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# HP 1000 Computer Real-Time Systems

June 1992

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## Investment Protection

**With the upgrade path to more CPU power.**

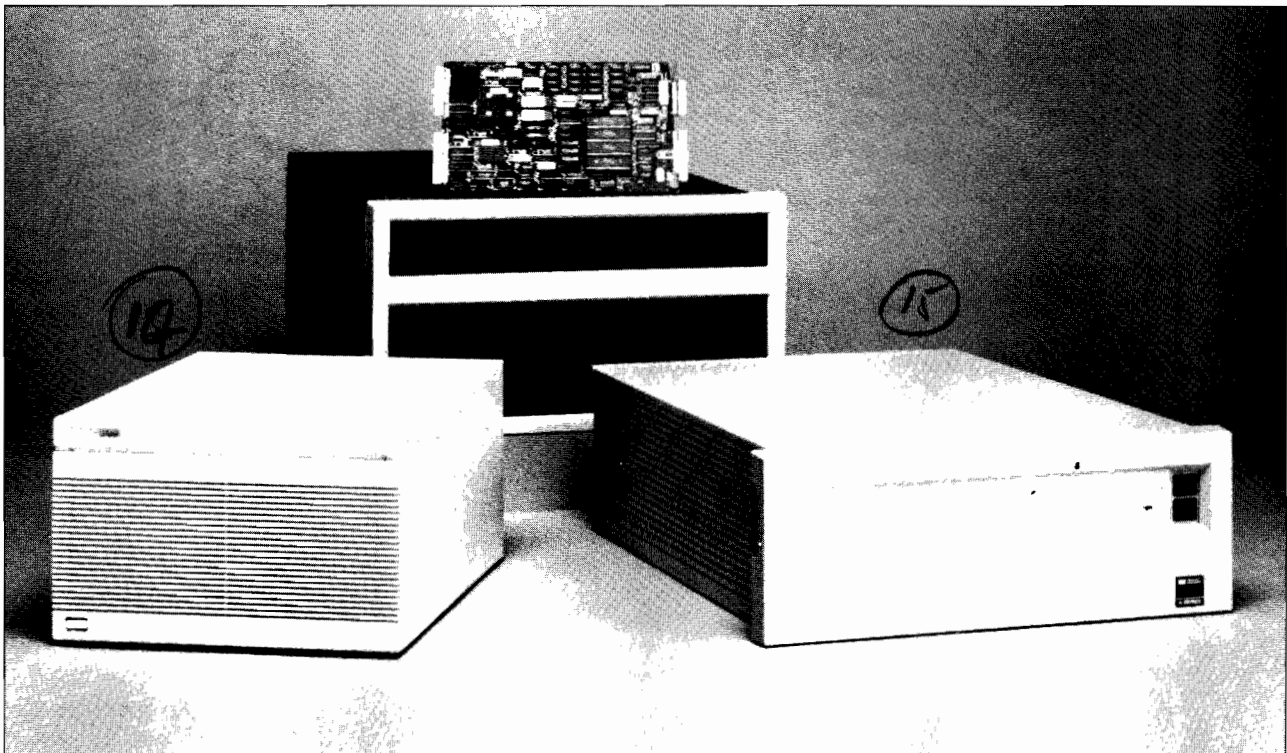
Our first HP 1000 Real-Time systems were released over 25 years ago, with the philosophy that these products were designed to last not five years, but decades.

Our current Real-Time systems adhere to the same philosophy. We have constantly refined and

enhanced the performance, reliability, and architecture of the HP 1000 System while continuing to consider and meet your needs.

Your investment is protected. You can also upgrade your existing system to the latest technology, making your HP 1000 more powerful than ever before.

**The HP 1000 product family: 6-slot box, 20-slot box, single-board computer, and 14-slot box.**



**HP Computer Museum**  
**[www.hpmuseum.net](http://www.hpmuseum.net)**

**For research and education purposes only.**

## HP 1000

### The HP 1000 Real-Time Family.

#### Delivering Real-Time solutions for over 25 years.

In 1966 HP introduced the first family of HP 1000 Real-Time computers. Since then, three major architectural changes have occurred, bringing you the HP 1000 Automator Series (A-Series).

Today's economical, entry-level workhorse—the HP 1000 A400—provides proven performance and reliability in severe industrial environments ranging from 0°C-55°C. It also operates without disks and consoles as part of a LAN-based network (RTE-A version 5.2 and later).

Available as either a single-board computer or in a variety of packages, the HP 1000 A400 meets most customer Real-Time needs.

The new HP 1000 A990 single-board processors provide

### Real-Time Executive Operating System.

RTE-A offers full functionality for Real-Time applications with:

- Small and completely modular operating system.
- Program scheduling by interrupt.
- Real-Time priority fence.
- DMA per I/O channel.
- Fast interprocess communication.

HP 1000 Configuration Table

Description	A400	U.S. List Price*	A900	U.S. List Price*	A990	U.S. List Price*
<b>HP 1000 including RTE license to use, no installation, no software.</b>						
Single Board Computer	12100A	\$2600.00	—		12990C <sup>+</sup>	\$25,025.00
6 - Slot Box	2424A	\$4995.00	—		—	
14-Slot Box	2434A	\$7180.00	2439B	\$21,250.00	2939A	\$27,750.00
20-Slot Box	2134A	\$8375.00	2139B	\$25,860.00	2959A	\$32,360.00
<b>HP 1000, including license, software, and local installation by HP.</b>						
14-Slot System	2484B	\$9845.00	2489B	\$25,550.00	2989A	\$32,350.00
20-Slot System	—		2199E	\$32,950.00	2999A	\$39,450.00
<b>HP 1000 I/O expanders, no installation.</b>						
14-Slot Expander	—		12025A	\$8,900.00	12025A	\$8,900.00
20-Slot Expander	—		12025B	\$9,990.00	12025B	\$9,990.00
For Upgrading see page 4.						

\* Effective July 1, 1992.

<sup>+</sup> Upgrades Only

Hewlett-Packard's fastest HP 1000 computers. Pipeline technology with two-level cache memory, boosted even more by a fast built-in hardware floating point processor having both scientific and vector instruction sets in firmware, provides unmatched computational speed.

The A990-based computers are completely compatible with all other HP 1000 A-Series computers operating under RTE-A, with or without VC+. Therefore, the A990 models are well suited to provide the very fast interrupt handling, high compu-

tational speed, or high I/O throughput needed for high-end workcell control or supervisory monitoring applications where communicating with other HP 1000 A-Series devices is necessary. This same compatibility also allows customers to leverage their investment in A-Series software, including I/O drivers, intelligent device handlers (PLCs), and databases. Similarly, with the A990, customers can also move HP mass storage devices and the vast array of available I/O cards among all their A-Series computers.

### Real-Time Performance of the HP 1000 A-Series

Context switch latency for non-privileged driver RTE version 5.0.

Processor	Minimum Time	Maximum Time
HP 1000/A400	0.792	2.216
*HP 1000/A600+	0.806	4.246
HP 1000/A900	0.438	1.744
HP 1000/A990	~ 0.378	~1.500
All times in milliseconds.		

\* Not available after November 1, 1992.

**Note:** Values listed above for the A990s are estimates only, not measured times.

## The HP 1000 and Real-Time Executive selected accessories.

### HP Memory Subsystems — reliability and supportability guaranteed.

If you've been waiting for subsystems that do not compromise on quality, Hewlett-Packard has some very welcome news.

HP accessories are designed to compete with the kind of performance that has always made HP the best investment. HP's new designs match the same standards with a keen emphasis on durability and supportability. Additional I/O cards are available if required.

Whatever your needs, Hewlett-Packard provides solutions that are powerful, reliable, and ready to meet your Real-Time requirements.

## The HP 1000 in rugged environments.

### Real-Time servers for your most demanding applications.

With version 5.2 of the RTE-A operating system and later, the HP 1000 A-Series can be configured as a diskless network node. Therefore, it is now possible to construct large control networks at significantly lower cost within even more rugged environments.

HP's Network Services and ARPA services provide data transfer and interprocess communication across the network.

## Memory Products

Description	Product Number	U.S. List Price*
Error Correcting memory for A900, A990 CPUs		
3.0 Mb	12221A	\$9,000.00
8.0 Mb	12221B	\$14,750.00
Parity Memory cards for A400, A600+ CPUs		
2.0 Mb	12103K	\$3,250.00
4.0 Mb	12103L	\$5,550.00
8.0 Mb	12103M	\$9,250.00

## Memory Bus connector for A-Series

Description	A400, A600, A700 Parity Memory	A900 ECC Memory	A990 ECC Memory
2-socket connector	12038A	12222A	A complete set of four A990 memory connectors is shipped with each A990 CPU or A990 Upgrade Kit.
3-socket connector	12038B	12222B	
4-socket connector	12038C	12222C	
5-socket connector	12038D	12222D	
6, 7, 8, 9-socket connector	not available	12222E/F/G/H	not available

Note: The A-Series supports up to a maximum of 32 Mb memory. The correct Memory Bus connector MUST be chosen for proper operation.

Note: A 2-socket connector connects the memory controller to one (1) memory card.



## Popular A-Series I/O cards

Product Number	Description	U.S. List Price*
12009A	HP-IB peripheral bus	\$1,309.00
12016A	SCSI peripheral bus	\$1,495.00
12040D	8-channel RS232 mux	\$2,530.00
12075A	X.25 Network interface	\$4,325.00
12006A	Intelligent 16-bit parallel interface	\$1,056.00
12005B	Asynchronous serial interface	\$1,195.00
12065A	RGB Color Monitor interface	\$2,532.00
12076A	LAN/1000 Link interface	\$3,685.00

For further information on service and support networks, please consult the HP 1000 Ordering Guide P/N 5952-1745D.

## Ordering a diskless node

Product Number	Description	U.S. List Price*
2424A	6-slot box with A400 CPU and 4xRS232 ports	\$4,995.00
92078E opt. 400	VC+ Right-to-Execute	\$204.00
91790R opt. 400	Right to copy NS-ARPA Software	\$1,715.00
12103K	2 Mb Parity Memory	\$3,250.00
12038A	Memory bus connector	\$70.00
12076A	LAN/1000 Link Interface	\$3,685.00

\* Effective July 1, 1992

## HP 1000

### Upgrade your HP 1000 Computer System.

The A990 utilizes the same error-correcting memory as the A900.

You only have to swap the 4-board A900 processor board set for the single-board A990 processor to double your CPU performance.

When upgrading to the new A990 from other A-Series, you will receive generous return credits for your existing memory boards.

Most existing A-Series I/O interface cards are supported on the A990.

### A990 CPU Field Upgrade information

From	To	Order	U.S. List Price
A400*	A990	12990C	\$25,025.00
		+ opt. 400	- \$1,000.00
A600*	A990	12990C	\$25,025.00
		+ opt. 600	- \$1,000.00
A700*	A990	12990C	\$25,025.00
		+ opt. 700	- \$11,000.00
A900	A990	12990C	\$25,025.00
		+ opt. 900	- \$14,000.00
*A400, A600, and A700 must replace existing memory with at least one of the 1222XX A990 memory boards.			

Return credits given for Product Number:	Description	U.S. List Price
HP 12103CN	512 Kb Parity memory card	- \$375.00
HP 12103DN	1 Mb Parity memory card	- \$375.00
HP 12111AN	512 Kb ECC memory card	- \$375.00
HP 12111BN	1 Mb ECC memory card	- \$375.00
HP 12111CN	2 Mb ECC memory card	- \$375.00
Additional A990 memory		
HP 12221A	+ 3 Mb memory card	\$9,000.00
HP 12221B	+ 8 Mb memory card	\$14,750.00

### Microcoding the new A990.

If you want to maximize the performance of your HP 1000 A990 system, the new A990 microprogramming package is available as HP 92049B.

### HP1000 A-Series Networking

#### ARPA/1000. HP 98170A

This product provides basic industry standard ARPA Services (FTP and TELNET) for standards based multivendor connectivity.

#### NS-ARPA/1000. HP 91790A

This product provides industry standard LAN based ARPA Services as well as programmatic access using the Berkeley Socket Interface for customers with more complex multivendor networking requirements.

NS Services include Starbase TCP/IP LAN based networks and X.25 OS compatible networks.

DS Compatible Services are also supported to aid in the migration to standards based networking.

#### RJE-II/1000. HP 91781A

This product provides IBM connectivity using the PSI point to point link.

# HP 1000

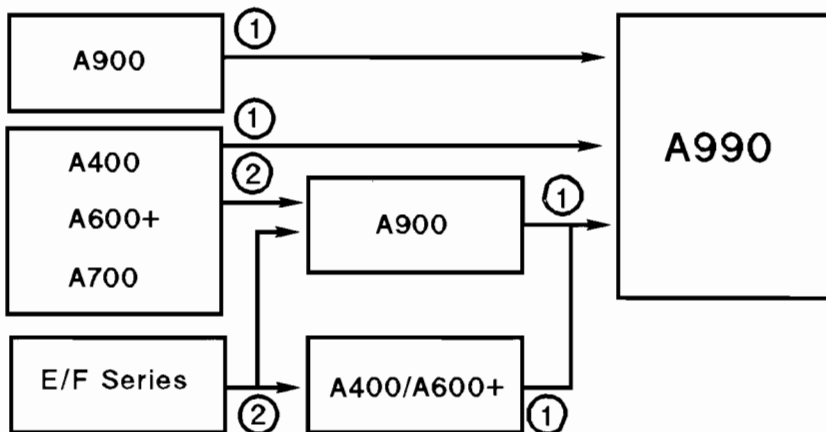
## UPGRADE PATHS FOR HP 1000 CUSTOMERS.

### Secure your Real-Time applications for the next two decades.

Hewlett-Packard is committed to manufacturing the A-Series until (at least) the year 2000 and supporting it until the year (again, at least) 2010.

The new A990 processor not only allows HP to deliver on this commitment, but also provides a significant CPU performance improvement for all HP 1000 customers.

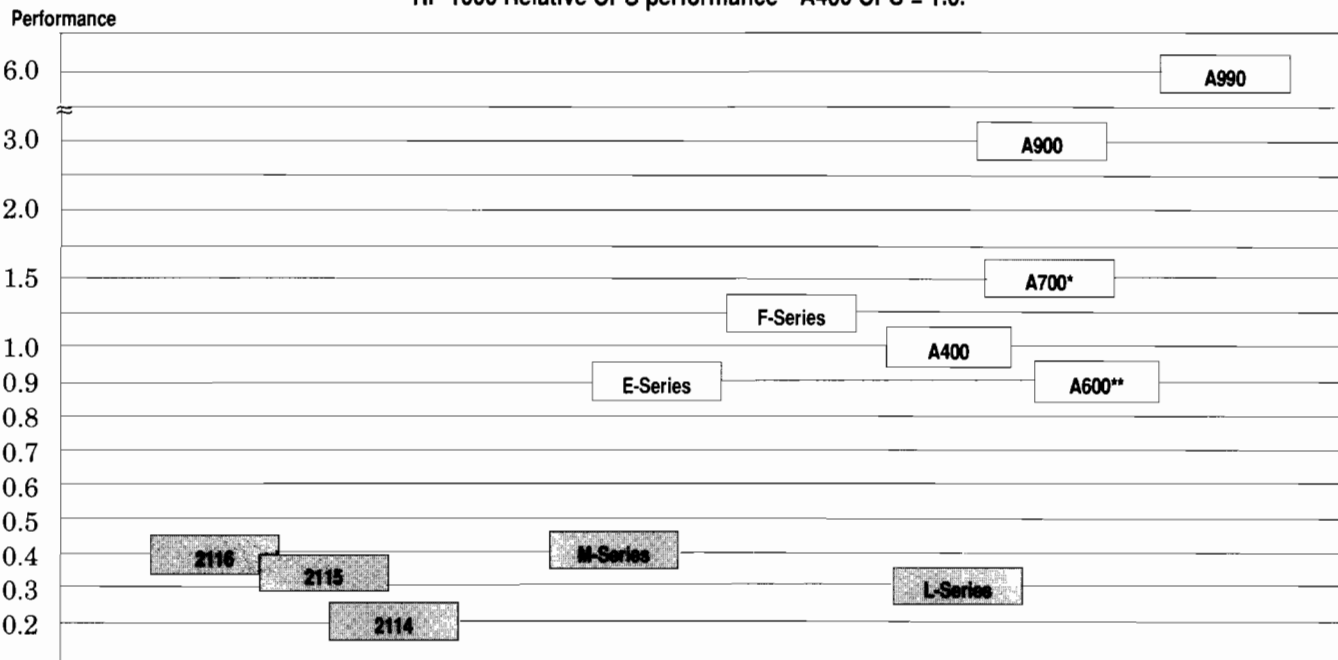
Upgrade to the new A990 processor today and secure your Real-Time application for the next two decades.



- ① = Board swap
- ② = Box swap



HP 1000 Relative CPU performance—A400 CPU = 1.0.



\* Discontinued 11/01/89  
 \*\* To be discontinued 11/01/92.

HP 1000 Performance Generations

# HP 1000

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## Operating system and enhancements.

### Real-Time Executive Operating System. HP 92077A

RTE-A disk or memory-based software system is for management of operations and resources of the HP 1000 computer systems.

Requiring a minimum of 512 Kbytes main memory, RTE-A systems provide true multiprocessing capability for monitoring and controlling concurrent events in Real-Time.

Product Number	Software and Software Development Tools
92860A	Symbolic Debug
92836A	FORTRAN 77
92833A	PASCAL
92571A	HP C/1000
92857A	BASIC/1000C
92083A	RTE Profile Monitor
92049A	A900 Microprogramming Package
92049B	A990 Microprogramming Package
92861A	Device Independent Graphics Library
92862A	Advanced 3D Graphics Package
94250B	Forms/1000 Screen Handler
92081A	Image/1000-II Database
91790A	NS-ARPA Network Services
91751A	X.25 Link Software
98170A	ARPA Services/1000
B2695A	GFoX
B2690A	Softbench Link/1000
92050A	DataPair/1000

### Virtual Code Extensions (VC+) of RTE-A. HP 92078A

This product extends the capabilities of RTE-A, supports code and data separation as well as reentrant and recursive use of shared program code. An improved environment for multiuser operations also is included.

### DataPair/1000. HP 92050A

DataPair/1000 supports configurations of disk volumes in mirrored pairs and is used for data protection and high availability.

DataPair/1000 also now supports SCSI disk drives and any combination of two disks, SCSI or HPIB. The only restriction is that the mirrored LUs be the same size.

### Software and Software Development Tools:

- Symbolic Debug
- FORTRAN 77
- PASCAL
- HP C/1000 Compiler
- BASIC/1000C
- RTE Profile Monitor
- Microprogramming Packages for A900 and A990
- Device Independent Graphics Library
- Advanced 3D Graphics Package
- Forms/1000 Screen Handler
- Image/1000-II Database
- NS-ARPA Network Services
- X.25 Link Software
- ARPA Services/1000

## New Software Products

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### **GFoX - HP Graphics and Forms Terminal Emulator for X11. HP B2695A**

GFoX is a Graphics/1000-II (AGP/DGL) and Forms/1000 I/O device which runs in an HP-UX X11 environment. GFoX interprets many of the 2397A Color Graphics Terminal escape sequences and includes many of its features such as dithering, line styles, and independent toggling of alphanumeric and graphics planes. Besides the HP 2397A features, GFoX supports many X11 features such as a dynamically resizable window and inputs from various sources including a keyboard, stylus pen, or mouse. GFoX can be run over multiple Telnet or RS-232C connections, and has provided increased performance when using Telnet over other HP 1000 graphics I/O solutions. GFoX is user-configurable either interactively or through the use of a .Xdefaults file.

GFoX allows customers to leverage existing real-time applications into an HP-UX (UNIX) environment since it runs on the HP 9000 Series 300 (345 and above), Series 400 and 700, and Series 800 (825 and above). It also runs on HP 700/RX X-Terminals.

Graphics applications using GFoX requires RTE-A revision 5.2 or greater. (ARPA/1000 or NS-ARPA/1000 requires 5.24 or greater.)

### **Softbench Link/1000 Encapsulation. HP B2690A**

HP announces a new product with the ability to build and manage HP 1000 applications from within the Softbench CASE environment. Take immediate advantage of the source code control system and Makefile generator.

SoftBench Link/1000 Encapsulation transparently integrates the HP 1000 into the SoftBench environment for HP-UX. SoftBench is an extensible software development environment featuring a Tool Integration Platform that supports the integration of many tools into a common development environment. SoftBench provides a core set of tools for RTE-A application construction, testing, and maintenance.

- Program Editor
- Program Builder
- Program Debugger
- Development Manager

SoftBench Link/1000 Encapsulation is designed for RTE-A application developers who must provide ongoing maintenance of existing RTE-A application software projects, in addition to those undertaking new RTE-A application development. It will also provide the necessary framework for developing engineering processes to improve the quality of software development and maintenance.

SoftBench Link/1000 Encapsulation supports program development for the HP 1000 in FORTRAN 77, HP C/1000, and Macro/1000 and integrates the standard Symbolic Debug/1000 debugger into the SoftBench environment for HP-UX.

**HP 1000 Computer Real-Time Systems....discover the upgrade path to more power.**



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Geneva, Switzerland

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\* Data subject to change