

Childhood's End: The 68000



ADDRESSING THE NEW FRONTIER...
THE MICROCOMPUTER COMES OF AGE.

CHILDHOODS END

The 8-bit processor gave birth to the microcomputer in the early seventies. However, as the system matured, its processor did not. Until now the microcomputer has contained either a standard, segmented, or enhanced version of the basic 8-bit processor. Of the new-generation processors, only the 68000 has a totally new and expanded architecture, leaving behind the limitations and restrictive buses of the 8-bit world. With the 16-bit data bus, 16 megabyte address space and 32-bit operations, the 68000-based microcomputer will leave the child's world and become the professional computer. In one long stride this newcomer has not only overtaken the microcomputer but is actually challenging the processing performance of the low-end mainframe. This child prodigy, the microcomputer, is about to become an adult. That adult is the 5402 II.

THE PROFESSIONAL COMPUTER

The 5402 II microcomputer is a collection of state-of-the-art hardware brought together into a concise, reliable and efficient design. It consists of a CPU board containing an interrupt-driven 8 megahertz 68000 microprocessor, up to 16 megabyte of RAM memory, a floppy disk controller, and several communication interfaces. This board is assembled with one or two 5 $\frac{1}{4}$ inch disk drives, and a switching power supply. It is then placed in a cabinet about the size of a 3" stack of wide computer paper. When this unit is combined with a terminal, printer and operating system it becomes a complete professional computer.

THE CHICKEN OR THE EGG?

Which came first, the hardware or the software? Few computer manufacturers want to design a system for which no software exists, and conversely, programmers do not typically create software for non-existent computers. This is the case with the 68000 microprocessor. Few 68000 based systems have emerged because of the lack of software. What is the key to breaking this circle of logic? Enter the portable egg. A portable operating system with an existing software base, operating independently of the machine architecture, solves this problem quite nicely. Sage Computer Technology will offer the portable-LCSD operating system for the 5402 II microcomputer. This sophisticated and interactive operating system supports four languages, a host of utility programs, plus a large application software base. This will allow a user to take advantage of the performance of the 5402 II using application programs which are currently running on 8-bit machines.

NO SECRETS HERE

We feel that in order to properly support the computer professional, all technical information should be openly published. The 5402 II owner's manual contains all definitions and timing information required to interface the system with other hardware. Source files for the bootstraps, debugger and BIOS software are included for each system. All of this material is copyrighted but may be used in the application of a 5402 II microcomputer. We believe that this policy will also enhance support from the industry in general.

RELIABILITY

The importance of reliability is widely reflected in the design of the 5402 II. All chips are socketed and there are no adjustments of any kind on the computer board. There are also very few discrete components in the design and all sections have an active 24 hour burn-in test before shipment. The machine has forced air cooling even though maximum power dissipation is only 64 watts and typical power dissipation is less than 22 watts.

WARRANTY

All products manufactured by Sage Computer Technology are warranted for one full year. Peripheral products such as disk drives, not manufactured by Sage Computer Technology, are warranted by Sage Computer Technology for the manufacturers warranty period.

PROCESSOR

- 8 MHz 68000 microprocessor
- Highly regular instruction set
- 32-bit data bus
- 24-bit address bus (with address 30 Mbytes)
- 32-bit registers and operations
- 2 million operations per second
- Multi-color processor status LED
- All I/O is interrupt driven but optionally polled

MEMORY

- 128K to 1M Megabyte of RAM on board
- Byte level parity error detection on all RAM
- No wait states needed for RAM access
- 150 Hsec 64K dynamic memory chips
- 8K (paritically 20K) EPROM firmware contains self-test, DZRU0002F, and bootstraps

FLOPPY DRIVE

- One or two 5 1/4" floppy disk drives
- 48 or 96 Tracks per inch
- Double-sided and double-density
- 320K to 1.2 Megabyte
- Will load 12M program in 1/2 second
- DIP switch defines configuration
- Automatically powers down when not in use to save heads media
- History-sensitive power-down time
- Interrupt-driven, optionally polled operation

TERMINAL PORT

- RS-232C serial port
- Defined as data communication equipment
- Software defined baud rate, 50 - 19.2M baud
- Interrupt driven or optionally polled
- DIP switch defines initial baud rate

MODEM PORT

- RS-232C serial port
- Defined as data terminal equipment
- Software defined baud rate, 50 - 19.2M baud
- Fully supported modem control lines
- Ringing detect supported
- Interrupt-driven or optionally polled

PRINTER PORT

- Centronics-compatible parallel port
- Interrupt-driven or optionally polled
- Can be used as a general purpose 15-bit software input, output or control port

USER-485 INTERFACE

- Implemented in hardware with MAX9800d controller and buffers
- Software definable characteristics
- Address and control masks defined by DIP switch or software
- Interrupt driven or optionally polled

UCSD/OPERATING SYSTEM

- Pascal, FORTRAN, BASIC, and Assembler
- Screen-oriented editor
- File and other utilities
- Interrupt driven with printer spooling

MISCELLANEOUS

- Real-time clock
- Separate task scheduler with 15.6 Usec resolution

POWER AND PACKAGING

- 30-watt switching power supply
- Magnetic circuit breaker
- Two separately switched A.C. peripheral outlets
- Forced-air cooling with quiet 20 CFM fan
- Low power consumption, typically 22 watts (drives off)
- Size - 3 1/4" by 12 1/2" by 18 1/2"
- Weight - 25 lbs.
- Modular construction
- Easy servicing



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