

RCA Broadcast Transmitter defects

The history of only one of many

Richard B. Johnson

Hans Bott designed some of the early RCA FM transmitters and, for their day, they were quite reliable.

<http://www.nrcdxas.org/articles/btf10c/>

When RCA moved their Broadcast group to Meadowlands, Pennsylvania, they lost their most significant transmitter designer as Hans went to Gates Radio, now Harris Broadcast Products, and headed up their new television transmitter division. Many years later, I worked for Hans as he came out of retirement to become VP of Engineering at McMartin Industries in Omaha, Nebraska. I am quite familiar with “both sides” of the RCA transmitter quagmire.

In the early '60s, RCA took the basic 10 kW RF final amplifier design, added a solid-state power supply, a new vacuum-tube exciter, the BTE-10C, a new power amplifier tube, and a larger blower to create the BTF-20E FM transmitter. This was to serve the 20 kW transmitter market. It had several problems all of which I will not detail here.

The major problem was that once an arc started in the PA Box, it would track across a highly-flammable Rexolite plastic shelf and start a fire which, fanned by the high-velocity air from the blower, would cause molten aluminum to run out of the transmitter and start fires.

Here is a Web thread about this transmitter. It is all about its fires.

<http://boards.radio-info.com/smf/index.php?topic=74168.0>

This transmitter eventually earned the unflattering nicknames of “Flame Thrower” and “Fireball.” I was working for RCA Service Company out of the South Philadelphia office at the time. I was very young, in my early twenties and enjoyed installing TV transmitters, rebuilding old ones, and performing proof-of-performance measurements for RCA equipment including TV transmitters and antennas. I loved the job because I visited many major cities and worked with some outstanding people in the broadcast industry. Since I spent most of my time in the field, the company paid my



living expenses so I was able to save money and even purchase my first new automobile. Life was good!

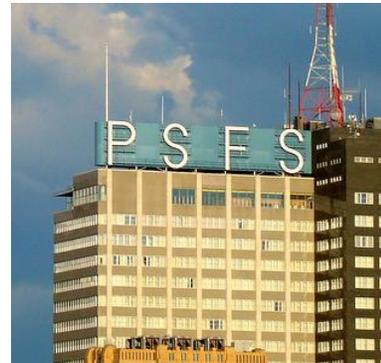
An emergency occurred. Fire had destroyed some stations that installed new RCA BTF-20E FM transmitters. To correct the problem, RCA had developed a new “retrofit kit” to install into the remaining FM transmitters. This was to prevent future fires. I was sent to Meadowlands to learn how to install these kits in the field. David Sauer was the engineer in charge. He explained that once an arc had started within the PA box there was no overload condition detected because the PA current could actually drop. The power that used to go out to the antenna would dissipate within the PA box, possibly starting a fire.

The retrofit installed a device to compare RF output power and, if the PA amplifier was on, but there was low RF output power, the kit would turn the PA back off. I asked Mr. Sauer how one could turn on the PA since there was no RF power until it was on. He explained that the logic bypassed the new circuit as long as the “ON” button operated or the remote control system performed the same action. This did not seem right to me, but I was just a technician, learning as I was gaining experience. Even as a technician, I had designed a one-kilowatt AM transmitter, Type Accepted by the FCC as the Johnson Associates RBJ1-C, and I did not need to make such a kludge.

<http://www.route495software.com/Job/Page156FCCList.pdf>

I was concerned because my experience within the broadcast industry made me think that an operator at the studio, sensing that the transmitter would go off as soon as he removed his finger from the ON button on the remote-control unit, would keep the button pressed until the chief engineer told him otherwise. This would certainly allow the RCA transmitter to continue to arc, possibly starting a fire.

The first transmitter into which I was selected to install the retrofit kit was that of WMMR, Metromedia Radio in Philadelphia, Pennsylvania. The transmitter was located at the top of the PSFS building. I installed the kit with the help of the station’s chief engineer. As trained, I instructed the chief engineer on the proper setting of the RF output meter trip point. Everything worked as expected.



About a week later, the WMMR transmitter caught fire. It burned the entire top of the PSFS building, destroying millions of dollars of telephone company equipment as well as the transmitting equipment.

I was promptly fired

To me, this meant that my whole life had been destroyed. I had become a fall guy for some big corporate bigwigs who had no concept, nor did they even care, about what was right or wrong.

Fortunately, I was able to quickly find another job so I did not dwell too long on the atrocious, unconscionable misbehavior of RCA. Nevertheless, it was then that I decided to continue my education so I could do everything within my power to design RCA out of the broadcast transmitter business.

Here is what one of those transmitters looks like after a fire, if one is lucky enough so extinguish it before it destroys the whole site.

There were many other RCA transmitter fires, often in the top floors of buildings like the PSFS building.

The fires continued to occur long after the company installed the so-called retrofit kits. I can only guess that RCA could not find anyone else to fire.

I did get my revenge. For the next fifteen years, I developed top of the line broadcast transmitters for new up and coming broadcast transmitter manufacturers. Included in my credits are two fifty-kilowatt AM broadcast transmitters and the first one-kilowatt solid-state FM transmitter ever Type Accepted by the FCC as well as the first one-kilowatt solid-state AM transmitter. The techniques I originally developed are still used today.

At mid career, I abandoned broadcast transmitter design to enter the medical electronics field where I continue today. At the age of sixty-seven, I am still gainfully employed as an engineer and many former RCA employees have gone to their final resting place, hopefully on the other side of the River Styx. I think that the persons who worked for RCA at the time still owe me apology.



Credits

The fire photographs were contributed by Neil Schwanitz, code_talker1960[at]yahoo.com