

486- JAL

MAIN BOARD USER'S MANUAL

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INTRODUCTION

OVERVIEW

The 486-JAL Motherboard

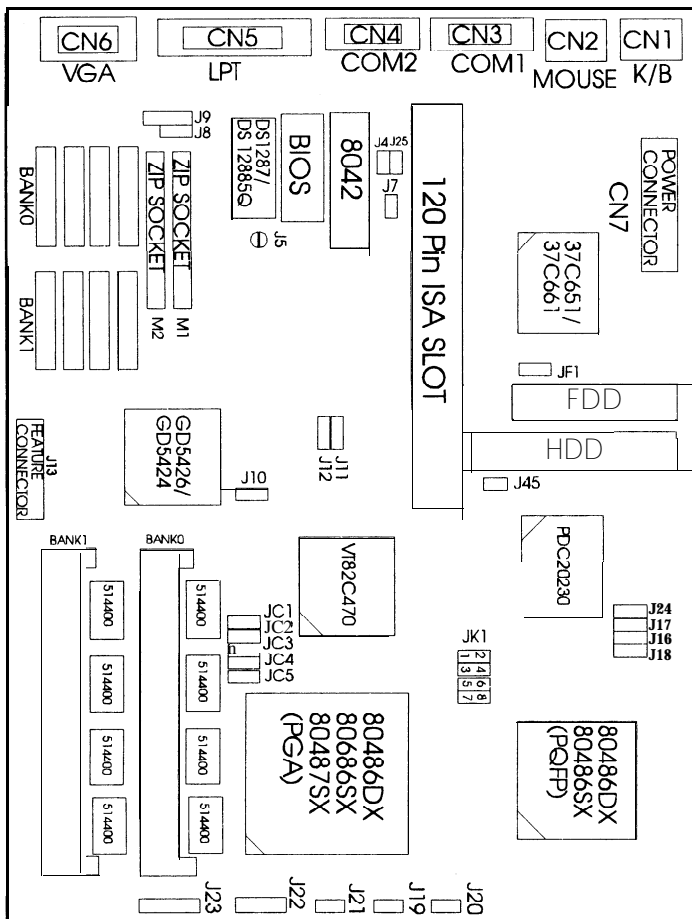
The 486-JAL is a high-performance VESA mother board, offering outstanding features and speed ideal for building advanced personal computers or workstations. The board utilizes high grade components as listed below:

SPECIFICATIONS

Features of this board include:

- Intel 80486DX/80486DX2/80486SX/80487SX microprocessor.
Dual CPU in PQFP and PGA packages.
- VIA VT82C470 PC/AT chipset.
- Supports 1MB up to 32MB of DRAM memory;
Provides page mode DRAM operation.
- Shadow RAM.
- 128KB BIOS.
- One 16-bit,120-pin ISA expansion slot.
- CPU clock output frequency selectable by jumpers.
- Cirrus GD5426 Local Bus VGA controller.
- Promise PCD20230 Local Bus IDE controller (optional).
- Real time clock/calendar.
- Built-in IDE HDD/FDD and Local Bus IDE interface.
- Two serial ports and one parallel port.
- PS/2 mouse and PS/2 keyboard connector.
- Local Bus VGA with 512K/1MB/2MB Video RAM on board.
- LPM-size board (**13.0" x 7.8"**)

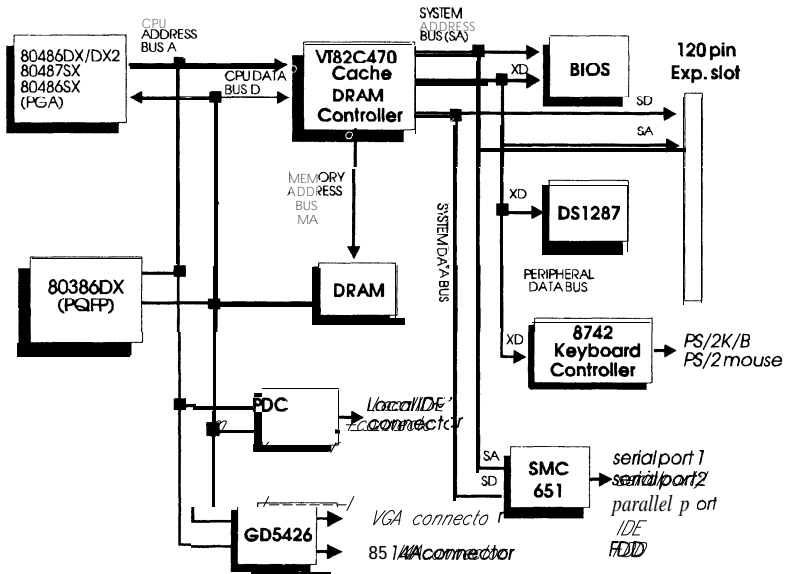
MOTHERBOARD LAYOUT



KEYLOCK SPKR RESET

486JAL Motherboard Layout

SYSTEM BLOCK DIAGRAM



System Block Diagram

INSTALLATION

CONNECTOR DESCRIPTION

Connector	Pin out	Signal Name
CN1 - PS/2 Keyboard	1	Keyboard data
	2	NC
	3	GND
	4	v c c
	5	Keyboard clock
	6	NC
CN2 - PS/2 Mouse	1	Mouse data
	2	NC
	3	GND
	4	v c c
	5	Mouse clock
	6	GND
CN3 - Serial port 1	1	Data carrier detect
	2	Receive data
	3	Transmit data
	4	Data transmit ready
	5	GND
	6	Ready to receive data
	7	Request to send data
	8	Clear to send
	9	Ring indicator
CN4 - Serial port2	1	Data carrier detect
	2	Receive data
	3	Transmit data
	4	Data transmit ready
	5	GND
	6	Ready to receive data
	7	Request to send data
	8	Clear to send
	9	Ring indicator

INSTALLATION

Connector	Pin out	Signal Name
CN5 - Parallel port	1	LPT strobe
	2	LPT DO
	3	LPT D1
	4	LPT D2
	5	LPT D3
	6	LPT D4
	7	LPT D5
	8	LPT D6
	9	LPT D7
	10	LPT acknowledge
	11	LPT busy
	12	Paper end
	13	Selected status
	14	Auto line feed
	15	LPT error
	16	Initiate printer
	17	Select printer
18-25	GND	
CN6 - VGA connector	1	Red
	2	Green
	3	Blue
	4	NC
	5-8	GND
	9	NC
	10	GND
	11-12	NC
	13	Horizontal sync
	14	Vertical sync
	15	NC
CN7 - Power connector	1	Power good
	2	+ 5V
	3	+ 12V
	4	-12V
	5-8	GND
	9	-5v
	10-12	+ 5v

Connector	Pin out	Signal Name
J13 - 85 14A connector	1	VP0
	2	GND
	3	VP1
	4	GND
	5	VP2
	6	GND
	7	VP3
	8	Enable video data
	9	VP4
	10	Enable sync signal
	11	VP5
	12	Enable video dot clock
	13	VP6
	14	NC
	15	VP7
	16	GND
	17	Video dot clock
	18	GND
	19	Banking
	20	GND
	21	Horizontal sync
	22	GND
	23	Vertical sync
	24	NC
	25	GND
	26	NC

INSTALLATION

Connector	Pin out	Signal Name
FDD - FDD connector	2	Density selection
	4	NC
	6	NC
	8	Index detection
	10	Select motor A
	12	Select drive B
	14	Select drive A
	16	Select motor B
	18	Direction control
	20	Step pulse
	22	Write data
	24	Write enable
	26	Track 0
	28	Write protect
	30	Read data
	32	Head select
	34	Disk change
	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33	GND

Connector	Pin out	Signal Name
HDD - IDE connector	1	Reset hard disk
	2	GND
	3	HD D7
	4	HD D8
	5	HD D6
	6	HD D9
	7	HD D5
	8	HD D10
	9	HD D4
	10	HD D11
	11	HD D3
	12	HD D12
	13	HD D2
	14	HD D13
	15	HD D1
	16	HD D14
	17	HD D0
	18	HD D 15
	19	GND
	20-21	NC
	22	GND
	23	HD I/O write
	24	GND
	25	HD I/O read
	26	GND
	27	IOCHRDY
	28	HD address latch
	29	NC
	30	GND
	31	IRQ 14
	32	IOCS16
	33	HD A1
	34	NC
	35	HD A0
	36	HD A2
	37	HD chip select 0
	38	HD chip select 1
	39	HD active
	40	GND

Connector	Pin out	Signal Name
J23 Keylock & Power LED	1	Power LED
	2	Power LED
	3	GND
	4	Keylock
	5	GND
J22 Speaker connector	1	Speaker signal
	2	NC
	3	GND
	4	v c c
J21 Reset switch	1	GND
	2	Reset signal
J19 Turbo switch	1	GND
	2	Turbo signal
J20 Turbo LED	1	LED
	2	Pull high
J45 HDD LED	1	LED
	2	VCC
J9 Ext Battery Connector	1	Anode +
	2	NC
	3	NC
	4	Cathode -

JUMPER DESCRIPTION

Jumper	Function	Open	Close
J4	Display type	Mono/EGA/ VGA (default)	Color
J5	CMOS DATA Clear (FOR DS1287A only)	Normal	Clear
J7	Password Reset (For AWARD BIOS only)	Normal	Reset
J25	Password Reset (For AM1 BIOS only)	Normal	Reset

SYSTEM MEMORY

MEMORY CONFIGURATION .

NOTE 1 : Bank 0 and Bank 1 are 72-pin SIMM-type sockets.

Total Memory	Bank 0	Bank 1
1M	1M	
2M	1M	1M
4M	4M	
5M	4M	1M
8M	4M	4M
16M	16M	
17M	16M	1M
20M	16M	4M
32M	16M	16M

NOTE 2 : Bank 0 has the 4MB DRAM on-board and Bank1 is a 72-pin SIMM type socket.

Total Memory	Bank 0#	Bank 1
4M	4M	0
5M	4M	1Mx1
8M	4M	4Mx1
20M	4M	16Mx1

On BANK 0, you can install a 72-pin SIMM-type module (4Mx1pcs), or an SOJ-type DRAM (1Mx4bitx8pcs).

**INT/EXT BATTERY SELECTION
(FOR DS12885Q ONLY)**

J8	
1-2	External Battery
2-3	Internal Battery

CPU TYPE SELECTION

Jumper	486SX (PQFP)	486SX (PGA)	486SX(PQFP) &487XS (PGA)	486DX/486DX2 (PGA)
JC1	2-3 shorted	2-3 shorted	1-2 shorted	1-2 shorted
JC2	2-3 shorted	2-3 shorted	1-2 shorted	1-2 shorted
JC3	2-3 shorted	2-3 shorted	2-3 shorted	1-2 shorted
JC4	OFF	OFF	2-3 shorted	1-2 shorted
J11	2-3 shorted	1-2 shorted	1-2 shorted	1-2 shorted

ON-BOARD VGA CONTROLLER

Jumper	Enable	Disable
J10	1-2 shorted	2-3 shorted

FDD TYPE SELECTION

Jumper	SMC37C651 (1.44 MB)	SMC 37C661 (2.88 MB)
JF1	2-3 shorted	1-2 shorted

LOCAL IDE SELECTION

	Local IDE Enable	Local IDE Disable
J24	1-2	2-3

HDD SPEED SELECTION (PDC 20230 ONLY)

	J16	J17
SPEED 0	2-3	2-3
SPEED 1	1-2	2-3
SPEED 2	1-2	1-2

CPU SPEED SELECTION (PDC 20230 ONLY)

CPU SPEED	J18
< = 33 Mhz	1-2
> 33 Mhz	2-3

CPU CLOCK SELECTION

JK1				Freq. (MHz)	CPU Type
1-2	3-4	5-6	7-8		
on	on	on	on	24	
on	on	on	off	12	
on	on	off	on	80	
on	on	off	off	40	
on	off	on	on	40	
on	off	on	off	20	
on	off	off	on	66.6	
on	off	off	off	33.3	486DX-33, 486DX2-66
off	on	on	on	32	
off	on	on	off	16	
off	on	off	on	66.6	
off	on	off	off	50	
off	off	on	on	50	
off	off	on	off	25	486SX-25 , 486DX-25 486DX2-50
off	off	off	on	—	
off	off	off	off	—	

SYSTEM MEMORY

MEMORY CONFIGURATION .

NOTE 1 : Bank 0 and Bank 1 are 72-pin SIMM-type sockets.

Total Memory	Bank 0	Bank 1
1M	1M	
2M	1M	1M
4M	4M	
5M	4M	1M
8M	4M	4M
16M	16M	
17M	16M	1M
20M	16M	4M
32M	16M	16M

NOTE 2 : Bank 0 has the 4MB DRAM on-board and Bank1 is a 72-pin SIMM type socket.

Total Memory	Bank 0#	Bank 1
4M	4M	0
5M	4M	1Mx1
8M	4M	4Mx1
20M	4M	16Mx1

On BANK 0, you can install a 72-pin SIMM-type module (4Mx1pcs), or an SOJ-type DRAM (1Mx4bitx8pcs).

AWARD BIOS SETUP

SYSTEM SETUP CONFIGURATION

A SETUP program, built into the system BIOS, is stored in the CMOS RAM that allows the configuration settings to be changed. This program is executed when:

- (1) User changes system configuration.
- (2) User changes system backup battery.
- (3) System detects a configuration error and asks the user to run the SETUP program.

After power-on RAM testing, the message below appears:

“TO ENTER SETUP BEFORE BOOT, PRESS CTRL-ALT-ESC”

Press “CTRL+ ALT+ ESC” to run SETUP. The screen below appears:

Date : 13 Jan 1992	ROM ISA BIOS (VIA)
Time : 10:49:26	Award Software, Inc.
Drive A : 1.2M, 5 ¹ / ₄ in.	Base Memory : 640K
Drive B : none	Extended Memory : 3072K
Video : EGA/VGA	Expanded Memory: OK
Halt On : All Errors	Other Memory : 384K
	Total Memory : 4096
Cache : Internal Cache	Boot Sequence : A, C
Shadow : System & Video	Virus Warning : Disabled
Security : Disabled	NumLock Boot Status : On
	CYL Head Sector PrecompLanzone
Drive C : None (***Mb)	0 0 0 0 0
Drive D : None (***Mb)	0 0 0 0 0
Alt-F1 for Menu Help	F10 exits
Page 01 : Status Page	PgDn = Options Page
	F2 change colors

STATUS PAGE SETUP

The SETUP program is completely menu-driven. Use the arrow keys to select an entry; “+/-” keys to change an entry; and “F 10” key to exit. Help messages are displayed in the window on the screen when you press “Alt-F 1.”

A sample screen of the Status Page SETUP is displayed above. System BIOS automatically detects memory size, thus no changes are necessary. After the changes are made, press “F10” to exit.

OPTIONS PAGE SETUP

Moving around the Options Page Setup program is similar to moving around the Status Page Setup.

BUS CONTROL		I/O CONTROL	
ISA Command Delay	: Normal	COM1 Select	: Enabled
ISA Wait state	: Normal	COM2 Select	: Enabled
I/O Recovery Time	: Disabled	Parallel Port Address	: 0378H
Extended ALE	: Disabled	IDE Select	: Enabled
Decouple Refresh	: Disabled	FDC Select	: Enabled
		Local IDE Select	: Disabled
Cache Control			
256K/384K Relocation	: Disabled		
Cache Timing	: Normal		
Dram Timing	: Fast		
Video Cacheable	: Enabled		
System Cacheable	: Enabled		
Alt-F1 for Menu Help	PgUp = Status Page	F10 exits	
Page 02 : Options Page		F2 change colors	

Users are not encouraged to run the option Status Page SETUP program unless absolutely necessary and user understands and knows how to modify the settings. Improper SETUP may cause the system to fail, so consult **dealer** before making any changes.

SAVE AND EXIT

When you have made changes under SETUP, press F 10 to exit. If no changes have been made, press F 1 to exit; otherwise, press F5 to save and exit.

AMI BIOS SETUP

SYSTEM SETUP CONFIGURATION

The SETUP program, built into the system BIOS, is stored in the CMOS RAM so that the configuration settings can be changed. This program should be executed when :

- (1) User changes system configuration”
- (2) User changes system backup battery.
- (3) System detects a configuration error and asks the user to run the SETUP program.

After power-on RAM testing, the message below appears

“Press < DEL,> if you want to run SETUP”

Press “DEL” to run SETUP and the screen below appears:

AMIBIOS SETUP PROGRAM -BIOS SETUP UTILITIES (C) 1992 American Megatrends Inc., All Rights Reserved	
<table border="1"><tr><td>STANDARD CMOS SETUP</td></tr></table> ADVANCED CMOS SETUP AUTO CONFIGURATION WITH BIOS DEFAULTS AUTO CONFIGURATION WITH POWER-ON DEFAULTS CHANGE PASSWORD AUTO DETECT HARD·DISK HARD DISK UTILITY WRITE TO CMOS AND EXIT DO NOT WRITE TO CMOS AND EXIT	STANDARD CMOS SETUP
STANDARD CMOS SETUP	
Standard CMOS Setup for Changing Time, Date, Hard Disk Type, etc. ESC : Exit ↓→↑Self2/F3 : Color F10 : Save & Exit	

Use ↓ and ↑ keys to move cursor to your chosen SETUP utility and press “Enter” to run the selected program.

STANDARD CMOS SETUP

AMIBIOS SETUP PROGRAM -STANDARD CMOS SETUP (C) 1992 American Megatrends Inc., All Rights Reserved		
Date (mm/dd/year)	: Fri, Jun 11 1993	Base memory : 640 KB
Time (hour/min/sec)	: 11 : 32 : 03	Ext. memory : 3072 KB
		Cyl/n Head WPcomLZone Sect Size
Hard disk C: Type	: Not Install	
Hard disk D: Type	: Not Install	
Floppy drive A:	: 1.2MB, 5 ¹ / ₄ "	
Floppy drive B:	: Not Installed	
Primary display	: VGA/PGA/EGA	
Keyboard	: Installed	

Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

The SETUP program is completely menu driven; use the arrow keys to select an entry; "PgUp"/"PgDn" keys to change an entry; and "Esc" key to exit. Help messages are displayed in the window on the screen when "Alt-F 1" is pressed.

The Standard CMOS SETUP screen is shown above. System BIOS automatically detects memory size, thus no changes are necessary. After the changes are made, press "Esc" to exit.

ADVANCED CMOS SETUP

AMI BIOS SETUP PROGRAM -ADVANCED CMOS SETUP (C) 1992 American Megatrends Inc., All Rights Reserved				
Wait For <F1>If Any Error	:	Enabled	ID E Select	Enabled
System Boot Up Sequencd	:	A., C.	FDC Select	Enable
External Cache Memory	:	Enabled	Local IDE Select	Disabled
Internal Cache Memory	:	Enabled		
Password checking Option	:	Setup		
Video ROM Shadow COOO, 32K	:	Enabled		
Adaptor ROM Shadow C800, 32K	:	Disabled		
Adaptor ROM Shadow D000, 32K	:	Disabled		
Adaptor ROM Shadow D800, 32K	:	Disabled		
Adaptor ROM Shadow E000, 64K	:	Disabled		
BIOS Cacheable Option	:	Enabled		
Video Cacheable Option	:	Enabled		
256K Relocate Option	:	Disabled		
Decouple Refresh	:	Disabled		
FAST A20 PORT 92H	:	Enabled		
COM1 Select	:	Enabled		
COM2 Select	:	Enabled		
Parallel port address	:	0378H		

ESC: Exit ↓ → ↑ Sel (Ctrl) Pu/Pd:Modify F1 : Help F2/F3 : Color
F5 : Old Values F6 : BIOS Setup Defaults F7 : Power-on Defaults

Moving around the Advanced CMOS SETUP program works in the same way as the Standard CMOS SETUP.

Users are not encouraged to run Advanced CMOS SETUP program. Your system should have been fine-tuned before shipping. Improper SETUP may cause the system to fail, consult your dealer before making any changes.

WRITE TO CMOS AND EXIT

After making changes under SETUP, press “Esc” to return to the main menu, move cursor to “Write to CMOS and Exit”, and press “y” to change the CMOS SETUP. If no changes are made, press ESC again and then “y”, then the CMOS SETUP will not change.

AMIBIOS SETUP PROGRAM - BIOS SETUP UTILITIES (C) 1992 American Megatrends Inc., All Rights Reserved
STANDARD CMOS SETUP ADVANCED CMOS SETUP AUTO CONFIGURATION WITH BIOS DEFAULTS AUTO CONFIGURATION WITH POWER-ON DEFAULTS CHANGE PASSWORD
Write to CMOS and Exit (Y/N) ? Y
Write the settings to the CMOS and Exit
ESC : Exit ↓→↑Sel F2/F3 : Color F10 : Save & Exit

TECHNICAL INFORMATION

SYSTEM I/O ADDRESS MAP

Hex Range	Usage
000-01F	DMA controller 1, 8237A-5
020-03F	Interrupt controller 1, 8259A, Master
02E 1	GPIB (Adapter 0)
02E2 & 02E3	Data Acquisition (Adapter 0)
040-05F	Timer 8254.2
060-06F	8042 (Keyboard)
06E2 & 06E3	Data Acquisition (Adapter 1)
070-07F	Real-time clock, NMI (non-maskable interrupt) mask
080-09F	DMA page registers, 74LS612
OAO-0BF	Interrupt controller 2, 8259A
OAE2 & OAE3	Data Acquisition (Adapter 2)
OCO-ODF	DMA controller 2, 8237A-5
OEE2 & OEE3	Data Acquisition (Adapter 3)
0F0	Clear Math Coprocessor Busy
0F 1	Reset Math Coprocessor
0F8-0FF	Math Coprocessor
1F0-1F8	Fixed Disk
200-207	Game I/O
22E 1	GPIB (Adapter 1)
278-27F	Parallel printer port 2
2B0-2DF	Alternate Enhanced Graphics Adapter
2F8-2FF	Serial port 2

Hex Range	Usage
300-31F	Prototype card
360-36F	PC network
378-37F	Parallel printer port 1
380-38F	SDLC, bisynchronous 2
390-393	Cluster
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter
3C0-3CF	Enhanced graphics adapter
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1
42E1	GPIB (Adapter 2)
62E1	GPIB (Adapter 3)
790-793	Cluster (Adapter 1)
82E1	GPIB (Adapter 4)
A2E1	GPIB (Adapter 5)
B90-B93	Cluster (Adapter 2)
C2E1	GPIB (Adapter 6)
E2E1	GPIB (Adapter 7)
1390-1393	Cluster (Adapter 3)
2390-2393	Cluster (Adapter 4)

Note: I/O address, hex 000 to 0FF, are reserved for the m other board I/O. Hex 100 to 3FF are available on the I/O channel. The base addresses for GPIB and Data Acquisition are shown.

HARDWARE INTERRUPT REQUESTS

IRQ No.	Function
IRQ0	Timer output
IRQ1	Keyboard
IRQ3	Serial port 2
IRQ4	Serial port 1
IRQ5	Available
IRQ6	FDD controller
IRQ7	Parallel port 1
IRQ8	Real-time clock
IRQ9	Available
IRQ 10	Available
IRQ11	Available
IRQ 12	PS/2 compatible mouse
IRQ 13	Math coprocessor
IRQ 14	HDD controller
IRQ 15	Available

DMA ASSIGNMENTS

Level	Assigned devices
DMA0	Reserved
DMA 1	Reserved
DMA2	Floppy controller (8-bit)
DMA3	Reserved
DMA5	Reserved
DMA6	Reserved
DMA7	Reserved

MEMORY MAP

