

**PE-520**  
**4MB RAM CARD**  
**USER'S MANUAL**

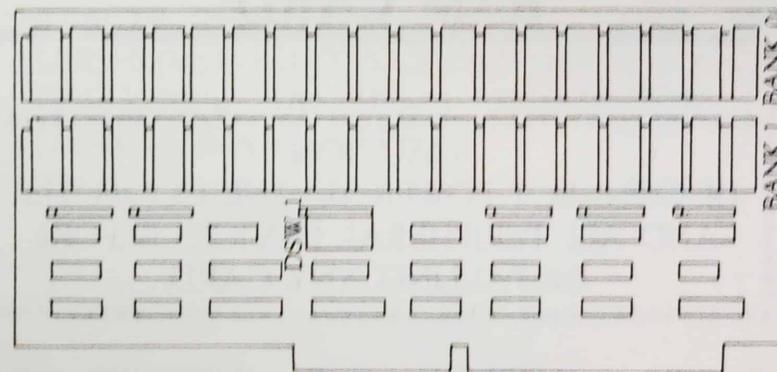
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## I. INTRODUCTION

The PE-520 4MB RAM CARD is designed to expand the memory on your IBM PC-AT or compatible computer. RAM chip 41256 and 411000 both can be used on PE-520 and its maximum RAM capacity can up to 4MB

- \* Expandable to 4MB
- \* Both 41256 and 411000 can be used
- \* Starting address selectable
- \* Fully tested.



PE-520 4MB RAM CARD

## II. CARE AND HANDLING OF PRODUCT

All LSI/MOS devices are static sensitive. Care should be taken when installing any additional peripheral boards to your IBM personal computer. Be sure to discharge yourself before handling the board or entering the IBM Personal Computer. Do not directly touch the gold edge connectors. These connectors need to be kept clean to insure reliable operation of any peripheral boards.

## III. INSTALLING APPEND RAM CARD

```
*****
*                                     *
*          CAUTION                   *
* DISCONNECT POWER TO THE COMPUTER  *
* AND ALL PERIPHERAL DEVICES BEFORE *
*          INSTALLING ANY CARD.      *
*                                     *
*****
```

PARTS SUPPLIED OR NEEDED FOR INSTALLATION.

- \* Ram Card
- \* Ram Card Operations Manual

To install the PE-520 4MB RAM Card, complete the following steps;

1. Turn off power to the computer. Disconnect the AC line cord.
2. Remove the cover of the computer.
3. Configure your RAM Card.

THE TABLE OF CHIP CAPACITY

	ONLY USING BANK 0	USING BANK 0 & BANK 1
1M Byte RAM Chip	2M Byte	4M Byte
256K Byte RAM Chip	512K Byte	1M Byte

- \* Don't promise use 1M BYTE and 256K BYTE RAM CHIP together.
- \* Available RAM LIST FOR 1M DRAM CHIP:  
HITACHI (HM511000P), NEC (D421000C), MITSUBISHI (M5M4C1000P), OKI (M5110000), TOSHIBA (TC511000P), SAMSUNG (KM41C1000P), TI (TMS4C1024) AND SO ON.

## IV. DIP SWITCH SETTING OF PE-520 4MB RAM CARD

## USING 1MB RAM CHIP

START ADDRESS	HEX ADDRESS	BASE MEMORY	EXPANSION MEMORY	DIP SWITCH (DSW1) SETTING:							
				S1	S2	S3	S4	S5	S6	S7	S8
512K	08000H	512K	0K	ON	ON	ON	-	ON	ON	ON	ON
640K	10000H	640K	0K	ON	OFF	ON	-	ON	ON	ON	ON
1024K	16000H	640K	384K	ON	ON	OFF	-	ON	ON	ON	ON
1536k	20000H	512K	1024K	ON	OFF	ON	-	OFF	OFF	OFF	OFF
2048K	26000H	640K	1408K	ON	ON	OFF	-	OFF	OFF	OFF	OFF
2560k	30000H	512K	2048K	ON	OFF	ON	-	ON	OFF	OFF	OFF
3072K	36000H	640K	2432K	ON	ON	OFF	-	ON	OFF	OFF	OFF
3584K	40000H	512K	3072K	ON	OFF	ON	-	OFF	ON	OFF	OFF
4096K	46000H	640K	3456K	ON	ON	OFF	-	ON	ON	OFF	OFF
4608K	50000H	512K	4096K	ON	OFF	ON	-	ON	ON	OFF	OFF
5120K	56000H	640K	4480K	ON	ON	OFF	-	ON	ON	OFF	OFF
5632K	60000H	512K	5120K	ON	OFF	ON	-	OFF	OFF	ON	OFF
6144K	66000H	640K	5504K	ON	ON	OFF	-	OFF	OFF	ON	OFF
6656K	70000H	512K	6144K	ON	OFF	ON	-	ON	OFF	ON	OFF
7168K	76000H	640K	6528K	ON	ON	OFF	-	ON	OFF	ON	OFF
7680K	80000H	512K	7168K	ON	OFF	ON	-	OFF	ON	ON	OFF
8192K	86000H	640K	7552K	ON	ON	OFF	-	OFF	ON	ON	OFF
8704K	90000H	512K	8192K	ON	OFF	ON	-	ON	ON	ON	OFF
9216K	96000H	640K	8576K	ON	ON	OFF	-	ON	ON	ON	OFF
9728K	A0000H	512K	9216K	ON	OFF	ON	-	OFF	OFF	OFF	ON
10240K	A6000H	640K	9600K	ON	ON	OFF	-	OFF	OFF	OFF	ON
10752K	B0000H	512K	10240K	ON	OFF	ON	-	ON	OFF	OFF	ON
11264K	B6000H	640K	10624K	ON	ON	OFF	-	ON	OFF	OFF	ON
11776K	C0000H	512K	11264K	ON	OFF	ON	-	OFF	ON	OFF	ON
12288K	C6000H	640K	11648K	ON	ON	OFF	-	OFF	ON	OFF	ON
12800K	D0000H	512K	12288K	ON	OFF	ON	OFF	ON	ON	OFF	ON
13312K	D6000H	640K	12672K	ON	ON	OFF	OFF	ON	ON	OFF	ON
13824K	E0000H	512K	13312K	ON	OFF	ON	OFF	OFF	OFF	ON	ON

## USING 256KB DRAM CHIP

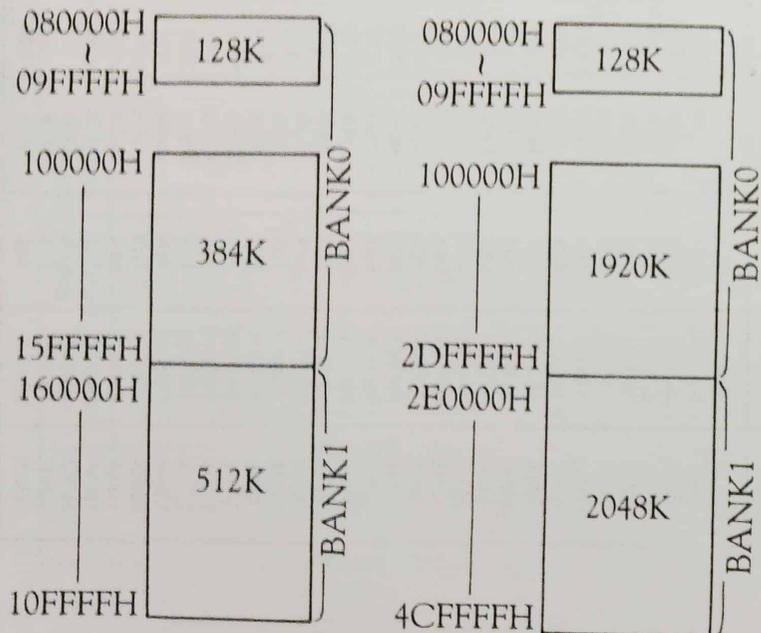
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				S1	S2	S3	S4	S5	S6	S7	S8
512K	08000H	512K	0K	OFF	ON	ON	-	ON	ON	ON	ON
640K	10000H	640K	0K	OFF	OFF	ON	-	ON	ON	ON	ON
1024K	16000H	640K	384K	OFF	ON	OFF	-	ON	ON	ON	ON
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13312K	D6000H	640K	12672K	OFF	ON	OFF	-	ON	ON	OFF	ON
13824K	E0000H	512K	13312K	OFF	OFF	ON	-	OFF	OFF	ON	ON
14336K	E6000H	640K	13696	OFF	ON	OFF	-	OFF	OFF	ON	ON
14848K	F0000H	512K	14336	OFF	OFF	ON	-	ON	OFF	ON	ON
15360K	F6000H	640K	14720	OFF	ON	OFF	OFF	ON	OFF	ON	ON

\* THE TOGGLE SWITCH 4

After setting the switch for start address, you can decide to use BANK 1 or not by the toggle switch 4 "ON" or "OFF". First, you have to dip ram chip on BANK0, then, if you don't use the BANK1, put the toggle switch 4 "OFF", otherwise, put the toggle switch 4 "ON".

For 512K Start Address

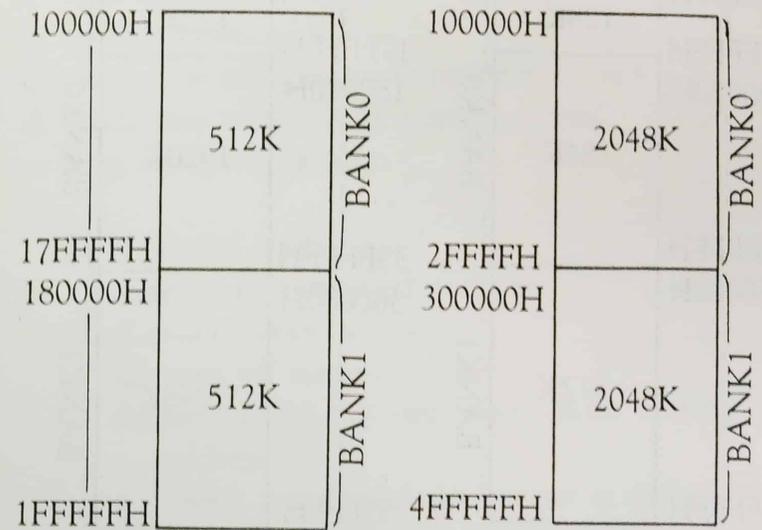
Attention: Mainboard must not decoder 08000H ~ 09FFFFH CPU address



Using 41256

Using 411000

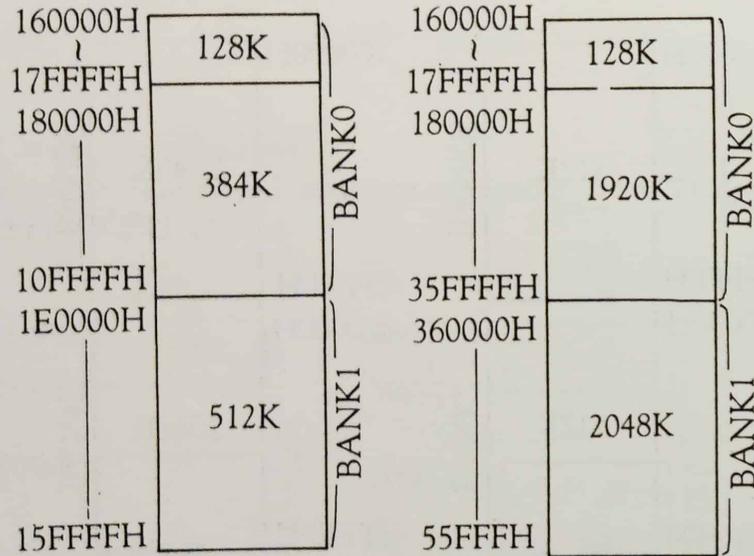
For 640K Start Address



Using 41256

Using 411000

FOR 1024K (640K + 384K)



Using 41256

Using 411000

## VI. TROUBLESHOOTING

1. The PE-520 is for memory expansion only. If after adding this card system board can't boot up what to do?

- a. turn off system.
  - b. remove cover.
  - c. check this card is seated properly or not
  - d. check any other cards were disturbed.
  - e. turn on system power.
- (1) if system boots:
    - may be not installed properly.
  - (2) if system does not boot.,
    - (a) turn off system power.
    - (b) remove PE-520 ram card. check starting address
    - (c) check mainboard j18 jumper is setting for or 512K RAM mainboard setting proper position.
    - (d) reinstall PE-520 ram card. turn on system power.
    - (e) if the computer is still not operating, the RAM card should be returned for repair.
  - (3) if system boots up but gives an error message, decode the error message to find the problem. a typical memory error message will look like:

XXXXX — XXXX 201

first five digit "x" error message represent the address of failing memory, second four digit "x" error message represent the data of failing memory.

USING 41256 (256K × 1) RAM CHIP

ERROR MESSAGE    FAILING ADDRESS    FAIL DATA

100000-0080    201            BANK 0            BIT-7  
 180000-0800    201            BANK 1            BIT-11

EACH BANK DATA ALLOCATION

DATA BITS	ERROR CODE	PATA BITS	ERROR CODE
DATA BIT-7	XX80	DATA BIT-15	80XX
DATA BIT-6	XX40	DATA BIT-14	40XX
DATA BIT-5	XX20	DATA BIT-13	20XX
DATA BIT-4	XX10	DATA BIT-12	10XX
DATA BIT-3	XX08	DATA BIT-11	08XX
DATA BIT-2	XX04	DATA BIT-10	04XX
DATA BIT-1	XX02	DATA BIT-9	02XX
DATA BIT-0	XX01	DATA BIT-8	01XX
PARITY—0	0000	PARITY—1	0000

FAIL DATA BIT MESSAGE

0001 BIT 0 BAD    0100 BIT-8 BAD  
 0002 BIT 1 BAD    0200 BIT-9 BAD  
 0004 BIT 2 BAD    0400 BIT-10 BAD  
 0008 BIT 3 BAD    0800 BIT-11 BAD  
 0010 BIT 4 BAD    1000 BIT-12 BAD  
 0020 BIT 5 BAD    2000 BIT-13 BAD  
 0040 BIT 6 BAD    4000 BIT-14 BAD  
 0080 BIT 7 BAD    8000 BIT-15 BAD

has two BITs BAD            had two BITs BAD

Ex: 0003 BIT 0, BIT 1 BAD    Ex: 0900 BIT 8, BIT 11  
 (0001+0002)                    (0100+0800)

Find out error BANK and BIT check RAM pins are completely inserted into socket if RAM pins are inserted correctly please change fail DATA BIT with a new RAM chip.