BY BILL FIZETTE, W2DGB

A Structured Approach to Fixing up Those Nice Old Radios

Preserving The Clough Brengle Model 87 Transmitter

Part 1—Acquiring a Rare CCC Veteran

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This edition of "Fixing Up Nice Old Radios" differs in two ways from the usual. First, the subject is a transmitter, not a receiver; second, the objective was to restore original appearance, but not necessarily to make the unit operational.

The author has set for one of his radio goals the documentation of the history of, and the collection of the artifacts of, the little-known 1930s Clough-Brengle Company of Chicago. When it came to my attention that he had acquired a rare Clough-Brengle transmitter that had been damaged in shipping and was restoring it to display status, I asked him to document the process for this column.

Ron presented us with enough material for two columns. Part 1, which follows, concerns the company and product history. Part 2, to appear in the July issue, will detail the actual preservation process. Ron's perseverance and hard work makes for a very interesting story, and underlines his commitment as a radio historian—wf.

The subject of this article is a Clough-Brengle Model 87 transmitter, built in 1935. And to answer one of the first questions I get, no, they are not a German company. Founded in 1932 by Kendal Clough, formerly the Chief Engineer for Silver- Marshall and Ralph Brengle, the company was located in Chicago, IL.

The company's main product line was radio and laboratory test equipment, but they also built at least two models of radio transmitters and I have examples of both. However, in more then ten years of searching documentation, including Clough-Brengle's advertising and catalogs, I have not been able to locate any mention of the transmitters.

Unfortunately, no company records are known to exist. The best explanation seems to be that these two models were built under contract for the U.S. government to be used in Civilian Conservation Corps (CCC) radio stations.

The Civilian Conservation Corps was an agency formed by the Federal government to hire unemployed young men for public conservation work during the Depression. It was set up as part of President Franklin Roosevelt's New Deal program in 1933, and formally organized by Congress in 1937. Its goal was to provide training and employment while creating useful public works. Operating under quasi-military guidelines, the CCC conserved and developed natural resources by activities such as planting trees, building dams and pipelines, and fighting forest fires. More than two million men served in the CCC before it was disbanded in 1942. Coincidentally, both a brother-in-law of the editor and the father of the author served in the CCC during the late 1930s.—wf

Shortly after the Corps was formed, those in charge realized that they had no way to communicate with the far-flung camps scattered all over the country, mostly in remote areas. Someone suggested they try radio, so they used young hams who were already in the Corps as the first operators. Later they expanded the program to include radio operator and radio service training as part of the vocational classes offered to the young men.

The camps were set up in a network where one central camp with a radio would be linked to as many a ten smaller camps by field telephones. The camp with the radio would take reports from the other camps and then radio the information to headquarters. When they weren't handling official Corps traffic, the licensed operators were free to make ham radio contacts.

I became aware of the use of Clough-Brengle (C-B) transmitters by the CCC shortly after my first acquisition, a C-B Model 4581, was featured in John Dilks' "Old Radio" Column in *QST* for March, 2000. I subsequently received letters from two old timers who had been radio operators at CCC stations. Neither could remember model numbers, but fortunately they did have original photographs of those stations, WUEV, located in

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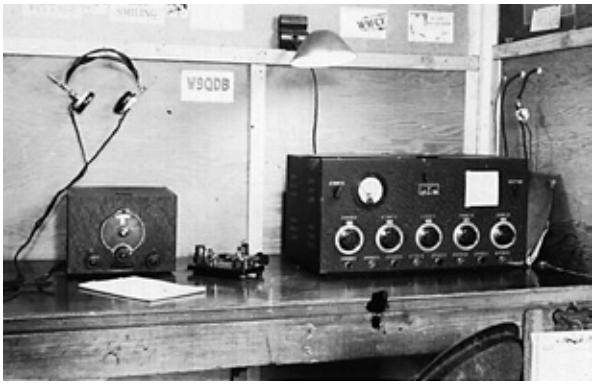


CCC radio station WUEV, Wasau, WI, 1938. Photo supplied by W9QYK (now W4KWJ), who was one of the operators.

Wausau, WI, and WUCR, located in Fort Lincoln, ND. The transmitters differed from my Model 4581, but there was a definite family resemblance.

This just added pieces to the puzzle for here was another model of a C-B transmitter, different from mine, and I still had no company data. In response to the *QST* article, I also received a phone call from a ham in Texas telling me about his C-B transmitter. I expected it to be like the ones in the CCC photos, but it turned out to be a Model 4581, just like mine. It was also interesting that his transmitter serial number is 157, while mine is 156. What are the odds against two nearly 70-year old transmitters, a thousand miles apart, having sequential numbers?

About a year after the *QST* article an old friend, Brian Harrison, KN4R, mailed me an E-bay auction link. To my great surprise, here was a C-B transmitter just like the ones in the CCC station photographs. In addition the seller referred to a web page with about 30 close-up shots. Now that I had learned the model number, I contacted the seller and found out that he knew nothing about the item, other than that it had been found in his father's house. No one knew why it was there.

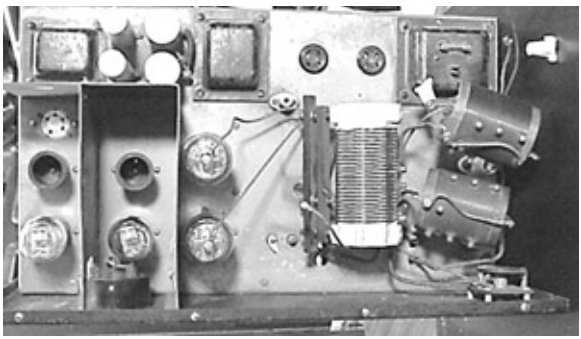
I had to have this transmitter! But as fate would have it, I had just recently been downsized by the company I had worked for for over 20 years. However, I promised the XYL that I would sell something out of the collection to replace the money.

Unfortunately, I was outbid by someone with a faster Internet connection and deeper pockets. I contacted the winner and told him if he ever wanted to sell it to please let me know. A couple of weeks later I received a sickening e-mail from him, telling me that UPS had dropped it and that it was severely damaged.

Several years passed and I hadn't thought about this transmitter for a long time, when one day I received an e-mail from a friend telling me that he had heard that someone had a C-B Model 87 for sale. Since I had been doing a lot of research on C-B test equipment, which included Models 88 and 89, the Model 87 mention just didn't ring a bell. However, I followed up, and when I received a photo I did a double-take and almost fell out of my chair. I checked it against my file photos from the original E-bay listing, and found it to be the same transmitter. The name of the seller confirmed it. When I contacted him, he said that because of the damage he had just never done anything with it, and had decided to let it go to someone else.

While he didn't remember me, he promised to send me photos. When they arrived it was clear to me that there were problems, but I didn't feel that it was anything that I couldn't take care of. There was no structural damage to the cabinet, either externally or internally, and the meter appeared intact.

The large ceramic tank coil was also intact, although the small ceramic standoffs on which it was mounted were broken. There had been no packing inside the unit to protect the tubes and coils, and when the heavy tank coil broke loose, it smashed the two type 802 finals, the type 83, and both antenna coils and their standoffs. Being afraid that someone else would come along to



Top view of my Model 87 before repairs. Note broken coils at right.

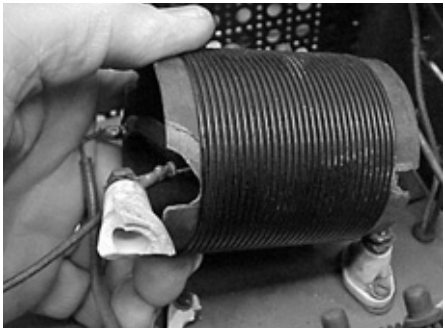
scoop me on it, I quickly accepted his asking price and sent him the money.

Now I had to get the transmitter to my home in North Carolina. I seriously considered renting a car and driving to Pittsburgh to pick it up, but the seller assured me that he knew how to pack something like this properly, so I decided to chance it. At 145 pounds, the shipping weight was well over the US Postal Service maximum. So we decided on Fed Ex Ground. When it finally arrived I found it had been packed so well that Fed Ex could literally have thrown it off the truck with no further damage.

A lot of folks in our hobby, including me in the past, complain about how shipping companies damage radios. But the responsibility is really with the shipper. If the item is important and fragile, it should be packed to withstand extreme stress.

While there is no way to prove it, I feel that this may well be the only surviving example of the Model 87. In more than ten years of searching for Clough-Brengle equipment it is the only one I have come across.

I don't know how many were made originally, but the photos indicate at least two others in CCC radio stations. They are slightly different from mine in that they both have an extra knob in the upper left section of the panel. On my other C-B transmitter, the Model 4581, this knob is a two-position switch that selects either "Amateur" or "Official" crystals.



A closer look at one of the broken coils.

I suspect that when the CCC was disbanded in 1942 the radio equipment was turned over to the US Army Signal Corps, which was responsible for the CCC radio stations. Since there might have been only a limited number, they were probably of little use in the war effort. Perhaps they went to a Signal Corps depot to be used for training and parts.

Part 2 of this column, "Restoration and Preservation," will appear in the July issue of the Journal.

ABOUT OUR AUTHORS,
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DAN MERZ
Grid Blocking of 6BE6 Converter Tubes

Dan's interest in radio began in California in the 1940s, when he spent time sitting in front of the family's Philco console. From there he progressed to a crystal set, then a Hallicrafter's S-38 followed by a homebrew two-band ham receiver. After that, his professional career took over.

He graduated from Stanford University in metallurgical engineering, studied metallurgy in England at Sheffield University, and returned to Stanford for a doctorate in Materials Science. He worked for Battelle Pacific Northwest Laboratories in Richland, WA on plutonium metallurgy and vacuum sputtering of advanced materials before retiring.

Dan has collected and repaired old radios for about 20 years and has accumulated about 200, including early battery sets, crystal sets, boatanchors, and regenerative shortwave sets. He enjoys restoring the sets and exploring the details of their circuits and materials.

BOB SCUPP, K5SEP
The Tube Caddy Patent

A Licensed Radio Amateur since 1967, Bob now holds an extra class ticket. An avid VHF-UHF contester and weak-signal enthusiast, he became a member of the Knight Raiders VHF Club, K2DEL (Passaic, NJ), in 1967 and held various offices, including President. After moving to Albuquerque, New Mexico in 1976, he held several offices in local clubs including President and Vice-President of the Albuquerque Amateur Radio Club, Assistant Caravan Master of the Caravan Club and finally President of QCWA Chapter 94 for two years. He was elected for two consecutive terms (1990-1994) as ARRL Vice-Director of the Rocky Mountain Division. Bob is a charter member and treasurer of the Estancia Valley Amateur Radio Association. He has been an ARRL and W5YI Extra Class VE for twenty years. Bob also collects and repairs antique radios and is a member of the New Mexico Radio Collectors Club. He devotes some of his time to freelance writing activities and has had articles published in *CQ VHF*, *Electric Radio* and other magazines. He also writes for the New Mexico Radio Collectors Club newsletter.

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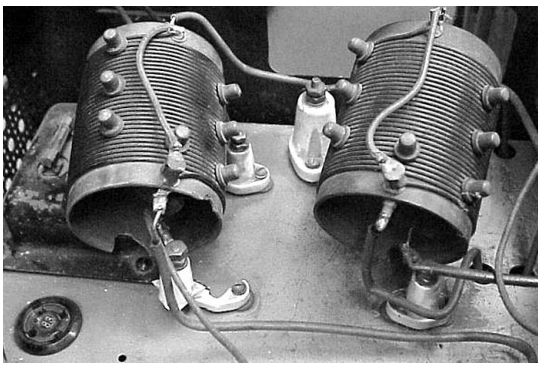
Part 2—The Restoration

The first installment of this two-part story dealt with background on the 1930s Clough-Brengle Company and two of their CW transmitters. Both models were used in the Civilian Conservation Corps camps during the Great Depression. In this final part, Ron continues to tell us about his restoration/preservation of an example of one of them—a model 87 that he had purchased in damaged condition.—wf

When I got the Model 87 unpacked I was pleased with what I saw. Not only is a neat-looking piece of gear, but the reported damage was not nearly as bad as expected. My first order of business was to get out the digital camera and take some "before" photos and get a quick inventory of the damaged parts. Then it was time to get busy.

I went to the computer and posted a quick message to the AWA and CC-AWA Email reflectors about what I had found and what parts I would be needing, namely the four ceramic stand-offs and an oscillator tuning knob. As luck would have it, the source who told me about the availability of the Model 87 also had the parts, and immediately shipped them to me. With the parts in hand, the remaining problem was the broken antenna coil forms, which were missing large pieces of phenolic where the mounting screws had broken out. More about that later.



The condition of the antenna coil forms as received.

When I took the chassis out of the cabinet I was very pleased to see that it had never been "hammed." It appeared to have been untouched since it was built in 1935, with all the original parts still in place. This confirmed my decision to do nothing to disturb the originality of the piece.

I vacuumed out the dust and loose dirt, and the remains of the three broken tubes, being careful to not suck up any loose hardware. Next, to remove the 70 years of dirt and grime from the chassis, I used a "multi-surface foaming cleaner" that I found at the local dollar store. It works great and hasn't damaged anything yet. For the tight spots, I used a toothbrush with the head bent back slightly, as well as long cotton-tip swabs. When I do this work, I am careful to wipe down any cleaned surface with distilled water, to make sure I don't leave any residue behind.

When the ceramic standoffs were broken, most of the mounting hardware was lost. The main missing pieces were 8-32 nickel-plated brass machine screws with matching flat washers and nuts. Luckily the local hardware store still stocked brass hardware, and my good friend and ace restorer Robert Lozier was kind enough to do a quick plating job for me. The resulting beautiful shiny pieces didn't resemble at all the dull gray of the other hardware in the transmitter, so I swapped the bright stuff for the original in places where it wouldn't be seen.

After the replacement standoffs were installed, I had to do the hard part, which was replacing or repairing the damaged phenolic coil forms. Unfortunately, the broken pieces were missing, so they had to be replaced. Luckily, I was able to locate some matching coil forms, and I decided to patch the originals, cutting pieces from the spare forms and grafting them onto the broken ones.

After some trial and error, I found that my Dremel tool with a thin cut-off disk worked quite

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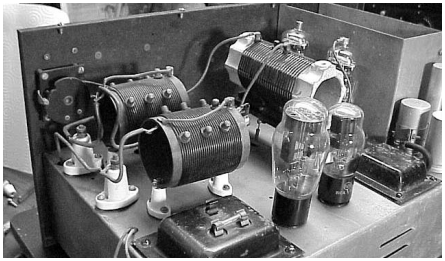
Model 87 front panel after restoration.



Interior view showing repaired antenna coils.

well. I cleaned up the broken forms, making a square hole at each location, sanding and filing until the patches fit. I next bridged each patch on the bottom of the coil with another piece from the donor form, out of sight, to give the patch the needed strength to support the coil. Contact cement worked well.

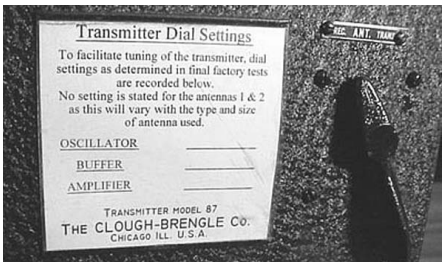
After the cement had set, I used brown plastic wood filler to blend the patches with the original. Sanding and coloring with a brown Magic Marker completed the patch. Mounting holes were drilled, and the coils remounted on the standoffs. Replacement tubes, a pair of 802s and an 83, were obtained and installed.

Another clue to the fact that this transmitter was totally original was the fact that all of the solder joints were uniformly gray. I also found several cold, loose solder joints, and a very short plate cap wire to one of the 802 finals. It is unlikely that this transmitter could be put in the air today without considerable rehab work. But, as I stated at the beginning, that was not my goal for this project.

One of the problems with vintage communications gear is what to do about the paint on the cabinet. The textured finishes that they were able apply in the 1930s and 1940s just can't be replicated today—possibly due to EPA-required restrictions in paint formulas.

Many restorers say they can get a good finish using modern wrinkle paint, but the results I've seen are far from looking correct. And if you are a BA (boat anchor) fan, you know that even if the textured paint is intact, it will turn gray with age, and no amount of cleaning will bring it back.

Some time ago I ran across an item in a 1950s *RCA Ham Tips*, recommending the use of thinned black paint applied with a balled-up cloth, rubbing the paint color into the textured finish. This will leave just the color and not fill in the depressions. I found another way to accomplish the same thing using Testors Paint Pens (available at most hobby shops) instead of the thinned black paint. I tried it on an old voltmeter with the typical gray color. The result was outstanding, with the original texture clear and



The replicated factory instruction card.

sharp under a clean gloss black color.

The paint pen looks like a magic marker, except the tip is spring-loaded. The pen is shaken and pumped to load the paint into the tip, and after a few seconds the paint will begin to flow. The best method I have found is to do a small area, and then use a paper towel to wipe off the excess. As you progress to the next area, wipe the excess off over the previous area to avoid lines.

Try out the technique on an experimental piece first. While the process is time consuming and labor intensive, I feel it is worth the effort. I have also found that it is a good idea to complete one surface in a single session; this will keep the lines between each area leas visible.

After a little cleaning and polishing of the knobs and dial skirts, I was almost done. The last thing I had to do was come up with something to go in the card holder on the front panel. One of the old CCC operators had told me that the card showed basic tuning instructions. I replicated the factory instructions shown on the Model 4581, another C-B CCC transmitter in my collection. Hopefully this is close to what would have appeared on the original.

There are still a few things I would like to do, such as replacing the damaged Cornell-Dublier paper labels on the chassis-mounted vertical filter cans. But, in conclusion, I am very pleased with how this job turned out. I would love to hear your comments on my little project, and most important, if you have any information on the Clough-Brengle Company or the CCC radio stations, please contact me.