



## Jack Clark – Transistors to Tree Farming

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Jack Clark was born at Campground in 1925, where his grandparents lived, and grew up in Woodville.

His soft voice and easy smile make him a ready friend as he meticulously recalls his life.

After moving around a bit, at three years old in 1928, his family moved back to Tyler County a mile down the Clark-Martin road, now CR 4320. Mostly, though, the road was known by the big oak tree that split the road just as one entered.



Rita knocked the tree down in 2005, a landmark lost forever. Jack wished he had a photo of that old tree.

“My great-grandfather William Clark settled here in 1855 and married Clementine Cruse, her parents having settled here in 1834 while Texas was still part of Mexico.”

Jack’s family lived in the Martin log house in the summer of 1928 while his father built a house facing the road in the photo, just a few yards from the home he lives in today, on land handed down from his great-grandfather.

“Daddy’s brother lived across the street – Clem Clark, who was J. C. Clark’s daddy.”

In 1929, his father lost their cotton cash-crop to a flood, went to work in the oil field in Dayton, Texas, and was killed in an accident in 1930. Jack was only five years old, and his mother moved them back to the Campground Community.

“In 1931, mother bought a place at the fire tower south of town,” he said. “Hwy. 69 was a dirt road until about 1933 and ran in front of our house. In about 1934, they used blacktop and gravel, and when it got wet, it was slick, slick, slick. Seven were killed in auto accidents between Woodville and Hillister. Instead of 20-30 mph, they were going 50 mph ... really fast then.”

Jack graduated from Kirby High School in 1942, and his mother signed the papers for Jack to join the Navy at 17 years old. Six months after Pearl Harbor, the U.S. was fully committed.

Just as Jack was getting orientated, the U.S. won the Battle of Midway against the Japanese in the Pacific.

At the Corpus Christi Naval Air Station, Jack worked on observation planes that were catapulted off of battleships. While there, Jack met R. A. Young, Maxie Young's oldest brother, so nice to see a friendly face from home.

After becoming a radioman, Jack was transferred to Banana River, Fla., known as Cape Canaveral today, and then to San Diego, to look for submarines off the coast.

Jack and a friend volunteered for special duty and were shipped to the Admiralty Islands, just north of Australia. One day, Jack was strolling along to chow. And guess who Jack saw? There was R. A. Young, again, only here on the other side of the planet. Strange, small world.

After Jack's last post on the Philippines in 1946, he returned to Woodville, and then quickly to work with his Uncle D. E. "Cotton" Young overhauling oil field pumping units in Sulfur Bluff and Greggton, Texas. That is where Jack got reacquainted with Frances Moulton, whom he had first met in high school in Woodville. Her father was also working for Cotton. Before long, Jack and Frances married on June 28, 1946, one week after Jack's 21st birthday.

Jack continued his education at West State Teacher's College and Sam Houston, earning a B.S. and a M.A.; then he worked for Sears Roebuck and Lone Star Steel.

In January 1959, Jack went to work for Texas Instruments in Dallas as a technician checking the gold plating on silicon transistors for \$1.85 an hour.

The 1959 transistors were little cans about 3/8 inch high. The transistor changes an electrical current for a specific purpose, and Jack would spend almost 30 years of his life refining integrated circuits, first patented by TI's Jack Kilby in 1962. Jack rose to the rank of senior process engineer developing new processes and overseeing manufacturing.

"In the early 1960s," Jack said, "there were 32 to 64 memory spots per circuit in about 1/4 inch square. When I retired in 1986, our integrated circuits were 3/8 inch square and had 8,000 memory spots, and they took no more power to process than the circuits of the 1960s. We were in the process of doubling that to 16,000 memory spots."

With the discovery of silicon's properties as semi-conductors, the dimensions shrank to the atomic level. A single atom of silicon is a perfect cube 5.4 angstroms wide (5.4 ten-billionths of a meter), which is about 10,000 times smaller than a human hair.

"Those silicon cubes had to line up side by side throughout and on all six planes," Jack said, "and line up perfectly. We grew crystals three feet long, three inches in diameter – and listen to this – the atoms were lined up perfectly. We cut the them slices 20 mils thick, about 25 slices to an inch, because the saw itself consumed 40 mils of crystal in each slice."

The six-month process of making a transistor involves depositing impurities into the perfectly aligned silicon crystals. Through several diffusions said Jack, "You control the depth by how long the deposit was exposed to 1,300 degrees centigrade heat (2,372 F)." With a deposit of phosphorus here and some boron there – poof – one has a "transistor" thousands of times smaller than a human hair and the backbone of the computer age.

Production boggles the mind. When Jack retired in 1986 the first memory chips contained a million transistors, then a billion in 2005, and tens of billions in 2007. Today, we have off-the-shelf computers at Walmart advertising internal storage in the terabytes – in the trillions – and we barely wink the eye.

Jack retired from TI on Dec. 31, 1986, with 28 years, and they moved back to Woodville.

He and Frances started a tree farm and bought a travel trailer.

On the Sunday after buying the travel trailer, Red and Thelma McGee invited them to Groveton, Texas, to help build a couple a classrooms on a little country church.

“Monday, Tuesday, and Wednesday morning,” said Jack with a spirited smile. “It was like getting a big shot of dope. I was hooked!”

From 1988 to 2002 they travelled with the Volunteer Christian Builders to nearly every state in the U.S. except the New England states and a few others east of the Mississippi. They loved every moment.

In 2002, his beloved Frances became ill, and after eight years of struggle, she passed in 2010. “We were together almost 64 years,” he said. He bows his head, pauses ... it’s hard to talk about.

Jack fondly remembers chairing Woodville FBC’s building committee as they built their Family Life Center, joking, “I was not there at the first committee meeting, and they elected me chairman.”

He’s enjoyed teaching Sunday school and taught the Dave Ramsey Financial University at the church and the local prison, but scaled back a few years ago, his eyesight dimming.

“A couple of months ago, I began taking my Kindle to church,” Jack said, “so I could read my Bible. Then Eddie Harrison came by and asked, ‘Why aren’t you teaching a Sunday school class?’” A light shined. If he could use his Kindle, he could teach, and Richard McCullough facilitated getting the Sunday school material to his Kindle.

From the woods of Woodville almost 100 years ago, through WWII and decades designing transistors that would make possible the very Kindle he uses, his spirit is as energetic as ever, voice still soft and smile still easy. Traits no one can manufacture in any laboratory.