User's Manual
for the
PROMDISK-Chip/EPROM/SRAM Board

MCSI PART NO. 72600901
For Industrial/Embedded System Applications

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PREFACE

This manual provides information about the MCSI PROMDISK-Chip/EPROM/SRAM Memory Board. This information is intended for users who must implement IBM PC/AT compatible computer solutions to a wide variety of applications which cannot be satisfied using conventional desktop computers. This manual assumes that the reader has a good understanding of MS-DOS and the standard IBM PC/AT compatible architecture. For more information on the IBM PC compatible hardware and software architecture, refer to any of the many books available on the subject. A few suggestions are listed below:

- *Advanced MS-DOS Programming*, Microsoft Press
- *Programmers Guide to the IBM PC*, Microsoft Press
- *Undocumented DOS,* Addison Wesley

INVENTORY CHECKLIST

The complete PROMDISK-Chip/EPROM/SRAM Memory Board package consists of the following:

PROMDISK-Chip/EPROM/SRAM Memory Board
This Manual

If any of the above is missing or appears to be damaged, inform MCSI immediately. Note that for quantity shipments, only one copy of this manual is included, unless otherwise requested.

Table of Contents

SECTION 1 - GENERAL DESCRIPTION

The PROMDISK-Chip/EPROM/SRAM board is a general purpose memory board designed for use in IBM PC/XT/AT compatible computers to provide additional memory capacity.

The PROMDISK-Chip/EPROM/SRAM board will support up to four 28 or 32-pin JEDEC standard 8Kx8, 32Kx8, 64Kx8, and 128Kx8 devices. It allows the use of PROMDISK-Chips, EPROMs, Flash EPROMs, SRAMs, or NVRAMs .

The four memory sockets will accommodate the following generic memory devices:

PROMDISK-Chip
EPROMs - 2764, 27128, 27C010
Flash EPROMs - 29F010
SRAMs - 6164, 61256
NVRAMs - Dallas DS1225, DS1235

The board is intended to be used in the D000H-EFFFH BIOS extension address space of system memory; therefore, depending on the number and type of memory chips used, the board can accommodate up to 128K bytes of memory. Device types are not intended to be mixed, although some cases of mixing EPROMs and SRAMs may be possible.

When using MCSI PROMDISK-Chips, the board will emulate a read/write hard disk drive up to 64MB bytes while occupying only 32K of address space.

A Clock/Calendar function may be added by using a Dallas DS1216E Smartwatch chip. This option is transparent to the memory device installed in the adapter.

MCSI's PROMDISK Disk Emulator Software can be used with the PROMDISK-Chip/EPROM/SRAM board to configure a small solid state disk emulator using EPROM or SRAM in place of a physical disk, permitting construction of diskless, ruggedized terminals, workstations, controllers, instruments, etc.

1.1 FEATURES

A complete list of features is listed below:

- IBM PC/XT/AT Compatible
- Capacity up to 64M-bytes using four PROMDISK-Chips
- Supports Four 28 or 32-pin Standard Byte-wide Memories
- Jumper Selectable Address Boundaries
- Supports Flash EPROMs and NVRAMs for Nonvolatile Operation
- Passive Backplane Architecture
- Low Power CMOS Design
- Standard Quarter Size "XT" Plug-in Board

1.2 BOARD POWER REQUIREMENTS

The PROMDISK-Chip/EPROM/SRAM board is implemented using CMOS technology for low power

consumption and is powered from the +5VDC I/O expansion bus power supply. The power requirements for the PROMDISK-Chip/EPROM/SRAM board are shown in Table 1.2 below:

Table 1.2
PROMDISK-Chip/EPROM/SRAM BOARD POWER REQUIREMENTS

Voltage	Tolerance	Operating	Standby
+5VDC	10%	40 ma.	25 ma.

Note: The values in the above table do not include memory chips.

SECTION 2 - CONFIGURING THE BOARD

The memory configuration jumpers for the board are selected by a combination of shorting jumpers on headers E1 and E2. The E1 header is used to enable each of the sockets. The E2 header controls the starting address, chip size, and chip type.

2.1 SETTING THE ADDRESS, CHIP TYPE, AND CHIP SIZE

The PROMDISK-Chip/EPROM/SRAM board base address is determined by the Starting Address (E2-1 & E2-3), Chip Size (E2-5 & E2-7), and the Chip Type (E2-11) jumpers. The configuration jumper settings for the various type and sizes of chips are shown in Table 2.1 below:

Table 2.1
STARTING ADDRESS, CHIP SIZE, and CHIP TYPE JUMPER E2

ADDRESS	TYPE	SIZE	1-2	3-4	5-6	7-8	11-12
D000H	PROMDISK-Chip	8Kx8	ON	ON	ON	ON	ON
D800H	PROMDISK-Chip	8Kx8	ON	OFF	ON	ON	ON
E000H	PROMDISK-Chip	8Kx8	OFF	ON	ON	ON	ON
E800H	PROMDISK-Chip	8Kx8	OFF	OFF	ON	ON	ON
D000H	EPROM	8Kx8	ON	ON	ON	ON	ON
D800H	EPROM	8Kx8	ON	OFF	ON	ON	ON
E000H	EPROM	8Kx8	OFF	ON	ON	ON	ON
E800H	EPROM	8Kx8	OFF	OFF	ON	ON	ON
D000H	EPROM	64Kx8	ON	ON	OFF	ON	ON
D000H	EPROM/FLASH	128Kx8	ON	ON	OFF	OFF	ON
D000H	SRAM	8Kx8	ON	ON	ON	ON	OFF
D800H	SRAM	8Kx8	ON	OFF	ON	ON	OFF
E000H	SRAM	8Kx8	OFF	ON	ON	ON	OFF
E800H	SRAM	8Kx8	OFF	OFF	ON	ON	OFF
D000H	SRAM	32Kx8	ON	ON	ON	OFF	OFF

Care must be taken when using address E000H as this address is sometimes occupied by the system BIOS EPROM.

2.2 ENABLING THE CHIPS

Each of the memory sockets on the PROMDISK-Chip/EPROM/SRAM may be individually enabled or disabled. Header E1-1, E1-3, E1-5, and E1-7 are used to enable the sockets U1 through U4, respectively. Installing the shunt enables the socket, removing the shunt disables the socket.

The addressing of the sockets for the various sizes of chips is shown in Table 2.2 below:

Table 2.2
SOCKET ADDRESS TABLE

Size	E2 (1-2)	E2-(3-4)	U1	U2	U3	U4
8Kx8	ON	ON	D000	D200	D400	D600
8Kx8	ON	OFF	D800	DA00	DC00	DE00
8Kx8	OFF	ON	E000	E200	E400	E600
8Kx8	OFF	OFF	E800	EA00	EC00	EE00
32Kx8	ON	ON	D000	D800	E000	E800
64Kx8	ON	ON	D000	E000	N/A	N/A
128Kx8	ON	ON	D000	N/A	N/A	N/A

2.3 INSTALLING THE MEMORY CHIPS

The PROMDISK-Chip/EPROM/SRAM board supports popular 28 or 32-pin JEDEC standard byte-wide memory devices. For proper operation the devices should have a ***maximum access time of less than 150 nanoseconds.*** The following is a list of some of the more common generic chip types:

EPROM:	64Kx8	D27C512-150 Intel
	128Kx8	27C010-150 Intel
FLASH:	128Kx8	AMD29F010 (5V only)
SRAM:	8Kx8	TC5565A-15 Toshiba
	32Kx8	KM62256AP-15 Samsung
NVRAM:	8Kx8	DS1225Y-150 Dallas
	32Kx8	DS1235Y-150 Dallas
PROMDISK-Chip:	4MB	72300 *MCSI*
	8MB	72301 *MCSI*
	16MB	72302 *MCSI*

For chip types not listed, please consult the factory.

NOTE: When using 28-pin chips, the top four pins of the sockets are not used (two pins on each side). When installing 28-pin chips, make sure that pin 1 (notch) of the chip is pointing to the top of the board and is aligned with pin 3 of the socket, i.e. the chip is bottom justified in the socket.

SECTION 3 - INSTALLING THE BOARD IN YOUR SYSTEM

This section describes the procedures for installing the PROMDISK-Chip/EPROM/SRAM board into your system. Be sure to check both the configuration jumpers closely before installing the board into your computer system.

3.1 SETTING UP YOUR SYSTEM

IBM PC/XT/AT compatible computers have a CMOS memory to set the maximum memory contained on your system board. The configuration of your system board must be set properly before installing the PROMDISK-Chip/EPROM/SRAM board. Computers that have Shadow Memory in the BIOS extension area must be disabled when trying to use the board at these locations. Refer to your computer's Operations Manual and set the DIP switch or CMOS memory accordingly.

3.2 INSTALLING THE BOARD

To install the board in your target system, the following steps should be followed:

1. Remove power from your target system and unplug the AC power cord from the DC power supply.
2. Remove the cover (if applicable) and locate an empty I/O card slot.
3. Install the board in any one of the unused I/O expansion slots in your computer.
4. Be sure the system board CMOS memory is setup properly.
5. Replace the cover, if applicable.
6. Apply AC power to power supply.
7. Apply power and boot system.

After power is turned on to your target system you can access the memory on the PROMDISK-Chip/EPROM/SRAM board.

APPENDIX A - SPECIFICATIONS

This appendix lists the specifications for the PROMDISK-Chip/EPROM/SRAM Memory board.

BOARD SPECIFICATIONS

Memory:	Four 28 or 32-pin JEDEC Standard Sockets. Access Time: 150 nanoseconds maximum
I/O Bus:	IBM PC/XT/AT Compatible 62-pin Edge Connector
DMA:	Not Used
Timers:	Not Used
Interrupts:	Not Used
I/O Ports:	Not Used
Size:	Quarter size XT board 4.04"L X 3.35"H
Power:	+5VDC @ 0.04A