Confessions of a "Tape Head"

By Dave Sieg

My first exposure to videotape was in 1967 while attending Dobyns-Bennett High School in Kingsport, Tennessee. The city had just completed a new state-of-the-art building with pie-shaped classrooms, ramps instead of stairwells, and closed-circuit TV monitors in every room. Finding my way through the usual hallway shuffle between classes I happened past a half-open doorway and got a glimpse of plastic-wrapped racks of equipment and a guy scratching his head looking at some drawings. Not being able to resist, I stepped in and asked him what all the equipment was for. "This is going to be a TV studio! Do you want to help me put it together?" he asked. His name was Gary Smith and that invitation undoubtedly changed the course of my life. I had always tinkered with old radios and electronic kits, but this was on a completely different level! I thought I had died and gone to heaven!

The studio had a monochrome GPL camera and film-chain, and there were two Ampex 7100 1" VTRs and a little Dynair switcher. Gary arranged for me to help him during my study-hall time and I found myself staying after school, soldering PL-259's onto coax, but more importantly, learning how sync generators hooked up to DA's and switchers and made a TV studio work. We had a great time playing video production and doing live homeroom "broadcasts" every morning. Sadly, nobody bothered to keep any of those old 1" type A videos. I'd love to see them today!

Me, posing for an annual picture in 1968. Can you say *Geek*?

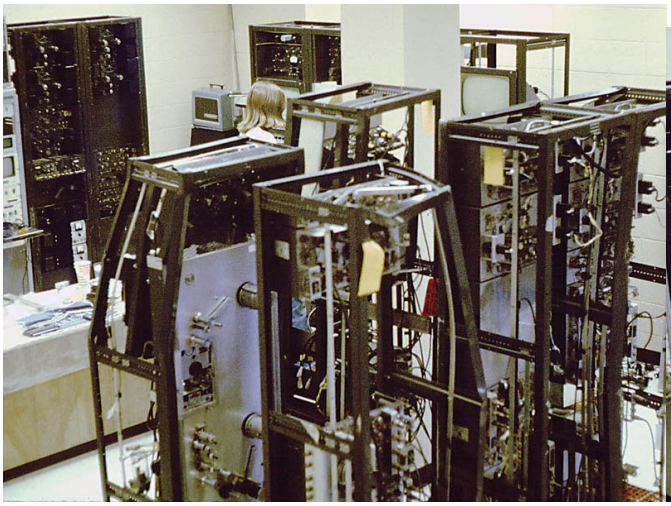
The following summer, our local cable-TV franchise was bought by United Transmission of Kansas City. They began originating local programming on cable channel 12, and Gary and I helped them put their studio together in a garage downtown. They had a little Telemation switcher, 2 small GE monochrome industrial cameras, a film chain, and an Ampex 7000 VTR. They ran *Felix the Cat* cartoons and a live newscast, which consisted of a guy reading the paper aloud weekday afternoons. I was hired with two other guys to cover their two "remotes" every week. We lugged one of the cameras and that 100 lb VTR to the National Guard Armory and shot "*Wrasslin"*" every Wednesday night, and then we did the same thing every Saturday night at the old Gem Theatre, shooting the "*Lonesome Valley Jamboree*". I learned the difference between great and not-so-good Bluegrass music first hand.

A year later, WKPT-TV-19 signed on and they asked Gary if he knew any kids that might be interested in part-time work. He recommended me. After my small introduction to monochrome TV, I was in awe of the station's control room. This was REAL broadcast color TV! They had a TRT-1C and a TR-22 quad machines, a TK-27 filmchain, and a hulking TK-41 color orthicon camera. I found myself loading slides and film, cueing up quad tapes, lighting sets, running camera, airswitching, and eventually directing newscasts and even a live *Bozo the Clown Show* every afternoon.

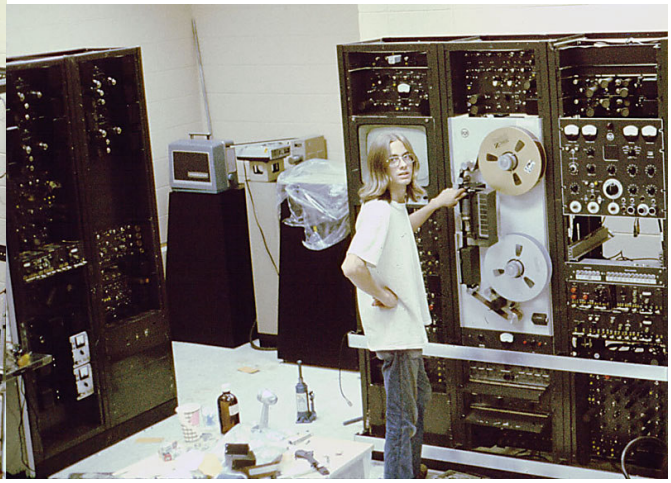
It was a minor miracle that I managed to graduate, given all the time I was spending with my extracurricular activities instead of studying. But I was hooked. I knew I wanted to be a TV engineer! I had an offer from Ole Miss, and I had a lot of relatives in Oxford, so thats where I ended up attending college. But they had nothing like the equipment I'd cut my teeth on. They had a little studio in their Fine Arts Center made up of old TK-11 camera equipment that WHBQ in Memphis had donated. I was to major in Radio and TV, but after my first year, I was convinced I was headed in the wrong direction. Gary had convinced me that to be a *real* TV engineer, I'd have to get my "First Phone" license from the FCC, and so the following summer, I did.

That fall, I couldn't stand having my "ticket" and not using it, so I dropped out of school and went back to work at WKPT, but this time in Engineering. I did manage to help repair a few monitors and such, but found myself mostly driving a truck up to Holston Mountain every day to verify the meter readings read remotely at the studio. At the time, UHF stations were allowed to operate by remote control, but only after proving that their readings were reliable for some period of time. I guess sending me up to the mountain every day was cheaper than having resident engineers like our VHF competitors had. I had the best boss I have ever worked for, Harold Doughtery. He was patient with my youthful enthusiasm and kinder than he needed to be when I screwed up. WKPT also had an AM and an FM in different locations too, so I could easily burn up an entire day just visiting and inspecting all three transmitters and writing "All appears OK" in the logs. I learned a lot but it was mostly about driving mountain-top roads in three feet of snow, or getting stuck in the muddy swamp where the AM tower lived. It only took a year of that before I realized college was a better long-term direction for me.

When I got back to Ole Miss, I discovered Jack Lacy shooting a conference with a couple of monochrome Telemation cameras and an IVC 700. We struck up a conversation and I ended up with a part-time job helping him run the "media center" in Bishop Hall. The following summer we visited the Mississippi Surplus Properties warehouse in Jackson, looking for anything we could scrounge to build up our facility. To my complete and utter amazement, I found two TRT's sitting in the corner of the warehouse! They had been at Patrick AFB in Florida. One of them had somehow fallen on its face and the other one had some of its rack frames torqued out of square, but there were two headwheels in their shipping containers, two full sets of manuals, and both had been equipped with the solid-state servos and color processors! Jack convinced somebody in the University to cough up $150, and suddenly we had 12 racks full of vacuum tubes to add to our tiny studio!



The TRT-1C as it arrived, bent racks and all.



My brother, Alan Sieg helping with the restoration.

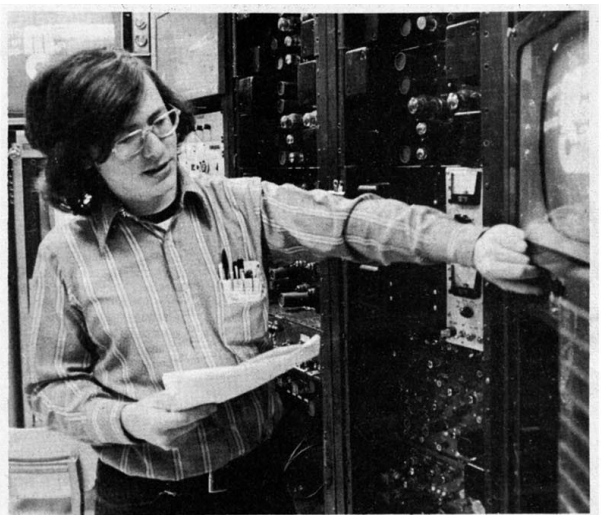
Fortunately, the engineers who had de-installed those machines had done so with loving care, unlike the apes who ran the forklifts. The TRTs had 2 racks consisting of power supplies and servo amps, connected to the main 3 transport racks via a 25 foot long 2" thick umbilical cable that fanned out at either end with coaxes and individual (thankfully color-coded) wires that went to huge transmitter-style jones strips in the various racks. My brother Alan and I spent nearly the entire summer using a hydraulic jack to bend the racks back square, and tracing out and re-connecting the cables. I remember we had lots of conversations with his head buried in the servo racks and mine in the transport that went like: "2TB6-13 is a white-blue-red thats supposed to go to 5TB3-7." and "OK, it is now!"

I had a general idea how a VTR worked, but that summer I immersed myself in the TRT's books, learning every detail of how servo circuits and FM video mod/demodulation circuits work, and how they all play together. I have to credit RCA for having written very good maintenance manuals for those machines! The TRT was laid out really well, with sections in U-shaped rackmount chassis tubs, each with a dozen or so vacuum tubes and hand-wiring on the back. RF or video ran in RG-59 and power supply and control logic ran in single conductors via the Jones strips. These machines were new enough that they had nice solid-sate 400v DC power supplies, unlike earlier versions with furnace-like tube regulation.

We finally felt we had everything hooked up right and had the courage to turn everything on! Surprisingly, there were no fires, smoke, or even tripped circuit breakers! Then we spent quite a few days carefully checking voltages, signals, vacuum and pressure gauges, and replacing tubes. We also had to do some major re-direction of air-conditioning vents to handle the extra kilowatts we were injecting into the building's heat load! I gather that RCA had built the machine with the umbilical cable allowing racks 4 and 5 to be in another room. Each servo rack had two huge tube-type audio amplifiers, two driving the headwheel through a Scott transformer, and two driving the capstan motor.

Finally, we had the courage to hit standby and listen to the satisfying sound of the headwheel spinning up! Fortunately, there had even been a test-tape with the machines, and even though it didn't lock right up, it ran tape and you could see video from the demod out! A little further tweaking and replacing tubes in the servos and we got it to lock! That was an amazing day! I recall the servo amps had mercury regulator tubes and when you first hit standby, you could see the throbbing purple glow as the motors came up to speed and the servo's hunted for lock. We had quite a stream of visitors in to see our $150 miracle!

Success! No smoke, fires or tripped breakers!



Gee, has it really been 36 years ago?

It took a little more work to get the machine to record up to spec, and fortunately the headwheels we had gotten still had a lot of life on them. (Convincing the university that they were going to have to spend $1,000 to get them rebuilt every thousand hours or so was an interesting experience!) Then, the color processor work began. Unfortunately we had no documentation on these. At NAB one year, I cornered our RCA rep, Paul Higginbotham, and he pulled strings somehow and got the group (I think in Camden, NJ) to send us the ORIGINAL drawings to the color proc! They claimed we had the last working TRT! From those it was easy to get color working and the machine was used in many productions for several years.

One day we had a group of visiting dignitaries in to show them “Iron Bessie” in operation. As one of the “suits” stood watching the whirling reels and blinking waveform monitor there was a sudden hissing sound. A filter cap down in one of the power supplies had had enough and it let loose with a hot stream of stinking electrolyte right onto the guy's shoes! I will never forget the look on his face! I'm sure it re-inforced his obvious fear of technology, but fortunately, he didn't control our budget!

The facility grew and I ended up on the University Staff as Chief Engineer, thanks to my FCC license. Staff were allowed to take two tuition-free courses per semester, which was how I eventually got my degree. I thought it was a good deal: they paid me and I had a studio to play in. We scoured the surplus properties listings, and the Media Center ended up with a practically unused TR-5, which I later high-banded, a bunch of TR-4s, and a color studio with three Phillips LDK-50 cameras and a big production switcher donated by the state ETV network.

By 1978, we were producing the Ole Miss football hilights shows early Sunday mornings and making a dozen or so dupes that were flown around the state for air. Eventually, that led to 1”C VTRs, and eventuallly, satellite distribution. By then I had moved on to work at Image West in Hollywood, where we had a VR1200 and three IVC 9000s and some very unusual analog animation computers called Scanimates... But thats another story!

I will always have a warm spot in my heart for that old TRT machine! It was built like a tank, and it was in some ways over-designed, allowing for more than the usual tolerance for error. It made a lot of heat, and required a constant vigil for soft-going tubes, but it was a good machine, and I knew every circuit in it! That knowledge has served me well over the years!