



PROM-IVTM

PART # 3072

USER MANUAL

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Section 1.

Installation

The PROM-IV board can be installed in any of the PC expansion slots, except J8 on the original IBM XT and portable. Be sure to set the address and jumper options before installation. Remove the PC case, remove the blank metal slot cover, and you are done.

Section 2.

Address Selection

You must select a base address for the board that does not conflict with any other EPROMS or PC memory areas. Some known conflicts are address c000:0 if you have EGA or VGA video, and address E000:0 through E000:FFF (segment E) on some at models. We recommend D000:0, however, this may conflict with extended memory.

Dip Switch Settings	SW1			
Base Address	(Board silkscreen)			
	A14	A15	A16	A17

C000:0000.....	ON	ON	ON	ON
C400:0000.....	OFF	ON	ON	ON
C800:0000.....	ON	OFF	ON	ON
CC00:0000.....	OFF	OFF	ON	ON
D000:0000.....	ON	ON	OFF	ON
D400:0000.....	OFF	ON	OFF	ON
D800:0000.....	ON	OFF	OFF	ON
DC00:0000.....	OFF	OFF	OFF	ON
E000:0000.....	ON	ON	ON	OFF
E400:0000.....	OFF	ON	ON	OFF
E800:0000.....	ON	OFF	ON	OFF
EC00:0000.....	OFF	OFF	ON	OFF

Switch Position	Address Line	Example: D000 HEX	Switch
1	A14	0	ON
2	A15	0	ON
3	A16	1	OFF
4	A17	0	ON

Note that setting the switch on or closed corresponds to A “0” in the address, while leaving it open or off corresponds to A “1”.

The board contains four switch settings and several jumper locations which must be set for proper operation. For switch location, refer to figure 1.

Board enable/disable: the PROM-IV can be enabled or disabled with switch position 5, marked "EN" on the dip switch. The board is enabled with the switch "ON" and disabled when "OFF" or "OPEN".

Write protect: Each group can be write protected by enabling the switch that corresponds to the group. "WP1" will enable write protection for group 1 and "WP2" for group 2. The devices may not be written to (write protected) with the switch "OFF". Normal operation is with the switches "ON" or Closed.

Wait state generation: Closing the "W" switch (position #6) generated a wait state to the PC bus for every board access. This may be necessary when running in extremely fast machines that do not slow down to the (normal) 8 megahertz (Mhz) speed for bus accesses. This should not be necessary for most machines when utilizing 250 nana-second (nS) EPROMS. If you suspect a speed problem, try setting the "W" switch ON, or Closed.

Jumper block E2, E3: the PROM-IV allows the use of 1 megabit or 2 megabit devices such as the 27010 EPROMS, 27020 EPROMS, 28F010 Flash EPROMS, 28F020 Flash EPROMS, 128K byte static rams, or battery backed RAM modules (Dallas semiconductor part #DS1245Y). The jumpers on E2 & E3 provide for these options. The boards are divided into two groups, the right six sockets (U1-U6), and the left six, (U7-U12). This provides a mixture of up to 3072K bytes of EPROM, and up to 1536K bytes of RAM. These numbers are the maximum memory amount, utilizing twelve 2 megabit EPROMS or twelve 1 megabit sram parts. Promkit will format a drive of 2.88 megabytes, or 1.44 megabytes. The 27010 EPROM and the 28F010 flash EPROM use the same jumper settings. The selection is made for group 1 (U1-U6) by setting the three jumpers on E3 either all to the "PROM" position for EPROM (and flash), or all to the "RAM" (and battery backed modules). The selection for group two (U7-U12) is on E2, again, all three jumpers on "PROM" selects EPROM, and all jumpers on "RAM" selects RAM. See the examples below.

Device size selection- the jumpers labeled "1" and "2" on E2 and E3 are set to reflect the device size for each group. You cannot mix device types

or size within a group, but you can have different devices and device size for either group 1 or group 2. Set the jumper to “1” for 1 megabit devices, and to “2” for 2 megabit devices.

Section 3 continued:

Jumper E5: Used only for flash EPROMS. Be sure to remove this jumper is you are using 27010 EPROMS or RAMS.

Jumper E1: Used only for battery backed RAMS. Be sure to remove this jumper when installing or removing RAM chips. Damage to the RAMS may occur if this precaution is not taken.

Jumper E4: Used only if you want to put 28F010 flash EPROM in U1 and wish to protect it from being written to. This jumper prevents U1 from being erased and re-written during flash program updates. Position A is for flash EPROM programming only, while position B is for 27010 EPROMS, RAM modules, and "Program-Protecting" a flash EPROM device.

Section 3.1 Annabooks Promkit Software Configurations

To use the PROM-IV with Annabooks diskless EPROM software, simply follow the initial promkit instructions. The PROM-IV default address should be set at address segment D000:0. The enable switch should be ON, and the wait state switch OFF, or OPEN. Note that the EPROM containing the file XXX.PK1 is placed in the board to emulate two drives (group 1 and 2), be sure to follow the promkit instructions carefully.

Section 4. Technical Description

The Sealevel Systems PROM-IV board uses bank-switching procedures to supply the PC with access to 2.88 MEG of memory in a 16K footprint. The board can be populated with up to twelve 27010, 27020n EPROMS, 28F010, 28F020 flash EPROMS, 128 K byte RAMS or battery backed RAM modules; the following description explains the basic operation of the board.

Section 4 continued:

Assuming a board base address of D0000 HEX, each 27010(128K x 8) EPROM is broken down into 16 – 8k pages of data. The pages are accessed by writing an “actual” bank # to D0000- D1FFF HEX. The selected 8K pages is then read from D2000 – D3FFF HEX. Please refer to section 5, software considerations for programming examples.

The first 8K page if the first EPROM (logical bank 0) is always accessed at D0000 – D1FFF HEX. This page could also be accessed by writing a 0 to D000:0 and A 0 to D000:1, and then reading locations D2000 – D3FFF HEX. The purpose of this architecture is to provide a common driver area (for automatically booting and initialization/driver code) and then up to 95 bank selected pages of EPROM or RAM per group. This similar to the Lotus/Intel/Microsoft (LIM) extended memory specifications EMS.

If you are writing a specialized program, or driver to utilize the PROM-IV, you need to know how to switch pages. If you are running an existing application, such as promkit by Annabooks, you needn't concern yourself with the operation of the board.

EPROM Page Format:

		1 Megabit EPROM		
EPROM # 0		1	2 5
U1		U2	U3	U6
Address offset				
Page #	within EPROM	Page #	Page#	Page#

0	0000-1FFF	10	20	50
1	2000-3FFF	11	21	51
2	4000-5FFF	12	22	52
3	6000-7FFF	13	23	53
4	8000-9FFF	14	24	54
5	A000-BFFF	15	25	55
6	C000-DFFF	16	26	56
7	E000-FFFF	17	27	57
8	10000-11FFF	18	28	58
9	12000-13FFF	19	29	59
A	14000-15FFF	1A	2A	5A
B	16000-17FFF	1B	2B	5B
C	18000-1BFFF	1C	2C	5C
D	1A000-1BFFF	1D	2D	5D
E	1C000-1FFFF	1E	2E	5E

F

1E000-1FFFF

1F

2F

5F

2 Megabit EPROM				
EPROM # 0		1	2 5
U1		U2	U3	U6
Address offset				
Page # within EPROM		Page #	Page#	Page#

0	0000-1FFF	20	40	A0
1	2000-3FFF	21	41	A1
2	4000-5FFF	22	42	A2
1E	3C000-3DFFF	3E	5E	BE
1F	3E000-3FFFF	3F	5F	BF

Please note that the page register requires writing to location base:0 for the specified page number and the writing to base:1 for the specified group. See section 5 for examples.

Section 5.

Software Considerations

Examples: Base address = D000:0. The basic language is used for clarity and to ease the understanding of bank selected memory.

- Read and print all data within the 8K driver bank:

```

DEF SEG = &HD000      DEF SEG = & HD000   ;Base Address
For X=0 to &h1FFF      (OR) POKE 0,&H0:POKE 1,0 ;Set Page
Print Peek(X);        DEF SEG = &HD200   ;Point to
Data                  For X=0 to &H1FFF   ;1FFFH=8K
Next X                Print Peek(X);      ;Print
Data                  Next X              ;Get Next Byte

```

-Read and print all data within the last 8K of the first one megabit (27010) EPROM in group 1:

```

DEF SEG = &HD000      ;Base address of driver and page register
POKE 0, &H0f         ;Last Page=>of HEX, 1 MEG; 1F HEX, 2 MEG
POKE 1,0             ;Select group 1
DEF SEG = &HD200     ;Data area
For X=0 to &H1FFF    ;1FFF HEX = 8K
Print peek (X);     ;Print data

```

Next X

;Get the next byte

-Read and print all data within the first 8K of the first two megabit (27020) EPROM in group 2:

```
DEF SEG = &HD000
POKE 0, &H0           ;Set the bank # to the first one in the EPROM
POKE 1,1             ;Select group 2
DEF SEG = &HD200      ;Data area
For X=0 to &H1FFF     ;Still 8K
Print Peek (X);"";
Next X
```

-Read and print all data within 96 (5F HEX) 8K pages in group 2 using 6 one megabit (27010) devices:

```
For Bank = 0 to 95   ;0 to 95= 96, 96 * 8K =768 K (192 for 2 MEG)
DEF SEG = &HD000     ;Base address & page numbers
POKE 1,1            ;Set the group to 2
DEF SEG = &HD200     ;Data area
For X=0 to &H1FFF    ;Read 8k of data
Print Peek (X);"";
Next X
Next Bank           ;Repeat for 96 banks
End                ;
```

Writing a sixteen bit page word to the base location address will select the proper page. This is due to the fact that the PC/XT and PC/AT will write the low byte to base and the high byte to base+1. Again, this is only a consideration if you are writing your own driver.

Section 6.

Warranty

Sealevel Systems, Inc. provides a lifetime warranty for this product. Should this product fail to be in good working order at any time during this period, Sealevel Systems will, at its option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

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