Telemetry Technology

New low-cost telemetry collection products have been made available to the commercial aerospace community by taking advantage of NASA's technology transfer program.

In 1990, Avtec Systems, Inc., located in Fairfax, Virginia, developed its first telemetry boards for Goddard Space Flight Center. Since that time, Avtec has provided innovative, flexible telemetry board and system designs which keep costs low and reliability high. Avtec's customer base has quickly expanded to include a number of NASA centers, major aerospace firms, and a diverse set of commercial and government buyers.

"Over the years, we have worked closely with NASA engineers to design products that meet the needs of the NASA community. We have leveraged this technology to serve the needs of the commercial aerospace community as well," says Avtec's Mary Ellen Orsino, manager of marketing and sales.
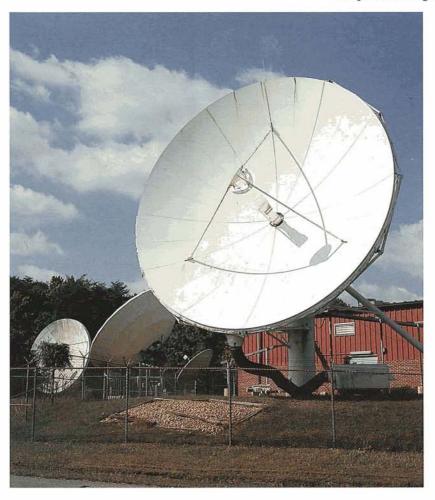
Avtec products now include PC/AT, PCI, and VME-based high speed I/O boards and turnkey systems.

By building intelligence into its boards, high data rates can be attained without burdening the host central processing unit.

In addition to Avtec's board-level products, the company offers complete turnkey systems for telemetry acquisition, data quality monitoring, bit error rate testing, and high speed data logging. Along with high speed bidirectional telemetry boards, the company integrates third party products to support several functions, including receiver, bit synchronizer, time code processor, and others as required.

From the beginning, Avtec boards were designed with flexibility in mind by implementing board functionality on Field Programmable Gate Arrays (FPGA). Then, as additional functions were developed, the same board could be used by swapping logic modules. The result? Cost savings to the customer by providing for multiple uses of the same board designs. Additionally, by providing bidirectional capability (both frame synchronization/decommutation and PCM simulation) on a single board, Avtec has matched what competitors charge for unidirectional boards.

The most recent and most successful technology transfer from NASA to Avtec is the Programmable Telemetry Processor (PTP), a personal computer-based, multi-channel telemetry front-end processing system originally developed to support the NASA communications (NASCOM) network. The PTP performs data acquisition, real-time network transfer, and store and forward operations.
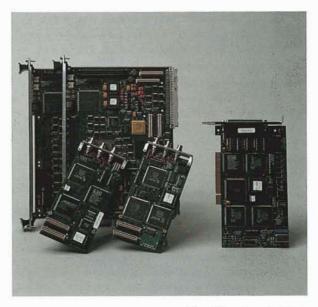
Commercial sales of Avtec telemetry hardware was founded on NASA transferred technology.
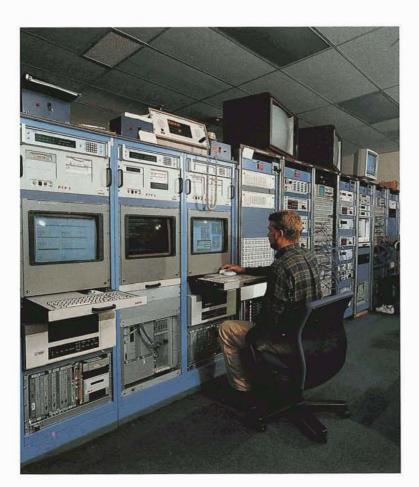
There are over 100 PTP systems located in NASA facilities and throughout the world. Widespread NASA support of PTP is a result of its low cost and flexible design. Since commercializing the PTP, Avtec has added even more capabilities, created a commercial documentation package, and provides top-notch technical support on the hardware and software for the systems they sell.

"Our NASA customers have responded enthusiastically," says Avtec's Orsino. "We recently delivered over 100 systems to Goddard's NASCOM division for the NASCOM-IP transition, resulting in over $1.5 million in sales for Avtec," she says.

PTPs are scheduled to be used to support Landsat-7, and Stanford University's Gravity Probe B Relativity experiment. "We are also working with many other NASA and commercial aerospace customers, selling PTPs for use all over the world," Orsino adds.

One of Avtec's product lines uses NASA-designed Reed-Solomon Decoder chips.

Avtec has provided telemetry hardware in support of NASA's Communications Network (NASCOM). Shown are NASCOM boards at Goddard Space Flight Center's Simulations Operations Center.