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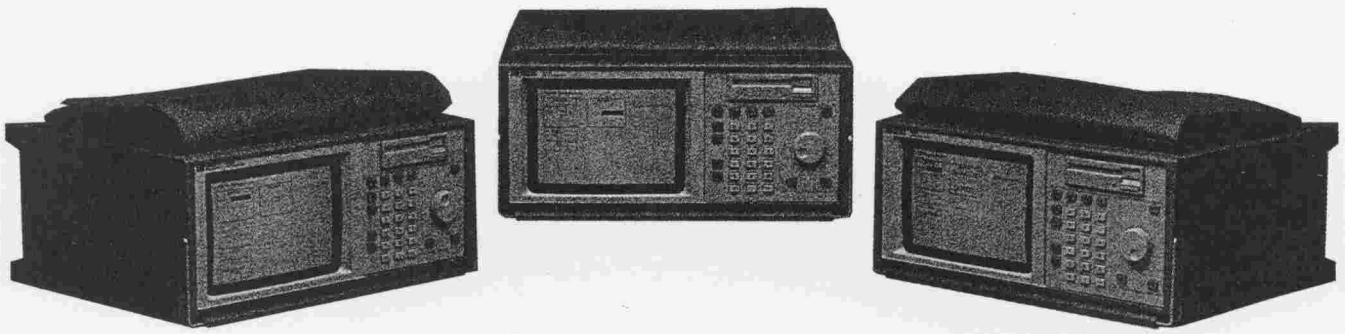
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- HP 1650B: 80 channels of 35 MHz state/100 MHz timing
- HP 1651B: 32 channels of 35 MHz state/100 MHz timing
- HP 1654B: 64 channels of 35 MHz state/100 MHz timing
- Broad support for microprocessors, buses and interfaces
- Simultaneous state/state or state/timing measurements



HP 1650B HP 1651B HP 1654B

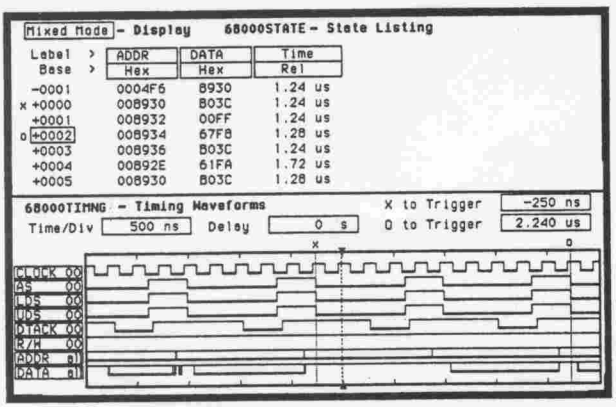
DESIGNED FOR HP-IB SYSTEMS

HP 1650B, HP 1651B, HP 1654B: Best Value in General-Purpose Logic Analyzers

For microprocessor analysis or general-purpose state and timing-debug, the HP 1650B, HP 1651B, and HP 1654B logic analyzers offer the best value. Each analyzer can be configured as a one- or two-state analyzer, a state analyzer/timing analyzer, or a timing analyzer. Data captured by each analyzer can be displayed with full time correlation. Lightweight, flexible, passive probing is included.

Support for Most Microprocessors, Buses, and Interfaces

The HP 1650B, 1651B and 1654B support a broad range of microprossessors, buses, and interfaces. Each support package turns your analyzer into a powerful debugging tool dedicated to the task at hand. Most support packages include a 3½-inch disk that configures the analyzer and translates captured data into mnemonics. See pages 324-326 for details on support for your system.



Time Correlated State and Timing Displayed on the Same Screen

Powerful State Analysis Helps You Focus on Needed Information

The HP 1650B's powerful state triggering filters out unnecessary data and provides a listing of the crucial data:

- Clocks and clock qualifiers allow your system to determine when the analyzer takes a sample.
- Storage qualification allows you to specify which states are stored in memory.
- Eight sequence levels determine the sequence of states required for trigger and help you to focus on a specific area of code execution.
- Eight pattern recognizers, one range recognizer, or logical combinations of these are used to identify stored states.
- Tagging keeps track of the amount of time or the number of states between stored states.
- Enable/disable can be used to restrict storage to the activity of a specific routine.

Transitional Timing on All Channels Extends the Measurement Range

Each analyzer provides 10 ns timing resolution on every channel. The analyzer stores data only when there is a transition, thus avoiding redundant data storage. 100 MHz transitional timing on all channels effectively extends the memory by lengthening the time covered by the acquisition. Because timing analyzer samples at full speed, events that are seconds or minutes apart are captured with 10 ns resolution. You can use pattern, edge, or duration triggering across all 80, 64, or 32 channels when you need to see what is happening around a hardware interrupt or handshake.

Glitch Capture on All Channels

With glitch capture on all channels, you no longer need to move probes around your system to detect intermittent problems. You can trigger on and capture 5 ns glitches on all channels of your HP 1650B, 1651B, and 1654B analyzers. Glitches are displayed as vertical dashed lines, so you can easily distinguish legitimate system activity from glitches.

LOGIC ANALYZERS

Portable Logic Analyzers (cont'd)

HP 1650B, 1651B, 1654B

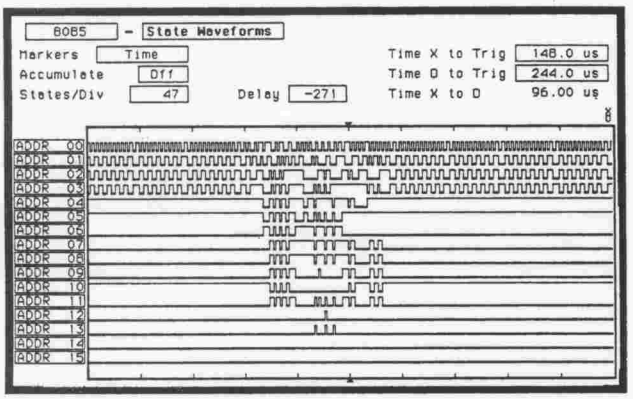
Capture the Data You Want to See

You can trigger on a pattern across the full number of channels, or qualify a pattern by specifying a duration, glitch, or edge. Or you can specify a pattern duration to capture error conditions indicated by a pattern that exceeds a specified limit. When you need to see what is happening around a troublesome glitch or hardware interrupt signal, use glitch or edge triggering. Use postprocessing to determine statistical variance of edge placement, or to detect propagation delays that fall outside specified values.

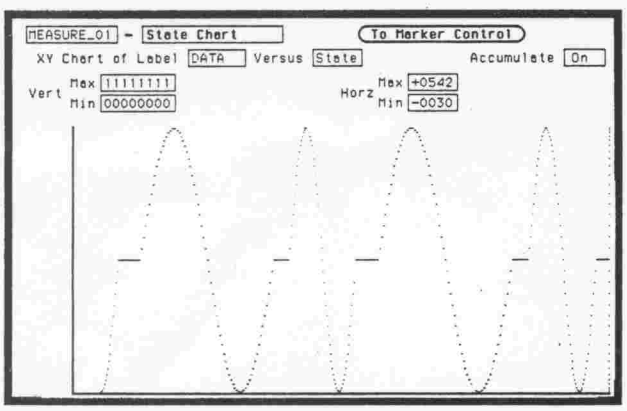
Flexible Data Display Modes Decrease Debugging Time

Display state acquisitions in one of five forms:

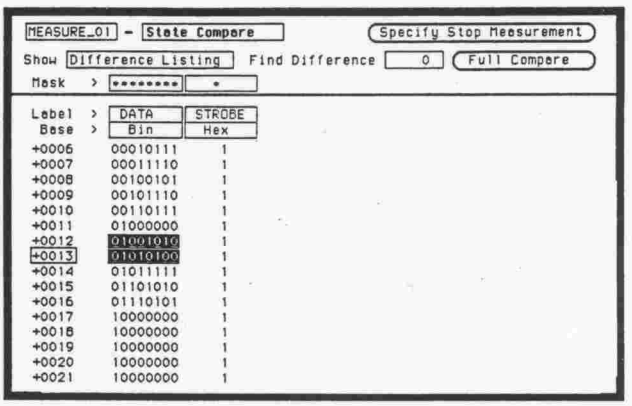
- State listing, which displays your acquisition as a binary, hexadecimal, octal, decimal, or ASCII listing
- Symbolic/inverse assembler, which displays your data in easy-to-interpret mnemonics
- State waveform mode, which displays the data in waveform diagram format
- X-Y chart mode, which displays the value of a data label versus acquisitions or other labels
- State compare mode, which enables you to compare an acquisition to previously acquired state data



View an entire state acquisition at a glance to examine bus activity or processor control, fully correlated with state listing, X-Y chart, and compare modes.



Plot label versus states to check A/D converters or memory coverage. Plot label versus label to obtain a circuit or routine "signature." Correlate chart display with inverse assembled listing.



Compare state acquisitions with previously acquired state data. Select channel and range masks to "zoom in" on important data. Repetitively capture data until compare is equal or not equal.

Lightweight, Flexible Probing

Like all HP logic analyzers, the HP 1650B, 1651B, and 1654B feature lightweight, flexible, passive probing. Passive probing means lower cost and increased reliability, because no active circuitry is needed at the probe tip. Measurement quality is not sacrificed; each probe only loads your digital system with 100 KΩ and 8 pF.

Compact and Portable

With their small footprint, the HP 1650B, 1651B, and 1654B fit easily on your workbench, within your field of vision along with the device you're working on. At only 22 pounds, these analyzers can be carried easily with the built-in handle or soft carrying case. The case allows you to keep all the probes and cables conveniently stored on top of the instrument.

Measurement Compatibility

Save setup time by transferring state and timing configurations or measurements made with one instrument to another. Make measurements in the field with confidence that the setups and data can be reproduced later in the lab. Use a 3½-inch disk to transfer data from one analyzer to another. Use the HP 10392A state-to-pattern generator link to transfer activity captured in the field to the HP 16500A digital pattern generator to duplicate failure modes in the lab.

Programmability Over HP-IB or RS-232

Both HP-IB and RS-232 interface ports are standard equipment on the HP 1650B, HP 1651B, and 1654B. You can program front-panel functions from either interface, or send hardcopy output to HP-IB or RS-232 printers.

Built-in Upgrade Path

The HP 1650B/1651B feature a built-in upgrade path to the HP1652B/1653B logic analyzers with built-in oscilloscopes. You can get a 32- or 80-channel analyzer now and upgrade with a 400 MSa/s oscilloscope when you need to.

The HP 1651B and 1654B – for 8- and 16-Bit Microprocessor Applications

The HP 1651B and 1654B offer all the features of the HP 1650B, except channel count (and state speed on the HP 1651B). For debugging most 8-bit processors, or to monitor timing activity across up to 32 channels, the HP 1651B is the ideal tool. For debugging 16-bit processors, or to monitor 8-bit processors with extra channels for timing analysis, the HP 1654B is the perfect match.

Key Specifications and Characteristics

Model Number	HP 1650B	HP 1651B	HP 1654B
Timing	100 MHz all 80 channels	100 MHz all 32 channels	100 MHz all 64 channels
State	35 MHz all 80 channels	35 MHz all 32 channels	35 MHz all 64 channels
Memory	1 Kbit/channel	1 Kbit/channel	1 Kbit/channel
Microprocessor Support	Most 8-, 16-, and 32-bit microprocessors	Most 8-bit microprocessors	Most 8-, 16-bit microprocessors

See page 343 for ordering information.

Artisan Technology Group is an independent supplier of quality pre-owned equipment

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