

Synertek System's Versatile Interface Module, SYM-1.

The Complete Microcomputer System.

ASK ABOUT OUR
OEM MODEL,
SM100, WITHOUT
KEYBOARD DISPLAY

The SYM-1 Has Arrived! Time to Get On-Board!

Don't become stuck in an old technology. Master the latest, state-of-the-art Technology of Microprocessors.

Develop insight into the future systems trends of microprocessor technology.

Start with SYM, Grow with SYM.

Learn, grow, apply, and stay with the system that expands as your needs grow. GET ON-BOARD with the SYM-1 Microcomputer Board.

FULLY ASSEMBLED, TESTED, DOCUMENTED AND EXPANDABLE.

The SYM-1 Formula:

SYM =Advanced Architecture +
....Versatility +
....Expandability +
....Product Reliability +
....Quality Manufacturing +
....Experience.



EDUCATORS, ENGINEERS, HOBBYISTS, STUDENTS AND INDUSTRIAL USERS, if you need help learning about or developing microprocessor systems, call on your SYM-1. This Versatile

Interface Module (SYM) will provide you with the techniques and tools to fully understand a microprocessor system.

Once you've mastered these techniques SYM can be

used as a development tool to develop new systems, or as a practical system ready to meet your actual needs.

SYM-1 Features Include:

- FULLY-ASSEMBLED AND COMPLETELY INTEGRATED SYSTEM that's ready-to use as soon as you open the box. Any table or counter top serves as a workbench. Provide the nominal power requirements and you're set to go.
- 28 DOUBLE-FUNCTION KEYPAD INCLUDING UP TO 30 BUILT-IN FUNCTIONS
- EASY-TO-VIEW 6-DIGIT HEX LED DISPLAY
- KIM-1 HARDWARE COMPATIBILITY (KIM-1 is a product of MOS Technology).

- The powerful 6502 8-Bit MICROPROCESSOR whose advanced architectural features have made it one of the largest selling "micros" on the market today.
- FIVE ON-BOARD PROGRAMMABLE INTERVAL TIMERS available to the user for timing loops, watchdog functions, and real-time communication protocols.
- 4K BYTE ROM RESIDENT MONITOR, user expandable.
- SINGLE 5 VOLT POWER SUPPLY is all that is required.
- 1K BYTES OF 2114 STATIC RAM on-board with sockets provided for immediate expansion to 4K bytes on-board, with total memory expansion to 65,536 bytes.
- USER PROM/ROM: The system is equipped with 4 PROM/ROM sockets for 2316/2332 ROMs or 2716 EPROMs, up to 28K bytes.
- STANDARD INTERFACES INCLUDE:
 - Audio Cassette Recorder Interface with Remote Control (Two modes: 8 Bytes/sec KIM-1 compatible, Hi-Speed 185 Bytes/sec)
 - Full Duplex 20mA Teletype Interface
 - System Expansion Bus Interface
 - TV/KB Controller Board Interface
 - RS232 Compatible Interface
 - Oscilloscope Single Line, 32 Character Display
- APPLICATION PORT: 15 Bi-directional TTL lines for user applications with expansion capability for added lines
- EXPANSION PORT FOR ADD-ON MODULES (50 I/O Lines in the basic system).
- FOUR INPUT/OUTPUT BUFFERS for driving or receiving real world interfaces.
- SEPARATE POWER SUPPLY connector for easy disconnect of the d-c power.
- AUDIBLE RESPONSE KEYPAD.
- SYM-1 MANUALS: Our well organized documentation package is complete and easy-to-understand.

When You're Ready for More We Don't Let You Down!

SYM-1 CAN GROW AS YOU GROW. It's the system to BUILD-ON.

Expansion features that are planned:

- TV/KB Interface Card with ASCII Keyboard and Numeric Pad (Nov. '78)
- BASIC Interpreter (Nov. '78)
- Resident Assembler/Editor (Dec. '78)
- Port Expansion Kit (Available now)
- RAM Expansion Kit (Available now)

If You Liked KIM* You Will Love SYM

SYM-1 PROVIDES YOU WITH ON-BOARD EXPANSION. The printed circuit board includes in its layout the capability to add additional ROM, PROM, RAM, or Peripheral Ports when you require them. SYM-1 doesn't require you to build up wire-wrap boards to use these options. SYM-1 option chips are merely plugged into the basic unit to give you the added capability you require. The system is neatly configured and you won't have to have a "rat's nest of wires" hanging off the basic board. We have maintained KIM* hardware compatibility. Our boards will plug into any KIM* motherboard and card cage.

We've Put More in Our Software!

We have enhanced software as well as hardware. The software has simplified the user interface. Our standard SYM-1 system can be programmed EITHER in machine language for those users wishing to gain an in-depth understanding of micro-processor operations, or can be loaded with object code developed on a cross-assembler resident on another system. For those users who want to develop in assembly language directly on SYM-1 our optional RESIDENT ASSEMBLER/EDITOR can be purchased and plugged into the ROM/PROM expansion sockets ALREADY PROVIDED.

Similarly, those users wishing to develop in a higher level language can purchase SYM-1 BASIC as a nominally priced option. Monitor status is easily accessible, and our monitor gives the keypad user the same full functional capability of the TTY user.

**KIM is a product of MOS Technology.*

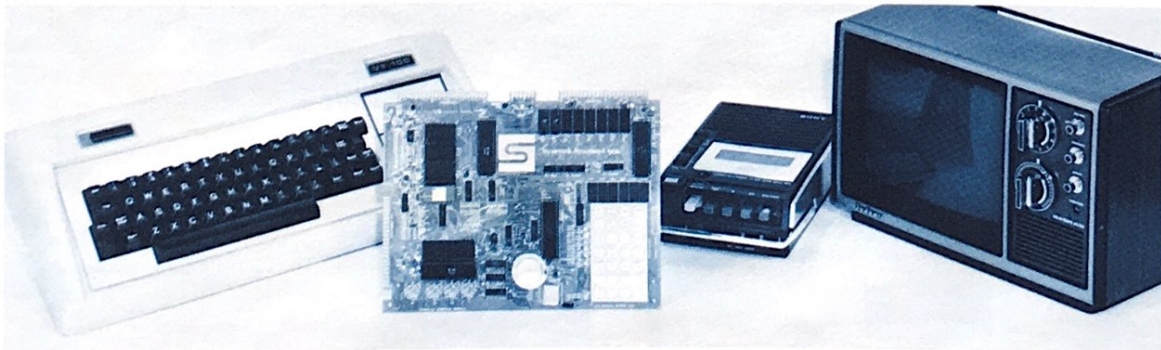
Other Software Enhancements Include:

- Write Protect of Selectable Memory Areas
- Byte Search Capability
- Decimal Point Prompting on Hex Display
- User Expandable Monitor Program
- Break Function to Halt Program
- Programmable/Debug/On-Off
- Programmable Single-Step
- Software Breakpoint Feature

SYM is a Versatile Computer Tool

WHAT YOU BUY IS NOT ALL YOU GET! Future growth and expansion is a key requirement in any system and such growth has been designed into SYM-1. Unlike any other systems which you "discard" once you've mastered them, SYM-1 GROWS WITH YOU.

You can store your programs in the 1K Static RAM and debug by simply using the single-step feature on the keypad. User Static RAM is easily expandable to 4K SRAM on-board the basic unit. The I/O lines which are available to control your custom applications can be expanded via an additional socket provided for SYNERTEK's Versatile Interface Adapter SY6522. Connector sockets have also been provided to our optional CRT-TV/KB Interface Card, which includes an ASCII Keyboard. This card will enable any home CRT monitor or TV to be turned into a versatile video terminal, with the addition of a standard RF adapter supplied by the user.



Components shown above represent a typical configuration: SYM-1, keyboard, cassette recorder, and home TV.

Using SYM-1

STAND-ALONE MICROCOMPUTER: With the addition of a user-provided 5-volt power supply the SYM-1 becomes a functional stand-alone microcomputer development system. In this configuration the user can select any memory addresses, read/modify data and execute or single-step through programs.

AUDIO TAPE CASSETTE: By providing an audio cassette the user gains low-cost File Capability and External Memory Store. The SYM-1 user can Create Files, Block Data into Records on tape from SYM-1 Memory, Read Data Records from tape into Memory. A remote control feature has been added. The audio cassette feature can operate in two speed modes:

- 1.) 8 Bytes/sec KIM-compatible
- 2.) High-Speed 185 Bytes/sec Mode

TELEPRINTER INTERFACE: The standard 20mA Teleprinter interface allows for the easy installation of a Model 33 Teletype. The user can now LIST programs and maintain permanent records of user's data. The use of the full Alpha-Numeric keyboard expands the character set available to the user. The paper tape reader/punch options allow the user alternative methods for storing programs and data. The SYM-1

AUTOMATICALLY ADJUST FOR A VARIETY OF BAUD RATES.

TV/KB Interface Option

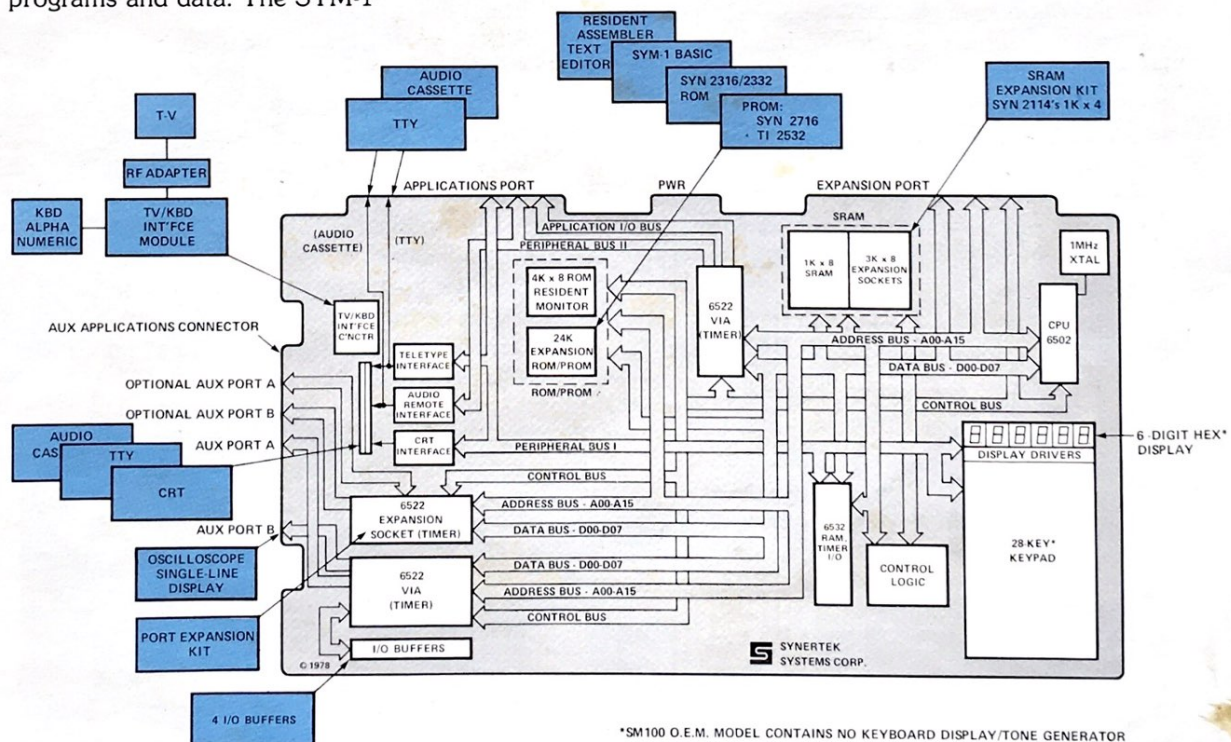
With the addition of our TV/KB Interface option board, plus a standard RF Adapter the SYM-1 becomes a complete computer system, with your TV or CRT monitor used as a video display terminal. The full alpha-numeric keyboard available on the TV Interface card has the same capability found in larger and more expensive computer systems.

Reliability in SYM-1

SYM-1 incorporates the tried and tested SY6502 8-bit microprocessor. This "micro" with its powerful architecture has been incorporated into a multitude of system types. It has been used extensively on TV GAMES where reliability is a must. The powerful COMBO's and VIA's (SY6532 and SY6522) RAM's (SY2114) and ROM's (SY2332) have all been extensively used and proven in the field.

Low Price

The SYM-1 is priced attractively in single unit quantities. SYNTERTEK also offers attractive OEM discounts and distribution pricing.



*SM100 O.E.M. MODEL CONTAINS NO KEYBOARD DISPLAY/TONE GENERATOR

