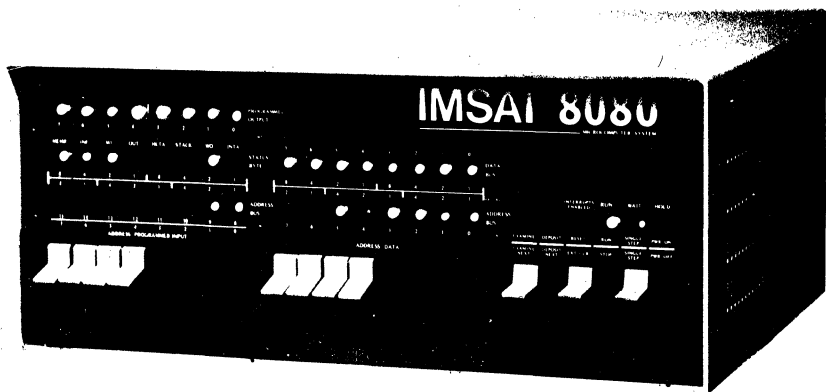


IMS Associates, Inc.

CATALOG

IMSAI[®] 8080 SYSTEM

FEBRUARY 1976



THE COMPLETE MICROPROCESSOR SYSTEM

POWERFUL

MODULAR

VERSATILE

LOW COST

EASY TO USE

NAME & NUMBER	SLOT REQUIREMENT	DESCRIPTION
I-8080 Microcomputer		The IMSAI 8080 was designed around the Intel 8080A and will serve either as a small general purpose computing machine, or a dedicated processor. The capabilities of the 8080A and other LSI chips incorporated, result in a truly powerful system. The basic IMSAI 8080 system comes with an MPU board (MPU-A), front panel control board (CP-A), a power supply (PS-20), expander board (EXP-6), with space for 6 card slots, two 100 pin edge connectors and 4 card edge guides (2 EXPM-1), and a cabinet with room for up to 22 card slots (see EXP-22 below). The front panel uses LED's and photographic masks and labels; switches are provided with wide paddle handles for easy error-free operation.
I-8080 RM		Rack Mount Version of I-8080 above, with special mounting hardware. Unit is configured with a special dust cover designed to control air flow cooling (in lieu of the standard top cover).
I-8080 1K		Same as I-8080 above, but with 1K of RAM on a 4K board (RAM 4-1).
I-8080 RM-1K		Same as I-8080 RM above, but with 1K of RAM on a 4 K board. (RAM 4-1)
I-8080 OEM		This is a special unit configured for the OEM customer. It comes with everything noted in I-8080 above, less the front panel. Since the IMSAI 8080 can run without a front panel board, and since many "dedicated" applications do not require the availability of a front panel, OEM customers may reduce their equipment costs substantially by ordering this special version.
I-8080 OEM RM		Same as I-8080 OEM but with Rack Mount. Unit is configured with a special dust cover designed to control air flow cooling (in lieu of the standard top cover).
MPU-A Microprocessor Board	1	The microprocessor card uses INTEL's 8080A processor chip and includes clock, tri-state bus drivers, control signal timing. This is a complete processor board which is the basis of the IMSAI 8080 system. The I/O signal definitions and pin numbers are the same as Altair's bus so that boards from the IMSAI 8080 system and the Altair 8800 system are fully interchangeable. Multiple MPU-A boards can share the same memory, and operate the same or different programs in parallel. (See Shared Memory Facility.)*
RAM 4-4 4K Static Memory Board		This board contains 4K of 450 nsec static RAM memory on a 4K board. Switchable write protect on each 1K block prevents all writes into that block for debugging purposes.*
RAM 4-1 1K Static Memory Board	1	This board contains 1K of 450 nsec static RAM memory on a 4K board. Up to three MM11-1 kits can be installed to make the total board capacity 4K bytes.*
PROM 4-4 (4K PROM Board)		Eraseable Programmable Read Only Memory Board using the popular 1702A EPROM. Comes with 4K of fast (1 microsecond) 1702A's (16 chips).*
PROM 4-2 (2K PROM Board)	1	Same as above, but with 2K 1702A EPROM. This board has a capacity of 4K (16 1702A chips).
MM702-5 (512 word EPROM Memory Module)		Expansion kit for the PROM-4 board; includes 512 words of memory on fast (1 microsecond) 1702A chips. Interface requirement - Space on PROM-4 board.
CP-A Control Panel	1	This control panel, while designed as the IMSAI 8080's front panel, is a complete self-contained unit. It can be plugged into any slot to control the processor. This permits debugging of a system configured as a dedicated controller, with our PIO board or other special display board at the front panel. After debugging, the control panel can be removed from the system. Large paddle handle address/data and control switches along with photographically produced labels and LED masks make this an attractive and easy to use panel.
EXT Extender Board		Enough labeling is supplied on this extender board to locate any pin number quickly. A high quality gold plated connector and gold plated contact fingers insure high reliability.
EXP-4 Expander Board		Expander boards to fit the IMSAI cabinet. (No connectors included). Adds 4 slots.
EXP-22 Expander Board		This is a special expander (Mother) board, designed to provide the maximum number of card slots, 22 in all. It replaces all other expander boards in the cabinet. (Note: if this board is ordered with the original computer, a special discounted price is offered. Please see Price List enclosed.)
EXPM Expansion Module		Contains 1 gold plated 100 pin edge connector and 2 card edge guides. This fills 1 slot on EXP boards.
PIO 4-4 4 Port Parallel I/O Board	1	This board has four 8 bit input ports, and four 8 bit output ports, all with handshake flags for conventional parallel interface. Both input and output has its own latch for buffering, and the handshake flags drive interrupts. The PIO 4-4 board hosts a series of LED's, (one LED to display each bit of output port.) Using these program controlled LED's, this board can be used to debug software programs, as well as for diagnostic work on the general system. This board can be used in a turnkey system as a special front panel (can replace standard front panel control board in certain applications.) See PIO cable below.*

NAME & NUMBER	SLOT REQUIREMENT	DESCRIPTION
PIO 4-1 1 Port Parallel I/O Board	1	Same as above, but with 1 port in and 1 port out. Can be upgraded to 2, 3, or full 4 ports via the use of PIOM-1 below. (See PIO Cable listed below) *
PIOM-1 Parallel I/O Module		The parallel I/O module contains components necessary to add 1 input and 1 output port to the PIO-4 board. A total of 4 input and 4 output ports will fit on a board.
PIO Cable		Plugs onto the PIO board and goes back to the rear of the chassis with two standard 25 pin type D subminiature connectors.
SIO 2-2 Dual Channel Serial I/O Board	1	This board has everything required for two asynchronous or synchronous half or full duplex serial interfaces. It is based on the INTEL 8251 Programmable USART chip, with buffers for receive and transmit, and extensive program control of options. The board will interrupt the MPU (through the PIC-8 board) or it can be operated without interrupts. RS-232 level drivers/receivers are provided for data and control lines so no additional circuitry is needed. They are fully independent, can run at different baud rates, etc. Control line jumpers between two channels permit board to "break into" an RS 232 line, intercepting and processing only the data. Jumper options permit operation as either the computer or terminal end of an RS 232 line. Current loop drivers/receivers are provided for operation at either end of a serial current loop interface. TTL level drivers/receivers are provided. Standard baud rates are jumper selectable, special or higher rates available with SIOC. Both channels handle from 75 to 9600 baud asynchronous or 56,000 baud synchronous.*
SIO 2-1 Single Channel Serial I/O Board	1	Same as SIO 2-2 but with 1 channel of I/O. This board can be expanded to 2 channels by the addition of SIOM-1 (see SIO Cable listed below).*
SIOM-1 Serial I/O Module		Expansion module to upgrade a SIO 2-1 board to a SIO 2-2 board. Includes everything necessary.
SIO Cable		Plugs onto SIO board and runs to rear of cabinet with standard 25 pin type D subminiature connectors where peripherals may be plugged into it.
SIOC Serial I/O Clock	1	Expansion "piggy back" board permitting jumper selection of any baud rate up to 56,000. Works with SIO 2-1 or SIO 2-2. Interface requirement - SIO board.
PIC-8 Priority Interrupt/real time Clock Board	1	Handles interrupts at 8 priority levels. Program controls current permissible priority of interrupts using INTEL 8214; lower priority interrupts are held until permissible or I/O device lowers request. Also has clock interrupt circuit, giving program selectable interrupts at .1, .2, 1, 2, 10, 20, 100, 200, and 1000 millisecond intervals. Single bit output port provided with transistor driver and space for a 3" speaker; or may be used to control custom circuit in 5 spare IC socket locations provided with power and decoupling.
PS-20 Power Supply		Up to 20 amperes at +8 volts and 3 amps each at +16 and -16 volts (unregulated). 115 or 110 volt 60Hz input.
PSM Power Supply Module		A special module which can be added to PS-20 above to increase the 8 volt output to a maximum of 30 amps.
FM (Cooling Fan)		Keeps cabinets with many installed boards cooler.

Shared Memory Facility

MABP-3 Memory Access Port Board	2-3 Memory	These three boards are used to configure shared memory modules. A shared memory module consists of standard memory boards in any combination up to 64K, one MAPT-6 board, and one or two MABP-3 boards. It must go on a separate section of expander board. Each MABP-3 board permits up to 3 MPU's to access the shared memory; each of these is connected by a flat cable from the MABP-3 board to a BB board plugged into a slot in the MPU's expander boards. If one MPU is connected to more than one shared memory module, only one BB board is needed at that MPU. Each MPU uses the shared memory module as though it were its own local memory; if the shared memory is busy, an MPU is held not ready until the memory is free. A selectable portion of the shared memory has a special interlock to insure successive cycles to an increment memory instruction; permitting easy software flag interlocks for multiple user entries in the same stack.
MAPT-6 Memory Access Port Timing Board		
BB (Bus Board)		

JAME & NUMBER	SLOT REQUIREMENT	DESCRIPTION
FIF Floppy Disk Drive Interface	2	This pair of boards uses an on board 8080A to create an intelligent disk interface, which can control up to 4 drives. Its intelligence allows the microprocessor board (MPU-A) of the basic computer more time to perform other functions. DMA (Direct Memory Access) is used to communicate with main memory. The Driving Program (Standard IBM Format) is on 8708 EPROMs. Using "Read All" command, the user can read all bits (clock and data). Hard sectoring and other formatting can be used by changing EPROM Programming. Interface has 512 Bytes of RAM used as data buffer. 1 FIF cable-5 (listed below) is provided with Interface Board.
FDC2-1 Floppy Disk Drive		One floppy disk drive in a dual drive cabinet with necessary power supply. This is a high quality unit with cast frame and positive air pressure dust control.
FDC4-1		Same as above, but with 1 disk drive and power supply in a 4 drive cabinet.
FDC		Floppy disk drive and power supply to fill FDC2-1 or to expand FDC4-1. This unit comes with Flat cable (FIF Cable-1 listed below) used to interconnect floppy drives within cabinet.
FIF Cable-5		Flat cable needed to connect Interface (FIF) to Floppy Disk Drive Cabinet.
FIF Cable-1		Flat cable for interconnection of Floppy Drives within cabinet.
AP-40 Alphanumeric Printer	1	This is a very sturdy 40 characters per line printer. It uses standard paper and a 2 color ribbon. It is an impact printer, producing dot matrix characters. It consists of the basic print mechanism only (power supply and interface not provided.)
GP-88 General Purpose Prototype Board		This is a general purpose prototype board providing pads for thirty-one 16 pin chips, and room for two 40 pin chips or three 24 pin chips. It is supplied with an on board regulator and tantalum capacitors.
UCRI-1 Universal Cassette Recorder Interface	1	This board provides all necessary circuits and control I/O ports for recording or reading digital data from any audio tape or cassette recorder. The UCRI-1 uses the new "Byte" Standard, and can also use the Hobbist Interchange Tape (HIT) Standard. No other hardware is needed.
IMSAI-30A Character Printer		Diablo/Hytype printer ("daisy wheel" type character printer) including cable to standard PIO-4 board. Runs 30 characters/second - has plot mode - many 10 and 12 char./in fonts available - 1 or 2 color, cloth or carbon ribbon - 132 character platen. Very high quality solid character printing is the equal of any office typewriter; accuracy is sufficient for back spacing and retyping lines without degrading appearance.
IMSAI-300A Line Printer		300 line per minute chain printer. High quality, very solid construction by a major U. S. firm.
LIF Line Printer Interface		Interface card to drive IMSAI - 300A contains everything necessary.
IMSAI - 108 50 Megabyte disk System		50 Million byte disk storage system with multiple microprocessor controller and advance data storage and retrieval firmware. This "Intelligent Disk" is extremely easy to use, all indexing, physical and logical data management is provided by the multiprocessor system's firmware. Interface to IMSAI 8080 system provided free; very easy interface to any other system. Includes all necessary cabinets and power supplies.
Disk 50 50 Megabyte Disk and Interface	2	50 Megabyte disk and interface. Everything that is needed to attach disk to Altair 8800 or IMSAI 8080.

*Standard computers come with 100 pin edge connectors and card edge guides for each board included in basic system. Additional boards ordered require 1 EXPM.

LIMITED WARRANTY

IMS Associates Incorporated, hereinafter referred to as IMSAI, in recognition of its responsibility to provide quality products, components, and workmanship, warrants its products as follows: All components sold by IMSAI are purchased through normal factory distribution and any part which fails because of defects in workmanship or material will be replaced at no charge for a period of 3 months following the date of purchase. The defective part must be returned post paid to IMSAI within the warranty period. Any malfunctioning module, purchased as a kit and returned to IMSAI within the warranty period, which in the judgement of IMSAI has been assembled with care and not subjected to electrical or mechanical abuse, will be restored to proper operating condition and returned, regardless of cause of malfunction, with a minimal charge to cover postage and handling. Any modules purchased as a kit and returned to IMSAI which in the judgement of IMSAI are not covered by the above conditions will be repaired and returned at a cost commensurate with the work required. In no case will this charge exceed \$20.00 without prior notification and approval of the owner. Any modules, purchased as assembled units are guaranteed to meet specifications in effect at the time of manufacture for a period of at least 3 months following purchase. These modules are additionally guaranteed against defects in materials or workmanship for the same 3 month period. All warranted factory assembled units returned to IMSAI post paid will be repaired and returned without charge.

This warranty is made in lieu of all other warranties expressed or implied and is limited in any case to the repair or replacement of the module involved. (Specifications subject to change without notice.)

IMS Associates, Inc.
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IMSAI ASSOCIATES, INC.

THE COMPLETE MICROCOMPUTER SYSTEM

Thank you for your interest in the IMSAI 8080. Attached is a packet of information describing the superior features and functions of the IMSAI 8080 System.

Some of the highlights for you to consider in making your decision to buy the IMSAI 8080 are:

- . IMSAI's dedication to serving its customers by offering the highest quality commercial grade microcomputer on the market today.
- . The IMSAI 8080 is a powerful system using current semiconductor technology, modularly expandable up to 64K bytes of memory with the versatility of supporting a wide range of peripherals.
- . An exclusive shared memory facility from the company that pioneered shared memory microprocessing. Shared memory facilities allow multiple microprocessors in the same cabinet to share the same memory, and run the same or different programs in parallel with each other. This feature allows a user to increment the processing capacity of an IMSAI 8080 easily and economically.
- . A lower cost model of the IMSAI 8080 is offered for OEM's or for dedicated application use where no front panel is required.
- . A complete and professional documentation package accompanies each system including a Users Manual (200 pages), Intel Data Book (157 pages), and Introduction to Microcomputers (460 pages). The comprehensive Users Manual makes our system easy to assemble and simple to use.
- . In addition to our 90 day warranty, we offer factory repair service and continuing technical consultation.
- . Initial software provided with the IMSAI 8080 includes an Assembler, Monitor, Text Editor and Loader in paper tape with listings.
- . Future software includes Basic (4K, 8K, 12K), FORTRAN IV, DOS and PLM, and will be provided to our customers for a nominal handling charge. Choice of media for distribution will be offered with a charge for the media and distribution only.

In summary, IMSAI (developer of the HYPERCUBE and IMSAI 108 Intelligent Disk System) is offering a superior microcomputer fully supported by our documentation, software and, most importantly, our willingness to serve and support our customers in the successful use of the IMSAI 8080.

Name _____
 Address _____
 Telephone No. _____

D.L.No. _____
 Soc. Sec. No. _____
 BAC _____
 M/C _____

IMSAI MICROCOMPUTER PRODUCTS PRICE LIST/ ORDER FORM

QTY	UNIT PRICE	EXTENDED PRICE	ITEM NO.	DESCRIPTION	KIT PRICE	ASSEMBLED PRICE
COMPUTER AND COMPUTER MEMORY						
_____	_____	_____	I-8080	IMSAI 8080 COMPUTER (Cabinet, MPU-A, CP-A, PS-20)	\$ 499	\$ 931
_____	_____	_____	I-8080RM	IMSAI 8080 COMPUTER (Rack Mount Cabinet, MPU-A, CP-A, PS-20) \$	518	\$ 950
_____	_____	_____	I-8080-1K	IMSAI 8080 COMPUTER (Cabinet, MPU-A, CP-A, PS-20, RAM 4-1) . . . \$	559	\$ 999
_____	_____	_____	I-8080RM-1K	IMSAI 8080 COMPUTER (Rack Mount Cabinet, MPU-A, CP-A, PS-20, RAM 4-1) \$	578	\$ 1027
_____	_____	_____	I-8080 OEM	IMSAI 8080 Less Front Panel (For dedicated applications)	\$ 429	\$ 749
_____	_____	_____	I-8080 OEM RM	IMSAI 8080 Less Front Panel with Rack Mount	\$ 448	\$ 768
_____	_____	_____	MPU-A	MICROPROCESSOR BOARD	\$ 181	\$ 350
_____	_____	_____	RAM 4-1	1K STATIC MEMORY BOARD	\$ 69	\$ 139
_____	_____	_____	RAM 4-4	4K STATIC MEMORY BOARD	\$ 165	\$ 299
_____	_____	_____	MM11-1	1K STATIC MEMORY MODULE	\$ 35	\$ 59
_____	_____	_____	PROM 4-2	2K EPROM ON 4K BOARD	\$ 175	\$ 344
_____	_____	_____	PROM 4-4	4K EPROM ON 4K BOARD	\$ 289	\$ 579
_____	_____	_____	MM702-5	512 WORD EPROM MEMORY MODULE	\$ 34	\$ 69
EXPANSION DEVICES						
_____	_____	_____	EXT	EXTENDER BOARD	\$ 37	\$ 43
_____	_____	_____	EXP-4	4 SLOT EXPANDER BOARD	\$ 14	
_____	_____	_____	EXP-22	22 SLOT EXPANDER BOARD	\$ 65	
				WHEN ORDERED WITH 8080 SYSTEM	\$ 52	
_____	_____	_____	EXPM	EXPANSION MODULE (1-100 Pin Connector, 2 Card Edge Guides) . . \$	6	\$ 12
I/O BOARDS AND MODULES						
_____	_____	_____	PIO 4-1	1 PORT PARALLEL I/O BOARD	\$ 89	\$ 140
_____	_____	_____	PIO 4-4	4 PORT PARALLEL I/O BOARD	\$ 149	\$ 299
_____	_____	_____	PIOM	PARALLEL I/O MODULE	\$ 21	\$ 39
_____	_____	_____	SIO 2-1	SINGLE CHANNEL SERIAL I/O BOARD	\$ 119	\$ 235
_____	_____	_____	SIO 2-2	DUAL CHANNEL SERIAL I/O BOARD	\$ 149	\$ 299
_____	_____	_____	SIOM-1	SERIAL I/O MODULE	\$ 31	\$ 59
_____	_____	_____	SIOC	SERIAL I/O CLOCK	\$ 29	\$ 59
SHARED MEMORY FACILITY						
_____	_____	_____	MABP-3	SHARED MEMORY ACCESS PORT BOARD	\$ 295	\$ 399
_____	_____	_____	MAPT-6	SHARED MEMORY ACCESS PORT TIMING BOARD	\$ 195	\$ 205
_____	_____	_____	BB	BUS BOARD	\$ 15	\$ 15

IMSAI®

February 1, 1976

QTY	UNIT PRICE	EXTENDED PRICE	ITEM NO.	DESCRIPTION	KIT PRICE	ASSEMBLED PRICE
PERIPHERALS AND CONTROLLERS						
			FIF	FLOPPY DISK INTERFACE BOARDS	\$ 299	\$ 599
			FDC 2-1	FLOPPY DISK DRIVE, PS, 2-Drive Cabinet		\$1050
			FDC 4-1	FLOPPY DISK DRIVE, PS, 4-Drive Cabinet		\$1225
			FDC	FLOPPY DISK DRIVE AND POWER SUPPLY ONLY		\$ 925
			AP-40	ALPHANUMERIC PRINTER		\$ 269
			IMSAI-30A	30 CPS HY-TYPE CHARACTER PRINTER		\$2695
			30A-TF	IMSAI 30A TRACTOR FEED OPTION		\$ 325
			IMSAI-300A	300 LPM 80 COLUMN PRINTER		\$2495
			IMSAI-300B	300 LPM 120 COLUMN PRINTER		\$3495
			LIF	LINE PRINTER INTERFACE	\$ 299	\$ 475
			DISK-50	50 MEGABYTE DISK AND INTERFACE		\$12500
			IMSAI 108	50 MEGABYTE INTELLIGENT DISK SYSTEM	\$27800	\$29500
			UCRI-1	UNIVERSAL CASSETTE RECORDER INTERFACE	\$ 49	\$ 99
			CRT-1280	12 x 80 CRT TERMINAL WITH KEYBOARD	\$	\$1595
			CRT-2480	24 x 80 CRT TERMINAL WITH KEYBOARD		\$2395
MISCELLANEOUS						
			CP-A	8080 FRONT PANEL CONTROL BOARD	\$ 169	\$ 325
			PIC-8	PRIORITY INTERRUPT/CLOCK BOARD	\$ 119	\$ 238
			GP-88	GENERAL PURPOSE PROTOTYPE BOARD	\$ 37	\$ 47
			PS-20	POWER SUPPLY	\$ 89	\$ 179
			PSM	POWER SUPPLY MODULE 30 AMPS	\$ 20	\$ 30
			FM	COOLING FAN	\$ 20	\$ 39
			RM	RACK MOUNT OPTION	\$ 19	\$ 19
			SIO CABLE	15" FLAT RIBBON CABLE WITH CONNECTORS		\$ 18
			PIO CABLE	15" FLAT RIBBON CABLE WITH CONNECTORS		\$ 22
			FIF CABLE	5' CABLE BETWEEN 8080 AND FLOPPY DISK DRIVE CABINET		\$ 25
			FDC CABLE	SHORT CABLE BETWEEN FLOPPY DISK DRIVES		\$ 18
BOOKS						
			Intel Data Book	Contains complete specifications and data sheets on Intel 8080A and all associated Intel memory and peripheral chips. Also includes preliminary specs on 'coming' Intel chips; 157 pages		\$ 5
			TTL Data Book	Contains complete electrical specifications for all 7400 Series TTL. This is the TTL 'BIBLE'; 640 pages		\$ 10
			PINOUT HANDBOOK	Covers the entire 5400/7400 series D.I.P.I.C.'s, Pin connections, functional specifications cross-reference		\$ 3.95
			IMSAI's INTRODUCTION TO MICROCOMPUTERS	In our opinion, the best basic microcomputer book published to date; 460 pages		\$ 7.50
			IMSAI 8080 USERS MANUAL			\$ 50
			Total	Prices, terms and specifications subject to change without notice.		
			Handling	TERMS: Cash, check, or money order; BankAmericard or Mastercharge (include all embossed data on card); 25% non-refundable deposit on C.O.D. orders. Add		
			Tax	5% handling on orders under \$1000. On orders between \$1000 and \$9999, net as shown. On orders over \$10,000, deduct 5%. California residents add 6% sales tax.		
			TOTAL			

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