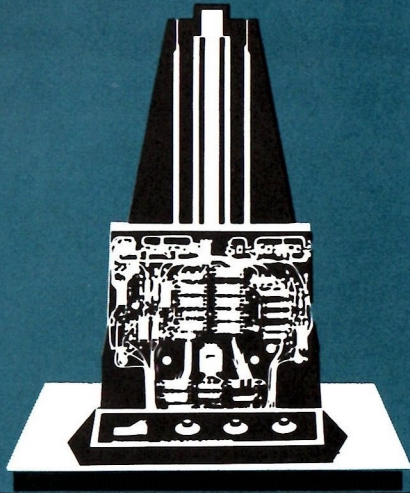




NEW S3200 SERIES DIGITAL SYSTEMS

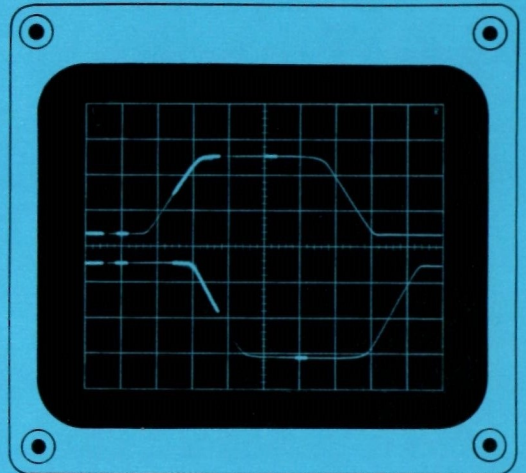
AUTOMATIC DEVICE HANDLING
AND SORTING



HIGH SPEED DIGITAL MEASUREMENTS

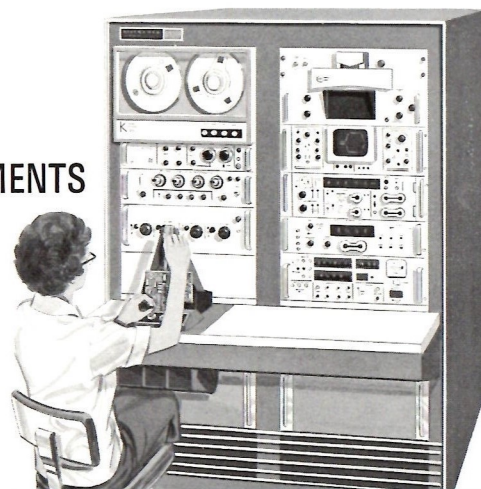
+ 0 1 . 5 0 NS

MEASUREMENT VERIFICATION



DATA RECORDING

100
DYNAMIC MEASUREMENTS
PER
SECOND



AUTOMATICALLY PROGRAMMED MEASUREMENTS

S-3200 digital systems provide fully automatic test sequences. Each measurement instruction contains the memory address for the next test in addition to all data required to set up system measurements. Thus, the system automatically sequences through a complete test routine, then resets for the next sequence. If the magazine of the automatic handler is loaded with devices to be tested, the measurement routine repeats until all devices are tested and sorted.

The test sequence is begun by selecting the first measurement address of the test sequence and actuating the start button on the system control unit. The test routine may be selected manually or by computer. Measurement address is visually displayed by a 4-digit readout on the programming control unit. Test programs are stored on an 8-track rotating disk memory with a capacity of 1,024 separate measurements. In the operating mode, test programs are read serially from the disk into a 400 bit register in the programming unit where parity check is accomplished prior to parallel programming of system instruments.

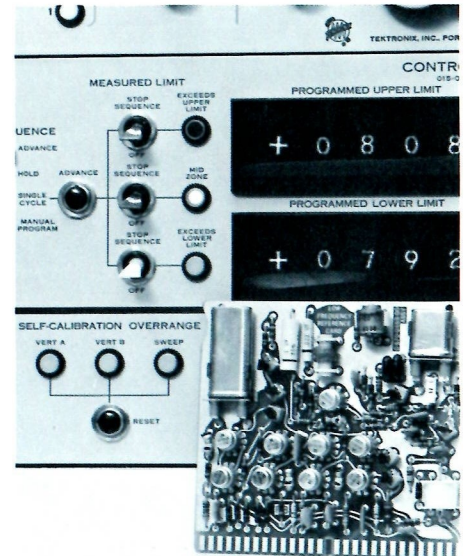
The system is set up for operation by preparing a test program with the required

sequence of measurements and by installing the proper test station fixture card.

Test programs can be prepared on the system itself, or remotely. Test equipment technicians may prepare measurement programs using the system programming unit, manually setting up measurement and address instructions character by character, and using CRT and digital readout displays to verify measurement parameters prior to committing the test routine to memory. Optionally, technicians may prepare measurement programs remotely from the system, thereby allowing it to be productive while additional programs are prepared. This is accomplished by punching paper tape with measurement instructions which can then be read into the programming unit through a serial reader, verified in the same manner as if prepared on the system, changed if necessary, then committed to memory.

The test station fixture card contains a device interface socket, power supply and input signal paths, buffer drivers, fanout loads, signal reference choppers and signal pickup leads. These cards may be designed and fabricated by your test equipment engineers, or can be furnished by Tektronix.

ACCURACY, RELIABILITY AND REPEATABILITY



S-3200 series digital systems bring Tektronix' basic commitment to accurate and reliable measuring equipment to the field of high-speed automated testing.

The typical $\pm 3\%$ measurement accuracy of system instruments has been improved to $\pm 1\%$ with the inclusion of a self-calibration feature. This feature allows the system to be programmed, measure and (if necessary) readjust the gain of its own horizontal and vertical amplifiers to insure measurement accuracy of $\pm 1\%$. This may be done just prior to critical measurements. Noise and trigger jitter limit the accuracy on the two most sensitive vertical ranges and the fastest time base range to between 2% and 5%.

Repeatability of all measurement parameters and test limits is assured through positive digital programming. Repeatability (long and short term) is equal to or better than $\pm 1\%$.

Reliability is engineered into the system through extensive use of integrated circuits and advanced manufacturing techniques.



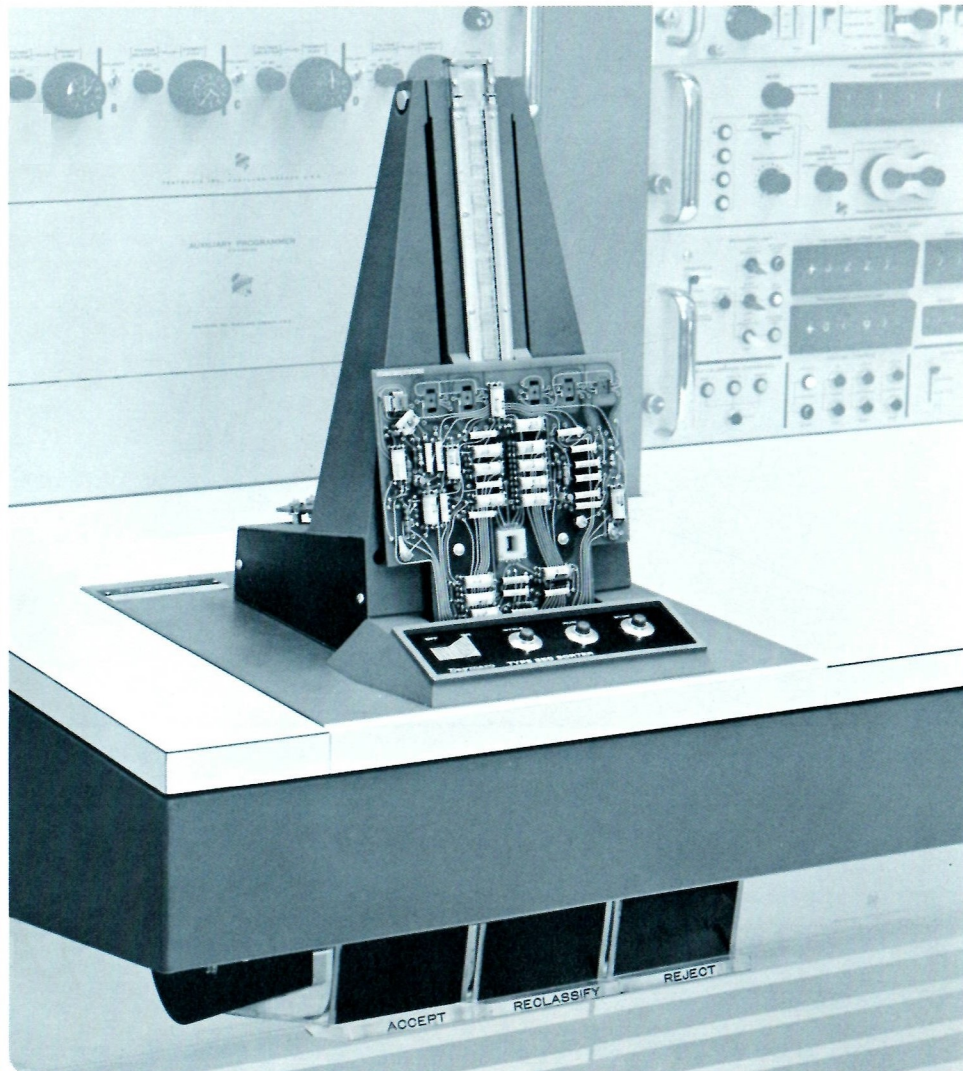
AUTOMATIC DEVICE HANDLING AND SORTING

Over-all speed and effectiveness of S-3200 series digital systems are substantially increased by automatic handling and sorting of devices under test.

The automatic sorter furnished with the system is the Daymarc series 350 Integrated Circuit Sorter which mounts to the system fixture table. This unit houses the test station fixture card, signal probes and all interface electronics needed at the test station. The sorter is automated to the extent that the operator need only load new magazines and remove tested devices from the bins beneath the fixture table, neatly sorted into three categories (accepted, reclassify and rejected).

The device handling capability of the automatic sorter is well matched to the measurement speed capability of the system. For test routines of 40 to 60 measurements per device, the handling capability of one device per second is efficiently utilized.

For applications involving large quantities of devices to be tested, the Daymarc series 850 or 1650 Integrated Circuit Sorters are recommended. These new automatic handling systems have been specifically designed for the careful preservation of nanosecond signals, thereby facilitating high-speed dynamic testing.



BROAD RANGE OF APPLICATIONS

S-3200 digital systems can help the circuit design engineer:

- Exhaustively test new designs,
- Establish primary specifications on dynamic as well as DC parameters.

With this new capability, the manufacturer achieves:

- A higher test throughput rate,
- Improved process control,
- Repeatable dynamic test parameters and accurate results,
- Faster and more complete prototype appraisal,
- More effective pilot and pre-production evaluation,
- Improved quality control and quality assurance sampling procedures.

The new Tektronix automated dynamic test system brings to the user of active devices:

- A method of dynamic evaluation of new devices,
- More efficient high volume incoming inspection,
- Improved in-process quality control of modules and sub-assemblies,
- More effective quality assurance sampling capability.

A FULLY INTEGRATED AND COORDINATED MEASURING CAPABILITY

S-3200 digital systems bring you a complete dynamic testing capability. Measurement routines and sequential instructions are stored and automatically read from a rotating disk memory. All instruments and peripheral equipment are selected and properly set up to make the required measurements by the programming equipment. The system features serial programming by data stored on the disk or in an external source. Programming information is checked for parity prior to parallel distribution.

Analog and digital displays of the R568 oscilloscope and R230 digital unit are available for measurement and program verification, and trouble shooting.

A programmable digital voltmeter can be included as an integral part of the system to provide limited DC measurements.

Primary system controls are simplified and centralized on the control panel. Digital displays of programmed upper and lower test limits are presented on the control panel for program verification.

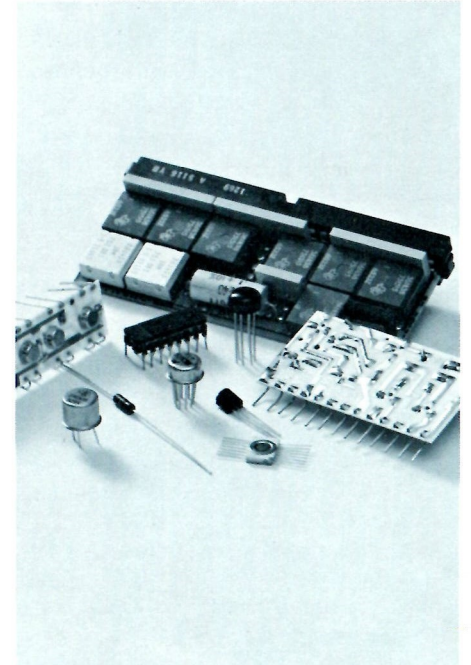
BROAD RANGE OF MEASUREMENT CAPABILITY

S-3200 digital systems measure nanosecond and microsecond signals by means of equivalent time sampling techniques—millisecond and slower signals by real time techniques.

The specified maximum rate of 100 measurements/second, (including reprogramming time), is achieved when using equivalent sweep speeds of 100 ns/div or faster and by programming techniques designed to optimize the measurement rates. Measurement rates in excess of the maximum may be obtained dependent upon the measurements to be made and the programming technique employed.

At slower equivalent sweep speeds, measurement rates decrease because of sampling limitations. However, measurement rates at all sweep speeds have been significantly increased as a result of improved measurement and sampling techniques in the new digital instruments.

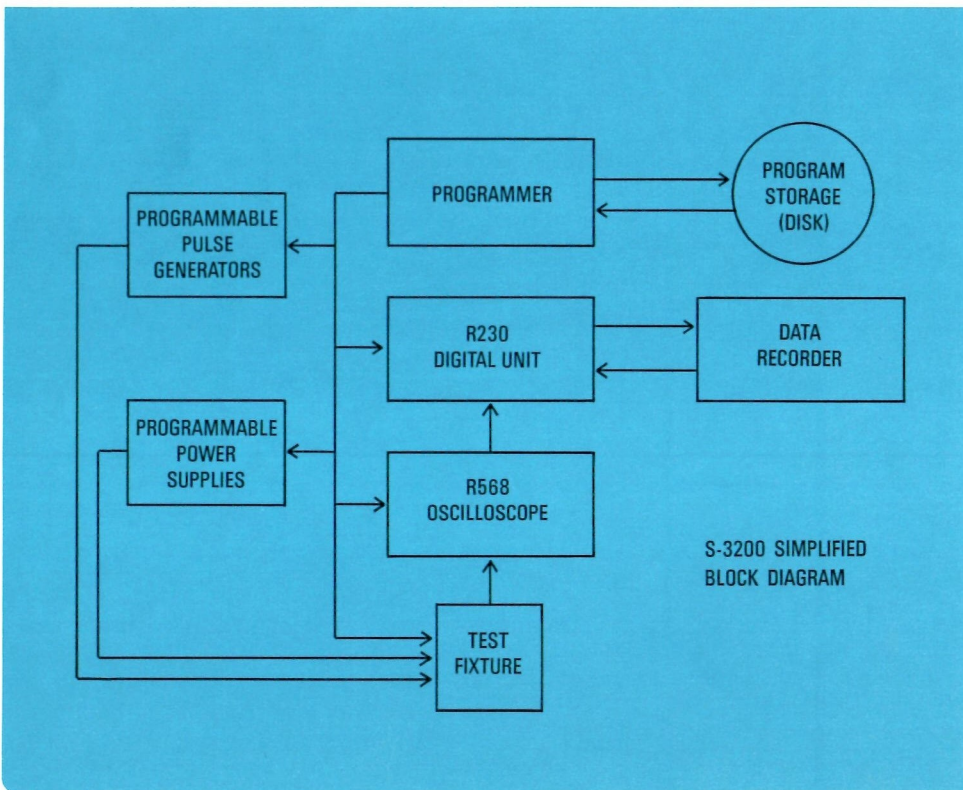
The system can be programmed to make equivalent time sampling measurements from 1 nanosecond per division to 200



microseconds per division (10 nanoseconds to 2 milliseconds full scale). If realtime measurements are required, an R283 realtime adapter can be integrated into the system, thereby extending its capability to 1 second per division (10 seconds full scale). Amplitude measurements from 5 millivolts per division to 100 millivolts per division (40 to 800 millivolts full scale) can be programmed. Programmable attenuators with a range of X2 to X100 are available which extend the input sensitivity range to 10 volts per division (80 volts full scale).

A high order of flexibility in the test station and new programming techniques enable you to perform complete series of dynamic measurements and some DC measurements on a variety of devices, such as:

- Integrated circuits (*flat pack, dual-in-line and TO-5 configurations*),
 - Thin film and hybrid devices,
 - Transistors and diodes,
 - Logic modules and sub-assemblies,
- And many other devices.



TESTS

TYPICALLY MADE BY S-3200 SERIES DIGITAL SYSTEMS:

Input pulse
Amplitude
Width
Period
Risetime
Falltime
Delay between
input pulses

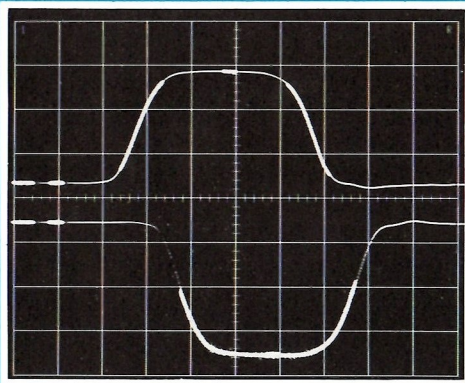
Output pulse
Amplitude
Width
Period
Risetime
Falltime
Overshoot
Undershoot

Delay time
Storage time
Turn on time
Turn off time
Propogation delay
Time to voltage level
Time between voltage levels

Diode forward and
reverse recovery time
Noise immunity
Noise feed through
Truth table verification

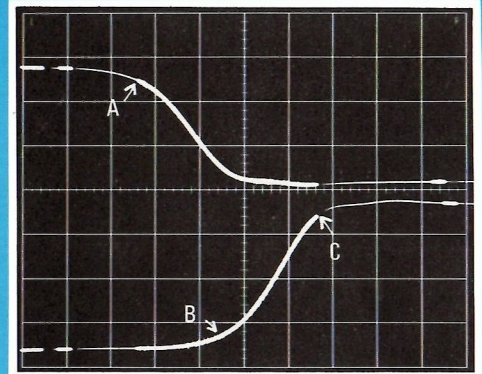
Input voltage
Output voltage
Set voltage
Reset voltage
Preset voltage
Offset voltage
Breakdown voltage
Saturation voltage

Input pulse
Amplitude
Risetime
Falltime
(Multiple Exposure)



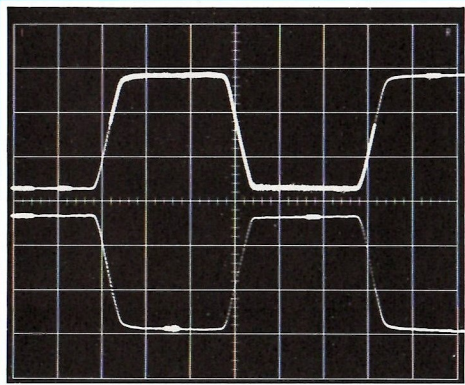
Output pulse
Pulse width

Input pulse
Storage time
A to B



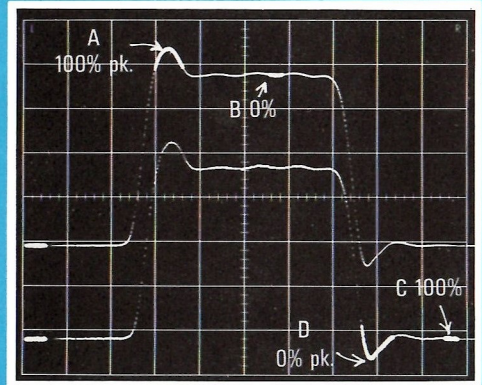
Output pulse
Turn off time
A to C

Input pulse
Period



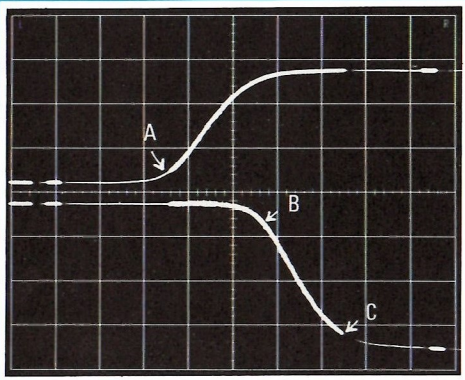
Output pulse
Amplitude

Output pulse
Overshoot
B to A



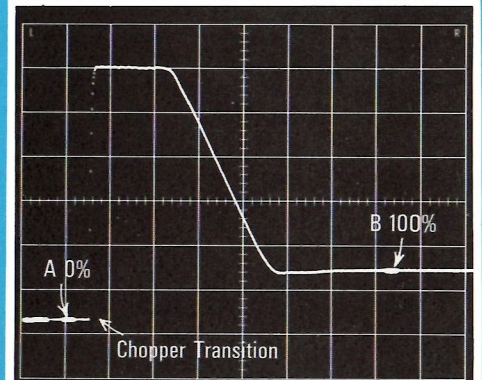
Negative
overshoot
C to D

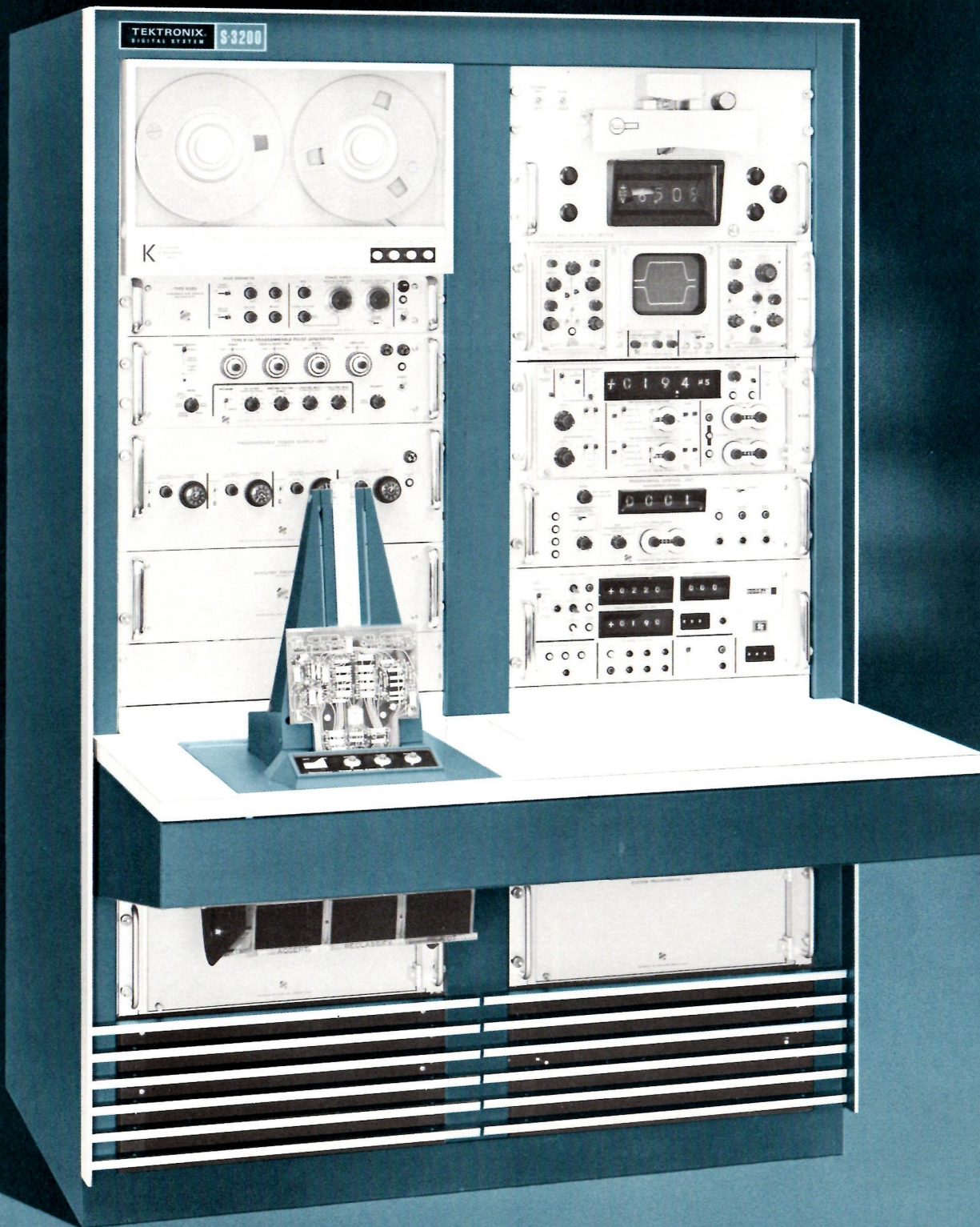
Input pulse
Propogation
delay
A to B



Output pulse
Turn on time
A to C

Output pulse
Collector to
emitter or
Source to
drain
Saturation
Voltage
A to B





TEKTRONIX
DIGITAL SYSTEM S-3200

THE NEW S3200 SERIES DIGITAL SYSTEMS

AN AUTOMATED DYNAMIC TESTING CAPABILITY WITH:

- High testing speed—
(100 measurements per second max.),
- Programmed measurement routines,
- Ease of programming, on line or off,
- Rotating disk storage—
(1024 measurement capacity),
- Simplified fixed word length logic,
- Simple measurement and program verification,
- Programmable self-calibration of measuring instruments,
- Automatic device handling and categorization (*programmable*),
- Rapid interchange of test heads (*fixture cards*),
- Centralized operating controls,
- Digital output for data processing or recording,
- Digital voltmeter for some DC measurements.

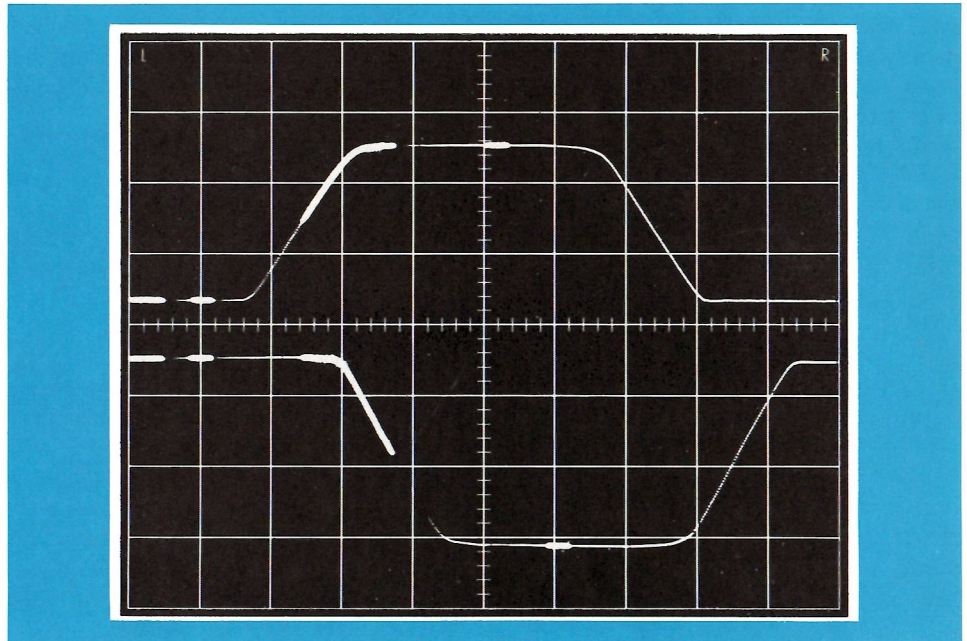
Additionally, the S-3200 series system is:

- Adaptable to environmental testing,
- Adaptable to closed loop computer operation,
- Available in 2-bay standing rack or 3-bay console enclosures.

These new systems feature:

- New Tektronix measuring instruments,
- R568 oscilloscope,
- R230 digital unit,
- New high-speed programming equipment,
- Magnetic tape data recording.

DYNAMIC TESTING

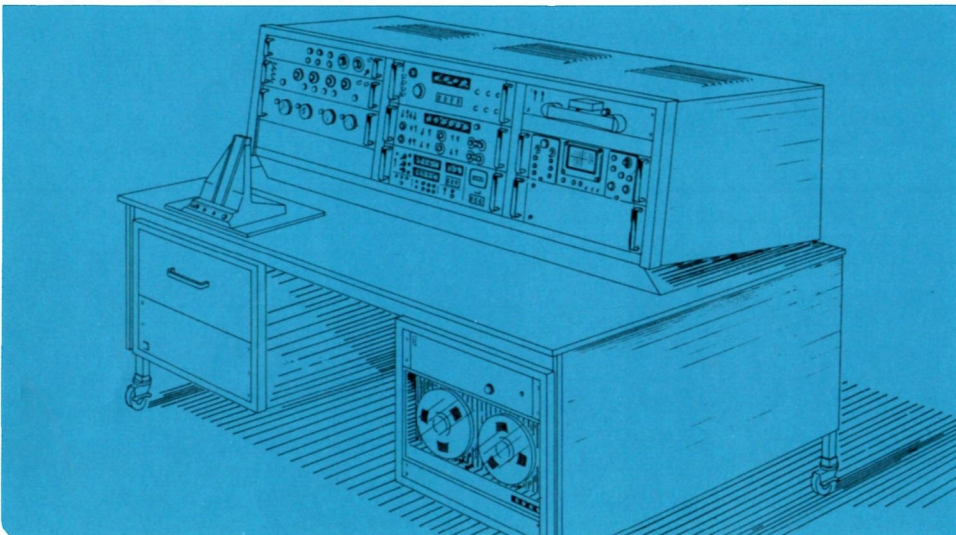


Dynamic testing is a powerful tool enabling you to verify the performance of active devices under operating conditions. Operating circuitry is contained on the fixture card (test head) which provides power supplies, bias voltages, input signals, fanout loads and signal pickup probes to verify and measure in-circuit performance of the device under test.

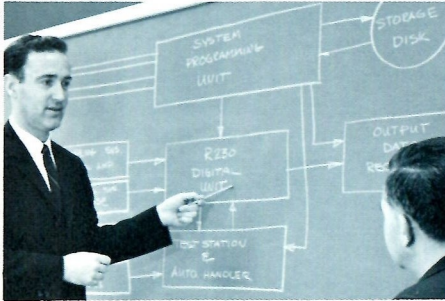
The benefits of programmed dynamic testing accrue to the user as well as to the manufacturer since operation of elec-

tronic devices can be measured against required as well as designed performance specifications.

The new Tektronix S-3200 series digital systems open new opportunities in automated electronic testing. The accuracy and repeatability of new digital readout instruments have been combined with digital programming and peripheral equipment to bring you an integrated and flexible high-speed dynamic testing capability. The heart of the system is a new family of digital instruments comprised of the R568 analog display unit, the R230 digital measuring unit and special versions of the 3S3/3T4 sampling instruments. System measuring instruments and peripheral equipment are digitally programmed by new equipment developed by Tektronix utilizing a rotating disk memory, programming control circuitry and serial to parallel registers. Devices under test are automatically fed through a test station and categorized by a new automatic handler and sorter. Peripheral equipment to power the devices under test, supply signal inputs and record the resulting measurement data are an integral part of the system and controlled by the programming equipment.



SYSTEM DESIGNED FOR MAXIMUM FLEXIBILITY



The building block concept of system design has been used to provide a solution to your measurement requirements while avoiding the expense of unneeded capability. Components used in the system have standard interface, thus minimize engineering required for individual applications.

Rapid changes of the device type under test, are accommodated by removable test fixture cards containing needed test circuitry for each device type. New measurement routines are selected by front panel control on the programming control unit.

S-3200 series digital systems are easily adapted to closed loop computer operation. Programming can be accomplished by direct word entry, selection of specific measurements or measurement routines stored in the disk memory, or by supplying a field of contact closures for direct parallel programming. Resulting measurement data can be fed back to the computer through an intercoupler or may be stored on punched cards, punched tape or magnetic tape for off-line data processing.

When discussing measurement requirements with your field engineer, you will want to consider options available in the following areas:

Programming

Tektronix digital programming units (rotating disk)
Direct computer programming
Punched tape photocell reader.

Device handling

Daymarc series 350 Integrated Circuit Sorter
Other Daymarc automatic handling and sorting equipment for integrated circuits, transistors and diodes
Manual test fixture (single or dual station)

Power supplies

Wide range of voltage and current sources dependent on test requirements.

Pulse generators

Tektronix type R116
Tektronix type R293
E-H type 1121/1421
E-H type 1139/1420
Data Pulse type 110FP
Other types available dependent on test requirements.

Digital voltmeters (programmable)

Fairchild 7100A series
Non-Linear Systems model 9100
Dana model 5400
Other DVMs, according to your preference.

Environmental testing

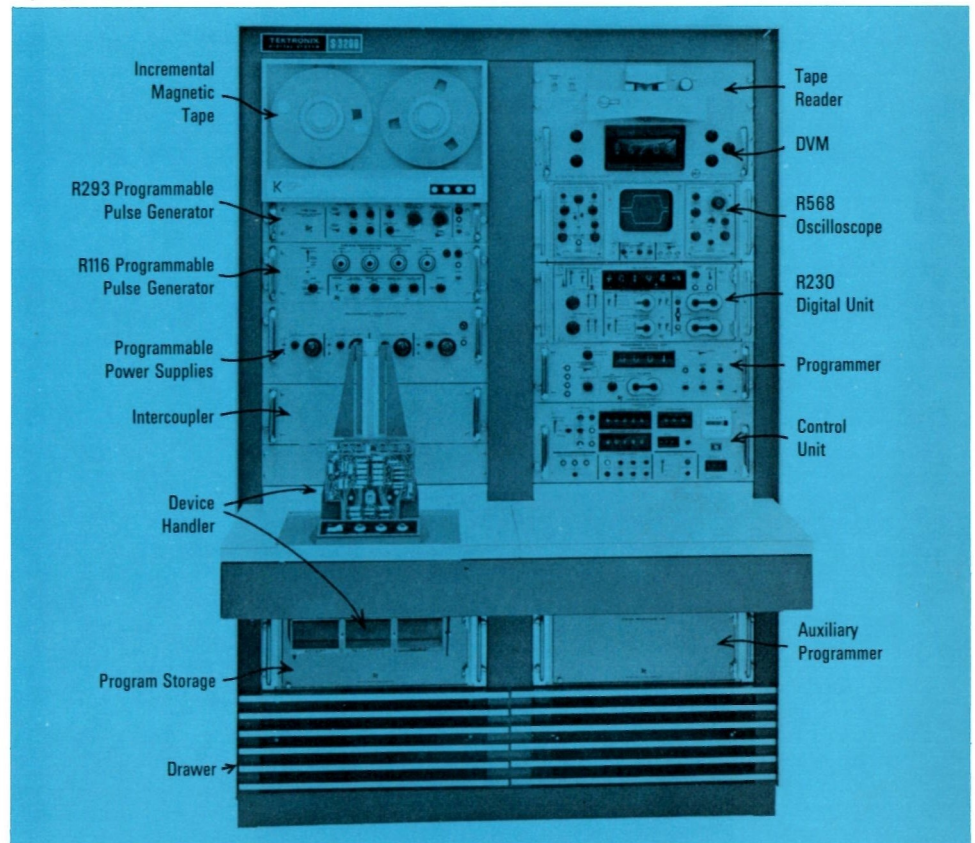
Delta Design dynamic environmental test chamber
Scionics dynamic environmental test chamber

Millisecond and slower measurements

The Tektronix type R283 Real Time Adapter for applications requiring sweep speeds slower than 200 microseconds per centimeter.

Output data recording

Punched cards
Punched tape
Flexowriter
Incremental tape recorder
High-speed printer.



For more complete and detailed information, contact your local Tektronix field engineer. Following a discussion of measurement requirements, you will receive a formal proposal, outlining an S-3200 series digital system which will meet your requirements.

Tektronix, Inc.

P. O. Box 500 • Beaverton, Oregon 97005 • Phone: (Area Code 503) 644-0161 • Telex: 036-691 • TWX: 503-291-6805 • Cable: TEKTRONIX • Overseas Distributors in over 30 countries • TEKTRONIX Field Offices in principal cities in United States • Consult Telephone Directory. 2/67