

# New Products

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## Test

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### Pattern processors run as stand-alone systems

Pattern Processing has announced its APP 100/200 associative pattern processors, machine vision recognition systems that identify patterns by hardware circuitry extensions beyond traditional programming.

The APP 100 and 200 systems provide fast, accurate vision recognition without the use of complicated computer software. The APP system has a 3000 part-per-minute image recognition capability using pixel densities of 154,880 per image processed. The image density is 320 pixels  $\times$  484 pixels, each with 64 levels of gray.

The system adjusts to non-uniform lighting and has no image shape restrictions. System operation features continuous image recognition, zero- to 100-percent adjustable sensitivity, and image freeze-framing without stopping the processing.

The system can store up to 255 independent images (each image having a multitude of configurations) in the main processor without utilizing external storage devices. The APP 200 version can provide 256 independent windows on any single image. Expansion of up to 510 independent images is planned.

The interfaces available are RS-232C, IEEE 488, and 16 digital lines for BCD or other customized uses. The ASCII code set is also supported.

APP 100/200 systems can be run as stand-alone systems or interfaced to computers or controllers. The camera selected for the product is the Fairchild CCD3000. Other cameras with a standard RS-170 interface can also be used.

The APP 100/200 will initially be marketed for verification, inspection, measurement, part identification, material handling, process/machine control, and quality control functions.

**Reader Service Number 31**

### Board test systems have flexible fixturing

Everett/Charles Test Equipment has introduced two new board test systems, the Kryterion 500 and the Kryterion 550. The Kryterion 500 can test up to 131,072 points and features complete fixturing flexibility, software masking, automatic test program generation, host computer and CAD downloading, program entry, and editing via ASCII keyboard. A bar

code reader option permits rapid entry of board type and serial data.

A built-in translator function allows the user to define test result mnemonics, up to 16 characters per point, producing meaningful fault reports. The Kryterion 500 has an integrated datalogger that will produce an analyzed and collated list of board test results, including the number

and percentage of passed boards, failed boards, failures by class, and frequency of specific failures.

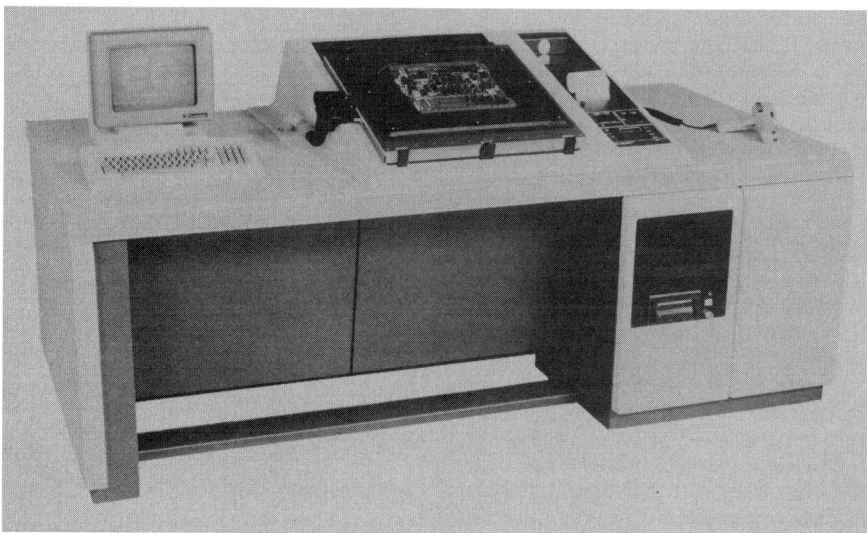
The Kryterion 550 utilizes an optimized in-circuit test technique to isolate manufacturing faults on PC boards. It also detects and identifies manufacturing defects such as wrong-value components, misoriented components, missing or damaged components, workmanship faults, and shorts and opens.

The 550 features a built-in datalogger that provides a comprehensive, statistically organized listing of test results. It also offers a choice of automatic or manual programming. In either case, the 550's ability to self-learn point-to-point measurements from a known good board speeds up the program generation process.

The Kryterion 550 may be configured to test up to 8192 points. Capable of handling Everett/Charles loaded and bare board test fixtures, the 550 can also use existing GenRad, Zehntel, Fairchild, Hewlett-Packard, and Marconi fixtures. A fixture identification code can automatically call up test programs for up to 64,576 different fixtures.

The Kryterion 500 and 550 are priced from \$70,000 to \$300,000, depending on the number of test points and fixturing requirements.

**Reader Service Number 32**



**The Kryterion 550 loaded board test system from Everett/Charles Test Equipment utilizes an optimized in-circuit test technique to isolate manufacturing faults on loaded printed circuit boards.**

## Board test systems address complex LSI/VLSI problems

GenRad is offering a 2276 board test workstation, a high-throughput system designed to be compatible with its 227X family of in-circuit test systems. The company is also introducing the 2720 performance test system, which tests complex, bus-structured digital VLSI PCBs. To optimize performance of its 2275 and 2276, the company developed the Bantam, a lightweight, molded vacuum fixture.

**Workstation.** To address LSI/VLSI testing problems, the 2276 board test workstation is equipped with 1152 high-speed hybrid pins, all capable of testing at 5 MHz and 20 MHz multiphase clocking capability. For devices with complex initialization routines, the tester has 28 unique trigger pins designed to monitor logic states on the board.

The 2276 can isolate bad devices on the bus with no operator intervention and distinguish between confusingly similar fault classes. A memory test module has been designed to provide full cell checks on up to 1M-bit RAM chips as well as CRC checking across all pins for ROM and PROMS. Incorporating GenRad's four-line scanning system, the 2276 also can route analog functional instrumentation to the board-under-test via 8 lines. The tester has a software package that allows the plotting of all analog component values over a wide range of boards and speeds up the final stages of analog component debug.

The 2276's hardware includes the DEC PDP-11/23, 22-bit computer. The system offers more mass storage capacity than any other GenRad tester. Winchester disks are available in various configurations from 55 to 110M bytes. An IEEE interface and several printers are available as options. The 2276 can also be linked to other 227X systems via GenRad's high-speed data link GR net. For users with a DEC Vax computer, GenRad offers a Vax/227X program development software package.

**Bantam.** Designed to work with the 2276, GenRad's Bantam ensures reliable contact between the unit under test and the test probes. It features vacuum channels molded into the perimeter of fixture's bottom plate. According to GenRad this design allows for the rapid escape of air when the UUT is sealed in place, creating a fast, snapping action that assures positive probe and UUT contact at every test cycle.

The Bantam fixture is available in two configurations—single-well for testing individual boards up to 12×18 inches; and dual-well for high throughput application—testing two boards, up to 8×12 inches each. A Bantam fixture kit includes one ground plane, one signal inter-

face board, and one triple power supply interface board.

**Test system.** Because of its test and diagnostic power, the 2720 is suitable for performance testing after in-circuit test or as a diagnostic repair station for boards returning from final system test. The system is designed to test printed circuit boards with processor families such as the 68000 and 8086.

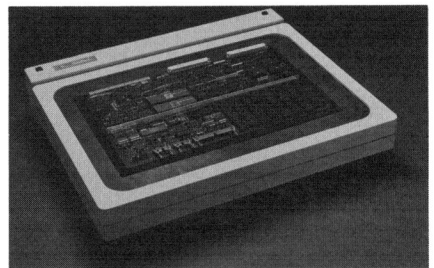
The 2720 applies stimulus through a microprocessor on a bus-structured UUT. It can be interconnected to the UUT in one of two configurations. For high-volume operations, a bed-of-nails fixture provides maximum throughput. For smaller production runs, the UUT processor can be clipped directly, and sensors can be strategically connected to edge pins and other key locations. Probing can provide access to additional points needed for fault isolation. In either case, the board being tested remains interconnected to the final system in which it will be used. Both stimulus and response are synchronized to a free-running UUT clock for a true performance test. The 2720's measurement system allows for parallel data collection on complex board designs. The tester's 1024 high-speed sensors collect qualified data at rates up to 32 MHz.

The 2720 features include memory emulation interface modules, and a 68000

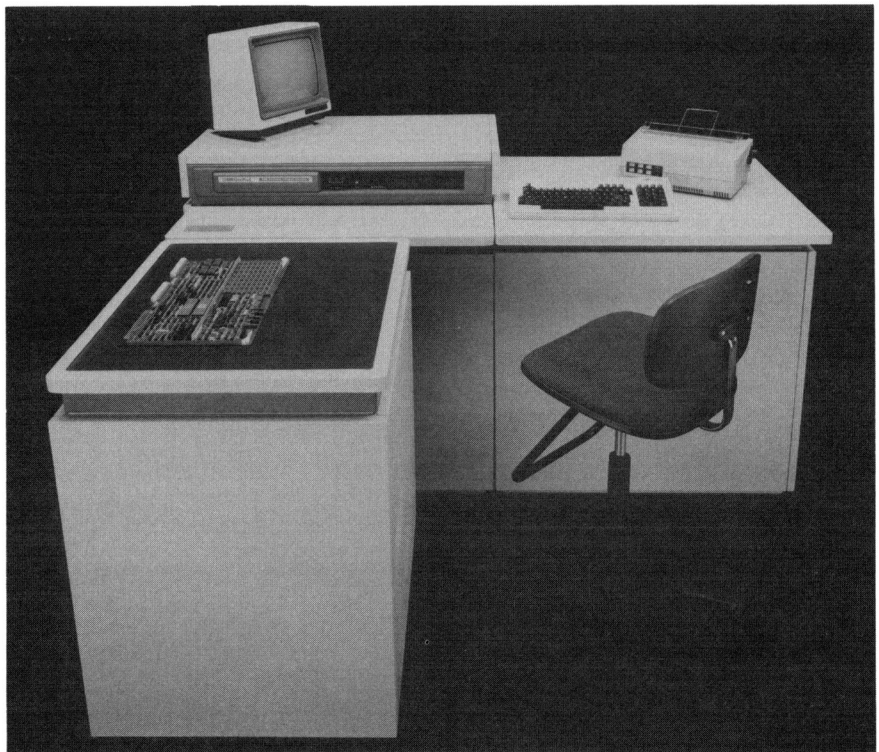
microprocessor-based system design with 1.5M bytes of memory. The 2720's system software is a high-level test language executed on a Unix operating system. IEEE and RS-232 interfaces and several printers are available with the system. Storage options include 20M byte Winchester and 8-inch floppy disks. The 2720 can be linked to other GenRad testers via the company's GR net.

Prices for the 2720 begin at \$105,000. The 2276 price range is \$190,000-\$225,000. Deliveries of the systems will begin in the third quarter of 1984.

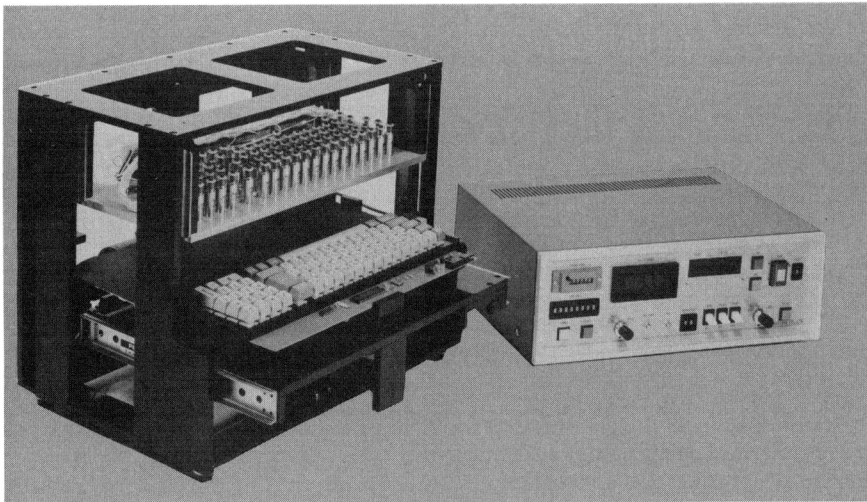
**Reader Service Number 33**



One of a new series of GenRad products, this lightweight, molded vacuum fixture is available in single- and dual-well configurations.



GenRad's 2720 performance test system automatically tests and diagnoses complex, bus-structured digital VLSI printed circuit boards at their operating speeds in their native system environment.



Consisting of two units, a programmable system control module and a keyboard actuating module, Osawa's KRC-2000 adapts to incoming, on-line, and quality-assurance testing applications.

### Programmable keyboard tester has 128-key capacity

Osawa & Company has announced the US availability of the KGS Model KRC-2000 Automated Keyboard Testing System. Consisting of two units, a programmable system control module and a keyboard actuating module, the KRC-2000 System is based upon solenoid engineering technology. The two modules together provide a programmable auto-

mated testing device, capable of performing both life and functional tests for virtually any keyboard assembly. The KRC-2000, adaptable to virtually all testing applications: incoming, on-line, or quality assurance functions, has a 10 key-per-second, 128-key capacity.

**Reader Service Number 34**

### Access tester measures RAM, ROM, PROM performance

Hilevel Technology's Model AT700 access time tester checks and measures RAM, ROM, and PROM access times; ROM and PROM memory content; and gate and cable delay times. The access time tester can be used in incoming inspection to verify device specifications; in the engineering laboratory to select or grade devices; and in production test to measure device degradation caused by voltage, current, heat, or other environmental conditions.

Unskilled operators can be taught to use the instrument in less than one hour, the company claims. A plug-in module, furnished with the instrument, is used to calibrate the system before use. Calibration values can be stored in memory for recall. Calibration is relative to the device under test, allowing calculation for cable delays between tester and handler.

Personality modules for most popular TTL device types plug into a convenient front panel connector. Test mode, pass/fail limits, checksum values, memory size, and other test condition information is entered from the front panel keyboard. These setups can also be stored in memory for later recall. An alphanumeric

LCD readout prompts the operator and presents test results as well as comparisons with desired parameters.

For memory content verification, the readout shows the correct value adjacent to the value measured. The operator can rely on PASS/FAIL flags to denote results, or the instrument can be programmed to issue an audible alarm to indicate a failed device.

The instrument is priced at \$2850; delivery is 30 days ARO.

**Reader Service Number 35**

### Memory test system provides quad-site testing

Teradyne's new memory test system, the J386A, optimizes the high-volume test technology of the company's J385A parallel test system. The J386A provides quad-site testing of one-wide RAMs, dual-site testing of four-wide memories, and single-site testing of byte-wide devices.

The J386A can use programs written for the J385A. Its master operating program automatically maintains summary



CR Technology's System 240 features dual-mode character recognition, 256×240 pixel resolution, up to four separate cameras, modular design, optimized algorithms for reading electronic displays, and optional pneumatic actuator controller.

### Machine vision system automates inspections

CR Technology's machine vision system is designed for automatic functional test of electronic subassemblies. The System 240 reads electronic displays, detects sounds, actuates mechanical switches and monitors signals.

Automatically at high speed, the System 240 reads and recognizes any alphanumeric or symbolic readout on an electronic display—including LEDs, LCDs, and vacuum fluorescent units. It can also control pneumatic actuators to exercise a test unit's keyboard; check the frequency and amplitude of an audible tone (such as the beep generated when a test unit's keys are pressed); measure or send electrical signals to the unit under test; and receive or transmit TTL or other digital signals. Acting on any of these inputs, the System 240 can evaluate results or adapt the test procedure to changing conditions.

The system includes all necessary software to define character style and sequence and to control necessary external stimuli.

**Reader Service Number 36**

information for each test site. The same device test program can be used whether one, two, three, or four devices are in the test sockets. The footprint for the J386A is the same as for the J385A, eight square feet.

The base price of the J386A memory test system is \$170,000, with a delivery of approximately 26 weeks ARO.

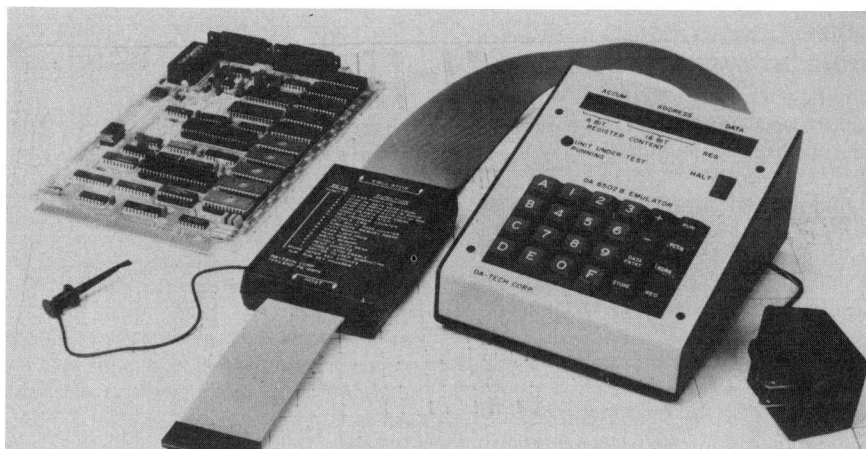
**Reader Service Number 37**



## Emulator facilitates 6502 development, test

A circuit emulator designed to facilitate 6502 software development, testing, and troubleshooting is available from DA-Tech. An interactive, transparent, stand-alone unit, the DA-6502B can support and service systems in a variety of applications—from breadboard and software debugging to production testing, training, and field service.

The in-circuit emulator can perform memory read/write diagnostics on the user RAM over any preselected range, provide a memory checksum on user memory space, and download diagnostic code from the emulator to user RAM. In addition, it can load user subroutines in the emulator, enabling the user program to jump to this subroutine at desired points in the user program. Other features include an eight-digit LED display, 24-station data entry keyboard, separate emulator memory, scope sync output signal, multimode functions, and separate pod interface.



**An interactive stand-alone unit, DA-Tech's circuit emulator supports 6502 software development.**

The portable unit allows the user to examine processor registers, read and modify memory locations, halt a program at a specific address, step through a program one instruction at a time, and stop a program at a location after a

number of loops have been completed.

The DA-6502B costs \$595 in single quantity. OEM discounts are available. Delivery is 30 days ARO.

**Reader Service Number 38**

## Controller accommodates four simultaneous users

Designed for a variety of integrated circuit testing applications, Pragmatic designs' modular Inspector 300M controller, I-300M, enables as many as four users to run simultaneous test programs using any combination of the manufacturer's family of test heads.

System reconfiguration with the I-300M is accomplished by swapping test heads. Available test heads include the TM-4, a 48-pin digital MOS test head; the TM-6, a 24-pin TTL test head; the TM-7A, a 54-pin linear test head; and the TM-4S, a 72-pin universal digital test head.

Each test head is totally static and is supported by its own control I/O interface, automatic handling-equipment interface, hardware math processor, and timing generator. The architecture of the system test heads and the MP/M-86-based operating system software enable

off-line program development, testing, and debugging on any station without affecting the operation of other test stations. All stations can datalog to the standard system floppy disks or to the optionally available hard disk or high-speed memory disk.

Based on the MP/M-86 operating system, the I-300's operating system enables not only using the wide variety of available CP/M and MP/M applications programs, but also running this software simultaneously with the system's test software. The system uses a dual processor 8085/8088 architecture to allow both 8- and 16-bit programs to run simultaneously. Over 1500 programs are available for use on the I-300M systems.

All I-300M systems are programmed using Pragmatic Design's T-Basic, an extension of Basic, which adds features to facilitate IC testing while giving users

direct control over all test system resources. Other features include data logging, program debugging, and failure analysis capabilities.

The standard I-300M system costs \$19,400 and supports two test stations, with expansion to four available. To add users requires a simple field upgrade—often user installed—at \$4300 per test station or \$3500 per programming station. The system includes an 8085/8088 dual CPU card, 256K bytes of static RAM—expandable to 1M byte, 2.4M bytes of floppy disk storage, ten I/O channels, terminals, and all required system software. Test heads run from \$7000 to \$48,000. Options include a 20M-byte hard disk at \$7100, a 512K-byte high-speed memory disk at \$2895, and a variety of applications software. Delivery is 45 days ARO.

**Reader Service Number 39**

## Disk drive test system offers portability

Cambrian Systems is offering the Winspector CS-1000, a portable disk-drive test system designed for use by drive manufacturers, OEM system integrators, and end-users. A complementary unit designed for use with floppy disk drives is scheduled for introduction in the near future.

The Winspector CS-1000 provides a uniform means of measuring timing-window margins for any disk drive, is networkable for multilevel volume test

applications, and has self-diagnostic and testing features.

Layered software provides accessibility at different levels of testing from go/no-go to engineering analysis using PROM-based custom software. A CP/M environment is accessed via English language commands describing disk drive mnemonics.

The 20-pound Winspector uses a liquid crystal display to reveal two lines of menu data at a time; 12 menus are stored in

firmware. A calculator style keyboard is color coded. In media-scan format, Winspector requires only seven rotations of the disk under test (typical 19M-byte drive) to inspect each track, characterize all surface defects, and format the disks for maximum usable area. For protection during field use, a sliding ABS panel closes over the keyboard and display.

The Winspector CS-1000 costs \$6750 and is available 30 days ARO.

**Reader Service Number 40**



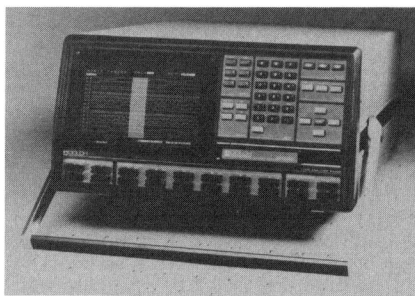
## Dolch upgrades its 64300 logic analysis system

Dolch Logic Instruments has announced the 64300S logic analysis system, an enhanced version of its 64300 introduced in June 1983.

Lighter and more compact than the 64300, the 64300S offers additional software and hardware features that are available as retrofits for the 64300. The system is fully modular in 16-channel increments—up to 64 channels total, including sixteen 300-MHz asynchronous channels for timing analysis and forty-eight 25/50-MHz synchronous/asynchronous channels for state/timing analyses.

The software enhancements are Labeling, Area Trace, and Reference Timing. Labeling permits the 64300S user to add names to all 64 channels on the timing display. Each label can be up to seven characters in length—up to five alphanumeric characters per channel for identification via mnemonics plus a one- or two-character physical label for identification of the channel input that is related to the timing trace displayed. The labels may be stored in Dolch's Datapak, a transportable, plug-in, integrated mass-memory module, for reuse.

Area Trace permits the recording of information by the 64300S to be limited to user-specified blocks of data. Up to 10 areas can be defined across 16 data bits. Area trace also includes a histogram capability for analysis of software perfor-



**The 64300S logic analysis system, an enhanced version of Dolch Logic Instrument's 64300, features new software and hardware.**

mance. Reference Timing permits a timing diagram to be created for data stored either in the analyzer's data memory or in a Datapak module.

A test/verification adapter provides a 4-bit-counter data pattern that can be used to test the 64300S's front-end inputs and as a stimulus for the logic probes. Included with the adapter is an active demonstration procedure that allows an inexperienced user to become familiar with the operation of the 64300S. The procedure is complete, providing even high-speed glitches to demonstrate or test the machine's glitch latch or 300-MHz sections.

The 64300S is priced from \$11,350 to \$18,150 depending on options.

**Reader Service Number 41**

## New instrument selects optimum disk drive

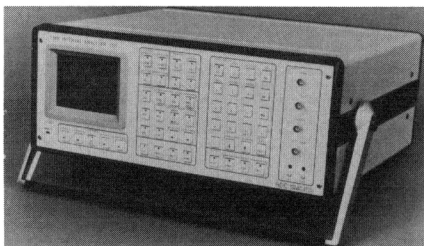
Applied Data Communications has developed a time interval analyzer to help OEM system integrators select the optimum disk drive for any computer system and the optimum controller for the drive. The TIA-150 works like a passive bus analyzer to capture bit-shift jitter, reduce it in hardware, and display it as a series of distribution histograms.

The TIA-150 connects directly to the drive-under test. Each controller's effect

on a given disk drive is clearly visible, and the resultant histogram-shapes are useful for diagnostics. Since it looks at data jitter instead of logic, the TIA-150 can be used to evaluate the jitter content and distribution of any kind of data stream, including run-length limited NRZ, FM (Manchester), MFM (Miller), and group coded recording, at any data rate from 10K bps to 10M bps. This includes stand-alone computer systems, local area nets, telephone systems, satellite telemetry links, and optical data storage units. The analyzer combines the functions of a precision ( $\pm 1$  ns) time-interval counter, a 1000-channel event-counter with 16,000,000 events per channel, a very high speed RAM, and a proprietary software package that produces the display graphics and mathematical data reductions.

The TIA-150 is priced at \$15,000. OEM volume discounts are available. Delivery is quoted from stock to 8 weeks ARO.

**Reader Service Number 42**



**Time interval analyzer from Applied Data Communications evaluates bit shift and jitter of rotating memories and communications systems.**

## AFIT 3000C and 4400Z upgraded by Fairchild

Fairchild Service Test Systems has introduced the Iceolator option for its AFIT 3000C tester and released five new software enhancements for its Model 4400Z in-circuit analyzer.

Featuring in-circuit emulation for up to 40 different microprocessors, the Iceolator provides logic probing for fault isolation, and analog measurement of voltage, current, resistance, frequency, and temperature.

Adding the Iceolator to the AFIT 3000C results in a combination functional and in-circuit tester. The Iceolator has signature analysis or transition counting to enable the service technician to functionally troubleshoot microprocessor-based boards. The clip access AFIT 3000C in-circuit test capability allows rapid fault isolation to the device level on both microprocessor and straight logic boards. Analog measurement adds a third dimension to fault detection.

The Revision 6 software for the 4400Z in-circuit analyzer expands capacitor range from 50 pF to 5000  $\mu$ F; increases test point capacity to 6488; provides real-time datalogging with generation of trend charts, histograms, fault distribution, and component analysis; provides a real-time clock; and adds a bar code reader utility.

According to Fairchild, the new software increases testing capability and flexibility. Its real-time trend reporting capability allows production engineers to tune the manufacturing process and eliminate PCB faults at the source, rather than waiting for board test.

**Reader Service Number 43**

## DUT station connects to measuring facilities

A device-under-test Station from Leighton Electronics, Model 8700, provides a wide variety of rapidly interchangeable device sockets to be connected to user's measuring facilities. Model 8700 capabilities provide for use with in-house test facilities, standard laboratory test instruments used for incoming inspection measurements, repair stations, and application performance testing. Model 8700 features include rapid interchange of test sockets with different pin configurations, force and sense wiring (up to 42 pins), and gold-plated connection pads with pogo pin DUT boards. It is available with 64-, 40-, 28-, 24-, and 16-pin sockets plus chip carrier and other types.

**Reader Service Number 44**

## Analog tester takes a modular approach

The Zehntel 850 features a modular approach to analog testing with its analog test module; increased test throughput via a 68000 computer and software optimization; and a user-flexible package design.

The modular architecture of the ATM allows each user's test system to be individually tailored to meet his specific analog in-circuit and functional test needs. Each ATM subsection is built on a plug-connector module, which is fitted to a general-purpose motherboard. Up to four motherboards, for a total of 16 modules, can be added to cover virtually any combination of analog in-circuit or functional test need, the company states.

Three frequencies (159.1 Hz, 1.591 kHz, 15.91 kHz) are available in the standard ATM for improved high-impedance resolution, especially for small value capacitors. Phase detection measurement improves complex impedance measurement accuracy and parallel RC resolution accuracy to two percent of resistance value and to five percent of capacitance.

ATM's basic three-wire measurement and guarding capabilities of resistance, capacitance and inductance with tolerance levels to two percent for most components, exceed those of common four-wire systems presently in use, according to the company. Its six-wire capability offers these same high accuracies while extending the measurement range by at least ten times for all component types.

The Active Guard feature in the ATM improves the guard ratio by reducing the offset voltage between the summing junction of the measurement amplifier and the guard point. The driven guard circuit tracks movement in the summing junction potential due to temperature, time, drift, and circuit configuration and automatically compensates for these changes. Typical six-wire guard ratios exceed 100:1 with one percent error.

For higher quality parametric testing of transistor characteristics and reduced programming efforts, transistor beta testing is performed directly via the Beta programming statement. Auto-Retry provides automatic parameter variance and re-test upon failure of a component. Optimal parameters are automatically found, simplifying the programming task.

Up to six independently programmable stimulus (voltage or current, ac or dc) sources may be applied simultaneously in a single test. The standard ATM is equipped with two channels for direct testing of three terminal devices.

The 850's 68000-based computer and Unix operating system increase test throughput more than twofold with

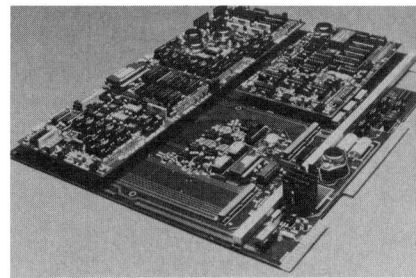
easier-to-create software programs for test and debug functions and special dual memory architecture. A 1M-byte private memory with a proprietary memory management scheme eliminates CPU wait states, according to company spokesmen. An additional 512K-byte memory supports other system functions.

The multiuser capabilities of Unix enables the 850 to support multiple tasks, such as program generation, computer-aided board rework, and management reporting and data analysis concurrently with testing.

Data Director, Zehntel's universal LSI/VLSI emulator (standard on the 850), expands the variety of digital LSI and VLSI components that can be inspected by digital in-circuit techniques. The 850 accommodates up to 32 Data Director driver/receiver boards, for 512 LSI/VLSI test points.

Because the 850 is prewired for 1024 universal test points, analog and digital testing can be combined to allow direct testing of a broad range of VLSI devices.

The 850 permits the use of functional IEEE 488 instruments such as counter/



**Part of Zehntel's 850 tester, the analog test module yields typical in-circuit board coverage of 95 percent of total analog components. Its modular architecture enables it to be individually tailored for specific analog in-circuit and functional test needs. Standard ATM configuration includes ac and dc stimuli modules, an amplifier module (for in-circuit guarding), and a measurement module.**

timers and waveform generators to test mixed signal devices.

The standard 850, complete with motherboard, two stimulus modules, one measurement module, and one amplifier module and configured for 640 test points costs \$209,000.

**Reader Service Number 45**

## Instrumentation mainframe has 20 plug-in modules

Dolch Logic Instruments' compact logic tester, the Colt 300, is a computer-based instrumentation mainframe that can be configured to solve a variety of digital logic problems by plugging in the appropriate instrumentation module.

Colt has a slot that accepts a single plug-in instrumentation module. More than 20 plug-ins are now available. They turn Colt into a state or timing, universal or microprocessor-specific logic analyzer; in-circuit emulator; digital pattern generator; serial data analyzer; EPROM programmer; or PAL/IFL programmer. According to Dolch, the plug-in concept allows Colt to satisfy all the testing needs of 8- and 16-bit microprocessor-based systems.

As a logic analyzer, Colt may be configured as a 48-channel unit sampling at up to 20 MHz synchronously or asynchronously, as a 32-channel unit operating at 100 MHz synchronously or asynchronously, or as a 16-channel instrument sampling asynchronously at 300 MHz for very high-speed timing analyses.

Colt's mainframe includes two 5¼-inch floppy disk drives that are used to load a plug-in instrumentation module's programs and for reference data files and set-up programs. Also included are two RS-232C ports, a Centronics-compatible parallel printer port, and an

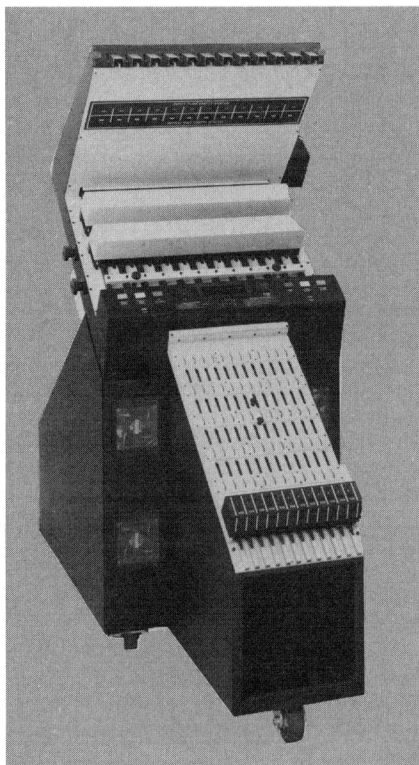
IEEE 488 BUS interface. Colt is operated through an integral instrument keypad on the mainframe. Colt's integral keypad and 48 lb weight contribute to its transportability. A separate ASCII keyboard is optional as is a two-slot extension chassis for additional instrumentation plug-ins.

Colt's base cost is \$9500 for the mainframe. The universal logic analyzer plug-ins range from \$3350 to \$5300, while the microprocessor-specific logic-analyzer plug-ins range from \$3200 to \$4200. Delivery is 60 days ARO.

**Reader Service Number 46**



**The Colt 300 from Dolch Logic Instruments is a benchtop instrument for digital logic testing in R&D and production environments.**



With up to 24 serial parallel capacity, this DIP handler from Parallel Systems can speed throughput up to 3456 dph (25-second test time).

### 24 test-site handler increases throughput

Parallel Systems has announced a parallel, multitest-site ambient handler. This DIP handler can increase yields by eliminating operator handling and by speeding throughput up to 3456 dph (25-second test time).

The multi-microprocessor-based system handles 600 mil devices up to 40 pins, with intelligent intray sorting and automatic binning to ten classifications. Special consideration has been made for ceramic packages. An alphanumeric display monitors each of the 24 self-contained, modular test sites.

**Reader Service Number 47**

### Chip carrier handler accepts most IC packages

A universal chip carrier handler that can deliver virtually any IC package to any major ATE system at rates up to 3600/hour has recently been introduced by LFE's Automation Products Group.

The Model 4800E chip carrier handler is a fully-automated, microprocessor-controlled system that handles LCCs and plastic and ceramic chip carriers with flat leads, preformed leads, C-clips, and J-clips. It also handles pin grid arrays,

### CAD software expands Via Systems' Series 100s

Diagram, a multifunction integrated design engineering and layout system from Via Systems, provides IC design engineers with logic and schematic capture, and design verification for gate arrays and standard cell layouts. This system has been integrated into Via's Series 100 CAD/CAM systems for VLSI custom layout and mask preparation.

The data structure of Series 100 products has been extended to support connectivity directly in the database. According to the company, these changes make it easier for the designer to trace a signal network in a schematic or layout. The Trace function highlights all pins and wires connected to the net in a highlighting color. This function can also be used to highlight multiple signal nets in

the logic diagram. The Traceoff command restores all signal wires to their original color.

With Diagram and the Series 100, before a netlist can be generated from the completed logic or schematic diagram, a postprocessor performs basic checking operations to flag any violations before a netlist can be generated. The netlist can be formatted to interface to logic simulation and analysis tools as well as placement and routing programs.

Diagram formats the netlist for automatic input to the Cadat simulation and test program development system resident on a simulation processor, which can be either Vax/VMS- or Unix-based.

**Reader Service Number 48**

### Burn-in unloader handles wide boards

Two new burn-in board unloaders are available from Idea, Inc. The fully automatic, microprocessor controlled 20K-MPX can unload extra-wide boards in 50 seconds with throughput rates of 26,000 units per hour, the company claims. The 15K-MPA unloads a burn-in board in 30 seconds without damage to device, leads, or board.

The new 20K-MPX has an interchangeable board carrier that allows it to unload boards of different sizes. With extra-wide capabilities, the 20K-MPX can handle virtually all board styles within a single DIP size; 300-, 400-, or 600-mil plastic or ceramic DIPs can be handled.

To assure 100-percent lead quality, the 20K-MPX removes DIPs straight out of the sockets, thereby avoiding the problems created by wedging. Unloaders can be customized to customer board samples. Microprocessor control features self-diagnostics and the future capability for smart unloading of boards with known failed DIP locations.

The 15K-MPA features universal board carriage; its positioning to variable socket locations makes it possible to

unload all board styles of one device size with quick, simple settings.

No bent leads occur, because IC removal action is perpendicular to the socket, and no wedging action is used. IC hermeticity and cosmetic quality are protected by a soft, force-limiting board carriage drive. ICs whose leads were bent under manual loading are automatically separated from the quality ICs.

Tubes can be filled and transferred while the board is being automatically unloaded, doubling the throughput. According to the company, a five-month payback is possible because of the unloader's ability to remove up to 15,000 units per hour directly into transfer tubes with one operator. This microprocessor-based fully automatic unloader also features self-diagnostics and fault isolation to operate with the maximum uptime. It will handle 0.3-, 0.4-, and 0.6-inch ceramic and plastic DIPs with 14 through 40 leads.

Base price for the 20K-MPX is \$21,550.

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SIP packages, hybrid packages, and more.

A pick-and-place feed mechanism with vacuum pick-up eliminates shingling and dual escapement problems, the company states. Frictionless air bearings move devices smoothly in input and output reservoirs. Complete ESD protection is provided, and device visibility and access are maintained throughout the entire sequence.

A four-zone heating system provides temperatures from ambient to 155°C, controlled to within  $\pm 1^\circ\text{C}$ , during the test cycle from programmable presoak to the test socket.

The Model 4800E places the device either in the handler contactor assembly or directly on the test system load board. Active contactors can reach test points at almost any location on the device under test.

**Reader Service Number 50**



## Tektronix adds capabilities to LSI/VLSI tester

Tektronix has extended the capabilities of its S-3295 LSI/VLSI test system. The extensions include the Tektest V test language and support tools running under the DEC RSX-11M operating system; a 40-MHz dual-algorithmic pattern generator; a real-time image buffer; and a scan-pattern source option for level sensitive scan design.

The Tektest V package consists of an enhanced version of the Tektest test language and other ancillary support tools. Use of the RSX-11M operating system provides the user with increased flexibility in peripheral selection, widely utilized and supported networking architectures, and a source for DEC-supported or third-party applications software. Most of the language and support tools found in earlier versions of Tektest are retained. Significant new features include test program compilation and enhanced language constructs.

The dual-algorithmic pattern generator option expands the algorithmic address and data facilities of the S-3295's standard pattern processor to provide full address and data word width during 40-MHz multiplex mode operation.

The real-time image buffer, a multipurpose storage buffer that works in conjunction with the S-3295 pattern processor, provides the real-time error storage essential to memory failure mode analysis. The RTIB's data reduction and bit-mapping functions condense error data into manageable composites. The RTIB can also be used as a compare data source for ROM testing or as a stored-response data source for testing any type of logic devices.

The scan-pattern source option is a special-purpose pattern storage memory that satisfies the unique testing requirements of scan-design logic devices. It has the capacity, channel partitioning, pattern modularity, and error storage essential to meet the needs of these devices.

All enhancements for the S-3295 LSI/VLSI test systems will be available in mid-1984. The dual algorithmic pattern generator will be priced at \$12,000, the real-time image buffer at \$165,000, and the scan pattern source option at \$15,000.

**Reader Service Number 52**

## 50-MHz data generator provides five output formats

Pulse Instruments' new PI-5800 Data Generator features true 50-MHz operation in all modes, memory depth exceeding 4K bits per channel, up to 256 output channels, and simplified user-programming. It provides five output formats: RZ, NRZ, high impedance, true, and complement.

The PI-5800's dynamic pattern updating permits up to a 90-percent change in the data pattern output of a single channel, while in the RUN mode. It can be performed on up to one-half of all channels in the system at any given time. Dynamic pattern updating also allows faster reactions to changes in test data and minimizes the need to stop a test for reprogramming.

Twelve program-controlled soft keys provide a selection of menus that are displayed on the PI-5800's 7-inch CRT monitor. The menus include pattern entry and editing, instruction entry and editing, output format and channel status, clock and interface setup, output waveform display, and self-test routine. Repeated patterns may be entered by formula.

Since each PI-5800 channel has a memory depth of 4K bits, looping and nesting modes permit a virtually endless data stream. As many as 256 repeatable subpatterns can be generated, each having a different word length and repeating factor that can range from one to 1024

times. As second-level looping allows subpatterns to be repeated within the main program, it is possible to program patterns whose length exceeds 250 trillion bits.

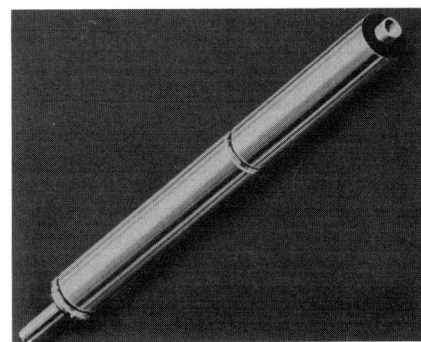
Expandable hardware and software allows the PI-5800 to provide from 16 to 256 channels. Up to four mainframes may be employed, each with up to four, 16-channel data output cards. The internal clock rate is from 1 kHz to 50 MHz.

## Parametric tester uses DEC's PDP-11/23

Keithley Instruments' System 250 parametric tester is a fixed-configuration, standardized-component model for use primarily as a process monitor in the manufacture of semiconductor wafers.

The System 250 features a DEC PDP-11/23 minicomputer controller with 256K bytes of RAM, direct memory access, and eight serial ports to drive standard peripherals and customer-selected options. These include system and operator CRT consoles, probe interfaces, and an optional second test station, printer, and plotter. The cabinet also houses a 31.2M-byte Winchester hard disk drive and a 1M-byte floppy disk drive for mass storage and data transfer.

The System 250 is fully compatible with all other systems in the Keithley family of parametric testers. Software



Coaxial RF spring probes designed for such applications as testing gate arrays and RF printed circuit boards are now available from Everett/Charles Contact Products. Custom-designed and manufactured for specific RF applications, the new product features replaceable spring probes available in a variety of tip configurations. The probes are designed for applications from 40 MHz to 1.5 GHz, with characteristic impedance of the probe and connector at 100 MHz,  $Z_0 = 50$  ohms. The RF probe and connector assembly can be mounted on 0.100-inch centers and terminated with commercially available 50-ohm coaxial cable.

**Reader Service Number 53**

Other features include 0 to 2.5-V output levels back-terminated by 50 ohms, dc to 50-MHz external clock input, IEEE-488/RS-232C compatibility, optional EEPROM program storage, and optional 16-channel data output cards with programmable delay in 1-nsec increments.

A 16-channel, standard PI-5800 is priced at \$21,000 in single quantities. Deliveries began in April.

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needs are met by DEC's RSX-11M operating system and Keithley's KPT test software. KPT includes the Keithley Command Language, test libraries, monitors, analysis programs, peripheral control software, diagnostics, and database facilities. The programming language is Fortran-77 Plus.

Voltage and current meters, voltage and current sources, and a 48-pin, six-pathway relay matrix give the System 250 programming and measurement accuracies of 0.1 percent or better. Two test stations can be operated. Additional instrumentation, including a capacitance meter for capacitance measurement through the matrix, is also available.

The base price for the System 250 is \$80,000.

**Reader Service Number 51**

## Wafer test/probe system has raster display option

System I from Pacific Western Systems provides a fully automated wafer test/probe solution for the entire spectrum of IC memories, according to the company. Enclosed in one self-contained station, System I includes complete 25-MHz memory testing and automated probing for DRAM/SRAM and ROM/EEPROM wafers. System I has three major modules: test, error capture, and automated probe.

System I's wafer cassette load/unload module has automated X, Y, and theta alignment, auto Z control, mapping, summary printout, internal step, and tip scrub routines. It also includes full wafer characterization, SHMOO plots, and data distributions. Operator intervention occurs only at initial start of wafer run. Memories with redundant rows and columns may be electrically repaired by use

of System I's high-speed error capture capability, while RS-232 ports enable interfacing to the customer's host CPUs for full data management, downloading, and data retrieval.

System I features minimal cabling, connectors, and subsystem interconnects. Program control of the system is accomplished through Tslang a high-level language that incorporates an on-line editing system. Test programs are compiled during downloading and stored in object form. Program changes can be made directly in source language. Tslang is a total operating system with editing, on-line debug, bit mapping, data logging, and interactive control of test programs. The system can also accommodate an optional raster display unit.

**Reader Service Number 55**

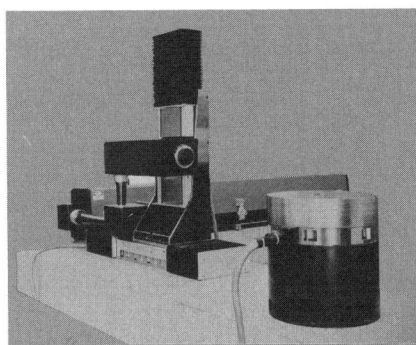
## Positioning system transfers laser to curved surfaces

Anorad has announced an X-Z-theta positioning system that utilizes customer-supplied software and YAG laser to transfer a laser beam precisely onto curved surfaces.

The Model 1623 Anoride positioning system employs three axes for rotation of the cylindrical work piece; vertical movement of optical elements, allowing the laser beam to scan the work piece; and horizontal movement of the optical elements to follow the curved surface, keeping the laser beam in focus.

The rotating axis normally revolves at 30 rpm, while the vertical axis moves constantly to develop a TV-type scan. Both motions are fully programmable. The third axis constantly follows the shape of the work surface stored in memory or through an auto-focus assembly.

The system provides positional resolution in the X-Z axes of .0001 inches and unlimited 360° travel in the theta stage. Adjusting the speed of the rotary and Z



**Anorad's laser positioning system employs three axes for rotation of the cylindrical work piece and for vertical and horizontal movement of the optical elements.**

stage permits a variety of patterns. Control of the system is dependent upon Anorad's Anomatic II CNC microprocessor controller or through interfacing with a host computer.

**Reader Service Number 56**

## IBC PC becomes firmware development tool with assembler, Emulyzer

A new macro meta assembler permits IBM PC users to combine their systems with Hilevel Technology's DS370 Emulyzer to form a firmware development station for microprogrammed, bit-slice, and other high performance processor-based design. With Hilevel's new assembler, users can download programs into the Emulyzer and, when debugging and analysis is complete, upload into the PC.

The DS370 Emulyzer combines PROM emulation with a logic analyzer. It offers

graphic performance analysis, selective trace, symbolic debug, 16 triggering levels with eight qualifiers each, powerful bit-slice architecture, and expandable modular design.

The DS370's performance analysis feature allows the user to define up to 16 program activities to measure the efficiency of the architecture and code being developed. A bar-chart histogram displays the results on the PC's CRT. Trace memory can also be used to capture pre-

## Handler tests loaded PCBs at temperatures to 85°C

Trigon has introduced two test handlers for functional and in-circuit PCB testing. The Model T-2210 tests loaded PCBs at temperatures to 85° Celsius. A companion unit, the Model T-2205, provides similar testing capabilities under room-ambient temperature conditions. Both models can be adjusted to accommodate PCBs over approximately a 3:1 size range; no change kits are required.

These loaded board handlers are available with either a Kelvin contact set for functional testing applications via PCB edge fingers or a bed-of-nails fixture for in-circuit testing at selected nodes. Standard units are configured for tube input and output with special adaptations available for PCB cassette carriers or in-line conveyor applications.

**Reader Service Number 57**

## Modular ATE equipment allows customized testing

Scientific Machines, a supplier of testing products and services, has announced availability of a new ATE system with modular architecture.

The SM2000 production test system addresses the needs of production and repair testing. It provides a single, repeatable, computer-controlled test that includes analog, parametric, and at-speed digital testing. For analysis and repair, the operator can invoke the test program's fault isolation capabilities, which are not required in production testing. The user can buy only those modules required to test his own particular circuits. In addition to the customary modularity in pin counts, the SM2000 test system offers options for digital pattern depth, data formats, logic levels, dc parametrics measurement, timing channels, and high-performance analog signals.

Prices begin at \$68,000.

**Reader Service Number 58**

cise time measurements. The Emulyzer allows full-speed, real-time emulation of virtually all PROMS. Up to 80-bit wide microcode can be emulated. Writable control store modules are available in 16-bit wide by 1K, 4K or 16K deep increments, allowing the user to tailor the system to match changing needs.

The IBM PC-compatible macro meta assembler costs \$3250. DS370 Emulyzer prices begin at \$12,000.

**Reader Service Number 59**