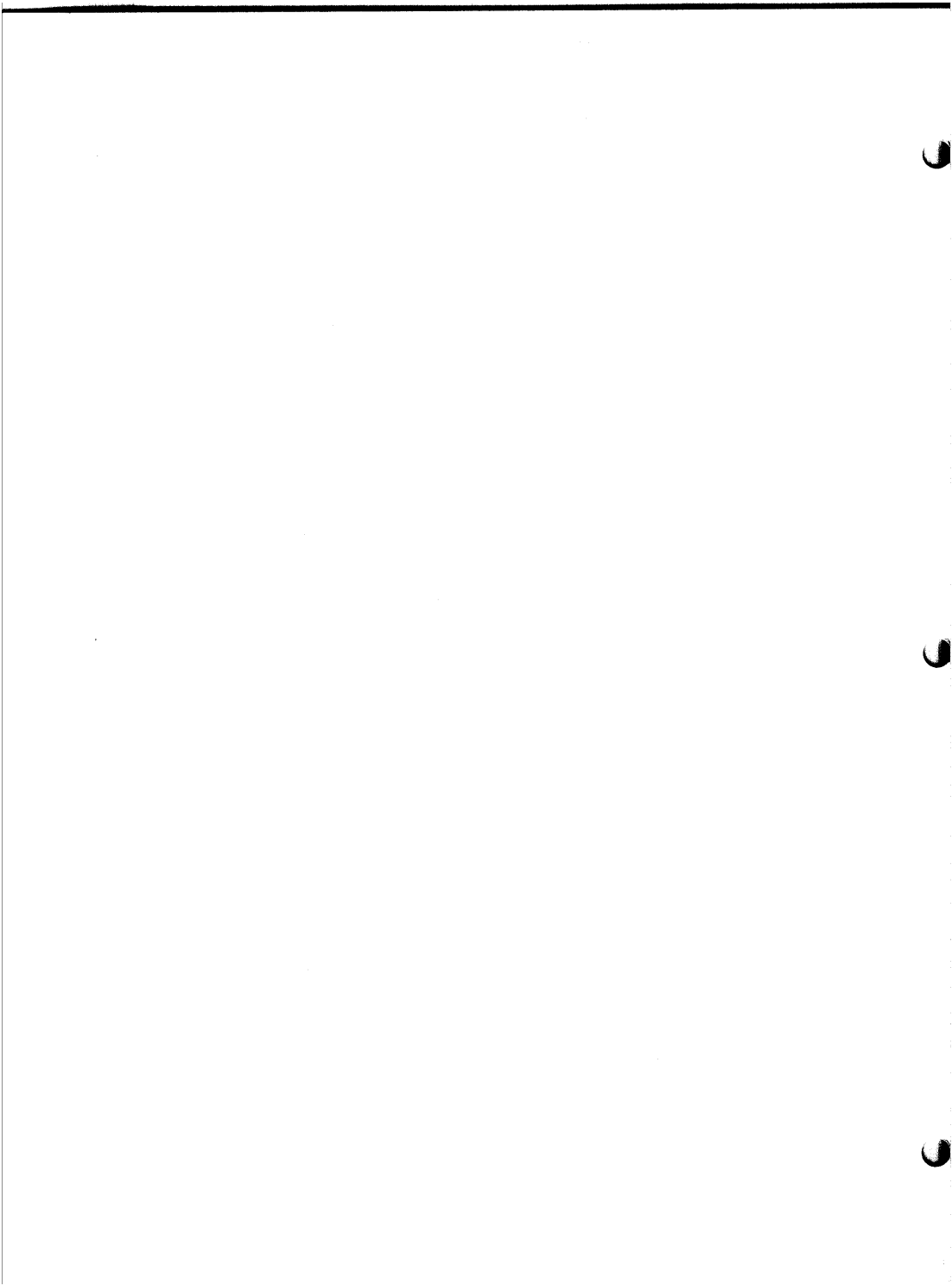**mits**

January 15, 1976

Altair 680 UPDATE INFORMATION

Due to delays in shipment of the first generation Altair 680, it has been decided to upgrade all Altair 680's to the second generation design. This means that the Altair 680 will include the following items at no additional cost:

1) PROM monitor. 1702A PROM chip programmed so that you can immediately load paper tape. Also contains interrupt vectors for software, reset, maskable, and non-maskable interrupts.

2) Asynchronous Communication Interface Adapter (ACIA). Allows machine to transmit and receive a character at a time rather than one bit. Minimizes software needed for I/0 routines. Containes crystal clock for baud rate synchronization. User-selectable for RS232, TTL, 60 mA, or 20 mA current loop. Baud rates of 110, 150, 300, 1200, and 2400.

3) Compatible with all Motorola 6800 software. This software will be available from MITS, Inc.

While these changes will greatly enhance the Altair 680, this change will cause a 30-60 day delay in delivery schedule.

2450 ALAMO SE, ALBUQUERQUE, NEW MEXICO 87106

MITS ALTAIR 8800

Price List

Part Number	Description	Kit	Assem	Days Delivery
8800	Altair 8800 Computer	$ 439.00	$ 621.00	60
COMTER II	Terminal w/Audio Cassette I/0	780.00	920.00	60
CT-256	Comter 256 Terminal	745.00	885.00	45-60
CT257,8 or 9	Pages 2, 3, or 4 for CT-256	95.00	105.00	45-60
CT-8096	CRT Terminal	TBD	TBD	TBD
88-VLCT	Low Cost Terminal	129.00	169.00	45-60
88-80LP	Line Printer & Controller	1,750.00	1,975.00	60
88-TTY	Teletype ASR-33	1,500.00	1,500.00	60
88-MM	Adds 256 words to 88-MCS	14.00	26.00	30
88-1MCS	1K Static Memory	97.00	139.00	30
88-4MCD	4K Dynamic Memory	195.00	275.00	60
88-DCDD	Disc Controller & 1 Drive	1,480.00	1,980.00	60
88-DISC	Disc Drive in Cabinet	1,180.00	1,600.00	60
88-DMAC	Direct Memory Access Cont.	98.00	149.00	TBD
88-DMAE	Direct Memory I/0 Channel	126.00	186.00	TBD
88-DMAI	Direct Memory I/0 Channel	123.00	183.00	TBD
88-4PIO	4 Port Parallel I/0	86.00	112.00	30
88-PP	Extra Port on 4PIO	30.00	39.00	30
88-2SIO	2 Port Serial Board (State I/0)	115.00	144.00	30
88-SP	Extra Port for 2SIO Board	24.00	35.00	30
88-EC	Expander Mother Board only	16.00	31.00	30
88-MB	88-EC inc. connectors and card guides	65.00	138.00	30
88-EBC	Expander Cabinet	394.00	485.00	60
88-EXC	Extender Card	57.00	83.00	30
88-ACR	Audio Cassette Record Interface	128.00	174.00	30
88-VI	Vectored Interrupt	126.00	179.00	90
88-RTC	Real Time Clock	53.00	84.00	90
88-PPCB	Prototype PC Board	57.00	84.00	30
88-FAN	Cooling Fan	16.00	20.00	30
88-FMC	PROM Memory Card (no PROM's)	65.00	128.00	60
88-PROM	PROM's (256 x 8 Bytes)	25.00	37.00	60
88-PPC	PROM Programmer Card	CONTACT FACTORY		90
25DB	I/0 Socket for Cabinet Case	11.00	25.00	30
MS-416	MITScope--4 channel scope	127.00	189.00	30
680F	680 MPU Unit (Assem state I/0)	345.00	420.00	60
680T	680 Less Front Panel	280.00		60
680 CPU Bd	CPU Board w/microprocessor chip	195.00	275.00	60
680 PROM	256 x 8-Bit PROM	25.00	37.00	60
680FAN	Peewee Fan Option	16.00	20.00	60
680Socket	680 IC Socket Option	29.00	42.00	60

NOTE   Prices, specifications, development and delivery all subject to change without notice.

Suggested 8800 System Prices	Kit	Assem	Days Delivery
System I ALTAIR Basic I	1,712.00	2,265.00	60
System II ALTAIR Extended Basic II	1,893.00	2,566.00	60
System III ALTAIR DOS/Basic III	4,714.00	6,397.00	90
System IV ALTAIR Extended Engr/Acctg IV	7,938.00	9,985.00	120

(To substitute teletype for COMTER II add $720.00 to kit or $580.00
to assembled price.)

Postage and Handling for systems will be subject to quotation.

Software for 8800 Systems

Prices for Purchasers of 8800 plus:

4K Basic	$150.00	4K memory, I/O	$ 60.00	30
8K Basic	$200.00	w/ 8K memory, I/O	$ 75.00	30
EXT Basic	$350.00	w/12K memory, I/O	$ 150.00	30
Package #1	$175.00	w/ 8K memory, I/O	$ 30.00	30
DOS	$500.00	w/12K memory, I/O	$ 150.00	60
DEBUG	$100.00	4K memory, I/O	$ 25.00	60

$15.00 copying charge for update copy or second copy
of above software. Copying charge in addition
to update charge will be imposed for those
updating their software.
PLEASE SPECIFY PAPER TAPE OR AUDIO TAPE WHEN ORDERING SOFTWARE
except for DOS which is available only on DISC.

Manuals

CT-256

Operator's	6.50	BASIC Language	
Assembly	10.00	Documentation	10.00
Theory of Operation	10.00		

8800

Operator's	7.50	} Special Offer--All Three
Assembly	9.00	Manuals in a Binder--$15.00
Theory of Operation	9.00	

680

Operator's	7.50	}
Assembly	7.50	} Special Offer--All Three
Theory of Operation	10.00	} Manuals in a Binder--$14.50

Postage & Terms

Terms: Cash with order, Mastercharge or Bankamericard
Postage & Handling:
       1. Add $8.00 for each terminal, computer, line printer
          and disc
       2. Add for Modular Boards
          a. -0- if ordered with computer
          b. $3.00 if ordered separately
       3. Postage included in price of manuals
       4. Teletype orders will be sent truck freight charges
          collect.
       5. Canada, Hawaii & Alaska postage charges subject to
          quotation.
    Above applies to domestic shipments in U.S.A. only. Overseas
shipment, unless otherwise specified are usually made by
airfreight via our shipping agents, Emery Airfreight, on
airfreight collect basis.

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Author: Gerhald Hansel
Length: 46 lines of Basic
Title: Addition problems
Produces a group of math addition
problems and answers. Written to
use PRINT USING, a feature of Ex-
tended Basic, to format its output.

#1020752 -- $2.00
Author: Lee Eastburn
Length: 290 locations
Title: Print program
Dumps a program with page headings,
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An interrupt level routine to switch
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Using the real-time-clock interrupts
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TVTDR is designed to overcome a de-
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The appropriate number of spaces are
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Instructions for interfacing to Altair
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Currently set up to multiply two 8-
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Title: ASCII Octal Loader and Dumper
The DUMP section outputs the contents
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characters except "Ø" through "7." The
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Title: VLCT load program
Allows entry of a load address and pro-
gram data in octal from a VLCT keyboard.
The entered data is displayed for veri-
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of start address as "XXX" so the program
can easily be located at the start of
any memory page (a block of 256 consec-
utive memory locations, the first loca-
tion of which has an address divisible
by 256 [decimal]).

#117751 -- $5.00
Author: S. Armstrong
Length: 124 instruction bytes (not
         including embedded NOPS)
         342 data bytes
Title: Punch tape label
Punches paper tape labels by using 5
tape frames to make a block letter. Can
"print" any alphabetic, numeric, or com-
mon delimeter. Additional characters
can easily be added. "Prints" an entire
line at once with separating blanks.

#117752 -- no charge
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Length: 318 bytes
Title: JAMON - a teletype monitor
This monitor allows examining (dumping)
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Title: GET - a "Lifeline" subroutine
A well-documented subroutine to per-
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LGET subroutines specified in the
lifeline article in Byte magazine.
(October 1975, pp. 34-41) Includes
test routine.

#1117752 -- $2.00
Author: George Rompot
Length: 25 bytes
Title: CHECK
A well-documented subroutine to cal-
culate a 16-bit sum of an area of
core specified in the calling param-
eters. Optionally checks the com-
puted checksum with a checksum pro-
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#1121751 -- $2.00
Author: Gary Tack
Length: 152 bytes
Title: Random Magic Squares
Generates 3 numbers which are used
to make a magic square (a 3x3 grid
in which the sums of the numbers in
each row, column and diagonal are
equal). All "magic squares" can be
generated since 3 numbers character-
ize a magic square. Each group of 3
numbers generates a distinct magic
square. Stores magic square infor-
mation in memory. Doesn't do any
input/output.

#1123751 -- $15.00
Author: Jim Gerow
Length: 33 pages
Title: A FORTRAN simulator for the
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A FORTRAN program to take as input
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[Altair/AMI 6800 MPU]
Computer Project

*Features compact size, simplified construction,
built-in TTY interface, and low cost*

LARGE SCALE integration (LSI)
has provided many useful
IC chips for the hobbyist. One of
the latest LSI devices is the micro-
processor unit (MPU), which has
made it possible to build micro-
computers that are fairly easy to
assemble at moderate cost. The
most popular MPU's are the 8008
and 8080 due to their reasonable
cost and wide availability in com-
puter kits.

However, many knowledgeable
hobbyists have been looking for a
microcomputer built around one
of a number of other MPU's avail-
able, just as some people would
like to try a diesel or steam engine
to replace the gasoline motor.
Most of these readers have told us
they were interested in the Mo-
torola M6800 MPU, for one rea-
son or another. Many also felt that
the price of a microcomputer was
still too high. POPULAR ELEC-
TRONICS is therefore pleased to
introduce the first microcomputer
using the 6800 MPU, in a design
that substantially reduces cost.

THE Altair 680 is a complete
microcomputer built around the
6800 MPU available from Motorola
and American Micro Systems, Inc.
Measuring a very compact 11-7/16 W
× 11-1/16 D × 4-11/16 H (28.8 × 28 ×
11.9 cm), the 680 is less than one-third
the size of the Altair 8800. Although
both computers have MPU's with the
same memory capacity, the 680's
smaller enclosure makes internal ex-
pandability significantly less. How-
ever it is more than adequate for most
applications. More importantly, the
680 costs less than half the price of the
8800 when the two machines are con-
figured similarly in a complete system.

Other attributes of the new compu-
ter include ease of assembly from the
large pc board, built-in TTY interface,
and high speed (its minimum cycle
time). The last is some 10 to 50 times
faster than earlier small computers
built around the 8008 MPU but not the
speed of the 8800.

Another important consideration
in a 6800 MPU computer design is the
array of instructional material readily
available from Motorola Semiconduc-
tor Products Inc., including the
M6800 Microprocessor Program-
ming Manual. Also, the 6800 is
compatible and uses just one 5-volt
power supply.
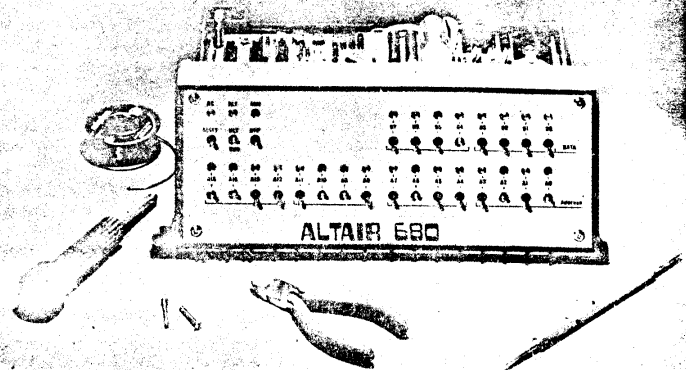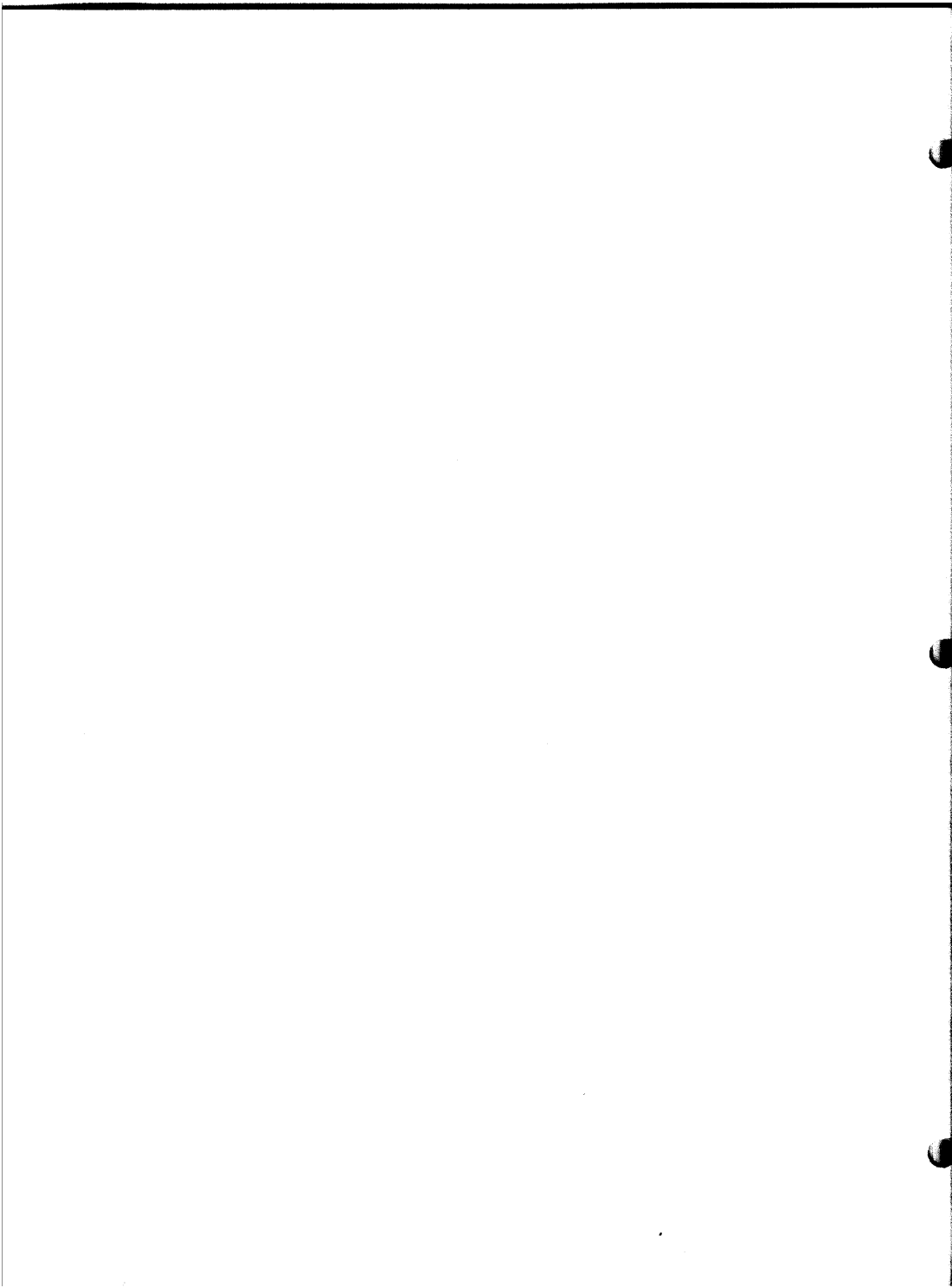
ALTAIR 680

ALTAIR COMPUTER COMPARISON CHART

Features	Altair 680	Altair 8800
Maximum word size	24 bits (byte oriented)	24 bits (byte oriented)
Arithmetic unit	8-bit parallel	8-bit parallel
Minimum cycle time	4 μs	2 μs
Program instructions	72	78
Maximum memory size	65k bytes	65k bytes
Internal expandability	5 interface cards	250 interface cards
Interrupt	3 levels	8 levels
MPU	6800 (Motorola, AMI)	8080 (Intel, TI)
Approximate system cost (lk memory, I/O, case, P/S)	$300	$600
Miscellaneous	Fewer parts 2 printed circuit boards Smaller size Built-in TTY interface	Minimum of 4 pc boards

MAIN BOARD PARTS LIST

BD1—Bridge rectifier (VJ048)
C1—3300-μF, 50-V electrolytic capacitor
C2,C3—100-μF, 50-V electrolytic capacitor
C4 to C9—0.33-μF, 50-V disc ceramic capacitor
C10,C13—0.1-μF, 16-V disc capacitor
C11,C12—0.33-μF, 16-V disc capacitor
C14—0.01-μF, 16-V disc capacitor
C15—1-μF, 50-V electrolytic capacitor
D1,D2,D7 to D12—1N4004 diode
D3 to D6—1N4739A, 9.1-V zener diode
F1—1-A, 250-V ac, 3-AG fuse
ICA—7404
ICB—7473
ICC,ICUU—7408
ICD,ICE,ICS—4449
ICF,ICG—74LS01
ICH,ICJ,ICK,ICL,ICM,ICN,ICP, ICR—2102
ICT,ICU,ICGG,ICHH,ICPP, ICRR—74L30

ICV—74L00
ICW—74L74
ICX,ICY,ICTT—4050
ICZ,ICAA,ICBB,ICCC—1702
ICDD,ICFF—74L04
ICEE,ICMM—74L10
ICJJ—6800
ICKK,ICLL,ICSS—74LS05
ICNN—74LS27
Q1,Q3,Q4—T1S98
Q2—EN3907
Except where noted, following resistors are ½-watt, 5%:
R1,R2—33 ohms, 2-watt, 5%
R3,R4,R5,R7—100 ohms
R6—130 ohms, 1-watt, 5%
R8,R11—800 ohms
R9—220 ohms, 1-watt, 5%
R10,R28 to R51—7500 ohms
R12,R15,R16,R17—1000 ohms
R13—470 ohms
R14,R20,R21—390 ohms
R18,R19—330 ohms
R22—33,000 ohms
R23,R24,R25,R60—10,000 ohms

R26,R27,R56,R57,R58,R59—not used
R52 to R55—3000 ohms
SP1—Spdt toggle switch
T1—5-volt, 1.2-A transformer
VR1—7805 regulator
XTAL—2-MHz crystal
Misc.—Fuse holder (Buss HKP-CC, line cord, fan (IMC 3⅜"), I/O socket (DB-255), sockets (14-pin, 22; 16-pin, 20; 24-pin, 4; 40-pin, 1), case optional).
Note—The following are available from MITS, 6328 Linn, N.E., Albuquerque, NM 87108: complete kit (all parts) #680F at $293; complete kit except for front panel board #680T at $240; kit #680MPU, including pc board, 6800 MPU, lk memory, and all main board components except power supply at $180; front panel and MPU pc boards #680PC at $48; I/O socket kit at $29; fan kit at $16; 256 x 8-bit PROM kit at $42; construction information package is free, with self-addressed stamped 9" x 12" envelope.
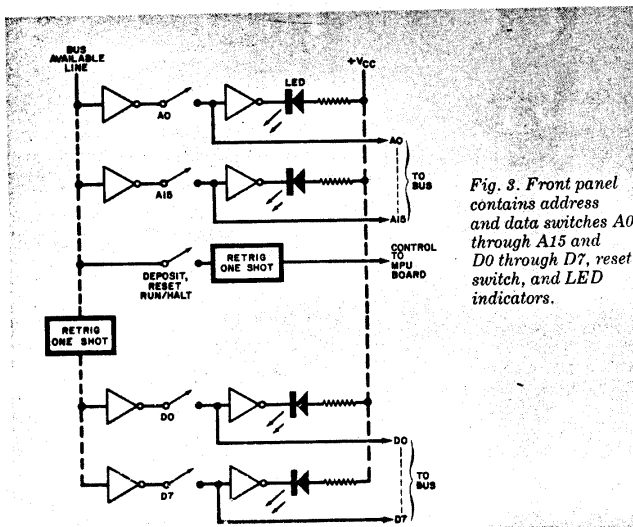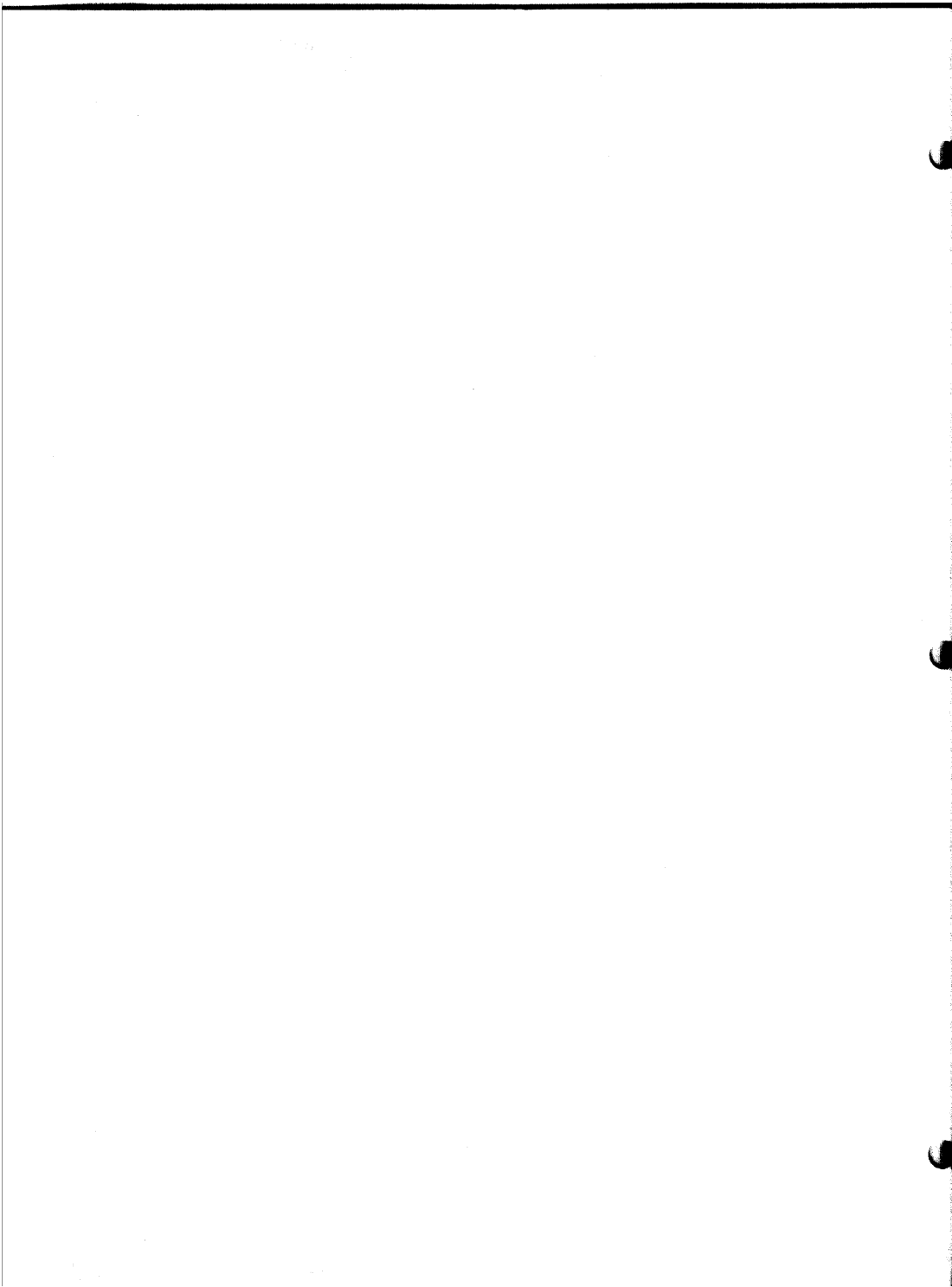

Fig. 3. Front panel contains address and data switches A0 through A15 and D0 through D7, reset switch, and LED indicators.
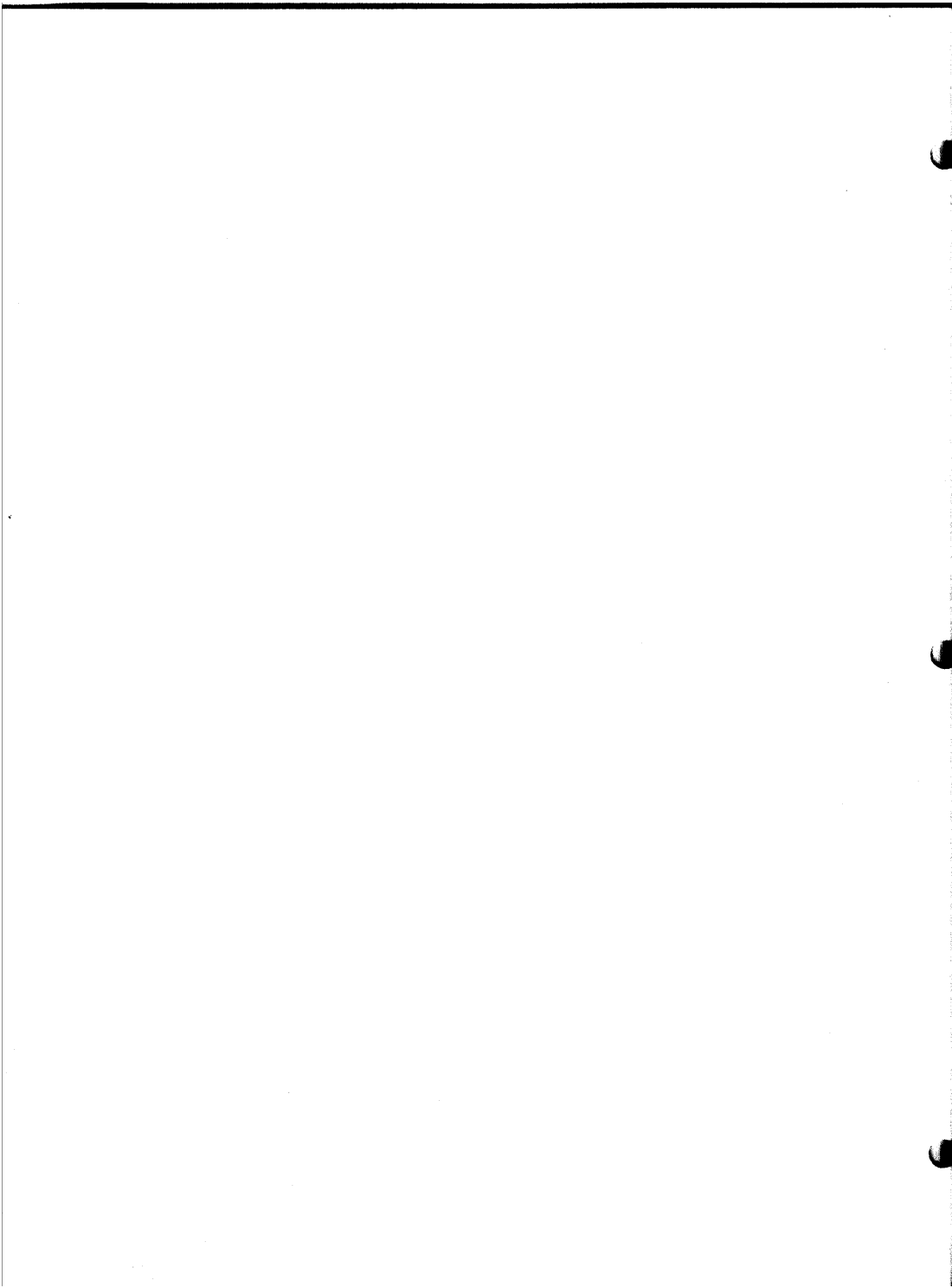
memory address location will then appear as lighted and unlighted LED's in the DATA display.

To change data in a location, the desired data is written via the DATA switches and entered by operating the DEPOSIT switch. This triggers a one-shot multivibrator, enabling the data information to the data bus and causing the R/W signal to go low. Since the address bus is already connected to the switches by being in the halt state, the write pulse causes the data to be written into the selected RAM address.

When the RESET switch is operated, the CPU resets. This, in turn, initiates a restart sequence. That is, the address bus is pulled to the high state and causes the hard-wired data in the board jumpers to be used as the restart address.
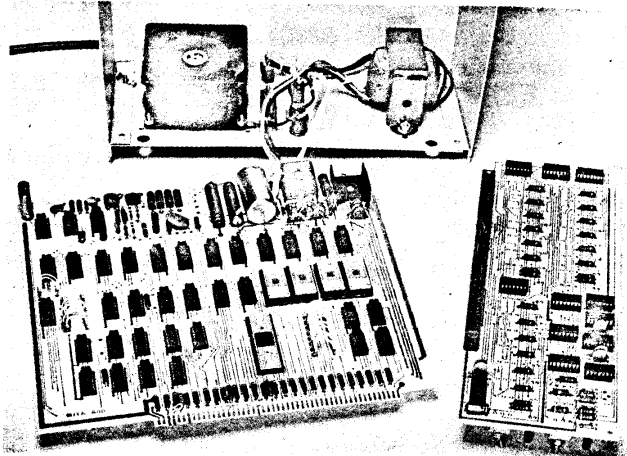
Access to the I/O port is gained by addressing location 17577 (in octal). A sequence of events then occurs that

Fig. 1. Basic internal arrangement
of 6800 MPU used in computer
is shown here in block-diagram form.

Basic System Philosophy. The basic MPU, memory, I/O (input/output), and power-supply circuits in the Altair 680 are located on a single printed circuit board. The addition of a compact power transformer makes this assembly a complete computer system. (Front-panel switch programming can be used, but in the absence of this assembly, PROM's or ROM's must be installed for programming.)

The front-panel assembly contains all the logic needed to reset, halt, or start the processor. Also, any memory cell can be read or written into from the front panel via 16 ADDRESS and eight DATA switches. Mounted on the front-panel circuit board is a 100-contact edge connector that permits the main MPU board to plug directly into the front panel, thus eliminating the need for a wiring harness. (In systems that do not use the front-panel assembly, the MPU board automatically starts running at an address specified by either a PROM or a hard-wired patch.) The front panel contains 27 LED's that indicate the state of each switch. As a safety measure, the POWER switch is located on

the back of the cabinet to obviate the possibility of its being accidentally operated during programming.

The basic computer contains 1024 bytes of memory and has provisions for an additional 1024 bytes of PROM or ROM memory. An I/O channel and interface are also included in the basic system. The I/O channel can be configured to interface RS-232 or a 20-mA or 60-mA TTY loop. This means that anyone who can obtain an old five-level Baudot-type Teletype—such as the MOD-15, MOD-19, etc.—can use it as a computer terminal. (Many such Teletypes are available for less than $100 and frequently for as little as $25 nationwide.)

The Altair 680 can be built with either a full-programmability or a "turn-key" front panel. The latter eliminates all controls except restarting the processor. There are a number of applications where this is desirable to eliminate the possibility of having an operator affect the contents of the memory or the computing cycle. An example might be in a sophisticated intruder-detection system where the only control provided for the operator is essentially on/off.

Software. The software associated with the 6800 MPU includes an editor, PROM monitor, and assembler, as contrasted to the editor, assembler, monitor and basic for the Altair 8800 computer.

System Details. The Altair 680 computer is composed of five sections: MPU and clock, memory, control and indication, I/O port, and power supply.

MPU and Clock. As mentioned earlier, the MPU and clock are the new 6800 LSI chip. Its basic internal arrangement is shown in Fig. 1. The main elements are instruction decode and control, instruction register, data and address registers and buffers, 16-bit index register, 16-bit program counter, 16-bit stack pointer, two 8-bit accumulators, condition code register, and ALU (arithmetic logic unit).

The timing and control inputs and outputs for the 6800 chip are:

Phase 1 and phase 2 clock (φ1,φ2)—a nonoverlapping 500-kHz clock at V_{cc}.

Address bus A0 through A15—16 high active outputs that determine address or I/O sections to use.

*Almost entire computer is assembled on a single large pc board
(left). Board at right is for front panel. Boards plug together.*

Data bus D0 through D7—eight high active bidirectional lines for transfer to and from memory and peripherals.

Halt signal (HLT)—low active input that ceases activity in the computer.

Read/write signal (R/W)—in the high state, signals the memory and peripherals that the MPU is in the read condition; in the low state, signals that the MPU is in the write condition.

Valid memory address (VMA) —signals external devices (memory and I/O) that the MPU has a valid address on the memory bus.

Data bus enable (DBE)—enables the bus drivers.

Bus available (BA)—indicates machine has stopped and address bus is available.

Reset (RES)—resets and starts the MPU from a power-off condition. A positive-going edge on this input tells the MPU to begin the restart sequence.

Interrupt request (IRQ)—when low, tells the MPU to start an interrupt sequence (save the registers on the stack, set interrupt mask bit high so no other interrupts can occur, and vector to the interrupt address). This type of interrupt can only occur if the interrupt mask bit in the condition code register is low.

Nonmaskable interrupt (NMI)—

essentially the same as the IRQ, except it is not dependent on the condition code register.

The clock is a 2-MHz crystal-controlled oscillator that uses a pair of inverters that drive flip-flops to form a 500-kHz, two-phase clock that is distributed to the MPU, memory, and I/O sections in the computer via inverters and buffers.

Memory. The memory system consists of 1024 words of 8-bit-wide RAM, using 2102-type 1024 × 1-bit devices, and up to 1024 words of PROM, using ultraviolet-erasable 1702 devices. The basic arrangement is shown in Fig. 2. The low-order address bits are fed to both the RAM's and PROM's.

Front Panel. The front panel assembly contains the RUN/HALT switch, with a LED for each switch position; a reset switch with no LED indicator; and the ac power ON LED indicator (Fig. 3). The 16 ADDRESS switches and eight DATA switches each have their own LED indicator.

The DEPOSIT, RESET, DATA, and ADDRESS switches are enabled only when the RUN/HALT switch is in the HALT position, at which time, a retriggerable one-shot multivibrator drives the halt input of the MPU low. This, in turn, drives the bus-available (BA) signal high and also conditions the other switches. To view the data in any memory location, the RUN/HALT switch must be placed in the HALT position and the ADDRESS switches set to the required address. The data at that
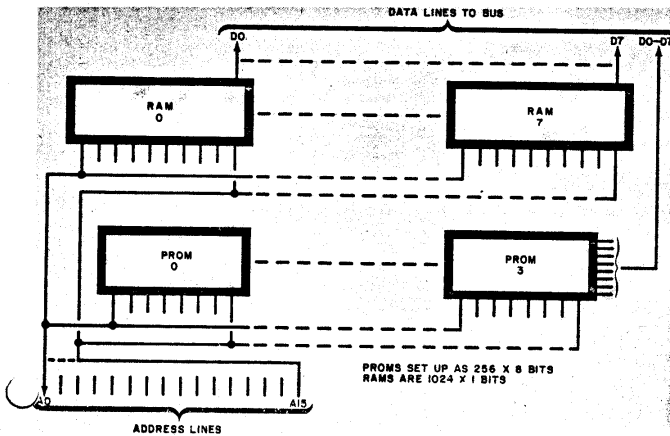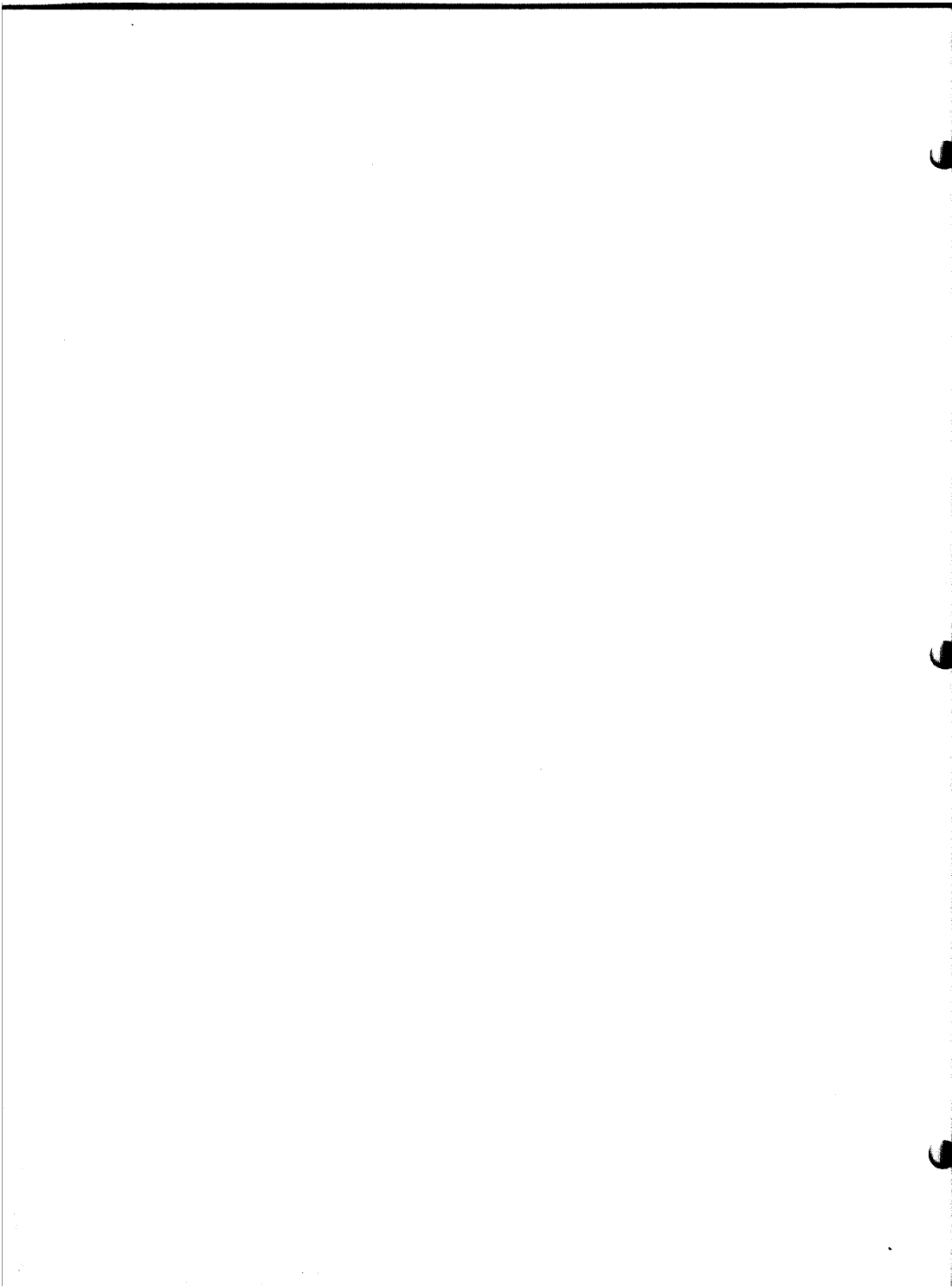

Fig. 2. There are eight RAM's (RAM 0 through RAM 7) and four PROM's (PROM 0 through PROM 3) in the computer's memory system.

causes an output to the built-in TTY output jack and at the Teletype itself.

Power Supply. The main 5-volt line is generated within the computer by a conventional bridge rectifier, filter capacitor, and IC regulator circuit. A 32-volt winding on the transformer is used to generate the unregulated ±16 volts required for the TTY interface system, while a −16-volt line is fed to four zener-diode-regulated outputs to provide four 9-volt lines for the PROM's.

Construction. The actual-size etching and drilling guides for the computer boards are larger than our page size. Rather than reducing or cutting them up to fit our pages, a free construction package is available. If you wish to obtain a construction information package, simply send a self-addressed stamped 9″ × 12″ envelope to the address given at the end of the Parts List.

The construction package contains full-size schematics, full-size etching and drilling guides, component-placement diagrams, and front-panel layout. ◈

CRAMER ELECTRONICS ENTERS OEM COMPUTER KIT MARKET

THE major reason for the tremendous success of the various computer kits on the market is that they save considerable time. One doesn't have to hunt down the MPU's, memories, etc., that must be accumulated before embarking on a home computer project. It appears that OEM engineers are also spending considerable time in hunting down computer parts. Cramer Electronics, one of the leading U.S. electronic parts distributors, has decided to enter the computer kit business, with emphasis on the OEM market.

Cramer is starting with three kits, separately based on the Intel 8080, Motorola 6800, and Texas Instruments TMS8080 MPU's. Each of the kits shares a common $495 price tag.

You get a lot for $495: complete color-coded schematic diagram; RAM with 1024 (8-bit) bytes, expandable to 65 k bytes; erasable PROM with 1024 (8-bit) bytes; support circuitry, including clock, complete buffering, control and synchronization logic, interrupts, DMA controls; etc. The PROM gives you a program to run at the outset. There are at least four 8-bit-wide input and output ports, with expandability to 512 ports, decoding for 16 of which is included.
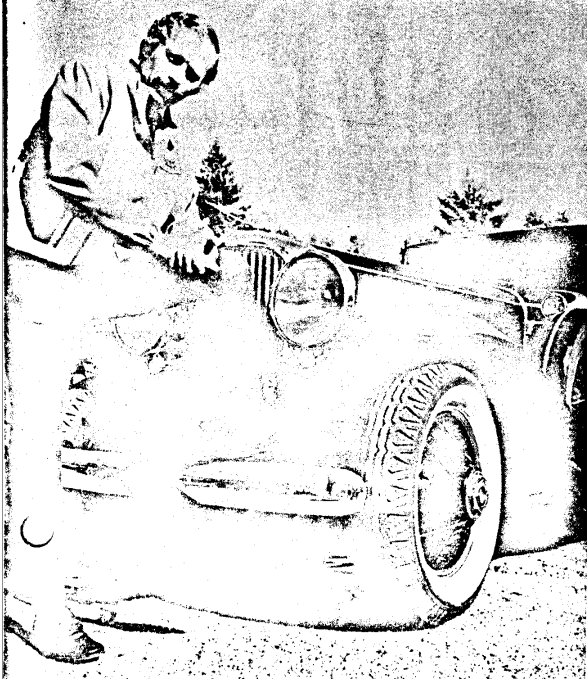
The PROM contains a system monitor to permit the computer to be used as soon as it is assembled. Programs can be entered, modified, examined, and executed under switch control or by typed-in commands. A cassette program, included with the kit, can be used to debug the computer. Finally, a complete user manual gives hints on programming and how to expand the computer.

All together, there are about 190 parts in each kit, adding up to a total catalog value of some $700. Software is included in the kits to help in programming via front-panel switches and LED's, cassette tape, Teletypewriter, or any RS-232-compatible terminal. Not supplied are printed circuit boards, power supply, and cabinet.

For more information about the new computer kits, write to: Cramer Electronics, Inc., 65 Wells Ave., Newton, MA 02159. ◈

MITS ALTAIR 8800

PRICE LIST

AUG.1,1975

PART NUMBER	DESCRIPTION	KIT	ASSEM	DAYS DELIVERY
Computers, Terminals & Line Printer				
*8800	Altair 8800 Computer	$ 439.00	$ 621.00	60
COMTER II	Terminal w/ Built in Audio Cassette I/0	780.00	920.00	60
CT-256	Comter 256 Terminal	745.00	885.00	45-60
CT-256	Comter 256 in Aluminum Suitcase	--	965.00	90
CT257, 8 or 9	Pages 2, 3 or 4 for CT-256	95.00	105.00	45-60
CT-8096	CRT Terminal	TBD	TBD	TBD
88-VLCT	Low Cost Terminal	129.00	169.00	45-60
88-80LP	Line Printer & Controller. 110 char/sec	1,750.00	1,975.00	90
88-TTY	Teletype ASR-33	1,500.00	1,500.00	60-90
Memory				
88-MM	Adds 256 words to 88-MCS	14.00	26.00	60
88-1MCS	1K Static Memory	97.00	139.00	60
88-2MCS	2K Static Memory	145.00	195.00	60
88-4MCD	4K Dynamic Memory	264.00	338.00	60
88-DCDD	Disc Controller, 1 Disc Drive & Multiplexer	1,480.00	1,980.00	60
88-DISC	Disc Drive in cabinet with added Multiplexer	1,180.00	1,600.00	60
88-DMAC	Direct Memory Access Controller	98.00	149.00	TBD
88-DMAE	Direct Memory I/0 Channel--External	126.00	186.00	TBD
88-DMAI	Direct Memory I/0 Channel--Internal	123.00	183.00	TBD
I/0 and Expansion Devices				
88-PIO	Parallel I/0	92.00	114.00	60
88-SIOA	Serial I/0 RS-232 compatible	119.00	138.00	60
88-SIOB	Serial I/0--TTL	124.00	146.00	60
88-SIOC	Serial I/0--TTY	124.00	146.00	60
*88-EC	Expander Mother Board (adds 4 slots to 8800)	16.00	31.00	60
88-MB	88-EC including all edge connectors and card guides	65.00	138.00	30
88-EBC	Expander Cabinet (add'l case, P/S, etc. for 16 slots)	394.00	485.00	60
88-EXC	Extender Card	57.00	83.00	60
88-ACR	Audio Cassette Record Interface	128.00	174.00	60
Miscellaneous				
88-VI	Vectored Interrupt	126.00	179.00	90
88-RTC	Real Time Clock	53.00	84.00	90
88-ACC	Altair Cyclops Camera	180.00	235.00	90
88-CCC	Camera Controller Card	260.00	340.00	90
88-KB	ASCII Keyboard	198.00	254.00	60
88-32DU	32 char Alpha/Numeric Display	498.00	549.00	60
88-PPCB	Prototype P.C. Board	57.00	84.00	60
88-FAN	Cooling Fan	16.00	20.00	15
88-25DB	Pr. Connectors--1 each 7325-DB25P & S + cover	11.00	11.00	15
MS-416	MitScope--4 channel scope	127.00	189.00	60
PROM				
88-PMC	PROM Memory Card (Holds 2K Bytes)	CONTACT FACTORY		90
88-PROM	PROM'S (256x8 Bytes)	CONTACT FACTORY		90
88-PPC	PROM Programmer Card	CONTACT FACTORY		90

Suggested Systems

		KIT	ASSEM	DELIVERY DAYS
I	ALTAIR Basic I	1,850.00	2,391.00	60
II	ALTAIR Extended Basic II	2,100.00	2,755.00	60
III	ALTAIR DOS/Basic III	4,990.00	6,649.00	90
IV	ALTAIR Extended Engr/Acct'g IV	8,490.00	10,489.00	120

(To substitute teletype for Compter II add $720 to kit or $580 to assembled price.)

Postage & handling is $16 for Systems I, II & III and $40 for System IV.

Software

Purchasers of 8800 plus:

4K BASIC	$350.00	4K memory, I/O	$60.00	15
8K BASIC	$500.00	8K memory, I/O	$75.00	15
EXT BASIC	$750.00	12K memory, I/O	$150.00	60
Package 1	$500.00	8K memory, I/O	$30.00	15
DOS	$500.00	12K memory, I/O	$150.00	90
DEBUG	$100.00	4K memory, I/O	$25.00	30

4K 8K Source..........................$3000.00*
DEBUG Source..........................$75.00

*OEM's contact factory. End-user price.

NOTE: Software cannot be shipped until Software License Agreement is received by factory. Specify paper tape or audio tape when ordering.

Miscellaneous Parts

		KIT	ASSEM	DELIVERY DAYS
(A)	P/N 88-CPU Complete CPU Board	310.00	360.00	60

USERS GROUP ...$30/yr free w/8800 (Foreign add $5)

Manuals - Terminal CT-256

Operators	$ 6.50
Assembly	10.00
Theory of Operation, Schematics & Trouble Shooting	10.00

Manuals - Altair 8800 Computer

Operators	7.50
Assembly	9.00
Theory of Operation, Schematics & Trouble Shooting	9.00
One year up-to-date to theory manual	10.00

BASIC Language Documentation...........$10.00
Assembler, Monitor, Editor.............$7.50
Debug..................................$5.00

Manuals - Modular Boards

Combination Operators & Assembly (each)	5.00

Postage & Terms

-- Terms: Cash with order, Mastercharge or Bankamericard
-- Postage & Handling:
1) Add $8.00 each for Terminal, Line Printer, Teletype and Disc
2) Add for Modular Boards
   (a) -0- if ordered with computer
   (b) $3.00 if ordered separately
3) Postage included in price of manuals
4) Canada, Hawaii & Alaska, postage charges subject to quotation.

(*) Note: Basic unit has 4 slots available, one of which is used up with CPU Board. When ordering more than 3 added boards, added 88-EC required for each 4 boards.

(**) Note: Manuals are included at no cost with purchased units.

NOTE: Prices, specifications, development and delivery all subject to change without notice.