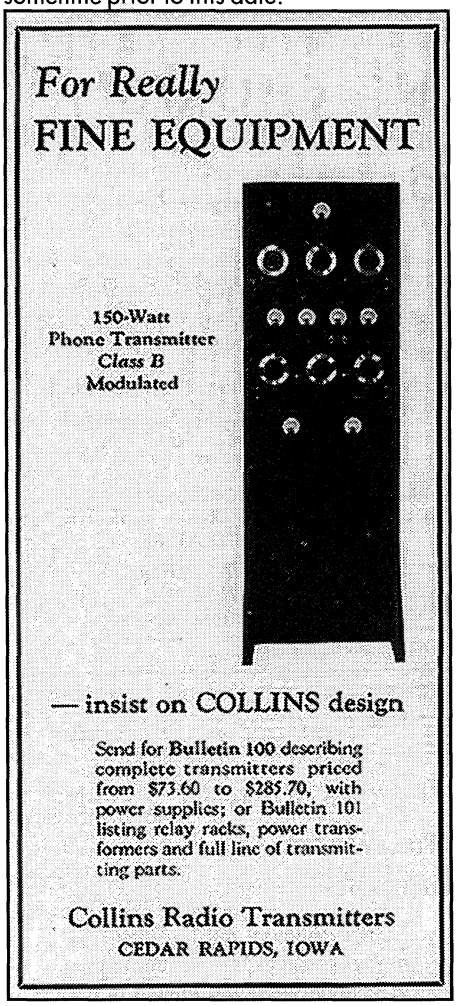
Doug Hickman, K4RIK.....silent key!

I want to thank everyone involved with preparing the CCA for Dayton this year...especially Butch K0BS our Dayton Chairman, Art WA8VSJ who made all the hotel arrangements for us, and to Floyd W8RO our Banquet Door Price Chairman. Fine job guys!! The amount of work that goes into planning our CCA events at Dayton is mind-boggling. Unfortunately, one of our outstanding CCA members from Dallas, Doug Hickman K4RIK won't be able to join us this year and his presence will be missed. Doug passed away in late April after a two-year battle with Cancer. Doug and I exchanged written letters via mail and he was one of the nicest people I ever met in all my years in ham radio. Goodbye Doug, we'll miss you.....73' Sandy KW6KW

Collins Legacies: The 150 Series Amateur Transmitters

by J.B. Jenkins, W5EU and Gary Halverson, WA9MZU

The 150W and 150BW transmitters were introduced to the amateur market in the May 1932 issue of QST. The first Collins QST ad to contain a photograph, the 150W used the 10A exciter (remember the kit?) as one of its building block components, which indicates that the design had been completed for sometime prior to this date.



The 150W/BW used a 10A exciter (common to all the early Collins transmitters), followed by a 3A Power Amplifier using a UX-203A output. Mounted in a six-foot rack with a protective back cover, the transmitter contained the 1200A power Supply, 30B Modulator, and a choice of several meter panels. An antenna coupler of the Pi design was not yet available.

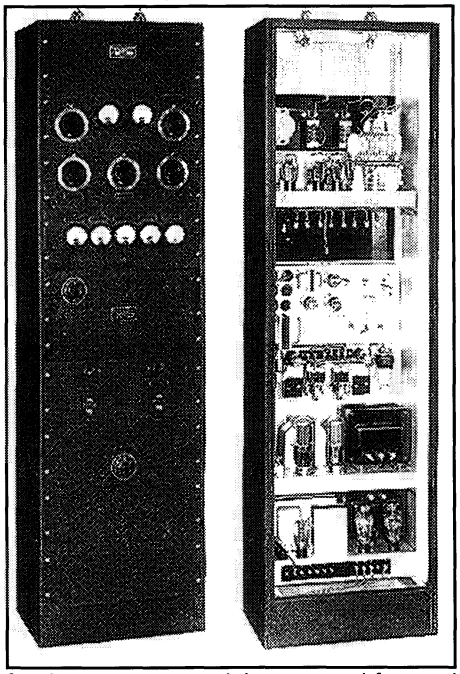
Later in 1932 the 150W/BW underwent a minor redesign. "The 150A/150B now replace the 150W/150BW" read Collins Bulletin 100. "The basic transmitter remains the same, but the 1200A, now designated 1200B, has improved regulation for the class B modulator." The meter panels were also slightly changed.

The 150A was priced at $290.00, while the 150B was $350.00. One set of coils was included in the price. The 150B used the same components as the 150A but added the 30B Modulator. This was a class B modulator rated at 100-200 watts of audio output. It used two 245's or 250's driving a push-pull pair of 503's. Two modulation transformers were available with different impedances for use with single-ended or push-pull class C RF amplifiers.

By 1935 the 150C and later models were a completely different design. The RF deck and power supply were similar to that used in the 30FX transmitter. Control circuits featured push buttons and the design included an antenna coupler, all contained in a beautiful self enclosed rack.

One Good Thing Leads to Another

While the 150A/B were complete transmitters, they also made excellent drivers



for the new 20B one kilowatt amplifier and modulator. The first installation of the 150B and 20B combination (the "last word in appearance and performance") was described in the February 1933 Collins Signal (the first issue). The installation was made at

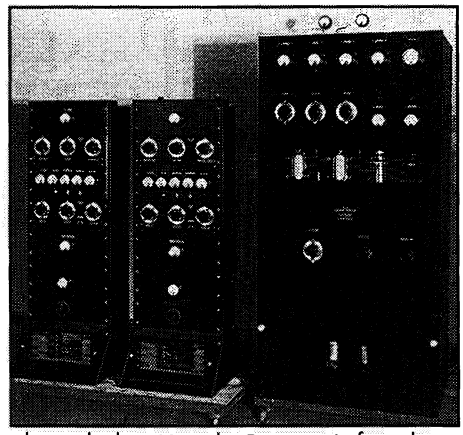
W9BHT, world famous station of W.P. Ingersoll located Canton, Illinois. Mr. Ingersoll, "owner of a starch factory", as Art once said, was the first to purchase and receive a number of the later Collins designs.

The combination of the 150B and 20B proved to be a winner. With the addition of another pi section to the 1200B (now designated 1200C) power supply, the hum level was reduced to broadcast quality. The headline of the January 1934 Collins Signal gives the complete story:

"The BYRD Antarctic Expedition Sails with A Complete Collins Shortwave Broadcasting Station Aboard!"

On Byrd's and McMillen's previous trips to the North and South Poles, amateurs handled the numerous personal messages and news releases by telegraphy. However, because of the advances made in the art of shortwave telephony, Rear Admiral Byrd's Antarctic Expedition II decided to transmit word-by-word broadcasts so that the vast radio broadcast audience of the nation-wide CBS network could hear the daily undertakings.

"A Collins type 20B Transmitter, operating at 1000 Watts output, is the basic unit used



aboard the 'Jacob Ruppert' for these broadcasts. In addition two Collins 150 transmitters are being used for communication between the different camps of the expedition", the Collins Signal reported.

The publicity of these events gained Collins Radio world-wide recognition and a reputation that helped establish them as a world-class communications equipment vendor. It is also not surprising that the 20B provided Collins an entry into the booming AM broadcast market – with a little help from the 150B.

You can email J.B. Jenkins at jenkjb@flash.net, or Gary Halverson at ghal@ix.netcom.com.

CCA Hot Line
507-282-2141
Sorry, no call-backs available!