Data Book.

1983

Synertek.

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Synertek.

SYM-1
Single Board Computer

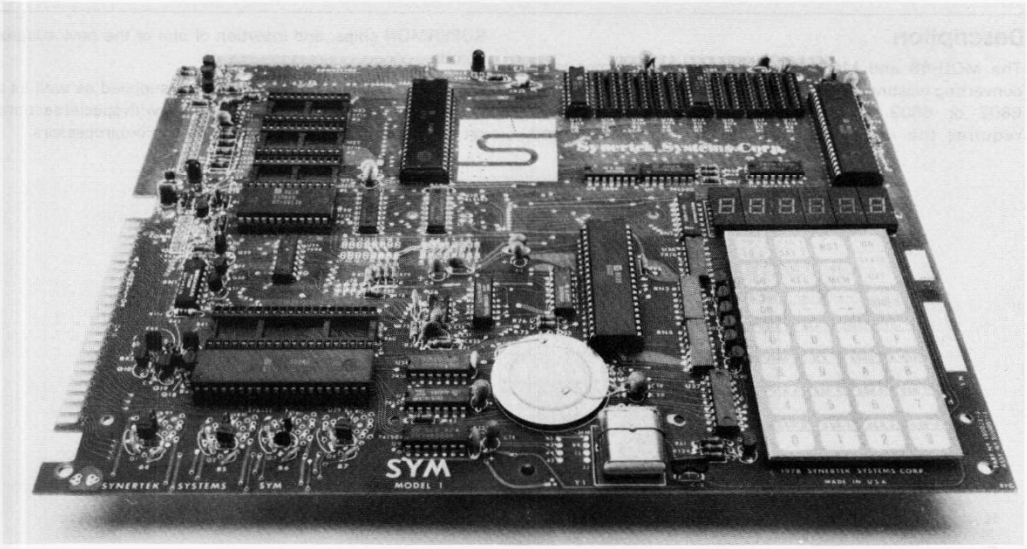
Features

- Assembled, Tested and Ready to Use
- Full Documentation — Two Manuals
- SY6502 NMOS 8-Bit Microprocessor
- 51 I/O Lines, Expandable to 71
- Five On-Board Programmable Interval Timers
- 28 Key Keypad
- Six Digit Display
- 4K Byte ROM SUPERMON Resident Monitor, User Expandable
- 1K Bytes of Static RAM provided, expandable to 4K Bytes On-Board with Sockets Provided
- User PROM/ROM for up to 28K Bytes of User Program
- Application Port — 15 Bi-directional TTL Lines, with Expansion Capability
- Expansion Port for Add-On Modules
- Requires Single +5V Supply
- Standard Interfaces:
  - Audio Cassette Recorder with Remote Control
  - Full Duplex 20 mA TTY
  - System Expansion Bus
  - RS-232-C Compatible Interface
  - Four Strappable Relay Drivers or Input Buffers
- Applications in
  - Training
  - Engineering
  - Prototyping
  - Instrumentation
  - Testing
  - Experimentation
- Dimensions 8.25 in. x 10.72 in.

Description

SYM-1 Versatile Interface Module is designed for future growth and expansion.

You can store your programs in the 1K Static RAM and debug by simply using the single-step feature of the monitor. User static RAM is easily expandable to 4K bytes on-board the basic unit. The 51 I/O lines which are available to control your custom applications can be expanded to a total of 71 I/O lines via an additional socket provided for Synertek's Versatile Interface Adapter — SY6522. Connect the SYM-1 to our KTM-3 Keyboard Terminal Module and your home TV (using an RF adapter) or monitor and you have a complete computer system with keyboard entry and video display.



SYSTEMS

Features

- Features Popular 6802 8-bit NMOS Microprocessor (SYM-1/68) or New Powerful 6809 8-bit NMOS Microprocessor (SYM-1/69)
- Incorporates the Same Features and Capabilities as the Original SYM-1
- Includes New 4K Byte SUPERMON Monitors for Each New Microprocessor

Description

Now the highly popular SYM-1 Microcomputer is available with a choice of microprocessors; the 6802 or the 6809 as well as the original SY6502. New SUPERMON Monitors give the SYM-1/68 and SYM-1/69 all the commands and operating features of the original SYM-1. A newly written SYM-1 Reference Manual is supplied which includes special sections describing use of the SYM-1 using the new microprocessors.

Also available are adaptor boards which allow existing SYM-1 microcomputers to use one of the new microprocessors. Refer to MOD-68 and MOD-69 on the next page.

MOD-68, MOD-69

Adapter Board

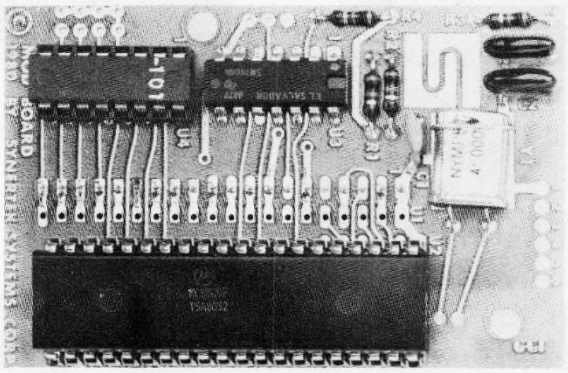
Features

- Adaptor Boards for SYM-1 Allow use of Popular 6802 or Powerful New 6809 8-bit NMOS Microprocessors
- New Microprocessor and Circuitry Included on Small 2" x 3" Circuit Board
- Includes New SUPERMON Monitor Firmware
- Full Instructions Supplied for Making the Simple Conversion

Description

The MOD-68 and MOD-69 provide a low-cost means of converting existing SYM-1 microcomputers to use either the 6802 or 6809 microprocessor. The simple conversion requires the removal of the old microprocessor and SUPERMON chips, and insertion of one of the new adaptor boards.

Complete installation instructions are supplied as well as a newly written SYM-1 Reference Manual with special sections on the use of the SYM-1 with the new microprocessors.



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SYM-2
Single Board Computer

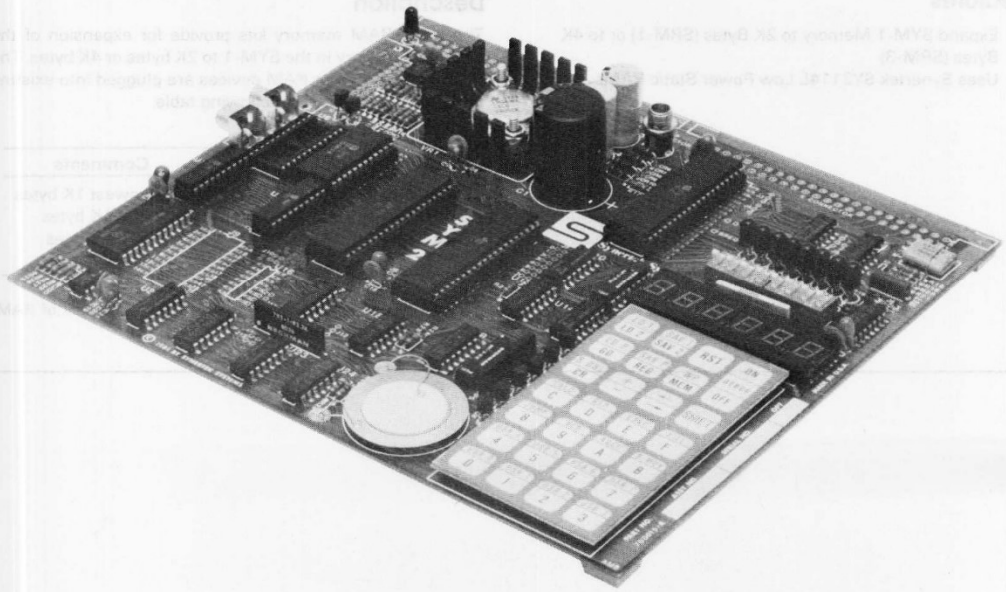
Features

- Completely Assembled, Tested and Ready to Use
- Built-in Power Supply
- Full Documentation —
  SYM Reference Manual
  Programming Manual
- SY6502 NMOS 8-Bit Microprocessor
- 28 Key Keypad
- Six Digit Display
- Eight Toggle Switches for User Input
- Eight LEDs for User Output
- Cassette Interface Jacks
- 4K Byte SUPERMON Resident Monitor, User Expandable
- 1K Byte User RAM
- User ROM/EPROM Socket for BASIC (BAS-1), Resident Assembler/Editor (RAE-1) or Custom Firmware
- RS-232-C Compatible Serial Interface
- Designed Specifically for Applications in Education and Training
- Software Compatible with SYM-1

Description

The SYM-2 single-board microcomputer is based on and incorporates many of the most popular features of the SYM-1. In addition, some of the most requested features — built-in power supply, switches and LEDs for user I/O and cassette interface jacks — have been added to make the SYM-2 an ideal, cost effective single-board microcomputer for classroom and educational use.

So that the growing bank of user developed software will not be obsoleted, the new SYM-2 has full software compatibility with the SYM-1. This means that programs and firmware for the SYM-1, such as BASIC (BAS-1) and the assembler/editor (RAE-1), are immediately useable with the SYM-2.



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SM100

OEM Version of SYM-1

Features

- Same Power, Features, and Performance as the SYM-1 Module at Lower Cost
- Additional Economies for O.E.M. Applications Achieved by Supplying Board without the Keyboard, Display, Speaker and Associated Electronics

Description

The SM100 is designed especially for OEM controller or other applications where the microcomputer board is an integral part of a user's system. All the power and flexibility of the SYM-1 is retained but without the overhead of on-board keyboard and display.

SRM-1, SRM-3

Static RAM Memory Kit

Features

- Expand SYM-1 Memory to 2K Bytes (SRM-1) or to 4K Bytes (SRM-3)
- Uses Synertek SY2114L Low Power Static RAMs

Description

The static RAM memory kits provide for expansion of the on-board memory in the SYM-1 to 2K bytes or 4K bytes. The SY2114L low power RAM devices are plugged into existing on-board sockets per the following table.

RAM Address	Sockets	Comments
0000-03FF	U12, U13*	Lowest 1K bytes
0400-07FF	U14, U15	2nd 1K bytes
0800-0BFF	U16, U17	3rd 1K bytes
0C00-0FFF	U18, U19	4th 1K bytes

*The SYM-1 microcomputer is shipped with 1K bytes of RAM inserted in sockets U12 and U13.

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BAS-1
BASIC

Features

- Resides in ROM, Always Available
- I/O Supported by SUPERMON on SYM-1 or SM100
- Full Floating-Point 9-Digit, Extended BASIC
- Standard Dartmouth BASIC Statements
  LET READ PRINT DATA IF
  THEN FOR NEXT DIM END
  GOTO
- Extended BASIC Statements
  RESTORE REM STEP GOSUB DEF
  RETURN STOP INPUT FN
  ON...GOTO ON...GOSUB
- Scientific Functions
  SGN INT ABS SQR RND
  LOG EXP
- Logical Operators
  AND OR NOT
- Operation Commands
  RUN NEW CLR LIST CONT FRE
- Formatting Functions (TAB, POS, SPC)
- Peek, Poke, JSR to Machine Code Subroutines
- String Functions
- Cassette SAVE and LOAD Statements
- Decimal, Hexadecimal and String Constants
- Real, Integer and String Variables

Description

BAS-1 is a full function BASIC developed for Synertek Systems by Microsoft Corporation. BASIC provides higher level language capabilities, always instantly available from ROM.

RAE-1
Resident Assembler/ Editor/Loader

Features

- Compatible with SYM-1 or SM100
- Resides in ROM, always available
- I/O Supported by SUPERMON

Assembler

- Macro Capability
- Conditional Assembly
- Source Input from RAM or Tape
- Produces Relocatable Object Code
- Relocating Loader
- Assemble with Source Listing or Errors-Only Listing
- Hex, Binary, Decimal or Mixed Data Types
- 16 Assembler Pseudo-Ops
- 23 Error Codes
- Storage of Hex or ASCII Bytes

Text Editor

- Edits Line Numbered Text
- Upper and Lower Case
- Character String Search with Optional Replace, Display or Show Number of Occurrences
- Line Edit
- Block Insert
- Delete Line(s)
- Delete File
- Renumber Text File
- Tabbing
- Free Format Command Input
- Output to Hard Copy Device with or Without Line Numbers
- Load and Record in High Speed Format; Entire File or Range of Lines
- Automatic Cassette Motor Control or Manual Control through ON and OFF Commands

Description

RAE-1 is a full features Resident Assembler/Editor. Many powerful text editing functions are available with error messages giving error type and location. The user has complete control over all editor and assembler functions as well as editor controlled entry to SYM BASIC or SYM SUPERMON. The user also has control over cassette recorders for file I/O, or control may be left to software. The relocating loader may store executable code in memory during assembly or may store object code offset from its proper execution address.

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FOR-1
Forth

Features

- ROM-Based for Instant Availability
- Fully Extensible
- Subset of Forth-79 Standard
- Supplied with Full Glossary plus Tutorial Text
- Ideal for Control System and Instrumentation Applications

Description

FOR-1 is the ideal language for the SYM-1 and SYM-2 for all control-system and instrumentation applications. FOR-1 blends the functions of operating-system, high-level structured language and straight-forward hardware accessibility into a package of virtually endless power and flexibility.

FOR-1 includes words from the required word set of the Standard with provision for linking user-defined double-length and disk I/O words into existing nucleus definitions. Additional words are included such as GET and PUT for cassette tape I/O, and MON for easy access to the SYM SUPERMON monitor.

FOR-1 is supplied in a 4K-byte ROM, with a complete glossary and the excellent tutorial text "Starting Forth" by Leo Brodie.

EPS-1
SYM-1 Diagnostic Program

Features

- Diagnostic/Test Program for SYM-1
- Supplied as a Pre-Programmed 2716 EPROM
- Function Test for On-Board RAM, ROM, Display LEDs, Keyboard, I/O Chips, TTY/CRT I/O, Cassette I/O, and Scope Output
- Modular Tests with Separate Error Messages
- Version Available for SUPERMON V1.0 or SUPERMON V1.1
- Useful for Receiving Inspection, Field Service, or Self-Test by User
- Complete with Manual Containing Instructions, Error Codes, Flow Charts, Trouble Shooting Aids and a Complete Test Program Listing

Description

The EPS-1 Diagnostic Program for SYM provides a valuable self-test capability to aid in any phase of test, trouble shooting or repair. Essentially all components of the SYM are functionally tested assuring a fully working unit.

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PEX-1
Port Expansion and Connector Kit

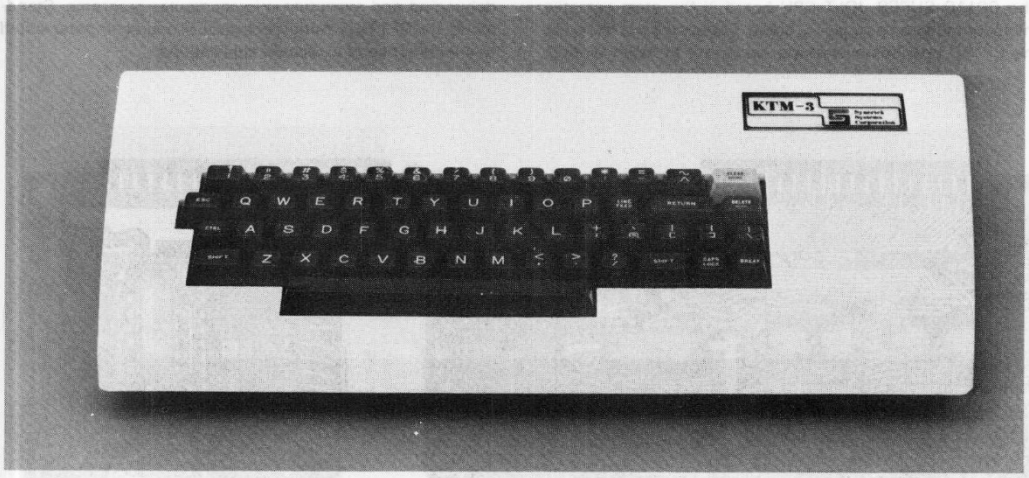
Features

- Includes SY6522 Versatile Interface Adaptor
- Edge Connectors for Applications and Expansion Ports
- EIA Connector for RS-232-C Interface
- Phono Connectors for Cassette Interface

Description

The PEX-1 provides a SY6522 VIA which expands the SYM-1 I/O by an additional 20 lines. The SY6522 is plugged into socket U28 on the SYM-1 board.

Also provided are connectors to allow building a variety of interfacing cables. Included in the PEX-1 kit is a diagram for a suggested cable assembly which will provide complete connection to an EIA (RS-232-C) terminal, an audio cassette recorder, and a TTY.



SYSTEMS

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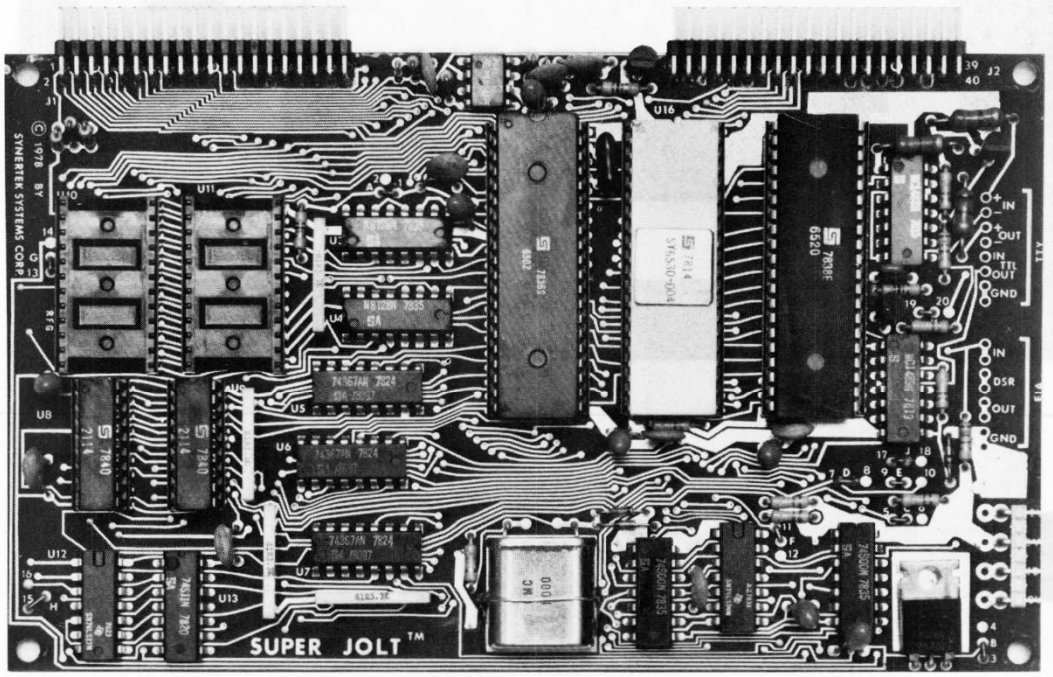
CP110
Super Jolt CPU Board

Features

- SY6502 NMOS 8-Bit Microprocessor
- 1K Bytes of Static RAM Memory
- 64 Bytes of Interrupt Vector RAM
- 28 Bi-Directional Programmable I/O Lines
- 1 MHz Crystal Controlled Clock
- Interval Timer
- Four Interrupts, Including a Timer Interrupt and a Non-Maskable Interrupt
- Three Serial Interfaces — 20 mA Current Loop, RS-232-C and TTL
- Buffered Address and Data Lines
- 1,024 Bytes of Resident ROM Program Memory Containing DEMON Debug Monitor Program
- Dimensions 4.25 in. x 7.00 in.

Description

The CP110 SUPER JOLT CPU board is the most versatile microcomputer on a single PC board. Connected to a terminal, the CP110 provides everything necessary to begin writing, debugging and executing microcomputer programs. Stand-alone, the CP110 is a single board OEM microcomputer suited to a wide range of dedicated applications.



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KTM-2
Keyboard Terminal Module

Features

- Choice of Character Screen Sizes:
  24 x 80 Character Screen Size (KTM-2/80)
  24 x 40 Character Screen Size (KTM-2/40)
- Full ASCII Upper and Lower Alphanumeric Character Set with Descenders
- Control and Special Characters
- 128 Graphics Characters
- Reverse Video
- Scrolling
- Blinking Cursor
- Full Cursor Control
- Absolute and Relative Cursor Addressing
- Auto CR at end of Line (Switch Selectable)
- 110 to 9600 Baud
- Even, Odd, or No Parity
- Complete RS-232-C Handshaking
- Auxilliary RS-232-C I/O Port
- Typewriter Style Keyboard 54 Keys
- Automatic Character Repeat
- Alpha Lock
- Erase — Partial Line, Partial Screen, Full Screen
- Programmable Bell Output
- Programmable Device Control Output
- Interlaced Screen (Switch Selectable)
- European (50Hz) Compatible (Switch Selectable)
- Requires Single +5V Supply

Description

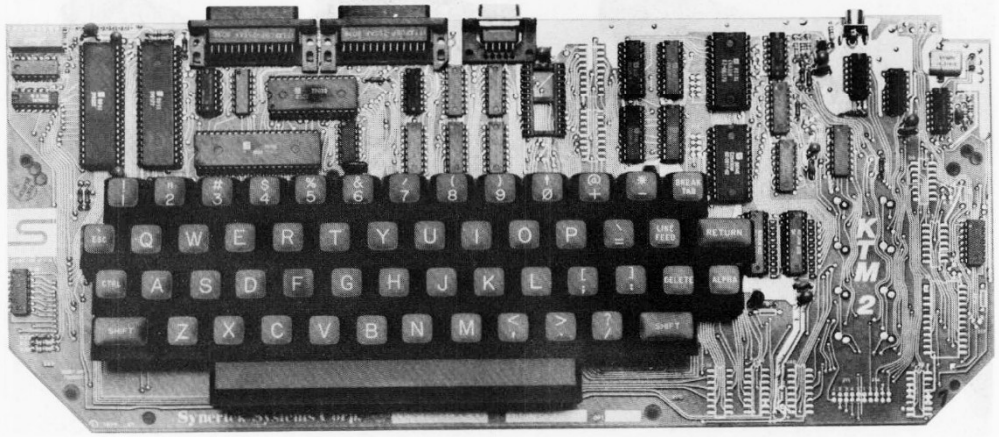
The KTM-2 provides a keyboard and all the logic circuitry for a full keyboard terminal. The display interface provides composite video for user provided monitor or for a standard TV set equipped with an RF modulator.

The design of the KTM-2 incorporates 8 MOS-LSI integrated circuit chips, including two dedicated microprocessors. Twenty TTL devices are used, resulting in a total chip count of 28 devices.

The use of standard LSI devices results in a highly cost effective design with great flexibility allowing modifications for custom OEM applications. More features are available at lower cost than if a CRT controller chip or other approach had been used.

Custom

For large volume requirements, Synertek Systems has the capability to customize the keyboard terminal modules to meet OEM terminal subsystem requirements, offering flexibility over screen size, character size, scan rate, character set, and keyboard function and definition.



SYSTEMS

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KTM-3

The Tubeless Terminal

Features

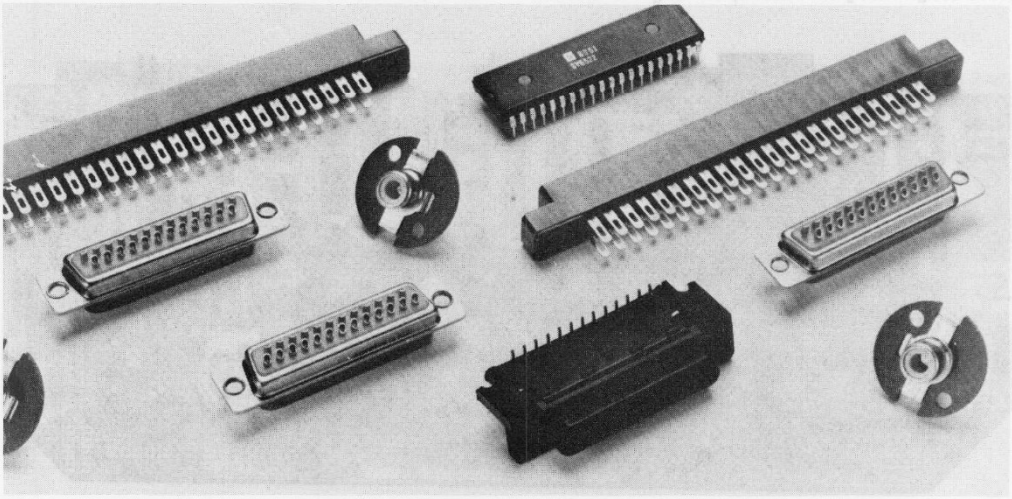
- New Design with
  - — Case
  - — Additional Keys
  - — Built-In Power Supply
- 110 to 19.2K Baud
- Choice of Character Screen Sizes:
  24 x 80 Character Screen Size (KTM-3/80)
  24 x 40 Character Screen Size (KTM-3/40)
- 7 x 9 Character Matrix in 8 x 10 Field
- Typewriter Style Keyboard — 58 Keys
- CAPS LOCK Key
- Upper and Lower Case Alphanumeric Character Set with Descenders
- Generates and Displays 128 ASCII Characters
- Full and Half Duplex with Modem Controls
- Built-In Power Includes On/Off Switch
- Scrolling
- Full Cursor Control
- Absolute and Relative Cursor Positioning
- Clear to End-of-Screen, End-of-Line
- Even, Odd, or No Parity
- One or Two Stop Bits
- Framing and Parity Errors Displayed
- Auto Key Repeat
- Debug Mode (Displays Control Characters)
- Cables Included
- Built-In Diagnostics
- KTM-3/40 Will Attach to Standard TV Set Using RF Modulator
- 50/60 Hz Operation
- 220 Volt Version Available

Description

Newly designed to incorporate the best features of the popular KTM-2 series, the KTM-3 uses the latest LSI technology with two microprocessors to provide a highly reliable, ready-to-use terminal minus the CRT monitor. The dual microprocessor design is highly cost-effective with great flexibility, providing more features at lower cost than other approaches used today. For volume usage, Synertek Systems can customize the KTM-3 to your O.E.M. specifications.

The display interface provides composite video output and complete video control including scrolling, full cursor control, and absolute and relative cursor positioning. A choice of screen sizes is offered — either 24 x 40 characters, or 24 x 80 characters.

The unit is now in stock and available from your local distributor.



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MBC010/MBC020

CPU/Video Board

Features

- Choice of Microprocessors — SY6512 (MBC010-65; MBC020-65) or MC6800 (MBC010-68; MBC020-68)
- Fully Buffered Data and Address lines
- 1024 bytes of User RAM
- SY6551 ACIA for RS-232-C Serial Interface with Crystal-Controlled Programmable Baud Rate
- SY6522 VIA Provides 20 I/O Lines (with 7 lines optionally buffered), and 2 16-Bit Counter/Timers
- Full 65K Programmable Memory Map in 2K Increments, using 32 x 8 Bipolar PROM
- Direct Memory Access (DMA) Controls
- Dynamic Memory Refresh Controls
- Power-on Reset
- MBC020 Includes Complete Video Interface Circuitry for Direct Attachment to a CRT Monitor
- 1 or 2 MHz Versions

Video Features for MBC020

- Dual Intensity Video Levels
- SY6545 Programmable CRT Controller for User Definable Screen Formats
- Light Pen Input
- Composite or Separated Video Outputs

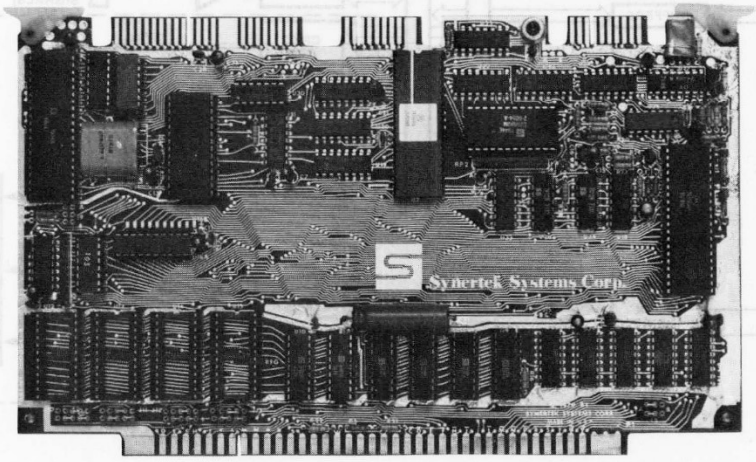
Description

From single board computers to single-purpose special usage boards. Synertek Systems offers a growing line of Micromodules that are Motorola EXORcisor™ and Micromodule bus compatible. These boards provide high quality yet are low in cost for maximum utility in any microprocessor application.

Three types of boards are available: CPU and Single Board Computers, Memory Boards, and Peripheral Boards.

The MBC010 and MBC020 CPU Boards provide complete computers on a single board. Both are fully compatible with the Motorola EXORcisor™/Micromodule bus and support RAM, I/O, and analog boards in those families. Both offer a choice of microprocessors — either SY6512 or MC6800 — for use in a full range of systems or development applications.

The MBC020 may be used as a cost-effective alternative single board computer, or, with the video circuitry, it can replace two or more boards and operate as the heart of a complete system.



SYSTEMS

+5 VDC @ 1.75 A (max) MBC020
+12 VDC1 @ 50 mA (max)
-12 VDC @ 50 mA (max)

Bus Signals

ADDRESS BUS: Three-state TTL-compatible buffered outputs.
DATA BUS: TTL-compatible buffered inputs/outputs.
CONTROL BUS:
R/W, VMA, VUA: Three-state TTL-compatible buffered outputs
BA, REF GRANT, MEMCLK, SYNC, Baud Rate: TTL-compatible buffered outputs.
$\overline{IRQ}$, $\overline{NMI}$, $\overline{RESET}$, HALT, $\overline{REF\ REQ}$, $\overline{RDY}$, $\overline{DMA}$: TTL-

Operating Temperature

0° C to 70° C

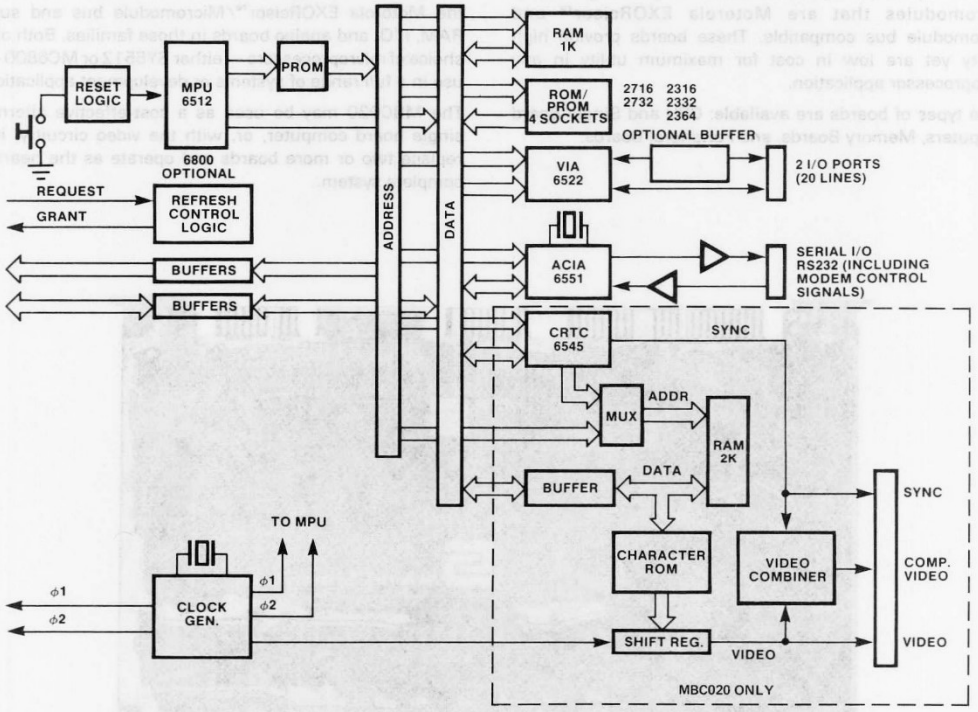
Physical Characteristics

Width: 9.75 in.
Height: 6.00 in.
Board Thickness: .0625 in.

Connectors

86 pins:
Stanford Applied Engineering
SAC-43 D/1-2
50 pins: 3M type 3415-0001
20 pins: 3M type 3461-0001

Block Diagram



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MBC01A2, MBC01A2-1

Single Board Computer Motorola Micromodule Replacement

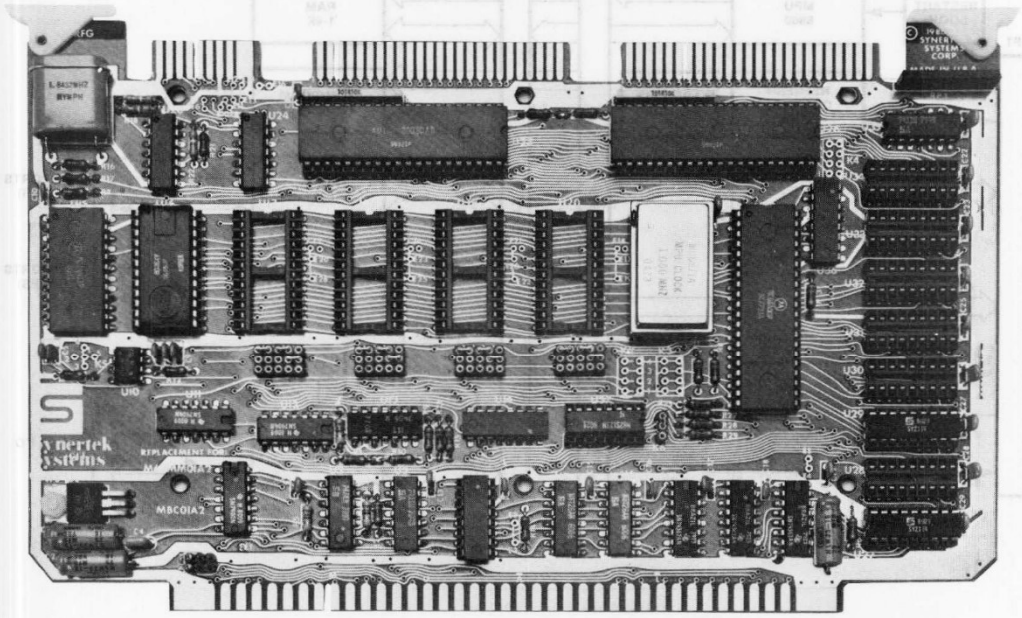
Features

- Exact Replacement for Motorola M68MM01A2 Micromodule with additional RAM and ROM capacity
- EXORcisor™/Micromodule Bus Compatible
- Serial Communication Port using MC6850 ACIA with RS-232-C interface
- Four Parallel Ports using MC6821 PIAs
- 1 MHz operation (2 MHz available on special order)
- 1024 Bytes of Static RAM with Sockets for up to 4096 Bytes total
- Four ROM/EPROM/RAM Sockets for interfacing with 1K-8K ROM's; 1K-4K EPROMs; or compatible 1K and 2K RAM's
- Power-On Reset Circuitry
- Dynamic Memory Refresh Circuitry
- Four mating connectors supplied with MBC01A2-1

Description

The MBC01A2 board is a direct replacement for Motorola's M68MM01A2 Micromodule. Additional ROM and RAM capacity has been added for increased system requirements. Up to 4096 bytes of static RAM and 32K bytes of ROM can be utilized on the MBC01A2 Micromodule.

The MBC01A2 Micromodule includes a serial communications interface using the MC6850 and two MC6821 PIA's for parallel interfacing.



SYSTEMS

Specifications

Power Requirements with 1K of RAM and no EPROMs
+5 VDC @ 1.1 A (max)
+12 VDC @ 25 mA (max)
-12 VDC @ 25 mA (max)

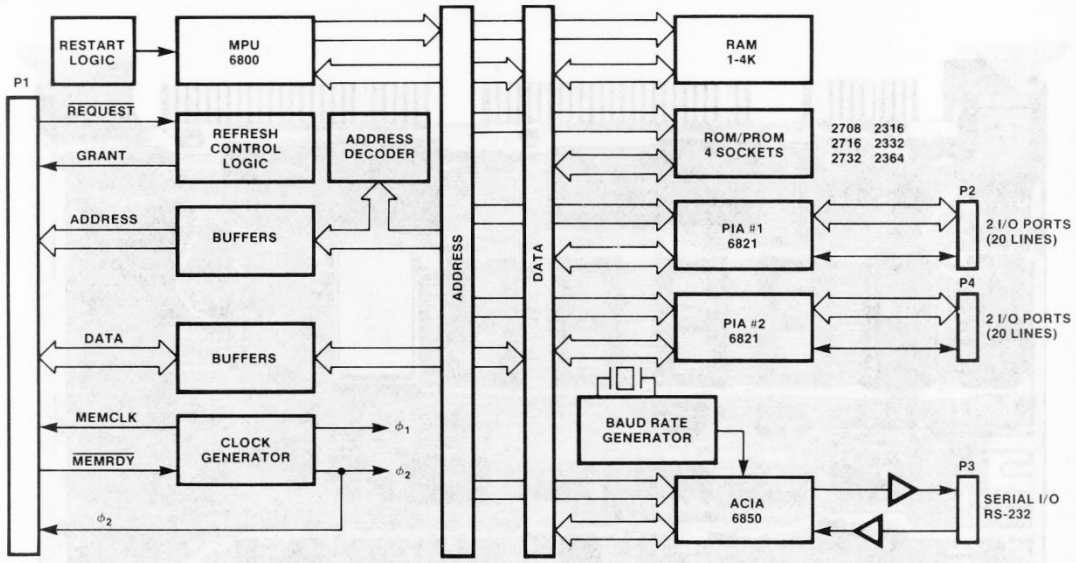
Bus Signals
ADDRESS BUS: Three-state TTL-compatible buffered outputs.
DATA BUS: TTL-compatible buffered inputs/outputs.
CONTROL BUS:
R/W, VMA, VUA: Three-state TTL-compatible buffered outputs
OTHERS:
TTL-compatible

Operating Temperature
0° C to 70° C

Physical Characteristics
Width: 9.75 in.
Height: 6.00 in.
Board Thickness: .0625 in.

Connectors (supplied with MBC01A2-1 only)
86 pins:
Stanford Applied Engineering
SAC-43 D/1-2
50 pins: 3M type 3415-0001
20 pins: 3M type 3461-0001

Block Diagram



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MBC008/MBC016
Static RAMs

Features

- Two Speed Versions — 500 ns Access and 300 ns Access
- Two Power Versions — 3.5A max. and 2.5A max.
- MBC016 has 16K Bytes of Random Access Memory Address in 8K Sections
- Separate Write-Protect of Each 8K Section of Memory
- Static — No Clocks or Refresh Required
- Single +5V Power Supply Required

Description

The MBC008/MBC016 Static RAM Modules are directly compatible with Motorola EXORcisor™/Micromodule bus. The modules include address decoding, write protection, and data buffering circuitry. The MBC008 contains 8K bytes of read/write memory, implemented with 16 SY2114 1024 x 4 static RAM memory devices, while the MBC016 contains 16K bytes of memory implemented with 32 SY2114 devices. Address select switches allow each 8K memory section to be independently placed in any 8K address range. On the MBC016, each 8K section can be independently write-protected through the write-protect lines.

Specifications

Power Requirements
+5 VDC @ 3.5 A (max)

Low Power Version
+5 VDC @ 2.5 A (max)

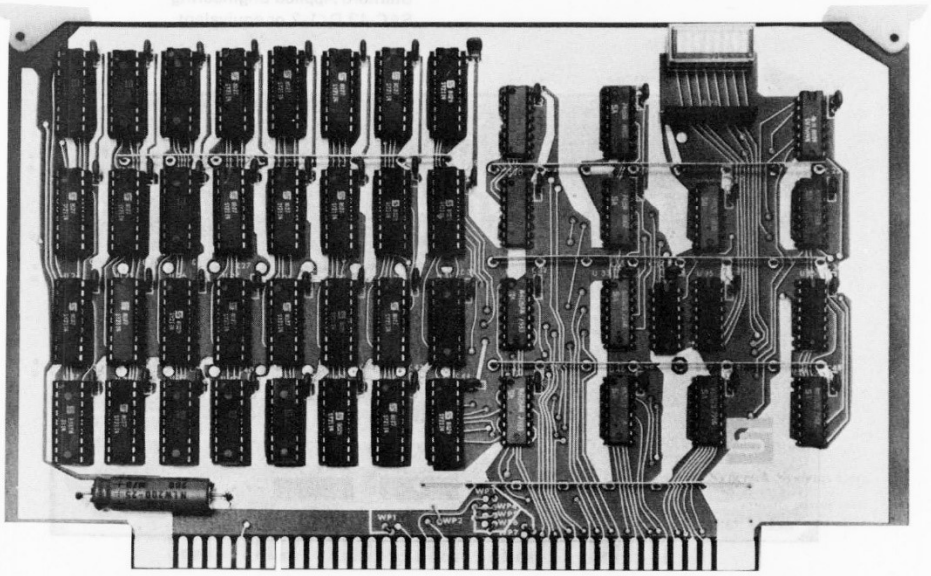
Operating Temperature
0° C to 70° C

Physical Characteristics
Width: 9.75 in.
Height: 6.00 in.
Thickness: .0625 in.

Connectors
86 pins:
Stanford Applied Engineering
SAC-43 D/1-2

Part Numbers

Power Consumption	Speed-nsec	
	500	300
2.5 Amps (Typ.)	MBC008	MBC008-3
	MBC016	MBC016-3
1.75 Amps (Typ.)	MBC008L	MBC008L-3
	MBC016L	MBC016L-3



SYSTEMS

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MBC016D/MBC032D
MBC048D/MBC064D
Dynamic RAMs

Features

- Available in 16K, 32K, 48K, or 64K Memory Arrays
- 1 or 2 MHz Versions
- Hidden Refresh (without processor interruption)
- Fully Buffered Address, Data, and Control Lines
- Any 4K Block Memory can be Deselected by Jumpers
- 20 Pin Header for Implementation of Priority Interrupts, Multi-Paged Memory, and I/O Systems
- Even Parity Error Checking with Jumper Selectable Output
- Power-Saving Selective Refresh During $\phi 1$ of Every Fourth Processor Cycle

Description

The Dynamic RAM Boards with hidden refresh are available in 16K, 32K, 48K, and 64K memory arrays in either 1 or 2 MHz versions. Memory refresh is performed on-board during $\phi 1$ when the processor is not accessing memory. On-board circuitry generates and detects even parity through the use of an additional memory bit. Whenever a parity error is detected, a signal is output to the system which is jumper selectable as a parity error or non-maskable interrupt. The memory array can be deselected in 4096 byte blocks to meet any system requirements. As with all SSC Micromodules, the Dynamic RAM Boards are directly compatible with Motorola EXORcisor™-/Micromodule bus.

Specifications

Power Requirements (64K of RAM)
+5 VDC @ 0.7 A (max)
+12 VDC @ .12 mA (max)
-12 VDC @ 8 mA (max)

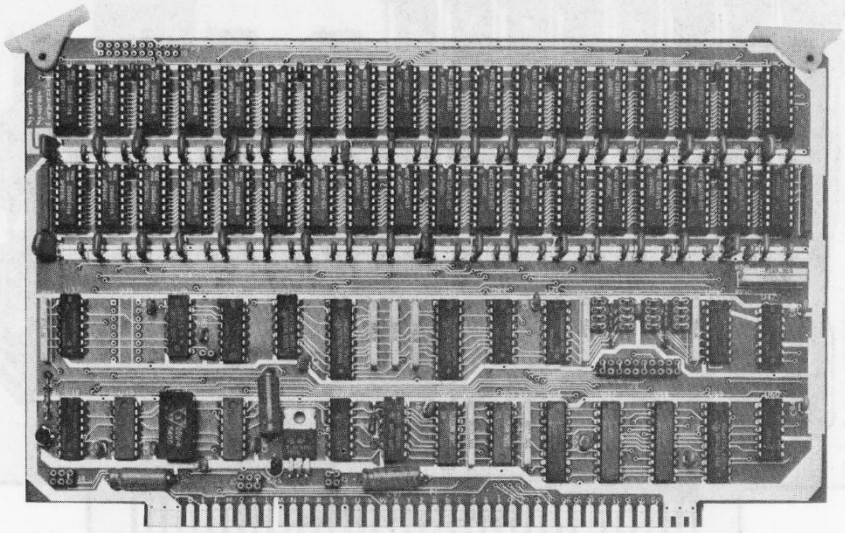
Operating Temperature
0° C to 70° C

Physical Characteristics
Width: 9.75 in.
Height: 6.00 in.
Board Thickness: .0625 in.

Connectors
86 pins:
Stanford Applied Engineering
SAC-43 D/1-2 or equivalent

Read Access Time
2 MHz operation —
210 ns after leading edge of $\phi 2$
1 MHz operation —
350 ns after leading edge of $\phi 2$

Write Data Available
2 MHz operation —
110 ns after leading edge of $\phi 2$
1 MHz operation —
220 ns after leading edge of $\phi 2$



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MBC081/MBC091/ MBC092/MBC093

EPROM Programmer/ Prototyping Board/Extenders

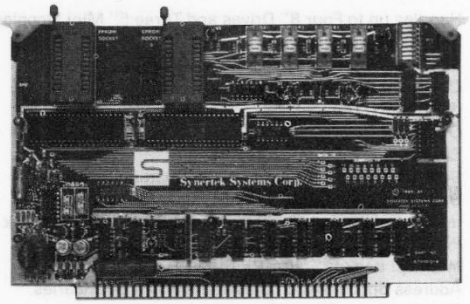
Features

- Two EPROM Sockets, Each Capable of Programming 2716, 2532, and 2732 EPROMs
- On-Board DC to DC Converter Provides +25V Regulated Supply Voltage with Short Circuit Protection
- Address Switch Selectable in 256 Byte Blocks
- MBC081-1 includes special cable for installing board in MDT2000 Micro. Development System

MBC081, MBC081-1 Description

The MBC081 EPROM PROGRAMMER provides two EPROM sockets for copying one EPROM to another, verifying contents of one EPROM against another, or simultaneous programming of two EPROMs.

Programs 2716, 2532, or 2732 EPROMs.



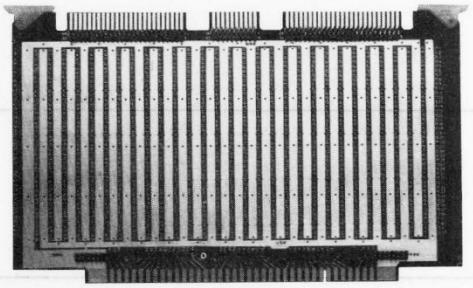
MBC081

Features

- Provides Space for Developing Experimental or Custom Circuits
- Standard Spacing for Wirewrap IC Sockets
- One 20-Pin and Two 50-Pin Edge Finger Connectors are Provided at Top of Board
- All Wirewraping Hardware for Edge Finger Connectors is Provided

MBC091 Description

The MBC091 PROTOTYPING BOARD plugs directly into the standard Micromodule bus and provides space for prototyping user developed circuits. To aid prototyping, ground and power buses are provided with locations for decoupling capacitors.



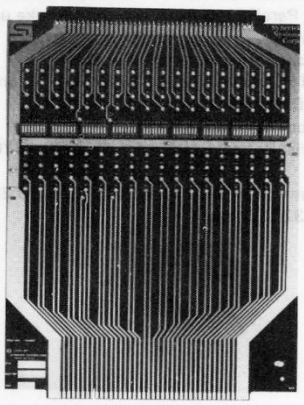
MBC091

Features

- Useful for Troubleshooting and Testing
- Allows Access to all Points on Circuit Board
- Built-In Test Points and In-Line Switches
- Interfaces with all MBC Boards and Micromodules

MBC092, MBC093 Description

EXTENDER BOARDS are available in two versions. The MBC092 is an extender only, allowing the user access to all points on the circuit board under test. The MBC093, in addition to its role as an extender, also has switches in each line to allow opening selected lines between the board in test and the backplane bus. Labeled test points are also provided between the board in test and the backplane bus for monitoring system signals.



MBC093

SYSTEMS

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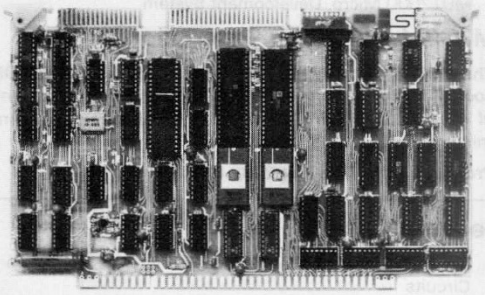
MBC210
Floppy Disk Controller

Features

- Handles up to Four 8" Drives and Three 5" Mini Floppies
- Single or Double Sided
- Single or Double Density
- On-Board Processor Controller
- IBM Format Compatible
- On-Board Diagnostics
- Extensive Error/Status Reporting
- Self-Contained On-Board Disk Formatting Software
- Data Transfers, Control and Status Information Communicated through On-Board RAM Buffer/Status Block Providing Processor Independent Interface
- Interrupt and/or Status Bit Buffer Handshaking
- Address Space Switch Selectable on 2K Boundaries
- Simple "Daisy Chain" Drive Connection

Description

The MBC210 FLOPPY DISK CONTROLLER/FORMATTER is an intelligent interface between the Micromodule bus and up to seven floppy drives — four 8" drives and three 5" mini floppies. Sixteen RAM locations provide a control/status block for simplified processor independent interfacing to the MBC210.



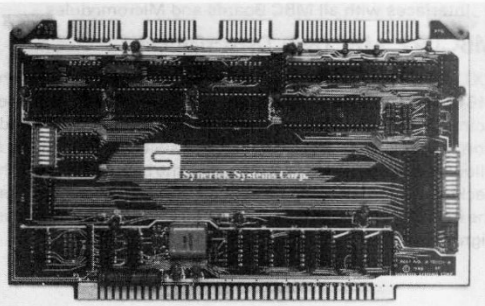
MBC510
Combo I/O Board

Features

- Address Switch Selectable in 256 Byte Blocks
- Two 8-bit Parallel I/O Ports with Handshake using SY6522 VIAs
- Nibble Programmable with Buffer Option
- Expanded Handshake Capability for Positive and Negative Data Transfer Control
- Sockets for Terminators Provided
- Three Serial Ports using Crystal-Controlled SY6551 ACIAs
- 16 Programmable Baud Rates from 50 to 19.2K Baud
- Full RS-232-C Compatiblity

Description

The MBC510 COMBO I/O BOARD provides three serial ports using SY6551 ACIAs with complete RS-232-C compatiblity and two parallel ports with buffers and sockets for resistor terminators. The MBC510 also contains four 16-bit counter/timers to provide several operating modes.



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MDT 2000

Micro Development System for Z8 and SY6500 Processors

Features

- Supports both SY6500 and Z8 Microprocessors
- Supports Up to Three Debug Cards, Providing Four Breakpoint Registers and Trace
- Intelligent Floppy Disk Controller with Two 8" Drives
- Three Serial and One Parallel Interfaces
- PASCAL Disk-Based Operating System with Command Prompting
- Powerful CRT Screen-Oriented Editor
- Versatile Disk File Operations with "Ignore Character" Selection
- Optional PASCAL Compiler
- Optional Remote Communications Software
- ROM-Based RAM/Disk Diagnostics and Mini-Debugger
- Supports Disk Booting of User-Generated Operating Systems
- Supports Single or Double Density 8" Data Disks
- User Configuration of CRT Terminal/Printer Attributes
- PASCAL Access to Serial or Parallel Printer (mutually exclusive)
- Disk File Hexadecimal Patch Utility
- 230 Volt Option Available
- 2K User RAM (Expandable to 4K) for Z8 Internal ROM Emulation Option
- Screen Graphics Control of Emulation
- Optional EPROM Programmer Board
- Two Sockets for Programming 2716, 2732, 2532 EPROMs
- Optional Assemblers for 6800, 6809, Z80, 8080, 9900, and LSI-11

Description

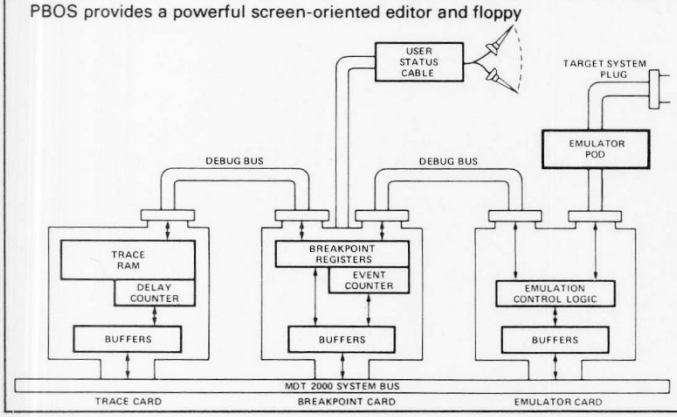
The MDT 2000 MICRO DEVELOPMENT SYSTEM provides the user with a flexible, powerful, development and emulation system for Z8, and development system for SY6500 series microprocessors. Debugging is facilitated with in-circuit emulation which provides a separate and non-conflicting execution environment. Optional Debug (Breakpoint/Trace) boards permit an execution halt, or real-time trace events to be qualified by complex breakpoint conditions. These events can include user-system status.

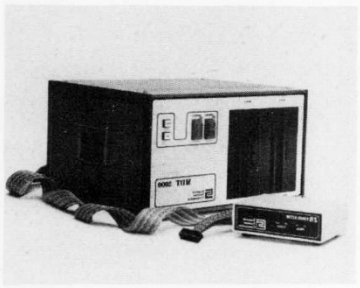
Emulation control is achieved with a screen-oriented Supervisor which provides various prompting background displays and parameter toggle fields.

Assembly language source and object program generation is supported with a PASCAL-Based Operating System (PBOS). PBOS provides a powerful screen-oriented editor and floppy disk file manager with user-controlled operations on file name families (i.e., wildcards). User-adaptable CRT terminal and printer configuration utilities are available to tailor the system to various terminal and printer characteristics.

A versatile ROM Bootstrap provides power-up access to RAM and/or disk diagnostics, user-controlled booting of PBOS, and an elementary RAM-oriented debugger for pre-disk boot utilization. Remote Communications software (optional) provides access to other systems for terminal interaction or file transfer (binary/ASCII) with error detection and recovery capability.

The intelligent floppy disk controller maintains a log of soft (recoverable) disk errors for user request via a PBOS utility. Self-test of ROM and RAM is automatically performed at power-up and system reset time, and the results are reported.





SYSTEMS