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ATS-9

TEXAS INSTRUMENTS
INCORPORATED

Automated Test System
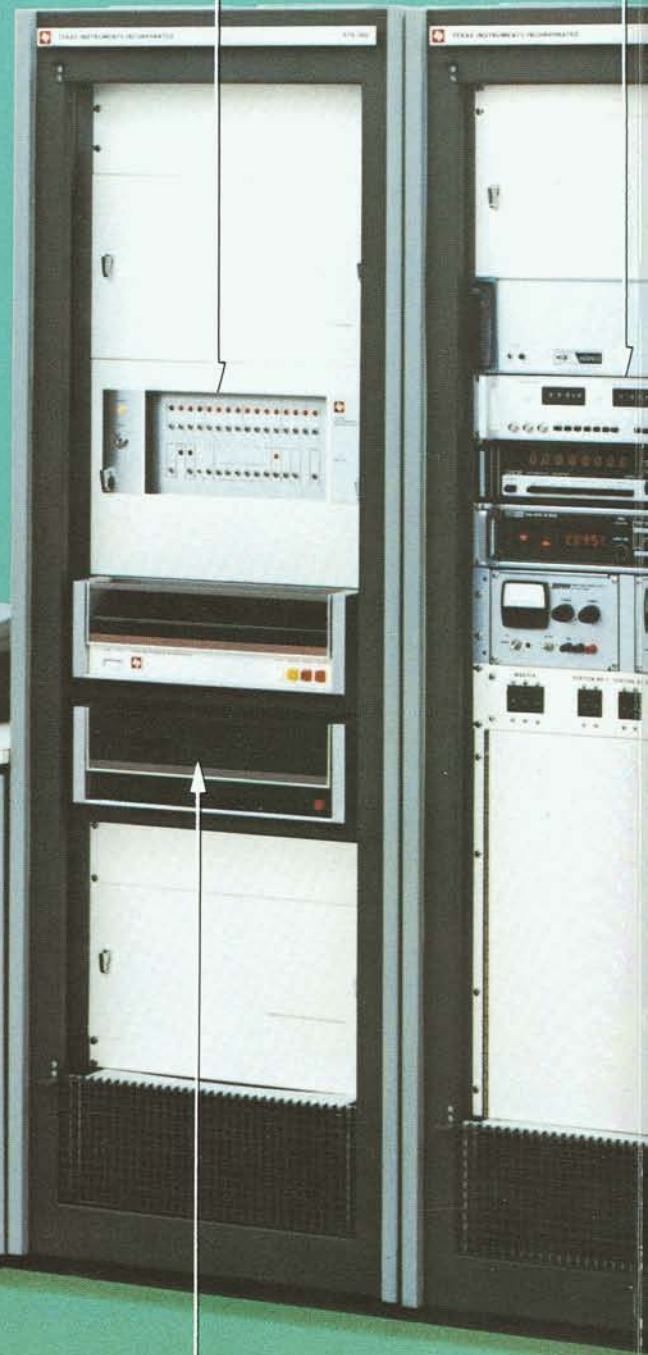# from Texas Instruments

960A COMPUTER　　　**TEST INSTRUMENT**

TEST STATION　　　**DISC UNITS**

ATS-960
Automated Test System

Cost-effective PC board, component and module testing

The *ATS*-960* Test System is designed to lower your testing costs substantially. It tests analog, digital and hybrid electronic assemblies at high speeds, and its simplicity of operation reduces the need for extensive operator training. It is easily programmed and extremely versatile, capable of performing static, functional and dynamic testing as well as analog and digital fault isolation.

Up to four test stations

Modular construction allows each *ATS-960* system to accommodate up to four test stations. All may be operated simultaneously with each station performing a different type of test on components or PC boards. For example, one station can perform fault isolation on digital PC boards while a second performs go/no-go tests on analog assemblies while a third is used for program debugging or editing and a fourth is performing incoming inspection of integrated circuits.

Each station may contain its own keyboard, operator controls, status indicators, visual display, optional fault isolation probe assembly and provisions for external test circuitry. Also, the desired operational mode—normal test sequence under program control, recycle one or more tests, manual advance one test at a time, etc.—can be selected by the operator.

Operator instructions concerning calibration procedures for the unit under test can be automatically displayed as shown below.

Automatic operator instructions
1. Adjust Trig Adjust (R3) until Fail Low Light Appears
2. Adjust Trig Adjust Slowly Clockwise until Pass Light Appears

Typical easy-to-write *ATS-960* system programming

ATS-960 Instruction	*Description*
SETUP, DVM, VOLTS DC, AUTO $	Set the DVM to measure DC volts in Autorange Mode
READ, DVM $	Read the DVM
CONNECT, SCOPE A, 10 $	Connect oscilloscope Channel A to Pin 10
APPLY, 1, B' 1001110000011011' $ or APPLY, 1, 0' 116033' $ or APPLY, 1, X' 9C1B' $	Apply test pattern 1001110000011011 beginning with first 16 pins of the unit under test. Pattern may alternately be noted in Octal or Hexadecimal code as shown (up to sixteen 16-bit patterns may be programmed with one apply statement).

Because of its modularity, ease of operation, and versatility in accepting a wide variety of test instruments, the *ATS-960* system eliminates the need for a multiplicity of special test equipment. Virtually all of the PC board, component and module testing requirements of your manufacturing quality assurance, service and engineering departments can be satisfied by this one system.

Easy-to-write English language programs

All test programs for the *ATS-960* system are written in ATLAS, an industry standard English language which has been thoroughly proven and universally accepted. This language is automatically converted to machine language by an on-line language processor—skill in computer programming is not required.

This easy-to-use ATLAS language enables you to merely write a new program when adding new products rather than adding new test equipment *(see example above)*. New test programs can be written and tested while the *ATS-960* system is processing production circuits.

Since all program editing and debugging is done on-line in the ATLAS language, the programmer can quickly and simply change, add or delete instructions or test sequences by means of the test station keyboard.

Economical testing

Manufacturers who must test many kinds of PC board assemblies where design changes are frequent will gain the greatest economic benefit from the *ATS-960* system. While it is particularly cost-effective for small quantity production—10 to 200 boards of a kind per production lot—it also has proven highly effective for quantities in the thousands.

FAULT
ISOLATION
PROBE

VISUAL
DISPLAY

TAPE
CASSETTE

KEYBOARD/PRINTER

TEST STATION

102646118

ATS-960
Automated Test System

Rapid fault isolation

Isolation of faults to individual devices or components represents a major portion of the total cost in manufacturing electronic equipment. The *ATS-960* system substantially reduces PC board and module troubleshooting times by its automatic fault isolation capability. This capability is provided using digital fault isolation probes comple-

mented by optional computer-generated test patterns and diagnostics.

Digital fault isolation using computer-generated diagnostics—Computer-generated diagnostics provide high-speed fault isolation for high-volume production.

Digital fault isolation using universal program – The TI-developed universal digital fault isolation program is cost-effective for both

low volume and high volume production. The need for special fault isolation programming is eliminated by an automatic learning mode in the *ATS-960*. The system uses a multi-pin IC probe together with a universal fault isolation subroutine to pinpoint faults to individual ICs. This method also solves the problem of isolating faults in embedded logic.

Computer compares probe data to reference data on disc.

Display tells operator which IC to probe.

Multiple-pin IC probe senses all leads on package simultaneously.

Terminal prints fault analysis report to accompany defective board.

Customer training
Programmer and operator training is furnished at TI, Houston, Texas, with each *ATS-960* system at no extra charge. Training at the purchaser's site is available optionally.

Field service
ATS-960 systems are serviced by TI's own worldwide factory service organi-

zation. Both contract maintenance and maintenance-as-required are offered.

Warranty
System warranty covers parts for a period of 12 months from date of delivery and labor for a period of 90 days.

Sales and Service Offices of Texas

Instruments are located throughout the United States, Canada and in major countries overseas. Contact the Digital Systems Division, Texas Instruments Incorporated, P.O. Box 1444, Houston, Texas 77001. Or call (713) 494-5115, Ext. 2558 or 2194, for the location of the office nearest you or for more information on the *ATS-960*.

Texas Instruments reserves the right to make changes at any time in order to improve design and supply the best product possible.

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