

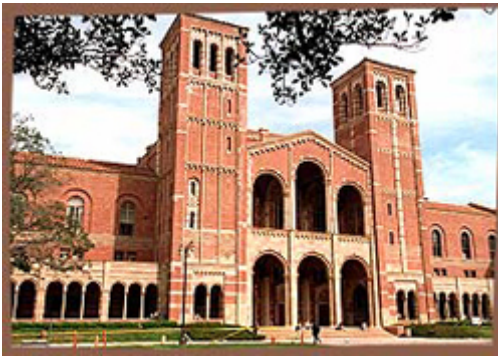
## News from Nan

### COMPUTER HISTORY

# MY HIGH-TECH ADVENTURE: CHAPTER 03, COMPUTERS AT UCLA

SEPTEMBER 1, 2018 | DICK

*Dick wrote this post, which was part of a book, My high-tech adventure, to record his memories of working in the computer industry, starting in about 1960. It was first published in 2012.*



UCLA Royce Hall

## Western Data Processing Center

I entered UCLA as a freshman math major in the fall of 1960. At that time, IBM and UCLA were joint participants in running a data center (Western Data Processing Center) at UCLA. The center was located in the Graduate Business Administration building on campus. Shortly after arriving at UCLA, I went on a tour of the Center. This was the first time I had seen a real computer “up close and personal.” It was an IBM 7090 with assorted card readers, printers, and tape drives attached to it. The tour guide key-punched a short Fortran program that calculated a table of sines and cosines for us and printed them out on the line printer attached to the machine. The speed with which the machine did this and the flashing lights on the 7090 console fascinated me. When we entered the glass-walled machine room, the card reader was on the left, the 7090 in the middle, and the line printer on the right. The guide put the cards in the reader, which went “kachunk, kachunk!” reading the cards, then the lights flashed on the 7090 console for a few seconds, and almost at the same moment the line printer began printing the results. Prior to this I had been used to calculating sines and cosines with tables of logarithms and slide rules, which took a lot longer.

The person who led the tour was Steve Crocker, who later went on to become famous designing the ARPANET. The Center housed the machine in a setting that was fairly typical of early machine rooms. The front wall of the room was all glass, which allowed people passing by to see the flashing lights and moving tape drives. This is where the term “glass house” came from.

The figure below shows an IBM 7090 computer.



*IBM 7090 Computer*

## UCLA Computer Club

In 1960, the way a student learned about computers at UCLA was to join the UCLA Computer Club and take Saturday classes from them. There were no computer science classes or majors at the time. I majored in mathematics, which was the closest thing I could find to computing. Also, I really was very interested in mathematics. My first computer class was “Introduction to Fortran Programming on the IBM 7090.” At that time, this meant learning the Fortran II language, the first of many computer languages I learned. The first Fortran program I wrote calculated and printed a table of compound interest. The programs were key-punched on an IBM 026 or 029 key punch onto 80-column cards. The card decks could be listed on an IBM 407, which read in card decks and printed them on a printer. We would place our card decks in a long metal tray kept in the basement of the Mathematics Building, and our programs would be run overnight on the IBM 7090. If we were lucky, we would get the printed or punched output back the next day. Sometimes we got nothing at all, because the computer had been busy doing something “more important.” This meant you could wait a day or two just to find out you had made a key punch error!

The program listed below produces a table of compound interest values. The first two lines are control cards identifying who gets charged for the run and that the Fortran compiler is to be invoked.

```

*9017J 2 10 RICHARD JOHNSON UCLA COMPUTER CLUB HOMEWORK PROBLEM
*FORTRAN
11      FORMAT(1H ,13F9.6)
      DIMENSION PV(13,100)
      DO 10 N=1,100
      DO 10 I=1,13
      XI=35+5*I PV(I,N)=1./(1.+XI/1000.)*I
10      CONTINUE
      PRINT      11, ((PV(I,N), I=1,13), N=1,100)
      CALL EXIT
      END

```

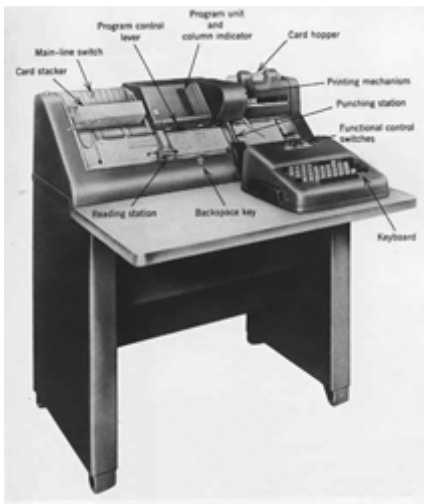
*My first computer program*

The 7090 took about 7 seconds to run this program, and my latest Thinkpad laptop computer runs the same program in .01 seconds.

Not long after I wrote this program, I wrote another one like it and submitted it for an overnight run. The next day I got the results back, and they were wrong! I was convinced that the 7090 had made a mistake. It was only a day or so later that I found I had created my first software bug.

Since then I have created thousands more.

The following figure shows an IBM 026 key punch.



*IBM 026 keypunch*

## Computer operator

One time in 1960 I came home to Lemon Grove from UCLA on a visit, and my friend Lane Carroll took me to the place where he was working as a computer operator. I don't remember what the place was (maybe one of the aerospace companies?), but Lane was the operator for an IBM 1620. This was the

small scientific machine of its day (even though it didn't have a divide instruction!) It had 20K of memory and was pretty slow. But it was relatively cheap, so people bought it. Lane had programmed it to type out random doggerel poetry stanzas, and we had great fun watching. That was the first time I actually got to operate a computer. In those days it was not easy to get near a computer, since they were all expensive and scarce.

The figure below shows an IBM 1620 computer.



*IBM 1620 computer*

## Smyth Research Associates

At UCLA I interviewed with Dr. John Smyth for a summer job after my freshman year. I worked that summer and the next at Smyth Research Associates in San Diego. The company's only customer was the U.S. Air Force. Smyth specialized in the physics of the bending of radio waves by the ionosphere, and the Air Force was interested in this because they wanted to track radio signals from Soviet missiles and wanted to know how to account for bending effects in the atmosphere. I spent both summers doing bending calculations on a Friden desk calculator, because at that time it was cheaper to hire a student to do this than to buy time on a computer to do the same calculations. In my junior year at UCLA I wrote a small Fortran program to do these calculations and it took seconds to do what had taken me and the Friden hours.

The following figure shows the front of Smyth Research Associates in San Diego, California.



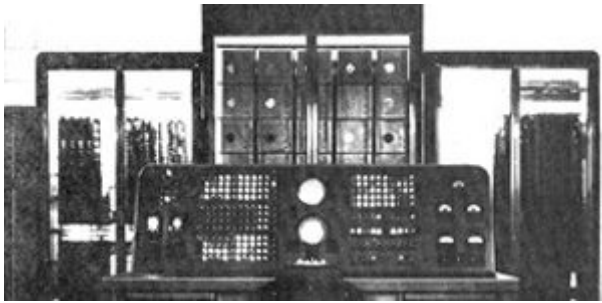
*Smyth Research Associates*

## Graduate school

After I got my BA in mathematics in 1964, I enrolled as a mathematics graduate student at UCLA. My advisor was Dr. Charles B. Tompkins. Tompkins played a significant role in the invention of linear program-

ming after World War II. Dr. Tompkins wanted me do one research project using the SWAC (Standards Western Automatic Computer), which was housed in the basement of the Mathematics Building. SWAC dated from about 1952, and it was a vacuum tube machine that was not very reliable by the time I saw it in 1965. I never actually got to write a program for the SWAC, but I did get to see it being used by other students. Just before I got my BA from UCLA, I decided to try to work in the computer industry. Dr. Tompkins got me an interview at IBM on Wilshire Blvd. I talked with someone there who told me to take numerical analysis classes if I wanted to work at IBM after college. I got my MA in mathematics in 1965, and I did take numerical analysis.

The following figure shows the SWAC computer.



*SWAC computer*

◀ 2018   ◀ CHARLES TOMPKINS   ◀ FRIDEN DESK CALCULATOR   ◀ IBM 1620   ◀ IBM 7090   ◀ JOHN SMYTH   ◀ LANE CARROLL  
◀ MYHITECH   ◀ SMYTH RESEARCH ASSOCIATES   ◀ STEVE CROCKER   ◀ SWAC   ◀ UCLA COMPUTER CLUB  
◀ WESTERN DATA PROCESSING CENTER