KIM System Products

For use with the KIM-1™ Microcomputer Board

Systems Sales Division
MOS Technology
A Commodore Company
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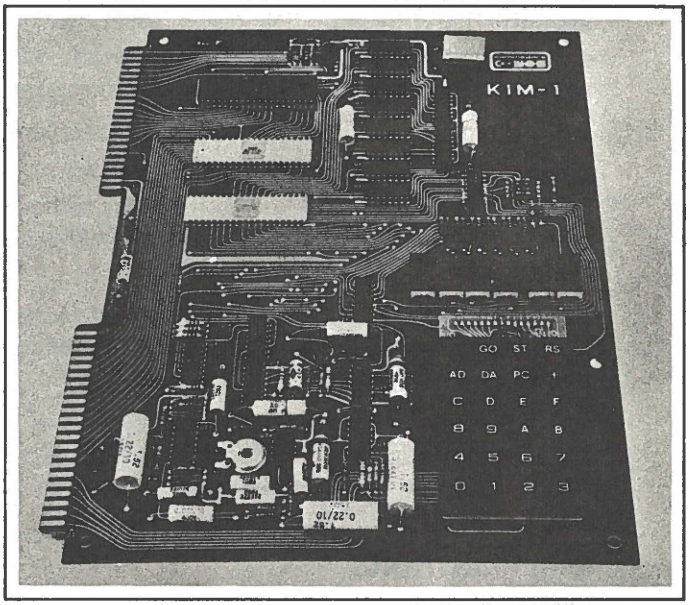
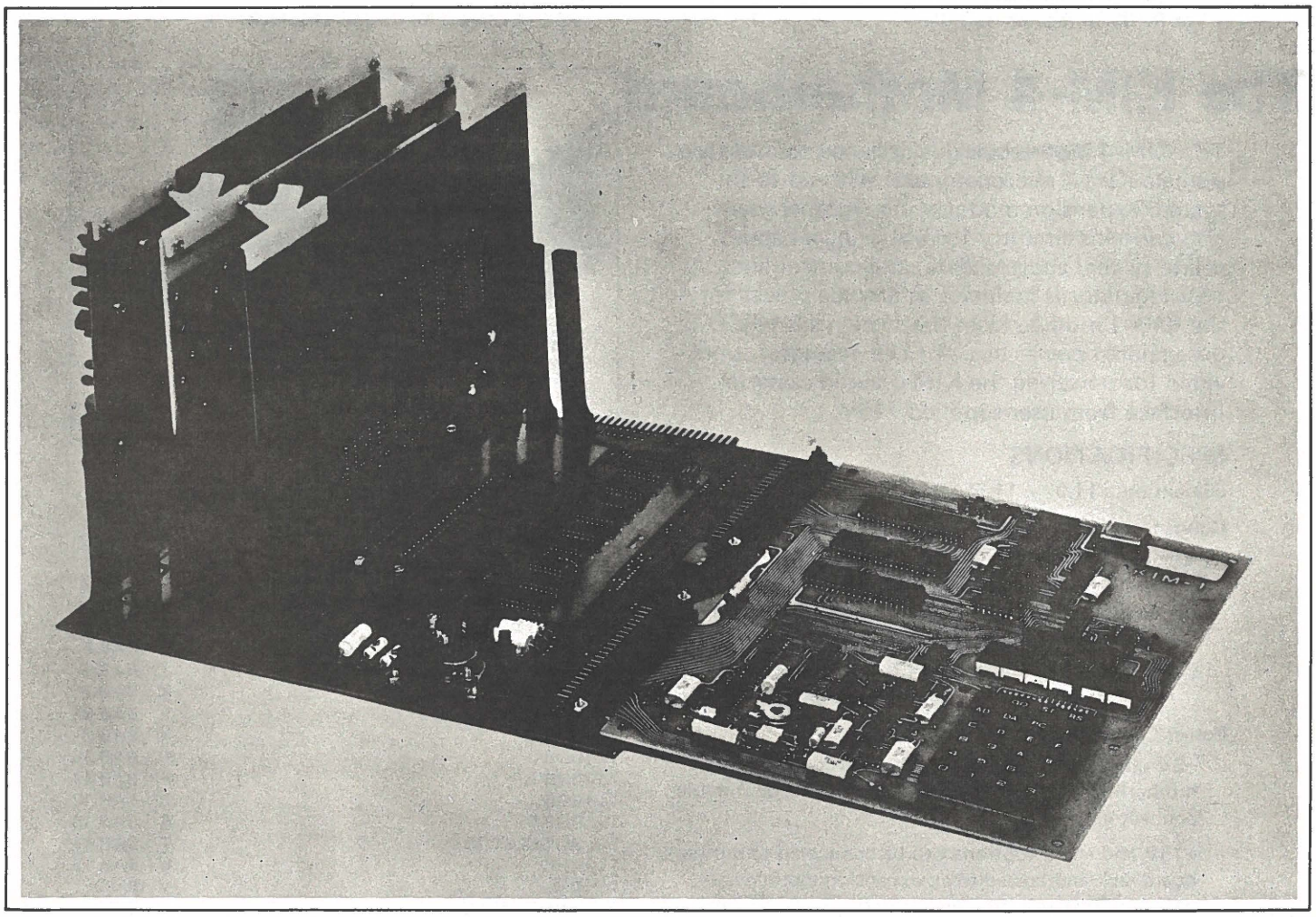
Norristown, Pennsylvania 19401





Shown in place: the KIM-4™ Motherboard connected to the KIM-1 Microcomputer. One each of the KIM-3B™ Memory Expansion Module, the KIM-5™ Resident Assembler/Editor and the KIM-6™ Prototyping Board are connected to the KIM-4 Motherboard.

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The KIM-3B Memory Expansion Module

The **KIM-3B Memory Expansion Module** is designed for use with systems using the **KIM-1** microcomputer. The module is completely assembled and tested. High speed, low power, static memory integrated circuits are used: no memory slowdown or refresh cycles are required.

An on-board regulator allows system operation from a +8 volt unregulated power supply.

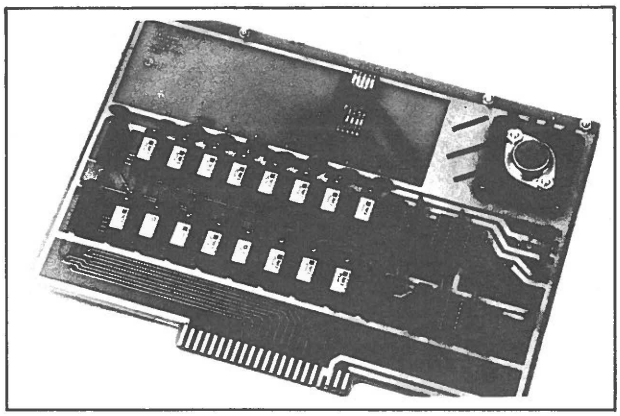
Switches on the board allow the boards to be placed at any 8K (KIM-3B) boundary in the system memory space.

Complete documentation is provided for board installation, checkout, and operation. Schematics and theory of operation are also provided.

A single **KIM-3B** can be wired directly to a **KIM-1** module. System expansion to 65K of memory can be implemented using a KIM-4 motherboard.

SPECIFICATIONS

Current required
at +5V (5% regulated)
or 8-10V unregulated: 3.0A



Memory size (8-bit words) 8192 words

Physical Dimensions: 10" x 6½" exclusive of connector tab and removal tabs.

Connector: Single 44-connection male edge connector. Mating female connector—similar to Vector R644. Connector tab is centered on 10" side of board.

Warranty: 90 days parts and labor.

Memory Circuits: High speed, low power 2114-type static memories. 450ns access time. Suitable for systems using 1 MHz, 2 phase clocks.

The KIM-4 Motherboard

The **KIM-4 Motherboard** is designed to interface a single KIM-1 microcomputer with up to six system expansion modules. The motherboard also contains circuitry for buffering all appropriate system address, data, and control lines. A +5V regulator is included to provide power for the **KIM-1** module from the system's 8-10V D.C. unregulated power bus. A +12V regulator is provided for powering the **KIM-1** audio cassette interface from user-supplied +15V.

SPECIFICATIONS

Dimensions: 11.0" x 11.5" inclusive of connector tabs.

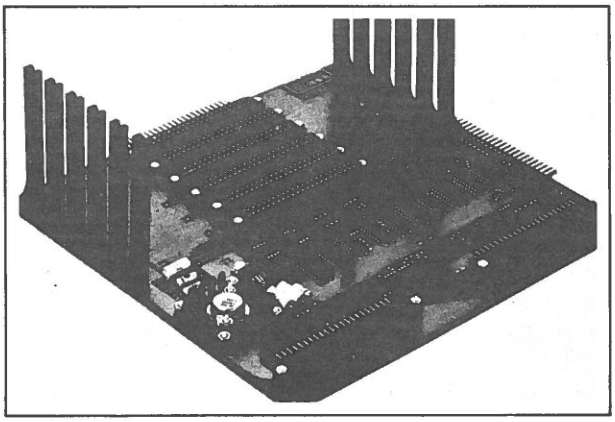
Connectors provided: (6) 44 pin female (similar to Vector R644) for expansion modules.
(2) 44 pin female connectors for interface to KIM-1.
(1) 44 pin male connector duplicating the function of KIM-1 application connector.
(1) 44 pin male with standard bus pinout for connection to expansion motherboard or backplane.

Power Connections:

+8V unregulated system power to be connected to motherboard jack and bussed to all expansion module connectors.

+15V and –15V (optional) to be connected to motherboard jack and bussed to all expansion module connectors. Regulator provided to derive +12V for audio cassette interface from user-supplied +15V.

Note: +5V regulated is not bussed to expansion module connectors. Each module will have on-board regulators powered from the system +8V unregulated bus.



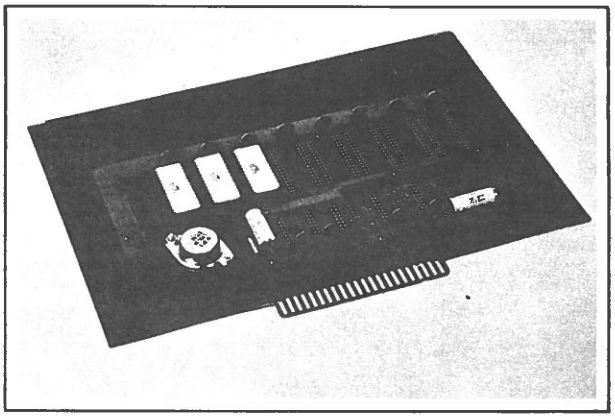
KIM-4
STANDARD BUS CONNECTIONS

1	GND	A	GND
2	B SYNC	B	BAB Ø
3	B RDY	C	BAB 1
4	B IRQ	D	BAB 2
5	–15V	E	BAB 3
6	B NMI	F	BAB 4
7	B RST	G	BAB 5
8	BDB 7	J	BAB 6
9	BDB 6	K	BAB 7
10	BDB 5	L	BAB 8
11	BDB 4	M	BAB 9
12	BDB 3	N	BAB 10
13	BDB 2	P	BAB 11
14	BDB 1	R	BAB 12
15	BDB Ø	S	BAB 13
16	BD SELECTED	T	BAB 14
17	+15V	U	BAB 15
18	$\overline{\text{DMA}}$	V	B Ø 2
19	+8V RAW DC	W	B R/W
20	+8V RAW DC	X	$\overline{\text{B Ø 2}}$
21	+5V	Y	+5
22	GND	Z	GND

*The "B" prefix indicates the same signal output by KIM-1 but buffered on the motherboard. E.G. the B RDY line is the KIM-1 RDY line.

The KIM-5 Resident Assembler/Editor

The **KIM-5 Resident Assembler/Editor** is a complete system for entering, storing, editing and assembling programs for KIM-based processing systems. The program is stored in three MCS6540 ROM packages, mounted on a **KIM-4** compatible board. The memory locators are addresses E000 to F7FF.



Text-Editor

A program for creating, editing and saving line-numbered text files stored in a random-access memory.

Functions supported are: Enter new text • Delete text • Find designated string in text • Resequence line numbers • List specified block of text • Load text from paper tape or audio cassette • Dump text to paper tape or audio cassette • Transfer control to assembler • Return to KIM monitor • Clear text area.

Features: Line-number orientation for ease of use • Any command preceded by an "X" is passed to a user-specified routine. The user can create his own commands • Simple interface to paper tape or audio cassette files • User-specified location of text in memory. No restriction on location of text file; multiple text files may be stored in memory simultaneously • Length of text file limited only by available memory • Text files are completely relocatable • ROM-resident—no need to buy or reload RAM • Complete documentation provided.

Resident Assembler

A single-pass assembler which accepts the entire 650X instruction set. Source code may be memory or paper-tape resident. Object code is always written to memory.

Features: Single pass provides source listing, object code and error messages • User may specify input and output device routines or accept TTY as default • All 650X instruction and addressing modes supported • User defines symbol table and source location for complete memory flexibility • ROM-resident.

The KIM-6 Prototyping Board

The **KIM-6 Prototyping Board** is a wirewrap board for user-defined expansion of a **KIM** System.

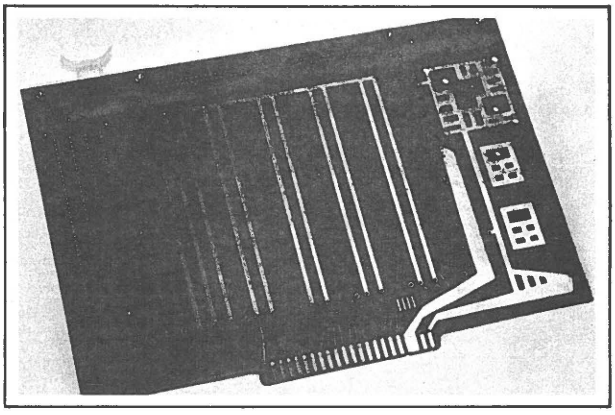
The board provides a 5" x 7½" predrilled area for wirewrap or soldertail IC sockets. The KIM-6 also provides a prewired area for a 5-volt T0-3 style IC voltage regulator, and pads are provided for two additional T0-220 style regulators. PC runs are provided throughout the wirewrap area for V_{CC} and ground busses.

A gold-plated tab connector is provided for standard interconnection to a KIM-4 Motherboard. The board is predrilled to accept two 40-pin flat cable connectors for connection to external devices.

Dimensions: 7" x 10" including tab connector

Board Type: G-10 or equivalent, 4 oz. tin-plated copper

Wirewrap Sockets Accepted: All common pinouts from 14 to 40 pins including 22 pin.



I/O Connectors: (2) Ainsley 609-4042M or equivalent (not supplied)

Bus Connector: KIM Buss 44 pin edge connector (gold-plated). All buss connections brought out to three 16-pin socket pads.

Wirewrap Area: 1144 holes, 5" x 7½" area

Commodore and the Commodore Companies

Commodore is a pioneer consumer electronics company. Less than ten short years ago, Commodore recognized the coming revolution in consumer electronics . . . at a time when that industry scarcely existed. By 1971, Commodore introduced the first popular-priced, compact electronic calculator.

Today Commodore is the only consumer electronics company that is thoroughly vertically integrated, with full MOS/LSI chip and LED/LCD display design and production facilities . . . with worldwide sales and service facilities.

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