

Signal One CX-7/A Power Supply Rebuild

Several notes are in order regarding this Power Supply rebuild:

- *This board was rebuilt to the [original PS schematic](#), with the discrete transistors, not the more common three terminal regulators.*
- *The latest schematic known by me to exist is [here](#). It incorporates all the PS board revisions and the latest (at the time) three terminal regulators.*
- *For those of you who are interested in what an original PS board (traces only) looks like, here is the [front](#) and [rear](#).*

The passage of time has aged most of the components in the Signal One radios. In the case of Electrolytic capacitors it has caused degrading of the associated circuits and their performance. The result is usually some sort of voltage related failure accompanied by a whiff of smoke, if you are lucky, or no visual/audible response at power up. Just such a failure of a CX-7A initiated the rebuild of its A3 power supply PCB and external chassis mounted Electrolytic capacitors.

The +1400 output from the PS PCB to the chassis filter bank was disconnected. A HV probe confirmed that the PA B+ was OK. Additional checks on the rest of the power transformer revealed no damage.

At this point Re-Capping the Rig looked like a good idea considering its age which was about 38+ years. This rig is an early Florida radio with serial number under 300. A list of all the Electrolytic capacitors involved on the PS PCB and chassis was made. A look through several component distributors catalogs revealed that several values, used on the chassis, were not available or were in a can size that was not comparable to the originals diameter. Component distributors, as a rule, only carry a narrow band of the most common/high volume parts. Because of this several of the chassis parts were procured directly from CDE as noted in the [attached spread sheet](#). NOS parts were not considered for the obvious reasons.

The mounting system initially used for the chassis Electrolytics is obsolete. CDE capacitor mounting rings appeared to be a reasonable alternative in that they matched the original drill pattern on the chassis. An additional consideration was that C6 and C9 had to be limited in their vertical dimension so as to fit under the four controls on the back chassis wall. Snap-Mount capacitors were ruled out because of the need to fabricate a separate board, either PCB or plastic, to which they would be mounted (Glue?) and then mount that into the chassis and clear the adjacent controls and wire cabling. The feeling was the mounting rings would give a cleaner result.

During the initial placing of parts on the chassis, it was discovered that the tabs on the mounting ring which, are held together by a small machine screw, were interfering with adjacent mounting rings. The solution was to re-orient the rings into a pattern of least interference. This resulted in drilling a few new 0.080 holes to match the new positions. This gave most mounting rings two hold down points. The exceptions are C6 and C9, which only have one screw. The unsecured side of their mounting ring is against the back chassis wall on top of a welded seam under the controls, an impossible place to drill. Use caution when tightening the screw that holds the capacitor to the ring. I also used a lock nut. Tighten to the point of being able to turn the capacitor in the ring with a high amount of finger pressure. You do not want to cause the capacitor case to be distorted or bent by over tightening. That will guaranty a not to far in the future failure of the part. Once the part is mounted to the chassis, using the original sheet metal screws, you can orient it to the best position for wiring. The parts used have screw terminals to accommodate either solder or crimp lugs. An inspection of the removed chassis parts found several that had leaked.

The parts for the A3 power supply PCB were straight forward in that the main consideration was finding a part which had a lead spacing and vertical height that matched the original. Distribution had all the parts needed. The values selected were twice the value of the original parts. This is based on notes made by Paul Kollar. Paul came to this conclusion after rebuilding numerous power supply boards that had similar failures attributed to regulation stability. The improvement in components in the last 35 years has resulted in greater capacitance in a smaller package at higher voltages. Care should be taken when removing the old parts. The circuit traces, because of their age, are damaged very easily by high heat and rough handling. This circuit board had not been removed since it was installed at the factory yet it had six separate trace repairs. Some resistors were also replaced due to heat induced damage and the resulting value change. The finished assembly looks similar to the original. One noticeable difference is that C2 is twice its original value and voltage yet is smaller than the original.

The attached pictures ([PCB1](#)) and ([PCB2](#)) show the resulting PCB assembly and chassis area ([Upper1](#)), ([Upper2](#)), ([Lower1](#)) and ([Lower2](#)). The final page details the parts involved and their source. In the case of the CDE parts they were purchased directly from the factory. These parts result from production over runs. The caveat is \$100.00 USD per line item (i.e. part number X quantity = \$100) plus shipping. They accept Master Card and Visa. Call Aron Cobb, Sales F.A.E. at (864) 843-2277. He can run your P/N and check availability.

A few extra parts are available: (1) C3, \$20 and (3) C2, \$25/ea, plus shipping. Contact Bill Turini at bill.turini@HAManuals.com if interested.