

SBC-370

SOCKET 370 CELERON, PENTIUM III

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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I Features

OVERVIEW

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 parallel 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 443H. This must be done within the timeout 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.

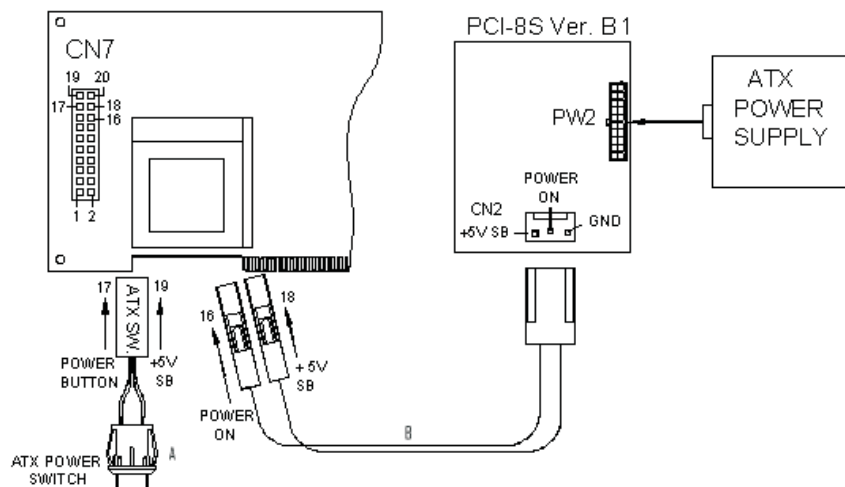


Figure 1. SBC-370 (through Power Button and +5VSB).

- 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

BOARD LAYOUT

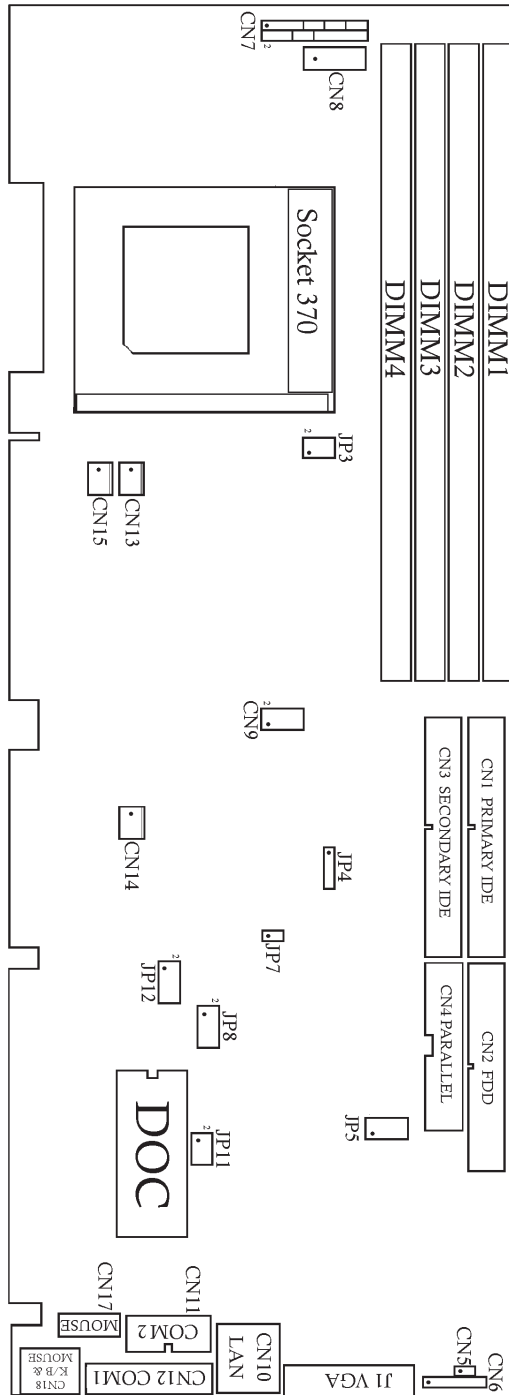


Figure 2. SBC-370

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

JUMPERS

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.

CONNECTORS

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
1	GND
2	REDUCE WRITE
3	GND
4	NC
5	GND
6	NC
7	GND
8	INDEX#
9	GND
10	MOTOR ENABLE A#
11	GND
12	DRIVE SELECT B#
13	GND
14	DRIVE SELECT A#
15	GND
16	MOTOR ENABLE B#
17	GND
18	DIRECTION#

Pin Number	Description
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	SIDE 1 SELECT#
33	GND
34	DISK CHANGE#

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
1	RESET#
2	GND
3	DATA 7
4	DATA 8
5	DATA 6
6	DATA 9
7	DATA 5
8	DATA 10
9	DATA 4
10	DATA 11
11	DATA 3
12	DATA 12
13	DATA 2
14	DATA 13
15	DATA 1
16	DATA 14
17	DATA 0
18	DATA 15
19	GND
20	NC

Pin Number	Description
21	IDE DRQ
22	GND
23	IOW#
24	GND
25	IOR#
26	GND
27	IDE CHRDY
28	GND
29	IDE DACK
30	GND
31	INTERRUPT
32	NC
33	SA 1
34	NC
35	SA 0
36	SA 2
37	HDC CS0#
38	HDC CS1#
39	HDD ACTIVE#
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
1	SPEAKER
2	VCC
3	NC
4	NC
5	NC
6	GND
7	+5V
8	KEYLOCK
9	RESET SW
10	GND

Pin Number	Description
11	GND
12	GND
13	IDE LED
14	NC
15	+5V
16	ATX POWER CONTROL
17	ATX POWER BUTTON
18	ATX 5VSB
19	ATX 5VSB
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							
	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	Blk Mode	PIO 32Bit Mode
Pri Master :	Auto								0n
Pri Slave :	Auto								0n
Sec Master :	Auto								0n
Sec Slave :	Auto								0n
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: Disabled ▶ Enabled
1st Boot Device	Floppy	
2nd Boot Device	IDE-0	
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
0000,16k 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 F000H 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 (C)1998 American Megatrends, Inc. All Rights Reserved	
***** SDRAM Timing *****	
Configure SDRAM Timing by SPD	Disabled
SDRAM RAS# to CAS# delay	3 SCLks
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
PIIX4 Delayed Transaction	Disabled
USB Function	Disabled
Available Options: ▶ Disabled Enabled	
ESC:Exit ↑↓:Sel PgUp/PgDn:Modify 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.

POWER MANAGEMENT SETUP

AMIBIOS SETUP - POWER MANAGEMENT SETUP		
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Power Management/APM	Disabled	Available Options: ▶ Disabled Enabled
Green PC Monitor Power State	Off	
Video Power Down Mode	Disabled	
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	
Power Button Function	Suspend	
Ring Resume From Soft Off	Disabled	
		ESC:Exit ↑↓:Sel PgUp/PgDn:Modify 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.

PCI/PLUG AND PLAY SETUP

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		(C)1998 American Megatrends, Inc. All Rights Reserved	
Plug and Play Aware O/S	No	Available Options: ▶ No Yes	
Clear NVRAM	No		
PCI Latency Timer (PCI Clocks)	64		
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		
DMA Channel 7	PnP		
IRQ3	PCI/PnP	ESC:Exit ↑↓:Sel PgUp/PgDn:Modify 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: ▶ Auto Disabled Enabled ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color
OnBoard Serial PortA	3F8h/COM1	
OnBoard Serial PortB	2F8h/COM2	
Serial PortB Mode	Normal	
IR Duplex Mode	N/A	
IrDA Protocol	N/A	
OnBoard Parallel Port	378h	
Parallel Port Mode	Normal	
EPP Version	N/A	
Parallel Port IRQ	?	
Parallel Port DMA Channel	N/A	
OnBoard IDE	Both	

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	
(C)1998 American Megatrends, Inc. All Rights Reserved	
CPU Plug & Play	Auto
CPU Frequency Selection	100 Mhz
--≡ System Hardware Monitor ≡--	
Current System Temperature	48°C/118°F
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
Available Options: Manual ▶ Auto	
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 (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
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 (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
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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