

## Tube of the Month

### 8D21

Television has been around in one form or another since the late 1920's. RCA's first experimental station in New York had one transmitter, three scattered receivers and a "Felix the Cat" doll slowly rotating on a turntable. Very exciting. After the end of WWII, the FCC licensed commercial VHF television channels in two frequency segments and 70 stations were quickly licensed. Coverage was a real problem as stations tended to be low power, but with tube technology learned during the War, new tubes were being developed. RCA had been working on the problem and by 1948 developed a new transmitter, the TT-5A (Television Transmitter 5 KW) around its new tube, the 8D21 that had been in development for several years.

All glass tubes have a practical limit of about 2 KW dissipation, so the 8D21 was built with all its elements water cooled and not just the anode. This gave the tube a dissipation of 6 KW with an input power of 10 KW. With an upper frequency limit of 300 MHz, it would operate on all TV frequencies. UHF TV wasn't approved until 1955.

The TT-5A used two of the 8D21 tubes. One was in the video transmitter and the second in the FM audio transmitter. Both transmitters were constructed with similar RF sections. Low channel transmitters could omit the last two driver stages. The upper channels required the additional stages ending in push pull 4C33s (later 4X500As). Due to the tube's construction, they needed to be mounted on their sides. The complicated network of wires and water hoses made fast tube replacement a real problem. The TT-5A had the tube mounted on a vertical plate that could slide out with the tube attached. Most of the water lines were combined so a new tube module could be slid in quickly.

With this powerful transmitter the range was greatly increased. TT-5As were quickly installed on Mt. Wilson and the Los Angeles basin was all in range. The weird looking tubes were used in RCA tube advertising for several years and are scarce today. I think the old TV engineers kept all the replaced tubes as souvenirs.

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