S T O P ! ! ! R E A D M E F I R S T !!!!

Thank you for purchasing the MX01 MEMORY ENHANCEMENT SYSTEM.

PLEASE READ and follow the instructions in each of the MANUALS in the following order:

MODEL MX01 Memory Enhancement

MODEL MX01 RAVE_OS SOFTWARE

MODEL MX01 RAMDISK SOFTWARE

MODEL MX01 MACRO LOADER

MODEL MX01

Memory Enhancement System

INSTALLATION AND OPERATING MANUAL

C O P Y R I G H T

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INTRODUCTION

The RAVE 99 MEMORY ENHANCEMENT System is a powerfull combination of computer hardware and software for the TI99/4A that allows memory expansion far beyond the system provided by Texas Instruments. The System is made up from RAVE 99 MX01 memory cards which allows up to 544K of memory per card. This card may be used with TI Extented BASIC, Editor/Assembler, TI LOGO, or any other software designed to utilized the additional memory.

The Model MX01 card represents a major advance over other memory systems. The System provides memory expansion up to 2 MEGABYTES, Two 8K Byte DSR's, 8K Byte NON-DSR memory, and 8K bytes of cartridge space memory. The TI-32K memory space is built into the MX01 card, saving a card slot in the PE Box. The TI-32K memory card is not required and must not be used with the MX01 cards. The MX01 is "BACKED-UP" using a new "SUPER CAPACITOR" technology which provides memory backup protection without the use of batteries or external power sources.
The MX01 is available in three Models: (See Figure 1.)

Model MX01/64 - Includes
8K BYTEs of memory at >6000 -> >7FFF
8K BYTEs of Non-DSR Memory
8K BYTEs for DSR A
8K BYTEs for DSR B
32K BYTEs of Main Memory
Advanced memory Backup Design
Expansion Sockets to increase memory to 544K BYTEs.

Model MX01/288 - Includes
All of the features of the MX01/64 with additional memory included to have 256K BYTEs of main memory.

Model MX01/544 - Includes
All of the features of the MX01/64 with additional memory included to have 512K BYTEs of main memory.

Options for the MX01 Memory Enhancement System include additional memories, LITHIUM batteries, and Software.

Memory Management software is supplied with the MX01 card which controls the memory bank switching, Cartridge space access, and loading of programs into the DSR memories. System "CALLs" from (X)BASIC allow the selection of the 32K memory bank as well as ENABLING/DISABLING the "CARTRIDGE" memory space.

Optional software available from RAVE 99 include a RAM DISK, Keyboard "MACRO", and RAVE 99 disk based version of Extended Basic. A PRINT SPOOLER is currently under development. These programs are sold separately and come complete with Users Manuals.

To get the most from your MX01 Memory Enhancement Card, First read this manual and perform the examples as you go. Also, review the appendices for special information and applications.

SPECIFICATIONS

Physical

Size.	5.75 x 8.00 inches
PCB	Double Sided with Solder mask
Weight.	7 Ounces

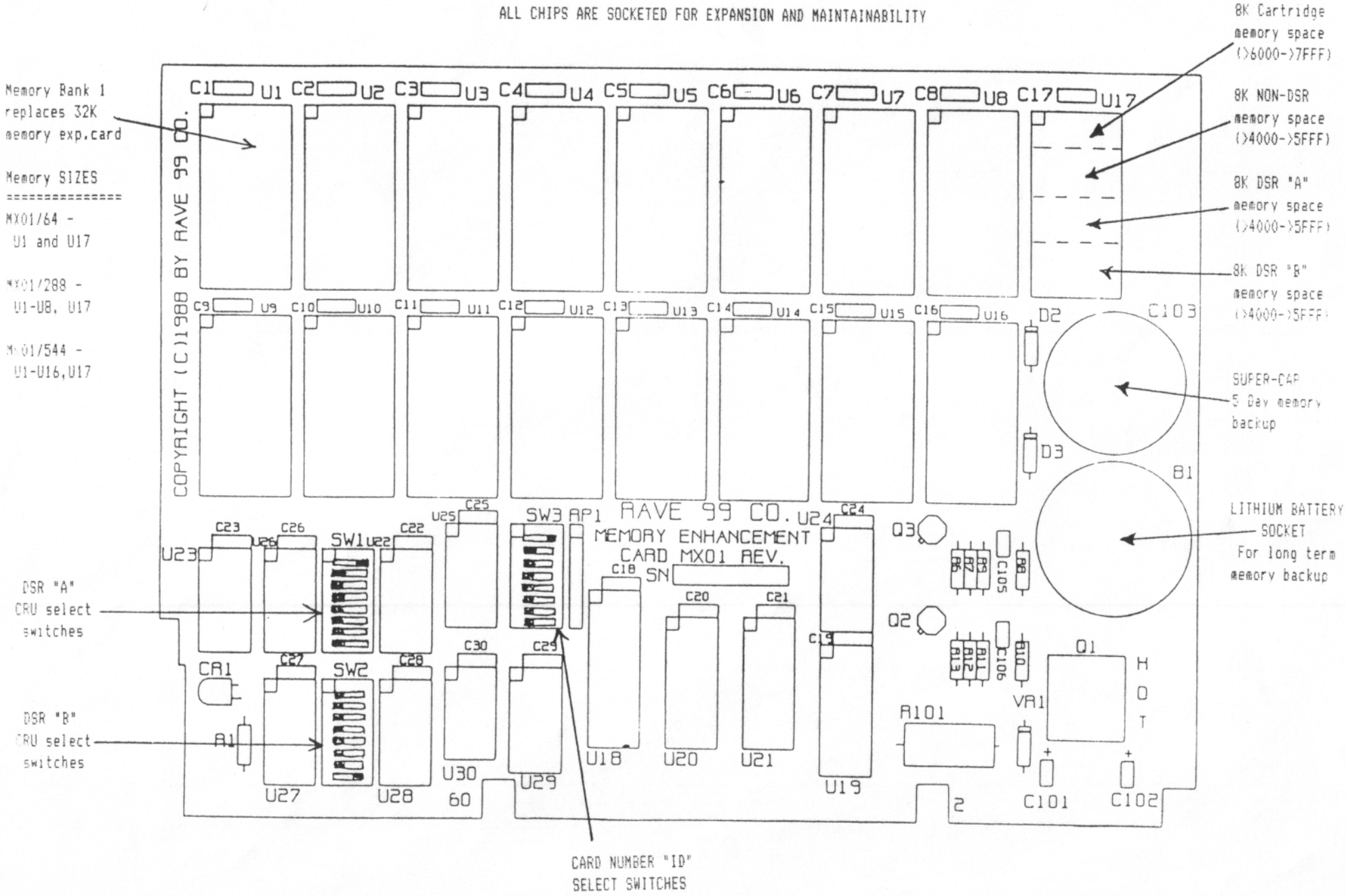
Electrical

Input Voltage	8 to 15 volts DC
Operating Current with NEC D43256C-12LL memories. .	70 ma
Standby Current with NEC D43256C-12LL memories. .	20 ua
Time to fully Charge SUPER-CAPACITOR.	14 Hours
Backup Time of Fully charged SUPER-CAPACITOR.	5 Days
Minimum Guaranteed Voltage for data retention	2.0 volts DC
Memory Chips.	32K x 8 CMOS Static RAMs, low power (NEC D43256C-12LL) 120 nano-seconds
Optional Lithium Battery. . .	MATSUSHITA ELECTRIC LITHIUM BATTERY BR2320 3-Volt

Memory Capacity

MX01/64	64K Bytes
MX01/288.	288K Bytes
MX01/544.	544K Bytes
Maximum # MX01 per PE BOX . .	4 Cards

ALL CHIPS ARE SOCKETED FOR EXPANSION AND MAINTAINABILITY



COMPATIBILITY

Software Compatibility

All software originaly programmed to run on the TI 32K memory expansion card are compatible. Advanced programs which already take advantage of the additional memory are:

RAVE 99 OS
RAVE 99 RAMDISK
RAVE 99 Keyboard "MACRO"s
RAVE 99 Extended Basic II, Disk Version
RAVE 99 Print Spooler (under development)

RYTE DATA¶s COMMAND DOS
R.A. Green¶s MACRO Assembler
DataBioTics Software Support Loader
Asgard Software¶s BATCH-IT

Hardware Compatibility

The following cards have been tested with the MX01 Memory Enhancement System and are compatible:

TI RS232 Card, TI Disk Controller Card, MYARC Floppy Disk Controller Card, CorComp Disk Controller and Triple Tech cards, DIGIT 80 Column Card,Horizon Ram Disk, RAVE 99 Speech Adapter Card, and RAVE 99 Keyboard Enhancement System. Other cards MAY work but have not been tested.

Cards that are NOT compatible include TI 32K Expansion memory, MYARC Expansion memories, CorComp Expansion Memories.

Hardware Requirements

To use the MX01 Memory Enhancement System you need:

a) TI-99/4A console and TV or monitor

b) 99/4 Peripheral Expansion System (PEB)

c) TI Compatible Disk controller card

d) At least one floppy disk drive

e) one of the following Command Modules

TI Extended BASIC

Editor/Assembler

TI-Writer

UNPACKING THE CARD

```
**********************************************
*                                            *
*  CAUTION: The MX01 Memory Enhancement System *
*                                            *
*  contains CMOS components which may easily be*
*                                            *
*  damaged by STATIC ELECTICITY if not handled *
*                                            *
*  correctly. Please follow the instructions  *
*                                            *
*  below to avoid this problem.              *
*                                            *
**********************************************
```

STOP!!!

BEFORE UNPACKING YOUR CARD ... PLEASE BE AWARE THAT THE MX01 MEMORY ENHANCEMENT SYSTEM CONTAINS CMOS CHIPS WHICH ARE DAMAGED BY STATIC ELECTRICITY, MUCH MORE EASILY THAN "TTL" STYLE LOGIC DEVICES. STATIC DISCHARGE IS ESPECIALLY BAD IN THE WINTER MONTHS WHEN THE HUMIDITY IS VERY LOW. WHEN HANDLING THE CARD, PLEASE USE COMMON SENSE AND AVOID CONDITIONS WHICH MAY PRODUCE STATIC CHARGES.

The MX01 card is packaged in a static protective bag which should be saved and used when transporting the card. Be sure to use this bag if you need to send the card back for service.

Before removing the card from its bag, be sure that static discharge shall not occur. Avoid wearing sweaters or like clothing that increases the chances of static discharge. Next ground yourself by touching the bare metal chassie of the PE BOX. Remove the board from the protective bag handling it only from the edges of the card. DO NOT TOUCH ANY OF THE LOGIC DEVICES ON THE BOARD!

When configuring the card in the next few steps, place the protective bag under the card and lay flat on a table or bench. This should prevent any chance of static discharge while configuring the card.

Selecting the DSR Addresses

Two DIP style switches are located on the MX01 card to set the addresses for DSR "A"(SW1) and DSR "B"(SW2). The factory addresses for these DSR's is >1000 for DSR "A" and >1700 for DSR "B". These addresses may need to be changed depending on the other cards located in the PE BOX.

Each DIP switch allows an address selection from >1000 to >1700. The slide switch marked "1" corresponds to address >1000, slide switch marked "2" corresponds to address >1100. Select the address required by moving the specific slide to the "ON" position. See table Below:

DSR ADDRESS SWITCH SETTINGS

SW1 or SW2 SLIDE SW #	NONE	>1000	>1100	>1200	>1300	>1400	>1500	>1600	>1700
1	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
6	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
8	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON

****
* Please NOTE!! Only ONE slide Switch may be in the "ON" position *
* at a time. Damage to the card may result if more than one switch*
* per DIP switch is in the "ON" position. *
****

The factory switch settings for SW1 and SW2 are shown in Figure 2.

Selecting the Card Configuration

The MX01 Card is designed to allow multiple cards in the same PE Box. Proper configuration of these cards is required to prevent conflicts with other MX01 cards. Switch #3 (SW3) controls the configuration of each card.

Card Identification Selection

Each card must be assigned a unique card ID # from 1 to 4. The first card should be 1, the second #2, the third card #3, and the fourth card #4. Slide switches 1 -> 4 of SW3 control this selection. See table below.

Card Identification Selection

SW3 SLIDE SW #	NONE	1	2	3	4
1	OFF	ON	OFF	OFF	OFF
2	OFF	OFF	ON	OFF	OFF
3	OFF	OFF	OFF	ON	OFF
4	OFF	OFF	OFF	OFF	ON

****
* Please NOTE!! Only ONE slide Switch may be in the "ON" position *
* at a time. Damage to the card may result if more than one switch*
* of the above slide switches is in the "ON" position. *
****

Special MEMORY CHIP Enable/Disable Selection.

Memory chip U17 contains all of the special memory areas, ie DSR¶s, NON-DSR, and Catridge space memory. This memory must only be ENABLED on the FIRST MX01 card and Disabled on MX01 cards #2,3, and 4. Slide switch #7 of SW3 controls this selection with the "OFF" position "ENABLING" the chip and the "ON" position "DISABLING" the Chip. The table below shows the selections.

SW3 SLIDE SW #	U17 ENABLED	U17 DISABLED
7	OFF	ON

The factory switch settings for this switch is "OFF".

Lower Card Half ENABLE/DISABLE Selection.

This feature allows for additional memory sub-divisions in the future. Slide Switch #8 of SW3 controls this selection with the "OFF" position "ENABLING" the lower half of the memory card. The "ON" position "DISABLES" the lower half of the memory card. The table below shows the selection.

SLIDE SW #	SW3 ¶U1 - U8 ENABLED	¶U1 - U8 DISABLED
8	OFF	ON

The factory switch setting for this switch is "OFF".

Slide switches 5 and 6 of SW3 are unused.

Additional Memory Chips

Three models of the MX01 card are available and each have different memory configurations. The MODELS MX01/64 and MX01/288 have sockets for additional memory chips. The chips used are 32K by 8 static rams that require very low power and run at 120 NANO Seconds. The recommeded chip is NEC D43256C-12LL. The Standby power required by these chips is very low and typically in the .5uA range. This parameter has a major affect on backup times the MX01 will provide when only the SUPER-CAP is used as backup. These chips are available from RAVE 99 Co. in upgrade sets or in single quantity.

Memory Backup System

The MX01 Card is memory backed-up using two methods.
First, the card is designed to backup memory for about 5 days without the use of batteries or external power source. Each time the system is powered ON, the card "RECHARGES" itself automatically. New SUPER capacitor advances has led to this new method for memory backup.
To extend the backup time beyond 5 days, an optional LITHIUM battery may be installed which provides backup for months to years depending on system usage.

Optional "LITHIUM" Battery

Battery socket "B1" on the MX01 card allows for the use of a "LITHIUM" battery to provide backup beyond the 5 days provided by the SUPER-CAP system. The recommended battery is the MATSUSHITA ELECTRIC LITHIUM BATTERY BR2320 3v. When installing the battery, be sure that the (+) side is up, facing the battery hold-down spring.

DO NOT ATTEMPT TO RECHARGE THIS BATTERY!!!!! This battery in not intended for recharging! Recharging a LITHIUM battery may be dangerous because it can cause leaking and may possibly explode. When the battery fails, throw it away and replace it with a new one.

INSTALLING THE CARD

Before proceeding, be sure the MX01 is configured to work with your system. Next, follow the instructions below to install the MX01 Memory Enhancement Card into the PE Box.

1) Turn OFF the computer console and all attached devices.

2) WARNING: TO AVOID DAMAGING ACCESSORY CARDS, WAIT TWO(2) MINUTES AFTER TURNING OFF THE UNIT FOR THE POWER TO DISCHARGE BEFORE PROCEEDING.

3) Remove the top from the peripheral expansion box by lifting the back edge of the top and pulling up.

4) To orient the card correctly for installation, the green led must point toward the front of the PE Box. When the card is properly oriented, all of the IC's and other components will be facing the disk drive enclosure.

5) Install the MX01 in any available slot. Check that none of the components on either side of the card touches any other card or card case (clam-shell).

6) Replace the top on the PE Box by sliding the front edge under the extension on the front of the unit and firmly pressing down on the back edge of the top. Do not run the system without the top in place because the top ensures proper ventilation.

CHARGING THE SUPER-CAP

The SUPER-CAP requires initially, about 14 hours of continuous charging to reach its fully charged state. Once charged, regular use of the system shall keep the SUPER-CAP charged to a near full level. Each time the PE Box is powered on, the SUPER-CAPACITOR automatically charges at a slow rate towards the fully charged state. After inserting the MX01 Memory Enhancement card for the first time, power on the PE Box for 5 minutes prior to turning on the rest of the system. This gives the SUPER-CAP time to charge to the minimum voltage levels required for reliable operation. After this time, turn on the rest of the system as you normally would. Allow the PE Box to remain on for about 14 hours to allow the SUPER-CAP to fully charge and thus provide maximum backup time of 5 Days.

LOADING THE SYSTEM DSR PROGRAM

The MX01 Memory Enhancement System Diskette is included with the card and contains programs which allow access to all of the features of the MX01 card. The system DSR software must be loaded into DSR "A" to allow these features. The program that "LOADs" the DSR software is on the same diskette and is described in the following sections.

LOADING THE "LOADER" PROGRAM

The DSR LOADER program is located on the System Diskette and has the filename "LOADER". This program must first be loaded, at which time it prompts for the system DSR information. Follow the steps below to load both programs into the correct memory locations.

1) It is recommended that you make a working copy of the System diskette and keep the System diskette in a safe place.

2) Insert the E/A cartridge into the console and power-up the system in the normal manner.

3) Select the E/A from the title screen and then Option 5 of the E/A screen.

4) Insert the working copy of the MX01 Memory Enhancement system diskette into disk drive #1.

5) At the Filename prompt, type "DSK1.LOADER" followed by "RETURN". After a few seconds, the "RAVE 99 RAM DSR LOADER" program title screen will appear. The program asks for the DSR address of the DSR to be loaded. For the default address selection, this address would be >1000.

6) Type in the default address of >1000 or the address selected in the previous section. Press "RETURN"

7) Next, the program prompts for the name of the program to be loaded into the DSR. Type "DSK1.XMEMDSR" and press return. In a few seconds, the DSR is loaded and the screen is updated with the last memory location used.

8) Press "RETURN" twice to exit to the E/A software. At this point, the DSR program is loaded and ready to run. Press Function 9 to return to the title screen.

9) To check that the DSR software is properly loaded, select TI BASIC from the the title screen. Type "CALL XON" which should cause the green LED on the MX01 card to flash. Type "CALL XOF" which should also cause the green LED to flash. If the above operations do not occur, try reloading the DSR software again.

LOADING THE "DEMO" PROGRAMS

A public domain program called LINES and CIRCLES has been included on the System Diskette to demonstrate the use of the Cartridge space memory >6000 -> >7FFF.

Follow the step below to turn "ON" the cartridge memory space and then load the LINES & CIRCLES program in this space. On the TI menu screen there shall be two additional program selections to run either the LINES or CIRCLES demo programs.

1) Insert the E/A cartridge into the console and power-up the system in the normal manner.

2) Select TI BASIC from the main menu screen.

3) Turn on the Cartridge space memory by typing "CALL CSE". Press Function-Equal to return to the TI main menu screen.

4) Select E/A form the main menu. At the E/A selection screen, select #3. At the filename prompt, type "DSK1.DEMOLC6". Atfer a few seconds the prompt repeats. Press "RETURN" and type "LINES" then press return. The screen should soon be displaying a series of lines which repeats every few seconds. You may switch to the CIRCLES demo by typing "O" while the lines demo is running. Type "Q" which terminates the demo and returns to the TI title screen.

5) Hit any key to see the main menu selections. There are now 4 programs to select from. 1-TI BASIC, 2-E/A, 3-CIRCLS, and 4-LINES. Type either 3 or 4 to start the demo program running again. Type "Q" to stop the demo program.

6) Turn the console and PE Box OFF for 5 Minutes.

7) Turn the console and PE Box ON again and go to the main menu selection. Notice that the demo programs are still there due to the memory backup provided by the card. Type either 3 or 4 to verify that the programs are really there. Type "Q" to stop it.

8) Select TI BASIC from the Main menu screen. Turn OFF the Cartridge memory space by typing "CALL CSD". Press Function = to return to the main menu screen. Notice that the demo programs no longer appear as options. This is due to the fact that the computer can not see the memory at >6000 -> 7FFF because it was disabled with the "CALL CSD" command.

9) Select TI BASIC from the main menu screen. Turn back ON the Cartridge memory space by typing "CALL CSE". Press Function = to return to the main menu screen. Notice that the demo prosfams have reappeared again.

MEMORY LAYOUT DESCRIPTION

The MX01 Memory Enhancement System uses a BANK Switching technique to map in the various memory chips. Figure "3" gives a memory layout of the MX01 card. Refer to this figure when reading the following memory descriptions.

32K Memory Banks

The MX01 card has 16 memory banks which allows 512K bytes of main memory. The first bank is located at U1 and the last (16) at U16 on the card. Only one 32K memory bank may be selected at a time. Each bank is memory mapped so that it has the same addressing as the original TI-32K card. This allows any memory bank to be selected for program execution and not just data storage. Because a complete 32k memory bank is mapped in at once, the program or code which controls the memory mapping must be external to the 32K memory banks. This is why the following addition memory areas are included on the MX01 card.

SPECIAL MEMORY AREAS

The MX01 Memory Enhancement System has 4 Special 8K Byte memory areas located at U17 on the card. Three of these are DSR¶s mapped into the memory at addresses >4000 -> >5FFF and the fourth mapped in at >6000 -> 7FFF, the Cartridge space. See figure "Y". At any given time, only one of the DSR¶s may be mapped into the DSR space. When no DSR¶s are active, a NON-DSR memory area is mapped into the >4000 -> >5FFF range to add an additional 8K Bytes of memory to the system. If the cartridge space 8K memory is enabled at the same time as the non-DSR memory, then an additional 16K bytes of program memory has been added to the computer memory without any software memory mapping. This bring the total memory capacity to 48K bytes of memory. This allows for programs up to 48K bytes to run in the computer at one time without any memory mapping by the user. Figure "4" shows the memory layout for the above condition.

8K DSR "A"

This memory area is located in U17 and is address selectable via SW1 from >1000 -> >1700. The MX01 System DSR is stored in this area.

8K DSR "B"

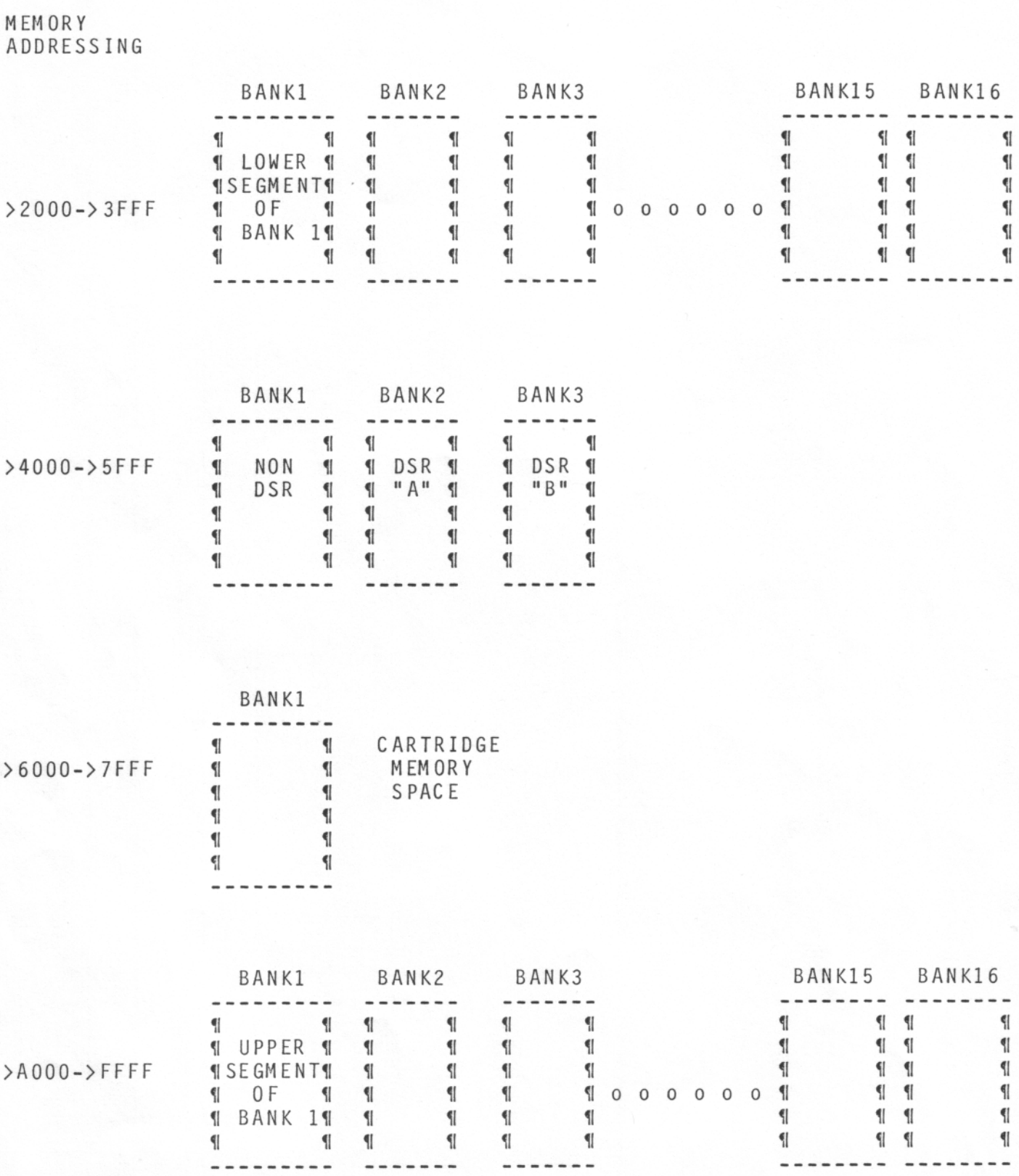
This memory area is located in U17 and is address selectable via SW2 from >1000 -> >1700. This DSR is available for the user but may get used by the System DSR if it should exceed 8K bytes.

8K Non-DSR

This memory area is located in U17 and is mapped into address space >4000 -> >5FFF by hardware logic whenever no other DSR is mapped in.

FIGURE 3

MX01 CARD MEMORY LAYOUT



8K Cartridge Space

This memory area is located in U17 and is mapped into address space >6000 -> >7FFF. This memory is reset(DISABLED) at power-up by the hardware. The area is mapped in by the "CALL CSE" subprogram and mapped out by the "CALL CSD" subprogram. This space should not be mapped in if a cartridge is installed which uses the cartrigde memory space. (IE TI-Extended BASIC) Most cartridges use the GROM address space and not the direct memory address space.

"BASIC" CALL SUBPROGRAMS

The MX01 System DSR contains six CALL subprograms which can be used directly from TI-BASIC either within a running program or in Command Mode. Below are descriptions of each of the CALL subprograms supported by the system DSR.

Memory Number - CALL MN(n)

This subprogram allows the selection of the 32K bank to be selected and used. At power-up, this number is always set to bank 1 by the hardware. When the system DSR is scanned during power-up, the last used bank is selected as the current bank number. The "n" inside the parenthesis must be a number from 1 to 16.

Card ID - CALL CID(n)

This subprogram allows the card ID selection. This selection determines which MX01 card shall be accessed to find the specific memory bank. The "n" inside the parenthesis must be a number from 1 to 4. At power-up, this number is always set to MX01 #1 by the hardware. When the system DSR is scanned during power-up, the last used card is selected as the current card Number.

Cartridge Space Enable - CALL CSE

This subprogram turns "ON" the Cartridge Memory space at >6000 -> >7FFF. At power-up, this space is turned "OFF" by the hardware. When the system DSR is scanned at power-up, a check is made to determine if a cartridge is using this space. If not, this space is returned to its last known state (ON or OFF). If a cartridge uses this space, the Cartridge memory space is left OFF.

Cartridge Space Disable - CALL CSD

This subprogram turns "OFF" the Cartridge Memory space at >6000 -> >7FFF.

MX01 Card CRU Enable - CALL XON

The CALL XON instruction enables the System DSR. This allows access to system software via TI-BASIC.

MX01 Card CRU Disable - CALL XOF

This subprogram simply turns OFF the MX01 card DSR.

Optional MX01 Programs from RAVE 99 Co.

"RAVE_OS

The RAVE_OS is an operating system designed around the MX01 card. It provides a user interface in the form of menu screens which may be easly taliored by the user. The program controls all of the resources of the MX01 card using the RAVE 99 SYSTEM PROFILE SCREEN. These include USER memory allocation, RAMDISK memory allocation, turning ON and OFF the Cartridge space memory, and displaying the total memory in the system. The main menu allows cataloging disks, Running, Viewing, and Printing of files by typing in the filenames on a command line. Additional File oriented features are provided when cataloging a disk which include Running, Viewing, Printing, and Deleting Files from the directory. Displaying of the TIME is also provided if a clock is found in the system.

"RAVE 99 MX01 RAMDISK Software

The RAVE 99 MX01 RAMDISK Software turns the MX01 card into a HIGH speed RAMDISK. A RAMDISK simulates a real disk drive in the additional memory chips of the backed-up memory. Up to 10 RAMDISKs may be defined at one time and may have up to 1440 sectors (DSDD) or as little as 3 sectors. Sizes of RAMDISKs may be sized to handle a specific real disk which requires a special volume name to work properly. The SYSTEM PROFILE SCREEN of the RAVE_OS program allows quick and easy tailoring of the RAMDISK to your specific requirements. Most programs run significantly faster when used with a RAMDISK if the program makes frequent disk requests.

"RAVE 99 Keyboard "MACRO¶s"

The RAVE 99 Keyboard MACRO program allows multiple key presses to be defined as a group or "MACRO". This "MACRO" is associated with a "single" keypress, which when pressed, causes the keypresses defined in the group to be sent to the computer as if they were being typed one at a time.

Typical use for a MACRO would be to define the printer setup of your printer. The string "RS232.BA=4800.DA=8" could be defined as MACRO "Control-P". Whenever "Control-P" is pressed, the above string would be sent to the computer. Also, filenames from the directory option of the RAVE_OS program may be access via a mailbox feature which all but eliminates typing filenames any more. It may now be clear as to the power of this program.

"RAVE 99 Extended BASIC II"

The RAVE 99 Version of Extended BASIC allows use of Extended BASIC from the MX01 Card without the use of any cartridges. It is a disked based system which may be put onto a RAMDISK for very fast operations by simply pressing the "X" key from any of the RAVE_OS screens. Programs run between 3 to 4 times faster than with TI¶s version of Extended BASIC. Additonal commands allow the use of HI-Resolution Graphics with commands such as DRAW, FILL, CIRCLE, RECT, and many more. A MX01/288 or higher is required to run this program.

PROGRAMS THAT MAKE USE OF THE ADVANCED MEMORY ARCHITECTURE

The following programs are currently available and have been tested with the MX01 Memory Enhancement System. It is very possible that you may already own one or more of these programs if you have a "SUPER-CARTRIDGE" type device.

"FUNNELWEB V4.0

This program is a FAIRWARE product and is available from Tony and Will McGovern at 215 Grinsell St., Kotara, NSW 2289, AUSTRALIA. This program provides a method of loading programs through the use of menu screens. This program normaly resides in the 32k memory space, but may to be loaded as cartridge at >6000 -> 7FFF with the MX01 card.

"RAG" MACRO ASSEMBLER

This program is a FAIRWARE product and is available from Mr. R.A. Green at the following address:

1032 Chantenay Drive
Gloucester, Ontario
Canada K1C 2K9

This program allows MACRO statements inside your assembly programs. The program may be configured such that the MACRO DEFINITION table may be stored at memory locations >6000 -> >7FFF, allowing larger CROSS REFERENCE tables than when using only the normal 32k memory.

"DATABIOTICS Software Support Program"

This program is available from DATABIOTICS at P.O. Box 1194, Palos Verdes Estates, CA 90274 and is sold as part of their "Super Space" Cartridges. This program loads at memory location >6000 -> >7FFF and provides a set of utilities which makes assembly level programing much more convenient.

"RYTE DATA¶s Command DOS"

This program is available from RYTE DATA at 210 Mountain Street, Haliburton Ontario, Canada K0M 1S0 and is sold by itself. The program provides a "DOS" like screen which many IBM user are familar with. The program supports numerous utilities and also BATCH processing. This programs loads at memory location >6000 -> >7FFF.

"Asgard Software¶s BATCH-IT"

This program is available from Asgard Software, P.O. Box 10306, Rockville, MD 20850 and is sold by itself. The Program provides a Batch Style command language. Commands are stored on disk for multiple command operations which may later be executed by a single command. This program loads at memory locations >6000 -> >7FFF.

Memory Management System

The MX01 Memory Enhancement System has memory management control logic built into each card. The specific bank selection and crd selection is accomplished by setting the bank and card addresses via the CRU system. The address definition for the memory bank and card ID is shown below.

BANK Select- The memory bank select is controlled by a six bit address which is relative to DSR "A" Address SELECTED

The first 4 bits select the 32k memory chip on a given card. The next 2 bits select the card, 1 - 4.

CRU ADDRESSING bit offset & definition

DSR "A"	CRU + 2	-	BIT0 memory sel. LSB
DSR "A"	CRU + 4	-	BIT1 memory sel.
DSR "A"	CRU + 6	-	BIT2 memory sel.
DSR "A"	CRU + 8	-	BIT3 memory sel. MSB
DSR "A"	CRU + A	-	BIT0 CARD sel. LSB
DSR "A"	CRU + C	-	BIT1 CARD sel. MSB

The address selection of DSR "A" and DSR "B" also use the CUR system int the normal addressing manner. "CRU" addresses from >1000 to >1700 are available for the MX01 DSRs.

The selection of the NON-DSR memory is controlled completly in hardware. No software is required and no address bits are available.

The address selection of the "Cartridge memory" use the CRU system, bit "E" relative to the DSR "A" base address.

GROM SPACE ENABLING/DISABLING

DSR "A" CRU + E = 0 GROM SPACE MEMORY MAPPED OUT.

DSR "A" CRU + E = 1 GROM SPACE MEMORY MAPPED IN.

THREE-MONTH LIMITED WARRANTY

This RAVE 99 MX01 MEMORY ENHANCEMENT Warranty Extends To The Original Consumer Purchaser of the Accessory.

WARRANTY DURATION

This MX01 MEMORY ENHANCEMENT is Warranteed for a period of three(3) months from the date of the original purchase by the consumer.

WARRANTY COVERAGE

This MX01 MEMORY ENHANCEMENT is Warranted against defective materials or workmanship. THIS WARRANTY IS VOID IF THE ACCESSORY HAS BEEN DAMAGED BY ACCIDENT, UNREASONABLE USE, NEGLECT, IMPROPER SERVICE OR OTHER CAUSES NOT ARISING OUT OF DEFECTS IN MATERIALS OR WORKMANSHIP.

WARRANTY DISCLAIMERS

ANY IMPLIED WARRANTIES ARISING OUT OF THIS SALE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE ABOVE THREE-MONTH PERIOD. RAVE 99 SHALL NOT BE LIABLE FOR LOSS OF USE OF THE HARDWARE OR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES, OR DAMAGES INCURRED BY THE CONSUMER OR ANY OTHER USER.

Some states do not allow the exclusion or limitation of implied warranties or consequential damages, so the limitations or exclusions may not apply to you in these states.

LEGAL REMEDIES

This warranty gives you specific legal rights, and you may have other rights that vary from state to state.

WARRANTY PERFORMANCE

During the above three month period, your MX01 Memory Enhancement will be repaired or replaced with a new or reconditioned unit of the same or equivalent model(at RAVE 99's option) when the unit is returned by prepaid shipment to RAVE 99 at the address below. The repaired or replacement unit will be warranted for three months from the date of repair or replacement. Other than the postage requirement, no charge will made for repair or replacement of in-warranty units.

RAVE 99 strongly recommends that you insure the unit for value prior to shipping.

SHIP TO :

RAVE 99 CO.
112 RAMBLING ROAD
VERNON, CT. 06066