Roy Justus Builds a Replica of the Jon Titus Mark 8 Computer

I first learned to program a computer by taking a class at Virginia Tech which taught Fortran IV on the IBM370 main frame using punch cards for data entry. The year was 1978 and it was an enjoyable class. We worked at our own pace and were graded on our mastery of the subject as measured by how many programs we completed and how well we solved the problem in logic given. Then came video terminals in place of the punch cards for a chemistry class. Very cool stuff. I spent many late hours at those old HP terminals running simulations of NMR spectra and chemical composition problems.

I left Tech in 1980 and took a job as a lab technician and operator at a local waste water treatment plant. I wasn't seriously going to take the job at first, but I went to check it out anyway. When I got there I talked to the superintendent and looked around. I walked into a room filled with analog controllers, strip chart recorders and alarm systems and I changed my mind about taking the job. It was a fine opportunity to learn more about process control and analog electronics.

I went back to tech in 1984 and took some digital electronics classes taught under Mr. David Larsen and Dr. Paul Field. Just about that time the plant I worked at began to be upgraded with digital electronic controllers and we received our first IBM PC. Actually it was a Radio Shack model 1200 which was an accurate clone. I spent the next year writing the software we used for processing the data we collected throughout the plant. We used this software for about 14 years until we upgraded to a windows system and had to purchase a professionally written program to replace my homebrew software. The classes in digital electronics and computer programming at Virginia Tech prepared me for the transition from analog to digital electronics and for the use of computers in the lab.

I first heard of the Mark8 when I saw an Ebay auction for a kit to build the

machine in the vintage computer hardware category. I started reading about it and to my astonishment learned it was built by a guy from Virginia Tech. I myself attended Virginia Tech in the 70's and 80's and hadn't heard about the Mark8 until this time (2006). I also read that most original Mark8 kits sold did not result in operational machines because of its complexity so I decided to try my luck with it. I purchased two of the kits which contained the pc boards and a few critical components and set to work on the machine. After a couple of weeks stuffing the boards and constructing the framework they resided in, I completed the enclosure, wired up the switch banks to the pc boards and completed all the miscellaneous connections necessary for operation. When I applied power nothing happened. After some investigation with a logic probe I found a dead chip and replaced it. I also had to replace three flip-flop circuits and powered up again. IT WORKED!! Couldn't believe my luck.

The next task was to run the test program provided in the original magazine article. I input the program and set the switches and the machine began to execute the test program. Everything worked and the output register began to count in binary from 0 to 255 then cycle back to zero and start again in an endless loop. The machine was alive and I had a fully functional Mark8 on my hands!

Building the keyboard was the next step. I nabbed a couple of ASCII keyboards off Ebay but couldn't get them to work since they didn't have any documentation with

them. I finally found a basic matrix keyboard complete with schematics and used that in conjunction with a microcontroller to produce a fully functional ASCII keyboard. I also programmed the microcontroller, an Atmel ATmega16, with some custom Mark8 software that it could transmit to the machine after a 17 byte boot-loader program was manually entered into the Mark8. That is how I came to know the Mark8. The machine that started the PC revolution we live today....

Roy R Justus

Roy has graciously donated his Mark 8 to the Microcomputer Museum in Floyd, Virginia. The curator of the museum, Mr. David Larsen, was Roy's instructor at Virginia Tech when Roy attended in 1984. Roy's computer can be seen on display at the museum located at the LCF Professional Center, Suites 8 & 9 of the Village Green, 201 E. Main Street, Floyd, VA.

For more information go to:

www.lcfvideo.com
www.microcomputermuseum.com
http://bugbookcomputermuseum.com/

Mr. David Larsen www.littlefamilyfarm.com