

THE AGE OF **ALTAIR**



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MITS

The people who design and manufacture Altair Computer Products.



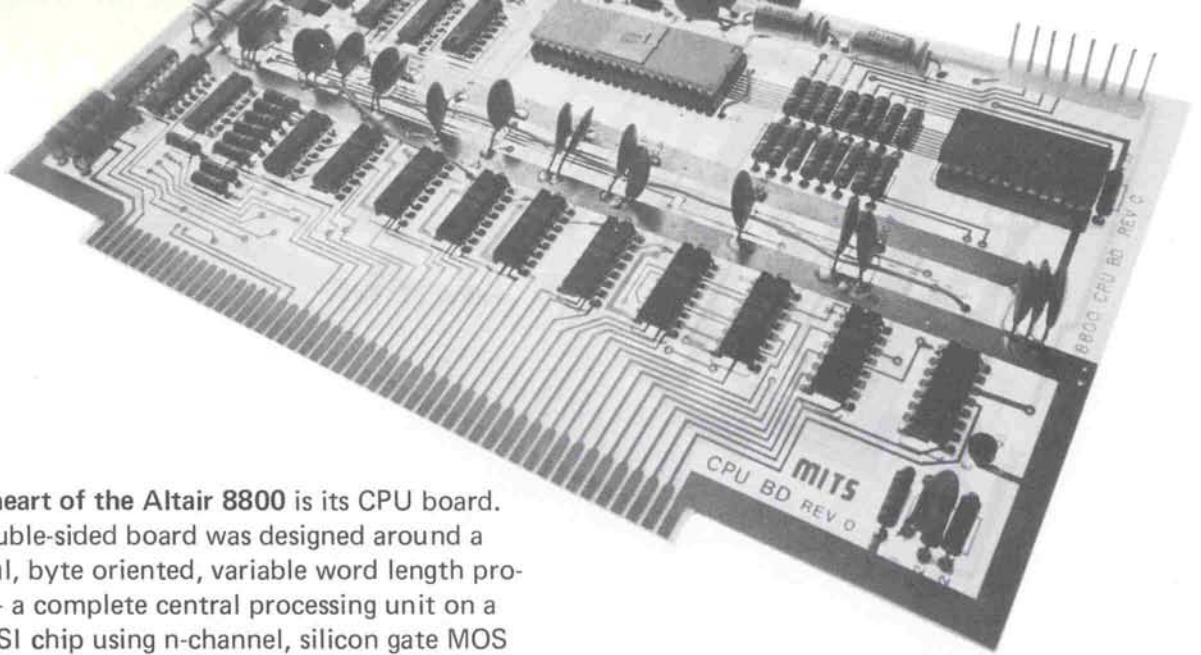
The Altair 8800 is a powerful, general purpose computer that sells for an amazingly low price.

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.

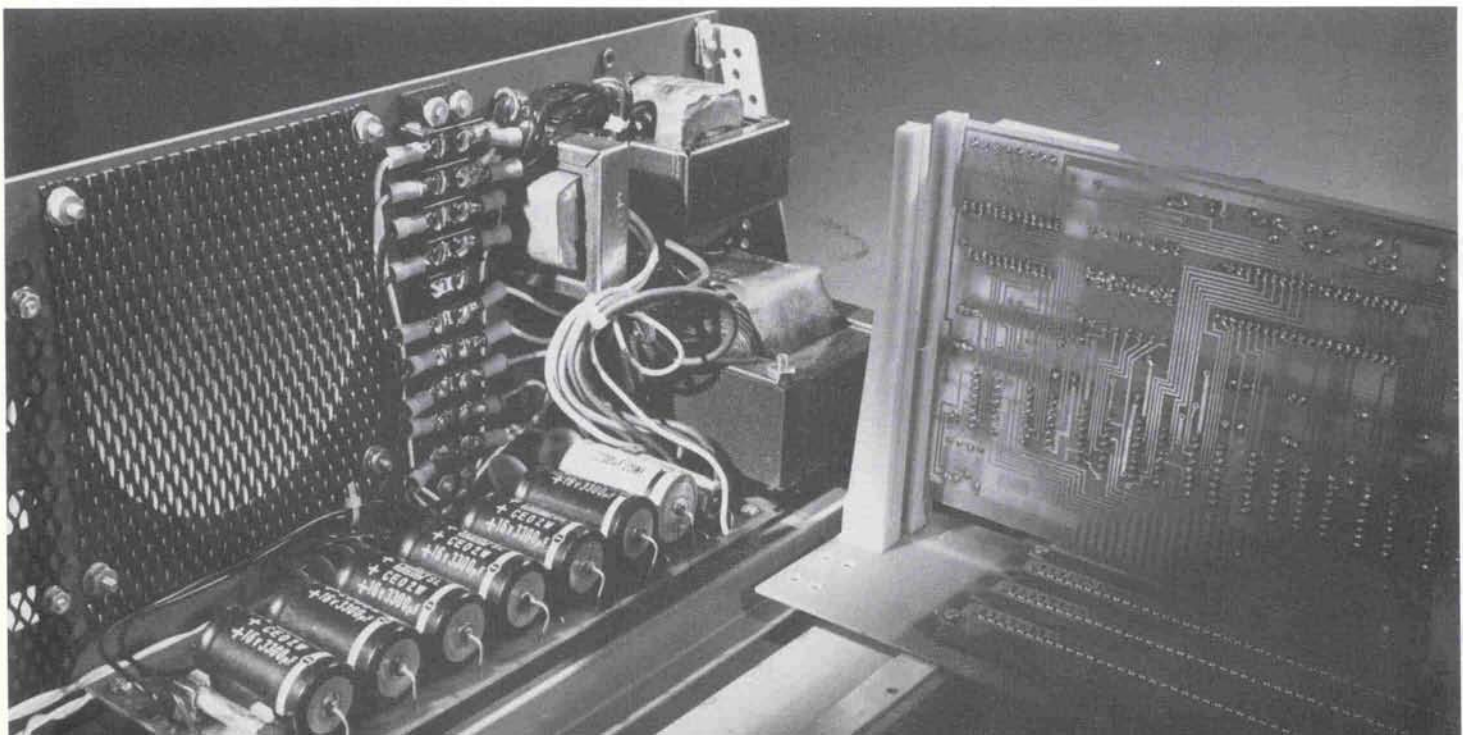
The Altair Age. It is the Age of the Affordable Computer. The Age of Computer Power for every business and every home in the Modern World.

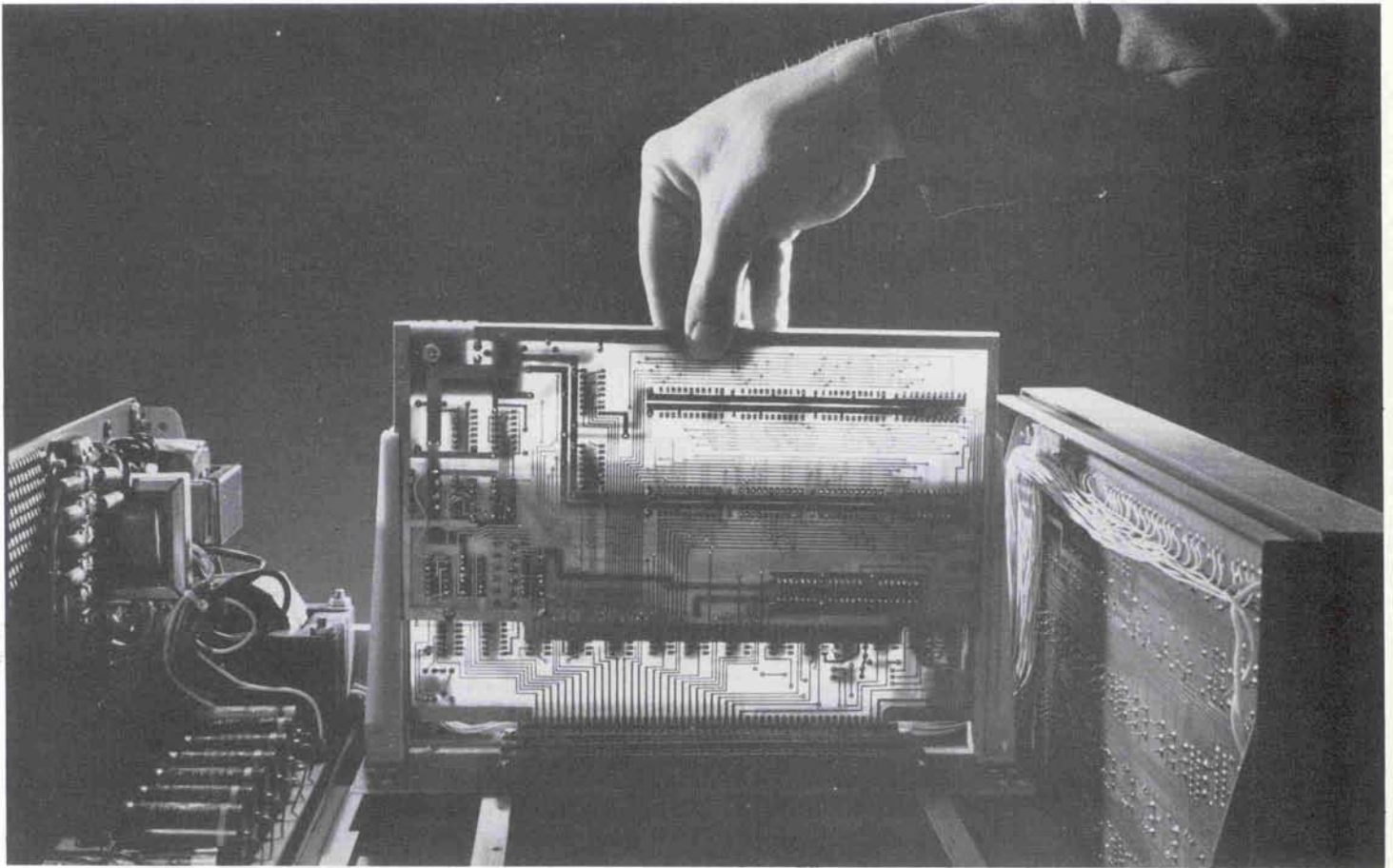


The heart of the Altair 8800 is its CPU board. This double-sided board was designed around a powerful, byte oriented, variable word length processor — a complete central processing unit on a single LSI chip using n-channel, silicon gate MOS technology. The CPU board also contains the Altair System Clock — a standard TTL oscillator with a 2.000 MHz crystal as the feedback element.

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.





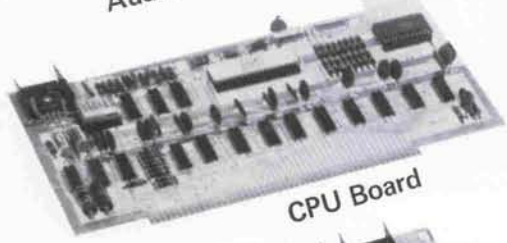
The Altair 8800 has been designed with buss orientation to be easily expanded and easily adapted to thousands of applications. Any card can be plugged into any slot and the correct address, etc., for that card will be picked up off the buss system.

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.

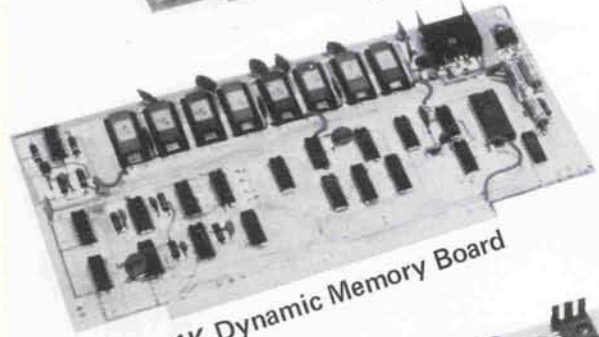
The Altair 8800 has been designed to meet the toughest industrial standards. MITS will match the quality of the Altair against any other computer in existence.



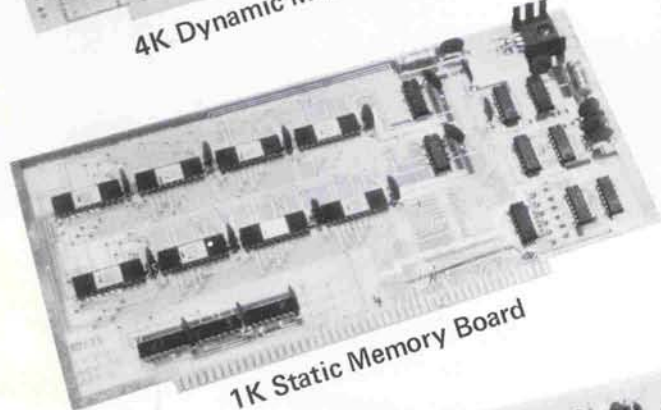
Audio-Cassette Interface (MODEM)



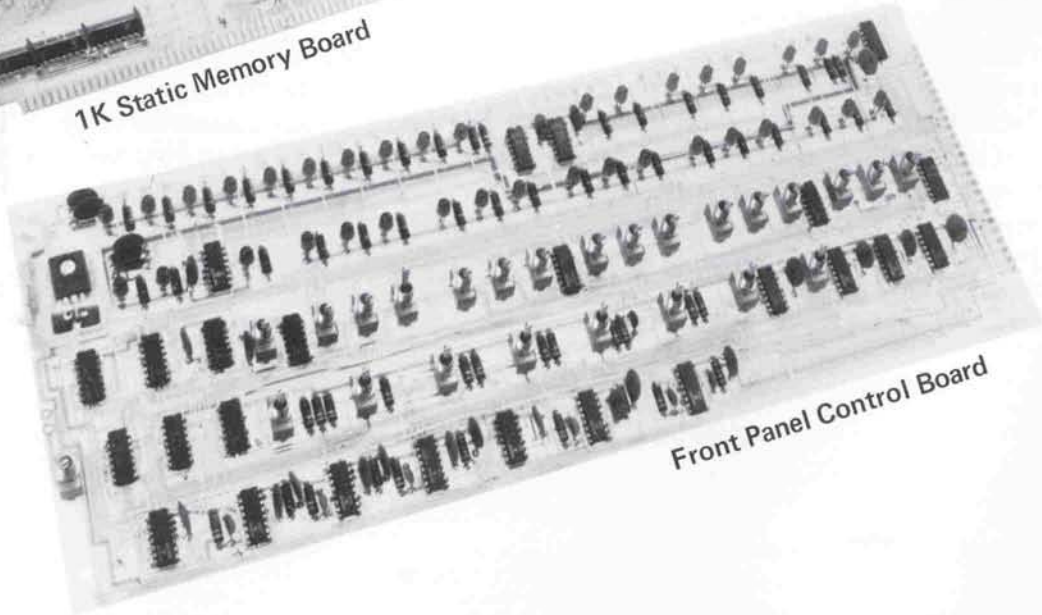
CPU Board



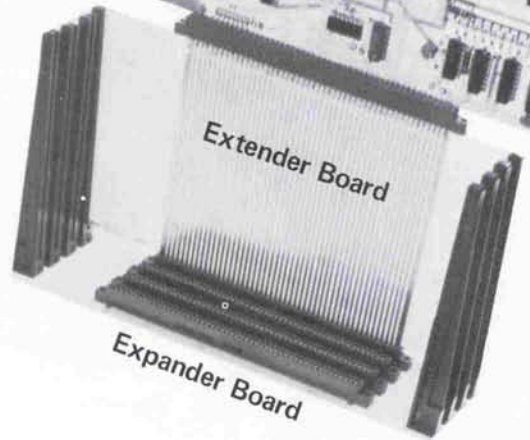
4K Dynamic Memory Board



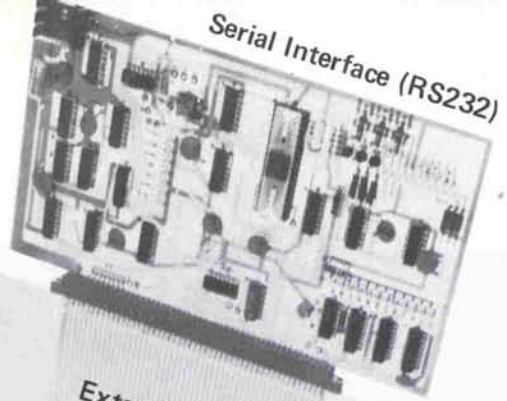
1K Static Memory Board



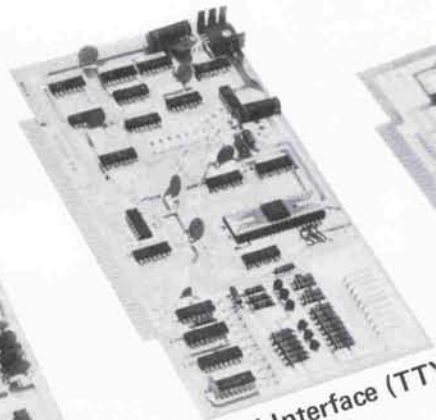
Front Panel Control Board



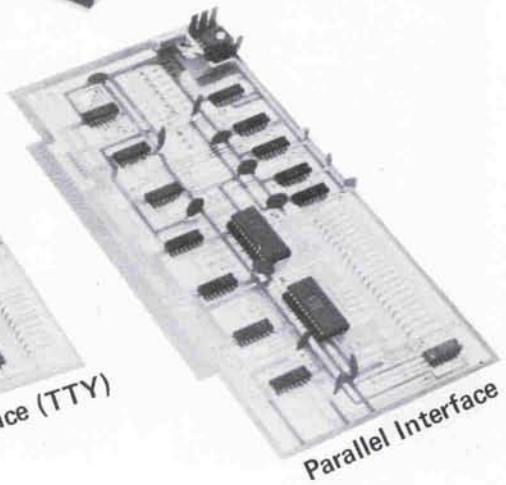
Expander Board



Serial Interface (RS232)



Serial Interface (TTY)



Parallel Interface

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.

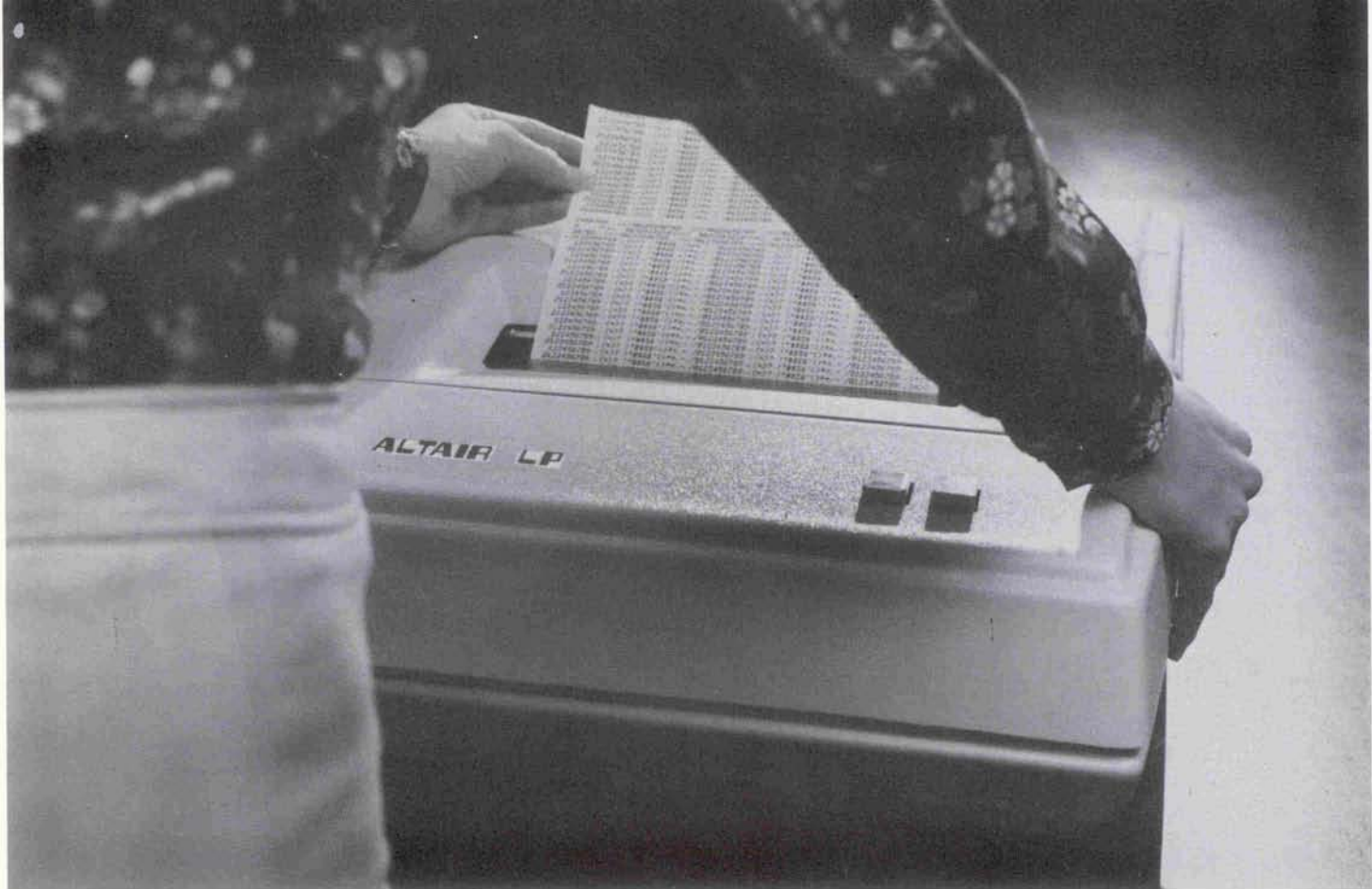
Comter II Computer Terminal

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 teletypewriter 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.

**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.

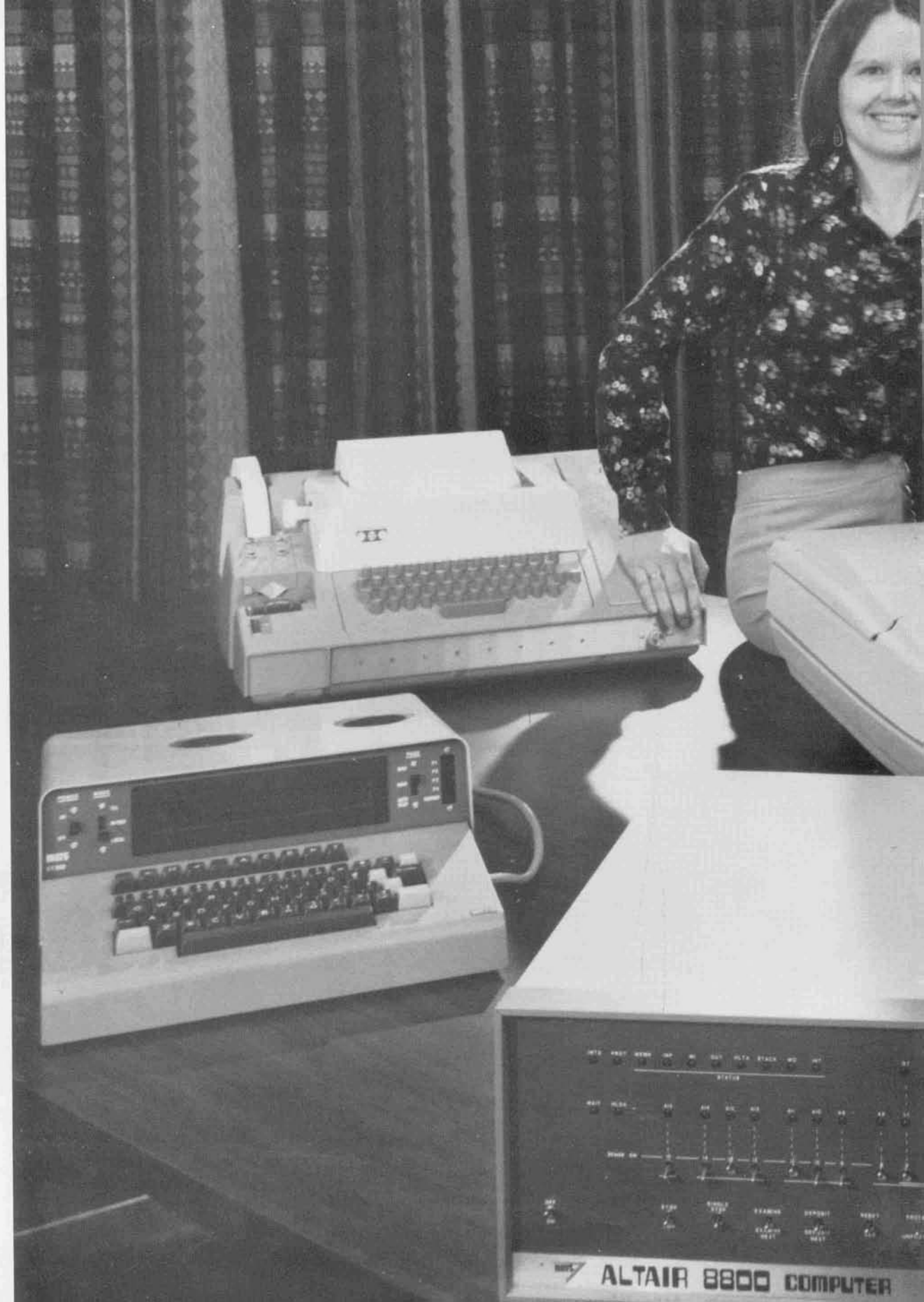
The Altair Floppy Disk consists of the Altair Disk Drive (Pertec FD 400) with power supply, cooling fan, disk buffer and address select electronics in all-aluminum case similar to Altair Computer case *and* the Altair Disk Controller (two cards).

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.

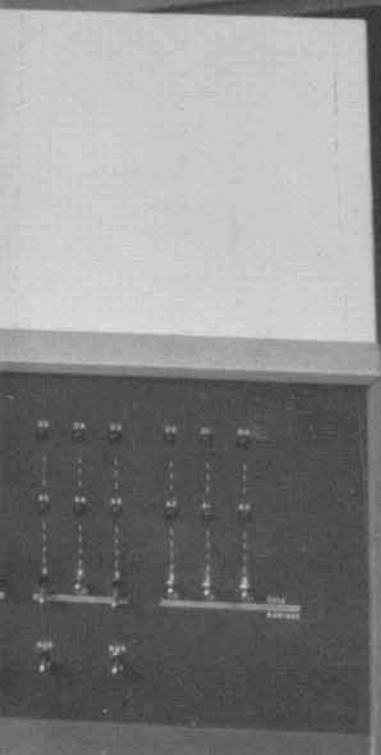
The Altair Disk Controller is capable of controlling up to 16 Altair Disk Drives.



HARDWARE



ALTAIR 8800 COMPUTER



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 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 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 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.

SOFTWARE

4K BASIC

STATEMENTS	COMMANDS	FUNCTIONS
IF... THEN ¹	END	RND
GOSUB	DATA	SQR
RETURN	LET ²	SIN
FOR	CLEAR ⁷	ABS
NEXT	SCRATCH	INT
READ	REM	SGN
INPUT	RESTORE	
STOP	PRINT ³	

NOTES: ¹ IF... THEN can be followed by a statement. Example: IF A<5 THEN PRINT B
² LET is optional in variable assignments. Example: A=5 is identical to LET A=5
³ 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: ? US ERROR IN 50 would indicate a reference to an undefined statement in a GOTO, etc., during execution 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 10⁻³⁸ to 10³⁷.
- 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 ⁵	COS ATN
ON... GOSUB		LOG INP ⁴
DEF ⁶		EXP FRE ⁹
OUT ⁵		TAN POS

NOTES: ⁵ OUT sets status of a hardware I/O channel.
⁴ INP returns status of a hardware I/O channel.
⁶ DEF allows for single variable single statement user defined functions.
⁸ CONT continues program execution after Control C or STOP.
⁹ FRE 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-dimensional (up to 255) arrays for both strings and numbers.
- AND, OR, NOT operators can be used in IF statements or formulas.
- STRINGS
 - 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.
 - RIGHTS\$ — Return substrings of specified string formulas; beginning at
 - LEFT\$ — leftmost character (LEFT\$) or ending at rightmost (RIGHT\$) or beginning at specified position (MID\$) 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

Mnemonic	Description	Instruction Code (1)								Clock (2) Cycles
		D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀	
MOV r ₁ , r ₂	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
MOV r, M	Move memory to register	0	1	D	D	D	1	1	0	7
HLT	Halt	0	1	1	1	0	1	1	0	7
MVI r	Move immediate register	0	0	D	D	D	1	1	0	7
MVI M	Move immediate memory	0	0	1	1	0	1	1	0	10
INR r	Increment register	0	0	D	D	D	1	0	0	5
DCR r	Decrement register	0	0	D	D	D	1	0	1	5
INR M	Increment memory	0	0	1	1	0	1	0	0	10
DCR M	Decrement memory	0	0	1	1	0	1	0	1	10
ADD r	Add register to A	1	0	0	0	0	S	S	S	4
ADC r	Add register to A with carry	1	0	0	0	1	S	S	S	4
SUB r	Subtract register from A	1	0	0	1	0	S	S	S	4
SBB r	Subtract register from A with borrow	1	0	0	1	1	S	S	S	4
ANA r	And register with A	1	0	1	0	0	S	S	S	4
XRA r	Exclusive Or register with A	1	0	1	0	1	S	S	S	4
ORA r	Or register with A	1	0	1	1	0	S	S	S	4
CMP r	Compare register with A	1	0	1	1	1	S	S	S	4
ADD M	Add memory to A	1	0	0	0	0	1	1	0	7
ADC M	Add memory to A with carry	1	0	0	0	1	1	1	0	7
SUB M	Subtract memory from A	1	0	0	1	0	1	1	0	7
SBB M	Subtract memory from A with borrow	1	0	0	1	1	1	1	0	7
ANA M	And memory with A	1	0	1	0	0	1	1	0	7
XRA M	Exclusive Or memory with A	1	0	1	0	1	1	1	0	7
ORA M	Or memory with A	1	0	1	1	0	1	1	0	7
CMP M	Compare memory with A	1	0	1	1	1	1	1	0	7
ADI	Add immediate to A	1	1	0	0	0	1	1	0	7
ACI	Add immediate to A with carry	1	1	0	0	1	1	1	0	7
SUI	Subtract immediate from A	1	1	0	1	0	1	1	0	7
SBI	Subtract immediate from A with borrow	1	1	0	1	1	1	1	0	7
ANI	And immediate with A	1	1	1	0	0	1	1	0	7
XRI	Exclusive Or immediate with A	1	1	1	0	1	1	1	0	7
ORI	Or immediate with A	1	1	1	1	0	1	1	0	7
CPI	Compare immediate with A	1	1	1	1	1	1	1	0	7
RLC	Rotate A left	0	0	0	0	0	1	1	1	4
RRC	Rotate A right	0	0	0	0	1	1	1	1	4
RAL	Rotate A left through carry	0	0	0	1	0	1	1	1	4
RAR	Rotate A right through carry	0	0	0	1	1	1	1	1	4
JMP	Jump unconditional	1	1	0	0	0	0	1	1	10
JC	Jump on carry	1	1	0	1	1	0	1	0	10
JNC	Jump on no carry	1	1	0	1	0	0	1	0	10
JZ	Jump on zero	1	1	0	0	1	0	1	0	10
JNZ	Jump on no zero	1	1	0	0	0	0	1	0	10
JP	Jump on positive	1	1	1	1	0	0	1	0	10
JM	Jump on minus	1	1	1	1	1	0	1	0	10
JPE	Jump on parity even	1	1	1	0	1	0	1	0	10
JPO	Jump on parity odd	1	1	1	0	0	0	1	0	10
CALL	Call unconditional	1	1	0	0	1	1	0	1	17
CC	Call on carry	1	1	0	1	1	1	0	0	11/17
CNC	Call on no carry	1	1	0	1	0	1	0	0	11/17
CZ	Call on zero	1	1	0	0	1	1	0	0	11/17
CNZ	Call on no zero	1	1	0	0	0	1	0	0	11/17
CP	Call on positive	1	1	1	1	0	1	0	0	11/17
CM	Call on minus	1	1	1	1	1	1	0	0	11/17
CPE	Call on parity even	1	1	1	0	1	1	0	0	11/17
CPO	Call on parity odd	1	1	1	0	0	1	0	0	11/17
RET	Return	1	1	0	0	1	0	0	1	10
RC	Return on carry	1	1	0	1	1	0	0	0	5/11
RNC	Return on no carry	1	1	0	1	0	0	0	0	5/11

Mnemonic	Description	Instruction Code (1)								Clock (2) Cycles
		D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀	
RZ	Return on zero	1	1	0	0	1	0	0	0	5/11
RNZ	Return on no zero	1	1	0	0	0	0	0	0	5/11
RP	Return on positive	1	1	1	1	0	0	0	0	5/11
RM	Return on minus	1	1	1	1	1	0	0	0	5/11
RPE	Return on parity even	1	1	1	0	1	0	0	0	5/11
RPO	Return on parity odd	1	1	1	0	0	0	0	0	5/11
RST	Restart	1	1	A	A	A	1	1	1	11
IN	Input	1	1	0	1	1	0	1	1	10
OUT	Output	1	1	0	1	0	0	1	1	10
LXI B	Load immediate register Pair B & C	0	0	0	0	0	0	0	1	10
LXI D	Load immediate register Pair D & E	0	0	0	1	0	0	0	1	10
LXI H	Load immediate register Pair H & L	0	0	1	0	0	0	0	1	10
LXI SP	Load immediate stack pointer	0	0	1	1	0	0	0	1	10
PUSH B	Push register Pair B & C on stack	1	1	0	0	0	1	0	1	11
PUSH D	Push register Pair D & E on stack	1	1	0	1	0	1	0	1	11
PUSH H	Push register Pair H & L on stack	1	1	1	0	0	1	0	1	11
PUSH PSW	Push A and Flags on stack	1	1	1	1	0	1	0	1	11
POP B	Pop register pair B & C off stack	1	1	0	0	0	0	0	1	10
POP D	Pop register pair D & E off stack	1	1	0	1	0	0	0	1	10
POP H	Pop register pair H & L off stack	1	1	1	0	0	0	0	1	10
POP PSW	Pop A and Flags off stack	1	1	1	1	0	0	0	1	10
STA	Store A direct	0	0	1	1	0	0	1	0	13
LDA	Load A direct	0	0	1	1	1	0	1	0	13
XCHG	Exchange D & E, H & L Registers	1	1	1	0	1	0	1	1	4
XTHL	Exchange top of stack, H & L	1	1	1	0	0	0	1	1	18
SPHL	H & L to stack pointer	1	1	1	1	1	0	0	1	5
PCHL	H & L to program counter	1	1	1	0	1	0	0	1	5
DAD B	Add B & C to H & L	0	0	0	0	1	0	0	1	10
DAD D	Add d & E to H & L	0	0	0	1	1	0	0	1	10
DAD H	Add H & L to H & L	0	0	1	0	1	0	0	1	10
DAD SP	Add stack pointer to H & L	0	0	1	1	1	0	0	1	10
STAX B	Store A indirect	0	0	0	0	0	0	1	0	7
STAX D	Store A indirect	0	0	0	1	0	0	1	0	7
LDAX B	Load A indirect	0	0	0	0	1	0	1	0	7
LDAX D	Load A indirect	0	0	0	1	1	0	1	0	7
INX B	Increment B & C registers	0	0	0	0	0	0	1	1	5
INX D	Increment D & E registers	0	0	0	1	0	0	1	1	5
INX H	Increment H & L registers	0	0	1	0	0	0	1	1	5
INX SP	Increment stack pointer	0	0	1	1	0	0	1	1	5
DCX B	Decrement B & C	0	0	0	0	1	0	1	1	5
DCX D	Decrement D & E	0	0	0	1	1	0	1	1	5
DCX H	Decrement H & L	0	0	1	0	1	0	1	1	5
DCX SP	Decrement stack pointer	0	0	1	1	1	0	1	1	5
CMA	Complement A	0	0	1	0	1	1	1	1	4
STC	Set carry	0	0	1	1	0	1	1	1	4
CMC	Complement carry	0	0	1	1	1	1	1	1	4
DAA	Decimal adjust A	0	0	1	0	0	1	1	1	4
SHLD	Store H & L direct	0	0	1	0	0	0	1	0	16
LHLD	Load H & L direct	0	0	1	0	1	0	1	0	16
EI	Enable Interrupts	1	1	1	1	1	0	1	1	4
DI	Disable interrupt	1	1	1	1	0	0	1	1	4
NOP	No-operation	0	0	0	0	0	0	0	0	4

NOTES: 1. DDS or SSS - 000 D - 011 E - 100 B - 001 C - 010 H - 101 L - 110 Memory - 111 A.

2. Two possible cycle times, (5/11) indicate instruction cycles dependent on condition flags.

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.

- I. 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 REQUIREMENT	SPACE REQUIREMENT
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 adding 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

INTERFACE BOARDS

NAME & NUMBER	DESCRIPTION	APPLICATION	INTERFACE REQUIREMENT	SPACE REQUIREMENT
88-DMAC Direct Memory Access 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 Direct 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 Direct 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		
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 conventional RS232 type peripherals.	Conventional 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

INPUT/OUTPUT DEVICES

NAME & NUMBER	DESCRIPTION	APPLICATION	INTERFACE REQUIREMENT	SPACE REQUIREMENT
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 channels 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, 1000 microseconds, 10 milliseconds or 100 milliseconds.	Any real time system or data logging system.	Requires Vectored Interrupt	fits on Vectored Interrupt card
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	Same as CT256 except that it has tape play/record feature instead of acoustic coupler and 256 character memory that is not expandable.	Computer terminal with Alpha-numeric display and mass storage capability.	88-SIOA Serial I/O	
88-TTY Teletype	Standard ASR-33 Teletype. 72 character page width, full ASCII keyboard, 10 cps paper tape reader and punch.	Any application requiring alpha-numeric data in print-out form.	88-SIOC	
88-80LP Line Printer	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).	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 Controller 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
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	

MISC. OPTIONS

NAME & NUMBER	DESCRIPTION	APPLICATION	INTERFACE REQUIREMENT	SPACE REQUIREMENT
88-EXC Extender Card	Double-sided circuit board with edge connector 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.		

ORDERING INSTRUCTIONS

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Send purchase orders to: MITS/6328 Linn NE/Albuquerque, NM 87108.

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- 5) Canada, Hawaii & Alaska, postage charges subject to quotation

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NOTE: Prices, specifications, future development and delivery subject to change

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MEMORY OPTIONS

(new since first printing of catalog)

NAME & NUMBER	DESCRIPTION	APPLICATION	INTERFACE REQUIRE- MENT	SPACE REQUIRE- MENT
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

MITS ALTAIR 8800-IDS Industrial Development System

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

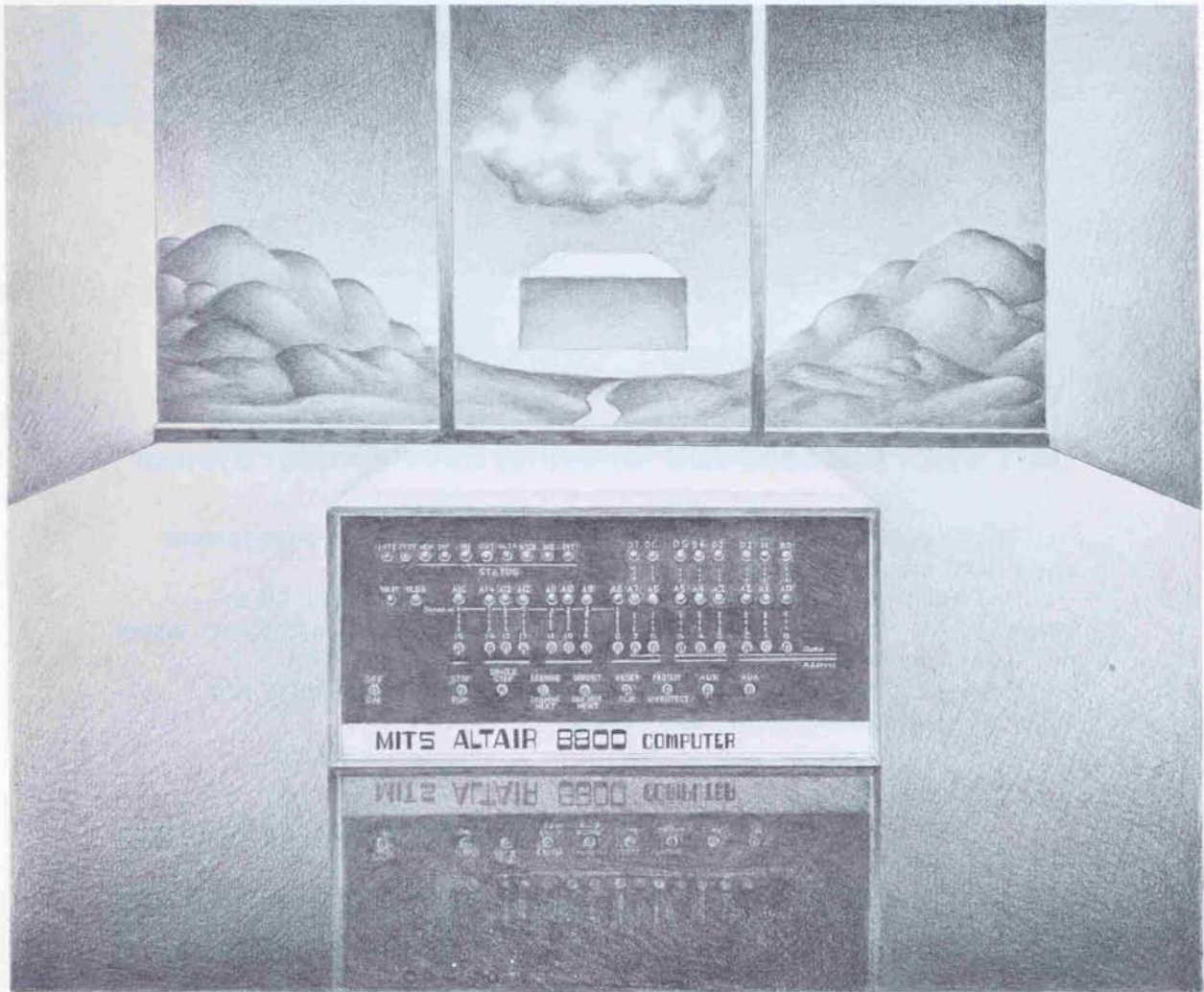
The Industrial Development System includes an Altair 8800, 8K of dynamic RAM memory, teletype or RS232 interface, PROM programmer, loader on PROM, and software on cassette or punched tape.

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

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