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The people who design and manufacture Altair Computer Products.



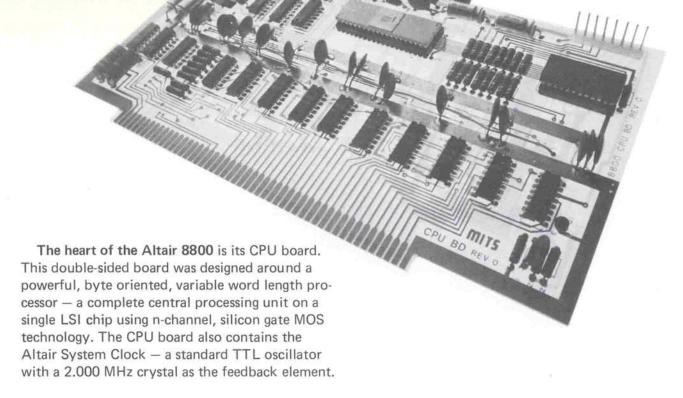
The Altair 8800 is a powerful, general purpose computer that sells for an amazingly low price.

The Altair 8800 is a superbly engineered, variable word length computer. Its byte orientation structure was designed to give the Altair the most efficient utilization possible — an efficiency only found in the most advanced computers.

The Altair 8800 has bench marks comparable to those of much more expensive mini-computers. It has a cycle speed of 2 microseconds; it can directly address 65K bytes of memory and 256 input/output devices; and it has 78 basic machine instructions with variations over 200 instructions.

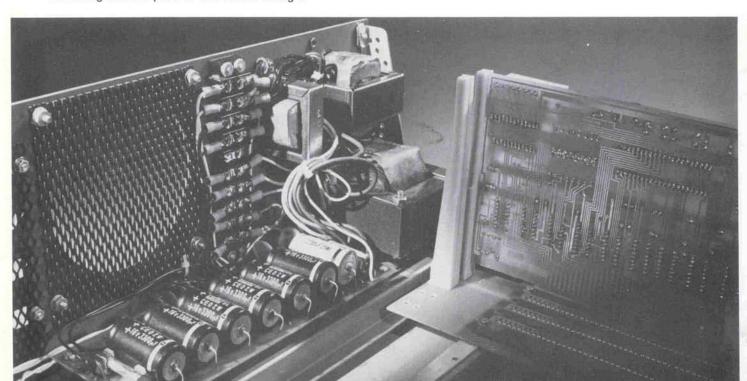
The Altair 8800 is the dawning of a New Age in the computer industry.

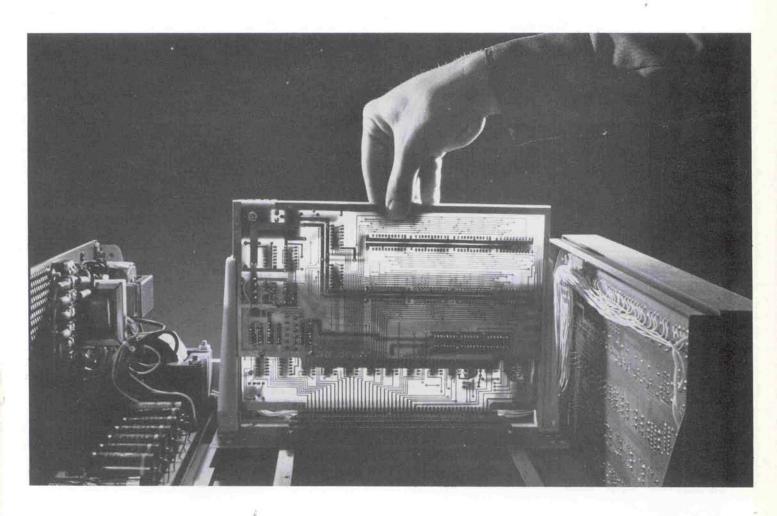
The Altair Age. It is the Age of the Affordable Computer. The Age of Computer Power for every business and every home in the Modern World.



The Altair 8800 power supply provides +8, a +16 and a -16 volts. These voltages are unregulated until they reach the individual boards (CPU, Front Panel, Memory, I/O, etc.). Each board has all the necessary regulation for its own operation.

The Altair 8800 power supply allows you to expand your computer by adding up to 16 boards inside the main case. Provisions for the addition of a cooling fan are part of the Altair design.



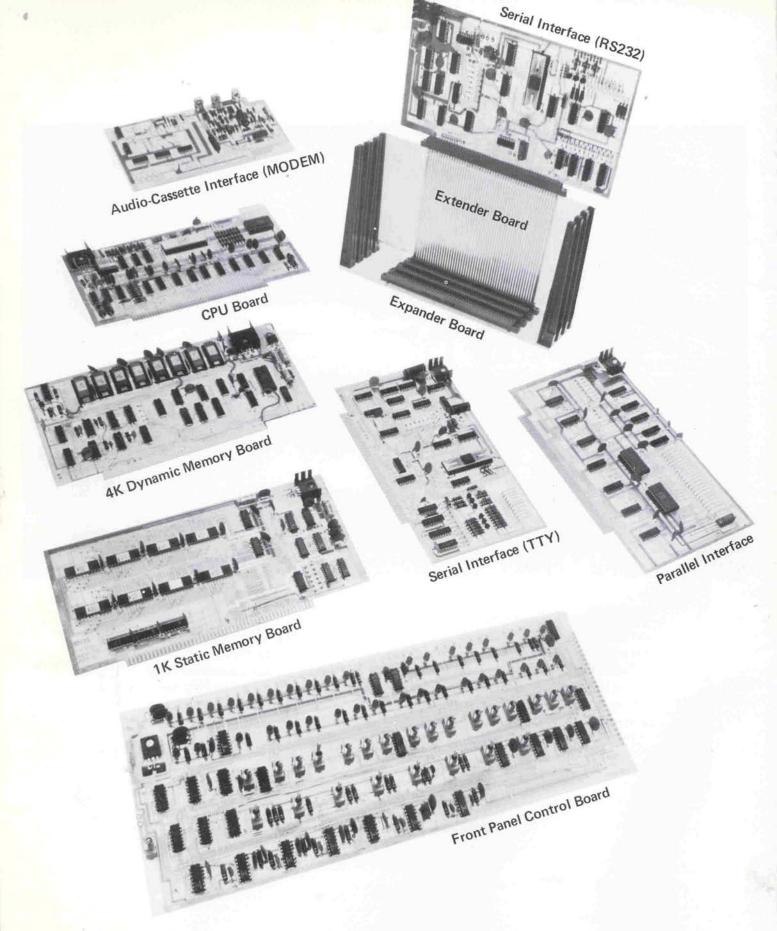


The Altair 8800 has been designed with buss orientation to be easily expanded and easily adapted to thousands of applications. Any card can be plugged into any slot and the correct address, etc., for that card will be picked up off the buss system.

Because of the Altair's unique design, the Altair can be custom assembled to fit almost anywhere. Besides general purpose computing, the Altair is also ideal for process control and industrial uses. Many OEM's (Original Equipment Manufacturers) have "buried" Altair 8800's inside their own equipment.

The Altair 8800 has been designed to meet the toughest industrial standards.

MITS will match the quality of the Altair against any other computer in existence.



Memory board options include 1024 byte static cards, 4096 byte dynamic cards and an Audio-Cassette Record Interface that allows you to connect your Altair to any tape recorder for inexpensive, unlimited storage. EACH MEMORY CARD HAS MEMORY PROTECT FEATURES.

Interface board options include a Parallel Interface Board and 3 Serial Interface Boards (TTY, TTL and RS-232). These boards allow you to connect the Altair to our growing list of input/output devices including computer terminals, teletypes, and line printers.

Other Altair Boards include PROM Programmer, Real Time Clock, Vectored Interrupt, Disk Controller, Direct Memory Access, and more. (See Back of catalog for technical data.)



# Comter 256 Computer Terminal

The Comter 256 is a surprisingly versatile computer terminal. It has its own internal memory of 256 characters (expandable to 1024) which combines with a highly-readable 32 character display to provide ease of operation and information retrieval.

The Comter 256 has a full alpha-numeric keyboard with complete cursor control. It can send and receive information at a baud rate of 10 characters per second or 30 characters per second.

Other features include a built-in acoustic coupler which allows you to "talk" to a computer over the phone lines, auto-transmit and an RS-232 standard connector.

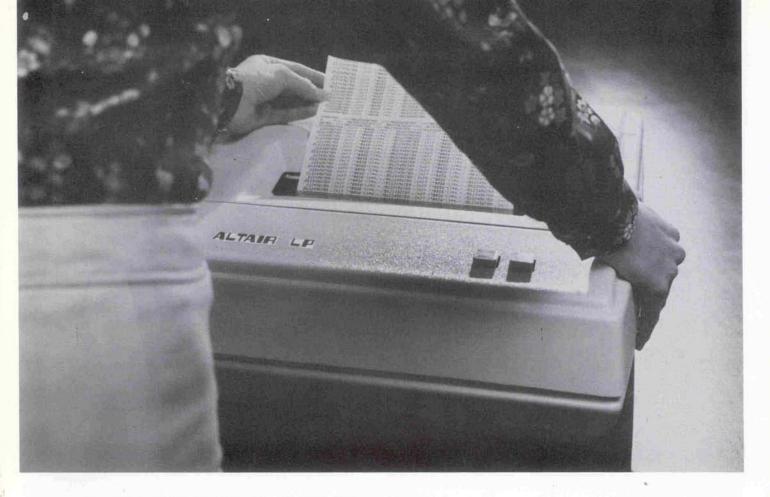
# **Comter II Computer Terminal**

Same as above with built-in Audio-Cassette Record Interface replacing the acoustic coupler. Can be connected to any tape player to record information from the computer or put information into the computer. Ideal for loading software.

NOTE: To connect the Comter 256 or Comter II to the Altair Computer, you need an RS-232 Serial Interface Board.



This teletype terminal prints 10 characters per second. It has a built-in paper tape reader and punch. It is a completely checked-out machine with a standard 120 day warranty. Includes teletyprewriter interface card.



The Altair 110 Line Printer is a desktop line printer that produces 80 columns of 5 x 7 dot matrix characters at 100 characters per second x 70 lines per minute. The impact head prints bidirectionally on a 8½" roll paper\* using a conventional teletype ribbon. The Altair Line Printer will print up to four copies of any item.

Maximum reliability is provided by a mechanism which contains no brakes, clutches, dampers or stepper motors. All control electronics including one-line buffer and self-test circuitry are contained on a single 5" x 15" printed circuit card. The Model 110 was expressly designed for the simplicity, reliability and extremely low cost required by current small-scale data handling systems and terminals.

Vibration and wear are minimized because the print head moves uniformly in both directions and pauses only at the end of each line. Opto-electronic sensing is used to accurately position each dot and permit characters to be printed on the fly.

The Altair 110 Line Printer comes with complete control electronics including a printer control card. Requires one slot in the Altair Computer.

<sup>\*</sup>Pin-fed Optional.

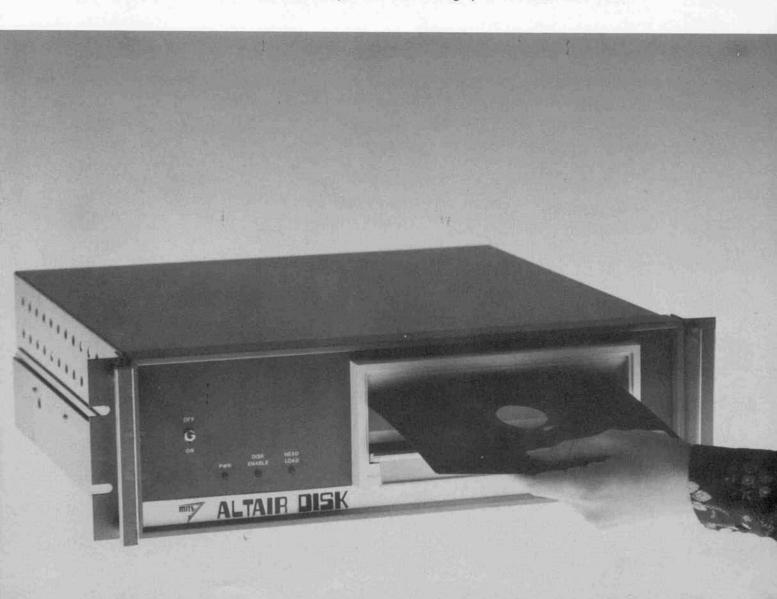
# **MASS STORAGE**

The Altair Floppy Disk can store over 300,000 bytes of information on a flexible disk. With a data transfer rate of 250K bits/sec. and a track to track access time of 10 msec., it has the capability for advanced data processing procedures.

The Altair Floppy Disk consists of the Altair Disk Drive (Pertec FD 400) with power supply, cooling fan, disk buffer and address select electronics in all-aluminum case similar to Altair Computer case and the Altair Disk Controller (two cards).

The Altair Floppy Disk System is hard sectored for 32 sectors per track (128 data words per sector). There are 77 tracks on each disk.

The Altair Disk Controller is capable of controlling up to 16 Altair Disk Drives.







# **4 ALTAIR BASIC LANGUAGE SYSTEMS**

#### \*ALTAIR BASIC I

Altair 8800 Computer
2 4K Dynamic Memory Boards
Comter II
Serial Input/Output Card
Cooling Fan
BASIC Software

#### \*ALTAIR DOS/BASIC III

Altair 8800 Computer
4 4K Dynamic Memory Boards
Comter II Terminal
Serial Input/Output Card
Cooling Fan
Extra Expander Board
Disk Controller
2 Disk Drives
EXTENDED BASIC and
DOS Software

#### \*ALTAIR EXTENDED BASIC II

Altair 8800 Computer
3 4K Dynamic Memory Boards
Comter II Terminal
Serial Input/Output Card
Cooling Fan
Extra Expander Board
EXTENDED BASIC Software

#### ALTAIR EXTENDED Engr/Acctg IV

Altair 8800 Computer
8 4K Dynamic Memory Boards
Teletype ASR-33
Altair Line Printer
Serial Input/Output Card
Cooling Fan
3 Extra Expander Boards
Disk Controller
2 Disk Drives
EXTENDED BASIC and
DOS Software

\*Teletype ASR-33 can be substituted for Comter II Terminal — See Price List

# ALTAIR BASIC - UP AND RUNNING

BASIC programming language was chosen for the Altair Computer because of its versatility and power and because it is easy to use. Altair BASIC comes in three versions (4K, 8K and EXTENDED BASIC). It has many features not normally found in BASIC language including an OUT statement and corresponding INPut function that allows the user to control low speed devices (machine control without assembly language).

Other Altair software includes resident assembler, text editor and system monitor. A complete accounting software package, DOS, and a debugging package are currently under development.

All Altair software is marketed at special low prices for Altair customers.

#### **4K BASIC**

STATEMEN	TS	COMMANDS	FUNCTIONS
IF THEN!	END	LIST	RND
GOSUB	DATA	RUN	SQR
RETURN	LET <sup>2</sup>	CLEAR?	SIN
FOR	DIM	SCRATCH	ABS
NEXT	REM		INT
READ	RESTORE		SGN
INPUT	PRINT <sup>3</sup>		
STOP			

NOTES: <sup>1</sup> IF . . . THEN can be followed by a statement. Example: IF A<5 THEN PRINT B

<sup>2</sup> LET is optional in variable assignments, Example: A=5 is identical to LET A=5

<sup>3</sup>TAB(X) within PRINT statement tabs to print column X.

7 CLEAR deletes all variables.

#### **FEATURES**

- Multiple statements per line, separated by a colon ":" (72 characters per line)
- Approximately 750 bytes available for program and variable storage before SIN or SIN, SQR, RND are deleted.
- "@" deletes a whole line and "+-" (or underline) deletes last character typed.
- Direct execution of any statements except INPUT.
- Two character error code and line number printed when error occurs.
   Example: 7 US ERROR IN 50 would indicate a reference to an undefined statement in a GOTO, etc., during exeuction of line 50.
- Control C − interrupt program (prints BREAK IN LINE XX)
- Control O toggles suppress output switch
- All results are calculated to at least six decimal digits of precision.
   Exponents may range from 10<sup>-3.8</sup> to 10<sup>-3.7</sup>.
- Maximum line number of 65,535.

#### **8K BASIC**

8K Altair BASIC provides all the features of the 4K version, plus these additional features.

STATEMENTS	COMMANDS	FUNCTIONS			
ON GOTO	CONT*	cos	ATN		
ONGOSUB		LOG	INP4		
DEF <sup>6</sup>		EXP	FRE9		
OUT <sup>5</sup>		TAN	POS		

NOTES: 5 OUT sets status of a hardware I/O channel.

4 INP returns status of a hardware I/O channel.

<sup>6</sup>DEF allows for single variable single statement user defined functions.

<sup>8</sup> CONT continues program execution after Control C or STOP.
<sup>9</sup> F RE returns number of free bytes for program or variable storage. With a string argument, FRE returns amount of free string space.

#### FEATURES

- Approximately 2K bytes available for program and variable storage before ATN or ATN, COS, SIN, TAN are deleted.
- Multi-dimensioned (up to 255) arrays for both strings and numbers.
- AND, OR, NOT operators can be used in IF statements or formulas.
- STRINGS
- D Maximum length = 255 characters
- □ String concatenation (A\$ + B\$)
- String functions:
- □ LEN length of string.
- ASC returns the equivalent ASCII decimal number for the specified argument.
- CHR\$ truncates the numeric formula to an integer, interprets the integer as a decimal number, and converts it to its equivalent ASCII character.
- Return substrings of specified string formulas; beginning at
- □ LEFT\$ leftmost character (LEFT\$) or ending at rightmost
- MIDS (RIGHTS) or beginning at specified position (MIDS) of the string formula, and containing the number of characters specified by the numeric formula.
- □ STR\$ number converted to a string.
- VAL string converted to a number.

#### **EXTENDED BASIC**

Extended Basic is the same as 8K Basic with the addition of double precision arithmetic, PRINT USING and disk file I/O. A minimum of 12K memory is required to support Extended Basic.

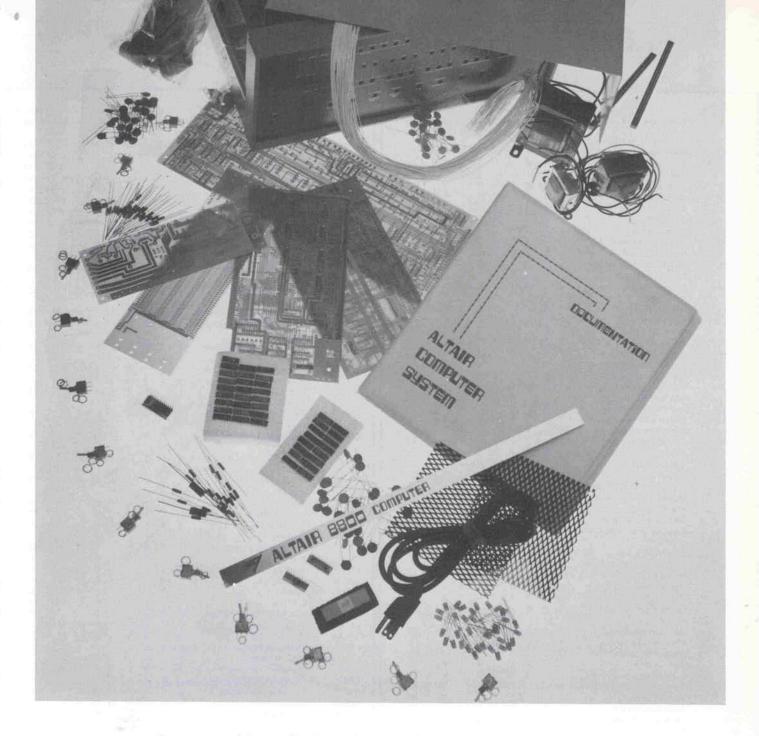
### ALTAIR USERS GROUP

Every person and every company who purchases an Altair 8800 is entitled to a free, one year membership in the Altair Users Group. This group (now numbering over 3,000) is a means of communication between Altair Users and a method of building a comprehensive library of Altair programs.

Members of the Altair Users Group are encouraged to submit programs by entering Altair "Software Contests". Winners are awarded prizes of up to \$1000.00 credit toward the purchase of an Altair Computer or Altair options.

Contest winners are announced in the Altair Newspaper, Computer Notes, which is published monthly and mailed free to all members of the Altair Users Group. Computer Notes contains complete update information on Altair hardware and software developments, programming tips, general computer articles and other useful information.

Associate Memberships are available to non Altair Customers for \$30.00 per year. Membership fees are refunded to Associate Members who buy an Altair Computer within 8 months after they become a member of the Altair Users Group.



For cost sensitive applications, the Altair 8800 and most Altair options come in kit form. Already, thousands of Altair computer kits have been assembled and are in full operating order.

Altair 8800 kit builders include individuals, companies and industrial users.

At MITS, we have been successfully marketing electronic kits for years. We take the extra pain to write accurate, straight-forward assembly manuals. (We leave nothing to the imagination.)

At MITS, we're quite serious about making computer power available at a price most everyone can afford.

## SUMMARY OF PROCESSOR INSTRUCTIONS

				le.	stru	ction	Co	de (1	)		Clock (2)				100	trunt	ion (	Code	(1)		Cloc
	<b>Anemonic</b>	Description	$D_7$	D <sub>6</sub>						Do	Cycles	Mnemonic	Description	D <sub>7</sub>				D <sub>3</sub> [		D <sub>1</sub> I	
1	MOV r1, r2	Move register to register	0	1	D	D	D	S	S	S	5										
	MOV M, r	Move register to memory	0	1	1	1	0	S	S	S	7	RZ	Return on zero	1	1	0	0		0		0 5/1
	MOV r, M	Move memory to register	0	1	D	D	D	1	1	0	7	RNZ	Return on no zero	1	1	0	0	0	0	0	0 5/1
	ILT	Halt	0	1	1	1	0	1	1	0	7	RP	Return on positive	1	1	1	1	0	0	0	0 5/1
			0	o	D	D	D	1	÷	0	7	RM	Return on minus	1	1	1	1	1	0	0	0 5/
	MVIr	Move immediate register	124.0						-	0	10	RPE	Return on parity even	1	1	1	0	1	0	0	0 5/1
	MIN	Move immediate memory	0	0	-		0		1		115,574.1	RPO	Return on parity odd	1	1	1	0	0	0	0	0 5/1
	NRr	Increment register	0	0	D	D	D	1	0	0	5	RST	Restart	1	1	Δ	Δ		1		1 1
E	OCR r	Decrement register	0	0	D	D	D	1	0	1	5	IN		1	1	0	7		0	120	1 10
1	NR M	Increment memory	0	0	1	1	0	1	0	0	10	4450.00	Input	- 2	1	0.53					
1	OCR M	Decrement memory	0	0	1	1	0	1	0	1	10	OUT	Output	1	1	0	1		0		1 10
	ADD r	Add register to A	1	0	0	0	0	S	S	S	4	LXIB	Load immediate register	0	0	0	0	0	0	0	1 10
	ADCr	Add register to A with carry	1	0	0	0	1	S	S	S	4		Pair B & C								
	SUB r	Subtract register from A	1	0	0	1	0	S	S	S	4	LXID	Load immediate register	0	0	0	1	0	0	0	1 1
			1		0	1	1	S	S	S	4		Pair D & E								
,	SBB r	Subtract register from A		0	U	3	1	2	3	3	*	LXIH	Load immediate register	0	0	1	0	0	0	0	1 1
		with borrow		1020		-	7-227-1		-	-			Pair H & L							2.70	
	ANAr	And register with A	1	0	1	0	0	S	S	S	4	LXI SP	Load immediate stack pointer	0	0	1	1	0	0	0	1 1
1	XRA r	Exclusive Or register with A	1	0	1	0	1	S	S	S	4	200000000000000000000000000000000000000			1	0	n		1		
	ORA r	Or register with A	1	0	1	1	0	S	S	S	4	PUSH B	Push register Pair B & C on	1	-1	0	0	0	1	0	1 1
	CMPr	Compare register with A	1	0	1	1	1	S	S	S	4		stack				17				
	ADD M	Add memory to A	1	0	0	0	0	1	1	0	7	PUSH D	Push register Pair D & E on	1	1	0	1	0	1	0	1 1
	ADC M		1	0	0	0	1		1	0	7		stack								
		Add memory to A with carry				1					7	PUSH H	Push register Pair H & L on	1	1	1	0	0	1	0	1 1
	SUB M	Subtract memory from A	1	0	0	137	0	1		0	100		stack								
	SBB M	Subtract memory from A	1	0	0	1	1	1	1	0	7	PUSH PSW	Push A and Flags	4		1	1	0	1	0	1 1
		with borrow										PUSH PSW		3		1	1	U	1	U	1 1
,	ANA M	And memory with A	1	0	1	0	0	1	1	0	7		on stack				1112	1200	-		
	XRAM	Exclusive Or memory with A	1	0	1	0	1	1	1	0	7	POP B	Pop register pair B & C off	1	1	0	0	0	0	0	1 1
	ORAM	Or memory with A	1	0	1	1	0	1	1	0	7		stack								
	CMP M		1	0	1	1	1		1	0	7	POP D	Pop register pair D & E off	1	1	0	1	0	0	0	1 1
		Compare memory with A	- 0	0	100		-	- 2	0.5		7		stack								
	ADI	Add immediate to A	1	1	0	0	0	- 1	1	0	375.65	POP H	Pop register pair H & L off	1	1	1	0	0	0	0	1 1
	ACI	Add immediate to A with	1	1	0	0	1	1	1	0	7	10111		Ç.		*	0			U	
		carry										200 0000	stack		12.11						
	SUI	Subtract immediate from A	1	1	0	1	0	1	1	0	7	POP PSW	Pop A and Flags	1	1	1	1 ,	, 0	0	0	1 1
	SBI	Subtract immediate from A	1	1	0	1	1	1	1	0	7		off stack								
	001	with borrow	-				- 1			100		STA	Store A direct	0	0	1	1	0	0	1	0 1
				4		0	0		4	0	7	LDA	Load A direct	0	0	1	1	1	0	1	0 1
	ANI	And immediate with A	1	1	1	0	0	1	1	0	7	XCHG	Exchange D & E, H & L	1	1	1	0		0	1	1 4
	XRI	Exclusive Or immediate with	1	1	1	0	1	1	- 1	0	7	Adria		335	13.0	0.				100	
		A									A RESTAURA	2077111	Registers							**	
	ORI	Or immediate with A	1	1	1	1	0	1	1	0	7	XTHL	Exchange top of stack, H & L	- 3		1	0	0	0	. !	1 1
	CPI	Compare immediate with A	1	1	1	1	1	1	1	0	7	SPHL	H & L to stack pointer	- 7	1	1	1	1	0		1 :
	RLC	Rotate A left	0	0	0	0	0	1	1	1	4	PCHL	H & L to program counter	1	1	1	0	1	0	0	1 5
	RRC		0	0	0	0	1	1	1	1	4	DADB	Add B & C to H & L	0	0	0	0	1	0	0	1 1
		Rotate A right				1	- 6	- 2	- 1	-	4	DADD	Add d & E to H & L	0	0	0	1	1	0	0	1 1
	RAL	Rotate A left through carry	0	0	0		0	1	1			DADH	Add H & L to H & L	0	0	1	0	1	0	0	1 1
	RAR	Rotate A right through	0	0	0	A	1	1	1	-1	4	DAD SP	Add stack pointer to H & L	0	0	1	1	1	0	0	1 1
		carry				- 2							[10] - [2] [4] [1] [4] [4] [4] [4] [4] [4] [4] [4] [4] [4			o	ò	ò		1	0
	JMP	Jump unconditional	1	1	0	0	0	0	1	1	10	STAX B	Store A indirect	0	0	30	0	0	0		
	JC	Jump on carry	1	1	0	1	1	0	1	0	10	STAX D	Store A indirect	0	0	0	1	0	0	1	0
	JNC	Jump on no carry	1	1	0	1	0	0	1		10	LDAX B	Load A indirect	0	0	0	0	1	0	1	0
	JZ		1	1	0	0	1		1		10	LDAX D	Load A indirect	0	0	0	1	1	0	1	0
		Jump on zero	-	1	0		0			0	10	INX B	Increment B & C registers	0	0	0	0	0	0	1	1 1
	JNZ	Jump on no zero	1	1	U	U	- 3				0.00	INX D	Increment D & E registers	0	0	0	1	0	0	1	1 1
	JP	Jump on positive	1	1	1	1	0	0	1	0	10	INX H	Increment H & L registers	0	0	1	0	0	0	1	1
	JM	Jump on minus	1	1	1	1	1	0	1	0	10								0	1	
	JPE	Jump on parity even	1	1	1	0	1	0	1	0	10	INX SP	Increment stack pointer	0	0			0	0		
	JPO	Jump on parity odd	1	1	1	0	0	0	1	0	10	DCX B	Decrement B & C	0	0	0	0	1	0	1.	1
	CALL	Call unconditional	- 1	1	0	0	1	1	0		17	DCX D	Decrement D & E	0	0	0	1	1	0	1	1
			- 1	4			- 1	- 14				DCX H	Decrement H & L	0	0	1	0	1	0	1	1
	CC	Call on carry	3	1	0	1	- 1	1	0		11/17	DCX SP	Decrement stack pointer	0	0	1	1	1	0	1	1
	CNC	Call on no carry	1	3	0	1	0	- 1	0		11/17	1 1 Dispension	Compliment A	0	0	4	0	1	1	1	i
	CZ	Call on zero	1	1	0	0	1	1	0	0	11/17	CMA				2				2	
	CNZ	Call on no zero	1	1	0	0	0	1	0	0	11/17	STC	Set carry	0	0	1	1	0	1	1	1
	CP	Call on positive	1	1	1	1	0		0		11/17	CMC	Compliment carry	0	0	1	4	1	1	1	1
			- 1	4	-	1	4		0		11/17	DAA	Decimal adjust A	0	0	1	0	0	1	1	1 3
	CM	Call on minus	1	1	1	1	- 1	- 1				SHLD	Store H & L direct	0		1	0	0	0	1	0 1
	CPE	Call on parity even	1	1	1	0	1	- 1	0		11/17	110000000000		0		1	0	1	0	1	0 1
	CPO	Call on parity odd	1	1	1	0	0	1	0	0	11/17	LHLD	Load H & L direct	U	U	3	U			1.5	
	RET	Return	1	1	0	0	1	0	0	1	10	EI	Enable Interrupts	1	1	1	1	1	0	1	1
	RC	Return on carry	1	1	0		1	0			5/11	DI	Disable interrupt	1	1	1	1	0	0	1	1
	RNC			1	0		o				5/11	NOP	No-operation	0	0	0	0	0	0	0	0
	PCIME	Return on no carry	- 1	- 1	U	- 1		U		U	3/11	0.000									

# MAINTENANCE OPTIONS

MITS' future development plans include the establishment of Service Centers throughout the United States. Until that time, there are two maintenance options available.

- 1. Time and materials \$22.00/hour plus retail parts cost.
- II. Maintenance contracts Contact factory for specific details.

# MEMORY OPTIONS

NAME & NUMBER	DESCRIPTION	APPLICATION	INTERFACE REQUIRE- MENT	SPACE REQUIRE MENT
88-MCS Static Memory Card	This Static Memory Card comes with 256 words of memory and is expandable to 1024 words. Contains provisions for disabling the ready to compensate for the speed of the card. It also contains memory protect features. The static memory on this card has a maximum access time of 850 nanoseconds.	Systems that require small memory, such as control applications.	none	one slot
88-MM Memory Module	Plugs into the 88C-MCS Memory Card add- ing 256 words memory. Three modules can be added to each Static Memory Card for a total 1024 words of memory.	Expand static memory in a minimum processor configuration.	Space on a 88-MCS card.	
88-IMCS Full 1000 Word Static Memory Card	88-MCS Static Memory Card with full 1000 words of memory. See price list for discount price.			one slot
88-4MCD 4K Dynamic Memory Card	This Dynamic Memory Card contains 4,096 words of memory. Maximum access time is 300 nanoseconds. An automatic refresh cycle is performed every 64 clock pulses at sync time. If the card is addressed at the same time that refresh occurs, the computer is given one or two wait states during refresh. Otherwise, the processor is unaware that refresh is occurring. Has write protect capability. Variable address circuitry allows user to provide a starting address in memory at anyone of 16 locations — 4K, 8K, 12K, 16K, etc.	Systems that require medium to large amounts of memory with fast access time.	none	one slot
88-ACR Audio- Cassette Record Interface	Allows virtually unlimited memory storage for data or software. Operates by modulating audio frequencies in the record mode. Demodulates recorded data in playback mode.	Connects to any medium quality cassette tape recorder.		one slot
88-DISK Disk Drive	Consists of Pertec FD 400 floppy disk drive, power supply (110-125v AC, 60 Hz), cooling fan, disk buffer and address select electronics in Optima case similar to Altair Computer case. Capable of storing over 300,000 words on a flexible disk. Disk included. Up to 16 disk drives can be controlled by one 88-DC Disk Controller. Hard sectored for 32 sectors per track, 128 data words per sector. 77 tracks on a disk.	Any application where mass memory is required.	88-DC	
88-DC Disk Controller	The 88-DC Disk Controller consists of two circuit boards containing read/write interface and disk control and timing interface. Capable of controlling up to 16 Disk Drives.	Any application where mass memory is required.		2 slots

*-	NAME & NUMBER	DESCRIPTION	APPLICATION	INTERFACE REQUIRE- MENT	SPACE REQUIRE- MENT
	88-DMAC Di- rect Memory Ac- cess Controller	This Direct Memory Access Controller will control 8 Dynamic Input/Output Cards. The controller generates a priority for each of the 8 cards and can generate either an interrupt or be sampled by the processor for job completion. Selects the channel to have access to the address buss and control buss when a DMA is to occur. Required in any system with DMA.	Systems that require rapid transfer of data into the CPU or out of the CPU. Allows for simplified software.	none	one slot
	88-DMAE Di- rect Memory I/O Channel for External Devices	Full parallel Input/Output channel used for Direct Memory Access transfers between the processor and external devices. With one DMA I/O channel operating, data transfer rate is 300K bytes per second, while the processor continues to operate at approximately 80% speed.	Systems that require rapid transfer of data between the CPU memory and external devices. Also for slow speed, high quantity transfer.	88-DMAC	one slot
	88-DMAI Di- rect Memory Access I/O Channel for Internal Transfers	Allows for high speed transfer of data blocks within the system's memory, without software intervention after set-up.	Data acquisition and logging systems.	88-DMAC	one slot
**	88-PPC PROM Programmer	Allows blocks of memory to be automatically programmed into Programmable Read Only Memories. The PROMs normally used in the Altair 8800 are silicon gate MOS PROMs with 1 microsecond access time. Each PROM is organized as a 256 x 8 memory. Includes external test socket for programming.	Particularly useful in control applications	5 PROMs	external cabinet
	88-PMC PROM Memory Card	Holds up to 2K of PROM.	Control applications		one slot
	88-PROM PROM kit	One silicon MOS electrically programmable 256 x 8 PROM, Access time of 1 microsecond. Erasable version (ultraviolet light) also available.	Control applications		
INTERFACE BOARDS	88-PIO Parallel Input/Output Card	Full parallel input/output card with necessary handshake flags for conventional parallel interface. Contains all required addressing circuitry to allow each card to be addressed anywhere from location 0 to location 255. Both input and output data have their own 8 bit latch for buffering. Includes necessary logic to allow an adjacent channel to be a control channel. Thus, adjacent channel can be used to set up flags and also clear flags and interrupts.	Any application where data is available in parallel or the external interface requires parallel data.	Has standard TTL drives & accepts standard TTL signals	one slot
	88-SIOA Serial Input/Output Card RS232	Full RS232 interface card with signal compatibility to conventional RS232 interface. Uses a UART and has divider logic to allow for presettable baud rates up to 25,000 baud. Provides both hardware and software interrupt capability. Allows odd-even or no parity selection for the number of data bits per character. The board has two device code addresses, hardware selectable from 0-376 octal. The control channel is an even numbered address and the data channel is an odd numbered address.	Interfacing any conven- tional RS232 type peripherals.	Conven- tional RS232	one slot
	88-SIOB Serial Input/Output Card TTL	Same as 88-SIOA except all signals are TTL levels (both in and out).	Transmission of data with serial format.	Standard TTL signals	one slot
	88-SIOC Serial Input/Output Card TTY	Same as 88-SIOA except that it is for interfacing with conventional teletypes. (20 milliamp current 100p)	Interfacing to teletypes	Standard TTY signals	one slot

Card TTY

milliamp current 100p)

	NAME & NUMBER	DESCRIPTION	APPLICATION	INTERFACE REQUIRE- MENT	SPACE REQUIRE- MENT
	88-VI Vectored Interrupt	Gives user 8 levels of hardware vectored interrupt. Automatically establishes restart addresses for interrupts.	Any type of interrupt structured system. Especially useful in real time applications.	All MITS standard I/O chan- nels have provisions to interface to vectored interrupt.	one slot
	88-RTC Real Time Clock	Provides interrupts to the processor at user selected rate of once every 100 microseconds, 100 microseconds, 100 milliseconds or 100 milliseconds.	Any real time system or data logging system.	Requires Vectored Interrupt	fits on Vectored Interrupt card
DEVICES	CT256 Computer Terminal	Basic memory of 256 characters with expandability to 1024 characters combines with a 32 character display to provide ease of operation. Acoustic coupler for time share connection. Special function keys for data retrieval, display format and auto transmit. ASCII coded keyboard and 110/300 baud rates.	Computer terminal with Alpha-numeric display.	88-SIOA Serial I/O	
	COMTER II Computer Terminal 88-TTY Teletype	Same as CT256 except that it has tape play/record feature instead of acoustic coupler and 256 character memory that is not expandable.  Standard ASR-33 Teletype. 72 character page width, full ASCII keyboard, 10 cps	Computer terminal with Alpha-numeric display and mass storage capability. Any application requiring alpha-numeric	88-SIOA Serial I/O 88-SIOC	
	88-80LP Line Printer	paper tape reader and punch.  Low price impact printer. 110 characters per second/70 lines per minute. 80 columns of 5x7 dot matrix characters. Pin-fed. Will print up to four copies. Weighs less than 30 pounds, and measures 18" wide x 8" high x 23" deep. A universal input transformer allows for use world wide. Includes necessary control electronics (control board).	data in print-out form.  Any application requiring printed output.	Controller card included	one slot
	88-KB ASCII Keyboard	Keyboard and case. Contains all logic and debounce circuitry for 96 ASCII characters. Controller is contained in 88-32DU 32 Character Alpha-numeric Display.	Any application requiring alpha-numeric data,	88-32DU Alpha- numeric Display	external cabinet
	88-32DU 32 Character Alpha- numeric Display	32 character alpha-numeric Burroughs Self-Scan display mounted in its own case. Includes controller with interface logic and power supply. Displays 64 ASCII characters and has 32 character memory.	Any application needing alpha-numeric display	none	1 slot plus external cabinet
	88-VLCT Low Cost Terminal	Allows user to convert from octal format to binary and back to octal.	Machine Language programming.	88-PIO Parallel I/O	
	88-ACC Altair Cyclops Camera	Digital, solid state TV camera. 1024 elements in a 32 x 32 array. Each detector is capable of 16 gray levels and automatic electronic stops are adjustable by the software. Up to 16 cameras can be controlled by one Cyclops Controller. Multiple controllers can be used.	Computer with eyes such as an intrusion system, production line control, automatic inspection stations.	88-CCC Cyclops Controller Card	Camera is 2"'x3"'x8"
	88-CCC Altair Cyclops Con- troller Card	Will support up to 16 cameras simultaneously. Contains buffer memory and all 8 stop controls to communicate with the camera. Provides all interfacing for Altair Cyclops Camera.			one slot
MISC. OPTIONS	88-EC Expander Board	Expander Board comes with space for four edge connector sockets to allow for the addition of four cards to the Altair 8800. The Altair comes with one Expander Board. Three additional boards can be added, making provisions for 16 cards. Expander Chassis needed for additional expansion.	Expand the 8800	Space in Altair 8800 chassis or Expander chassis	

needed for additional expansion.

NAME & NUMBER	DESCRIPTION	APPLICATION	REQUIRE- MENT	REQUIRE MENT
88-EXC Extender Card	Double-sided circuit board with edge con- nector to allow all cards on the buss to be extended out of the card rack for easy maintenance.	Where extensive development or maintenance is anticipated.		
88-PPCB Prototype Printed Circuit Board	Double-sided plated through board for designing custom interfaces to the Altair 8800. Includes 5 volt regulator and associated filters. Provides for up to eighteen 16-pin chips. Also accepts 22, 24, or 40-pin chips.	Developing Custom Interfaces	Defined by user	one slot
88-EBC Expander Board Chassis	Power supply. Optima cabinet and four Expander Cards allows for an expansion of 16 cards to the Altair 8800. All necessary interface logic included.	Expanded system	One slot in basic Altair	8" rack space
Cases	A wide assortment of cases is available for adding external devices.			
88-FAN Cooling Fan	Suggested for use with 4 or more boards.			
88-25DB Connectors	One each 7325-DB25P & S plus cover.	Direct connection from I/O device to computer. Provided free with I/O cards.		

INTERFACE SPACE

## **ORDERING INSTRUCTIONS**

Companies: Net 30 available to companies (subject to credit approval). Send purchase orders to: MITS/6328 Linn NE/Albuquerque, NM 87108.

Individuals: Terms are cash with order, Mastercharge or BankAmericard.

- Postage & Handling:
  - 1) Add \$8.00 each for Terminal, Computer, Line Printer, Teletype and Disc
  - 2) Add for Peripherals:
    - (a) -0- if ordered with computer
    - (b) \$3.00 if ordered separately
  - 3) Add \$1.00 postage for Chip Package & P.C. Board Set
  - 4) Postage included in price of manuals
  - 5) Canada, Hawaii & Alaska, postage charges subject to quotation

To place orders over the phone, call (505) 265-7553 NOTE: Prices, specifications, future development and delivery subject to change

MITS/6328 Linn NE/Albuquerque, NM 87108

	NAME & NUMBER	DESCRIPTION	APPLICATION	REQUIRE- MENT	REQUIRE- MENT
MEMORY OPTIONS (new since first printing of catalog)	88-2MCS Static Memory Card	This Static Memory Card comes with 2048 words of memory. Contains provisions for disabling the ready to compensate for the speed of the card. It also contains memory protect features. Card will be initially with 850 nanosecond memories. May be offered later with faster memory if there is a demand.	System requiring medium amount of memory	none	one slot

INTERFACE SPACE

# MITS ALTAIR 8800-IDS Industrial Development System

The Altair 8800 Industrial Development System is a software development and PROM programming system.

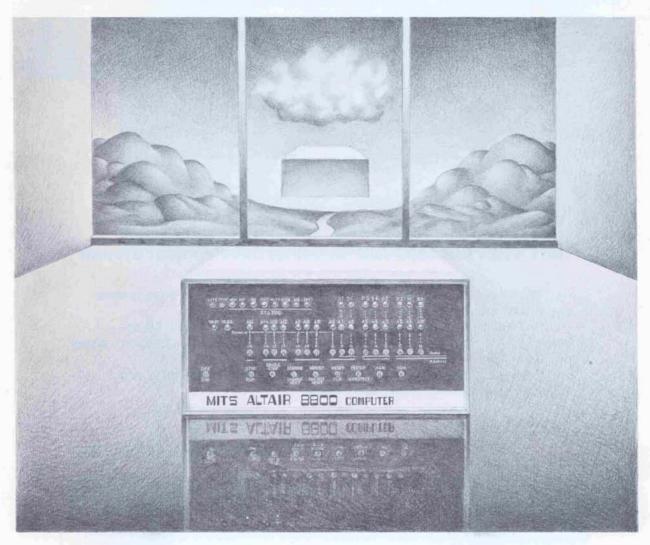
The Industrial Development System includes an Altair 8800, 8K of dynamic RAM memory, teletype or RS232 interface, PROM programmer, loader on PROM, and software on cassette or punched tape.

Software included with the 8800-IDS is the resident assembler, text editor, system monitor, BASIC and Debug.

# PRICES:

CONSULT PRICE LIST FOR SINGLE UNIT PRICES. CONTACT FACTORY FOR OEM QUANTITY DISCOUNTS. ADDITIONAL PRICE LISTS AVAILABLE FROM FACTORY.

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