

# The Invention and Development of the Integrated Circuit

Jack Landers, January 23, 2022

In 1958, Jack Kilby was a new hire at Dallas Texas Instruments, left alone in the office for two weeks while all his coworkers were on vacation. In this time, he theorized a solution to a problem facing engineers all over the world. How to compact the components of a computer chip to no longer need miles of wiring to connect electronics. He achieved this by designing an integrated circuit on a semiconductor material, silicon. With this compact technology Texas Instruments would begin to apply his concepts for commercial household computers, the first of which being the calculator, which they released in 1967. The calculator brought computing power that had never been seen before to most American consumers, opening up a whole new form of education and taking students to much higher levels of math faster. Not until 2000 would Jack Kilby receive the Nobel Prize for his contribution to a massive developmental shift in our history, and would still always remain humble of his great achievement until his death to cancer in 2005 at 81 years old.

But Jack Kilby did not manage this creation alone, it was with the help of co-founder Robert Noyce from MIT who would apply and more effectively manufacture Kilby's design for an integrated circuit at his company Fairchild Semiconductors. This led to a legal battle where the two companies would fight for the patent until agreeing to share the rights to the invention with a cross-licensed patent. Noyce would later move on to co-found Intel with Robert Moore in 1968. There he oversaw the invention of the first microprocessor at Intel, a company that would go on to develop the technology to such an extent that it would create a technological revolution.

This was as predicted by his partner Gordon Moore who, in 1965, would famously predict that from then on the technology would be innovated to become smaller, cheaper, and more powerful at exponential rates, to be known as Moore's law. And this it did, as over decades Intel would hugely increase the number of transistors they could use while making the integrated circuit all the more improved. Today, the integrated circuit is now 90,000 times more efficient, and 60,000 times cheaper per transistor, and 35,000 times more powerful than Intel's first microprocessor, signalling that Moore's law has come into full fruition, and allowing us to process the massive amounts of information that we do.