

## **Texas Instruments: The role the IC played in real-time signal processing**

On September 12, 1958, Jack S. Kilby demonstrated the first working integrated circuit to managers at Texas Instruments. This was the first time electronic components were integrated onto a single substrate. This seminal device consisted of a phase shift oscillator circuit on a tiny bar of germanium measuring 7/16" by 1/16" (11.1 mm by 1.6 mm). Today, integrated circuits are the fundamental building blocks of virtually all electronic equipment.

The new concept of the IC resulted in the development of many products that were the foundation of all of the technologies we use today. TI took the role of making these things practical and demonstrating their usefulness to society.

- TI demonstrated the capability of the integrated circuit through things such as TTL, the TMS1000 microcontroller and the calculator
- The "TI" calculator: This was, by far, the best recognized of TI's demonstration of the use of the integrated circuit and microcontroller. Calculators were a breakthrough in the eyes of society. Its change was so significant that TI is still best recognized as "the Calculator company."
- Digital Signal Processors: DSP, from one perspective, was an outgrowth of the success in calculators. An early extension of the calculator success was the learning aid --- a product to help teach math to students. With this success, the learning aid concept was extended to other areas, spelling being the obvious one. It was in the creation of the first spelling learning aid, the Speak and Spell, that TI turned to the concepts of digital signal processing to become successful. This was the beginning of the device now called the digital signal processor. This processor, along with the underlying base of theory, revolutionized society. It has allowed us to get things that were once in big rooms to a size small enough to fit in our pocket as well as give us communications infrastructure systems that can manage thousands of data and communications channels simultaneously in one system. It has also given us cool new gadgets in digital audio, digital video, video security, automotive vision, digital still cameras, digital telephony, wireless and groundbreaking medical devices, to name a few.
- Wireless communications – Among the many applications of DSP was the digital cell phone. This, unlike many of the other applications, made the greatest impact on society over the past 20 years.

Celebrating the last 50 years of the IC is an exciting thing, but to TI, what is even more exciting is looking at the next 25 years and what is to come. Things that were once in big rooms such as big computers or telecommunications equipment are now small enough to fit in our pockets. But, what's next? We believe that getting things small enough to fit in the pocket is still going to be a goal in the future but eventually we believe that we will have devices small enough and power efficient enough to embed in our clothes and even in our bodies. Just think of the possibilities in the medical arena if we can create products that can run off scavenged energy or body heat. The invention of the IC is exactly what is making these things closer and closer to reality and the future is an exciting place for TI and the IC!