SBC-370

Board Processor Guide

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Precautions

Some components on SBC-370 are very sensitive to static electric charges and can be damaged by a sudden rush of power. To protect it from unintended damage, be sure to follow these precautions:

Ground yourself to remove any static charge before touching the SBC-370. You can do this by using a grounded wrist strap at all times or by frequently touching any conducting materials that are connected to the ground.

Handle your SBC-370 by its edges. Don't touch IC chips, leads, or circuitry if not necessary.

Do not plug any connector or jumper while the power is on.

Do not put your SBC-370 unprotected on a flat surface because it has components on both sides.

BATTERY REPLACEMENT CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

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1 **Features**

The Intel® Socket 370 Celeron® and Pentium III (FC-PGA) with AGP VGA and 10/100 Mbps Ethernet Single Board Computer (SBC-370) is a PICMG bus form factor board. It is equipped with a high performance Intel® Celeron processor (up to 500 MHz) or Pentium III (FC-PGA) 500 MHz (or above) processor, and advanced high performance multi-mode I/O.

This board has a built-in DiskOnChip™ (DOC) Flash Disk for embedded applications. The DOC Flash Disk is 100% compatible to hard disk. Users can use any DOS command without any extra software utility. The DOC currently is available from 2 MB to 144 MB.

An advanced high performance super AT I/O chip - Winbond W83977TF is used in the SBC-370 board. The on-chip UARTs are compatible with NS16C550. The parellel port and IDE interface are compatible with IBM PC/AT architecture.

SBC-370 uses the advanced Intel 440BX Chipset which is 100% compatible chipset with PCI 2.1 standard.

FEATURE LIST

CPU

- Intel Celeron® processor up to 500 MHz and Pentium III (FC-PGA) 500 MHz (or above) processor
- PICMG bus, meets PCI 2.1 standard
- 7DMA channels
- 15 Interrupt levels
- Intel 82440BX 66/100MHz CPU Clock Chipset

SDRAM

- Four 168-pin DIMM sites support up to 1 GB SDRAM
- Each DIMM module is 3.3 V SDRAM with a maximum of 256 MB

AGP VGA Controller

- S3 Trio® 3D/2x AGP VGA controller
- 133 MHz AGP bus speed
- Screen resolutions supported up to 1280 x 1024 x 64K colors @ 60 Mz refresh
- Screen resolutions also supported up to:
    - 1600 x 1200 x 64K colors at 85 Hz refresh, non-interlaced mode
    - 1024 x 768 x 16M colors at 85 Hz refresh, non-interlaced mode

Ethernet Controller

- Realtek RTL8139 IEEE802.u 100 BaseTX standard
- Dual Auto-sensing interface to 10Mbps, 100Mbps Network
- RJ45 connector for 10 BaseTX and 100 BaseTX
- Full Duplex capability
- Full software driver support

Ultra DMA/33 Enhanced PCI EDI Interface

- Up to four PCI Enhance IDE hard drives
- Data transfer up to 33 MB/s
- Compatible with existing ATA-2 IDE specifications

Multi-I/O Chip

- W83977
- All I/O setup by BIOS
- Two 16C550 RS-232C Ports
- One EPP/ECP Parallel Port, Floppy Port

Floppy Disk Drive Interface

- Two 2.88 MB, 1.44MB, 1.2MB, 720K, or 360K floppy disk drives

Two High Speed Series Ports

- NS16C550 compatible UARTs

Parallel Port

- Bidirectional

Hardware Monitoring System

- Built-in LM78 hardware monitoring system
- Monitors power supply voltage and fan speed status

IrDA Port

- Supports Serial Infrared (SIR) and Amplitude Shift Keyed IR(ASKIR) interface

USB Port

- Supports two USB ports for future expansion

ISAPLUS

- Enhance the ISA bus drive capability

E2Key™

- 1Kbit EEPROM (nonvolatile memory)
- Accepts read/write data by customer's program
- Stores system ID, password, and critical data on the board

Watchdog Timer

- Can be set by 1, 2, 10, 20, 110, or 220 second periods
- Reset or NMI is generated when CPU does not periodically trigger the timer
- Your program uses hex 043 and 443 to control the watchdog and generate a system reset

Flash Disk - DiskOnChip™

- 100% compatibility with hard disk
- Supports M-Systems
- Built-in True FFS Transparent Flash Block Management and Space Reclamation, which allows the use of the Flash Disk with DOS command with no need for any extra software utility
- 2 MB to 144 MB

ATX Power Supply Function

- Connect to the backplanes and /or the ISBC card

Power Consumption

- +5V/6.8A (Celeron 333 MHz, 512 MB SDRAM), +12V/170mA (maximum), -12V/60mA (maximum)

Operating Humidity

- 5 - 95%, non-condensing

WATCHDOG TIMER

The Watchdog Timer is provided to ensure that standalone systems can recover from catastrophic conditions that cause the CPU to crash. This condition can occur from external EMI or a software bug. When the CPU stops working correctly, hardware on the board will either perform a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

Two I/O ports control the Watchdog Timer:

443 (hex)	Read	Enable to refresh the Watchdog Timer
043 (hex)	Read	Disable the Watchdog Timer

To enable the Watchdog Timer, a read from I/O port 443H must be performed. This will enable and activate the countdown timer which will eventually timeout and either reset the CPU or cause a NMI, depending on the setting of JP5. To ensure that this reset condition does not occur, the Watchdog Timer must periodically be refreshed by reading the same I/O port 433H. This must be done within the time-out period that is selected by JP12.

A tolerance of at least 20% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time consuming. Therefore, if the timeout period has been set to 10 seconds, the I/O port 443H must be read within 7 seconds.

Note: When exiting a program, it is necessary to disable the Watchdog Timer, otherwise the system will reset.

E²KEY™ FUNCTION

The SBC-370 provides an E²KEY™ function for system integrators. Based on the E²KEY utility, you can freely store the ID Code, Password, or Critical Data in the 1Kbit EEPROM. Because the EEPROM is nonvolatile memory, you don't have to worry about losing important data.

The E²KEY utility is based on a 1Kbit EEPROM which is configured to 64 words (from 0 to 63). You can access (read or write) each word at any time.

The E²KEY utility is provided on a CD-ROM with your system. The software utility will include four files as files:

- README.DOC
- E2KEY.OBJ
- EKEYDEMO.C
- EKEYDEMO.EXE

The E2KEY.OBJ provides two library functions for you to integrate your application with the E²KEY function. The read_e2key and write_e2key libraries are written and compiled in C language. To implement them, refer to the functions below:

*/unsigned int read_e2key(unsigned int address): This function will return the E²KEY data to a certain address. The address range is from 0 to 63. Return data is one word, 16 bits.

*/void write_e2key(unsigned int address, unsigned data): This function will write the given data to E²Key to a certain address. The address is from 0 to 63. The data value is from 0 to 0xffff.

To begin using this function, refer to the included EKEYDEMO.C code.

> *Note:* The E²KEY function is based on the parallel port. Therefore, you should enable SBC-370's parallel port or it will not work.

CONNECTING TO AN ATX POWER SUPPLY

To Connect ATX Power Supply to the Backplanes and/or the ISBC Card

1. Disconnect the AC cord from the power supply to prevent sudden electric surge.

2. Connect the ATX power supply switch to the pin 17 (power button) and pin 19 (+5VSB) of CN7 (multi panel) on the board.
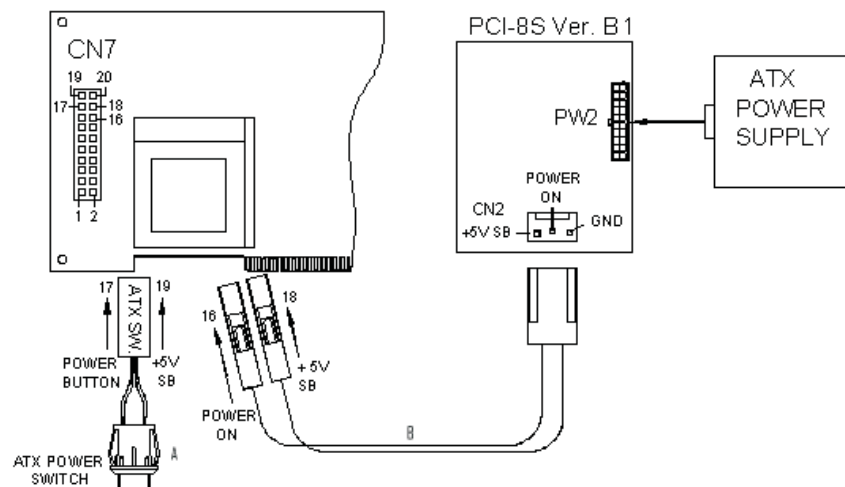
Figure 1. SBC-370 (through Power Button and +5VSB).

• To turn off the power supply, push the ATX power switch button for about four seconds.

• To turn the system on, push the button once.

② Board Configuration
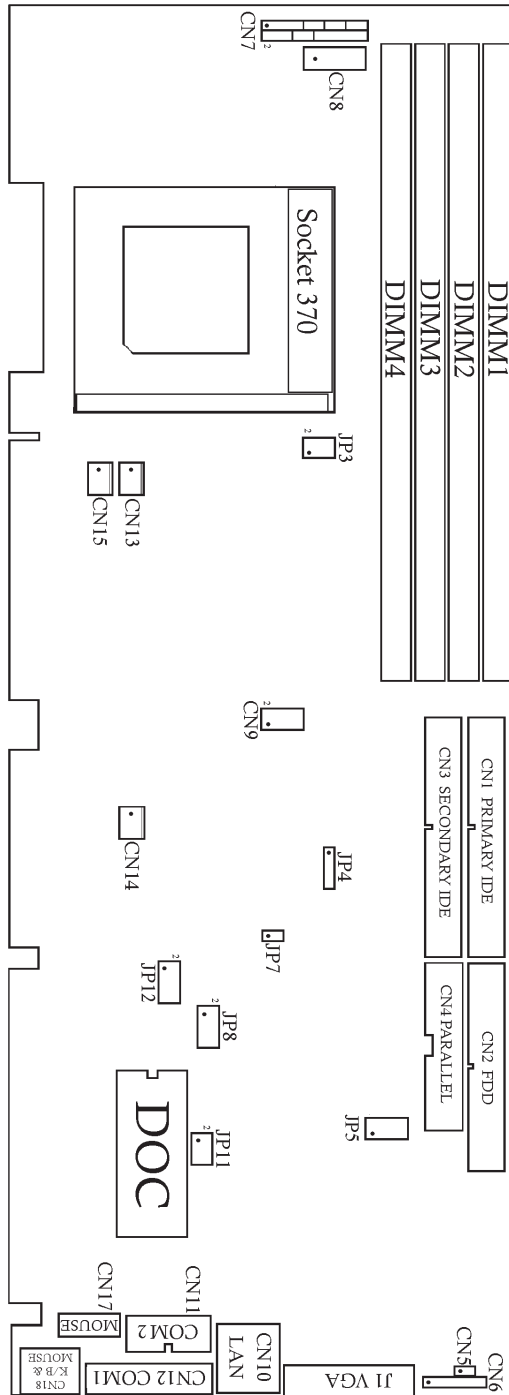
Figure 2. SBC-370 Configuration.
JP3, CPU Frequency
JP8, CPU Multiplier Setting
JP5, Watchdog Timer Type Setting
JP12, Watchdog Timeout Period
JP11, DiskOnChip Memory Address Setting
JP4, Clear CMOS Setup
JP7, PS/2 Mouse Setting
CN2, Floppy Disk Drive
CN1, Primary IDE
CN3, Secondary IDE
CN4, Parallel Port
CN12, Serial Port 9-pin D-sub (COM1)
CN11, Serial Port 2x5 pin header (COM2)
CN8, External Keyboard
CN17, Mouse
CN18, Keyboard/Mouse
CN7, Multi Panel Switch
CN9, USB
CN6, IrDA
J1, VGA
CN10, LAN RJ45
CN5, LED Connector for LAN
CN13, CPU Fan
CN14, System1 Fan
CN15, System2 Fan
DIMM1/2/3/4, DIMM Sockets
Socket 370, Intel Socket 370 Celeron processor

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The default settings are highlighted in the tables that follow.

CPU Frequency Setting (JP3)

Frequency	1-3	2-4	3-5	4-6
50 MHz	OFF	OFF	ON	ON
66 MHz/100 MHz*	ON	ON	OFF	OFF
75 MHz	OFF	ON	ON	OFF
83.3 MHz	ON	OFF	OFF	ON

*Intel Celeron CPU will auto-detect 66 MHz.

* Intel Pentium III (FC-PGA) CPU will auto detect 100MHz.

*Refer to figure 2 for the location of JP3.

CPU Multiplier Setting (JP8)

Ration	1-2	3-4	5-6	7-8
3.0 x	ON	OFF	ON	ON
3.5 x	ON	OFF	OFF	ON
4.0 x	OFF	ON	ON	ON
4.5 x	OFF	ON	OFF	ON
5.0 x	OFF	OFF	ON	ON
5.5 x	OFF	OFF	OFF	ON
6.0 x	ON	ON	ON	OFF
6.5 x	ON	ON	OFF	OFF
7x	ON	OFF	ON	OFF
7.5x	ON	OFF	OFF	OFF
8x	OFF	ON	ON	OFF

Refer to figure 2 for the location of JP8.

Watchdog Timer Type Setting (JP5)

The Watchdog Timer is enabled by reading port 443H. It should be triggered before the timeout period ends; otherwise, it will assume the program operation is abnormal and will issue a reset signal to reboot or activate NMI to CPU. The Watchdog Timer is disabled by reading port 043H.

Pin Number	Description
1-2	NMI
2-3	RESET

Refer to figure 2 for the location of JP5.

Watchdog Timeout Period (JP12)

Period	1-2	3-4	5-6	7-8
1 sec.	OFF	OFF	ON	OFF
2 sec.	OFF	OFF	ON	ON
10 sec.	OFF	ON	OFF	OFF
20 sec.	OFF	ON	OFF	ON
110 sec.	ON	OFF	OFF	OFF
220 sec.	ON	OFF	OFF	ON

Refer to figure 2 for the location of JP12.

DiskOnChip™ Memory Address Setting (JP11)

The DiskOnChip™ (DOC) Flash Disk Chip is produced by M-Systems. No extra software utility is needed because the DOC is 100% compatible to hard disk. It is "plug and play", easy, and reliable. The DOC is available from 2 MB to 144 MB.

Pin Number	Address
1-2	CE00-CFFF
3-4	D600-D7FF
5-6	DE00-DFFF

Refer to figure 2 for the location of JP11.

Clear CMOS Setup (JP4)

If you forget the CMOS password, you can clear or reset it by closing JP4. After JP4 is closed, turn on the power for about three seconds, then turn it off and open JP4. Now, the password has been cleared from your CMOS.

Pin Number	Description
2-3	Normal Operation
3-4	Clear CMOS Setup

> *Note:* 1-4 is for connection with external battery (4=GND)

Refer to figure 2 for the location of JP4.

PS/2 Mouse Setting (JP7)

The PS/2 mouse uses IRQ12 while in operation.

JP7	Description
ON	Enable the PS/2 Mouse, IRQ12
OFF	Disable the PS/2 Mouse

Refer to figure 2 for the location of JP7.

This section describes how to connect peripherals, switches, and indicators to the SBC-370.

Floppy Disk Drive Connector (CN2)

The SBC-370 is equipped with a 34-pin daisy-chain drive connector cable. For the location of this connector, refer to CN2 in figure 2.

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

PCI E-IDE Disk Drive Connector (CN1/CN3)

You can attach four IDE (Integrated Device Electronics) hard disk drives to the SBC-370 IDE controller.

- CN1 (IDE 1): Primary IDE Connector
- CN3 (IDE 2): Secondary IDE Connector

For the location of these connectors, refer to CN1 and CN3 in figure 2.

Pin Number	Description	Pin Number	Description
1	RESET#	21	IDE DRQ
2	GND	22	GND
3	DATA 7	23	IOW#
4	DATA 8	24	GND
5	DATA 6	25	IOR#
6	DATA 9	26	GND
7	DATA 5	27	IDE CHRDY
8	DATA 10	28	GND
9	DATA 4	29	IDE DACK
10	DATA 11	30	GND
11	DATA 3	31	INTERRUPT
12	DATA 12	32	NC
13	DATA 2	33	SA 1
14	DATA 13	34	NC
15	DATA 1	35	SA 0
16	DATA 14	36	SA 2
17	DATA 0	37	HDC CS0#
18	DATA 15	38	HDC CS1#
19	GND	39	HDD ACTIVE#
20	NC	40	GND

Parallel Port (CN4)

This port is usually connected to a printer. The SBC-370 includes an onboard parallel port accessed through a 26-pin flat-cable connector. For the location of this connector, refer to CN4 in figure 2.

Pin Number	Description
1	STROBE#
2	DATA 0
3	DATA 1
4	DATA 2
5	DATA 3
6	DATA 4
7	DATA 5
8	DATA 6
9	DATA 7
10	ACKNOWLEDGE
11	BUSY
12	PAPER EMPTY
13	PRINTER SELECT
14	AUTO FORM FEED #
15	ERROR#
16	INITIALIZE
17	PRINTER SELECT LN#
18	GND
19	GND
20	GND
21	GND
22	GND
23	GND
24	GND
25	GND
26	NC

Serial Ports (CN12/CN11)

The SBC-370 offers two high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports (COM1/COM2).

• CN12: Serial Port 9-pin D-sub Connector (COM1)

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

• CN11: Serial Port 2x5 pin header Connector (COM2)

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

For the location of these connectors, refer to CN12 and CN11 in figure 2.

Keyboard/Mouse Connector (CN8/CN17/CN18)

The SBC-370 provides one external keyboard, one external mouse, and one PS/2 keyboard and mouse connector.

• CN8: 5-pin Header External Keyboard Connector (see note below)

Pin Number	Description
1	KB CLK
2	KB DATA
3	NC
4	GND
5	+5V

• CN17: PS/2 Mouse 5-pin Header Connector

Pin Number	Description
1	MS DATA
2	NC
3	GND
4	+5V
5	MS CLK

• CN18: 6-pin Mini-DIN PS/2 Keyboard and Mouse Connector (see note below)

Pin Number	Description
1	KB DATA
2	NC
3	GND
4	+5V
5	KB CLK
6	NC

For the location of these connectors, refer to figure 2.

Note: A keyboard cannot be connected to CN8 and CN18 simultaneously. A mouse cannot be connected to CN17 and CN18 simultaneously. One of each device can be connected to CN18 via a Y adapter cable) or CN8 and CN17.

External Switches and Indicators (CN7)

There are several external switches and indicators for monitoring and controlling the CPU board. All the functions are in the CN7 Multi Panel connector. For the location of this connector, refer to figure 2.

Pin Number	Description	Pin Number	Description
1	SPEAKER	11	GND
2	VCC	12	GND
3	NC	13	IDE LED
4	NC	14	NC
5	NC	15	+5V
6	GND	16	ATX POWER CONTROL
7	+5V	17	ATX POWER BUTTON
8	KEYLOCK	18	ATX 5VSB
9	RESET SW	19	ATX 5VSB
10	GND	20	ATX 5VSB

USB Port Connector (CN9)

The SBC-370 has two built-in USB ports for future I/O bus expansion. Pins 1, 3, 5, and 7 for USB 0. Pins 2, 4, 6, and 8 for USB 1. For the location of this connector, refer to figure 2.

Pin Number	Description
1	VCC
3	SBD0-
5	SBD0+
7	GND
2	GND
4	SBD1+
6	SBD1-
8	VCC

IrDA Infrared Interface Port (CN6)

The built-in IrDA port supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. To use the IrDA port, configure the SIR or ASKIR model in the BIOS's Peripheral Setup's COM2. Then, the normal RS-232 COM2 will be disabled. For the location of this connector, refer to figure 2.

Pin Number	Description
1	VCC
2	FIR-RX
3	IR-RX
4	GND
5	IR-TX
6	CIR-RX

VGA Connector (J1)

The built-in 15-pin VGA connector can be connected directly to your monochrome CRT monitor as well as a high resolution color CRT monitor. For the location of this connector, refer to figure 2.

Pin Number	Description
1	RED
2	GREEN
3	BLUE
4	NC
5	GND
6	GND
7	GND
8	GND
9	VCC
10	GND
11	NC
12	DDC DATA
13	HSYNC
14	VSYNC
15	DDC CLK

LAN RJ45 Connector (CN10)

The SBC-370 is equipped with a built-in 10/100Mbps Ethernet Controller. You can connect it to your LAN through the RJ45 LAN connector. For the location of this connector, refer to figure 2.

Pin Number	Description
1	TX+
2	TX-
3.	RX+
4.	75 Ω termination
5.	75 Ω termination
6.	RX-
7.	75 Ω termination
8.	75 Ω termination

LED Connector for LAN (CN5)

For the location of this connector, refer to figure 2.

Pin Number	Description
1	VCC
2	LAN ACT.

Fan Connector (CN13/CN14/CN15)

The SBC-370 provides one CPU cooling fan connector and two system fan connectors. These connectors can supply 12V/500mA (maximum) to the cooling fan. The connector has a rotation pin that supplies the fan's rotation signal to the system so that the system BIOS can read the fan speed. For the location of each connector, refer to figure 2.

- CN13: CPU Fan Connector

- CN14: System1 Fan Connector

- CN15: System2 Fan Connector

Pin Number	Description
1	Fan Sensor
2	+12V
3	GND

SYSTEM INTERRUPTS (IRQS)

IRQ	Description
IRQ0	System Timer
IRQ1	Keyboard
IRQ2	Cascade to IRQ Controller
IRQ3	COM2/COM4
IRQ4	COM1/COM3
IRQ5	Unused
IRQ6	Floppy Drive (FDC)
IRQ7	Printer
IRQ8	Real Time Clock
IRQ9	Unused
IRQ10	Unused
IRQ11	Unused
IRQ12	PS/2 Mouse
IRQ13	FPU
IRQ14	Primary IDE
IRQ15	Secondary IDE

DMA CHANNEL ASSIGNMENTS

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA Controller 1
5	Available
6	Available
7	Available

1ST MB MEMORY ADDRESS MAP

The default setting is highlighted.

Memory Address	Description
00000-9FFFF	System Memory
A0000-BFFFF	VGA Buffer
C0000-CBFFF	VGA BIOS
D6000-D7FFF	DOC 2000
E0000-FFFFF	System BIOS
1000000-	Extend BIOS

I/O MAP

I/O Address Range	Description
000-01F	DMA Controller #1
020-021	Interrupt Controller #1, Master
040-05F	8254 Timer
060-06F	8042 (Keyboard Controller)
070-07F	Real time Clock, NMI (non-maskable interrupt) Mask
080-09F	DMA Page Register
0A0-0BF	Interrupt Controller #2
0C0-0DF	DMA Controller #2
0F0	Clear Math Coprocessor Busy
0F1	Reset Math Coprocessor
0F8-0FF	Math Coprocessor
1F0-1F8	Fixed Disk
200-207	Game I/O
278-27F	Parallel Printer Port 2 (LPT3)
2E8-2EF	Serial Port 4
2F8-2FF	Serial Port 2
300-31F	Prototype Card
360-36F	Reserved
378-37F	Parallel Printer Port 1 (LPT2)
380-38F	SDLC, Bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome Display and Printer Adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/Graphics Monitor Adapter
3E8-3EF	Serial Port 3
3F0-3F7	Diskette Controller
3F8-3FF	Serial Port 1
443	Watchdog Timer Enable
043	Watchdog Timer Disable

③ AMI BIOS Setup Menus

The SBC-370 uses the AMI PCI/ISA BIOS for system configuration. The AMI BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options for end user requirements. This section is provided to assist you in the proper usage of these features.

GETTING STARTED

When you turn the system on, the BIOS will enter the Power-On-Self-Test routines. These routines will be executed for system test and initialization and system configuration verification.

Hit DEL if you want to run SETUP

To access AMI PCI/ISA BIOS Setup program, press the Del key. The following screen will be displayed at this time.

```
        AMIBIOS HIFLEX SETUP UTILITY - VERSION 1.23
        (C)1998 American Megatrends, Inc. All Rights Reserved



                        Standard CMOS Setup
                        Advanced CMOS Setup
                       Advanced Chipset Setup
                       Power Management Setup
                      PCI / Plug and Play Setup
                          Peripheral Setup
                       Hardware Monitor Setup
                        Change User Password
                      Change Supervisor Password
                        Auto-Detect Hard Disks
                 Auto Configuration with Optimal Settings
                 Auto Configuration with Fail Safe Settings
                        Save Settings and Exit
                         Exit Without Saving




        Standard CMOS setup for changing time, date, hard disk type, etc.
             ESC:Exit   ↑↓:Sel   F2/F3:Color   F10:Save & Exit
```

STANDARD CMOS SETUP

The standard CMOS Setup is used for basic hardware system configuration. The main

function is for Date/Time setting and Floppy/Hard Disk setting. Refer to the following screen.

```
                 AMIBIOS SETUP - STANDARD CMOS SETUP
            (C)1998 American Megatrends, Inc. All Rights Reserved

Date (mm/dd/yyyy): Thu Apr 15,1999              Base Memory: 0 KB
Time (hh/mm/ss)  : 14:50:39                     Extd Memory: 0 MB

Floppy Drive A:    1.44 MB 3½
Floppy Drive B:    Not Installed
                                               LBA  Blk  PIO  32Bit
            Type            Size  Cyln  Head WPcom Sec Mode Mode Mode Mode
Pri Master : Auto                                                 On
Pri Slave  : Auto                                                 On
Sec Master : Auto                                                 On
Sec Slave  : Auto                                                 On

Boot Sector Virus Protection    Disabled

Month:  Jan - Dec                              ESC:Exit  ↑↓:Sel
  Day:    01 - 31                              PgUp/PgDn:Modify
 Year: 1901 - 9999                             F1:Help F2/F3:Color
```

Date/Time: Use the left arrow, right arrow, and **Enter** keys to move from one field to the next. The numeric keys, 0-9, are used to change the field values. To set the date (MM:DD:YYYY), select one of the fields (Month, Day, or Year) and then press either **PgUp** or **PgDn** to set it to the current Month, Day, and Year. Follow the same procedure for setting the Time (HH/MM/SS). The hour is calculated according to a 24-hour military clock, i.e., 00:00:00 through 23:59:59.

> *Note:* It is not necessary to enter the seconds or type zeros in front of numbers.

IDE hard disk drive setup: Use one of the following setup procedures:

• Use the Auto setting for detection during boot-up.

• Use the Auto-Detect Hard Disk option in the main menu; the computer will automatically detect the HDD specifications.

• Manually enter the specifications from the **User** option.

ADVANCED CMOS SETUP

The Advanced CMOS Setup is designed for optimizing the performance of the SBC-370. Under normal operation, you do not have to change any default settings. The default settings are preset for the most reliable operation.

The following screen will be displayed if you select Advanced CMOS Setup:

```
                 AMIBIOS SETUP - ADVANCED CMOS SETUP
          (C)1998 American Megatrends, Inc. All Rights Reserved

 Quick Boot                      Enabled      │  Available Options:
 1st Boot Device                 Floppy       │    Disabled
 2nd Boot Device                 IDE-0        │  ▶ Enabled
 3rd Boot Device                 CDROM        │
 Try Other Boot Devices          Yes          │
 Floppy Access Control           Read-Write   │
 Hard Disk Access Control        Read-Write   │
 S.M.A.R.T. for Hard Disks       Disabled     │
 BootUp Num-Lock                 On           │
 Floppy Drive Swap               Disabled     │
 Floppy Drive Seek               Disabled     │
 PS/2 Mouse Support              Enabled      │
 System Keyboard                 Absent       │
 Primary Display                 Absent       │
 Password Check                  Setup        │
 Boot To OS/2 > 64MB             No           │
 CPU Serial Number               Enabled      │
 Cache Bus ECC                   Disabled     │  ESC:Exit  ↑↓:Sel
 System BIOS Cacheable           Enabled      │  PgUp/PgDn:Modify
 C000,16k Shadow                 Cached       │  F1:Help F2/F3:Color
```

You can change the value of each option by using the PgUp and PgDn key. The available options are shown on the right side of the screen.

Quick Boot > : With the Quick Boot set to Enabled, the BIOS will only check the first 1 MB of the system memory, providing a quick boot when you turn on your computer. With the Quick Boot Disabled, the BIOS will test all system memory when it boots up. It will spend about 40 seconds until it receives a Ready signal from the HDD. It will also wait for you to press the Del key.

1st, 2nd, 3rd Boot Device >: This is used to define the sequence of boot drives after the routine check up completes. If the 1st Boot Device fails, the BIOS will attempt to boot from the 2nd or 3rd device. The Optimal and Fail-Safe default settings are C:, A:, CDROM.

Try Other Boot Devices >: The BIOS will try to boot from any other available device in the system if the 1st, 2nd, and 3rd device fails to boot.

Floppy Access Control >: This defines the read/write access which is set when booting from a floppy drive.

Hard Disk Access Control >: This defines the read/write access which is set when booting from a HDD.

S.M.A.R.T. for Hard Disks >: Allows the BIOS to use the System Management and Reporting Technologies protocol for reporting server system information on a network.

BootUp Num-Lock >: Turns on/off the Num-Lock option on an enhanced keyboard when you boot. If you turn it off, the arrow keys on the numeric keypad can be used just as the other set of arrow keys on the keyboard and vice versa.

Floppy Drive Swap >: This function enables you to swap the floppy disk drives through software without moving the hardware.

Floppy Drive Seek >: When this option is **Enabled**, the BIOS will perform a Seek command on floppy drive A: before boot-up.

PS/2 Mouse Support >: This is used to determine whether or not a PS/2 mouse is supported.

System Keyboard >: Configures the keyboard. If you set it to **Absent**, the BIOS will not report keyboard errors.

Primary Display >: Used to define the type of display monitor for the system. The **Absent** option is for network file servers.

Password Check >: Used to define whether or not a password is necessary for access to the BIOS setup.

Boot to OS/2 >: If you run the OS/2 operating system, this option must be set to **Yes**, permitting the BIOS to run properly if OS/2 or any other OS that does not support Plug and Play is found in your computer.

CPU Serial Number> : This option is available only if you use a Pentium® III processor.

Cache Bus ECC >: This option is available only if you use a Pentium® III processor.

System BIOS Cacheable >: Used to define whether or not the memory segment FOOOH can be read from or written to cache memory. Setting it to **Enabled** will provide faster execution in your system.

XXXX, 16k Shadow >: ROM Shadow is a technique in which BIOS code is copied from slower ROM to faster RAM. If you enable it, the BIOS will be executed from the RAM. Each option allows 16 K segment to be shadowed to the RAM.

ADVANCED CHIPSET SETUP

These setup functions are working mostly for Chipset (Intel 440BX). These options are used to change the Chipset's registers. Carefully change any default setting, otherwise the system will run unstably.

```
             AMIBIOS SETUP - ADVANCED CHIPSET SETUP
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 ******** SDRAM Timing ********              Available Options:
  Configure SDRAM Timing by SPD  Disabled   ▶ Disabled
   SDRAM RAS# to CAS# delay      3 SCLKs       Enabled
   SDRAM RAS# Precharge          3 SCLKs
   SDRAM CAS# Latency            3 SCLKs
   SDRAM Leadoff Cmd Timing      Auto
 DRAM Integrity Mode             Non-ECC
 DRAM Refresh Rate               15.6 us
 Memory Hole                     Disabled
 VGA Frame Buffer USWC           Disabled
 PCI Frame Buffer USWC           Disabled
 USWC Write Post                 Enabled
 Graphics Aperture Size          64MB
 Search for MDA Resources        Yes
 8bit I/O Recovery Time          1 Sysclk
 16bit I/O Recovery Time         1 Sysclk
 USB Passive Release             Enabled
 PIIX4 Passive Release           Enabled    ESC:Exit   ↑↓:Sel
 PIIX4 Delayed Transaction       Disabled   PgUp/PgDn:Modify
 USB Function                    Disabled   F1:Help F2/F3:Color
```

Configure SDRAM Timing by SPD >: Enabled will select predetermined optimal values of chipset parameters. When **Disabled**, chipset parameters return to setup information stored in CMOS.

SDRAM RAS# to CAS Delay >: Used to specify the relative delay between row and column address strobe from SDRAM.

SDRAM RAS# Precharge >: This option specifies the length of time for Row Address Strobe from SDRAM to precharge.

SDRAM CAS# Latency >: Used to specify the CAS latency timing from SDRAM DRAM.

DRAM Integrity Mode >: Used to choose DRAM Integrity Mode; ECC/EC will enable the Error Checking and Correction DRAM integrity mode.

DRAM Refresh Rate >: Used to specify the timing for DRAM Refresh.

Memory Hole >: Used to specify the location of a memory hole in the CMOS RAM. This setting reserves 15 to 16 MB memory address space for ISA expansion cards that specifically require this setting. Memory from 15 MB and up will be unavailable to the system because expansion cards can only access memory up to 16 MB.

VGA Frame Buffer USWC >: Used to specify whether or not a caching of the video A000-BFFF RAM is allowed. **Enabled** will provide better system performance.

PCI Frame Buffer USWC >: Used to specify whether or not a caching of the PCI VGA frame buffer is allowed.

USWC Write Post >: Enable or disable the use of Uncacheable, Speculatable, Write-Combined memory.

Graphics Aperture Size >: Define the size of Graphics Aperture.

Search for MDA Resources >: Allows the BIOS to search for MDA resources when **Yes** is specified.

8bit I/O Recovery Time >: Define the length of time for 8 bit I/O recovery.

16bit I/O Recovery Time >: Define the length of time for 16 bit I/O recovery.

USB Passive Release >: Specify whether or not PIIX4 is allowed to use Passive Release while transferring control data for USB transactions.

PIIX4 Passive Release >: PIIX4 points to the Intel 82371AB PCI/ISA/IDE Xcelerator chip. Setting this option to **Enabled** will prioritize PCI at the top, then IDE and ISA.

PIIX4 Delayed Transaction >: Used to enable or disable the embedded 32-bit posted write buffer, which supports delay transaction.

USB Function >: Enable or disable the USB (Universal Serial Bus) functions.

```
                 AMIBIOS SETUP - POWER MANAGEMENT SETUP
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Power Management/APM          Disabled        Available Options:
Green PC Monitor Power State  Off             ▶ Disabled
Video Power Down Mode         Disabled          Enabled
Hard Disk Power Down Mode     Disabled
Standby Time Out (Minute)     Disabled
Suspend Time Out (Minute)     Disabled
Throttle Slow Clock Ratio     50-62.5%
Modem Use IO Port             N/A
Modem Use IRQ                 N/A
Display Activity              Ignore
Device 6 (Serial port 1)      Monitor
Device 7 (Serial port 2)      Monitor
Device 8 (Parallel port)      Ignore
Device 5 (Floppy disk)        Monitor
Device 0 (Primary master IDE) Monitor
Device 1 (Primary slave IDE)  Ignore
Device 2 (Secondary master IDE) Monitor
Device 3 (Secondary slave IDE)  Ignore    ESC:Exit  ↑↓:Sel
Power Button Function         Suspend       PgUp/PgDn:Modify
Ring Resume From Soft Off     Disabled      F1:Help F2/F3:Color
```

Power Management/APM >: Enables or disables the Advanced Power Management feature.

Green PC Monitor Power State >: Specify the power state of the monitor after the specified period of display-idle has ended.

Video Power Down Mode >: Specify the power state of the VESA VGA video subsystem after the specified period of display-idle has ended.

Hard Disk Power Down Mode >: Specify the power state of the hard disk after the specified period of hard drive-idle has ended.

Standby Time Out (Minute) >: Specify the length of the system-idle period while the system is in full power-on state. After this period of time has ended, the system will go into Standby state.

Suspend Time Out (Minute) >: Specify the length of the system-idle period while the system is in Standby state. After this period of time has ended, the system will go into Suspend state.

Throttle Slow Clock Ratio >: Specify the speed of the system clock under power saving state. The figure is a ratio between power conserving and normal state CPU clock.

Modem Use IO Port >: Assign a port for modem.

Modem Use IRQ >: Assign an IRQ for modem.

Display Activity >: Specify if the BIOS should monitor display activity or not.

Device X >: Used to monitor or ignore specified device IRQs.

This setup handles the SBC-370 PCI function. All PCI bus slots on the system use INTA#, thus all installed PCI slots must be set.

```
              AMIBIOS SETUP - PCI / PLUG AND PLAY SETUP
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 Plug and Play Aware O/S        No            Available Options:
 Clear NVRAM                    No           ▶ No
 PCI Latency Timer (PCI Clocks) 64             Yes
 PCI VGA Palette Snoop          Disabled
 Allocate IRQ to PCI VGA        Yes
 PCI IDE BusMaster              Disabled
 OffBoard PCI IDE Card          Auto
 OffBoard PCI IDE Primary IRQ   Disabled
 OffBoard PCI IDE Secondary IRQ Disabled
 PCI Slot1 IRQ Priority         Auto
 PCI Slot2 IRQ Priority         Auto
 PCI Slot3 IRQ Priority         Auto
 PCI Slot4 IRQ Priority         Auto
 DMA Channel 0                  PnP
 DMA Channel 1                  PnP
 DMA Channel 3                  PnP
 DMA Channel 5                  PnP
 DMA Channel 6                  PnP          ESC:Exit   ↑↓:Sel
 DMA Channel 7                  PnP          PgUp/PgDn:Modify
 IRQ3                           PCI/PnP      F1:Help F2/F3:Color
```

Plug and Play Aware O/S >: When PNP OS is installed, interrupts will be reassigned by the OS when the setting is **Yes**. When a non-PNP OS is installed or to prevent reassigning of interrupt settings, set the setting to **No**.

Clear NVRAM >: Specify whether or not the BIOS will clear NVRAM on every boot.

PCI Latency Timer (PCI Clocks) >: Define the latency timing (PCI clock) for all PCI devices on the PCI bus.

PCI VGA Palette Snoop >: This option is useful only for a system with more than one VGA device connected to it through different bus (one PCI and one ISA). To enable those various VGA devices to handle signals from the CPU on each set of palette registers of every video device, it must be set to **Enabled**.

> *Note:* If another PCI or ISA video card is needed other than the onboard VGA, set **PCI VGA Palette Snoop** to **Enabled**. The system will automatically recognize and use the additional video card when **Enabled**.

Allocate IRQ to PCI VGA >: To allocate IRQ to PCI VGA, select **Yes**.

PCI IDE BusMaster >: Used to include the BusMastering capability into the IDE Controller on the PCI.

Offboard PCI IDE Card >: This function is used to specify whether or not an offboard PCI IDE card is installed in your computer. You must specify the slot number on the board which will be used for the card.

Offboard PCI IDE Primary (/Secondary) IRQ >: Specify the PCI interrupt that is assigned to the Primary (/Secondary) IDE channel on the offboard PCI IDE controller.

PCI Slot (1,2,3,4) IRQ Priority >: Specify the IRQ priority to be used by the PCI devices on slots 1 to 4.

DMA Channel (0,1,3,5,6,7) >: Used to indicate whether or not the DMA channel is assigned for a PnP or ISA card.

IRQ (3,4,5,7,9,10,11,14,15) >: Assign the displayed IRQ to be used by a legacy ISA adapter card. The settings are **ISA/EISA** or **PCI/PnP**.

PERIPHERAL SETUP

This setup works mostly on Multi-I/O Chip (W83977F). The options are used to change the Chipset's registers. Carefully change any default setting to meet your application needs. The only concern is Onboard Serial Port 2. If you want to use the IrDA port, you have to configure the SIR or ASKIR model in the BIOS's Peripheral Setup's COM2; the RS-232 COM2 will be disabled.

```
           AMIBIOS SETUP - PERIPHERAL SETUP
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 OnBoard FDC                    Auto          Available Options:
 OnBoard Serial PortA           3F8h/COM1     ▶ Auto
 OnBoard Serial PortB           2F8h/COM2       Disabled
   Serial PortB Mode            Normal          Enabled
     IR Duplex Mode             N/A
     IrDA Protocol              N/A
 OnBoard Parallel Port          378h
   Parallel Port Mode           Normal
   EPP Version                  N/A
   Parallel Port IRQ            7
   Parallel Port DMA Channel    N/A
 OnBoard IDE                    Both




                                              ESC:Exit  ↑↓:Sel
                                              PgUp/PgDn:Modify
                                              F1:Help F2/F3:Color
```

Onboard FDC >: Used to enable the FDC on your board. If you set it to **Auto**, the BIOS will automatically decide if the FDC should be enabled.

Onboard Serial Port A (/B) >: Specify the I/O port address of the serial port 1(/2). If you set it to **Auto**, the BIOS will decide the correct I/O port address automatically.

Serial Port B Mode >: Specify the mode of serial port 2.

IR Duplex Mode >: Specify the mode of IR device that is connected to the IR port.

IrDA Protocol >: Specify the function mode if an IrDA mode is selected.

Onboard Parallel Port >: Specify the I/O port address of the parallel port.

Parallel Port Mode >: Used to specify the mode of parallel port. The options are:

- **Normal** (normal parallel port mode)
- **Bi-Dir** (supports bidirectional transfer)
- **EPP** (supports devices that comply with the Enhanced Parallel Port specification)
- **ECP** (supports devices that comply with the Extended Capabilities Port)

Parallel Port IRQ >: This option is used to assign certain IRQ to the parallel port. The optimal and fail-safe setting is 7.

Parallel Port DMA Channel >: This function is available only if the parallel port mode is ECP. The optimal and fail-safe setting is 3.

Onboard IDE >: Define which onboard IDE controller channel(s) should be used. Available options are: **Primary**, **Secondary**, **Both**, and **Disabled**.

HARDWARE MONITOR SETUP

There is a LM78 chip that can monitor onboard system voltage and fan speed. The voltage monitoring will cover +5V, +12V, -12V, and -5V.

```
               AMIBIOS SETUP - HARDWARE MONITOR SETUP
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 CPU Plug & Play              Auto           Available Options:
 CPU Frequency Selection      100 Mhz           Manual
    -=≡ System Hardware Monitor ≡=-           ▶ Auto
    Current System Temperature 48℃/118℉
    CPU1 Fan Speed            5443 RPM
    CPU2 Fan Speed            0 RPM
    Vtt                       1.520 V
    Vcore                     1.984 V
    Vio                       3.392 V
    + 5.000V                  5.113 V
    +12.000V                  12.728 V
    -12.000V                  -12.209 V
    - 5.000V                  -5.124 V



                                            ESC:Exit  ↑↓:Sel
                                            PgUp/PgDn:Modify
                                            F1:Help F2/F3:Color
```

Note: Normal CPU fan RPM is more than 5000 RPM. If your CPU fan RPM is less than 5000 RPM, something is wrong and the CPU will be in overheat condition. Make sure that the connection at CN12/CN13 is correct.

CHANGE SUPERVISOR/USER PASSWORD

```
         AMIBIOS HIFLEX SETUP UTILITY - VERSION 1.23
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                      Standard CMOS Setup
                      Advanced CMOS Setup
                      Advanced Chipset Setup
                      Power Management Setup
                      PCI / Plug and Play Setup

            Enter new supervisor password:




                Auto Configuration with Optimal Settings
                Auto Configuration with Fail Safe Settings
                      Save Settings and Exit
                      Exit Without Saving


                   Change the supervisor password
        ESC:Exit   ↑↓:Sel   F2/F3:Color   F10:Save & Exit
```

Set a password that is used to protect your system and Setup Utility. Supervisor Password has higher priority than User Password. Once you setup the password, the system will ask you to enter the password every time you enter the BIOS SETUP. If you enter the BIOS SETUP with the Supervisor Password, you can access every setup option on the main menu. With a User Password, you can only choose three setup options (Change User Password, Save Setting and Exit**, and** Exit Without Saving)**. To disable these passwords, enter the BIOS SETUP menu with the Supervisor Password and then press the** Enter **key instead of entering a new password when the** Enter Password **prompt appears.**

AUTO-DETECT HARD DISK

This option detects the parameters of an IDE hard disk drive (HDD sector, cylinder, head, etc.) automatically and will put the parameters into the Standard CMOS Setup screen. Up to 4 IDE drives can be detected and the parameters will be listed in the box. Press Y **if you accept these parameters. Press** N **to skip to the next IDE drive.**

Note: If your IDE HDD was formatted in a previous system, incorrect parameters may be detected. In this case, you need to enter the correct parameters manually or low-level format the disk.

AUTO CONFIGURATION WITH OPTIMAL SETTINGS

This option lets you load the Optimal default settings. These settings are best-case values that will provide the best performance. Whenever your CMOS RAM is damaged, the Optimal settings will be loaded automatically.

```
                AMIBIOS HIFLEX SETUP UTILITY - VERSION 1.23
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                          Standard CMOS Setup
                          Advanced CMOS Setup
                          Advanced Chipset Setup
                          Power Management Setup
                          PCI / Plug and Play Setup

              Load high performance settings (Y/N) ? Y


                    Auto Configuration with Optimal Settings
                    Auto Configuration with Fail Safe Settings
                          Save Settings and Exit
                          Exit Without Saving


              Load configuration settings giving highest performance
                  ESC:Exit  ↑↓:Sel  F2/F3:Color  F10:Save & Exit
```

AUTO CONFIGURATION WITH FAIL SAFE SETTINGS

This option allows you to load the Fail Safe default settings when your computer cannot boot normally. These settings are not optimal, but are the most stable.

```
           AMIBIOS HIFLEX SETUP UTILITY - VERSION 1.23
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                        Standard CMOS Setup
                        Advanced CMOS Setup
                        Advanced Chipset Setup
                        Power Management Setup
                        PCI / Plug and Play Setup

                  Load failsafe settings (Y/N) ? Y


                  Auto Configuration with Optimal Settings
                  Auto Configuration with Fail Safe Settings
                        Save Settings and Exit
                        Exit Without Saving


                  Load failsafe configuration settings
             ESC:Exit   ↑↓:Sel   F2/F3:Color   F10:Save & Exit
```

SAVE SETTINGS AND EXIT

Select this option when you finish setting all the parameters and want to save them into the CMOS. Simply press the Enter key and all the configuration changes will be saved.

EXIT WITHOUT SAVING

Select this option if you want to exit the Setup without saving the changes that you made. Simply press the Enter key and you will exit the BIOS SETUP without saving the changes.

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