Informational Speech

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The Integrated Circuit

So most everyone here has a smartphone, right? And while many may credit the invention of such a device to Steve Jobs’ innovation, or the global market allowing for specialization, the real hero is the integrated circuit (IC) invented right here at Texas Instruments (Ott et. al., 2009).

Those that aren’t Electrical Engineering majors may be asking: what is an integrated circuit? Well, according to the Encyclopedia Britannica, it’s “an assembly of electronic components fabricated as a single unit” (Saint 2017). Rather than taking individual resistors and transistors and sticking them on a breadboard, the integrated circuit (or just a “chip”) allows us to easily fabricate and mass-produce different combinations of these basic electrical building blocks.

The story of the microchip’s conception began with the invention of the transistor in the early 20th century. As individual components like the resistor and transistor improved and became smaller, the annoyance of wiring between components became a major issue. In July of 1958 when most employees in TI’s new semiconductor lab were on vacation, Jack Kilby stayed behind to hold the fort. He knew that the proposed “Micro Module” solution, a series of uniformly-sized components that snapped onto a grid, was not the answer. He created a circuit on a sliver of germanium and showed a few co-workers, unknowingly changing the way the world uses and manufactures electronics (“The Chip That Jack Built”, 2018).

But, like many great inventions, the idea wasn’t accepted at first. The Air Force showed some interest, but most of the industry was doubtful. Kilby’s breakthrough came when his boss challenged him to make a calculator as powerful as the current tech which was large and bulky. Kilby’s success with this project kicked off of the personal calculator and brought his chip into the mainstream electrical industry. We can all thank Kilby for our wonderful TI-84’s.

In 2000, Kilby won the Nobel Prize for Physics for his contribution to the world of engineering and innovation (“The Nobel Prize in Physics 2000”, 2018). The chip made manufacturing and design much easier, and allowed electronic devices to enter our daily lives. Even now, 60 years later, research continues to improve the IC, from studying prevention of stresses on the chip to photonic IC’s in fiber optic communication (Kachani & Gartner, 2014).

Now that you know a bit more about the integrated circuit, you can take a little more pride in the founding company of this university.

References

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