

**VECTOR GRAPHIC MICROCOMPUTER HARDWARE**

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## VECTOR 1 MICROCOMPUTER

The Vector 1 digital computer is based on the 8080A or Z-80 microprocessor and the common S-100 bus structure. Vector 1 has 78 basic machine instructions and a minimum instruction cycle of two microseconds. There is room for up to 64K of directly addressable memory using a parallel 8 bit word/16 bit address. Up to 256 separate input and output devices can be addressed. An 18-slot motherboard comes standard. Factory assembled and tested.

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## MINDLESS TERMINAL\*

The first "mindless" terminal for small business computer systems. Accepts separate TTL video and sync — interfaces with most alphanumeric video display boards. 12" screen has crisp 900-line resolution at center and 750-line resolution at borders. Custom 60-key typewriter format with 12-key numeric pad. Special function, directional and control keys as well. Incorporates capacitance key switches and LSI N-channel MOS encoding electronics.

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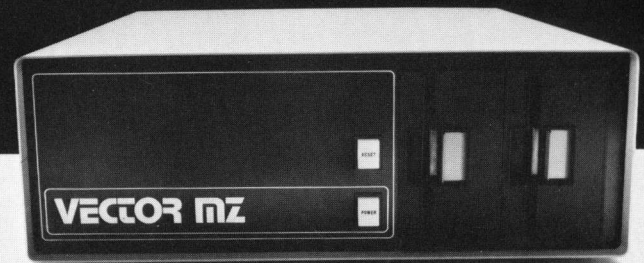


## VECTOR MZ MICROCOMPUTER\*

Z-80 based, dual-floppy, S-100 bus compatible digital microcomputer. Completely assembled and tested, basic system includes: 18-slot motherboard; Z-80 CPU with 4 MHz clock; two quad-density Micropolis 5¼" floppy disk drives, 630K bytes of storage capacity; disk controller board; Bitstreamer I/O board with 1 serial/2 parallel ports; 48K RAM easily expandable to 56K; 12K 2708 PROM/RAM board with extended monitor.

Up to 256 separate input and output devices can be addressed. System software includes Micropolis MDOS with 20K extended BASIC, debugger, editor, Z-80 assembler, MZOS disk operating system and CP/M.

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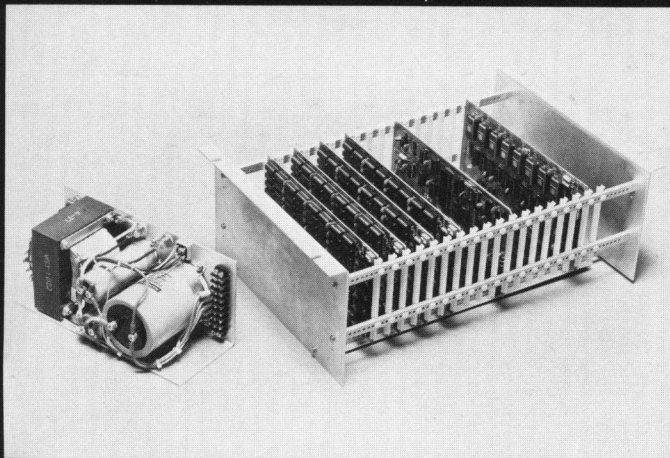
## MICRO-STOR DISK SYSTEM

Designed specifically to interface with the Vector Graphic disk controller board. Comes with two Micropolis MOD II disk drives. Each floppy disk has storage capacity of 315K bytes formatted with 16 hard sectors and 77 tracks. Operates with both static and dynamic memories at data rate of 250K bits/second. Requires 115 Vac power. Also includes controller board, disk operating system, compiler, Z-80 assembler, editor and debugger.

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\*A small business system called System B includes: (2) Mindless Terminal, (3) Vector MZ, (9) Flashwriter II.

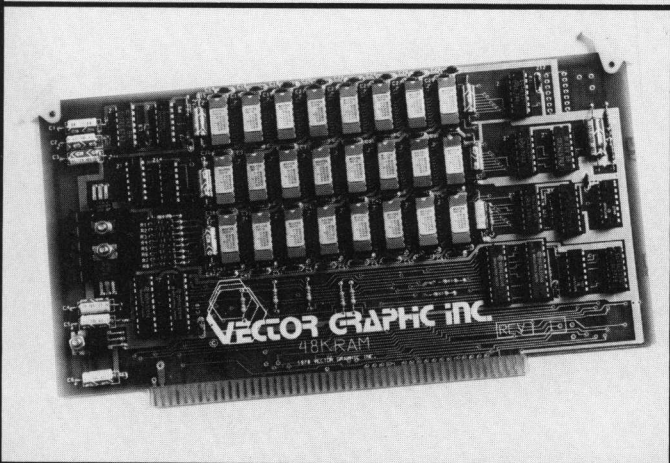


## RACK MOUNT MICROCOMPUTER

Rack mount includes a card cage, assembled and tested 18-slot motherboard with connectors, card guides and locking buttons. The motherboard is fully shielded and terminated to reduce noise on the bus.

A companion power supply is available completely assembled and designed for rack mounting. The 18 A + 8 V, 2.5 A ± 16 V custom supply provides power for a full 18 boards. Transformer has primary taps for 110 V, 120 V and 130 V. Features all Class B insulation.

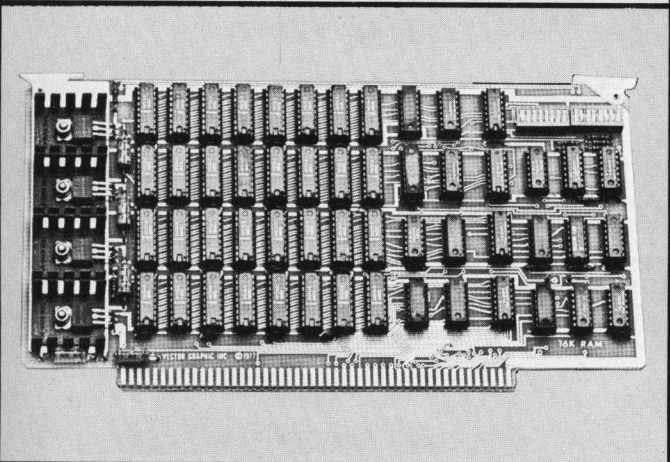
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## 48K RAM BOARD

The advanced 48K Dynamic Memory Board provides 49,152 8-bit bytes of random access memory utilizing 24 - 16K chips. Compatible with Z-80 based S-100 bus computers and features problem-free transparent refresh consuming less than 4 watts total power. Thermally cycled, aged and continuously read-write tested for over 400 million error-free cycles. Offers buffered data input and output. Incorporates gridded ground plane designed to reduce noise. Shipped fully assembled, tested and burned-in with one year guarantee.

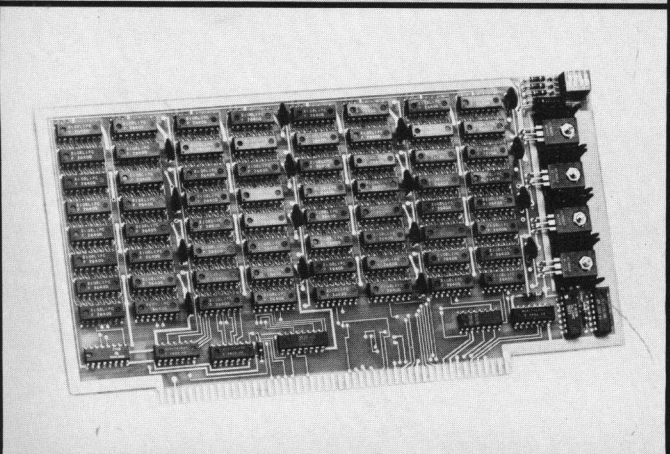
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## 16K STATIC MEMORY BOARD

This 16K board is addressable as two 8K blocks on 8K boundaries, as if two 8K memories were available. Bank selectable to allow up to one-half megabyte to be addressed by the CPU. Address lines buffered with Schmitt triggers, data in and data out also fully buffered. Hardware write protection offered for each 8K block. Phantom disable feature permits use with reset-and-go PROM/RAM boards.

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## 8K STATIC MEMORY BOARD

The 8K Static Memory board is offered fully tested and assembled. The board features rapid access time with no wait state. Conservative power regulators provide excellent reliability with typical power consumption of 1.5 A at + 5 V.

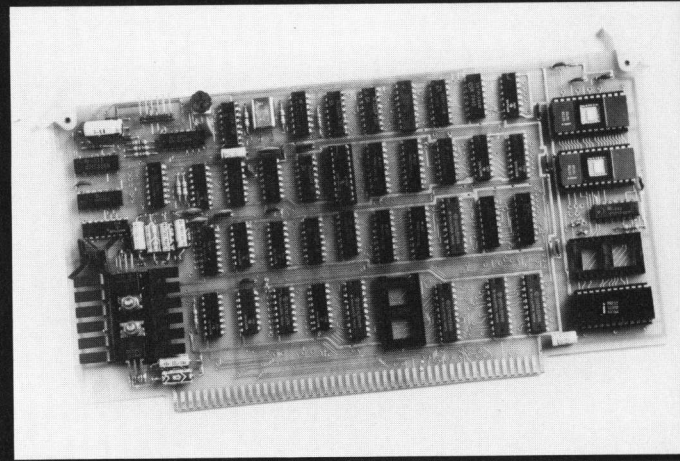
Address lines buffered with Schmitt triggers; hardware 8K memory protect. Address select through top-mounted dip switch; no need to remove board.

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## FLASHWRITER II VIDEO BOARD\*

Higher density version of alphanumeric video display board. Features 80 characters X 24 lines and character matrix of 8 X 10 dots. Reverse video optionally controlled by high-order bit of the character code. Up to 256 characters can be generated by 2708/2716 EPROMS which can be user-programmed for special symbols or graphic characters. Memory-mapped I/O permits rapid updating of screen. 1920 displayed characters serially mapped into 2048-byte memory block. Keyboard port (8 bits and strobe) with latched data allows easy interface to parallel keyboard. "Power on" jump circuit offers power-up operation without interfering with system RAM at low addresses.

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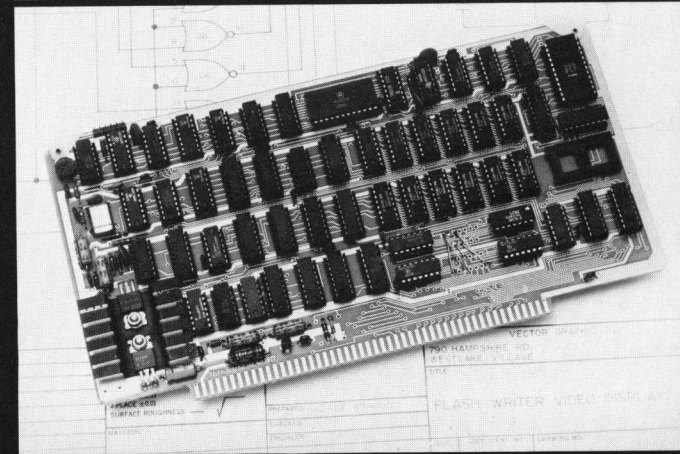


## FLASHWRITER I VIDEO BOARD

Video board will generate and display 64 characters by 16 lines. Additional features include character-by-character reverse video, block graphic and line graphic elements (may be super-imposed over characters) and reduced intensity field.

The board uses a 7 X 9 matrix character generator and independently addressable keyboard input port.

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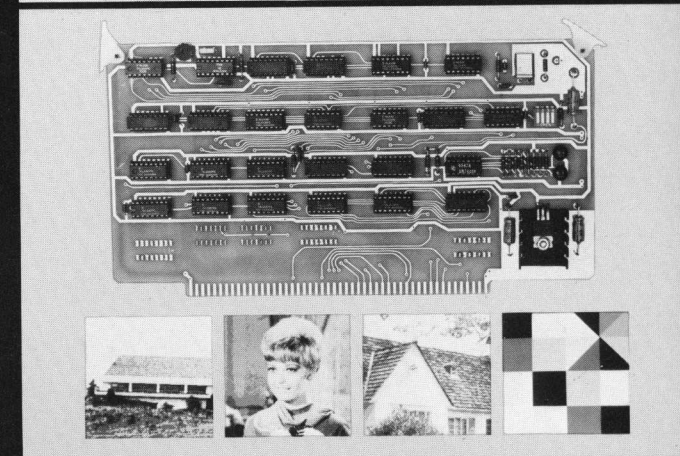


## HIGH RESOLUTION GRAPHIC DISPLAY BOARD

The High Resolution Graphic Display board offers several switch-selectable video outputs. In the high resolution mode, 256H X 240V screen elements are displayed, while the gray scale mode provides 128H X 120V screen elements with 16 levels of programmable gray scale.

The board is designed to utilize a standard Vector Graphic 8K static RAM board as the refresh memory, and will interface with most raster scan monitors.

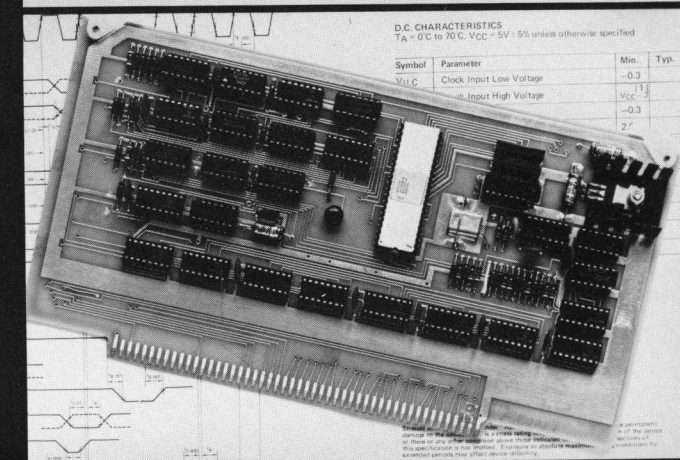
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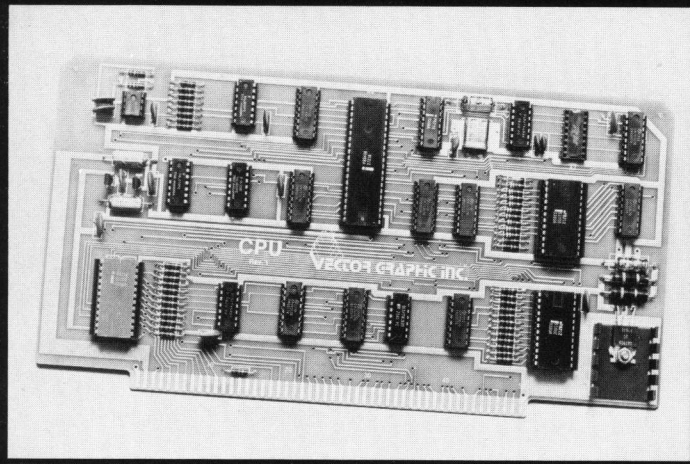


## Z-80 CPU BOARD

Z-80 CPU board, offered fully assembled and tested with on-board wait state select, is jumper selectable for operation at 2MHz or 4 MHz. Operates standard 8080 software without modification. All Z-80 lines are fully buffered. Supports all three modes of Z-80 interrupts. Has jumper selectable MWRITE generation. Quality features include solder mask on both sides of the PC board, gold plated edge contacts, card extractors for easy installation or removal and 256 I/O devices.

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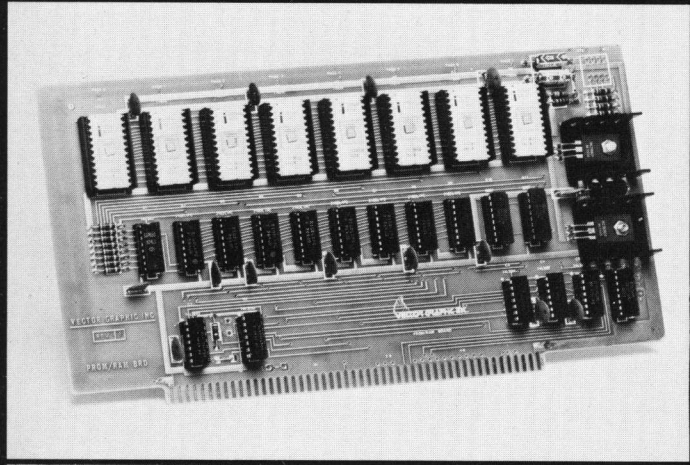


### CPU BOARD

Uses 8080A microprocessor with on-board real time clock. It has 8 vectored interrupts, fully buffered data and address lines. Includes 78 instructions and 2 microsecond instruction cycle time. Addresses up to 256 separate input and output devices. Features solder mask on both sides, plated through-holes and card extractors. All IC's are socketed for easy maintenance.

Available fully assembled and tested.

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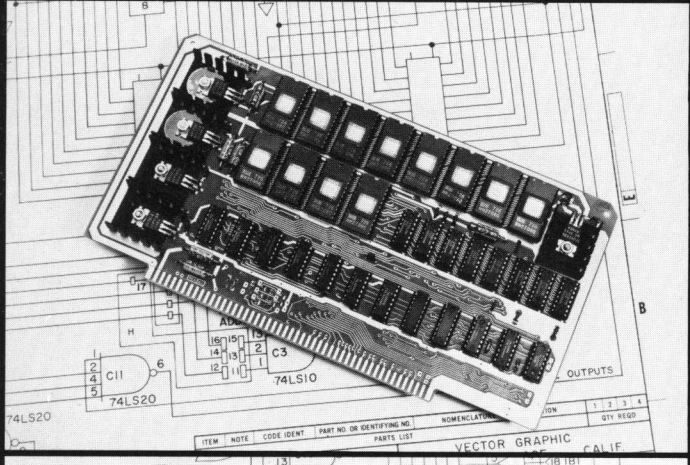
### PROM/RAM BOARD

PROM/RAM board, fully assembled, features 1K RAM 2102LIPC, low power, 450 nS access time. It has a PROM capacity for up to 2K bytes of type 1702A. Stores monitors, bootstrap loaders, and video drivers.

Has stack storage; no need to relocate stack when adding memory. Jump-on reset, MWRITE logic also included.

The PROM/RAM board can be used with all S-100 bus computers with or without front panel.

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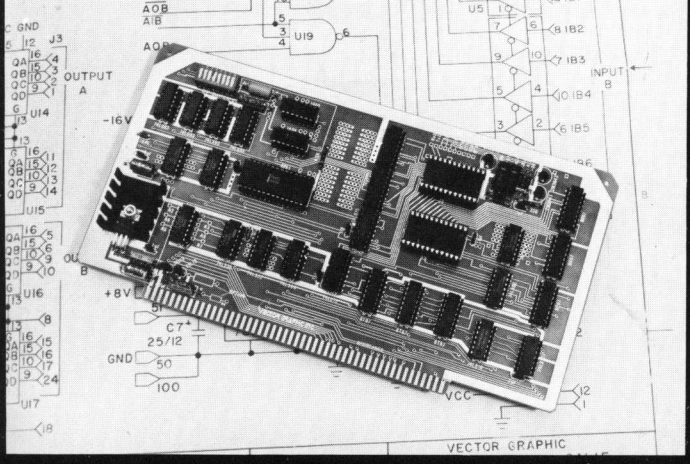
### 12K PROM/RAM BOARD

The 12K PROM/RAM board combines memory technologies of erasable programmable read-only memories (EPROM's) with high speed random access memory (RAM). 12K bytes of 2708-type EPROM's may be installed. RAM is 1K bytes of high speed static devices. Includes PROM programming capability.

Full buffering on all inputs and outputs is provided. Power-on jump to any PROM location, selectable wait state included.

Available fully assembled and tested.

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### BIT STREAMER I/O BOARD

Bit Streamer I/O board, available fully assembled, combines two parallel input and output ports, and a serial I/O port using an 8251 programmable universal synchronous/asynchronous receiver-transmitter. The parallel ports also can be used as keyboard input ports.

Will operate as an RS-232 or 20 mA current loop serial port using the initialization and I/O software on the Vector Graphic option C PROM.

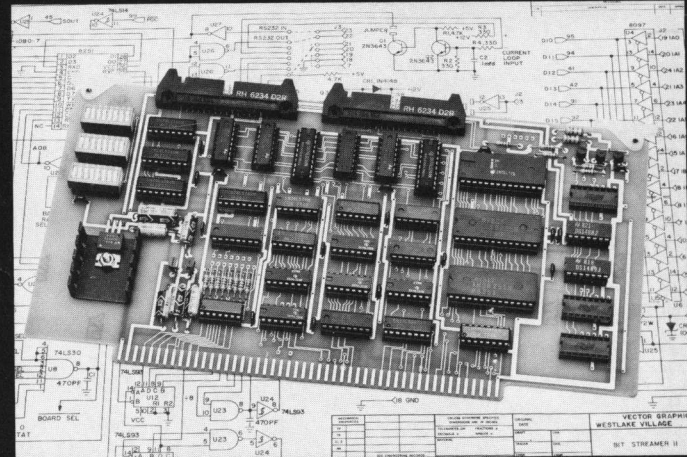
Interfaces with most terminals, printers, readers and punches.

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## BIT STREAMER II I/O BOARD

Fully S-100 bus compatible, the BITSTREAMER II allows interfacing with most terminals, printers, readers and punches. Uses 8251A programmable USARTs which can be software-configured for 5 to 8 data bits and 1, 1½ or 2 stop bits. Available factory assembled and tested. Provides three serial input/output ports interfaced at RS-232 levels and 20 mA current loop; two parallel input/output ports. By jumper option Bit Streamer II can generate interrupt requests.

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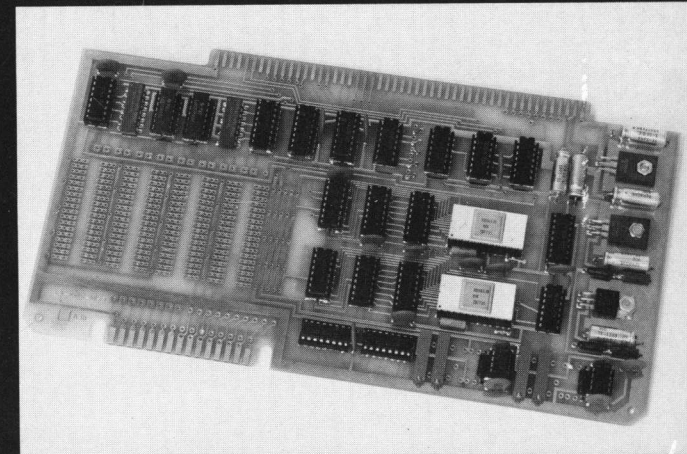


## PRECISION ANALOG INTERFACE BOARD

The Precision Analog Interface board, available fully assembled and tested, contains 2 analog outputs, 8 analog inputs and a versatile control port. It provides high accuracy 12-bit digital-to-analog and analog-to-digital conversion for measurement and control of up to 8 analog input channels.

Design uses the latest in hermetically sealed, laser-trimmed DAC's for true 12-bit (0.012%) accuracy. A variety of output voltage ranges are available and the board can operate in either monopolar or bipolar modes. A convenient patch area allows user-designed circuitry to be added.

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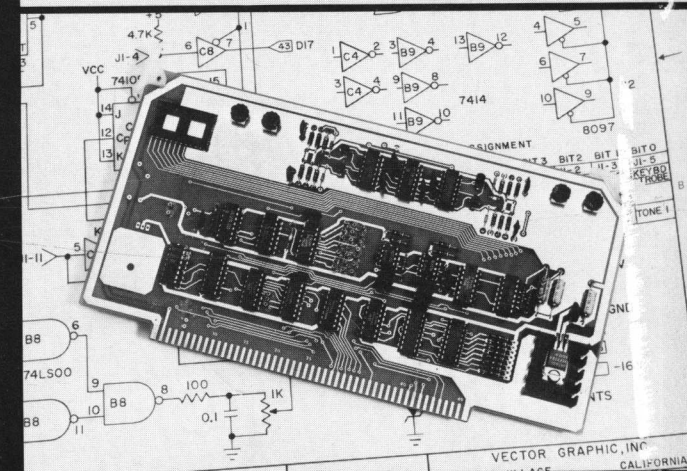


## ANALOG INTERFACE BOARD

Multi-function Analog Interface board, offered fully assembled, permits interfacing with potentiometers, joysticks or voltage sources. An 8-bit digital port with latched strobe can be used as a keyboard input port. Tone pulse generators also can be used to produce sounds for games or keyboard audio feedback.

Features include four A to D inputs and software-controlled resolution, ranging from 16 or 64 counts for cursor motion to 1024 or more for graph plotting or feedback controls.

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## MOTHERBOARD

Heart of the Vector Graphic computers is the 18-slot, fully shielded motherboard offered separately to the computer hobbyist and experimenter. Constructed of heavy .093" fiberglass, the board resists twisting and warping which can cause problems in board alignment.

Terminating resistors for the bus lines provide testbook clean signals. By using stripline techniques, proper characteristic impedance is ensured and coupling between adjacent lines is minimized.

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