

The Collins 30K-5 – Bringing up a rare find!

By Bill Carns, N7OTQ/K0CXX



That is the beautiful 30K-5 on the right!



The 30K-5 has a beautiful face!



Model # / Serial number plate at rear of 30K-5

The 30K-5 is not a commonly seen version of the 30K family. In short, it is the commercial market, 2-30 mc, younger brother of the 30K-1 amateur radio transmitter.

The 30K family uses a 4-125 in the final, driven by an 807, and modulated by two 75THs, to produce 250 watts of beautiful-sounding AM. Audio bandwidth is limited to 3 kc and clipping can be adjusted between 0 and 12 dB, constraining modulation to just under 100 %.

I would be remiss if I did not add a bit of the personal history associated with this transmitter, since it is the people of Collins Radio who made the company, and its equipment, what we love today.

Warren Bruene, W5OLY, (of the Bruene Coupler, Conjugate Match, 30S-1, and RF Power design fame) started it all shortly after WWII ended with the design of the 30K Amateur Radio Transmitter. At that time, Warren was a young design engineer with Collins Radio in Cedar Rapids, having joined the company in November 1939 at the age of 22. His original 30K design was a single-frequency crystal-controlled, or 310C-2

exciter driven, amateur radio transmitter. It was designed to operate between 75 and 10 meters. The original design had a link-coupled balanced output and no antenna tuning capability.

By 1946, Warren was working on the 30K-1, which included antenna tuning and loading capability in the main cabinet.

The first 30K-1s were delivered in 1947 and became the Cadillac AM transmitter of their day. Demand (from the Bureau of Reclamation) appeared in 1946 for a fixed-frequency two-channel (day and night) version for use between dam sites in the U.S.

By October of 1946, Warren had written the specs for the 30K-2 (two-channel) commercial version of the 30K-1, the big difference being the addition of all duplicate RF tuning components between the oscillator and the PA. Frequency change to either of the pre-tuned channels is accomplished with a single switch controlling lots of relays and one big solenoid in the PA deck.

The 30K-2 first shipped in 1947. Over the next several years, the 30K-2 evolved into the K-3, 4, and 5. The differences were minor and mostly associated with the remote-control capability and "tweaking" the models for various market niches.

The 30K-5 was specifically touted as a "Ground Station Transmitter" for ground air-traffic control and police service and has two relay-selectable unbalanced outputs with Pi (optional Pi-L) tuning. Warren was involved after the 30K-2, but by the introduction of the 30K-5 in 1955, he had moved on to focus on that new interloper - SSB. You also can credit him for that beautiful 30S-1 amplifier you love so much.

The 30K-5 that I obtained several years ago has a mysterious history. It was purchased in approximately 1956 and installed in an air-traffic control station in Guadalajara, Mexico. It is apparent now, after the restoration, that not long after it went into service it suffered some kind of "Antenna Event" which blew the RF Ammeter and the Plate Current Meter shunt. For some reason (I guess this was considered not repairable on site), it was then put back in the crate, sealed up, and put in storage . . . and then lost for 45 years. Several years ago, a friend of a friend was looking for MacIntosh tube stereo gear in a Mexican furniture warehouse and discovered the crate screwed to the wall in the warehouse office. It was supporting conduit and a light fixture and being used as a TV stand. Demeaning service for a pristine 30K-5!

The transmitter was promptly rescued and over the next several months made its way to Arizona after some checking and initial repair at the QTH of Sandy Meltzer, KW6KW. He and Gary Halverson, WA9MZU, did a little damage control after the MacIntosh guy tipped the box on its side and trucked it to San Francisco with the plate transformer rattling around in the bottom of the cabinet.

Early this year I decided it was time to get the 30K-5 on the air. As is my usual pattern, cosmetics, cleaning, and restoration came first. This was not trivial due to the mopping of the floor in Mexico with acrylic floor wax. Mucho days were spent removing that wax without removing the paint and then restoring the bottom four inches of the cabinet. In

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addition, I made the decision to run the box on 220 Vac, so I had to add the specified autotransformer, wiring, and brackets needed to generate the 110 Vac required internally. This turned out to be a good, but painful, decision.

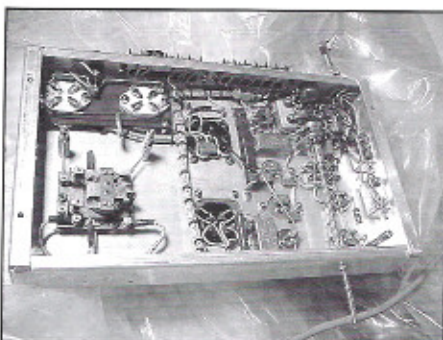
After months of cosmetic and electrical work on the 220 Vac issue, the day came to plug 'er in. I didn't even have to turn on the 30K-5 AC switch. Major smoke and blowing circuit breakers at my house! I immediately went into remorse mode, asking, "What have you done wrong now, you idiot?" The event blew almost every fuse in the 30K-5 box and there are a lot of them . . . fortunately.

To make a long story short, after going from "I made a mistake" to diagnostic mode and "It looks like a short in the harness," I found a wiring error that Collins had made at the factory. Two wires coming out of the harness behind the power panel were the same length, same tracer, and they were switched. In 110 Vac service, the problem was jumped. When I put in the autotransformer and removed the jumpers for 220 Vac service, the error put 220 Vac on the internal 110 V line. Boy, did I get lucky! No damage to anything but fuses. I swapped the two wires and up she came. I did call Collins the next day and tell them I had a warranty claim on my 30K-5. Rod Blocksome, K0DAS, was very nice . . . but refused the claim.

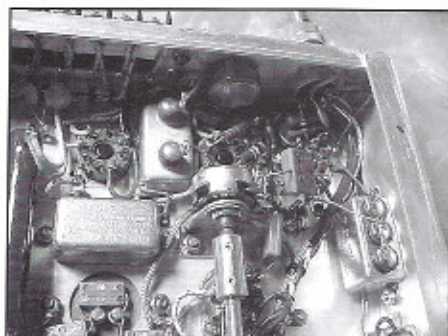
The rest was pretty straightforward. I had new bases tooled and made for several broken PA coils that I got. I got lucky and found a whole set of oscillator and multiplier plug-ins along with enough PA plug-ins to assemble a complete set of coils for all bands, including the WARC bands.

Then followed about a month of chasing dirty RF relay contacts. Those old relays didn't like 45 years of storage. The antenna relays were rewired to accommodate a single antenna unbalanced output (a Collins option using a provided relay) and a 310C-2 interface box was built to plug into the two adjacent crystal sockets. This gave the ability to easily switch from crystal to dual-channel PTO control. My 310C-2 exciter was then hooked up, and the transmitter has been getting 5-9 reports all over the west, including down into Texas with a "First Contact" with Pete, K5PZ, and his KW-1. OK, Pete, your 30K-5 is next on the agenda.

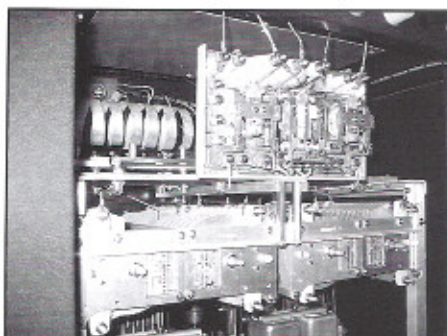
Oh . . . I also had a bit (understatement) of trouble with RF in the audio. This of course was my fault, since I needed to have some Collins audio processing in line. Therefore, a Collins 212Z-1 broadcast mixer was inserted in the micline. This required a mic transformer to get back to Hi Z. The result was an



A peek under a chassis - Note the lovely wiring



A 30K-5 that looks as good as the day it was built




Rear of 30K-5 showing the Antenna Relays

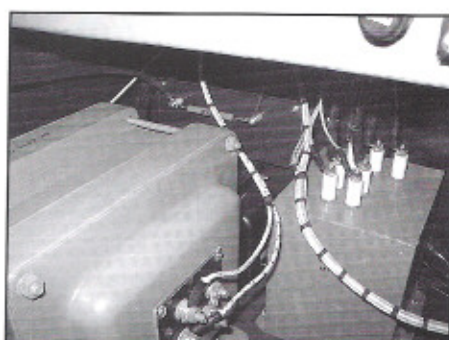
additional nominal 90 dB of audio gain in the chain to a Hi Z output and voila! – automatic howling audio. Putting a 60 dB 600 ohm pad and another 30 dB of external mic gain pot – all in the mic transformer box along with a low-pass filter – healed that self-inflicted wound.

Come by and see 30K-5 serial number 131. She's a beauty!

Warren, "Thank You!" for another beautiful design and taking the time to talk with me about your engineering book notes. Warren lives in Dallas, Texas with his wife and is still doing RF design – as a hobby of course. He is 88 years young!

I also would like to thank Pete Zilliox, K5PZ, for his help documenting coil data and configurations, sharing some critical parts with me, and listening to me whine when I blew all those fuses.

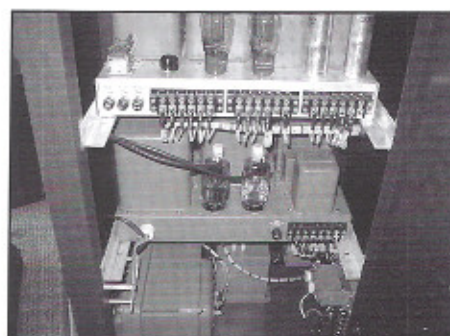
See you all on 75 or 40 meters...AM naturally! 73s for now, de N7OTQ 



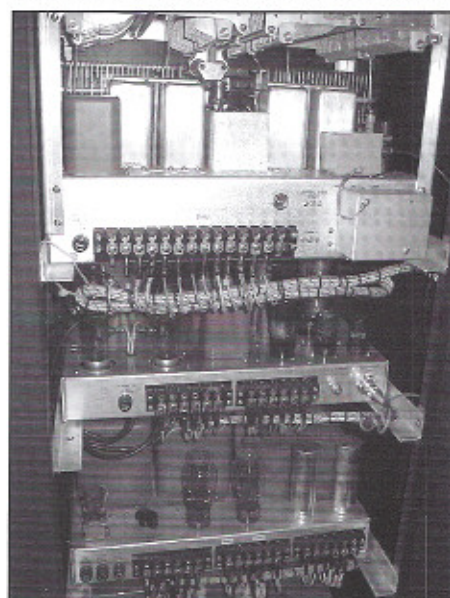
Rear Corner 220 V/110 V Auto Transformer



Ahhh! 75THs in residence - Charm at its finest



Rear of 30K-5 showing the Power Supply Chassis



30K-5 RF, Modulator and Power Supply Chassis