
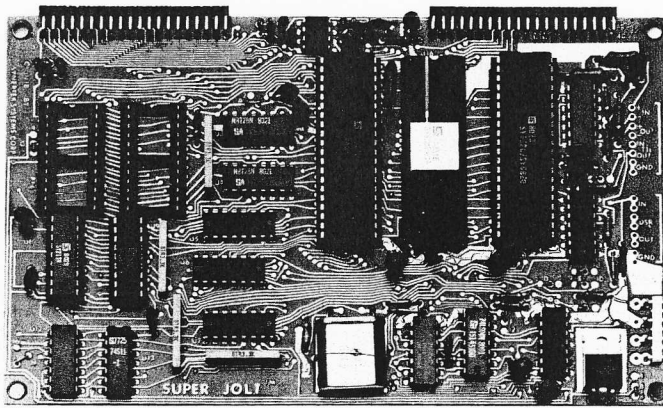


Popular Microcomputer Products
from Synertek Systems 

CP110 SUPER JOLT



- 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.

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, assembling and executing microcomputer programs. Stand-alone, the CP110 is a single board OEM microcomputer suited to a wide range of dedicated applications.

AS200 UNIVERSAL CARD

- Ideal for Experimental/Prototype Circuits
- Accepts 14-Pin to 40-Pin Wirewrap Sockets
- Power and Ground Busses Provided for Each Row of Holes
- Accepts up to 50 14-Pin Sockets
- Dimensions: 4.25 in. x 7.00 in. Card Compatible with SUPER JOLT

Universal Card is ideal for constructing experimental and prototype circuits. Holes are provided for mounting connectors for mating cables to interconnect the AS200 to other boards in the SUPER JOLT family.

EPS-1

SYM-1 DIAGNOSTIC PROGRAM

- 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

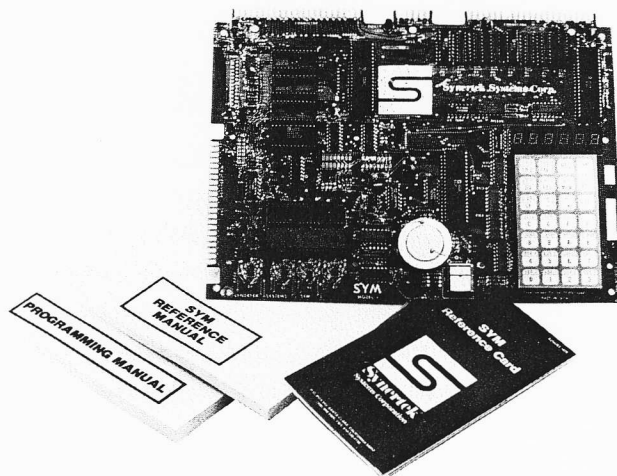
The EPS-1 Diagnostic Program for SYM provides a valuable self-test capability to aid in any phase of test, trouble shooting or repair. Essentially all components of the SYM are functionally tested assuring a fully working unit.

COMPUTER

- 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 20mA 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.

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.



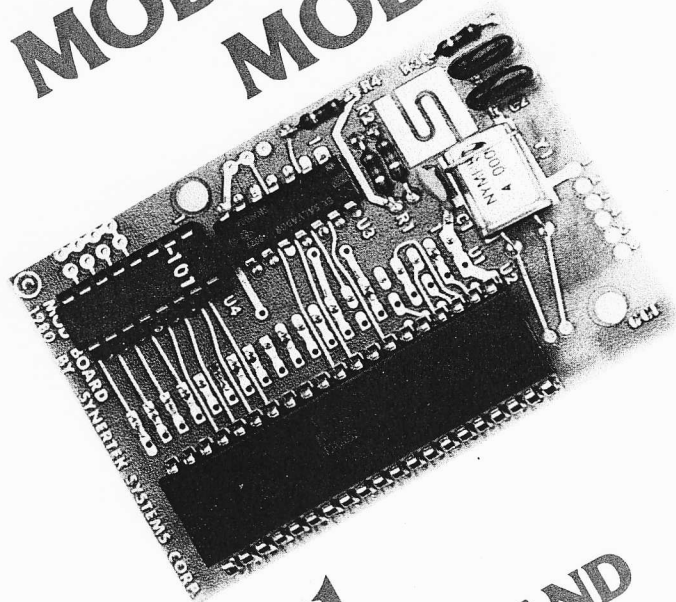
SYM-1/68 SYM-1/69 SINGLE BOARD COMPUTERS

- 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

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 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

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.

PEX-1 PORT EXPANSION AND CONNECTOR KIT



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

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.

SRM-1, SRM-3 STATIC RAM MEMORY KIT

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

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
0000-00FF	U16, U17	Low Power Static RAM
0400-07FF	U18, U19	Low Power Static RAM
0800-0FFF	U20, U21	Low Power Static RAM
0C00-0FFF	U22, U23	Low Power Static RAM

*The SY6522 Versatile Interface Adaptor is shipped with the SYM-1 board and is not included in the kit.

SM100 OEM VERSION OF SYM-1

- 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

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.

BAS-1 BASIC

- 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

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

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

Assembler

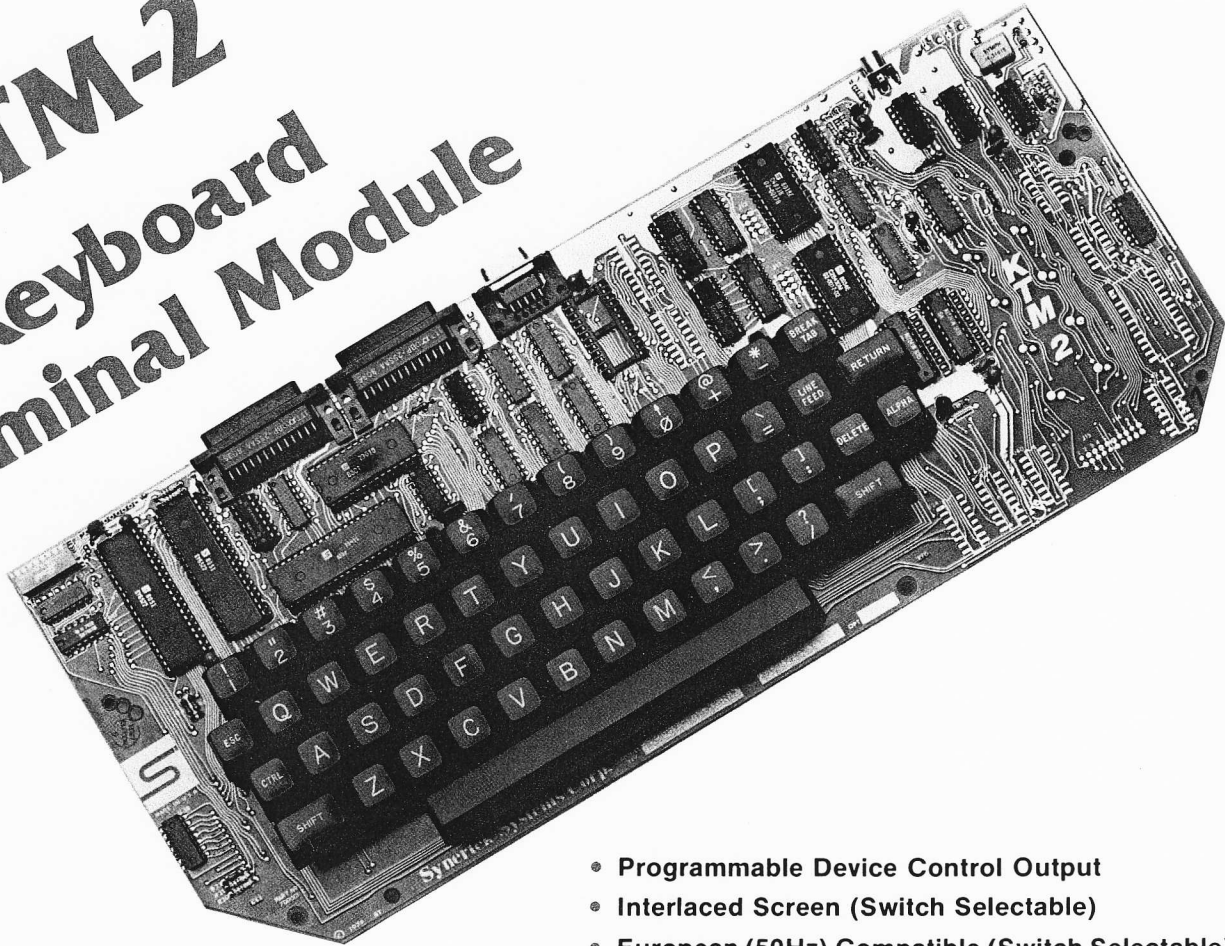
- Macro Capability
- Conditional Assembly
- Source Input from RAM or Tape
- Produces Relocatable Object Code
- Relocating Loader
- Assemble with Source Listing or Errors-Only Listing
- Hex, Binary, Decimal or Mixed Data Types
- 16 Assembler Pseudo-Ops
- 23 Error Codes
- Storage of Hex or ASCII Bytes

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

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.

KTM-2 Keyboard Terminal Module



- Choice of Character Screen Sizes:
 - 24×80 Character Screen Size (KTM-2/80)
 - 24×40 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
- Cursor Blanking
- 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
- Auxiliary 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

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.

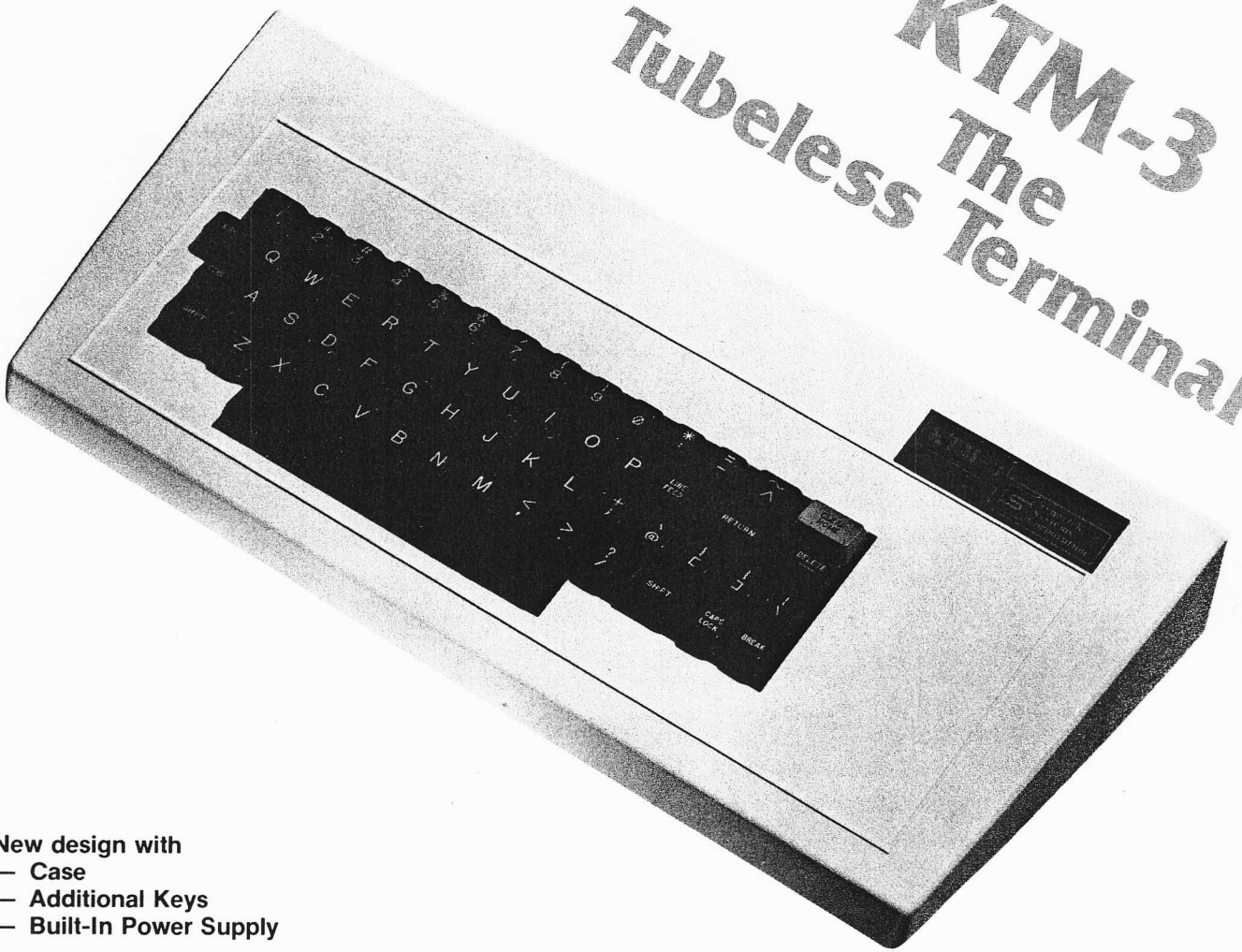
The design of the KTM-2 incorporates 8 MOS-LSI integrated circuit chips, including two dedicated microprocessors. Twenty TTL devices are used, resulting in a total chip count of 28 devices.

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.

KTM-3 The Tubeless Terminal



- New design with
 - Case
 - Additional Keys
 - Built-In Power Supply
- 110 to 19.2K Baud
- Choice of Character Screen Sizes:
 - 24 × 80 Character Screen Size (KTM-3/80)
 - 24 × 40 Character Screen Size (KTM-3/40)
- 7 × 9 Character Matrix in 8 × 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

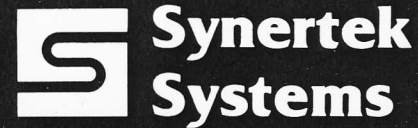
- Built-In Diagnostics
- KTM-3/40 Will Attach to Standard TV Set Using RF Modulator
- 50/60 Hz Operation
- 220 Volt Version Available

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 × 40 characters, or 24 × 80 characters.

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

P.O. Box 552 • Santa Clara, CA 95052



LITERATURE REQUEST FORM

U.S. & CANADA

MNA-1	SYM-1 Single Board Computer Reference Manual	_____	\$5.00	_____
MNA-2	6500 Programming Manual	_____	\$5.00	_____
MNA-3	6500 Hardware Manual (covers 6500 Microprocessor Series)	_____	\$5.00	_____
MNA-4	SYM BASIC Manual	_____	\$4.00	_____
MNA-5	Manual for EPS-1 (SYM-1 Diagnostic Firmware)	_____	\$4.00	_____
SRC-1	SYM-1 Reference Card	_____	*N/C	_____
SPT-1	SUPERJOLT (CP110) Single Board Computer Manual	_____	\$4.00	_____
KMM-1	KTM-2 Keyboard Terminal Module Reference Manual	_____	\$4.00	_____
KMM-2	KTM-3 Tubeless Terminal User's Manual	_____	\$4.00	_____
RMN-1	Resident Assembler/Editor Manual	_____	\$4.00	_____
TNP-1	Package of all Technical Notes	_____	\$4.00	_____

*Complimentary items (N/C) are single quantity only.
For additional copies contact factory.

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