STD Bus
CATALOG

C μ BIT DIVISION OF PROTEUS INDUSTRIES

TABLE OF CONTENTS

THE STD BUS

The STD Bus is a compact board format supported by over 100 manufacturers. A wide variety of industrial I/O and peripheral support permits tailoring a system to virtually any application. Analog to digital converters, opto-isolated I/O, stepper motor drivers, CRT controllers and communications boards are just a few examples of the expansion modules available.

STD Bus is, along with Multi-bus and VME Bus, one of the three most widely used busses. Each bus has areas of particular strength. The STD Bus is primarily an eight bit bus with a simple structure. Because of this, STD Bus boards are usually substantially less expensive than boards on other busses performing the same functions. A good general rule is: If it can be done at all on STD Bus, it can be done at lower cost.

STD Bus should also be considered where space is at a premium, due to its compact 4-1/2" X 6-1/2" format. The numerous industrially oriented I/O functions available on the bus make it a strong candidate for machine and process control applications.

Cubit boards will operate with any other boards meeting the STD Bus specification, except for those few which are processor dependent. Examples of processor dependent boards would be memory boards which require the Z80 refresh signal or are designed for an 8088 processor board with multiplexed address lines. Certain Cubit boards will also support particular processor dependent lines. Please call Cubit for applications assistance if it is not clear whether another manufacturer's board is compatible with a particular Cubit board.

The 80186 microprocessor is a member of the 8086 family. It features integration of many peripheral functions, and faster execution of 8086 code than an 8086 running at the same speed. While completely 8086 code compatible, it also offers 12 additional instructions.

Cubit's Model 8500 board is among the most powerful CPU's on STD Bus. Products described in this section support the 8500, but not the other CPU families in this catalog. The 8500 is also supported by peripheral controllers and I/O boards shown in the Expansion Boards section.

8500 CPU

The 80186 microprocessor is an advanced member of the 8086 family. Cubit brings the power of this chip to STD Bus.

Full 16-bit operation on board and an 8 MHz clock rate give exceptional processing capability. The STD Bus provides access to a wide selection of 8-bit STD Bus I/O.

The board may be populated with either 128K of DRAM (Model 8500-1) or 512K of DRAM (Model 8500-5). Two ROM sockets will accept up to 27512 EPROM's for a total of 128K bytes. An additional 128K of memory may be addressed through the STD Bus.

One RS-232 serial port and two 8-bit parallel ports are controlled by an 8256 chip.

An expansion connector in the Intel SBX format is included on the board.

Software development is supported by the Soft-Emulator firmware, which links the board to an IBM PC or RS-232 device and provides debugging functions.

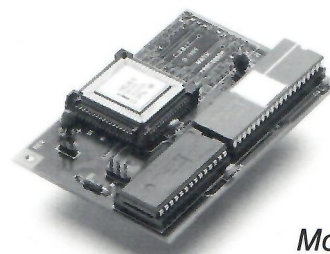*Model 8500*

8590 CO-PROCESSOR

An 8087 numeric co-processor may be added to the Model 8500 CPU board with a Model 8590 Co-Processor Board. This replaces the 80186 CPU chip on the 8500 board, and provides the 80186 and 8087 along with the required "glue" logic.

The 8087 performs arithmetic, logical and transcendental operations on 32-, 64-, and 80-bit floating point operands, 32- and 64-bit operands, 32- and 64-bit integers and 18-digit BCD operands to greatly enhance the speed of the 80186 microprocessor. Floating point operations are approximately 100 times faster than when run on the 80186. Accuracy is extended to 80 bits.
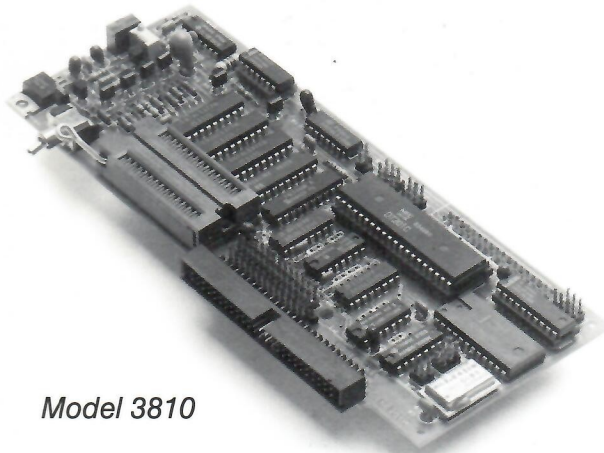
The Model 8590 should be ordered at the same time the 8500 CPU board is ordered.
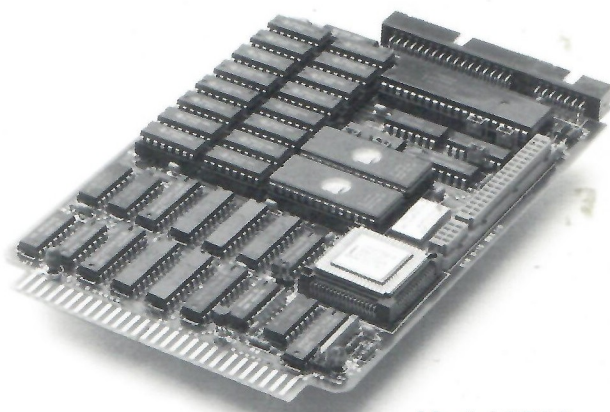
*Model 8590*

3810 EPROM PROGRAMMER/SERIAL EXPANDER

This hardware and software development tool for the Model 8500 CPU board attaches to the SBX connector. It may be used to burn an EPROM directly after code is exercised using the Soft-Emulator.

The EPROM programmer supports the following chip types: 2716, 2732, 2732A, 2764, 2764A, 27128, 27128A, 27256, 27256B and 27512.

Capabilities include RAM and ROM checksum calculation, verification for ROM against RAM, reading ROM into RAM and optionally splitting 16 bit data into even and odd byte ROM's.

The board includes two serial lines. One channel is RS-232 only, and the other operates as RS-232 or RS-422. SDLC and HDLC protocols are supported. Transmission rates are up to 38.4K bps. DMA capability is provided. Use of one serial channel to connect to a PC or terminal during development frees the serial channel on the CPU for use in the target applicaton.

Full compatibility with the Soft-Emulator on the Model 8500 eases development. Two other software routines are included to aid development. An EXE to HEX conversion program formats MS-DOS ".EXE" files for transmission to the Soft-Emulator or burning an EPROM. A sophisticated memory test routine supplements the basic memory test that is executed each time the Soft-Emulator is powered-up.
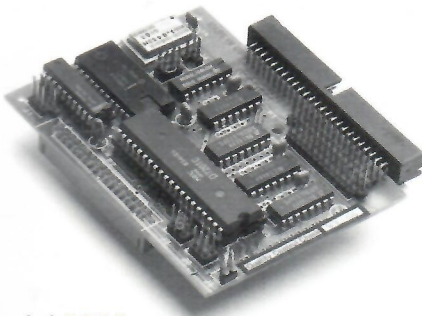
Model 3810

3820 SBX SERIAL I/O EXPANSION

Two serial channels are provided on this SBX module, which is a subset of the Model 3810 EPROM Programmer/Serial Expander module.

An 8274 supports two synchronous/asynchronous serial channels with bit or byte transfer capabilities. It is capable of handling HDLC/SDLC protocols and multi-drop mode. The flexible architecture allows easy implementation of many variations of these protocols.

Channel A of the board supports RS-232 and RS-422, full DMA and hardware handshake support. Baud rates up to 38.4K may be generated by timer 1 on the on-board 8254 timer/counter, or may be supplied externally.

Channel B supports RS-232 only. Baud rates up to 38.4K are generated by timer 2 on the 8254.

The 8254 provides a total of three cascadable 16-bit timer counters. It is jumper configurable to issue SBX interrupts.

The 3820 is compatible with boards of other manufacturers that meet SBX specifications.

Model 3820

3830 SBX INTERRUPT EXPANSION

Additional interrupt handling for the Model 8500 CPU is provided with two 8259A Programmable Interrupt Controllers on an SBX module. The 8259A's provide sixteen interrupts. They use both of the interrupts provided on the SBX connector.
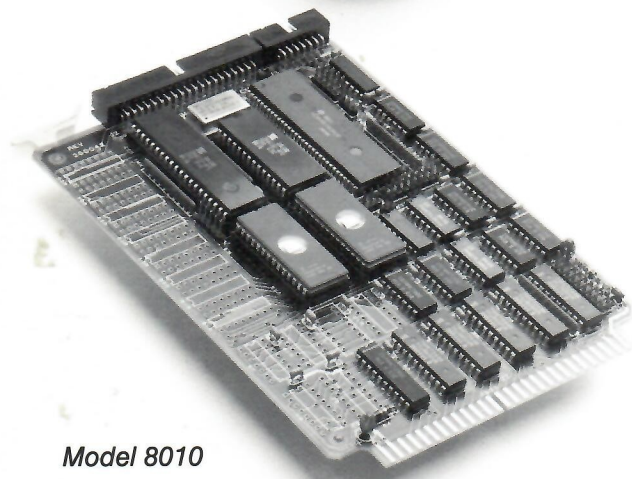
The 8259A permits priority modes to be set and dynamically changed under software control.

Connections to interrupt sources are made via header connector.

64180
ON STD BUS
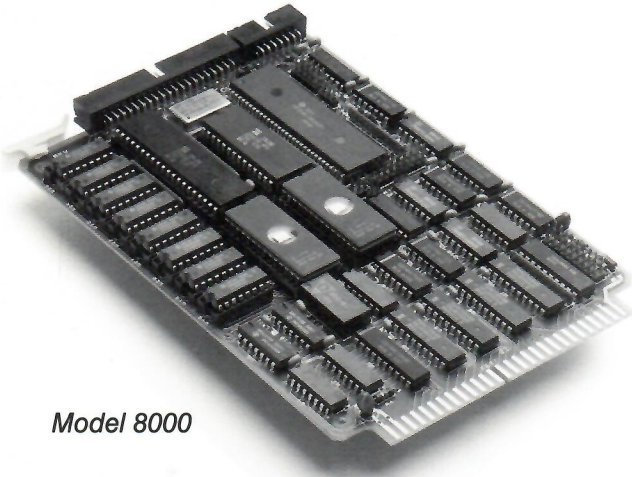
The 64180 is Hitachi's Z80 upgrade. It features CMOS technology, high integration, added instructions, and very fast execution of Z80 code.

Cubit offers two CPU boards based on this chip. One is implemented entirely in CMOS, while the other uses NMOS DRAM's to take full advantage of the 512K memory space.

Both boards are compatible with all of the peripheral controller and I/O expansion boards described in the Expansion Boards section of this catalog.

8000 AND 8010 CPU'S

These CPU's are based on the Hitachi HD64180 running at 6 MHz. The Model 8000 includes 256K of DRAM. The Model 8010 is an all CMOS implementation with 8K of static RAM.

The 64180 is Z80 code compatible, with faster execution than the Z80 at identical clock speeds. It includes a memory management unit which supports 512 Kbytes of memory space.

The board includes two full duplex asynchronous serial lines (RS-232) with programmable baud rate generators, and one high speed synchronous clocked half duplex serial I/O channel.

Other features include two 16 bit, and four 8 bit cascadable counter timers, two DMA channels, and two 8 bit parallel ports with handshaking.

Firmware links to a PC or RS-232 device for software development and debugging.

The Model 8000 includes 256 Kbytes of DRAM (NMOS). Two EPROM sockets accept up to 27512's.

The Model 8010 has two 28 pin JEDEC sockets for up to 27C256 EPROM's or 8K X 8 CMOS static RAM's. 8K of RAM is provided.

The board meets full processor-independent STD Bus specifications and Z80-STD Bus standards. Z80 Mode 2 interrupts are supported

Model 8000

Model 8010

Cubit offers the broadest line of 6502 based products available on STD Bus. These provide solutions to many industrial, instrument and process control problems at a modest cost. Extensive language support, and "human interface" peripherals and controllers simplify system development. Systems may be expanded using any of the boards in the "Expansion Boards" section of this brochure.

Further information on the 6502 line is available in a separate brochure. Manuals may also be requested for specific products.

7510 AND 7520 CPU'S

The Model 7510 CPU is based on the 6502 microprocessor running at 2 MHz. The 7520 is an all-CMOS implementation of the 7510. Both boards include complete processor, memory and I/O functions.

72 lines of parallel I/O are featured on these boards. Two 6522 VIA's, one 6520 PIA (6521 on the 7520) and one 6532 RIOT provide versatile and programmable I/O through header connectors on the edge of the board.

Seven memory sockets each accept 8K X 8 static RAM or EPROM, or smaller 2732 or 2532 EPROM's, or 2K X 8 static RAM's. This allows installation of up to 56K of memory in a flexible configuration.
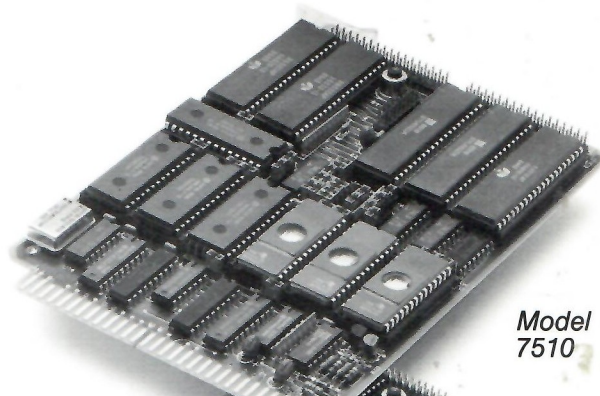
Four layer construction is used to give high quality power and ground planes in the PC board.

The CPU boards are compatible with the DOS/65 + BASIC or FORTH software described in this brochure, or with Rockwell/Dynatem AIM-65 software.

7530 AND 7540 CPU'S

The Model 7530 CPU board is based on the 6502 microprocessor running at 2 MHz. It is identical to the Model 7510, except that one 6522 VIA (two parallel ports) is replaced with one 6551 UART which supports one RS-232 line. The Model 7540 is an all-CMOS implementation of the 7530.

56 lines of parallel I/O and one serial line make these boards unusually rich in I/O. One 6522 VIA, one 6520 PIA (6521 on the 7520) and one 6532 RIOT provide versatile and programmable parallel ports through header connectors on the edge of the board. The serial line is implemented with a 6551 UART and 1488/1489 type line drivers. The 7540 is optionally available with a 5 volt serial output for full CMOS operation (Model 7540-1).

6502 ON STD BUS
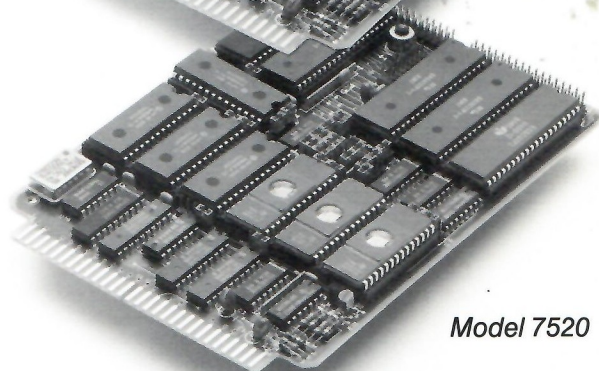
Model 7510

Model 7520
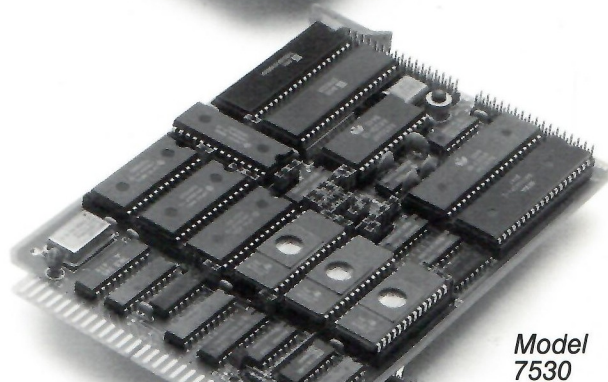
Model 7530

Model 7540

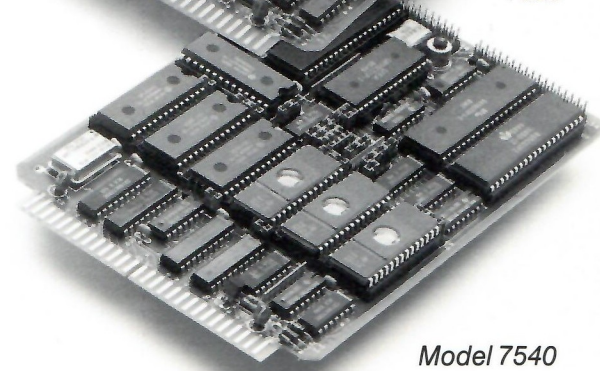Seven memory sockets each accept 8K X 8 static RAM or EPROM, or smaller 2732 or 2532 EPROM's, or 2K X 8 static RAM's. This allows installation of up to 56K of memory in a flexible configuration.

The CPU boards are compatible with the DOS/65 + BASIC or FORTH software described in this brochure, or with Rockwell/Dynatem AIM-65 software.

7550 HIGH INTEGRATION CPU

One STD Bus board contains a 6502 CPU, 48K of RAM, 6K of ROM, 2 serial lines, a color graphics CRT controller, and a floppy disk controller!

Six RAM sockets accept 8K X 8 byte wide static RAM chips. One 2764 EPROM is available for firmware (however 2K of the address space for this 8K chip is disabled for system use.)

A T.I. 9118 40 column CRT controller includes color graphics capability. Features of this advanced chip include a text mode which provides 24 lines of 40 characters each in two colors, and graphics capability or 256 X 192 pixels with 15 colors. The composite video output meets NTSC standards. A separate refresh memory is provided.

Control for a 5-1/4" floppy disk is provided by a Western Digital 2793 controller chip.

Two RS-232 lines are controlled with a Signetics 2681 Dual UART.

The board uses the DOS-65 + BASIC-E/65 software described below.

7020 FLOPPY DISK CONTROLLER

Up to four 5-1/4" floppy disks are interfaced to a 7510, 7520, 7530 or 7540 CPU board using the Model 7020 CRT controller. The hardware is also compatible with other STD Bus CPU boards, from Cubit or other manufacturers, but no operating system is supplied for CPU boards other than those listed.

The DOS/65 operating system, described below, with BASIC-E/65 and a 6502 assembler are included with the Model 7020. Used with a Model 7040 CRT Controller, a terminal, or 65XX series peripherals, a software development system may be constructed.

Disk control is provided by a Western Digital 2793 intelligent controller chip. This permits the board to be adapted to work with disk sizes and formats other than those supported by DOS/65. (OEM's needing to do this should contact the factory for applications assistance.)
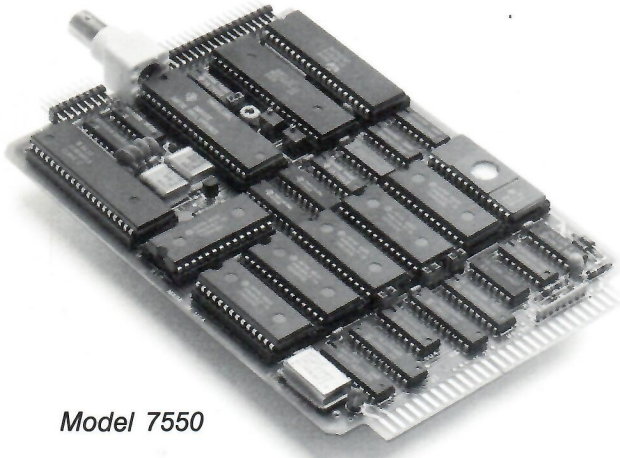
Model 7550
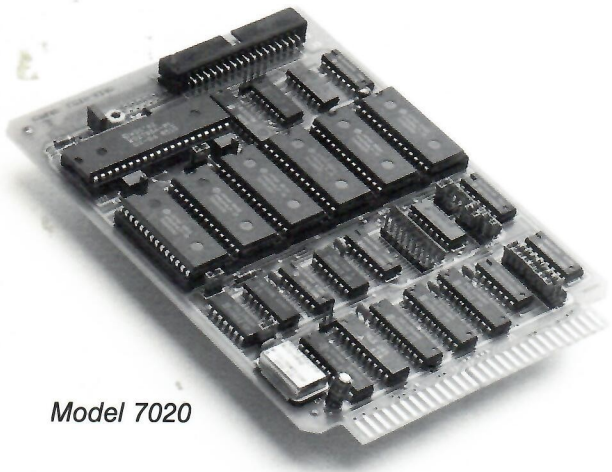
Model 7020

Six sockets for 8K by 8 static RAM's are provided on the board. This overlaps the address space on the 75XX series CPU boards, and is for special purpose applications.

65XX SERIES PERIPHERALS

A series of low cost peripherals assists OEM and other customers meet cost and packaging restrictions. Three different keyboards, a 20 character display and a 20 character thermal printer are included in the line. The display may be combined with the two flat keyboards to form a convenient package. All of these peripherals are supplied with flat cable to connect to the parallel I/O connectors on 7510, 7520, 7530, or 7540 CPU boards.

Three keyboards are available for the 6502 based CPU boards. The **Model 6550 Instrumentation Keyboard** is a flat, panel-mounted unit. It includes 23 keys (16 Hex keys, F1, F2, F3, Space, ".", Return and Delete), and a rectangular window for optional mounting of the Model 6520 Display. Dome technology is used to give the effect of a membrane keyboard with tactile response. The combination keyboard and display **(Model 6551)** is a particularly compact and cost-efficient terminal. The **Model 6553 Keyboard** is a full 54 key version of the 6550. When mounted with the Model 6520 Display, it forms the **Model 6554 Keyboard/Display**.
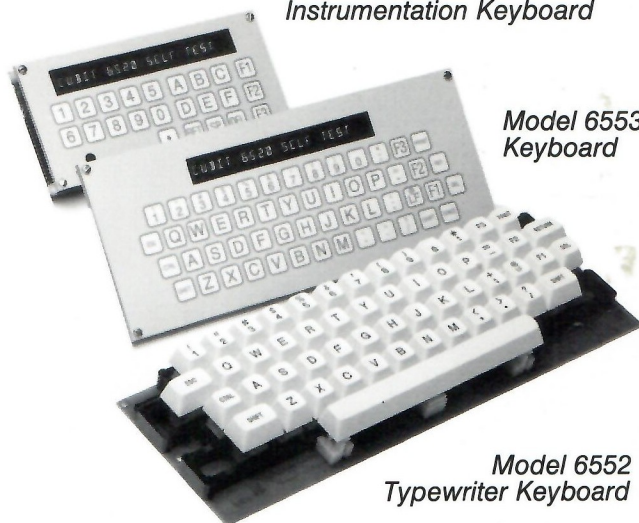
The **Model 6552 Typewriter Keyboard** is an inexpensive 54 key unit for use in applications that require extensive typing, or where a panel mounted keyboard is not suitable. The 12" by 4" unit has full action keys in a conventional keyboard layout.

All of these keyboards use a matrix scan technique, and will not connect to the ASCII encoded keyboard port on the Model 7040 CRT Controller.

The **Model 6520 Display** features a single row of twenty 14-segment vacuum fluorescent characters. An on-board microprocessor refreshes the display and interfaces to the CPU. The display may be panel mounted by itself or in combination with the Model 6550 or 6533 keyboards.

The **Model 6521 Printer** is a 20 character, 120 LPM thermal printer. The mechanism has a lifetime of 1,000,000 lines, or about three miles of print. A 24 volt unregulated power supply is required for the printer.
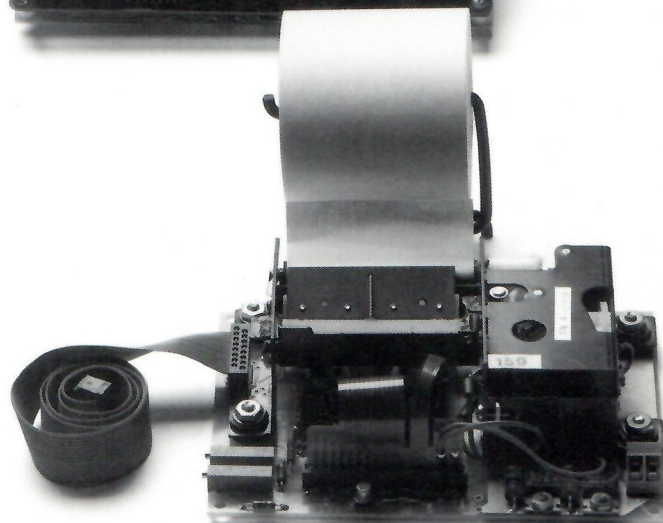
Model 6550
Instrumentation Keyboard
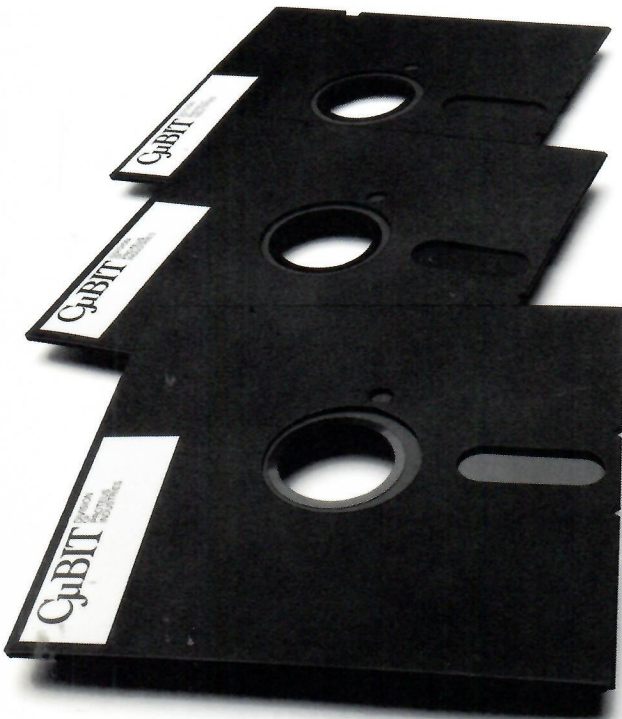
Model 6553
Keyboard

Model 6552
Typewriter Keyboard

Model 6520
Display

Model 6521
Printer

6502 SOFTWARE

Three software packages may be used with the 75XX series CPU boards. (DOS/65 is included with the Model 7550 High Integration CPU. This CPU is not compatible with the other two software packages.)

DOS/65

DOS/65 is a powerful CP/M*-like operating system, which includes BASIC-E/65 and a 6502 Assembler. A line editor and debug functions are also included. Files may be exchanged with CP/M* systems. User commands may be defined and added to the system.

BASIC-E/65 is a full feature BASIC which is included with DOS/65. It compiles to P-Code for faster execution than purely interpreted BASIC. Sequential and random access files are supported, as well as full string, arithmetic and trig functions.

*CP/M is a registered trademark of Digital Research Corp.

FORTH

FORTH is an increasingly popular language for control applications. It offers the advantages of compact code, efficient execution and flexibility that are associated with Assembler, while giving the programming convenience of higher level languages.

Cubit's FORTH implementation runs on the Models 7510, 7520, 7530 and 7540 CPU boards. Development is disk based, and requires a 7020 Floppy Disk Controller and a 7040 CRT Controller. The code is ROMable, so the final system may be either disk or ROM based.

Cubit's implementation, real-FORTH, is an extension of fig-FORTH. The manual includes a detailed discussion of the relation between the two. A screen editor and diagnostic capabilities are included.

AIM-COMPATIBLE SOFTWARE

Rockwell/Dynatem AIM-65 software may be usd on the Model 7510 and 7520 CPU boards without modification. It will run on the 7530 and 7540 CPU boards so long as the replacement of one 6522 parallel I/O chip with a 6551 UART is kept in mind. The **Model 6590 Monitor ROM** provides the AIM operating system. BASIC, Rockwell FORTH and 6502 Assembler are available from Dynatem.

Boards described in this section extend the I/O capabilities of any Cubit CPU board, as well as CPU boards made by other STD Bus manufacturers. Extended addressing for the 8088 is supported only where specifically noted.

7040 CRT AND I/O CONTROLLER

Cubit's CRT Controller uses an on-board microprocessor to off-load peripheral control from your system CPU. Additional parallel I/O allows you to drive a printer and keyboard from this controller. By accepting blocks of data from the host CPU, and handling all formatting and refresh tasks on-board, this card frees your host CPU to race ahead of slower peripherals.

The controller includes a dedicated microprocessor which is invisible to the user. It supports up to 32K bytes EPROM and 8K bytes static RAM.

An Intel 8275 controller chip provides CRT control. Screen sizes of 18 rows by 40 characters or 24 rows by 80 characters are selectable in software. Character blink, reverse, underline and dual intensity are supported by this monochrome controller. Composite or non-composite video out is selected with a jumper clip.
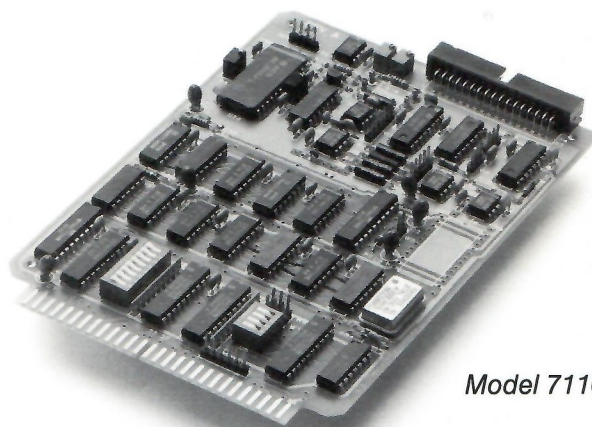
Standard peripheral control firmware is executed by the on-board processor to drive a CRT, a printer with a Centronics interface, and a strobed ASCII encoded keyboard. The host processor communicates with the 7040 using terminal-like commands.

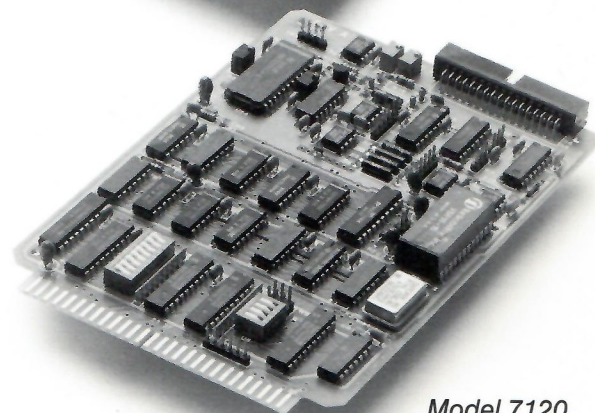The board is I/O mapped, and supports extended addressing for the 8088.
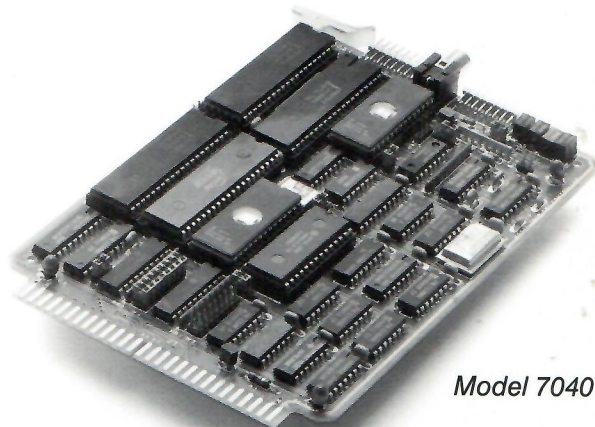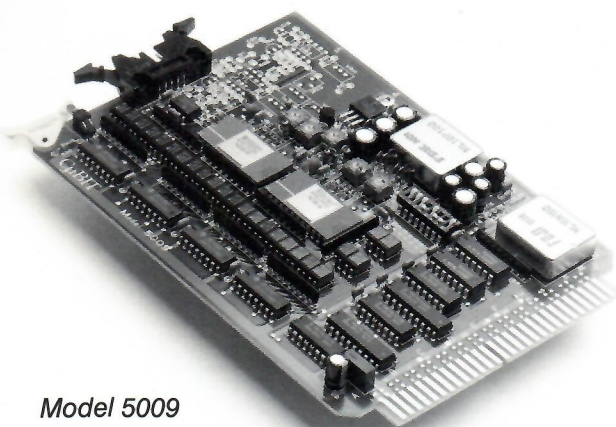
Model 7040

7110 AND 7120 A/D CONVERTERS

CMOS technology brings low power consumption and high noise immunity to A/D converters. Cubit's Model 7110 and 7120 Analog to Digital Converter boards put CMOS to work on STD Bus.

The boards are based on the National Semiconductor ADC 1205 successive approximation converter chip. This chip has 13 bit resolution, consisting of twelve data bits plus a sign bit.

Conversion time is 108 microseconds. Sample and hold capability freezes signals during conversion.

Model 7110

Two versions of the board are available. The **Model 7120** includes an on-board DC to DC converter which permits 5 volt only operation. The Model **7110** omits this feature, and requires +/- 12 volts as well as the 5 volt input. The two models are identical in all other respects.

The converter may be used with the 16 inputs configured as single ended channels, or they may be paired to give eight differential inputs. The input voltage range is from +5 volts to -5 volts. Optionally, two channels may be used for 4 to 20 mA or 10 to 50 mA inputs.

Model 7120
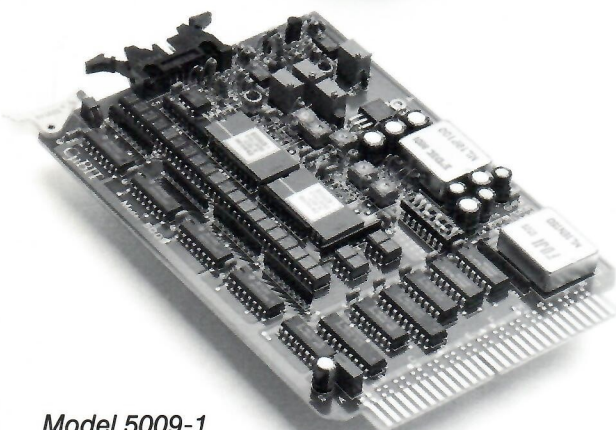
Model 5009

Model 5009-1

Model 7060

Gain may be selected either by hardware or software. For hardware selection, use of an appropriate resistor will select any gain between 1 and 100. Alternatively, software programmable gains of 1, 1.25, 2, 5, 10, 20, 50 or 100 may be used.
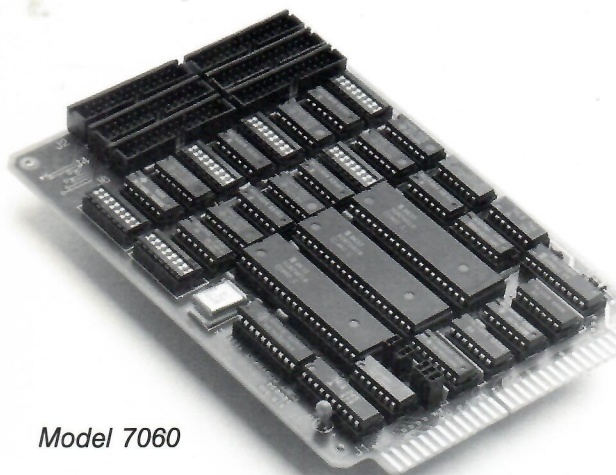
The converter is compatible with both NMOS and CMOS system CPU's.

5009 AND 5009-1 D/A CONVERTERS

Digital to analog converters allow computer systems to control real world processes that require analog inputs.

Two high speed digital to analog conversion channels provide either voltage or current output. The **Model 5009** provides outputs of +/-2.5 V, +/-5 V, +/-10 V, 0 to 5 V, or 0 to 10 V. The **Model 5009-1** gives current outputs of 0 to 20 mA or 4 to 20 mA.

Burr Brown DAC800 converters give maximum conversion times of 5 microseconds with 12 bit resolution.

A single five volt supply (1.1 Amps) is needed for the board. The power for the analog output is isolated from the digital portion of the board by an on-board DC to DC converter.

Temperature drift is 0.01% / degree C (0.02% for the 5009-1 with current output).

7060 SERIAL I/O EXPANDER

Up to six serial channels are provided by the 7060 series Serial I/O Expander. Four channels are RS-232, while two may be specified as RS-422 or RS-232 when ordering.

Serial lines are controlled by 2681 Dual UART's. Each channel may be specified to be a data terminal or data set, and the baud rate can be set independently for each channel up to 38.4K.

The board generates up to ten separate interrupt vectors for serial transmit and receive. Also, three 16 bit timer/counters may be usd to generate interrupts.

The board is I/O mapped, and occupies 16 bytes for every two channels.

The following configurations are available:

| Model	No. RS-232 Channels	No. RS-422 Channels
7060-1	6	0
7060-2	4	2
7060-3	2	0
7060-4	0	2

5011 OPTO-ISOLATED PARALLEL INPUT

24 channels of optically isolated parallel input interface noisy signals to the STD Bus. The board is especially useful in industrial environment where voltage spikes are anticipated. Switches, relays, triacs and similar devices may be sensed to determine system status or complete a feedback loop.

An 8255 Programmable Parallel Interface chip individually controls each of the channels. Toshiba TLP-521, or equal, photo-couplers provide isolation. An external twelve volt power supply is needed to drive the photo-couplers.

Input data speeds up to 5 kHz can be sensed. Although not normally needed, since the photo-coupler absorbs most noise, provision is made on the board for user installed RC circuits to supply special filtering of the inputs.

The board is I/O mapped on the STD Bus, with a DIP switch selectable address.
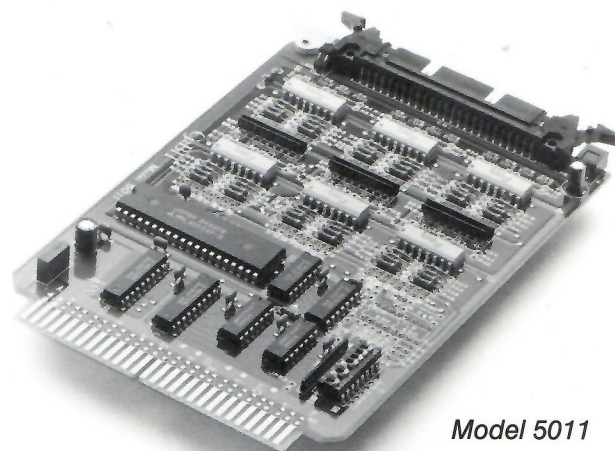
Model 5011

## 5036 OPTO-ISOLATED PARALLEL OUTPUT

24 channels of electrically isolated output permit control of real-world processes from STD Bus.

Three eight-bit ports are isolated using Toshiba TLP-521 or equal photo-isolators. These buffer the STD Bus system from external power spikes or other noise. Each line may be individually controlled.

Output power is supplied by an external power supply, up to a maximum of +12 volts at 10 mA. The output may be switched at rates up to 5 kHz.

The board is I/O mapped on the STD Bus, with a DIP switch selectable address.

To avoid unstable output conditions while powering up, the output channels are disabled prior to initialization. Eight of the channels may be jumpered to come up high rather than low.
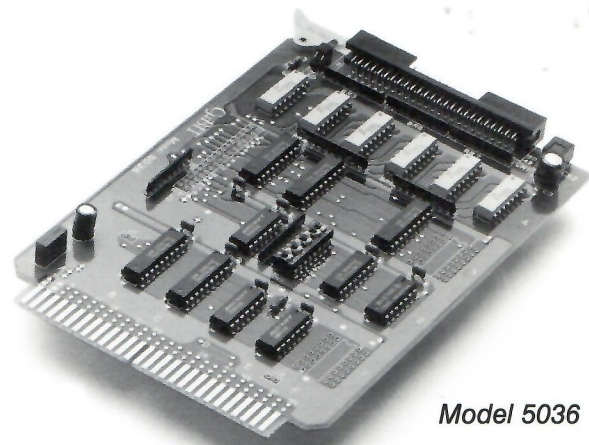
Model 5036

5010 RELAY OUTPUT BOARD

24 relay channels are supplied on this board. Each channel can switch up to 36 VDC at 0.4 Amps or 24 VAC at 0.2 Amps, with a resistive load in each case.

The relays are Matsushita G2019 or equal SPDT mechanical relays. Relays are normally open on delivery. Normally closed operation requires installation of a jumper soldered into holes provided on the board.

The board is I/O mapped, with DIP switch selectable addresses.
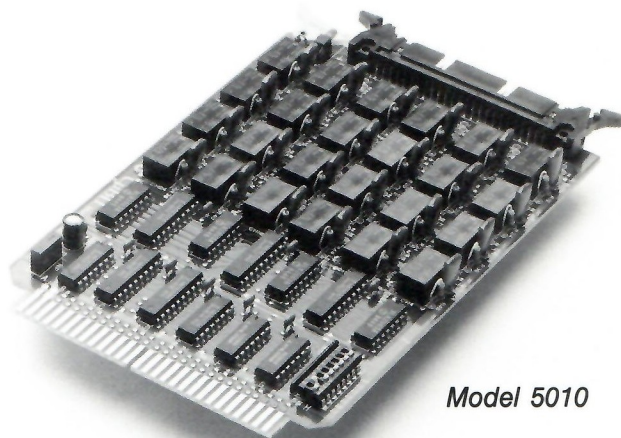
Model 5010
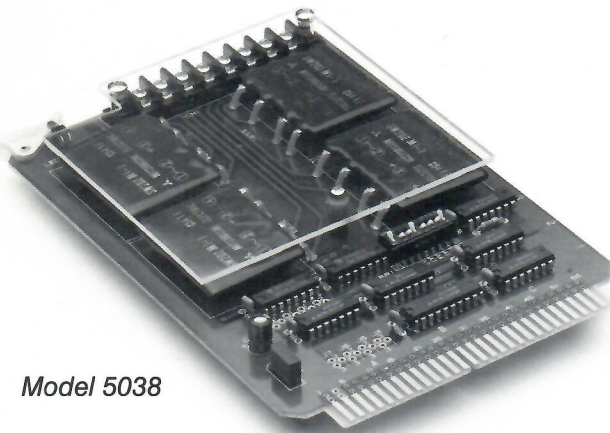
Model 5038

5038 SOLID STATE RELAY BOARD

AC Voltages from 80 to 120 volts and up to 0.5 Amp may be switched with this solid state relay board. The recommended frequency is 40 Hz to 70 Hz. Load factors (resistive component of load) of 5% to 100% are acceptable. Low noise is ensured by a zero cross system for switching when an alternating current crosses zero.
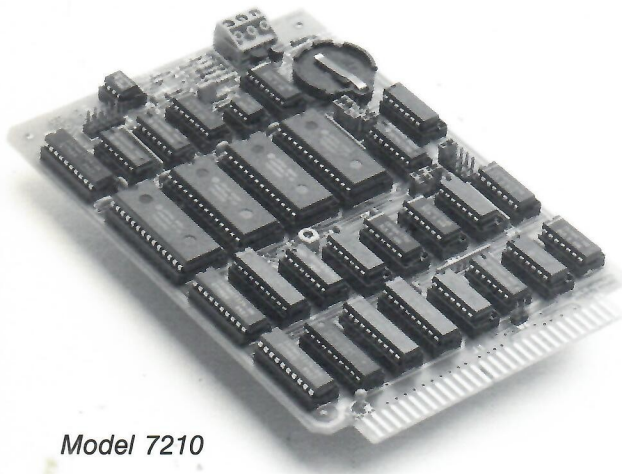
Four relay channels are independently controlled. Each relay can be independently set to be open or closed when resetting.

Maximum response time is 2 msec. Leakage current is 4 mA or less when the relay is off. The voltage drop when on is a maximum of 2.0 volts.

Full front and back safety shields are included.

Model 7210

7210 CMOS RAM AND CLOCK/CALENDAR WITH POWER-FAIL DETECT

This board is socketed for up to four 2K or 8K byte wide CMOS RAM chips. Thus, a maximum of 32K bytes can be installed on the board. The beginning address can be set on any 2K boundary within the address space. MEMEX and 8088 extended address space are supported.

A clock/calendar chip is included with 12 or 24 hour formats. Leap years are allowed for. A vectored interrupt, which can be disabled in software, is generated each second. The clock/calendar can be located at any of 16 locations relative to the base I/O address.

Power fail detection circuitry with write protection is included on the board. The board also allows the user to monitor the AC power line for an advanced warning of power failure. In this case, a non-maskable interrupt is generated to warn the system CPU of the impending power failure.

The board is implemented entirely in CMOS, and includes a lithium battery for backup. The on-board battery has a four month life. A connection for an off-board battery is provided.

The board is processor independent. It meets all 8-bit STD Bus specifications including the 8088 specifications, and works with all Cubit CPU boards.

The 7900 is an 8 position STD Bus backplane with ¾" spacing between slots for cooling and cabling. (Some Cubit STD Bus boards require at least ⅝" spacing.) Faraday shield lines are provided between signal lines, and additional shielding is provided on the back. Decoupling capacitors and terminal connections for power and ground are included. The board is 4.35" by 7" with 3" high card guides.
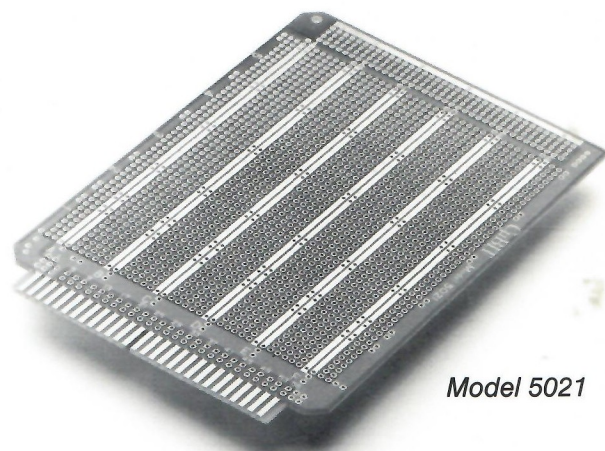
Model 7900
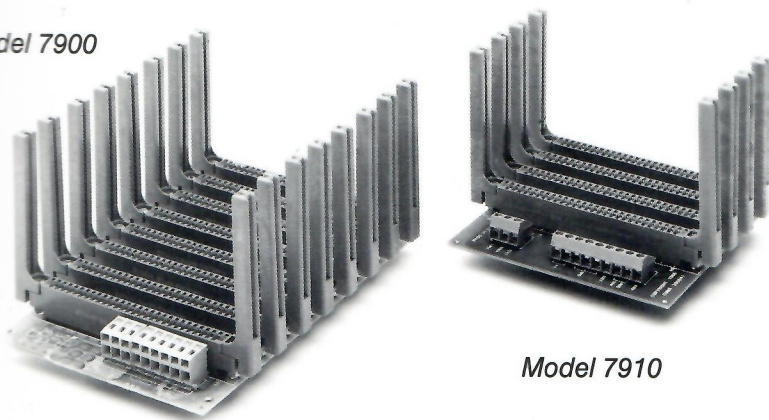
Model 7910

BACKPLANES AND ACCESSORIES

Model 5021

5021 DIGITAL PROTOTYPING BOARD

Custom circuits may be designed and tested using the 5021 Digital Prototyping Board. The board has a capacity for up to 30 16 pin DIP's. It also accommodates 4 pin, 8 pin, 14 pin, 16 pin, 18 pin, 22 pin, 24 pin, 28 pin, and 64 pin DIP'S. Mounting holes are provided for flat cable or header connectors on 0.1" centers and up to 60 pins.

5022 ANALOG PROTOTYPING BOARD

Analog and digital circuitry may be combined on the 5022 Analog Prototyping Board. A 36 by 40 grid of holes on 0.1" centers comprises most of the board. Locations for up to six 20 pin IC's allow bus buffering. Mounting holes are provided for flat cable or header connectors on 0.1" centers and up to 60 pins.
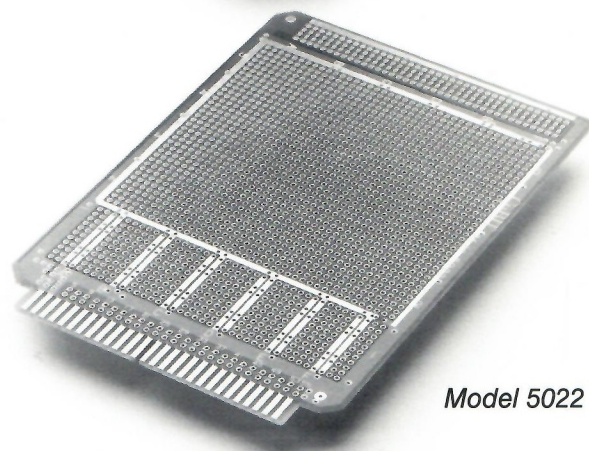
Model 5022

5023 EXTENDER BOARD

Extender boards permit the user to place an STD Bus board outside the card rack for convenient hardware or software troubleshooting.

The 5023 Extender Board includes 3" high card guides to support the board being extended.

Model 5023

TESTING AND WARRANTY

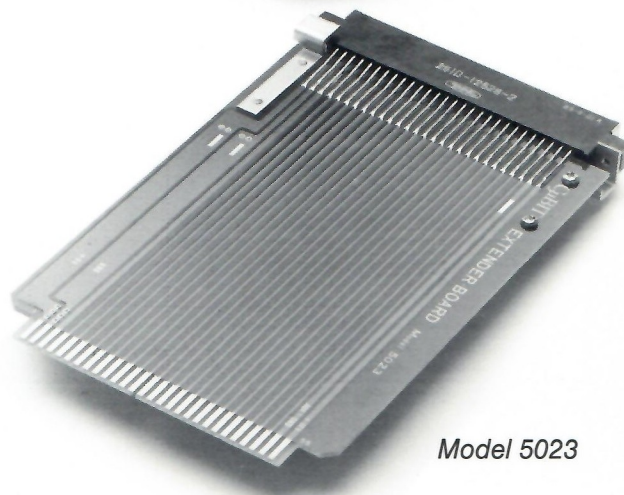Cubit boards are fully burned-in and tested. All edge and header connectors are gold plated.

The Cubit Div., Proteus Industries (Cubit) warrants its products to be free from defects in materials and workmanship for a period of **two** years from the date of shipment. Cubit's obligation is limited to repair or replacement, at Cubit's option, and is contingent on notification of the defect within 60 days after discovery. Equipment or parts which have been subject to abuse, misuse, accident, alteration or neglect are not covered by this warranty.

Cubit makes every effort to provide software and firmware products free from error. If a software or firmware product fails to operate as specified in Cubit's data sheets or user's manuals, and this failure is reported to Cubit during the two year warranty period, Cubit has 90 days to attempt to fix the error. If Cubit is unable to meet published specifications after 90 days, the customer may, at the customer's option, retain the product as is, or return the product within 30 days for full credit on software and any associated hardware in "like new" condition. Cubit shall not, in either case, have any further obligation.

This warranty is exclusive, and in lieu of all other expressed or implied warranties, including fitness for a particular purpose, except as made in writing by Cubit. Cubit shall not be liable for any defects attributable to the acts or omissions of others after shipment, nor for any consequential, incidental or contingent damages whatsoever.

CµBIT DIVISION
OF
PROTEUS
INDUSTRIES

190 S. Whisman Road   Mountain View, CA 94041-1577   415-962-8237   Telex - 797377 PROTEUS USA

STD BUS PRICE LIST

Prices Effective 5/86

MODEL	DESCRIPTION	1-9 UNIT PRICE
80186 on STD Bus		
8500-1	80186 based CPU - 128K DRAM and Soft-Emulator	550.00
8500-5	80186 based CPU - 512K DRAM and Soft-Emulator	640.00
8590	8087 Co-Processor Expansion for 8500 CPU Includes 8087-1 installed.	450.00
3810	EPROM Programmer/Serial Expander for 8500 CPU	339.00
3820	SBX Serial I/O Expansion	235.00
3830	SBX Interrupt Expansion (for 8500 CPU only)	115.00
64180 on STD Bus		
8000	64180 based CPU with 256K DRAM	435.00
8010	64180 based CPU - all CMOS version with 8K RAM	360.00
6502 on STD Bus		
7510	6502 CPU - NMOS - Memory chips not installed	230.00
7520	6502 CPU - CMOS - Memory chips not installed	275.00
7530	6502 CPU - NMOS - RS-232 - Memory not installed	240.00
7540	6502 CPU - CMOS - RS-232 - Memory not installed	285.00
7540-1	6502 CPU - same as 7540 but with 5 volt serial	285.00
7550	High Integration CPU with DOS/65 for serial line to terminal. Memory not installed.	435.00
7590	RAM - 8K X 8 CMOS Static RAM - 120 nsec	6.00
7591	EPROM - 2764 (NMOS) - 250 nsec	5.00
7592	EPROM - 27C64 (CMOS) - 250 nsec	7.00
7020-1	Floppy Disk Controller with DOS/65 and BASIC. DOS/65 boots to 7040 CRT Controller. No memory.	335.00
7020-2	Same as 7020-1, but boots to 65XX peripherals	335.00
7020-3	Same as 7020-1, boots to serial line on 7530/40	335.00
7021	User's Manual for DOS/65 and BASIC-E/65 (Hardware manuals are included in board prices)	25.00
7026	Cable - two disk drives to 7020 or 7550	25.00
6520	Display - 20 characters, vacuum fluorescent	130.00
6521	Printer	115.00
6550	Keyboard - Flat, 23 key instrumentation	45.00
6551	Keyboard/Display - combines 6520 and 6550	175.00
6552	Keyboard - Typewriter style	60.00
6553	Keyboard - Flat, 54 key instrumentation	60.00
6554	Keyboard/Display - combines 6520 and 6553	190.00
6590	AIM Monitor ROM set (operating system)	60.00
6591	Rockwell Manual Set for 6590 Monitor	30.00
6595	real-FORTH - license for use on one system Includes one copy of manual.	60.00
6596	real-FORTH - OEM license - allows making unlimited copies for use only with Cubit boards. Includes three copies of manual.	500.00
6597	real-FORTH user's manual	20.00
Expansion Boards		
7040-A	CRT and I/O Controller - 18 X 40 screen	345.00
7040-B	CRT and I/O Controller - 24 X 80 screen	345.00
7110	A/D Converter	385.00
7120	A/D Converter - on board DC/DC converter	440.00
5009	D/A Converter - voltage output	545.00
5009-1	D/A Converter - current output	595.00
7060-1	Serial I/O Expander - 6 RS-232	340.00
7060-2	Serial I/O Expander - 4 RS-232 & 2 RS-422	360.00
7060-3	Serial I/O Expander - 2 RS-232	250.00
7060-4	Serial I/O Expander - 2 RS-422	280.00
5011	Opto-Isolated Parallel Input	205.00
5036	Opto-Isolated Parallel Output	250.00
5010	Relay Output	265.00
5038	Solid State Relay Output	215.00
7210	CMOS RAM & Clock/Calendar with Power-Fail Detect Includes 32K CMOS RAM installed	225.00

Backplanes and Accessories

7900	Backplane - 8 position	130.00
7910	Backplane - 4 position	90.00
5021	Digital Prototyping Board	35.00
5022	Analog Prototyping Board	35.00
5023	Extender Board	65.00

DISCOUNT SCHEDULE

Discounts will be given on quantity purchases of any product. Products can *not* be mixed to obtain discounts. Shipment may be scheduled up to one year.

1- 9 units:	Net Price
10-24 units:	Less 5%
25-99 units:	Less 10%
100-249 units:	Less 15%
250+ units:	Contact factory.

EXPORT PRICES

Prices for orders which are shipped or billed outside of the U.S. or Canada will be increased by 5%.

SHIPPING

All shipments are FOB Mountain View, California

PAYMENT

UPS charges will be prepaid and billed. Air freight shipments will have charges billed directly to the customer. Payments should be made in US dollars.

Payment terms are Net 30 days on credit approval.