ExpertBoard 8054

User's Manual

OPTI 596/597+822

PENTIUM Motherboard

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CHAPTER 1
INTRODUCTION

1.1 Overview

The OPTI-596/597 is a new single-chip solution that offers the cost-effective system integration for PENTIUM systems. Besides the standard features, the OPTI-82C596/597 also supports VESA standards and PCI features for most of advanced I/O BUS on the market.

1.2 System Features

- ❑ Supports INTEL PENTIUM
- ❑ Supports 3 MASTER 32-bit PCI Bus
- ❑ Supports L1/L2 write back/write through cache feature
- ❑ Supports 2 MASTER VESA Bus
- ❑ Supports 64KB/ 128KB/ 256KB/ 512KB /1M cache size
- ❑ Supports 72pin SIM MODULES

1.3 System Specifications

Processor :	INTEL PENTIUM
CPU Clock :	60/66 MHz CPU
Memory :	2MB to 128MB
SRAM Configuration :	64K/128K/256K/512K/1M
BIOS Subsystem :	PHOENIX BIOS
Additional BIOS feature :	Set program resides in ROM
I/O Subsystem NO. slot :	Five 16-bit ISA Bus & Two 32-bit Local Bus & Three PCI 32-bit bus
I/O Interface :	Supports two serial port, one parallel port, floppy, one ISA IDE (option) & one PCI IDE (option)
Dimension :	Baby AT size

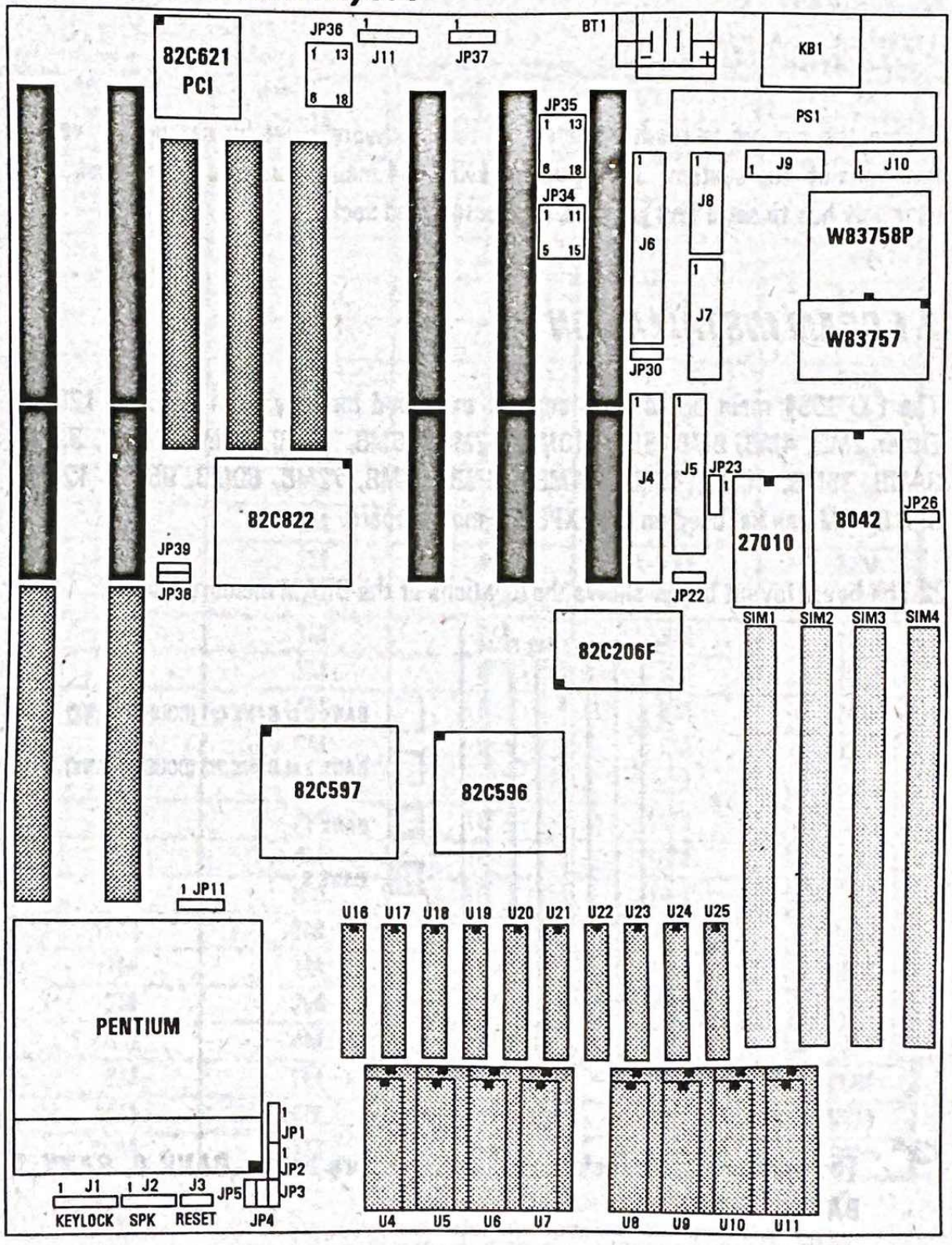
Additional features

Miscellaneous connectors :	Reset Button, Internal Battery
Board design :	4-layer implementation for low noise operation

1.4 System Performance

SOFTWARE / CPU TYPE	LANDMARK V2.0	POWER METER V1.7 MIPS	NORTON V7.0 CPU SPEED
60MHz	346.46MHz	41.0MIPS	190.3
66MHz	384.84MHz	45.9MIPS	211.3

1.5 EXP8054 Board Layout



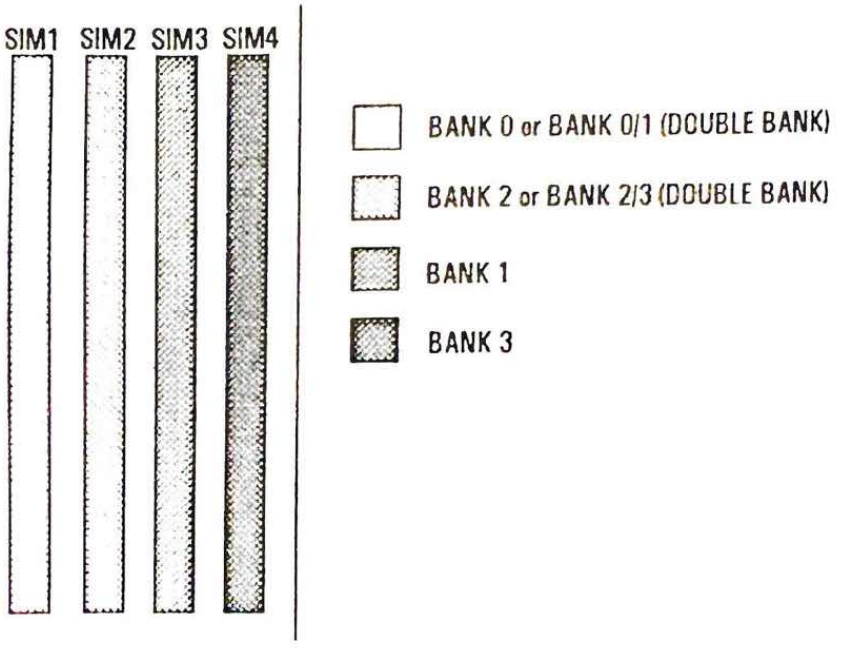
CHAPTER 2
INSTALLATION

Before the system is ready to operate, the hardware must be set up for various functions of the system. To set up the EXP8054 main board is a simple task. The user only has to set a few jumpers, connectors and sockets.

2.1 DRAM INSTALLATION

The EXP8054 main board can support expanded memory from 2MB to 128MB. Either 2MB, 4MB, 6MB, 8MB, 10MB, 12MB, 16MB, 18MB, 20MB, 24MB, 32MB, 34MB, 36MB, 40MB, 48MB, 64MB, 66MB, 68MB, 72MB, 80MB, 96MB, 128MB SIM DRAM can be used on the EXP8054 motherboard.

■ The board layout below shows the locations of the DRAM memory banks :

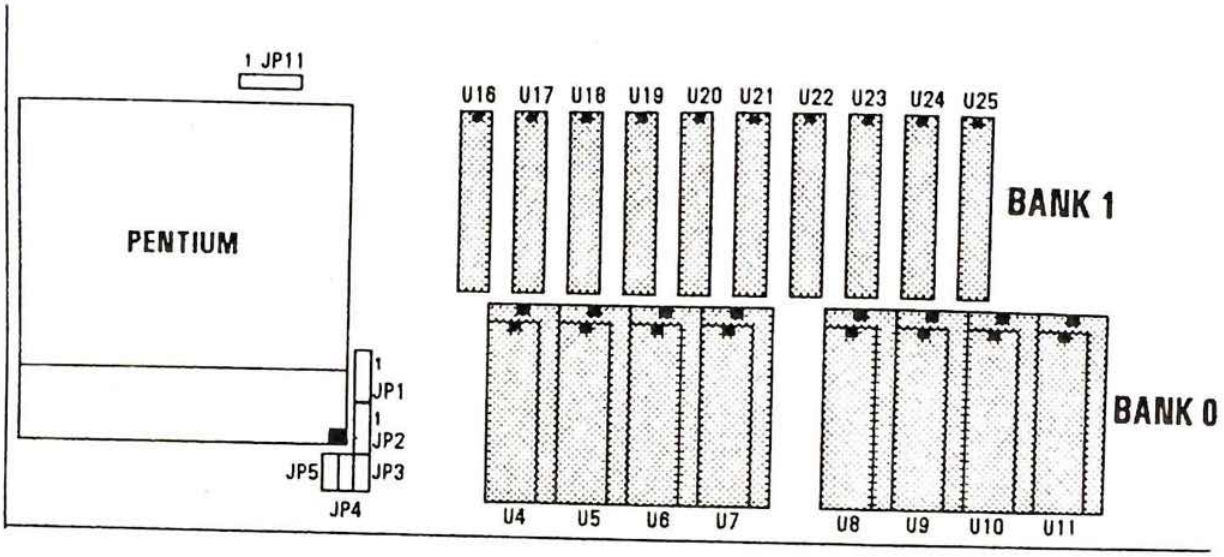


☞ **The motherboard consists of four memory banks, BANK 0, BANK 1, BANK 2 or BANK 3 .**

DRAM Configuration

BANK 0 SIM1	BANK 1 SIM3	BANK 2 SIM2	BANK 3 SIM4	TOTAL
1M	1M			2M
2M	2M	—	—	4M
4M	4M	—	—	8M
8M	8M		—	16M
16M	16M		—	32M
32M	16M			48M
1M	1M	1M	1M	4M
1M	1M	2M	2M	6M
2M	2M	2M	2M	8M
1M	1M	4M	4M	10M
2M	2M	4M	4M	12M
4M	4M	4M	4M	16M
1M	1M	8M	8M	18M
2M	2M	8M	8M	20M
4M	4M	8M	8M	24M
8M	8M	8M	8M	32M
1M	1M	16M	16M	34M
2M	2M	16M	16M	36M
4M	4M	16M	16M	40M
8M	8M	16M	16M	48M
16M	16M	16M	16M	64M
1M	1M	32M	32M	66M
2M	2M	32M	32M	68M
4M	4M	32M	32M	72M
8M	8M	32M	32M	80M
16M	16M	32M	32M	96M
32M	32M	32M	32M	128M

2.2 SRAM INSTALLATION

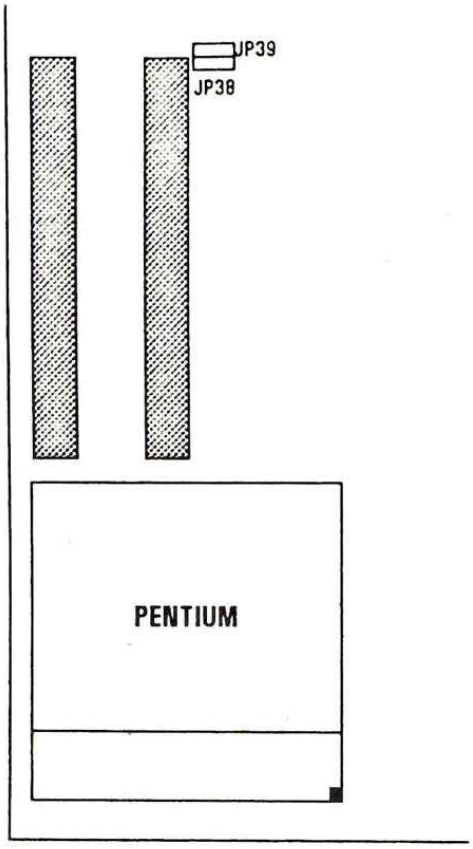


CACHE CONFIGURATION SIZE

64K		128K		256K *		512K		1M	
TAG RAM	DATA RAM	TAG RAM	DATA RAM	TAG RAM	DATA RAM	TAG RAM	DATA RAM	TAG RAM	DATA RAM
U17 8K×8	U4 – U11 8K×8	U17 8K×8	U4 – U11 U18 – U25 8K×8	U17 8K×8	U4 – U11 32K×8	U16, U17 8K×8	U4 – U11 U18 – U25 32K×8	U17 32K×8	U4 – U11 128K×8
JP11 1 JP1 1 JP2 1 JP3 JP4 JP5		JP11 1 JP1 1 JP2 1 JP3 JP4 JP5		JP11 1 JP1 1 JP2 1 JP3 JP4 JP5		JP11 1 JP1 1 JP2 1 JP3 JP4 JP5		JP11 1 JP1 1 JP2 1 JP3 JP4 JP5	

* : Default Setting

2.2 CPU INSTALLATION

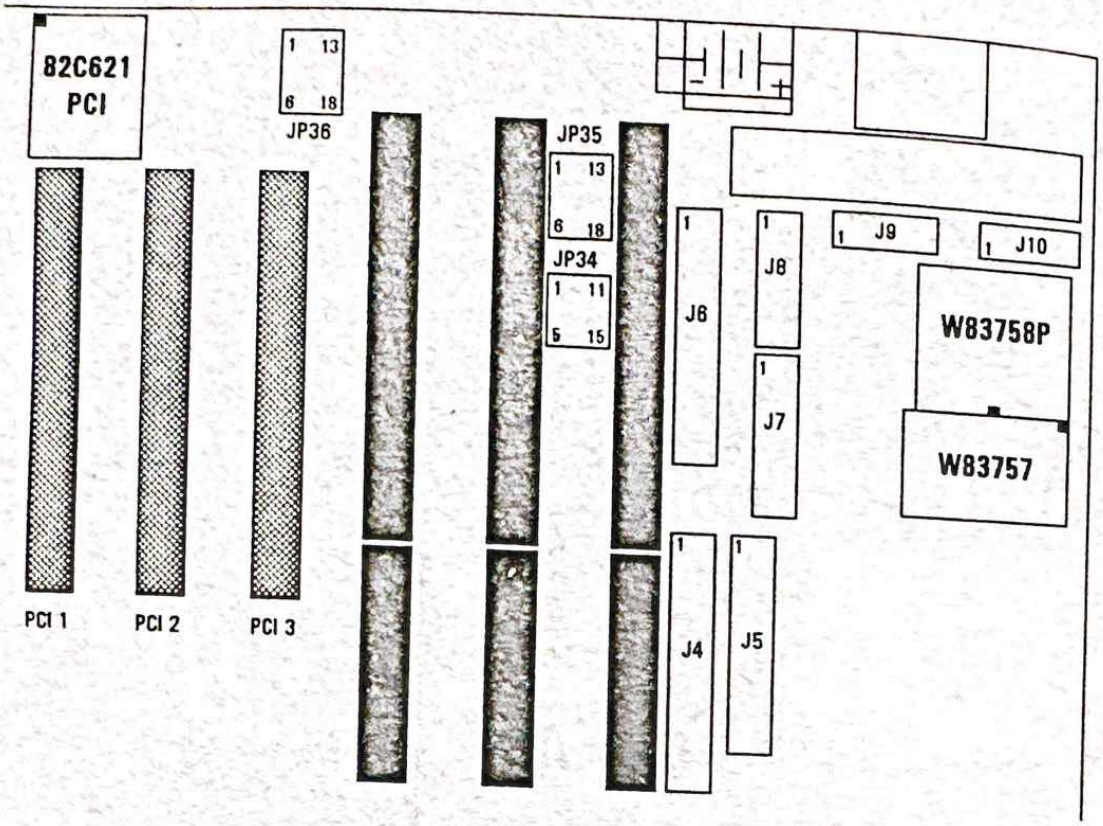


CPU FREQUENCY SETTING

PENTIUM 66.6 MHz		PENTIUM 60mhz *	
JP39 JP38		JP39 JP38	

* : Default Setting

2.4 IDE INSTALLATION

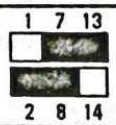
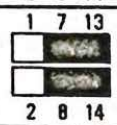
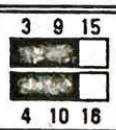
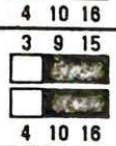
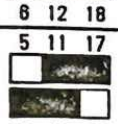


JP34 : ISA BUS HDD, FDC FUNCTION SELECT

DESCRIPTION	
1 6 11 A, B NORMAL MODE *	1 6 11 A, B CHANGE MODE
2 7 12 FDC ADDRESS : 3F0h-3F7h *	2 7 12 FDC ADDRESS : 370h-377h
3 8 13 IDE ENABLED *	3 8 13 IDE DISABLED
4 9 14 HDD ADDRESS : 3F6h, 3F7h, 1F0h-1F7h *	4 9 14 HDD ADDRESS : 376h, 377h,170h-177h
5 10 15 FDC ENABLED *	5 10 15 FDC DISABLED

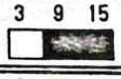
*** : Default Setting**

JP35 : SERIAL PORT & PARALLEL PORT FUNCTION SELECT

	RS232-1 (J10)	RS232-2 (J9)	PRINTER (J7)
COM4 (2E8H)			
COM1 (3F8H) *			
COM3 (3E8H)			
DISABLE			
COM3 (3E8H)			
COM2 (2F8H) *			
COM4 (2F8H)			
DISABLE			
LPT3 (3BCH)			
LPT2 (278H)			
LPT1 (378H) *			
DISABLE			

* : Default Setting

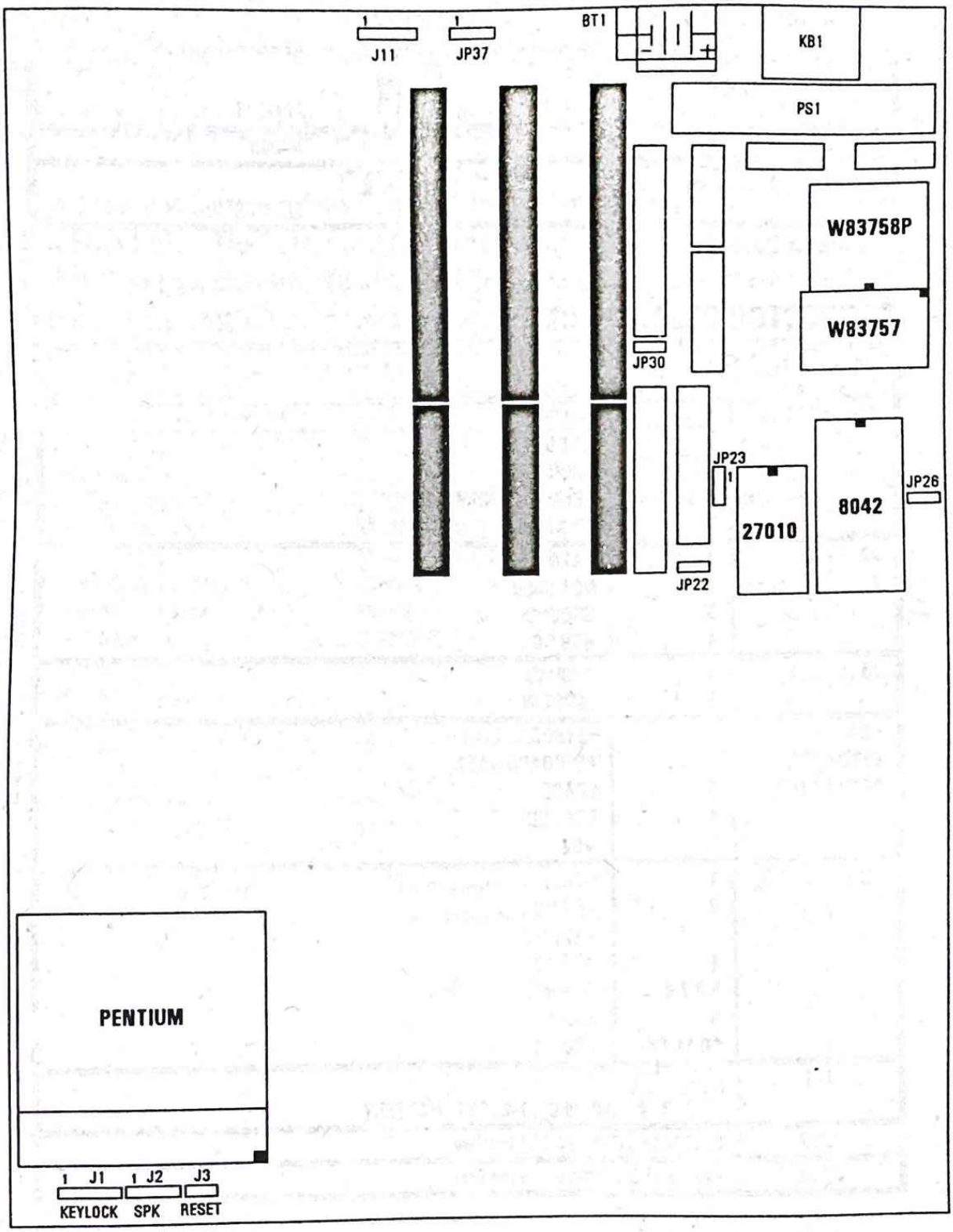
JP36 : PCI IDE FUNCTION SELECT (OPTION)

DESCRIPTION	
 DEFAULT ADDRESS *	 RELOCATABLE ADDRESS
 EDGE TRIGGERED *	 LEVEL TRIGGERED
 PCI CLK 33MHz *	 PCI CLK 25MHz
 PREFETCH OFF *	 PREFETCH ON

MODE 0 *	MODE 1	MODE 2	MODE 3
			

*** : Default Setting**

2.5 OTHER JUMPER & CONNECTOR INSTALLATION

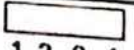


OTHER JUMPER DESCRIPTION

JUMPER	DESCRIPTION	
JP23	 1 NORMAL ROM *	 1 FRUSH ROM
JP26	 COLOR *	 MONO
JP37	 1 NORMAL *	 1 CLEAR CMOS

* : Default Setting

CONNECTOR DESCRIPTION

CONNECTOR	PIN OUT	SIGNAL NAME
J1 : KEY LOCK	1	LED POWER
	2	NOT USED
	3	GROUND
	4	KEYBOARD INHIBITOR
	5	GROUND
J2 : SPK	1	DATA OUT
	2	NOT USED
	3	GROUND
	4	+5V DC
J3 : RESET	1	GROUND
	2	RESET IN
KB1: KEYBOARD CONNECTOR	1	KEYBOARD CLOCK
	2	KEYBOARD DATA
	3	SPACE
	4	GROUND
	5	+5V
PS 1 : POWER CONNECTOR	1	POWER GOOD
	2	+5V DC
	3	+12V DC
	4	-12V DC
	5,6,7,8	GROUND
	9	5V DC
	10,11,12	+5V DC
J11	 1 2 3 4 2-3 : N.C., 1-4 : EXT. BATTERY	
JP22	ISA IDE LED CONNECTOR (option)	
JP30	PCI IDE LED CONNECTOR (option)	

CHAPTER 3
SYSTEM BIOS SETUP

3.1 PHOENIX BIOS SYSTEM CONFIGURATION SETUP

This section will explain how to set up the system configuration (CMOS) under the PHOENIX BIOS. The SETUP program is contained in the system's Read-Only-Memory rather than on a diskette. To enter SETUP, press the <F2> key when the system is booting up. The following menu appears:

Phoenix BIOS Setup - Copyright 1992-93 Phoenix Technologies Ltd.

Main Advanced Exit

		Item Specific Help
System Time:	[0:05:41]	<Tab>, <Shift-Tab>, or
System Date:	[01/01/1988]	<Enter> selects field.
Diskette A:	[1.2MB, 5 1/4"]	
Diskette B:	[1.44MB, 3 1/2"]	
▶ Fixed Disk 0 Type:	[None]	
▶ Fixed Disk 1 Type:	[None]	
Video System:	[EGA/VGA]	
▶ Memory Cache		
▶ Memory Shadow		
▶ Boot sequence:	[A: then C:]	
▶ Numlock:	[Auto]	
System Memory:	640KB	
Extended Memory:	7168KB	

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
ESC Exit → Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

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Main

Fixed Disk 0 Control (Boot Drive)		Item Specific Help
Autotype Fixed Disk:	[Press Enter]	Attempts to automatically detect the drive type for drives that comply with ANSI specifications
Fixed Disk 0 Type:	[None]	
Cylinders:		
Heads:		
Sectors/Track:		
Landing Zone:		
Write Precomp:		

F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults
ESC Exit	→ Select Menu	Enter Select Command	F10 Previous Values

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Main

Fixed Disk 1 Control		Item Specific Help
Autotype Fixed Disk:	[Press Enter]	Attempts to automatically detect the drive type for drives that comply with ANSI specifications
Fixed Disk 1 Type:	[None]	
Cylinders:		
Heads:		
Sectors/Track:		
Landing Zone:		
Write Precomp:		

F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults
ESC Exit	→ Select Menu	Enter Select Command	F10 Previous Values

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Main

Memory Cache		Item Specific Help
External Cache:	[Enabled]	Sets the state of the external system memory cache.
Primary Cache Write Mode:	[Write Back]	
Secondary Cache Write Mode:	[L2 Write Through]	
Write burst mode CLKs:	[X-4-4-4]	
Cache Write Lead Off Cycles:	[5-X-X-X / 4-X-X-X]	
Read burst mode CLKs:	[X-4-4-4]	
Cache Read Lead Off Cycle:	[5-X-X-X / 4-X-X-X]	
Cache System BIOS:	[Disabled]	
Cache Video BIOS:	[Disabled]	
Non-cacheable Regions		
Region 0, start:	[0KB]	
Region 0, size:	[Disabled]	
Region 1, start:	[0KB]	
Region 1, size:	[Disabled]	

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
ESC Exit → Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

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Main

Memory Shadow		Item Specific Help
System shadow	[Enabled]	Shadows Video BIOS ROMS
Video shadow:	[Enabled]	
Shadow Memory Regions	[Disabled]	
C800 - CBFF:	[Disabled]	
CC00 - CFFF:	[Disabled]	
D000 - D3FF:	[Disabled]	
D400 - D3FF:	[Disabled]	
D800 - D7FF:	[Disabled]	
DC00 - DBFF:	[Disabled]	
E000 - EFFF:	[Disabled]	

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
ESC Exit → Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

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Main

Boot Options		Item Specific Help
Boot sequence:	[A: then C:]	Order system searches drives for a boot disk.
SETUP prompt:	[Enabled]	
POST Errors:	[Enabled]	
Floppy check:	[Enabled]	
Summary screen:	[Enabled]	

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
ESC Exit → Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

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Main

Keyboard Features		Item Specific Help
Numlock:	[Auto]	Selects Power-on state for Numlock
Key Click:	[Disabled]	
Keyboard auto-repeat rate:	[30/sec]	
Keyboard auto-repeat delay:	[1/2 sec]	

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
ESC Exit → Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

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Main Advanced Exit

	Item Specific Help
Warning!	Some operating systems may not be DOS compatable
Setting items on this menu to incorrect values may cause your system to malfunction.	
Large Disk DOS Compatibility: [Enabled]	
▶ Advanced Chipset Control	
▶ PCI Devices	

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
ESC Exit → Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

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Advanced

Advanced Chipset Control		Item Specific Help
Row Address Hold:	[1 CLK]	Select Row address hold time after RAS
Address Decode Delay:	[Disabled]	
RAS Pulswidth for Refresh Clock	[5 CLK]	
RAS Precharge:	[5 CLK]	
CAS Precharge:	[2 CLK]	
Read CAS Pulswidth:	[2 CLK]	
Write CAS Pulswidth:	[2 CLK]	
DRAM Post Write:	[Disabled]	
Hidden refresh:	[Disabled]	
CPU Pipelining:	[Disabled]	

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults

ESC Exit → Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

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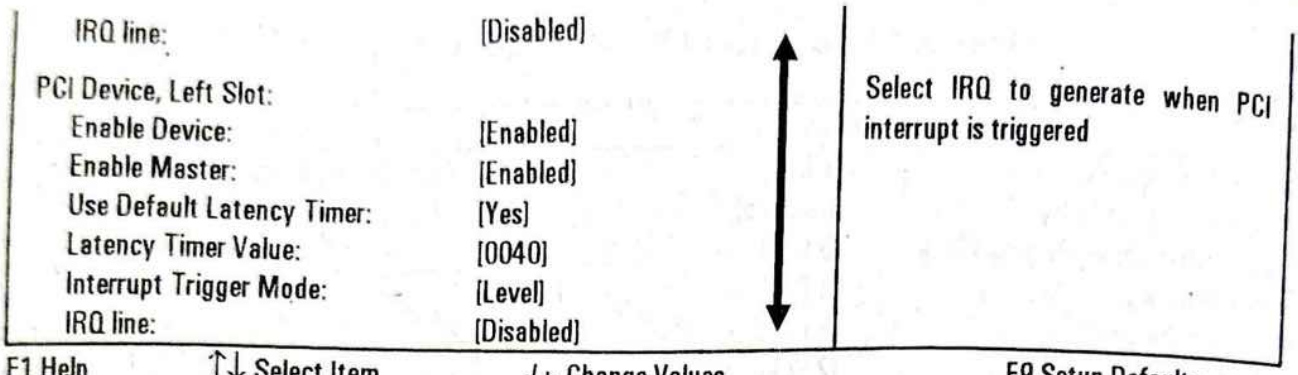
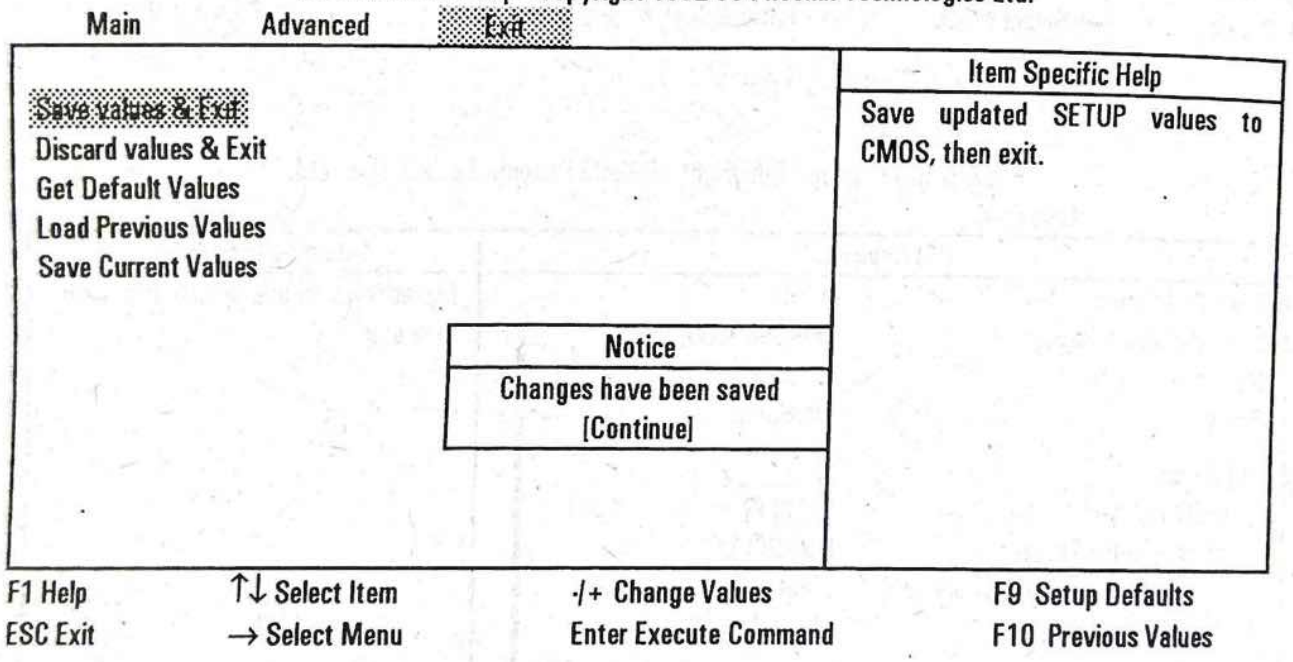
Advanced

PCI Devices		Item Specific Help
Base I/O Address:	[3000]	I/O address above which PCI cards may use
Base Memory Address:	[00A0000000]	
Multimedia mode:	[Disabled]	
Parity:	[Disabled]	
PCI Bridge:		
LRDY Delay:	[2 LCLK]	
Master Retry Timer:	[8 PCICLK]	
DMA/ISA Master to PCI Slave:	[Enabled]	
PCI Bus Clock:	[Async]	
PCI Device, Right slot:		Enable selected device as a PCI bus master
Enable Device:	[Enabled]	
Enable Master:	[Enabled]	
Use Default Latency Timer:	[Yes]	
Latency Timer Value:	[0040]	
Interrupt Trigger Mode:	[Level]	
IRQ line:	[Disabled]	
PCI Device, Middle slot:		
Enable Device:	[Enabled]	
Enable Master:	[Enabled]	
Use Default Latency Timer:	[Yes]	
Latency Timer Value:	[0040]	
Interrupt Trigger Mode:	[Level]	



Note : When use IRQ 11, 12, 15, "Interrupt Trigger Mode" must set "[Edge]".

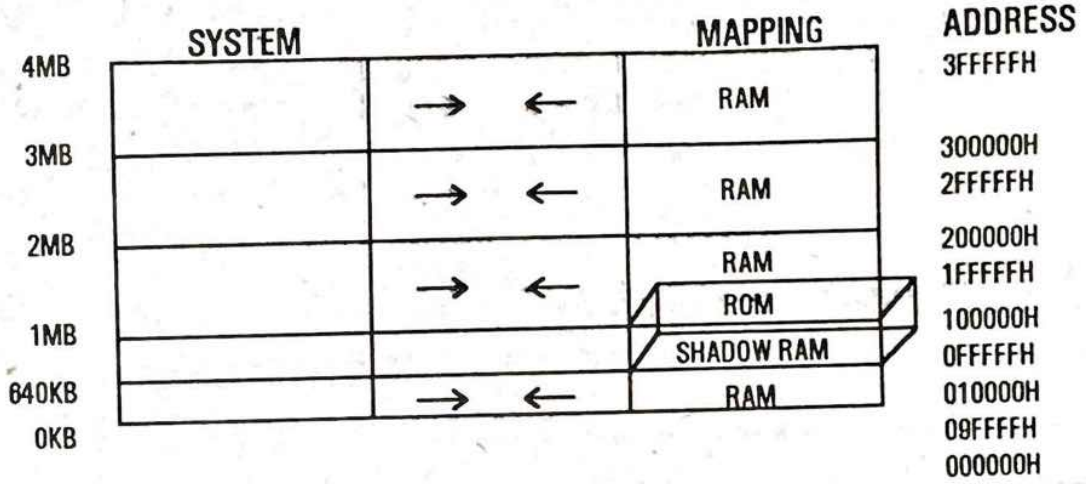


3.2 SHADOW RAM

For efficient execution of BIOS, it is preferable to execute BIOS code through faster DRAM accesses. The OPTI-82C895 provides the shadow RAM feature which if enabled allows the BIOS code to be executed from DRAM access with addresses like BIOS EPROMs. The software should transfer codes stored in the BIOS EPROMs to the system RAM, before enabling the shadow RAM feature. This feature significantly improves the performance of BIOS-call intensive applications. Performance improvements as high as 300 to 400% have been observed in benchmark tests by enabling the corresponding bits in the ROM enable register and the RAM mapping register.

When the Shadow RAM feature is being utilized, then the RAM is mapped as shown in Figure 1, overlapping or shadowing the EPROM area. In both cases, for accesses beyond the 1 Mbyte address range, the processor is switched from real to protected mode.

- FIGURE 1 : RAM MAPPING WITH SHADOW RAM (MORE THAN 1MB OF RAM)



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