

Restoring the Dumont Royal Sovereign Television Receiver

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The Dumont RA-119 Royal Sovereign, the 30 inch TV with the largest direct-view screen ever made, was presented to the public in 1952 at price of \$1800. It was found in hotels, bars, and the homes of the very rich.

CHRS is fortunate to have found one in Alameda in October 2004. The restoration started in April 2012.



This set uses a metal-cone 30 inch 90 degree deflection CRT that has a seal between the large screen and metal cone. This seal frequently leaks.

Before restoration was to start, the health of the CRT had to be determined as a full restoration could not be carried out without a working picture tube. Other Sovereigns have been fitted with a 27 inch rectangular tube but this would not do for us.

To test the CRT, the filament and grid voltages were applied to the gun and a 6 kV high-voltage power supply connected to the metal cone. An unfocused spot of light appeared on the screen. No focus or deflection coil were used. This indicated that the CRT was probably good, or at least not gone to air.

After this successful test, the rest of the receiver was evaluated. The electronics is contained on two chassis: one to provide RF, audio and deflection functions, and one to provide a regulated 20 kV high voltage for the CRT. The high voltage chassis was missing.



The RF/audio/deflection chassis is mounted on the side of the cabinet. The red cone of the CRT is mounted to its left.



But the floor of the cabinet is empty, the place where the 20 kV power supply is suppose to sit.

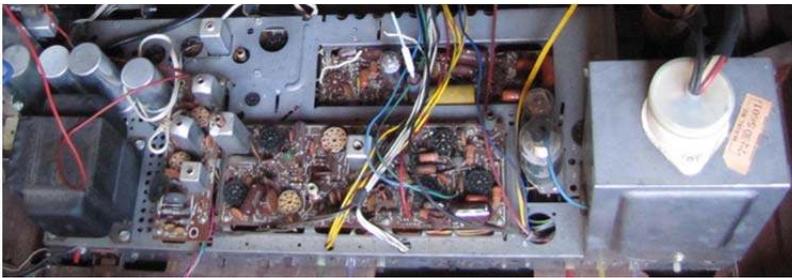
No HV power supply could be found. We could build one, but a “brute force” power supply using a large transformer and rectifier

was rejected as being just too dangerous. Except for the earliest TV sets, the high voltage is provided by a limited stored energy power supply that could not deliver a fatal shock (but a nasty one nevertheless).

A solution to the missing power supply problem was solved by using the chassis from another TV, which could safely provide the regulated 20 kV required.

Thanks to CHRS member Bill Voight, his operational RCA CTC-16 color TV was sacrificed and the chassis converted to work with the Dumont set.

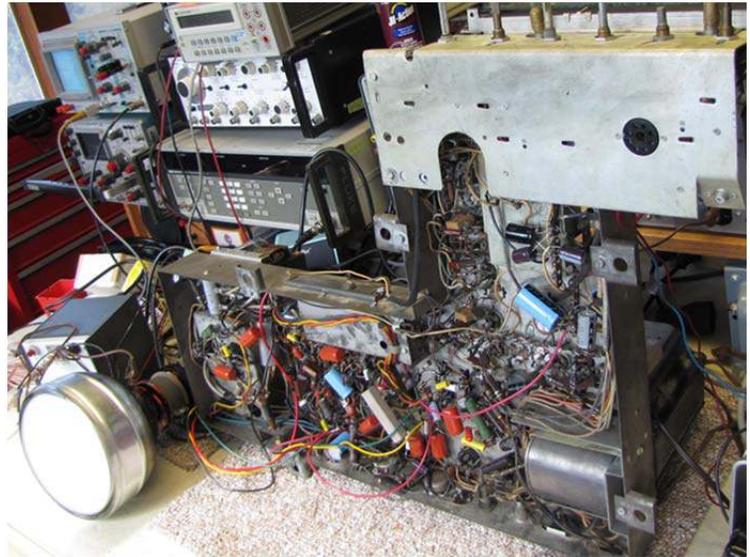
The RCA chassis was connected to the Dumont chassis to share the low-voltage power supplies. To prevent interference between the Dumont deflection circuit and the RCA flyback power supply, the horizontal sweep pulse from the Dumont synchronizes the RCA HV supply. All tubes were removed from the RCA chassis except the horizontal sweep and high-voltage rectifiers.



Now that the missing HV power supply problem was solved, the restoration of the Dumont chassis could begin.

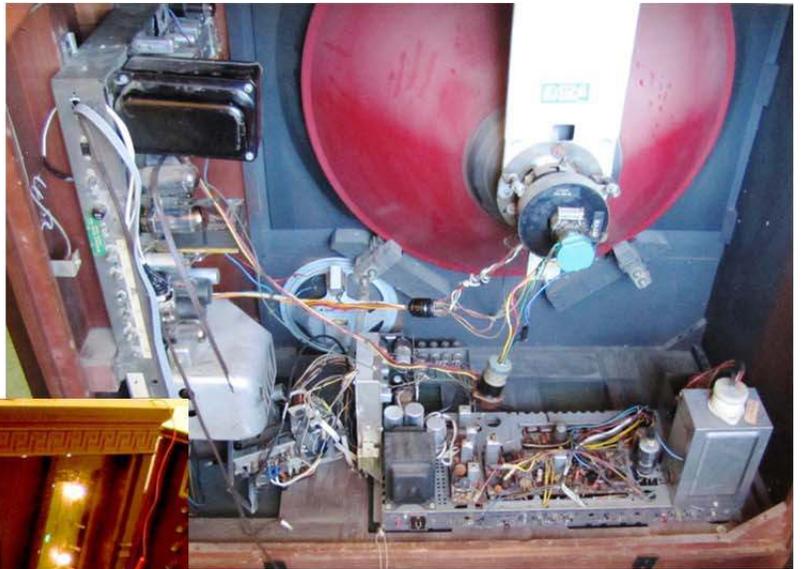
With a small test CRT, the restoration started by completely replacing all the capacitors and other damaged circuit elements.

This set also includes AM and FM tuners. The FM and TV tuner mechanism is based on the Mallory "Inductuner", a continuous-tuning variable inductor that covers the entire VHF TV and FM band. This type of tuner always requires cleaning of the moving contacts.



After the recapping and cleanup, both chassis were placed in the cabinet.

A small and distorted picture appeared, which was a good start. More work was needed.



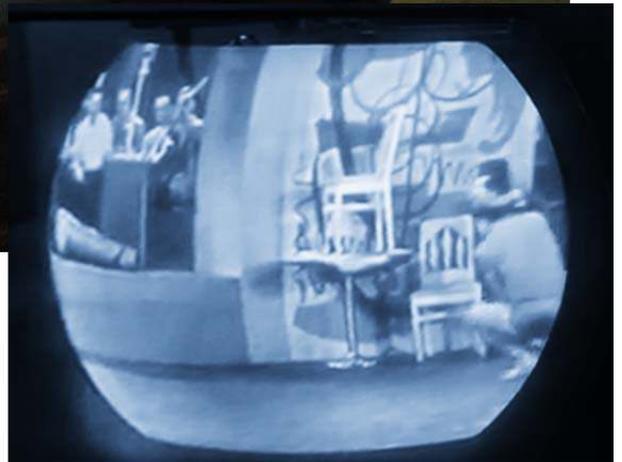
As the chassis is difficult to remove and replace, the Dumont chassis was set up in an “operating theater” right behind the cabinet and connected to the rest of the set through extended cables. This allowed further adjustments and improvements while observing the picture quality.





Finally, a good, sharp and bright picture!

We're still missing the original HV power supply. Can anyone find and supply one?



This is one of the very few surviving Royal Sovereigns still operating with the original 30 inch picture tube. With the transplant of the RCA HV chassis, it is not original, but at least operational.



Dr. John Staples, W6BM, designs and builds particle accelerators at the Lawrence Berkeley National Laboratory. He received his Extra Class ham license and First Class Radiotelephone and Radar licenses in 1958. Besides being an avid collector of vintage electronics, he has been a passionate motorcyclist for over 50 years.

All photographs by the author.