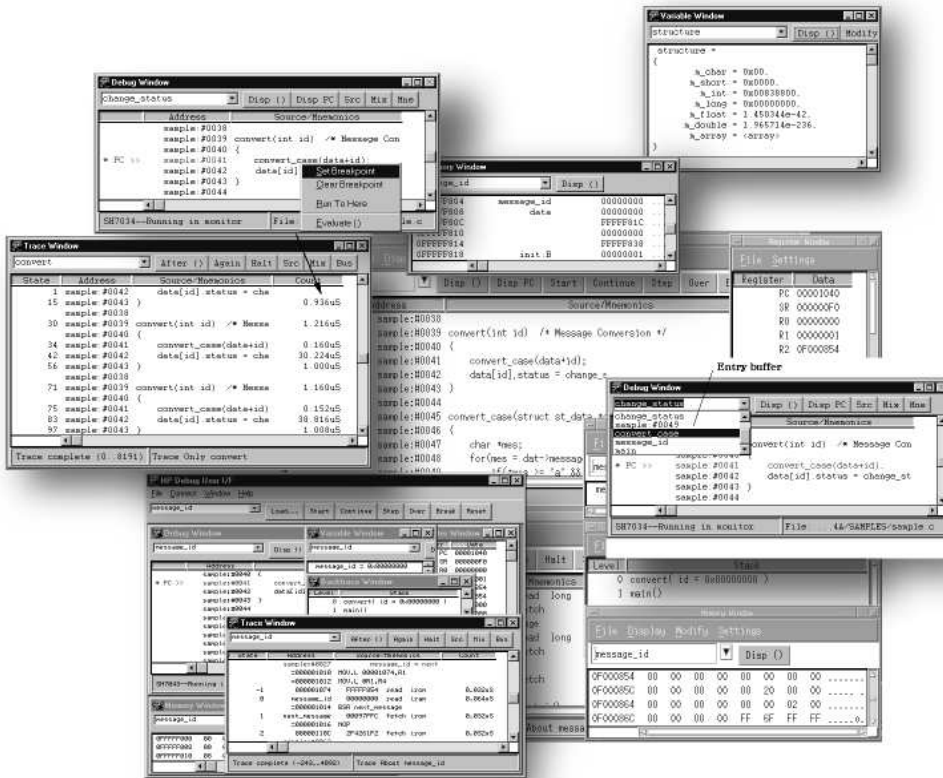


# HP C Debugger Interface for HP Distributed Emulation Environments and HP64700 Series of Emulators

## Product Overview

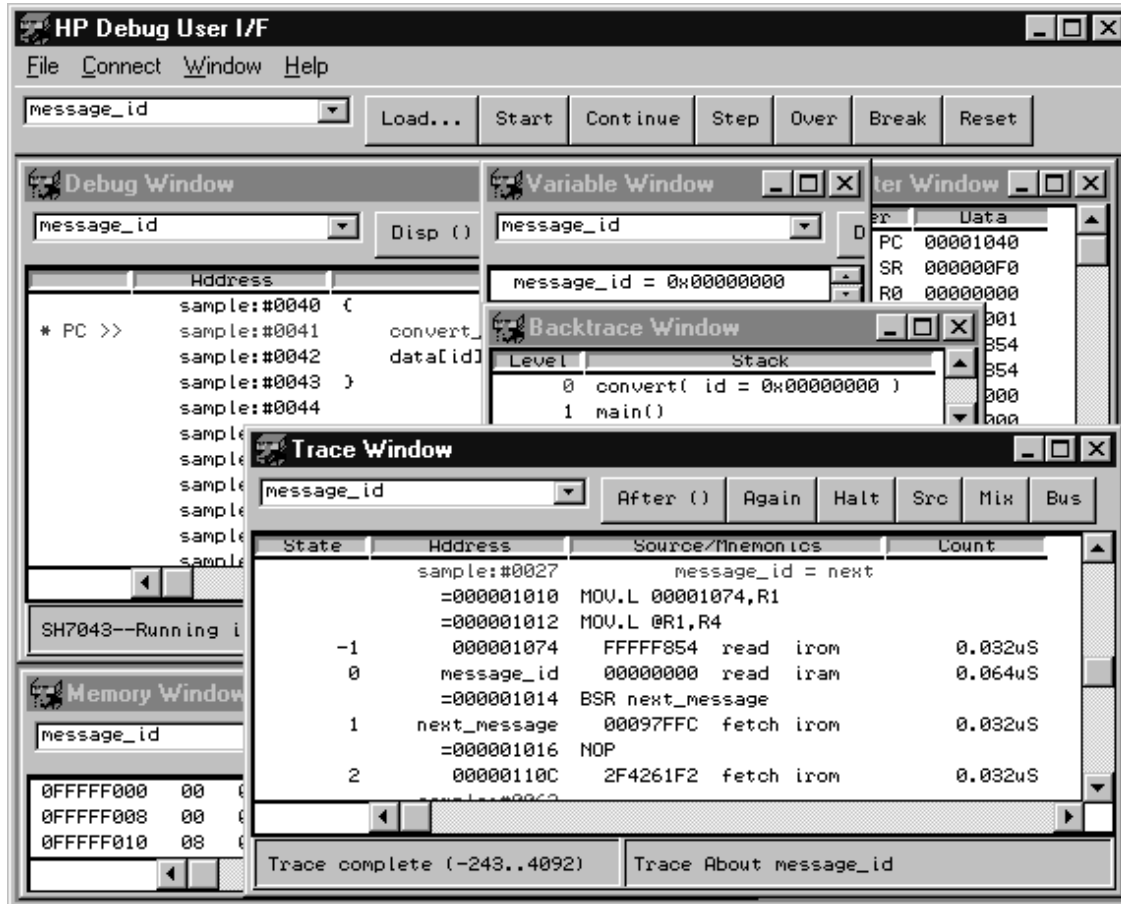
Graphical interface for real-time debugging



Hewlett-Packard's C Debugger Interface provides a full featured graphical software debugging environment. The C Debugger Interface accesses the easy-to-use non-intrusive real-time capabilities of HP's Distributed Emulation solutions and many of HP's 64700 Emulator series. The C Debugger Interface is a powerful integration tool for the

Distributed Emulation solutions. The Debugger is interconnective with Emulators and Logic Analyzers. The Logic Analyzer or the Emulator can be configured through the C Debugger Interface. The C Debugger Interface is supported on multiple platforms (IBM PC, Sun Sparc, and HP 9000 Series 700 workstations), and the same look-and-feel is provided.

Program files are quickly downloaded to the emulator through an Ethernet LAN. This reduces the debug cycle.



## Features

- \* Non-intrusive real-time debugging
- \* Access to variables
- \* C level trace
- \* Fast file download (6 M/sec) \*1
- \* Local and global variable display function (represented in decimal, hexadecimal, floating, and character modes)
- \* Structure/union members display function
- \* Array members display function
- \* Selective source code display function; C source with mnemonics, source only, or mnemonics only
- \* Trigger when variables change
- \* Trigger when variables change to specific values
- \* Time tags with 8 nsec resolution \*1
- \* 7 level sequential trigger function with data comparator \*1
- \* Stack back trace function \*2
- \* History cut buffer for symbol and character selection
- \* Customizable action buttons
- \* Direct editing of memory and registers
- \* Command file function
- \* Support for major compilers (Hitachi, Mitsubishi, GHS, IAR)
- \* Unlimited software breakpoints
- \* Multi-platform support (PCs, Sun Sparc, HP9000 series 700)
- \* Multi-window support (Win95/WinNT and Motif)

\*1 Depends on emulators

\*2 Depends on compilers

## Trigger by Change of Variables

Debugging at the C level often requires detecting changes in the variables. It is also important to be able to detect when a variable changes to a specific value. For example, problems often occur in the operation of peripherals when variables for an I/O port change to specific values. HP makes detecting this event a simple task. The HP C Debugger provides the capability to detect when a variable changes or when a variable changes to a specific value.

### Setting Break On Trigger when message\_id=1

(Fig.1)

Execution history is displayed on break when 1 is given to the variable message\_id. The resultant trace displays both source and mnemonic

(Fig.2)

The trigger can be set when message\_id changes from 1 to another value by changing the trigger condition to !=(not equal)

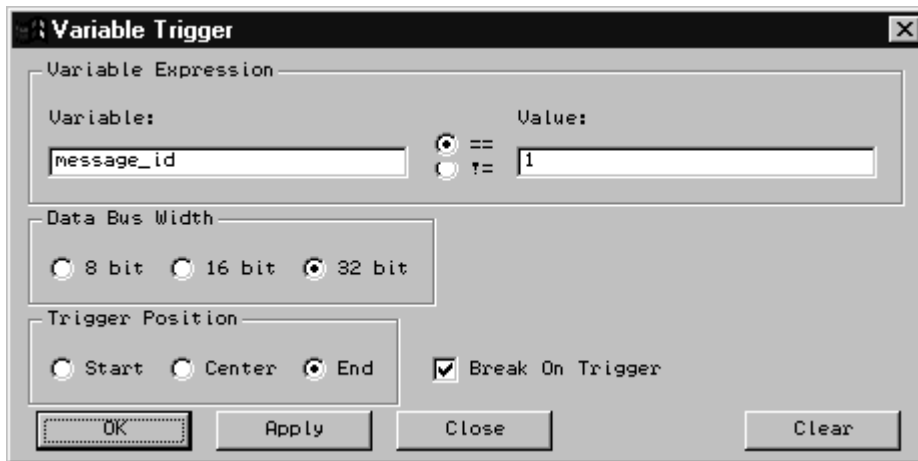


Figure 1, Variable Trigger

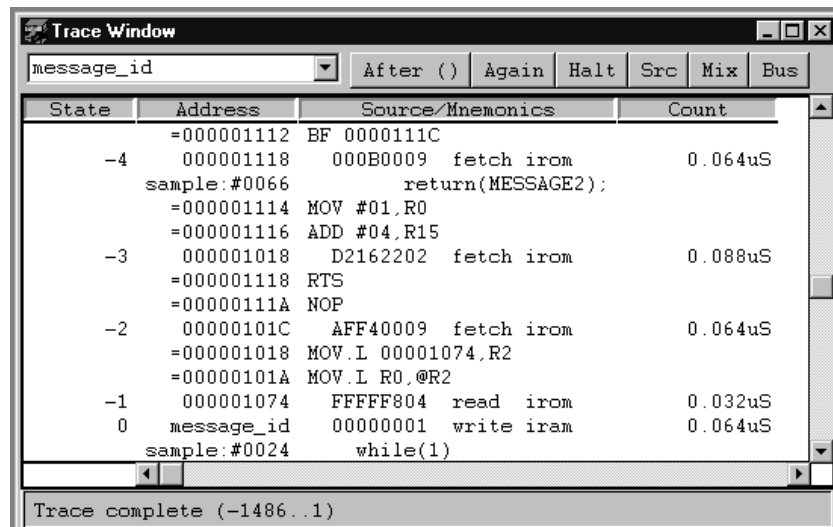


Figure 2, Trace Results by variable Trigger

### C Level Non-intrusive Real-Time Debugging

Real-time systems, that are interrupt driven, require real-time execution of programs for real-world debugging. Many C debuggers temporarily stop execution of programs when displaying or changing variables, when trace conditions are set, or when results are displayed.

The HP C Debugger takes full advantage of the real-time capability of HP's emulators. It provides debugging while programs are running in a real-time interrupt driven environment.

Conventional C debuggers support only module test. The HP C Debugger supports module test and hardware-software integration test. This provides easy debugging of complicated multiple interrupt real-time programs reducing time to market.

### Access to Variables, Non-intrusive to Execution of the Target Program

The HP C Debugger displays global variables (including registers), structure/union members, and array members. The values can be represented in decimal, hexadecimal, floating or character modes according to the data type. They can be displayed and changed without intruding on the execution of the target program, when emulation memory is used. \*1

When tracing, the trigger can be set and the results displayed without intruding on the program execution.

\*1 Depends on emulators.

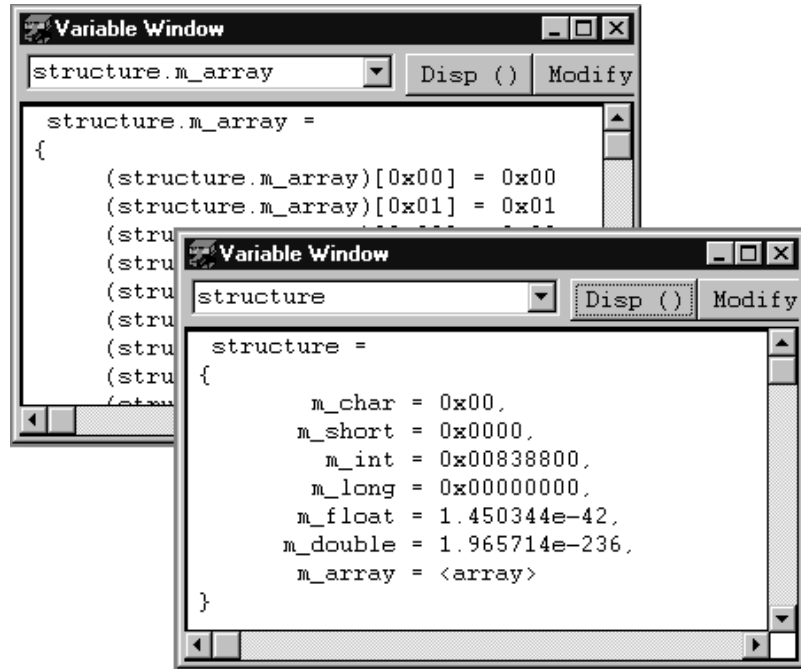


Figure 3. Display of Structure / Array Members

Structure members are represented according to the data type. Contents of m\_array can be displayed in a sperate sub-window.

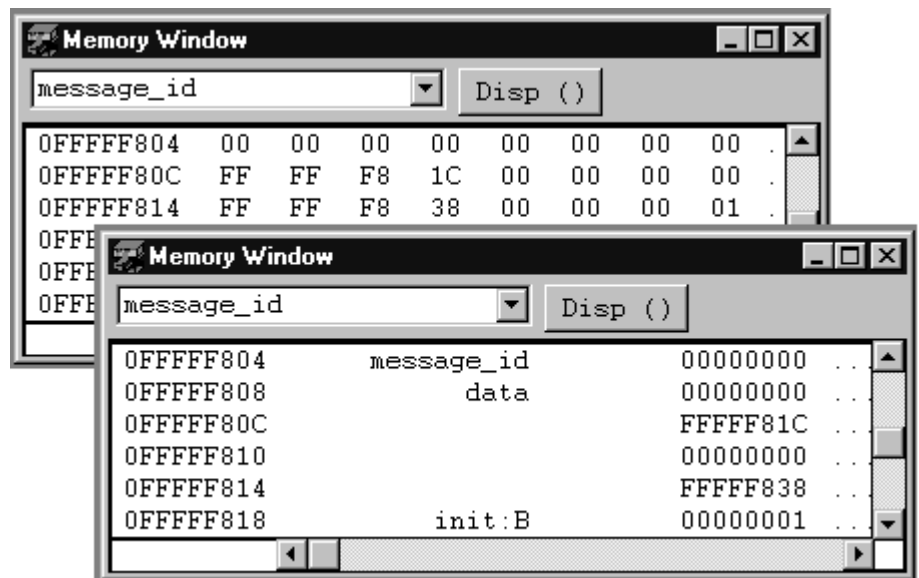


Figure 4. Representation of memory

## Powerful C Level Trace

While the target program is running the trigger/store function can be used. All of the target programs C symbols or assembly level language can be referenced in the set trace conditions. Time stamps, of every state, are displayed the trace

listing. The time stamp information is valuable for debugging programs where execution time is an important factor.



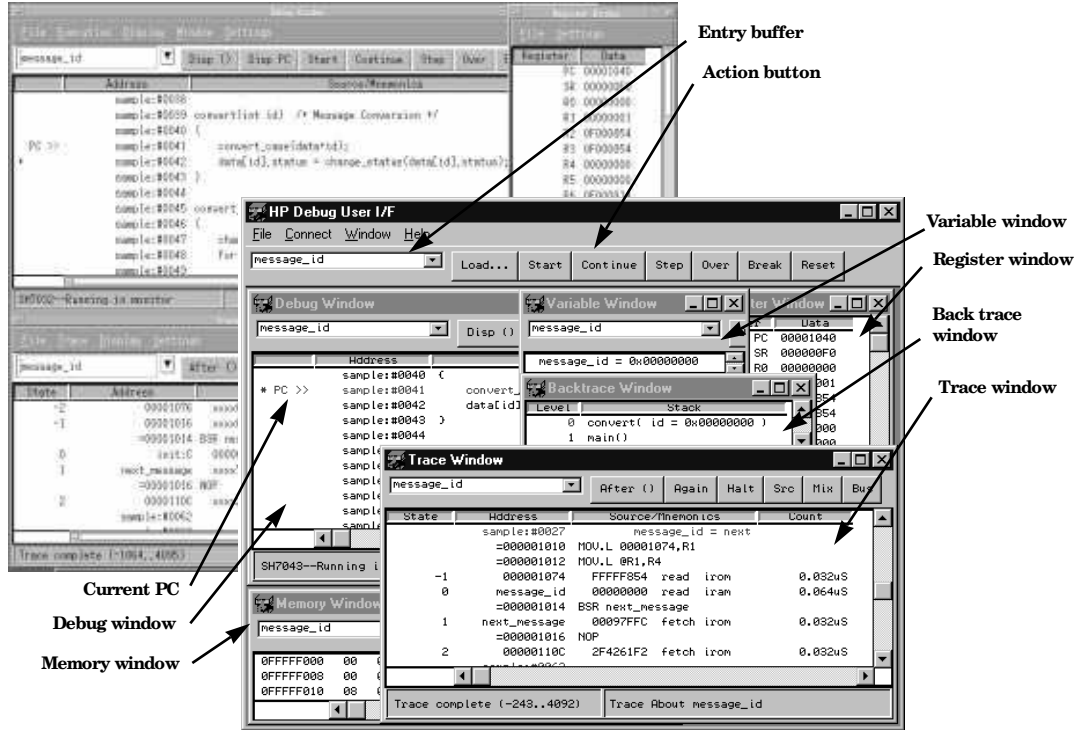
Figure 5. Applying only () mode trace function “convert” (selection from entry buffer)

Time stamp is available on every state

The screenshot shows the 'Trace Window' with the 'convert' function selected in the entry buffer. The trace results are displayed in a table with columns: State, Address, Source/Mnemonics, and Count. The status bar at the bottom indicates 'Trace complete (0..8191)' and 'Trace Only convert'.

State	Address	Source/Mnemonics	Count
1	sample:#0042	data[id].status = cha	
15	sample:#0043 }		0.936uS
	sample:#0038		
30	sample:#0039	convert(int id) /* Messa	1.216uS
	sample:#0040 {		
34	sample:#0041	convert_case(data+id)	0.160uS
42	sample:#0042	data[id].status = cha	30.224uS
56	sample:#0043 }		1.000uS
	sample:#0038		
71	sample:#0039	convert(int id) /* Messa	1.160uS
	sample:#0040 {		
75	sample:#0041	convert_case(data+id)	0.152uS
83	sample:#0042	data[id].status = cha	38.816uS
97	sample:#0043 }		1.008uS

Figure 6, Trace result of all bus activity with function “convert”



### Common commands and menus on PC and workstations

You can have the benefit of common commands and menus among multiple host computers;

- IBM PC/AT compatibles,
- Sun SPARC
- HP9000 Series 700.

The status of source, variables, memories, registers and others are displayed in sub-windows.

Sub-windows can be opened at the same time (Multi-window).

Easy-to-use operation with action buttons, pop-up menus and entry buffer shorten turn around time for debugging.

### Action Button:

Action buttons are for frequently used functions and are located in every sub-window. You can execute some debug functions by clicking on a button without pulling down menus. Action buttons can be customized for efficient debugging operations.

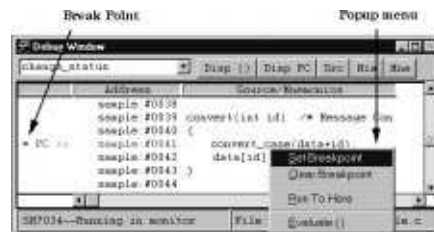


Figure 7, Pop-up menu

### Pop-up Menu:

In the debug window and source window using the right button will cause a pop-up menu to appear. The menu provides quick access to frequently used functions, i.e. setting breakpoints.

### Entry Buffer:

Every sub-window has an entry buffer serving as a command input field as well as a cut buffer with history function. Records of the symbols and variables selected with the mouse are in the buffer. You can re-enter symbols, variables, trace conditions, etc. by selecting them from the buffer without retyping.

## Host Computer Requirement

PC	CPU Memory Hard Disk OS LAN S/W LAN Card	Min.: Intel 486 DX 33 MHz / Recommended: Pentium Min.: 16MB / Recommended: 64 MB Min.: 10 MB available space Windows 95/NT Windows 95/NT TCP/IP (Winsock) LAN cards compatible with NDIS 3.0 and Windows 95/NT TCP/IP (Winstock)
WS HP 9000-700	Memory Hard Disk OS	Min.: 32MB / Recommended: 64MB Min.: 10MB available space HP-UX 9.0 or later
WS SUN Sparc	Memory Hard Disk OS	Min.: 32MB / Recommended: 64 MB Min.: 10MB available space SUN OS 4.1.4 + Open Windows 3.0 or later * Solaris 2.3 + Open Windows 3.0 or later*

\* Requires SunSoft OSF/Motif 1.2.2 (or later) or SCO IXI Premier Motif package 1.2.2 (or later).

## Emulator Support List

B3750A	64784A	H8/3003 series(Hitachi)
B3751A	64797A	H8/3048 series(Hitachi)
B3752A	E3471A	H8S/2000 series(Hitachi)
B3753A	E3470A/B	M16C/60/61 series(Mitsubishi)
B3754A	64785B	SH7020/32 series(Hitachi)
B3755A	E3472A/D *1	SH7040 series(Hitachi)
B3756A	E3473A *1	SH7050 series(Hitachi)

\* Logic Analyzer is used for trace functions.

For more information about Hewlett-Packard test & measurement products, applications, services, and for a current sales office listing, visit our web site, <http://www.hp.com/go/logicanalyzer-emulator>. You can also contact one of the following centers and ask for a test and measurement sales representative.

**United States:**  
**Hewlett-Packard Company**  
**Test and Measurement Call Center**  
**P.O. Box 4026**  
**Englewood, CO 80155-4026**  
**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**  
**(31 20) 547 9900**

**Japan:**  
**Hewlett-Packard Japan Ltd.**  
**Measurement Assistance Center**  
**9-1, Takakura-Cho, Hachioji-Shi,**  
**Tokyo 192, Japan**  
**Tel: (81-426) 56-7832**  
**Fax: (81-426) 56-7840**

**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**  
**Tel: (852) 2599 7777**  
**Fax: (852) 2506 9285**

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