NEW PRODUCTS

AN OFF-THE-SHELF INTERFACE SERVES ANY DEVICE UNDER TEST

FLEXIBLE TEKTRONIX SYSTEM SUITS JUST-IN-TIME MANUFACTURE

Tektronix has filled in a missing link in automatic test equipment—a standard interface to link the test system and the device under test. The company's Instrument Systems Integration Division has come up with the TSI-8150, an off-the-shelf test-system interface it claims will save ATE-system builders months of design work on custom interfaces.

The TSI-8150 consists of two primary hardware components—the main chassis and the device-under-test adapter. The full family of six switching cards and modules can be mounted in either component. Such flexibility allows the user to move the signal-routing switches close to the device under test when maximum signal integrity is critical.

The range of signal routing for the TSI-8150 goes from low-level dc to 18 GHz. "This is the most complete product of its kind," says Al Schamel, engineering program manager. "Others—the Fluke 2400 and the Hewlett-Packard 3497 among them—have preceded Tektronix into the data-acquisition-ATE market, but we offer the widest range.

"We're backing the trend to just-in-time manufacturing with flexible configuration and interchangeability of test heads, from vacuum bed-of-nails through custom device fixtures," Schamel says. JIT puts maximum pressure on the test system, he says, with its demand for quick changes from hybrids to components to boards on the line at any given moment.

SIMULTANEOUS TESTS. The 8150's flexibility suits it to a wide range of applications, including components, hybrids, wiring harnesses, and pc boards. Also, with two adapters installed, users can perform simultaneous tests—for example, on a device that must qualify under both industrial and military specifications. The adapter accepts custom or commercially available test heads. When the test heads are wired through an internal patch panel to a removable adapter module, the user can construct many adapters without reconfiguring the system for each device being tested.

The TSI-8150 is controlled by the IEEE-488 bus but has enough intelligence to work on its own and stay independent of task allocation on the bus. The developers' aim was to take intelligence as far down into the system as possible, taking switch closures out of the bottleneck on the IEEE-488 bus.

For example, up to 500 sequences can

WIDE SERVICE. Tektronix' test-system interface adapts to discrete components, ICs, hybrids, circuit boards, and cable harnesses.

be programmed and stored in a RAM buffer. Thus if 250 test sequences have been preprogrammed, 250 switches can be set on one clock pulse, as opposed to having 250 instructions transfer by way of the bus. All system switches can be set or cleared with a single clock pulse or, when desired, switches can be operated from a variety of trigger sources.

As another example of the interface's flexibility, switches can be as near to the device under test as 6 in. or as far away as 240 ft over cabling. In the latter case, the device can be placed in an environmental chamber while the operator is at a central location.
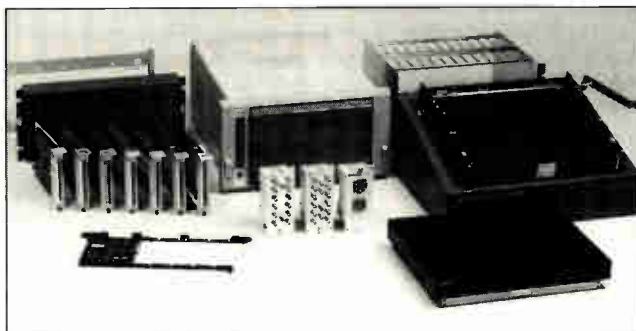
EASY ACCESS. The user can configure the system with the low-frequency scanners plugged in from the back or the front and the high-frequency scanners mounted across the front or the back in various combinations. The choice of front or rear signal-routing access makes setting up the system easy, Tektronix says.

Each TSI-8150 function card is coupled to its own shield in the main chassis, and, for additional signal integrity, a 190-W linear power supply minimizes system noise. Because internal bus traffic is held to a minimum, noise from internal digital sources is greatly reduced and ground loops are avoided. The signal relays likewise are quiet, reliable mercury-wetted devices with a long life expectancy. Throughout, the TSI-8150 is a 24-V system.

Typical systems run from about $8,000 to $15,000. A system with 12 cards and the adapter costs less than $10,000. Orders are being taken now, and initial deliveries are scheduled to begin in July.   *–Ann Jacobs*

CARD SWITCHES GRAPHICS FORMATS AUTOMATICALLY

When IBM Corp. streamlined the CRT controller functions in its Enhanced Graphics Adapter (EGA), users lost compatibility with some software that ran on the earlier Color Graphics Adapter and monochrome graphics adapter cards. Paradise Systems is putting back that compatibility with an EGA board that supports all Personal Computer graphics software.

The AutoSwitch EGA card for IBM PCs is transparently compatible with software written for color and monochrome PC graphics cards from other vendors as well as for the Enhanced Graphics Adapter. It automatically picks
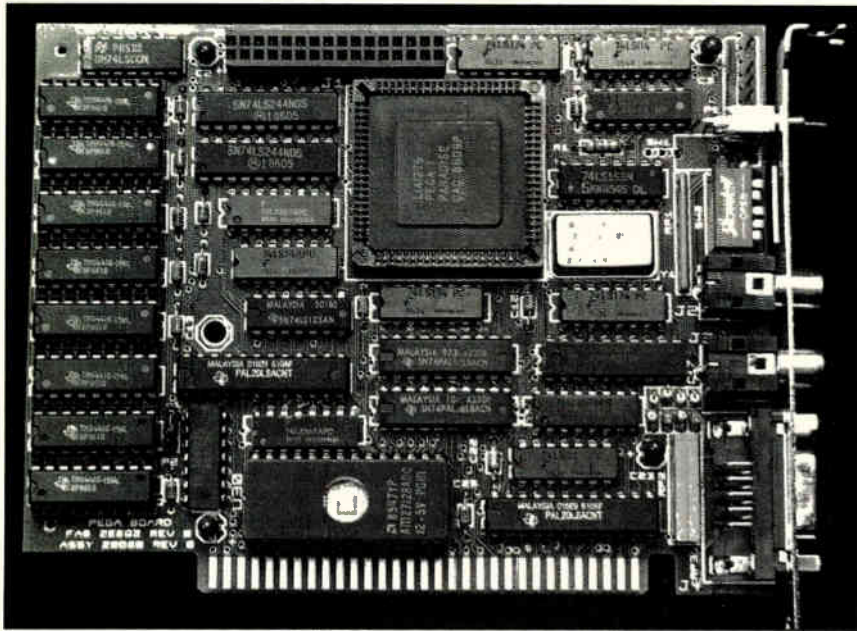
SMART. Paradise's card automatically switches to the correct graphics format.

the right mode to run the software. Other cards also support all the formats but not automatically, Paradise says.

Because the EGA mates the crisp 7-by-9-pixel characters of the IBM monochrome card with high-resolution (640 by 350 pixels) graphics, it has quickly become a de facto standard. "It's here, it's clear, and anybody who gets in the way will be run over," says Lawrence G. Finch, Paradise's president.

Advanced graphics microprocessors and software standards such as the Direct Graphics Interface Specification are next-generation equipment, Finch says. He adds that until software is written for DGIS, over the next 18 months to

two years, EGA is the best bet for text-and-graphics applications, including such interfaces as Microsoft Corp.'s Windows and Digital Research Inc.'s GEM.

EGA solved a problem for users who wanted color graphics but did not like the fuzzy character set of IBM's CGA and monochrome adapters. But these users found that many of their old applications would not run on the EGA card. **MISSING REGISTERS.** The reason, Finch says, is that in implementing EGA, IBM left out some registers in the CRT controller that were used by the earlier graphics cards. "Well-behaved" applications that march obediently through IBM's Basic Input/Output System are

accommodated by the EGA. But applications that attempt to boost performance by writing directly to hardware—most of them, according to Finch—are derailed by the missing registers. When an applications program tries to write to the missing registers, a latch on the AutoSwitch card alerts the BIOS, which contains firmware that switches the card to a CGA or monochrome emulation mode.

Last March, Paradise introduced a single-chip adaptation of the EGA. Rather than reverse-engineer the IBM board, it designed the chip from the bottom up, developing its own BIOS, an extension of IBM's, en route. For that reason, Paradise's board supports software written for the low-resolution color graphics and monochrome adapters even if the software tries to avoid the BIOS.

Some board makers have met this problem by adding to the graphics card a Motorola 6845 controller, which contains the full complement of registers, and switching it in and out either manually or through software. The Paradise PEGA 1 chip, heart of the AutoSwitch board, itself incorporates the 6845 controller functions and the missing registers. The chip is a 10,000-gate array designed by Paradise and built in 2-μm CMOS from LSI Logic Inc. It displays 16 colors from a palette of 64.

The AutoSwitch board comes with 256-K bytes of dual-ported video RAM that can be read and written to simultaneously. It sells for $599 and is available now.

Paradise Systems Inc., 217 E. Grand Ave., South San Francisco, Calif., 94080.
Phone (415) 588-6000   [Circle 339]

RISC ENTRY MERGES HP TECHNICAL LINES

Hewlett-Packard unveiled the second computer based on its Precision reduced-instruction-set-computer architecture [*Electronics*, March 3, 1986, p. 39] late last month. The introduction of the new machine, designated the HP 9000 series 800 model 840, makes official HP's cessation of development for HP 1000 A-series machines used for industrial control and the merging of that line with the HP 9000 line of technical computers under HP-UX, the HP operating system derived from Bell Laboratories' Unix.

The company is thus uniting a line of machines targeted for real-time factory automation with a line of machines used for design-automation work. The latter, the 9000 series, had already been pulled in under the HP-UX umbrella and so has software that can be moved

MERGED. By merging its technical lines, HP helps integrate design and factory automation.