LEAP

E/EPROM PROGRAMMER CARD LEAP-EP1

Written on 1994.11

CONTENTS

I. INTRODUCTION

A) LEAP-EP1 OVERVIEW

Thank you for utilizing LEAP E/EPROM Programmer card. With LEAP-EP1 programming tool, we have accomplished best quality combined with user upgradability and affordable price.

This LEAP-EP1 is an excellent programmer with a 32 pin socket, which presents users with an easy-to-understand and simple-to-use working environment. No ambiguous commands nor complicated procedures are required to be memorized, just follow the simple functions written in the window driven software and we assure you will enjoy the best programming time.

LEAP-EP1 has the capability of handling EPROM (Electrically Erasable Programmable Read Only Memories) and EEPROM (Electrically Erasable Programmable Read Only Memories) ranging from 2716 to 2 Mg IC or more. New devices are easily updated in software and without modifying the hardware.

In order to help us and help you achieved the fastest after sales service, be sure to write a detailed description of the error encountered and mail back the unit at the earliest possible date.

B) LEAP-EP1 COMPONENTS

LEAP-EP1 package consists of the following:

1) An IBM Compatible Plug-in Board

   LEAP-EP1 plug-in board contains all the hardware logic that is required to interface between the IBM compatible PC/XT/AT computer and the device socket. The LEAP board produces all the necessary voltages that are required to program the supported logic devices.

   It is all right for the board to be permanently installed in the user's IBM compatible PC/AT/XT computer, it does not interfere with normal operation.

2) Floppy Disk Based Software

   The standard LEAP package contain one floppy disk with all the program and utilities to enable you to use LEAP-EP1 The program are all menu driven and easy to use. The Programs on the disk directly control the hardware logic on the LEAP-EP1 plug-in board and socket pod to produce the correct programming voltages for selected device.

3) An External Device Socket Module

Using the socket to provide connection to the programmable device. This box is called 'Module or POD', it supports devices in DIP packages with up to 32 pins.

4) A 1 Meter Long Cable

5) This manual.

II. HOW TO START LEAP-EP1

A) IMPORTANT REMINDERS BEFORE STARTING LEAP-EP1

1) The "repeat key" located at the right hand side of the textool socket was purposedly designed to allow users to repeat reading, programming, verifying a device.

   Take for example, after accomplishing programming a certain device, user can just make use of the "repeat key" and repeat the same procedure.

2) To prevent damaging the IC, always make sure to remove whatever device in textool socket when starting or ending the system.

3) Always make sure that the textool socket is free from dirt, otherwise when users execute read or program commands, it will provide unstable results.

4) If IC pin has become dirty because of prolong use, make sure to clean the device before application.

200-207	Game I/O
278-27F	Parallel printer port 2
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port 1
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

This is current I/O port address of any personal computer, so again we suggest users to select the 200-2FF section for the 300-3FF sections are usually occupied by a lot of other add-on cards.

B) INSTALLATION PROCEDURES

All the instruction listed in the installation section should be followed carefully.

1) Make sure to switch off your computer system.

2) Check the JUMP of the computer system remote control card.

3) Insert the control board carefully into the slot and fasten it to the computer system with the slot cover screw.

4) Finally, connect the socket 'MODULE OR POD' to the board by using the attached cable. The male cable end should be connected to the plug-in board and the female end to the main module.

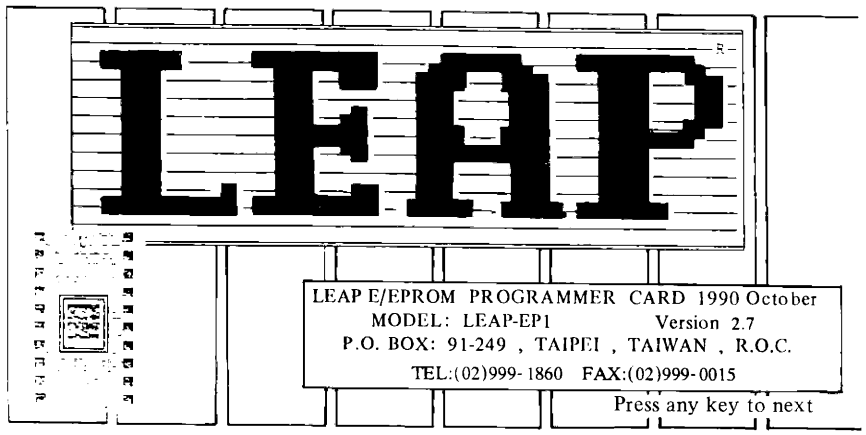
5) After booting the system with DOS in drive A. Insert LEAP-EP1 software in drive A.

Enter the command: A>EP1 [Enter] — —(Under 2M)

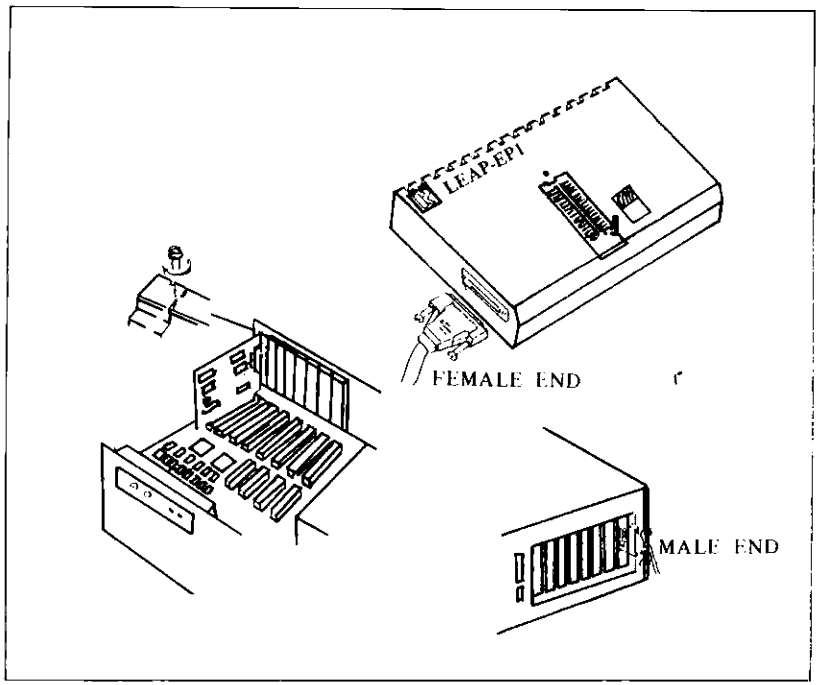
or

A>EP1-4M[Enter] —(4M)

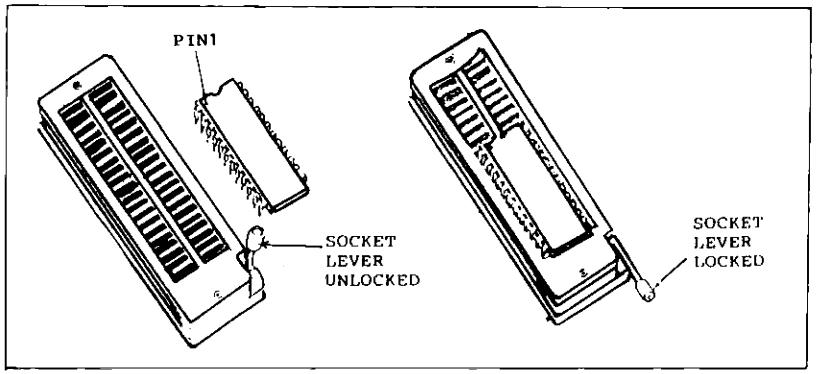
At this time, the big LEAP mark will appear on the screen and the system will automatically self-test. Press any key to start and the LEAP master menu as shown below will appear.



C) PRODUCT OUTLINE



D) DEVICE INSTALLATION

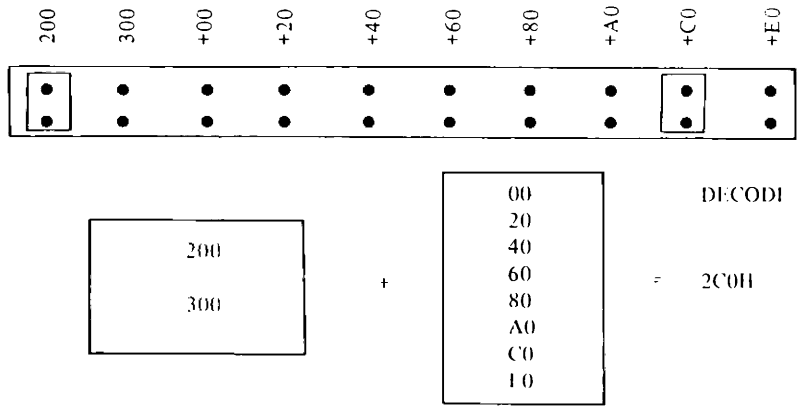


E) I/O ADDRESSING CONFLICTS

1) I/O PORT ADDRESS

I/O Address is divided into two big portions. The first section covers 200-2FF and the second section covers 300-3FF. The DIP Switch (SW1) handles 200-2FF and 300-3FF respectively, while Switch (SW2) handles the space range 01F(HEX).

In LEAP-EP1 the port address is default at 2C0h. If this I/O port address does not operate correctly in the system or comes in conflict with other interface cards, be sure therefore to temporarily remove other add-on cards or change the address of LEAP-EP1 (or others) by turning dip switches to on or off.

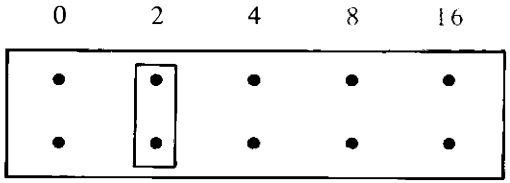


The illustration above identifies the I/O address postion 2C0F. Users can select correct Jumper as per own usage.

2) I/O WAIT SELECT

Jumpers are provided on the LEAP-EP1 card to enable moving specified location on the hardware. The I/O wait of LEAP-EP1 is preset at 0,2,4,8,16. In altering the PC speed, user must expand the I/O wait. For example, PC XT will jump to 0 I/O wait and AT will jump to 2-8 I/O wait.

Take illustration below as example:



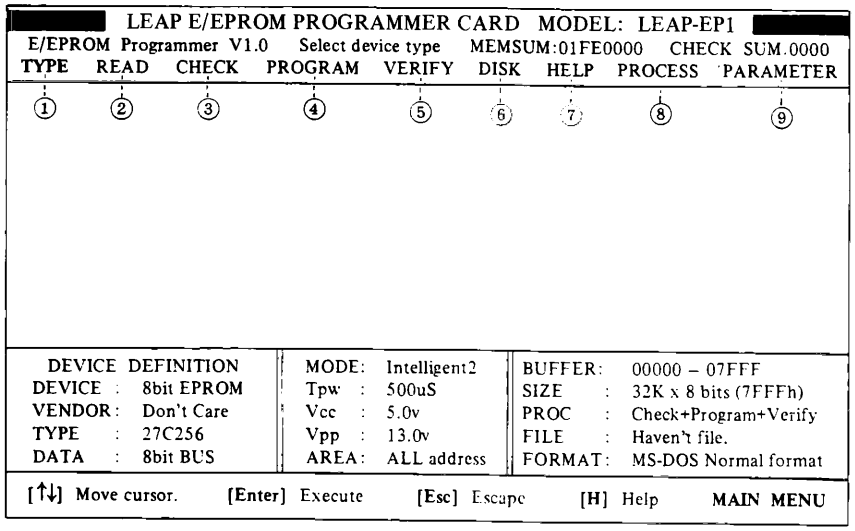
JUMPER 2

VI. STARTING WITH E/EPROM

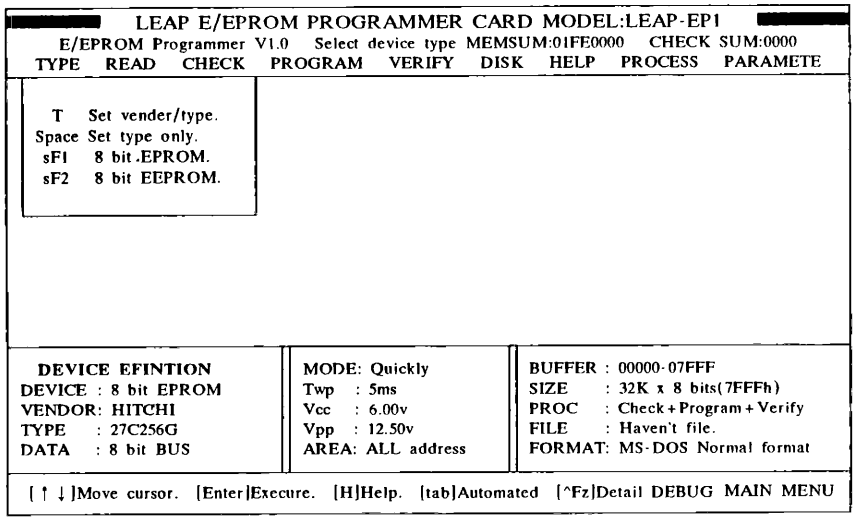
A) APPLYING THE FUNCTIONS

*(All the functions show below is only for reference only. The detail functions should be refer to the software).

1) TYPE



1) To select IC type and vendor
2) To read device data
3) To blank checks device
4) To program device
5) To verify device
6) To load/save disk data
7) To display operating instructions
8) To display main buffer
9) To select Vpp, Vcc, Toe, Tpw



This section described the procedures in selection of device, vendor, and type of IC to be programmed. After each selection, this will be entered in the lower portion of the screen under "DEVICE DEFINITION".

8 bit EPROM Devices Manufacturer / Vender					
[Spc]	Geneyal type	[9]	MITSUBISHI	[J]	SEIKO
[0]	AMD	[A]	MOSTEK	[K]	SGS(ST)
[1]	ATMEL	[B]	MOTOROLA	[L]	Signetics
[2]	EA	[C]	MXIC	[M]	TI
[3]	EUROTECHNIQUE	[D]	NEC	[N]	TOSHIBA
[4]	FUJITSU	[E]	NS	[O]	UMC
[5]	HITACHI	[F]	OKI	[P]	VLSI
[6]	HYUNDAI	[G]	RICOH		
[7]	Intel	[H]	SeeQ		
[8]	MATSHUSHITA	[I]	SHARP		

[T] Select Vendor and Type.

Device type can be changed by using "T" for type select. The selection sequence are as follows. User is prompted by first menu with the list of currently supported vendors and followed by a 3rd window with list of devices type. Both selection can be entered by using the single key code for each vendor or device type.

After selection, LEAP-EP1 will return to main menu while both vendor's name and type will be listed in the lower portion under "DEVICE DEFINITION" of the screen.

General type DEVICE TYPE					
[0]	2716	25.0v	[D]	27256A	12.5v
[1]	2716P	21.0v	[E]	27C256	13.0v
[2]	27C16B	12.5v	[F]	27512	21.0v
[3]	2732	25.0v	[G]	27512A	12.5v
[4]	2732A	21.0v	[H]	27C512	13.0v
[5]	2732B	12.5v	[I]	27C101G	13.0v
[6]	2764	21.0v	[J]	27C301G	13.0v
[7]	2764A	12.5v	[K]	27C020	13.0v
[8]	27C64	13.0v	[L]	27C2001D	13.0v
[9]	27128	21.0v			
[A]	27128A	12.5v			
[B]	27C128	13.0v			
[C]	27256	21.0v			

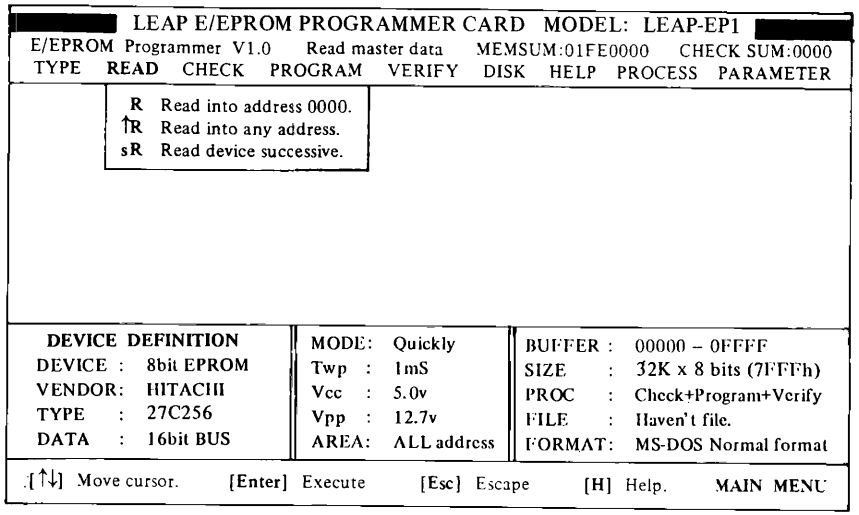
[Space] Set IC Type only.
If user don't care about vendor selection, he can go direct into this command and screen will display list of currently supported IC type or number.

Press [Ctrl] [ESC] escape key, at any time during the change device phase will return user to the previous master menu without affecting the currently selected device.

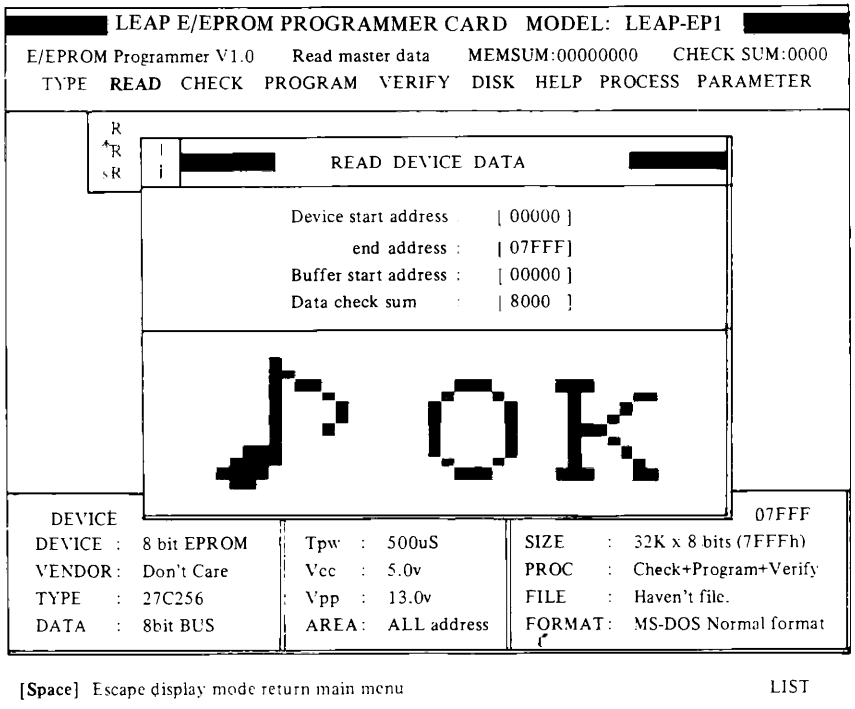
[Shift] [F1] 8 Bit EPROM
This command allows user to go direct into selection of device type and vendor of 8 Bit EPROM.

[Shift] [F2] 8 Bit EEPROM
This command allows user to go direct into selection of device type and vendor of 8 Bit EEPROM.

2) READ DEVICE TO MEMORY



When R' of Read is entered, the contents of the device in the module will be read into the memory buffer. After reading the data, a new check sum value will be calculated. Users are obliged to wait a few seconds when reading a large device. All correct check sum is displayed on the upper right hand side of the main menu screen. If the check sum of the current read in data is not the same with previous one, then the current stored checksum displayed in the main menu screen will blink.



[Ctrl] [R] Read in any address.

The 'CONTROL R' command is to read in any address. This allows user to select data device ranges that is to be read into buffer address from 'Start Address' to 'End Address'.

[Shift] [R] Read device successive.

With [SHIFT] [R] command, user can read in several small EPROMs successively into higher memory address of the memory buffer. It can combine data in small EPROMs and to program this data into a large EPROM.

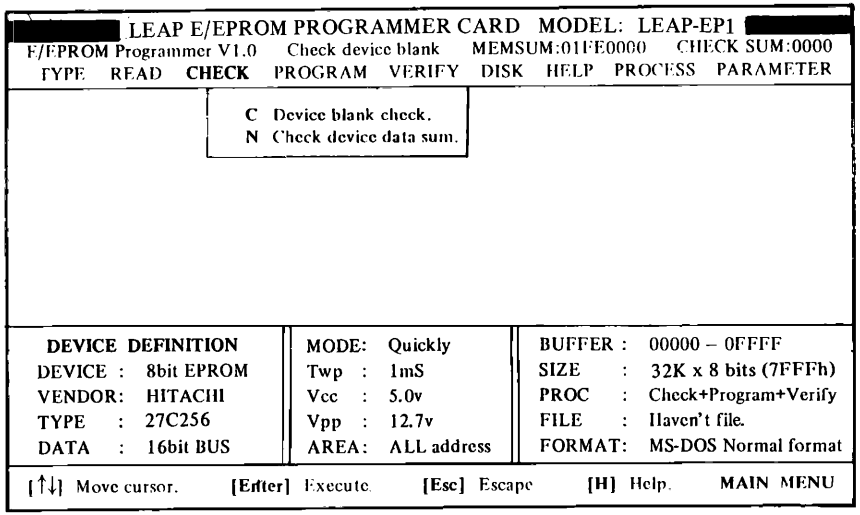
Example when combining the contents of two 2732 data into a single 2764.

1) Select the vendor and device 2732 which you intend to read.
2) Read one 2732 into buffer memory 0-FFFh.
3) Load second 2732 into socket pod.
4) Depress [Shift] [R] to read into next address starting from 1000-1FFFh.
5) Select the vendor and device 2764.
6) Insert 2764 device into socket and program with [P] command.

For example in reading the contents of 4M bits data to buffer, follow the instructions listed below:

1) **Select the vendor and device 27C4001 which you intend to read.**
2) **Enter "DISK" function and select 〔Shift〕〔I〕 command to open a cach file (U1.BUF) into disk. The capacity for the cache file are 1048576 bytes.**
3) **A window will appear and user is prompt to enter 〔pat9h〕〔filename〕 to initial mega cache file.**

3) CHECK DEVICE BLANK

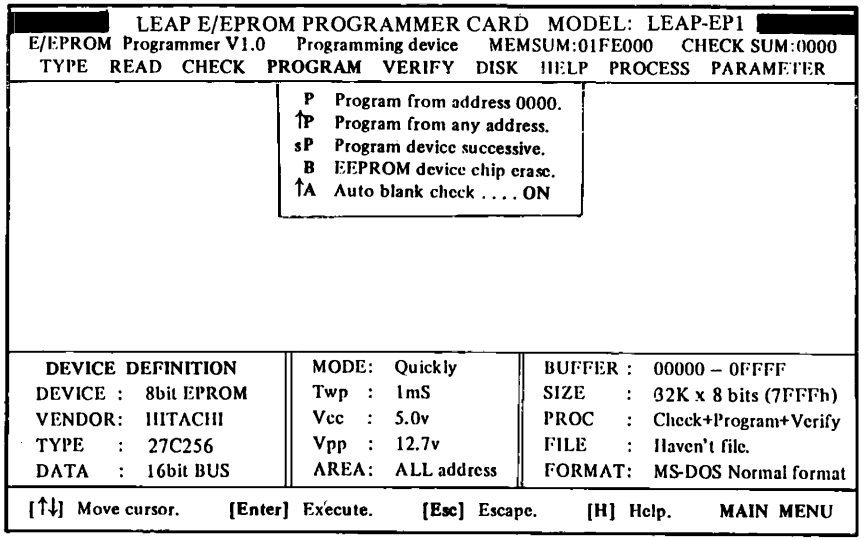


Blank checks the device before programming.

[C] Device blank check.
The [C] for device blank check allows user to verify or check a device before programming and to make sure that it is empty. Screen will display "PASS", if device is verified blank and "ERROR", if device is verified with data.

[N] Check device data sum.
Check the master data sum of IC oh socket without covering the original data in main buffer. User can get the check sum even without reading master data into memory buffer.

4) PROGRAMMING



The [P] programming command allows you to copy the data stored in the memory buffer into the device on the socket.

Before performing programming command, system will always blank checks device first, and after programming, the contents of the device will be verified against the contents of the memory buffers to confirm the programming outcome of the device. The message "PASS" will appear on the screen when everything is successfully completed. If there are any error, then the "FAIL" message will appear.

[P] Program from address 0000.
Programming device data starting from buffer address 0000. User will always be required to program from address 0000, then enter targeted end address, buffer start address and checking address.

NOTE: Do not remove or insert any device into socket when program starts working. If device is verified with data, screen will display "ERROR", then enter [Space] to return to main menu.

[Ctrl] [P] Program from any address.
Program device data from any address.
After typing [Ctrl] [P], user will be prompted to enter start address to end address and buffer start address to programming address.

NOTE: Do not remove or insert any device into socket when program starts working.

[Shift] [P] Program device successively.
With [Shift] [P] command, user can program one large EPROM successively into smaller memory address of the memory buffer.

Take for instance in programming one 27512 into two 27256:
1) Select type to 27512.
2) Read 27512 data to buffer.
3) Select type to 27256.

4) Enter [P] command to program the first IC from start address 000000-07FFF.
5) Enter [Shift] [P] command to program the second IC from 08000-0FFFF.

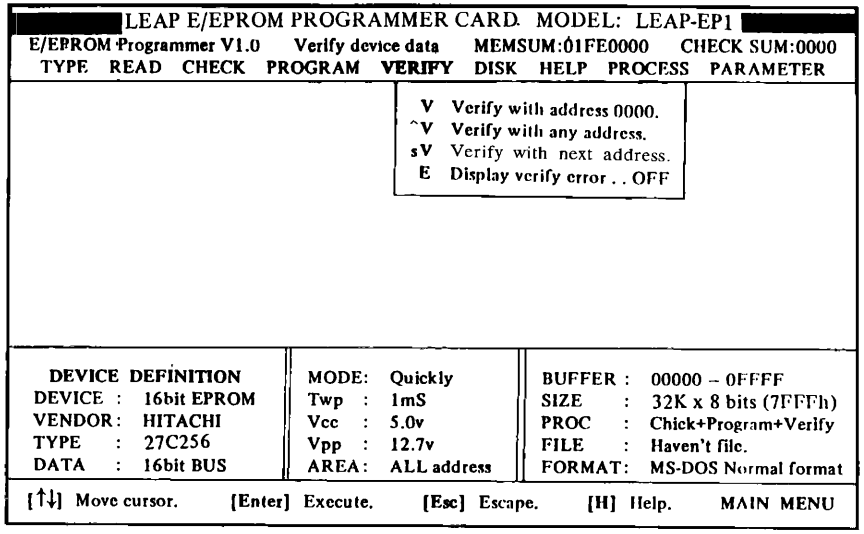
[B] EEPROM device chip erase.
Bulk erases the electronically erasable parts before LEAP-EP1 attempts to program them.

To erase a device, simply insert the device you want to erase and press "RETURN". LEAP-EP1 will erase the device and a message will appear to indicate that the operation has been completed.

If incorrect device type is entered, screen will display Operation error: Function suitable in erasing EEPROM only!
Press [ESC] to return to main menu and select the right type.

[Ctrl] [A] Auto blank check . . . ON (OFF).
To modify program enter this command, and screen will display the "Program Check" window. Choose [0] Turn-off, if you wish to eliminate blank checking device before program and [1] Turn-on, if you wish to blank check device automatically before program.

5) VERIFY DEVICE



The "V" verify command allows you to compare the contents of the device in the socket to the data in memory buffer.

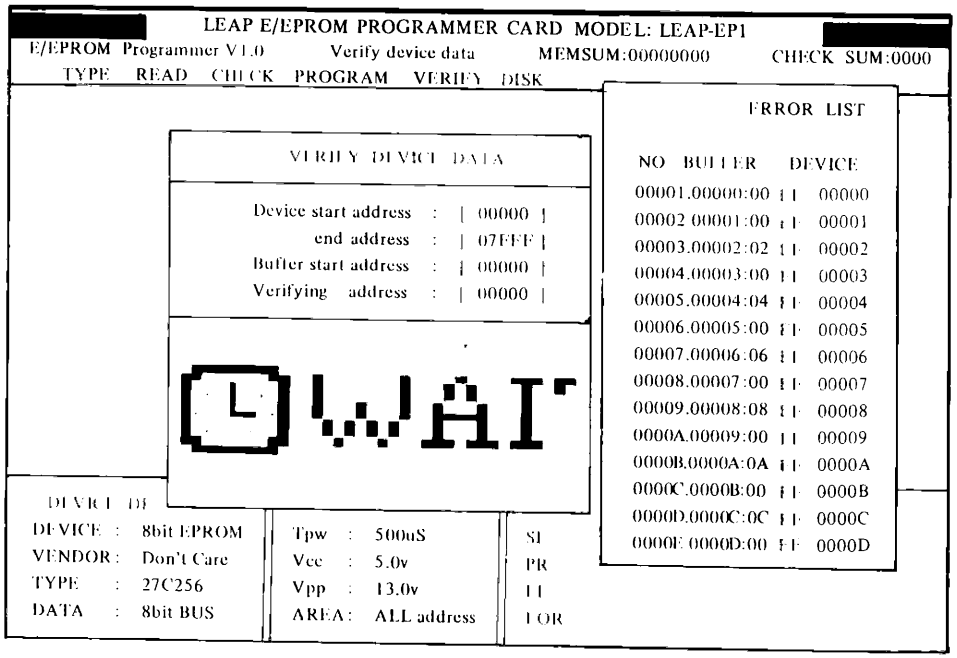
[V] Verify with address 00000.
Verify device data starting from buffer address 00000. Data will always be verified from buffer starting from address 00000, then enter targeted end addresses, buffer start address and verifying address.

WARNING: Do not remove or insert any device on the socket when program starts working.

[R] Read into address 00000.
Reading device data will always starts at address 0000.
User will not be given the choice of selecting own addresses, but can also go direct into the current file.

[Ctrl] [V] Verify with any address.
Verify device data from any address.
After typing [Ctrl] [V], user will be prompted to enter start address to end address and buffer start address to verifying address.

[Shift] [V] Verify device successive.
With [Shift] [V], user can verify several small EPROMs successively into higher memory address of the memory buffer.

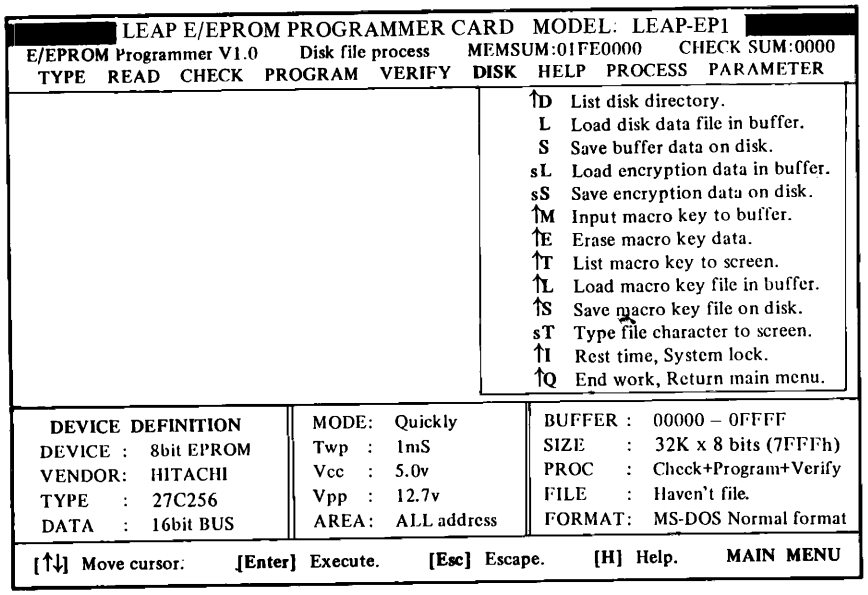


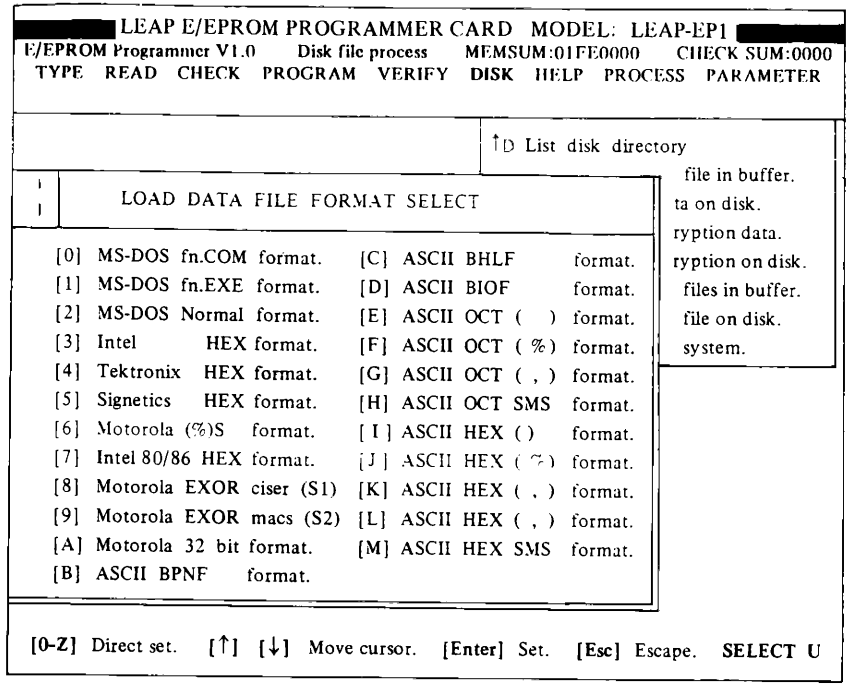
[S] Stop list, Any key to continue. [ESC]/[C] End list error **ERROR LIST**

[E] Display verify error. . OFF (or ON)

Enter this command, and screen will display the "Display Error" window. Choose [O] Turn-off, if you wish to eliminate verifying device after program and only display the verified error data in device. And [1] Turn-on, if you wish to verify device automatically after program and only display portion of verified error data in device.

6) DISK





[CTRL] [D] List disk directory

Enumerate all filenames of disk on screen.

[L] Load disk data file in buffer

Loads the data from the file selected into memory buffer. After typing [L], the system will display the file formats ranging from [0] to [M]. Select the right format and user will be prompted to enter the filename.

[S] Save buffer data

Save the data memory buffer into disk. After typing [S], user will be prompted to load the filename, start and end addresses. If data are all saved, then display will show "OK". If filename is not loaded, display will read DISK ERROR. If another file exist, display will read DISK ERROR, file exist, enter [Y] Yes or [N] No.

NOTE: LEAP-EP1 utilizes the normal format, so we suggest that when activating [L] & [S] commands, kindly use the same [2] normal format.

[Shift] [L] Load extra/ encryption data

Load added password number into extra memory buffer.

[Shift] [S] Save extra/encryption data

Save added password number into disk.

[Ctrl] [M] Input and set macro key.

Macro command enables user to capture, delete, initialize (erase), list, read data to a file and load macros from a file.

In [Ctrl] [M] command user can eliminate the primary set-up procedures and use the keystroke commands to be recorded as macros and recall by pressing any of the F1-F10 user's define keys.

Take for example in setting EPROM Intel 27010, please follow the instructions below:

1) Enter "DISK" function and select [Ctrl] [M] command.
2) A window will appear and user is prompt to enter [F1] key to macro key capture and 27010 to macro key remark.
3) Press [Enter] to lock selected file.
4) Press [Alt] [T] to enter select IC type window.
5) Press [sF1] key to directly select 8bit EPROM.
6) Press number [7] key to go direct into manufacturer "INTEL".
7) Press [K] key select type 27010 directly.
8) Press [Ctrl] [M] to enter macro command.
9) Press [F1] key and system will run macro.

NOTE: Do not use the cursor key to command instructions, otherwise the whole macro memory procedures will be distorted. Just make use of the proper function keys.

[Ctrl] [E] Erase Macro key data

Enter this command and the screen will display the macro key list with 10 **[F1]-[F10]** function keys, type the selection, which you intend to erase in the Macro key capture caption. Once macro key is entered, the system will automatically erase the macro key. Enter [Space] to escape display mode and return to main menu..

[Ctrl] [T] List macro key data

Enter this command to open the window with list of [F1] to [F10] Macro key. This will allow user to review which macro key was canceled.

[Shift] [S] Save extra/encryption data

Save added password number into disk.

[Ctrl] [L] Load macro key file in buffer

This command is to load 2nd set of macro key files into memory buffer and without cancelling contents of the main macro keys. Just enter [Ctrl] [L] and the second set of users define keys will be loaded into the memory buffer.

[Ctrl] [S] Save macro key file on disk

Save macro key file into disk. In case another file exists screen will display disk error, user will be prompted to renew or erase the previous file.

[Shift] [T] Type file character to screen

To scroll the data of any file on screen.

After typing [Shift] [T], screen will display the "List file to screen" window. User will be prompted to enter the filename of disk to view. Enter [Y] for yes, if you want to scan file page by page, and enter [N] for No, if you intend to scroll file on screen.

View file control keys are as following:

[A] In page list mode.
Means to scroll thru file.

[S] Stop display, followed by any key to continue.
Means to halt file on display.

[E] Escape display, return to master menu.
Means to exit display.

[Ctrl] [I] Rest time, system lock.

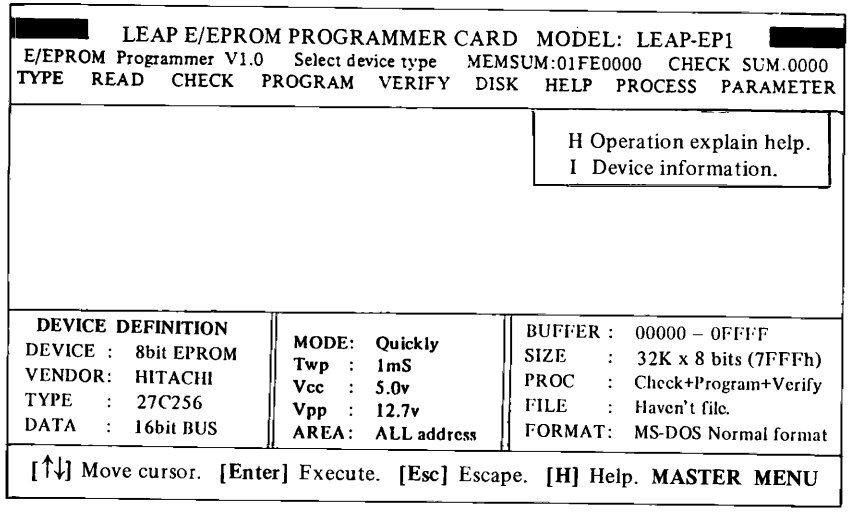
The [Ctrl] [I] command was especially designed to allow user to have a "time out" period. Enter your own password and system will locked data automatically. Return to work by entering the same password. This can also prevent intruders from pirating or using your file.

[Ctrl] [Q] End work, Exit System

This command allow you to escape LEAP-EP1 and return to DOS. After typing [Ctrl] [Q], screen will verify if you are sure to exit system, enter [Y] yes, if you want to escape or [N] No, if you intend to remain.

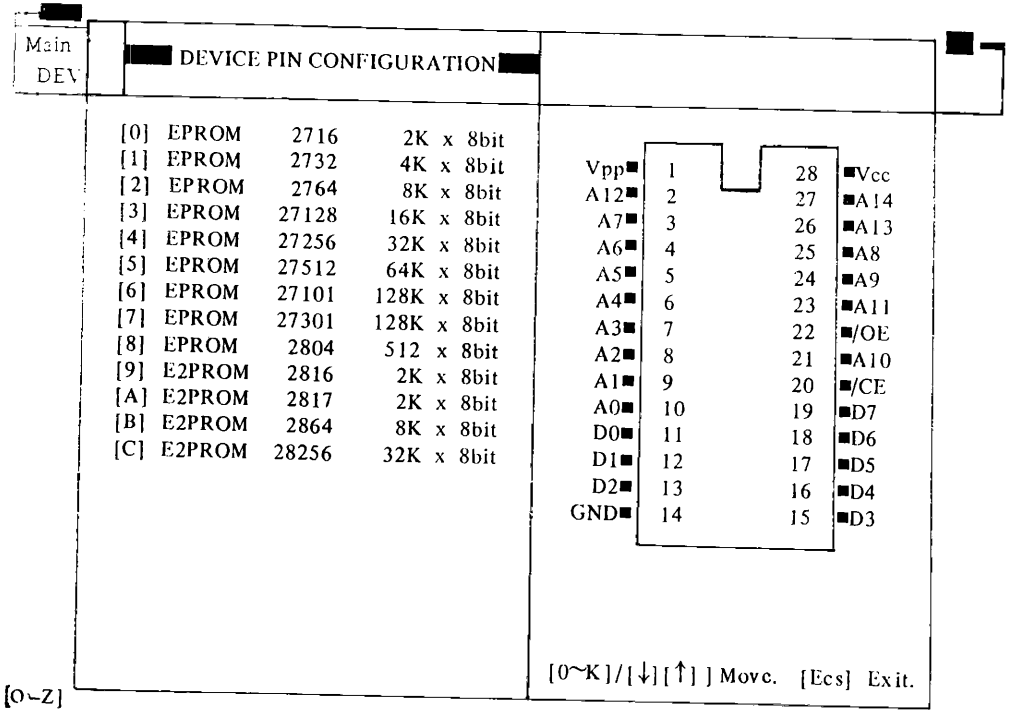
When LEAP-EP1 exit and return to DOS, all parameters set by user will be saved in DISK.

7) HELP



[H] Operation explain help

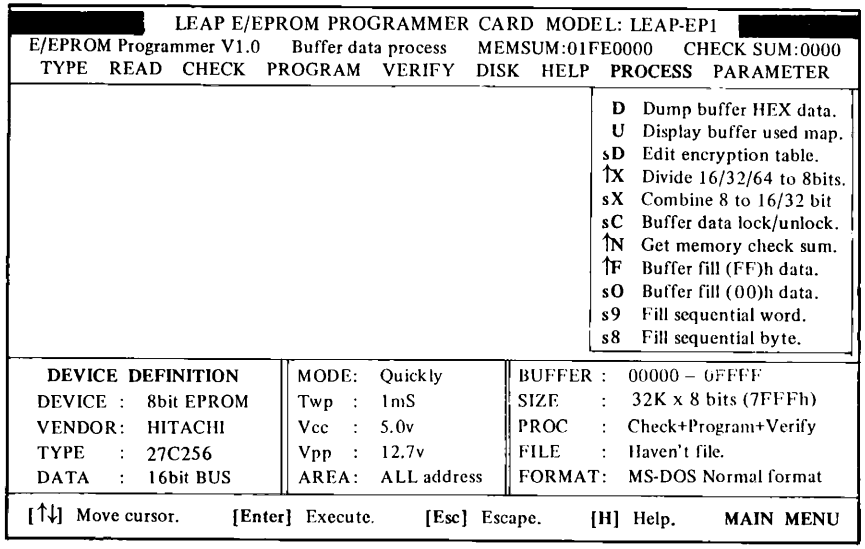
Open this command and user will find 6 pages compilation of the basic operations of LEAP-EP1. Use [Pg][Up] or [Pg][Dn] to turn the pages. [ESC] to escape display.



[I] Device information

Display IC pin configuration. Use cursor keys to select. [ESC] to exit display.

8) PROCESS

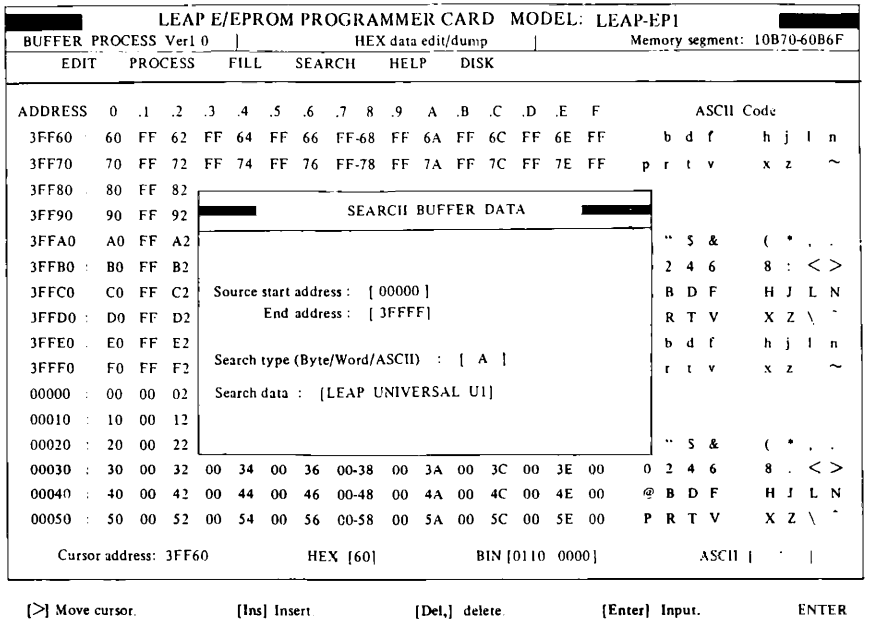


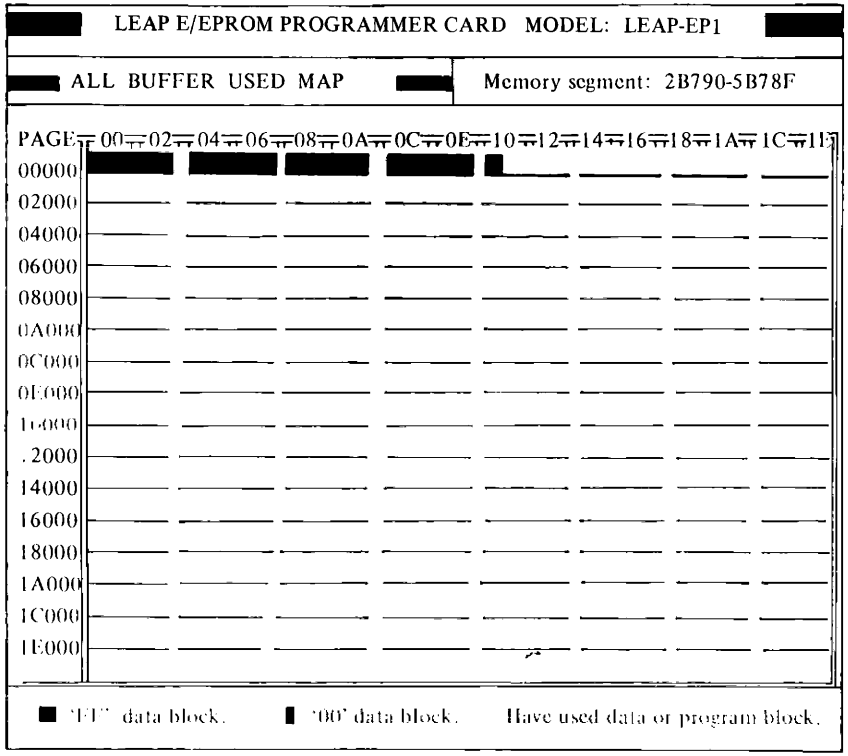
[D] Dump and simple EDIT buffer HEX data.
Select this command and screen will display the address and the current contents of the address in EPROM. User will be prompted to edit contents of the memory buffer by applying HEX and binary format.

For application follow the list of keys below:

[Ctrl] [Home] Dump to first (start) page.
[Ctrl] [End] Dump to last page.
[Shift][PgUp] To Change 40000h address.
[PgDn]

[Ctrl] [PgUp] To change 1000h address.
[PgDn]
[Ctrl] [E] To Edit data in HEX format.
Initiate command by using [0]~ [9], [A] ~ [F] key.
[Ctrl] [A] To Edit data in ASCII format.
[Ctrl] [D] To enter Dump page new address.
[Ctrl] [I] Set buffer index point in cursor address.
[Ctrl] [J] Jump to index point.
[ESC] To exit command and return to master menu.





[U] Display buffer used map.
To display all/portion used map. Open this command to view the scope of area blocked with data.

[Shift] [D] EDIT extra buffer data.
Select this command to examine or modify the extra (use 87C51) encryption data in memory buffer. For instance, if the 32 byte password of 87C51 is registered into the extra buffer, it will no longer be readable by those who should not have access to it.

After entering [Shift] [D], user will be prompted to load the address to be edited, followed by the HEX address, and the carriage return. The screen will display a 256 byte page of data from memory buffer.

[Ctrl] [X] Divide 16/32/64 bit to 8 bit.
This command is to allow division of 16/32/64 bits into 2,4,8 bits files. Upon entering command, and the screen will display the compile Bit number. User will be prompted to select between [0] 16 bit source to [2] 64 bit source. After entering the right choice, the 2nd window will display the Target byte position, type your choice and the 3rd window will prompt you to enter start and end addresses.

Example. The 16 bit source files can be divided into 8 bit files. The [Ctrl] [X] command can divide a 16 bit files into two 8 bit files that will be programmed to an EVEN EPROM and an ODD EPROM.

[Shift] [X] Combine 8 bits into 16/32 bit.
This command allow combining two or four 8 bits blocks into 16/32 bit data blocks.

Example: When combining two 8 bits blocks into a 16 bits file. The 1st 8 bit file will be collected to LOW byte of 16 bits file and the 2nd 8 bits file will be collected to HI byte of 16 bits file.

[Shift] [C] Buffer data lock/unlock.
This command allows user to utilize data of extra buffer in creating password to secure data of main buffer. The length of password can readily be changed.

[Ctrl] [N] Get memory check sum.
To retrieve and calculate the check sum of memory buffer.
Example: Select device type to 27256, enter [Ctrl] [N] command and it will automatically add the sum of 0000-7FFF, this will again be translated into 4 byte hexadecimal.

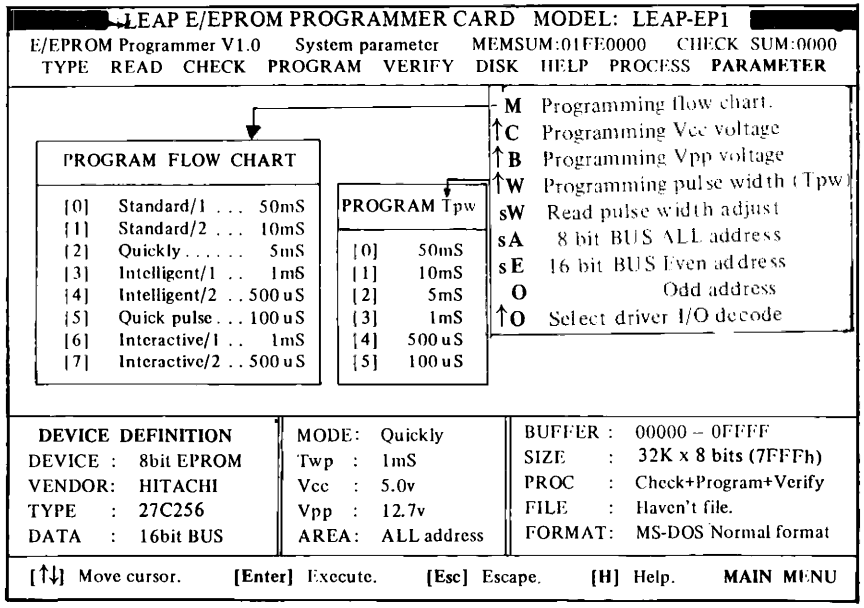
[Ctrl] [F] Buffer fill (FFh) data
Fill buffer memory with 'FF' data. After typing [Ctrl] [F], user will be prompted for inputting selection [Y]es or [N]o to initialize the command.

[Shift] [ϕ] Buffer fill (ϕϕh) data
Fill buffer memory with 'ϕϕ' data. After typing [Shift] [ϕ], user will be prompted for inputting [Y]es or [N]o to initialize the command.

[Shift] [9] Fill sequential word
Fill sequential word data into all buffer.
Example: (00000:00 00 02 00 04 00 ~ FC FD FE FF)

[Shift] [8] Fill sequential byte
Fill sequential byte data into all buffer.
Example: (00000.00 01 02 03 04 05 ~ FC FD FE FF)

9) PARAMETER



The programming algorithm is automatically selected when you change the manufacturer and type, but you can change it by yourself and only if you made it in accordance with the programming rules.

[M] Programming flow chart
Depress [M] to select required programming mode. Each selection will be entered in the lower portion of the screen for programming reference.

[Ctrl] [C] Programming Vcc voltage
Select required Vcc voltage prior to programming. Enter this command and user will be given three (0) 5.00v (1) 6.00v (2) 6.25v different choices to select and each selection will be listed in the lower portion of the screen for programming reference.

[Ctrl] [B] Programming Vpp voltage
Alter required Vpp voltage prior to programming. User is given 0.1 up to 25.0 to key in choice of voltages and each selection will be listed in the lower portion of the screen for programming reference.

[Ctrl] [W] Programming pulse width (TPW)
Alter required pulse width prior to programming. User is given 50ms (lowest) to 100us (fastest) choice of pulse width to select. Each selection will be recorded in the lower portion of the screen for programming reference.

NOTE: Each manufacturer have designed their devices with it's respective pulse width, so make sure to match the device to be programmed with its corresponding programming algorithm otherwise the device data will not be properly programmed.

After selecting programming flow chart, the Tpw will

automatically be changed.

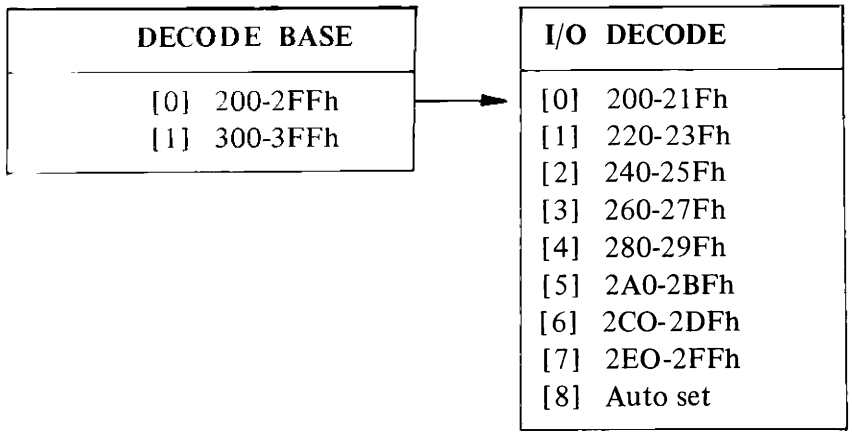
[Shift] [W] Read pulse width Toe
This command signifies the time interval in reading data to a device. The length of reading pulse width varies from [0] 1us to [5] 200us. 1us is considered the fastest, while 200us considered the slowest. User will be prompted to enter the correct choice.

NOTE: If IC encounters unreliable conditions in READ/CHECK/VERIFY commands, user can adjust pulse width to slowest us in attaining stable results.

[Shift] [A] 8 Bit BUS ALL address
Even in programming or verifying operations, the programmer is capable of selecting an address to be programmed. If [Shift] [A] is selected, an All memory address will be programmed.

[Shift] [E] 16 Bit EVEN address
If [Shift] [E] is to be selected, an even memory address will be programmed.

[Shift] [O] 16 Bit ODD address
If [Shift] [O] is selected, an odd memory address will be programmed.



[Ctrl] [O] System driver I/O decode.02C0h (HEX)
[0] 200-2FFH and [2] 300-3FFh are 2 sets of decode base option in LEAP-EP1 remote control card.

The drive I/O decode of LEAP-EP1 is permanently stationed in 02C0h. If I/O decode is not correctly selected, screen will display SYSTEM ERROR: I/O drive not found!

MEMO