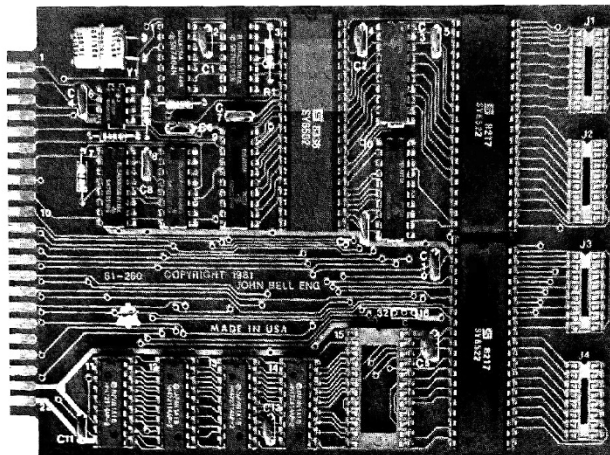# JOHN BELL
ENGINEERING, INC.

Catalog

MICROCOMPUTERS/INTERFACES
FOR
ENGINEERS—SCIENTISTS

415-592-8411

en-gi-neer-ing n: a science by which the properties of matter and sources of energy are made useful to man in structures, machines, and products.

SINGLE BOARD COMPUTERS

81-260 "SLIM COMPUTER"

This 4.5 × 6.5 board has a 6502 Microprocessor, two 6522 versatile Interface Adapters, 2K of 2114 RAM, and 2K or 4K of EPROM (2716 or 2532). The fully buffered 22/44 pin bus is similar to the AIM computer bus. This computer has power on reset and a 1 MHz crystal clock. This computer can stand alone or it can be expanded by using the 81-320 Six Slot Mother Board, 81-330 32K RAM-EPROM Board, 81-292 Analog I/O, and the 82-036 12 Port I/O Board. You can use an APPLE II computer with the 79-295 Parallel I/O and 80-244 EPROM Programmer to develop programs for the SLIM.

This computer can be used to control lab experiments for the scientist and for industrial robot control, security systems, point of sale computer-cash register, and to simulate complex logic functions.

An EPROM (2532) with a monitor and Tiny Basic is available. This program communicates serial RS-232 110 to 1200 baud using one of the VIA's. To order the EPROM order part number 81-260E for $39.95.
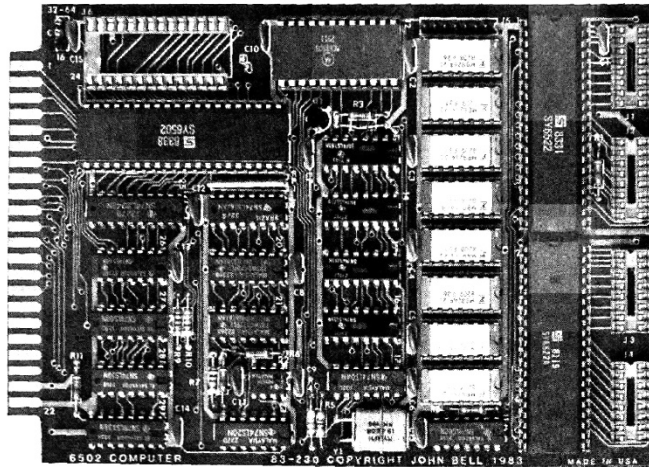
To order:
81-260A	Assembled and Tested	**$199.95**
81-260B	Bare Board with Doc.	**$ 39.95**
81-260E	EPROM Monitor and Basic	**$ 39.95**

OEM discounts available.

SINGLE BOARD COMPUTERS

83-230 "SLIM II COMPUTER"

This 4.5 × 6.5 board has a 6502 Microprocessor, two 6522 versatile Interface Adapters, 55K of 4164 DRAM, Serial RS-232 Port, and 2K to 8K of EPROM (2716, 2532, or 2564). The 22/44 pin bus is similar to the AIM computer bus. This computer has power on reset and a 1.2288 MHz crystal clock. This computer was designed to stand alone or it can be expanded by using the 81-320 Six Slot Mother Board, 81-292 Analog I/O, and the 82-036 12 Port I/O Board. You can use an APPLE II computer with the 79-295 Parallel I/O and 80-244 EPROM Programmer to develop programs for the SLIM II.

This computer can be used to control lab experiments for the scientist and for industrial robot control, security systems, point of sale computer-cash register, and to simulate complex logic functions.

An EPROM (2716) with a monitor is available. This program communicates serial RS-232 110 to 9600 baud using the serial port. To order the EPROM order part number 83-230E for $19.95.
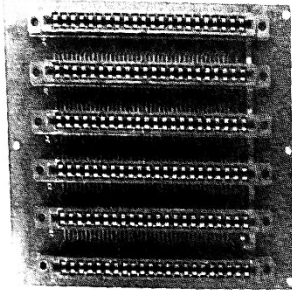
To order:

83-230A	Assembled and Tested	**$299.95**
83-230B	Bare Board with Doc.	**$ 49.95**
83-230E	EPROM Monitor	**$ 19.95**

OEM discounts available.

PERIPHERALS FOR THE SLIM—SLIM II


SIX SLOT MOTHER BOARD

This board has six 22/44 pin connectors. It was designed to be used with the SLIM computer to expand the system by adding more I/O and RAM or EPROM. It will mount in a Vector card cage. The card spacing is .750 inches.

This board can also be used to expand the AIM, and SYM computers.

To order:
81-320A   Assembled with 6 gold connectors **$99.95**
81-320B   Bare Board without connectors   **$49.95**
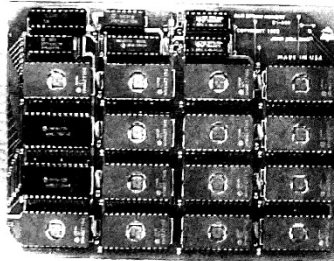
RAM — EPROM MEMORY 32K

This board has 16 24 pin sockets that will accept 6116 RAM's or 2716 EPROM's. RAM's and EPROM's can be mixed. The memory is mapped from 0000 to 7FFF. The first 2K can be deselected to allow for the 2K RAM on the SLIM computer.

This board can also be used to expand the AIM, and SYM computers.
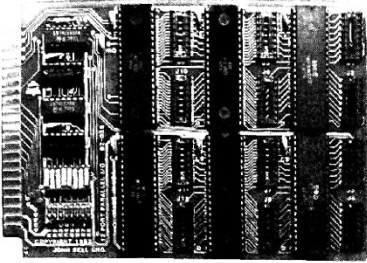
To order:
81-330A   Assembled and tested without memory **$99.95**
81-330B   Base Board   **$49.95**

4

PERIPHERALS FOR THE SLIM—SLIM II

12 PORT PARALLEL I/O

This board has six 6522 VIA's. This is a total of 96 I/O lines. Each of the 12 ports has 8 data lines, 2 handshake lines, and +5 and ground. The outputs are TTL and can sink at least 1.6 ma. Each 6822 also has two timers and a serial shift register.

This board can also be used to expand the AIM, and SYM computers.

To order:

82-036A	Assembled and tested	**$169.95**
82-036B	Bare Board	**$ 49.95**
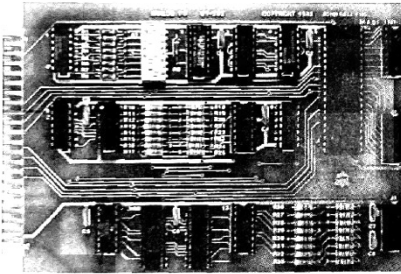
ANALOG I/O INTERFACE

This board has 16 analog inputs and two analog outputs. The inputs are 8 bit (256 steps) 0-5 volt high impedance with a conversion time of 200 μs. The outputs are R-2R ladders (R=15K) driven between 0-5 volts and are 8 bit (256 steps).
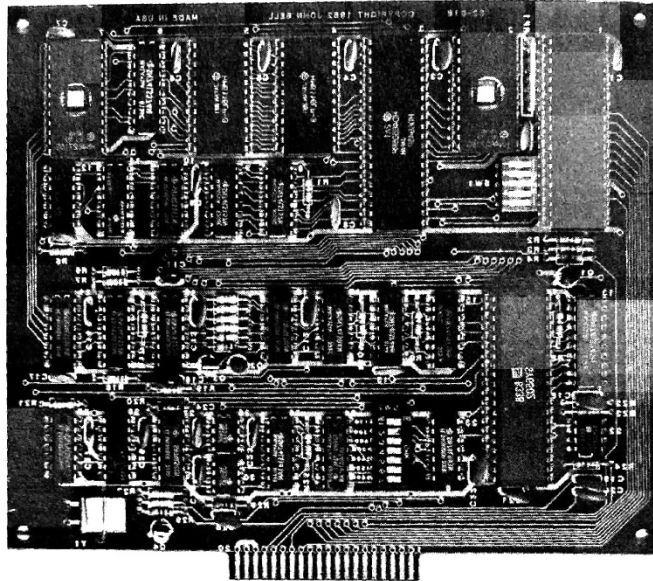
This board can also be used to expand the AIM, and SYM computers.

To order:

81-292A	Assembled and tested	**$199.95**
81-292B	Bare Board	**$ 49.95**

VIDEO TERMINAL

82-018 VIDEO TERMINAL BOARD

This is a complete stand alone Video Terminal board. All that is needed besides this board is a parallel ASCII keyboard, monitor, and a power supply. It displays 80 columns by 25 lines of upper and lower case characters. Data is transferred by RS-232 at rates of 110 to 9600 baud. This board comes with software to emulate the Hazeltine 1500 terminal. It will insert and delete lines and X-Y cursor positioning. It uses a 6502 MPU and a 6545 CRT controller. The software and character generator are 2716 EPROMs. It has 4K of static RAM (6116s). The board size is 6.2 × 7.2 inches. All connections are made through a 20/40 pin connector with .1 inch spacing.

This Terminal can be used in lab experiments for the scientist and for industrial control, security systems, point of sale computer-cash register, and as a terminal for JBE computers.

The bare board comes with a crystal and the two EPROMs for the Hazeltine 1500 emulation.
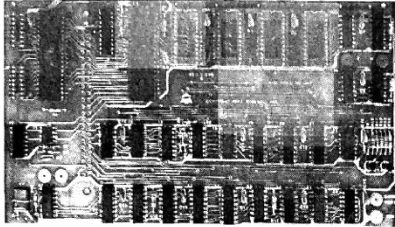
To order:
82-018A   Assembled and Tested   **$199.95**
82-018B   Bare Board with EPROMs and Xtal **$ 89.95**

OEM discounts available.

VIDEO + I/O

MINI VIDEO (40 × 24)

This board can be used to add a Video display to your AIM or other computer. It can also, with the addition of a parallel keyboard, 5 volt power supply, and video monitor, run Tom Pittman's Tiny Basic. The display is 40 columns by 24 lines.

This board uses a 6502 MPU and the video is done with TTL. It has one 6522 VIA for parallel I/O. The software and character generator are EPROM's.

To order:

82-140A	Assembled and tested w/o EPROMs	**$149.95**
82-140E	Tiny Basic EPROM set	**$ 59.90**
82-140G	General purpose display EPROM set	**$ 39.90**
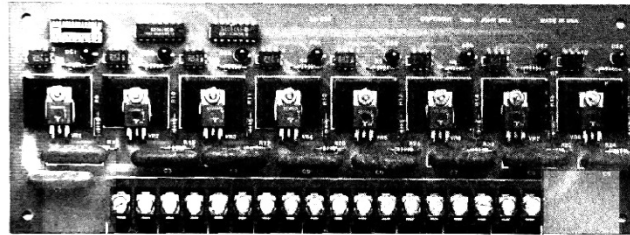
120 VAC CONTROL   This board has eight optically isolated triac switches. Each switch can control up to 200 watts. The voltage controlled can be 12 to 130 volts A.C. only. It connects via a 16 pin ribbon cable to a parallel output port. Screw terminals are provided for 120 vac connection.
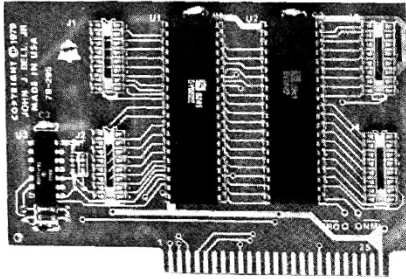
Order part number 82-332A   **$119.95.**
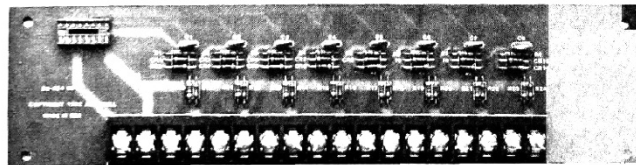
INPUT PROTECTOR   This board protects parallel or analog inputs. It connects to the port with a 16 pin ribbon cable and has screw terminals for external circuits.

Order part number 82-334A   **$89.95.**

7

PERIPHERALS FOR THE APPLE II—IIe


6522 PARALLEL INTERFACE

This board has two 6522 VIA's. It plugs into one of the APPLE slots. Sample programs for a real time clock and parallel printer interface are included. It interfaces with the 80-244 EPROM Programmer and the 82-332 120 VAC Controller and the 82-334 Input protector. Each of the 4 ports has 8 data lines, 2 handshake lines, and +5-Gnd.

This board uses four 16 pin ribbon cables for I/O.

To order:
79-295A   Assembled and tested **$69.95**
79-295B   Bare Board   **$29.95**
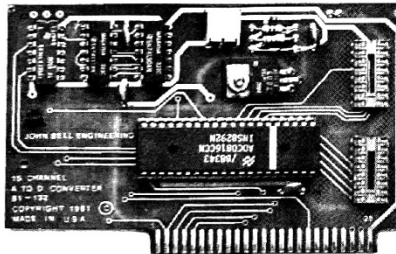
A-D CONVERTER

This board has 16 analog inputs that have a 0-5 volt range, 8 bit resolution, high impedance >20 meg. Conversion time is less than 100 μs per channel. Two 16 pin dip sockets are used for input. This board can be used to measure voltage, temp., or anything that can be converted to voltage.

This board plugs into a slot in the APPLE. Example programs included.
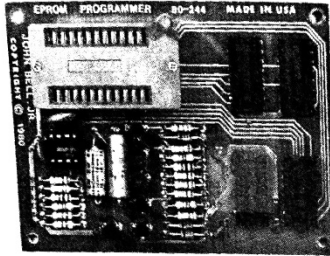
To order:
81-132A   Assembled and tested **$89.95**
81-132B   Bare Board   **$29.95**

8

PERIPHERALS FOR THE APPLE II—IIe

EPROM PROGRAMMER

This board is used with the 79-295 to allow the APPLE II to program 2716 and 2532 EPROMs. It connects to the 79-295 via 4 ribbon cables so the programmer is outside of the APPLE. This way you don't have to remove the cover to program EPROMs. Power is provided by the APPLE through the ribbon cables. You can read, write, and copy.

This board uses four 16 pin ribbon cables for interfacing to the 79-295.

To order:
80-244A   Assembled and tested   **$49.95** (with TEXTOOL socket)
80-244B   Bare Board   **$29.95**
4 cables   **$17.00**
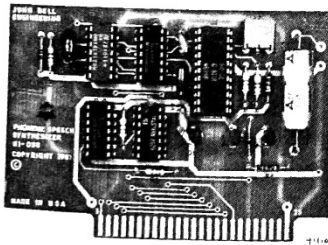
SPEECH SYNTHESIZER

This board uses the VOTRAX SC-01 phoneme synthesizer chip. A disk with text to speech program is included. This board connects to an 8 ohm speaker or to an amplifier. This board has unlimited vocabulary, just use PRINT statements in BASIC. He sounds like a robot.
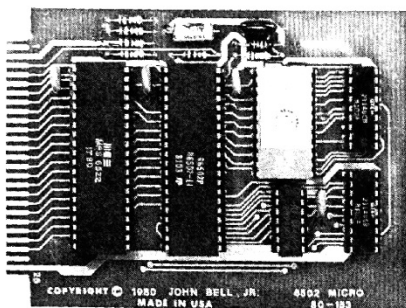
This board plugs into a slot in the APPLE. Example programs included.

To order:
81-088A   Assembled and tested with disk   **$89.95**
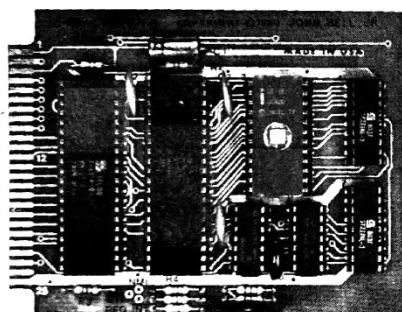
SINGLE BOARD
COMPUTERS—CONTROLLERS

6502 MICROCOMPUTER

This 3.3 × 4.2 inch board uses the 6502 MPU, 6522 VIA, 1K RAM, and 2716 or 2532 EPROM. It has an RC 1 MHz clock and power on reset. Power requirements 5 volts at 350 ma. This board was designed as a controller for industrial and lab applications. A 2716 EPROM with a monitor program is available. The monitor communicates serial RS-232.

| To order:	80-153A	Assembled and tested	$110.95
	80-153B	Bare board	$ 29.95
	80-153E	2716 EPROM Monitor	$ 19.95

Z-80 MICROCOMPUTER

This 3.3 × 4.2 inch board uses the Z-80 MPU, Z-80 PIO, 1K RAM, and 2716 or 2532 EPROM. It has an RC 2 MHz clock and power on reset. Power requirements 5 volts at 300 ma. This board was designed as a controller for industrial and lab applications. A 2716 EPROM with a monitor program is available. The monitor communicates serial RS-232.

| To order:	80-280A	Assembled and tested	$129.95
	80-280B	Bare board	$29.95
	80-280E	2716 EPROM Monitor	$19.95
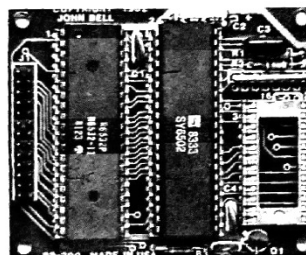
TCM MODULE

This 2.5 × 3 inch 6502 based computer-controller has two 8 bit I/O ports (6532), 128 bytes of RAM, and 2716 or 2532 EPROM. It has power on reset and a 1 MHz RC clock. This is the most cost effective and smallest computer-controller we sell. Call for OEM prices.

To order: 82-300A Assembled and tested **$59.95**

PERIPHERALS FOR THE IBM PC-XT AND IBM COMPATIBLES
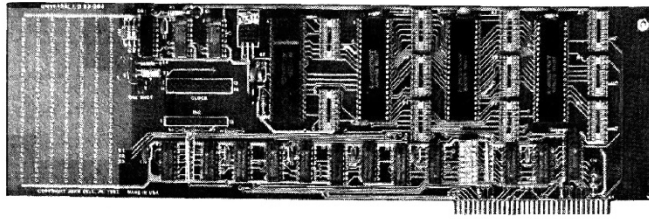
UNIVERSAL I/O

This board has three 8255 PIA's that make up the nine 8 bit parallel I/O ports. That's 72 I/O lines! This board also has 16 analog inputs. Each analog input has a 0–5 volt range, 8 bit resolution (256 steps), >20 Meg. input impedance. Conversion time is 200 μs per channel. This board also has interrupt-timer circuitry, prototyping area, and a LED to indicate power. A dip switch is used to select the I/O address. This board is designed for the scientist and engineer to be used in the lab or industrial control fucntions. The ports interface via 16 pin ribbon cables to the 82-332 120 VAC controller or the 82-334 Input protector. Sample programs are provided in the documentation.

To order:
83-064A   Assembled and tested   **$299.95**
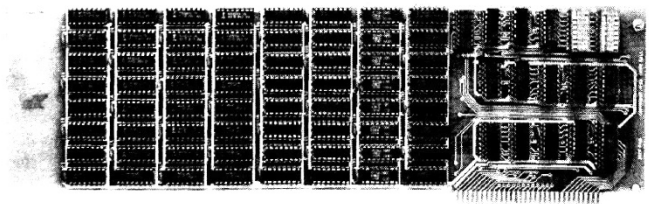
512 K MEMORY

This board can add up to 512 K of RAM to your computer to bring it up to 640 K. It uses 4164 or 8264 DRAMs.

To order:
83-244-512K	**$730.00**
83-244-384K	**$600.00**
83-244-320K	**$530.00**
83-244-64K	**$270.00**
83-244-0K	**$200.00**

Order Form

SHIPPING ADDRESS

Name		Name	
Address		Address	
City		City	
State	Zip	State	Zip
Phone		Phone	

PART #	ITEM DESCRIPTION	QTY.	PRICE EACH	AMOUNT
		SUB TOTAL		

MasterCard, Visa Welcome
COPY **FULL** ACCOUNT NO. FROM YOUR MASTERCARD OR VISA

MasterCard / VISA / MY CARD EXPIRES	SALES TAX	
	SHIPPING	
	TOTAL	

Signature of Cardholder

To order: Send check or money order. Add 6.5% tax in California. Add 5% shipping for orders less than $100 or 3% for orders over $100 or 10% outside U.S.A. Phone orders: We accept Visa or MC. Add $2.00 for C.O.D. Will Call Hours 9am to 4pm.

CALL FOR
OEM PRICES
415-592-8411

JOHN BELL

ENGINEERING, INC.

1014 Center Street
San Carlos, CA 94070
415-592-8411

TO: