

Jerry Merryman: the man who killed the slide rule

by Ed Millis

I have had the pleasure of knowing and associating with Jerry Merryman, both while we were employed by Texas Instruments and off the job as well. I can say without question that Jerry is one of the most talented, versatile, and entertaining people I've ever met, and he has successfully erased the boundary between work and play. Without fail, he is engrossed in at least one interesting project, whether it be the moon's tidal effect on his backyard, or chasing a leaky water pipe in the slab of his house. He understands the science of everything, and isn't afraid to use it.

His connections to the world of slide rules are two extremes. In college, he was a proven master of the slip-stick, and later went on in his professional life to render our favorite mathematical instrument obsolete. But we all know the slide rule lives on—in our hearts it will never be replaced by a \$2.99 plastic box, no matter how many decimals it has.



Jerry Merryman showed up at the door of Texas Instruments in March, 1963, and filled out an application for employment as an engineer. He'd heard about TI from two Texas A&M professors he knew who were now working there. Soon, as Jerry phrased it, he was “reluctantly hired,” and went to work in the Integrated Circuit Department. One of his co-workers was a quiet guy named Jack Kilby, later to become a Nobel Laureate for the integrated circuit.

Perhaps the reluctance of TI to hire Merryman was influenced by his mixed bag of work experiences. His technical career began at age 11. At a time when most of us were learning to sit up straight at the dinner table, Jerry was hired to repair radios. Born and raised in Hearne, Texas, he had been an inveterate tinkerer from birth, he says, and played with a Gilbert chemistry set, dismantled perfectly good alarm clocks, and used No. 6 dry cells from the trashcan of the railroad's telegraph office to power his youthful experiments.

Later, he signed on with the Hearne appliance store to advance his radio repair career. It was there his boss gave Jerry a rocket-ship boost to his lifetime profession—he saw Jerry poring over a book, Terman's *Radio Engineering*. Jerry remarked if he could learn everything in that book, he'd be pretty smart. The foresighted boss agreed and gave him the book. That turned out to be a gift with remarkable leverage.

As a break from repairing radios, Jerry took a job with the railroads and worked around Texas as a teenaged Railroad Agent icing “reefers,” refrigerated rail cars. Jerry claims he still flinches when he sees a banana. His plan to escape dumping ice on millions of bananas for the rest of his life led him to try for his FCC First Class Radio Telephone License. Not surprisingly, at the electronically precocious age of 18, Jerry got his “first-class phone ticket,” and was promptly hired by a local broadcast station as Chief Engineer. *Sic transit bananae*.

Merryman set his budding career aside to attend Texas A&M on a scholarship. In his freshman year he was encouraged by a professor to enter the annual A&M Engineering Department slide rule contest. Somewhat reluctantly, Jerry joined the 600 plus entrants after buying a used slide rule from another student the night before to replace his old one. A hometown newspaper headline told the story best: “Hearne student ‘pulverized ‘em’ in A&M contest.” Jerry scored 279 out of 280 points, the highest ever achieved. Jerry said later that since he used his unfamiliar “new” slide rule in the contest, he was extra careful. He also mentioned that the problem he missed was by a single digit in the fourth place of the answer.

In 1959, he began work at the Texas A&M Department of Oceanography and Meteorology with the less-than-enviable job of measuring the force of hurricane winds and oceans on an oil platform in the Gulf of Mexico. When a hurricane moved in, Jerry moved out—out to the platform and into the storm to run the equipment. “The hurricanes broke a lot of things,” he explained. Fortunately Jerry wasn’t one of them, and survival of this first job at A&M led to a better job. He designed a mobile meteorological data-gathering station, which included building his first computer.

During the next few years Jerry broadened his experience by designing time-code generators, doing mathematical analyses, “and sweeping floors.” Then he found Texas Instruments.

Jerry’s first “favorite” project of many at TI was the development of the pocket calculator with Jack Kilby and Jim Van Tassel. In 1965, TI’s newfangled integrated circuits, “ICs,” were selling at less than hot-cake velocities, mostly because no one had found the “first big thing” for them, much less the “next big thing.” Pat Haggerty, president of TI and noted long-range thinker, decided a new and unique product was needed. Haggerty had run down this path before in 1954 with the recently invented transistors that TI could build, but the world lacked a growth market. You could just sell so many hearing aids, he figured correctly. Haggerty set up a joint effort with I.D.E.A of Indianapolis to design and build a pocket radio to showcase what the transistor could do. The Regency TR-1 pocket radio was the result, and it was the first big thing for transistors, big time, and for TI and everyone else.

Haggerty's new product idea for the fledgling chips was an unheard-of pocket calculator that would add, subtract, multiply, and divide, and do it with lots of decimal places. Because of the complexity of the logic, the only way such a thing could be built would be with the ultra-compact integrated circuits. It was a typical Haggerty project—a giant technical stretch with potentially terrific rewards. Sometimes a giant technical stretch resulted in ripping the crotch out of your pants, but not this time. Haggerty's project caused two necessary things to happen at TI: Merryman would generate the practical logic design for such a device, and the IC engineering department would get on the stick and learn how to make devices an order of magnitude more complex than had ever been built.

Merryman, as project manager, single-handedly did the circuit design for this first calculator in three days and nights. His design was based on excess-3 binary logic and used about four thousand transistors, compared to the Regency radio's four. Jack Kilby later said he thought Jerry was one of the few people who could have done the design at that time.

Jerry's functional "breadboard" of this calculator logic circuitry was constructed with individual transistors and components and took up most of a small room. It was used to test the production chips as they were designed and built. The magic shrinking power of the integrated circuits did the rest, and the roomful of transistors and parts turned into a handful of chips and parts: the pocket calculator was born.



The pocket calculator was born because the galloping technology of semiconductors had reached the necessary and critical point, if just barely. Soon, this useful device would have been built by someone in the industry. But Jerry D. Merryman, Jack S. Kilby, and James H. Van Tassel were the pioneers who pushed the boundaries and made it happen first. The result is described in U.S. Patent 3,819,921, "Miniature Electronic Calculator," filed by Texas Instruments on September 29, 1967, and issued June 5, 1974.

Much like the history of the pocket radio, calculator prices soon dropped as other companies saw the future and jumped on the bandwagon. The slide rule's rule had come

to an end, and Jerry Merryman, winner of the A&M slide rule contest, had been a prime mover in its demise.

When Texas Instruments instituted the Technical Ladder in 1975, Jerry was elected a TI Fellow in the first group. This faith was not misplaced, as Jerry accumulated dozens of patents during his fruitful career at TI, many further patented in countries around the world.

Merryman retired from TI in 1993 after 30 prolific years. Unable to resist the lure of his friends, he later returned to TI as a consultant and worked on the digital light processing chip program, the DLP, which was one of the most technically challenging products ever produced by TI.

Outside of his professional career, Jerry is locally famous for his successful home-grown measurement of the gravitational constant. He spent months of spare-time effort designing and building his version of the famous Cavendish experiment, which included casting spheres from lead salvaged from auto batteries and finding a source of 1-mil tungsten wire for the torsional suspension. His final result for the gravitational constant missed the National Bureau of Standards' value by a scant 1%, but Jerry explained, "I think I know what their problem was..."

In another backyard science experiment, Jerry measured the upward movement of the earth's surface caused by the tug of the passing moon's gravity. ("It's about 3 to 3 ½ inches.") Less technical, but possibly equally challenging for the body and the brain, Jerry, age 37, learned to ride the unicycle. It didn't surprise his friends.