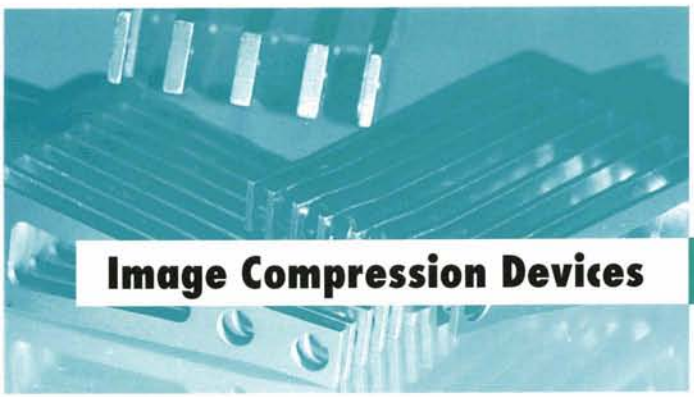

Image Compression Devices

Computer Technology

Below, engineer Bill Thompson of Advanced Hardware Architectures (AHA), Pullman, Washington is conducting a reliability test on an integrated circuit tester. The product he is testing is a new, two-chip Image Compression Chip Set **(bottom right)** developed by the NASA Microelectronics Research Center(MRC) and marketed by AHA.

AHA is a spinoff company, started by former employees of the MRC when the center was located at the University of Idaho; MRC is now the NASA Space Engineering Research Center for VLSI (Very Large Scale Integration) Systems and it is located at the University of New Mexico. In February 1988, a number of MRC researchers established AHA as a semiconductor company focused on the emerging market for advanced data coprocessor products.

The image compression device pictured is the AHA3370/3371 chip set for medical/scientific imaging applications, such as x-ray and ultrasound imaging. Other members of the AHA Series 3000 family are designed for applications in storage devices and general purpose printers.

The AHA3370/3371 set is based on Rice algorithm technology originally developed at Jet Propulsion Laboratory by Robert F. Rice and implemented in VLSI by MRC. The Rice algorithm is a "lossless" compression algorithm; it takes an image or other data that has been broken down into short strings of digital data and processes each string mathematically to reduce the amount of memory it takes to store them, or the time it takes to transmit them. In lossless compression, the data is completely restored after decompression. Other algorithms, called "lossy" algorithms, compress by throwing away insignificant portions of the data, a technique appropriate for some applications but not for medical, scientific or engineering applications where all data must be preserved.

The Rice algorithm processes the data through 12 different optimal code options and selects the one that gives the best compression for the data on which it is working; this maintains efficient performance as data characteristics vary. With the AHA3370/3371 chip set, the typical compression ratio is 2.5 to 1 and ratios of 7 to 1 or more are possible.