



General Description

The TURBO-16 is a 16 Mhz accelerator card for Hewlett Packard Series 9000 computers. The card contains a Motorola 68020 processor, an optional Motorola 68882 coprocessor and 1 to 4 megabytes of 80 nanosecond dynamic ram. An internal 32 bit data bus provides high speed data transfers between the processors and the memory.

Compatible Models

The TURBO-16 is compatible with the HP 216, 217, 220, 226, 236, 237, 310 and 320 workstations. The card uses one slot in the host computer.

BASIC and PASCAL

The TURBO-16 is designed for the BASIC and PASCAL operating systems. No modifications are required for user programs.

Speed Improvement

Programs run from 3 to over 100 times faster.

The speed increase depends on the type of computation. The following table shows the range of speed improvements.

PROGRAM TYPE	COMPUTATION TYPE	SPEED INCREASE
Compiled Programs	Integer Arithmetic	3 to 4
	Real Arithmetic	14 to 25
	Real Transcendental	74 to 150
Interpreted Programs	Integer Arithmetic	3 to 4
	Real Arithmetic	5 to 6
	Real Transcendental	18 to 35

NEWPORT DIGITAL

14731 Franklin Avenue, Suite A ■ Tustin, California 92680 ■ (714) 730-3644

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Benchmark Comparisons

The following tables compare system performance of the HP Series 200 computers, the HP-310 and the TURBO-16. An HP-236 was used for the Series 200 tests. System performance is approximately the same for the various HP Series 200 computers. The TURBO-16 was configured with the Motorola 68882 for the tests. The figures represent the time in seconds to execute 100,000 iterations of the indicated function.

Program Type	Benchmark	HP-200	HP-310	TURBO-16
Interpreted BASIC	Integer Arithmetic	32.91	30.15	9.08
	Real Arithmetic	68.70	60.26	11.61
	Square Root	216.61	186.72	10.02
	Sine	411.89	349.28	11.75
Compiled Basic	Integer Arithmetic	4.30	3.09	.97
	Real Arithmetic	38.49	31.46	2.11
	Square Root	192.19	162.74	1.89
	Sine	395.35	332.45	4.48
Compiled Pascal	Integer Arithmetic	4.07	3.76	1.16
	Real Arithmetic	39.92	26.76	1.54
	Square Root	178.90	115.88	1.19
	Sine	373.79	240.19	2.79

System Memory

Memory cards which have been added to the HP computers are too slow to run with the TURBO-16. These memory cards must be removed when installing the TURBO-16.

Installation Procedure

The installation process is quick and easy. Two switches must be set on the TURBO card. Existing memory cards are removed from the computer and then the TURBO-16 is plugged into any available slot.

Power Requirements

The TURBO-16 requires a maximum of 1.0 Amps from the 5 Volt supply.

Product Warranty

The TURBO-16 has a 5 year warranty.

Ordering Information

Product Description	Reference
TURBO-16 with 1 megabyte	10-00-0000
TURBO-16 with 2 megabytes	10-00-0001
TURBO-16 with 4 megabytes	10-00-0002
TURBO-16/68882-16 with 1 megabyte	10-00-0003
TURBO-16/68882-16 with 2 megabytes	10-00-0004
TURBO-16/68882-16 with 4 megabytes	10-00-0005

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PRICE LIST

<u>Product Description</u>	<u>Part Number</u>	<u>List price</u>
TURBO-16 with 1 megabyte	10-00-0000	1,190.00
TURBO-16 with 2 megabytes	10-00-0001	1,670.00
TURBO-16 with 4 megabytes	10-00-0002	2,630.00
TURBO-16/68882-16 with 1 megabyte	10-00-0003	1,440.00
TURBO-16/68882-16 with 2 megabytes	10-00-0004	1,920.00
TURBO-16/68882-16 with 4 megabytes	10-00-0005	2,880.00
TURBO-25 with 1 megabyte	10-00-0006	1,690.00
TURBO-25 with 2 megabytes	10-00-0007	2,170.00
TURBO-25 with 4 megabytes	10-00-0008	3,130.00
TURBO-25/68882-25 with 1 megabyte	10-00-0009	2,040.00
TURBO-25/68882-25 with 2 megabytes	10-00-0010	2,520.00
TURBO-25/68882-25 with 4 megabytes	10-00-0011	3,480.00
TURBO-33 with 1 megabyte	10-00-0012	2,290.00
TURBO-33 with 2 megabytes	10-00-0013	2,770.00
TURBO-33 with 4 megabytes	10-00-0014	3,730.00
TURBO-33/68882-33 with 1 megabyte	10-00-0015	2,840.00
TURBO-33/68882-33 with 2 megabytes	10-00-0016	3,320.00
TURBO-33/68882-33 with 4 megabytes	10-00-0017	4,280.00
Motorola 68882-16 Coprocessor	20-00-0001	250.00
Motorola 68882-25 Coprocessor	20-00-0003	350.00
Motorola 68882-33 Coprocessor	20-00-0005	550.00
Memory Upgrade - 1 to 2 Megabytes	15-00-0000	480.00
Memory Upgrade - 2 to 4 Megabytes	15-00-0001	960.00
Memory Upgrade - 1 to 4 Megabytes	15-00-0002	1440.00

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Tustin, California 92680

714 730-3644