486 ISA-BUS

Main board User's Manual

for 486DX/SX

WeSpeedYourWorld

MB 459

UMC 486 SUPER DEEP GREEN PC

470-024591990

C-4 RTC & CMOS RAM MAP

RTC & CMOS:

00	Seconds
01	Second alarm
02	Minutes
03	Minutes alarm
04	Hours
05	Hours alarm
06	Day of week
07	Day of month
08	Month
09	Year
0A	Status register A
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown byte
10	FLOPPY DISK drive type byte
11	Reserve
12	HARD DISK type byte
13	Reserve
14	Equipment type
15	Base memory low byte
16	Base memory high byte
17	Extension memory low byte
18	Extension memory high byte
19-2D	Reserve
2E-2F	2-byte, COMS RAM chechsum
30	Reserve for extension memory low byte
31	Reserve for extension memory high byte
32	DATE CENTURY byte
33	INFORMATION FLAG
34-3F	Reserve
40-7F	Reserve for CHIPSET SETTING DATA

USER'S MANUAL

Table of Contents

C-3 : INTERRUPT MAP

NMI: Parity check error

IRQ(H/W): 0 System TIMER interrupt from TIMER-0
1 KEYBOARD output buffer full
2 Cascade for IRQ 8-15
3 SERIAL port 2
4 SERIAL port 1
5 PARALLEL port 2
6 FLOPPY DISK adapter
7 PARALLEL port 1
8 RTC clock
9 Available
10 Available
11 Available
12 Available
13 MATH coprocessor
14 HARD DISK adapter
15 Available

From	To	Description
360	36F	NETWORK ports.
378	37F	PARALLEL ports-1.
3B0	3BF	MONOCHROME & PRINTER adapter.
3C0	3CF	EGA adapter.
3D0	3DF	CGA adapter
3F0	3F7	FLOPPY DISK controller.
3F8	3FF	SERIAL port-1.

C-2 : TIMER & DMA CHANNELS MAP

TIMER MAP:

TIMER Channel-0 system timer interrupt
TIMER Channel-1 DRAM REFRESH request
TIMER Channel-2 speaker tone generator

DMA CHANNELS:

DMA Channel-0 Available
DMA Channel-1 IBM SDLC
DMA Channel-2 FLOPPY DISK adapter
DMA Channel-3 Available
DMA Channel-4 Cascade for DMA controller 1
DMA Channel-5 Available
DMA Channel-6 Available
DMA Channel-7 Available

Chapter 1

Features

CPU TYPE :
Intel 486SX,486DX,486DX2, and S-series SMM CPU
AMD 5V 486DX,DX2,DXL,DXL2 and AMD 3V DX2/DX4 CPU
Cyrix M6, M7
UMC 486 CPU

Cache memory : 128KB, 256KB and 512KB 2nd CACHE memory selectable Write-back direct mapped CACHE operation. Supports SRAM type 32Kx8,64Kx8 and 128Kx8

Main Memory : 64MB max on board Using 256K, 1M, 4M and 16M SIMM DRAM Supports PS2/72pin SIM module and auto - banking of every DRAM banks

I/O Slot : Six 16-bit ISA Slots

BIOS : Award, AMI or other

Dimension : 25 cm x 22 cm

CPU Vcc Input : Supports 5V and 3.45V, 3.3V Voltage (But Q3 regulator and some parts must be installed)

Green Function

Supports the EPA Energy Star PC specification with Deep Green system Design. It supports the advanced SMM CPU. Accommodated with UMC 486DX/SX U5S- series CPU , system performs stop clock mode. The functions for power saving options are:

. HDD Standby Timer :

The Hard disk entering power down mode.

. Display Power Down :

The display screen will be closed.

. System power down mode :

Full-on : System runs in full speed CPU clock

Doze : Sytem runs in lower CPU clock

Standby : System scales-down the CPU clock

Suspend : With SMM CPU, performs stop clock in suspend mode

Pressing any Key or moving Mouse to Wake up the system.

APPENDIX C : AT TECHNICAL INFORMATION

C-1 : I/O & MEMORY MAP

MEMORY MAP :

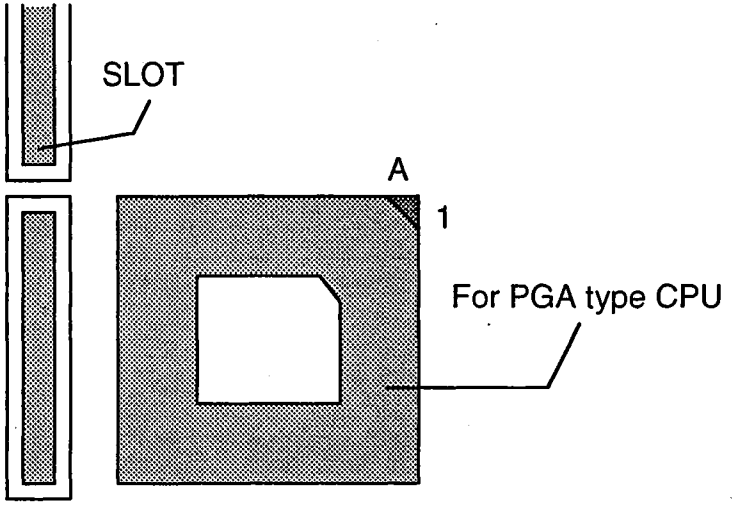
[0000000-009FFFF]	System memory used by DOS and application program.
[00A0000-00BFFFF]	Display buffer memory for VGA/EGA/CGA/ Monochrome adapter.
[00C0000-00DFFFF]	Reserved for I/O device BIOS ROM or RAM buffer.
[00E0000-00EFFFF]	Reserved for BASIC ROM.
[00F0000-00FFFFF]	System BIOS ROM.
[0100000-1FFFFFF]	System extension memory.

I/O MAP :

From	To	Description
001	01F	DMA controller.(MASTER)
020	021	INTERRUPT controller.(MASTER)
022	023	CHIPSET control registers I/O ports.
040	05F	TIMER control registers.
060	06F	KEYBOARD interface controller.(8042)
070	07F	RTC ports & CMOS I/O ports.
080	09F	DMA register.
0A0	0BF	INTERRUPT controller.(SLAVE)
0C0	0DF	DMA controller.(SLAVE)
0F0	0FF	MATH COPROCESSOR
1F0	1F8	HARD DISK controller
278	27F	PARALLEL port-2
2B0	2DF	GRAPHICS adapter controller.
2F8	2FF	SERIAL port-2

APPENDIX B:

INSTALLING CPU :

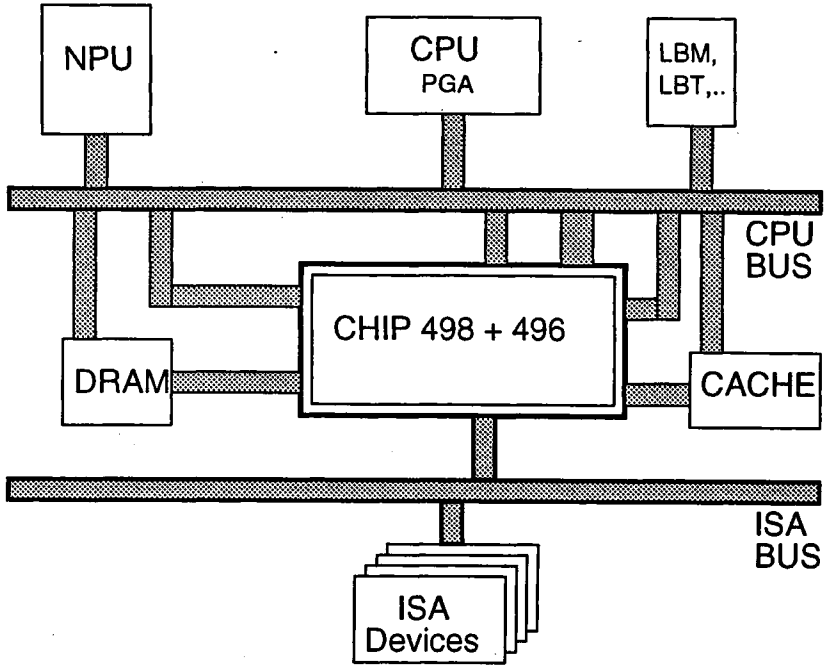


The system board is specifically designed to support Intel, AMD, Cyrix and UMC CPU as below :

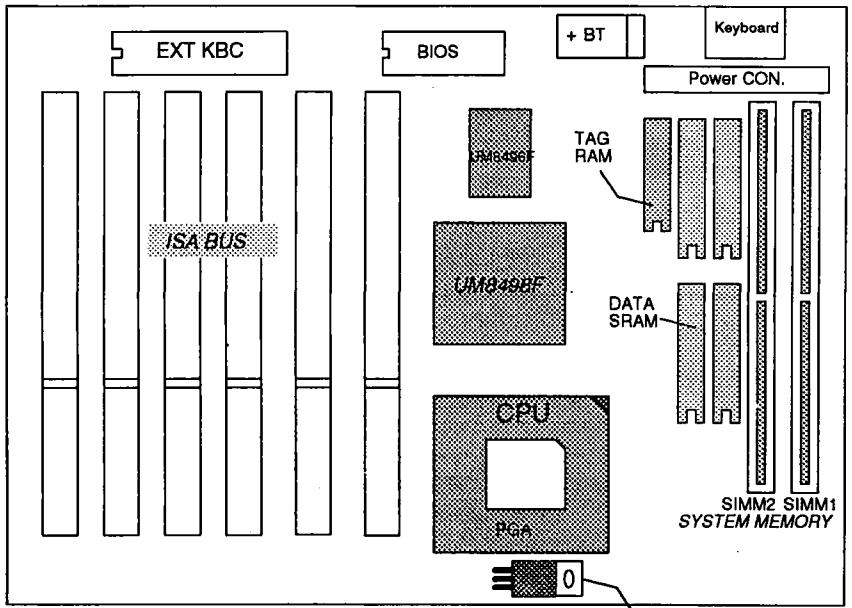
Intel 486SX,486DX,486DX2 and s-series CPU
AMD 486DX,DX2/DX4
Cyrix M6,M7
UMC 486 CPU

Note : Place the CPU into the socket. Make sure pin 1 on the CPU lines up with pin 1 on the socket.

System Block Diagram



System Board Layout



B1 : GND
B2 : SYSRST
B3 : Vcc
B4 : IRQ9
B5 : - 5v
B6 : DRQ2
B7 : - 12v
B8 : WS0#
B9 : + 12v
B10: GND
B11: SMEMW#
B12: SMEMR#
B13: IOW#
B14: IOR#
B15: DACK3#
B16: DRQ3
B17: DACK1#
B18: DRQ1
B19: RFSH#
B20: SYSCLK
B21: IRQ7
B22: IRQ6
B23: IRQ5
B24: IRQ4
B25: IRQ3
B26: DACK2#
B27: TC
B28: BALE
B29: Vcc
B30: OSC
B31: GND

C1 : SBHE#
C2 : SA23
C3 : SA22
C4 : SA21
C5 : SA20
C6 : SA19
C7 : SA18
C8 : SA17
C9 : MEMR#
C10: MEMW#
C11: SD8
C12: SD9
C13: SD10
C14: SD11
C15: SD12
C16: SD13
C17: SD14
C18: SD15

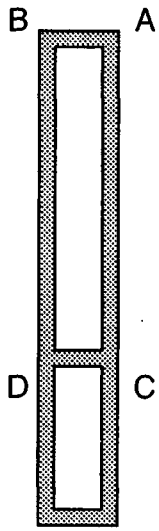
D1 : MEMCS16#
D2 : IOCS16#
D3 : IRQ10
D4 : IRQ11
D5 : IRQ12
D6 : IRQ15
D7 : IRQ14
D8 : DACK0#
D9 : DRQ0
D10: DACK5#
D11: DRQ5
D12: DACK6#
D13: DRQ6
D14: DACK7#
D15: DRQ7
D16: Vcc
D17: MASTER#
D18: GND

Chapter 4

APPENDIX

APPENDIX A :

ISA SLOT PIN OUT SPECIFICATIONS :



A1	: IOCHCK#	A17:	SA14
A2	: SD7	A18:	SA13
A3	: SD6	A19:	SA12
A4	: SD5	A20:	SA11
A5	: SD4	A21:	SA10
A6	: SD3	A22:	SA9
A7	: SD2	A23:	SA8
A8	: SD1	A24:	SA7
A9	: SD0	A25:	SA6
A10:	IOCHRDY	A26:	SA5
A11:	BAEN	A27:	SA4
A12:	SA19	A28:	SA3
A13:	SA18	A29:	SA2
A14:	SA17	A30:	SA1
A15:	SA16	A31:	SA0
A16:	SA15		

Chapter 2

Jumper setting and connector

2-1 CPU TYPE SELECT:

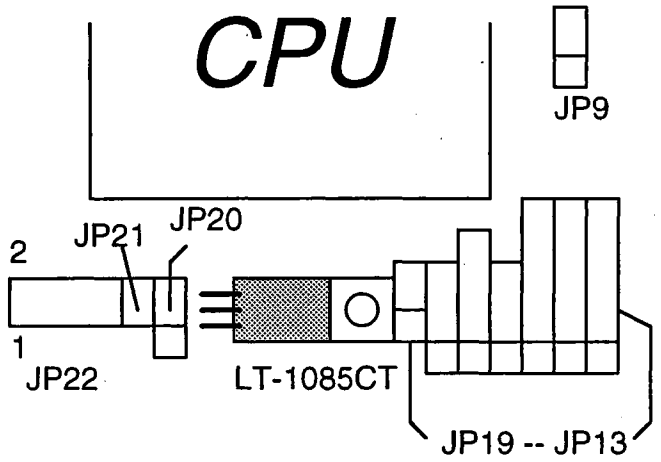
	JP13	JP14	JP15	JP16	JP17	JP18
486SX	2 - 3	OPEN	OPEN	OPEN	OPEN	2 - 3
486DX/DX2	2 - 3	OPEN	OPEN	1 - 2	OPEN	1 - 2 3 - 4
486DX-SL	1 - 2	1 - 2	5 - 6	1 - 2	1 - 2 3 - 4	1 - 2 3 - 4
AMD486DXL (5V CPU)	2 - 3	2 - 3	1 - 2	1 - 2 3 - 4	OPEN	1 - 2 3 - 4
UMC486	2 - 3	2 - 3	1 - 2	3 - 4	OPEN	2 - 3
M6 Cyrix	1 - 2 3 - 4 5 - 6 #	1 - 2 3 - 4 5 - 6	2 - 3 4 - 5	OPEN	2 - 3 4 - 5	2 - 3
M7 Cyrix	1 - 2 3 - 4 5 - 6 #	1 - 2 3 - 4 5 - 6	2 - 3 4 - 5	1 - 2	2 - 3	1 - 2 3 - 4

MARK ' # ' IS FOR DOUBLE CLOCK

P24C : Jumper setting is same as 486DX-SL
JP19 : OPEN : --> INT. CLK x 3
1 - 2 : --> x 2.5
2 - 3 : --> x 2
Others type CPU this (JP19) is open

AMD 3V CPU : Jumper setting is same as 486DX
JP9: 1 - 2 : --> x 3(DX4)
2 - 3 : --> x 2(DX2)
Others type CPU this (JP9) is open

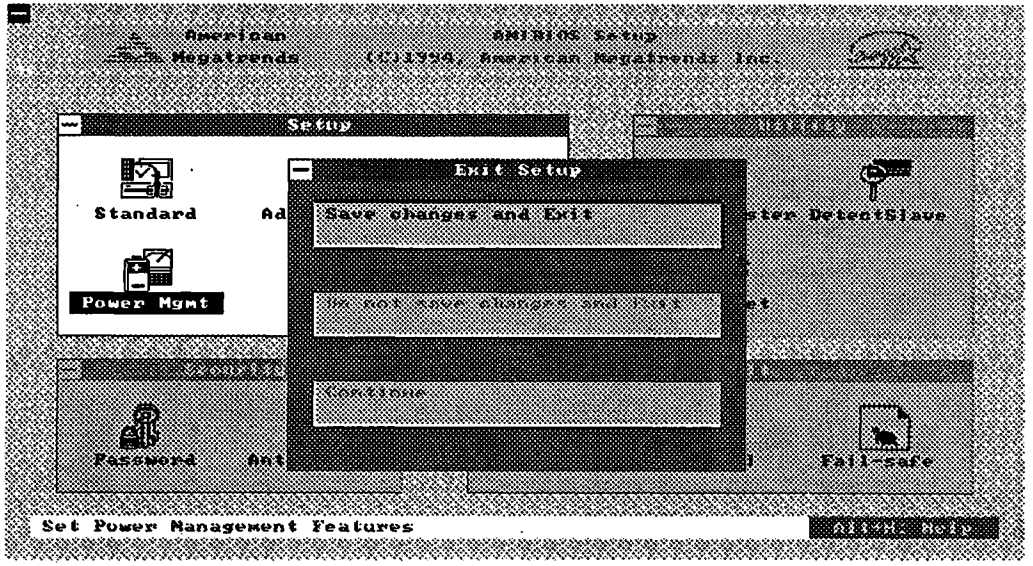
Jumper Location :



2-2 CACHE SIZE SETTING :

	512KB	256KB	128KB
JP4	ON	ON	ON
JP5	ON	ON	ON
JP6	ON	ON	OFF
JP7	ON	OFF	OFF
JP8	1 - 2	1 - 2	1 - 2
SRAM TYPE	128K*8	64K*8	32K*8

3 - 10 Exit Setup



POWER MANAGEMENT Timer Selection :

Disabled : HDD Standby Timer : Disabled
Standy Timer Value : Disabled
Inactive Timer Value : Disabled

Enabled : IDE Power Control : Enabled
Standy Timer Value :
0.5 -- 512 Min
Inactive Timer Value :
2 -- 512 Min

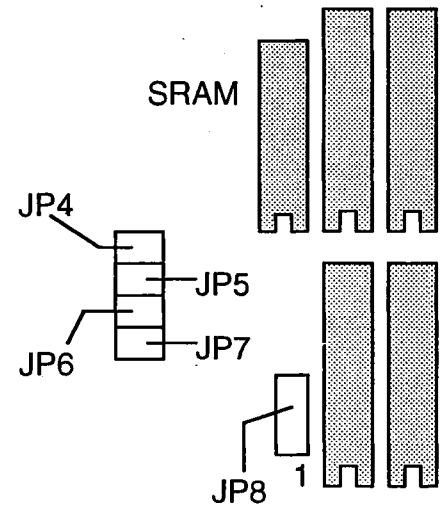
Control Item Select :

CPU CLK : For CPU input Clock Control
1/4 CLKI --> Slow Down CPU to Clock/4
1/8 CLKI --> Slow Down CPU to Clock/8
VGA : Disabled --> Display screen always open
Normal --> The display screen will be closed When inactive mode

Wake up the system:

Pressing any Key or moving Mouse to Wake up the system.

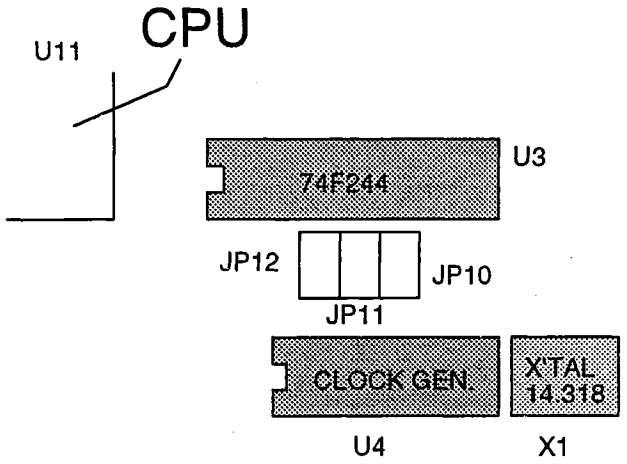
SRAM Jumper location :



2 - 3 CPU CLOCK SETTING :

	JP10	JP11	JP12
25MHz	ON	OFF	OFF
33MHz	ON	ON	ON
40MHz	ON	ON	OFF
50MHz	OFF	OFF	ON

Jumper Location :

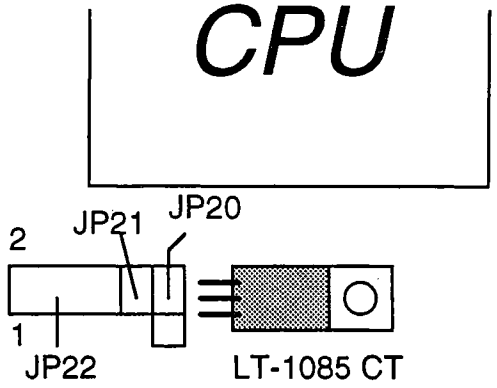


2 - 4 CPU POWER SETTING

Q3 for 5V --> 3.3V, 3.45V regulator, LT 1085CT must be installed

	5V	3.45V	3.3V
JP22	1-2 3-4	5-6 7-8	5-6 7-8
JP21	OFF	ON	ON
JP20	OFF	2-3	1-2

Jumper Location :



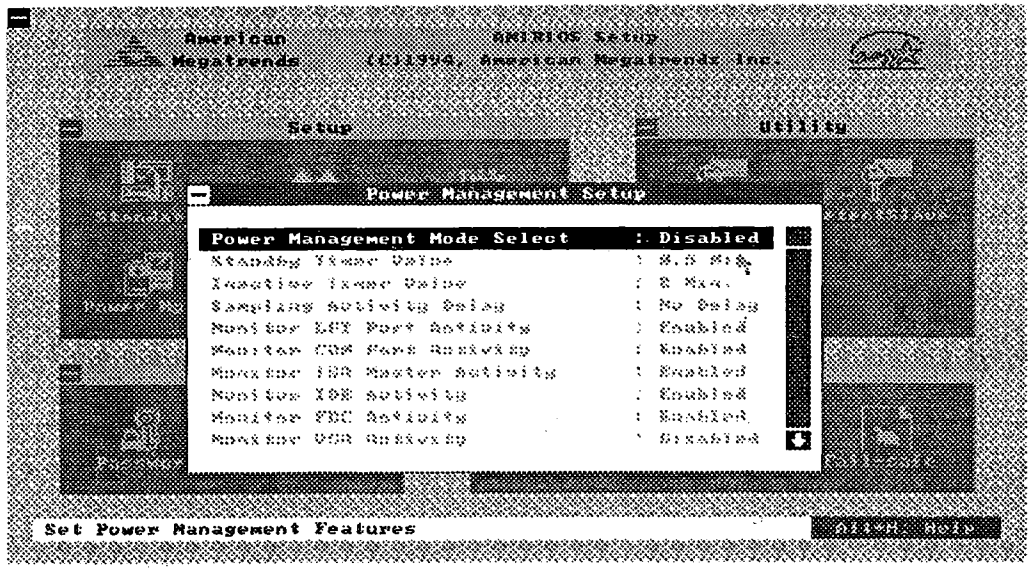
3 - 9 Power Mgmt

Supporting the EPA Energy Star PC specification with Deep
Green system Design. It supports the advanced SMM CPU. Accommodated with Intel S series CPU or AMD DXL, DXL2 CPU, system performs stop clock mode. The function for power savings options are:

. IDE Power Control :
The Hard disk entering power down mode.

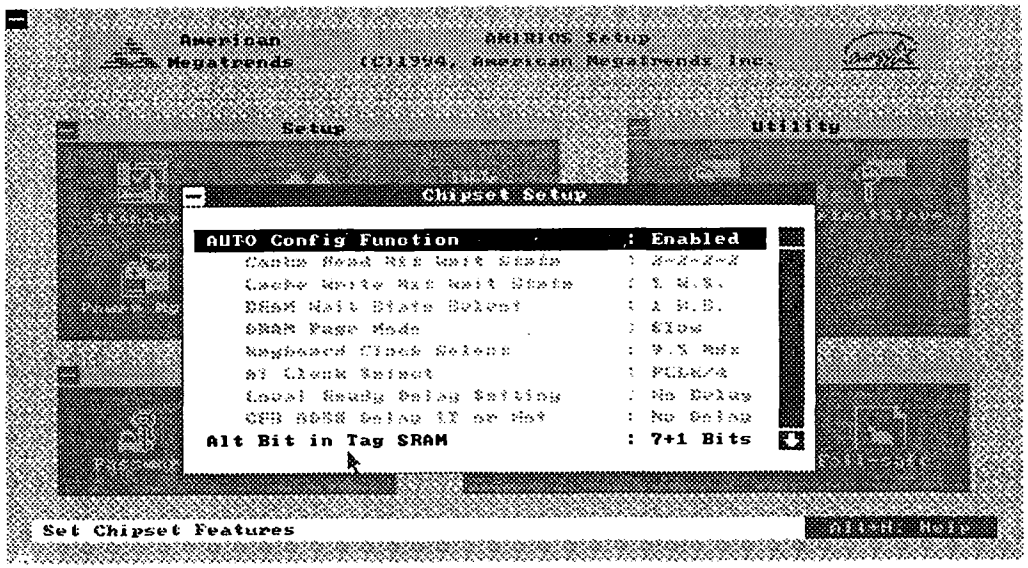
. VGA Power Control :
The display screen will be closed.

. System power down mode :
Full-on : System runs in full speed CPU clock
Standby : System runs in lower CPU clock
Suspend : With SMM CPU, performs stop clock in suspend mode



3 - 8 Chipset Setup

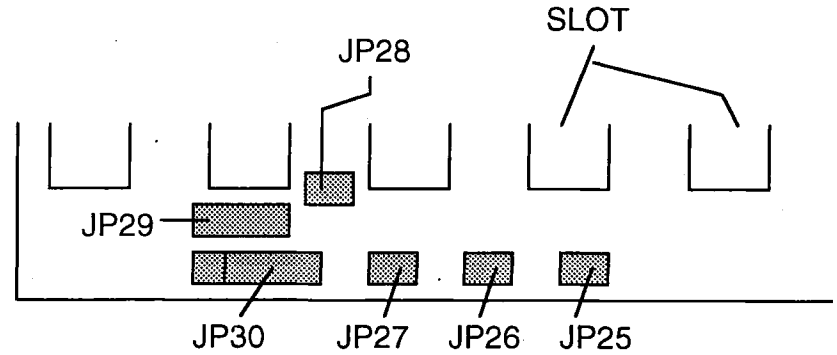
The Chipset Features Setup is entirely chipset specific portion and requires full knowledge about the detail definition of UMC chipset . Each option is tightly corresponding with the hardware structure. Without our engineering change notice,we strongly recommend"don't change any contents in advanced chipset setup menu".



2 - 5 OTHER ON BOARD JUMPER SETTING

P1 : Power Connector
KB1 : Keyboard Connector
JP25 : Hardware Reset
JP26 : Turbo Switch
JP27 : Turbo LED
JP28 : Normal close for internal KBC. keylock
JP29 : Speaker
JP30 : Power LED and Key Lock
JP1 : For on board battery --> Normal 2 - 3
For extend battery --> Pin 1 "+", Pin 4 "-"

Jumper Location :



2 - 6 *DRAM INSTALLATION*

The memory is capable of supporting a minimum 1 Megabyte of memory up to total 64 megabytes memory. The 256KB /1MB / 4MB/16MB SIMM memory are available.

The mainboard allows you to install and expand the system memory via on board two PS2/72-pin SIMM sockets.
It supports fast-page mode DRAM SIMM memory, with a minimum 70ns RAS (Row Address Strobe) access time.
There are four banks of memory (Bank0/1/2/3),
you don't care which one is Bank0 because the BIOS will automatically test which one is Bank0.

DRAM TYPE SUPPORT :

72-pin DRAM single bank or 72-pin DRAM double bank

2 - 7 *CACHE MEMORY INSTALL*

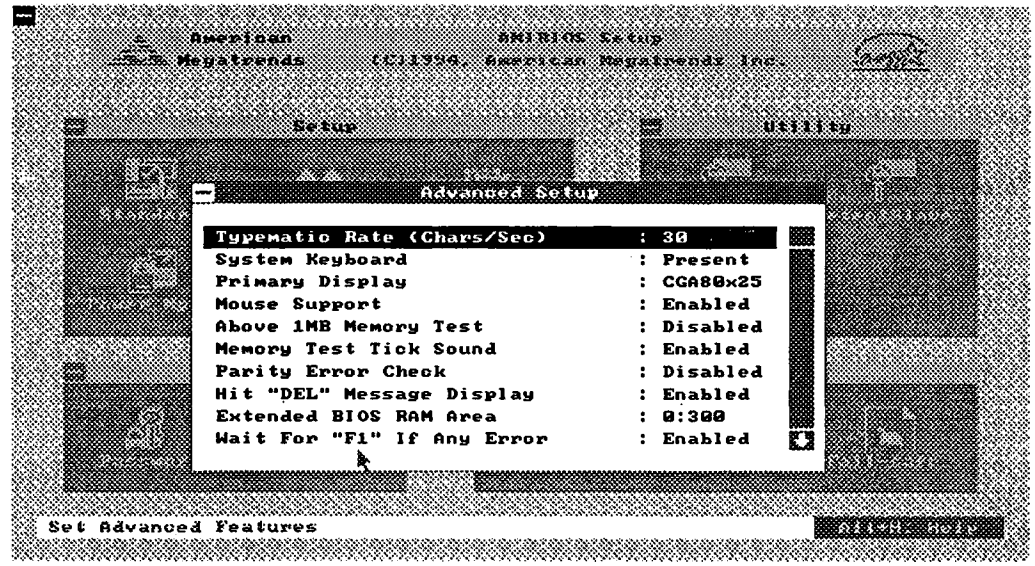
This mainboard supports Cache SRAM configurations: 64KB,128KB,256KB and 512KB.

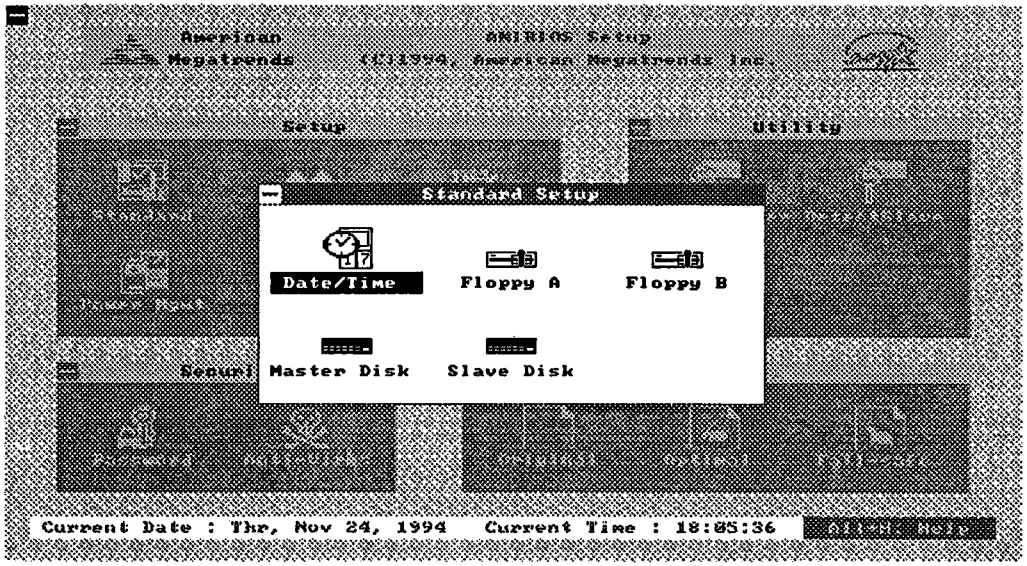
Before you can consider altering the CACHE memory configuration on your main-board, please read this section as below:

	U7 TAG SRAM	U1,U2,U5,U6 DATA SRAM
128KB	32KB*8	32KB*8
256KB	32KB*8	64KB*8
512KB	32KB*8	128KB*8

3 - 7 *Advance Setup*

If you don't really understand the meanings of each item, please don't change the default values. The default setting maybe different from those shown below:





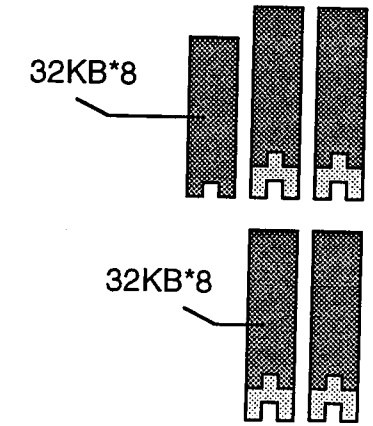
Keystroke/Mouse Convention

Keystroke/Mouse Convention

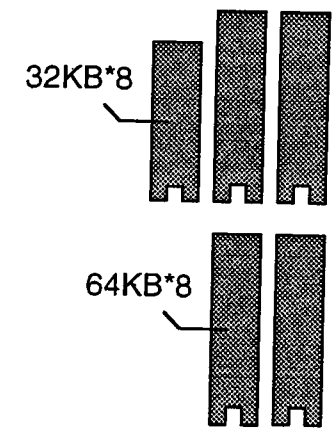
Mouse click	: Point/Select item
Tab	: Select window
Enter	: Select item
Esc	: Return to previous Level
Alt+H	: Help
Alt+Space	: Global exit
Cursor Keys	: Usual meaning

SRAM Location :

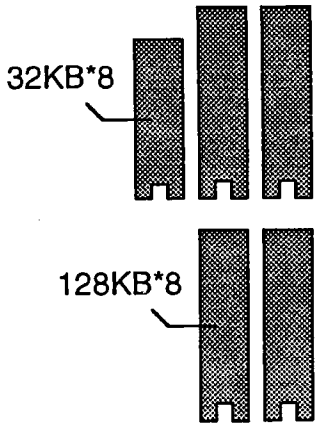
128KB Cache size :



256KB Cache size :



512KB Cache size :

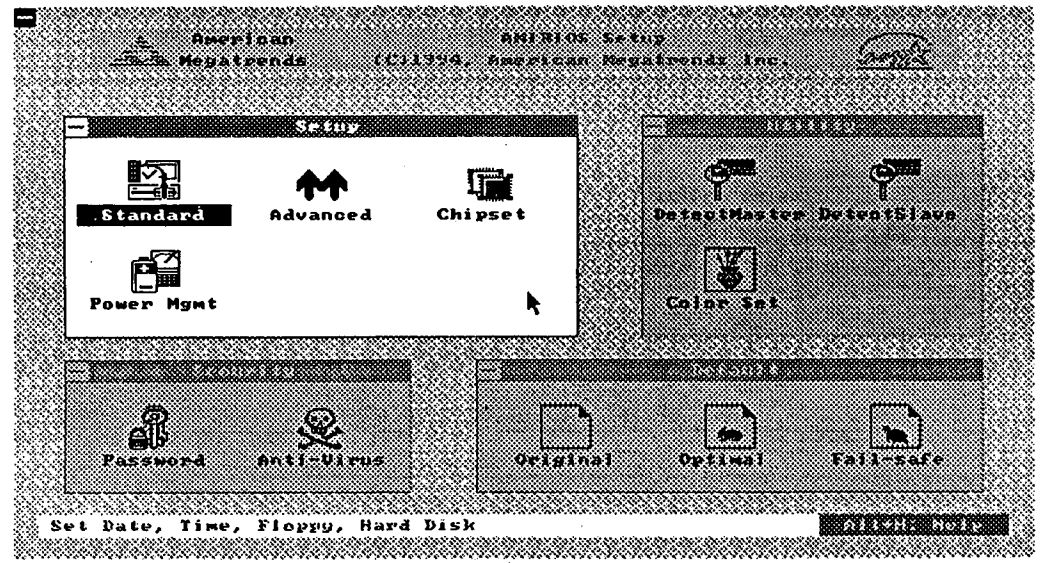


AMI BIOS SETUP

When the system is being powered on or reset, the BIOS will display a copyright message on the first line of the screen, then the BIOS will perform the diagnostics and initialization. After all of the above tests have been passed, the message

"Hit DEL of you want to run SETUP"

is displayed. If the [DEL] key is pressed, the screen will be cleared and then the following message will be showed:



3-5 Standard type of hard disk

Type	Size	Cylinders	Heads	Sec	W-Pcomp	L-Zone
1	10MB	306	4	17	128	305
2	20MB	615	4	17	300	615
3	30MB	615	6	17	300	615
4	62MB	940	8	17	512	940
5	46MB	940	6	17	512	940
6	20MB	615	4	17	None	615
7	30MB	462	8	17	256	511
8	30MB	733	5	17	None	733
9	112MB	900	15	17	None	901
10	20MB	820	3	17	None	820
11	35MB	855	5	17	None	855
12	49MB	855	7	17	None	855
13	20MB	306	8	17	128	319
14	42MB	733	7	17	None	733
15	Reserved					
16	20MB	612	4	17	0	663
17	40MB	977	5	17	300	977
18	56MB	977	7	17	None	977
19	59MB	1024	7	17	512	1023
20	30MB	733	5	17	300	732
21	42MB	733	7	17	300	732
22	30MB	306	5	17	300	733
23	10MB	977	4	17	0	336
24	40MB	1024	5	17	None	976
25	76MB	1224	9	17	None	1023
26	71MB	1224	7	17	None	1223
27	111MB	1224	11	17	None	1223
28	152MB	1024	15	17	None	1223
29	68MB	1024	8	17	None	1023
30	93MB	918	11	17	None	1023
31	83MB	925	11	17	None	1023
32	69MB	1024	9	17	None	926
33	85MB	1024	10	17	None	1023
34	102MB	1024	12	17	None	1023
35	110MB	1024	13	17	None	1023
36	119MB	1024	14	17	None	1023
37	17MB	1024	2	17	None	1023
38	136MB	1024	16	17	None	1023
39	114MB	918	15	17	None	1023
40	40MB	820	6	17	None	1023
41	42MB	1024	5	17	None	1023
42	65MB	1024	5	26	None	1023
43	40MB	809	6	17	None	852
44	61MB	809	6	26	None	852
45	100MB	776	8	33	None	775
46	203MB	684	16	38	None	685
USER						

Chapter 3

AWARD BIOS SETUP

When the system is being powered on or reset, the BIOS will display a copyright message on the first line of the screen, then the BIOS will perform the diagnostics and initialization. After all of the above tests have been passed, the message

"Press DEL to enter SETUP, ESC to skip memory test"

is displayed. If the [DEL] key or [ctrl-alt-esc] is pressed, the screen will be cleared and then the following message will be showed:

ROM ISA BIOS (XXXXXXXX)
CMOS SETUP UTILITY
AWARD SOFTWARE. INC.

STANDARD CMOS SETUP	PASSWORD SETTING
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FEATURES SETUP	SAVE & EXIT SETUP
POWER MANAGEMENT SETUP	EXIT WITHOUT SAVING
LOAD BIOS DEFAULTS	
LOAD SETUP DEFAULTS	

3 - 1 Standard CMOS Setup

Date (mn/date/year) : Sat, Jan 1 1994
Time (hh/min/sec) : 16 : 45 : 44

	CYLS	HEADS	PRECOMP	LANDZONE	SECTORS
Drive C: None (0Mb)	0	0	0	0	0
Drive D: None (0Mb)	0	0	0	0	0

Drive A: : 1.2M , 5.25 in.
Drive B: : None

Video : EGA/VGA

Halt On : All Errors

Base Memory:	640K
Extended Memory:	3328K
Expended Memory:	0K
Other Memory:	128K
Total Memory:	4096K

The setup program is completely menu-driven:

1. Use arrow keys to select entry : Data, Time, Hard Disk(C/D),Floppy, and Display.

2. Use PgUp/PgDn key to modify the option of each entry.

3. Use Esc to exit this screen.

Optimize : HDD Standby Timer : 3 Min
Doze Timer Select : 8 Min
Standy Timer Select : 8 Min
Inactive Timer Select : 8 Min

User Define : HDD Standby Timer : Disabled
Doze Timer Select : 512 Min
Standy Timer Select : 512 Min
Inactive Timer Select : 512 Min

Control Item Select :

CPU CLK : For CPU input Clock Control
1/4 CLKI --> Slow Down CPU to Clock/4
1/8 CLKI --> Slow Down CPU to Clock/8
STOP CLK --> CPU Clock Stop
VGA : On --> Display screen open
Off--> The display screen will be closed.

Wake up the system:

Pressing any Key or moving Mouse to Wake up the system.

ROM ISA BIOS (XXXXXXXX)
POWER MANAGEMENTSETUP
AWARD SOFTWARE, INC.

Power Management	: Disabled	* Monitor Even In Full On Mode	
PM Control By APM	: Enabled	VESA Slave Activity	: Disabled
Video Off Method	: Blank Screen	LPT Port Activity	: Enabled
HDD Standby Timer	: Disabled	COM Port Activity	: Enabled
Doze Timer Select	: 512 Min	ISA Master Activity	: Enabled
Standby Timer Select	: 512 Min	IDE Activity	: Enabled
Inactive Timer Select	: 512 Min	Floppy Activity	: Enabled
Control Item	: CPU CLK VGA	VGA Activity	: Disabled
Doze mode Control	: 1/4 CLKI On	Keyboard Active	: Enabled
Standby Mode Control	: 1/8 CLKI Off		
Inactive Mode Control	: STOP CLK Off		
Suspend Switch Select	: Disabled		

POWER MANAGEMENT Timer Selection :

Disabled : HDD Standby Timer : Disabled
Doze Timer Select : 512 Min
Standy Timer Select : 512 Min
Inactive Timer Select : 512 Min

Min Saving : HDD Standby Timer : 15 Min
Doze Timer Select : 512 Min
Standy Timer Select : 512 Min
Inactive Timer Select : 512 Min

Max Saving : HDD Standby Timer : 1 Min
Doze Timer Select : 0.5 Min
Standy Timer Select : 2 Min
Inactive Timer Select : 2 Min

3 - 2 BIOS Feature Setup

If you don't really understand the meanings of each item, please don't change the default values. The default setting maybe different from those shown below:

ROM ISA BIOS (XXXXXXXX)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
External Cache	: Enabled	CC000-CFFFF Shadow	: Disabled
Quick Power on Seft Test	: Enabled	D0000-D3FFF Shadow	: Disabled
Boot Sequence	: A, C	D4000-D7FFF Shadow	: Disabled
Swap Floppy Driver	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot Up Floppy Seek	: Enabled	DC000-DFFFF Shadow	: Disabled
Boot Up NumLock Status	: On	E0000-E3FFF Shadow	: Disabled
Boot Up System Speed	: High	E4000-E7FFF Shadow	: Disabled
HDD IDE Block Mode	: Disabled	E8000-EBFFF Shadow	: Disabled
Gate A20 Option	: Fast	EC000-EFFFF Shadow	: Disabled
Memory Parity Check	: Enabled		
Typematic Reat Setting	: Disabled		
Typematic Reat (Chars/Sec)	: 6		
Typematic Reat (Msec)	: 250		
Security Option	: Setup		
IDE Second Channel Control	: Enabled		

3 - 3 *Chipset Features Setup*

The Chipset Features Setup is entirely chipset specific portion and requires full knowledge about the detail definition of UMC chipset . Each option is tightly corresponding with the hardware structure. Without our engineering change notice,we strongly recommend"don't change any contents in advanced chipset setup menu".

ROM ISA BIOS (XXXXXXXX)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration	: Enabled	Hold CPU Percentage	: 1/1
DRAM Wait State select	: 2 WS	Alt Bit in Tag SRAM	: 7 + 1 Bit
DRAM Type	: Normal Page	ISA Bus Refresh Mode	: Fast
L2 Cache Read Wait State	: 3-2-2-2	LOWA20# Emulation	: Disabled
L2 Cache Write Wait State	: 2WS	RC Reset Emulation	: Disabled
L1 Cache Update Scheme	: Wr-Through	Weitek type coprocessor	: Absent
Keyboard Controller Clock	: 9.5 MHz	DRAM Refresh Method	: Ras Only
ISA Bus Clock Option	: CLKI/4		
System BIOS Cacheable	: Disabled		
Video BIOS Cacheable	: Disabled		
IO Recovery (Bus/Onboard)	: 5/ 3		
Weitek Ready Out Delay	: 2WS		
Local Ready Delay Setting	: Delay 1T		
Signal LDEV# Sample Time	: In T2		
CPU ADS# Delay 1T or Not	: Delay 1T		
Flush Cache when Dethrbo	: Disabled		
Force Miss when Deturbo	: Disabled		

3 - 4 *Power Management Setup*

Supporting the EPA Energy Star PC specification with Deep
Green system Design. It supports the advanced SMM CPU. Accommodated with UMC Super U5S CPU.
System performs stop clock mode. The function for power savings options are:

. HDD Standby Timer :
The Hard disk entering power down mode.

. Display Power Down :
The display screen will be closed.

. System power down mode :
Full-on : System runs in full speed CPU clock
Doze : Sytem runs in lower CPU clock
Standby : System scales-down the CPU clock
Suspend : With SMM CPU, performs stop clock in suspend mode