



integration with integrity

User's Manual

Single Board Computer 3301129

Version 1.0, 2003

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Warning

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1. Disconnect your SBC Module from the power source whenever you want to handle the module
2. Use a grounded wrist strap when handling the module.
3. Hold the module by the edges and try not to touch the IC chips, leads or circuitry
4. Place the module on a grounded antistatic pad or on the bag that came with the SBC Module when handling it.

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Packing list

Before you begin installing your single board computer, please make sure that the following materials have been shipped:

- > 1 x 3301129A & 3301129B Half-sized ISA CPU Card
- > 1 x Quick Installation Guide
- > 1 x CD-ROM (for driver used)
- > 1 x Cable Kits contains the followings:

Content

- . 1 x 3 in 1 Cable Kit(HDD/IDE/PRT+COM/B)
- . 2 x Serial Port Cable
- . 1 x GPIO cable
- . 1 x PS2 Cable

Ordering Codes

3301129A

Half-size 386SX-40 SBC with 4 MB EDO soldered onboard,
Flat Panel / CRT SVGA, 4 Serial Ports and LAN

3301129B

same as above without LAN

Specifications

System

- **CPU + Chipset:** ALi M6117 is an implementation of an INTEL compatible 386SX-40 CPU a watchdog timer and ALi's M1217B chipset
- **System Memory:** 4 MB EDO memory soldered onboard and one SIMM socket (16MB) for up to 20 MB additional EDO memory
- **BIOS:** AMI system BIOS
- **Enhanced IDE:** Supports 1 port and up to 2 ATAPI devices, PIO Mode
- **Watchdog Timer:** Generates a system RESET or NMI when your application loses control over the system. Optionally the watchdog can trigger a user specified IRQ. The watchdog is configurable from 30.5 μ s to 512 seconds (in 30.5 μ s segments)
- **Expansion Interface:** ISA (passive backplane) and PC/104 (ISA)
- **Real Time Clock:** **Benchmark BQ3285LF or compatible with Lithium Battery**

Multiple I/O

- **Serial :** three RS-232C ports (COM1/3/4) and one RS-232C/485 port (COM2)
- **Parallel :** supports SPP, EPP and ECP mode
- **Floppy :** supports 2 floppy disk drives
- **K/B & Mouse:** PS/2 Keyb/Mouse on bracket, onboard AT keyboard port
- **Digital I/O :** 16-bit, 8 Digital In and 8 Digital Out

LAN

- **Chipset:** Realtek 8019AS
- **Type :** 10 Mbps, NE2000 compatible
- **Connector:** RJ-45 on bracket

Flash Disk

- **Dual Disk On Chip 2000 socket :** supports up to 1 GB Flash Disks or Dual Flash EPROM socket (Optional)

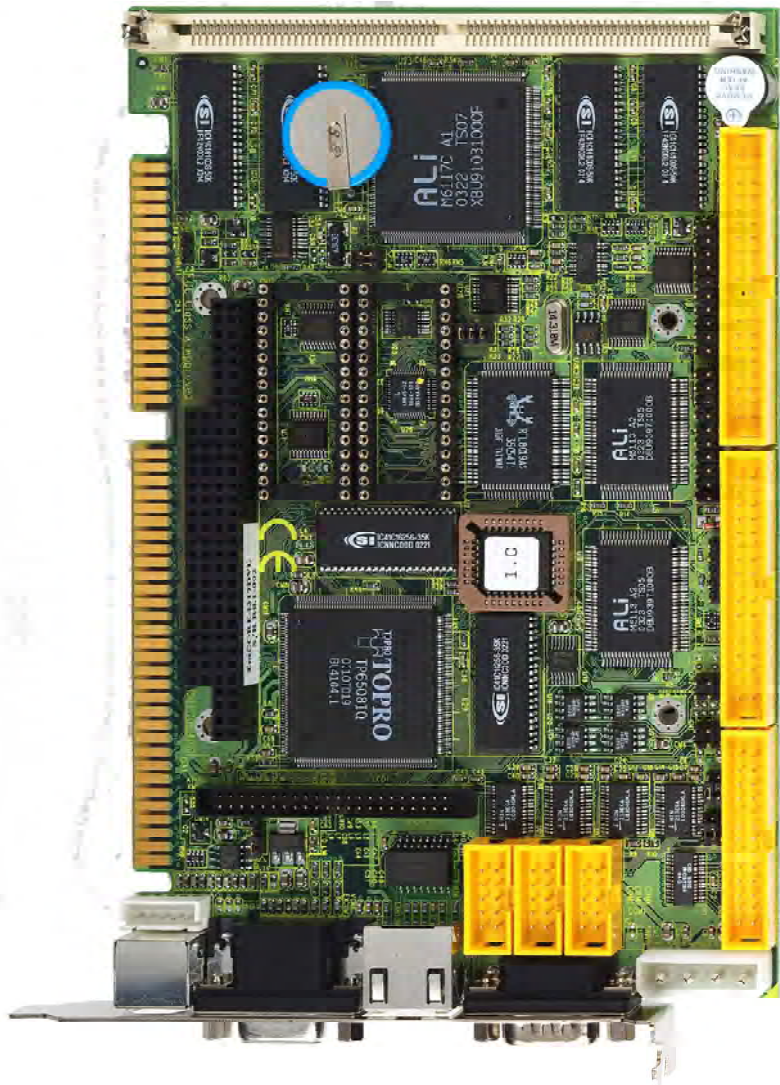
Display

- **Chipset:** TP 6508IQ or compatible
- **Display Memory:** 1 MB onboard
- **Display Type:** >CRT 1024x768 @ 256 color
800x600 @ Hi-color
640x480 @ True color
>Flat Panel Mono/TFT/DSTN/EL support panel resolution up to 800x600
- **Resolution:** 800 x 600 up to 16bpp
- **LCD Interface:** TTL 24-bit

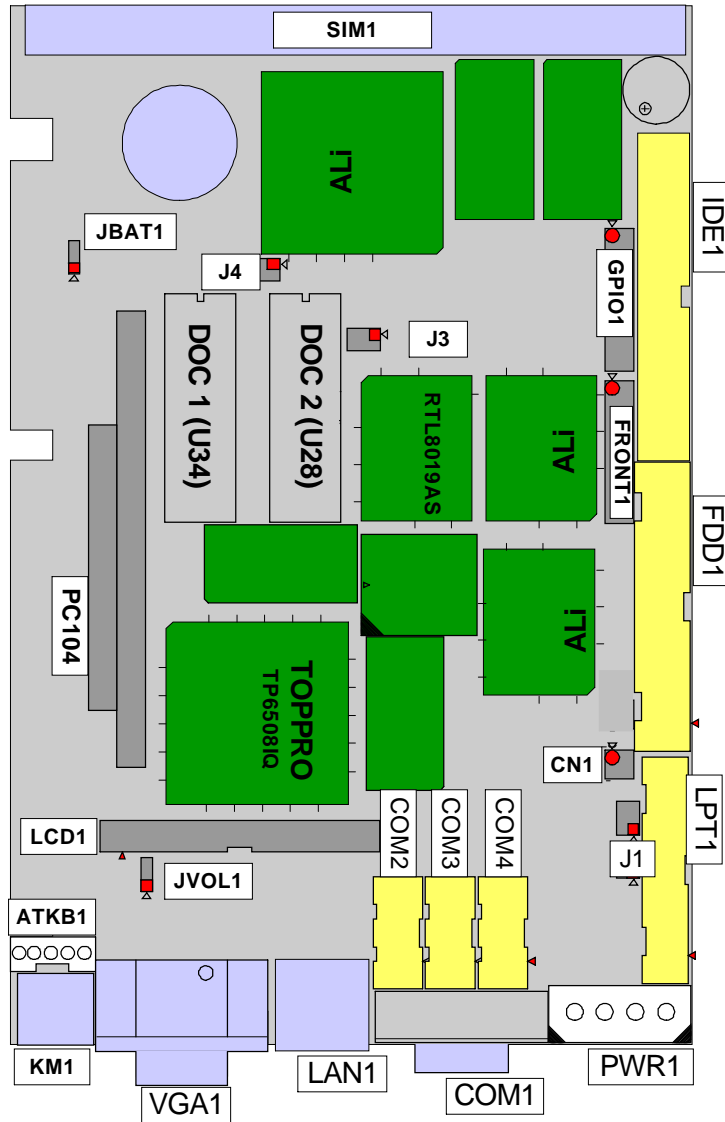
Mechanical and Environment

- **Power Requirement:** Single voltage +5 V @ 0.8 A (with 4 MB DRAM and 1 MB Flash disk installed)
- **Operating Temperature :** 0 ~ 60 C (32 ~ 140 F)
- **Relative Humidity :** up to 90% @ 55°C
- **Board Size:** 185 x 122 mm (7.3" x 4.8")
- **Weight:** 0.24 Kg

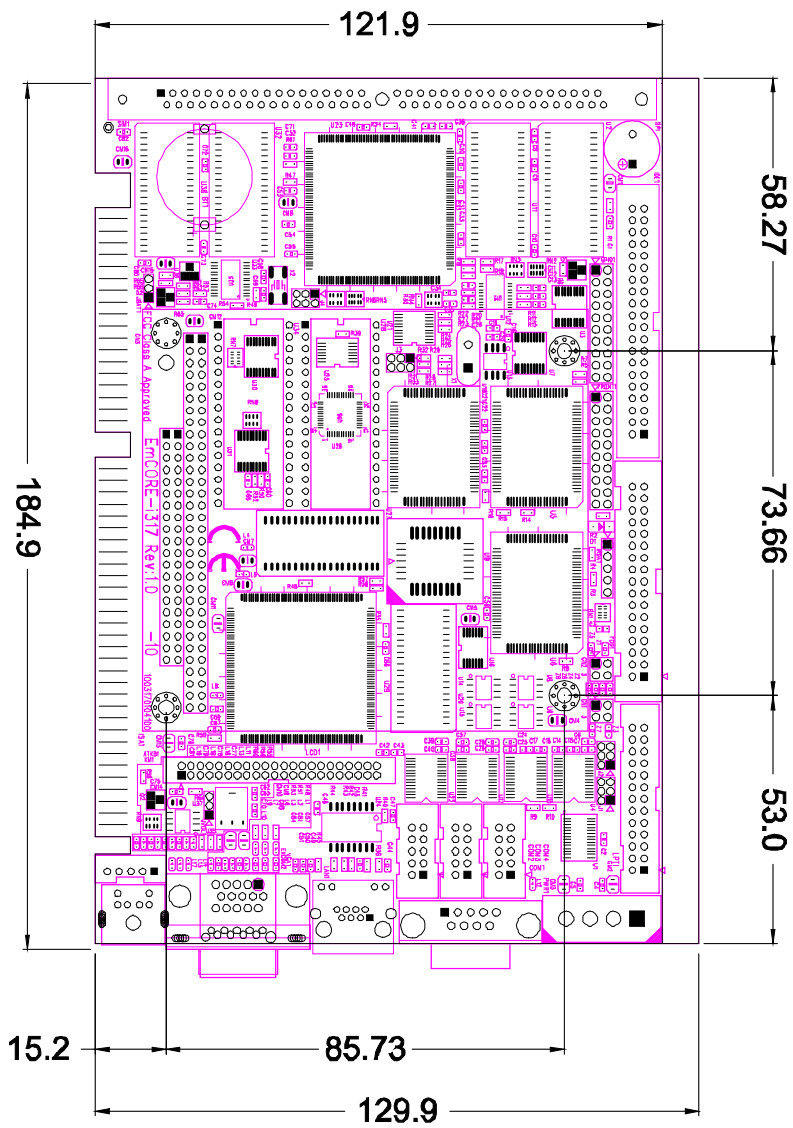
Board Image



Board Layout



Board Dimension



Jumper/Connector Quick Reference**Jumpers**

| Label | Function |
|-------|------------------------------|
| J1 | RS-232/485 selection on COM2 |
| J3 | DOC Address selection |
| J4 | COM3 and COM4 IRQ selection |
| JBAT1 | Clear CMOS |
| JVOL1 | LCD Power Selection |

Jumper/Connector Quick Reference

Connector

| Label | Function |
|-----------|------------------------------|
| FRONT1 | Front Panel Connector |
| PWR1 | Power 4P Power Connector |
| LAN1 | LAN Connector |
| KM1 | PS/2 Keyboard and PS/2 Mouse |
| IDE1 | Primary IDE Connector |
| FDD1 | Floppy Disk Connector |
| LPT1 | Parallel Port |
| CN1 | RS-485 Port |
| GPIO1 | 16-bit General Purpose I/O |
| LCD1 | LCD Connector |
| COM2~COM4 | COM port |

RS-232 & 485 selection On COM2

COM2 RS-232/485 selection (J1)

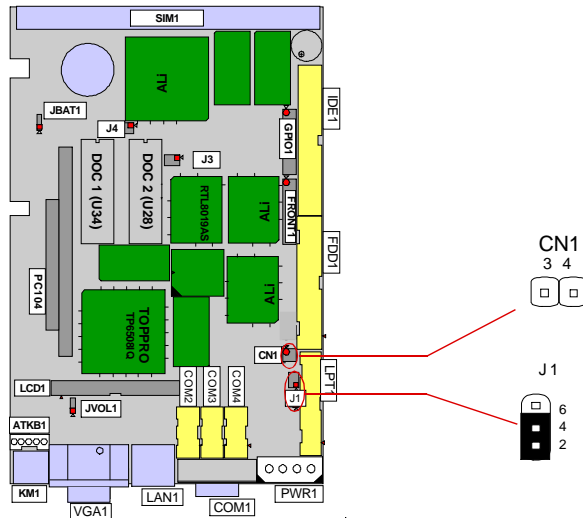
COM2 can be configured by jumper J1.

The onboard COM2 port can be configured to operate in RS-232 or RS-485 modes. RS-232 modes differ in the way RX/TX is being handled. Jumper J1 switches between RS-232C or RS-485 mode.

Connector : J1

Type : onboard 3-pin(1*3) header

| Pin | Status | CN1 |
|-----|-------------------------|----------------------------|
| 2-4 | RS232 on COM2 (Default) | CN1 Disabled |
| 4-6 | RS485 on CN1 | Pin 3: Data+, Pin 4: Data- |

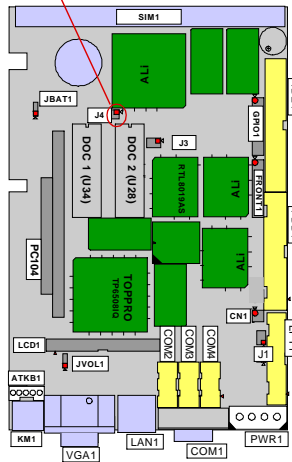
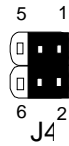


COM3 & COM4 IRQ Selection

Label : J4

Type : Onboard 6-pin header

| Pin | Status |
|-----|--------------------------|
| 1-3 | COM3 uses IRQ4 (Default) |
| 3-5 | COM3 uses IRQ10 |
| 2-4 | COM4 uses IRQ3 (Default) |
| 4-6 | COM4 uses IRQ11 |



CMOS Jumper Settings

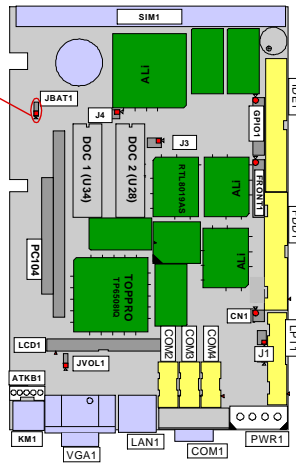
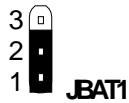
CMOS Operation (JBAT1)

Type : J1: onboard 3-pin header

If the 3301129 refuses to boot due to inappropriate CMOS settings here is how to proceed to clear (reset) the CMOS to its default values.

CMOS Setup (JBAT1) JBAT1 Status

| | | |
|------------------|-----|----|
| Normal Operation | 1-2 | ON |
| Clear CMOS | 2-3 | ON |
| default setting | 1-2 | ON |



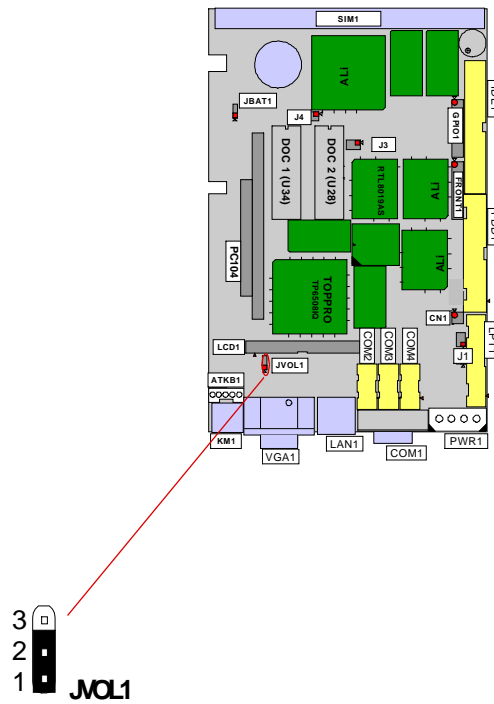
LCD Power Selection

Connector : JVOL1

Type : onboard 3-pin header

The voltage of LCD panel could be selected by JVOL1 in 5V or 3.3V .

| Mode | JVOL1 |
|-----------------|-------|
| 5V | 1-2 |
| 3.3V | 2-3 |
| default setting | +5V |



16-bit General Purpose I/O

Connector : **GPIO1**
 Type : Onboard 20-pin header

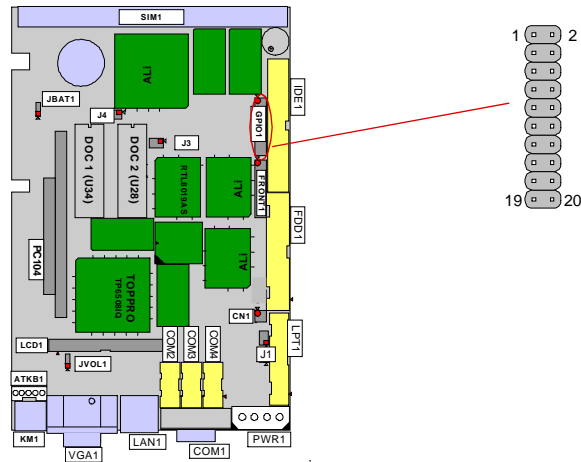
Digital Input

Logic Level 0: 0.5V (max)
 Logic Level 1: 2.0V (min)
 Output Current per pin: ± 25 mA (max)

Digital Output

Logic Level 0: 0.8V (max)
 Logic Level 1: 2.0V (min)

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | GND | 2 | Vcc |
| 3 | DI0 | 4 | DO0 |
| 5 | DI1 | 6 | DO1 |
| 7 | DI2 | 8 | DO2 |
| 9 | DI3 | 10 | DO3 |
| 11 | DI4 | 12 | DO4 |
| 13 | DI5 | 14 | DO5 |
| 15 | DI6 | 16 | DO6 |
| 17 | DI7 | 18 | DO7 |
| 19 | Vcc | 20 | GND |



GPIO Sample Program

```
; Please use TASM to compiler the following program.
; Execute under DOS environment.
;
.model tiny
.486
.code
.startup
    mov ax,0c513h    ; Unlock configuration register
    call writechip
    mov ax,05568h    ; Enable GPO[7-0] is output pin.
    call writechip
    mov ax,1173h     ; Output data value is 55h to output pin GPO[7-0].
    call writechip
    mov ax,003Eh     ; Set the GPI[7-0] is input pin.
    call writechip
    mov ax,003Eh     ; Input data value from GPI[7-0].
    call readchip
    mov ax,0013h     ; Lock configuration register
    call writechip
    mov ax,4c00h
    int 21h

readchip proc near
    out 22h,al
    nop
```

```
    nop
    in al,23h
    nop
    nop
    ret
readchip endp

writechip proc near
    out 22h,al
    nop
    nop
    xchg ah,al
    out 23h,al
    nop
    nop
    xchg ah,al
    ret
writechip endp

    end
```

Configuring the Watchdog Timer by Software

Chipset configuration registers

The M6117D configuration register INDEX 37H, 38H, 39H, 3AH, 3BH, 3Ch are used to control the watchdog functions and/or display its current status.

Enable/Disable watchdog - INDEX 37H

| Bit | Value | Action |
|-----|----------------|---|
| 7 | reserved. | Do not modify the value of this bit ! |
| 6 | 0 | disable watchdog timer |
| | 1 | enable watchdog timer |
| 5~0 | Other function | Do not modify the value of these bits ! |

Watchdog time out action - INDEX 38H

| Bit | Value | Action |
|-----|-----------------|----------------------------|
| 7~4 | 0000 | no output signal |
| | 0001 | IRQ3 |
| | 0010 | IRQ4 |
| | 0011 | IRQ5 |
| | 0100 | IRQ6 |
| | 0101 | IRQ7 |
| | 0110 | IRQ9 |
| | 0111 | IRQ10 |
| | 1000 | IRQ11 |
| | 1001 | IRQ12 |
| | 1010 | IRQ14 |
| | 1011 | IRQ15 |
| | 1100 | NMI |
| | 1101 | system RESET |
| | 1110 | no output signal |
| | 1111 | no output signal |
| 3-0 | other function, | do not modify these bits ! |

Watchdog timer - INDEX 39H, 3AH, 3BH

| Index | 3Bh | 3Ah | 39h |
|--------------|-------------|------------|------------|
| Bits | D7.....D0 | D7.....D0 | D7.....D0 |
| counter | MSB.....LSB | | |

for example,

| INDEX | 3Bh | 3Ah | 39h | time out |
|--------------|------------|------------|------------|-----------------|
| | 00h | 00h | 01h | 30.5 μ sec |
| | 00h | 00h | 02h | 61 μ sec |
| | 00h | 01h | 00h | 7.8 msec |
| | 00h | 02h | 00h | 15.6 msec |
| | 01h | 00h | 00h | 2 sec |
| | 02h | 00h | 00h | 4 sec |
| | FFh | FFh | FFh | 512 sec |

Timeout Status & Reset - INDEX 3CH

| Bit | Value | Action | remarks |
|------------|--|--------------------------------|----------------|
| 7 | 0 | timeout has not (yet) occurred | read only |
| | 1 | timeout has occurred | |
| 6 | | | |
| 5 | write 1 | reset timer | |
| | 0 | has no meaning | |
| 4~0 | other function, do not modify these bits ! | | |

Programming the watchdog

To perform any operation on the M6117D configuration registers you always have to unlock first and lock the registers afterwards

Unlock configuration register

```
mov    al, 013h
out    22h, al
nop
nop
mov    al, 0c5h
out    23h, al
nop
nop
```

Lock configuration register

```
mov    al, 013h
out    22h, al
nop
nop
mov    al, 000h
out    23h, al
nop
nop
```

Read the value of a configuration register

For example, read INDEX 3Ch :

Unlock configuration register

```
mov    al, 03ch
out    22h, al
nop
nop
in     al, 23h
nop
nop
push   ax
```

Lock configuration register

```
pop    ax    ; AL - result
```

Write data to configuration register

For example, write 0FFh to INDEX 3Bh :

Unlock configuration register

```
mov    al, 03bh
out    22h, al
nop
nop
mov    al, 0ffh
out    23h, al
nop
nop
```

Lock configuration register

Watchdog Program Example

We use the following sequence to initialize the watchdog timer:

- (1) Unlock configuration register.
- (2) Disable watchdog timer by setting INDEX 37H Bit 6 to '0'.
- (3) Set the expected counter value to INDEX 3BH, 3AH, 39H.
- (4) Select timeout action from INDEX 38H Bit 7-4.
- (5) Enable watchdog timer by setting INDEX 37H Bit 6 to '1'.
- (6) Lock configuration register.

Example: Set timeout to 128 sec to generate a system RESET.

```
; Please use MASM to compiler the following program
; Execute under DOS environment
dosseg
. model small
. stack 100h
.code
main proc
    mov     ax, 0c513h    ; Unlock config. register
    call   writechip
    mov     ax, 03737h    ; Disable watchdog timer
    call   readchip
    and     al, 10111111b
    xchg   ah, al
    call   writechip
    mov     ax, 0403bh    ; Set the expected counter
                        ; value
    call   writechip     ; to [400000h]
    mov     ax, 0003ah    ; 30.5*sec*400000h= 128 sec
    call   writechip
    mov     ax, 00039h
    call   writechip
    mov     ax, 03838h    ; Select "system reset" as
                        ; timeout action

    call   readchip
    and     al, 00001111b
    or      al, 11010000b
    xchg   ah, al
    call   writechip

    mov     ax, 03737h    ; Enable watchdog timer
    call   readchip
    or      al, 01000000b
    xchg   ah, al
    call   writechip

    mov     ax, 00013h    ; Lock config. register
    call   writechip
    mov     ax, 04c00h
    int     21h

main endp
```

```

readchip proc
    out        22h, al
    nop
    nop
    in         al, 23h
    nop
    nop
    ret
readchip endp

writechip proc
    out        22h, al
    nop
    nop
    xchg       ah, al
    out        23h, al
    nop
    nop
    xchg       ah, al
    ret
writechip endp

end main

```

Reset watchdog timer

Resets the watchdog timer periodically to prevent timeout.

```

mov    ax, 0c513h    ; Unlock configuration
                        ; register
call   writechip
mov    ax, 03C3Ch    ; Reset watchdog timer
                        ; counter
call   readchip
or     al, 00100000b ; The counter is reset at
xchg   ah, al        ; out 23h, al
call   writechip
mov    ax, 00013h    ; Lock configuration
                        ; register
call   writechip

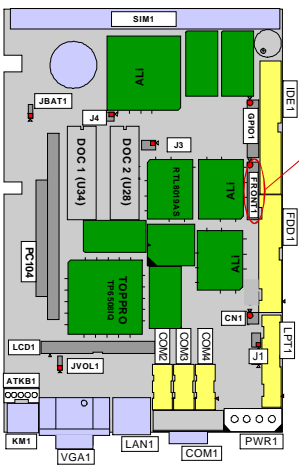
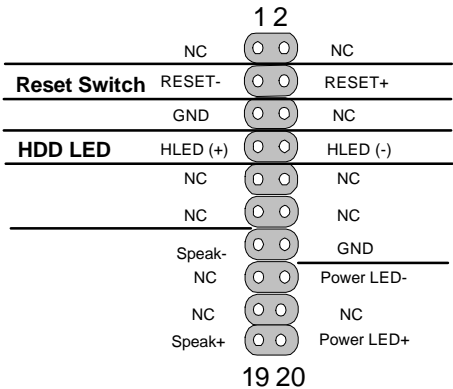
```

(the above code uses *readchip* and *writechip* procedures)

Switches and Indicators

Switch & indicator : FRONT1

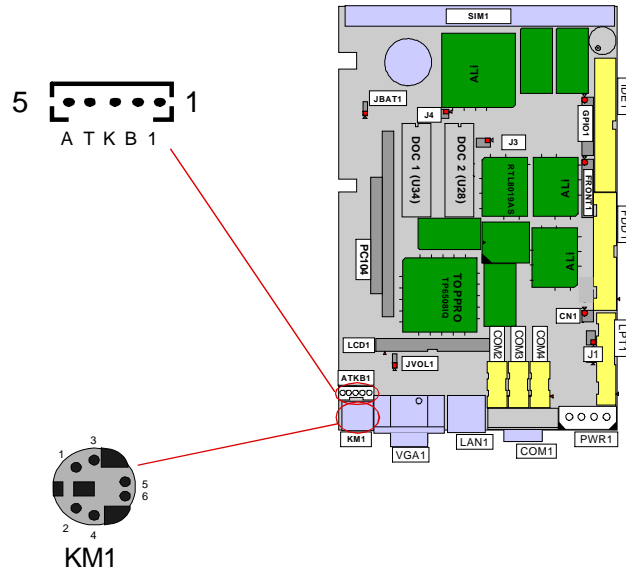
| Connector | Description |
|-----------|----------------|
| RESET | Reset function |
| HLED | Hard Disk LED |
| PLED | Power LED |
| SPKE | Speaker |



External Keyboard Connector

Connector : **ATKB1**
 Type : Onboard 5-pin header

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | CLK | 2 | DATA |
| 3 | NC | 4 | GND |
| 5 | Vcc | | |



PS/2 Keyboard & Mouse

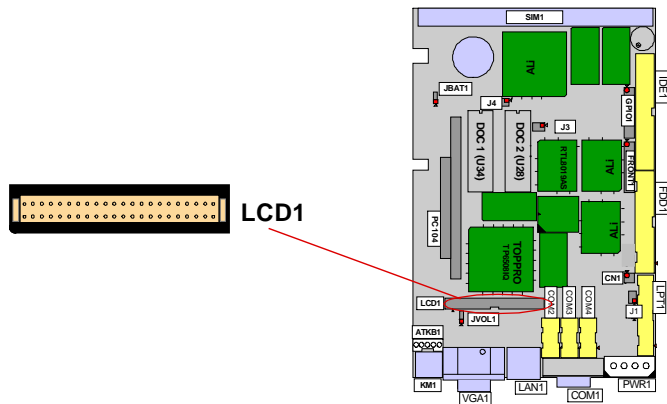
Connector : **KM1**
 Type : PS/2 Connector

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | KB_CLK | 2 | MS_CLK |
| 3 | GND | 4 | Vcc |
| 5 | KB_DATA | 6 | MS_DATA |

LCD Connector

Connector : **LCD1**
 Type : onboard 44-pin box header

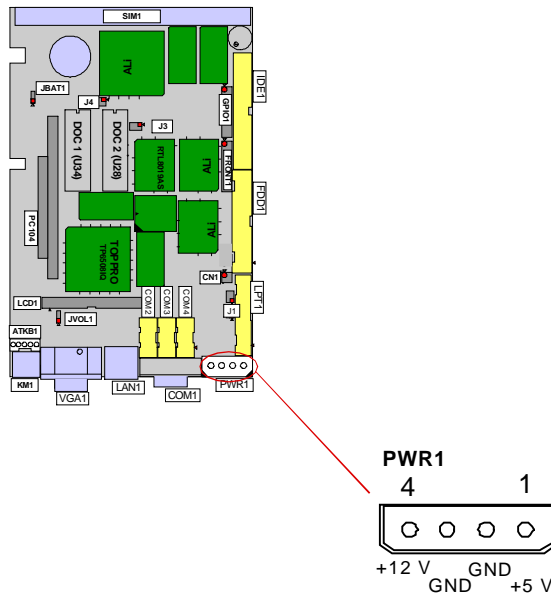
| Pin | Description | Pin | Description |
|-----|------------------|-----|------------------|
| 1 | Reserved for 12V | 2 | Reserved for 12V |
| 3 | GND | 4 | GND |
| 5 | LCDVDD | 6 | FPVDDEN |
| 7 | VBAEN | 8 | GND |
| 9 | B0 | 10 | B1 |
| 11 | B2 | 12 | B3 |
| 13 | B4 | 14 | B5 |
| 15 | B6 | 16 | B7 |
| 17 | G0 | 18 | G1 |
| 19 | G2 | 20 | G3 |
| 21 | G4 | 22 | G5 |
| 23 | G6 | 24 | G7 |
| 25 | R0 | 26 | R1 |
| 27 | R2 | 28 | R3 |
| 29 | R4 | 30 | R5 |
| 31 | R6 | 32 | R7 |
| 33 | GND | 34 | GND |
| 35 | FPSCCLK | 36 | FP |
| 37 | DE | 38 | LP |
| 39 | GND | 40 | FPEN |
| 41 | GND | 42 | NC |
| 43 | VCC | 44 | VCC |



Power Connector

Connector : **PWR1**
 Type : onboard 4-pin Wafer connector

| Pin | Description |
|-----|-------------|
| 1 | +5V |
| 2 | GND |
| 3 | GND |
| 4 | +12V |

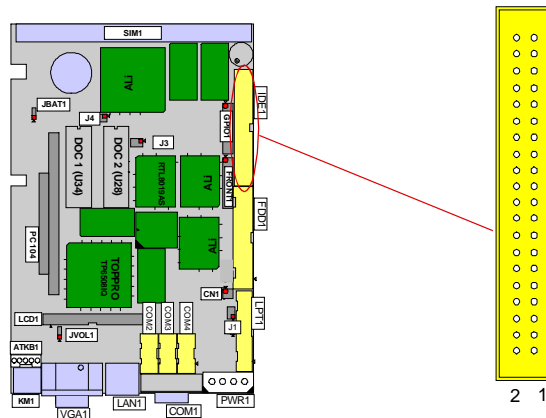


IDE Connector

Connector : **IDE1**

Type : onboard 40-pin box header, primary and secondary IDE

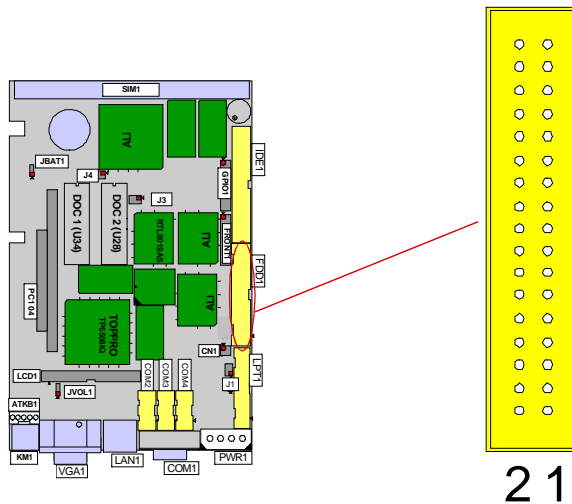
| Pin | Description | Pin | Description |
|-----|-------------|-----|------------------|
| 1 | #RESET | 2 | GND |
| 3 | D7 | 4 | D8 |
| 5 | D6 | 6 | D9 |
| 7 | D5 | 8 | D10 |
| 9 | D4 | 10 | D11 |
| 11 | D3 | 12 | D12 |
| 13 | D2 | 14 | D13 |
| 15 | D1 | 16 | D14 |
| 17 | D0 | 18 | D15 |
| 19 | GND | 20 | NC |
| 21 | REQ | 22 | GND |
| 23 | #IOW | 24 | GND |
| 25 | #IOR | 26 | GND |
| 27 | #IORDY | 28 | IDESEL |
| 29 | #DACK | 30 | GND |
| 31 | IRQ | 32 | NC (-IOCS16) |
| 33 | ADDR1 | 34 | CBLID |
| 35 | ADDR0 | 36 | ADDR2 |
| 37 | #CS1 | 38 | #CS3(#HD SELET1) |
| 39 | #ACT | 40 | GND |



FDD Connector

Connector : **FDD1**
 Type : onboard 34-pin box header

| Pin | Description | Pin | Description |
|-----|-------------|-----|------------------------|
| 1 | GND | 2 | DRIVE DENSITY SELECT 0 |
| 3 | GND | 4 | NC |
| 5 | GND | 6 | DRIVE DENSITY SELECT 1 |
| 7 | GND | 8 | #INDEX |
| 9 | GND | 10 | #MOTOR ENABLE A |
| 11 | GND | 12 | #DRIVER SELECT B |
| 13 | GND | 14 | #DRIVER SELECT A |
| 15 | GND | 16 | #MOTOR ENABLE B |
| 17 | GND | 18 | #DIRECTION |
| 19 | GND | 20 | #STEP |
| 21 | GND | 22 | #WRITE DATA |
| 23 | GND | 24 | #WRITE GATE |
| 25 | GND | 26 | #TRACK 0 |
| 27 | GND | 28 | #WRITE PROTECT |
| 29 | GND | 30 | #READ DATA |
| 31 | GND | 32 | #HEAD SELECT |
| 33 | GND | 34 | #DISK CHANGE |

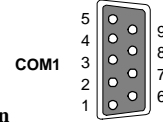


COM1~COM4 Connector

COM1 RS-232C Ports on bracket

Connector : COM1

Type : external 9-pin D-sub male connector on bracket

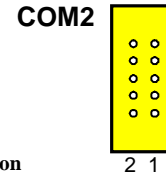


| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | DCD | 2 | RXD |
| 3 | TXD | 4 | DTR |
| 5 | GND | 6 | DSR |
| 7 | RTS | 8 | CTS |
| 9 | RI | | |

COM2 with RS-232 Mode

Connector : COM2~COM4

Type : onboard 10-pin box header



| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | DCD | 2 | RXD |
| 3 | TXD | 4 | DTR |
| 5 | GND | 6 | DSR |
| 7 | RTS | 8 | CTS |
| 9 | RI | 10 | NC |

CN1 : 3 Data+

4 Data-

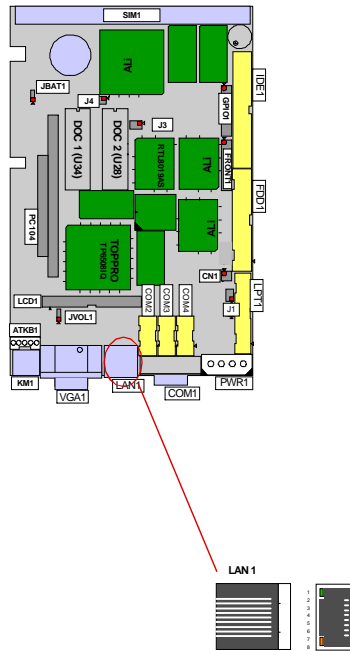
Fast Ethernet Connectors

LAN Port (10/100Mbps)

Connector : **LAN1**

Type : external RJ-45 on bracket

| Pin | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------------|-----|-----|-----|----|----|-----|----|----|
| Description | TX+ | TX- | RX+ | NC | NC | RX- | NC | NC |



ISA PC/104 Interface

Connector : **PC104 BUS**
 Type : Onboard 30-pin and 20-pin header



| # | A | B | C | D |
|----|----------|--------------------|--------------------|----------|
| 0 | -- | -- | GND | GND |
| 1 | IOCHCHK* | GND | SBHE* | MEMCS16* |
| 2 | SD7 | RESETDRV | LA23 | IOCS16* |
| 3 | SD6 | +5V | LA22 | IRQ10 |
| 4 | SD5 | IRQ9 | LA21 | IRQ11 |
| 5 | SD4 | -5V | LA20 | IRQ12 |
| 6 | SD3 | DRQ2 | LA19 | IRQ15 |
| 7 | SD2 | -12V | LA18 | IRQ14 |
| 8 | SD1 | ENDXFR* | LA17 | DACK0* |
| 9 | SD0 | +12V | MEMR* | DRQ0 |
| 10 | IOCHRDY | (KEY) ² | MEMW* | DACK5* |
| 11 | AEN | SMEMW* | SD8 | DRQ5 |
| 12 | SA19 | SMEMR* | SD9 | DACK6* |
| 13 | SA18 | IOW* | SD10 | DRQ6 |
| 14 | SA17 | IOR* | SD11 | DACK7* |
| 15 | SA16 | DACK3* | SD12 | DRQ7 |
| 16 | SA15 | DRQ3 | SD13 | +5V |
| 17 | SA14 | DACK1* | SD14 | MASTER* |
| 18 | SA13 | DRQ1 | SD15 | GND |
| 19 | SA12 | REFRESH* | (KEY) ² | GND |
| 20 | SA11 | SYSCLK | -- | -- |
| 21 | SA10 | IRQ7 | -- | -- |
| 22 | SA9 | IRQ6 | -- | -- |
| 23 | SA8 | IRQ5 | -- | -- |
| 24 | SA7 | IRQ4 | -- | -- |
| 25 | SA6 | IRQ3 | -- | -- |
| 26 | SA5 | DACK2* | -- | -- |
| 27 | SA4 | TC | -- | -- |
| 28 | SA3 | BALE | -- | -- |
| 29 | SA2 | +5V | - | -- |
| 30 | SA1 | OSC | -- | -- |
| 31 | SA0 | GND | -- | -- |
| 32 | GND | GND | -- | -- |

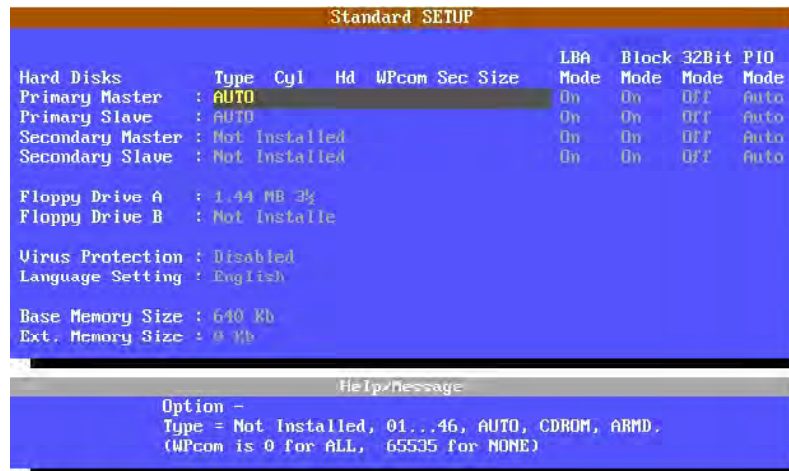
AMI BIOS Setup

The SBC uses the AMI PCI/ISA BIOS ver 7.51 for the system configuration. The AMI BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options which could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

To access AMI PCI/ISA BIOS Setup program, press key. The Main Menu will be displayed at this time.

Once you enter the AMI CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

Standard CMOS Setup



Hard Disks

Primary/Secondary Master and Slave selection

Floppy Drive A

The drive A type. See section Floppy drive A in Standard CMOS Setup to alter this setting.

Floppy Drive B

Idem.

Virus Protection

Allows you to choose the VIRUS Protection feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write

data into this area, BIOS will show a warning message on screen and beep.

Enabled Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Disabled No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

Language Setting Select the language of BIOS.

Base Memory Size The number of KB of base memory. Usually 640.

Ext. Memory Size The number of KB of extended memory.

Chipset Setup

| Chipset SETUP | | | | |
|---------------------------------|--------|--------|----------|----------|
| Option Name | Active | Rights | Optimal | FailSafe |
| AT Bus Clock | Yes | Both | 14.318/2 | 14.318/2 |
| Slow Refresh (us) | Yes | Both | 15 | 15 |
| Memory Hole At 15-16M | Yes | Both | Disabled | Disabled |
| RAS Precharge time | Yes | Both | 3.5T | 3.5T |
| RAS Active Time Insert Wait | Yes | Both | Enabled | Enabled |
| CAS Precharge Time Insert Wait | Yes | Both | Enabled | Enabled |
| Memory Write Insert Wait | Yes | Both | Enabled | Enabled |
| Memory Miss Read Insert Wait | Yes | Both | Enabled | Enabled |
| ISA Write cycle end Insert Wait | Yes | Both | Enabled | Enabled |
| I/O Recovery | Yes | Both | Enabled | Enabled |
| I/O Recovery Period | Yes | Both | 0.75 us | 0.75 us |
| On-Chip I/O Recovery | Yes | Both | Disabled | Disabled |
| 16Bit ISA Insert Wait | Yes | Both | Enabled | Enabled |

Help/Message
 In this window, you can press [Enter] to edit question/option/option help string or press [PageUp]/[PageDown] to change setting.

AT BUS Clock

Selection : Gives a division of the CPU clock so it can reach the ISA - EISA bus clock. An improper setting may cause significant decrease in performance. The settings are in terms of CLK/x, (or CLKIN/x) where x may have values like 2, 3, 4, 5, etc. CLK represents your processor speed, with the exception that clock-multiple processors need to use the EXTERNAL clock rate, so a 486DX33, 486DX2/66, and 486DX3/99 all count as 33. You should try to reach 8.33 Mhz (that's the old bus clock of IBM AT; there may be cards which could do higher, but it's not highly recommended). On some motherboards, the AT bus speed is 7.15 Mhz. On new BIOS versions, there is an AUTO setting that will look at the clock frequency and determine the proper divider.

| CPU Speed | Appropriate setting |
|----------------------|---------------------|
| 16 | CLK/2 |
| 25 or DX2/50 | CLK/3 |
| 33, DX2/66 or DX3/99 | CLK/4 |
| 40 or DX2/80 | CLK/5 |
| 50 or DX2/100 | CLK/6 |

You can try other settings to increase performance. If you choose a too small divider (CLK/2 for a DX33) your system may hang. For a too big divider (CLK/5 for a DX33) the performance of ISA cards will decrease. This setting is for data exchange with ISA cards, NOT VESA cards which run at CPU bus clock speeds: 25Mhz, 33Mhz and higher. If your ISA cards are fast enough to

keep up, it is possible to run the bus at 12 Mhz. Note that if you switch crystals to overclock your CPU, you are also overclocking the ISA bus unless you change settings to compensate. Just because you can overclock the CPU doesn't mean you can get away with overclocking the ISA bus. It might just be one card that causes trouble, but one is enough. It might cause trouble even if you aren't using it by responding when it shouldn't.

Slow Refresh : Causes RAM refresh to happen less often than usual. This increases the performance slightly due to the reduced contention between the CPU and refresh circuitry, but not all DRAMs necessarily support these reduced refresh rates (in which case you will get parity errors and crashes).

Memory Hole At 15-16M

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

RAS Precharge Time : Row Address Strobe.

RAS Active Time Insert Wait : Select Enabled if the installed DRAM requires additional wait states.

CAS Precharge Time Insert Wait : Inserts one wait state. Determines the number of CPU clock cycles allocated for the CAS signal to accumulate its charge before EDO DRAM is allowed to precharge. If insufficient time is allowed, refresh may be incomplete and data lost.

Memory Write Insert Wait : states is for RAM which aren't fast enough for the computer. On a 486, 1 or more wait states are often required for RAM with 80ns or higher access time. And, depending on the processor and mother board, also for lower than 80ns access time. The less wait states, the better. If wait states are too low, a parity error will occur. For 386 or 486 nonburst memory access cycle takes 2 clock ticks. A *rough* indication of RAM speed necessary for 0 wait states is $2000/\text{Clock}[\text{MHz}]/10$ [ns]. For a 40Mhz processor, this would give 50ns of access time required. The number of wait states necessary is *approximately* $(\text{RamSpeed}[\text{ns}] + 10) * \text{Clock}[\text{MHz}] / 1000$. For 70ns RAM and a 33Mhz processor (very standard configuration), this would give roughly 1 wait state. But this really is dependent on chip set, mother board and cache design, CPU type and whether we talk about reads or writes. Take these formulas with a large grain of salt. You can find out the access time of your RAM chips by looking at their product numbers. Mostly at the end there is a 70, 80, 90, or even 60. If 10 stands there, it means 100 ns. Some RAM chips also have an explicitly written speed in ns. The RAM you buy these days mostly have 70ns or 60ns.

Memory Miss Insert Wait: Same as above. Select Enabled if the installed DRAM requires additional wait states. Do not change from the default setting unless you are experiencing memory errors.

ISA Write cycle end Insert Wait : If you have add-on RAM in an ISA expansion slot, select Enabled to allow additional time for the slower through-

put of the ISA bus.

I/O Recovery : When enabled, allows you to insert wait states (see "I/O Recovery Period")

I/O Recovery Period : When enabled, more I/O wait states are inserted. A transfer from IDE hard- drive to memory happens without any handshaking, meaning the data has to be present (in the cache of the hard disk) when the CPU wants to read them from an I/O Port. This is called PIP (Programmed I/O) and works with a REP INSW assembler instruction. Now I/O Recovery Time enabled adds some wait states to this instruction. When disabled, the harddrive is a lot faster. Note that there is a connection between I/O Recovery Time and AT BUS Clock Selection. For example, if the AT BUS Clock is set to 8 MHZ and you have a normal hard disk, I/O Recovery Time can be turned off, resulting in a higher transfer rate from hard disk.

On-Chip I/O Recovery : Select Enabled to allow extra preparation time between I/O cycles.

16Bit ISA Insert Wait Your system quite possibly has much higher performance than some of your input/output (I/O) devices. This means that unless the system is instructed to allow more time, more wait states, for devices to respond, it might think the device has malfunctioned and stop its request for I/O. If all your I/O devices are capable, then disabling this setting could result in greater throughput. Otherwise, data could be lost.

Advanced CMOS Setup

| Advanced CMOS SETUP | | | | |
|------------------------|--------|--------|----------|----------|
| Option Name | Active | Rights | Optimal | FailSafe |
| Quick Boot | Yes | Both | Enabled | Enabled |
| 1st Boot Device | Yes | Both | IDE-0 | IDE-0 |
| 2nd Boot Device | Yes | Both | IDE-1 | Floppy |
| 3rd Boot Device | Yes | Both | Floppy | Disabled |
| Try Other Boot Devices | Yes | Both | Yes | Yes |
| Buzzer Beep | Yes | Both | Enable | Enable |
| Bootup Num-Lock | Yes | Both | On | On |
| Floppy Drive Swap | Yes | Both | Disabled | Disabled |
| Floppy Drive Seek | Yes | Both | Disabled | Disabled |
| PS/2 Mouse Support | Yes | Both | Enabled | Enabled |
| System Keyboard | Yes | Both | Present | Present |
| Primary Display | Yes | Both | UGA/EGA | UGA/EGA |
| Password Check | Yes | Both | Setup | Setup |
| Wait For 'F1' If Error | Yes | Both | Enabled | Enabled |
| Wait For 'F1' If Error | Yes | Both | Enabled | Enabled |
| C000, 32k Shadow | Yes | Both | Disabled | Disabled |
| C800, 32k Shadow | Yes | Both | Disabled | Disabled |
| D000, 32k Shadow | Yes | Both | Disabled | Disabled |
| D800, 32k Shadow | Yes | Both | Disabled | Disabled |

Help/Message

In this window, you can press [Enter] to edit question/option/option help string or press [PageUp]/[PageDown] to change setting.

Quick Boot : Setting the item to Enabled allows the system to boot within 5 seconds since it will skip some check items.

1st/2nd/3rd Boot Device : The items allow you to set the sequence of boot devices where AMIBIOS attempts to load the operating system. The settings are:

| | |
|----------|--|
| IDE0 | The system will boot from the first HDD. |
| IDE1 | The system will boot from the second HDD. |
| IDE2 | The system will boot from the third HDD. |
| IDE3 | The system will boot from the fourth HDD. |
| Floppy | The system will boot from floppy drive. |
| ARMD-ZIP | The system will boot from LS-120/ZIP-100/ZIP-250 drives. |
| CD-ROM | The system will boot from the CD-ROM. |
| SCSI | The system will boot from the SCSI. |
| Network | The system will boot from the Network drive. |
| Disabled | Disable this sequence. |

Try Other Boot Devices: Setting the option to Yes allows the system to try to boot from other devices if the system fails to boot from the 1st/2nd/3rd boot device.

Buzzer Beep: Cycles through various volumes of system (buzzer) beep.

Bootup Num-Lock: Specify if you want the Num Lock key to be activated at boot up.

Floppy Drive Swap: This field is effective only in systems with two floppy drives. Selecting Enabled assigns physical drive B to logical drive A, and

physical drive A to logical Drive B.

Floppy Drive Seek: When Enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360-KB floppy drives have 40 tracks; drives with 720 KB, 1.2 MB, and 1.44 MB capacity all have 80 tracks. Because very few modern PCs have 40-track floppy drives, we recommend that you set this field to Disabled to save time.

PS/2 Mouse Support: This setting is specially for those who wish to connect a PS/2 mouse. Enabling reserves IRQ 12 for the PS/2 mouse. Disabling releases IRQ 12 for use by another system component.

System Keyboard: "Present". If "Absent" is selected this option sets the BIOS to pass the keyboard test in the POST, allowing to reset a PC without a keyboard (file server, printer server, etc.), without the BIOS producing a keyboard error.

Primary Display: This option specifies the type of display monitor and adapter in the computer. The settings are Mono, CGA40, CGA80, EGA/VGA, or Absent. If you want to use the board without display controller set this value to "Absent". This option sets the BIOS to pass the display controller test in the POST, allowing to boot a PC without a display controller. Even if set to "Absent" the board will still try to initialize a display card if present.

Password Check: If you have set a password, select whether the password is required every time the System boots, or only when you enter the BIOS setup.

| | |
|--------|---|
| Always | The system will not boot and access to 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. |

Wait for 'F1' if Error: AMIBIOS POST error messages are followed by: Press <F1> to continue

System BIOS Shadow Cacheable When this option is set to Enabled, the contents of the F0000h system memory segment can be read from or written to L2 secondary cache memory. The contents of the F0000h memory segment are always copied from the BIOS ROM to system RAM for faster execution. The settings are Enabled or Disabled. The Optimal default setting is Enabled. The Fail-Safe default setting is Disabled.

C000,32K Shadow

C800,32K Shadow

D000,32K Shadow

D800,32K Shadow

These options control the location of the contents of the 32KB of ROM beginning at the specified memory location. If no adaptor ROM is using the named ROM area, this area is made available to the local bus.

Peripheral Setup

| Peripheral SETUP | | | | |
|---------------------------|--------|--------|-----------|-----------|
| Option Name | Active | Rights | Optimal | FailSafe |
| OnBoard FDC | Yes | Both | Auto | Auto |
| OnBoard Serial Port1 | Yes | Both | 3F8h/COM1 | 3F8h/COM1 |
| OnBoard Serial Port2 | Yes | Both | 2F8h/COM2 | 2F8h/COM2 |
| Serial Port2 Mode | Yes | Both | Normal | Normal |
| OnBoard Serial Port3 | Yes | Both | 3E8h/COM3 | 3E8h/COM3 |
| Serial Port3 IRQ | Yes | Both | 4 | 4 |
| OnBoard Serial Port4 | Yes | Both | 2E8h/COM4 | 2E8h/COM4 |
| Serial Port4 IRQ | Yes | Both | 3 | 3 |
| OnBoard Parallel Port | Yes | Both | 378h | 378h |
| Parallel Port Mode | Yes | Both | Normal | Normal |
| EPP Version | Yes | Both | N/A | N/A |
| Parallel Port DMA Channel | Yes | Both | N/A | N/A |
| Parallel Port IRQ | Yes | Both | 7 | 7 |

Help/Message

In this window, you can press [Enter] to edit question/option/option help string or press [PageUp]/[PageDown] to change setting.

Onboard FDC This option enables the floppy drive controller on the motherboard. The settings are Enabled or Disabled. The Optimal default setting is Enabled. The Fail-Safe default setting is Disabled.

Onboard Serial Port1 This option enables serial port 1 on the motherboard and specifies the base I/O port address for serial port 1.

Onboard Serial Port2 This option enables serial port 2 on the motherboard and specifies the base I/O port address for serial port 2.

Onboard Serial Port3 This option enables serial port 3 on the motherboard and specifies the base I/O port address for serial port 3.

Onboard Serial Port4 This option enables serial port 4 on the motherboard and specifies the base I/O port address for serial port 4.

Onboard Parallel Port This option enables the parallel port on the motherboard and specifies the parallel port base I/O port address. The settings are 378h, 278h, or Disabled.

Parallel Port Mode This option specifies the parallel port mode. ECP and EPP are both bidirectional data transfer schemes that adhere to the IEEE P1284 specifications.

EPP Version

Parallel Port DMA Channel This option is only available if the setting for the Parallel Port Mode option is ECP.

Parallel Port IRQ This option is to set the IRQ of parallel port.

Howto : Flash the BIOS

What do you need ?

To flash your BIOS you'll need

- 1) a xxxxx.rom file that is a file image of the new BIOS
- 2) FLASH634.EXE a utility that can write the data-file into the BIOS chip.

The procedure

Create a new, clean DOS (format under Win95/Win98 etc is acceptable as long as the disk can boot) bootable floppy with "format a: /s".

Copy flash utility and the BIOS image file to this disk.

Make sure you have a complete and full back up of your data. Also make sure you have copied all of the CMOS settings down prior to making any BIOS changes.

Boot MS-DOS from the floppy and run the flash writer with the image filename as argument eg:

```
FLASH634 xxxxxx.ROM
```

After the writer is completed, turn off the system power and turn back on to boot

Enter the CMOS setup (either press F1 or the DEL key).

Set everything to the defaults and check your system.

What if things go wrong

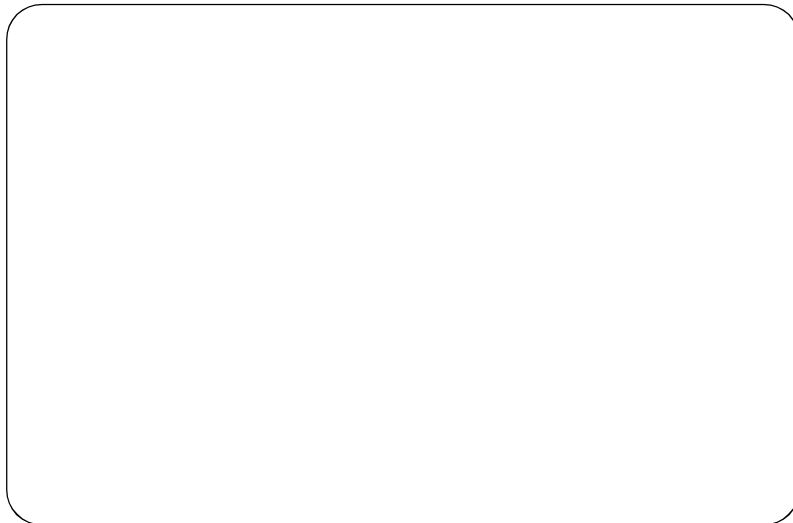
If you use the wrong Flash BIOS or if the writing process gets interrupted, there is a fat chance that your computer won't boot anymore. Then please contact your local dealer to fix your problem.

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.



Any advice or comments about our products and service, or anything we can help you with please don't hesitate to contact with us. We will do our best to support your products, projects and business.



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