# 486-GL VESA Main Board Specifications:

Central Processing Unit:	Intel 486 SX-25/30; 486 DX-33/40/50; 486 DX2- 50/66; Intel SL enhance serial CPU; Intel DX4- 75/100; P24T; P24D; CX 486S/S2/DX/DX2 (M6,M7) *(The manual does not mention AMD chips here, but the board does support them and they are listed under jumper settings)
Main Memory:	On board MAX 128MB
On Board Memory Model:	2MB; 4MB; 8MB; 16MB; 20MB; 24MB; 28MB; 32MB; 34MB; 40MB; 48MB; 52MB; 64MB; 128MB
DRAM Access Cycle Time:	80ns
Cache Memory:	<ul> <li>Write-Back Direct-Mapped Cache</li> <li>64K; 128K; 256K (Option)</li> <li>Supports 2-1-1-1,3-1-1-1, 2-2-2-2, and 3-2-2-2 cache burst cycles</li> </ul>
Data Bus Widths:	32 Bit
I/O Slots:	<ul> <li>8 Expansion slots</li> <li>8 bit x 2</li> <li>16 bit x 6/VESA slot x 3</li> </ul>
Dimension:	22cm x 25cm (2/3 Baby AT size)
PCB Layout:	4 Layers PCB
BIOS:	AMI WinBIOS FLASH ROM BIOS optional
Chip Set:	OPTi 895/602
СРИ Туре:	PGA (With ZIF Socket) or PQFP
AT Clock:	AT-bus clock selectable from CPU CLK (/6, /5, /4, /3)
Other Features:	<ul> <li>Shadow RAM support for System BIOS</li> <li>Turbo/slow speed selection</li> <li>CAS# before RAS# refresh reduces power consumption</li> <li>Hidden refresh support to enhance system performance</li> <li>Supports full SMI Interface</li> </ul>

## SETTING UP YOUR 486-GL

#### Intorduction

The 486-GL mainboard has a number of jumper switches which allow you to tailor the board to your particular hardware setup. For ease of access, the settings of these jumper switches should be made before the 486-GL has been installed in your case.

## How to Set Jumper switch

A jumper switch consists of two or more pins and a plastic slider, called a jumper, Witch fits over these pins. Witch a two pin jumper, when the jumper is in position over the two pins, the switch is ON (this shorts the two pins together); when the jumper is removed from the two pins, the switch is OFF. If you wish to set a two pin jumper as OFF, and remove the jumper, you should push the jumper ONE pin in order to void losing it. A two pin jumper is only ON when the jumper is over both pins. With a three pin jumper, two settings are possible. When the jumper is over pins 1 and 2 one setting is achieved; and when the jumper is over pins 2 and 3 another setting is achieved.

#### Pin "1"

A small figure "1" can be seen next to one pin of some jumper switches and connectors on your 486-GL. This indicates pin 1 of the jumper switch or connector. The other pins are not usually numbered but follow in sequential order. Where there might be confusion as to the numbering, all pins are numbered.

When connecting the jumpers attached to your case components to the jumper connectors, particular attention must be paid to the orientation of the jumper with regardspin 1. Unfortunately there is no color standard for the leads attached to case components so we cannot specify which color lead should be attached to pin 1. In general, however, the lead to be connected to pin 1 is often colored red, or is of a different color from the other leads attached to the jumper.

## 486-GL Jumper Switch Setting

The illustration on the next pages shows the position of the jumper switches and jumper connectors on you 486-GL mainboard. Compare this illustration with your mainboard to locate the position of the jumper switchs.

## JUMPER SETTING:

## J1: External Battery

#### J2: Keylock/Power LED:

- •1-3 Power LED Connector
- •4-5 Keylock Connector

#### S1: Rest

#### JP1: PQFP CPU select:

•Close PQFP CPU Disable •Open PQFP CPU Enable

#### JP2: 5Volts/3.3Volts CPU select:

•1-2, 4-5 5Volts CPU •2-3, 5-6 3.3Volts CPU

#### JP6, JP7: SX/DX CPU select:

•Close "DX" CPU •Open "SX" CPU

#### JP16: Turbo Switch:

•Close Turbo •Open Non-Turbo

### JP17: Turbo LED

#### JP18: Speaker

#### JP21: Hardware Wake Up Switch

#### JP26: Discharge Battery:

- •2-3 Battery Enable
- •1-2 Discharge

#### JP30: Monitor Type:

•Close Color

•Open Mono

#### JP32: Monitor Power - Saving Control

#### JP45: Intel SMI CPU select:

•Close Intel SMI CPU •Open Other CPU

СРИ Туре	JP3	JP5	JP8	JP9	JP12	JP22	JP23	JP50
486SX	Open	Open	2-3	Open	Open	1-2	Open	Open
487SX	2-3	2-3	1-2	Open	Open	1-2	Open	Open
486DX/DX2/DX4	1-2	2-3	1-2	Open	Open	1-2	Open	Open
AMD DX2-66/80	1-2	2-3	1-2	Open	Open	1-2	Open	2-3
AMD DX4-100	1-2	2-3	1-2	Open	Open	1-2	Open	1-2
P24T	1-2	2-3	1-2	2-3	Open	2-3	Open	Open
P24D				Open	Close		Close	1-2
CX486S M6	Open	Open	2-3	1-2	Open	1-2	Open	2-3
CX486DX M7	1-2	2-3	1-2	1-2	Open	1-2	Open	2-3

JP3,JP5,JP8,JP9,JP12,JP22,JP23,JP50: CPU Type select:

## JP43, JP27: SMI CPU select:

СРИ Туре	JP43	JP27
Intel SLe CPU	Open	Open
AMD SMI CPU	Open	Open
DX4 P24C 3X	Open	Open
DX4 P24C 2X	1-2	Open
CX486DX M7 1X	Open	1-2
CX486DX M7 2X	Open	2-3
Other CPU	Open	Open

## JP48,JP40,JP39,JP38,JJ2: CPU CLK select:

Clock	JP48	JP40	JP39	JP38	JJ2
20MHz	1-2	Open	Close	Open	1-2
25MHz	1-2	Open	Close	Close	1-2
33MHz(DX2-66,DX4-100 CPU)	1-2	Close	Open	Close	1-2
33MHz(DX4-100 CPU)	2-3	Open	Open	Close	1-2
40MHz(DX-40, DX2-80 CPU)	1-2	Close	Close	Open	1-2
50MHz	1-2	Close	Close	Close	1-2
50MHz(DX4-100 CPU)	2-3	Open	Close	Close	2-3

JP46: VL-Bus CLK speed select:

LCLK	JP46
>33MHz	1-2
<=33MHz	2-3

Cache Size	JP10	JP11	JP13	JP35	U13	U5 - U8	U9 - U12
64KB	Open	Open	2-3	1-2	8KB*8	8KB*8	8KB*8
128KB	Open	Close	1-2	1-2	8KB*8	32KB*8	
256KB	Close	Close	2-3	1-2	32KB*8	32KB*8	32KB*8
				2-3	16KB*8		

### JP10, JP11, JP13, JP35: Cache RAM Size select:

## JUMPER SWITCHES LOCATION: INSERT GIF HERE

### J1: External Battery

Your 486-GL comes with a battery build-in. This battery powers the real-time clock and ensures that the SETUP data stored in the CMOS RAM are not lost whenyour computer is turned off. The on-board battery is quite sufficient for normal use, but you may wish to installan external battery which may provide longer usage. If you wish to connect an external battery, you should connect it to J1 as illustrated above, and this battery will then provide the backup powerfor your 486GL. Note that one of the leads attched to the battery will be colored (usually red), and this lead must be attached to the pin marked "1".

#### J2: Keylock/Power LED

If the case into which you wishto install your 486-GL has a keylock and power-on LED, there will be a five-lead jumper connected to the panel in which the keylock and poweron LED are situated. You should plug this jumper directly onto J2. Take care that the jumper is correctly oriented with pin 1 of J2.

#### S1: Rest

Most cases are fitted with a reset button to allow you to reboot your machine in case it should "hang" during operation due to a faulty hardware or software configuration. Attach the jumper from the reset button to S1.

#### JP1: PQFP CPU select

Set these jumper as OFF (open) only if a 485 PQFP is installed. Set the jumper as ON (close) for all other type CPU.

#### JP16: Turbo Switch

Connect the jumper connected to the turbo switch on your system case directly to this jumper connector.

## JP17: Turbo LED

If the case into which you wish to install your 486-GL has a turbo LED to indicate when the computer is running in the turbo mode, connect the jumper attached to this component to JP17. The Turbo LED will illuminate when you enter the turbo mode, and remain illuminated until you switch back to normal mode.

### JP18: Speaker

Most cases have a small speaker build-in. Attach the jumper connected to the speaker over the pins on JP18, ensuring that the colored wire (often red) is over Pin 1. Though the speaker jumper is a four pin jumper, there are usually only two leads attached to the jumper.

## JP26: Discharge Battery (Discharge CMOS RAM)

Installed on your 486-GL is a battery which ensures that the real-time clock keeps time and that SETUP information stored in the CMOS non-volatile RAM is not lost when you turnyour computer off. The normal setting for JP26 will be with the jumper over pins 1 and 2, which enable the on board battery. This is the default setting. It is possible to make an incorrect setting in the SETUP program stored in the CMOS, which will cause your computer to "hang" as soon as you turn on your computer. If this occurs you may find it impossible to run the SETUP program to correct the faulty setting. This is when you may need to set the jumper of JP26 over pins 1 and 2, which will discharge the battery,thus causing the information stored in the CMOS RAM, including the incorrect setting to be erased. You should place the jumper over pins 1 and 2 for about ten seconds to discharge the battery and than replace it over pins 2 and 3 before rebooting your system.

## JP30: Monitor Type Select

Jumper JP30 should be set as OFF (open) for a monochrome monitor and ON (close) for a color or vga monitor.

## JP48, JP40, JP39, JP38: CPU Clock Speed Select

These Jumpers are setting up for your CPU clock speed.

## JP3,JP5,JP8,JP9,JP12,JP22,JP23,JP50: CPU Type Select

The setting of these jumper switches depends on whether a 486DX or 486SX CPU is installed.

## JP10, JP11, JP13, JP35: Cache Size Select

The settings of these four jumper switches must be made according to the cache size installed. The table below details the correct setting.

CPU TYPE		Volt	JP3	JP5	JP8	JP9	JP12	JP22	JP23	JP27
Intel 486SX-25	PQFP	5	Open	Open	2-3	Open	Open	1-2	Open	Open
Intel 486SX-33	PQFP	5	Open	Open	2-3	Open	Open	1-2	Open	Open
Intel 486SX-25	PGA	5	Open	Open	2-3	Open	Open	1-2	Open	Open
Intel 486SX-33	PGA	5	Open	Open	2-3	Open	Open	1-2	Open	Open
Intel 486DX-25	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Intel 486DX-33	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Intel 486DX-50	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Intel DX2-50	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Intel DX2-66	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Intel 486SX-25 SLe	PGA	5	Open	Open	2-3	Open	Open	1-2	Open	Open
Intel 486SX-33 SLe	PGA	5	Open	Open	2-3	Open	Open	1-2	Open	Open
Intel 486DX-25 SLe	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Intel 486DX-33 SLe	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Intel 486DX-40 SLe	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Intel 486DX-50 SLe	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Intel DX2-50 SLe	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Intel DX2-66 SLe	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Intel DX2-66 P24D	PGA	5				Open	Close		Close	Open
Intel P24T OverDrive	PGA	5	1-2	2-3	1-2	2-3	Open	2-3	Open	Open
Intel DX4-75 P24C 3X	PGA	3.3	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Intel DX4-100 P24C 3X	PGA	3.3	1-2	2-3	1-2	Open	Open	1-2	Open	Open

#### CPU JUMPER SETTING CHICKING LIST:

Intel DX4-100 P24C 2X	PGA	3.3	1-2	2-3	1-2	Open	Open	1-2	Open	Open
AMD 486DX-33	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
AMD 486DX-40	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
AMD DX2-50	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
AMD DX2-66	PGA	5	1-2	2-3	1-2	Open	Open	1-2	Open	Open
AMD DX2-66	PGA	3.3	1-2	2-3	1-2	Open	Open	1-2	Open	Open
AMD DX2-80	PGA	3.3	1-2	2-3	1-2	Open	Open	1-2	Open	Open
AMD DX4-100	PGA	3.3	1-2	2-3	1-2	Open	Open	1-2	Open	Open
Cyrix 486S-33 M6	PGA	5	Open	Open	2-3	1-2	Open	1-2	Open	Open
Cyrix 486S2-66 M6	PGA	5	Open	Open	2-3	1-2	Open	1-2	Open	Open
Cyrix 486DX-40 M7	PGA	5	1-2	2-3	1-2	1-2	Open	1-2	Open	1-2
Cyrix 486DX-50 M7	PGA	5	1-2	2-3	1-2	1-2	Open	1-2	Open	1-2
Cyrix 486DX2-66 M7	PGA	5	1-2	2-3	1-2	1-2	Open	1-2	Open	2-3

## CPU JUMPER SETTING CHICKING LIST:

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CPU TYPE		Volt	JP38	JP39	JP40	JP43	JP45	JP48	JP50	JJ2
Intel 486SX-25	PQFP	5	Close	Close	Open	Open	Open	1-2	Open	1-2
Intel 486SX-33	PQFP	5	Close	Open	Close	Open	Open	1-2	Open	1-2
Intel 486SX-25	PGA	5	Close	Close	Open	Open	Open	1-2	Open	1-2
Intel 486SX-33	PGA	5	Close	Open	Close	Open	Open	1-2	Open	1-2
Intel 486DX-25	PGA	5	Close	Close	Open	Open	Open	1-2	Open	1-2
Intel 486DX-33	PGA	5	Close	Open	Close	Open	Open	1-2	Open	1-2
Intel 486DX-50	PGA	5	Close	Close	Close	Open	Open	1-2	Open	1-2
Intel DX2-50	PGA	5	Close	Close	Open	Open	Open	1-2	Open	1-2
Intel DX2-66	PGA	5	Close	Open	Close	Open	Open	1-2	Open	1-2
Intel 486SX-25 SLe	PGA	5	Close	Close	Open	Open	Close	1-2	Open	1-2
Intel 486SX-33 SLe	PGA	5	Close	Open	Close	Open	Close	1-2	Open	1-2
Intel 486DX-25 SLe	PGA	5	Close	Close	Open	Open	Close	1-2	Open	1-2
Intel 486DX-33 SLe	PGA	5	Close	Open	Close	Open	Close	1-2	Open	1-2
Intel 486DX-40 SLe	PGA	5	Open	Close	Close	Open	Close	1-2	Open	1-2
Intel 486DX-50 SLe	PGA	5	Close	Close	Close	Open	Close	1-2	Open	1-2
Intel DX2-50 SLe	PGA	5	Close	Close	Open	Open	Close	1-2	Open	1-2

Intel DX2-66 SLe	PGA	5	Close	Open	Close	Open	Close	1-2	Open	1-2
Intel DX2-66 P24D	PGA	5	Close	Close	Close	Open	Open	1-2	1-2	1-2
Intel P24T OverDrive	PGA	5	Close	Close	Close	Open	Open	1-2	Open	1-2
Intel DX4-75 P24C 3X	PGA	3.3	Close	Close	Open	Open	Open	2-3	Open	1-2
Intel DX4-100 P24C 3X	PGA	3.3	Close	Close	Open	Open	Open	2-3	Open	1-2
Intel DX4-100 P24C 2X	PGA	3.3	Close	Close	Open	1-2	Open	2-3	Open	2-3
AMD 486DX-33	PGA	5	Close	Open	Close	Open	Open	1-2	Open	1-2
AMD 486DX-40	PGA	5	Open	Close	Close	Open	Open	1-2	Open	1-2
AMD DX2-50	PGA	5	Close	Close	Open	Open	Open	1-2	Open	1-2
AMD DX2-66	PGA	5	Close	Close	Open	Open	Open	1-2	Open	1-2
AMD DX2-66	PGA	3.3	Close	Open	Close	Open	Open	1-2	2-3	1-2
AMD DX2-80	PGA	3.3	Open	Close	Close	Open	Open	1-2	2-3	1-2
AMD DX4-100	PGA	3.3	Close	Open	Close	Open	Open	1-2	1-2	1-2
Cyrix 486S-33 M6	PGA	5	Close	Open	Close	Open	Open	1-2	2-3	1-2
Cyrix 486S2-66 M6	PGA	5	Close	Open	Close	Open	Open	1-2	2-3	1-2
Cyrix 486DX-40 M7	PGA	5	Open	Close	Close	Open	Open	1-2	2-3	1-2
Cyrix 486DX-50 M7	PGA	5	Close	Close	Close	Open	Open	1-2	2-3	1-2
Cyrix 486DX2-66 M7	PGA	5	Close	Open	Close	Open	Open	1-2	2-3	1-2

#### MEMORY CONFIGURATIONS:

The table below shows some possible combinations of SIMM's supported by the 486-GL. The memory configuration shown in the table below.

	-			
Total Memory	SIM4	SIM3	SIM2	SIM1
2M	0	0	1M	1M
2M	0	0	2M	0
4M	1M	1M	1M	1M
4M	2M	0	2M	0
4M	0	0	0	4M
5M	0	0	4M	1M
6M	0	4M	1M	1M
6M	0	4M	2M	0
8M	0	0	4M	4M
8M	0	0	8M	0
10M	4M	4M	1M	1M
10M	4M	4M	2M	0
10M	8M	0	1M	1M
10M	8M	0	2M	0
12M	4M	4M	0	4M
12M	8M	0	0	4M
16M	4M	4M	4M	4M
16M	8M	0	8M	0
16M	0	0	0	16M
17M	0	0	16M	1M
20M	0	0	16M	4M
32M	0	0	16M	16M
32M	0	0	32M	0
40M	0	8M	16M	16M
48M	0	16M	16M	16M
52M	4M	16M	16M	16M
64M	16M	16M	16M	16M
64M	32M	0	32M	0
64M	0	0	0	64M
128M	0	0	64M	64M
128M	0	0	128M	0

#### CACHE MEMORY CONFIGURATIONS:

The cache memory is configured as two banks; Bank 0 and Bank1. There is also one or two TGA RAM chips, which is an integral part of the cache sub-system. Please refer to

the illustration of the board layout on jumper switch location, locate the two banks of data cache SRAM and the TAG RAM chip. The table below illustrates the chip configurations for each cache size.

Cache Size	Bank 0	Bank 1	TAG RAM
64K	8Kx8	8Kx8	8Kx8 1pcs
128K	32Kx8		8Kx8 1pcs
256K	32Kx8	32Kx8	32Kx8 1 pcs or 16Kx8 1 pcs

## The BIOS Features Setup

To access the BIOS Features Setup Program, highlight BIOS FEATURES SETUP in the main menu and press <Enter>. A warning message will appear on your screen and you may press any key to remove this and access the BIOS Features Setup program, as illustrated below.

## INSERT GIF HERE

*External Cache* These two categories speed up memory access.

<u>Quick Power On Self Test</u> This category speeds up Power On Self Test (POST) after you power on the computer. If it is set to enable, BIOS will shorten or skip some check item during POST.

**Boot Sequence** This category determines which drive computer searches first for the disk operating system(i.e.,DOS). Default value is A,C.

**Boot Up Floppy Seek** During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 760L, 1.2M and 1.44M are all 80 tracks.

Boot Up NumLock Status The default value is On.

•On: Keypad is number keys.

Off: Keypad is arrow keys.

## Gate A20 Option

•Normal: keypad

•Fast: chipset

*Security Option* This category allows you to limit access to the system and Setup, or just to Setup.

•System: This system will not boot and access too Setup will be denied if the correct password is not entered at the prompt.

•Setup: The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

•Note: To disabled security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely. *Video BIOS Shadow* It determines whether video BIOS will be copied to RAM, Video Shadow will increase the video speed.

•Enable: Video shadow is enabled.

•Disabled: Video shadow is disabled.

#### C8000-CFFFF Shadow

#### D0000-DEFFFF Shadow

#### E0000-EFFFF Shadow

•These categories determine whether optional ROM will be copied to RAM by 16Kbyte.

The BIOS FEATURES SETUP allows you fine tune certain features supported by the chipset and AWARD BIOS. It also includes support for shadow RAM under which the contents of the ROM BIOS can be copied into memory at boot up, enhancing performance. When you first access the BIOS FEATURES SETUP program the default settings will be loaded. If you change any of the settings you may recall the default setting at any time from the main menu.

The CHIPSET Features Setup INSERT GIF HERE

The Power Management Setup INSERT GIF HERE

#### <u>PM Mode</u>

•SMI Green: Pre-defined only for the Intel S-Serial CPU, That all of Power-Management interrupt is using SMI.

•Auto Green: Pre-defined only for the other CPU (AMD, Cyrix...)

*Power Management* This category determines how power consumption for system after selection below items. Default value is Disable.

•User Defined: All the power down time-out values are selected by user.

•Max power Saving: Auto setting power down time-out value to maximum power consumption.

•Min power Saving: Auto setting power down time-out value to save minimum.

•Disable: Disable whole system power management function.

**Doze timer** Defines the continous idle time before the system entering DOZE mode

•Options: 15Sec 2Min 5Min 15Min 30Min 45Min 60Min 240Min

•Disabled: System will never enter DOZE mode.

•Note: This mode is only for Intel S-Serial, the CPU Clock will down to 8MHz in DOZE mode.

<u>Sleep timer</u> Defines the continuous idle time before the system entering Sleep mode

•Options: 15Sec 2Min 5Min 15Min 30Min 45Min 60Min 240Min

•Disabled: System will never enter Sleep mode

**HDD Standby Timer** Select time-out value 1-15 minutes for IDE with disk auto standby. This function depends on disk drive, some older mode disk drive don't support auto standby function. system BIOS set this function before booting is HDD supported.

Disabled: HDD's motor will not off.

<u>Sleep Clock</u> This item is only for Intel S-Serial, the BIOS will automatically detect CPU and disable this item if the CPU is not Intel S-Serial.

•Stop: To define the CPU stop in sleep mode

•Slow: To define the CPU slowdown (8MHz) in sleep mode

## <u>CRT Sleep</u>

- •Disabled: To define the CRT will not turn off during SLEEP mode
- •Enable: To define the CRT will turn off during SLEEP mode

**IRQ3-15** IRQ3-IRQ15 Monitor. These bits, if enabled, will allow the IRQ input to be monitored for both inactivity for entering the Green Mode and activity for entering the NORMAL Mode.

*LDEV/LDEQ Detection* These two bits, if enabled, will allow local bus devices to be monitored for entering the GREEN Mode.

*Video Detection* This bit, if enabled, will allow video port devices to be monitored for entering the GREEN Mode.

*HDD Detection* This bit, if enabled, will allow hard disk port devices to be monitored for entering the GREEN Mode.

**FDD Detection** This bit, if enabled, will allow floppy disk port devices to be monitored for entering the GREEN Mode.

**DRQ0-7 Detection** IRQ3-IRQ15 Monitor. These bits, if enabled, will allow the DRQ input to be monitored for both inactivity for entering the GREEN Mode.

The Load BIOS/Setup Defaults Setting

The BIOS/Setup Defaults setting are best-case Values that should optimize system performance.

Manual taken from: <u>http://www.physics.mun.ca/~dbpynn/mboard/mboard.html</u>