HP E3493A Pentium® Pro Processor Probe

Run Control for Pentium Pro Processors

For use with HP logic analyzers

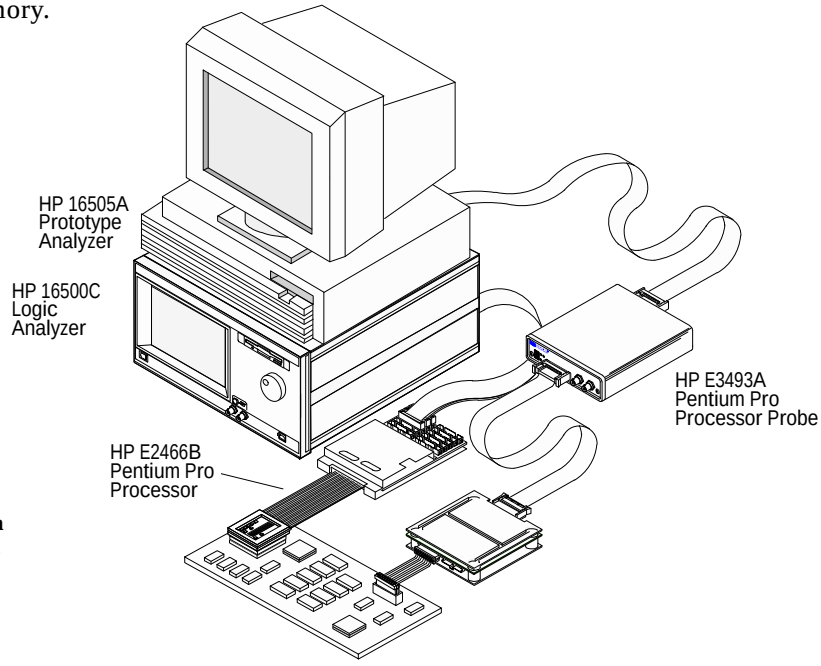
The HP E3493A Pentium Pro processor probe provides the Pentium Pro processor system designers with processor run control of one to four processors. It also gives them the ability to read and modify the contents of all processors' registers, system memory, and I/O. In addition, the HP E3493A increases debug efficiency by expanding the capabilities of the HP 16500 logic analysis system and HP 16505A prototype analyzer.

Increasing System Debug Efficiency

Pentium Pro processor based system debug is simplified by using the HP E3493A in combination with the HP 16500C/HP 16505A logic analysis tools. Combining logic analysis and processor run control provides you with the system visibility needed to quickly trace multi-processor system problems to their root cause.

While cache memories are enabled, the processors may execute out of internal memory for hundreds of instructions. In such a system, following program operation with a logic analyzer is difficult. The HP E3493A enhances real-time debug using a logic analyzer by providing a simple means of enabling the Pentium Pro processor's branch trace messaging. With branch messaging enabled, the HP E2466B Pentium Pro preprocessor interface, in combination with HP 16550 family logic analyzer modules, will display branch messages. Using the logic analyzer in this mode reveals your program's path while all processors are executing out of cache memory.

The HP E3493A provides you with increased flexibility in the control of a multi-processor Pentium Pro system. Through the HP E3493A interface you can choose to either step one processor, or step one processor while running the remaining processors. In addition, the HP E3493A gives you the ability to select which processor responds to the execution of break conditions. You choose to have one or all processors break when a breakpoint occurs, or break all processors when a BREAK IN input occurs.



Pentium Pro System Debug Environment

Increasing Your Insight into Elusive Hardware Problems

- **View and Modify System State**
  The Pentium Pro processor probe allows you to easily display and modify the contents of the processors registers, system memory, and I/O.

- **Break Processor Execution**
  Now you can stop processor execution based on breakpoint or BREAK IN input conditions. The HP E3493A allows you to set the breakpoint conditions of each processor individually or broadcast the same breakpoints to all processors. BREAK IN input, a front panel connection to the HP E3493A, provides a convenient way to break the execution of all processors from the trigger output of the HP 16500 logic analysis system. Your HP 16500 logic analyzer can be set to generate a trigger out from the occurrence of a system bus event.

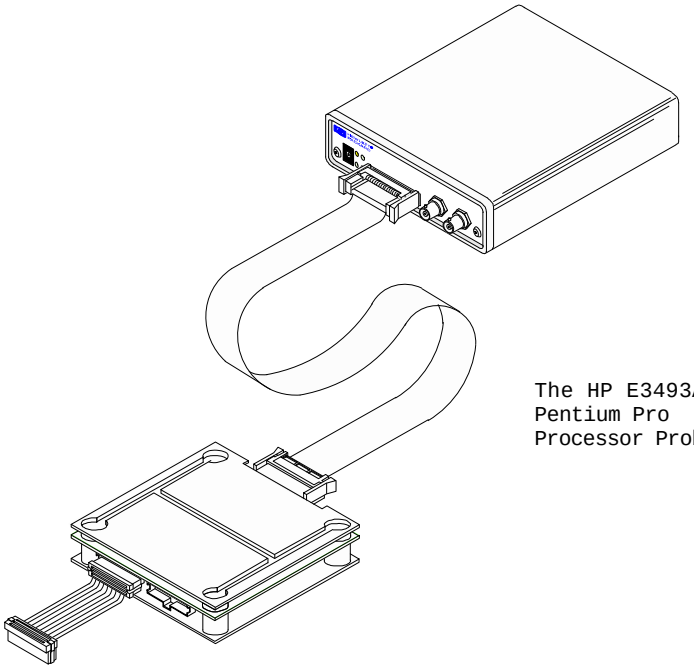
- **Display Code as Instructions**
  View memory code disassembled into familiar Pentium Pro processor instructions. The memory disassembly window of the HP E3493A displays your code as Pentium Pro processor mnemonics from any starting address. With the HP E3493A it's easy to display one memory disassembly window for each processor in a multi-processor system, referenced to its current EIP register of each processor, or frozen for easy comparison.

- **Control Processor Execution**
  From the run control window of the HP E3493A you can instruct one or all processors to RUN or BREAK. To provide more debug control, you can choose to either step one processor or step one processor while running the remaining processors. Selecting RESET ALL resets processors simultaneously. You select whether memory, I/O, and register displays are updated on processor breakpoint execution and single step.

- **Use the Flexible Interface**
  You define the view of your system that maximizes insight into its current operation. The HP E3493A set up and display interface is integrated into the workspace of the HP 16505A prototype analyzer. The flexible workspace of the HP 16505A lets you control both the HP E3493A and the 16500C logic analysis system. Multiple register, memory, and I/O windows can be displayed by the HP E3493A. You can assign one register window to each processor concurrently to give you maximum visibility during the system debug process. In addition, you can open windows in the workspace to display logic analyzer trace listing or waveforms of PCI bus activity adjacent to processor registers and system memory displays.

- **Repeat Frequently Used Setups**
  Writing procedures that set up registers, memory, and I/O in your system are easy with the HP E3493A command language. Once the procedure is written, save it to the HP 16505A hard disk. When you want to initialize your hardware system to a particular state, simply recall and execute the procedure.

- **Connection to Your Target System**
  You can easily connect the control port of the HP E3493A to the Pentium Pro processor debug port on your board . The HP E3493A supports the 30-pin Pentium Pro processor debug port connector.



The HP E3493A Pentium Pro Processor Probe

Features and Specifications

- Processor Run Control
  Processor run control facilities for multi-processor RUN, BREAK, RESET, and SINGLE STEP.

- Register Read and Write
  Examine and edit all registers on each processor through individual register windows.[1]

- Breakpoint Registers
  Examine, set, and edit the Pentium Pro processor's four hardware breakpoint registers on individual processors or broadcast the same breakpoints to all processors.[1]

- Memory and I/O Read and Write
  Examine and edit memory and I/O locations.

- Memory Disassembly
  Disassembles memory code segments into Pentium Pro processor mnemonics. A memory disassembly window can be opened easily for each processor.[1]

- Command Language
  Command language provides a convenient way to develop and save frequently used hardware setup procedures.

- Coordinated Run Control
  BREAK IN input is edge sensitive. Processor execution stops on BREAK IN input's active edge. Active edge of input is user selectable.

- Trigger Out
  Output transitions to active state when the processors stops execution. Trigger out returns to inactive state when user program begins execution. Active state of Trigger Out is user selectable.

- User Interface
  The HP E3493A is controlled from the HP 16505A prototype analyzer user interface.

Specifications

Supported Processors	Pentium Pro Processors
Physical connections	10base2 or 10baseT Ethernet connections TCP/IP protocol Compatible with Pentium Pro processor debug port [1] 30 pin connector
Physical	155 mm width × 161 mm depth × 65 mm height
Environmental	
Temperature	Operating 0 to +55 °C (+32 °F to 131 °F) Non operating – 40 °C to 70 °C (– 40 °F to + 158 °F)
Humidity	15% to 95% relative
Supplied with HP E3493A	Pentium Pro processor probe 30 pin cable HP E3493A user interface software (for the HP 16505A) on disc power supply module

[1] As documented in the Intel Pentium Pro Developer's Manuals; Programming and Specifications

Ordering Information

HP E3493A
Pentium Pro processor probe for the Pentium Pro processor (requires HP 16505A prototype analyzer)

HP E2466B
Preprocessor interface for the Pentium Pro processor (requires HP 16500B or HP 16500C mainframe)

HP 16554A
500 K-sample, 70-MHz state/250-MHz timing logic analyzer module (Requires an HP 16500B or HP 16500C mainframe)

HP 16555A/D
1 M/2 M-sample, 110-MHz state/500-MHz timing logic analyzer module (Requires an HP 16500B or HP 16500C mainframe)

HP 16556A/D
1 M/2 M-sample, 100-MHz state/400-MHz timing logic analyzer module (Requires an HP 16500B or HP 16500C mainframe)

HP 16550A
100-MHz state/500-MHz timing logic analyzer module

HP 16500C
Logic Analysis System Mainframe

HP 16505A
Prototype Analysis System

HP E2479A
Upgrades an HP 16500A or HP 16500B mainframe to an HP 16500C mainframe

HP B4600A
System performance analysis for the HP 16505A prototype analyzer

---

For more information on Hewlett-Packard Test & Measurement products, applications or services please call your local Hewlett-Packard sales offices. A current listing is available via Web through Access HP at http://www/hp.com. If you do not have access to the internet please contact one of the HP centers listed below and they will direct you to your nearest HP representative.

United States:
Hewlett-Packard Company Test and Measurement Organization
5301 Stevens Creek Blvd.
Bldg. 51L-SC
Santa Clara, CA 95052-8059
1 800 452 4844

Canada:
Hewlett-Packard Canada Ltd.
5150 Spectrum Way
Mississauga, Ontario
L4W 5G1
(905) 206 4725

Europe:
Hewlett-Packard
European Marketing Centre
P.O. Box 999
1180 AZ Amstelveen
The Netherlands

Japan:
Hewlett-Packard Japan Ltd.
Measurement Assistance Center
9-1, Takakura-Cho, Hachioji-Shi,
Tokyo 192, Japan
Tel: (81-426) 48-0722
Fax: (81-426) 48-1073

Latin America:
Hewlett-Packard
Latin American Region Headquarters
5200 Blue Lagoon Drive
9th Floor
Miami, Florida 33126
U.S.A.
(305) 267 4245/4220

Australia/New Zealand:
Hewlett-Packard Australia Ltd.
31-41 Joseph Street
Blackburn, Victoria 3130
Australia
1 800 629 485

Asia Pacific:
Hewlett-Packard Asia Pacific Ltd
17-21/F Shell Tower, Times Square,
1 Matheson Street, Causeway Bay,
Hong Kong
(852) 2506 9285

Technical information in this document is subject to change without notice.

Data subject to change
Printed in U.S.A. 11/96
5965-6036E